H. O. PUB. NO. 214

VOL. IX

TABLES OF COMPUTED ALTITUDE AND AZIMUTH

LATITUDES 80° – 89°, INCLUSIVE

U. S. NAVY HYDROGRAPHIC OFFICE

SPEED-TIME-DISTANCE TABLE

SPEED IN KNOTS

Min.	Hr.	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	.017	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
2	.033	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.9	0.9
3	.050	0.3	0.4	0.4	0.4	0.5	0.6	0.6	0.6	0.7	0.8	0.8	0.8	0.9	1.0	1.0	1.0	1.1	1.2	1.2	1.2	1.3	1.4
4	.067	0.4	0.5	0.5	0.6	0.7	0.7	0.8	0.9	0.9	1.0	1.1	1.1	1.2	1.3	1.3	1.4	1.5	1.5	1.6	1.7	1.7	1.8
5	.083	0.5	0.6	0.7	0.8	0.8	0.9	1.0	1.1	1.2	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.8	1.9	2.0	2.1	2.2	2.2
6	.100	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7
7	.117	0.7	0.8	0.9	1.0	1.2	1.3	1.4	1.5	1.6	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.6	2.7	2.8	2.9	3.0	3.2
8	.133	0.8	0.9	1.1	1.2	1.3	1.5	1.6	1.7	1.9	2.0	2.1	2.3	2.4	2.5	2.7	2.8	2.9	3.1	3.2	3.3	3.5	3.6
9	.150	0.9	1.0	1.2	1.4	1.5	1.6	1.8	2.0	2.1	2.2	2.4	2.6	2.7	2.8	3.0	3.2	3.3	3.4	3.6	3.8	3.9	4.0
10	.167	1.0	1.2	1.3	1.5	1.7	1.8	2.0	2.2	2.3	2.5	2.7	2.8	3.0	3.2	3.3	3.5	3.7	3.8	4.0	4.2	4.3	4.5
11	.183	1.1	1.3	1.5	1.6	1.8	2.0	2.2	2.4	2.6	2.8	2.9	3.1	3.3	3.5	3.7	3.8	4.0	4.2	4.4	4.6	4.8	5.0
12	.200	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.4	3.6	3.8	4.0	4.2	4.4	4.6	4.8	5.0	5.2	5.4
13	.217	1.3	1.5	1.7	2.0	2.2	2.4	2.6	2.8	3.0	3.2	3.5	3.7	3.9	4.1	4.3	4.6	4.8	5.0	5.2	5.4	5.6	5.8
14	.233	1.4	1.6	1.9	2.1	2.3	2.6	2.8	3.0	3.3	3.5	3.7	4.0	4.2	4.4	4.7	4.9	5.1	5.4	5.6	5.8	6.1	6.3
15	.250	1.5	1.8	2.0	2.2	2.5	2.8	3.0	3.2	3.5	3.8	4.0	4.2	4.5	4.8	5.0	5.2	5.5	5.8	6.0	6.2	6.5	6.8
16	.267	1.6	1.9	2.1	2.4	2.7	2.9	3.2	3.5	3.7	4.0	4.3	4.5	4.8	5.1	5.3	5.6	5.9	6.1	6.4	6.7	6.9	7.2
17	.283	1.7	2.0	2.3	2.6	2.8	3.1	3.4	3.7	4.0	4.2	4.5	4.8	5.1	5.4	5.7	6.0	6.2	6.5	6.8	7.1	7.4	7.6
18	.300	1.8	2.1	2.4	2.7	3.0	3.3	3.6	3.9	4.2	4.5	4.8	5.1	5.4	5.7	6.0	6.3	6.6	6.9	7.2	7.5	7.8	8.1
19	.317	1.9	2.2	2.5	2.8	3.2	3.5	3.8	4.1	4.4	4.8	5.1	5.4	5.7	6.0	6.3	6.6	7.0	7.3	7.6	7.9	8.2	8.6
20	.333	2.0	2.3	2.7	3.0	3.3	3.7	4.0	4.3	4.7	5.0	5.3	5.7	6.0	6.3	6.7	7.0	7.3	7.7	8.0	8.3	8.7	9.0
21	.350	2.1	2.4	2.8	3.2	3.5	3.8	4.2	4.6	4.9	5.2	5.6	6.0	6.3	6.6	7.0	7.4	7.7	8.0	8.4	8.8	9.1	9.4
22	.367	2.2	2.6	2.9	3.3	3.7	4.0	4.4	4.8	5.1	5.5	5.9	6.2	6.6	7.0	7.3	7.7	8.1	8.4	8.8	9.2	9.5	9.9
23	.383	2.3	2.7	3.1	3.4	3.8	4.2	4.6	5.0	5.4	5.8	6.1	6.5	6.9	7.3	7.7	8.0	8.4	8.8	9.2	9.6	10.0	10.4
24	.400	2.4	2.8	3.2	3.6	4.0	4.4	4.8	5.2	5.6	6.0	6.4	6.8	7.2	7.6	8.0	8.4	8.8	9.2	9.6	10.0	10.4	10.8
25	.417	2.5	2.9	3.3	3.8	4.2	4.6	5.0	5.4	5.8	6.2	6.7	7.1	7.5	7.9	8.3	8.8	9.2	9.6	10.0	10.4	10.8	11.2
26	.433	2.6	3.0	3.5	3.9	4.3	4.8	5.2	5.6	6.1	6.5	6.9	7.4	7.8	8.2	8.7	9.1	9.5	10.0	10.4	10.8	11.3	11.7
27	.450	2.7	3.2	3.6	4.0	4.5	5.0	5.4	5.8	6.3	6.8	7.2	7.6	8.1	8.6	9.0	9.4	9.9	10.4	10.8	11.2	11.7	12.2
28	.467	2.8	3.3	3.7	4.2	4.7	5.1	5.6	6.1	6.5	7.0	7.5	7.9	8.4	8.9	9.3	9.8	10.3	10.7	11.2	11.7	12.1	12.6
29	.483	2.9	3.4	3.9	4.4	4.8	5.3	5.8	6.3	6.8	7.2	7.7	8.2	8.7	9.2	9.7	10.2	10.6	11.1	11.6	12.1	12.6	13.0
30	.500	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5
31	.517	3.1	3.6	4.1	4.6	5.2	5.7	6.2	6.7	7.2	7.8	8.3	8.8	9.3	9.8	10.3	10.8	11.4	11.9	12.4	12.9	13.4	14.0
32	.533	3.2	3.7	4.3	4.8	5.3	5.9	6.4	6.9	7.5	8.0	8.5	9.1	9.6	10.1	10.7	11.2	11.7	12.3	12.8	13.3	13.9	14.4
33	.550	3.3	3.8	4.4	5.0	5.5	6.0	6.6	7.2	7.7	8.2	8.8	9.4	9.9	10.4	11.0	11.6	12.1	12.6	13.2	13.8	14.3	14.8
34	.567	3.4	4.0	4.5	5.1	5.7	6.2	6.8	7.4	7.9	8.5	9.1	9.6	10.2	10.8	11.3	11.9	12.5	13.0	13.6	14.2	14.7	15.3
35	.583	3.5	4.1	4.7	5.2	5.8	6.4	7.0	7.6	8.2	8.8	9.3	9.9	10.5	11.1	11.7	12.2	12.8	13.4	14.0	14.6	15.2	15.8
36	.600	3.6	4.2	4.8	5.4	6.0	6.6	7.2	7.8	8.4	9.0	9.6	10.2	10.8	11.4	12.0	12.6	13.2	13.8	14.4	15.0	15.6	16.2
37	.617	3.7	4.3	4.9	5.6	6.2	6.8	7.4	8.0	8.6	9.2	9.9	10.5	11.1	11.7	12.3	13.0	13.6	14.2	14.8	15.4	16.0	16.6
38	.633	3.8	4.4	5.1	5.7	6.3	7.0	7.6	8.2	8.9	9.5	10.1	10.8	11.4	12.0	12.7	13.3	13.9	14.6	15.2	15.8	16.5	17.1
39	.650	3.9	4.6	5.2	5.8	6.5	7.2	7.8	8.4	9.1	9.8	10.4	11.0	11.7	12.4	13.0	13.6	14.3	15.0	15.6	16.2	16.9	17.6
40	.667	4.0	4.7	5.3	6.0	6.7	7.3	8.0	8.7	9.3	10.0	10.7	11.3	12.0	12.7	13.3	14.0	14.7	15.3	16.0	16.7	17.3	18.0
41	.683	4.1	4.8	5.5	6.2	6.8	7.5	8.2	8.9	9.6	10.2	10.9	11.6	12.3	13.0	13.7	14.4	15.0	15.7	16.4	17.1	17.8	18.4
42	.700	4.2	4.9	5.6	6.3	7.0	7.7	8.4	9.1	9.8	10.5	11.2	11.9	12.6	13.3	14.0	14.7	15.4	16.1	16.8	17.5	18.2	18.9
43	.717	4.3	5.0	5.7	6.4	7.2	7.9	8.6	9.3	10.0	10.8	11.5	12.2	12.9	13.6	14.3	15.0	15.8	16.5	17.2	17.9	18.6	19.4
44	.733	4.4	5.1	5.9	6.6	7.3	8.1	8.8	9.5	10.3	11.0	11.7	12.5	13.2	13.9	14.7	15.4	16.1	16.9	17.6	18.3	19.1	19.8
45	.750	4.5	5.2	6.0	6.8	7.5	8.2	9.0	9.8	10.5	11.2	12.0	12.8	13.5	14.2	15.0	15.8	16.5	17.2	18.0	18.8	19.5	20.2
46	.767	4.6	5.4	6.1	6.9	7.7	8.4	9.2	10.0	10.7	11.5	12.3	13.0	13.8	14.6	15.3	16.1	16.9	17.6	18.4	19.2	19.9	20.7
47	.783	4.7	5.5	6.3	7.0	7.8	8.6	9.4	10.2	11.0	11.8	12.5	13.3	14.1	14.9	15.7	16.4	17.2	18.0	18.8	19.6	20.4	21.2
48	.800	4.8	5.6	6.4	7.2	8.0	8.8	9.6	10.4	11.2	12.0	12.8	13.6	14.4	15.2	16.0	16.8	17.6	18.4	19.2	20.0	20.8	21.6
49	.817	4.9	5.7	6.5	7.4	8.2	9.0	9.8	10.6	11.4	12.2	13.1	13.9	14.7	15.5	16.3	17.2	18.0	18.8	19.6	20.4	21.2	22.0
50	.833	5.0	5.8	6.7	7.5	8.3	9.2	10.0	10.8	11.7	12.5	13.3	14.2	15.0	15.8	16.7	17.5	18.3	19.2	20.0	20.8	21.7	22.5
51	.850	5.1	6.0	6.8	7.6	8.5	9.4	10.2	11.0	11.9	12.8	13.6	14.4	15.3	16.2	17.0	17.8	18.7	19.6	20.4	21.2	22.1	23.0
52	.867	5.2	6.1	6.9	7.8	8.7	9.5	10.4	11.3	12.1	13.0	13.9	14.7	15.6	16.5	17.3	18.2	19.1	19.9	20.8	21.7	22.5	23.4
53	.883	5.3	6.2	7.1	8.0	8.8	9.7	10.6	11.5	12.4	13.2	14.1	15.0	15.9	16.8	17.7	18.6	19.4	20.3	21.2	22.1	23.0	23.8
54	.900	5.4	6.3	7.2	8.1	9.0	9.9	10.8	11.7	12.6	13.5	14.4	15.3	16.2	17.1	18.0	18.9	19.8	20.7	21.6	22.5	23.4	24.3
55	.917	5.5	6.4	7.3	8.2	9.2	10.1	11.0	11.9	12.8	13.8	14.7	15.6	16.5	17.4	18.3	19.2	20.2	21.1	22.0	22.9	23.8	24.8
56	.933	5.6	6.5	7.5	8.4	9.3	10.3	11.2	12.1	13.1	14.0	14.9	15.9	16.8	17.7	18.7	19.6	20.5	21.5	22.4	23.3	24.3	25.2
57	.950	5.7	6.6	7.6	8.6	9.5	10.4	11.4	12.4	13.3	14.2	15.2	16.2	17.1	18.0	19.0	20.0	20.9	21.8	22.8	23.8	24.7	25.6
58	.967	5.8	6.8	7.7	8.7	9.7	10.6	11.6	12.6	13.5	14.5	15.5	16.4	17.4	18.4	19.3	20.3	21.3	22.2	23.2	24.2	25.1	26.1
59	.983	5.9	6.9	7.9	8.8	9.8	10.8	11.8	12.8	13.8	14.8	15.7	16.7	17.7	18.7	19.7	20.6	21.6	22.6	23.6	24.6	25.6	26.6
	1	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
	2	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54
	3	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63	66	69	72	75	78	81
	4	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84	88	92	96	100	104	108
	5	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120	125	130	135
	6	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126	132	138	144	150	156	162
	7	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140	147	154	161	168	175	182	189
	8	48	56	64	72	80	88	96	104	112	120	128	136	144	152	160	168	176	184	192	200	208	216
	9	54	63	72	81	90	99	108	117	126	135	144	153	162	171	180	189	198	207	216	225	234	243
	10	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260	270
	11	66	77	88	99	110	121	132	143	154	165	176	187	198	209	220	231	242	253	264	275	286	297
	12	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252	264	276	288	300	312	324
	13	78	91	104	117	130	143	156	169	182	195	208	221	234	247	260	273	286	299	312	325	338	351
	14	84	98	112	126	140	154	168	182	196	210	224	238	252	266	280	294	308	322	336	350	364	378
	15	90	105	120	135	150	165	180	195	210	225	240	255	270	285	300	315	330	345	360	375	390	405
	16	96	112	128	144	160	176	192	208	224	240	256	272	288	304	320	336	352	368	384	400	416	432
	17	102	119	136	153	170	187	204	221	238	255	272	289	306	323	340	357	374	391	408	425	442	459
	18	108	126	144	162	180	198	216	234	252	270	288	306	324	342	360	378	396	414	432	450	468	486
	19	114	133	152	171	190	209	228	247	266	285	304	323	342	361	380	399	418	437	456	475	494	513
	20	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	520	540
	21	126	147	168	189	210	231	252	273	294	315	336	357	378	399	420	441	462	483	504	525	546	567
	22	132	154	176	198	220	242	264	286	308	330	352	374	396	418	440	462	484	506	528	550	572	594
	23	138	161	184	207	230	253	276	299	322	345	368	391	414	437	460	483	506	529	552	575	598	621
	24	144	168	192	216	240	264	288	312	336	360	384	408	432	456	480	504	528	552	576	600	624	648
	25	150	175	200	225	250	275	300	325	350	375	400	425	450	475	500	525	550	575	600	625	650	675

TIME

SPE[...]TABLE

SPEED IN KNOTS

Left-side fragment (partial columns):

6	27
.4	0.4
.9	0.9
.3	1.4
.7	1.8
2.2	2.2
2.6	2.7
3.0	3.2
3.5	3.6
3.9	4.0
4.3	4.5
4.8	5.0
5.2	5.4
5.6	5.8
6.1	6.3
6.5	6.8
6.9	7.2
7.4	7.6
7.8	8.1
8.2	8.6
8.7	9.0
9.1	9.4
9.5	9.9
10.0	10.4
10.4	10.8
10.8	11.2
11.3	11.7
11.7	12.2
12.1	12.6
12.6	13.0
13.0	13.5
13.4	14.0
13.9	14.4
14.3	14.8
14.7	15.3
15.2	15.8
15.6	16.2
16.0	16.6
16.5	17.1
16.9	17.6
17.3	18.0
17.8	18.4
18.2	18.9
18.6	19.4
19.1	19.8
19.5	20.2
19.9	20.7
20.4	21.2
20.8	21.6
21.2	22.0
21.7	22.5
22.1	23.0
22.5	23.4
23.0	23.8
23.4	24.3
23.8	24.8
24.3	25.2
24.7	25.6
25.1	26.1
25.6	26.6
26	27
52	54
78	81
104	108
130	135
156	162
182	189
208	216
234	243
260	270
286	297
312	324
338	351
364	378
390	405
416	432
442	459
468	486
494	513
520	540
546	567
572	594
598	621
624	648
650	675

TIME

Main table:

Min.	Hr.	28	29	30	31	32	33	34	35	36	37	38	39	40	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
1	.017	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	.033	0.9	1.0	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.3	1.3	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	.050	1.4	1.4	1.5	1.6	1.6	1.6	1.7	1.8	1.8	1.8	1.9	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	.067	1.9	1.9	2.0	2.1	2.1	2.2	2.3	2.3	2.4	2.5	2.5	2.6	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
5	.083	2.3	2.4	2.5	2.6	2.7	2.8	2.8	2.9	3.0	3.1	3.2	3.2	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
6	.100	2.8	2.9	3.0	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
7	.117	3.3	3.4	3.5	3.6	3.7	3.8	4.0	4.1	4.2	4.3	4.4	4.6	4.7	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
8	.133	3.7	3.9	4.0	4.1	4.3	4.4	4.5	4.7	4.8	4.9	5.1	5.2	5.3	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
9	.150	4.2	4.4	4.5	4.6	4.8	5.0	5.1	5.2	5.4	5.6	5.7	5.8	6.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2
10	.167	4.7	4.8	5.0	5.2	5.3	5.5	5.7	5.8	6.0	6.2	6.3	6.5	6.7	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
11	.183	5.1	5.3	5.5	5.7	5.9	6.0	6.2	6.4	6.6	6.8	7.0	7.2	7.3	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
12	.200	5.6	5.8	6.0	6.2	6.4	6.6	6.8	7.0	7.2	7.4	7.6	7.8	8.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
13	.217	6.1	6.3	6.5	6.7	6.9	7.2	7.4	7.6	7.8	8.0	8.2	8.4	8.7	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
14	.233	6.5	6.8	7.0	7.2	7.5	7.7	7.9	8.2	8.4	8.6	8.9	9.1	9.3	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
15	.250	7.0	7.2	7.5	7.8	8.0	8.2	8.5	8.8	9.0	9.2	9.5	9.8	10.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
16	.267	7.5	7.7	8.0	8.3	8.5	8.8	9.1	9.3	9.6	9.9	10.1	10.4	10.7	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3
17	.283	7.9	8.2	8.5	8.8	9.1	9.4	9.6	9.9	10.2	10.5	10.8	11.0	11.3	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3
18	.300	8.4	8.7	9.0	9.3	9.6	9.9	10.2	10.5	10.8	11.1	11.4	11.7	12.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3
19	.317	8.9	9.2	9.5	9.8	10.1	10.4	10.8	11.1	11.4	11.7	12.0	12.4	12.7	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3
20	.333	9.3	9.7	10.0	10.3	10.7	11.0	11.3	11.7	12.0	12.3	12.7	13.0	13.3	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3
21	.350	9.8	10.2	10.5	10.8	11.2	11.6	11.9	12.2	12.6	13.0	13.3	13.6	14.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4
22	.367	10.3	10.6	11.0	11.4	11.7	12.1	12.5	12.8	13.2	13.6	13.9	14.3	14.7	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.4
23	.383	10.7	11.1	11.5	11.9	12.3	12.6	13.0	13.4	13.8	14.2	14.6	15.0	15.3	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4
24	.400	11.2	11.6	12.0	12.4	12.8	13.2	13.6	14.0	14.4	14.8	15.2	15.6	16.0	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.4
25	.417	11.7	12.1	12.5	12.9	13.3	13.8	14.2	14.6	15.0	15.4	15.8	16.2	16.7	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.4
26	.433	12.1	12.6	13.0	13.4	13.9	14.3	14.7	15.2	15.6	16.0	16.5	16.9	17.3	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.4
27	.450	12.6	13.0	13.5	14.0	14.4	14.8	15.3	15.8	16.2	16.6	17.1	17.6	18.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.4
28	.467	13.1	13.5	14.0	14.5	14.9	15.4	15.9	16.3	16.8	17.3	17.7	18.2	18.7	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5
29	.483	13.5	14.0	14.5	15.0	15.5	16.0	16.4	16.9	17.4	17.9	18.4	18.8	19.3	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5
30	.500	14.0	14.5	15.0	15.5	16.0	16.5	17.0	17.5	18.0	18.5	19.0	19.5	20.0	0.0	0.1	0.2	0.2	0.2	0.3	0.4	0.4	0.4	0.5
31	.517	14.5	15.0	15.5	16.0	16.5	17.0	17.6	18.1	18.6	19.1	19.6	20.2	20.7	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5
32	.533	14.9	15.5	16.0	16.5	17.1	17.6	18.1	18.7	19.2	19.7	20.3	20.8	21.3	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5
33	.550	15.4	16.0	16.5	17.0	17.6	18.2	18.7	19.2	19.8	20.4	20.9	21.4	22.0	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.6
34	.567	15.9	16.4	17.0	17.6	18.1	18.7	19.3	19.8	20.4	21.0	21.5	22.1	22.7	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.5	0.5	0.6
35	.583	16.3	16.9	17.5	18.1	18.7	19.2	19.8	20.4	21.0	21.6	22.2	22.8	23.3	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.5	0.6
36	.600	16.8	17.4	18.0	18.6	19.2	19.8	20.4	21.0	21.6	22.2	22.8	23.4	24.0	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.5	0.6
37	.617	17.3	17.9	18.5	19.1	19.7	20.4	21.0	21.6	22.2	22.8	23.4	24.0	24.7	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.6	0.6
38	.633	17.7	18.4	19.0	19.6	20.3	20.9	21.5	22.2	22.8	23.4	24.1	24.7	25.3	0.1	0.1	0.2	0.3	0.3	0.4	0.4	0.5	0.6	0.6
39	.650	18.2	18.8	19.5	20.2	20.8	21.4	22.1	22.8	23.4	24.0	24.7	25.4	26.0	0.1	0.1	0.2	0.3	0.3	0.4	0.5	0.5	0.6	0.6
40	.667	18.7	19.3	20.0	20.7	21.3	22.0	22.7	23.3	24.0	24.7	25.3	26.0	26.7	0.1	0.1	0.2	0.3	0.3	0.4	0.5	0.5	0.6	0.7
41	.683	19.1	19.8	20.5	21.2	21.9	22.6	23.2	23.9	24.6	25.3	26.0	26.6	27.3	0.1	0.1	0.2	0.3	0.3	0.4	0.5	0.5	0.6	0.7
42	.700	19.6	20.3	21.0	21.7	22.4	23.1	23.8	24.5	25.2	25.9	26.6	27.3	28.0	0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.6	0.6	0.7
43	.717	20.1	20.8	21.5	22.2	22.9	23.6	24.4	25.1	25.8	26.5	27.2	28.0	28.7	0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.6	0.6	0.7
44	.733	20.5	21.3	22.0	22.7	23.5	24.2	24.9	25.7	26.4	27.1	27.9	28.6	29.3	0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.7
45	.750	21.0	21.8	22.5	23.2	24.0	24.8	25.5	26.2	27.0	27.8	28.5	29.2	30.0	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.7
46	.767	21.5	22.2	23.0	23.8	24.5	25.3	26.1	26.8	27.6	28.4	29.1	29.9	30.7	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.8
47	.783	21.9	22.7	23.5	24.3	25.1	25.8	26.6	27.4	28.2	29.0	29.8	30.6	31.3	0.1	0.2	0.2	0.3	0.4	0.5	0.5	0.6	0.7	0.8
48	.800	22.4	23.2	24.0	24.8	25.6	26.4	27.2	28.0	28.8	29.6	30.4	31.2	32.0	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.6	0.7	0.8
49	.817	22.9	23.7	24.5	25.3	26.1	27.0	27.8	28.6	29.4	30.2	31.0	31.8	32.7	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.7	0.7	0.8
50	.833	23.3	24.2	25.0	25.8	26.7	27.5	28.3	29.2	30.0	30.8	31.7	32.5	33.3	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.7	0.7	0.8
51	.850	23.8	24.6	25.5	26.4	27.2	28.0	28.9	29.8	30.6	31.4	32.3	33.2	34.0	0.1	0.2	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.8
52	.867	24.3	25.1	26.0	26.9	27.7	28.6	29.5	30.3	31.2	32.1	32.9	33.8	34.7	0.1	0.2	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9
53	.883	24.7	25.6	26.5	27.4	28.3	29.2	30.0	30.9	31.8	32.7	33.6	34.4	35.3	0.1	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.8	0.9
54	.900	25.2	26.1	27.0	27.9	28.8	29.7	30.6	31.5	32.4	33.3	34.2	35.1	36.0	0.1	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.8	0.9
55	.917	25.7	26.6	27.5	28.4	29.3	30.2	31.2	32.1	33.0	33.9	34.8	35.8	36.7	0.1	0.2	0.3	0.4	0.5	0.6	0.6	0.7	0.8	0.9
56	.933	26.1	27.1	28.0	28.9	29.9	30.8	31.7	32.7	33.6	34.5	35.5	36.4	37.3	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.7	0.8	0.9
57	.950	26.6	27.6	28.5	29.4	30.4	31.4	32.3	33.2	34.2	35.2	36.1	37.0	38.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
58	.967	27.1	28.0	29.0	30.0	30.9	31.9	32.9	33.8	34.8	35.8	36.7	37.7	38.7	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
59	.983	27.5	28.5	29.5	30.5	31.5	32.4	33.4	34.4	35.4	36.4	37.4	38.4	39.3	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
	1	28	29	30	31	32	33	34	35	36	37	38	39	40	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
	2	56	58	60	62	64	66	68	70	72	74	76	78	80	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0
	3	84	87	90	93	96	99	102	105	108	111	114	117	120	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7	3.0
	4	112	116	120	124	128	132	136	140	144	148	152	156	160	0.4	0.8	1.2	1.6	2.0	2.4	2.8	3.2	3.6	4.0
	5	140	145	150	155	160	165	170	175	180	185	190	195	200	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
	6	168	174	180	186	192	198	204	210	216	222	228	234	240	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0
	7	196	203	210	217	224	231	238	245	252	259	266	273	280	0.7	1.4	2.1	2.8	3.5	4.2	4.9	5.6	6.3	7.0
	8	224	232	240	248	256	264	272	280	288	296	304	312	320	0.8	1.6	2.4	3.2	4.0	4.8	5.6	6.4	7.2	8.0
	9	252	261	270	279	288	297	306	315	324	333	342	351	360	0.9	1.8	2.7	3.6	4.5	5.4	6.3	7.2	8.1	9.0
	10	280	290	300	310	320	330	340	350	360	370	380	390	400	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
	11	308	319	330	341	352	363	374	385	396	407	418	429	440	1.1	2.2	3.3	4.4	5.5	6.6	7.7	8.8	9.9	11.0
	12	336	348	360	372	384	396	408	420	432	444	456	468	480	1.2	2.4	3.6	4.8	6.0	7.2	8.4	9.6	10.8	12.0
	13	364	377	390	403	416	429	442	455	468	481	494	507	520	1.3	2.6	3.9	5.2	6.5	7.8	9.1	10.4	11.7	13.0
	14	392	406	420	434	448	462	476	490	504	518	532	546	560	1.4	2.8	4.2	5.6	7.0	8.4	9.8	11.2	12.6	14.0
	15	420	435	450	465	480	495	510	525	540	555	570	585	600	1.5	3.0	4.5	6.0	7.5	9.0	10.5	12.0	13.5	15.0
	16	448	464	480	496	512	528	544	560	576	592	608	624	640	1.6	3.2	4.8	6.4	8.0	9.6	11.2	12.8	14.4	16.0
	17	476	493	510	527	544	561	578	595	612	629	646	663	680	1.7	3.4	5.1	6.8	8.5	10.2	11.9	13.6	15.3	17.0
	18	504	522	540	558	576	594	612	630	648	666	684	702	720	1.8	3.6	5.4	7.2	9.0	10.8	12.6	14.4	16.2	18.0
	19	532	551	570	589	608	627	646	665	684	703	722	741	760	1.9	3.8	5.7	7.6	9.5	11.4	13.3	15.2	17.1	19.0
	20	560	580	600	620	640	660	680	700	720	740	760	780	800	2.0	4.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0
	21	588	609	630	651	672	693	714	735	756	777	798	819	840	2.1	4.2	6.3	8.4	10.5	12.6	14.7	16.8	18.9	21.0
	22	616	638	660	682	704	726	748	770	792	814	836	858	880	2.2	4.4	6.6	8.8	11.0	13.2	15.4	17.6	19.8	22.0
	23	644	667	690	713	736	759	782	805	828	851	874	897	920	2.3	4.6	6.9	9.2	11.5	13.8	16.1	18.4	20.7	23.0
	24	672	696	720	744	768	792	816	840	864	888	912	936	960	2.4	4.8	7.2	9.6	12.0	14.4	16.8	19.2	21.6	24.0
	25	700	725	750	775	800	825	850	875	900	925	950	975	1000	2.5	5.0	7.5	10.0	12.5	15.0	17.5	20.0	22.5	25.0

°	h m	°	h m	°	h m	°	h m	°	h m	°	h m	′	m s	″	s
0	0 0	60	4 0	120	8 0	180	12 0	240	16 0	300	20 0	0	0 0	0	0.00
1	0 4	61	4 4	121	8 4	181	12 4	241	16 4	301	20 4	1	0 4	1	0.07
2	0 8	62	4 8	122	8 8	182	12 8	242	16 8	302	20 8	2	0 8	2	0.13
3	0 12	63	4 12	123	8 12	183	12 12	243	16 12	303	20 12	3	0 12	3	0.20
4	0 16	64	4 16	124	8 16	184	12 16	244	16 16	304	20 16	4	0 16	4	0.27
5	0 20	65	4 20	125	8 20	185	12 20	245	16 20	305	20 20	5	0 20	5	0.33
6	0 24	66	4 24	126	8 24	186	12 24	246	16 24	306	20 24	6	0 24	6	0.40
7	0 28	67	4 28	127	8 28	187	12 28	247	16 28	307	20 28	7	0 28	7	0.47
8	0 32	68	4 32	128	8 32	188	12 32	248	16 32	308	20 32	8	0 32	8	0.53
9	0 36	69	4 36	129	8 36	189	12 36	249	16 36	309	20 36	9	0 36	9	0.60
10	0 40	70	4 40	130	8 40	190	12 40	250	16 40	310	20 40	10	0 40	10	0.67
11	0 44	71	4 44	131	8 44	191	12 44	251	16 44	311	20 44	11	0 44	11	0.73
12	0 48	72	4 48	132	8 48	192	12 48	252	16 48	312	20 48	12	0 48	12	0.80
13	0 52	73	4 52	133	8 52	193	12 52	253	16 52	313	20 52	13	0 52	13	0.87
14	0 56	74	4 56	134	8 56	194	12 56	254	16 56	314	20 56	14	0 56	14	0.93
15	1 0	75	5 0	135	9 0	195	13 0	255	17 0	315	21 0	15	1 0	15	1.00
16	1 4	76	5 4	136	9 4	196	13 4	256	17 4	316	21 4	16	1 4	16	1.07
17	1 8	77	5 8	137	9 8	197	13 8	257	17 8	317	21 8	17	1 8	17	1.13
18	1 12	78	5 12	138	9 12	198	13 12	258	17 12	318	21 12	18	1 12	18	1.20
19	1 16	79	5 16	139	9 16	199	13 16	259	17 16	319	21 16	19	1 16	19	1.27
20	1 20	80	5 20	140	9 20	200	13 20	260	17 20	320	21 20	20	1 20	20	1.33
21	1 24	81	5 24	141	9 24	201	13 24	261	17 24	321	21 24	21	1 24	21	1.40
22	1 28	82	5 28	142	9 28	202	13 28	262	17 28	322	21 28	22	1 28	22	1.47
23	1 32	83	5 32	143	9 32	203	13 32	263	17 32	323	21 32	23	1 32	23	1.53
24	1 36	84	5 36	144	9 36	204	13 36	264	17 36	324	21 36	24	1 36	24	1.60
25	1 40	85	5 40	145	9 40	205	13 40	265	17 40	325	21 40	25	1 40	25	1.67
26	1 44	86	5 44	146	9 44	206	13 44	266	17 44	326	21 44	26	1 44	26	1.73
27	1 48	87	5 48	147	9 48	207	13 48	267	17 48	327	21 48	27	1 48	27	1.80
28	1 52	88	5 52	148	9 52	208	13 52	268	17 52	328	21 52	28	1 52	28	1.87
29	1 56	89	5 56	149	9 56	209	13 56	269	17 56	329	21 56	29	1 56	29	1.93
30	2 0	90	6 0	150	10 0	210	14 0	270	18 0	330	22 0	30	2 0	30	2.00
31	2 4	91	6 4	151	10 4	211	14 4	271	18 4	331	22 4	31	2 4	31	2.07
32	2 8	92	6 8	152	10 8	212	14 8	272	18 8	332	22 8	32	2 8	32	2.13
33	2 12	93	6 12	153	10 12	213	14 12	273	18 12	333	22 12	33	2 12	33	2.20
34	2 16	94	6 16	154	10 16	214	14 16	274	18 16	334	22 16	34	2 16	34	2.27
35	2 20	95	6 20	155	10 20	215	14 20	275	18 20	335	22 20	35	2 20	35	2.33
36	2 24	96	6 24	156	10 24	216	14 24	276	18 24	336	22 24	36	2 24	36	2.40
37	2 28	97	6 28	157	10 28	217	14 28	277	18 28	337	22 28	37	2 28	37	2.47
38	2 32	98	6 32	158	10 32	218	14 32	278	18 32	338	22 32	38	2 32	38	2.53
39	2 36	99	6 36	159	10 36	219	14 36	279	18 36	339	22 36	39	2 36	39	2.60
40	2 40	190	6 40	160	10 40	220	14 40	280	18 40	340	22 40	40	2 40	40	2.67
41	2 44	101	6 44	161	10 44	221	14 44	281	18 44	341	22 44	41	2 44	41	2.73
42	2 48	102	6 48	162	10 48	222	14 48	282	18 48	342	22 48	42	2 48	42	2.80
43	2 52	103	6 52	163	10 52	223	14 52	283	18 52	343	22 52	43	2 52	43	2.87
44	2 56	104	6 56	164	10 56	224	14 56	284	18 56	344	22 56	44	2 56	44	2.93
45	3 0	105	7 0	165	11 0	225	15 0	285	19 0	345	23 0	45	3 0	45	3.00
46	3 4	106	7 4	166	11 4	226	15 4	286	19 4	346	23 4	46	3 4	46	3.07
47	3 8	107	7 8	167	11 8	227	15 8	287	19 8	347	23 8	47	3 8	47	3.13
48	3 12	108	7 12	168	11 12	228	15 12	288	19 12	348	23 12	48	3 12	48	3.20
49	3 16	109	7 16	169	11 16	229	15 16	289	19 16	349	23 16	49	3 16	49	3.27
50	3 20	110	7 20	170	11 20	230	15 20	290	19 20	350	23 20	50	3 20	50	3.33
51	3 24	111	7 24	171	11 24	231	15 24	291	19 24	351	23 24	51	3 24	51	3.40
52	3 28	112	7 28	172	11 28	232	15 28	292	19 28	352	23 28	52	3 28	52	3.47
53	3 32	113	7 32	173	11 32	233	15 32	293	19 32	353	23 32	53	3 32	53	3.53
54	3 36	114	7 36	174	11 36	234	15 36	294	19 36	354	23 36	54	3 36	54	3.60
55	3 40	115	7 40	175	11 40	235	15 40	295	19 40	355	23 40	55	3 40	55	3.67
56	3 44	116	7 44	176	11 44	236	15 44	296	19 44	356	23 44	56	3 44	56	3.73
57	3 48	117	7 48	177	11 48	237	15 48	297	19 48	357	23 48	57	3 48	57	3.80
58	3 52	118	7 52	178	11 52	238	15 52	298	19 52	358	23 52	58	3 52	58	3.87
59	3 56	119	7 56	179	11 56	239	15 56	299	19 56	359	23 56	59	3 56	59	3.93
60	4 0	120	8 0	180	12 0	240	16 0	300	20 0	360	24 0	60	4 0	60	4.00

H. O. PUB. NO. 214

VOL. IX

U.S. Hydrograp...

TABLES OF COMPUTED ALTITUDE AND AZIMUTH

Latitudes 80° — 89°, Inclusive

PREFACE

These tables consist of tabulated solutions of the navigational triangle, so arranged as to yield computed altitude and azimuth angle by inspection. The scheme of precomputing such values for ready use is a long-established one. It is in the scope, arrangement, and convenience of interpolation, developed by the Hydrographic Office, that these tables are unique.

The tables are applicable equally to observations of the sun, moon, planets, and navigational stars, whether observed in north or south latitude. For convenience, the values for only 10 degrees of latitude are included in each volume. This series of tables, commonly known as H. O. Pub. No. 214, is intended primarily for marine navigation. For air navigation the H. O. Pub. No. 249 series of tables consisting of three volumes and entitled "Sight Reduction Tables for Air Navigation" is recommended.

In the 1952 reprint the basic information remains unchanged. Some modification has been made in the descriptive text, and the illustrative examples have been changed to reflect recent modifications of the *Nautical Almanac*. A speed-time-distance table replaces the sextant altitude correction tables formerly shown on the inside front cover but now omitted because recent almanac changes render them unnecessary.

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Captain, U. S. Navy (Ret.),
Hydrographer.

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H. O. PUB. NO. 214

TABLES OF COMPUTED ALTITUDE AND AZIMUTH

Description of the Tables

The tables are equally applicable to sights of the sun, moon, planets, and navigational stars.

The arrangement is on the basis of whole degrees of latitude, the data for each degree comprising a section of 24 pages, with 2 additional pages for star identification.

Declination arguments in degrees and half degrees head the main columns of each page, while meridian angle arguments in whole degrees appear at the sides. Within the limits of each declination column are four groups of figures representing, from left to right—the altitude (Alt.); the multiplier (Δd) for declination difference; the multiplier (Δt) for meridian angle difference; and the azimuth angle (Az.). The declination arguments for celestial bodies not commonly used in practical navigation are omitted.

The altitudes have been computed to an accuracy of one-tenth of a minute of arc by seven place logarithms.

The azimuth angle has been computed to an accuracy of one-tenth of a degree.

Δd represents the change in altitude due to a change of 1' of arc of declination, computed for the tabulated entering arguments.

Δt represents the change in altitude due to a change of 1' of arc of meridian angle, and is one-sixtieth of the difference between the tabulated altitude and that for the next larger meridian angle.

ΔL represents the change in altitude due to a change of 1' of arc of latitude. A special table on pages 260–261 gives the corrections for minutes of latitude.

The following procedures are available for finding a line of position:

(1) Assuming both latitude and longitude, using only the Δd correction.

(2) Assuming latitude with the DR longitude, using the Δd and Δt corrections.

(3) Working from the DR position, using the Δd, Δt, and ΔL corrections.

When either Δd or Δt is changing rapidly, or when Δd changes sign (at the maximum altitude for any given meridian angle), interpolation may be somewhat less accurate than in other parts of the tables, but should not introduce a significant error unless the body is near the zenith.

(1) SOLUTION FOR LINE OF POSITION USING Δd CORRECTION ONLY

This is the primary method for which the tables were designed. The solution is short and simple. The tables are entered with arguments of nearest whole degree of latitude, nearest whole or half degree of declination, and nearest whole degree of meridian angle. Alt., Δd, and Az. are taken from the body of the tables.

The azimuth angle obtained from the tables is correct for the values with which the tables are entered and, for plotting lines of position, generally needs no correction. If extreme accuracy is desired, the azimuth angle may be interpolated by inspection. The tabulated azimuth angle (Az.) is reckoned from the elevated pole of the observer, to the east when the body is rising or east of the meridian; and to the west when the body is setting or west of the meridian. Azimuth angle is customarily converted to azimuth (Zn) before plotting.

The altitude (Alt.) obtained from the tables is correct for the values with which the tables are entered; but since the exact declination of the body usually differs from the tabulated declination, a correction to the tabulated altitude must be made for this difference. For example, if the exact declination of a star is 57° 28.'7 and the table is entered with a declination of 57° 30.'0, the declination difference is 1.'3. Since Δd represents the change in altitude due to a change of 1' of arc of declination, if Δd is multiplied by the declination difference, the correction to the altitude for declination difference is obtained. When this correction is applied to the tabulated altitude (Alt.), the altitude thus obtained is the correct computed altitude for arguments of whole degree of latitude, whole degree of meridian angle, and the exact declination of the body. The correction can be obtained by inspection from a multiplication table on the back cover pages. The multiplication table is entered with arguments, Δd at the side, and the declination difference at the top. The correction to the altitude for declination difference is taken from the body of the table. The multiplication table is so arranged that it may be entered at the top with both whole numbers and tenths. For example, using Δd 65, and declination difference 6.'4, the multiplication table is entered with 65 at the side and 6' at the top, the correction is 3.'9; with 65 at the side and 0.'4 at the top, the correction is 0.'3; the total correction to the altitude for declination difference being 3.'9+0.'3=4.'2.

By comparing the tabulated altitude for the entering declination with the values of altitude for adjoining tabulated declinations, one can determine whether the altitude is increasing or decreasing as the tabulated declination approaches the exact declination. The correction is applied to the tabulated altitude, plus if the altitude is increasing, and minus if the altitude is decreasing. *Watch the plus or minus signs for Δd, and apply correctly, remembering that Δd may change sign between entries at the maximum altitude.* The multiplier Δd should not be interpolated.

When the Δd correction only is made to the tabulated altitude, the sight must be plotted from an assumed position as follows:

Latitude.—The whole degree with which the tables were entered.

Longitude.—The longitude which was assumed in finding the meridian angle in whole degrees.

Example 1.—On May 12, 1951, the GMT* 1211 dead reckoning position of a dirigible is lat. 88° 15ʹ0 N, long. 70° 30ʹ0 W.   Nearly simultaneous observations are made as follows:

	GMT	Declination	Obs. Alt. (Ho)
Sun	12ʰ 10ᵐ 04ˢ	18° 00ʹ2 N	19° 05ʹ8
Moon	12ʰ 11ᵐ 49ˢ	23° 16ʹ9 N	22° 05ʹ6

SUN		MOON	
GMT	12ʰ 10ᵐ 04ˢ	GMT	12ʰ 11ᵐ 49ˢ
GHA for 12ʰ GMT	0° 55ʹ6	GHA for 12ʰ GMT	284° 45ʹ2
Correction for 10ᵐ 04ˢ	2° 31ʹ0	Correction for 11ᵐ 49ˢ	2° 49ʹ2
GHA	3° 26ʹ6	Code correction [code (+)122]	2ʹ3
Longitude	70° 26ʹ6 W	GHA	287° 36ʹ7
LHA	293° 00ʹ0	Longitude	70° 36ʹ7 W
t(HA)	67° 00ʹ0 E	LHA	217° 00ʹ0
Latitude	88° 00ʹ0 N	t(HA)	143° 00ʹ0 E
Declination	18° 00ʹ2 N	Latitude	88° 00ʹ0 N
		Declination	23° 16ʹ9 N

	Alt.	Δd	Az.		Alt.	Δd	Az.
	18° 46ʹ3	(+)1.0	N 112°4 E		21° 53ʹ8	(−)1.0	N 36°5 E
Δd correction for 0ʹ2	(+)0ʹ2 (See note)			Δd correction for 13ʹ1	(−)13ʹ1		
Hc	18° 46ʹ5			Hc	21° 40ʹ7		
Ho	19° 05ʹ8			Ho	22° 05ʹ6		
a	19.3 miles toward			a	24.9 miles toward		
Zn	112°4			Zn	036°5		

MERCATOR

NOTE.—Plus 1.0 is obtained from the Δd column abreast Alt. in the tables.   The value 0ʹ2 (corr. for 0ʹ2) is obtained by multiplying 0ʹ2 of declination by 1.0.   The value is added because as the tabulated declination 18° approaches the exact declination 18° 00ʹ2 the altitude is increasing.   The tabulated azimuth angle is reckoned from the observer's elevated pole toward the east when the body is rising and requires no correction.   The sun sight is plotted from the nearest whole degree of latitude (88° 00ʹ0 N) and the assumed longitude 70° 26ʹ6 W.   The moon sight is plotted from lat. 88° 00ʹ0 N, long. 70° 36ʹ7 W.

*Greenwich mean time; called Greenwich civil time (GCT) before January 1, 1953 in the United States.

It is recommended that in extremely high latitudes lines of position be plotted on some type of polar graticule in preference to the regular Mercator plotting sheet. In the above example the intercepts are long and the great circle azimuths at the DR position, or assumed position, and the true position differ appreciably. Further, the great circle azimuth lines of the bodies, along which the intercepts are measured, depart considerably from their straight-line (rhumb line) representation. Additionally, the position circle does not correspond closely with its rhumb-line tangent, the position line. Straight position lines perpendicular to the straight-line plot of the great circle azimuth lines give erroneous fixes, as shown in the plot on the preceding page. An accurate fix is indicated by intersecting position circles perpendicular to the curved bearing lines of the geographical positions of the celestial bodies observed.

The following polar graticules are suggested for plotting in this area: stereographic, gnomonic, azimuthal equidistant, inverse (transverse) Mercator, modified Lambert conformal. Plotting sheets or charts upon all of these projections except the last are available at the U. S. Navy Hydrographic Office. Upon these graticules directions can be plotted directly from the meridian, or these may be converted to grid bearings.

The diagram below shows Example 1 replotted on a polar azimuthal equidistant projection from two sets of assumed positions. Consider first the plot from the same assumed positions as those used on the previous page. Azimuths measured directly from the meridian are shown as dashed lines. The fix obtained in this plot is accurate. This can be proved by comparing the observed altitudes with the altitudes computed for the position of the fix.

The fact that any other position in the vicinity of that previously assumed might have been used suggests possible use of the pole as the assumed position. This results in a simplified solution, as shown on the next page.

AZIMUTHAL EQUIDISTANT
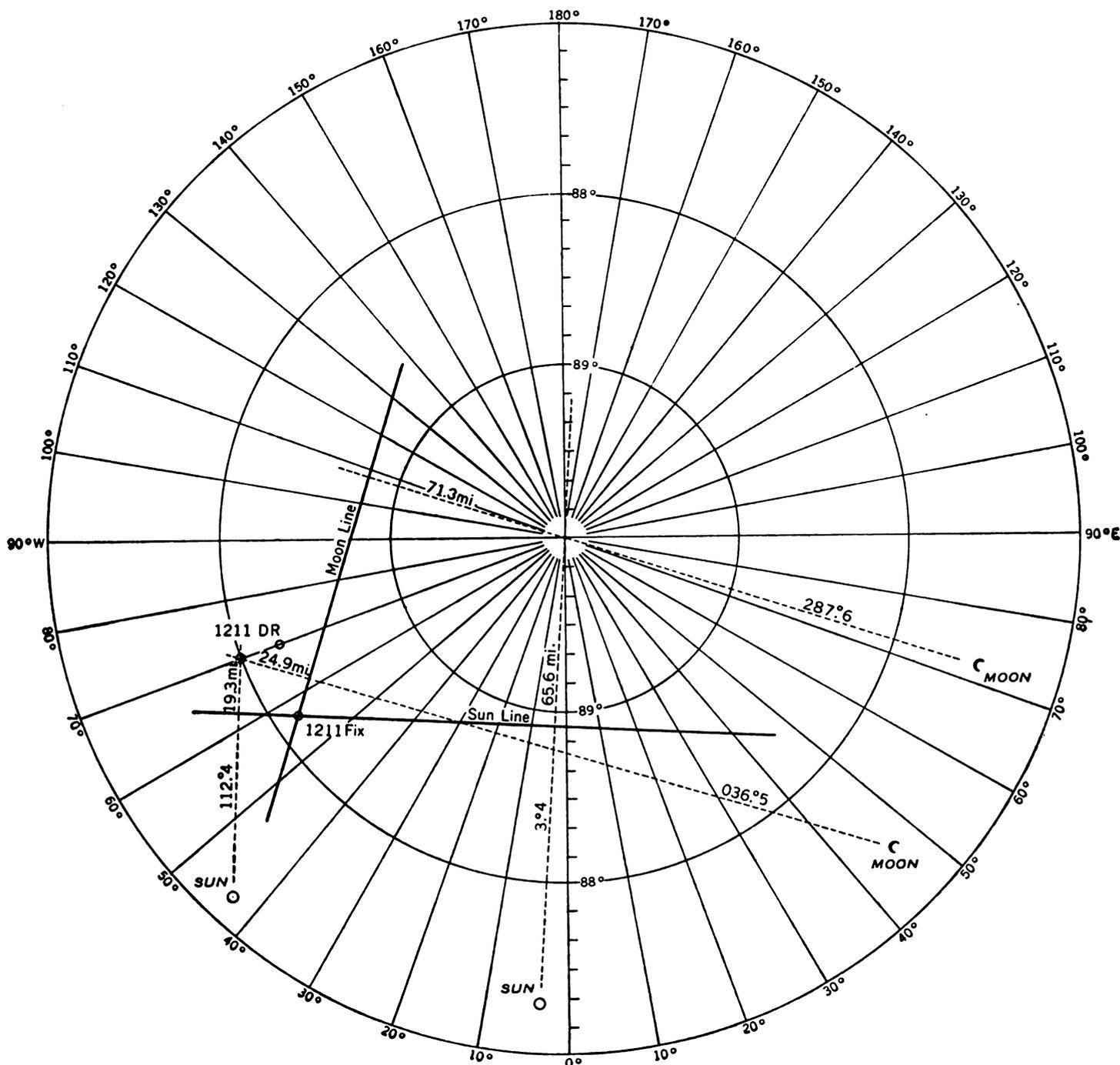
In general, the navigator measures the altitude of a celestial body and upon correction determines the body's observed altitude. If he journeyed toward the pole, the observed altitude would approach the declination of the body and at the pole the two would be exactly equal. This would be anticipated, inasmuch as the celestial equator and the celestial horizon for an observer at the pole coincide, and hence the body's altitude and declination become equal. Further, the azimuth at the pole of any body with reference to a specific meridian is the same as the hour angle measured from the same meridian. These facts suggest that a navigator near the pole, having measured the altitude of a celestial body, may plot his position line from the pole with the additional knowledge of the body's declination and Greenwich hour angle, which values are obtainable from the *Nautical Almanac.* Thus, the difference between the observed altitude and the body's declination is the intercept from the pole for locating the position line perpendicular to the hour circle of the body. Consider the declination as Hc to determine whether the altitude difference should be measured toward or away from the body.

Normally, sights are plotted from a DR position, or an assumed position near thereto, and the position line is drawn perpendicular to the body's azimuth line, at a distance from the chosen position equal to the altitude difference. This position line is a tangent to the position circle. It can be seen that another tangent to the same position circle but perpendicular to the body's hour circle is practically identical with the former near the pole. In Example 1 these tangents merge into approximately the same straight line, as seen in the diagram. It is not recommended that this method be used far distant from the pole, unless the body is near the observer's celestial meridian, either upper or lower branch, as the position circle may depart too far from its tangent, the position line.

The following data from Example 1 for plotting from the pole is obtainable from the *Nautical Almanac.*

SUN		MOON	
GHA	3° 26′6	GHA	287° 36′7
Declination (Hc)	18° 00′2 N	Declination (Hc)	23° 16′9 N
Ho	19° 05′8	Ho	22° 05′6
a	65.6 miles toward	a	71.3 miles away

Measure the altitude difference from the pole, along the hour circles of the bodies, toward the sun and away from the moon.

Example 2.—On December 4, 1951, the GMT 0400 dead reckoning position of a plane is lat. 86° 10ʹ0 S, long. 170° 00ʹ0 E. The course is 180° and the ground speed 280 knots. Observations are made as follows:

	GMT	Declination	Obs. Alt. (Ho)
Moon	3ʰ 55ᵐ 14ˢ	15° 20ʹ4 S	19° 11ʹ8
Sun	3ʰ 58ᵐ 26ˢ	22° 07ʹ6 S	24° 39ʹ0

MOON

GMT	3ʰ 55ᵐ 14ˢ
GHA for 3ʰ GMT	153° 11ʹ6
Correction for 55ᵐ 14ˢ	13° 10ʹ8
Code correction [code (+) 98]	9ʹ1
GHA	166° 31ʹ5
Longitude	170° 28ʹ5 E
LHA	337° 00ʹ0
t(HA)	23° 00ʹ0 E
Latitude	86° 00ʹ0 S
Declination	15° 20ʹ4 S

SUN

GMT	3ʰ 58ᵐ 26ˢ
GHA for 3ʰ GMT	227° 32ʹ1
Correction for 58ᵐ 26ˢ	14° 36ʹ5
GHA	242° 08ʹ6
Longitude	169° 51ʹ4 E
LHA	52° 00ʹ0
t(HA)	52° 00ʹ0 W
Latitude	86° 00ʹ0 S
Declination	22° 07ʹ6 S

	Alt.	Δd	Az.
	19° 10ʹ5	(−)1.0	S 156°5 E
Δd corr. for 9ʹ6	(−)9ʹ6		
Hc	19° 00ʹ9		
Ho	19° 11ʹ8		
a	10.9 miles toward		
Zn	023°5		

	Alt.	Δd	Az.
	24° 25ʹ5	(+)1.0	S 126°6 W
Δd corr. for 7ʹ6	(+)7ʹ6		
Hc	24° 33ʹ1		
Ho	24° 39ʹ0		
a	5.9 miles toward		
Zn	306°6		

MERCATOR
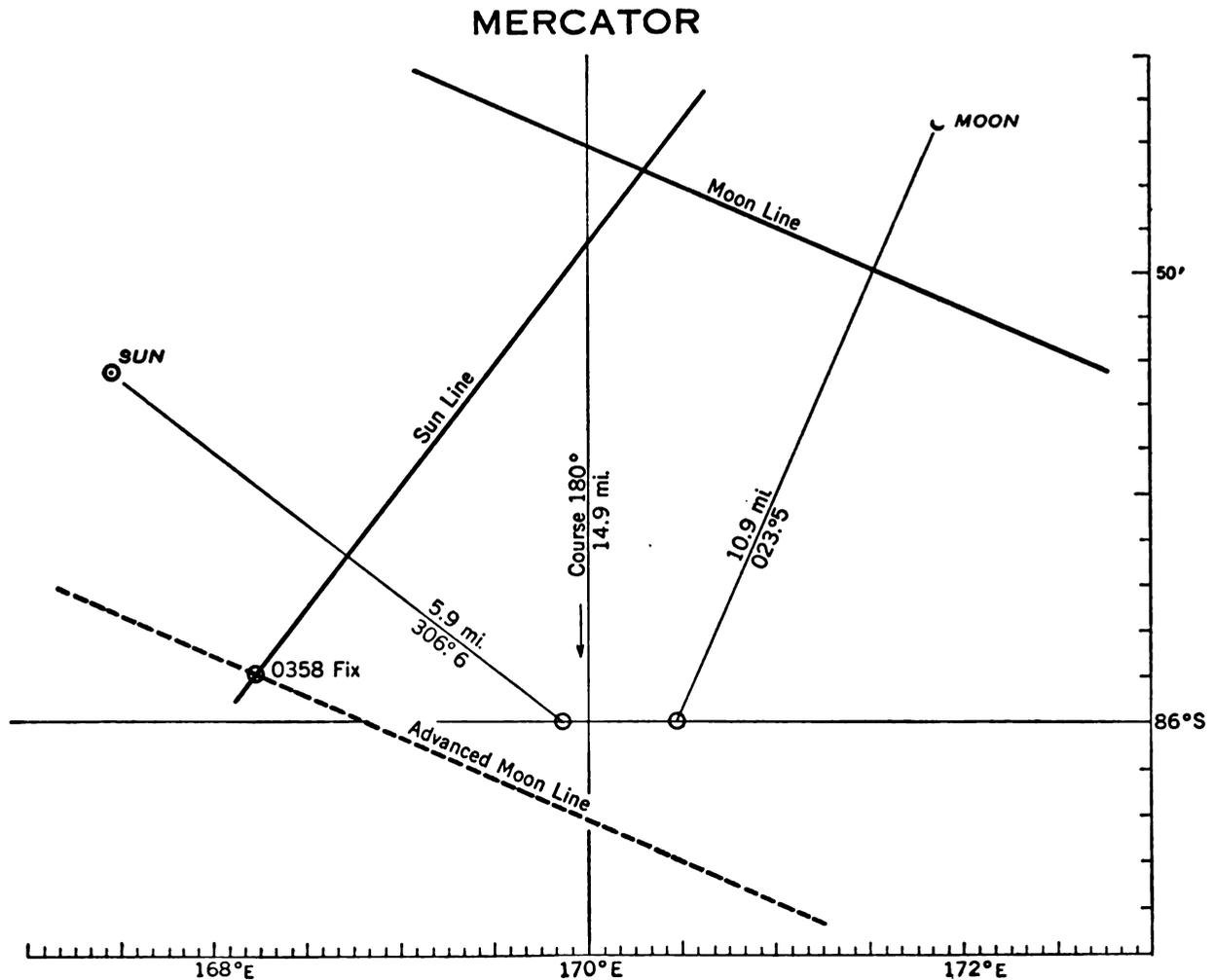
NOTE.—Plot the moon sight from lat. 86° 00ʹ0 S, long. 170° 28ʹ5 E. Plot the sun sight from lat. 86° 00ʹ0 S, long. 169° 51ʹ4 E. The time elapsed between the moon and sun sights is 3ᵐ.2, which is equal to a distance along the track of 14.9 miles. Advance the moon line 14.9 miles in direction 180° to obtain the 0358 fix.

VIII

As in Example 1, it is preferable to use a polar graticule for plotting the lines of position: However, the intercepts are not so long and a comparison of the plot on the preceding page with that below on a gnomonic base shows close agreement of the resulting fixes.

GNOMONIC
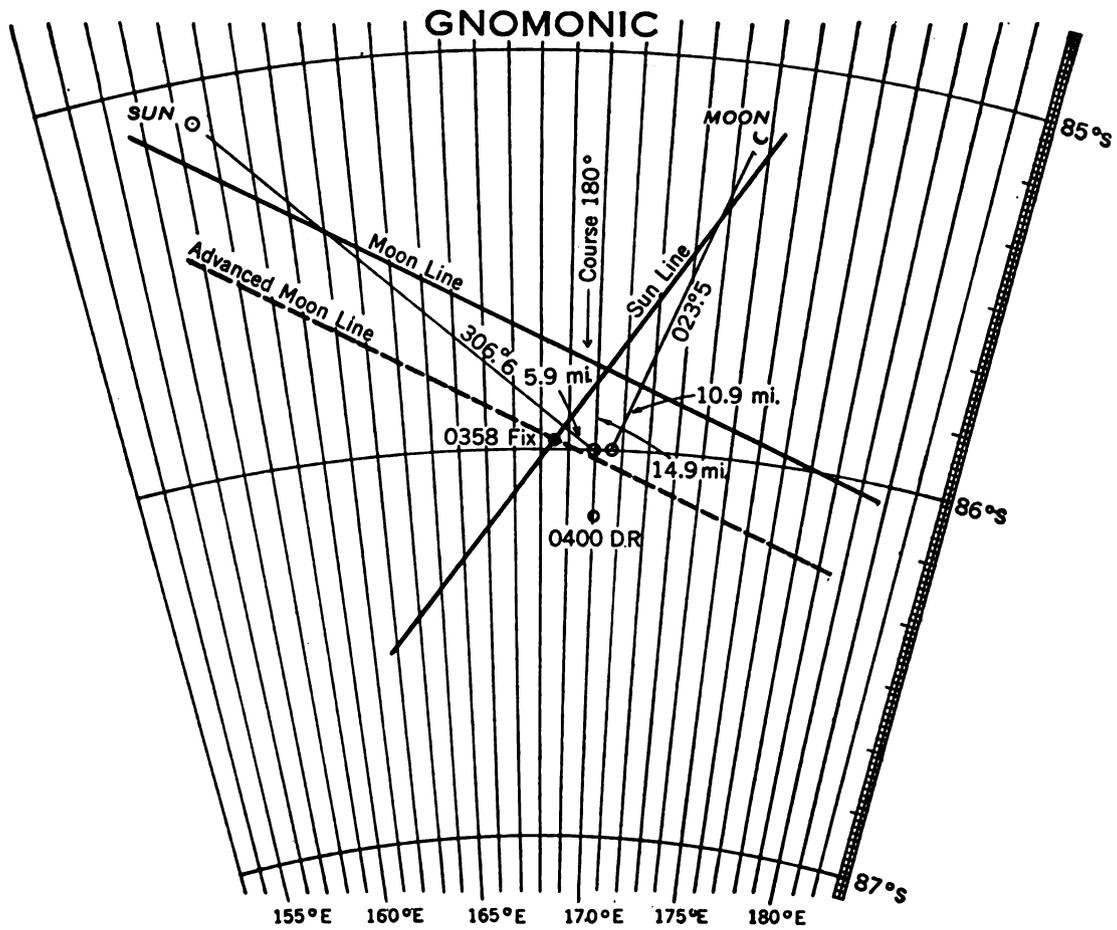
(2) SOLUTION FOR LINE OF POSITION USING BOTH Δd and Δt CORRECTIONS

If the navigator desires to plot the sight from his dead reckoning longitude (and the nearest whole degree of latitude to his dead reckoning position), he may do so by applying an additional correction to the altitude for hour angle difference. For example, if the exact hour angle of a star is 20° 10.'2 and the tables are entered with an hour angle of 20°, the hour angle difference is 10.'2. The correction is determined as follows:

Since Δt represents the change in altitude due to a change of 1' of arc of hour angle, if Δt is multiplied by the hour angle difference, the correction for hour angle difference is obtained. When this correction, together with the Δd correction, is applied to the tabulated altitude, the value thus obtained is the correct computed altitude for arguments of whole degree of latitude, the exact hour angle, and the exact declination of the body.

When successive Δt values have large differences in numerical value, always make the altitude interpolation forward from the lower entering hour angle, never interpolating backward from the nearest entering hour angle. Even with this precaution, the computed altitude will not be of the usual accuracy. In general, it is preferable to not use Δt in this situation.

The Δt correction is obtained from the multiplication table in exactly the same manner as the Δd correction, i. e., by entering the multiplication table with Δt at the side and the hour angle difference at the top of the page, the Δt correction is taken from the body of the table by inspection.

By comparing the values of altitude for the tabulated hour angles between which the exact hour angle lies, one can determine whether the altitude is increasing or decreasing as the tabulated hour angle approaches the exact hour angle. The correction is applied to the tabulated altitude, plus if the altitude is increasing, and minus if the altitude is decreasing.

When both the Δd and the Δt corrections have been made to the tabulated altitude, the sight is plotted from the following position:

Latitude.—The whole degree with which the tables were entered.

Longitude.—The dead reckoning longitude.

Example 3.—On July 8, 1951, the GMT 0812 dead reckoning position of a ship is lat. 81° 10.'0 N, long. 15° 00.'0 E. The navigator of a ship observes the lower limb of the sun for a line of position, as follows: GMT 8^h 11^m 59^s, sextant altitude (hs) 28° 55.'7, IC(−) 0.'5, height of eye, 28 ft.

SUN

GMT	8^h 11^m 59^s	hs	28° 55.'7	IC	(−) 0.'5	
GHA for 8^h GMT	298° 47.'8	Correction	(+) 8.'7	Altitude correction	(+) 14.'1	
Corr. for 11^m 59^s	2° 59.'8	Ho	29° 04.'4	Ht. eye correction	(−) 5.'0	
GHA	301° 47.'6			Additional correction	(+) 0.'1	
DR Longitude	15° 00.'0 E			Total correction	(+) 8.'7	
LHA	316° 47.'6					
t(HA)	43° 12.'4 E	Declination 22° 33.'7 N (from *Nautical Almanac*)				
Latitude	81° 00.'0 N	(Assume nearest whole degree)				
Declination	22° 33.'7 N	(Enter table with Lat. 81° 00.'0, HA 43° 00.'0; Dec. 22° 30.'0)				

		Alt.	Δd	Δt	Az.
		28° 55.'5	(+) 0.99	(−) 0.11	N 134.°0 E
Δd corr. for 3.'7	(+) 3.'7				
Δt corr. for 12.'4	(−) 1.'3				
Total correction	(+) 2.'4	(+) 2.'4			
Hc		28° 57.'9			
Ho		29° 04.'4			
a		6. 5 miles toward			
Zn		134.°0			

NOTE.—From lat. 81° 00.'0 N, long. 15° 00.'0 E, plot the azimuth of sun 134.°0 and lay off from this position 6.5 miles toward the direction of the sun. Draw the line of position through this latter point perpendicular to the azimuth line.

x

MERCATOR
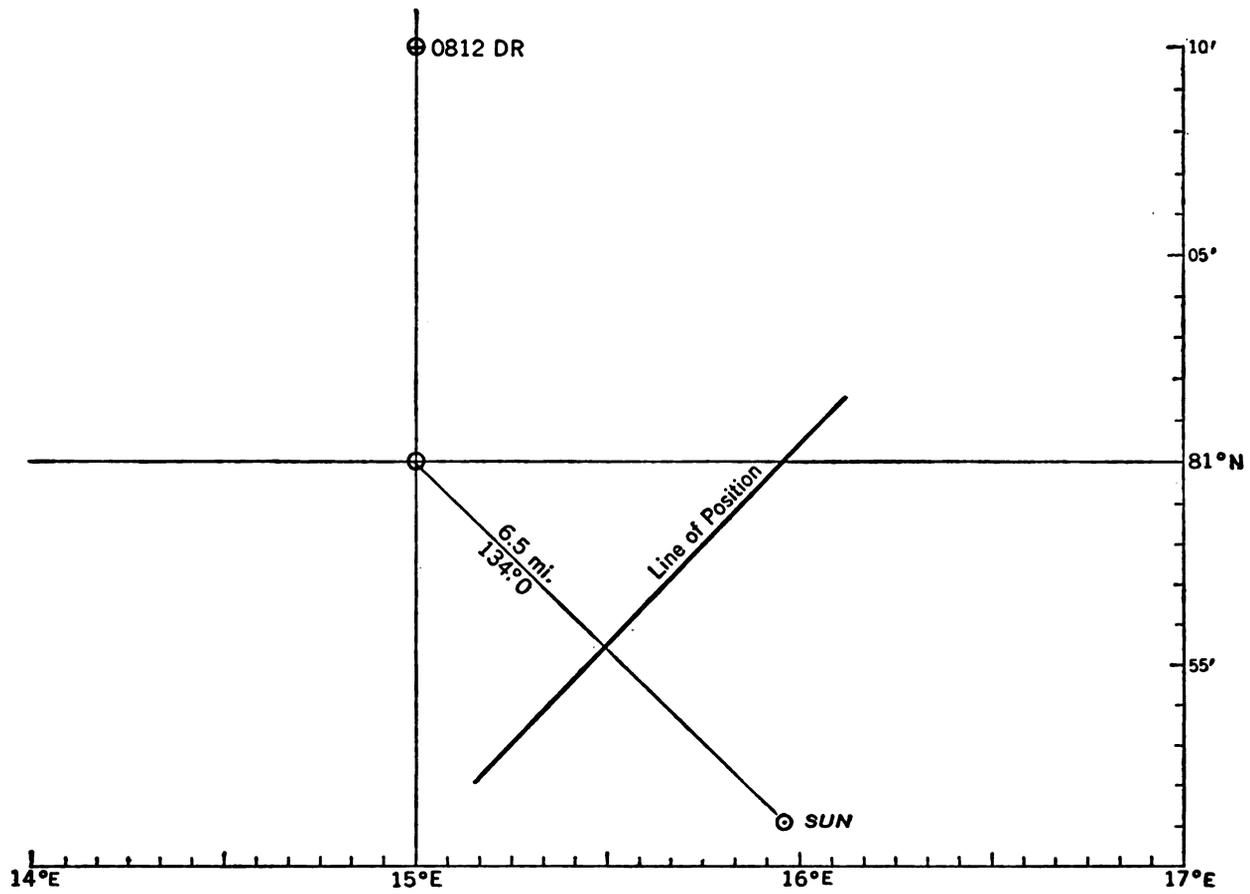
The above example is next shown plotted on a modified Lambert conformal graticule.

MODIFIED LAMBERT CONFORMAL
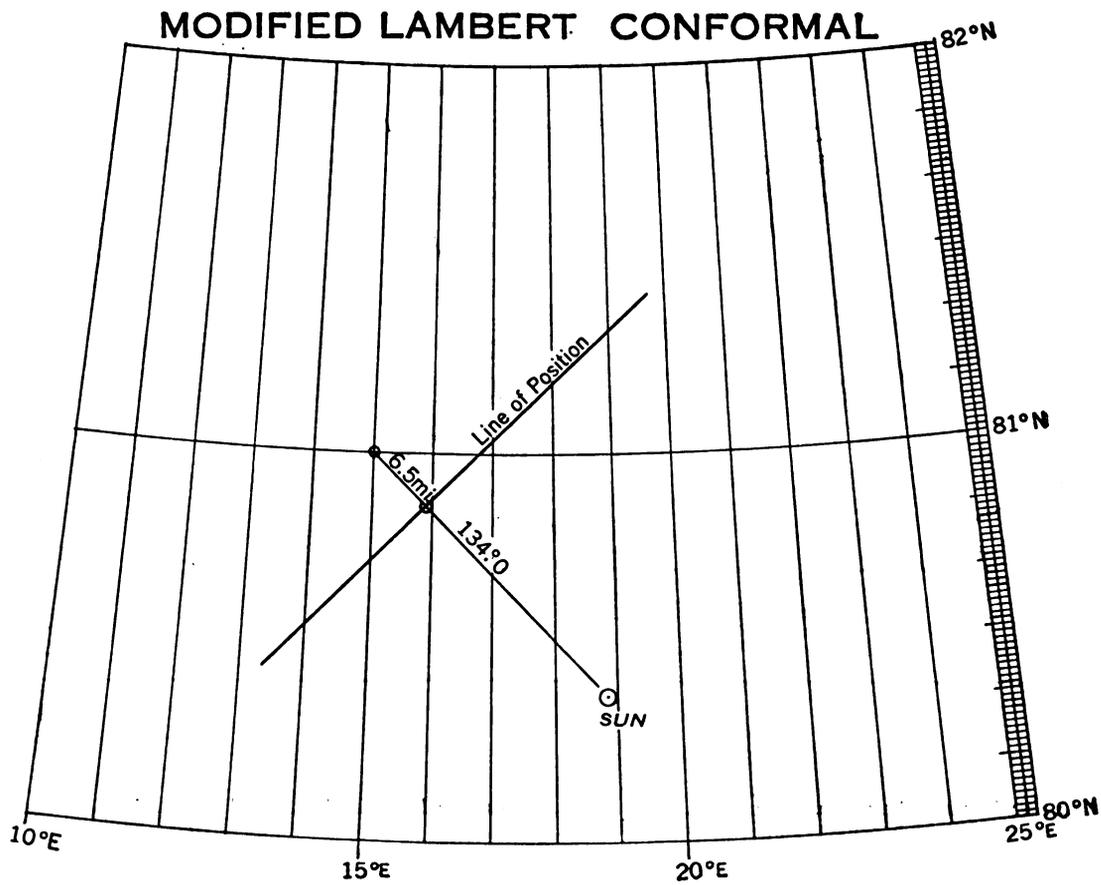
Example 4.—On December 5, 1951, the GMT 0303 dead reckoning position of a plane is lat. 82° 33′.0 S, long. 165° 00′.0 W. The course is 180°, and the ground speed 120 knots. Observations are made as follows:

	GMT	Declination	Obs. Alt. (Ho)
Sun	3ʰ 02ᵐ 34ˢ	22° 15′.5 S	25° 31′.8
Moon	3ʰ 05ᵐ 35ˢ	9° 34′.0 S	16° 33′.3

<table>
<tr><td colspan="2">SUN</td><td colspan="2">MOON</td></tr>
<tr><td>GMT</td><td>3ʰ 02ᵐ 34ˢ</td><td>GMT</td><td>3ʰ 05ᵐ 35ˢ</td></tr>
<tr><td>GHA for 3ʰ GMT</td><td>227° 26′.1</td><td>GHA for 3ʰ GMT</td><td>141° 10′.7</td></tr>
<tr><td>Correction for 2ᵐ 34ˢ</td><td>0° 38′.5</td><td>Correction for 5ᵐ 35ˢ</td><td>1° 19′.9</td></tr>
<tr><td></td><td></td><td>Code correction [code (+)121]</td><td>1′.1</td></tr>
<tr><td>GHA</td><td>228° 04′.6</td><td>GHA</td><td>142° 31′.7</td></tr>
<tr><td>Longitude</td><td>165° 00′.0 W</td><td>Longitude</td><td>165° 00′.0 W</td></tr>
<tr><td>LHA</td><td>63° 04′.6</td><td>LHA</td><td>337° 31′.7</td></tr>
<tr><td>t(HA)</td><td>63° 04′.6 W</td><td>t(HA)</td><td>22° 28′.3 E</td></tr>
<tr><td>Latitude</td><td>83° 00′.0 S</td><td>Latitude</td><td>83° 00′.0 S</td></tr>
<tr><td>Declination</td><td>22° 15′.5 S</td><td>Declination</td><td>9° 34′.0 S</td></tr>
</table>

SUN
Alt. 25°31′.7   Δd (−)0.99   Δt (−)0.11   Az. S 114°.2 W
Corr. (−)14′.9   Δd corr. for 14′.5 (−)14′.4
Hc 25° 16′.8   Δt corr. for 4′.6 (−) 0′.5
Ho 25° 31′.8   Total correction (−)14′.9
a   15.0 miles toward
Zn 294°.2

MOON
Alt. 15°58′.7   Δd (+)1.0   Δt (−)0.05   Az. S 157°.4 E
Corr. (+)2′.6   Δd corr. for 4′.0 (+) 4′.0
Hc 16° 01′.3   Δt corr. for 28′.3 (−) 1′.4
Ho 16° 33′.3   Total correction (+) 2′.6
a   32.0 miles toward
Zn 022°.6

MERCATOR
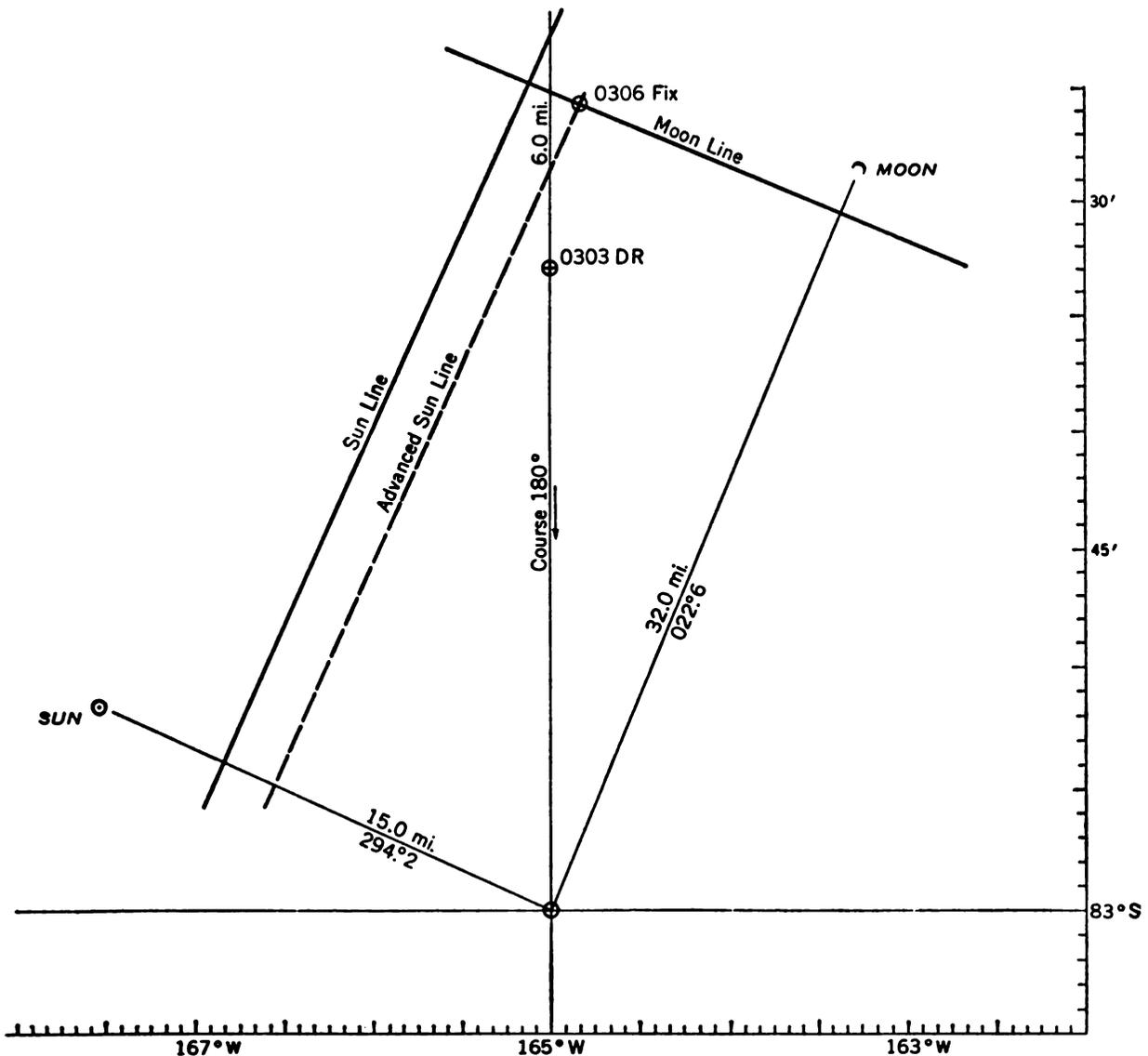
NOTE.—Plot the sun and moon sights from lat. 83° 00′.0 S, long. 165° 00′.0 W. Distance flown on course 180° for 3ᵐ is 6.0 miles. Move sun line 6.0 miles 180°, and the intersection of the sun line with the moon line is the fix.

XII

Below, this example is replotted on the polar stereographic graticule.

STEREOGRAPHIC
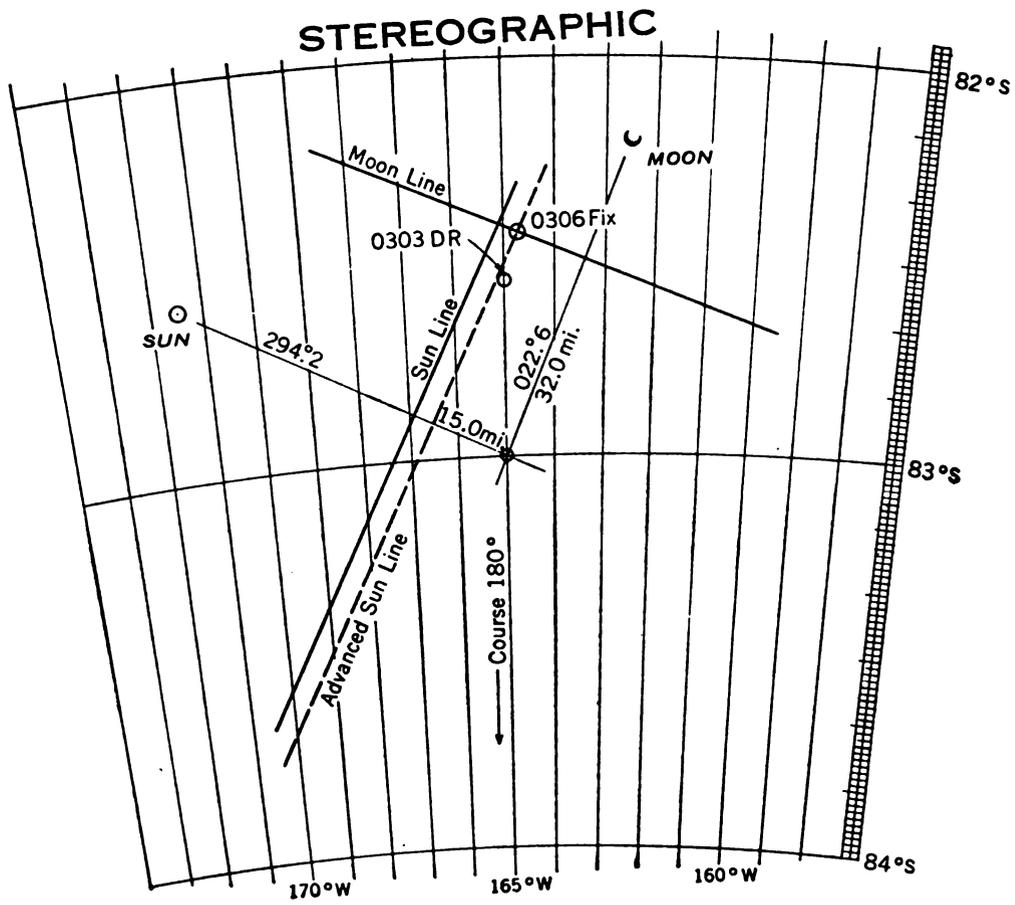
(3) SOLUTION FOR LINE OF POSITION FROM THE DEAD RECKONING POSITION USING Δd, Δt, AND ΔL

If the navigator desires to plot the sight from the dead reckoning position, in addition to the Δd and Δt corrections, a correction to the altitude for latitude (called the ΔL correction) must be applied. If the nearest whole degree of latitude is used for entering the table, it will be necessary to correct for as much as 30′ difference in latitude between the integral degree with which the table is entered and the dead reckoning latitude. On pages 260 and 261 of this book is given a ΔL multiplication table from which corrections for minutes of latitude can be taken directly by inspection. The values in this table are the product of the ΔL value times the minutes of latitude. The value ΔL is the natural cosine of the azimuth angle, so that it is necessary to know only the azimuth angle of observation and the difference of latitude between the dead reckoning position and the integral latitude of this table, as arguments for entry. In working from the dead reckoning position, corrections are made for Δd and Δt exactly as shown in the previous examples.

The LHA for the dead reckoning longitude is found by applying the dead reckoning longitude to the GHA.

With the nearest whole degree of latitude, the LHA, and declination as arguments, take from the main table Alt., Δd, Δt, and Az. With the arguments azimuth angle and the difference of latitude between the dead reckoning position and the tabulated latitude of the table, take the correction for latitude directly by inspection from the ΔL multiplication table on page 260 or 261. The sign of the ΔL correction is determined as follows:

Azimuth angle greater than 90°:

 If DR latitude is greater than selected tabulated latitude, ΔL correction is minus; but for DR latitude less than selected tabulated latitude, the correction is plus.

Azimuth angle less than 90°:

 If DR latitude is greater than selected tabulated latitude, ΔL correction is plus; but for DR latitude less than selected tabulated latitude, the correction is minus.

Example 5.—On May 12, 1951, the GMT 1414 dead reckoning position of a ship is lat. 81° 12′.5 N, long. 15°10′.5 E. The navigator makes the following observations from a height of eye of 25 feet, using a sextant having an IC of (−) 1′.5:

	GMT	Declination	Sextant Alt. (hs)
Sun (lower limb)	14ʰ 13ᵐ 02ˢ	18° 01′.6 N	23° 22′.5
Moon (lower limb)	14ʰ 14ᵐ 53ˢ	22° 58′.9 N	29° 51′.5

SUN			MOON		
hs sun	23° 22′.5	IC	(−) 1′.5	hs moon	29° 51′.5	IC	(−) 1′.5

SUN

hs sun	23° 22′.5	IC	(−) 1′.5
Correction	(+) 7′.6	Alt. correction	(+) 13′.6
Ho	23° 30′.1	Ht. eye corr.	(−) 4′.7
		Add'l correction	(+) 0′.2
		Total correction	(+) 7′.6

MOON

hs moon	29° 51′.5	IC	(−) 1′.5
Correction	(+) 54′.4	Alt. correction	(+) 47′.8
Ho	30° 45′.9	Ht. eye corr.	(−) 4′.7
		Add'l correction	(+) 12′.8
		Total correction	(+) 54′.4

SUN		MOON	
GMT	14ʰ 13ᵐ 02ˢ	GMT	14ʰ 14ᵐ 53ˢ
GHA for 14ʰ GMT	30° 55′.7	GHA for 14ʰ GMT	313° 47′.7
Correction for 13ᵐ 02ˢ	3° 15′.5	Correction for 14ᵐ 53ˢ	3° 33′.1
		Code correction [code (+)123]	3′.0
GHA	34° 11′.2	GHA	317° 23′.8
Longitude	15° 10′.5 E	Longitude	15° 10′.5
LHA	49° 21′.7	LHA	332° 34′.3
t(HA)	49° 21′.7 W	t(HA)	27° 25′.7 E
Latitude	81° 12′.5 N	Latitude	81° 12′.5 N
Declination	18° 01′.6 N	Declination	22° 58′.9 N

	Alt.	Δd	Δt	Az.
	23° 45′.3	(+)0.99	(−)0.12	N 128°.4 W
Corr.	(−)8′.8		Δd corr. for 1′.6	(+)1′.6
Hc	23° 36′.5		Δt corr. for 21′.7	(−)2′.6
Ho	23° 30′.1		ΔL corr. for 12′.5	(−)7′.8
a	6.4 miles away		Total correction	(−)8′.8
Zn	231°.6			

	Alt.	Δd	Δt	Az.
	30° 56′.7	(−)1.0	(−)0.08	N 150°.8 E
Corr.	(−)14′.1		Δd corr. for 1′.1	(−) 1′.1
Hc	30° 42′.6		Δt corr. for 25′.7	(−) 2′.1
Ho	30° 45′.9		ΔL corr. for 12′.5	(−)10′.9
a	3.3 miles toward		Total correction	(−)14′.1
Zn	150°.8			

XIV

MERCATOR
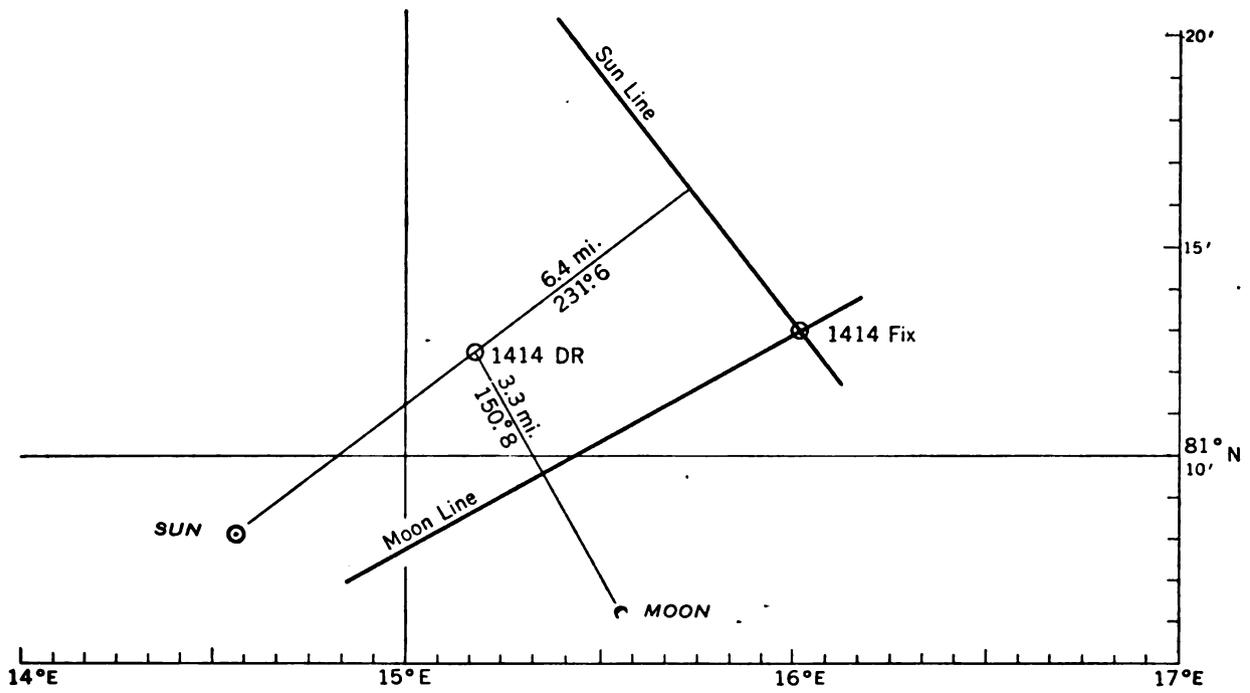
NOTE.—From the DR position, lat. 81° 12′.5 N, long. 15° 10′.5 E, lay down the azimuth of the sun, 231°.6, and the azimuth of the moon, 150°.8. From the DR position, plot 6.4 miles away from the sun and 3.3 miles toward the moon. Through the latter two points draw the position lines perpendicular to the azimuth lines.

The above example is next shown plotted on a polar azimuthal equidistant graticule.

AZIMUTHAL EQUIDISTANT

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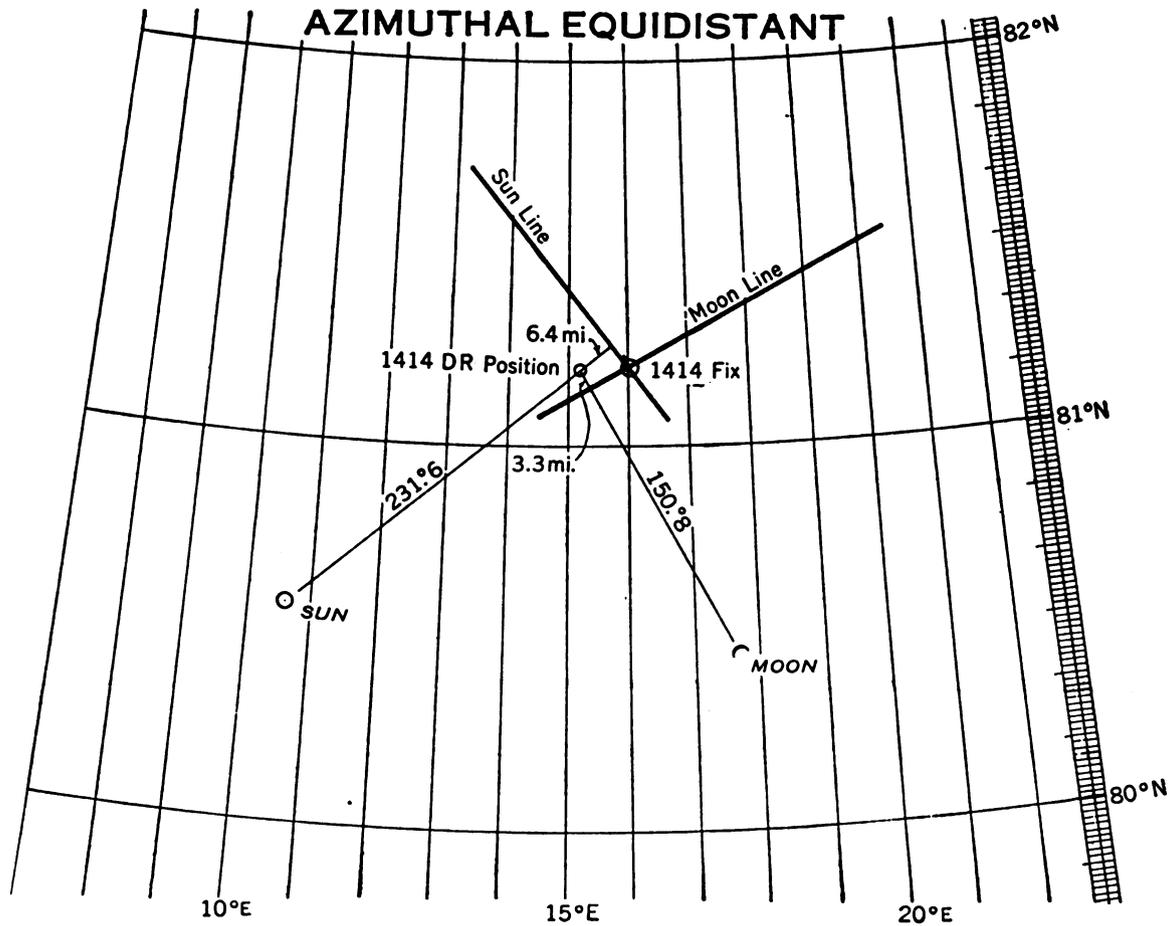
Example 6.—On May 13, 1951, the GMT 0115 dead reckoning position of a dirigible is lat. 81° 15.'2 N, long. 170° 00.'0 W. The navigator obtains nearly simultaneous observations as follows:

	GMT	*Declination*	*Obs. Alt. (Ho)*
Sun	1ʰ 14ᵐ 14ˢ	18° 08.'5 N	25° 31.'4
Moon	1ʰ 16ᵐ 12ˢ	21° 14.'8 N	26° 10.'7

MOON

GMT	1ʰ 16ᵐ 12ˢ
GHA 1ʰ GMT	113° 34.'9
Correction for 16ᵐ 12ˢ	3° 51.'9
Code correction [code (+)128]	3.'5
GHA	117° 30.'3
Longitude	170° 00.'0 W
LHA	307° 30.'3
t(HA)	52° 29.'7 E
Latitude	81° 15.'2 N
Declination	21° 14.'8 N

SUN

GMT	1ʰ 14ᵐ 14ˢ
GHA 1ʰ GMT	195° 55.'8
Correction for 14ᵐ 14ˢ	3° 33.'5
GHA	199° 29.'3
Longitude	170° 00.'0 W
LHA	29° 29.'3
t(HA)	29° 29.'3 W
Latitude	81° 15.'2 N
Declination	18° 08.'5 N

	Alt.	*Δd*	*Δt*	*Az.*
	26° 21.'1	(+)0.99	(−)0.13	N 124.°8 E
Corr.	(+)2.'1		Δd corr. for 14.'8. (+)14.'7	
Hc	26° 23.'2		Δt corr. for 29.'7. (−) 3.'9	
Ho	26° 10.'7		ΔL corr. for 15.'2. (−) 8.'7	
a	12.5 miles away		Total correction. (+) 2.'1	
Zn	124.°8			

	Alt.	*Δd*	*Δt*	*Az.*
	25° 48.'4	(+)1.0	(−)0.08	N 149.°2 W
Corr.	(−) 6.'9		Δd corr. for 8.'5. (+) 8.'5	
Hc	25° 41.'5		Δt corr. for 29.'3. (−) 2.'3	
Ho	25° 31.'4		ΔL corr. for 15.'2 (−)13.'1	
a	10.1 miles away		Total correction. (−) 6.'9	
Zn	210.°8			

MERCATOR
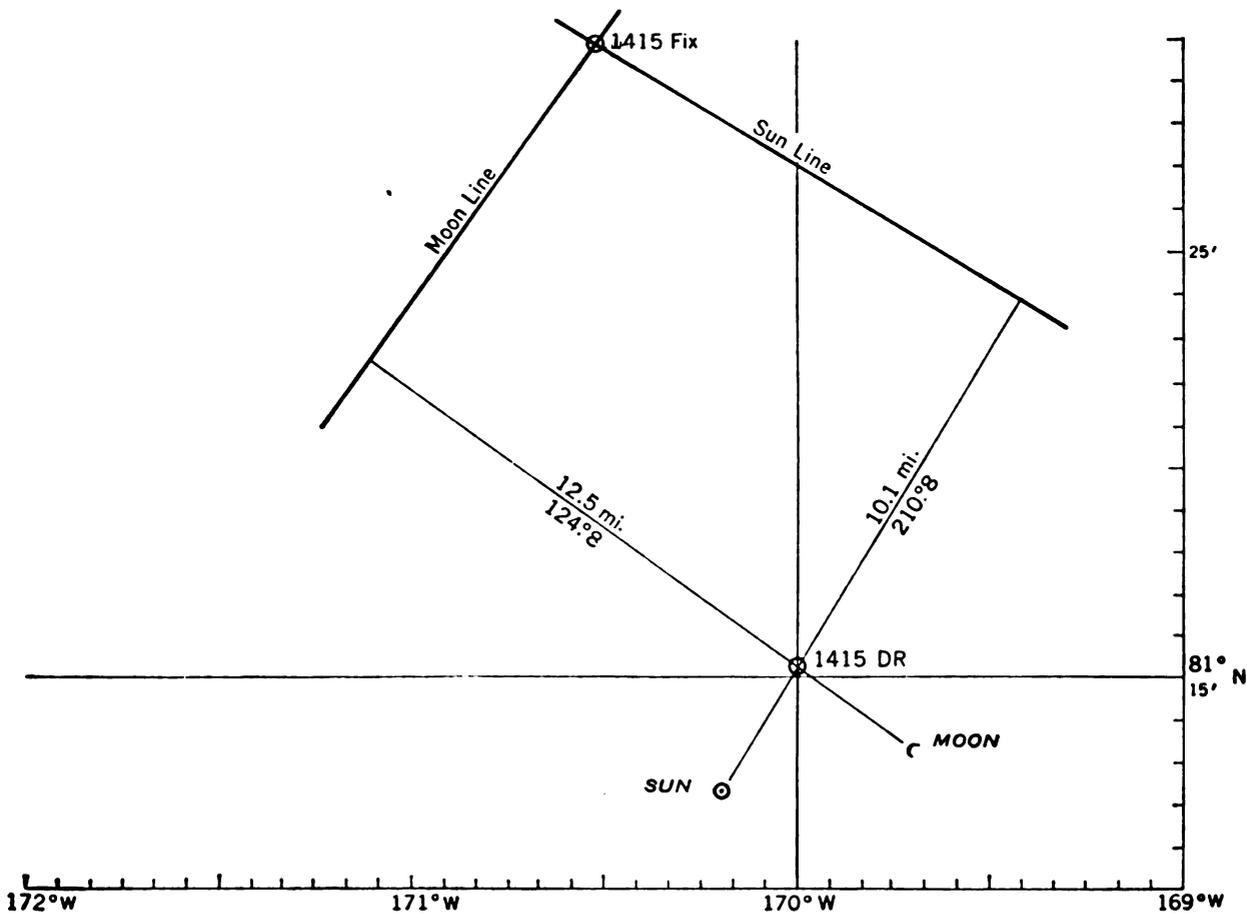
NOTE.—The moon and sun sights are plotted from lat. 81° 15.'2 N, long. 170° 00.'0 W.

This example is next shown plotted on an inverse Mercator graticule.

INVERSE MERCATOR
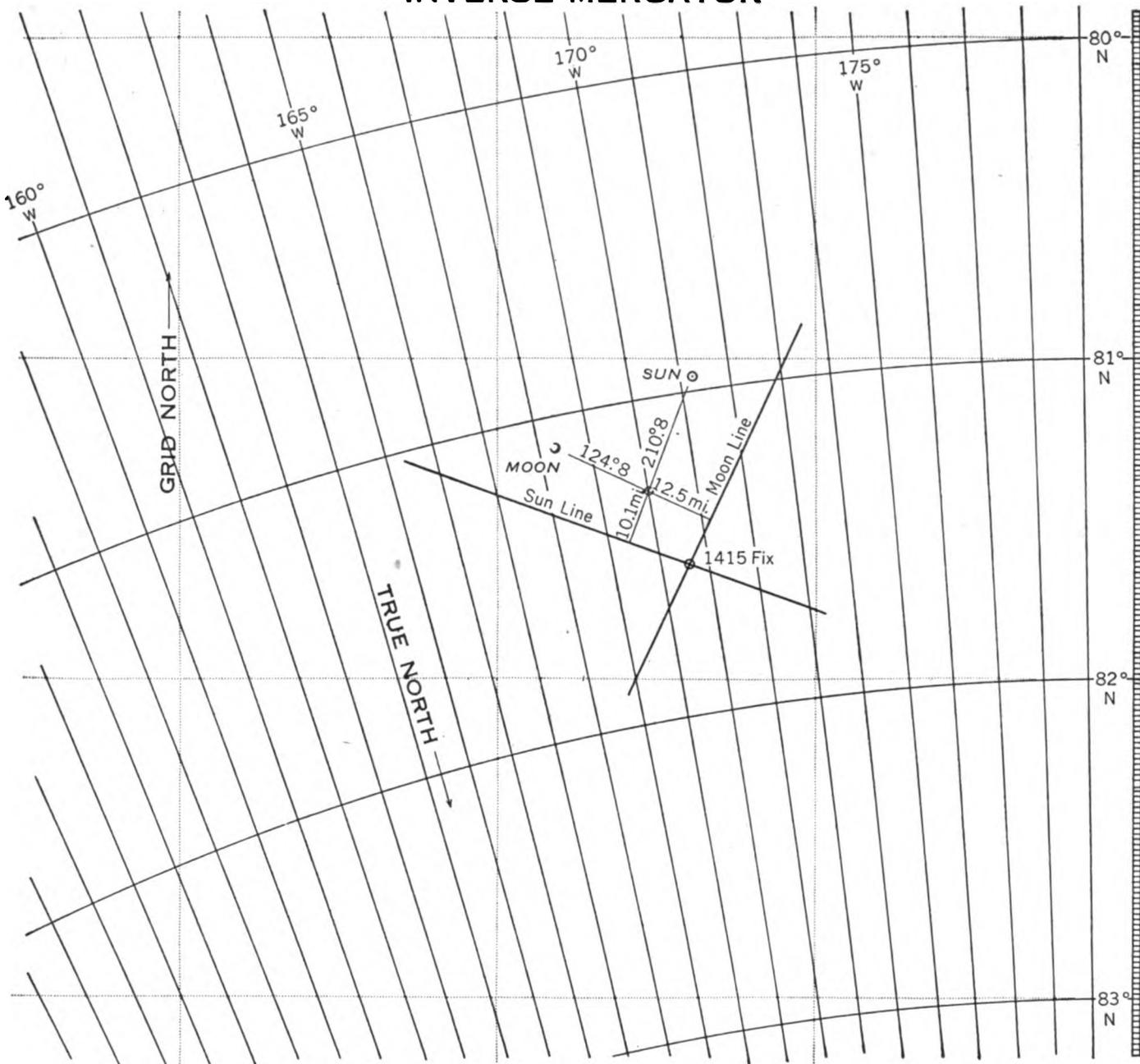
STAR IDENTIFICATION

With the sextant altitude and azimuth angle of the unknown star, enter the double-page Star Identification Table immediately following the applicable latitude section and extract the tabular values of declination and hour angle. Eye interpolation will suffice for accuracy.

Combine the LHA with the longitude to determine the GHA of the star, and compare this with GHA ♈ to obtain its SHA. Enter the *Nautical Almanac* with the declination and SHA, and identify the star.

Example 7.—On September 30, 1951, the GMT 1710 dead reckoning position of a ship is lat. 80° 12'.5 N, long. 9° 12'.3 W. About this time the navigator observes a star through a break in the clouds, as follows: sextant altitude 60° 08'.2; bearing 290°. Identify the star.

SOLUTION

Enter the star identification table for latitude 80° with the approximate arguments Alt. 60° and Az. 70° (Zn 290° =Az. N 70° W in north latitude) and find approximate

Dec. 62° N, HA 92° W

t(HA)	92° W	GMT	17ʰ 10ᵐ
LHA☆	92°	GHA ♈ for 17ʰ	263° 38'.0
Longitude	9° W	Correction for 10ᵐ	2° 30'.4
GHA☆	101°	GHA ♈	266° 08'.4
GHA ♈	266°		
SHA	195°		

Enter the *Nautical Almanac* under stars with the approximate declination 62° N and sidereal hour angle 195° and the star sought is seen to be number 27, Dubhe.

GREAT CIRCLE SAILING

These tables can be used to solve for initial course and distance in great circle sailing problems. Substitute latitude of departure for assumed latitude, latitude of destination for declination, and difference of longitude between the point of departure and the destination for hour angle. Great circle distance in nautical miles is found by subtracting computed altitude (Hc) from 90° and converting the answer to minutes of arc. The azimuth becomes the initial great circle course.

Example 8.—Find the great circle distance and the initial course between Cape Columbia and Karachi, India:

Departure	*Destination*
Lat. 83° 07' N	Lat. 24° 51' N
Long. 70° 20' W	Long. 67° 00' E

SOLUTION

Latitude of departure 83° 07' N, latitude of destination 24° 51' N, difference of longitude 137° 20' E. Enter tables with Lat. 83°, Dec. 25° (same name as latitude), HA 137°.

	Alt.	*Δd*	*Δt*	*Az.*
	19° 47'.8	(−) 1.0	(−) 0.08	N 41°.1 E

Δd correction for 9'	(−) 9'.0
Δt correction for 20'	(−) 1'.6
ΔL correction for 7'	(+) 5'.3
Total correction	(−) 5'.3

(−) 5'.3
Hc.... 19° 42'.5
(−) 90°

Zenith distance (great circle distance) ... ... 70° 17'.5 =4217. 5 nautical miles
Great circle course................................. 041°.1

16—43722-2

If the combination of latitude of departure, latitude of destination, and difference of longitude cannot be found in the table, the name of the latitude of destination is reversed and the supplement of the difference of longitude is used for entering the table. The distance is found by *adding* the altitude to 90°, the great circle course angle is the supplement of the azimuth angle. In the example, if the point of destination is lat. 24° 51′ S, the name is changed to N and the supplement of the difference of longitude is found (180° − 137° 20′ = 42° 40′). Enter the table with Lat. 83°, Dec. 25° (same name as latitude), HA 43°.

	Alt.	. Δd	Δt	*Az.*
	30° 01′.0	(−) 1. 0	(+) 0. 09	134°.5

Δd correction for 9′......... (−) 9′.0
Δt correction for 20′......... (+) 1′.8
ΔL correction for 7′......... (−) 4′.9
Total correction.............. (−) 12′.1   (−) 12′.1

                                        Hc.......... 29° 48′.9
                                                  (+) 90°
Zenith distance (great circle distance)..............119° 48′.9 = 7188. 9 nautical miles
Great circle course (180° − 134°.5 = N 45′.5 E)....   045°.5

In those cases where neither combination of entering arguments can be found in the tables, this method of solution cannot be used.

H.A.	0° 00' Alt. Δd Δt Az.	0° 30' Alt. Δd Δt Az.	1° 00' Alt. Δd Δt Az.	1° 30' Alt. Δd Δt Az.	2° 00' Alt. Δd Δt Az.	2° 30' Alt. Δd Δt Az.	3° 00' Alt. Δd Δt Az.	3° 30' Alt. Δd Δt Az.	H.A.
00	10 00.0 1.0 00 180.0	10 30.0 1.0 00 180.0	11 00.0 1.0 00 180.0	11 30.0 1.0 00 180.0	12 00.0 1.0 00 180.0	12 30.0 1.0 00 180.0	13 00.0 1.0 00 180.0	13 30.0 1.0 00 180.0	00
1	9 59.9 1.0 00 179.0	10 29.9 1.0 00 179.0	10 59.9 1.0 00 179.0	11 29.9 1.0 00 179.0	11 59.9 1.0 00 179.0	12 29.9 1.0 00 179.0	12 59.9 1.0 00 179.0	13 29.9 1.0 00 179.0	1
2	9 59.6 1.0 01 178.0	10 29.6 1.0 01 178.0	10 59.6 1.0 01 178.0	11 29.6 1.0 01 178.0	11 59.6 1.0 01 178.0	12 29.6 1.0 01 178.0	12 59.6 1.0 01 178.0	13 29.6 1.0 01 177.9	2
3	9 59.2 1.0 01 177.0	10 29.2 1.0 01 176.9	10 59.2 1.0 01 176.9	11 29.2 1.0 01 176.9	11 59.2 1.0 01 176.9	12 29.2 1.0 01 176.9	12 59.2 1.0 01 176.9	13 29.2 1.0 01 176.9	3
4	9 58.5 1.0 01 175.9	10 28.5 1.0 01 175.9	10 58.5 1.0 01 175.9	11 28.5 1.0 01 175.9	11 58.5 1.0 01 175.9	12 28.5 1.0 01 175.9	12 58.5 1.0 01 175.9	13 28.5 1.0 01 175.9	4
05	9 57.7 1.0 02 174.9	10 27.7 1.0 02 174.9	10 57.7 1.0 02 174.9	11 27.7 1.0 02 174.9	11 57.7 1.0 02 174.9	12 27.7 1.0 02 174.9	12 57.7 1.0 02 174.9	13 27.7 1.0 02 174.9	05
6	9 56.7 1.0 02 173.9	10 26.7 1.0 02 173.9	10 56.7 1.0 02 173.9	11 26.7 1.0 02 173.9	11 56.7 1.0 02 173.9	12 26.6 1.0 02 173.9	12 56.6 1.0 02 173.9	13 26.6 1.0 02 173.8	6
7	9 55.5 1.0 02 172.9	10 25.5 1.0 02 172.9	10 55.5 1.0 02 172.9	11 25.5 1.0 02 172.8	11 55.5 1.0 02 172.8	12 25.4 1.0 02 172.8	12 55.4 1.0 02 172.8	13 25.4 1.0 02 172.8	7
8	9 54.1 1.0 03 171.9	10 24.1 1.0 03 171.9	10 54.1 1.0 03 171.9	11 24.1 1.0 03 171.8	11 54.1 1.0 03 171.8	12 24.1 1.0 03 171.8	12 54.0 1.0 03 171.8	13 24.0 1.0 03 171.8	8
9	9 52.5 1.0 03 170.9	10 22.5 1.0 03 170.8	10 52.5 1.0 03 170.8	11 22.5 1.0 03 170.8	11 52.5 1.0 03 170.8	12 22.5 1.0 03 170.8	12 52.5 1.0 03 170.8	13 22.5 1.0 03 170.8	9
10	9 50.8 1.0 03 169.8	10 20.8 1.0 03 169.8	10 50.8 1.0 03 169.8	11 20.8 1.0 03 169.8	11 50.7 1.0 03 169.8	12 20.7 1.0 03 169.8	12 50.7 1.0 03 169.8	13 20.7 1.0 03 169.7	10
1	9 48.9 1.0 04 168.8	10 18.8 1.0 04 168.8	10 48.8 1.0 04 168.8	11 18.8 1.0 04 168.8	11 48.8 1.0 04 168.7	12 18.8 1.0 04 168.7	12 48.8 1.0 04 168.7	13 18.7 1.0 04 168.7	1
2	9 46.8 1.0 04 167.8	10 16.7 1.0 04 167.8	10 46.7 1.0 04 167.8	11 16.7 1.0 04 167.8	11 46.7 1.0 04 167.7	12 16.7 1.0 04 167.7	12 46.6 1.0 04 167.7	13 16.6 1.0 04 167.7	2
3	9 44.5 1.0 04 166.8	10 14.4 1.0 04 166.8	10 44.4 1.0 04 166.8	11 14.4 1.0 04 166.7	11 44.4 1.0 04 166.7	12 14.4 1.0 04 166.7	12 44.3 1.0 04 166.7	13 14.3 1.0 04 166.7	3
4	9 42.0 1.0 04 165.8	10 12.0 1.0 04 165.8	10 41.9 1.0 04 165.7	11 11.9 1.0 04 165.7	11 41.9 1.0 04 165.7	12 11.9 1.0 04 165.7	12 41.8 1.0 04 165.7	13 11.8 1.0 04 165.6	4
15	9 39.4 1.0 05 164.8	10 09.3 1.0 05 164.8	10 39.3 1.0 05 164.7	11 09.3 1.0 05 164.7	11 39.2 1.0 05 164.7	12 09.2 1.0 05 164.7	12 39.2 1.0 05 164.6	13 09.1 1.0 05 164.6	15
6	9 36.5 1.0 05 163.8	10 06.5 1.0 05 163.7	10 36.5 1.0 05 163.7	11 06.4 1.0 05 163.7	11 36.4 1.0 05 163.7	12 06.4 1.0 05 163.6	12 36.3 1.0 05 163.6	13 06.3 1.0 05 163.6	6
7	9 33.5 1.0 05 162.8	10 03.5 1.0 05 162.7	10 33.5 1.0 05 162.7	11 03.4 1.0 05 162.7	11 33.4 1.0 05 162.6	12 03.3 1.0 05 162.6	12 33.3 1.0 05 162.6	13 03.2 1.0 05 162.6	7
8	9 30.4 1.0 06 161.7	10 00.3 1.0 06 161.7	10 30.3 1.0 06 161.7	11 00.2 1.0 06 161.7	11 30.2 1.0 06 161.6	12 00.1 1.0 06 161.6	12 30.1 1.0 06 161.6	13 00.0 1.0 06 161.5	8
9	9 27.0 1.0 06 160.7	9 57.0 1.0 06 160.7	10 26.9 1.0 06 160.7	10 56.9 1.0 06 160.6	11 26.8 1.0 06 160.6	11 56.8 1.0 06 160.6	12 26.7 1.0 06 160.6	12 56.7 1.0 06 160.5	9
20	9 23.5 1.0 06 159.7	9 53.4 1.0 06 159.7	10 23.4 1.0 06 159.7	10 53.3 1.0 06 159.6	11 23.3 1.0 06 159.6	11 53.2 1.0 06 159.6	12 23.1 1.0 06 159.5	12 53.1 1.0 06 159.5	20
1	9 19.8 1.0 06 158.7	9 49.7 1.0 06 158.7	10 19.7 1.0 06 158.6	10 49.6 1.0 06 158.6	11 19.5 1.0 06 158.6	11 49.5 1.0 06 158.5	12 19.4 1.0 06 158.5	12 49.4 1.0 06 158.5	1
2	9 15.9 1.0 07 157.7	9 45.8 1.0 07 157.7	10 15.8 1.0 07 157.6	10 45.7 1.0 07 157.6	11 15.6 1.0 07 157.6	11 45.6 1.0 07 157.5	12 15.5 1.0 07 157.5	12 45.4 1.0 07 157.5	2
3	9 11.9 1.0 07 156.7	9 41.8 1.0 07 156.6	10 11.7 1.0 07 156.6	10 41.7 1.0 07 156.6	11 11.6 1.0 07 156.5	11 41.5 1.0 07 156.5	12 11.4 1.0 07 156.5	12 41.4 1.0 07 156.4	3
4	9 07.7 1.0 07 155.7	9 37.6 1.0 07 155.6	10 07.5 1.0 07 155.6	10 37.4 1.0 07 155.6	11 07.4 1.0 07 155.5	11 37.3 1.0 07 155.5	12 07.2 1.0 07 155.5	12 37.1 1.0 07 155.4	4
25	9 03.3 1.0 08 154.7	9 33.2 1.0 08 154.6	10 03.1 1.0 08 154.6	10 33.0 1.0 08 154.5	11 03.0 1.0 08 154.5	11 32.9 1.0 08 154.5	12 02.8 1.0 08 154.4	12 32.7 1.0 08 154.4	25
6	8 58.7 1.0 08 153.7	9 28.7 1.0 08 153.6	9 58.6 1.0 08 153.6	10 28.5 1.0 08 153.5	10 58.4 1.0 08 153.5	11 28.3 1.0 08 153.4	11 58.2 1.0 08 153.4	12 28.1 1.0 08 153.4	6
7	8 54.0 1.0 08 152.6	9 23.9 1.0 08 152.6	9 53.8 1.0 08 152.6	10 23.8 1.0 08 152.5	10 53.7 1.0 08 152.5	11 23.6 1.0 08 152.4	11 53.5 1.0 08 152.4	12 23.4 1.0 08 152.4	7
8	8 49.2 1.0 08 151.6	9 19.1 1.0 08 151.6	9 49.0 1.0 08 151.6	10 18.9 1.0 08 151.5	10 48.8 1.0 08 151.5	11 18.7 1.0 08 151.4	11 48.6 1.0 08 151.4	12 18.4 1.0 08 151.3	8
9	8 44.1 1.0 09 150.6	9 14.0 1.0 09 150.6	9 43.9 1.0 09 150.5	10 13.8 1.0 09 150.5	10 43.7 1.0 09 150.5	11 13.6 1.0 09 150.4	11 43.5 1.0 09 150.4	12 13.4 1.0 09 150.3	9
30	8 38.9 1.0 09 149.6	9 08.8 1.0 09 149.6	9 38.7 1.0 09 149.5	10 08.6 1.0 09 149.5	10 38.5 1.0 09 149.4	11 08.4 1.0 09 149.4	11 38.2 1.0 09 149.3	12 08.1 1.0 09 149.3	30
1	8 33.6 1.0 09 148.6	9 03.5 1.0 09 148.6	9 33.4 1.0 09 148.5	10 03.2 1.0 09 148.5	10 33.1 1.0 09 148.4	11 03.0 1.0 09 148.4	11 32.9 1.0 09 148.3	12 02.7 1.0 09 148.3	1
2	8 28.1 1.0 09 147.6	8 58.0 1.0 09 147.6	9 27.8 1.0 09 147.5	9 57.7 1.0 09 147.5	10 27.6 1.0 09 147.4	10 57.4 1.0 10 147.4	11 27.3 1.0 10 147.3	11 57.2 1.0 10 147.3	2
3	8 22.4 1.0 10 146.6	8 52.3 1.0 10 146.6	9 22.2 1.0 10 146.5	9 52.0 1.0 10 146.5	10 21.9 1.0 10 146.4	10 51.7 1.0 10 146.4	11 21.6 1.0 10 146.3	11 51.5 1.0 10 146.3	3
4	8 16.6 1.0 10 145.6	8 46.5 1.0 10 145.5	9 16.3 1.0 10 145.5	9 46.2 1.0 10 145.4	10 16.0 1.0 10 145.4	10 45.9 1.0 10 145.3	11 15.8 1.0 10 145.3	11 45.6 1.0 10 145.2	4
35	8 10.7 99 10 144.6	8 40.5 99 10 144.5	9 10.4 99 10 144.5	9 40.2 99 10 144.4	10 10.1 99 10 144.4	10 39.9 99 10 144.3	11 09.7 99 10 144.3	11 39.6 99 10 144.2	35
6	8 04.6 99 10 143.6	8 34.4 99 10 143.5	9 04.2 99 10 143.5	9 34.1 99 10 143.4	10 03.9 99 10 143.4	10 33.7 99 10 143.3	11 03.6 99 10 143.3	11 33.4 99 10 143.2	6
7	7 58.3 99 11 142.6	8 28.1 99 11 142.5	8 58.0 99 11 142.5	9 27.8 99 11 142.4	9 57.6 99 11 142.4	10 27.5 99 11 142.3	10 57.3 99 11 142.3	11 27.1 99 11 142.2	7
8	7 51.9 99 11 141.6	8 21.7 99 11 141.5	8 51.5 99 11 141.5	9 21.4 99 11 141.4	9 51.2 99 11 141.4	10 21.0 99 11 141.3	10 50.8 99 11 141.2	11 20.7 99 11 141.2	8
9	7 45.3 99 11 140.6	8 15.2 99 11 140.5	8 45.0 99 11 140.5	9 14.8 99 11 140.4	9 44.6 99 11 140.3	10 14.4 99 11 140.3	10 44.2 99 11 140.2	11 14.1 99 11 140.2	9
40	7 38.7 99 11 139.6	8 08.5 99 11 139.5	8 38.3 99 11 139.4	9 08.1 99 11 139.4	9 37.9 99 11 139.3	10 07.7 99 11 139.3	10 37.5 99 11 139.2	11 07.3 99 11 139.2	40
1	7 31.8 99 12 138.6	8 01.6 99 12 138.5	8 31.4 99 12 138.4	9 01.2 99 12 138.4	9 31.0 99 12 138.3	10 00.8 99 12 138.3	10 30.6 99 12 138.2	11 00.4 99 12 138.2	1
2	7 24.9 99 12 137.6	7 54.7 99 12 137.5	8 24.5 99 12 137.4	8 54.2 99 12 137.4	9 24.0 99 12 137.3	9 53.8 99 12 137.3	10 23.6 99 12 137.2	10 53.4 99 12 137.1	2
3	7 17.8 99 12 136.6	7 47.6 99 12 136.5	8 17.3 99 12 136.4	8 47.1 99 12 136.4	9 16.9 99 12 136.3	9 46.7 99 12 136.3	10 16.5 99 12 136.2	10 46.3 99 12 136.1	3
4	7 10.5 99 12 135.6	7 40.3 99 12 135.5	8 10.1 99 12 135.4	8 39.9 99 12 135.4	9 09.6 99 12 135.3	9 39.4 99 12 135.3	10 09.2 99 12 135.2	10 39.0 99 12 135.1	4
45	7 03.2 99 12 134.6	7 33.0 99 12 134.5	8 02.7 99 12 134.4	8 32.5 99 13 134.4	9 02.3 99 13 134.3	9 32.0 99 13 134.2	10 01.8 99 13 134.2	10 31.6 99 13 134.1	45
6	6 55.7 99 13 133.6	7 25.5 99 13 133.5	7 55.2 99 13 133.4	8 25.0 99 13 133.4	8 54.7 99 13 133.3	9 24.5 99 13 133.3	9 54.3 99 13 133.2	10 24.0 99 13 133.1	6
7	6 48.1 99 13 132.6	7 17.8 99 13 132.5	7 47.6 99 13 132.4	8 17.3 99 13 132.4	8 47.1 99 13 132.3	9 16.8 99 13 132.2	9 46.6 99 13 132.2	10 16.3 99 13 132.1	7
8	6 40.3 99 13 131.6	7 10.1 99 13 131.5	7 39.8 99 13 131.4	8 09.6 99 13 131.4	8 39.3 99 13 131.3	9 09.1 99 13 131.2	9 38.8 99 13 131.2	10 08.6 99 13 131.1	8
9	6 32.5 99 13 130.6	7 02.2 99 13 130.5	7 32.0 99 13 130.4	8 01.7 99 13 130.4	8 31.4 99 13 130.3	9 01.2 99 13 130.2	9 30.9 99 13 130.2	10 00.6 99 13 130.1	9
50	6 24.5 99 14 129.6	6 54.2 99 14 129.5	7 24.0 99 14 129.4	7 53.7 99 14 129.4	8 23.4 99 14 129.3	8 53.2 99 14 129.2	9 22.9 99 14 129.2	9 52.6 99 14 129.1	50
1	6 16.4 99 14 128.6	6 46.2 99 14 128.5	7 15.9 99 14 128.4	7 45.6 99 14 128.4	8 15.3 99 14 128.3	8 45.0 99 14 128.2	9 14.8 99 14 128.2	9 44.5 99 14 128.1	1
2	6 08.2 99 14 127.6	6 37.9 99 14 127.5	7 07.7 99 14 127.4	7 37.4 99 14 127.4	8 07.1 99 14 127.3	8 36.8 99 14 127.2	9 06.5 99 14 127.2	9 36.2 99 14 127.1	2
3	5 59.9 99 14 126.6	6 29.6 99 14 126.5	6 59.3 99 14 126.4	7 29.0 99 14 126.4	7 58.7 99 14 126.3	8 28.4 99 14 126.2	8 58.1 99 14 126.2	9 27.8 99 14 126.1	3
4	5 51.5 99 14 125.6	6 21.2 99 14 125.5	6 50.9 99 14 125.4	7 20.6 99 14 125.4	7 50.3 99 14 125.3	8 20.0 99 14 125.2	8 49.7 99 14 125.2	9 19.4 99 14 125.1	4
55	5 43.0 99 14 124.6	6 12.7 99 14 124.5	6 42.4 99 14 124.4	7 12.0 99 14 124.4	7 41.7 99 14 124.2	8 11.4 99 14 124.2	8 41.1 99 14 124.1	9 10.8 99 14 124.1	55
6	5 34.3 99 15 123.6	6 04.0 99 15 123.5	6 33.7 99 15 123.4	7 03.4 99 15 123.4	7 33.1 99 15 123.3	8 02.8 99 15 123.2	8 32.4 99 15 123.2	9 02.1 99 15 123.1	6
7	5 25.6 99 15 122.6	5 55.3 99 15 122.5	6 25.0 99 15 122.5	6 54.6 99 15 122.4	7 24.3 99 15 122.3	7 54.0 99 15 122.2	8 23.7 99 15 122.2	8 53.3 99 15 122.1	7
8	5 16.8 99 15 121.6	5 46.5 99 15 121.5	6 16.1 99 15 121.5	6 45.8 99 15 121.4	7 15.5 99 15 121.3	7 45.1 99 15 121.2	8 14.8 99 15 121.1	8 44.5 99 15 121.1	8
9	5 07.9 99 15 120.6	5 37.5 99 15 120.5	6 07.2 99 15 120.5	6 36.9 99 15 120.4	7 06.5 99 15 120.3	7 36.2 99 15 120.2	8 05.8 99 15 120.2	8 35.5 99 15 120.1	9
60		5 28.5 99 15 119.5	5 58.2 99 15 119.5	6 27.8 99 15 119.4	6 57.5 99 15 119.3	7 27.1 99 15 119.2	7 56.8 99 15 119.2	8 26.4 99 15 119.1	60
1		5 19.4 99 15 118.6	5 49.1 99 15 118.5	6 18.7 99 15 118.4	6 48.3 99 15 118.3	7 18.0 99 15 118.2	7 47.6 99 15 118.2	8 17.3 99 15 118.1	1
2		5 10.2 99 16 117.6	5 39.9 99 15 117.5	6 09.5 99 16 117.4	6 39.1 99 16 117.3	7 08.8 99 16 117.3	7 38.4 99 16 117.2	8 08.1 99 16 117.1	2
3		5 00.9 99 16 116.6	5 30.6 99 16 116.5	6 00.2 99 16 116.4	6 29.8 99 16 116.3	6 59.5 99 16 116.3	7 29.1 99 16 116.2	7 58.7 99 16 116.1	3
4			5 21.2 99 16 115.5	5 50.8 99 16 115.4	6 20.5 99 16 115.3	6 50.1 99 16 115.3	7 19.7 99 16 115.2	7 49.3 99 16 115.1	4
65			5 11.8 99 16 114.5	5 41.4 99 16 114.4	6 11.0 99 16 114.3	6 40.6 99 16 114.3	7 10.2 99 16 114.2	7 39.9 99 16 114.1	65
6			5 02.2 99 16 113.5	5 31.9 99 16 113.4	6 01.5 99 16 113.4	6 31.1 99 16 113.3	7 00.7 99 16 113.2	7 30.3 99 16 113.1	6
7				5 22.3 99 16 112.4	5 51.9 99 16 112.4	6 21.5 99 16 112.3	6 51.1 99 16 112.2	7 20.7 99 16 112.1	7
8				5 12.6 99 16 111.5	5 42.2 99 16 111.4	6 11.8 99 16 111.3	6 41.4 99 16 111.2	7 11.0 99 16 111.1	8
9				5 02.9 99 16 110.5	5 32.5 99 16 110.4	6 02.1 99 16 110.3	6 31.7 99 16 110.2	7 01.3 99 16 110.1	9
70					5 22.7 99 16 109.4	5 52.3 99 16 109.3	6 21.9 99 16 109.2	6 51.5 99 16 109.1	70
1					5 12.8 99 17 108.4	5 42.4 99 17 108.3	6 12.0 99 17 108.2	6 41.6 99 17 108.2	1
2					5 02.9 99 17 107.4	5 32.5 99 17 107.3	6 02.1 99 17 107.2	6 31.7 99 17 107.2	2
3						5 22.5 99 17 106.3	5 52.1 99 17 106.2	6 21.7 99 17 106.2	3
4						5 12.5 99 17 105.4	5 42.1 99 17 105.3	6 11.6 99 17 105.2	4
75						5 02.4 99 17 104.4	5 32.0 99 17 104.3	6 01.6 99 17 104.2	75
6							5 21.9 99 17 103.3	5 51.4 99 17 103.2	6
7							5 11.7 99 17 102.3	5 41.3 99 17 102.2	7
8							5 01.5 99 17 101.3	5 31.1 99 17 101.2	8
9								5 20.8 99 17 100.2	9
80								5 10.6 99 17 99.3	80
1								5 00.3 99 17 98.3	1

Lat. 80°

H.A.	0° 00' Alt. Δd Δt Az.	0° 30' Alt. Δd Δt Az.	1° 00' Alt. Δd Δt Az.	1° 30' Alt. Δd Δt Az.	2° 00' Alt. Δd Δt Az.	2° 30' Alt. Δd Δt Az.	3° 00' Alt. Δd Δt Az.	3° 30' Alt. Δd Δt Az.	H.A.
00	10 00.0 1.0 00 180.0	9 30.0 1.0 00 180.0	9 00.0 1.0 00 180.0	8 30.0 1.0 00 180.0	8 00.0 1.0 00 180.0	7 30.0 1.0 00 180.0	7 00.0 1.0 00 180.0	6 30.0 1.0 00 180.0	00
1	9 59.9 1.0 00 179.0	9 29.9 1.0 00 179.0	8 59.9 1.0 00 179.0	8 29.9 1.0 00 179.0	7 59.9 1.0 00 179.0	7 29.9 1.0 00 179.0	6 59.9 1.0 00 179.0	6 29.9 1.0 00 179.0	1
2	9 59.6 1.0 01 178.0	9 29.6 1.0 01 178.0	8 59.6 1.0 01 178.0	8 29.6 1.0 01 178.0	7 59.6 1.0 01 178.0	7 29.6 1.0 01 178.0	6 59.6 1.0 01 178.0	6 29.6 1.0 01 178.0	2
3	9 59.2 1.0 01 177.0	9 29.2 1.0 01 177.0	8 59.2 1.0 01 177.0	8 29.2 1.0 01 177.0	7 59.2 1.0 01 177.0	7 29.2 1.0 01 177.0	6 59.2 1.0 01 177.0	6 29.2 1.0 01 177.0	3
4	9 58.5 1.0 01 175.9	9 28.5 1.0 01 175.9	8 58.5 1.0 01 176.0	8 28.5 1.0 01 176.0	7 58.5 1.0 01 176.0	7 28.5 1.0 01 176.0	6 58.5 1.0 01 176.0	6 28.5 1.0 01 176.0	4
05	9 57.7 1.0 02 174.9	9 27.7 1.0 02 174.9	8 57.7 1.0 02 174.9	8 27.7 1.0 02 174.9	7 57.7 1.0 02 175.0	7 27.7 1.0 02 175.0	6 57.7 1.0 02 175.0	6 27.7 1.0 02 175.0	05
6	9 56.7 1.0 02 173.9	9 26.7 1.0 02 173.9	8 56.7 1.0 02 173.9	8 26.7 1.0 02 173.9	7 56.7 1.0 02 173.9	7 26.7 1.0 02 174.0	6 56.7 1.0 02 174.0	6 26.7 1.0 02 174.0	6
7	9 55.5 1.0 02 172.9	9 25.5 1.0 02 172.9	8 55.5 1.0 02 172.9	8 25.5 1.0 02 172.9	7 55.5 1.0 02 172.9	7 25.5 1.0 02 172.9	6 55.5 1.0 02 173.0	6 25.5 1.0 02 173.0	7
8	9 54.1 1.0 03 171.9	9 24.1 1.0 03 171.9	8 54.1 1.0 03 171.9	8 24.1 1.0 03 171.9	7 54.1 1.0 03 171.9	7 24.1 1.0 03 171.9	6 54.2 1.0 03 172.0	6 24.2 1.0 03 172.0	8
9	9 52.5 1.0 03 170.9	9 22.6 1.0 03 170.9	8 52.6 1.0 03 170.9	8 22.6 1.0 03 170.9	7 52.6 1.0 03 170.9	7 22.6 1.0 03 170.9	6 52.6 1.0 03 170.9	6 22.6 1.0 03 171.0	9
10	9 50.8 1.0 03 169.8	9 20.8 1.0 03 169.9	8 50.8 1.0 03 169.9	8 20.8 1.0 03 169.9	7 50.8 1.0 03 169.9	7 20.9 1.0 03 169.9	6 50.9 1.0 03 169.9	6 20.9 1.0 03 170.0	10
1	9 48.9 1.0 04 168.8	9 18.9 1.0 04 168.9	8 48.9 1.0 04 168.9	8 18.9 1.0 04 168.9	7 48.9 1.0 04 168.9	7 19.0 1.0 03 168.9	6 49.0 1.0 03 168.9	6 19.0 1.0 03 169.0	1
2	9 46.8 1.0 04 167.8	9 16.8 1.0 04 167.8	8 46.8 1.0 04 167.9	8 16.8 1.0 04 167.9	7 46.8 1.0 04 167.9	7 16.9 1.0 04 167.9	6 46.9 1.0 04 167.9	6 16.9 1.0 04 167.9	2
3	9 44.5 1.0 04 166.8	9 14.5 1.0 04 166.8	8 44.5 1.0 04 166.8	8 14.5 1.0 04 166.9	7 44.6 1.0 04 166.9	7 14.6 1.0 04 166.9	6 44.6 1.0 04 166.9	6 14.6 1.0 04 166.9	3
4	9 42.0 1.0 04 165.8	9 12.0 1.0 04 165.8	8 42.1 1.0 04 165.8	8 12.1 1.0 04 165.9	7 42.1 1.0 04 165.9	7 12.1 1.0 04 165.9	6 42.2 1.0 04 165.9	6 12.2 1.0 04 165.9	4
15	9 39.4 1.0 05 164.8	9 09.4 1.0 05 164.8	8 39.4 1.0 05 164.8	8 09.4 1.0 05 164.8	7 39.5 1.0 05 164.9	7 09.5 1.0 05 164.9	6 39.5 1.0 05 164.9	6 09.6 1.0 05 164.9	15
6	9 36.5 1.0 05 163.8	9 06.6 1.0 05 163.8	8 36.6 1.0 05 163.8	8 06.6 1.0 05 163.8	7 36.7 1.0 05 163.9	7 06.7 1.0 05 163.9	6 36.7 1.0 05 163.9	6 06.8 1.0 05 163.9	6
7	9 33.5 1.0 05 162.8	9 03.6 1.0 05 162.8	8 33.6 1.0 05 162.8	8 03.6 1.0 05 162.8	7 33.7 1.0 05 162.9	7 03.7 1.0 05 162.9	6 33.8 1.0 05 162.9	6 03.8 1.0 05 162.9	7
8	9 30.4 1.0 06 161.7	9 00.4 1.0 06 161.8	8 30.4 1.0 06 161.8	8 00.5 1.0 06 161.8	7 30.5 1.0 06 161.9	7 00.6 1.0 06 161.9	6 30.6 1.0 06 161.9	6 00.7 1.0 06 161.9	8
9	9 27.0 1.0 06 160.7	8 57.1 1.0 06 160.8	8 27.1 1.0 06 160.8	7 57.2 1.0 06 160.8	7 27.2 1.0 06 160.8	6 57.2 1.0 06 160.9	6 27.3 1.0 06 160.9	5 57.3 1.0 06 160.9	9
20	9 23.5 1.0 06 159.7	8 53.5 1.0 06 159.7	8 23.6 1.0 06 159.8	7 53.6 1.0 06 159.8	7 23.7 1.0 06 159.8	6 53.7 1.0 06 159.9	6 23.8 1.0 06 159.9	5 53.9 1.0 06 159.9	20
1	9 19.8 1.0 06 158.7	8 49.8 1.0 06 158.7	8 19.9 1.0 06 158.8	7 50.0 1.0 06 158.8	7 20.0 1.0 06 158.8	6 50.1 1.0 06 158.9	6 20.1 1.0 06 158.9	5 50.2 1.0 06 158.9	1
2	9 15.9 1.0 07 157.7	8 46.0 1.0 07 157.7	8 16.0 1.0 07 157.8	7 46.1 1.0 07 157.8	7 16.2 1.0 07 157.8	6 46.2 1.0 07 157.9	6 16.3 1.0 07 157.9	5 46.4 1.0 07 157.9	2
3	9 11.9 1.0 07 156.7	8 41.9 1.0 07 156.7	8 12.0 1.0 07 156.8	7 42.1 1.0 07 156.8	7 12.2 1.0 07 156.8	6 42.2 1.0 07 156.9	6 12.3 1.0 07 156.9	5 42.4 1.0 07 156.9	3
4	9 07.7 1.0 07 155.7	8 37.7 1.0 07 155.7	8 07.8 1.0 07 155.7	7 37.9 1.0 07 155.8	7 08.0 1.0 07 155.8	6 38.0 1.0 07 155.9	6 08.1 1.0 07 155.9	5 38.2 1.0 07 155.9	4
25	9 03.3 1.0 08 154.7	8 33.4 1.0 08 154.7	8 03.5 1.0 08 154.7	7 33.5 1.0 08 154.8	7 03.6 1.0 08 154.8	6 33.7 1.0 08 154.8	6 03.8 1.0 08 154.9	5 33.9 1.0 08 154.9	25
6	8 58.7 1.0 08 153.7	8 28.8 1.0 08 153.7	7 58.9 1.0 08 153.7	7 29.0 1.0 08 153.8	6 59.1 1.0 08 153.8	6 29.2 1.0 08 153.8	5 59.3 1.0 08 153.9	5 29.4 1.0 08 153.9	6
7	8 54.0 1.0 08 152.6	8 24.1 1.0 08 152.7	7 54.2 1.0 08 152.7	7 24.3 1.0 08 152.8	6 54.4 1.0 08 152.8	6 24.5 1.0 08 152.8	5 54.6 1.0 08 152.9	5 24.7 1.0 08 152.9	7
8	8 49.2 1.0 08 151.6	8 19.3 1.0 08 151.7	7 49.4 1.0 08 151.7	7 19.5 1.0 08 151.8	6 49.6 1.0 08 151.8	6 19.7 1.0 08 151.8	5 49.8 1.0 08 151.9	5 19.9 1.0 08 151.9	8
9	8 44.1 1.0 09 150.6	8 14.2 1.0 09 150.7	7 44.4 1.0 09 150.7	7 14.5 1.0 09 150.8	6 44.6 1.0 09 150.8	6 14.7 1.0 09 150.8	5 44.8 1.0 09 150.9	5 14.9 1.0 09 150.9	9
30	8 38.9 1.0 09 149.6	8 09.1 1.0 09 149.7	7 39.2 1.0 09 149.7	7 09.3 1.0 09 149.8	6 39.4 1.0 09 149.8	6 09.5 1.0 09 149.8	5 39.6 1.0 09 149.9	5 09.8 1.0 09 149.9	30
1	8 33.6 1.0 09 148.6	8 03.7 1.0 09 148.7	7 33.8 1.0 09 148.7	7 04.0 1.0 09 148.8	6 34.1 1.0 09 148.8	6 04.2 1.0 09 148.8	5 34.3 1.0 09 148.9	5 04.5 1.0 09 148.9	1
2	8 28.1 1.0 09 147.6	7 58.2 1.0 09 147.7	7 28.4 1.0 09 147.7	6 58.5 1.0 09 147.7	6 28.6 1.0 09 147.8	5 58.7 1.0 09 147.8	5 28.9 1.0 09 147.9		2
3	8 22.4 1.0 10 146.6	7 52.6 1.0 10 146.6	7 22.7 1.0 10 146.7	6 52.8 1.0 10 146.7	6 23.0 1.0 10 146.8	5 53.1 1.0 10 146.8	5 23.3 1.0 10 146.9		3
4	8 16.6 1.0 10 145.6	7 46.8 1.0 10 145.6	7 16.9 1.0 10 145.7	6 47.1 1.0 10 145.7	6 17.2 1.0 10 145.8	5 47.3 1.0 10 145.8	5 17.5 1.0 10 145.9		4
35	8 10.7 99 10 144.6	7 40.8 99 10 144.6	7 11.0 99 10 144.7	6 41.1 99 10 144.7	6 11.3 99 10 144.8	5 41.4 99 10 144.8	5 11.6 99 10 144.9		35
6	8 04.6 99 10 143.6	7 34.7 99 10 143.6	7 04.9 99 10 143.7	6 35.0 99 10 143.7	6 05.2 99 10 143.8	5 35.3 99 10 143.8	5 05.5 99 10 143.9		6
7	7 58.3 99 11 142.6	7 28.5 99 11 142.6	6 58.6 99 11 142.7	6 28.8 99 11 142.7	5 59.0 99 11 142.8	5 29.1 99 11 142.8			7
8	7 51.9 99 11 141.6	7 22.1 99 11 141.6	6 52.2 99 11 141.7	6 22.4 99 11 141.7	5 52.6 99 11 141.8	5 22.8 99 11 141.8			8
9	7 45.3 99 11 140.6	7 15.5 99 11 140.6	6 45.7 99 11 140.7	6 15.9 99 11 140.7	5 46.1 99 11 140.8	5 16.3 99 11 140.8			9
40	7 38.7 99 11 139.6	7 08.8 99 11 139.6	6 39.0 99 11 139.7	6 09.2 99 11 139.7	5 39.4 99 11 139.8	5 09.6 99 11 139.8			40
1	7 31.8 99 12 138.6	7 02.0 99 12 138.6	6 32.2 99 12 138.7	6 02.4 99 12 138.7	5 32.6 99 12 138.8	5 02.8 99 12 138.9			1
2	7 24.9 99 12 137.6	6 55.1 99 12 137.6	6 25.3 99 12 137.7	5 55.5 99 12 137.7	5 25.7 99 12 137.8				2
3	7 17.8 99 12 136.6	6 48.0 99 12 136.6	6 18.2 99 12 136.7	5 48.4 99 12 136.7	5 18.6 99 12 136.8				3
4	7 10.5 99 12 135.6	6 40.8 99 12 135.6	6 11.0 99 12 135.7	5 41.2 99 12 135.7	5 11.4 99 12 135.8				4
45	7 03.2 99 12 134.6	6 33.4 99 12 134.6	6 03.6 99 12 134.7	5 33.9 99 12 134.7	5 04.1 99 12 134.8				45
6	6 55.7 99 13 133.6	6 25.9 99 13 133.6	5 56.2 99 13 133.7	5 26.4 99 13 133.8					6
7	6 48.1 99 13 132.6	6 18.3 99 13 132.6	5 48.6 99 13 132.7	5 18.8 99 13 132.8					7
8	6 40.3 99 13 131.6	6 10.6 99 13 131.6	5 40.9 99 13 131.7	5 11.1 99 13 131.8					8
9	6 32.5 99 13 130.6	6 02.8 99 13 130.6	5 33.0 99 13 130.7	5 03.3 99 13 130.8					9
50	6 24.5 99 13 129.6	5 54.8 99 13 129.6	5 25.1 99 13 129.7						50
1	6 16.4 99 14 128.6	5 46.7 99 14 128.6	5 17.0 99 14 128.7						1
2	6 08.2 99 14 127.6	5 38.5 99 14 127.6	5 08.8 99 14 127.7						2
3	5 59.9 99 14 126.6	5 30.2 99 14 126.6	5 00.5 99 14 126.7						3
4	5 51.5 99 14 125.6	5 21.8 99 14 125.7							4
55	5 43.0 99 14 124.6	5 13.3 99 14 124.7							55
6	5 34.3 99 15 123.6	5 04.7 99 15 123.7							6
7	5 25.6 99 15 122.6								7
8	5 16.8 99 15 121.6								8
9	5 07.9 99 15 120.6								9

H.A.	4° 00' Alt.	Δd Δt	Az.	4° 30' Alt.	Δd Δt	Az.	5° 00' Alt.	Δd Δt	Az.	5° 30' Alt.	Δd Δt	Az.	6° 00' Alt.	Δd Δt	Az.	6° 30' Alt.	Δd Δt	Az.	7° 00' Alt.	Δd Δt	Az.	7° 30' Alt.	Δd Δt	Az.	H.A.
00	14 00.0	1.00 0	180.0	14 30.0	1.00 0	180.0	15 00.0	1.00 0	180.0	15 30.0	1.00 0	180.0	16 00.0	1.00 0	180.0	16 30.0	1.00 0	180.0	17 00.0	1.00 0	180.0	17 30.0	1.00 0	180.0	00
1	13 59.9	1.00 0	179.0	14 29.9	1.00 0	179.0	14 59.9	1.00 0	179.0	15 29.9	1.00 0	179.0	15 59.9	1.00 0	179.0	16 29.9	1.00 0	179.0	16 59.9	1.00 0	179.0	17 29.9	1.00 0	179.0	1
2	13 59.6	1.00 1	177.9	14 29.6	1.00 1	177.9	14 59.6	1.00 1	177.9	15 29.6	1.00 1	177.9	15 59.6	1.00 1	177.9	16 29.6	1.00 1	177.9	16 59.6	1.00 1	177.9	17 29.6	1.00 1	177.9	2
3	13 59.2	1.00 1	176.9	14 29.2	1.00 1	176.9	14 59.2	1.00 1	176.9	15 29.2	1.00 1	176.9	15 59.2	1.00 1	176.9	16 29.2	1.00 1	176.9	16 59.2	1.00 1	176.9	17 29.2	1.00 1	176.9	3
4	13 58.5	1.00 1	175.9	14 28.5	1.00 1	175.9	14 58.5	1.00 1	175.9	15 28.5	1.00 1	175.9	15 58.5	1.00 1	175.9	16 28.5	1.00 1	175.9	16 58.5	1.00 1	175.8	17 28.5	1.00 1	175.8	4
05	13 57.7	1.00 2	174.9	14 27.7	1.00 2	174.9	14 57.7	1.00 2	174.8	15 27.7	1.00 2	174.8	15 57.7	1.00 2	174.8	16 27.6	1.00 2	174.8	16 57.6	1.00 2	174.8	17 27.6	1.00 2	174.8	05
6	13 56.6	1.00 2	173.8	14 26.6	1.00 2	173.8	14 56.6	1.00 2	173.8	15 26.6	1.00 2	173.8	15 56.6	1.00 2	173.8	16 26.6	1.00 2	173.8	16 56.6	1.00 2	173.8	17 26.6	1.00 2	173.8	6
7	13 55.4	1.00 2	172.8	14 25.4	1.00 2	172.8	14 55.4	1.00 2	172.8	15 25.4	1.00 2	172.8	15 55.4	1.00 2	172.8	16 25.4	1.00 2	172.7	16 55.4	1.00 2	172.7	17 25.4	1.00 2	172.7	7
8	13 54.0	1.00 3	171.8	14 24.0	1.00 3	171.8	14 54.0	1.00 3	171.8	15 24.0	1.00 3	171.7	15 54.0	1.00 3	171.7	16 24.0	1.00 3	171.7	16 54.0	1.00 3	171.7	17 24.0	1.00 3	171.7	8
9	13 52.4	1.00 3	170.8	14 22.4	1.00 3	170.7	14 52.4	1.00 3	170.7	15 22.4	1.00 3	170.7	15 52.4	1.00 3	170.7	16 22.4	1.00 3	170.7	16 52.4	1.00 3	170.7	17 22.4	1.00 3	170.6	9
10	13 50.7	1.00 3	169.7	14 20.7	1.00 3	169.7	14 50.7	1.00 3	169.7	15 20.6	1.00 3	169.7	15 50.6	1.00 3	169.7	16 20.6	1.00 3	169.6	16 50.6	1.00 3	169.6	17 20.6	1.00 3	169.6	10
1	13 48.7	1.00 4	168.7	14 18.7	1.00 4	168.7	14 48.7	1.00 4	168.7	15 18.7	1.00 4	168.6	15 48.7	1.00 4	168.6	16 18.6	1.00 4	168.6	16 48.6	1.00 4	168.6	17 18.6	1.00 4	168.6	1
2	13 46.6	1.00 4	167.7	14 16.6	1.00 4	167.7	14 46.6	1.00 4	167.6	15 16.5	1.00 4	167.6	15 46.5	1.00 4	167.6	16 16.5	1.00 4	167.6	16 46.5	1.00 4	167.6	17 16.4	1.00 4	167.5	2
3	13 44.3	1.00 4	166.6	14 14.3	1.00 4	166.6	14 44.2	1.00 4	166.6	15 14.2	1.00 4	166.6	15 44.2	1.00 4	166.6	16 14.2	1.00 4	166.5	16 44.1	1.00 4	166.5	17 14.1	1.00 4	166.5	3
4	13 41.8	1.00 4	165.6	14 11.8	1.00 4	165.6	14 41.7	1.00 4	165.6	15 11.7	1.00 4	165.6	15 41.7	1.00 4	165.5	16 11.6	1.00 4	165.5	16 41.6	1.00 5	165.5	17 11.6	1.00 4	165.5	4
15	13 39.1	1.00 5	164.6	14 09.1	1.00 5	164.6	14 39.0	1.00 5	164.5	15 09.0	1.00 5	164.5	15 39.0	1.00 5	164.5	16 08.9	1.00 5	164.5	16 38.9	1.00 5	164.4	17 08.9	1.00 5	164.4	15
6	13 36.2	1.00 5	163.6	14 06.2	1.00 5	163.5	14 36.2	1.00 5	163.5	15 06.1	1.00 5	163.5	15 36.1	1.00 5	163.5	16 06.1	1.00 5	163.4	16 36.0	1.00 6	163.4	17 06.0	1.00 5	163.4	6
7	13 33.2	1.00 5	162.5	14 03.2	1.00 5	162.5	14 33.1	1.00 5	162.5	15 03.1	1.00 5	162.5	15 33.0	1.00 5	162.4	16 03.0	1.00 6	162.4	16 33.0	1.00 6	162.4	17 02.9	1.00 6	162.4	7
8	13 30.0	1.00 6	161.5	13 59.9	1.00 6	161.5	14 29.9	1.00 6	161.5	14 59.9	1.00 6	161.4	15 29.8	1.00 6	161.4	15 59.8	1.00 6	161.4	16 29.7	1.00 6	161.3	16 59.7	1.00 6	161.3	8
9	13 26.6	1.00 6	160.5	13 56.6	1.00 6	160.5	14 26.5	1.00 6	160.4	14 56.5	1.00 6	160.4	15 26.4	1.00 6	160.4	15 56.3	1.00 6	160.3	16 26.3	1.00 6	160.3	16 56.2	1.00 6	160.3	9
20	13 23.0	1.00 6	159.5	13 53.0	1.00 6	159.4	14 22.9	1.00 6	159.4	14 52.9	1.00 6	159.4	15 22.8	1.00 6	159.3	15 52.8	1.00 6	159.3	16 22.7	1.00 6	159.3	16 52.6	1.00 6	159.2	20
1	13 19.3	1.00 7	158.4	13 49.2	1.00 7	158.4	14 19.2	1.00 7	158.3	14 49.1	1.00 7	158.3	15 19.0	1.00 7	158.3	15 49.0	1.00 7	158.3	16 18.9	1.00 7	158.2	16 48.9	1.00 7	158.2	1
2	13 15.4	1.00 7	157.4	13 45.3	1.00 7	157.4	14 15.2	1.00 7	157.4	14 45.2	1.00 7	157.3	15 15.1	1.00 7	157.3	15 45.0	1.00 7	157.2	16 15.0	1.00 7	157.2	16 44.9	1.00 7	157.2	2
3	13 11.3	1.00 7	156.4	13 41.2	1.00 7	156.4	14 11.1	1.00 7	156.3	14 41.1	1.00 7	156.3	15 11.0	1.00 7	156.3	15 40.9	1.00 7	156.2	16 10.9	1.00 7	156.2	16 40.8	1.00 7	156.1	3
4	13 07.0	1.00 7	155.4	13 37.0	1.00 7	155.3	14 06.9	1.00 7	155.3	14 36.8	1.00 7	155.3	15 06.7	1.00 7	155.2	15 36.6	1.00 7	155.2	16 06.6	1.00 7	155.2	16 36.5	1.00 7	155.1	4
25	13 02.6	1.00 8	154.4	13 32.5	1.00 8	154.3	14 02.4	1.00 8	154.3	14 32.4	1.00 8	154.2	15 02.3	1.00 8	154.2	15 32.2	1.00 8	154.2	16 02.1	1.00 8	154.1	16 32.0	1.00 8	154.1	25
6	12 58.0	1.00 8	153.3	13 27.9	1.00 8	153.3	13 57.8	1.00 8	153.2	14 27.7	1.00 8	153.2	14 57.7	1.00 8	153.2	15 27.6	1.00 8	153.1	15 57.5	1.00 8	153.1	16 27.4	1.00 8	153.1	6
7	12 53.3	1.00 8	152.3	13 23.2	1.00 8	152.3	13 53.1	1.00 8	152.2	14 23.0	1.00 8	152.2	14 52.9	1.00 8	152.1	15 22.8	1.00 8	152.1	15 52.7	1.00 8	152.1	16 22.6	1.00 8	152.0	7
8	12 48.3	1.00 8	151.3	13 18.2	1.00 8	151.3	13 48.1	1.00 8	151.2	14 18.0	1.00 8	151.2	14 47.9	1.00 9	151.1	15 17.8	1.00 9	151.1	15 47.7	1.00 9	151.0	16 17.6	1.00 9	151.0	8
9	12 43.3	1.00 9	150.3	13 13.1	1.00 9	150.2	13 43.0	1.00 9	150.2	14 12.9	1.00 9	150.1	14 42.8	1.00 9	150.1	15 12.7	1.00 9	150.1	15 42.6	1.00 9	150.0	16 12.5	1.00 9	150.0	9
30	12 38.0	1.00 9	149.3	13 07.9	1.00 9	149.2	13 37.8	1.00 9	149.2	14 07.7	1.00 9	149.1	14 37.5	1.00 9	149.1	15 07.4	1.00 9	149.0	15 37.3	1.00 9	149.0	16 07.2	1.00 9	148.9	30
1	12 32.6	1.00 9	148.2	13 02.6	1.00 9	148.2	13 32.4	1.00 9	148.1	14 02.2	1.00 9	148.1	14 32.1	1.00 9	148.1	15 02.0	1.00 9	148.0	15 31.8	1.00 9	148.0	16 01.7	1.00 9	147.9	1
2	12 27.0	1.00 10	147.2	12 56.9	1.00 10	147.2	13 26.8	1.00 10	147.1	13 56.6	1.00 10	147.1	14 26.5	1.00 10	147.0	14 56.4	1.00 10	147.0	15 26.2	1.00 10	146.9	15 56.1	1.00 10	146.9	2
3	12 21.3	1.00 10	146.2	12 51.2	1.00 10	146.1	13 21.0	1.00 10	146.1	13 50.9	1.00 10	146.1	14 20.8	1.00 10	146.0	14 50.6	1.00 10	146.0	15 20.5	1.00 10	145.9	15 50.3	1.00 10	145.9	3
4	12 15.5	1.00 10	145.2	12 45.3	1.00 10	145.1	13 15.2	1.00 10	145.1	13 45.0	1.00 10	145.0	14 14.9	99 10	145.0	14 44.7	99 10	144.9	15 14.6	99 10	144.9	15 44.4	99 10	144.8	4
35	12 09.4	99 10	144.2	12 39.3	99 10	144.1	13 09.1	99 10	144.1	13 39.0	99 10	144.0	14 08.8	99 10	144.0	14 38.6	99 10	143.9	15 08.5	99 10	143.9	15 38.3	99 10	143.8	35
6	12 03.3	99 11	143.2	12 33.1	99 11	143.1	13 02.9	99 11	143.1	13 32.8	99 11	143.0	14 02.6	99 11	142.9	14 32.4	99 11	142.9	15 02.3	99 11	142.8	15 32.1	99 11	142.8	6
7	11 56.9	99 11	142.1	12 26.8	99 11	142.1	12 56.6	99 11	142.0	13 26.4	99 11	142.0	13 56.2	99 11	141.9	14 26.1	99 11	141.9	14 55.9	99 11	141.8	15 25.7	99 11	141.8	7
8	11 50.5	99 11	141.1	12 20.3	99 11	141.1	12 50.1	99 11	141.0	13 19.9	99 11	141.0	13 49.7	99 11	140.9	14 19.6	99 11	140.9	14 49.4	99 11	140.8	15 19.2	99 11	140.7	8
9	11 43.9	99 11	140.1	12 13.7	99 11	140.1	12 43.5	99 11	140.0	13 13.3	99 11	139.9	13 43.1	99 11	139.9	14 12.9	99 11	139.8	14 42.7	99 11	139.8	15 12.5	99 11	139.7	9
40	11 37.1	99 12	139.1	12 06.9	99 12	139.0	12 36.7	99 12	138.9	13 06.5	99 12	138.9	13 36.3	99 12	138.8	14 06.1	99 12	138.8	14 35.9	99 12	138.8	15 05.7	99 12	138.7	40
1	11 30.2	99 12	138.1	12 00.0	99 12	138.0	12 29.8	99 12	138.0	12 59.6	99 12	137.9	13 29.4	99 12	137.9	13 59.2	99 12	137.8	14 29.0	99 12	137.7	14 58.8	99 12	137.7	1
2	11 23.2	99 12	137.1	11 53.0	99 12	137.0	12 22.8	99 12	137.0	12 52.6	99 12	136.9	13 22.3	99 12	136.8	13 52.1	99 12	136.8	14 21.9	99 12	136.7	14 51.7	99 12	136.7	2
3	11 16.0	99 12	136.1	11 45.8	99 12	136.0	12 15.6	99 12	136.0	12 45.4	99 12	135.9	13 15.2	99 12	135.8	13 44.9	99 12	135.8	14 14.7	99 12	135.7	14 44.5	99 12	135.6	3
4	11 08.7	99 12	135.1	11 38.5	99 12	135.0	12 08.3	99 12	135.0	12 38.1	99 12	134.9	13 07.8	99 12	134.8	13 37.6	99 12	134.8	14 07.4	99 12	134.7	14 37.1	99 12	134.6	4
45	11 01.3	99 13	134.1	11 31.1	99 13	134.0	12 00.8	99 13	133.9	12 30.6	99 13	133.9	13 00.4	99 13	133.8	13 30.1	99 13	133.7	13 59.9	99 13	133.7	14 29.6	99 13	133.6	45
6	10 53.8	99 13	133.0	11 23.5	99 13	133.0	11 53.3	99 13	132.9	12 23.0	99 13	132.9	12 52.8	99 13	132.8	13 22.5	99 13	132.7	13 52.3	99 13	132.7	14 22.0	99 13	132.6	6
7	10 46.1	99 13	132.0	11 15.8	99 13	132.0	11 45.6	99 13	131.9	12 15.3	99 13	131.8	12 45.1	99 13	131.8	13 14.8	99 13	131.7	13 44.6	99 13	131.6	14 14.3	99 13	131.6	7
8	10 38.3	99 13	131.0	11 08.0	99 13	131.0	11 37.8	99 13	130.9	12 07.5	99 13	130.8	12 37.2	99 13	130.8	13 07.0	99 13	130.7	13 36.7	99 13	130.6	14 06.5	99 13	130.6	8
9	10 30.4	99 13	130.0	11 00.1	99 13	130.0	11 29.8	99 13	129.9	11 59.6	99 13	129.8	12 29.3	99 13	129.8	12 59.0	99 13	129.7	13 28.8	99 13	129.6	13 58.5	99 13	129.5	9
50	10 22.3	99 14	129.0	10 52.1	99 14	129.0	11 21.8	99 14	128.9	11 51.5	99 14	128.8	12 21.2	99 14	128.7	12 50.9	99 14	128.7	13 20.7	99 14	128.6	13 50.4	99 14	128.5	50
1	10 14.2	99 14	128.0	10 43.9	99 14	128.0	11 13.6	99 14	127.9	11 43.3	99 14	127.8	12 13.0	99 14	127.7	12 42.8	99 14	127.7	13 12.5	99 14	127.6	13 42.2	99 14	127.5	1
2	10 05.9	99 14	127.0	10 35.6	99 14	126.9	11 05.3	99 14	126.9	11 35.0	99 14	126.8	12 04.8	99 14	126.7	12 34.5	99 14	126.7	13 04.2	99 14	126.6	13 33.9	99 14	126.5	2
3	9 57.5	99 14	126.0	10 27.2	99 14	125.9	10 56.9	99 14	125.9	11 26.6	99 14	125.8	11 56.3	99 14	125.7	12 26.0	99 14	125.7	12 55.7	99 14	125.6	13 25.4	99 14	125.5	3
4	9 49.1	99 14	125.0	10 18.8	99 14	124.9	10 48.5	99 14	124.9	11 18.1	99 14	124.8	11 47.8	99 14	124.7	12 17.5	99 14	124.7	12 47.2	99 14	124.6	13 16.9	99 14	124.5	4
55	9 40.5	99 14	124.0	10 10.2	99 14	123.9	10 39.9	99 14	123.9	11 09.5	99 14	123.8	11 39.2	99 14	123.7	12 08.9	99 15	123.7	12 38.6	99 15	123.6	13 08.3	99 15	123.5	55
6	9 31.8	99 15	123.0	10 01.5	99 15	122.9	10 31.2	99 15	122.9	11 00.8	99 15	122.8	11 30.5	99 15	122.7	12 00.2	99 15	122.6	12 29.8	99 15	122.6	12 59.5	99 15	122.5	6
7	9 23.0	99 15	122.0	9 52.7	99 15	121.9	10 22.4	99 15	121.9	10 52.0	99 15	121.8	11 21.7	99 15	121.7	11 51.4	99 15	121.6	12 21.0	99 15	121.6	12 50.7	99 15	121.5	7
8	9 14.1	99 15	121.0	9 43.8	99 15	120.9	10 13.5	99 15	120.9	10 43.1	99 15	120.8	11 12.8	99 15	120.7	11 42.4	99 15	120.6	12 12.1	99 15	120.6	12 41.8	99 15	120.5	8
9	9 05.2	99 15	120.0	9 34.8	99 15	119.9	10 04.5	99 15	119.9	10 34.1	99 15	119.8	11 03.8	99 15	119.7	11 33.4	99 15	119.6	12 03.1	99 15	119.6	12 32.7	99 15	119.5	9
60	8 56.1	99 15	119.0	9 25.7	99 15	118.9	9 55.4	99 15	118.9	10 25.0	99 15	118.8	10 54.7	99 15	118.7	11 24.3	99 15	118.6	11 54.0	99 15	118.5	12 23.6	99 15	118.5	60
1	8 46.9	99 15	118.0	9 16.6	99 15	117.9	9 46.2	99 15	117.9	10 15.9	99 15	117.8	10 45.5	99 15	117.7	11 15.1	99 15	117.6	11 44.8	99 15	117.5	12 14.4	99 15	117.5	1
2	8 37.7	99 16	117.0	9 07.3	99 16	116.9	9 37.0	99 16	116.9	10 06.6	99 16	116.8	10 36.2	99 16	116.7	11 05.9	99 16	116.6	11 35.5	99 16	116.5	12 05.1	99 16	116.5	2
3	8 28.4	99 16	116.0	8 58.0	99 16	115.9	9 27.6	99 16	115.9	9 57.3	99 16	115.8	10 26.9	99 16	115.7	10 56.5	99 16	115.6	11 26.1	99 16	115.5	11 55.8	99 16	115.5	3
4	8 19.0	99 16	115.0	8 48.6	99 16	114.9	9 18.2	99 16	114.9	9 47.8	99 16	114.8	10 17.5	99 16	114.7	10 47.1	99 16	114.6	11 16.7	99 16	114.5	11 46.3	99 16	114.5	4
65	8 09.5	99 16	114.0	8 39.1	99 16	113.9	9 08.7	99 16	113.9	9 38.3	99 16	113.8	10 08.0	99 16	113.7	10 37.6	99 16	113.6	11 07.2	99 16	113.5	11 36.8	99 16	113.5	65
6	7 59.9	99 16	113.0	8 29.5	99 16	113.0	8 59.2	99 16	112.9	9 28.8	99 16	112.8	9 58.4	99 16	112.7	10 28.0	99 16	112.6	10 57.6	99 16	112.5	11 27.2	99 16	112.5	6
7	7 50.3	99 16	112.0	8 19.9	99 16	112.0	8 49.5	99 16	111.9	9 19.1	99 16	111.8	9 48.7	99 16	111.7	10 18.3	99 16	111.6	10 47.9	99 16	111.5	11 17.5	99 16	111.5	7
8	7 40.6	99 16	111.0	8 10.2	99 16	111.0	8 39.8	99 16	110.9	9 09.4	99 16	110.8	9 39.0	99 16	110.7	10 08.6	99 16	110.6	10 38.2	99 16	110.6	11 07.8	99 16	110.5	8
9	7 30.9	99 16	110.1	8 00.5	99 16	110.0	8 30.1	99 16	109.9	8 59.6	99 16	109.8	9 29.2	99 16	109.7	9 58.8	99 16	109.6	10 28.4	99 16	109.6	10 58.0	99 16	109.5	9
70	7 21.0	99 16	109.1	7 50.6	99 16	109.0	8 20.2	99 16	108.9	8 49.8	99 16	108.8	9 19.4	99 16	108.7	9 49.0	99 16	108.6	10 18.6	99 16	108.6	10 48.2	99 16	108.5	70
1	7 11.2	99 17	108.1	7 40.8	99 17	108.0	8 10.3	99 17	107.9	8 39.9	99 17	107.8	9 09.5	99 17	107.7	9 39.1	99 17	107.6	10 08.7	99 17	107.6	10 38.2	99 17	107.5	1
2	7 01.2	99 17	107.1	7 30.8	99 17	107.0	8 00.4	99 17	106.9	8 30.0	99 17	106.8	8 59.6	99 17	106.7	9 29.1	99 17	106.7	9 58.7	99 17	106.6	10 28.3	99 17	106.5	2
3	6 51.3	99 17	106.1	7 20.8	99 17	106.0	7 50.4	99 17	105.9	8 20.0	99 17	105.8	8 49.6	99 17	105.8	9 19.1	99 17	105.7	9 48.7	99 17	105.6	10 18.2	99 17	105.5	3
4	6 41.3	99 17	105.1	7 10.8	99 17	105.0	7 40.4	99 17	104.9	8 09.9	99 17	104.8	8 39.5	99 17	104.8	9 09.1	99 17	104.7	9 38.6	99 17	104.6	10 08.2	99 17	104.5	4
75	6 31.1	99 17	104.1	7 00.7	99 17	104.0	7 30.3	99 17	103.9	7 59.8	99 17	103.9	8 29.4	99 17	103.8	8 59.0	99 17	103.7	9 28.5	99 17	103.6	9 58.1	99 17	103.5	75
6	6 21.0	99 17	103.1	6 50.6	99 17	103.0	7 20.1	99 17	102.9	7 49.7	99 17	102.9	8 19.3	99 17	102.8	8 48.8	99 17	102.7	9 18.4	99 17	102.6	9 47.9	99 17	102.5	6
7	6 10.8	99 17	102.1	6 40.4	99 17	102.0	7 10.0	99 17	101.9	7 39.5	99 17	101.9	8 09.1	99 17	101.8	8 38.6	99 17	101.7	9 08.2	99 17	101.6	9 37.8	99 17	101.5	7
8	6 00.6	99 17	101.1	6 30.2	99 17	101.0	6 59.8	99 17	101.0	7 29.3	99 17	100.9	7 58.9	99 17	100.8	8 28.4	99 17	100.7	8 58.0	99 17	100.6	9 27.5	99 17	100.5	8
9	5 50.4	99 17	100.2	6 20.0	99 17	100.1	6 49.5	99 17	100.0	7 19.1	99 17	99.9	7 48.6	99 17	99.8	8 18.2	99 17	99.7	8 47.7	99 17	99.6	9 17.3	98 17	99.5	9
80	5 40.1	99 17	99.2	6 09.7	99 17	99.1	6 39.2	99 17	99.0	7 08.8	99 17	98.9	7 38.3	98 17	98.8	8 07.9	98 17	98.7	8 37.4	98 17	98.6	9 07.0	98 17	98.6	80
1	5 29.8	99 17	98.2	5 59.4	99 17	98.1	6 28.9	99 17	98.0	6 58.5	98 17	97.9	7 28.0	98 17	97.8	7 57.6	98 17	97.7	8 27.1	98 17	97.7	8 56.7	98 17	97.6	1
2	5 19.5	98 17	97.2	5 49.0	98 17	97.1	6 18.6	98 17	97.0	6 48.1	98 17	96.9	7 17.7	98 17	96.8	7 47.2	98 17	96.8	8 16.8	98 17	96.7	8 46.3	98 17	96.6	2
3	5 09.2	98 17	96.2	5 38.7	98 17	96.1	6 08.2	98 17	96.0	6 37.8	98 17	95.9	7 07.3	98 17	95.9	7 36.9	98 17	95.8	8 06.4	98 17	95.7	8 36.0	98 17	95.6	3
4				5 28.3	98 17	95.1	5 57.9	98 17	95.0	6 27.4	98 17	95.0	6 57.0	98 17	94.9	7 26.5	98 17	94.8	7 56.0	98 17	94.7	8 25.6	98 17	94.6	4
85				5 17.9	98 17	94.1	5 47.5	98 17	94.1	6 17.0	98 17	94.0	6 46.6	98 17	93.9	7 16.1	98 17	93.8	7 45.7	98 17	93.7	8 15.2	98 17	93.6	85
6				5 07.5	98 17	93.2	5 37.1	98 17	93.1	6 06.6	98 17	93.0	6 36.2	98 17	92.9	7 05.7	98 17	92.8	7 35.3	98 17	92.7	8 04.8	98 17	92.6	6
7							5 26.7	98 17	92.1	5 56.2	98 17	92.0	6 25.8	98 17	91.9	6 55.3	98 17	91.8	7 24.8	98 17	91.7	7 54.4	98 17	91.6	7
8							5 16.3	98 17	91.1	5 45.8	98 17	91.0	6 15.3	98 17	90.9	6 44.9	98 17	90.8	7 14.4	98 17	90.7	7 44.0	98 17	90.7	8
9							5 05.8	98 17	90.1	5 35.4	98 17	90.0	6 04.9	98 17	89.9	6 34.5	98 17	89.9	7 04.0	98 17	89.8	7 33.5	98 17	89.7	9
90							5 25.0	98 17	89.0	5 54.5	98 17	89.0	6 24.1	98 17	88.9	6 53.6	98 17	88.8	7 23.1	98 17	88.7				90

H.A.	4° 00' Alt. / Az.	4° 30' Alt. / Az.	5° 00' Alt. / Az.	5° 30'	6° 00'	6° 30'	7° 00'	7° 30'	H.A.
00	6 00.0 1.0 00 180.0	5 30.0 1.0 00 180.0	5 00.0 1.0 00 180.0						00
1	5 59.9 1.0 00 179.0	5 29.9 1.0 00 179.0							1
2	5 59.6 1.0 01 178.0	5 29.6 1.0 01 178.0							2
3	5 59.2 1.0 01 177.0	5 29.2 1.0 01 177.0							3
4	5 58.5 1.0 01 176.0	5 28.5 1.0 01 176.0							4
05	5 57.7 1.0 02 175.0	5 27.7 1.0 02 175.0							05
6	5 56.7 1.0 02 174.0	5 26.7 1.0 02 174.0							6
7	5 55.5 1.0 02 173.0	5 25.5 1.0 02 173.0							7
8	5 54.2 1.0 03 172.0	5 24.2 1.0 03 172.0							8
9	5 52.6 1.0 03 171.0	5 22.6 1.0 03 171.0							9
10	5 50.9 1.0 03 170.0	5 20.9 1.0 03 170.0							10
1	5 49.0 1.0 03 169.0	5 19.0 1.0 03 169.0							1
2	5 46.9 1.0 04 168.0	5 16.9 1.0 04 168.0							2
3	5 44.7 1.0 04 167.0	5 14.7 1.0 04 167.0							3
4	5 42.2 1.0 04 166.0	5 12.2 1.0 04 166.0							4
15	5 39.6 1.0 05 165.0	5 09.6 1.0 05 165.0							15
6	5 36.8 1.0 05 164.0	5 06.8 1.0 05 164.0							6
7	5 33.8 1.0 05 163.0	5 03.9 1.0 05 163.0							7
8	5 30.7 1.0 06 162.0	5 00.7 1.0 06 162.0							8
9	5 27.4 1.0 06 161.0								9
20	5 23.9 1.0 06 160.0								20
1	5 20.3 1.0 06 159.0								1
2	5 16.4 1.0 07 158.0								2
3	5 12.4 1.0 07 157.0								3
4	5 08.3 1.0 07 156.0								4
25	5 03.9 1.0 07 155.0								25

DECLINATION SAME NAME AS LATITUDE

H.A.	4° 00' Alt. / Az.	4° 30' Alt. / Az.	5° 00' Alt. / Az.	5° 30' Alt. / Az.	6° 00' Alt. / Az.	6° 30' Alt. / Az.	7° 00' Alt. / Az.	7° 30' Alt. / Az.	H.A.
91				5 14.6 98 17 88.1	5 44.1 98 17 88.0	6 13.6 98 17 87.9	6 43.2 98 17 87.8	7 12.7 98 17 87.7	91
2				5 04.1 98 17 87.1	5 33.7 98 17 87.0	6 03.2 98 17 86.9	6 32.8 98 17 86.8	7 02.3 98 17 86.7	2
3					5 23.3 98 17 86.0	5 52.8 98 17 85.9	6 22.4 98 17 85.8	6 51.9 98 17 85.7	3
4					5 12.9 98 17 85.0	5 42.4 98 17 84.9	6 12.0 98 17 84.8	6 41.5 98 17 84.8	4
95					5 02.5 98 17 84.0	5 32.1 98 17 83.9	6 01.6 98 17 83.9	6 31.2 98 17 83.8	95
6						5 21.7 98 17 83.0	5 51.3 98 17 82.9	6 20.8 98 17 82.8	6
7						5 11.4 98 17 82.0	5 40.9 98 17 81.9	6 10.5 98 17 81.8	7
8						5 01.1 98 17 81.0	5 30.6 98 17 80.9	6 00.2 98 17 80.8	8
9							5 20.4 99 17 79.9	5 49.9 99 17 79.8	9
100							5 10.1 99 17 78.9	5 39.7 99 17 78.9	100
1								5 29.5 99 17 77.9	1
2								5 19.3 99 17 76.9	2
3								5 09.2 99 17 75.9	3

H.A.	8° 00' Alt (Δd Δt) Az	8° 30' Alt (Δd Δt) Az	9° 00' Alt (Δd Δt) Az	9° 30' Alt (Δd Δt) Az	10° 00' Alt (Δd Δt) Az	10° 30' Alt (Δd Δt) Az	11° 00' Alt (Δd Δt) Az	11° 30' Alt (Δd Δt) Az	H.A.
00	18 00.9 1.0 00 180.0	18 30.0 1.0 00 180.0	19 00.0 1.0 00 180.0	19 30.0 1.0 00 180.0	20 00.0 1.0 00 180.0	20 30.0 1.0 00 180.0	21 00.0 1.0 00 180.0	21 30.0 1.0 00 180.0	00
1	17 59.9 1.0 00 179.0	18 29.9 1.0 00 179.0	18 59.9 1.0 00 179.0	19 29.9 1.0 00 179.0	19 59.9 1.0 00 179.0	20 29.9 1.0 00 179.0	20 59.9 1.0 00 178.9	21 29.9 1.0 00 178.9	1
2	17 59.6 1.0 01 177.9	18 29.6 1.0 01 177.9	18 59.6 1.0 01 177.9	19 29.6 1.0 01 177.9	19 59.6 1.0 01 177.9	20 29.6 1.0 01 177.9	20 59.6 1.0 01 177.9	21 29.6 1.0 01 177.9	2
3	17 59.1 1.0 01 176.9	18 29.1 1.0 01 176.9	18 59.1 1.0 01 176.9	19 29.1 1.0 01 176.9	19 59.1 1.0 01 176.9	20 29.1 1.0 01 176.8	20 59.1 1.0 01 176.8	21 29.1 1.0 01 176.8	3
4	17 58.5 1.0 01 175.8	18 28.5 1.0 01 175.8	18 58.5 1.0 01 175.8	19 28.5 1.0 01 175.8	19 58.5 1.0 01 175.8	20 28.5 1.0 01 175.8	20 58.5 1.0 01 175.8	21 28.5 1.0 01 175.8	4
05	17 57.6 1.0 02 174.8	18 27.6 1.0 02 174.8	18 57.6 1.0 02 174.8	19 27.6 1.0 02 174.8	19 57.6 1.0 02 174.8	20 27.6 1.0 02 174.8	20 57.6 1.0 02 174.7	21 27.6 1.0 02 174.7	05
6	17 56.6 1.0 02 173.8	18 26.6 1.0 02 173.7	18 56.6 1.0 02 173.7	19 26.6 1.0 02 173.7	19 56.6 1.0 02 173.7	20 26.6 1.0 02 173.7	20 56.6 1.0 02 173.7	21 26.6 1.0 02 173.7	6
7	17 55.4 1.0 02 172.7	18 25.4 1.0 02 172.7	18 55.4 1.0 02 172.7	19 25.3 1.0 02 172.7	19 55.3 1.0 02 172.7	20 25.3 1.0 02 172.7	20 55.3 1.0 02 172.6	21 25.3 1.0 02 172.6	7
8	17 54.0 1.0 03 171.7	18 23.9 1.0 03 171.7	18 53.9 1.0 03 171.7	19 23.9 1.0 03 171.6	19 53.9 1.0 03 171.6	20 23.9 1.0 03 171.6	20 53.9 1.0 03 171.6	21 23.9 1.0 03 171.6	8
9	17 52.4 1.0 03 170.6	18 22.3 1.0 03 170.6	18 52.3 1.0 03 170.6	19 22.3 1.0 03 170.6	19 52.3 1.0 03 170.6	20 22.3 1.0 03 170.6	20 52.3 1.0 03 170.5	21 22.3 1.0 03 170.5	9
10	17 50.6 1.0 03 169.6	18 20.5 1.0 03 169.6	18 50.5 1.0 03 169.6	19 20.5 1.0 03 169.5	19 50.5 1.0 03 169.5	20 20.5 1.0 03 169.5	20 50.5 1.0 03 169.5	21 20.5 1.0 03 169.5	10
1	17 48.6 1.0 04 168.6	18 18.6 1.0 04 168.5	18 48.6 1.0 04 168.5	19 18.5 1.0 04 168.5	19 48.5 1.0 04 168.5	20 18.5 1.0 04 168.5	20 48.5 1.0 04 168.4	21 18.5 1.0 04 168.4	1
2	17 46.4 1.0 04 167.5	18 16.4 1.0 04 167.5	18 46.4 1.0 04 167.5	19 16.4 1.0 04 167.5	19 46.3 1.0 04 167.4	20 16.3 1.0 04 167.4	20 46.3 1.0 04 167.4	21 16.3 1.0 04 167.4	2
3	17 44.1 1.0 04 166.5	18 14.1 1.0 04 166.5	18 44.0 1.0 05 166.4	19 14.0 1.0 05 166.4	19 44.0 1.0 05 166.4	20 14.0 1.0 05 166.4	20 43.9 99 10 166.3	21 13.9 1.0 05 166.3	3
4	17 41.6 1.0 04 165.4	18 11.5 1.0 05 165.4	18 41.5 1.0 05 165.4	19 11.5 1.0 05 165.4	19 41.4 1.0 05 165.3	20 11.4 1.0 05 165.3	20 41.4 1.0 05 165.3	21 11.3 1.0 05 165.3	4
15	17 38.8 1.0 05 164.4	18 08.8 1.0 05 164.4	18 38.8 1.0 05 164.3	19 08.7 1.0 05 164.3	19 38.7 1.0 05 164.3	20 08.7 1.0 05 164.3	20 38.6 1.0 05 164.2	21 08.6 1.0 05 164.2	15
6	17 35.9 1.0 05 163.4	18 05.9 1.0 05 163.3	18 35.9 1.0 05 163.3	19 05.8 1.0 05 163.3	19 35.8 1.0 05 163.3	20 05.8 1.0 05 163.2	20 35.7 1.0 05 163.2	21 05.7 1.0 05 163.2	6
7	17 32.9 1.0 05 162.3	18 02.8 1.0 05 162.3	18 32.8 1.0 05 162.3	19 02.7 1.0 05 162.2	19 32.7 1.0 05 162.2	20 02.7 1.0 05 162.2	20 32.6 1.0 05 162.2	21 02.6 1.0 05 162.1	7
8	17 29.6 1.0 06 161.3	17 59.6 1.0 06 161.3	18 29.5 1.0 06 161.2	18 59.5 1.0 06 161.2	19 29.4 1.0 06 161.2	19 59.4 1.0 06 161.1	20 29.3 1.0 06 161.1	20 59.3 1.0 06 161.1	8
9	17 26.2 1.0 06 160.2	17 56.1 1.0 06 160.2	18 26.1 1.0 06 160.2	18 56.0 1.0 06 160.2	19 26.0 1.0 06 160.1	19 55.9 1.0 06 160.1	20 25.9 1.0 06 160.1	20 55.8 1.0 06 160.0	9
20	17 22.6 1.0 06 159.2	17 52.5 1.0 06 159.2	18 22.5 1.0 06 159.1	18 52.4 1.0 06 159.1	19 22.3 1.0 06 159.1	19 52.3 1.0 06 159.0	20 22.2 1.0 06 159.0	20 52.2 1.0 06 159.0	20
1	17 18.8 1.0 07 158.2	17 48.7 1.0 07 158.1	18 18.7 1.0 07 158.1	18 48.6 1.0 07 158.1	19 18.5 1.0 07 158.0	19 48.5 1.0 07 158.0	20 18.4 1.0 07 158.0	20 48.3 1.0 07 157.9	1
2	17 14.8 1.0 07 157.1	17 44.8 1.0 07 157.1	18 14.7 1.0 07 157.1	18 44.6 1.0 07 157.0	19 14.6 1.0 07 157.0	19 44.5 1.0 07 157.0	20 14.4 1.0 07 156.9	20 44.3 1.0 07 156.9	2
3	17 10.7 1.0 07 156.1	17 40.6 1.0 07 156.1	18 10.5 1.0 07 156.0	18 40.5 1.0 07 156.0	19 10.4 1.0 07 156.0	19 40.3 1.0 07 155.9	20 10.2 1.0 07 155.9	20 40.2 1.0 07 155.8	3
4	17 06.4 1.0 07 155.1	17 36.3 1.0 07 155.0	18 06.2 1.0 07 155.0	18 36.1 1.0 07 155.0	19 06.1 1.0 07 154.9	19 36.0 1.0 08 154.9	20 05.9 1.0 07 154.8	20 35.8 1.0 08 154.8	4
25	17 01.9 1.0 08 154.0	17 31.8 1.0 08 154.0	18 01.7 1.0 08 154.0	18 31.7 1.0 08 153.9	19 01.6 1.0 08 153.9	19 31.5 1.0 08 153.8	20 01.4 1.0 08 153.8	20 31.3 1.0 08 153.8	25
6	16 57.3 1.0 08 153.0	17 27.2 1.0 08 153.0	17 57.1 1.0 08 152.9	18 27.0 1.0 08 152.9	18 56.9 1.0 08 152.8	19 26.8 1.0 08 152.8	19 56.7 1.0 08 152.8	20 26.6 1.0 08 152.7	6
7	16 52.5 1.0 08 151.9	17 22.4 1.0 08 151.9	17 52.3 1.0 08 151.9	18 22.2 1.0 08 151.8	18 52.1 1.0 08 151.8	19 21.9 1.0 08 151.8	19 51.8 1.0 08 151.7	20 21.7 1.0 08 151.7	7
8	16 47.5 1.0 09 150.9	17 17.4 1.0 09 150.9	17 47.3 1.0 09 150.9	18 17.2 1.0 09 150.8	18 47.0 1.0 09 150.8	19 16.9 1.0 09 150.7	19 46.8 1.0 09 150.7	20 16.7 1.0 09 150.6	8
9	16 42.3 1.0 09 149.9	17 12.2 1.0 09 149.9	17 42.1 1.0 09 149.8	18 12.0 1.0 09 149.8	18 41.9 1.0 09 149.7	19 11.8 1.0 09 149.7	19 41.6 1.0 09 149.6	20 11.5 1.0 09 149.6	9
30	16 37.0 1.0 09 148.9	17 06.9 1.0 09 148.8	17 36.8 1.0 09 148.8	18 06.7 1.0 09 148.7	18 36.5 1.0 09 148.7	19 06.4 1.0 09 148.6	19 36.3 1.0 09 148.6	20 06.2 1.0 09 148.6	30
1	16 31.6 1.0 09 147.9	17 01.4 1.0 09 147.8	17 31.3 1.0 09 147.8	18 01.2 1.0 09 147.7	18 31.0 1.0 09 147.7	19 00.9 1.0 09 147.6	19 30.8 1.0 09 147.6	20 00.6 1.0 09 147.5	1
2	16 26.0 1.0 10 146.8	16 55.8 1.0 10 146.8	17 25.7 1.0 10 146.7	17 55.5 1.0 10 146.7	18 25.4 1.0 10 146.6	18 55.3 1.0 10 146.6	19 25.1 1.0 10 146.5	19 55.0 1.0 10 146.5	2
3	16 20.2 1.0 10 145.8	16 50.0 1.0 10 145.8	17 19.9 99 10 145.7	17 49.7 99 10 145.6	18 19.6 99 10 145.6	18 49.4 99 10 145.5	19 19.3 99 10 145.5	19 49.1 99 10 145.4	3
4	16 14.2 99 10 144.8	16 44.1 99 10 144.7	17 13.9 99 10 144.7	17 43.8 99 10 144.6	18 13.6 99 10 144.6	18 43.5 99 10 144.5	19 13.3 99 10 144.5	19 43.1 99 10 144.4	4
35	16 08.2 99 10 143.8	16 38.0 99 10 143.7	17 07.8 99 10 143.6	17 37.7 99 10 143.6	18 07.5 99 10 143.5	18 37.3 99 10 143.5	19 07.2 99 10 143.4	19 37.0 99 10 143.4	35
6	16 01.9 99 11 142.7	16 31.8 99 11 142.7	17 01.6 99 11 142.6	17 31.4 99 11 142.6	18 01.2 99 11 142.5	18 31.1 99 11 142.4	19 00.9 99 11 142.4	19 30.7 99 11 142.3	6
7	15 55.5 99 11 141.6	16 25.4 99 11 141.6	16 55.2 99 11 141.6	17 25.0 99 11 141.5	17 54.8 99 11 141.5	18 24.6 99 11 141.4	18 54.5 99 11 141.4	19 24.3 99 11 141.3	7
8	15 49.0 99 11 140.7	16 18.8 99 11 140.6	16 48.6 99 11 140.6	17 18.5 99 11 140.5	17 48.3 99 11 140.4	18 18.1 99 11 140.4	18 47.9 99 11 140.3	19 17.7 99 11 140.3	8
9	15 42.3 99 11 139.7	16 12.1 99 11 139.6	16 41.9 99 11 139.5	17 11.8 99 11 139.5	17 41.6 99 11 139.4	18 11.4 99 11 139.4	18 41.2 99 11 139.3	19 11.0 99 11 139.2	9
40	15 35.5 99 12 138.6	16 05.3 99 12 138.6	16 35.1 99 12 138.5	17 04.9 99 12 138.5	17 34.7 99 12 138.4	18 04.5 99 12 138.3	18 34.3 99 12 138.3	19 04.1 99 12 138.2	40
1	15 28.6 99 12 137.6	15 58.4 99 12 137.6	16 28.1 99 12 137.5	16 57.9 99 12 137.4	17 27.7 99 12 137.4	17 57.5 99 12 137.3	18 27.3 99 12 137.2	18 57.1 99 12 137.2	1
2	15 21.5 99 12 136.6	15 51.3 99 12 136.5	16 21.0 99 12 136.5	16 50.8 99 12 136.4	17 20.6 99 12 136.3	17 50.4 99 12 136.3	18 20.1 99 12 136.2	18 49.9 99 12 136.1	2
3	15 14.3 99 12 135.6	15 44.0 99 12 135.5	16 13.8 99 13 135.4	16 43.6 99 13 135.4	17 13.3 99 13 135.3	17 43.1 99 13 135.2	18 12.9 99 13 135.2	18 42.6 99 13 135.1	3
4	15 06.9 99 12 134.6	15 36.7 99 12 134.5	16 06.4 99 12 134.4	16 36.2 99 13 134.4	17 05.9 99 13 134.3	17 35.7 99 13 134.2	18 05.5 99 13 134.2	18 35.2 99 13 134.1	4
45	14 59.4 99 13 133.5	15 29.2 99 13 133.5	15 58.9 99 13 133.4	16 28.7 99 13 133.3	16 58.4 99 13 133.3	17 28.2 99 13 133.2	17 57.9 99 13 133.1	18 27.7 99 13 133.1	45
6	14 51.8 99 13 132.5	15 21.5 99 13 132.5	15 51.3 99 13 132.4	16 21.0 99 13 132.3	16 50.8 99 13 132.3	17 20.5 99 13 132.2	17 50.3 99 13 132.1	18 20.0 99 13 132.0	6
7	14 44.0 99 13 131.5	15 13.8 99 13 131.4	15 43.5 99 13 131.4	16 13.3 99 13 131.3	16 43.0 99 13 131.3	17 12.7 99 13 131.2	17 42.5 99 13 131.1	18 12.2 99 13 131.0	7
8	14 36.2 99 13 130.5	15 05.9 99 13 130.4	15 35.6 99 13 130.4	16 05.4 99 13 130.3	16 35.1 99 13 130.2	17 04.8 99 13 130.1	17 34.6 99 13 130.1	18 04.3 99 13 130.0	8
9	14 28.2 99 14 129.5	14 57.9 99 14 129.4	15 27.6 99 14 129.3	15 57.4 99 14 129.3	16 27.1 99 14 129.2	16 56.8 99 14 129.1	17 26.5 99 14 129.1	17 56.2 99 14 129.0	9
50	14 20.1 99 14 128.5	14 49.8 99 14 128.4	15 19.5 99 14 128.3	15 49.2 99 14 128.3	16 19.0 99 14 128.2	16 48.7 99 14 128.1	17 18.4 99 14 128.0	17 48.1 99 14 128.0	50
1	14 11.9 99 14 127.5	14 41.6 99 14 127.4	15 11.3 99 14 127.4	15 41.0 99 14 127.3	16 10.7 99 14 127.2	16 40.4 99 14 127.1	17 10.1 99 14 127.0	17 39.8 99 14 126.9	1
2	14 03.6 99 14 126.4	14 33.3 99 14 126.4	15 03.0 99 14 126.3	15 32.7 99 14 126.2	16 02.4 99 14 126.2	16 32.0 99 14 126.1	17 01.7 99 14 126.0	17 31.4 99 14 125.9	2
3	13 55.1 99 14 125.4	14 24.8 99 14 125.4	14 54.5 99 14 125.3	15 24.2 99 14 125.2	15 53.9 99 14 125.1	16 23.6 99 14 125.1	16 53.3 99 14 125.0	17 22.9 99 14 124.9	3
4	13 46.6 99 14 124.4	14 16.3 99 14 124.3	14 45.9 99 14 124.3	15 15.6 99 14 124.2	15 45.3 99 14 124.1	16 15.0 99 14 124.0	16 44.7 99 14 124.0	17 14.3 99 14 123.9	4
55	13 37.9 99 15 123.4	14 07.6 99 15 123.3	14 37.3 99 15 123.3	15 07.0 99 15 123.2	15 36.6 99 15 123.1	16 06.3 99 15 123.0	16 36.0 99 15 123.0	17 05.6 99 15 122.9	55
6	13 29.2 99 15 122.3	13 58.9 99 15 122.3	14 28.5 99 15 122.3	14 58.2 99 15 122.2	15 27.9 99 15 122.1	15 57.5 99 15 122.1	16 27.2 99 15 121.9	16 56.8 99 15 121.9	6
7	13 20.3 99 15 121.4	13 50.0 99 15 121.3	14 19.7 99 15 121.3	14 49.3 99 15 121.2	15 19.0 99 15 121.1	15 48.6 99 15 121.0	16 18.3 99 15 120.9	16 47.9 99 15 120.9	7
8	13 11.4 99 15 120.4	13 41.1 99 15 120.3	14 10.7 99 15 120.2	14 40.4 99 15 120.2	15 10.0 99 15 120.1	15 39.7 99 15 120.0	16 09.3 99 15 119.9	16 39.0 99 15 119.8	8
9	13 02.4 99 15 119.4	13 32.0 99 15 119.3	14 01.7 99 15 119.2	14 31.3 99 15 119.2	15 01.0 99 15 119.1	15 30.6 99 15 119.0	16 00.2 99 15 118.9	16 29.9 99 15 118.8	9
60	12 53.3 99 16 118.4	13 22.9 99 16 118.3	13 52.5 99 16 118.2	14 22.2 99 16 118.1	14 51.8 99 16 118.1	15 21.4 99 16 118.0	15 51.1 99 16 117.9	16 20.7 99 16 117.8	60
1	12 44.0 99 16 117.4	13 13.7 99 16 117.3	13 43.3 99 16 117.2	14 12.9 99 16 117.1	14 42.6 99 16 117.1	15 12.2 99 16 117.0	15 41.8 99 16 116.9	16 11.4 99 16 116.8	1
2	12 34.8 99 16 116.4	13 04.4 99 16 116.3	13 34.0 99 16 116.2	14 03.6 99 16 116.1	14 33.2 99 16 116.1	15 02.9 99 16 116.0	15 32.5 99 16 115.9	16 02.1 99 16 115.8	2
3	12 25.4 99 16 115.4	12 55.0 99 16 115.3	13 24.6 99 16 115.2	13 54.2 99 16 115.1	14 23.8 99 16 115.1	14 53.5 99 16 115.0	15 23.1 99 16 114.9	15 52.7 99 16 114.8	3
4	12 15.9 99 16 114.4	12 45.5 99 16 114.3	13 15.2 99 16 114.2	13 44.8 99 16 114.1	14 14.4 99 16 114.0	14 44.0 99 16 114.0	15 13.6 99 16 113.9	15 43.2 99 16 113.8	4
65	12 06.4 99 16 113.4	12 36.0 99 16 113.3	13 05.6 99 16 113.2	13 35.2 99 16 113.1	14 04.8 99 16 113.0	14 34.4 99 16 113.0	15 04.0 99 16 112.9	15 33.6 99 16 112.8	65
6	11 56.8 99 16 112.4	12 26.4 99 16 112.3	12 56.0 99 16 112.2	13 25.6 99 16 112.1	13 55.2 99 16 112.0	14 24.8 99 16 112.0	14 54.4 99 16 111.9	15 24.0 99 16 111.8	6
7	11 47.1 99 16 111.4	12 16.7 99 16 111.3	12 46.3 99 16 111.2	13 15.9 99 16 111.1	13 45.5 99 16 111.0	14 15.1 99 16 111.0	14 44.7 99 16 110.9	15 14.3 99 16 110.8	7
8	11 37.4 99 16 110.4	12 07.0 99 16 110.3	12 36.6 99 16 110.2	13 06.2 99 16 110.1	13 35.8 99 16 110.0	14 05.3 99 16 110.0	14 34.9 99 16 109.9	15 04.5 99 16 109.8	8
9	11 27.6 99 16 109.4	11 57.2 99 16 109.3	12 26.8 99 16 109.2	12 56.4 99 16 109.1	13 25.9 99 16 109.0	13 55.5 99 16 109.0	14 25.1 99 16 108.9	14 54.7 99 16 108.8	9
70	11 17.7 99 17 108.4	11 47.3 99 17 108.3	12 16.9 99 17 108.2	12 46.5 99 17 108.1	13 16.1 99 17 108.1	13 45.6 99 17 108.0	14 15.2 99 17 107.9	14 44.8 99 17 107.8	70
1	11 07.8 99 17 107.4	11 37.4 99 17 107.3	12 07.0 99 17 107.2	12 36.5 99 17 107.1	13 06.1 99 17 107.1	13 35.7 99 17 107.0	14 05.3 99 17 106.9	14 34.8 99 17 106.8	1
2	10 57.9 99 17 106.4	11 27.4 99 17 106.3	11 57.0 99 17 106.2	12 26.6 99 17 106.1	12 56.1 99 17 106.1	13 25.7 99 17 106.0	13 55.3 99 17 105.9	14 24.8 99 17 105.8	2
3	10 47.8 99 17 105.4	11 17.4 99 17 105.3	11 47.0 99 17 105.2	12 16.5 99 17 105.1	12 46.1 99 17 105.1	13 15.7 99 17 105.0	13 45.2 99 17 104.9	14 14.8 99 17 104.8	3
4	10 37.8 99 17 104.4	11 07.3 99 17 104.3	11 36.9 99 17 104.2	12 06.5 99 17 104.1	12 36.0 99 17 104.1	13 05.6 99 17 104.0	13 35.1 99 17 103.9	14 04.7 99 17 103.8	4
75	10 27.7 99 17 103.4	10 57.2 99 17 103.3	11 26.8 99 17 103.2	11 56.3 99 17 103.2	12 25.9 99 17 103.1	12 55.4 99 17 103.0	13 25.0 99 17 102.9	13 54.5 98 17 102.8	75
6	10 17.5 99 17 102.4	10 47.1 99 17 102.3	11 16.6 99 17 102.2	11 46.2 99 17 102.2	12 15.7 99 17 102.1	12 45.3 99 17 102.0	13 14.8 98 17 101.9	13 44.4 98 17 101.8	6
7	10 07.3 99 17 101.4	10 36.9 99 17 101.3	11 06.4 99 17 101.3	11 36.0 99 17 101.2	12 05.5 99 17 101.1	12 35.1 99 17 101.0	13 04.6 98 17 100.9	13 34.1 98 17 100.8	7
8	9 57.1 99 17 100.4	10 26.6 98 17 100.4	10 56.2 98 17 100.3	11 25.7 98 17 100.2	11 55.3 98 17 100.1	12 24.8 98 17 100.0	12 54.4 98 17 99.9	13 23.9 98 17 99.8	8
9	9 46.8 99 17 99.5	10 16.4 98 17 99.4	10 45.9 98 17 99.3	11 15.5 98 17 99.2	11 45.0 98 17 99.1	12 14.5 98 17 99.0	12 44.1 98 17 98.9	13 13.6 98 17 98.8	9
80	9 36.5 99 17 98.5	10 06.1 98 17 98.4	10 35.6 98 17 98.3	11 05.2 98 17 98.2	11 34.7 98 17 98.1	12 04.2 98 17 98.0	12 33.8 98 17 97.9	13 03.3 98 17 97.8	80
1	9 26.2 98 17 97.5	9 55.7 98 17 97.4	10 25.3 98 17 97.3	10 54.8 98 17 97.2	11 24.4 98 17 97.1	11 53.9 98 17 97.0	12 23.4 98 17 96.9	12 53.0 98 17 96.9	1
2	9 15.9 98 17 96.5	9 45.4 98 17 96.4	10 14.9 98 17 96.3	10 44.5 98 17 96.2	11 14.0 98 17 96.1	11 43.6 98 17 96.0	12 13.1 98 17 96.0	12 42.6 98 17 95.9	2
3	9 05.5 98 17 95.5	9 35.0 98 17 95.4	10 04.6 98 17 95.3	10 34.1 98 17 95.2	11 03.6 98 17 95.1	11 33.2 98 17 95.1	12 02.7 98 17 95.0	12 32.2 98 17 94.9	3
4	8 55.1 98 17 94.5	9 24.7 98 17 94.4	9 54.2 98 17 94.3	10 23.7 98 17 94.2	10 53.3 98 17 94.2	11 22.8 98 17 94.1	11 52.3 98 17 94.0	12 21.9 98 17 93.9	4
85	8 44.7 98 17 93.5	9 14.3 98 17 93.4	9 43.8 98 17 93.4	10 13.3 98 17 93.3	10 42.9 98 17 93.2	11 12.4 98 17 93.1	11 41.9 98 17 93.0	12 11.5 98 17 92.9	85
6	8 34.3 98 17 92.5	9 03.9 98 17 92.5	9 33.4 98 17 92.4	10 02.9 98 17 92.3	10 32.5 98 17 92.2	11 02.0 98 17 92.1	11 31.5 98 17 92.0	12 01.0 98 17 91.9	6
7	8 23.9 98 17 91.6	8 53.4 98 17 91.5	9 23.0 98 17 91.4	9 52.5 98 17 91.3	10 22.0 98 17 91.2	10 51.6 98 17 91.1	11 21.1 98 17 91.0	11 50.6 98 17 90.9	7
8	8 13.5 98 17 90.6	8 43.0 98 17 90.5	9 12.6 98 17 90.4	9 42.1 98 17 90.3	10 11.6 98 17 90.2	10 41.2 98 17 90.1	11 10.7 98 17 90.0	11 40.2 98 17 89.9	8
9	8 03.1 98 17 89.6	8 32.6 98 17 89.5	9 02.1 98 17 89.4	9 31.7 98 17 89.3	10 01.2 98 17 89.2	10 30.7 98 17 89.1	11 00.3 98 17 89.0	11 29.8 98 17 89.0	9
90	7 52.7 98 17 88.6	8 22.2 98 17 88.5	8 51.7 98 17 88.4	9 21.3 98 17 88.3	9 50.8 98 17 88.2	10 20.3 98 17 88.2	10 49.9 98 17 88.1	11 19.4 98 17 88.0	90

Each declination cell reads: **Alt.** (° ′)   **Δd Δt**   **Az.** (°)

H.A.	8° 00′	8° 30′	9° 00′	9° 30′	10° 00′	10° 30′	11° 00′	11° 30′	H.A.
91	7 42.2 98 17 87.6	8 11.8 98 17 87.5	8 41.3 98 17 87.4	9 10.9 98 17 87.4	9 40.4 98 17 87.3	10 09.9 98 17 87.2	10 39.4 98 17 87.1	11 09.0 98 17 87.0	91
2	7 31.8 98 17 86.6	8 01.4 98 17 86.5	8 30.9 98 17 86.5	9 00.4 98 17 86.4	9 30.0 98 17 86.3	9 59.5 98 17 86.2	10 29.0 98 17 86.1	10 58.6 98 17 86.0	2
3	7 21.4 98 17 85.7	7 51.0 98 17 85.6	8 20.5 98 17 85.5	8 50.1 98 17 85.4	9 19.6 98 17 85.3	9 49.1 98 17 85.2	10 18.7 98 17 85.1	10 48.2 98 17 85.0	3
4	7 11.1 98 17 84.7	7 40.6 98 17 84.6	8 10.1 98 17 84.5	8 39.7 98 17 84.4	9 09.2 98 17 84.3	9 38.7 98 17 84.2	10 08.3 98 17 84.1	10 37.8 98 17 84.0	4
95	7 00.7 98 17 83.7	7 30.2 98 17 83.6	7 59.8 98 17 83.5	8 29.3 98 17 83.4	8 58.9 98 17 83.3	9 28.4 98 17 83.2	9 57.9 98 17 83.1	10 27.5 98 17 83.1	95
6	6 50.4 98 17 82.7	7 19.9 98 17 82.6	7 49.4 98 17 82.5	8 19.0 98 17 82.4	8 48.5 98 17 82.4	9 18.1 98 17 82.3	9 47.6 98 17 82.2	10 17.1 98 17 82.1	6
7	6 40.0 98 17 81.7	7 09.6 98 17 81.6	7 39.1 98 17 81.5	8 08.7 98 17 81.5	8 38.2 98 17 81.4	9 07.7 98 17 81.3	9 37.3 98 17 81.2	10 06.8 98 17 81.1	7
8	6 29.7 98 17 80.7	6 59.3 98 17 80.7	7 28.8 98 17 80.6	7 58.4 98 17 80.5	8 27.9 98 17 80.4	8 57.5 98 17 80.3	9 27.0 98 17 80.2	9 56.5 98 17 80.1	8
9	6 19.5 98 17 79.8	6 49.0 98 17 79.7	7 18.6 98 17 79.6	7 48.1 98 17 79.5	8 17.7 98 17 79.4	8 47.2 98 17 79.3	9 16.7 98 17 79.2	9 46.3 98 17 79.1	9
100	6 09.2 99 17 78.8	6 38.8 99 17 78.7	7 08.3 99 17 78.6	7 37.9 99 17 78.5	8 07.4 98 17 78.4	8 37.0 98 17 78.3	9 06.5 98 17 78.3	9 36.1 98 17 78.2	100
1	5 59.0 99 17 77.8	6 28.6 99 17 77.7	6 58.1 99 17 77.6	7 27.7 99 17 77.5	7 57.2 99 17 77.4	8 26.8 99 17 77.4	8 56.3 98 17 77.3	9 25.9 98 17 77.2	1
2	5 48.9 99 17 76.8	6 18.4 99 17 76.7	6 48.0 99 17 76.6	7 17.5 99 17 76.6	7 47.1 99 17 76.5	8 16.7 99 17 76.4	8 46.2 99 17 76.3	9 15.8 99 17 76.2	2
3	5 38.7 99 17 75.8	6 08.3 99 17 75.7	6 37.9 99 17 75.7	7 07.4 99 17 75.6	7 37.0 99 17 75.5	8 06.5 99 17 75.4	8 36.1 99 17 75.3	9 05.7 99 17 75.2	3
4	5 28.7 99 17 74.9	5 58.2 99 17 74.8	6 27.8 99 17 74.7	6 57.4 99 17 74.6	7 26.9 99 17 74.5	7 56.5 99 17 74.4	8 26.0 99 17 74.3	8 55.6 99 17 74.3	4
105	5 18.6 99 17 73.9	5 48.2 99 17 73.8	6 17.8 99 17 73.7	6 47.3 99 17 73.6	7 16.9 99 17 73.5	7 46.5 99 17 73.4	8 16.0 99 17 73.4	8 45.6 99 17 73.3	105
6	5 08.6 99 17 72.9	5 38.2 99 17 72.8	6 07.8 99 17 72.7	6 37.4 99 17 72.6	7 06.9 99 16 72.6	7 36.5 99 17 72.5	8 06.1 99 16 72.4	8 35.7 99 16 72.3	6
7		5 28.3 99 16 71.8	5 57.9 99 16 71.7	6 27.5 99 16 71.7	6 57.0 99 16 71.6	7 26.6 99 16 71.5	7 56.2 99 16 71.4	8 25.8 99 16 71.3	7
8		5 18.4 99 16 70.8	5 48.0 99 16 70.8	6 17.6 99 16 70.7	6 47.2 99 16 70.6	7 16.8 99 16 70.5	7 46.3 99 16 70.5	8 15.9 99 16 70.3	8
9		5 08.6 99 16 69.9	5 38.2 99 16 69.7	6 07.8 99 16 69.7	6 37.4 99 16 69.6	7 07.0 99 16 69.5	7 36.5 99 16 69.5	8 06.1 99 16 69.4	9
110			5 28.5 99 16 68.8	5 58.0 99 16 68.7	6 27.6 99 16 68.6	6 57.2 99 16 68.6	7 26.8 99 16 68.5	7 56.4 99 16 68.4	110
1			5 18.8 99 16 67.8	5 48.4 99 16 67.7	6 18.0 99 16 67.7	6 47.6 99 16 67.6	7 17.2 99 16 67.5	7 46.8 99 16 67.4	1
2			5 09.2 99 16 66.9	5 38.8 99 16 66.8	6 08.4 99 16 66.7	6 38.0 99 16 66.6	7 07.6 99 16 66.5	7 37.2 99 16 66.4	2
3				5 29.2 99 16 65.8	5 58.8 99 16 65.7	6 28.4 99 16 65.6	6 58.1 99 16 65.5	7 27.7 99 16 65.5	3
4				5 19.8 99 16 64.8	5 49.4 99 16 64.7	6 19.0 99 16 64.7	6 48.6 99 16 64.6	7 18.2 99 16 64.5	4
115				5 10.4 99 16 63.8	5 40.0 99 16 63.8	6 09.6 99 16 63.7	6 39.2 99 15 63.6	7 08.9 99 15 63.5	115
6				5 01.1 99 15 62.9	5 30.7 99 15 62.8	6 00.3 99 15 62.7	6 29.9 99 15 62.6	6 59.6 99 15 62.5	6
7					5 21.5 99 15 61.8	5 51.1 99 15 61.7	6 20.7 99 15 61.6	6 50.4 99 15 61.6	7
8					5 12.3 99 15 60.8	5 42.0 99 15 60.7	6 11.6 99 15 60.7	6 41.2 99 15 60.6	8
9					5 03.3 99 15 59.8	5 32.9 99 15 59.8	6 02.6 99 15 59.7	6 32.2 99 15 59.6	9
120						5 24.0 99 15 58.8	5 53.6 99 15 58.7	6 23.3 99 15 58.6	120
1						5 15.1 99 15 57.8	5 44.8 99 15 57.7	6 14.4 99 15 57.7	1
2						5 06.3 99 14 56.8	5 36.0 99 14 56.8	6 05.7 99 14 56.7	2
3							5 27.3 99 14 55.8	5 57.0 99 14 55.7	3
4							5 18.8 99 14 54.8	5 48.4 99 14 54.7	4
125							5 10.3 99 14 53.8	5 40.0 99 14 53.8	125
6							5 01.9 99 14 52.9	5 31.6 99 14 52.8	6
7								5 23.4 99 14 51.8	7
8								5 15.3 99 13 50.8	8
9								5 07.2 99 13 49.9	9

Lat. 81°

Lat. 82°

Lat. 83°

at.)°

H.A.	12° 00' Alt. ° ' / Δd Δt / Az. °	12° 30' Alt. ° ' / Δd Δt / Az. °	13° 00' Alt. ° ' / Δd Δt / Az. °	13° 30' Alt. ° ' / Δd Δt / Az. °	14° 00' Alt. ° ' / Δd Δt / Az. °	14° 30' Alt. ° ' / Δd Δt / Az. °	15° 00' Alt. ° ' / Δd Δt / Az. °	15° 30' Alt. ° ' / Δd Δt / Az. °	H.A.
00	22 00.0 1.00 180.0	22 30.0 1.00 180.0	23 00.0 1.00 180.0	23 30.0 1.00 180.0	24 00.0 1.00 180.0	24 30.0 1.00 180.0	25 00.0 1.00 180.0	25 30.0 1.00 180.0	00
1	21 59.9 1.00 178.9	22 29.9 1.00 178.9	22 59.9 1.00 178.9	23 29.9 1.00 178.9	23 59.9 1.00 178.9	24 29.9 1.00 178.9	24 59.9 1.00 178.9	25 29.9 1.00 178.9	1
2	21 59.6 1.001 177.9	22 29.6 1.001 177.9	22 59.6 1.001 177.9	23 29.6 1.001 177.9	23 59.6 1.001 177.9	24 29.6 1.001 177.9	24 59.6 1.001 177.9	25 29.6 1.001 177.9	2
3	21 59.1 1.001 176.8	22 29.1 1.001 176.8	22 59.1 1.001 176.8	23 29.1 1.001 176.8	23 59.1 1.001 176.8	24 29.1 1.001 176.8	24 59.1 1.001 176.8	25 29.1 1.001 176.8	3
4	21 58.5 1.001 175.8	22 28.5 1.001 175.8	22 58.5 1.001 175.8	23 28.5 1.001 175.8	23 58.5 1.001 175.8	24 28.5 1.001 175.7	24 58.5 1.001 175.7	25 28.4 1.001 175.7	4
05	21 57.6 1.02 174.7	22 27.6 1.02 174.7	22 57.6 1.02 174.7	23 27.6 1.02 174.7	23 57.6 1.02 174.7	24 27.6 1.02 174.7	24 57.6 1.02 174.7	25 27.6 1.02 174.7	05
6	21 56.6 1.02 173.7	22 26.5 1.02 173.7	22 56.5 1.02 173.6	23 26.5 1.02 173.6	23 56.5 1.02 173.6	24 26.5 1.02 173.6	24 56.5 1.02 173.6	25 26.5 1.02 173.6	6
7	21 55.5 1.02 172.6	22 25.3 1.02 172.6	22 55.3 1.02 172.6	23 25.3 1.02 172.6	23 55.3 1.02 172.6	24 25.3 1.02 172.5	24 55.3 1.02 172.5	25 25.3 1.02 172.5	7
8	21 53.9 1.03 171.6	22 23.9 1.03 171.5	22 53.9 1.03 171.5	23 23.8 1.03 171.5	23 53.8 1.03 171.5	24 23.8 1.03 171.5	24 53.8 1.03 171.5	25 23.8 1.03 171.5	8
9	21 52.3 1.03 170.5	22 22.2 1.03 170.5	22 52.2 1.03 170.5	23 22.2 1.03 170.5	23 52.1 1.03 170.4	24 22.1 1.03 170.4	24 52.1 1.03 170.4	25 22.1 1.03 170.4	9
10	21 50.4 1.03 169.5	22 20.4 1.03 169.4	22 50.4 1.03 169.4	23 20.4 1.03 169.4	23 50.4 1.03 169.4	24 20.4 1.03 169.4	24 50.3 1.03 169.3	25 20.3 1.03 169.3	10
1	21 48.4 1.04 168.4	22 18.4 1.04 168.4	22 48.4 1.04 168.4	23 18.4 1.04 168.3	23 48.4 1.04 168.3	24 18.3 1.04 168.3	24 48.3 1.04 168.3	25 18.3 1.04 168.3	1
2	21 46.2 1.04 167.3	22 16.2 1.04 167.3	22 46.2 1.04 167.3	23 16.2 1.04 167.3	23 46.2 1.04 167.2	24 16.1 1.04 167.2	24 46.1 1.04 167.2	25 16.1 1.04 167.2	2
3	21 43.9 1.05 166.3	22 13.8 1.05 166.3	22 43.8 1.05 166.3	23 13.8 1.05 166.2	23 43.8 1.05 166.2	24 13.7 1.05 166.2	24 43.7 1.05 166.2	25 13.7 1.05 166.1	3
4	21 41.3 1.05 165.2	22 11.3 1.05 165.2	22 41.3 1.05 165.2	23 11.2 1.05 165.2	23 41.2 1.05 165.1	24 11.2 1.05 165.1	24 41.1 1.05 165.1	25 11.1 1.05 165.1	4
15	21 38.6 1.05 164.2	22 08.5 1.05 164.2	22 38.5 1.05 164.1	23 08.5 1.05 164.1	23 38.4 1.05 164.1	24 08.4 1.05 164.1	24 38.4 1.05 164.0	25 08.3 1.05 164.0	15
6	21 35.6 1.05 163.1	22 05.6 1.05 163.1	22 35.6 1.05 163.1	23 05.5 1.05 163.1	23 35.5 1.05 163.0	24 05.4 1.05 163.0	24 35.4 1.05 163.0	25 05.4 1.05 162.9	6
7	21 32.5 1.06 162.1	22 02.5 1.06 162.1	22 32.4 1.06 162.0	23 02.4 1.06 162.0	23 32.3 1.06 162.0	24 02.3 1.06 161.9	24 32.3 1.06 161.9	25 02.2 1.06 161.9	7
8	21 29.2 1.06 161.0	21 59.2 1.06 161.0	22 29.1 1.06 161.0	22 59.1 1.06 161.0	23 29.0 1.06 160.9	23 59.0 1.06 160.9	24 28.9 1.06 160.9	24 58.9 1.06 160.8	8
9	21 25.8 1.06 160.0	21 55.7 1.06 160.0	22 25.6 1.06 159.9	22 55.6 1.06 159.9	23 25.5 1.06 159.9	23 55.5 1.06 159.8	24 25.4 1.06 159.8	24 55.4 1.06 159.8	9
20	21 22.1 1.06 158.9	21 52.0 1.06 158.9	22 22.0 1.06 158.9	22 51.9 1.06 158.8	23 21.9 1.06 158.8	23 51.8 1.06 158.8	24 21.7 1.06 158.7	24 51.7 1.06 158.7	20
1	21 18.3 1.07 157.9	21 48.2 1.07 157.9	22 18.1 1.07 157.8	22 48.1 1.07 157.8	23 18.0 1.07 157.8	23 47.9 1.07 157.7	24 17.9 1.07 157.7	24 47.8 1.07 157.6	1
2	21 14.3 1.07 156.8	21 44.2 1.07 156.8	22 14.1 1.07 156.8	22 44.0 1.07 156.7	23 14.0 1.07 156.7	23 43.9 1.07 156.7	24 13.8 1.07 156.6	24 43.7 1.07 156.6	2
3	21 10.1 1.07 155.8	21 40.0 1.07 155.8	22 09.9 1.07 155.7	22 39.8 1.07 155.7	23 09.8 1.07 155.6	23 39.7 1.07 155.6	24 09.6 1.07 155.6	24 39.5 1.07 155.5	3
4	21 05.7 1.08 154.8	21 35.6 1.08 154.7	22 05.6 1.08 154.7	22 35.5 1.08 154.6	23 05.4 1.08 154.6	23 35.3 1.08 154.6	24 05.2 1.08 154.5	24 35.1 1.08 154.5	4
25	21 01.2 1.08 153.7	21 31.1 1.08 153.7	22 01.0 1.08 153.6	22 30.9 1.08 153.6	23 00.8 1.08 153.5	23 30.7 1.08 153.5	24 00.6 1.08 153.5	24 30.5 1.08 153.4	25
6	20 56.5 1.08 152.7	21 26.4 1.08 152.6	21 56.3 1.08 152.6	22 26.2 1.08 152.5	22 56.1 1.08 152.5	23 26.0 1.08 152.4	23 55.9 1.08 152.4	24 25.8 1.08 152.4	6
7	20 51.6 1.08 151.6	21 21.5 1.08 151.6	21 51.4 1.08 151.5	22 21.3 1.08 151.5	22 51.2 1.08 151.4	23 21.1 1.08 151.4	23 51.0 1.08 151.4	24 20.9 1.08 151.3	7
8	20 46.6 1.09 150.6	21 16.5 1.09 150.5	21 46.4 1.09 150.5	22 16.2 1.09 150.4	22 46.1 1.09 150.4	23 16.0 1.09 150.3	23 45.9 1.09 150.3	24 15.8 1.09 150.2	8
9	20 41.4 1.09 149.5	21 11.3 1.09 149.5	21 41.2 1.09 149.4	22 11.0 1.09 149.4	22 40.9 1.09 149.3	23 10.8 1.09 149.3	23 40.6 1.09 149.2	24 10.5 1.09 149.2	9
30	20 36.0 1.09 148.5	21 05.9 1.09 148.5	21 35.8 1.09 148.4	22 05.6 1.09 148.4	22 35.5 1.09 148.3	23 05.4 1.09 148.2	23 35.2 1.09 148.2	24 05.1 1.09 148.1	30
1	20 30.5 1.010 147.4	21 00.4 1.010 147.4	21 30.2 1.010 147.4	22 00.1 1.010 147.3	22 30.0 1.010 147.3	22 59.8 1.010 147.2	23 29.7 1.010 147.1	23 59.5 1.010 147.1	1
2	20 24.8 1.010 146.4	20 54.7 1.010 146.4	21 24.5 1.010 146.3	21 54.4 1.010 146.3	22 24.2 1.010 146.2	22 54.1 1.010 146.2	23 23.9 99 10 146.1	23 53.8 99 10 146.0	2
3	20 19.0 99 10 145.4	20 48.8 99 10 145.3	21 18.7 99 10 145.3	21 48.5 99 10 145.2	22 18.4 99 10 145.2	22 48.2 99 10 145.1	23 18.0 99 10 145.1	23 47.9 99 10 145.0	3
4	20 13.0 99 10 144.3	20 42.8 99 10 144.3	21 12.7 99 10 144.2	21 42.5 99 10 144.2	22 12.3 99 10 144.1	22 42.2 99 10 144.1	23 12.0 99 10 144.0	23 41.8 99 10 144.0	4
35	20 06.8 99 10 143.3	20 36.7 99 10 143.3	21 06.5 99 11 143.2	21 36.3 99 11 143.1	22 06.2 99 11 143.1	22 36.0 99 11 143.0	23 05.8 99 11 143.0	23 35.6 99 11 142.9	35
6	20 00.5 99 11 142.3	20 30.4 99 11 142.2	21 00.2 99 11 142.2	21 30.0 99 11 142.2	21 59.8 99 11 142.0	22 29.6 99 11 142.0	22 59.5 99 11 141.9	23 29.3 99 11 141.9	6
7	19 54.1 99 11 141.2	20 23.9 99 11 141.2	20 53.7 99 11 141.1	21 23.5 99 11 141.1	21 53.3 99 11 141.0	22 23.1 99 11 140.9	22 53.0 99 11 140.9	23 22.8 99 11 140.8	7
8	19 47.5 99 11 140.2	20 17.3 99 11 140.1	20 47.1 99 11 140.1	21 16.9 99 11 140.0	21 46.7 99 11 140.0	22 16.5 99 11 139.9	22 46.3 99 11 139.8	23 16.1 99 11 139.8	8
9	19 40.8 99 11 139.2	20 10.6 99 11 139.1	20 40.3 99 12 139.1	21 10.1 99 12 139.0	21 39.9 99 12 139.0	22 09.7 99 12 138.9	22 39.5 99 12 138.8	23 09.3 99 12 138.7	9
40	19 33.9 99 12 138.1	20 03.7 99 12 138.1	20 33.4 99 12 138.0	21 03.2 99 12 138.0	21 33.0 99 12 137.9	22 02.8 99 12 137.8	22 32.6 99 12 137.8	23 02.4 99 12 137.7	40
1	19 26.9 99 12 137.1	19 56.6 99 12 137.0	20 26.4 99 12 137.0	20 56.2 99 12 136.9	21 26.0 99 12 136.9	21 55.7 99 12 136.8	22 25.5 99 12 136.7	22 55.3 99 12 136.7	1
2	19 19.7 99 12 136.1	19 49.5 99 12 136.0	20 19.2 99 12 136.0	20 49.0 99 12 135.9	21 18.8 99 12 135.8	21 48.5 99 12 135.8	22 18.3 99 12 135.7	22 48.1 99 12 135.6	2
3	19 12.4 99 12 135.1	19 42.2 99 12 135.0	20 11.9 99 12 134.9	20 41.7 99 12 134.9	21 11.4 99 12 134.8	21 41.2 99 12 134.7	22 10.9 99 12 134.6	22 40.7 99 12 134.6	3
4	19 05.0 99 13 134.0	19 34.7 99 13 134.0	20 04.5 99 13 133.9	20 34.2 99 13 133.8	21 04.0 99 13 133.8	21 33.7 99 13 133.7	22 03.5 99 13 133.6	22 33.2 99 13 133.5	4
45	18 57.4 99 13 133.0	19 27.2 99 13 132.9	19 56.9 99 13 132.9	20 26.6 99 13 132.8	20 56.4 99 13 132.7	21 26.1 99 13 132.7	21 55.9 99 13 132.6	22 25.6 99 13 132.5	45
6	18 49.7 99 13 132.0	19 19.5 99 13 131.9	19 49.2 99 13 131.8	20 18.9 99 13 131.8	20 48.7 99 13 131.7	21 18.4 99 13 131.6	21 48.1 99 13 131.6	22 17.9 99 13 131.5	6
7	18 41.9 99 13 131.0	19 11.7 99 13 130.9	19 41.4 99 13 130.8	20 11.1 99 13 130.7	20 40.8 99 13 130.7	21 10.6 99 13 130.6	21 40.3 99 13 130.5	22 10.0 99 13 130.4	7
8	18 34.0 99 13 129.9	19 03.7 99 13 129.9	19 33.4 99 13 129.8	20 03.2 99 13 129.7	20 32.9 99 13 129.6	21 02.6 99 14 129.6	21 32.3 99 14 129.5	22 02.0 99 14 129.4	8
9	18 25.9 99 14 128.9	18 55.7 99 14 128.8	19 25.4 99 14 128.8	19 55.1 99 14 128.7	20 24.8 99 14 128.6	20 54.5 99 14 128.5	21 24.2 99 14 128.5	21 53.9 99 14 128.4	9
50	18 17.8 99 14 127.9	18 47.5 99 14 127.8	19 17.2 99 14 127.7	19 46.9 99 14 127.7	20 16.6 99 14 127.6	20 46.3 99 14 127.5	21 16.0 99 14 127.4	21 45.7 99 14 127.4	50
1	18 09.5 99 14 126.9	18 39.2 99 14 126.8	19 08.9 99 14 126.7	19 38.6 99 14 126.6	20 08.3 99 14 126.6	20 38.0 99 14 126.5	21 07.6 99 14 126.4	21 37.3 99 14 126.3	1
2	18 01.1 99 14 125.9	18 30.8 99 14 125.8	19 00.5 99 14 125.7	19 30.2 99 14 125.6	19 59.9 99 14 125.5	20 29.5 99 14 125.5	20 59.2 99 14 125.4	21 28.9 99 14 125.3	2
3	17 52.6 99 14 124.8	18 22.3 99 14 124.8	18 52.0 99 14 124.7	19 21.6 99 14 124.6	19 51.3 99 14 124.5	20 21.0 99 14 124.4	20 50.7 99 14 124.4	21 20.3 99 14 124.3	3
4	17 44.0 99 15 123.8	18 13.7 99 15 123.7	18 43.4 99 15 123.7	19 13.0 99 15 123.6	19 42.7 99 15 123.5	20 12.3 99 15 123.4	20 42.0 99 15 123.3	21 11.7 99 15 123.3	4
55	17 35.3 99 15 122.8	18 05.0 99 15 122.7	18 34.6 99 15 122.6	19 04.3 99 15 122.6	19 33.9 99 15 122.5	20 03.6 99 15 122.4	20 33.3 99 15 122.3	21 02.9 99 15 122.2	55
6	17 26.5 99 15 121.8	17 56.2 99 15 121.7	18 25.8 99 15 121.6	18 55.5 99 15 121.5	19 25.1 99 15 121.5	19 54.8 99 15 121.4	20 24.4 99 15 121.3	20 54.0 99 15 121.2	6
7	17 17.6 99 15 120.8	17 47.2 99 15 120.7	18 16.9 99 15 120.6	18 46.5 99 15 120.5	19 16.2 99 15 120.5	19 45.8 99 15 120.4	20 15.5 99 15 120.3	20 45.1 99 15 120.2	7
8	17 08.6 99 15 119.8	17 38.2 99 15 119.7	18 07.9 99 15 119.6	18 37.5 99 15 119.5	19 07.1 99 15 119.4	19 36.8 99 15 119.4	20 06.4 99 15 119.3	20 36.0 99 15 119.2	8
9	16 59.5 99 15 118.7	17 29.1 99 15 118.7	17 58.8 99 15 118.6	18 28.4 99 15 118.5	18 58.0 99 15 118.4	19 27.7 99 15 118.3	19 57.3 99 15 118.3	20 26.9 99 15 118.2	9
60	16 50.3 99 15 117.7	17 20.0 99 15 117.7	17 49.6 99 15 117.6	18 19.2 99 15 117.5	18 48.8 99 16 117.4	19 18.4 99 16 117.3	19 48.1 99 16 117.2	20 17.7 99 16 117.2	60
1	16 41.1 99 16 116.7	17 10.7 99 16 116.7	17 40.3 99 16 116.6	18 09.9 99 16 116.5	18 39.5 99 16 116.4	19 09.1 99 16 116.3	19 38.7 99 16 116.2	20 08.4 99 16 116.1	1
2	16 31.7 99 16 115.7	17 01.3 99 16 115.6	17 30.9 99 16 115.6	18 00.6 99 16 115.5	18 30.2 99 16 115.4	18 59.8 99 16 115.3	19 29.4 99 16 115.2	19 59.0 99 16 115.1	2
3	16 22.3 99 16 114.7	16 51.9 99 16 114.6	17 21.5 99 16 114.6	17 51.1 99 16 114.5	18 20.7 99 16 114.4	18 50.3 99 16 114.3	19 19.9 99 16 114.2	19 49.5 99 16 114.1	3
4	16 12.8 99 16 113.7	16 42.4 99 16 113.6	17 12.0 99 16 113.6	17 41.6 99 16 113.5	18 11.2 99 16 113.4	18 40.8 99 16 113.3	19 10.4 99 16 113.2	19 39.9 99 16 113.1	4
65	16 03.2 99 16 112.7	16 32.8 99 16 112.6	17 02.4 99 16 112.5	17 32.0 99 16 112.5	18 01.6 99 16 112.4	18 31.2 99 16 112.3	19 00.7 99 16 112.2	19 30.3 99 16 112.1	65
6	15 53.6 99 16 111.7	16 23.2 99 16 111.6	16 52.7 99 16 111.5	17 22.3 99 16 111.4	17 51.9 99 16 111.4	18 21.5 99 16 111.3	18 51.1 99 16 111.2	19 20.6 99 16 111.1	6
7	15 43.9 99 16 110.7	16 13.4 99 16 110.6	16 43.0 99 16 110.5	17 12.6 99 16 110.4	17 42.2 99 16 110.4	18 11.7 99 16 110.3	18 41.3 99 16 110.2	19 10.9 99 16 110.1	7
8	15 34.1 99 16 109.7	16 03.7 99 16 109.6	16 33.2 99 16 109.5	17 02.8 99 16 109.4	17 32.4 99 16 109.4	18 01.9 99 16 109.3	18 31.5 99 16 109.2	19 01.1 99 16 109.2	8
9	15 24.2 99 16 108.7	15 53.8 99 17 108.6	16 23.4 99 17 108.5	16 52.9 99 17 108.4	17 22.5 99 17 108.3	17 52.1 99 17 108.3	18 21.6 99 17 108.2	18 51.2 99 17 108.1	9
70	15 14.3 99 17 107.7	15 43.9 99 17 107.6	16 13.5 99 17 107.5	16 43.0 99 17 107.4	17 12.6 99 17 107.3	17 42.2 99 17 107.3	18 11.7 99 17 107.2	18 41.3 99 17 107.1	70
1	15 04.4 99 17 106.7	15 34.0 99 17 106.6	16 03.5 99 17 106.5	16 33.1 99 17 106.4	17 02.6 99 17 106.3	17 32.2 99 17 106.3	18 01.7 99 17 106.2	18 31.3 99 17 106.1	1
2	14 54.4 99 17 105.7	15 23.9 99 17 105.6	15 53.5 99 17 105.5	16 23.1 99 17 105.4	16 52.6 99 17 105.3	17 22.2 99 17 105.3	17 51.7 98 17 105.2	18 21.2 98 17 105.1	2
3	14 44.3 99 17 104.7	15 13.9 99 17 104.6	15 43.4 98 17 104.5	16 13.0 98 17 104.4	16 42.5 98 17 104.3	17 12.1 98 17 104.3	17 41.6 98 17 104.2	18 11.2 98 17 104.1	3
4	14 34.2 99 17 103.7	15 03.8 98 17 103.6	15 33.3 98 17 103.5	16 02.9 98 17 103.4	16 32.4 98 17 103.3	17 02.0 98 17 103.3	17 31.5 98 17 103.2	18 01.0 98 17 103.1	4
75	14 24.1 98 17 102.7	14 53.6 98 17 102.6	15 23.2 98 17 102.5	15 52.7 98 17 102.4	16 22.3 98 17 102.4	16 51.8 98 17 102.3	17 21.3 98 17 102.2	17 50.9 98 17 102.1	75
6	14 13.9 98 17 101.7	14 43.4 98 17 101.6	15 13.0 98 17 101.5	15 42.5 98 17 101.5	16 12.1 98 17 101.4	16 41.6 98 17 101.3	17 11.1 98 17 101.2	17 40.7 98 17 101.1	6
7	14 03.7 98 17 100.7	14 33.2 98 17 100.6	15 02.8 98 17 100.5	15 32.3 98 17 100.5	16 01.8 98 17 100.4	16 31.4 98 17 100.3	17 00.9 98 17 100.2	17 30.4 98 17 100.1	7
8	13 53.4 98 17 99.6	14 23.0 98 17 99.6	14 52.5 98 17 99.5	15 22.0 98 17 99.5	15 51.6 98 17 99.4	16 21.1 98 17 99.3	16 50.6 98 17 99.2	17 20.1 98 17 99.1	8
9	13 43.1 98 17 98.7	14 12.7 98 17 98.7	14 42.2 98 17 98.6	15 11.7 98 17 98.5	15 41.3 98 17 98.4	16 10.8 98 17 98.3	16 40.3 98 17 98.2	17 09.8 98 17 98.1	9
80	13 32.8 98 17 97.8	14 02.4 98 17 97.7	14 31.9 98 17 97.6	15 01.4 98 17 97.5	15 30.9 98 17 97.4	16 00.5 98 17 97.3	16 30.0 98 17 97.2	16 59.5 98 17 97.1	80
1	13 22.5 98 17 96.8	13 52.0 98 17 96.7	14 21.6 98 17 96.6	14 51.1 98 17 96.5	15 20.6 98 17 96.4	15 50.1 98 17 96.3	16 19.6 98 17 96.2	16 49.2 98 17 96.1	1
2	13 12.1 98 17 95.8	13 41.7 98 17 95.7	14 11.2 98 17 95.6	14 40.7 98 17 95.5	15 10.2 98 17 95.4	15 39.8 98 17 95.3	16 09.3 98 17 95.2	16 38.8 98 17 95.1	2
3	13 01.8 98 17 94.8	13 31.3 98 17 94.7	14 00.8 98 17 94.6	14 30.3 98 17 94.5	14 59.9 98 17 94.4	15 29.4 98 17 94.3	15 58.9 98 17 94.2	16 28.4 98 17 94.1	3
4	12 51.4 98 17 93.8	13 20.9 98 17 93.7	13 50.4 98 17 93.6	14 19.9 98 17 93.5	14 49.5 98 17 93.4	15 19.0 98 17 93.3	15 48.5 98 17 93.2	16 18.0 98 17 93.2	4
85	12 41.0 98 17 92.8	13 10.5 98 17 92.7	13 40.0 98 17 92.6	14 09.5 98 17 92.5	14 39.1 98 17 92.4	15 08.6 98 17 92.4	15 38.1 98 17 92.3	16 07.6 98 17 92.2	85
6	12 30.6 98 17 91.8	13 00.1 98 17 91.7	13 29.6 98 17 91.6	13 59.1 98 17 91.5	14 28.6 98 17 91.5	14 58.2 98 17 91.4	15 27.7 98 17 91.3	15 57.2 98 17 91.2	6
7	12 20.2 98 17 90.8	12 49.7 98 17 90.7	13 19.2 98 17 90.7	13 48.7 98 17 90.6	14 18.2 98 17 90.5	14 47.7 98 17 90.4	15 17.3 98 17 90.3	15 46.8 98 17 90.2	7
8	12 09.7 98 17 89.9	12 39.3 98 17 89.8	13 08.8 98 17 89.7	13 38.3 98 17 89.6	14 07.8 98 17 89.5	14 37.3 98 17 89.4	15 06.8 98 17 89.3	15 36.4 98 17 89.2	8
9	11 59.3 98 17 88.9	12 28.8 98 17 88.8	12 58.4 98 17 88.7	13 27.9 98 17 88.6	13 57.4 98 17 88.5	14 26.9 98 17 88.4	14 56.4 98 17 88.3	15 25.9 98 17 88.2	9
90	11 48.9 98 17 87.9	12 18.4 98 17 87.8	12 47.9 98 17 87.7	13 17.5 98 17 87.6	13 47.0 98 17 87.5	14 16.5 98 17 87.4	14 46.0 98 17 87.3	15 15.5 98 17 87.2	90

Lat. 80°

H.A.	12° 00' Alt.	Δd Δt	Az.	12° 30' Alt.	Δd Δt	Az.	13° 00' Alt.	Δd Δt	Az.	13° 30' Alt.	Δd Δt	Az.	14° 00' Alt.	Δd Δt	Az.	14° 30' Alt.	Δd Δt	Az.	15° 00' Alt.	Δd Δt	Az.	15° 30' Alt.	Δd Δt	Az.	H.A.
91	11 38.5	98 17	86.9	12 08.0	98 17	86.8	12 37.5	98 17	86.7	13 07.1	98 17	86.6	13 36.6	98 17	86.5	14 06.1	98 17	86.4	14 35.6	98 17	86.4	15 05.1	98 17	86.3	91
2	11 28.1	98 17	85.9	11 57.6	98 17	85.8	12 27.1	98 17	85.7	12 56.7	98 17	85.6	13 26.2	98 17	85.6	13 55.7	98 17	85.5	14 25.2	98 17	85.4	14 54.7	98 17	85.3	2
3	11 17.7	98 17	84.9	11 47.2	98 17	84.8	12 16.8	98 17	84.7	12 46.3	98 17	84.6	13 15.8	98 17	84.5	13 45.3	98 17	84.5	14 14.8	98 17	84.4	14 44.4	98 17	84.3	3
4	11 07.3	98 17	84.0	11 36.9	98 17	83.9	12 06.4	98 17	83.8	12 35.9	98 17	83.7	13 05.4	98 17	83.6	13 35.0	98 17	83.5	14 04.5	98 17	83.4	14 34.0	98 17	83.3	4
95	10 57.0	98 17	83.0	11 26.5	98 17	82.9	11 56.0	98 17	82.8	12 25.6	98 17	82.7	12 55.1	98 17	82.6	13 24.6	98 17	82.5	13 54.1	98 17	82.4	14 23.7	98 17	82.3	95
6	10 46.7	98 17	82.0	11 16.2	98 17	81.9	11 45.7	98 17	81.8	12 15.3	98 17	81.7	12 44.8	98 17	81.6	13 14.3	98 17	81.5	13 43.8	98 17	81.5	14 13.3	98 17	81.4	6
7	10 36.4	98 17	81.0	11 05.9	98 17	80.9	11 35.4	98 17	80.8	12 05.0	98 17	80.7	12 34.5	98 17	80.7	13 04.0	98 17	80.6	13 33.5	98 17	80.5	14 03.1	98 17	80.4	7
8	10 26.1	98 17	80.0	10 55.6	98 17	79.9	11 25.2	98 17	79.9	11 54.7	98 17	79.8	12 24.2	98 17	79.7	12 53.7	98 17	79.6	13 23.3	98 17	79.5	13 52.8	98 17	79.4	8
9	10 15.8	98 17	79.1	10 45.4	98 17	79.0	11 14.9	98 17	78.9	11 44.4	98 17	78.8	12 14.0	98 17	78.7	12 43.5	98 17	78.6	13 13.0	98 17	78.5	13 42.6	98 17	78.4	9
100	10 05.6	98 17	78.1	10 35.2	98 17	78.0	11 04.7	98 17	77.9	11 34.2	98 17	77.8	12 03.8	98 17	77.7	12 33.3	98 17	77.6	13 02.9	98 17	77.5	13 32.4	98 17	77.5	100
1	9 55.4	98 17	77.1	10 25.0	98 17	77.0	10 54.5	98 17	76.9	11 24.1	98 17	76.8	11 53.6	98 17	76.7	12 23.2	98 17	76.7	12 52.7	98 17	76.6	13 22.2	98 17	76.5	1
2	9 45.3	98 17	76.1	10 14.9	98 17	76.0	10 44.4	98 17	75.9	11 14.0	98 17	75.9	11 43.5	98 17	75.8	12 13.0	98 17	75.7	12 42.6	98 17	75.6	13 12.1	98 17	75.5	2
3	9 35.2	98 17	75.1	10 04.8	99 17	75.1	10 34.3	98 17	75.0	11 03.9	98 17	74.9	11 33.4	98 17	74.7	12 03.0	98 17	74.7	12 32.5	98 17	74.6	13 02.1	98 17	74.5	3
4	9 25.2	99 17	74.2	9 54.7	99 17	74.1	10 24.3	99 17	74.0	10 53.8	99 17	73.9	11 23.4	99 17	73.8	11 52.9	99 17	73.7	12 22.5	98 17	73.6	12 52.0	98 17	73.6	4
105	9 15.2	99 17	73.2	9 44.7	99 17	73.1	10 14.3	99 17	73.0	10 43.9	99 17	72.9	11 13.4	99 17	72.8	11 43.0	99 17	72.8	12 12.5	99 17	72.7	12 42.1	99 17	72.6	105
6	9 05.2	99 16	72.2	9 34.8	99 16	72.1	10 04.4	99 16	72.0	10 33.9	99 16	72.0	11 03.5	99 16	71.9	11 33.0	99 16	71.8	12 02.6	99 16	71.7	12 32.2	99 16	71.6	6
7	8 55.3	99 16	71.2	9 24.9	99 16	71.1	9 54.5	99 16	71.1	10 24.0	99 16	70.9	10 53.6	99 16	70.9	11 23.2	99 16	70.8	11 52.7	99 16	70.7	12 22.3	99 16	70.6	7
8	8 45.5	99 16	70.3	9 15.1	99 16	70.2	9 44.6	99 16	70.1	10 14.2	99 16	70.0	10 43.8	99 16	69.9	11 13.4	99 16	69.8	11 42.9	99 16	69.8	12 12.5	99 16	69.7	8
9	8 35.7	99 16	69.3	9 05.3	99 16	69.2	9 34.9	99 16	69.1	10 04.5	99 16	69.0	10 34.0	99 16	68.9	11 03.6	99 16	68.9	11 33.2	99 16	68.8	12 02.8	99 16	68.7	9
110	8 26.0	99 16	68.3	8 55.6	99 16	68.2	9 25.2	99 16	68.1	9 54.8	99 16	68.1	10 24.4	99 16	68.0	10 53.9	99 16	67.9	11 23.5	99 16	67.8	11 53.1	99 16	67.7	110
1	8 16.4	99 16	67.3	8 45.9	99 16	67.3	9 15.5	99 16	67.2	9 45.1	99 16	67.1	10 14.7	99 16	67.0	10 44.3	99 16	66.9	11 13.9	99 16	66.8	11 43.5	99 16	66.8	1
2	8 06.8	99 16	66.4	8 36.4	99 16	66.3	9 06.0	99 16	66.2	9 35.6	99 16	66.1	10 05.2	99 16	66.0	10 34.8	99 16	65.9	11 04.4	99 16	65.9	11 34.0	99 16	65.8	2
3	7 57.3	99 16	65.4	8 26.9	99 16	65.3	8 56.5	99 16	65.2	9 26.1	99 16	65.1	9 55.7	99 16	65.1	10 25.3	99 16	65.0	10 54.9	99 16	64.9	11 24.5	99 16	64.8	3
4	7 47.8	99 16	64.4	8 17.4	99 16	64.3	8 47.1	99 16	64.3	9 16.7	99 16	64.2	9 46.3	99 16	64.1	10 15.9	99 16	64.0	10 45.5	99 16	63.9	11 15.1	99 16	63.8	4
115	7 38.5	99 15	63.4	8 08.1	99 15	63.4	8 37.7	99 15	63.3	9 07.3	99 15	63.2	9 36.9	99 15	63.1	10 06.6	99 15	63.0	10 36.2	99 15	63.0	11 05.8	99 15	62.9	115
6	7 29.2	99 15	62.5	7 58.8	99 15	62.4	8 28.4	99 15	62.3	8 58.1	99 15	62.2	9 27.7	99 15	62.1	9 57.3	99 15	62.1	10 26.9	99 15	62.0	10 56.6	99 15	61.9	6
7	7 20.0	99 15	61.5	7 49.6	99 15	61.4	8 19.3	99 15	61.3	8 48.9	99 15	61.3	9 18.5	99 15	61.2	9 48.2	99 15	61.1	10 17.8	99 15	61.0	10 47.4	99 15	60.9	7
8	7 10.9	99 15	60.5	7 40.5	99 15	60.4	8 10.2	99 15	60.4	8 39.8	99 15	60.3	9 09.4	99 15	60.2	9 39.1	99 15	60.1	10 08.7	99 15	60.0	10 38.3	99 15	60.0	8
09	7 01.9	99 15	59.5	7 31.5	99 15	59.5	8 01.2	99 15	59.4	8 30.8	99 15	59.3	9 00.4	99 15	59.2	9 30.1	99 15	59.2	9 59.7	99 15	59.1	10 29.4	99 15	59.0	9
120	6 52.9	99 15	58.6	7 22.6	99 15	58.5	7 52.2	99 15	58.4	8 21.9	99 15	58.3	8 51.5	99 15	58.3	9 21.2	99 15	58.2	9 50.8	99 15	58.1	10 20.5	99 15	58.0	120
1	6 44.1	99 15	57.6	7 13.7	99 15	57.5	7 43.4	99 15	57.4	8 13.1	99 15	57.4	8 42.7	99 15	57.3	9 12.4	99 15	57.2	9 42.0	99 15	57.1	10 11.7	99 15	57.1	1
2	6 35.3	99 14	56.6	7 05.0	99 14	56.5	7 34.7	99 14	56.5	8 04.3	99 14	56.4	8 34.0	99 14	56.3	9 03.7	99 14	56.2	9 33.3	99 14	56.2	10 03.0	99 14	56.1	2
3	6 26.7	99 14	55.6	6 56.4	99 14	55.6	7 26.0	99 14	55.5	7 55.7	99 14	55.4	8 25.4	99 14	55.3	8 55.1	99 14	55.3	9 24.7	99 14	55.2	9 54.4	99 14	55.1	3
4	6 18.1	99 14	54.7	6 47.8	99 14	54.6	7 17.5	99 14	54.5	7 47.2	99 14	54.5	8 16.9	99 14	54.4	8 46.5	99 14	54.3	9 16.2	99 14	54.2	9 45.9	99 14	54.2	4
125	6 09.7	99 14	53.7	6 39.4	99 14	53.6	7 09.1	99 14	53.6	7 38.8	99 14	53.5	8 08.4	99 14	53.4	8 38.1	99 14	53.3	9 07.8	99 14	53.3	9 37.5	99 14	53.2	125
6	6 01.3	99 14	52.7	6 31.0	99 14	52.7	7 00.7	99 14	52.6	7 30.4	99 14	52.5	8 00.1	99 14	52.4	8 29.8	99 14	52.4	8 59.5	99 14	52.3	9 29.2	99 14	52.2	6
7	5 53.1	99 14	51.8	6 22.8	99 14	51.7	6 52.5	99 14	51.6	7 22.2	99 14	51.5	7 51.9	99 14	51.5	8 21.6	99 13	51.4	8 51.3	99 13	51.3	9 21.0	99 13	51.3	7
8	5 45.0	99 13	50.8	6 14.7	99 13	50.7	6 44.4	99 13	50.6	7 14.1	99 13	50.6	7 43.8	99 13	50.5	8 13.5	99 13	50.4	8 43.3	99 13	50.4	9 13.0	99 13	50.3	8
9	5 37.0	99 13	49.8	6 06.7	99 13	49.7	6 36.4	99 13	49.7	7 06.1	99 13	49.6	7 35.8	99 13	49.5	8 05.6	99 13	49.5	8 35.3	99 13	49.4	9 05.0	99 13	49.3	9
130	5 29.1	99 13	48.8	5 58.8	99 13	48.8	6 28.5	99 13	48.7	6 58.2	99 13	48.6	7 28.0	99 13	48.5	7 57.7	99 13	48.5	8 27.4	99 13	48.4	8 57.2	99 13	48.4	130
1	5 21.3	99 13	47.9	5 51.0	99 13	47.8	6 20.8	99 13	47.7	6 50.5	99 13	47.7	7 20.2	99 13	47.6	7 50.0	99 13	47.5	8 19.7	99 13	47.5	8 49.4	99 13	47.4	1
2	5 13.6	99 13	46.9	5 43.4	99 13	46.8	6 13.1	99 13	46.8	6 42.8	99 13	46.7	7 12.6	99 13	46.6	7 42.3	99 12	46.6	8 12.1	99 12	46.5	8 41.8	99 12	46.4	2
3	5 06.1	99 12	45.9	5 35.8	99 12	45.8	6 05.6	99 12	45.8	6 35.3	99 12	45.7	7 05.1	99 12	45.7	7 34.8	99 12	45.6	8 04.6	99 12	45.5	8 34.3	99 12	45.5	3
4				5 28.4	99 12	44.9	5 58.2	99 12	44.8	6 27.9	99 12	44.7	6 57.7	99 12	44.7	7 27.5	99 12	44.6	7 57.2	99 12	44.6	8 27.0	99 12	44.5	4
135				5 21.1	99 12	43.9	5 50.9	99 12	43.8	6 20.7	99 12	43.8	6 50.4	99 12	43.7	7 20.2	99 12	43.6	7 50.0	99 12	43.6	8 19.7	99 12	43.5	135
6				5 14.0	99 12	42.9	5 43.7	99 12	42.9	6 13.5	99 12	42.8	6 43.3	99 12	42.7	7 13.1	99 12	42.7	7 42.8	99 12	42.6	8 12.6	99 12	42.6	6
7				5 06.9	99 12	42.0	5 36.7	99 11	41.9	6 06.5	99 11	41.8	6 36.3	99 11	41.8	7 06.1	99 11	41.7	7 35.9	99 11	41.7	8 05.6	99 11	41.6	7
8				5 00.0	99 11	41.0	5 29.8	99 11	40.9	5 59.6	99 11	40.9	6 29.4	99 11	40.8	6 59.2	99 11	40.7	7 29.0	99 11	40.7	7 58.8	99 11	40.6	8
9							5 23.1	99 11	39.9	5 52.9	99 11	39.9	6 22.7	99 11	39.8	6 52.5	99 11	39.7	7 22.3	99 11	39.7	7 52.1	99 11	39.7	9
140							5 16.4	99 11	39.0	5 46.3	99 11	38.9	6 16.1	99 11	38.9	6 45.9	99 11	38.8	7 15.7	99 11	38.7	7 45.5	99 11	38.7	140
1							5 10.0	99 11	38.0	5 39.8	99 11	37.9	6 09.6	99 11	37.9	6 39.4	99 11	37.8	7 09.2	99 11	37.8	7 39.1	99 10	37.7	1
2							5 03.6	99 10	37.0	5 33.4	99 10	37.0	6 03.3	99 10	36.9	6 33.1	99 10	36.9	7 02.9	99 10	36.8	7 32.7	99 10	36.8	2
3										5 27.2	99 10	36.0	5 57.1	99 10	36.0	6 26.9	99 10	35.9	6 56.7	99 10	35.8	7 26.6	99 10	35.8	3
4										5 21.2	99 10	35.0	5 51.0	99 10	35.0	6 20.9	99 10	34.9	6 50.7	99 10	34.9	7 20.6	99 10	34.8	4
145										5 15.3	99 10	34.1	5 45.1	99 10	34.0	6 15.0	99 10	34.0	6 44.8	99 10	33.9	7 14.7	99 10	33.9	145
6										5 09.5	1.0 09	33.1	5 39.4	1.0 09	33.0	6 09.2	1.0 09	33.0	6 39.1	1.0 09	32.9	7 09.0	1.0 09	32.9	6
7										5 03.9	1.0 09	32.1	5 33.8	1.0 09	32.1	6 03.6	1.0 09	32.0	6 33.5	1.0 09	32.0	7 03.4	1.0 09	31.9	7
8													5 28.3	1.0 09	31.1	5 58.2	1.0 09	31.0	6 28.1	1.0 09	31.0	6 57.9	1.0 09	31.0	8
9													5 23.0	1.0 09	30.1	5 52.9	1.0 09	30.1	6 22.8	1.0 09	30.0	6 52.7	1.0 09	30.0	9
J													5 17.9	1.0 08	29.2	5 47.7	1.0 08	29.1	6 17.6	1.0 08	29.1	6 47.5	1.0 08	29.0	150
1													5 12.9	1.0 08	28.2	5 42.8	1.0 08	28.1	6 12.6	1.0 08	28.1	6 42.5	1.0 08	28.1	1
2													5 08.0	1.0 08	27.2	5 37.9	1.0 08	27.2	6 07.8	1.0 08	27.1	6 37.7	1.0 08	27.1	2
3													5 03.3	1.0 08	26.2	5 33.2	1.0 08	26.2	6 03.1	1.0 08	26.2	6 33.0	1.0 08	26.1	3
4																5 28.7	1.0 07	25.2	5 58.6	1.0 07	25.2	6 28.5	1.0 07	25.2	4
155																5 24.4	1.0 07	24.3	5 54.3	1.0 07	24.2	6 24.2	1.0 07	24.2	155
6																5 20.2	1.0 07	23.3	5 50.1	1.0 07	23.3	6 20.0	1.0 07	23.2	6
7																5 16.1	1.0 06	22.3	5 46.0	1.0 06	22.3	6 16.0	1.0 06	22.3	7
8																5 12.2	1.0 06	21.4	5 42.2	1.0 06	21.3	6 12.1	1.0 06	21.3	8
9																5 08.5	1.0 06	20.4	5 38.5	1.0 06	20.4	6 08.4	1.0 06	20.3	9
160																5 05.0	1.0 06	19.4	5 34.9	1.0 06	19.4	6 04.9	1.0 06	19.4	160
1																5 01.6	1.0 05	18.4	5 31.5	1.0 05	18.4	6 01.5	1.0 05	18.4	1
2																			5 28.3	1.0 05	17.4	5 58.3	1.0 05	17.4	2
3																			5 25.3	1.0 05	16.5	5 55.3	1.0 05	16.5	3
4																			5 22.4	1.0 04	15.5	5 52.4	1.0 04	15.5	4
165																			5 19.7	1.0 04	14.5	5 49.7	1.0 04	14.5	165
6																			5 17.2	1.0 04	13.6	5 47.2	1.0 04	13.6	6
7																			5 14.8	1.0 04	12.6	5 44.8	1.0 04	12.6	7
8																			5 12.6	1.0 03	11.6	5 42.6	1.0 03	11.6	8
9																			5 10.6	1.0 03	10.7	5 40.6	1.0 03	10.6	9
170																			5 08.8	1.0 03	09.7	5 38.8	1.0 03	09.7	170
1																			5 07.1	1.0 02	08.7	5 37.1	1.0 02	08.7	1
2																			5 05.6	1.0 02	07.8	5 35.6	1.0 02	07.7	2
3																			5 04.3	1.0 02	06.8	5 34.3	1.0 02	06.8	3
4																			5 03.2	1.0 02	05.8	5 33.2	1.0 02	05.8	4
175																			5 02.2	1.0 01	04.8	5 32.2	1.0 01	04.8	175
6																			5 01.4	1.0 01	03.9	5 31.4	1.0 01	03.9	6
7																			5 00.8	1.0 01	02.9	5 30.8	1.0 01	02.9	7
8																			5 00.4	1.0 00	01.9	5 30.4	1.0 00	01.9	8
9																			5 00.1	1.0 00	01.0	5 30.1	1.0 00	01.0	9
180																			5 00.0	1.0 00	00.0	5 30.0	1.0 00	00.0	180

Lat. 80°
Lat. 81°
Lat. 82°
Lat. 83°

H.A.	16° 00' Alt.	Δd Δt	Az.	16° 30' Alt.	Δd Δt	Az.	17° 00' Alt.	Δd Δt	Az.	17° 30' Alt.	Δd Δt	Az.	18° 00' Alt.	Δd Δt	Az.	18° 30' Alt.	Δd Δt	Az.	19° 00' Alt.	Δd Δt	Az.	19° 30' Alt.	Δd Δt	Az.	H.A.
00	26 00.0	1.00 0	180.0	26 30.0	1.00 0	180.0	27 00.0	1.00 0	180.0	27 30.0	1.00 0	180.0	28 00.0	1.00 0	180.0	28 30.0	1.00 0	180.0	29 00.0	1.00 0	180.0	29 30.0	1.00 0	180.0	00
1	25 59.9	1.00 0	178.9	26 29.9	1.00 0	178.9	26 59.9	1.00 0	178.9	27 29.9	1.00 0	178.9	27 59.9	1.00 0	178.9	28 29.9	1.00 0	178.9	28 59.9	1.00 0	178.9	29 29.9	1.00 0	178.9	1
2	25 59.6	1.00 1	177.9	26 29.6	1.00 1	177.9	26 59.6	1.00 1	177.9	27 29.6	1.00 1	177.8	27 59.6	1.00 1	177.8	28 29.6	1.00 1	177.8	28 59.6	1.00 1	177.8	29 29.6	1.00 1	177.8	2
3	25 59.1	1.00 1	176.8	26 29.1	1.00 1	176.8	26 59.1	1.00 1	176.8	27 29.1	1.00 1	176.8	27 59.1	1.00 1	176.8	28 29.1	1.00 1	176.8	28 59.1	1.00 1	176.8	29 29.1	1.00 1	176.8	3
4	25 58.4	1.00 1	175.7	26 28.4	1.00 1	175.7	26 58.4	1.00 1	175.7	27 28.4	1.00 1	175.7	27 58.4	1.00 1	175.7	28 28.4	1.00 1	175.7	28 58.4	1.00 1	175.7	29 28.4	1.00 2	175.7	4
05	25 57.6	1.00 2	174.7	26 27.6	1.00 2	174.6	26 57.6	1.00 2	174.6	27 27.6	1.00 2	174.6	27 57.6	1.00 2	174.6	28 27.6	1.00 2	174.6	28 57.5	1.00 2	174.6	29 27.5	1.00 2	174.6	05
6	25 56.5	1.00 2	173.6	26 26.5	1.00 2	173.6	26 56.5	1.00 2	173.6	27 26.5	1.00 2	173.6	27 56.5	1.00 2	173.5	28 26.5	1.00 2	173.5	28 56.5	1.00 2	173.5	29 26.5	1.00 2	173.5	6
7	25 55.2	1.00 2	172.5	26 25.2	1.00 2	172.5	26 55.2	1.00 2	172.5	27 25.2	1.00 2	172.5	27 55.2	1.00 2	172.4	28 25.2	1.00 2	172.4	28 55.2	1.00 2	172.4	29 25.2	1.00 2	172.4	7
8	25 53.8	1.00 3	171.4	26 23.8	1.00 3	171.4	26 53.8	1.00 3	171.4	27 23.8	1.00 3	171.4	27 53.7	1.00 3	171.4	28 23.7	1.00 3	171.4	28 53.7	1.00 3	171.4	29 23.7	1.00 3	171.3	8
9	25 52.1	1.00 3	170.4	26 22.1	1.00 3	170.4	26 52.1	1.00 3	170.3	27 22.1	1.00 3	170.3	27 52.1	1.00 3	170.3	28 22.1	1.00 3	170.3	28 52.1	1.00 3	170.3	29 22.0	1.00 3	170.3	9
10	25 50.3	1.00 3	169.3	26 20.3	1.00 3	169.3	26 50.3	1.00 3	169.3	27 20.3	1.00 3	169.2	27 50.2	1.00 3	169.2	28 20.2	1.00 3	169.2	28 50.2	1.00 3	169.2	29 20.2	1.00 3	169.2	10
1	25 48.3	1.00 4	168.2	26 18.3	1.00 4	168.2	26 48.2	1.00 4	168.2	27 18.2	1.00 4	168.2	27 48.2	1.00 4	168.2	28 18.2	1.00 4	168.1	28 48.2	1.00 4	168.1	29 18.1	1.00 4	168.1	1
2	25 46.1	1.00 4	167.2	26 16.0	1.00 4	167.2	26 46.0	1.00 4	167.1	27 16.0	1.00 4	167.1	27 46.0	1.00 4	167.1	28 15.9	1.00 4	167.0	28 45.9	1.00 4	167.0	29 15.9	1.00 4	167.0	2
3	25 43.7	1.00 5	166.1	26 13.6	1.00 4	166.1	26 43.6	1.00 4	166.1	27 13.6	1.00 4	166.0	27 43.5	1.00 4	166.0	28 13.5	1.00 4	166.0	28 43.5	1.00 4	166.0	29 13.5	1.00 4	165.9	3
4	25 41.1	1.00 5	165.0	26 11.0	1.00 5	165.0	26 41.0	1.00 5	165.0	27 11.0	1.00 5	165.0	27 40.9	1.00 5	164.9	28 10.9	1.00 5	164.9	28 40.9	1.00 5	164.9	29 10.8	1.00 5	164.9	4
15	25 38.3	1.00 5	164.0	26 08.2	1.00 5	164.0	26 38.2	1.00 5	163.9	27 08.2	1.00 5	163.9	27 38.1	1.00 5	163.9	28 08.1	1.00 5	163.8	28 38.0	1.00 5	163.8	29 08.0	1.00 5	163.8	15
6	25 35.5	1.00 5	162.9	26 05.3	1.00 5	162.9	26 35.2	1.00 5	162.9	27 05.2	1.00 5	162.8	27 35.1	1.00 5	162.8	28 05.1	1.00 5	162.8	28 35.1	1.00 5	162.7	29 05.0	1.00 5	162.7	6
7	25 32.2	1.00 6	161.8	26 02.1	1.00 6	161.8	26 32.1	1.00 6	161.8	27 02.0	1.00 6	161.7	27 32.0	1.00 6	161.7	28 01.9	1.00 6	161.7	28 31.9	1.00 6	161.7	29 01.8	1.00 6	161.6	7
8	25 28.8	1.00 6	160.8	25 58.8	1.00 6	160.8	26 28.7	1.00 6	160.7	26 58.7	1.00 6	160.7	27 28.6	1.00 6	160.7	27 58.5	1.00 6	160.6	28 28.5	1.00 6	160.6	28 58.4	1.00 6	160.6	8
9	25 25.3	1.00 6	159.7	25 55.2	1.00 6	159.7	26 25.2	1.00 6	159.7	26 55.1	1.00 6	159.6	27 25.1	1.00 6	159.6	27 55.0	1.00 6	159.5	28 24.9	1.00 6	159.5	28 54.9	1.00 6	159.5	9
20	25 21.6	1.00 6	158.7	25 51.5	1.00 6	158.6	26 21.5	1.00 6	158.6	26 51.4	1.00 6	158.6	27 21.3	1.00 6	158.5	27 51.3	1.00 7	158.5	28 21.2	1.00 7	158.4	28 51.1	1.00 7	158.4	20
1	25 17.7	1.00 7	157.6	25 47.6	1.00 7	157.6	26 17.6	1.00 7	157.5	26 47.5	1.00 7	157.5	27 17.4	1.00 7	157.4	27 47.4	1.00 7	157.4	28 17.3	1.00 7	157.4	28 47.2	1.00 7	157.3	1
2	25 13.7	1.00 7	156.5	25 43.6	1.00 7	156.5	26 13.5	1.00 7	156.4	26 43.4	1.00 7	156.4	27 13.3	1.00 7	156.4	27 43.3	1.00 7	156.3	28 13.2	1.00 7	156.3	28 43.1	1.00 7	156.3	2
3	25 09.4	1.00 7	155.5	25 39.3	1.00 7	155.4	26 09.3	1.00 7	155.4	26 39.2	1.00 7	155.4	27 09.1	1.00 7	155.3	27 39.0	1.00 7	155.3	28 08.9	1.00 7	155.2	28 38.8	1.00 7	155.2	3
4	25 05.0	1.00 8	154.4	25 34.9	1.00 8	154.4	26 04.8	1.00 8	154.3	26 34.7	1.00 8	154.3	27 04.6	1.00 8	154.3	27 34.5	1.00 8	154.2	28 04.5	1.00 8	154.2	28 34.4	1.00 8	154.1	4
25	25 00.4	1.00 8	153.4	25 30.3	1.00 8	153.3	26 00.2	1.00 8	153.3	26 30.1	1.00 8	153.2	27 00.0	1.00 8	153.2	27 29.9	1.00 8	153.1	27 59.8	1.00 8	153.1	28 29.7	1.00 8	153.0	25
6	24 55.7	1.00 8	152.3	25 25.6	1.00 8	152.3	25 55.5	1.00 8	152.2	26 25.4	1.00 8	152.2	26 55.2	1.00 8	152.1	27 25.1	1.00 8	152.1	27 55.0	1.00 8	152.0	28 24.9	1.00 8	152.0	6
7	24 50.7	1.00 8	151.3	25 20.6	1.00 8	151.2	25 50.5	1.00 9	151.1	26 20.4	1.00 9	151.1	26 50.3	1.00 9	151.1	27 20.2	1.00 9	151.0	27 50.1	1.00 9	151.0	28 19.9	1.00 9	150.9	7
8	24 45.7	1.00 9	150.2	25 15.5	1.00 9	150.2	25 45.4	1.00 9	150.1	26 15.3	1.00 9	150.0	26 45.2	1.00 9	150.0	27 15.0	1.00 9	149.9	27 44.9	1.00 9	149.9	28 14.8	1.00 9	149.8	8
9	24 40.4	1.00 9	149.1	25 10.3	1.00 9	149.1	25 40.1	1.00 9	149.0	26 10.0	1.00 9	149.0	26 39.9	1.00 9	148.9	27 09.7	1.00 9	148.9	27 39.6	1.00 9	148.8	28 09.5	1.00 9	148.8	9
30	24 35.0	1.00 9	148.1	25 04.8	1.00 9	148.0	25 34.7	1.00 9	148.0	26 04.6	1.00 9	147.9	26 34.4	1.00 9	147.9	27 04.3	1.00 9	147.8	27 34.1	1.00 9	147.8	28 04.0	1.00 9	147.7	30
1	24 29.4	1.0 10	147.0	24 59.2	1.0 10	147.0	25 29.1	1.0 10	146.9	25 58.9	1.0 10	146.9	26 28.8	99 10	146.8	26 58.6	99 10	146.8	27 28.5	99 10	146.7	27 58.3	99 10	146.7	1
2	24 23.6	99 10	146.0	24 53.5	99 10	145.9	25 23.3	99 10	145.9	25 53.2	99 10	145.8	26 23.0	99 10	145.8	26 52.8	99 10	145.8	27 22.7	99 10	145.6	27 52.5	99 10	145.6	2
3	24 17.7	99 10	144.9	24 47.6	99 10	144.9	25 17.4	99 10	144.8	25 47.2	99 10	144.8	26 17.1	99 10	144.7	26 46.9	99 10	144.7	27 16.7	99 10	144.6	27 46.6	99 10	144.5	3
4	24 11.7	99 10	143.9	24 41.5	99 10	143.8	25 11.3	99 10	143.8	25 41.1	99 10	143.7	26 11.0	99 10	143.7	26 40.8	99 10	143.6	27 10.6	99 10	143.5	27 40.4	99 10	143.5	4
35	24 05.4	99 11	142.8	24 35.3	99 11	142.8	25 05.1	99 11	142.7	25 34.9	99 11	142.7	26 04.7	99 11	142.6	26 34.5	99 11	142.5	27 04.3	99 11	142.5	27 34.2	99 11	142.4	35
6	23 59.1	99 11	141.7	24 28.9	99 11	141.7	24 58.7	99 11	141.7	25 28.5	99 11	141.6	25 58.3	99 11	141.6	26 28.1	99 11	141.5	26 57.9	99 11	141.4	27 27.7	99 11	141.4	6
7	23 52.6	99 11	140.8	24 22.4	99 11	140.7	24 52.2	99 11	140.6	25 22.0	99 11	140.6	25 51.8	99 11	140.5	26 21.6	99 11	140.4	26 51.4	99 11	140.4	27 21.1	99 11	140.3	7
8	23 45.9	99 11	139.7	24 15.7	99 11	139.6	24 45.5	99 11	139.6	25 15.3	99 11	139.5	25 45.1	99 11	139.5	26 14.9	99 11	139.4	26 44.6	99 11	139.3	27 14.4	99 11	139.3	8
9	23 39.1	99 12	138.7	24 08.9	99 12	138.6	24 38.7	99 12	138.5	25 08.4	99 12	138.5	25 38.2	99 12	138.4	26 08.0	99 12	138.3	26 37.8	99 12	138.3	27 07.5	99 12	138.2	9
40	23 32.1	99 12	137.6	24 01.9	99 12	137.6	24 31.7	99 12	137.5	25 01.5	99 12	137.4	25 31.2	99 12	137.4	26 01.0	99 12	137.3	26 30.8	99 12	137.2	27 00.5	99 12	137.1	40
1	23 25.0	99 12	136.6	23 54.8	99 12	136.5	24 24.6	99 12	136.5	24 54.3	99 12	136.4	25 24.1	99 12	136.3	25 53.9	99 12	136.2	26 23.6	99 12	136.2	26 53.4	99 12	136.1	1
2	23 17.8	99 12	135.5	23 47.6	99 12	135.5	24 17.3	99 12	135.4	24 47.1	99 12	135.3	25 16.8	99 12	135.3	25 46.6	99 12	135.2	26 16.3	99 12	135.1	26 46.1	99 12	135.1	2
3	23 10.5	99 12	134.5	23 40.2	99 13	134.4	24 10.0	99 13	134.4	24 39.7	99 13	134.3	25 09.4	99 13	134.2	25 39.2	99 13	134.2	26 08.9	99 13	134.1	26 38.7	99 13	134.0	3
4	23 03.0	99 13	133.5	23 32.7	99 13	133.4	24 02.4	99 13	133.3	24 32.2	99 13	133.3	25 01.9	99 13	133.2	25 31.6	99 13	133.1	26 01.4	99 13	133.0	26 31.1	99 13	133.0	4
45	22 55.3	99 13	132.4	23 25.1	99 13	132.4	23 54.8	99 13	132.3	24 24.5	99 13	132.2	24 54.2	99 13	132.1	25 24.0	99 13	132.1	25 53.7	99 13	132.0	26 23.4	99 13	131.9	45
6	22 47.6	99 13	131.4	23 17.3	99 13	131.3	23 47.0	99 13	131.3	24 16.7	99 13	131.2	24 46.5	99 13	131.1	25 16.2	99 13	131.0	25 45.9	99 13	131.0	26 15.6	99 13	130.9	6
7	22 39.7	99 13	130.4	23 09.4	99 13	130.3	23 39.1	99 13	130.2	24 08.8	99 13	130.1	24 38.5	99 13	130.0	25 08.2	99 13	130.0	25 38.0	99 13	129.9	26 07.7	99 13	129.8	7
8	22 31.7	99 14	129.3	23 01.4	99 14	129.3	23 31.1	99 14	129.2	24 00.8	99 14	129.1	24 30.5	99 14	129.0	25 00.2	99 14	129.0	25 29.9	99 14	128.9	25 59.6	99 14	128.8	8
9	22 23.6	99 14	128.3	22 53.3	99 14	128.2	23 23.0	99 14	128.2	23 52.7	99 14	128.1	24 22.4	99 14	128.0	24 52.0	99 14	127.9	25 21.7	99 14	127.8	25 51.4	99 14	127.8	9
50	22 15.4	99 14	127.3	22 45.0	99 14	127.2	23 14.7	99 14	127.1	23 44.4	99 14	127.0	24 14.1	99 14	127.0	24 43.8	99 14	126.9	25 13.4	99 14	126.8	25 43.1	99 14	126.7	50
1	22 07.0	99 14	126.3	22 36.7	99 14	126.2	23 06.4	99 14	126.1	23 36.0	99 14	126.0	24 05.7	99 14	125.9	24 35.4	99 14	125.9	25 05.0	99 14	125.8	25 34.7	99 14	125.7	1
2	21 58.6	99 14	125.2	22 28.2	99 14	125.2	22 57.9	99 14	125.1	23 27.6	99 14	125.0	23 57.2	99 14	124.9	24 26.9	99 14	124.8	24 56.5	99 14	124.7	25 26.2	99 14	124.7	2
3	21 50.0	99 14	124.2	22 19.7	99 14	124.1	22 49.3	99 14	124.0	23 19.0	99 14	124.0	23 48.6	99 14	123.9	24 18.3	99 15	123.8	24 47.9	99 15	123.7	25 17.6	99 15	123.6	3
4	21 41.3	99 15	123.2	22 11.0	99 15	123.1	22 40.6	99 15	123.0	23 10.3	99 15	122.9	23 39.9	99 15	122.9	24 09.6	99 15	122.8	24 39.2	99 15	122.7	25 08.8	99 15	122.6	4
55	21 32.6	99 15	122.2	22 02.2	99 15	122.1	22 31.8	99 15	122.0	23 01.5	99 15	121.9	23 31.1	99 15	121.8	24 00.8	99 15	121.7	24 30.4	99 15	121.7	25 00.0	99 15	121.6	55
6	21 23.7	99 15	121.1	21 53.3	99 15	121.1	22 23.0	99 15	120.9	22 52.6	99 15	120.8	23 22.2	99 15	120.8	23 51.8	99 15	120.7	24 21.5	99 15	120.6	24 51.1	99 15	120.5	6
7	21 14.7	99 15	120.1	21 44.3	99 15	120.0	22 14.0	99 15	120.0	22 43.6	99 15	119.9	23 13.2	99 15	119.8	23 42.8	99 15	119.7	24 12.5	99 15	119.6	24 42.1	99 15	119.5	7
8	21 05.7	99 15	119.1	21 35.3	99 15	119.0	22 04.9	99 15	118.9	22 34.5	99 15	118.8	23 04.1	99 15	118.8	23 33.7	99 15	118.7	24 03.4	99 15	118.6	24 33.0	99 15	118.5	8
9	20 56.5	99 15	118.1	21 26.1	99 15	118.0	21 55.7	99 15	117.9	22 25.4	99 15	117.8	22 55.0	99 15	117.7	23 24.6	99 15	117.7	23 54.2	99 15	117.6	24 23.8	99 16	117.5	9
60	20 47.3	99 16	117.1	21 16.9	99 16	117.0	21 46.5	99 16	116.9	22 16.1	99 16	116.8	22 45.7	99 16	116.7	23 15.3	99 16	116.6	23 44.9	99 16	116.5	24 14.5	99 16	116.5	60
1	20 38.0	99 16	116.1	21 07.6	99 16	116.0	21 37.2	99 16	115.9	22 06.8	99 16	115.8	22 36.3	99 16	115.7	23 05.9	99 16	115.6	23 35.5	99 16	115.5	24 05.1	99 16	115.4	1
2	20 28.6	99 16	115.0	20 58.2	99 16	115.0	21 27.7	99 16	114.9	21 57.3	99 16	114.8	22 26.9	99 16	114.7	22 56.5	99 16	114.6	23 26.1	99 16	114.5	23 55.7	99 16	114.4	2
3	20 19.1	99 16	114.0	20 48.7	99 16	113.9	21 18.3	99 16	113.9	21 47.8	99 16	113.8	22 17.4	99 16	113.7	22 47.0	99 16	113.6	23 16.6	99 16	113.5	23 46.1	99 16	113.4	3
4	20 09.5	99 16	113.0	20 39.1	99 16	112.9	21 08.7	99 16	112.8	21 38.3	99 16	112.8	22 07.8	99 16	112.7	22 37.4	99 16	112.6	23 07.0	99 16	112.5	23 36.5	99 16	112.4	4
65	19 59.9	99 16	112.0	20 29.5	99 16	111.9	20 59.1	99 16	111.8	21 28.6	99 16	111.7	21 58.2	99 16	111.7	22 27.8	99 16	111.6	22 57.3	99 16	111.5	23 26.9	99 16	111.4	65
6	19 50.2	99 16	111.0	20 19.8	99 16	110.9	20 49.3	99 16	110.8	21 18.9	99 16	110.7	21 48.5	99 16	110.6	22 18.0	99 16	110.5	22 47.6	99 16	110.5	23 17.1	99 16	110.4	6
7	19 40.5	99 16	110.0	20 10.0	99 16	109.9	20 39.6	99 16	109.8	21 09.1	99 16	109.7	21 38.7	99 16	109.6	22 08.2	99 16	109.5	22 37.8	98 16	109.4	23 07.3	98 16	109.4	7
8	19 30.6	99 16	109.0	20 00.2	99 16	108.9	20 29.7	99 16	108.8	20 59.3	99 16	108.7	21 28.8	99 16	108.6	21 58.4	98 16	108.5	22 27.9	98 17	108.4	22 57.5	98 17	108.3	8
9	19 20.7	99 17	108.0	19 50.3	99 17	107.9	20 19.9	99 17	107.8	20 49.4	98 17	107.7	21 18.9	98 17	107.6	21 48.5	98 17	107.5	22 18.0	98 17	107.4	22 47.6	98 17	107.3	9
70	19 10.8	98 17	107.0	19 40.4	98 17	106.9	20 09.9	98 17	106.8	20 39.4	98 17	106.7	21 09.0	98 17	106.6	21 38.5	98 17	106.5	22 08.1	98 17	106.4	22 37.6	98 17	106.3	70
1	19 00.8	98 17	106.0	19 30.4	98 17	105.9	19 59.9	98 17	105.8	20 29.4	98 17	105.7	20 59.0	98 17	105.6	21 28.5	98 17	105.5	21 58.0	98 17	105.4	22 27.6	98 17	105.3	1
2	18 50.8	98 17	105.0	19 20.3	98 17	104.9	19 49.9	98 17	104.8	20 19.4	98 17	104.7	20 48.9	98 17	104.6	21 18.4	98 17	104.5	21 48.0	98 17	104.4	22 17.5	98 17	104.3	2
3	18 40.7	98 17	104.0	19 10.2	98 17	103.9	19 39.8	98 17	103.8	20 09.3	98 17	103.7	20 38.8	98 17	103.6	21 08.3	98 17	103.5	21 37.9	98 17	103.4	22 07.4	98 17	103.3	3
4	18 30.6	98 17	103.0	19 00.1	98 17	102.9	19 29.6	98 17	102.8	19 59.1	98 17	102.7	20 28.7	98 17	102.6	20 58.2	98 17	102.5	21 27.7	98 17	102.4	21 57.2	98 17	102.3	4
75	18 20.4	98 17	102.0	18 49.9	98 17	101.9	19 19.4	98 17	101.8	19 49.0	98 17	101.7	20 18.5	98 17	101.6	20 48.0	98 17	101.5	21 17.5	98 17	101.4	21 47.0	98 17	101.3	75
6	18 10.2	98 17	101.0	18 39.7	98 17	100.9	19 09.2	98 17	100.8	19 38.7	98 17	100.7	20 08.3	98 17	100.6	20 37.8	98 17	100.5	21 07.3	98 17	100.4	21 36.8	98 17	100.3	6
7	17 59.9	98 17	100.0	18 29.5	98 17	99.9	18 59.0	98 17	99.8	19 28.5	98 17	99.7	19 58.0	98 17	99.6	20 27.5	98 17	99.5	20 57.0	98 17	99.4	21 26.5	98 17	99.3	7
8	17 49.7	98 17	99.0	18 19.2	98 17	98.9	18 48.7	98 17	98.8	19 18.2	98 17	98.7	19 47.7	98 17	98.6	20 17.2	98 17	98.5	20 46.7	98 17	98.4	21 16.2	98 17	98.3	8
9	17 39.4	98 17	98.0	18 08.9	98 17	97.9	18 38.4	98 17	97.8	19 07.9	98 17	97.7	19 37.4	98 17	97.6	20 06.9	98 17	97.5	20 36.4	98 17	97.4	21 05.9	98 17	97.3	9
80	17 29.0	98 17	97.0	17 58.5	98 17	96.9	18 28.0	98 17	96.8	18 57.6	98 17	96.7	19 27.1	98 17	96.6	19 56.6	98 17	96.5	20 26.1	98 17	96.4	20 55.6	98 17	96.3	80
1	17 18.7	98 17	96.0	17 48.2	98 17	95.9	18 17.7	98 17	95.8	18 47.2	98 17	95.7	19 16.7	98 17	95.6	19 46.2	98 17	95.5	20 15.7	98 17	95.5	20 45.2	98 17	95.4	1
2	17 08.3	98 17	95.0	17 37.8	98 17	94.9	18 07.3	98 17	94.8	18 36.8	98 17	94.8	19 06.3	98 17	94.7	19 35.8	98 17	94.6	20 05.3	98 17	94.5	20 34.8	98 17	94.4	2
3	16 57.9	98 17	94.0	17 27.4	98 17	94.0	17 56.9	98 17	93.9	18 26.4	98 17	93.8	18 55.9	98 17	93.7	19 25.4	98 17	93.6	19 54.9	98 17	93.5	20 24.4	98 17	93.4	3
4	16 47.5	98 17	93.1	17 17.0	98 17	93.0	17 46.5	98 17	92.9	18 16.0	98 17	92.7	18 45.5	98 17	92.7	19 15.0	98 17	92.6	19 44.5	98 17	92.5	20 14.0	98 17	92.4	4
85	16 37.1	98 17	92.1	17 06.6	98 17	92.0	17 36.1	98 17	91.9	18 05.6	98 17	91.8	18 35.1	98 17	91.7	19 04.6	98 17	91.6	19 34.1	98 17	91.5	20 03.6	98 17	91.4	85
6	16 26.7	98 17	91.1	16 56.2	98 17	91.0	17 25.7	98 17	90.9	17 55.2	98 17	90.8	18 24.7	98 17	90.7	18 54.2	98 17	90.6	19 23.7	98 17	90.5	19 53.2	98 17	90.4	6
7	16 16.3	98 17	90.1	16 45.8	98 17	90.0	17 15.3	98 17	89.9	17 44.8	98 17	89.8	18 14.3	98 17	89.7	18 43.8	98 17	89.6	19 13.3	98 17	89.5	19 42.8	98 17	89.4	7
8	16 05.9	98 17	89.1	16 35.4	98 17	89.0	17 04.9	98 17	88.9	17 34.4	98 17	88.8	18 03.9	98 17	88.7	18 33.4	98 17	88.6	19 02.9	98 17	88.5	19 32.3	98 17	88.4	8
9	15 55.4	98 17	88.1	16 24.9	98 17	88.0	16 54.4	98 17	87.9	17 24.0	98 17	87.8	17 53.4	98 17	87.7	18 22.9	98 17	87.6	18 52.4	98 17	87.6	19 21.9	98 17	87.5	9
90	15 45.0	98 17	87.1	16 14.5	98 17	87.1	16 44.0	98 17	87.0	17 13.5	98 17	86.9	17 43.0	98 17	86.8	18 12.5	98 17	86.7	18 42.0	98 17	86.6	19 11.5	98 17	86.5	90

Each declination column lists: Alt. (° ′), the Δd / Δt correction pair, and Az. (°).

H.A.	16° 00′ Alt	Δd Δt	Az	16° 30′ Alt	Δd Δt	Az	17° 00′ Alt	Δd Δt	Az	17° 30′ Alt	Δd Δt	Az	18° 00′ Alt	Δd Δt	Az	18° 30′ Alt	Δd Δt	Az	19° 00′ Alt	Δd Δt	Az	19° 30′ Alt	Δd Δt	Az	H.A.
91	15 34.6	98 17	86.2	16 04.1	98 17	86.1	16 33.6	98 17	86.0	17 03.1	98 17	85.9	17 32.6	98 17	85.8	18 02.1	98 17	85.7	18 31.6	98 17	85.6	19 01.1	98 17	85.5	91
2	15 24.2	98 17	85.2	15 53.8	98 17	85.1	16 23.3	98 17	85.0	16 52.8	98 17	84.9	17 22.3	98 17	84.8	17 51.8	98 17	84.7	18 21.3	98 17	84.6	18 50.8	98 17	84.5	2
3	15 13.9	98 17	84.2	15 43.4	98 17	84.1	16 12.9	98 17	84.0	16 42.4	98 17	83.9	17 11.9	98 17	83.8	17 41.4	98 17	83.7	18 10.9	98 17	83.6	18 40.4	98 17	83.5	3
4	15 03.5	98 17	83.2	15 33.0	98 17	83.1	16 02.5	98 17	83.0	16 32.0	98 17	82.9	17 01.5	98 17	82.9	17 31.0	98 17	82.8	18 00.5	98 17	82.7	18 30.0	98 17	82.6	4
95	14 53.2	98 17	82.2	15 22.7	98 17	82.2	15 52.2	98 17	82.1	16 21.7	98 17	82.0	16 51.2	98 17	81.9	17 20.7	98 17	81.8	17 50.2	98 17	81.7	18 19.7	98 17	81.6	95
6	14 42.9	98 17	81.3	15 12.4	98 17	81.2	15 41.9	98 17	81.1	16 11.4	98 17	81.0	16 40.9	98 17	80.9	17 10.4	98 17	80.8	17 39.9	98 17	80.7	18 09.4	98 17	80.6	6
7	14 32.6	98 17	80.3	15 02.1	98 17	80.2	15 31.6	98 17	80.1	16 01.1	98 17	80.0	16 30.6	98 17	79.9	17 00.2	98 17	79.8	17 29.7	98 17	79.7	17 59.2	98 17	79.6	7
8	14 22.3	98 17	79.3	14 51.9	98 17	79.2	15 21.4	98 17	79.1	15 50.9	98 17	79.0	16 20.4	98 17	78.9	16 49.9	98 17	78.9	17 19.4	98 17	78.8	17 48.9	98 17	78.7	8
9	14 12.1	98 17	78.3	14 41.6	98 17	78.2	15 11.2	98 17	78.2	15 40.7	98 17	78.1	16 10.2	98 17	78.0	16 39.7	98 17	77.9	17 09.2	98 17	77.8	17 38.7	98 17	77.7	9
100	14 01.9	98 17	77.4	14 31.5	98 17	77.3	15 01.0	98 17	77.2	15 30.5	98 17	77.1	16 00.0	98 17	77.0	16 29.5	98 17	76.9	16 59.1	98 17	76.8	17 28.6	98 17	76.7	100
1	13 51.8	98 17	76.4	14 21.3	98 17	76.3	14 50.8	98 17	76.2	15 20.4	98 17	76.1	15 49.9	98 17	76.1	16 19.4	98 17	75.9	16 48.9	98 17	75.8	17 18.5	98 17	75.7	1
2	13 41.7	98 17	75.4	14 11.2	98 17	75.3	14 40.7	98 17	75.2	15 10.3	98 17	75.1	15 39.8	98 17	75.1	16 09.3	98 17	75.0	16 38.9	98 17	74.9	17 08.4	98 17	74.8	2
3	13 31.6	98 17	74.4	14 01.2	98 17	74.4	14 30.7	98 17	74.3	15 00.2	98 17	74.2	15 29.8	98 17	74.1	15 59.3	98 17	74.0	16 28.8	98 17	73.9	16 58.4	98 17	73.8	3
4	13 21.6	98 17	73.5	13 51.1	98 17	73.4	14 20.7	98 17	73.3	14 50.2	98 17	73.2	15 19.8	98 17	73.1	15 49.3	98 17	73.0	16 18.8	98 17	72.9	16 48.4	98 17	72.8	4
105	13 11.6	99 16	72.5	13 41.2	98 16	72.4	14 10.7	98 16	72.3	14 40.3	99 16	72.2	15 09.8	98 16	72.1	15 39.4	98 16	72.0	16 08.9	98 16	72.0	16 38.4	98 16	71.9	105
6	13 01.7	99 16	71.5	13 31.3	99 16	71.4	14 00.8	99 16	71.3	14 30.4	99 16	71.3	14 59.9	99 16	71.2	15 29.5	99 16	71.1	15 59.0	99 16	71.0	16 28.6	99 16	70.9	6
7	12 51.9	99 16	70.5	13 21.4	99 16	70.5	13 51.0	99 16	70.4	14 20.5	99 16	70.3	14 50.1	99 16	70.2	15 19.7	99 16	70.1	15 49.2	99 16	70.0	16 18.8	99 16	69.9	7
8	12 42.1	99 16	69.6	13 11.6	99 16	69.5	13 41.2	99 16	69.4	14 10.8	99 16	69.3	14 40.3	99 16	69.2	15 09.9	99 16	69.1	15 39.4	99 16	69.1	16 09.0	99 16	69.0	8
9	12 32.3	99 16	68.6	13 01.9	99 16	68.5	13 31.5	99 16	68.4	14 01.1	99 16	68.3	14 30.6	99 16	68.3	15 00.2	99 16	68.2	15 29.7	99 16	68.1	15 59.3	99 16	68.0	9
110	12 22.7	99 16	67.6	12 52.3	99 16	67.6	13 21.8	99 16	67.5	13 51.4	99 16	67.4	14 21.0	99 16	67.3	14 50.5	99 16	67.2	15 20.1	99 16	67.1	15 49.7	99 16	67.1	110
1	12 13.1	99 16	66.7	12 42.7	99 16	66.6	13 12.2	99 16	66.5	13 41.8	99 16	66.4	14 11.4	99 16	66.3	14 41.0	99 16	66.2	15 10.6	99 16	66.2	15 40.1	99 16	66.1	1
2	12 03.5	99 16	65.7	12 33.1	99 16	65.6	13 02.7	99 16	65.5	13 32.3	99 16	65.4	14 01.9	99 16	65.4	14 31.5	99 16	65.3	15 01.1	99 16	65.2	15 30.6	99 16	65.1	2
3	11 54.1	99 16	64.7	12 23.7	99 16	64.6	12 53.3	99 16	64.6	13 22.9	99 16	64.5	13 52.5	99 16	64.4	14 22.1	99 16	64.3	14 51.6	99 16	64.2	15 21.2	99 16	64.1	3
4	11 44.7	99 16	63.8	12 14.3	99 16	63.7	12 43.9	99 16	63.6	13 13.5	99 15	63.5	13 43.1	99 16	63.4	14 12.7	99 16	63.3	14 42.3	99 16	63.3	15 11.9	99 16	63.2	4
115	11 35.4	99 15	62.8	12 05.0	99 15	62.7	12 34.6	99 15	62.6	13 04.2	99 15	62.5	13 33.8	99 15	62.4	14 03.4	99 15	62.4	14 33.0	99 15	62.3	15 02.6	99 15	62.2	115
6	11 26.2	99 15	61.8	11 55.8	99 15	61.7	12 25.4	99 15	61.7	12 55.0	99 15	61.6	13 24.6	99 15	61.5	13 54.2	99 15	61.4	14 23.8	99 15	61.3	14 53.5	99 15	61.2	6
7	11 17.0	99 15	60.9	11 46.7	99 15	60.8	12 16.3	99 15	60.7	12 45.9	99 15	60.6	13 15.5	99 15	60.5	13 45.1	99 15	60.4	14 14.7	99 15	60.4	14 44.4	99 15	60.3	7
8	11 08.0	99 15	59.9	11 37.6	99 15	59.8	12 07.2	99 15	59.7	12 36.9	99 15	59.6	13 06.5	99 15	59.6	13 36.1	99 15	59.5	14 05.7	99 15	59.4	14 35.4	99 15	59.3	8
9	10 59.0	99 15	58.9	11 28.6	99 15	58.8	11 58.3	99 15	58.8	12 27.9	99 15	58.7	12 57.5	99 15	58.6	13 27.2	99 15	58.5	13 56.8	99 15	58.4	14 26.5	99 15	58.4	9
120	10 50.1	99 15	58.0	11 19.8	99 14	57.9	11 49.4	99 14	57.8	12 19.1	99 14	57.7	12 48.7	99 14	57.6	13 18.3	99 14	57.6	13 48.0	99 14	57.5	14 17.6	99 14	57.4	120
1	10 41.3	99 14	57.0	11 11.0	99 14	56.9	11 40.6	99 14	56.8	12 10.3	99 14	56.8	12 39.9	99 14	56.7	13 09.6	99 14	56.6	13 39.2	99 14	56.5	14 08.9	99 14	56.4	1
2	10 32.7	99 14	56.0	11 02.3	99 14	55.9	11 32.0	99 14	55.9	12 01.6	99 14	55.8	12 31.3	99 14	55.7	13 00.9	99 14	55.6	13 30.6	99 14	55.6	14 00.3	99 14	55.5	2
3	10 24.1	99 14	55.0	10 53.7	99 14	55.0	11 23.4	99 14	54.9	11 53.1	99 14	54.8	12 22.7	99 14	54.7	12 52.4	99 14	54.7	13 22.1	99 14	54.6	13 51.7	99 14	54.5	3
4	10 15.6	99 14	54.1	10 45.3	99 14	54.0	11 14.9	99 14	53.9	11 44.6	99 14	53.9	12 14.3	99 14	53.8	12 43.9	99 14	53.7	13 13.6	99 14	53.6	13 43.3	99 14	53.6	4
125	10 07.2	99 14	53.1	10 36.9	99 14	53.0	11 06.6	99 14	53.0	11 36.2	99 14	52.9	12 05.9	99 14	52.8	12 35.6	99 14	52.7	13 05.3	99 14	52.7	13 35.0	99 14	52.6	125
6	9 58.9	99 14	52.2	10 28.6	99 14	52.1	10 58.3	99 14	52.0	11 28.0	99 14	51.9	11 57.7	99 14	51.9	12 27.4	99 14	51.8	12 57.1	99 14	51.7	13 26.7	99 14	51.6	6
7	9 50.7	99 13	51.2	10 20.4	99 13	51.1	10 50.1	99 13	51.0	11 19.8	99 13	51.0	11 49.5	99 13	50.9	12 19.2	99 13	50.8	12 48.9	99 13	50.8	13 18.6	99 13	50.7	7
8	9 42.7	99 13	50.2	10 12.4	99 13	50.1	10 42.1	99 13	50.1	11 11.8	99 13	50.0	11 41.5	99 13	49.9	12 11.2	99 13	49.9	12 40.9	99 13	49.8	13 10.6	99 13	49.7	8
9	9 34.7	99 13	49.3	10 04.4	99 13	49.2	10 34.2	99 13	49.1	11 03.9	99 13	49.0	11 33.6	99 13	49.0	12 03.3	99 13	48.9	12 33.0	99 13	48.8	13 02.7	99 13	48.8	9
130	9 26.9	99 13	48.3	9 56.6	99 13	48.2	10 26.3	99 13	48.2	10 56.1	99 13	48.1	11 25.8	99 13	48.0	11 55.5	99 13	47.9	12 25.2	99 13	47.9	12 54.9	99 13	47.8	130
1	9 19.2	99 13	47.3	9 48.9	99 13	47.3	10 18.6	99 13	47.2	10 48.4	99 13	47.1	11 18.1	99 13	47.1	11 47.8	99 13	47.0	12 17.6	99 13	46.9	12 47.3	99 13	46.8	1
2	9 11.6	99 12	46.4	9 41.3	99 12	46.3	10 11.1	99 12	46.2	10 40.8	99 12	46.2	11 10.5	99 12	46.1	11 40.3	99 12	46.0	12 10.0	99 12	46.0	12 39.7	99 12	45.9	2
3	9 04.1	99 12	45.4	9 33.8	99 12	45.3	10 03.6	99 12	45.3	10 33.3	99 12	45.2	11 03.1	99 12	45.1	11 32.8	99 12	45.1	12 02.6	99 12	45.0	12 32.3	99 12	44.9	3
4	8 56.7	99 12	44.4	9 26.5	99 12	44.4	9 56.3	99 12	44.3	10 26.0	99 12	44.2	10 55.8	99 12	44.2	11 25.5	99 12	44.1	11 55.3	99 12	44.0	12 25.0	99 12	44.0	4
135	8 49.5	99 12	43.5	9 19.3	99 12	43.4	9 49.0	99 12	43.3	10 18.8	99 12	43.3	10 48.6	99 12	43.2	11 18.3	99 12	43.1	11 48.1	99 12	43.1	12 17.9	99 12	43.0	135
6	8 42.4	99 12	42.5	9 12.2	99 12	42.4	9 42.0	99 12	42.4	10 11.7	99 12	42.3	10 41.5	99 12	42.2	11 11.3	99 12	42.2	11 41.0	99 12	42.1	12 10.8	99 12	42.1	6
7	8 35.4	99 11	41.5	9 05.2	99 11	41.5	9 35.0	99 11	41.4	10 04.8	99 11	41.3	10 34.6	99 11	41.3	11 04.3	99 11	41.2	11 34.1	99 11	41.2	12 03.9	99 11	41.1	7
8	8 28.6	99 11	40.6	8 58.4	99 11	40.5	9 28.2	99 11	40.4	9 58.0	99 11	40.4	10 27.8	99 11	40.3	10 57.5	99 11	40.3	11 27.3	99 11	40.2	11 57.1	99 11	40.1	8
9	8 21.9	99 11	39.6	8 51.7	99 11	39.5	9 21.5	99 11	39.5	9 51.3	99 11	39.4	10 21.1	99 11	39.4	10 50.9	99 11	39.3	11 20.7	99 11	39.2	11 50.5	99 11	39.2	9
140	8 15.3	99 11	38.6	8 45.1	99 11	38.6	9 14.9	99 11	38.5	9 44.7	99 11	38.5	10 14.5	99 11	38.4	10 44.3	99 11	38.3	11 14.1	99 11	38.3	11 44.0	99 11	38.2	140
1	8 08.9	99 10	37.7	8 38.7	99 10	37.6	9 08.5	99 10	37.6	9 38.3	99 10	37.5	10 08.1	99 10	37.4	10 37.9	99 10	37.4	11 07.8	99 10	37.3	11 37.6	99 10	37.3	1
2	8 02.6	99 10	36.7	8 32.4	99 10	36.6	9 02.2	99 10	36.6	9 32.0	99 10	36.5	10 01.9	99 10	36.5	10 31.7	99 10	36.4	11 01.5	99 10	36.4	11 31.3	99 10	36.3	2
3	7 56.4	99 10	35.7	8 26.2	99 10	35.7	8 56.1	99 10	35.6	9 25.9	99 10	35.6	9 55.7	99 10	35.5	10 25.6	99 10	35.5	10 55.4	99 10	35.4	11 25.2	99 10	35.4	3
4	7 50.4	99 10	34.8	8 20.2	99 10	34.7	8 50.1	99 10	34.7	9 19.9	99 10	34.6	9 49.8	99 10	34.6	10 19.6	99 10	34.5	10 49.4	99 10	34.5	11 19.3	99 10	34.4	4
145	7 44.5	99 10	33.8	8 14.4	99 10	33.8	8 44.2	99 10	33.7	9 14.1	99 10	33.7	9 43.9	99 09	33.6	10 13.8	99 09	33.6	10 43.6	99 09	33.5	11 13.5	99 09	33.5	145
6	7 38.8	1.009	32.8	8 08.7	1.009	32.8	8 38.5	1.009	32.7	9 08.4	1.009	32.7	9 38.2	1.009	32.6	10 08.1	1.009	32.6	10 37.9	1.009	32.5	11 07.8	1.009	32.5	6
7	7 33.2	1.009	31.9	8 03.1	1.009	31.8	8 33.0	1.009	31.8	9 02.8	1.009	31.7	9 32.7	1.009	31.7	10 02.5	1.009	31.6	10 32.4	1.009	31.6	11 02.3	1.009	31.5	7
8	7 27.8	1.009	30.9	7 57.7	1.009	30.9	8 27.5	1.009	30.8	8 57.4	1.009	30.8	9 27.3	1.009	30.7	9 57.2	1.009	30.7	10 27.0	1.009	30.6	10 56.9	1.009	30.6	8
9	7 22.5	1.009	29.9	7 52.4	1.009	29.9	8 22.3	1.009	29.9	8 52.2	1.009	29.8	9 22.0	1.008	29.8	9 51.9	1.008	29.7	10 21.8	1.008	29.7	10 51.7	1.008	29.6	9
150	7 17.4	1.008	29.0	7 47.3	1.008	28.9	8 17.2	1.008	28.9	8 47.1	1.008	28.8	9 16.9	1.008	28.8	9 46.8	1.008	28.8	10 16.7	1.008	28.7	10 46.6	1.008	28.7	150
1	7 12.4	1.008	28.0	7 42.3	1.008	28.0	8 12.2	1.008	27.9	8 42.1	1.008	27.9	9 12.0	1.008	27.8	9 41.9	1.008	27.8	10 11.8	1.008	27.8	10 41.7	1.008	27.7	1
2	7 07.6	1.008	27.1	7 37.5	1.008	27.0	8 07.4	1.008	27.0	8 37.3	1.008	26.9	9 07.2	1.008	26.9	9 37.1	1.008	26.8	10 07.0	1.008	26.8	10 36.9	1.008	26.8	2
3	7 03.0	1.008	26.1	7 32.9	1.007	26.0	8 02.8	1.007	26.0	8 32.7	1.007	26.0	9 02.6	1.007	25.9	9 32.5	1.007	25.9	10 02.4	1.007	25.8	10 32.3	1.007	25.8	3
4	6 58.4	1.007	25.1	7 28.4	1.007	25.1	7 58.3	1.007	25.0	8 28.2	1.007	25.0	8 58.1	1.007	25.0	9 28.0	1.007	24.9	9 57.9	1.007	24.9	10 27.8	1.007	24.8	4
155	6 54.1	1.007	24.2	7 24.0	1.007	24.1	7 53.9	1.007	24.1	8 23.9	1.007	24.0	8 53.8	1.007	24.0	9 23.7	1.007	24.0	9 53.6	1.007	23.9	10 23.5	1.007	23.9	155
6	6 49.9	1.007	23.2	7 19.8	1.007	23.2	7 49.8	1.007	23.1	8 19.7	1.007	23.1	8 49.6	1.007	23.0	9 19.5	1.007	23.0	9 49.5	1.006	23.0	10 19.4	1.006	22.9	6
7	6 45.9	1.006	22.2	7 15.8	1.006	22.2	7 45.8	1.006	22.2	8 15.7	1.006	22.1	8 45.6	1.006	22.1	9 15.5	1.006	22.1	9 45.5	1.006	22.0	10 15.4	1.006	22.0	7
8	6 42.0	1.006	21.3	7 12.0	1.006	21.2	7 41.9	1.006	21.2	8 11.8	1.006	21.2	8 41.8	1.006	21.1	9 11.7	1.006	21.1	9 41.7	1.006	21.1	10 11.6	1.006	21.0	8
9	6 38.3	1.006	20.3	7 08.3	1.006	20.3	7 38.2	1.006	20.2	8 08.2	1.006	20.2	8 38.1	1.006	20.2	9 08.0	1.006	20.1	9 38.0	1.006	20.1	10 07.9	1.006	20.1	9
160	6 34.8	1.006	19.3	7 04.8	1.006	19.3	7 34.7	1.006	19.3	8 04.7	1.006	19.2	8 34.6	1.006	19.2	9 04.5	1.006	19.2	9 34.5	1.006	19.1	10 04.4	1.006	19.1	160
1	6 31.5	1.005	18.4	7 01.4	1.005	18.3	7 31.4	1.005	18.3	8 01.3	1.005	18.3	8 31.3	1.005	18.3	9 01.2	1.005	18.2	9 31.2	1.005	18.2	10 01.1	1.005	18.2	1
2	6 28.2	1.005	17.4	6 58.2	1.005	17.4	7 28.2	1.005	17.3	7 58.1	1.005	17.3	8 28.1	1.005	17.3	8 58.0	1.005	17.3	9 28.0	1.005	17.2	9 57.9	1.005	17.2	2
3	6 25.2	1.005	16.4	6 55.2	1.005	16.4	7 25.1	1.005	16.4	7 55.1	1.005	16.4	8 25.0	1.005	16.3	8 55.0	1.005	16.3	9 25.0	1.005	16.3	9 54.9	1.005	16.2	3
4	6 22.4	1.004	15.5	6 52.3	1.004	15.4	7 22.3	1.004	15.4	7 52.3	1.004	15.4	8 22.2	1.004	15.4	8 52.2	1.004	15.3	9 22.1	1.004	15.3	9 52.1	1.004	15.3	4
165	6 19.7	1.004	14.5	6 49.6	1.004	14.5	7 19.6	1.004	14.5	7 49.6	1.004	14.4	8 19.5	1.004	14.4	8 49.5	1.004	14.4	9 19.5	1.004	14.3	9 49.4	1.004	14.3	165
6	6 17.1	1.004	13.5	6 47.1	1.004	13.5	7 17.1	1.004	13.5	7 47.1	1.004	13.5	8 17.0	1.004	13.4	8 47.0	1.004	13.4	9 17.0	1.004	13.4	9 47.0	1.004	13.4	6
7	6 14.8	1.004	12.6	6 44.8	1.004	12.5	7 14.7	1.004	12.5	7 44.7	1.004	12.5	8 14.7	1.004	12.5	8 44.7	1.004	12.5	9 14.7	1.004	12.4	9 44.6	1.004	12.4	7
8	6 12.6	1.003	11.6	6 42.6	1.003	11.6	7 12.6	1.003	11.6	7 42.6	1.003	11.5	8 12.5	1.003	11.5	8 42.5	1.003	11.5	9 12.5	1.003	11.5	9 42.5	1.003	11.5	8
9	6 10.6	1.003	10.6	6 40.6	1.003	10.6	7 10.6	1.003	10.6	7 40.6	1.003	10.6	8 10.5	1.003	10.6	8 40.5	1.003	10.5	9 10.5	1.003	10.5	9 40.5	1.003	10.5	9
170	6 08.8	1.003	09.7	6 38.8	1.003	09.6	7 08.7	1.003	09.6	7 38.7	1.003	09.6	8 08.7	1.003	09.6	8 38.7	1.003	09.6	9 08.7	1.003	09.6	9 38.7	1.003	09.6	170
1	6 07.1	1.002	08.7	6 37.1	1.002	08.7	7 07.1	1.002	08.7	7 37.1	1.002	08.7	8 07.1	1.002	08.7	8 37.0	1.002	08.6	9 07.0	1.002	08.6	9 37.0	1.002	08.6	1
2	6 05.6	1.002	07.7	6 35.6	1.002	07.7	7 05.6	1.002	07.7	7 35.6	1.002	07.7	8 05.6	1.002	07.7	8 35.6	1.002	07.7	9 05.6	1.002	07.7	9 35.6	1.002	07.6	2
3	6 04.3	1.002	06.8	6 34.3	1.002	06.8	7 04.3	1.002	06.7	7 34.3	1.002	06.7	8 04.3	1.002	06.7	8 34.3	1.002	06.7	9 04.3	1.002	06.7	9 34.3	1.002	06.7	3
4	6 03.2	1.002	05.8	6 33.2	1.002	05.8	7 03.2	1.002	05.8	7 33.1	1.002	05.8	8 03.1	1.002	05.8	8 33.1	1.002	05.8	9 03.1	1.002	05.7	9 33.1	1.002	05.7	4
175	6 02.2	1.001	04.8	6 32.2	1.001	04.8	7 02.2	1.001	04.8	7 32.2	1.001	04.8	8 02.2	1.001	04.8	8 32.2	1.001	04.8	9 02.2	1.001	04.8	9 32.2	1.001	04.8	175
6	6 01.4	1.001	03.9	6 31.4	1.001	03.9	7 01.4	1.001	03.9	7 31.4	1.001	03.9	8 01.4	1.001	03.8	8 31.4	1.001	03.8	9 01.4	1.001	03.8	9 31.4	1.001	03.8	6
7	6 00.8	1.001	02.9	6 30.8	1.001	02.9	7 00.8	1.001	02.9	7 30.8	1.001	02.9	8 00.8	1.001	02.9	8 30.8	1.001	02.9	9 00.8	1.001	02.9	9 30.8	1.001	02.9	7
8	6 00.4	1.000	01.9	6 30.4	1.000	01.9	7 00.4	1.000	01.9	7 30.4	1.000	01.9	8 00.3	1.000	01.9	8 30.3	1.000	01.9	9 00.3	1.000	01.9	9 30.3	1.000	01.9	8
9	6 00.1	1.000	01.0	6 30.1	1.000	01.0	7 00.1	1.000	01.0	7 30.1	1.000	01.0	8 00.1	1.000	01.0	8 30.1	1.000	01.0	9 00.1	1.000	01.0	9 30.1	1.000	01.0	9
180	6 00.0	1.000	00.0	6 30.0	1.000	00.0	7 00.0	1.000	00.0	7 30.0	1.000	00.0	8 00.0	1.000	00.0	8 30.0	1.000	00.0	9 00.0	1.000	00.0	9 30.0	1.000	00.0	180

A narrow adjacent column (Lat. 80°) is partially visible along the left margin, giving Az. values. Legible Az. readings (top to bottom): 180.0, 178.9, 177.8, 176.7, 175.7, 174.6, 173.5, 172.4, 171.3, 170.3, 169.2, 168.1, 167.0, 165.9, 164.9, 163.8, 162.7, 161.6, 160.6, 159.5, 158.4, 157.3, 156.3, 155.2, 154.1, 153.0, 152.0, 150.9, 149.8, 148.8, 147.7, 146.7, 145.6, 144.5, 143.5, 142.4, 141.4, 140.3, 139.3, 138.2, 137.1, 136.1, 135.1, 134.0, 133.0, 131.9, 130.9, 129.8 …

H.A.	20° 00' Alt. / Δd Δt / Az.	20° 30' Alt. / Δd Δt / Az.	21° 00' Alt. / Δd Δt / Az.	21° 30' Alt. / Δd Δt / Az.	22° 00' Alt. / Δd Δt / Az.	22° 30' Alt. / Δd Δt / Az.	23° 00' Alt. / Δd Δt / Az.	23° 30' Alt. / Δd Δt / Az.	H.A.
00	30 00.0 1.0 00 180.0	30 30.0 1.0 00 180.0	31 00.0 1.0 00 180.0	31 30.0 1.0 00 180.0	32 00.0 1.0 00 180.0	32 30.0 1.0 00 180.0	33 00.0 1.0 00 180.0	33 30.0 1.0 00 180.0	00
1	29 59.9 1.0 00 178.9	30 29.9 1.0 00 178.9	30 59.9 1.0 00 178.9	31 29.9 1.0 00 178.9	31 59.9 1.0 00 178.9	32 29.9 1.0 00 178.9	32 59.9 1.0 00 178.9	33 29.9 1.0 00 178.9	1
2	29 59.6 1.0 01 177.8	30 29.6 1.0 01 177.8	30 59.6 1.0 01 177.8	31 29.6 1.0 01 177.8	31 59.6 1.0 01 177.8	32 29.6 1.0 01 177.8	32 59.6 1.0 01 177.8	33 29.6 1.0 01 177.8	2
3	29 59.1 1.0 01 176.7	30 29.1 1.0 01 176.7	30 59.1 1.0 01 176.7	31 29.1 1.0 01 176.7	31 59.1 1.0 01 176.7	32 29.1 1.0 01 176.7	32 59.1 1.0 01 176.7	33 29.1 1.0 01 176.7	3
4	29 58.4 1.0 01 175.7	30 28.4 1.0 01 175.7	30 58.4 1.0 01 175.6	31 28.4 1.0 01 175.6	31 58.4 1.0 01 175.6	32 28.4 1.0 01 175.6	32 58.4 1.0 01 175.6	33 28.4 1.0 02 175.6	4
05	29 57.5 1.0 02 174.6	30 27.5 1.0 02 174.6	30 57.5 1.0 02 174.6	31 27.5 1.0 02 174.5	31 57.5 1.0 02 174.5	32 27.5 1.0 02 174.5	32 57.5 1.0 02 174.5	33 27.5 1.0 02 174.5	05
6	29 56.5 1.0 02 173.5	30 26.4 1.0 02 173.5	30 56.4 1.0 02 173.5	31 26.4 1.0 02 173.5	31 56.4 1.0 02 173.4	32 26.4 1.0 02 173.4	32 56.4 1.0 02 173.4	33 26.4 1.0 02 173.4	6
7	29 55.2 1.0 02 172.4	30 25.2 1.0 02 172.4	30 55.2 1.0 02 172.4	31 25.1 1.0 02 172.4	31 55.1 1.0 02 172.3	32 25.1 1.0 02 172.3	32 55.1 1.0 02 172.3	33 25.1 1.0 02 172.3	7
8	29 53.7 1.0 03 171.3	30 23.7 1.0 03 171.3	30 53.7 1.0 03 171.3	31 23.7 1.0 03 171.3	31 53.7 1.0 03 171.3	32 23.6 1.0 03 171.2	32 53.6 1.0 03 171.2	33 23.6 1.0 03 171.2	8
9	29 52.0 1.0 03 170.2	30 22.0 1.0 03 170.2	30 52.0 1.0 03 170.2	31 22.0 1.0 03 170.2	31 52.0 1.0 03 170.2	32 22.0 1.0 03 170.1	32 51.9 1.0 03 170.1	33 21.9 1.0 03 170.1	9
10	29 50.2 1.0 03 169.2	30 20.2 1.0 03 169.1	30 50.1 1.0 03 169.1	31 20.1 1.0 03 169.1	31 50.1 1.0 03 169.1	32 20.1 1.0 03 169.1	32 50.1 1.0 03 169.0	33 20.0 1.0 03 169.0	10
1	29 48.1 1.0 04 168.1	30 18.1 1.0 04 168.1	30 48.1 1.0 04 168.0	31 18.0 1.0 04 168.0	31 48.0 1.0 04 168.0	32 18.0 1.0 04 168.0	32 48.0 1.0 04 167.9	33 18.0 1.0 04 167.9	1
2	29 45.9 1.0 04 167.0	30 15.8 1.0 04 167.0	30 45.8 1.0 04 166.9	31 15.8 1.0 04 166.9	31 45.8 1.0 04 166.9	32 15.7 1.0 04 166.9	32 45.7 1.0 04 166.8	33 15.7 1.0 04 166.8	2
3	29 43.4 1.0 04 165.9	30 13.4 1.0 04 165.9	30 43.4 1.0 04 165.9	31 13.3 1.0 04 165.8	31 43.3 1.0 04 165.8	32 13.3 1.0 04 165.8	32 43.2 1.0 04 165.8	33 13.2 1.0 04 165.7	3
4	29 40.8 1.0 05 164.8	30 10.8 1.0 05 164.8	30 40.7 1.0 05 164.8	31 10.7 1.0 05 164.7	31 40.6 1.0 05 164.7	32 10.6 1.0 05 164.7	32 40.6 1.0 05 164.7	33 10.5 1.0 05 164.6	4
15	29 38.0 1.0 05 163.8	30 07.9 1.0 05 163.7	30 37.9 1.0 05 163.7	31 07.8 1.0 05 163.7	31 37.8 1.0 05 163.6	32 07.8 1.0 05 163.6	32 37.7 1.0 05 163.6	33 07.7 1.0 05 163.5	15
6	29 35.0 1.0 05 162.7	30 04.9 1.0 05 162.6	30 34.9 1.0 05 162.6	31 04.8 1.0 05 162.6	31 34.8 1.0 05 162.5	32 04.7 1.0 05 162.5	32 34.7 1.0 05 162.5	33 04.6 1.0 05 162.4	6
7	29 31.8 1.0 06 161.6	30 01.7 1.0 06 161.6	30 31.7 1.0 06 161.5	31 01.6 1.0 06 161.5	31 31.6 1.0 06 161.5	32 01.5 1.0 06 161.4	32 31.4 1.0 06 161.4	33 01.4 1.0 06 161.4	7
8	29 28.4 1.0 06 160.5	29 58.3 1.0 06 160.5	30 28.3 1.0 06 160.4	30 58.2 1.0 06 160.4	31 28.1 1.0 06 160.4	31 58.1 1.0 06 160.3	32 28.0 1.0 06 160.3	32 58.0 1.0 06 160.3	8
9	29 24.8 1.0 06 159.4	29 54.8 1.0 06 159.4	30 24.7 1.0 06 159.4	30 54.6 1.0 06 159.3	31 24.6 1.0 06 159.3	31 54.5 1.0 06 159.2	32 24.4 1.0 06 159.2	32 54.4 1.0 06 159.2	9
20	29 21.1 1.0 07 158.4	29 51.0 1.0 07 158.3	30 20.9 1.0 07 158.3	30 50.9 1.0 07 158.2	31 20.8 1.0 07 158.2	31 50.7 1.0 07 158.2	32 20.6 1.0 07 158.1	32 50.6 1.0 07 158.1	20
1	29 17.1 1.0 07 157.3	29 47.1 1.0 07 157.2	30 17.0 1.0 07 157.2	30 46.9 1.0 07 157.2	31 16.8 1.0 07 157.1	31 46.7 1.0 07 157.1	32 16.7 1.0 07 157.0	32 46.6 1.0 07 157.0	1
2	29 13.0 1.0 07 156.2	29 42.9 1.0 07 156.2	30 12.8 1.0 07 156.1	30 42.8 1.0 07 156.1	31 12.7 1.0 07 156.0	31 42.6 1.0 07 156.0	32 12.5 1.0 07 155.9	32 42.4 1.0 07 155.9	2
3	29 08.7 1.0 07 155.1	29 38.6 1.0 07 155.1	30 08.5 1.0 07 155.1	30 38.5 1.0 07 155.0	31 08.4 1.0 08 155.0	31 38.3 1.0 08 154.9	32 08.2 1.0 08 154.9	32 38.1 1.0 08 154.8	3
4	29 04.3 1.0 08 154.1	29 34.2 1.0 08 154.0	30 04.1 1.0 08 154.0	30 34.0 1.0 08 153.9	31 03.9 1.0 08 153.9	31 33.8 1.0 08 153.8	32 03.7 1.0 08 153.8	32 33.5 1.0 08 153.7	4
25	28 59.6 1.0 08 153.0	29 29.5 1.0 08 152.9	29 59.4 1.0 08 152.9	30 29.3 1.0 08 152.9	30 59.2 1.0 08 152.8	31 29.1 1.0 08 152.8	31 59.0 1.0 08 152.7	32 28.8 1.0 08 152.6	25
6	28 54.8 1.0 08 151.9	29 24.7 1.0 08 151.9	29 54.6 1.0 08 151.8	30 24.5 1.0 08 151.8	30 54.3 1.0 08 151.7	31 24.2 1.0 08 151.7	31 54.1 1.0 08 151.6	32 24.0 1.0 08 151.6	6
7	28 49.8 1.0 09 150.9	29 19.7 1.0 09 150.8	29 49.6 1.0 09 150.8	30 19.4 1.0 09 150.7	30 49.3 1.0 09 150.6	31 19.2 1.0 09 150.6	31 49.1 1.0 09 150.5	32 18.9 1.0 09 150.5	7
8	28 44.7 1.0 09 149.8	29 14.5 1.0 09 149.7	29 44.4 1.0 09 149.7	30 14.3 1.0 09 149.6	30 44.1 1.0 09 149.6	31 14.0 1.0 09 149.5	31 43.8 1.0 09 149.5	32 13.7 1.0 09 149.4	8
9	28 39.3 1.0 09 148.7	29 09.2 1.0 09 148.7	29 39.0 1.0 09 148.6	30 08.9 1.0 09 148.6	30 38.8 1.0 09 148.5	31 08.6 1.0 09 148.4	31 38.5 1.0 09 148.4	32 08.3 1.0 09 148.3	9
30	28 33.8 1.0 09 147.7	29 03.7 1.0 09 147.6	29 33.5 1.0 09 147.5	30 03.4 99 09 147.5	30 33.2 99 09 147.4	31 03.1 99 10 147.4	31 32.9 99 10 147.3	32 02.8 99 10 147.3	30
1	28 28.2 99 10 146.6	28 58.0 99 10 146.5	29 27.9 99 10 146.5	29 57.7 99 10 146.4	30 27.5 99 10 146.4	30 57.4 99 10 146.3	31 27.2 99 10 146.2	31 57.0 99 10 146.2	1
2	28 22.4 99 10 145.5	28 52.2 99 10 145.5	29 22.0 99 10 145.4	29 51.9 99 10 145.4	30 21.7 99 10 145.3	30 51.5 99 10 145.2	31 21.3 99 10 145.2	31 51.2 99 10 145.1	2
3	28 16.4 99 10 144.5	28 46.2 99 10 144.4	29 16.0 99 10 144.3	29 45.9 99 10 144.3	30 15.7 99 10 144.2	30 45.5 99 10 144.2	31 15.3 99 11 144.1	31 45.1 99 11 144.1	3
4	28 10.3 99 10 143.4	28 40.1 99 10 143.3	29 09.9 99 10 143.3	29 39.7 99 11 143.2	30 09.5 99 11 143.2	30 39.3 99 11 143.1	31 09.1 99 11 143.0	31 38.9 99 11 143.0	4
35	28 04.0 99 11 142.4	28 33.8 99 11 142.3	29 03.6 99 11 142.2	29 33.4 99 11 142.2	30 03.2 99 11 142.1	30 33.0 99 11 142.0	31 02.8 99 11 142.0	31 32.6 99 11 141.9	35
6	27 57.5 99 11 141.3	28 27.3 99 11 141.2	28 57.1 99 11 141.2	29 26.9 99 11 141.1	29 56.7 99 11 141.0	30 26.5 99 11 141.0	30 56.3 99 11 140.9	31 26.1 99 11 140.8	6
7	27 50.9 99 11 140.2	28 20.7 99 11 140.2	28 50.5 99 11 140.1	29 20.3 99 11 140.0	29 50.1 99 11 140.0	30 19.9 99 11 139.9	30 49.6 99 11 139.8	31 19.4 99 11 139.8	7
8	27 44.2 99 12 139.2	28 14.0 99 12 139.1	28 43.8 99 12 139.0	29 13.5 99 12 139.0	29 43.3 99 12 138.9	30 13.1 99 12 138.8	30 42.8 99 12 138.8	31 12.6 99 12 138.7	8
9	27 37.3 99 12 138.1	28 07.1 99 12 138.1	28 36.9 99 12 138.0	29 06.6 99 12 137.9	29 36.4 99 12 137.8	30 06.1 99 12 137.8	30 35.9 99 12 137.7	31 05.7 99 12 137.6	9
40	27 30.3 99 12 137.1	28 00.1 99 12 137.0	28 29.8 99 12 136.9	28 59.6 99 12 136.9	29 29.3 99 12 136.8	29 59.1 99 12 136.7	30 28.8 99 12 136.6	30 58.6 99 12 136.6	40
1	27 23.1 99 12 136.0	27 52.9 99 12 136.0	28 22.6 99 12 135.9	28 52.4 99 12 135.8	29 22.1 99 12 135.7	29 51.9 99 12 135.7	30 21.6 99 12 135.6	30 51.3 99 12 135.5	1
2	27 15.8 99 12 135.0	27 45.6 99 12 134.9	28 15.3 99 12 134.8	28 45.0 99 12 134.7	29 14.8 99 12 134.7	29 44.5 99 12 134.6	30 14.2 99 12 134.5	30 44.0 99 12 134.4	2
3	27 08.4 99 13 133.9	27 38.1 99 13 133.9	28 07.9 99 13 133.8	28 37.6 99 13 133.7	29 07.3 99 13 133.6	29 37.0 99 13 133.5	30 06.7 99 13 133.5	30 36.5 99 13 133.3	3
4	27 00.8 99 13 132.9	27 30.5 99 13 132.8	28 00.3 99 13 132.7	28 30.0 99 13 132.7	28 59.7 99 13 132.6	29 29.4 99 13 132.5	29 59.1 99 13 132.4	30 28.8 99 13 132.3	4
45	26 53.1 99 13 131.8	27 22.8 99 13 131.8	27 52.5 99 13 131.7	28 22.3 99 13 131.6	28 52.0 99 13 131.5	29 21.7 99 13 131.4	29 51.4 99 13 131.4	30 21.1 99 13 131.3	45
6	26 45.3 99 13 130.8	27 15.0 99 13 130.7	27 44.7 99 13 130.6	28 14.4 99 13 130.6	28 44.1 99 13 130.5	29 13.8 99 13 130.4	29 43.5 99 13 130.3	30 13.2 99 13 130.2	6
7	26 37.3 99 13 129.7	27 07.0 99 13 129.7	27 36.7 99 13 129.6	28 06.4 99 14 129.5	28 36.1 99 14 129.4	29 05.8 99 14 129.3	29 35.5 99 14 129.3	30 05.2 99 14 129.2	7
8	26 29.3 99 14 128.7	26 59.0 99 14 128.6	27 28.6 99 14 128.6	27 58.3 99 14 128.5	28 28.0 99 14 128.4	28 57.7 99 14 128.3	29 27.3 99 14 128.2	29 57.0 99 14 128.1	8
9	26 21.1 99 14 127.7	26 50.8 99 14 127.6	27 20.4 99 14 127.5	27 50.1 99 14 127.4	28 19.8 99 14 127.3	28 49.4 99 14 127.3	29 19.1 99 14 127.2	29 48.8 99 14 127.1	9
50	26 12.8 99 14 126.6	26 42.5 99 14 126.6	27 12.1 99 14 126.5	27 41.8 99 14 126.4	28 11.4 99 14 126.3	28 41.1 99 14 126.2	29 10.7 99 14 126.1	29 40.4 99 14 126.0	50
1	26 04.4 99 14 125.6	26 34.0 99 14 125.5	27 03.7 99 14 125.4	27 33.3 99 14 125.4	28 03.0 99 14 125.3	28 32.6 99 14 125.2	29 02.3 99 14 125.1	29 31.9 99 14 125.0	1
2	25 55.8 99 14 124.5	26 25.5 99 14 124.5	26 55.1 99 14 124.4	27 24.8 99 14 124.3	27 54.4 99 14 124.2	28 24.1 99 14 124.1	28 53.7 99 14 124.1	29 23.3 99 14 124.0	2
3	25 47.2 99 15 123.5	26 16.9 99 15 123.5	26 46.5 99 15 123.4	27 16.1 99 15 123.3	27 45.8 99 15 123.2	28 15.4 99 15 123.1	28 45.0 99 15 123.0	29 14.6 99 15 122.9	3
4	25 38.5 99 15 122.5	26 08.1 99 15 122.4	26 37.7 99 15 122.3	27 07.4 99 15 122.2	27 37.0 99 15 122.2	28 06.6 99 15 122.1	28 36.2 99 15 122.0	29 05.8 99 15 121.9	4
55	25 29.6 99 15 121.5	25 59.3 99 15 121.4	26 28.9 99 15 121.3	26 58.5 99 15 121.2	27 28.1 99 15 121.1	27 57.7 99 15 121.0	28 27.3 99 15 120.9	28 56.9 99 15 120.9	55
6	25 20.7 99 15 120.4	25 50.3 99 15 120.4	26 19.9 99 15 120.2	26 49.5 99 15 120.2	27 19.2 99 15 120.1	27 48.8 99 15 120.0	28 18.4 99 15 119.9	28 47.9 99 15 119.8	6
7	25 11.7 99 15 119.4	25 41.3 99 15 119.3	26 10.9 99 15 119.3	26 40.5 99 15 119.2	27 10.1 99 15 119.1	27 39.7 99 15 119.0	28 09.3 99 15 118.9	28 38.9 99 15 118.8	7
8	25 02.6 99 15 118.4	25 32.2 99 15 118.3	26 01.8 99 15 118.2	26 31.4 99 15 118.1	27 00.9 99 15 118.0	27 30.5 99 15 117.9	28 00.1 99 15 117.9	28 29.7 99 15 117.8	8
9	24 53.4 99 15 117.4	25 22.9 99 16 117.3	25 52.5 99 16 117.2	26 22.1 99 16 117.1	26 51.7 99 16 117.0	27 21.3 99 16 116.9	27 50.9 99 16 116.8	28 20.4 99 16 116.7	9
60	24 44.1 99 16 116.4	25 13.6 99 16 116.3	25 43.2 99 16 116.2	26 12.8 99 16 116.1	26 42.4 99 16 116.0	27 11.9 99 16 115.9	27 41.5 99 16 115.8	28 11.1 99 16 115.7	60
1	24 34.7 99 16 115.3	25 04.3 99 16 115.3	25 33.8 99 16 115.2	26 03.4 99 16 115.1	26 33.0 99 16 115.0	27 02.5 99 16 114.9	27 32.1 99 16 114.8	28 01.6 99 16 114.7	1
2	24 25.2 99 16 114.2	24 54.8 99 16 114.2	25 24.4 99 16 114.1	25 53.9 99 16 114.0	26 23.5 99 16 114.0	26 53.0 99 16 113.9	27 22.6 98 16 113.8	27 52.1 98 16 113.7	2
3	24 15.7 99 16 113.3	24 45.3 99 16 113.2	25 14.8 99 16 113.1	25 44.4 99 16 113.0	26 13.9 99 16 112.9	26 43.5 98 16 112.8	27 13.0 98 16 112.7	27 42.6 98 16 112.6	3
4	24 06.1 99 16 112.3	24 35.7 99 16 112.2	25 05.2 99 16 112.1	25 34.8 98 16 112.0	26 04.3 98 16 111.9	26 33.8 98 16 111.8	27 03.4 98 16 111.7	27 32.9 98 16 111.6	4
65	23 56.4 99 16 111.3	24 26.0 98 16 111.2	24 55.5 98 16 111.1	25 25.1 98 16 111.0	25 54.6 98 16 110.9	26 24.1 98 16 110.8	26 53.7 98 16 110.7	27 23.2 98 16 110.6	65
6	23 46.6 98 16 110.3	24 16.2 98 16 110.2	24 45.8 98 16 110.1	25 15.3 98 16 110.0	25 44.8 98 16 109.9	26 14.4 98 16 109.8	26 43.9 98 16 109.7	27 13.4 98 16 109.6	6
7	23 36.9 98 16 109.3	24 06.4 98 16 109.2	24 35.9 98 16 109.1	25 05.5 98 16 109.0	25 35.0 98 16 108.9	26 04.5 98 16 108.8	26 34.0 98 16 108.7	27 03.6 98 17 108.6	7
8	23 27.0 98 17 108.2	23 56.5 98 17 108.2	24 26.1 98 17 108.1	24 55.6 98 17 108.0	25 25.1 98 17 107.9	25 54.6 98 17 107.8	26 24.1 98 17 107.7	26 53.7 98 17 107.6	8
9	23 17.1 98 17 107.2	23 46.6 98 17 107.1	24 16.1 98 17 107.0	24 45.7 98 17 106.9	25 15.2 98 17 106.9	25 44.7 98 17 106.8	26 14.2 98 17 106.7	26 43.7 98 17 106.6	9
70	23 07.1 98 17 106.2	23 36.6 98 17 106.1	24 06.1 98 17 106.0	24 35.7 98 17 105.9	25 05.2 98 17 105.8	25 34.7 98 17 105.7	26 04.2 98 17 105.6	26 33.7 98 17 105.5	70
1	22 57.1 98 17 105.2	23 26.6 98 17 105.1	23 56.1 98 17 105.0	24 25.6 98 17 104.9	24 55.1 98 17 104.8	25 24.6 98 17 104.7	25 54.1 98 17 104.6	26 23.6 98 17 104.5	1
2	22 47.0 98 17 104.2	23 16.5 98 17 104.1	23 46.0 98 17 104.0	24 15.5 98 17 103.9	24 45.0 98 17 103.8	25 14.5 98 17 103.7	25 44.0 98 17 103.6	26 13.5 98 17 103.5	2
3	22 36.9 98 17 103.2	23 06.4 98 17 103.1	23 35.9 98 17 103.0	24 05.4 98 17 102.9	24 34.9 98 17 102.8	25 04.4 98 17 102.7	25 33.9 98 17 102.6	26 03.4 98 17 102.5	3
4	22 26.7 98 17 102.2	22 56.2 98 17 102.1	23 25.7 98 17 102.0	23 55.2 98 17 101.9	24 24.7 98 17 101.8	24 54.2 98 17 101.7	25 23.7 98 17 101.6	25 53.2 98 17 101.5	4
75	22 16.5 98 17 101.2	22 46.0 98 17 101.1	23 15.5 98 17 101.0	23 45.0 98 17 100.9	24 14.5 98 17 100.8	24 44.0 98 17 100.7	25 13.5 98 17 100.6	25 42.9 98 17 100.5	75
6	22 06.3 98 17 100.2	22 35.8 98 17 100.1	23 05.3 98 17 100.0	23 34.8 98 17 99.9	24 04.3 98 17 99.8	24 33.7 98 17 99.7	25 03.2 98 17 99.6	25 32.7 98 17 99.5	6
7	21 56.0 98 17 99.2	22 25.5 98 17 99.1	22 55.0 98 17 99.0	23 24.5 98 17 98.9	23 54.0 98 17 98.8	24 23.4 98 17 98.7	24 52.9 98 17 98.6	25 22.4 98 17 98.5	7
8	21 45.7 98 17 98.2	22 15.2 98 17 98.1	22 44.7 98 17 98.0	23 14.2 98 17 97.9	23 43.7 98 17 97.8	24 13.1 98 17 97.7	24 42.6 98 17 97.6	25 12.1 98 17 97.5	8
9	21 35.4 98 17 97.2	22 04.9 98 17 97.1	22 34.4 98 17 97.0	23 03.8 98 17 96.9	23 33.3 98 17 96.8	24 02.8 98 17 96.7	24 32.3 98 17 96.6	25 01.7 98 17 96.5	9
80	21 25.0 98 17 96.1	21 54.5 98 17 96.1	22 24.0 98 17 96.0	22 53.4 98 17 95.9	23 23.0 98 17 95.8	23 52.4 98 17 95.7	24 21.9 98 17 95.6	24 51.4 98 17 95.5	80
1	21 14.7 98 17 95.3	21 44.2 98 17 95.2	22 13.6 98 17 95.1	22 43.1 98 17 95.0	23 12.6 98 17 94.9	23 42.1 98 17 94.8	24 11.5 98 17 94.7	24 41.0 98 17 94.5	1
2	21 04.3 98 17 94.3	21 33.8 98 17 94.2	22 03.3 98 17 94.1	22 32.7 98 17 94.0	23 02.2 98 17 93.9	23 31.7 98 17 93.8	24 01.1 98 17 93.7	24 30.6 98 17 93.6	2
3	20 53.9 98 17 93.3	21 23.4 98 17 93.2	21 52.9 98 17 93.1	22 22.3 98 17 93.0	22 51.8 98 17 92.9	23 21.3 98 17 92.8	23 50.7 98 17 92.7	24 20.2 98 17 92.6	3
4	20 43.5 98 17 92.3	21 13.0 98 17 92.2	21 42.5 98 17 92.1	22 11.9 98 17 92.0	22 41.4 98 17 91.9	23 10.9 98 17. 91.8	23 40.3 98 17 91.7	24 09.8 98 17 91.6	4
85	20 33.1 98 17 91.3	21 02.6 98 17 91.2	21 32.0 98 17 91.1	22 01.5 98 17 91.0	22 31.0 98 17 90.9	23 00.5 98 17 90.8	23 29.9 98 17 90.7	23 59.4 98 17 90.6	85
6	20 22.7 98 17 90.3	20 52.1 98 17 90.2	21 21.6 98 17 90.1	21 51.1 98 17 90.0	22 20.5 98 17 89.9	22 50.0 98 17 89.8	23 19.5 98 17 89.7	23 49.0 98 17 89.6	6
7	20 12.2 98 17 89.3	20 41.7 98 17 89.2	21 11.2 98 17 89.1	21 40.7 98 17 89.0	22 10.1 98 17 88.9	22 39.6 98 17 88.8	23 09.1 98 17 88.7	23 38.5 98 17 88.6	7
8	20 01.8 98 17 88.3	20 31.3 98 17 88.2	21 00.8 98 17 88.1	21 30.3 98 17 88.0	21 59.7 98 17 87.9	22 29.2 98 17 87.8	22 58.7 98 17 87.7	23 28.1 98 17 87.6	8
9	19 51.4 98 17 87.4	20 20.9 98 17 87.3	20 50.4 98 17 87.2	21 19.9 98 17 87.1	21 49.3 98 17 87.0	22 18.8 98 17 86.9	22 48.3 98 17 86.8	23 17.7 98 17 86.7	9
90	19 41.0 98 17 86.4	20 10.5 98 17 86.3	20 40.0 98 17 86.2	21 09.5 98 17 86.1	21 38.9 98 17 86.0	22 08.4 98 17 85.9	22 37.9 98 17 85.8	23 07.3 98 17 85.7	90

H.A.	20° 00′			20° 30′			21° 00′			21° 30′			22° 00′			22° 30′			23° 00′			23° 30′			H.A.
	Alt.	Δd Δt	Az.	Alt.	Δd Δt	Az.	Alt.	Δd Δt	Az.	Alt.	Δd Δt	Az.	Alt.	Δd Δt	Az.	Alt.	Δd Δt	Az.	Alt.	Δd Δt	Az.	Alt.	Δd Δt	Az.	
91	19 36.6	98 17	85.4	20 00.1	98 17	85.3	20 29.6	98 17	85.2	20 59.1	98 17	85.1	21 28.5	98 17	85.0	21 58.0	98 17	84.9	22 27.5	98 17	84.8	22 56.9	98 17	84.7	91
2	19 20.2	98 17	84.4	19 49.7	98 17	84.3	20 19.1	98 17	84.2	20 48.7	98 17	84.1	21 18.2	98 17	84.0	21 47.6	98 17	83.9	22 17.1	98 17	83.8	22 46.6	98 17	83.7	2
3	19 09.9	98 17	83.4	19 39.4	98 17	83.3	20 08.9	98 17	83.2	20 38.3	98 17	83.2	21 07.8	98 17	83.1	21 37.3	98 17	83.0	22 06.8	98 17	82.9	22 36.2	98 17	82.8	3
4	18 59.5	98 17	82.5	19 29.0	98 17	82.4	19 58.5	98 17	82.3	20 28.0	98 17	82.2	20 57.5	98 17	82.1	21 27.0	98 17	82.0	21 56.4	98 17	81.9	22 25.9	98 17	81.8	4
95	18 49.2	98 17	81.5	19 18.7	98 17	81.4	19 48.2	98 17	81.3	20 17.7	98 17	81.2	20 47.2	98 17	81.1	21 16.7	98 17	81.0	21 46.1	98 17	80.9	22 15.6	98 17	80.8	95
6	18 38.9	98 17	80.5	19 08.4	98 17	80.4	19 37.9	98 17	80.3	20 07.4	98 17	80.2	20 36.9	98 17	80.1	21 06.4	98 17	80.0	21 35.9	98 17	79.9	22 05.3	98 17	79.8	6
7	18 28.7	98 17	79.5	18 58.2	98 17	79.4	19 27.7	98 17	79.3	19 57.2	98 17	79.2	20 26.6	98 17	79.2	20 56.1	98 17	79.1	21 25.6	98 17	79.0	21 55.1	98 17	78.9	7
8	18 18.4	98 17	78.6	18 47.9	98 17	78.5	19 17.4	98 17	78.4	19 46.9	98 17	78.3	20 16.4	98 17	78.2	20 45.9	98 17	78.1	21 15.4	98 17	78.0	21 44.9	98 17	77.9	8
9	18 08.2	98 17	77.6	18 37.8	98 17	77.5	19 07.3	98 17	77.4	19 36.8	98 17	77.3	20 06.3	98 17	77.2	20 35.7	98 17	77.1	21 05.2	98 17	77.0	21 34.7	98 17	76.9	9
100	17 58.1	98 17	76.6	18 27.6	98 17	76.5	18 57.1	98 17	76.4	19 26.6	98 17	76.3	19 56.1	98 17	76.2	20 25.6	98 17	76.1	20 55.1	98 17	76.0	21 24.6	98 17	75.9	100
1	17 48.0	98 17	75.7	18 17.5	98 17	75.6	18 47.0	98 17	75.5	19 16.5	98 17	75.4	19 46.0	98 17	75.3	20 15.5	98 17	75.2	20 45.0	98 17	75.1	21 14.5	98 17	75.0	1
2	17 37.9	98 17	74.7	18 07.4	98 17	74.6	18 36.9	98 17	74.5	19 06.5	98 17	74.4	19 36.0	98 17	74.3	20 05.5	98 17	74.2	20 35.0	98 17	74.1	21 04.5	98 17	74.0	2
3	17 27.9	98 17	73.7	17 57.4	98 17	73.6	18 26.9	98 17	73.5	18 56.4	98 17	73.4	19 26.0	98 17	73.3	19 55.5	98 17	73.2	20 25.0	98 17	73.1	20 54.5	98 17	73.0	3
4	17 17.9	98 17	72.7	17 47.4	98 17	72.6	18 17.0	98 16	72.6	18 46.5	98 16	72.5	19 16.0	98 16	72.4	19 45.5	98 16	72.3	20 15.0	98 16	72.2	20 44.5	98 16	72.1	4
105	17 08.0	98 16	71.8	17 37.5	98 16	71.7	18 07.0	98 16	71.6	18 36.6	98 16	71.5	19 06.1	98 16	71.4	19 35.6	98 16	71.3	20 05.1	98 16	71.2	20 34.7	98 16	71.1	105
6	16 58.1	98 16	70.8	17 27.7	98 16	70.7	17 57.2	98 16	70.6	18 26.7	98 16	70.5	18 56.3	98 16	70.4	19 25.8	98 16	70.3	19 55.3	98 16	70.2	20 24.8	98 16	70.2	6
7	16 48.3	98 16	69.8	17 17.8	98 16	69.7	17 47.4	98 16	69.7	18 16.9	98 16	69.6	18 46.5	98 16	69.5	19 16.0	98 16	69.4	19 45.5	98 16	69.3	20 15.1	98 16	69.2	7
8	16 38.6	99 16	68.9	17 08.1	98 16	68.8	17 37.6	98 16	68.7	18 07.2	98 16	68.6	18 36.7	98 16	68.5	19 06.3	98 16	68.4	19 35.8	98 16	68.3	20 05.3	98 16	68.2	8
9	16 28.9	99 16	67.9	16 58.4	99 16	67.8	17 28.0	98 16	67.7	17 57.5	98 16	67.6	18 27.1	98 16	67.5	18 56.6	98 16	67.5	19 26.2	98 16	67.4	19 55.7	98 16	67.3	9
110	16 19.2	99 16	66.9	16 48.8	99 16	66.9	17 18.4	99 16	66.8	17 47.9	99 16	66.7	18 17.5	99 16	66.6	18 47.0	99 16	66.5	19 16.6	98 16	66.4	19 46.1	98 16	66.3	110
1	16 09.7	99 16	66.0	16 39.3	99 16	65.9	17 08.8	99 16	65.8	17 38.4	99 16	65.7	18 08.0	99 16	65.6	18 37.5	99 16	65.5	19 07.1	99 16	65.4	19 36.6	99 16	65.3	1
2	16 00.2	99 16	65.0	16 29.8	99 16	64.9	16 59.4	99 16	64.8	17 28.9	99 16	64.7	17 58.5	99 16	64.7	18 28.1	99 16	64.6	18 57.6	99 16	64.5	19 27.2	99 16	64.4	2
3	15 50.8	99 15	64.0	16 20.4	99 16	64.0	16 50.0	99 16	63.9	17 19.5	99 16	63.8	17 49.1	99 15	63.7	18 18.7	99 15	63.6	18 48.3	99 15	63.5	19 17.8	99 15	63.4	3
4	15 41.5	99 15	63.1	16 11.1	99 15	63.0	16 40.7	99 15	62.9	17 10.2	99 15	62.8	17 39.8	99 15	62.7	18 09.4	99 15	62.7	18 39.0	99 15	62.6	19 08.6	99 15	62.5	4
115	15 32.2	99 15	62.1	16 01.8	99 15	62.0	16 31.4	99 15	62.0	17 01.0	99 15	61.9	17 30.6	99 15	61.8	18 00.2	99 15	61.7	18 29.8	99 15	61.6	18 59.4	99 15	61.5	115
6	15 23.1	99 15	61.2	15 52.7	99 15	61.1	16 22.3	99 15	61.0	16 51.9	99 15	60.9	17 21.5	99 15	60.8	17 51.1	99 15	60.7	18 20.6	99 15	60.6	18 50.2	99 15	60.6	6
7	15 14.0	99 15	60.2	15 43.6	99 15	60.1	16 13.2	99 15	60.0	16 42.8	99 15	59.9	17 12.4	99 15	59.9	17 42.0	99 15	59.8	18 11.6	99 15	59.7	18 41.2	99 15	59.6	7
8	15 05.0	99 15	59.2	15 34.6	99 15	59.2	16 04.2	99 15	59.1	16 33.8	99 15	59.0	17 03.4	99 15	58.9	17 33.1	99 15	58.8	18 02.7	99 15	58.7	18 32.3	99 15	58.7	8
9	14 56.1	99 15	58.3	15 25.7	99 15	58.2	15 55.3	99 15	58.1	16 24.9	99 15	58.0	16 54.6	99 15	57.9	17 24.2	99 15	57.9	17 53.8	99 15	57.8	18 23.4	99 15	57.7	9
120	14 47.3	99 15	57.3	15 16.9	99 14	57.2	15 46.5	99 14	57.2	16 16.2	99 14	57.1	16 45.8	99 14	57.0	17 15.4	99 14	56.9	17 45.0	99 14	56.8	18 14.7	99 14	56.7	120
1	14 38.5	99 14	56.4	15 08.2	99 14	56.3	15 37.8	99 14	56.2	16 07.5	99 14	56.1	16 37.1	99 14	56.0	17 06.7	99 14	56.0	17 36.4	99 14	55.9	18 06.0	99 14	55.8	1
2	14 29.9	99 14	55.4	14 59.6	99 14	55.3	15 29.2	99 14	55.2	15 58.9	99 14	55.2	16 28.5	99 14	55.1	16 58.1	99 14	55.0	17 27.8	99 14	54.9	17 57.4	99 14	54.8	2
3	14 21.4	99 14	54.4	14 51.0	99 14	54.4	15 20.7	99 14	54.3	15 50.4	99 14	54.2	16 20.0	99 14	54.1	16 49.7	99 14	54.0	17 19.3	99 14	54.0	17 49.0	99 14	53.9	3
4	14 13.0	99 14	53.5	14 42.6	99 14	53.4	15 12.3	99 14	53.3	15 42.0	99 14	53.2	16 11.6	99 14	53.2	16 41.3	99 14	53.1	17 10.9	99 14	53.0	17 40.6	99 14	52.9	4
125	14 04.6	99 14	52.5	14 34.3	99 14	52.4	15 04.0	99 14	52.4	15 33.7	99 14	52.3	16 03.3	99 14	52.2	16 33.0	99 14	52.1	17 02.7	99 14	52.1	17 32.3	99 14	52.0	125
6	13 56.4	99 14	51.6	14 26.1	99 13	51.5	14 55.8	99 13	51.4	15 25.5	99 13	51.3	15 55.1	99 13	51.3	16 24.8	99 13	51.2	16 54.5	99 13	51.1	17 24.2	99 13	51.0	6
7	13 48.3	99 13	50.6	14 18.0	99 13	50.5	14 47.7	99 13	50.5	15 17.4	99 13	50.4	15 47.1	99 13	50.3	16 16.8	99 13	50.2	16 46.4	99 13	50.2	17 16.1	99 13	50.1	7
8	13 40.3	99 13	49.6	14 10.0	99 13	49.6	14 39.7	99 13	49.5	15 09.4	99 13	49.4	15 39.1	99 13	49.4	16 08.8	99 13	49.3	16 38.5	99 13	49.2	17 08.2	99 13	49.1	8
9	13 32.4	99 13	48.7	14 02.1	99 13	48.6	14 31.9	99 13	48.5	15 01.6	99 13	48.5	15 31.3	99 13	48.4	16 01.0	99 13	48.3	16 30.7	99 13	48.3	17 00.4	99 13	48.2	9
130	13 24.7	99 13	47.7	13 54.4	99 13	47.7	14 24.1	99 13	47.6	14 53.8	99 13	47.5	15 23.5	99 13	47.4	15 53.2	99 13	47.4	16 23.0	99 13	47.3	16 52.7	99 13	47.2	130
1	13 17.0	99 13	46.8	13 46.7	99 13	46.7	14 16.5	99 12	46.6	14 46.2	99 12	46.6	15 15.9	99 12	46.5	15 45.6	99 12	46.4	16 15.4	99 12	46.4	16 45.1	99 12	46.3	1
2	13 09.5	99 12	45.8	13 39.2	99 12	45.8	14 09.0	99 12	45.7	14 38.7	99 12	45.6	15 08.4	99 12	45.5	15 38.1	99 12	45.5	16 07.9	99 12	45.4	16 37.6	99 12	45.3	2
3	13 02.1	99 12	44.9	13 31.8	99 12	44.8	14 01.6	99 12	44.7	14 31.3	99 12	44.7	15 01.0	99 12	44.6	15 30.8	99 12	44.5	16 00.5	99 12	44.5	16 30.3	99 12	44.4	3
4	12 54.8	99 12	43.9	13 24.5	99 12	43.8	13 54.3	99 12	43.8	14 24.0	99 12	43.7	14 53.8	99 12	43.6	15 23.5	99 12	43.6	15 53.3	99 12	43.5	16 23.0	99 12	43.4	4
135	12 47.6	99 12	43.0	13 17.4	99 12	42.9	13 47.1	99 12	42.8	14 16.9	99 12	42.8	14 46.7	99 12	42.7	15 16.4	99 12	42.6	15 46.2	99 12	42.6	16 15.9	99 12	42.5	135
6	12 40.6	99 12	42.0	13 10.3	99 11	41.9	13 40.1	99 11	41.9	14 09.9	99 11	41.8	14 39.7	99 11	41.7	15 09.4	99 11	41.7	15 39.2	99 11	41.6	16 09.0	99 11	41.6	6
7	12 33.7	99 11	41.0	13 03.5	99 11	41.0	13 33.2	99 11	40.9	14 03.0	99 11	40.9	14 32.8	99 11	40.8	15 02.6	99 11	40.7	15 32.3	99 11	40.7	16 02.1	99 11	40.6	7
8	12 26.9	99 11	40.1	12 56.7	99 11	40.0	13 26.5	99 11	40.0	13 56.3	99 11	39.9	14 26.0	99 11	39.8	14 55.8	99 11	39.8	15 25.6	99 11	39.7	15 55.4	99 11	39.7	8
9	12 20.3	99 11	39.1	12 50.1	99 11	39.1	13 19.9	99 11	39.0	13 49.6	99 11	38.9	14 19.4	99 11	38.9	14 49.2	99 11	38.8	15 19.0	99 11	38.8	15 48.8	99 11	38.7	9
140	12 13.8	99 11	38.2	12 43.6	99 11	38.1	13 13.4	99 11	38.1	13 43.2	99 11	38.0	14 13.0	99 11	37.9	14 42.8	99 11	37.9	15 12.6	99 11	37.8	15 42.4	99 11	37.8	140
1	12 07.4	99 11	37.2	12 37.2	99 10	37.2	13 07.0	99 10	37.1	13 36.8	99 10	37.0	14 06.6	99 10	37.0	14 36.4	99 10	36.9	15 06.2	99 10	36.9	15 36.1	99 10	36.8	1
2	12 01.2	99 10	36.3	12 31.0	99 10	36.2	13 00.8	99 10	36.2	13 30.6	99 10	36.1	14 00.4	99 10	36.0	14 30.2	99 10	36.0	15 00.1	99 10	35.9	15 29.9	99 10	35.9	2
3	11 55.1	99 10	35.3	12 24.9	99 10	35.3	12 54.7	99 10	35.2	13 24.5	99 10	35.1	13 54.4	99 10	35.1	14 24.2	99 10	35.0	14 54.0	99 10	35.0	15 23.8	99 10	34.9	3
4	11 49.1	99 10	34.4	12 18.9	99 10	34.3	12 48.8	99 10	34.2	13 18.6	99 10	34.2	13 48.5	99 10	34.1	14 18.3	99 10	34.1	14 48.1	99 10	34.0	15 17.9	99 10	34.0	4
145	11 43.3	1.009	33.4	12 13.2	1.009	33.3	12 43.0	1.009	33.3	13 12.8	1.009	33.2	13 42.7	99 09	33.2	14 12.5	99 09	33.1	14 42.4	99 09	33.1	15 12.2	99 09	33.0	145
6	11 37.6	1.009	32.4	12 07.5	1.009	32.4	12 37.3	1.009	32.3	13 07.2	1.009	32.3	13 37.0	99 09	32.2	14 06.9	99 09	32.2	14 36.7	99 09	32.1	15 06.6	99 09	32.1	6
7	11 32.1	1.009	31.5	12 02.0	1.009	31.4	12 31.8	1.009	31.4	13 01.7	1.009	31.3	13 31.6	1.009	31.3	14 01.4	1.009	31.2	14 31.3	1.009	31.2	15 01.1	1.009	31.1	7
8	11 26.8	1.009	30.5	11 56.6	1.009	30.5	12 26.5	1.009	30.4	12 56.4	1.009	30.4	13 26.2	1.009	30.3	13 56.1	1.009	30.3	14 26.0	1.009	30.2	14 55.8	1.009	30.2	8
9	11 21.5	1.008	29.6	11 51.4	1.008	29.5	12 21.3	1.008	29.5	12 51.2	1.008	29.4	13 21.0	1.008	29.4	13 50.9	1.008	29.3	14 20.8	1.008	29.3	14 50.7	1.008	29.3	9
150	11 16.5	1.008	28.6	11 46.4	1.008	28.6	12 16.2	1.008	28.5	12 46.1	1.008	28.5	13 16.0	1.008	28.4	13 45.9	1.008	28.4	14 15.8	1.008	28.4	14 45.6	1.008	28.3	150
1	11 11.6	1.008	27.7	11 41.4	1.008	27.6	12 11.3	1.008	27.6	12 41.2	1.008	27.5	13 11.1	1.008	27.5	13 41.0	1.008	27.4	14 10.9	1.008	27.4	14 40.8	1.008	27.4	1
2	11 06.8	1.008	26.7	11 36.7	1.008	26.7	12 06.6	1.008	26.6	12 36.5	1.008	26.6	13 06.4	1.008	26.5	13 36.3	1.008	26.5	14 06.2	1.008	26.5	14 36.1	1.008	26.4	2
3	11 02.2	1.008	25.8	11 32.1	1.007	25.7	12 02.0	1.007	25.7	12 31.9	1.007	25.6	13 01.8	1.007	25.6	13 31.7	1.007	25.6	14 01.6	1.007	25.5	14 31.5	1.007	25.5	3
4	10 57.7	1.007	24.8	11 27.6	1.007	24.8	11 57.6	1.007	24.7	12 27.5	1.007	24.7	12 57.4	1.007	24.6	13 27.3	1.007	24.6	13 57.2	1.007	24.6	14 27.1	1.007	24.5	4
155	10 53.4	1.007	23.9	11 23.4	1.007	23.8	11 53.3	1.007	23.8	12 23.2	1.007	23.7	12 53.1	1.007	23.7	13 23.0	1.007	23.7	13 52.9	1.007	23.6	14 22.8	1.007	23.6	155
6	10 49.3	1.007	22.9	11 19.2	1.007	22.9	11 49.2	1.007	22.8	12 19.1	1.007	22.8	12 49.0	1.007	22.8	13 18.9	1.007	22.7	13 48.8	1.007	22.7	14 18.8	1.007	22.6	6
7	10 45.3	1.006	21.9	11 15.3	1.006	21.9	11 45.2	1.006	21.9	12 15.1	1.006	21.8	12 45.0	1.006	21.8	13 15.0	1.006	21.8	13 44.9	1.006	21.7	14 14.8	1.006	21.7	7
8	10 41.5	1.006	21.0	11 11.5	1.006	21.0	11 41.4	1.006	20.9	12 11.3	1.006	20.9	12 41.3	1.006	20.9	13 11.2	1.006	20.8	13 41.1	1.006	20.8	14 11.1	1.006	20.8	8
9	10 37.8	1.006	20.0	11 07.8	1.006	20.0	11 37.7	1.006	20.0	12 07.7	1.006	19.9	12 37.6	1.006	19.9	13 07.6	1.006	19.9	13 37.5	1.006	19.8	14 07.4	1.006	19.8	9
160	10 34.4	1.005	19.1	11 04.3	1.005	19.1	11 34.3	1.005	19.0	12 04.2	1.005	19.0	12 34.2	1.005	19.0	13 04.1	1.005	18.9	13 34.1	1.005	18.9	14 04.0	1.005	18.9	160
1	10 31.1	1.005	18.1	11 01.0	1.005	18.1	11 31.0	1.005	18.1	12 00.9	1.005	18.0	12 30.9	1.005	18.0	13 00.8	1.005	18.0	13 30.8	1.005	18.0	14 00.7	1.005	17.9	1
2	10 27.9	1.005	17.2	10 57.9	1.005	17.1	11 27.8	1.005	17.1	11 57.8	1.005	17.1	12 27.7	1.005	17.1	12 57.7	1.005	17.0	13 27.6	1.005	17.0	13 57.6	1.005	17.0	2
3	10 24.9	1.005	16.2	10 54.9	1.005	16.2	11 24.8	1.005	16.2	11 54.8	1.005	16.1	12 24.7	1.005	16.1	12 54.7	1.005	16.1	13 24.7	1.005	16.1	13 54.6	1.005	16.0	3
4	10 21.9	1.004	15.3	10 52.0	1.004	15.2	11 21.8	1.004	15.2	11 52.0	1.004	15.2	12 21.7	1.004	15.2	12 51.9	1.004	15.1	13 21.7	1.004	15.1	13 51.8	1.004	15.1	4
165	10 19.4	1.004	14.3	10 49.4	1.004	14.3	11 19.4	1.004	14.3	11 49.3	1.004	14.2	12 19.3	1.004	14.2	12 49.3	1.004	14.2	13 19.2	1.004	14.2	13 49.2	1.004	14.1	165
6	10 16.9	1.004	13.4	10 46.9	1.004	13.3	11 16.9	1.004	13.3	11 46.8	1.004	13.3	12 16.8	1.004	13.3	12 46.8	1.004	13.2	13 16.8	1.004	13.2	13 46.7	1.004	13.2	6
7	10 14.6	1.004	12.4	10 44.6	1.004	12.4	11 14.6	1.004	12.4	11 44.5	1.004	12.3	12 14.5	1.004	12.3	12 44.5	1.004	12.3	13 14.5	1.004	12.3	13 44.4	1.004	12.3	7
8	10 12.4	1.003	11.5	10 42.4	1.003	11.4	11 12.4	1.003	11.4	11 42.4	1.003	11.4	12 12.3	1.003	11.4	12 42.3	1.003	11.4	13 12.3	1.003	11.3	13 42.3	1.003	11.3	8
9	10 10.5	1.003	10.5	10 40.5	1.003	10.5	11 10.4	1.003	10.5	11 40.4	1.003	10.5	12 10.4	1.003	10.4	12 40.4	1.003	10.4	13 10.4	1.003	10.4	13 40.3	1.003	10.3	9
170	10 08.7	1.003	09.5	10 38.6	1.003	09.5	11 08.6	1.003	09.5	11 38.6	1.003	09.5	12 08.6	1.003	09.5	12 38.6	1.003	09.5	13 08.6	1.003	09.4	13 38.6	1.003	09.4	170
1	10 07.0	1.002	08.6	10 37.0	1.002	08.6	11 07.0	1.002	08.6	11 37.0	1.002	08.5	12 07.0	1.002	08.5	12 37.0	1.002	08.5	13 06.9	1.002	08.5	13 36.9	1.002	08.5	1
2	10 05.5	1.002	07.6	10 35.5	1.002	07.6	11 05.5	1.002	07.6	11 35.5	1.002	07.6	12 05.5	1.002	07.6	12 35.5	1.002	07.6	13 05.5	1.002	07.6	13 35.5	1.002	07.5	2
3	10 04.2	1.002	06.7	10 34.1	1.002	06.7	11 04.1	1.002	06.7	11 34.1	1.002	06.7	12 04.1	1.002	06.6	12 34.1	1.002	06.6	13 04.2	1.002	06.6	13 34.2	1.002	06.6	3
4	10 03.1	1.002	05.7	10 33.1	1.002	05.7	11 03.1	1.002	05.7	11 33.1	1.002	05.7	12 03.1	1.002	05.7	12 33.1	1.002	05.7	13 03.1	1.002	05.7	13 33.1	1.002	05.7	4
175	10 02.2	1.001	04.8	10 32.2	1.001	04.8	11 02.2	1.001	04.8	11 32.2	1.001	04.7	12 02.2	1.001	04.7	12 32.2	1.001	04.7	13 02.1	1.001	04.7	13 32.1	1.001	04.7	175
6	10 01.4	1.001	03.8	10 31.4	1.001	03.8	11 01.4	1.001	03.8	11 31.4	1.001	03.8	12 01.4	1.001	03.8	12 31.4	1.001	03.8	13 01.4	1.001	03.8	13 31.4	1.001	03.8	6
7	10 00.8	1.001	02.9	10 30.8	1.001	02.9	11 00.8	1.001	02.9	11 30.8	1.001	02.9	12 00.8	1.001	02.8	12 30.8	1.001	02.8	13 00.8	1.001	02.8	13 30.8	1.001	02.8	7
8	10 00.3	1.000	01.9	10 30.3	1.000	01.9	11 00.3	1.000	01.9	11 30.3	1.000	01.9	12 00.3	1.000	01.9	12 30.3	1.000	01.9	13 00.3	1.000	01.9	13 30.3	1.000	01.9	8
9	10 00.1	1.000	01.0	10 30.1	1.000	01.0	11 00.1	1.000	01.0	11 30.1	1.000	01.0	12 00.1	1.000	01.0	12 30.1	1.000	01.0	13 00.1	1.000	01.0	13 30.1	1.000	01.0	9
180	10 00.0	1.000	00.0	10 30.0	1.000	00.0	11 00.0	1.000	00.0	11 30.0	1.000	00.0	12 00.0	1.000	00.0	12 30.0	1.000	00.0	13 00.0	1.000	00.0	13 30.0	1.000	00.0	180

Lat. 0°

Each declination cell is given as: Alt. (° ′)   Δd   Δt   Az.

H.A.	4° 00′	4° 30′	5° 00′	5° 30′	6° 00′	6° 30′	7° 00′	7° 30′	H.A.
00	14 00.0 1.000 180.0	14 30.0 1.000 180.0	15 00.0 1.000 180.0	15 30.0 1.000 180.0	16 00.0 1.000 180.0	16 30.0 1.000 180.0	17 00.0 1.000 180.0	17 30.0 1.000 180.0	00
1	13 59.9 1.000 179.0	14 29.9 1.000 179.0	14 59.9 1.000 179.0	15 29.9 1.000 179.0	15 59.9 1.000 179.0	16 29.9 1.000 179.0	16 59.9 1.000 179.0	17 29.9 1.000 179.0	1
2	13 59.6 1.001 177.9	14 29.6 1.001 177.9	14 59.6 1.001 177.9	15 29.6 1.001 177.9	15 59.6 1.001 177.9	16 29.6 1.001 177.9	16 59.6 1.001 177.9	17 29.6 1.001 177.9	2
3	13 59.2 1.001 176.9	14 29.2 1.001 176.9	14 59.2 1.001 176.9	15 29.2 1.001 176.9	15 59.2 1.001 176.9	16 29.2 1.001 176.9	16 59.2 1.001 176.9	17 29.2 1.001 176.9	3
4	13 58.5 1.001 175.9	14 28.5 1.001 175.9	14 58.5 1.001 175.9	15 28.5 1.001 175.9	15 58.5 1.001 175.9	16 28.5 1.001 175.9	16 58.5 1.001 175.8	17 28.5 1.001 175.8	4
05	13 57.7 1.002 174.9	14 27.7 1.002 174.9	14 57.7 1.002 174.8	15 27.7 1.002 174.8	15 57.7 1.002 174.8	16 27.6 1.002 174.8	16 57.6 1.002 174.8	17 27.6 1.002 174.8	05
6	13 56.6 1.002 173.8	14 26.6 1.002 173.8	14 56.6 1.002 173.8	15 26.6 1.002 173.8	15 56.6 1.002 173.8	16 26.6 1.002 173.8	16 56.5 1.002 173.8	17 26.5 1.002 173.8	6
7	13 55.4 1.002 172.8	14 25.4 1.002 172.8	14 55.4 1.002 172.8	15 25.4 1.002 172.8	15 55.4 1.002 172.8	16 25.4 1.002 172.7	16 55.3 1.002 172.7	17 25.3 1.002 172.7	7
8	13 54.0 1.003 171.8	14 24.0 1.003 171.8	14 54.0 1.003 171.8	15 24.0 1.003 171.7	15 54.0 1.003 171.7	16 24.0 1.003 171.7	16 54.0 1.003 171.7	17 24.0 1.003 171.7	8
9	13 52.4 1.003 170.8	14 22.4 1.003 170.7	14 52.4 1.003 170.7	15 22.4 1.003 170.7	15 52.4 1.003 170.7	16 22.4 1.003 170.7	16 52.4 1.003 170.7	17 22.4 1.003 170.6	9
10	13 50.7 1.003 169.7	14 20.7 1.003 169.7	14 50.7 1.003 169.7	15 20.6 1.003 169.7	15 50.6 1.003 169.6	16 20.6 1.003 169.6	16 50.6 1.003 169.6	17 20.6 1.003 169.6	10
1	13 48.7 1.004 168.7	14 18.7 1.004 168.7	14 48.7 1.004 168.7	15 18.7 1.004 168.6	15 48.7 1.004 168.6	16 18.6 1.004 168.6	16 48.6 1.004 168.6	17 18.6 1.004 168.6	1
2	13 46.6 1.004 167.7	14 16.6 1.004 167.7	14 46.6 1.004 167.6	15 16.5 1.004 167.6	15 46.5 1.004 167.6	16 16.5 1.004 167.6	16 46.5 1.004 167.6	17 16.4 1.004 167.5	2
3	13 44.3 1.004 166.6	14 14.3 1.004 166.6	14 44.2 1.004 166.6	15 14.2 1.004 166.6	15 44.2 1.004 166.6	16 14.2 1.004 166.5	16 44.1 1.004 166.5	17 14.1 1.004 166.5	3
4	13 41.8 1.004 165.6	14 11.8 1.004 165.6	14 41.7 1.004 165.6	15 11.7 1.004 165.6	15 41.7 1.004 165.5	16 11.6 1.004 165.5	16 41.6 1.004 165.5	17 11.6 1.004 165.5	4
15	13 39.1 1.005 164.6	14 09.1 1.005 164.6	14 39.0 1.005 164.5	15 09.0 1.005 164.5	15 39.0 1.005 164.5	16 08.9 1.005 164.5	16 38.9 1.005 164.4	17 08.9 1.005 164.4	15
6	13 36.2 1.005 163.6	14 06.2 1.005 163.5	14 36.2 1.005 163.5	15 06.1 1.005 163.5	15 36.1 1.005 163.5	16 06.1 1.005 163.4	16 36.0 1.005 163.4	17 06.0 1.005 163.4	6
7	13 33.2 1.005 162.5	14 03.2 1.005 162.5	14 33.1 1.005 162.5	15 03.1 1.005 162.4	15 33.0 1.005 162.4	16 03.0 1.005 162.4	16 33.0 1.005 162.4	17 02.9 1.005 162.4	7
8	13 30.0 1.006 161.5	13 59.9 1.006 161.5	14 29.9 1.006 161.5	14 59.9 1.006 161.4	15 29.8 1.006 161.4	15 59.8 1.006 161.4	16 29.7 1.006 161.3	16 59.7 1.006 161.3	8
9	13 26.6 1.006 160.5	13 56.6 1.006 160.5	14 26.5 1.006 160.4	14 56.5 1.006 160.4	15 26.4 1.006 160.4	15 56.3 1.006 160.3	16 26.3 1.006 160.3	16 56.2 1.006 160.3	9
20	13 23.0 1.006 159.5	13 53.0 1.006 159.4	14 22.9 1.006 159.4	14 52.9 1.006 159.4	15 22.8 1.006 159.3	15 52.8 1.006 159.3	16 22.7 1.006 159.3	16 52.6 1.006 159.2	20
1	13 19.2 1.007 158.4	13 49.2 1.007 158.4	14 19.2 1.007 158.4	14 49.1 1.007 158.3	15 19.0 1.007 158.3	15 49.0 1.007 158.3	16 18.9 1.007 158.2	16 48.9 1.007 158.2	1
2	13 15.4 1.007 157.4	13 45.3 1.007 157.4	14 15.2 1.007 157.4	14 45.2 1.007 157.3	15 15.1 1.007 157.3	15 45.0 1.007 157.2	16 15.0 1.007 157.2	16 44.9 1.007 157.2	2
3	13 11.3 1.007 156.4	13 41.2 1.007 156.4	14 11.1 1.007 156.3	14 41.1 1.007 156.3	15 11.0 1.007 156.3	15 40.9 1.007 156.2	16 10.9 1.007 156.2	16 40.8 1.007 156.1	3
4	13 07.0 1.007 155.4	13 37.0 1.007 155.3	14 06.9 1.007 155.3	14 36.8 1.007 155.3	15 06.7 1.007 155.2	15 36.6 1.007 155.2	16 06.6 1.007 155.2	16 36.5 1.007 155.1	4
25	13 02.6 1.008 154.4	13 32.5 1.008 154.3	14 02.4 1.008 154.3	14 32.4 1.008 154.2	15 02.3 1.008 154.2	15 32.2 1.008 154.2	16 02.1 1.008 154.1	16 32.0 1.008 154.1	25
6	12 58.0 1.008 153.3	13 27.9 1.008 153.3	13 57.8 1.008 153.3	14 27.7 1.008 153.2	14 57.7 1.008 153.2	15 27.6 1.008 153.1	15 57.5 1.008 153.1	16 27.4 1.008 153.1	6
7	12 53.3 1.008 152.3	13 23.2 1.008 152.3	13 53.1 1.008 152.2	14 23.0 1.008 152.2	14 52.9 1.008 152.1	15 22.8 1.008 152.1	15 52.7 1.008 152.0	16 22.6 1.008 152.0	7
8	12 48.3 1.008 151.3	13 18.2 1.008 151.3	13 48.1 1.008 151.2	14 18.0 1.008 151.2	14 47.9 1.008 151.1	15 17.8 1.008 151.1	15 47.7 1.009 151.0	16 17.6 1.009 151.0	8
9	12 43.3 1.009 150.3	13 13.1 1.009 150.2	13 43.0 1.009 150.2	14 12.9 1.009 150.1	14 42.8 1.009 150.1	15 12.7 1.009 150.1	15 42.6 1.009 150.0	16 12.5 1.009 150.0	9
30	12 38.0 1.009 149.3	13 07.9 1.009 149.2	13 37.8 1.009 149.2	14 07.7 1.009 149.1	14 37.5 1.009 149.1	15 07.4 1.009 149.0	15 37.3 1.009 149.0	16 07.2 1.009 148.9	30
1	12 32.6 1.009 148.2	13 02.5 1.009 148.2	13 32.4 1.009 148.1	14 02.2 1.009 148.1	14 32.1 1.009 148.1	15 02.0 1.009 148.0	15 31.8 1.009 148.0	16 01.7 1.009 147.9	1
2	12 27.0 1.010 147.2	12 56.9 1.010 147.2	13 26.8 1.010 147.1	13 56.6 1.010 147.1	14 26.5 1.010 147.0	14 56.4 1.010 147.0	15 26.2 1.010 146.9	15 56.1 1.010 146.9	2
3	12 21.3 1.010 146.2	12 51.2 1.010 146.2	13 21.0 1.010 146.1	13 50.9 1.010 146.1	14 20.8 1.010 146.0	14 50.6 1.010 146.0	15 20.5 1.010 145.9	15 50.3 1.010 145.9	3
4	12 15.5 1.010 145.2	12 45.3 1.010 145.1	13 15.2 1.010 145.1	13 45.0 1.010 145.0	14 14.9 99 10 145.0	14 44.7 99 10 144.9	15 14.6 99 10 144.9	15 44.4 99 10 144.8	4
35	12 09.4 99 10 144.2	12 39.3 99 10 144.1	13 09.1 99 10 144.1	13 39.0 99 10 144.0	14 08.8 99 10 144.0	14 38.6 99 10 143.9	15 08.5 99 10 143.9	15 38.3 99 10 143.8	35
6	12 03.3 99 11 143.2	12 33.1 99 11 143.1	13 02.9 99 11 143.1	13 32.8 99 11 143.0	14 02.6 99 11 142.9	14 32.4 99 11 142.9	15 02.3 99 11 142.8	15 32.1 99 11 142.8	6
7	11 56.9 99 11 142.1	12 26.8 99 11 142.1	12 56.6 99 11 142.0	13 26.4 99 11 142.0	13 56.2 99 11 141.9	14 26.1 99 11 141.9	14 55.9 99 11 141.8	15 25.7 99 11 141.8	7
8	11 50.5 99 11 141.1	12 20.3 99 11 141.1	12 50.1 99 11 141.0	13 19.9 99 11 141.0	13 49.7 99 11 140.9	14 19.6 99 11 140.9	14 49.4 99 11 140.8	15 19.2 99 11 140.7	8
9	11 43.9 99 11 140.1	12 13.7 99 11 140.1	12 43.5 99 11 140.0	13 13.3 99 11 139.9	13 43.1 99 11 139.9	14 12.9 99 11 139.8	14 42.7 99 11 139.8	15 12.5 99 11 139.7	9
40	11 37.1 99 12 139.1	12 06.9 99 12 139.0	12 36.7 99 12 139.0	13 06.5 99 12 138.9	13 36.3 99 12 138.9	14 06.1 99 12 138.8	14 35.9 99 12 138.8	15 05.7 99 12 138.7	40
1	11 30.2 99 12 138.1	12 00.0 99 12 138.0	12 29.8 99 12 138.0	12 59.6 99 12 137.9	13 29.4 99 12 137.9	13 59.2 99 12 137.7	14 29.0 99 12 137.7	14 58.8 99 12 137.7	1
2	11 23.2 99 12 137.1	11 53.0 99 12 137.0	12 22.8 99 12 137.0	12 52.6 99 12 136.9	13 22.3 99 12 136.8	13 52.1 99 12 136.8	14 21.9 99 12 136.7	14 51.7 99 12 136.7	2
3	11 16.0 99 12 136.1	11 45.8 99 12 136.0	12 15.6 99 12 136.0	12 45.4 99 12 135.9	13 15.2 99 12 135.8	13 44.9 99 12 135.8	14 14.7 99 12 135.7	14 44.5 99 12 135.6	3
4	11 08.7 99 12 135.1	11 38.5 99 12 135.0	12 08.3 99 12 134.9	12 38.1 99 12 134.9	13 07.8 99 12 134.8	13 37.6 99 12 134.8	14 07.4 99 12 134.7	14 37.1 99 12 134.6	4
45	11 01.3 99 13 134.1	11 31.1 99 13 134.0	12 00.8 99 13 133.9	12 30.6 99 13 133.9	13 00.4 99 13 133.8	13 30.1 99 13 133.7	13 59.9 99 13 133.7	14 29.6 99 13 133.6	45
6	10 53.8 99 13 133.0	11 23.5 99 13 133.0	11 53.3 99 13 132.9	12 23.0 99 13 132.8	12 52.8 99 13 132.8	13 22.5 99 13 132.7	13 52.3 99 13 132.7	14 22.0 99 13 132.6	6
7	10 46.1 99 13 132.0	11 15.8 99 13 132.0	11 45.6 99 13 131.9	12 15.3 99 13 131.8	12 45.1 99 13 131.8	13 14.8 99 13 131.7	13 44.6 99 13 131.6	14 14.3 99 13 131.6	7
8	10 38.3 99 13 131.0	11 08.0 99 13 131.0	11 37.8 99 13 130.8	12 07.5 99 13 130.8	12 37.2 99 13 130.8	13 07.0 99 13 130.7	13 36.7 99 13 130.6	14 06.5 99 13 130.6	8
9	10 30.4 99 13 130.0	11 00.1 99 13 130.0	11 29.8 99 13 129.9	11 59.6 99 13 129.8	12 29.3 99 13 129.8	12 59.0 99 13 129.7	13 28.8 99 14 129.6	13 58.5 99 14 129.5	9
50	10 22.3 99 14 129.0	10 52.1 99 14 129.0	11 21.8 99 14 128.8	11 51.5 99 14 128.8	12 21.2 99 14 128.7	12 50.9 99 14 128.7	13 20.7 99 14 128.6	13 50.4 99 14 128.5	50
1	10 14.2 99 14 128.0	10 43.9 99 14 128.0	11 13.6 99 14 127.9	11 43.3 99 14 127.8	12 13.0 99 14 127.8	12 42.8 99 14 127.7	13 12.5 99 14 127.6	13 42.2 99 14 127.5	1
2	10 05.9 99 14 127.0	10 35.6 99 14 126.9	11 05.3 99 14 126.9	11 35.0 99 14 126.8	12 04.8 99 14 126.7	12 34.5 99 14 126.7	13 04.2 99 14 126.6	13 33.9 99 14 126.5	2
3	9 57.5 99 14 126.0	10 27.2 99 14 125.9	10 56.9 99 14 125.9	11 26.6 99 14 125.8	11 56.3 99 14 125.7	12 26.0 99 14 125.7	12 55.7 99 14 125.6	13 25.4 99 14 125.5	3
4	9 49.1 99 14 125.0	10 18.8 99 14 124.9	10 48.5 99 14 124.9	11 18.1 99 14 124.8	11 47.8 99 14 124.7	12 17.5 99 14 124.6	12 47.2 99 14 124.6	13 16.9 99 14 124.5	4
55	9 40.5 99 14 124.0	10 10.2 99 14 123.9	10 39.9 99 14 123.8	11 09.5 99 14 123.8	11 39.2 99 15 123.7	12 08.9 99 15 123.6	12 38.6 99 15 123.6	13 08.3 99 15 123.5	55
6	9 31.8 99 15 123.0	10 01.5 99 15 122.9	10 31.2 99 15 122.9	11 00.8 99 15 122.8	11 30.5 99 15 122.7	12 00.2 99 15 122.6	12 29.8 99 15 122.6	12 59.5 99 15 122.5	6
7	9 23.0 99 15 122.0	9 52.7 99 15 121.9	10 22.4 99 15 121.9	10 52.0 99 15 121.8	11 21.7 99 15 121.7	11 51.4 99 15 121.6	12 21.0 99 15 121.6	12 50.7 99 15 121.5	7
8	9 14.1 99 15 121.0	9 43.8 99 15 120.9	10 13.5 99 15 120.9	10 43.1 99 15 120.8	11 12.8 99 15 120.7	11 42.4 99 15 120.6	12 12.1 99 15 120.6	12 41.8 99 15 120.5	8
9	9 05.2 99 15 120.0	9 34.8 99 15 119.9	10 04.5 99 15 119.9	10 34.1 99 15 119.8	11 03.8 99 15 119.7	11 33.4 99 15 119.6	12 03.1 99 15 119.5	12 32.7 99 15 119.5	9
60	8 56.1 99 15 119.0	9 25.7 99 15 118.9	9 55.4 99 15 118.8	10 25.0 99 15 118.8	10 54.7 99 15 118.7	11 24.3 99 15 118.6	11 54.0 99 15 118.5	12 23.6 99 15 118.5	60
1	8 46.9 99 15 118.0	9 16.6 99 15 117.9	9 46.2 99 15 117.9	10 15.9 99 15 117.8	10 45.5 99 15 117.7	11 15.1 99 15 117.6	11 44.8 99 15 117.5	12 14.4 99 15 117.5	1
2	8 37.7 99 16 117.0	9 07.3 99 16 116.9	9 37.0 99 16 116.9	10 06.6 99 16 116.8	10 36.2 99 16 116.7	11 05.9 99 16 116.6	11 35.5 99 16 116.5	12 05.1 99 16 116.5	2
3	8 28.4 99 16 116.0	8 58.0 99 16 115.9	9 27.6 99 16 115.9	9 57.3 99 16 115.8	10 26.9 99 16 115.7	10 56.5 99 16 115.6	11 26.1 99 16 115.5	11 55.8 99 16 115.5	3
4	8 19.0 99 16 115.0	8 48.6 99 16 114.9	9 18.2 99 16 114.9	9 47.8 99 16 114.8	10 17.5 99 16 114.7	10 47.1 99 16 114.6	11 16.7 99 16 114.5	11 46.3 99 16 114.5	4
65	8 09.5 99 16 114.0	8 39.1 99 16 113.9	9 08.7 99 16 113.8	9 38.3 99 16 113.8	10 08.0 99 16 113.7	10 37.6 99 16 113.6	11 07.2 99 16 113.5	11 36.8 99 16 113.5	65
6	7 59.9 99 16 113.0	8 29.5 99 16 113.0	8 59.2 99 16 112.9	9 28.8 99 16 112.8	9 58.4 99 16 112.7	10 28.0 99 16 112.6	10 57.6 99 16 112.5	11 27.2 99 16 112.5	6
7	7 50.3 99 16 112.0	8 19.9 99 16 112.0	8 49.5 99 16 111.9	9 19.1 99 16 111.8	9 48.7 99 16 111.7	10 18.3 99 16 111.6	10 47.9 99 16 111.5	11 17.5 99 16 111.5	7
8	7 40.6 99 16 111.0	8 10.2 99 16 111.0	8 39.8 99 16 110.8	9 09.4 99 16 110.8	9 39.0 99 16 110.7	10 08.6 99 16 110.6	10 38.2 99 16 110.6	11 07.8 99 16 110.5	8
9	7 30.9 99 16 110.0	8 00.5 99 16 110.0	8 30.1 99 16 109.9	8 59.6 99 16 109.9	9 29.2 99 16 109.7	9 58.8 99 16 109.6	10 28.4 99 16 109.6	10 58.0 99 16 109.5	9
70	7 21.0 99 16 109.1	7 50.6 99 16 109.0	8 20.2 99 16 108.9	8 49.8 99 16 108.8	9 19.4 99 16 108.7	9 49.0 99 16 108.6	10 18.6 99 16 108.6	10 48.2 99 16 108.5	70
1	7 11.2 99 17 108.1	7 40.8 99 17 108.0	8 10.3 99 17 107.9	8 39.9 99 17 107.8	9 09.5 99 17 107.7	9 39.1 99 17 107.6	10 08.7 99 17 107.6	10 38.2 99 17 107.5	1
2	7 01.2 99 17 107.1	7 30.8 99 17 107.0	8 00.4 99 17 106.9	8 30.0 99 17 106.8	8 59.6 99 17 106.7	9 29.1 99 17 106.7	9 58.7 99 17 106.6	10 28.3 99 17 106.5	2
3	6 51.3 99 17 106.1	7 20.8 99 17 106.0	7 50.4 99 17 105.9	8 20.0 99 17 105.8	8 49.6 99 17 105.7	9 19.1 99 17 105.7	9 48.7 99 17 105.6	10 18.3 99 17 105.5	3
4	6 41.2 99 17 105.1	7 10.8 99 17 105.0	7 40.4 99 17 104.9	8 09.9 99 17 104.9	8 39.5 99 17 104.7	9 09.1 99 17 104.7	9 38.6 99 17 104.6	10 08.2 99 17 104.5	4
75	6 31.1 99 17 104.1	7 00.7 99 17 104.0	7 30.3 99 17 103.9	7 59.8 99 17 103.9	8 29.4 99 17 103.8	8 59.0 99 17 103.7	9 28.5 99 17 103.6	9 58.1 99 17 103.5	75
6	6 21.0 99 17 103.1	6 50.6 99 17 103.0	7 20.1 99 17 102.9	7 49.7 99 17 102.9	8 19.3 99 17 102.8	8 48.8 99 17 102.7	9 18.4 99 17 102.6	9 47.9 99 17 102.5	6
7	6 10.8 99 17 102.1	6 40.4 99 17 102.0	7 10.0 99 17 102.0	7 39.5 99 17 101.9	8 09.1 99 17 101.8	8 38.6 99 17 101.7	9 08.2 99 17 101.6	9 37.8 99 17 101.5	7
8	6 00.6 99 17 101.1	6 30.2 99 17 101.0	6 59.8 99 17 101.0	7 29.3 99 17 100.9	7 58.9 99 17 100.8	8 28.4 99 17 100.7	8 58.0 99 17 100.6	9 27.5 99 17 100.5	8
9	5 50.4 99 17 100.2	6 20.0 99 17 100.1	6 49.5 99 17 100.0	7 19.1 99 17 99.9	7 48.6 99 17 99.8	8 18.2 99 17 99.7	8 47.7 99 17 99.6	9 17.3 98 17 99.5	9
80	5 40.1 99 17 99.2	6 09.7 99 17 99.1	6 39.2 99 17 99.0	7 08.8 99 17 98.9	7 38.3 98 17 98.8	8 07.9 98 17 98.7	8 37.4 98 17 98.6	9 07.0 98 17 98.6	80
1	5 29.8 99 17 98.2	5 59.4 99 17 98.1	6 28.9 98 17 98.0	6 58.5 98 17 97.9	7 28.0 98 17 97.8	7 57.6 98 17 97.7	8 27.1 98 17 97.7	8 56.7 98 17 97.6	1
2	5 19.5 98 17 97.2	5 49.0 98 17 97.1	6 18.6 98 17 97.0	6 48.1 98 17 96.9	7 17.7 98 17 96.8	7 47.2 98 17 96.8	8 16.8 98 17 96.7	8 46.3 98 17 96.6	2
3	5 09.2 98 17 96.2	5 38.7 98 17 96.1	6 08.2 98 17 96.0	6 37.8 98 17 95.9	7 07.3 98 17 95.8	7 36.9 98 17 95.8	8 06.4 98 17 95.7	8 36.0 98 17 95.6	3
4		5 28.3 98 17 95.1	5 57.9 98 17 95.0	6 27.4 98 17 94.9	6 57.0 98 17 94.8	7 26.5 98 17 94.8	7 56.0 98 17 94.7	8 25.6 98 17 94.6	4
85		5 17.9 98 17 94.1	5 47.5 98 17 94.1	6 17.0 98 17 94.0	6 46.6 98 17 93.9	7 16.1 98 17 93.8	7 45.7 98 17 93.7	8 15.2 98 17 93.6	85
6		5 07.5 98 17 93.2	5 37.1 98 17 93.1	6 06.6 98 17 93.0	6 36.2 98 17 92.9	7 05.7 98 17 92.8	7 35.3 98 17 92.7	8 04.8 98 17 92.6	6
7			5 26.7 98 17 92.1	5 56.2 98 17 92.0	6 25.8 98 17 91.9	6 55.3 98 17 91.8	7 24.8 98 17 91.7	7 54.4 98 17 91.6	7
8			5 16.3 98 17 91.1	5 45.8 98 17 91.0	6 15.3 98 17 90.9	6 44.9 98 17 90.8	7 14.4 98 17 90.7	7 43.9 98 17 90.7	8
9			5 05.8 98 17 90.1	5 35.4 98 17 90.0	6 04.9 98 17 89.9	6 34.5 98 17 89.9	7 04.0 98 17 89.8	7 33.5 98 17 89.7	9
90				5 25.0 98 17 89.0	5 54.5 98 17 89.0	6 24.1 98 17 88.9	6 53.6 98 17 88.8	7 23.1 98 17 88.7	90

H.A.	4° 00' Alt. Δd Δt Az.	4° 30' Alt. Δd Δt Az.	5° 00' Alt. Δd Δt Az.	5° 30'	6° 00'	6° 30'	7° 00'	7° 30'	H.A.
00	6 00.0 1.0 00 180.0	5 30.0 1.0 00 180.0	5 00.0 1.0 00 180.0						00
1	5 59.9 1.0 00 179.0	5 29.9 1.0 00 179.0							1
2	5 59.6 1.0 01 178.0	5 29.6 1.0 01 178.0							2
3	5 59.2 1.0 01 177.0	5 29.2 1.0 01 177.0							3
4	5 58.5 1.0 01 176.0	5 28.5 1.0 01 176.0							4
05	5 57.7 1.0 02 175.0	5 27.7 1.0 02 175.0							05
6	5 56.7 1.0 02 174.0	5 26.7 1.0 02 174.0							6
7	5 55.5 1.0 02 173.0	5 25.5 1.0 02 173.0							7
8	5 54.2 1.0 03 172.0	5 24.2 1.0 03 172.0							8
9	5 52.6 1.0 03 171.0	5 22.6 1.0 03 171.0							9
10	5 50.9 1.0 03 170.0	5 20.9 1.0 03 170.0							10
1	5 49.0 1.0 03 169.0	5 19.0 1.0 03 169.0							1
2	5 46.9 1.0 04 168.0	5 16.9 1.0 04 168.0							2
3	5 44.7 1.0 04 167.0	5 14.7 1.0 04 167.0							3
4	5 42.2 1.0 04 166.0	5 12.2 1.0 04 166.0							4
15	5 39.6 1.0 05 165.0	5 09.6 1.0 05 165.0							15
6	5 36.8 1.0 05 164.0	5 06.8 1.0 05 164.0							6
7	5 33.8 1.0 05 163.0	5 03.9 1.0 05 163.0							7
8	5 30.7 1.0 06 162.0	5 00.7 1.0 06 162.0							8
9	5 27.4 1.0 06 161.0								9
20	5 23.9 1.0 06 160.0								20
1	5 20.3 1.0 06 159.0								1
2	5 16.4 1.0 07 158.0								2
3	5 12.4 1.0 07 157.0								3
4	5 08.3 1.0 07 156.0								4
25	5 03.9 1.0 07 155.0								25

DECLINATION SAME NAME AS LATITUDE

H.A.	4° 00' Alt. Δd Δt Az.	4° 30' Alt. Δd Δt Az.	5° 00' Alt. Δd Δt Az.	5° 30' Alt. Δd Δt Az.	6° 00' Alt. Δd Δt Az.	6° 30' Alt. Δd Δt Az.	7° 00' Alt. Δd Δt Az.	7° 30' Alt. Δd Δt Az.	H.A.
91				5 14.6 98 17 88.1	5 44.1 98 17 88.0	6 13.6 98 17 87.9	6 43.2 98 17 87.8	7 12.7 98 17 87.7	91
2				5 04.1 98 17 87.1	5 33.7 98 17 87.0	6 03.2 98 17 86.9	6 32.8 98 17 86.8	7 02.3 98 17 86.7	2
3					5 23.3 98 17 86.0	5 52.8 98 17 85.9	6 22.4 98 17 85.8	6 51.9 98 17 85.7	3
4					5 12.9 98 17 85.0	5 42.4 98 17 84.9	6 12.0 98 17 84.8	6 41.5 98 17 84.8	4
95					5 02.5 98 17 84.0	5 32.1 98 17 83.9	6 01.6 98 17 83.9	6 31.2 98 17 83.8	95
6						5 21.7 98 17 83.0	5 51.3 98 17 82.9	6 20.8 98 17 82.8	6
7						5 11.4 98 17 82.0	5 40.9 98 17 81.9	6 10.5 98 17 81.8	7
8						5 01.1 98 17 81.0	5 30.6 98 17 80.9	6 00.2 98 17 80.8	8
9							5 20.4 99 17 79.9	5 49.9 99 17 79.8	9
100							5 10.1 99 17 78.9	5 39.7 99 17 78.9	100
1								5 29.5 99 17 77.9	1
2								5 19.3 99 17 76.9	2
3								5 09.2 99 17 75.9	3

Each data cell is given as: Alt (° ′) Δd Δt Az (°)

H.A.	8° 00′	8° 30′	9° 00′	9° 30′	10° 00′	10° 30′	11° 00′	11° 30′	H.A.
00	18 00.0 1.00 00 180.0	18 30.0 1.00 00 180.0	19 00.0 1.00 00 180.0	19 30.0 1.00 00 180.0	20 00.0 1.00 00 180.0	20 30.0 1.00 00 180.0	21 00.0 1.00 00 180.0	21 30.0 1.00 00 180.0	00
1	17 59.9 1.00 00 179.0	18 29.9 1.00 00 179.0	18 59.9 1.00 00 179.0	19 29.9 1.00 00 179.0	19 59.9 1.00 00 179.0	20 29.9 1.00 00 179.0	20 59.9 1.00 00 178.9	21 29.9 1.00 00 178.9	1
2	17 59.6 1.00 01 177.9	18 29.6 1.00 01 177.9	18 59.6 1.00 01 177.9	19 29.6 1.00 01 177.9	19 59.6 1.00 01 177.9	20 29.6 1.00 01 177.9	20 59.6 1.00 01 177.9	21 29.6 1.00 01 177.9	2
3	17 59.1 1.00 01 176.9	18 29.1 1.00 01 176.9	18 59.1 1.00 01 176.9	19 29.1 1.00 01 176.9	19 59.1 1.00 01 176.9	20 29.1 1.00 01 176.8	20 59.1 1.00 01 176.8	21 29.1 1.00 01 176.8	3
4	17 58.5 1.00 01 175.8	18 28.5 1.00 01 175.8	18 58.5 1.00 01 175.8	19 28.5 1.00 01 175.8	19 58.5 1.00 01 175.8	20 28.5 1.00 01 175.8	20 58.5 1.00 01 175.8	21 28.5 1.00 01 175.8	4
05	17 57.6 1.00 02 174.8	18 27.6 1.00 02 174.8	18 57.6 1.00 02 174.8	19 27.6 1.00 02 174.8	19 57.6 1.00 02 174.8	20 27.6 1.00 02 174.8	20 57.6 1.00 02 174.7	21 27.6 1.00 02 174.7	05
6	17 56.6 1.00 02 173.8	18 26.6 1.00 02 173.7	18 56.6 1.00 02 173.7	19 26.6 1.00 02 173.7	19 56.6 1.00 02 173.7	20 26.6 1.00 02 173.7	20 56.6 1.00 02 173.7	21 26.6 1.00 02 173.7	6
7	17 55.4 1.00 02 172.7	18 25.4 1.00 02 172.7	18 55.4 1.00 02 172.7	19 25.3 1.00 02 172.7	19 55.3 1.00 02 172.7	20 25.3 1.00 02 172.6	20 55.3 1.00 02 172.6	21 25.3 1.00 02 172.6	7
8	17 54.0 1.00 03 171.7	18 23.9 1.00 03 171.7	18 53.9 1.00 03 171.6	19 23.9 1.00 03 171.6	19 53.9 1.00 03 171.6	20 23.9 1.00 03 171.6	20 53.9 1.00 03 171.6	21 23.9 1.00 03 171.6	8
9	17 52.4 1.00 03 170.6	18 22.3 1.00 03 170.6	18 52.3 1.00 03 170.6	19 22.3 1.00 03 170.6	19 52.3 1.00 03 170.6	20 22.3 1.00 03 170.6	20 52.3 1.00 03 170.5	21 22.3 1.00 03 170.5	9
10	17 50.6 1.00 03 169.6	18 20.5 1.00 03 169.6	18 50.5 1.00 03 169.6	19 20.5 1.00 03 169.5	19 50.5 1.00 03 169.5	20 20.5 1.00 03 169.5	20 50.5 1.00 03 169.5	21 20.5 1.00 03 169.5	10
1	17 48.6 1.00 04 168.6	18 18.6 1.00 04 168.5	18 48.5 1.00 04 168.5	19 18.5 1.00 04 168.5	19 48.5 1.00 04 168.5	20 18.5 1.00 04 168.4	20 48.5 1.00 04 168.4	21 18.5 1.00 04 168.4	1
2	17 46.4 1.00 04 167.5	18 16.4 1.00 04 167.5	18 46.4 1.00 04 167.5	19 16.4 1.00 04 167.5	19 46.3 1.00 04 167.4	20 16.3 1.00 04 167.4	20 46.3 1.00 04 167.4	21 16.3 1.00 04 167.4	2
3	17 44.1 1.00 04 166.5	18 14.1 1.00 04 166.5	18 44.0 1.00 04 166.4	19 14.0 1.00 04 166.4	19 44.0 1.00 04 166.4	20 14.0 1.00 04 166.4	20 43.9 1.00 05 166.3	21 13.9 1.00 04 166.3	3
4	17 41.6 1.00 04 165.4	18 11.5 1.00 04 165.4	18 41.5 1.00 04 165.4	19 11.5 1.00 05 165.4	19 41.4 1.00 05 165.3	20 11.4 1.00 05 165.3	20 41.4 1.00 05 165.3	21 11.3 1.00 05 165.3	4
15	17 38.8 1.00 05 164.4	18 08.8 1.00 05 164.4	18 38.8 1.00 05 164.3	19 08.7 1.00 05 164.3	19 38.7 1.00 05 164.3	20 08.7 1.00 05 164.3	20 38.6 1.00 05 164.2	21 08.6 1.00 05 164.2	15
6	17 35.9 1.00 05 163.4	18 05.9 1.00 05 163.3	18 35.9 1.00 05 163.3	19 05.8 1.00 05 163.3	19 35.8 1.00 05 163.3	20 05.8 1.00 05 163.2	20 35.7 1.00 05 163.2	21 05.7 1.00 05 163.2	6
7	17 32.9 1.00 05 162.3	18 02.8 1.00 05 162.3	18 32.8 1.00 05 162.3	19 02.7 1.00 05 162.2	19 32.7 1.00 05 162.2	20 02.7 1.00 05 162.2	20 32.6 1.00 05 162.2	21 02.6 1.00 05 162.1	7
8	17 29.6 1.00 06 161.3	17 59.6 1.00 06 161.3	18 29.5 1.00 06 161.2	18 59.5 1.00 06 161.2	19 29.4 1.00 06 161.2	19 59.4 1.00 06 161.1	20 29.3 1.00 06 161.1	20 59.3 1.00 06 161.1	8
9	17 26.2 1.00 06 160.2	17 56.1 1.00 06 160.2	18 26.1 1.00 06 160.2	18 56.0 1.00 06 160.2	19 26.0 1.00 06 160.1	19 55.9 1.00 06 160.1	20 25.9 1.00 06 160.1	20 55.8 1.00 06 160.0	9
20	17 22.6 1.00 06 159.2	17 52.5 1.00 06 159.2	18 22.5 1.00 06 159.1	18 52.4 1.00 06 159.1	19 22.3 1.00 06 159.1	19 52.3 1.00 06 159.0	20 22.2 1.00 06 159.0	20 52.2 1.00 06 159.0	20
1	17 18.8 1.00 07 158.2	17 48.7 1.00 07 158.1	18 18.7 1.00 07 158.1	18 48.6 1.00 07 158.1	19 18.5 1.00 07 158.0	19 48.5 1.00 07 158.0	20 18.4 1.00 07 158.0	20 48.3 1.00 07 157.9	1
2	17 14.8 1.00 07 157.1	17 44.8 1.00 07 157.1	18 14.7 1.00 07 157.1	18 44.6 1.00 07 157.0	19 14.5 1.00 07 157.0	19 44.5 1.00 07 157.0	20 14.4 1.00 07 156.9	20 44.3 1.00 07 156.9	2
3	17 10.7 1.00 07 156.1	17 40.6 1.00 07 156.1	18 10.5 1.00 07 156.0	18 40.5 1.00 07 156.0	19 10.4 1.00 07 156.0	19 40.3 1.00 07 155.9	20 10.2 1.00 07 155.9	20 40.2 1.00 07 155.8	3
4	17 06.4 1.00 07 155.1	17 36.3 1.00 07 155.0	18 06.2 1.00 07 155.0	18 36.1 1.00 08 155.0	19 06.1 1.00 08 154.9	19 36.0 1.00 08 154.9	20 05.9 1.00 08 154.8	20 35.8 1.00 08 154.8	4
25	17 01.9 1.00 08 154.0	17 31.8 1.00 08 154.0	18 01.7 1.00 08 154.0	18 31.7 1.00 08 153.9	19 01.6 1.00 08 153.9	19 31.5 1.00 08 153.8	20 01.4 1.00 08 153.8	20 31.3 1.00 08 153.8	25
6	16 57.3 1.00 08 153.0	17 27.2 1.00 08 153.0	17 57.1 1.00 08 152.9	18 27.0 1.00 08 152.9	18 56.9 1.00 08 152.8	19 26.8 1.00 08 152.8	19 56.7 1.00 08 152.8	20 26.6 1.00 08 152.7	6
7	16 52.5 1.00 08 151.9	17 22.4 1.00 08 151.9	17 52.3 1.00 08 151.8	18 22.2 1.00 08 151.8	18 52.1 1.00 08 151.8	19 21.9 1.00 08 151.7	19 51.8 1.00 08 151.7	20 21.7 1.00 08 151.6	7
8	16 47.5 1.00 09 150.9	17 17.4 1.00 09 150.9	17 47.3 1.00 09 150.8	18 17.2 1.00 09 150.8	18 47.0 1.00 09 150.8	19 16.9 1.00 09 150.7	19 46.8 1.00 09 150.7	20 16.7 1.00 09 150.6	8
9	16 42.3 1.00 09 149.9	17 12.2 1.00 09 149.9	17 42.1 1.00 09 149.8	18 12.0 1.00 09 149.8	18 41.9 1.00 09 149.7	19 11.8 1.00 09 149.7	19 41.6 1.00 09 149.6	20 11.5 1.00 09 149.6	9
30	16 37.0 1.00 09 148.9	17 06.9 1.00 09 148.8	17 36.8 1.00 09 148.8	18 06.7 1.00 09 148.7	18 36.5 1.00 09 148.7	19 06.4 1.00 09 148.6	19 36.3 1.00 09 148.6	20 06.2 1.00 09 148.6	30
1	16 31.6 1.00 10 147.9	17 01.4 1.00 10 147.8	17 31.3 1.00 10 147.8	18 01.1 1.00 10 147.7	18 31.0 1.00 10 147.7	19 00.9 1.00 10 147.6	19 30.8 1.00 10 147.6	20 00.6 1.00 10 147.5	1
2	16 26.0 1.0 10 146.8	16 55.8 1.0 10 146.8	17 25.7 1.0 10 146.7	17 55.5 1.0 10 146.7	18 25.4 1.0 10 146.6	18 55.3 1.0 10 146.6	19 25.1 1.0 10 146.5	19 55.0 1.0 10 146.5	2
3	16 20.2 1.0 10 145.8	16 50.0 1.0 10 145.8	17 19.9 1.0 10 145.7	17 49.7 1.0 10 145.6	18 19.6 1.0 10 145.6	18 49.4 1.0 10 145.5	19 19.3 1.0 10 145.5	19 49.1 1.0 10 145.4	3
4	16 14.2 99 10 144.8	16 44.1 99 10 144.7	17 13.9 99 10 144.7	17 43.8 99 10 144.6	18 13.6 99 10 144.6	18 43.5 99 10 144.5	19 13.3 99 10 144.5	19 43.1 99 10 144.4	4
35	16 08.2 99 10 143.8	16 38.0 99 10 143.7	17 07.8 99 10 143.6	17 37.7 99 10 143.6	18 07.5 99 10 143.5	18 37.3 99 10 143.5	19 07.2 99 10 143.4	19 37.0 99 10 143.4	35
6	16 01.9 99 11 142.7	16 31.8 99 11 142.7	17 01.6 99 11 142.6	17 31.4 99 11 142.6	18 01.2 99 11 142.5	18 31.1 99 11 142.4	19 00.9 99 11 142.4	19 30.7 99 11 142.3	6
7	15 55.5 99 11 141.7	16 25.4 99 11 141.6	16 55.2 99 11 141.6	17 25.0 99 11 141.5	17 54.8 99 11 141.5	18 24.6 99 11 141.4	18 54.5 99 11 141.4	19 24.3 99 11 141.3	7
8	15 49.0 99 11 140.7	16 18.8 99 11 140.6	16 48.6 99 11 140.6	17 18.5 99 11 140.5	17 48.3 99 11 140.4	18 18.1 99 11 140.4	18 47.9 99 11 140.3	19 17.7 99 11 140.3	8
9	15 42.3 99 11 139.7	16 12.1 99 11 139.6	16 41.9 99 11 139.5	17 11.8 99 11 139.5	17 41.6 99 11 139.4	18 11.4 99 11 139.4	18 41.2 99 11 139.3	19 11.0 99 11 139.2	9
40	15 35.5 99 12 138.6	16 05.3 99 12 138.6	16 35.1 99 12 138.5	17 04.9 99 12 138.5	17 34.7 99 12 138.4	18 04.5 99 12 138.3	18 34.3 99 12 138.3	19 04.1 99 12 138.2	40
1	15 28.6 99 12 137.6	15 58.4 99 12 137.6	16 28.1 99 12 137.5	16 57.9 99 12 137.4	17 27.7 99 12 137.4	17 57.5 99 12 137.3	18 27.3 99 12 137.2	18 57.1 99 12 137.2	1
2	15 21.5 99 12 136.6	15 51.3 99 12 136.5	16 21.0 99 12 136.5	16 50.8 99 12 136.4	17 20.6 99 12 136.3	17 50.4 99 12 136.3	18 20.1 99 12 136.2	18 49.9 99 12 136.1	2
3	15 14.3 99 12 135.6	15 44.0 99 12 135.5	16 13.8 99 12 135.4	16 43.6 99 12 135.4	17 13.3 99 12 135.3	17 43.1 99 12 135.3	18 12.9 99 13 135.2	18 42.6 99 13 135.1	3
4	15 06.9 99 12 134.6	15 36.7 99 12 134.5	16 06.4 99 13 134.4	16 36.2 99 13 134.4	17 05.9 99 13 134.3	17 35.7 99 13 134.2	18 05.5 99 13 134.2	18 35.2 99 13 134.1	4
45	14 59.4 99 13 133.5	15 29.2 99 13 133.5	15 58.9 99 13 133.4	16 28.7 99 13 133.3	16 58.4 99 13 133.3	17 28.2 99 13 133.2	17 57.9 99 13 133.1	18 27.7 99 13 133.1	45
6	14 51.8 99 13 132.5	15 21.5 99 13 132.5	15 51.3 99 13 132.4	16 21.0 99 13 132.3	16 50.8 99 13 132.3	17 20.5 99 13 132.2	17 50.3 99 13 132.1	18 20.0 99 13 132.0	6
7	14 44.0 99 13 131.5	15 13.8 99 13 131.4	15 43.5 99 13 131.4	16 13.3 99 13 131.3	16 43.0 99 13 131.2	17 12.7 99 13 131.2	17 42.5 99 13 131.1	18 12.2 99 13 131.0	7
8	14 36.2 99 13 130.5	15 05.9 99 13 130.4	15 35.6 99 13 130.4	16 05.4 99 13 130.3	16 35.1 99 13 130.2	17 04.8 99 13 130.1	17 34.6 99 13 130.1	18 04.3 99 13 130.0	8
9	14 28.2 99 14 129.5	14 57.9 99 14 129.4	15 27.6 99 14 129.3	15 57.4 99 14 129.3	16 27.1 99 14 129.2	16 56.8 99 14 129.1	17 26.5 99 14 129.1	17 56.2 99 14 129.0	9
50	14 20.1 99 14 128.5	14 49.8 99 14 128.4	15 19.5 99 14 128.3	15 49.2 99 14 128.3	16 19.0 99 14 128.2	16 48.7 99 14 128.1	17 18.4 99 14 128.0	17 48.1 99 14 128.0	50
1	14 11.9 99 14 127.4	14 41.6 99 14 127.4	15 11.3 99 14 127.3	15 41.0 99 14 127.2	16 10.7 99 14 127.2	16 40.4 99 14 127.1	17 10.1 99 14 127.0	17 39.8 99 14 126.9	1
2	14 03.6 99 14 126.4	14 33.3 99 14 126.4	15 03.0 99 14 126.3	15 32.7 99 14 126.2	16 02.4 99 14 126.2	16 32.0 99 14 126.1	17 01.7 99 14 126.0	17 31.4 99 14 125.9	2
3	13 55.1 99 14 125.4	14 24.8 99 14 125.4	14 54.5 99 14 125.3	15 24.2 99 14 125.2	15 53.9 99 14 125.1	16 23.6 99 14 125.1	16 53.3 99 14 125.0	17 22.9 99 14 124.9	3
4	13 46.6 99 14 124.4	14 16.3 99 14 124.3	14 45.9 99 14 124.3	15 15.6 99 14 124.2	15 45.3 99 14 124.1	16 15.0 99 14 124.0	16 44.7 99 14 124.0	17 14.3 99 14 123.9	4
55	13 37.9 99 15 123.4	14 07.6 99 15 123.3	14 37.3 99 15 123.3	15 07.0 99 15 123.2	15 36.6 99 15 123.1	16 06.3 99 15 123.1	16 36.0 99 15 123.0	17 05.6 99 15 122.9	55
6	13 29.2 99 15 122.4	13 58.9 99 15 122.3	14 28.5 99 15 122.2	14 58.2 99 15 122.2	15 27.9 99 15 122.1	15 57.5 99 15 122.0	16 27.2 99 15 121.9	16 56.8 99 15 121.9	6
7	13 20.3 99 15 121.4	13 50.0 99 15 121.3	14 19.7 99 15 121.2	14 49.3 99 15 121.2	15 19.0 99 15 121.1	15 48.6 99 15 121.0	16 18.3 99 15 120.9	16 47.9 99 15 120.9	7
8	13 11.4 99 15 120.4	13 41.1 99 15 120.3	14 10.7 99 15 120.2	14 40.4 99 15 120.2	15 10.0 99 15 120.1	15 39.7 99 15 120.0	16 09.3 99 15 119.9	16 39.0 99 15 119.8	8
9	13 02.4 99 15 119.4	13 32.0 99 15 119.3	14 01.7 99 15 119.2	14 31.3 99 15 119.2	15 01.0 99 15 119.1	15 30.6 99 15 119.0	16 00.2 99 15 118.9	16 29.9 99 15 118.8	9
60	12 53.3 99 15 118.4	13 22.9 99 15 118.3	13 52.5 99 16 118.3	14 22.2 99 16 118.1	14 51.8 99 16 118.1	15 21.4 99 16 118.0	15 51.1 99 16 117.9	16 20.7 99 16 117.8	60
1	12 44.0 99 16 117.4	13 13.7 99 16 117.3	13 43.3 99 16 117.2	14 12.9 99 16 117.1	14 42.6 99 16 117.1	15 12.2 99 16 117.0	15 41.8 99 16 116.9	16 11.4 99 16 116.8	1
2	12 34.8 99 16 116.4	13 04.4 99 16 116.3	13 34.0 99 16 116.2	14 03.6 99 16 116.1	14 33.2 99 16 116.1	15 02.9 99 16 116.0	15 32.5 99 16 115.9	16 02.1 99 16 115.8	2
3	12 25.4 99 16 115.4	12 55.0 99 16 115.3	13 24.6 99 16 115.2	13 54.2 99 16 115.1	14 23.8 99 16 115.1	14 53.5 99 16 115.0	15 23.1 99 16 114.9	15 52.7 99 16 114.8	3
4	12 15.9 99 16 114.4	12 45.5 99 16 114.3	13 15.2 99 16 114.2	13 44.8 99 16 114.1	14 14.4 99 16 114.0	14 44.0 99 16 114.0	15 13.6 99 16 113.9	15 43.2 99 16 113.8	4
65	12 06.4 99 16 113.4	12 36.0 99 16 113.3	13 05.6 99 16 113.2	13 35.2 99 16 113.1	14 04.8 99 16 113.0	14 34.4 99 16 113.0	15 04.0 99 16 112.9	15 33.6 99 16 112.8	65
6	11 56.8 99 16 112.4	12 26.4 99 16 112.3	12 56.0 99 16 112.2	13 25.6 99 16 112.1	13 55.2 99 16 112.0	14 24.8 99 16 112.0	14 54.4 99 16 111.9	15 24.0 99 16 111.8	6
7	11 47.1 99 16 111.4	12 16.7 99 16 111.3	12 46.3 99 16 111.2	13 15.9 99 16 111.1	13 45.5 99 16 111.0	14 15.1 99 16 111.0	14 44.7 99 16 110.9	15 14.3 99 16 110.8	7
8	11 37.4 99 16 110.4	12 07.0 99 16 110.3	12 36.6 99 16 110.2	13 06.2 99 16 110.1	13 35.8 99 16 110.0	14 05.3 99 16 110.0	14 34.9 99 16 109.9	15 04.5 99 16 109.8	8
9	11 27.6 99 16 109.4	11 57.2 99 16 109.3	12 26.8 99 16 109.2	12 56.4 99 16 109.1	13 25.9 99 16 109.0	13 55.5 99 16 109.0	14 25.1 99 16 108.9	14 54.7 99 16 108.8	9
70	11 17.7 99 17 108.4	11 47.3 99 17 108.3	12 16.9 99 17 108.2	12 46.5 99 17 108.1	13 16.1 99 17 108.0	13 45.6 99 17 107.9	14 15.2 99 17 107.9	14 44.8 99 17 107.8	70
1	11 07.8 99 17 107.4	11 37.4 99 17 107.3	12 07.0 99 17 107.2	12 36.5 99 17 107.1	13 06.1 99 17 107.1	13 35.7 99 17 107.0	14 05.3 99 17 106.9	14 34.8 99 17 106.8	1
2	10 57.9 99 17 106.4	11 27.4 99 17 106.3	11 57.0 99 17 106.2	12 26.6 99 17 106.1	12 56.1 99 17 106.1	13 25.7 99 17 106.0	13 55.3 99 17 105.9	14 24.8 99 17 105.8	2
3	10 47.8 99 17 105.4	11 17.4 99 17 105.3	11 47.0 99 17 105.2	12 16.5 99 17 105.1	12 46.1 99 17 105.1	13 15.7 99 17 105.0	13 45.2 99 17 104.9	14 14.8 99 17 104.8	3
4	10 37.8 99 17 104.4	11 07.3 99 17 104.3	11 36.9 99 17 104.2	12 06.5 99 17 104.2	12 36.0 99 17 104.1	13 05.6 99 17 104.0	13 35.1 99 17 103.9	14 04.7 99 17 103.8	4
75	10 27.7 99 17 103.4	10 57.2 99 17 103.3	11 26.8 99 17 103.2	11 56.3 99 17 103.2	12 25.9 99 17 103.1	12 55.4 99 17 103.0	13 25.0 99 17 102.9	13 54.5 98 17 102.8	75
6	10 17.5 99 17 102.4	10 47.1 99 17 102.3	11 16.6 99 17 102.3	11 46.2 99 17 102.2	12 15.7 99 17 102.1	12 45.3 98 17 102.0	13 14.8 98 17 101.9	13 44.4 98 17 101.8	6
7	10 07.3 99 17 101.4	10 36.9 99 17 101.3	11 06.4 99 17 101.3	11 36.0 99 17 101.2	12 05.5 98 17 101.1	12 35.1 98 17 101.0	13 04.6 98 17 100.9	13 34.1 98 17 100.8	7
8	9 57.1 99 17 100.4	10 26.6 99 17 100.4	10 56.2 98 17 100.3	11 25.7 98 17 100.2	11 55.3 98 17 100.1	12 24.8 98 17 100.0	12 54.4 98 17 99.9	13 23.9 98 17 99.8	8
9	9 46.8 99 17 99.5	10 16.3 99 17 99.4	10 45.9 98 17 99.3	11 15.4 98 17 99.2	11 45.0 98 17 99.1	12 14.5 98 17 99.0	12 44.0 98 17 98.9	13 13.6 98 17 98.8	9
80	9 36.5 98 17 98.5	10 06.1 98 17 98.4	10 35.6 98 17 98.3	11 05.2 98 17 98.2	11 34.7 98 17 98.1	12 04.2 98 17 98.0	12 33.8 98 17 97.9	13 03.3 98 17 97.8	80
1	9 26.2 98 17 97.5	9 55.7 98 17 97.4	10 25.3 98 17 97.3	10 54.8 98 17 97.2	11 24.4 98 17 97.1	11 53.9 98 17 97.0	12 23.4 98 17 96.9	12 53.0 98 17 96.9	1
2	9 15.9 98 17 96.5	9 45.4 98 17 96.4	10 14.9 98 17 96.3	10 44.5 98 17 96.2	11 14.0 98 17 96.1	11 43.6 98 17 96.0	12 13.1 98 17 96.0	12 42.6 98 17 95.9	2
3	9 05.5 98 17 95.5	9 35.0 98 17 95.4	10 04.6 98 17 95.3	10 34.1 98 17 95.2	11 03.6 98 17 95.1	11 33.2 98 17 95.1	12 02.7 98 17 95.0	12 32.2 98 17 94.9	3
4	8 55.1 98 17 94.5	9 24.7 98 17 94.4	9 54.2 98 17 94.3	10 23.7 98 17 94.2	10 53.3 98 17 94.1	11 22.8 98 17 94.1	11 52.3 98 17 94.0	12 21.9 98 17 93.9	4
85	8 44.7 98 17 93.5	9 14.3 98 17 93.4	9 43.8 98 17 93.3	10 13.3 98 17 93.3	10 42.9 98 17 93.2	11 12.4 98 17 93.1	11 41.9 98 17 93.0	12 11.5 98 17 92.9	85
6	8 34.3 98 17 92.5	9 03.9 98 17 92.5	9 33.4 98 17 92.4	10 02.9 98 17 92.3	10 32.5 98 17 92.2	11 02.0 98 17 92.1	11 31.5 98 17 92.0	12 01.0 98 17 91.9	6
7	8 23.9 98 17 91.6	8 53.4 98 17 91.5	9 23.0 98 17 91.4	9 52.5 98 17 91.3	10 22.0 98 17 91.2	10 51.6 98 17 91.1	11 21.1 98 17 91.0	11 50.6 98 17 90.9	7
8	8 13.5 98 17 90.6	8 43.0 98 17 90.5	9 12.6 98 17 90.4	9 42.1 98 17 90.3	10 11.6 98 17 90.2	10 41.2 98 17 90.1	11 10.7 98 17 90.0	11 40.2 98 17 89.9	8
9	8 03.1 98 17 89.5	8 32.6 98 17 89.5	9 02.1 98 17 89.4	9 31.7 98 17 89.3	10 01.2 98 17 89.2	10 30.7 98 17 89.1	11 00.2 98 17 89.0	11 29.8 98 17 89.0	9
90	7 52.7 98 17 88.6	8 22.2 98 17 88.5	8 51.7 98 17 88.4	9 21.3 98 17 88.3	9 50.8 98 17 88.2	10 20.3 98 17 88.2	10 49.8 98 17 88.1	11 19.4 98 17 88.0	90

Lat. 80°

H.A.	8° 00' Alt. (Δd Δt)	Az.	8° 30' Alt. (Δd Δt)	Az.	9° 00' Alt. (Δd Δt)	Az.	9° 30' Alt. (Δd Δt)	Az.	10° 00' Alt. (Δd Δt)	Az.	10° 30' Alt. (Δd Δt)	Az.	11° 00' Alt. (Δd Δt)	Az.	11° 30' Alt. (Δd Δt)	Az.	H.A.
91	7 42.2 98 17	87.6	8 11.8 98 17	87.5	8 41.3 98 17	87.4	9 10.9 98 17	87.4	9 40.4 98 17	87.3	10 09.9 98 17	87.2	10 39.4 98 17	87.1	11 09.0 98 17	87.0	91
2	7 31.8 98 17	86.6	8 01.4 98 17	86.5	8 30.9 98 17	86.5	9 00.4 98 17	86.4	9 30.0 98 17	86.3	9 59.5 98 17	86.2	10 29.0 98 17	86.1	10 58.6 98 17	86.0	2
3	7 21.4 98 17	85.7	7 51.0 98 17	85.6	8 20.5 98 17	85.5	8 50.1 98 17	85.4	9 19.6 98 17	85.3	9 49.1 98 17	85.2	10 18.7 98 17	85.1	10 48.2 98 17	85.0	3
4	7 11.1 98 17	84.7	7 40.6 98 17	84.6	8 10.1 98 17	84.5	8 39.7 98 17	84.4	9 09.2 98 17	84.3	9 38.7 98 17	84.2	10 08.3 98 17	84.1	10 37.8 98 17	84.0	4
95	7 00.7 98 17	83.7	7 30.2 98 17	83.6	7 59.8 98 17	83.5	8 29.3 98 17	83.4	8 58.9 98 17	83.3	9 28.4 98 17	83.2	9 57.9 98 17	83.2	10 27.5 98 17	83.1	95
6	6 50.4 98 17	82.7	7 19.9 98 17	82.6	7 49.4 98 17	82.5	8 19.0 98 17	82.4	8 48.5 98 17	82.4	9 18.1 98 17	82.3	9 47.6 98 17	82.2	10 17.1 98 17	82.1	6
7	6 40.0 98 17	81.7	7 09.6 98 17	81.6	7 39.1 98 17	81.5	8 08.7 98 17	81.5	8 38.2 98 17	81.4	9 07.7 98 17	81.3	9 37.3 98 17	81.2	10 06.8 98 17	81.1	7
8	6 29.7 98 17	80.7	6 59.3 98 17	80.7	7 28.8 98 17	80.6	7 58.4 98 17	80.5	8 27.9 98 17	80.4	8 57.5 98 17	80.3	9 27.0 98 17	80.2	9 56.5 98 17	80.1	8
9	6 19.5 98 17	79.8	6 49.0 98 17	79.7	7 18.6 98 17	79.6	7 48.1 98 17	79.5	8 17.7 98 17	79.4	8 47.2 98 17	79.3	9 16.7 98 17	79.2	9 46.3 98 17	79.1	9
100	6 09.2 99 17	78.8	6 38.8 99 17	78.7	7 08.3 99 17	78.6	7 37.9 99 17	78.5	8 07.4 98 17	78.4	8 37.0 98 17	78.3	9 06.5 98 17	78.3	9 36.1 98 17	78.2	100
1	5 59.0 99 17	77.8	6 28.6 99 17	77.7	6 58.1 99 17	77.6	7 27.7 99 17	77.5	7 57.2 99 17	77.4	8 26.8 99 17	77.4	8 56.3 99 17	77.3	9 25.9 98 17	77.2	1
2	5 48.9 99 17	76.8	6 18.4 99 17	76.7	6 48.0 99 17	76.6	7 17.5 99 17	76.6	7 47.1 99 17	76.5	8 16.7 99 17	76.4	8 46.2 99 17	76.3	9 15.8 99 17	76.2	2
3	5 38.7 99 17	75.8	6 08.3 99 17	75.7	6 37.9 99 17	75.7	7 07.4 99 17	75.6	7 37.0 99 17	75.5	8 06.5 99 17	75.4	8 36.1 99 17	75.3	9 05.7 99 17	75.2	3
4	5 28.7 99 17	74.9	5 58.2 99 17	74.8	6 27.8 99 17	74.7	6 57.4 99 17	74.6	7 26.9 99 17	74.5	7 56.5 99 17	74.4	8 26.0 99 17	74.3	8 55.6 99 17	74.3	4
105	5 18.6 99 17	73.9	5 48.2 99 17	73.8	6 17.8 99 17	73.7	6 47.3 99 17	73.6	7 16.9 99 17	73.5	7 46.5 99 17	73.4	8 16.0 99 17	73.4	8 45.6 99 17	73.3	105
6	5 08.6 99 17	72.9	5 38.2 99 17	72.8	6 07.8 99 17	72.7	6 37.4 99 17	72.6	7 06.9 99 16	72.6	7 36.5 99 17	72.5	8 06.1 99 16	72.4	8 35.7 99 16	72.3	6
7			5 28.3 99 16	71.8	5 57.9 99 16	71.7	6 27.5 99 16	71.7	6 57.0 99 16	71.6	7 26.6 99 16	71.5	7 56.2 99 16	71.4	8 25.8 99 16	71.3	7
8			5 18.4 99 16	70.8	5 48.0 99 16	70.8	6 17.6 99 16	70.7	6 47.2 99 16	70.6	7 16.8 99 16	70.5	7 46.3 99 16	70.4	8 15.9 99 16	70.3	8
9			5 08.6 99 16	69.9	5 38.2 99 16	69.8	6 07.8 99 16	69.7	6 37.4 99 16	69.6	7 07.0 99 16	69.5	7 36.5 99 16	69.5	8 06.1 99 16	69.4	9
110					5 28.5 99 16	68.8	5 58.0 99 16	68.7	6 27.6 99 16	68.6	6 57.2 99 16	68.6	7 26.8 99 16	68.5	7 56.4 99 16	68.4	110
1					5 18.8 99 16	67.8	5 48.4 99 16	67.7	6 18.0 99 16	67.7	6 47.6 99 16	67.6	7 17.2 99 16	67.5	7 46.8 99 16	67.4	1
2					5 09.2 99 16	66.9	5 38.8 99 16	66.8	6 08.4 99 16	66.7	6 38.0 99 16	66.6	7 07.6 99 16	66.5	7 37.2 99 16	66.4	2
3							5 29.2 99 16	65.8	5 58.8 99 16	65.7	6 28.4 99 16	65.6	6 58.1 99 16	65.5	7 27.7 99 16	65.5	3
4							5 19.8 99 16	64.8	5 49.4 99 16	64.7	6 19.0 99 16	64.7	6 48.6 99 16	64.6	7 18.2 99 16	64.5	4
115							5 10.4 99 16	63.8	5 40.0 99 16	63.8	6 09.6 99 15	63.7	6 39.2 99 15	63.6	7 08.9 99 15	63.5	115
6							5 01.1 99 15	62.9	5 30.7 99 15	62.8	6 00.3 99 15	62.7	6 29.9 99 15	62.6	6 59.6 99 15	62.5	6
7									5 21.5 99 15	61.8	5 51.1 99 15	61.7	6 20.7 99 15	61.6	6 50.4 99 15	61.6	7
8									5 12.3 99 15	60.8	5 42.0 99 15	60.7	6 11.6 99 15	60.7	6 41.2 99 15	60.6	8
9									5 03.3 99 15	59.8	5 32.9 99 15	59.8	6 02.6 99 15	59.7	6 32.2 99 15	59.6	9
120											5 24.0 99 15	58.8	5 53.6 99 15	58.7	6 23.3 99 15	58.6	120
1											5 15.1 99 15	57.8	5 44.8 99 15	57.7	6 14.4 99 15	57.7	1
2											5 06.3 99 14	56.8	5 36.0 99 14	56.8	6 05.7 99 14	56.7	2
3													5 27.3 99 14	55.8	5 57.0 99 14	55.7	3
4													5 18.8 99 14	54.8	5 48.4 99 14	54.7	4
125													5 10.3 99 14	53.8	5 40.0 99 14	53.8	125
6													5 01.9 99 14	52.9	5 31.6 99 14	52.8	6
7															5 23.4 99 14	51.8	7
8															5 15.3 99 13	50.8	8
9															5 07.2 99 13	49.9	9

Lat. 81°

Lat. 82°

Lat. 83

10—49722-1

Lat. 80°

H.A.	12° 00′ Alt. Δd Δt Az.	12° 30′ Alt. Δd Δt Az.	13° 00′ Alt. Δd Δt Az.	13° 30′ Alt. Δd Δt Az.	14° 00′ Alt. Δd Δt Az.	14° 30′ Alt. Δd Δt Az.	15° 00′ Alt. Δd Δt Az.	15° 30′ Alt. Δd Δt Az.	H.A.
00	22 00.0 1.00 180.0	22 30.0 1.00 180.0	23 00.0 1.00 180.0	23 30.0 1.00 180.0	24 00.0 1.00 180.0	24 30.0 1.00 180.0	25 00.0 1.00 180.0	25 30.0 1.00 180.0	00
1	21 59.9 1.00 178.9	22 29.9 1.00 178.9	22 59.9 1.00 178.9	23 29.9 1.00 178.9	23 59.9 1.00 178.9	24 29.9 1.00 178.9	24 59.9 1.00 178.9	25 29.9 1.00 178.9	1
2	21 59.6 1.01 177.9	22 29.6 1.01 177.9	22 59.6 1.01 177.9	23 29.6 1.01 177.9	23 59.6 1.01 177.9	24 29.6 1.01 177.9	24 59.6 1.01 177.9	25 29.6 1.01 177.9	2
3	21 59.1 1.01 176.8	22 29.1 1.01 176.8	22 59.1 1.01 176.8	23 29.1 1.01 176.8	23 59.1 1.01 176.8	24 29.1 1.01 176.8	24 59.1 1.01 176.8	25 29.1 1.01 176.8	3
4	21 58.5 1.01 175.8	22 28.5 1.01 175.8	22 58.5 1.01 175.8	23 28.5 1.01 175.8	23 58.5 1.01 175.8	24 28.5 1.01 175.7	24 58.5 1.01 175.7	25 28.4 1.01 175.7	4
05	21 57.6 1.02 174.7	22 27.6 1.02 174.7	22 57.6 1.02 174.7	23 27.6 1.02 174.7	23 57.6 1.02 174.7	24 27.6 1.02 174.7	24 57.6 1.02 174.7	25 27.6 1.02 174.7	05
6	21 56.6 1.02 173.7	22 26.5 1.02 173.7	22 56.5 1.02 173.6	23 26.5 1.02 173.6	23 56.5 1.02 173.6	24 26.5 1.02 173.6	24 56.5 1.02 173.6	25 26.5 1.02 173.6	6
7	21 55.3 1.02 172.6	22 25.3 1.02 172.6	22 55.3 1.02 172.6	23 25.3 1.02 172.6	23 55.3 1.02 172.6	24 25.3 1.02 172.6	24 55.3 1.02 172.5	25 25.3 1.02 172.5	7
8	21 53.9 1.03 171.6	22 23.9 1.03 171.5	22 53.9 1.03 171.5	23 23.8 1.03 171.5	23 53.8 1.03 171.5	24 23.8 1.03 171.5	24 53.8 1.03 171.5	25 23.8 1.03 171.5	8
9	21 52.3 1.03 170.5	22 22.2 1.03 170.5	22 52.2 1.03 170.5	23 22.2 1.03 170.5	23 52.2 1.03 170.4	24 22.2 1.03 170.4	24 52.2 1.03 170.4	25 22.2 1.03 170.4	9
10	21 50.4 1.03 169.5	22 20.4 1.03 169.4	22 50.4 1.03 169.4	23 20.4 1.03 169.4	23 50.4 1.03 169.4	24 20.4 1.03 169.4	24 50.3 1.03 169.3	25 20.3 1.03 169.3	10
1	21 48.4 1.04 168.4	22 18.4 1.04 168.4	22 48.4 1.04 168.4	23 18.4 1.04 168.3	23 48.4 1.04 168.3	24 18.3 1.04 168.3	24 48.3 1.04 168.3	25 18.3 1.04 168.3	1
2	21 46.2 1.04 167.4	22 16.2 1.04 167.3	22 46.2 1.04 167.3	23 16.2 1.04 167.3	23 46.2 1.04 167.3	24 16.1 1.04 167.2	24 46.1 1.04 167.2	25 16.1 1.04 167.2	2
3	21 43.9 1.04 166.3	22 13.8 1.04 166.3	22 43.8 1.04 166.3	23 13.8 1.04 166.2	23 43.8 1.04 166.2	24 13.7 1.04 166.2	24 43.7 1.04 166.2	25 13.7 1.04 166.1	3
4	21 41.3 1.05 165.2	22 11.3 1.05 165.2	22 41.3 1.05 165.2	23 11.2 1.05 165.2	23 41.2 1.05 165.1	24 11.2 1.05 165.1	24 41.1 1.05 165.1	25 11.1 1.04 165.1	4
15	21 38.6 1.05 164.2	22 08.5 1.05 164.2	22 38.5 1.05 164.1	23 08.5 1.05 164.1	23 38.4 1.05 164.1	24 08.4 1.05 164.1	24 38.4 1.05 164.0	25 08.3 1.05 164.0	15
6	21 35.6 1.05 163.1	22 05.6 1.05 163.1	22 35.6 1.05 163.1	23 05.5 1.05 163.1	23 35.5 1.05 163.0	24 05.4 1.05 163.0	24 35.4 1.05 163.0	25 05.4 1.06 162.9	6
7	21 32.5 1.06 162.1	22 02.5 1.06 162.0	22 32.4 1.06 162.0	23 02.4 1.06 162.0	23 32.3 1.06 161.9	24 02.3 1.06 161.9	24 32.3 1.06 161.9	25 02.2 1.06 161.9	7
8	21 29.2 1.06 161.0	21 59.2 1.06 161.0	22 29.1 1.06 161.0	22 59.1 1.06 161.0	23 29.0 1.06 160.9	23 59.0 1.06 160.9	24 28.9 1.06 160.9	24 58.9 1.06 160.8	8
9	21 25.8 1.06 160.0	21 55.7 1.06 160.0	22 25.6 1.06 159.9	22 55.6 1.06 159.9	23 25.5 1.06 159.9	23 55.5 1.06 159.8	24 25.4 1.06 159.8	24 55.4 1.06 159.8	9
20	21 22.1 1.06 158.9	21 52.0 1.06 158.9	22 22.0 1.06 158.9	22 51.9 1.06 158.8	23 21.9 1.06 158.8	23 51.8 1.06 158.8	24 21.7 1.06 158.7	24 51.7 1.06 158.7	20
1	21 18.3 1.07 157.9	21 48.2 1.07 157.9	22 18.1 1.07 157.8	22 48.1 1.07 157.8	23 18.0 1.07 157.8	23 47.9 1.07 157.7	24 17.9 1.07 157.7	24 47.8 1.07 157.6	1
2	21 14.3 1.07 156.9	21 44.2 1.07 156.8	22 14.1 1.07 156.8	22 44.0 1.07 156.7	23 14.0 1.07 156.7	23 43.9 1.07 156.7	24 13.8 1.07 156.6	24 43.7 1.07 156.6	2
3	21 10.1 1.07 155.8	21 40.0 1.07 155.8	22 09.9 1.07 155.7	22 39.8 1.07 155.7	23 09.8 1.07 155.6	23 39.7 1.07 155.6	24 09.6 1.07 155.6	24 39.5 1.07 155.5	3
4	21 05.7 1.08 154.8	21 35.6 1.08 154.7	22 05.6 1.08 154.7	22 35.5 1.08 154.6	23 05.4 1.08 154.6	23 35.3 1.08 154.6	24 05.2 1.08 154.5	24 35.1 1.08 154.5	4
25	21 01.2 1.08 153.7	21 31.1 1.08 153.7	22 01.0 1.08 153.6	22 30.9 1.08 153.6	23 00.8 1.08 153.5	23 30.7 1.08 153.5	24 00.6 1.08 153.5	24 30.5 1.08 153.4	25
6	20 56.5 1.08 152.7	21 26.4 1.08 152.6	21 56.3 1.08 152.6	22 26.2 1.08 152.5	22 56.1 1.08 152.5	23 26.0 1.08 152.4	23 55.9 1.08 152.4	24 25.8 1.08 152.4	6
7	20 51.6 1.09 151.6	21 21.5 1.09 151.6	21 51.4 1.09 151.5	22 21.3 1.09 151.5	22 51.2 1.08 151.4	23 21.1 1.08 151.4	23 51.0 1.08 151.4	24 20.9 1.08 151.3	7
8	20 46.6 1.09 150.6	21 16.5 1.09 150.5	21 46.4 1.09 150.5	22 16.2 1.09 150.4	22 46.1 1.09 150.4	23 16.0 1.09 150.3	23 45.9 1.09 150.3	24 15.8 1.09 150.2	8
9	20 41.4 1.09 149.5	21 11.3 1.09 149.5	21 41.2 1.09 149.4	22 11.0 1.09 149.4	22 40.9 1.09 149.3	23 10.8 1.09 149.3	23 40.6 1.09 149.2	24 10.5 1.09 149.2	9
30	20 36.0 1.09 148.5	21 05.9 1.09 148.5	21 35.8 1.09 148.4	22 05.6 1.09 148.4	22 35.5 1.09 148.3	23 05.4 1.00 148.2	23 35.2 1.00 148.2	24 05.1 1.00 148.1	30
1	20 30.5 1.10 147.5	21 00.3 1.10 147.4	21 30.2 1.10 147.4	22 00.1 1.10 147.3	22 30.0 1.10 147.3	22 59.8 1.10 147.2	23 29.7 1.10 147.1	23 59.5 1.10 147.1	1
2	20 24.8 1.10 146.4	20 54.7 1.10 146.4	21 24.5 1.10 146.3	21 54.4 1.10 146.3	22 24.2 1.10 146.2	22 54.1 99 10 146.2	23 23.9 99 10 146.1	23 53.8 99 10 146.0	2
3	20 19.0 99 10 145.4	20 48.8 99 10 145.3	21 18.7 99 10 145.3	21 48.5 99 10 145.2	22 18.4 99 10 145.2	22 48.2 99 10 145.1	23 18.0 99 10 145.1	23 47.9 99 10 145.0	3
4	20 13.0 99 10 144.3	20 42.8 99 10 144.3	21 12.7 99 10 144.2	21 42.5 99 10 144.2	22 12.3 99 10 144.1	22 42.2 99 10 144.1	23 12.0 99 10 144.0	23 41.8 99 10 144.0	4
35	20 06.8 99 10 143.3	20 36.7 99 10 143.3	21 06.5 99 11 143.2	21 36.3 99 11 143.1	22 06.2 99 11 143.1	22 36.0 99 11 143.1	23 05.8 99 11 143.0	23 35.6 99 11 142.9	35
6	20 00.5 99 11 142.3	20 30.3 99 11 142.2	21 00.2 99 11 142.2	21 30.0 99 11 142.1	21 59.8 99 11 142.1	22 29.6 99 11 142.0	22 59.5 99 11 142.0	23 29.3 99 11 141.9	6
7	19 54.1 99 11 141.2	20 23.9 99 11 141.2	20 53.7 99 11 141.1	21 23.5 99 11 141.1	21 53.3 99 11 141.0	22 23.1 99 11 140.9	22 53.0 99 11 140.9	23 22.8 99 11 140.8	7
8	19 47.5 99 11 140.2	20 17.3 99 11 140.1	20 47.1 99 11 140.1	21 16.9 99 11 140.0	21 46.7 99 11 140.0	22 16.5 99 11 139.9	22 46.3 99 11 139.8	23 16.1 99 11 139.8	8
9	19 40.8 99 11 139.2	20 10.6 99 11 139.1	20 40.3 99 12 139.1	21 10.1 99 12 139.0	21 39.9 99 12 138.9	22 09.7 99 12 138.9	22 39.5 99 12 138.8	23 09.3 99 12 138.7	9
40	19 33.9 99 12 138.1	20 03.7 99 12 138.1	20 33.4 99 12 138.0	21 03.2 99 12 138.0	21 33.0 99 12 137.9	22 02.8 99 12 137.8	22 32.6 99 12 137.8	23 02.4 99 12 137.7	40
1	19 26.9 99 12 137.1	19 56.6 99 12 137.0	20 26.4 99 12 137.0	20 56.2 99 12 136.9	21 26.0 99 12 136.9	21 55.7 99 12 136.8	22 25.5 99 12 136.7	22 55.3 99 12 136.7	1
2	19 19.7 99 12 136.1	19 49.5 99 12 136.0	20 19.2 99 12 136.0	20 49.0 99 12 135.9	21 18.8 99 12 135.8	21 48.5 99 12 135.8	22 18.3 99 12 135.7	22 48.1 99 12 135.6	2
3	19 12.4 99 12 135.1	19 42.2 99 12 135.0	20 11.9 99 13 134.9	20 41.7 99 13 134.9	21 11.4 99 13 134.8	21 41.2 99 13 134.7	22 10.9 99 13 134.6	22 40.7 99 13 134.6	3
4	19 05.0 99 13 134.0	19 34.7 99 13 134.0	20 04.5 99 13 133.9	20 34.2 99 13 133.8	21 04.0 99 13 133.8	21 33.7 99 13 133.7	22 03.5 99 13 133.6	22 33.2 99 13 133.5	4
45	18 57.4 99 13 133.0	19 27.2 99 13 132.9	19 56.9 99 13 132.9	20 26.6 99 13 132.8	20 56.4 99 13 132.7	21 26.1 99 13 132.7	21 55.9 99 13 132.6	22 25.6 99 13 132.5	45
6	18 49.7 99 13 132.0	19 19.5 99 13 131.9	19 49.2 99 13 131.8	20 18.9 99 13 131.8	20 48.7 99 13 131.7	21 18.4 99 13 131.6	21 48.1 99 13 131.6	22 17.9 99 13 131.5	6
7	18 41.9 99 13 131.0	19 11.7 99 13 130.9	19 41.4 99 13 130.8	20 11.1 99 13 130.7	20 40.8 99 13 130.7	21 10.6 99 13 130.6	21 40.3 99 13 130.5	22 10.0 99 13 130.4	7
8	18 34.0 99 13 129.9	19 03.7 99 13 129.9	19 33.4 99 13 129.8	20 03.2 99 13 129.7	20 32.9 99 13 129.6	21 02.6 99 14 129.6	21 32.3 99 14 129.5	22 02.0 99 14 129.5	8
9	18 25.9 99 14 128.9	18 55.7 99 14 128.8	19 25.4 99 14 128.8	19 55.1 99 14 128.7	20 24.8 99 14 128.6	20 54.5 99 14 128.5	21 24.2 99 14 128.5	21 53.9 99 14 128.4	9
50	18 17.8 99 14 127.9	18 47.5 99 14 127.8	19 17.2 99 14 127.7	19 46.9 99 14 127.7	20 16.6 99 14 127.6	20 46.3 99 14 127.5	21 16.0 99 14 127.4	21 45.7 99 14 127.4	50
1	18 09.5 99 14 126.9	18 39.2 99 14 126.8	19 08.9 99 14 126.7	19 38.6 99 14 126.6	20 08.3 99 14 126.6	20 38.0 99 14 126.5	21 07.6 99 14 126.4	21 37.3 99 14 126.3	1
2	18 01.1 99 14 125.9	18 30.8 99 14 125.8	19 00.5 99 14 125.7	19 30.2 99 14 125.6	19 59.9 99 14 125.5	20 29.5 99 14 125.5	20 59.2 99 14 125.4	21 28.9 99 14 125.3	2
3	17 52.6 99 14 124.8	18 22.3 99 14 124.8	18 52.0 99 14 124.7	19 21.6 99 14 124.6	19 51.3 99 14 124.5	20 21.0 99 14 124.4	20 50.7 99 14 124.4	21 20.3 99 14 124.3	3
4	17 44.0 99 15 123.8	18 13.7 99 15 123.7	18 43.4 99 15 123.7	19 13.0 99 15 123.6	19 42.7 99 15 123.5	20 12.3 99 15 123.4	20 42.0 99 15 123.3	21 11.7 99 15 123.3	4
55	17 35.3 99 15 122.8	18 05.0 99 15 122.7	18 34.6 99 15 122.6	19 04.3 99 15 122.6	19 33.9 99 15 122.5	20 03.6 99 15 122.4	20 33.3 99 15 122.3	21 02.9 99 15 122.2	55
6	17 26.5 99 15 121.8	17 56.2 99 15 121.7	18 25.8 99 15 121.6	18 55.5 99 15 121.5	19 25.1 99 15 121.5	19 54.8 99 15 121.4	20 24.4 99 15 121.3	20 54.0 99 15 121.2	6
7	17 17.6 99 15 120.8	17 47.2 99 15 120.7	18 16.9 99 15 120.6	18 46.5 99 15 120.5	19 16.2 99 15 120.5	19 45.8 99 15 120.4	20 15.5 99 15 120.3	20 45.1 99 15 120.2	7
8	17 08.6 99 15 119.8	17 38.2 99 15 119.7	18 07.9 99 15 119.6	18 37.5 99 15 119.5	19 07.1 99 15 119.4	19 36.8 99 15 119.4	20 06.4 99 15 119.3	20 36.0 99 15 119.2	8
9	16 59.5 99 15 118.8	17 29.1 99 15 118.7	17 58.7 99 15 118.6	18 28.4 99 15 118.5	18 58.0 99 15 118.4	19 27.7 99 15 118.3	19 57.3 99 15 118.3	20 26.9 99 15 118.2	9
60	16 50.3 99 15 117.7	17 20.0 99 15 117.7	17 49.6 99 16 117.6	18 19.2 99 16 117.5	18 48.8 99 16 117.4	19 18.4 99 16 117.3	19 48.1 99 16 117.3	20 17.7 99 16 117.2	60
1	16 41.1 99 16 116.7	17 10.7 99 16 116.7	17 40.3 99 16 116.6	18 09.9 99 16 116.5	18 39.5 99 16 116.4	19 09.1 99 16 116.3	19 38.7 99 16 116.2	20 08.4 99 16 116.1	1
2	16 31.7 99 16 115.7	17 01.3 99 16 115.6	17 30.9 99 16 115.6	18 00.6 99 16 115.5	18 30.2 99 16 115.4	18 59.8 99 16 115.3	19 29.4 99 16 115.2	19 59.0 99 16 115.1	2
3	16 22.3 99 16 114.7	16 51.9 99 16 114.6	17 21.5 99 16 114.6	17 51.1 99 16 114.5	18 20.7 99 16 114.4	18 50.3 99 16 114.3	19 19.9 99 16 114.2	19 49.5 99 16 114.1	3
4	16 12.8 99 16 113.7	16 42.4 99 16 113.6	17 12.0 99 16 113.6	17 41.6 99 16 113.5	18 11.2 99 16 113.4	18 40.8 99 16 113.3	19 10.4 99 16 113.2	19 39.9 99 16 113.1	4
65	16 03.2 99 16 112.7	16 32.8 99 16 112.6	17 02.4 99 16 112.5	17 32.0 99 16 112.5	18 01.6 99 16 112.4	18 31.2 99 16 112.3	19 00.7 99 16 112.2	19 30.3 99 16 112.1	65
6	15 53.6 99 16 111.7	16 23.2 99 16 111.6	16 52.7 99 16 111.5	17 22.3 99 16 111.4	17 51.9 99 16 111.4	18 21.5 99 16 111.3	18 51.1 99 16 111.2	19 20.6 99 16 111.1	6
7	15 43.9 99 16 110.7	16 13.4 99 16 110.6	16 43.0 99 16 110.5	17 12.6 99 16 110.4	17 42.2 99 16 110.4	18 11.7 99 16 110.3	18 41.3 99 16 110.2	19 10.9 99 16 110.1	7
8	15 34.1 99 16 109.7	16 03.6 99 16 109.6	16 33.2 99 16 109.5	17 02.8 99 16 109.4	17 32.4 99 16 109.4	18 01.9 99 16 109.3	18 31.5 99 16 109.3	19 01.1 99 16 109.1	8
9	15 24.2 99 17 108.7	15 53.8 99 17 108.6	16 23.4 99 17 108.5	16 52.9 99 17 108.4	17 22.5 99 17 108.3	17 52.1 99 17 108.3	18 21.6 99 17 108.2	18 51.2 99 17 108.1	9
70	15 14.3 99 17 107.7	15 43.9 99 17 107.6	16 13.5 99 17 107.5	16 43.0 99 17 107.4	17 12.6 99 17 107.3	17 42.2 99 17 107.3	18 11.7 99 17 107.2	18 41.3 99 17 107.1	70
1	15 04.4 99 17 106.7	15 34.0 99 17 106.6	16 03.5 99 17 106.5	16 33.1 99 17 106.4	17 02.6 99 17 106.3	17 32.2 99 17 106.3	18 01.7 98 17 106.2	18 31.3 98 17 106.1	1
2	14 54.4 99 17 105.7	15 23.9 99 17 105.6	15 53.5 99 17 105.5	16 23.1 99 17 105.4	16 52.6 99 17 105.3	17 22.2 99 17 105.3	17 51.7 98 17 105.2	18 21.2 98 17 105.1	2
3	14 44.3 99 17 104.7	15 13.9 99 17 104.6	15 43.4 99 17 104.5	16 13.0 99 17 104.4	16 42.5 99 17 104.3	17 12.1 98 17 104.3	17 41.6 98 17 104.2	18 11.2 98 17 104.1	3
4	14 34.2 99 17 103.7	15 03.8 99 17 103.6	15 33.3 99 17 103.5	16 02.9 98 17 103.4	16 32.4 98 17 103.4	17 02.0 98 17 103.3	17 31.5 98 17 103.2	18 01.0 98 17 103.1	4
75	14 24.1 98 17 102.7	14 53.6 98 17 102.6	15 23.2 98 17 102.5	15 52.7 98 17 102.4	16 22.3 98 17 102.4	16 51.8 98 17 102.3	17 21.3 98 17 102.2	17 50.9 98 17 102.1	75
6	14 13.9 98 17 101.7	14 43.4 98 17 101.6	15 13.0 98 17 101.5	15 42.5 98 17 101.5	16 12.1 98 17 101.4	16 41.6 98 17 101.3	17 11.1 98 17 101.2	17 40.7 98 17 101.1	6
7	14 03.7 98 17 100.7	14 33.2 98 17 100.6	15 02.8 98 17 100.5	15 32.3 98 17 100.5	16 01.8 98 17 100.4	16 31.4 98 17 100.3	17 00.9 98 17 100.3	17 30.4 98 17 100.1	7
8	13 53.4 98 17 99.7	14 23.0 98 17 99.6	14 52.5 98 17 99.6	15 22.0 98 17 99.5	15 51.6 98 17 99.4	16 21.1 98 17 99.3	16 50.6 98 17 99.2	17 20.1 98 17 99.1	8
9	13 43.1 98 17 98.7	14 12.7 98 17 98.7	14 42.2 98 17 98.6	15 11.7 98 17 98.5	15 41.3 98 17 98.4	16 10.8 98 17 98.3	16 40.3 98 17 98.2	17 09.8 98 17 98.1	9
80	13 32.8 98 17 97.8	14 02.4 98 17 97.7	14 31.9 98 17 97.6	15 01.4 98 17 97.5	15 30.9 98 17 97.4	16 00.5 98 17 97.3	16 30.0 98 17 97.2	16 59.5 98 17 97.1	8
1	13 22.5 98 17 96.8	13 52.0 98 17 96.7	14 21.6 98 17 96.6	14 51.1 98 17 96.5	15 20.6 98 17 96.4	15 50.1 98 17 96.3	16 19.6 98 17 96.2	16 49.2 98 17 96.1	1
2	13 12.1 98 17 95.8	13 41.7 98 17 95.7	14 11.2 98 17 95.6	14 40.7 98 17 95.5	15 10.2 98 17 95.4	15 39.8 98 17 95.3	16 09.3 98 17 95.2	16 38.8 98 17 95.1	2
3	13 01.8 98 17 94.8	13 31.3 98 17 94.7	14 00.8 98 17 94.6	14 30.3 98 17 94.5	14 59.9 98 17 94.4	15 29.4 98 17 94.3	15 58.9 98 17 94.2	16 28.4 98 17 94.1	3
4	12 51.4 98 17 93.8	13 20.9 98 17 93.7	13 50.4 98 17 93.6	14 19.9 98 17 93.5	14 49.5 98 17 93.4	15 19.0 98 17 93.3	15 48.5 98 17 93.2	16 18.0 98 17 93.2	4
85	12 41.0 98 17 92.8	13 10.5 98 17 92.7	13 40.0 98 17 92.6	14 09.5 98 17 92.5	14 39.1 98 17 92.4	15 08.6 98 17 92.4	15 38.1 98 17 92.3	16 07.6 98 17 92.2	85
6	12 30.6 98 17 91.8	13 00.1 98 17 91.7	13 29.6 98 17 91.6	13 59.1 98 17 91.5	14 28.6 98 17 91.5	14 58.2 98 17 91.4	15 27.7 98 17 91.3	15 57.2 98 17 91.2	6
7	12 20.2 98 17 90.8	12 49.7 98 17 90.7	13 19.2 98 17 90.7	13 48.7 98 17 90.6	14 18.2 98 17 90.5	14 47.7 98 17 90.4	15 17.3 98 17 90.2	15 46.8 98 17 90.2	7
8	12 09.7 98 17 89.9	12 39.3 98 17 89.8	13 08.8 98 17 89.7	13 38.3 98 17 89.6	14 07.8 98 17 89.5	14 37.3 98 17 89.4	15 06.8 98.17 89.3	15 36.4 98 17 89.2	8
9	11 59.3 98 17 88.9	12 28.8 98 17 88.8	12 58.4 98 17 88.7	13 27.9 98 17 88.6	13 57.4 98 17 88.5	14 26.9 98 17 88.4	14 56.4 98 17 88.3	15 25.9 98 17 88.2	9
90	11 48.9 98 17 87.9	12 18.4 98 17 87.8	12 47.9 98 17 87.7	13 17.5 98 17 87.6	13 47.0 98 17 87.5	14 16.5 98 17 87.4	14 46.0 98 17 87.3	15 15.5 98 17 87.2	90

H.A.	12°00' Alt. (Δd Δt)	Az.	12°30' Alt. (Δd Δt)	Az.	13°00' Alt. (Δd Δt)	Az.	13°30' Alt. (Δd Δt)	Az.	14°00' Alt. (Δd Δt)	Az.	14°30' Alt. (Δd Δt)	Az.	15°00' Alt. (Δd Δt)	Az.	15°30' Alt. (Δd Δt)	Az.	H.A.
91	11 38.5 98 17	86.9	12 08.0 98 17	86.8	12 37.5 98 17	86.7	13 07.1 98 17	86.6	13 36.6 98 17	86.5	14 06.1 98 17	86.4	14 35.6 98 17	86.4	15 05.1 98 17	86.3	91
2	11 28.1 98 17	85.9	11 57.6 98 17	85.8	12 27.1 98 17	85.7	12 56.7 98 17	85.6	13 26.2 98 17	85.6	13 55.7 98 17	85.5	14 25.2 98 17	85.4	14 54.7 98 17	85.3	2
3	11 17.7 98 17	84.9	11 47.2 98 17	84.8	12 16.8 98 17	84.8	12 46.3 98 17	84.7	13 15.8 98 17	84.6	13 45.3 98 17	84.5	14 14.8 98 17	84.4	14 44.4 98 17	84.3	3
4	11 07.3 98 17	84.0	11 36.9 98 17	83.9	12 06.4 98 17	83.8	12 35.9 98 17	83.7	13 05.4 98 17	83.6	13 35.0 98 17	83.5	14 04.5 98 17	83.4	14 34.0 98 17	83.3	4
95	10 57.0 98 17	83.0	11 26.5 98 17	82.9	11 56.0 98 17	82.8	12 25.6 98 17	82.7	12 55.1 98 17	82.6	13 24.6 98 17	82.5	13 54.1 98 17	82.4	14 23.7 98 17	82.3	95
6	10 46.7 98 17	82.0	11 16.2 98 17	81.9	11 45.7 98 17	81.8	12 15.3 98 17	81.7	12 44.8 98 17	81.6	13 14.3 98 17	81.5	13 43.8 98 17	81.5	14 13.3 98 17	81.4	6
7	10 36.4 98 17	81.0	11 05.9 98 17	80.9	11 35.4 98 17	80.8	12 05.0 98 17	80.7	12 34.5 98 17	80.7	13 04.0 98 17	80.6	13 33.5 98 17	80.5	14 03.1 98 17	80.4	7
8	10 26.1 98 17	80.0	10 55.6 98 17	79.9	11 25.2 98 17	79.9	11 54.7 98 17	79.8	12 24.2 98 17	79.7	12 53.7 98 17	79.6	13 23.3 98 17	79.5	13 52.8 98 17	79.4	8
9	10 15.8 98 17	79.1	10 45.4 98 17	79.0	11 14.9 98 17	78.9	11 44.4 98 17	78.8	12 14.0 98 17	78.7	12 43.5 98 17	78.6	13 13.0 98 17	78.5	13 42.6 98 17	78.4	9
100	10 05.6 98 17	78.1	10 35.2 98 17	78.0	11 04.7 98 17	77.9	11 34.2 98 17	77.8	12 03.8 98 17	77.7	12 33.3 98 17	77.6	13 02.9 98 17	77.5	13 32.4 98 17	77.5	100
1	9 55.4 98 17	77.1	10 25.0 98 17	77.0	10 54.5 98 17	76.9	11 24.1 98 17	76.8	11 53.6 98 17	76.7	12 23.2 98 17	76.7	12 52.7 98 17	76.6	13 22.2 98 17	76.5	1
2	9 45.3 99 17	76.1	10 14.9 98 17	76.0	10 44.4 98 17	75.9	11 14.0 98 17	75.9	11 43.5 98 17	75.8	12 13.0 98 17	75.7	12 42.6 98 17	75.6	13 12.1 98 17	75.5	2
3	9 35.2 99 17	75.1	10 04.8 99 17	75.1	10 34.3 98 17	75.0	11 03.9 98 17	74.9	11 33.4 98 17	74.8	12 03.0 98 17	74.7	12 32.5 98 17	74.6	13 02.1 98 17	74.5	3
4	9 25.2 99 17	74.2	9 54.7 99 17	74.1	10 24.3 98 17	74.0	10 53.8 98 17	73.9	11 23.4 98 17	73.8	11 52.9 99 17	73.7	12 22.5 98 17	73.6	12 52.0 98 17	73.6	4
105	9 15.2 99 17	73.2	9 44.7 99 17	73.1	10 14.3 99 17	73.0	10 43.9 99 17	72.9	11 13.4 99 17	72.8	11 43.0 99 17	72.8	12 12.5 99 17	72.7	12 42.1 99 17	72.6	105
6	9 05.2 99 16	72.2	9 34.8 99 16	72.1	10 04.4 99 16	72.0	10 33.9 99 16	72.0	11 03.5 99 16	71.9	11 33.0 99 16	71.8	12 02.6 99 16	71.7	12 32.2 99 16	71.6	6
7	8 55.3 99 16	71.2	9 24.9 99 16	71.1	9 54.5 99 16	71.1	10 24.0 99 16	71.0	10 53.6 99 16	70.9	11 23.2 99 16	70.8	11 52.7 99 16	70.7	12 22.3 99 16	70.6	7
8	8 45.5 99 16	70.3	9 15.1 99 16	70.2	9 44.6 99 16	70.1	10 14.2 99 16	70.0	10 43.8 99 16	69.9	11 13.4 99 16	69.8	11 42.9 99 16	69.8	12 12.5 99 16	69.7	8
9	8 35.7 99 16	69.3	9 05.3 99 16	69.2	9 34.9 99 16	69.1	10 04.5 99 16	69.0	10 34.0 99 16	68.9	11 03.6 99 16	68.9	11 33.2 99 16	68.8	12 02.8 99 16	68.7	9
110	8 26.0 99 16	68.3	8 55.6 99 16	68.2	9 25.2 99 16	68.1	9 54.8 99 16	68.1	10 24.4 99 16	68.0	10 53.9 99 16	67.9	11 23.5 99 16	67.8	11 53.1 99 16	67.7	110
1	8 16.4 99 16	67.3	8 45.9 99 16	67.3	9 15.5 99 16	67.2	9 45.1 99 16	67.1	10 14.7 99 16	67.0	10 44.3 99 16	66.9	11 13.9 99 16	66.8	11 43.5 99 16	66.8	1
2	8 06.8 99 16	66.4	8 36.4 99 16	66.3	9 06.0 99 16	66.2	9 35.6 99 16	66.1	10 05.2 99 16	66.0	10 34.8 99 16	65.9	11 04.4 99 16	65.9	11 34.0 99 16	65.8	2
3	7 57.3 99 16	65.4	8 26.9 99 16	65.3	8 56.5 99 16	65.2	9 26.1 99 16	65.1	9 55.7 99 16	65.1	10 25.3 99 16	65.0	10 54.9 99 16	64.9	11 24.5 99 16	64.8	3
4	7 47.8 99 16	64.4	8 17.4 99 16	64.3	8 47.1 99 16	64.3	9 16.7 99 16	64.2	9 46.3 99 16	64.1	10 15.9 99 16	64.0	10 45.5 99 16	63.9	11 15.1 99 16	63.8	4
115	7 38.5 99 16	63.4	8 08.1 99 16	63.4	8 37.7 99 15	63.3	9 07.3 99 15	63.2	9 36.9 99 15	63.1	10 06.6 99 15	63.0	10 36.2 99 15	63.0	11 05.8 99 15	62.9	115
6	7 29.2 99 15	62.5	7 58.8 99 15	62.4	8 28.4 99 15	62.3	8 58.1 99 15	62.2	9 27.7 99 15	62.1	9 57.3 99 15	62.1	10 26.9 99 15	62.0	10 56.6 99 15	61.9	6
7	7 20.0 99 15	61.5	7 49.6 99 15	61.4	8 19.3 99 15	61.3	8 48.9 99 15	61.3	9 18.5 99 15	61.2	9 48.2 99 15	61.1	10 17.8 99 15	61.0	10 47.4 99 15	60.9	7
8	7 10.9 99 15	60.5	7 40.5 99 15	60.4	8 10.2 99 15	60.4	8 39.8 99 15	60.3	9 09.4 99 15	60.2	9 39.1 99 15	60.1	10 08.7 99 15	60.0	10 38.3 99 15	60.0	8
9	7 01.9 99 15	59.5	7 31.5 99 15	59.5	8 01.2 99 15	59.4	8 30.8 99 15	59.3	9 00.4 99 15	59.2	9 30.1 99 15	59.2	9 59.7 99 15	59.1	10 29.4 99 15	59.0	9
120	6 52.9 99 15	58.6	7 22.6 99 15	58.5	7 52.2 99 15	58.4	8 21.9 99 15	58.3	8 51.5 99 15	58.3	9 21.2 99 15	58.2	9 50.8 99 15	58.1	10 20.5 99 15	58.0	120
1	6 44.1 99 15	57.6	7 13.7 99 15	57.5	7 43.4 99 15	57.4	8 13.1 99 15	57.4	8 42.7 99 15	57.3	9 12.4 99 15	57.2	9 42.0 99 14	57.1	10 11.7 99 14	57.1	1
2	6 35.3 99 14	56.6	7 05.0 99 14	56.5	7 34.7 99 14	56.5	8 04.3 99 14	56.4	8 34.0 99 14	56.3	9 03.7 99 14	56.2	9 33.3 99 14	56.2	10 03.0 99 14	56.1	2
3	6 26.7 99 14	55.6	6 56.4 99 14	55.6	7 26.0 99 14	55.5	7 55.7 99 14	55.4	8 25.4 99 14	55.3	8 55.1 99 14	55.3	9 24.7 99 14	55.2	9 54.4 99 14	55.1	3
4	6 17.8 99 14	54.7	6 47.8 99 14	54.6	7 17.5 99 14	54.5	7 47.2 99 14	54.5	8 16.9 99 14	54.4	8 46.5 99 14	54.3	9 16.2 99 14	54.2	9 45.9 99 14	54.2	4
125	6 09.7 99 14	53.7	6 39.4 99 14	53.6	7 09.1 99 14	53.6	7 38.8 99 14	53.5	8 08.4 99 14	53.4	8 38.1 99 14	53.3	9 07.8 99 14	53.3	9 37.5 99 14	53.2	125
6	6 01.3 99 14	52.7	6 31.0 99 14	52.7	7 00.7 99 14	52.6	7 30.4 99 14	52.5	8 00.1 99 14	52.4	8 29.8 99 14	52.4	8 59.5 99 14	52.3	9 29.2 99 14	52.2	6
7	5 53.1 99 14	51.8	6 22.8 99 14	51.7	6 52.5 99 14	51.6	7 22.2 99 14	51.5	7 51.9 99 14	51.5	8 21.6 99 13	51.4	8 51.3 99 13	51.3	9 21.0 99 13	51.3	7
8	5 45.0 99 13	50.8	6 14.7 99 13	50.7	6 44.4 99 13	50.6	7 14.1 99 13	50.6	7 43.8 99 13	50.5	8 13.5 99 13	50.4	8 43.3 99 13	50.4	9 13.0 99 13	50.3	8
9	5 37.0 99 13	49.8	6 06.7 99 13	49.7	6 36.4 99 13	49.7	7 06.1 99 13	49.6	7 35.8 99 13	49.5	8 05.6 99 13	49.5	8 35.3 99 13	49.3	9 05.0 99 13	49.3	9
130	5 29.1 99 13	48.8	5 58.8 99 13	48.8	6 28.5 99 13	48.7	6 58.2 99 13	48.6	7 28.0 99 13	48.6	7 57.7 99 13	48.5	8 27.4 99 13	48.4	8 57.2 99 13	48.4	130
1	5 21.3 99 13	47.9	5 51.0 99 13	47.8	6 20.8 99 13	47.7	6 50.5 99 13	47.7	7 20.2 99 13	47.6	7 50.0 99 13	47.5	8 19.7 99 13	47.5	8 49.4 99 13	47.4	1
2	5 13.6 99 13	46.9	5 43.4 99 13	46.8	6 13.1 99 13	46.8	6 42.8 99 13	46.7	7 12.6 99 13	46.6	7 42.3 99 12	46.6	8 12.1 99 12	46.5	8 41.8 99 12	46.4	2
3	5 06.1 99 12	45.9	5 35.8 99 12	45.8	6 05.6 99 13	45.8	6 35.3 99 12	45.7	7 05.1 99 12	45.7	7 34.8 99 12	45.6	8 04.6 99 12	45.5	8 34.3 99 12	45.5	3
4			5 28.4 99 12	44.9	5 58.2 99 12	44.8	6 27.9 99 12	44.7	6 57.7 99 12	44.7	7 27.5 99 12	44.6	7 57.2 99 12	44.6	8 27.0 99 12	44.5	4
135			5 21.1 99 12	43.9	5 50.9 99 12	43.8	6 20.7 99 12	43.8	6 50.4 99 12	43.7	7 20.2 99 12	43.6	7 50.0 99 12	43.6	8 19.7 99 12	43.5	135
6			5 14.0 99 12	42.9	5 43.7 99 12	42.9	6 13.5 99 12	42.8	6 43.3 99 12	42.7	7 13.1 99 12	42.7	7 42.8 99 12	42.6	8 12.6 99 12	42.6	6
7			5 06.9 99 12	42.0	5 36.7 99 11	41.9	6 06.5 99 11	41.8	6 36.3 99 11	41.8	7 06.1 99 11	41.7	7 35.9 99 11	41.7	8 05.6 99 11	41.6	7
8			5 00.0 99 11	41.0	5 29.8 99 11	40.9	5 59.6 99 11	40.9	6 29.4 99 11	40.8	6 59.2 99 11	40.7	7 29.0 99 11	40.7	7 58.8 99 11	40.6	8
9					5 23.1 99 11	39.9	5 52.9 99 11	39.9	6 22.7 99 11	39.8	6 52.5 99 11	39.8	7 22.3 99 11	39.7	7 52.1 99 11	39.7	9
140					5 16.4 99 11	39.0	5 46.3 99 11	38.9	6 16.1 99 11	38.9	6 45.9 99 11	38.8	7 15.7 99 11	38.7	7 45.5 99 11	38.7	140
1					5 10.0 99 11	38.0	5 39.8 99 11	37.9	6 09.6 99 11	37.9	6 39.4 99 11	37.8	7 09.2 99 11	37.8	7 39.1 99 10	37.7	1
2					5 03.6 99 10	37.0	5 33.4 99 10	37.0	6 03.3 99 10	36.9	6 33.1 99 10	36.9	7 02.9 99 10	36.8	7 32.7 99 10	36.8	2
3							5 27.2 99 10	36.0	5 57.1 99 10	36.0	6 26.9 99 10	35.9	6 56.7 99 10	35.8	7 26.6 99 10	35.8	3
4							5 21.2 99 10	35.0	5 51.0 99 10	35.0	6 20.9 99 10	34.9	6 50.7 99 10	34.9	7 20.6 99 10	34.8	4
145							5 15.3 99 10	34.1	5 45.1 99 10	34.0	6 15.0 99 10	34.0	6 44.8 99 10	33.9	7 14.7 99 10	33.9	145
6							5 09.5 1.0 09	33.1	5 39.4 1.0 09	33.0	6 09.2 1.0 09	33.0	6 39.1 1.0 09	32.9	7 09.0 1.0 09	32.9	6
7							5 03.9 1.0 09	32.1	5 33.8 1.0 09	32.1	6 03.6 1.0 09	32.0	6 33.5 1.0 09	32.0	7 03.4 1.0 09	31.9	7
8									5 28.2 1.0 09	31.1	5 58.2 1.0 09	31.0	6 28.1 1.0 09	31.0	6 57.9 1.0 09	31.0	8
9									5 23.0 1.0 09	30.1	5 52.9 1.0 09	30.1	6 22.8 1.0 09	30.0	6 52.6 1.0 09	30.0	9
150									5 17.9 1.0 08	29.2	5 47.7 1.0 08	29.1	6 17.6 1.0 08	29.1	6 47.5 1.0 08	29.0	150
1									5 12.9 1.0 08	28.2	5 42.8 1.0 08	28.1	6 12.6 1.0 08	28.1	6 42.5 1.0 08	28.1	1
2									5 08.0 1.0 08	27.2	5 37.9 1.0 08	27.2	6 07.8 1.0 08	27.1	6 37.7 1.0 08	27.1	2
3									5 03.3 1.0 08	26.2	5 33.2 1.0 08	26.2	6 03.1 1.0 08	26.1	6 33.0 1.0 08	26.1	3
4											5 28.7 1.0 07	25.2	5 58.6 1.0 07	25.2	6 28.5 1.0 07	25.2	4
155											5 24.4 1.0 07	24.3	5 54.3 1.0 07	24.2	6 24.2 1.0 07	24.2	155
6											5 20.2 1.0 07	23.3	5 50.1 1.0 07	23.3	6 20.0 1.0 07	23.2	6
7											5 16.1 1.0 06	22.3	5 46.0 1.0 06	22.3	6 16.0 1.0 06	22.3	7
8											5 12.2 1.0 06	21.4	5 42.2 1.0 06	21.3	6 12.1 1.0 06	21.3	8
9											5 08.5 1.0 06	20.4	5 38.5 1.0 06	20.4	6 08.4 1.0 06	20.3	9
160											5 05.0 1.0 06	19.4	5 34.9 1.0 06	19.4	6 04.9 1.0 06	19.4	160
1											5 01.6 1.0 05	18.4	5 31.5 1.0 05	18.4	6 01.5 1.0 05	18.4	1
2													5 28.3 1.0 05	17.4	5 58.3 1.0 05	17.4	2
3													5 25.3 1.0 05	16.5	5 55.3 1.0 05	16.5	3
4													5 22.4 1.0 04	15.5	5 52.4 1.0 04	15.5	4
165													5 19.7 1.0 04	14.5	5 49.7 1.0 04	14.5	165
6													5 17.2 1.0 04	13.6	5 47.2 1.0 04	13.6	6
7													5 14.8 1.0 04	12.6	5 44.8 1.0 04	12.6	7
8													5 12.6 1.0 03	11.6	5 42.6 1.0 03	11.6	8
9													5 10.6 1.0 03	10.7	5 40.6 1.0 03	10.6	9
170													5 08.8 1.0 03	09.7	5 38.8 1.0 03	09.7	170
1													5 07.1 1.0 02	08.7	5 37.1 1.0 02	08.7	1
2													5 05.6 1.0 02	07.8	5 35.6 1.0 02	07.8	2
3													5 04.3 1.0 02	06.8	5 34.3 1.0 02	06.8	3
4													5 03.2 1.0 02	05.8	5 33.2 1.0 02	05.8	4
175													5 02.2 1.0 01	04.8	5 32.2 1.0 01	04.8	175
6													5 01.4 1.0 01	03.9	5 31.4 1.0 01	03.9	6
7													5 00.8 1.0 01	02.9	5 30.8 1.0 01	02.9	7
8													5 00.4 1.0 00	01.9	5 30.4 1.0 00	01.9	8
9													5 00.1 1.0 00	01.0	5 30.1 1.0 00	01.0	9
180													5 00.0 1.0 00	00.0	5 30.0 1.0 00	00.0	180

Lat. 80°
Lat. 81°
Lat. 82°
Lat. 83°
Lat. 84°

10—48722-1

Each degree column below lists: **Alt. (° ') Δd Δt Az.**

H.A.	16° 00′	16° 30′	17° 00′	17° 30′	18° 00′	18° 30′	19° 00′	19° 30′	H.A.
00	26 00.0 1.00 180.0	26 30.0 1.00 180.0	27 00.0 1.00 180.0	27 30.0 1.00 180.0	28 00.0 1.00 180.0	28 30.0 1.00 180.0	29 00.0 1.00 180.0	29 30.0 1.00 180.0	00
1	25 59.9 1.00 178.9	26 29.9 1.00 178.9	26 59.9 1.00 178.9	27 29.9 1.00 178.9	27 59.9 1.00 178.9	28 29.9 1.00 178.9	28 59.9 1.00 178.9	29 29.9 1.00 178.9	1
2	25 59.6 1.001 177.9	26 29.6 1.001 177.7	26 59.6 1.001 177.8	27 29.6 1.001 177.8	27 59.6 1.001 177.8	28 29.6 1.001 177.8	28 59.6 1.001 177.8	29 29.6 1.001 177.8	2
3	25 59.1 1.001 176.8	26 29.1 1.001 176.8	26 59.1 1.001 176.8	27 29.1 1.001 176.8	27 59.1 1.001 176.8	28 29.1 1.001 176.8	28 59.1 1.001 176.8	29 29.1 1.001 176.8	3
4	25 58.4 1.001 175.7	26 28.4 1.001 175.7	26 58.4 1.001 175.7	27 28.4 1.001 175.7	27 58.4 1.001 175.7	28 28.4 1.001 175.7	28 58.4 1.001 175.7	29 28.4 1.002 175.7	4
05	25 57.6 1.002 174.7	26 27.6 1.002 174.6	26 57.6 1.002 174.6	27 27.6 1.002 174.6	27 57.6 1.002 174.6	28 27.6 1.002 174.6	28 57.5 1.002 174.6	29 27.5 1.002 174.6	05
6	25 56.5 1.002 173.6	26 26.5 1.002 173.6	26 56.5 1.002 173.6	27 26.5 1.002 173.6	27 56.5 1.002 173.5	28 26.5 1.002 173.5	28 56.5 1.002 173.5	29 26.5 1.002 173.5	6
7	25 55.2 1.002 172.5	26 25.2 1.002 172.5	26 55.2 1.002 172.5	27 25.2 1.002 172.5	27 55.2 1.002 172.5	28 25.2 1.002 172.4	28 55.2 1.002 172.4	29 25.2 1.002 172.4	7
8	25 53.8 1.003 171.4	26 23.8 1.003 171.4	26 53.8 1.003 171.4	27 23.8 1.003 171.4	27 53.7 1.003 171.4	28 23.7 1.003 171.4	28 53.7 1.003 171.4	29 23.7 1.003 171.3	8
9	25 52.1 1.003 170.4	26 22.1 1.003 170.4	26 52.1 1.003 170.3	27 22.1 1.003 170.3	27 52.1 1.003 170.3	28 22.1 1.003 170.3	28 52.1 1.003 170.3	29 22.0 1.003 170.3	9
10	25 50.3 1.003 169.3	26 20.3 1.003 169.3	26 50.3 1.003 169.3	27 20.3 1.003 169.3	27 50.2 1.003 169.2	28 20.2 1.003 169.2	28 50.2 1.003 169.2	29 20.2 1.003 169.2	10
1	25 48.3 1.004 168.2	26 18.3 1.004 168.2	26 48.2 1.004 168.2	27 18.2 1.004 168.2	27 48.2 1.004 168.1	28 18.2 1.004 168.1	28 48.1 1.004 168.1	29 18.1 1.004 168.1	1
2	25 46.1 1.004 167.2	26 16.0 1.004 167.2	26 46.0 1.004 167.1	27 16.0 1.004 167.1	27 46.0 1.004 167.1	28 15.9 1.004 167.1	28 45.9 1.004 167.0	29 15.9 1.004 167.0	2
3	25 43.7 1.004 166.1	26 13.6 1.004 166.1	26 43.6 1.004 166.1	27 13.6 1.004 166.0	27 43.5 1.004 166.0	28 13.5 1.004 166.0	28 43.5 1.004 166.0	29 13.5 1.004 165.9	3
4	25 41.1 1.005 165.0	26 11.0 1.005 165.0	26 41.0 1.005 165.0	27 11.0 1.005 165.0	27 40.9 1.005 164.9	28 10.9 1.005 164.9	28 40.9 1.005 164.9	29 10.8 1.005 164.9	4
15	25 38.3 1.005 164.0	26 08.2 1.005 164.0	26 38.2 1.005 163.9	27 08.2 1.005 163.9	27 38.1 1.005 163.9	28 08.1 1.005 163.8	28 38.0 1.005 163.8	29 08.0 1.005 163.8	15
6	25 35.3 1.005 162.9	26 05.3 1.005 162.9	26 35.2 1.005 162.9	27 05.2 1.005 162.8	27 35.1 1.005 162.8	28 05.1 1.005 162.8	28 35.1 1.005 162.7	29 05.0 1.005 162.7	6
7	25 32.2 1.006 161.9	26 02.1 1.006 161.8	26 32.1 1.006 161.8	27 02.0 1.006 161.7	27 32.0 1.006 161.7	28 01.9 1.006 161.7	28 31.9 1.006 161.7	29 01.8 1.006 161.6	7
8	25 28.8 1.006 160.8	25 58.8 1.006 160.8	26 28.7 1.006 160.7	26 58.7 1.006 160.7	27 28.6 1.006 160.7	27 58.5 1.006 160.6	28 28.5 1.006 160.6	28 58.4 1.006 160.6	8
9	25 25.3 1.006 159.7	25 55.2 1.006 159.7	26 25.2 1.006 159.7	26 55.1 1.006 159.6	27 25.1 1.006 159.6	27 55.0 1.006 159.5	28 24.9 1.006 159.5	28 54.9 1.006 159.5	9
20	25 21.6 1.006 158.7	25 51.5 1.006 158.6	26 21.5 1.006 158.6	26 51.4 1.006 158.6	27 21.3 1.006 158.5	27 51.3 1.007 158.5	28 21.2 1.007 158.4	28 51.1 1.007 158.4	20
1	25 17.7 1.007 157.6	25 47.6 1.007 157.6	26 17.5 1.007 157.5	26 47.5 1.007 157.5	27 17.4 1.007 157.4	27 47.4 1.007 157.4	28 17.3 1.007 157.4	28 47.2 1.007 157.3	1
2	25 13.7 1.007 156.5	25 43.6 1.007 156.5	26 13.5 1.007 156.5	26 43.4 1.007 156.4	27 13.3 1.007 156.4	27 43.3 1.007 156.3	28 13.2 1.007 156.3	28 43.1 1.007 156.3	2
3	25 09.4 1.007 155.5	25 39.3 1.007 155.4	26 09.3 1.007 155.4	26 39.2 1.007 155.4	27 09.1 1.007 155.3	27 39.0 1.007 155.3	28 08.9 1.007 155.2	28 38.8 1.007 155.2	3
4	25 05.0 1.008 154.4	25 34.9 1.008 154.4	26 04.8 1.008 154.3	26 34.7 1.008 154.3	27 04.6 1.008 154.3	27 34.5 1.008 154.2	28 04.5 1.008 154.2	28 34.4 1.008 154.1	4
25	25 00.4 1.008 153.4	25 30.3 1.008 153.3	26 00.2 1.008 153.3	26 30.1 1.008 153.2	27 00.0 1.008 153.2	27 29.9 1.008 153.1	27 59.8 1.008 153.1	28 29.7 1.008 153.0	25
6	24 55.7 1.008 152.3	25 25.6 1.008 152.3	25 55.5 1.008 152.2	26 25.4 1.008 152.2	26 55.2 1.008 152.1	27 25.1 1.008 152.1	27 55.0 1.008 152.0	28 24.9 1.008 152.0	6
7	24 50.7 1.009 151.3	25 20.6 1.009 151.2	25 50.5 1.009 151.2	26 20.4 1.009 151.1	26 50.3 1.009 151.1	27 20.2 1.009 151.0	27 50.1 1.009 151.0	28 19.9 1.009 150.9	7
8	24 45.7 1.009 150.2	25 15.5 1.009 150.2	25 45.4 1.009 150.1	26 15.3 1.009 150.0	26 45.2 1.009 150.0	27 15.0 1.009 149.9	27 44.9 1.009 149.9	28 14.8 1.009 149.8	8
9	24 40.4 1.009 149.1	25 10.3 1.009 149.1	25 40.1 1.009 149.0	26 10.0 1.009 149.0	26 39.9 1.009 148.9	27 09.7 1.009 148.9	27 39.6 1.009 148.8	28 09.5 1.009 148.8	9
30	24 35.0 1.009 148.1	25 04.8 1.009 148.0	25 34.7 1.009 148.0	26 04.6 1.009 147.9	26 34.4 1.009 147.9	27 04.3 1.009 147.8	27 34.1 1.009 147.8	28 04.0 1.009 147.7	30
1	24 29.4 1.0 10 147.0	24 59.2 1.0 10 147.0	25 29.1 1.0 10 146.9	25 58.9 1.0 10 146.9	26 28.8 99 10 146.8	26 58.6 99 10 146.8	27 28.5 99 10 146.7	27 58.3 99 10 146.7	1
2	24 23.6 99 10 146.0	24 53.5 99 10 145.9	25 23.3 99 10 145.9	25 53.2 99 10 145.8	26 23.0 99 10 145.8	26 52.8 99 10 145.7	27 22.7 99 10 145.6	27 52.5 99 10 145.6	2
3	24 17.7 99 10 144.9	24 47.6 99 10 144.9	25 17.4 99 10 144.8	25 47.2 99 10 144.8	26 17.1 99 10 144.7	26 46.9 99 10 144.7	27 16.7 99 10 144.6	27 46.6 99 10 144.5	3
4	24 11.7 99 10 143.9	24 41.5 99 10 143.8	25 11.3 99 10 143.8	25 41.1 99 10 143.7	26 11.0 99 10 143.7	26 40.8 99 10 143.6	27 10.6 99 10 143.5	27 40.4 99 10 143.5	4
35	24 05.4 99 11 142.8	24 35.3 99 11 142.8	25 05.1 99 11 142.7	25 34.9 99 11 142.7	26 04.7 99 11 142.6	26 34.5 99 11 142.5	27 04.3 99 11 142.5	27 34.2 99 11 142.4	35
6	23 59.1 99 11 141.8	24 28.9 99 11 141.7	24 58.7 99 11 141.7	25 28.5 99 11 141.6	25 58.3 99 11 141.6	26 28.1 99 11 141.5	26 57.9 99 11 141.4	27 27.7 99 11 141.4	6
7	23 52.6 99 11 140.8	24 22.4 99 11 140.7	24 52.2 99 11 140.6	25 22.0 99 11 140.6	25 51.8 99 11 140.5	26 21.6 99 11 140.4	26 51.4 99 11 140.4	27 21.1 99 11 140.3	7
8	23 45.9 99 11 139.7	24 15.7 99 11 139.6	24 45.5 99 11 139.6	25 15.3 99 11 139.5	25 45.1 99 11 139.5	26 14.9 99 11 139.4	26 44.6 99 11 139.3	27 14.4 99 11 139.3	8
9	23 39.1 99 12 138.7	24 08.9 99 12 138.6	24 38.7 99 12 138.5	25 08.4 99 12 138.5	25 38.2 99 12 138.4	26 08.0 99 12 138.3	26 37.8 99 12 138.3	27 07.5 99 12 138.2	9
40	23 32.1 99 12 137.6	24 01.9 99 12 137.6	24 31.7 99 12 137.5	25 01.5 99 12 137.4	25 31.2 99 12 137.4	26 01.0 99 12 137.3	26 30.8 99 12 137.2	27 00.5 99 12 137.1	40
1	23 25.0 99 12 136.6	23 54.8 99 12 136.6	24 24.6 99 12 136.5	24 54.3 99 12 136.4	25 24.1 99 12 136.4	25 53.9 99 12 136.3	26 23.6 99 12 136.2	26 53.4 99 12 136.1	1
2	23 17.8 99 12 135.6	23 47.6 99 12 135.5	24 17.3 99 12 135.4	24 47.1 99 12 135.3	25 16.8 99 12 135.3	25 46.6 99 12 135.2	26 16.3 99 12 135.1	26 46.1 99 12 135.1	2
3	23 10.5 99 12 134.5	23 40.2 99 12 134.4	24 10.0 99 13 134.4	24 39.7 99 13 134.3	25 09.4 99 13 134.2	25 39.2 99 13 134.2	26 08.9 99 13 134.1	26 38.7 99 13 134.0	3
4	23 03.0 99 13 133.5	23 32.7 99 13 133.4	24 02.4 99 13 133.3	24 32.2 99 13 133.3	25 01.9 99 13 133.2	25 31.6 99 13 133.1	26 01.4 99 13 133.0	26 31.1 99 13 133.0	4
45	22 55.3 99 13 132.4	23 25.1 99 13 132.4	23 54.8 99 13 132.3	24 24.5 99 13 132.2	24 54.2 99 13 132.1	25 24.0 99 13 132.1	25 53.7 99 13 132.0	26 23.4 99 13 131.9	45
6	22 47.6 99 13 131.4	23 17.3 99 13 131.3	23 47.0 99 13 131.3	24 16.7 99 13 131.2	24 46.5 99 13 131.1	25 16.2 99 13 131.0	25 45.9 99 13 131.0	26 15.6 99 13 130.9	6
7	22 39.7 99 13 130.4	23 09.4 99 13 130.3	23 39.1 99 13 130.2	24 08.8 99 13 130.1	24 38.5 99 13 130.1	25 08.2 99 13 130.0	25 38.0 99 14 129.9	26 07.7 99 14 129.8	7
8	22 31.7 99 14 129.3	23 01.4 99 14 129.3	23 31.1 99 14 129.2	24 00.8 99 14 129.1	24 30.5 99 14 129.0	25 00.2 99 14 129.0	25 29.9 99 14 128.9	25 59.6 99 14 128.8	8
9	22 23.6 99 14 128.3	22 53.3 99 14 128.2	23 23.0 99 14 128.2	23 52.7 99 14 128.1	24 22.4 99 14 128.0	24 52.0 99 14 127.9	25 21.7 99 14 127.8	25 51.4 99 14 127.8	9
50	22 15.4 99 14 127.3	22 45.0 99 14 127.2	23 14.7 99 14 127.1	23 44.4 99 14 127.0	24 14.1 99 14 127.0	24 43.8 99 14 126.9	25 13.4 99 14 126.8	25 43.1 99 14 126.7	50
1	22 07.0 99 14 126.3	22 36.7 99 14 126.2	23 06.4 99 14 126.1	23 36.0 99 14 126.0	24 05.7 99 15 125.9	24 35.4 99 15 125.8	25 05.0 99 15 125.8	25 34.7 99 15 125.7	1
2	21 58.6 99 14 125.2	22 28.2 99 14 125.2	22 57.9 99 14 125.1	23 27.6 99 14 125.0	23 57.2 99 14 124.9	24 26.9 99 14 124.8	24 56.5 99 15 124.7	25 26.2 99 15 124.7	2
3	21 50.0 99 14 124.2	22 19.7 99 14 124.1	22 49.3 99 14 124.0	23 19.0 99 14 124.0	23 48.6 99 14 123.9	24 18.3 99 15 123.8	24 47.9 99 15 123.7	25 17.6 99 15 123.6	3
4	21 41.3 99 15 123.2	22 11.0 99 15 123.1	22 40.6 99 15 123.0	23 10.3 99 15 122.9	23 39.9 99 15 122.9	24 09.6 99 15 122.8	24 39.2 99 15 122.7	25 08.8 99 15 122.6	4
55	21 32.6 99 15 122.2	22 02.2 99 15 122.1	22 31.8 99 15 122.0	23 01.5 99 15 121.9	23 31.1 99 15 121.8	24 00.8 99 15 121.7	24 30.4 99 15 121.7	25 00.0 99 15 121.6	55
6	21 23.7 99 15 121.1	21 53.3 99 15 121.1	22 23.0 99 15 121.0	22 52.6 99 15 120.9	23 22.2 99 15 120.8	23 51.8 99 15 120.7	24 21.5 99 15 120.6	24 51.1 99 15 120.5	6
7	21 14.7 99 15 120.1	21 44.3 99 15 120.0	22 14.0 99 15 120.0	22 43.6 99 15 119.9	23 13.2 99 15 119.8	23 42.8 99 15 119.7	24 12.5 99 15 119.6	24 42.1 99 15 119.5	7
8	21 05.7 99 15 119.1	21 35.3 99 15 119.0	22 04.9 99 15 118.9	22 34.5 99 15 118.8	23 04.1 99 15 118.8	23 33.7 99 15 118.7	24 03.4 99 15 118.6	24 33.0 99 16 118.5	8
9	20 56.5 99 15 118.1	21 26.1 99 15 118.0	21 55.7 99 15 117.9	22 25.4 99 15 117.8	22 55.0 99 15 117.7	23 24.6 99 15 117.7	23 54.2 99 16 117.6	24 23.8 99 16 117.5	9
60	20 47.3 99 16 117.1	21 16.9 99 16 117.0	21 46.5 99 16 116.9	22 16.1 99 16 116.8	22 45.7 99 16 116.7	23 15.3 99 16 116.6	23 44.9 99 16 116.5	24 14.5 99 16 116.5	60
1	20 38.0 99 16 116.1	21 07.6 99 16 116.0	21 37.2 99 16 115.9	22 06.8 99 16 115.7	22 36.3 99 16 115.7	23 05.9 99 16 115.6	23 35.5 99 16 115.5	24 05.1 99 16 115.4	1
2	20 28.6 99 16 115.0	20 58.2 99 16 115.0	21 27.7 99 16 114.9	21 57.3 99 16 114.8	22 26.9 99 16 114.7	22 56.5 99 16 114.6	23 26.1 99 16 114.5	23 55.7 99 16 114.4	2
3	20 19.1 99 16 114.0	20 48.7 99 16 113.9	21 18.3 99 16 113.9	21 47.8 99 16 113.8	22 17.4 99 16 113.7	22 47.0 99 16 113.6	23 16.6 99 16 113.5	23 46.1 99 16 113.4	3
4	20 09.5 99 16 113.0	20 39.1 99 16 112.9	21 08.7 99 16 112.8	21 38.3 99 16 112.8	22 07.8 99 16 112.7	22 37.4 99 16 112.6	23 07.0 99 16 112.5	23 36.5 99 16 112.4	4
65	19 59.9 99 16 112.0	20 29.5 99 16 111.9	20 59.1 99 16 111.8	21 28.6 99 16 111.7	21 58.2 99 16 111.7	22 27.8 99 16 111.6	22 57.3 99 16 111.5	23 26.9 99 16 111.4	65
6	19 50.2 99 16 111.0	20 19.8 99 16 110.9	20 49.3 99 16 110.8	21 18.9 99 16 110.8	21 48.5 99 16 110.7	22 18.0 99 16 110.5	22 47.6 99 16 110.5	23 17.1 99 16 110.4	6
7	19 40.5 99 16 110.0	20 10.0 99 16 109.9	20 39.6 99 16 109.8	21 09.1 99 16 109.7	21 38.7 99 16 109.6	22 08.2 99 16 109.5	22 37.8 98 16 109.4	23 07.3 98 16 109.4	7
8	19 30.6 99 16 109.0	20 00.2 99 16 108.9	20 29.7 99 16 108.8	20 59.3 99 16 108.7	21 28.8 98 16 108.6	21 58.4 98 16 108.5	22 27.9 98 17 108.4	22 57.5 98 17 108.3	8
9	19 20.7 99 17 108.0	19 50.3 99 17 107.9	20 19.9 99 17 107.8	20 49.4 99 17 107.7	21 18.9 99 17 107.6	21 48.5 98 17 107.5	22 18.0 98 17 107.4	22 47.6 98 17 107.3	9
70	19 10.8 98 17 107.0	19 40.4 98 17 106.9	20 09.9 98 17 106.8	20 39.4 98 17 106.7	21 09.0 98 17 106.6	21 38.5 98 17 106.5	22 08.1 98 17 106.4	22 37.6 98 17 106.3	70
1	19 00.8 98 17 106.0	19 30.4 98 17 105.9	19 59.9 98 17 105.8	20 29.4 98 17 105.7	20 59.0 98 17 105.6	21 28.5 98 17 105.5	21 58.0 98 17 105.4	22 27.6 98 17 105.3	1
2	18 50.8 98 17 105.0	19 20.3 98 17 104.9	19 49.9 98 17 104.8	20 19.4 98 17 104.7	20 48.9 98 17 104.6	21 18.4 98 17 104.5	21 48.0 98 17 104.4	22 17.5 98 17 104.3	2
3	18 40.7 98 17 104.0	19 10.2 98 17 103.9	19 39.8 98 17 103.8	20 09.3 98 17 103.7	20 38.8 98 17 103.6	21 08.3 98 17 103.5	21 37.9 98 17 103.4	22 07.4 98 17 103.3	3
4	18 30.6 98 17 103.0	19 00.1 98 17 102.9	19 29.6 98 17 102.8	19 59.1 98 17 102.7	20 28.7 98 17 102.6	20 58.2 98 17 102.5	21 27.7 98 17 102.4	21 57.2 98 17 102.3	4
75	18 20.4 98 17 102.0	18 49.9 98 17 101.9	19 19.4 98 17 101.8	19 49.0 98 17 101.7	20 18.5 98 17 101.6	20 48.0 98 17 101.5	21 17.5 98 17 101.4	21 47.0 98 17 101.3	75
6	18 10.2 98 17 101.0	18 39.7 98 17 100.9	19 09.2 98 17 100.8	19 38.7 98 17 100.7	20 08.3 98 17 100.6	20 37.8 98 17 100.5	21 07.3 98 17 100.4	21 36.8 98 17 100.3	6
7	17 59.9 98 17 100.0	18 29.5 98 17 99.9	18 59.0 98 17 99.8	19 28.5 98 17 99.7	19 58.0 98 17 99.6	20 27.5 98 17 99.5	20 57.0 98 17 99.4	21 26.5 98 17 99.3	7
8	17 49.7 98 17 99.0	18 19.2 98 17 98.9	18 48.7 98 17 98.8	19 18.2 98 17 98.7	19 47.7 98 17 98.6	20 17.2 98 17 98.5	20 46.7 98 17 98.4	21 16.2 98 17 98.3	8
9	17 39.4 98 17 98.0	18 08.9 98 17 97.9	18 38.4 98 17 97.8	19 07.9 98 17 97.7	19 37.4 98 17 97.6	20 06.9 98 17 97.5	20 36.4 98 17 97.4	21 05.9 98 17 97.3	9
80	17 29.0 98 17 97.0	17 58.5 98 17 96.9	18 28.0 98 17 96.8	18 57.6 98 17 96.7	19 27.1 98 17 96.6	19 56.6 98 17 96.5	20 26.1 98 17 96.4	20 55.6 98 17 96.3	80
1	17 18.7 98 17 96.0	17 48.2 98 17 95.9	18 17.7 98 17 95.8	18 47.2 98 17 95.7	19 16.7 98 17 95.6	19 46.2 98 17 95.5	20 15.7 98 17 95.5	20 45.2 98 17 95.4	1
2	17 08.3 98 17 95.0	17 37.8 98 17 94.9	18 07.3 98 17 94.8	18 36.8 98 17 94.8	19 06.3 98 17 94.7	19 35.8 98 17 94.6	20 05.3 98 17 94.5	20 34.8 98 17 94.4	2
3	16 57.9 98 17 94.0	17 27.4 98 17 94.0	17 56.9 98 17 93.9	18 26.4 98 17 93.8	18 55.9 98 17 93.7	19 25.4 98 17 93.6	19 54.9 98 17 93.5	20 24.4 98 17 93.4	3
4	16 47.5 98 17 93.1	17 17.0 98 17 93.0	17 46.5 98 17 92.9	18 16.0 98 17 92.8	18 45.5 98 17 92.7	19 15.0 98 17 92.6	19 44.5 98 17 92.5	20 14.0 98 17 92.4	4
85	16 37.1 98 17 92.1	17 06.6 98 17 92.0	17 36.1 98 17 91.9	18 05.6 98 17 91.8	18 35.1 98 17 91.7	19 04.6 98 17 91.6	19 34.1 98 17 91.5	20 03.6 98 17 91.4	85
6	16 26.7 98 17 91.1	16 56.2 98 17 91.0	17 25.7 98 17 90.9	17 55.2 98 17 90.8	18 24.7 98 17 90.7	18 54.2 98 17 90.6	19 23.7 98 17 90.5	19 53.2 98 17 90.4	6
7	16 16.3 98 17 90.1	16 45.8 98 17 90.0	17 15.3 98 17 89.9	17 44.8 98 17 89.8	18 14.3 98 17 89.7	18 43.8 98 17 89.6	19 13.3 98 17 89.5	19 42.8 98 17 89.4	7
8	16 05.9 98 17 89.1	16 35.4 98 17 89.0	17 04.9 98 17 88.9	17 34.4 98 17 88.8	18 03.9 98 17 88.7	18 33.4 98 17 88.6	19 02.9 98 17 88.5	19 32.3 98 17 88.4	8
9	15 55.4 98 17 88.1	16 24.9 98 17 88.0	16 54.4 98 17 87.9	17 24.0 98 17 87.8	17 53.4 98 17 87.7	18 22.9 98 17 87.6	18 52.4 98 17 87.6	19 21.9 98 17 87.5	9
90	15 45.0 98 17 87.1	16 14.5 98 17 87.0	16 44.0 98 17 87.0	17 13.5 98 17 86.9	17 43.0 98 17 86.8	18 12.5 98 17 86.7	18 42.0 98 17 86.6	19 11.5 98 17 86.5	90

H.A.	16°00' Alt	Δd Δt	Az	16°30' Alt	Δd Δt	Az	17°00' Alt	Δd Δt	Az	17°30' Alt	Δd Δt	Az	18°00' Alt	Δd Δt	Az	18°30' Alt	Δd Δt	Az	19°00' Alt	Δd Δt	Az	19°30' Alt	Δd Δt	Az	H.A.
91	15 34.6	98 17	86.2	16 04.1	98 17	86.1	16 33.6	98 17	86.0	17 03.1	98 17	85.9	17 32.6	98 17	85.8	18 02.1	98 17	85.7	18 31.6	98 17	85.6	19 01.1	98 17	85.5	91
2	15 24.2	98 17	85.2	15 53.8	98 17	85.1	16 23.3	98 17	85.0	16 52.8	98 17	84.9	17 22.3	98 17	84.8	17 51.8	98 17	84.7	18 21.3	98 17	84.6	18 50.8	98 17	84.5	2
3	15 13.9	98 17	84.2	15 43.4	98 17	84.1	16 12.9	98 17	84.0	16 42.4	98 17	83.9	17 11.9	98 17	83.8	17 41.4	98 17	83.7	18 10.9	98 17	83.6	18 40.4	98 17	83.5	3
4	15 03.5	98 17	83.2	15 33.0	98 17	83.1	16 02.5	98 17	83.0	16 32.0	98 17	82.9	17 01.5	98 17	82.9	17 31.0	98 17	82.8	18 00.5	98 17	82.7	18 30.0	98 17	82.6	4
95	14 53.2	98 17	82.2	15 22.7	98 17	82.2	15 52.2	98 17	82.1	16 21.7	98 17	82.0	16 51.2	98 17	81.9	17 20.7	98 17	81.8	17 50.2	98 17	81.7	18 19.7	98 17	81.6	95
6	14 42.9	98 17	81.3	15 12.4	98 17	81.2	15 41.9	98 17	81.1	16 11.4	98 17	81.0	16 40.9	98 17	80.9	17 10.4	98 17	80.8	17 39.9	98 17	80.7	18 09.4	98 17	80.6	6
7	14 32.6	98 17	80.3	15 02.1	98 17	80.2	15 31.6	98 17	80.1	16 01.1	98 17	80.0	16 30.6	98 17	79.9	17 00.2	98 17	79.8	17 29.7	98 17	79.7	17 59.2	98 17	79.6	7
8	14 22.3	98 17	79.3	14 51.9	98 17	79.2	15 21.4	98 17	79.1	15 50.9	98 17	79.0	16 20.4	98 17	78.9	16 49.9	98 17	78.9	17 19.4	98 17	78.8	17 48.9	98 17	78.7	8
9	14 12.1	98 17	78.3	14 41.6	98 17	78.2	15 11.2	98 17	78.2	15 40.7	98 17	78.1	16 10.2	98 17	78.0	16 39.7	98 17	77.9	17 09.2	98 17	77.8	17 38.7	98 17	77.7	9
100	14 01.9	98 17	77.4	14 31.5	98 17	77.3	15 01.0	98 17	77.2	15 30.5	98 17	77.1	16 00.0	98 17	77.0	16 29.5	98 17	76.9	16 59.1	98 17	76.8	17 28.6	98 17	76.7	100
1	13 51.8	98 17	76.4	14 21.3	98 17	76.3	14 50.8	98 17	76.2	15 20.4	98 17	76.1	15 49.9	98 17	76.0	16 19.4	98 17	75.9	16 48.9	98 17	75.8	17 18.5	98 17	75.7	1
2	13 41.7	98 17	75.4	14 11.2	98 17	75.3	14 40.7	98 17	75.2	15 10.3	98 17	75.1	15 39.8	98 17	75.0	16 09.3	98 17	75.0	16 38.9	98 17	74.9	17 08.4	98 17	74.8	2
3	13 31.6	98 17	74.4	14 01.2	98 17	74.4	14 30.7	98 17	74.3	15 00.2	98 17	74.2	15 29.8	98 17	74.1	15 59.3	98 17	74.0	16 28.8	98 17	73.9	16 58.4	98 17	73.8	3
4	13 21.6	98 17	73.5	13 51.1	98 17	73.4	14 20.7	98 17	73.3	14 50.2	98 17	73.2	15 19.8	98 17	73.1	15 49.3	98 17	73.0	16 18.8	98 17	72.9	16 48.4	98 17	72.8	4
105	13 11.6	99 17	72.5	13 41.2	98 16	72.4	14 10.7	98 16	72.3	14 40.3	98 16	72.2	15 09.8	98 16	72.1	15 39.4	98 16	72.0	16 08.9	98 16	72.0	16 38.4	98 16	71.9	105
6	13 01.7	99 16	71.5	13 31.3	99 16	71.4	14 00.8	99 16	71.3	14 30.4	99 16	71.3	14 59.9	98 16	71.2	15 29.5	98 16	71.1	15 59.0	98 16	71.0	16 28.6	98 16	70.9	6
7	12 51.9	99 16	70.5	13 21.4	99 16	70.5	13 51.0	99 16	70.4	14 20.5	99 16	70.3	14 50.1	99 16	70.2	15 19.7	99 16	70.1	15 49.2	98 16	70.0	16 18.8	98 16	69.9	7
8	12 42.1	99 16	69.6	13 11.6	99 16	69.5	13 41.2	99 16	69.4	14 10.8	99 16	69.3	14 40.3	99 16	69.2	15 09.9	99 16	69.1	15 39.4	99 16	69.1	16 09.0	99 16	69.0	8
9	12 32.3	99 16	68.6	13 01.9	99 16	68.5	13 31.5	99 16	68.4	14 01.1	99 16	68.3	14 30.6	99 16	68.3	15 00.2	99 16	68.2	15 29.7	99 16	68.1	15 59.3	99 16	68.0	9
110	12 22.7	99 16	67.6	12 52.3	99 16	67.6	13 21.8	99 16	67.5	13 51.4	99 16	67.4	14 21.0	99 16	67.3	14 50.5	99 16	67.2	15 20.1	99 16	67.1	15 49.7	99 16	67.0	110
1	12 13.1	99 16	66.7	12 42.7	99 16	66.6	13 12.2	99 16	66.5	13 41.8	99 16	66.4	14 11.4	99 16	66.3	14 41.0	99 16	66.2	15 10.6	99 16	66.2	15 40.1	99 16	66.1	1
2	12 03.5	99 16	65.7	12 33.1	99 16	65.6	13 02.7	99 16	65.5	13 32.3	99 16	65.4	14 01.9	99 16	65.4	14 31.5	99 16	65.3	15 01.1	99 16	65.2	15 30.6	99 16	65.1	2
3	11 54.1	99 16	64.7	12 23.7	99 16	64.6	12 53.3	99 16	64.6	13 22.9	99 16	64.5	13 52.5	99 16	64.4	14 22.1	99 16	64.3	14 51.6	99 16	64.2	15 21.2	99 16	64.1	3
4	11 44.7	99 16	63.8	12 14.3	99 16	63.7	12 43.9	99 16	63.6	13 13.5	99 15	63.5	13 43.1	99 16	63.4	14 12.7	99 15	63.3	14 42.3	99 15	63.3	15 11.9	99 15	63.2	4
115	11 35.4	99 15	62.8	12 05.0	99 15	62.7	12 34.6	99 15	62.6	13 04.2	99 15	62.5	13 33.8	99 15	62.5	14 03.4	99 15	62.4	14 33.0	99 15	62.3	15 02.6	99 15	62.2	115
6	11 26.2	99 15	61.8	11 55.8	99 15	61.7	12 25.4	99 15	61.7	12 55.0	99 15	61.6	13 24.6	99 15	61.5	13 54.2	99 15	61.4	14 23.8	99 15	61.3	14 53.5	99 15	61.2	6
7	11 17.0	99 15	60.9	11 46.7	99 15	60.8	12 16.3	99 15	60.7	12 45.9	99 15	60.6	13 15.5	99 15	60.5	13 45.1	99 15	60.4	14 14.7	99 15	60.4	14 44.4	99 15	60.3	7
8	11 08.0	99 15	59.9	11 37.6	99 15	59.8	12 07.2	99 15	59.7	12 36.9	99 15	59.6	13 06.5	99 15	59.6	13 36.1	99 15	59.5	14 05.7	99 15	59.4	14 35.4	99 15	59.3	8
9	10 59.0	99 15	58.9	11 28.6	99 15	58.8	11 58.3	99 15	58.8	12 27.9	99 15	58.7	12 57.5	99 15	58.6	13 27.2	99 15	58.5	13 56.8	99 15	58.4	14 26.4	99 15	58.4	9
120	10 50.1	99 15	58.0	11 19.8	99 15	57.9	11 49.4	99 15	57.8	12 19.1	99 15	57.7	12 48.7	99 15	57.6	13 18.3	99 15	57.6	13 48.0	99 15	57.5	14 17.6	99 15	57.4	120
1	10 41.3	99 14	57.0	11 11.0	99 14	56.9	11 40.6	99 14	56.8	12 10.3	99 14	56.8	12 39.9	99 14	56.7	13 09.6	99 14	56.6	13 39.2	99 14	56.5	14 08.9	99 14	56.4	1
2	10 32.7	99 14	56.0	11 02.3	99 14	55.9	11 32.0	99 14	55.9	12 01.6	99 14	55.8	12 31.3	99 14	55.7	13 00.9	99 14	55.6	13 30.6	99 14	55.6	14 00.3	99 14	55.5	2
3	10 24.1	99 14	55.0	10 53.7	99 14	55.0	11 23.4	99 14	54.9	11 53.1	99 14	54.8	12 22.7	99 14	54.7	12 52.4	99 14	54.7	13 22.1	99 14	54.6	13 51.7	99 14	54.5	3
4	10 15.6	99 14	54.1	10 45.3	99 14	54.0	11 14.9	99 14	53.9	11 44.6	99 14	53.9	12 14.3	99 14	53.8	12 43.9	99 14	53.7	13 13.6	99 14	53.6	13 43.3	99 14	53.6	4
125	10 07.2	99 14	53.1	10 36.9	99 14	53.0	11 06.6	99 14	53.0	11 36.2	99 14	52.9	12 05.9	99 14	52.8	12 35.6	99 14	52.7	13 05.3	99 14	52.7	13 35.0	99 14	52.6	125
6	9 58.9	99 14	52.2	10 28.6	99 14	52.1	10 58.3	99 14	52.0	11 28.0	99 14	51.9	11 57.7	99 14	51.9	12 27.4	99 14	51.8	12 57.1	99 14	51.7	13 26.7	99 14	51.6	6
7	9 50.7	99 13	51.2	10 20.4	99 13	51.1	10 50.1	99 13	51.0	11 19.8	99 13	51.0	11 49.5	99 13	50.9	12 19.2	99 13	50.8	12 48.9	99 13	50.8	13 18.6	99 13	50.7	7
8	9 42.7	99 13	50.2	10 12.4	99 13	50.1	10 42.1	99 13	50.0	11 11.8	99 13	50.0	11 41.5	99 13	49.9	12 11.2	99 13	49.9	12 40.9	99 13	49.8	13 10.6	99 13	49.7	8
9	9 34.7	99 13	49.3	10 04.4	99 13	49.2	10 34.2	99 13	49.1	11 03.9	99 13	49.0	11 33.6	99 13	49.0	12 03.3	99 13	48.9	12 33.0	99 13	48.8	13 02.7	99 13	48.8	9
130	9 26.9	99 13	48.3	9 56.6	99 13	48.2	10 26.3	99 13	48.2	10 56.1	99 13	48.1	11 25.8	99 13	48.0	11 55.5	99 13	47.9	12 25.2	99 13	47.9	12 54.9	99 13	47.8	130
1	9 19.2	99 13	47.3	9 48.9	99 13	47.3	10 18.6	99 13	47.2	10 48.4	99 13	47.1	11 18.1	99 13	47.1	11 47.8	99 13	47.0	12 17.6	99 13	46.9	12 47.3	99 13	46.8	1
2	9 11.6	99 12	46.4	9 41.3	99 12	46.3	10 11.1	99 12	46.2	10 40.8	99 12	46.2	11 10.5	99 12	46.1	11 40.3	99 12	46.0	12 09.7	99 12	45.9	12 39.7	99 12	45.9	2
3	9 04.1	99 12	45.4	9 33.8	99 12	45.3	10 03.6	99 12	45.3	10 33.3	99 12	45.2	11 03.1	99 12	45.1	11 32.8	99 12	45.1	12 02.6	99 12	45.0	12 32.3	99 12	44.9	3
4	8 56.7	99 12	44.4	9 26.5	99 12	44.4	9 56.3	99 12	44.3	10 26.0	99 12	44.2	10 55.8	99 12	44.2	11 25.5	99 12	44.1	11 55.3	99 12	44.0	12 25.0	99 12	44.0	4
135	8 49.5	99 12	43.5	9 19.3	99 12	43.4	9 49.0	99 12	43.3	10 18.8	99 12	43.3	10 48.6	99 12	43.2	11 18.3	99 12	43.1	11 48.1	99 12	43.1	12 17.9	99 12	43.0	135
6	8 42.4	99 12	42.5	9 12.2	99 12	42.4	9 42.0	99 12	42.4	10 11.7	99 12	42.3	10 41.5	99 12	42.2	11 11.3	99 12	42.2	11 41.0	99 12	42.1	12 10.8	99 12	42.1	6
7	8 35.4	99 11	41.5	9 05.2	99 11	41.5	9 35.0	99 11	41.4	10 04.8	99 11	41.3	10 34.6	99 11	41.3	11 04.3	99 11	41.2	11 34.1	99 11	41.2	12 03.9	99 11	41.1	7
8	8 28.6	99 11	40.6	8 58.4	99 11	40.5	9 28.2	99 11	40.4	9 58.0	99 11	40.4	10 27.8	99 11	40.3	10 57.5	99 11	40.3	11 27.3	99 11	40.2	11 57.1	99 11	40.1	8
9	8 21.9	99 11	39.6	8 51.7	99 11	39.5	9 21.5	99 11	39.5	9 51.3	99 11	39.4	10 21.1	99 11	39.4	10 50.9	99 11	39.3	11 20.7	99 11	39.2	11 50.5	99 11	39.2	9
140	8 15.3	99 11	38.6	8 45.1	99 11	38.6	9 14.9	99 11	38.5	9 44.7	99 11	38.5	10 14.5	99 11	38.4	10 44.3	99 11	38.3	11 14.1	99 11	38.3	11 44.0	99 11	38.2	140
1	8 08.9	99 10	37.7	8 38.7	99 10	37.6	9 08.5	99 10	37.6	9 38.3	99 10	37.5	10 08.1	99 10	37.4	10 37.9	99 10	37.4	11 07.8	99 10	37.3	11 37.6	99 10	37.3	1
2	8 02.6	99 10	36.7	8 32.4	99 10	36.6	9 02.2	99 10	36.6	9 32.0	99 10	36.5	10 01.9	99 10	36.5	10 31.7	99 10	36.4	11 01.5	99 10	36.4	11 31.3	99 10	36.3	2
3	7 56.4	99 10	35.7	8 26.2	99 10	35.7	8 56.1	99 10	35.6	9 25.9	99 10	35.6	9 55.7	99 10	35.5	10 25.6	99 10	35.5	10 55.4	99 10	35.4	11 25.2	99 10	35.4	3
4	7 50.4	99 10	34.8	8 20.2	99 10	34.7	8 50.1	99 10	34.7	9 19.9	99 10	34.6	9 49.8	99 10	34.6	10 19.6	99 10	34.5	10 49.4	99 10	34.5	11 19.3	99 10	34.4	4
145	7 44.5	99 10	33.8	8 14.4	99 10	33.8	8 44.2	99 10	33.7	9 14.1	99 10	33.7	9 43.9	99 09	33.6	10 13.8	99 09	33.6	10 43.6	99 09	33.5	11 13.5	99 09	33.5	145
6	7 38.8	1.009	32.8	8 08.7	1.009	32.7	8 38.5	1.009	32.7	9 08.4	1.009	32.7	9 38.2	1.009	32.6	10 08.1	1.009	32.6	10 37.9	1.009	32.5	11 07.8	1.009	32.5	6
7	7 33.3	1.009	31.9	8 03.1	1.009	31.8	8 33.0	1.009	31.8	9 02.8	1.009	31.7	9 32.7	1.009	31.7	10 02.5	1.009	31.6	10 32.4	1.009	31.6	11 02.3	1.009	31.5	7
8	7 27.8	1.009	30.9	7 57.7	1.009	30.9	8 27.5	1.009	30.8	8 57.4	1.009	30.8	9 27.3	1.009	30.7	9 57.2	1.009	30.7	10 27.0	1.009	30.6	10 56.9	1.009	30.6	8
9	7 22.5	1.009	29.9	7 52.4	1.009	29.9	8 22.3	1.009	29.9	8 52.2	1.008	29.8	9 22.0	1.008	29.8	9 51.9	1.008	29.7	10 21.8	1.008	29.7	10 51.7	1.008	29.6	9
150	7 17.4	1.008	29.0	7 47.3	1.008	28.9	8 17.2	1.008	28.9	8 47.1	1.008	28.8	9 16.9	1.008	28.8	9 46.8	1.008	28.8	10 16.7	1.008	28.7	10 46.6	1.008	28.7	150
1	7 12.4	1.008	28.0	7 42.3	1.008	28.0	8 12.2	1.008	27.9	8 42.1	1.008	27.9	9 12.0	1.008	27.8	9 41.9	1.008	27.8	10 11.8	1.008	27.8	10 41.7	1.008	27.7	1
2	7 07.6	1.008	27.1	7 37.5	1.008	27.0	8 07.4	1.008	27.0	8 37.3	1.008	26.9	9 07.2	1.008	26.9	9 37.1	1.008	26.8	10 07.0	1.008	26.8	10 36.9	1.008	26.8	2
3	7 03.0	1.008	26.1	7 32.9	1.007	26.0	8 02.8	1.007	26.0	8 32.7	1.007	26.0	9 02.6	1.007	25.9	9 32.5	1.007	25.9	10 02.4	1.007	25.8	10 32.3	1.007	25.8	3
4	6 58.4	1.007	25.1	7 28.4	1.007	25.1	7 58.3	1.007	25.0	8 28.2	1.007	25.0	8 58.1	1.007	25.0	9 28.0	1.007	24.9	9 57.9	1.007	24.9	10 27.8	1.007	24.8	4
155	6 54.1	1.007	24.1	7 24.0	1.007	24.1	7 53.9	1.007	24.1	8 23.9	1.007	24.0	8 53.8	1.007	24.0	9 23.7	1.007	24.0	9 53.6	1.007	23.9	10 23.5	1.007	23.9	155
6	6 49.9	1.007	23.2	7 19.8	1.007	23.2	7 49.8	1.007	23.1	8 19.7	1.007	23.1	8 49.6	1.007	23.0	9 19.5	1.007	23.0	9 49.5	1.007	23.0	10 19.4	1.007	22.9	6
7	6 45.9	1.006	22.2	7 15.8	1.006	22.2	7 45.8	1.006	22.2	8 15.7	1.006	22.1	8 45.6	1.006	22.1	9 15.5	1.006	22.1	9 45.5	1.006	22.0	10 15.4	1.006	22.0	7
8	6 42.0	1.006	21.3	7 12.0	1.006	21.2	7 41.9	1.006	21.2	8 11.8	1.006	21.2	8 41.8	1.006	21.1	9 11.7	1.006	21.1	9 41.7	1.006	21.1	10 11.6	1.006	21.0	8
9	6 38.1	1.006	20.3	7 08.1	1.006	20.3	7 38.2	1.006	20.2	8 08.2	1.006	20.2	8 38.1	1.006	20.2	9 08.0	1.006	20.1	9 38.0	1.006	20.1	10 07.9	1.006	20.1	9
160	6 34.8	1.006	19.3	7 04.8	1.006	19.3	7 34.7	1.006	19.3	8 04.7	1.006	19.2	8 34.6	1.006	19.2	9 04.5	1.006	19.2	9 34.5	1.006	19.1	10 04.4	1.006	19.1	160
1	6 31.5	1.005	18.4	7 01.4	1.005	18.3	7 31.4	1.005	18.3	8 01.3	1.005	18.3	8 31.3	1.005	18.2	9 01.2	1.005	18.2	9 31.2	1.005	18.2	10 01.1	1.005	18.2	1
2	6 28.3	1.005	17.4	6 58.2	1.005	17.4	7 28.2	1.005	17.3	7 58.1	1.005	17.3	8 28.1	1.005	17.3	8 58.0	1.005	17.3	9 28.0	1.005	17.2	9 57.9	1.005	17.2	2
3	6 25.2	1.005	16.4	6 55.2	1.005	16.4	7 25.1	1.005	16.4	7 55.1	1.004	16.4	8 25.1	1.004	16.3	8 55.0	1.004	16.3	9 25.0	1.004	16.3	9 54.9	1.004	16.2	3
4	6 22.4	1.004	15.5	6 52.3	1.004	15.4	7 22.3	1.004	15.4	7 52.3	1.004	15.4	8 22.2	1.004	15.4	8 52.2	1.004	15.3	9 22.1	1.004	15.3	9 52.1	1.004	15.3	4
165	6 19.7	1.004	14.5	6 49.6	1.004	14.5	7 19.6	1.004	14.5	7 49.6	1.004	14.4	8 19.5	1.004	14.4	8 49.5	1.004	14.4	9 19.5	1.004	14.4	9 49.4	1.004	14.3	165
6	6 17.1	1.004	13.5	6 47.1	1.004	13.5	7 17.1	1.004	13.5	7 47.1	1.004	13.5	8 17.0	1.004	13.4	8 47.0	1.004	13.4	9 17.0	1.004	13.4	9 47.0	1.004	13.4	6
7	6 14.8	1.004	12.6	6 44.8	1.004	12.5	7 14.7	1.004	12.5	7 44.7	1.004	12.5	8 14.7	1.004	12.5	8 44.7	1.004	12.5	9 14.7	1.004	12.4	9 44.6	1.004	12.4	7
8	6 12.6	1.003	11.6	6 42.6	1.003	11.6	7 12.6	1.003	11.6	7 42.6	1.003	11.5	8 12.5	1.003	11.5	8 42.5	1.003	11.5	9 12.5	1.003	11.5	9 42.5	1.003	11.5	8
9	6 10.6	1.003	10.6	6 40.6	1.003	10.6	7 10.6	1.003	10.6	7 40.6	1.003	10.6	8 10.5	1.003	10.6	8 40.5	1.003	10.5	9 10.5	1.003	10.5	9 40.5	1.003	10.5	9
170	6 08.8	1.003	09.7	6 38.8	1.003	09.6	7 08.7	1.003	09.6	7 38.7	1.003	09.6	8 08.7	1.003	09.6	8 38.7	1.003	09.6	9 08.7	1.003	09.6	9 38.7	1.003	09.6	170
1	6 07.1	1.002	08.7	6 37.1	1.002	08.7	7 07.1	1.002	08.7	7 37.1	1.002	08.7	8 07.1	1.002	08.6	8 37.1	1.002	08.6	9 07.0	1.002	08.6	9 37.0	1.002	08.6	1
2	6 05.6	1.002	07.7	6 35.6	1.002	07.7	7 05.6	1.002	07.7	7 35.6	1.002	07.7	8 05.6	1.002	07.7	8 35.6	1.002	07.6	9 05.6	1.002	07.6	9 35.6	1.002	07.6	2
3	6 04.3	1.002	06.8	6 34.3	1.002	06.7	7 04.3	1.002	06.7	7 34.3	1.002	06.7	8 04.3	1.002	06.7	8 34.3	1.002	06.7	9 04.3	1.002	06.7	9 34.3	1.002	06.7	3
4	6 03.2	1.002	05.8	6 33.2	1.002	05.8	7 03.2	1.002	05.8	7 33.1	1.002	05.8	8 03.1	1.002	05.8	8 33.1	1.002	05.8	9 03.1	1.002	05.7	9 33.1	1.002	05.7	4
175	6 02.2	1.001	04.8	6 32.2	1.001	04.8	7 02.2	1.001	04.8	7 32.2	1.001	04.8	8 02.2	1.001	04.8	8 32.2	1.001	04.8	9 02.2	1.001	04.8	9 32.2	1.001	04.8	175
6	6 01.4	1.001	03.9	6 31.4	1.001	03.9	7 01.4	1.001	03.9	7 31.4	1.001	03.8	8 01.4	1.001	03.8	8 31.4	1.001	03.8	9 01.4	1.001	03.8	9 31.4	1.001	03.8	6
7	6 00.8	1.001	02.9	6 30.8	1.001	02.9	7 00.8	1.001	02.9	7 30.8	1.001	02.9	8 00.8	1.001	02.9	8 30.8	1.001	02.9	9 00.8	1.001	02.9	9 30.8	1.001	02.9	7
8	6 00.4	1.000	01.9	6 30.4	1.000	01.9	7 00.4	1.000	01.9	7 30.4	1.000	01.9	8 00.3	1.000	01.9	8 30.3	1.000	01.9	9 00.3	1.000	01.9	9 30.3	1.000	01.9	8
9	6 00.1	1.000	01.0	6 30.1	1.000	01.0	7 00.1	1.000	01.0	7 30.1	1.000	01.0	8 00.1	1.000	01.0	8 30.1	1.000	01.0	9 00.1	1.000	01.0	9 30.1	1.000	01.0	9
180	6 00.0	1.000	00.0	6 30.0	1.000	00.0	7 00.0	1.000	00.0	7 30.0	1.000	00.0	8 00.0	1.000	00.0	8 30.0	1.000	00.0	9 00.0	1.000	00.0	9 30.0	1.000	00.0	180

H.A.	20° 00′ Alt. Δd Δt Az.	20° 30′ Alt. Δd Δt Az.	21° 00′ Alt. Δd Δt Az.	21° 30′ Alt. Δd Δt Az.	22° 00′ Alt. Δd Δt Az.	22° 30′ Alt. Δd Δt Az.	23° 00′ Alt. Δd Δt Az.	23° 30′ Alt. Δd Δt Az.	H.A.
00	30 00.0 1.00 0 180.0	30 30.0 1.00 0 180.0	31 00.0 1.00 0 180.0	31 30.0 1.00 0 180.0	32 00.0 1.00 0 180.0	32 30.0 1.00 0 180.0	33 00.0 1.00 0 180.0	33 30.0 1.00 0 180.0	00
1	29 59.9 1.00 0 178.9	30 29.9 1.00 0 178.9	30 59.9 1.00 0 178.9	31 29.9 1.00 0 178.9	31 59.9 1.00 0 178.9	32 29.9 1.00 0 178.9	32 59.9 1.00 0 178.9	33 29.9 1.00 0 178.9	1
2	29 59.6 1.00 1 177.8	30 29.6 1.00 1 177.8	30 59.6 1.00 1 177.8	31 29.6 1.00 1 177.8	31 59.6 1.00 1 177.8	32 29.6 1.00 1 177.8	32 59.6 1.00 1 177.8	33 29.6 1.00 1 177.8	2
3	29 59.1 1.00 1 176.7	30 29.1 1.00 1 176.7	30 59.1 1.00 1 176.7	31 29.1 1.00 1 176.7	31 59.1 1.00 1 176.7	32 29.1 1.00 1 176.7	32 59.1 1.00 1 176.7	33 29.1 1.00 1 176.7	3
4	29 58.4 1.00 1 175.7	30 28.4 1.00 1 175.7	30 58.4 1.00 1 175.6	31 28.4 1.00 2 175.6	31 58.4 1.00 2 175.6	32 28.4 1.00 1 175.6	32 58.4 1.00 1 175.6	33 28.4 1.00 2 175.6	4
05	29 57.5 1.00 2 174.6	30 27.5 1.00 2 174.6	30 57.5 1.00 2 174.6	31 27.5 1.00 2 174.5	31 57.5 1.00 2 174.5	32 27.5 1.00 2 174.5	32 57.5 1.00 2 174.5	33 27.5 1.00 2 174.5	05
6	29 56.5 1.00 2 173.5	30 26.4 1.00 2 173.5	30 56.4 1.00 2 173.5	31 26.4 1.00 2 173.5	31 56.4 1.00 2 173.4	32 26.4 1.00 2 173.4	32 56.4 1.00 2 173.4	33 26.4 1.00 2 173.4	6
7	29 55.2 1.00 2 172.4	30 25.2 1.00 2 172.4	30 55.2 1.00 2 172.4	31 25.1 1.00 2 172.4	31 55.1 1.00 2 172.3	32 25.1 1.00 2 172.3	32 55.1 1.00 2 172.3	33 25.1 1.00 2 172.3	7
8	29 53.7 1.00 3 171.3	30 23.7 1.00 3 171.3	30 53.7 1.00 3 171.3	31 23.7 1.00 3 171.3	31 53.7 1.00 3 171.2	32 23.6 1.00 3 171.2	32 53.6 1.00 3 171.2	33 23.6 1.00 3 171.2	8
9	29 52.0 1.00 3 170.2	30 22.0 1.00 3 170.2	30 52.0 1.00 3 170.2	31 22.0 1.00 3 170.2	31 52.0 1.00 3 170.2	32 22.0 1.00 3 170.1	32 51.9 1.00 3 170.1	33 21.9 1.00 3 170.1	9
10	29 50.2 1.00 3 169.2	30 20.2 1.00 3 169.1	30 50.1 1.00 3 169.1	31 20.1 1.00 3 169.1	31 50.1 1.00 3 169.1	32 20.1 1.00 3 169.1	32 50.1 1.00 3 169.0	33 20.0 1.00 3 169.0	10
1	29 48.1 1.00 4 168.1	30 18.1 1.00 4 168.1	30 48.1 1.00 4 168.0	31 18.0 1.00 4 168.0	31 48.0 1.00 4 168.0	32 18.0 1.00 4 168.0	32 48.0 1.00 4 167.9	33 18.0 1.00 4 167.9	1
2	29 45.9 1.00 4 167.0	30 15.8 1.00 4 167.0	30 45.8 1.00 4 166.9	31 15.8 1.00 4 166.9	31 45.8 1.00 4 166.9	32 15.7 1.00 4 166.9	32 45.7 1.00 4 166.8	33 15.7 1.00 4 166.8	2
3	29 43.4 1.00 4 165.9	30 13.4 1.00 4 165.9	30 43.4 1.00 4 165.9	31 13.3 1.00 4 165.8	31 43.3 1.00 4 165.8	32 13.3 1.00 4 165.8	32 43.2 1.00 4 165.8	33 13.2 1.00 4 165.7	3
4	29 40.8 1.00 5 164.8	30 10.8 1.00 5 164.8	30 40.7 1.00 5 164.8	31 10.7 1.00 5 164.7	31 40.6 1.00 5 164.7	32 10.6 1.00 5 164.7	32 40.6 1.00 5 164.7	33 10.5 1.00 5 164.6	4
15	29 38.0 1.00 5 163.8	30 07.9 1.00 5 163.7	30 37.9 1.00 5 163.7	31 07.8 1.00 5 163.7	31 37.8 1.00 5 163.6	32 07.8 1.00 5 163.6	32 37.7 1.00 5 163.6	33 07.7 1.00 5 163.5	15
6	29 35.0 1.00 5 162.7	30 04.9 1.00 5 162.6	30 34.9 1.00 5 162.6	31 04.8 1.00 5 162.6	31 34.8 1.00 5 162.5	32 04.7 1.00 5 162.5	32 34.7 1.00 5 162.5	33 04.6 1.00 5 162.4	6
7	29 31.8 1.00 6 161.6	30 01.7 1.00 6 161.6	30 31.7 1.00 6 161.5	31 01.6 1.00 6 161.5	31 31.6 1.00 6 161.5	32 01.5 1.00 6 161.4	32 31.4 1.00 6 161.4	33 01.4 1.00 6 161.4	7
8	29 28.4 1.00 6 160.5	29 58.3 1.00 6 160.5	30 28.3 1.00 6 160.4	30 58.2 1.00 6 160.4	31 28.1 1.00 6 160.4	31 58.1 1.00 6 160.3	32 28.0 1.00 6 160.3	32 58.0 1.00 6 160.3	8
9	29 24.8 1.00 6 159.4	29 54.8 1.00 6 159.4	30 24.7 1.00 6 159.4	30 54.6 1.00 6 159.3	31 24.6 1.00 6 159.3	31 54.5 1.00 6 159.2	32 24.4 1.00 6 159.2	32 54.4 1.00 6 159.2	9
20	29 21.1 1.00 7 158.4	29 51.0 1.00 7 158.3	30 20.9 1.00 7 158.3	30 50.9 1.00 7 158.2	31 20.8 1.00 7 158.2	31 50.7 1.00 7 158.2	32 20.6 1.00 7 158.1	32 50.6 1.00 7 158.1	20
1	29 17.1 1.00 7 157.3	29 47.1 1.00 7 157.2	30 17.0 1.00 7 157.2	30 46.9 1.00 7 157.2	31 16.8 1.00 7 157.1	31 46.7 1.00 7 157.1	32 16.7 1.00 7 157.0	32 46.6 1.00 7 157.0	1
2	29 13.0 1.00 7 156.2	29 42.9 1.00 7 156.2	30 12.8 1.00 7 156.1	30 42.8 1.00 7 156.1	31 12.7 1.00 7 156.0	31 42.6 1.00 7 156.0	32 12.5 1.00 7 155.9	32 42.4 1.00 7 155.9	2
3	29 08.7 1.00 7 155.1	29 38.6 1.00 7 155.1	30 08.5 1.00 7 155.1	30 38.5 1.00 7 155.0	31 08.4 1.00 8 155.0	31 38.3 1.00 8 154.9	32 08.1 1.00 8 154.9	32 38.1 1.00 8 154.8	3
4	29 04.3 1.00 8 154.1	29 34.2 1.00 8 154.0	30 04.1 1.00 8 154.0	30 34.0 1.00 8 153.9	31 03.9 1.00 8 153.9	31 33.8 1.00 8 153.8	32 03.7 1.00 8 153.8	32 33.5 1.00 8 153.7	4
25	28 59.6 1.00 8 153.0	29 29.5 1.00 8 152.9	29 59.4 1.00 8 152.9	30 29.3 1.00 8 152.9	30 59.1 1.00 8 152.8	31 29.1 1.00 8 152.8	31 59.0 1.00 8 152.7	32 28.8 1.00 8 152.6	25
6	28 54.8 1.00 8 151.9	29 24.7 1.00 8 151.9	29 54.6 1.00 8 151.8	30 24.5 1.00 8 151.8	30 54.3 1.00 8 151.7	31 24.2 1.00 8 151.7	31 54.1 1.00 8 151.6	32 24.0 1.00 8 151.6	6
7	28 49.8 1.00 9 150.9	29 19.7 1.00 9 150.8	29 49.6 1.00 9 150.8	30 19.4 1.00 9 150.7	30 49.3 1.00 9 150.6	31 19.2 1.00 9 150.6	31 49.1 1.00 9 150.5	32 18.9 1.00 9 150.5	7
8	28 44.7 1.00 9 149.8	29 14.5 1.00 9 149.7	29 44.4 1.00 9 149.7	30 14.3 1.00 9 149.6	30 44.1 1.00 9 149.6	31 14.0 1.00 9 149.6	31 43.8 1.00 9 149.4	32 13.7 1.00 9 149.4	8
9	28 39.3 1.00 9 148.7	29 09.2 1.00 9 148.7	29 39.0 1.00 9 148.6	30 08.9 1.00 9 148.6	30 38.8 1.00 9 148.5	31 08.6 1.00 9 148.4	31 38.5 1.00 9 148.4	32 08.3 1.00 9 148.3	9
30	28 33.8 1.00 9 147.7	29 03.7 1.00 9 147.6	29 33.5 1.00 9 147.5	30 03.4 0.99 10 147.5	30 33.2 0.99 10 147.4	31 03.1 0.99 10 147.4	31 32.9 0.99 10 147.3	32 02.8 0.99 10 147.3	30
1	28 28.2 0.99 10 146.6	28 58.0 0.99 10 146.5	29 27.9 0.99 10 146.5	29 57.7 0.99 10 146.4	30 27.5 0.99 10 146.4	30 57.4 0.99 10 146.3	31 27.2 0.99 10 146.2	31 57.0 0.99 10 146.2	1
2	28 22.4 0.99 10 145.5	28 52.2 0.99 10 145.5	29 22.0 0.99 10 145.4	29 51.9 0.99 10 145.4	30 21.7 0.99 10 145.3	30 51.5 0.99 10 145.2	31 21.3 0.99 10 145.2	31 51.2 0.99 10 145.1	2
3	28 16.4 0.99 10 144.4	28 46.2 0.99 10 144.4	29 16.0 0.99 10 144.3	29 45.9 0.99 10 144.3	30 15.7 0.99 10 144.2	30 45.5 0.99 10 144.2	31 15.3 0.99 10 144.1	31 45.1 0.99 10 144.0	3
4	28 10.3 0.99 10 143.4	28 40.1 0.99 10 143.3	29 09.9 0.99 10 143.3	29 39.7 0.99 11 143.2	30 09.5 0.99 11 143.2	30 39.3 0.99 11 143.1	31 09.1 0.99 11 143.0	31 38.9 0.99 11 143.0	4
35	28 04.0 0.99 11 142.4	28 33.8 0.99 11 142.3	29 03.6 0.99 11 142.2	29 33.4 0.99 11 142.2	30 03.2 0.99 11 142.1	30 33.0 0.99 11 142.0	31 02.8 0.99 11 142.0	31 32.6 0.99 11 141.9	35
6	27 57.5 0.99 11 141.3	28 27.3 0.99 11 141.2	28 57.1 0.99 11 141.2	29 26.9 0.99 11 141.1	29 56.7 0.99 11 141.0	30 26.5 0.99 11 141.0	30 56.3 0.99 11 140.9	31 26.1 0.99 11 140.8	6
7	27 50.9 0.99 11 140.2	28 20.7 0.99 11 140.2	28 50.5 0.99 11 140.1	29 20.3 0.99 11 140.0	29 50.1 0.99 11 140.0	30 19.9 0.99 11 139.9	30 49.6 0.99 11 139.8	31 19.4 0.99 11 139.8	7
8	27 44.2 0.99 12 139.2	28 14.0 0.99 12 139.1	28 43.8 0.99 12 139.0	29 13.5 0.99 12 139.0	29 43.3 0.99 12 138.9	30 13.1 0.99 12 138.8	30 42.8 0.99 12 138.8	31 12.6 0.99 12 138.7	8
9	27 37.3 0.99 12 138.1	28 07.1 0.99 12 138.1	28 36.9 0.99 12 138.0	29 06.6 0.99 12 137.9	29 36.4 0.99 12 137.8	30 06.1 0.99 12 137.8	30 35.9 0.99 12 137.7	31 05.7 0.99 12 137.6	9
40	27 30.3 0.99 12 137.1	28 00.1 0.99 12 137.0	28 29.8 0.99 12 136.9	28 59.6 0.99 12 136.9	29 29.3 0.99 12 136.8	29 59.1 0.99 12 136.7	30 28.8 0.99 12 136.6	30 58.6 0.99 12 136.6	40
1	27 23.1 0.99 12 136.0	27 52.9 0.99 12 136.0	28 22.6 0.99 12 135.9	28 52.4 0.99 12 135.8	29 22.1 0.99 12 135.7	29 51.9 0.99 12 135.7	30 21.6 0.99 12 135.6	30 51.3 0.99 12 135.5	1
2	27 15.8 0.99 12 135.0	27 45.6 0.99 12 134.9	28 15.3 0.99 12 134.8	28 45.0 0.99 12 134.7	29 14.8 0.99 12 134.7	29 44.5 0.99 12 134.6	30 14.2 0.99 12 134.5	30 44.0 0.99 12 134.4	2
3	27 08.4 0.99 13 133.9	27 38.1 0.99 13 133.9	28 07.9 0.99 13 133.8	28 37.6 0.99 13 133.7	29 07.3 0.99 13 133.6	29 37.0 0.99 13 133.5	30 06.7 0.99 13 133.5	30 36.5 0.99 13 133.4	3
4	27 00.8 0.99 13 132.9	27 30.5 0.99 13 132.8	28 00.3 0.99 13 132.7	28 30.0 0.99 13 132.7	28 59.7 0.99 13 132.6	29 29.4 0.99 13 132.5	29 59.1 0.99 13 132.4	30 28.8 0.99 13 132.3	4
45	26 53.1 0.99 13 131.8	27 22.8 0.99 13 131.8	27 52.5 0.99 13 131.7	28 22.3 0.99 13 131.6	28 52.0 0.99 13 131.5	29 21.7 0.99 13 131.4	29 51.4 0.99 13 131.4	30 21.1 0.99 13 131.3	45
6	26 45.3 0.99 13 130.8	27 15.0 0.99 13 130.7	27 44.7 0.99 13 130.6	28 14.4 0.99 13 130.6	28 44.1 0.99 13 130.5	29 13.8 0.99 13 130.4	29 43.5 0.99 13 130.3	30 13.2 0.99 13 130.2	6
7	26 37.3 0.99 14 129.8	27 07.0 0.99 13 129.7	27 36.7 0.99 13 129.6	28 06.4 0.99 14 129.6	28 36.1 0.99 14 129.4	29 05.8 0.99 14 129.4	29 35.5 0.99 14 129.3	30 05.2 0.99 14 129.2	7
8	26 29.3 0.99 14 128.7	26 59.0 0.99 14 128.6	27 28.6 0.99 14 128.6	27 58.3 0.99 14 128.5	28 28.0 0.99 14 128.4	28 57.7 0.99 14 128.3	29 27.3 0.99 14 128.2	29 57.0 0.99 14 128.1	8
9	26 21.1 0.99 14 127.7	26 50.8 0.99 14 127.6	27 20.4 0.99 14 127.5	27 50.1 0.99 14 127.4	28 19.8 0.99 14 127.3	28 49.4 0.99 14 127.3	29 19.1 0.99 14 127.2	29 48.8 0.99 14 127.1	9
50	26 12.8 0.99 14 126.6	26 42.5 0.99 14 126.6	27 12.1 0.99 14 126.5	27 41.8 0.99 14 126.4	28 11.4 0.99 14 126.3	28 41.1 0.99 14 126.2	29 10.7 0.99 14 126.1	29 40.4 0.99 14 126.0	50
1	26 04.4 0.99 14 125.6	26 34.0 0.99 14 125.5	27 03.7 0.99 14 125.4	27 33.3 0.99 14 125.4	28 03.0 0.99 14 125.3	28 32.6 0.99 14 125.2	29 02.3 0.99 14 125.1	29 31.9 0.99 14 125.0	1
2	25 55.8 0.99 14 124.5	26 25.5 0.99 14 124.5	26 55.1 0.99 14 124.4	27 24.8 0.99 14 124.3	27 54.4 0.99 14 124.2	28 24.1 0.99 14 124.1	28 53.7 0.99 14 124.1	29 23.3 0.99 14 124.0	2
3	25 47.2 0.99 15 123.5	26 16.9 0.99 15 123.5	26 46.5 0.99 15 123.4	27 16.1 0.99 15 123.3	27 45.8 0.99 15 123.2	28 15.4 0.99 15 123.1	28 45.0 0.99 15 123.0	29 14.6 0.99 15 122.9	3
4	25 38.5 0.99 15 122.5	26 08.1 0.99 15 122.4	26 37.7 0.99 15 122.3	27 07.4 0.99 15 122.2	27 37.0 0.99 15 122.2	28 06.6 0.99 15 122.1	28 36.2 0.99 15 122.0	29 05.8 0.99 15 121.9	4
55	25 29.6 0.99 15 121.5	25 59.3 0.99 15 121.4	26 28.9 0.99 15 121.3	26 58.5 0.99 15 121.2	27 28.1 0.99 15 121.1	27 57.7 0.99 15 121.0	28 27.3 0.99 15 120.9	28 56.9 0.99 15 120.9	55
6	25 20.7 0.99 15 120.4	25 50.3 0.99 15 120.4	26 19.9 0.99 15 120.3	26 49.5 0.99 15 120.2	27 19.2 0.99 15 120.1	27 48.8 0.99 15 120.0	28 18.4 0.99 15 119.9	28 47.9 0.99 15 119.8	6
7	25 11.7 0.99 15 119.4	25 41.3 0.99 15 119.3	26 10.9 0.99 15 119.3	26 40.5 0.99 15 119.2	27 10.1 0.99 15 119.1	27 39.7 0.99 15 119.0	28 09.3 0.99 15 118.9	28 38.9 0.99 15 118.8	7
8	25 02.6 0.99 15 118.4	25 32.2 0.99 15 118.3	26 01.8 0.99 15 118.2	26 31.4 0.99 15 118.1	27 00.9 0.99 15 118.0	27 30.5 0.99 15 117.9	28 00.1 0.99 15 117.9	28 29.7 0.99 15 117.8	8
9	24 53.4 0.99 16 117.4	25 22.9 0.99 16 117.3	25 52.5 0.99 16 117.2	26 22.1 0.99 16 117.1	26 51.7 0.99 16 117.0	27 21.3 0.99 16 116.9	27 50.9 0.99 16 116.8	28 20.4 0.99 16 116.7	9
60	24 44.1 0.99 16 116.4	25 13.6 0.99 16 116.3	25 43.2 0.99 16 116.2	26 12.8 0.99 16 116.1	26 42.4 0.99 16 116.0	27 11.9 0.99 16 115.9	27 41.5 0.99 16 115.8	28 11.1 0.99 16 115.7	60
1	24 34.7 0.99 16 115.3	25 04.3 0.99 16 115.3	25 33.8 0.99 16 115.2	26 03.4 0.99 16 115.1	26 33.0 0.99 16 115.0	27 02.5 0.99 16 114.9	27 32.1 0.99 16 114.8	28 01.6 0.99 16 114.7	1
2	24 25.2 0.99 16 114.3	24 54.8 0.99 16 114.2	25 24.4 0.99 16 114.1	25 53.9 0.99 16 114.0	26 23.5 0.99 16 114.0	26 53.0 0.99 16 113.9	27 22.6 0.98 16 113.8	27 52.1 0.98 16 113.7	2
3	24 15.7 0.99 16 113.3	24 45.3 0.99 16 113.2	25 14.8 0.99 16 113.1	25 44.4 0.99 16 113.0	26 13.9 0.99 16 112.9	26 43.5 0.99 16 112.8	27 13.0 0.98 16 112.7	27 42.6 0.98 16 112.6	3
4	24 06.1 0.99 16 112.3	24 35.7 0.99 16 112.2	25 05.2 0.99 16 112.1	25 34.8 0.99 16 112.0	26 04.3 0.99 16 111.9	26 33.8 0.98 16 111.8	27 03.4 0.98 16 111.7	27 32.9 0.98 16 111.6	4
65	23 56.4 0.99 16 111.3	24 26.0 0.98 16 111.2	24 55.5 0.98 16 111.1	25 25.1 0.98 16 111.0	25 54.6 0.98 16 110.9	26 24.1 0.98 16 110.8	26 53.7 0.98 16 110.7	27 23.2 0.98 16 110.6	65
6	23 46.7 0.98 16 110.3	24 16.3 0.98 16 110.2	24 45.8 0.98 16 110.1	25 15.3 0.98 16 110.0	25 44.8 0.98 16 109.9	26 14.4 0.98 16 109.8	26 43.9 0.98 16 109.7	27 13.4 0.98 16 109.6	6
7	23 36.9 0.98 16 109.3	24 06.4 0.98 16 109.2	24 35.9 0.98 16 109.1	25 05.5 0.98 16 109.0	25 35.0 0.98 16 108.9	26 04.5 0.98 16 108.8	26 34.0 0.98 16 108.7	27 03.6 0.98 17 108.6	7
8	23 27.0 0.98 17 108.2	23 56.5 0.98 17 108.2	24 26.1 0.98 17 108.1	24 55.6 0.98 17 108.0	25 25.1 0.98 17 107.9	25 54.6 0.98 17 107.8	26 24.1 0.98 17 107.7	26 53.7 0.98 17 107.6	8
9	23 17.1 0.98 17 107.2	23 46.6 0.98 17 107.1	24 16.1 0.98 17 107.0	24 45.7 0.98 17 106.9	25 15.2 0.98 17 106.9	25 44.7 0.98 17 106.8	26 14.2 0.98 17 106.7	26 43.7 0.98 17 106.6	9
70	23 07.1 0.98 17 106.2	23 36.6 0.98 17 106.1	24 06.1 0.98 17 105.9	24 35.7 0.98 17 105.9	25 05.2 0.98 17 105.8	25 34.7 0.98 17 105.7	26 04.2 0.98 17 105.6	26 33.7 0.98 17 105.5	70
1	22 57.1 0.98 17 105.2	23 26.6 0.98 17 105.1	23 56.1 0.98 17 105.0	24 25.6 0.98 17 104.9	24 55.1 0.98 17 104.8	25 24.6 0.98 17 104.7	25 54.1 0.98 17 104.6	26 23.6 0.98 17 104.5	1
2	22 47.0 0.98 17 104.2	23 16.5 0.98 17 104.1	23 46.0 0.98 17 104.0	24 15.5 0.98 17 103.9	24 45.0 0.98 17 103.8	25 14.5 0.98 17 103.7	25 44.0 0.98 17 103.6	26 13.5 0.98 17 103.5	2
3	22 36.9 0.98 17 103.2	23 06.4 0.98 17 103.1	23 35.9 0.98 17 103.0	24 05.4 0.98 17 102.9	24 34.9 0.98 17 102.8	25 04.4 0.98 17 102.7	25 33.9 0.98 17 102.6	26 03.4 0.98 17 102.5	3
4	22 26.7 0.98 17 102.1	22 56.2 0.98 17 102.1	23 25.7 0.98 17 102.0	23 55.2 0.98 17 101.9	24 24.7 0.98 17 101.8	24 54.2 0.98 17 101.7	25 23.7 0.98 17 101.6	25 53.2 0.98 17 101.5	4
75	22 16.5 0.98 17 101.2	22 46.0 0.98 17 101.1	23 15.5 0.98 17 101.0	23 45.0 0.98 17 101.0	24 14.5 0.98 17 100.8	24 44.0 0.98 17 100.7	25 13.5 0.98 17 100.6	25 42.9 0.98 17 100.5	75
6	22 06.3 0.98 17 100.1	22 35.8 0.98 17 100.1	23 05.3 0.98 17 100.0	23 34.8 0.98 17 99.9	24 04.3 0.98 17 99.8	24 33.7 0.98 17 99.7	25 03.2 0.98 17 99.6	25 32.7 0.98 17 99.5	6
7	21 56.0 0.98 17 99.2	22 25.5 0.98 17 99.1	22 55.0 0.98 17 99.0	23 24.5 0.98 17 98.9	23 54.0 0.98 17 98.8	24 23.4 0.98 17 98.7	24 52.9 0.98 17 98.6	25 22.4 0.98 17 98.5	7
8	21 45.7 0.98 17 98.2	22 15.2 0.98 17 98.1	22 44.7 0.98 17 98.0	23 14.2 0.98 17 97.9	23 43.7 0.98 17 97.8	24 13.1 0.98 17 97.7	24 42.6 0.98 17 97.6	25 12.1 0.98 17 97.5	8
9	21 35.4 0.98 17 97.2	22 04.9 0.98 17 97.1	22 34.4 0.98 17 97.0	23 03.8 0.98 17 96.9	23 33.3 0.98 17 96.8	24 02.8 0.98 17 96.7	24 32.3 0.98 17 96.6	25 01.7 0.98 17 96.5	9
80	21 25.0 0.98 17 96.2	21 54.5 0.98 17 96.1	22 24.0 0.98 17 96.0	22 53.5 0.98 17 95.9	23 23.0 0.98 17 95.8	23 52.4 0.98 17 95.7	24 21.9 0.98 17 95.6	24 51.4 0.98 17 95.5	80
1	21 14.7 0.98 17 95.3	21 44.2 0.98 17 95.2	22 13.6 0.98 17 95.1	22 43.1 0.98 17 95.0	23 12.6 0.98 17 94.9	23 42.1 0.98 17 94.8	24 11.5 0.98 17 94.7	24 41.0 0.98 17 94.6	1
2	21 04.3 0.98 17 94.3	21 33.8 0.98 17 94.2	22 03.3 0.98 17 94.1	22 32.7 0.98 17 94.0	23 02.2 0.98 17 93.9	23 31.7 0.98 17 93.8	24 01.1 0.98 17 93.7	24 30.6 0.98 17 93.6	2
3	20 53.9 0.98 17 93.3	21 23.4 0.98 17 93.2	21 52.9 0.98 17 93.1	22 22.3 0.98 17 93.0	22 51.8 0.98 17 92.9	23 21.3 0.98 17 92.8	23 50.7 0.98 17 92.7	24 20.2 0.98 17 92.6	3
4	20 43.5 0.98 17 92.3	21 13.0 0.98 17 92.2	21 42.5 0.98 17 92.1	22 11.9 0.98 17 92.0	22 41.4 0.98 17 91.9	23 10.9 0.98 17 91.8	23 40.3 0.98 17 91.7	24 09.8 0.98 17 91.6	4
85	20 33.1 0.98 17 91.3	21 02.6 0.98 17 91.2	21 32.0 0.98 17 91.1	22 01.5 0.98 17 91.0	22 31.0 0.98 17 90.9	23 00.5 0.98 17 90.8	23 29.9 0.98 17 90.7	23 59.4 0.98 17 90.6	85
6	20 22.7 0.98 17 90.3	20 52.1 0.98 17 90.2	21 21.6 0.98 17 90.1	21 51.1 0.98 17 90.0	22 20.6 0.98 17 89.9	22 50.0 0.98 17 89.8	23 19.5 0.98 17 89.7	23 49.0 0.98 17 89.6	6
7	20 12.2 0.98 17 89.3	20 41.7 0.98 17 89.2	21 11.2 0.98 17 89.1	21 40.7 0.98 17 89.0	22 10.1 0.98 17 88.9	22 39.6 0.98 17 88.8	23 09.1 0.98 17 88.7	23 38.5 0.98 17 88.6	7
8	20 01.8 0.98 17 88.3	20 31.3 0.98 17 88.2	21 00.8 0.98 17 88.1	21 30.3 0.98 17 88.0	21 59.7 0.98 17 87.9	22 29.2 0.98 17 87.8	22 58.7 0.98 17 87.8	23 28.1 0.98 17 87.6	8
9	19 51.4 0.98 17 87.4	20 20.9 0.98 17 87.3	20 50.4 0.98 17 87.2	21 19.9 0.98 17 87.1	21 49.3 0.98 17 87.0	22 18.8 0.98 17 86.9	22 48.3 0.98 17 86.8	23 17.7 0.98 17 86.7	9
90	19 41.0 0.98 17 86.4	20 10.5 0.98 17 86.3	20 40.0 0.98 17 86.2	21 09.5 0.98 17 86.1	21 38.9 0.98 17 86.0	22 08.4 0.98 17 85.9	22 37.9 0.98 17 85.8	23 07.3 0.98 17 85.7	90

Lat 30°

Each cell below is: **Alt (° ′) Δd Δt Az (°)**

H.A.	20° 00′	20° 30′	21° 00′	21° 30′	22° 00′	22° 30′	23° 00′	23° 30′	H.A.
91	19 30.6 98 17 85.4	20 00.1 98 17 85.3	20 29.6 98 17 85.2	20 59.1 98 17 85.1	21 28.5 98 17 85.0	21 58.0 98 17 84.9	22 27.5 98 17 84.8	22 56.9 98 17 84.7	91
2	19 20.2 98 17 84.4	19 49.7 98 17 84.3	20 19.2 98 17 84.2	20 48.7 98 17 84.1	21 18.2 98 17 84.0	21 47.6 98 17 83.9	22 17.1 98 17 83.8	22 46.6 98 17 83.7	2
3	19 09.9 98 17 83.4	19 39.4 98 17 83.3	20 08.9 98 17 83.2	20 38.3 98 17 83.1	21 07.8 98 17 83.0	21 37.3 98 17 83.0	22 06.8 98 17 82.8	22 36.2 98 17 82.8	3
4	18 59.5 98 17 82.5	19 29.0 98 17 82.4	19 58.5 98 17 82.3	20 28.0 98 17 82.2	20 57.5 98 17 82.1	21 27.0 98 17 82.0	21 56.4 98 17 81.9	22 25.9 98 17 81.8	4
95	18 49.2 98 17 81.5	19 18.7 98 17 81.4	19 48.2 98 17 81.3	20 17.7 98 17 81.2	20 47.2 98 17 81.1	21 16.7 98 17 81.0	21 46.1 98 17 80.9	22 15.6 98 17 80.8	95
6	18 38.9 98 17 80.5	19 08.4 98 17 80.4	19 37.9 98 17 80.3	20 07.4 98 17 80.2	20 36.9 98 17 80.1	21 06.4 98 17 80.0	21 35.9 98 17 79.9	22 05.3 98 17 79.8	6
7	18 28.7 98 17 79.5	18 58.2 98 17 79.4	19 27.7 98 17 79.3	19 57.2 98 17 79.2	20 26.6 98 17 79.2	20 56.1 98 17 79.1	21 25.6 98 17 79.0	21 55.1 98 17 78.9	7
8	18 18.4 98 17 78.6	18 47.9 98 17 78.5	19 17.4 98 17 78.4	19 46.9 98 17 78.3	20 16.4 98 17 78.2	20 45.9 98 17 78.1	21 15.4 98 17 78.0	21 44.9 98 17 77.9	8
9	18 08.2 98 17 77.6	18 37.8 98 17 77.5	19 07.3 98 17 77.4	19 36.8 98 17 77.3	20 06.3 98 17 77.2	20 35.7 98 17 77.1	21 05.2 98 17 77.0	21 34.7 98 17 76.9	9
100	17 58.1 98 17 76.6	18 27.6 98 17 76.5	18 57.1 98 17 76.4	19 26.6 98 17 76.3	19 56.1 98 17 76.2	20 25.6 98 17 76.1	20 55.1 98 17 76.0	21 24.6 98 17 75.9	100
1	17 48.0 98 17 75.7	18 17.5 98 17 75.6	18 47.0 98 17 75.5	19 16.5 98 17 75.4	19 46.0 98 17 75.3	20 15.5 98 17 75.2	20 45.0 98 17 75.1	21 14.5 98 17 75.0	1
2	17 37.9 98 17 74.7	18 07.4 98 17 74.6	18 36.9 98 17 74.5	19 06.5 98 17 74.4	19 36.0 98 17 74.3	20 05.0 98 17 74.2	20 35.0 98 17 74.1	21 04.5 98 17 74.0	2
3	17 27.9 98 17 73.7	17 57.4 98 17 73.6	18 26.9 98 17 73.5	18 56.4 98 17 73.4	19 26.0 98 17 73.3	19 55.5 98 17 73.2	20 25.0 98 17 73.1	20 54.5 98 17 73.0	3
4	17 17.9 98 17 72.7	17 47.4 98 17 72.6	18 17.0 98 16 72.6	18 46.5 98 17 72.5	19 16.0 98 16 72.4	19 45.5 98 16 72.3	20 15.0 98 16 72.2	20 44.5 98 16 72.1	4
105	17 08.0 98 16 71.8	17 37.5 98 16 71.7	18 07.0 98 16 71.6	18 36.6 98 16 71.5	19 06.1 98 16 71.4	19 35.6 98 16 71.3	20 05.1 98 16 71.2	20 34.7 98 16 71.1	105
6	16 58.1 98 16 70.8	17 27.7 98 16 70.7	17 57.2 98 16 70.5	18 26.7 98 16 70.5	18 56.3 98 16 70.4	19 25.8 98 16 70.3	19 55.3 98 16 70.2	20 24.8 98 16 70.2	6
7	16 48.3 98 16 69.8	17 17.8 98 16 69.7	17 47.4 98 16 69.7	18 16.9 98 16 69.6	18 46.5 98 16 69.5	19 16.0 98 16 69.4	19 45.5 98 16 69.3	20 15.1 98 16 69.2	7
8	16 38.6 99 16 68.9	17 08.1 98 16 68.8	17 37.6 98 16 68.7	18 07.2 98 16 68.6	18 36.7 98 16 68.5	19 06.3 98 16 68.4	19 35.8 98 16 68.3	20 05.3 98 16 68.2	8
9	16 28.9 99 16 67.9	16 58.4 99 16 67.8	17 28.0 99 16 67.7	17 57.5 98 16 67.6	18 27.1 98 16 67.5	18 56.6 98 16 67.5	19 26.2 98 16 67.4	19 55.7 98 16 67.3	9
110	16 19.2 99 16 66.9	16 48.8 99 16 66.9	17 18.4 99 16 66.8	17 47.9 99 16 66.7	18 17.5 99 16 66.6	18 47.0 99 16 66.5	19 16.6 99 16 66.4	19 46.1 98 16 66.3	110
1	16 09.7 99 16 66.0	16 39.3 99 16 65.9	17 08.8 99 16 65.8	17 38.4 99 16 65.7	18 08.0 99 16 65.6	18 37.5 99 16 65.5	19 07.1 99 16 65.4	19 36.6 99 16 65.3	1
2	16 00.2 99 16 65.0	16 29.8 99 16 64.9	16 59.4 99 16 64.8	17 28.9 99 16 64.7	17 58.5 99 16 64.7	18 28.1 99 16 64.6	18 57.6 99 16 64.5	19 27.2 99 16 64.4	2
3	15 50.8 99 16 64.0	16 20.4 99 16 64.0	16 50.0 99 16 63.9	17 19.5 99 16 63.8	17 49.1 99 16 63.7	18 18.7 99 16 63.6	18 48.3 99 15 63.5	19 17.8 99 15 63.4	3
4	15 41.5 99 15 63.1	16 11.1 99 15 63.0	16 40.7 99 15 62.9	17 10.2 99 15 62.8	17 39.8 99 15 62.7	18 09.4 99 15 62.7	18 39.0 99 15 62.6	19 08.6 99 15 62.5	4
115	15 32.2 99 15 62.1	16 01.8 99 15 62.0	16 31.4 99 15 62.0	17 01.0 99 15 61.9	17 30.6 99 15 61.8	18 00.2 99 15 61.7	18 29.8 99 15 61.6	18 59.4 99 15 61.5	115
6	15 23.1 99 15 61.2	15 52.7 99 15 61.1	16 22.3 99 15 61.0	16 51.9 99 15 60.9	17 21.5 99 15 60.8	17 51.1 99 15 60.7	18 20.6 99 15 60.6	18 50.2 99 15 60.6	6
7	15 14.0 99 15 60.2	15 43.6 99 15 60.1	16 13.2 99 15 60.0	16 42.8 99 15 59.9	17 12.4 99 15 59.9	17 42.0 99 15 59.8	18 11.6 99 15 59.7	18 41.2 99 15 59.6	7
8	15 05.0 99 15 59.2	15 34.6 99 15 59.2	16 04.2 99 15 59.1	16 33.8 99 15 59.0	17 03.4 99 15 58.9	17 33.1 99 15 58.8	18 02.7 99 15 58.7	18 32.3 99 15 58.7	8
9	14 56.1 99 15 58.3	15 25.7 99 15 58.2	15 55.3 99 15 58.1	16 24.9 99 15 58.0	16 54.6 99 15 57.9	17 24.2 99 15 57.9	17 53.8 99 15 57.8	18 23.4 99 15 57.7	9
120	14 47.3 99 15 57.3	15 16.9 99 14 57.2	15 46.5 99 14 57.2	16 16.2 99 14 57.1	16 45.8 99 14 57.0	17 15.4 99 14 56.9	17 45.0 99 14 56.8	18 14.7 99 14 56.7	120
1	14 38.5 99 14 56.4	15 08.2 99 14 56.3	15 37.8 99 14 56.2	16 07.5 99 14 56.1	16 37.1 99 14 56.0	17 06.7 99 14 56.0	17 36.4 99 14 55.9	18 06.0 99 14 55.8	1
2	14 29.9 99 14 55.4	14 59.6 99 14 55.3	15 29.2 99 14 55.3	15 58.9 99 14 55.2	16 28.5 99 14 55.1	16 58.1 99 14 55.0	17 27.8 99 14 54.9	17 57.4 99 14 54.8	2
3	14 21.4 99 14 54.4	14 51.0 99 14 54.4	15 20.7 99 14 54.3	15 50.4 99 14 54.2	16 20.0 99 14 54.1	16 49.7 99 14 54.0	17 19.3 99 14 54.0	17 49.0 99 14 53.9	3
4	14 13.0 99 14 53.5	14 42.6 99 14 53.4	15 12.3 99 14 53.3	15 42.0 99 14 53.3	16 11.6 99 14 53.2	16 41.3 99 14 53.1	17 10.9 99 14 53.0	17 40.6 99 14 52.9	4
125	14 04.6 99 14 52.5	14 34.3 99 14 52.4	15 04.0 99 14 52.4	15 33.7 99 14 52.3	16 03.3 99 14 52.2	16 33.0 99 14 52.2	17 02.7 99 14 52.1	17 32.3 99 14 52.0	125
6	13 56.4 99 13 51.6	14 26.1 99 13 51.5	14 55.8 99 13 51.4	15 25.5 99 13 51.3	15 55.1 99 13 51.3	16 24.8 99 13 51.2	16 54.5 99 13 51.1	17 24.2 99 13 51.0	6
7	13 48.3 99 13 50.6	14 18.0 99 13 50.5	14 47.7 99 13 50.5	15 17.4 99 13 50.4	15 47.1 99 13 50.3	16 16.8 99 13 50.2	16 46.4 99 13 50.2	17 16.1 99 13 50.1	7
8	13 40.3 99 13 49.6	14 10.0 99 13 49.6	14 39.7 99 13 49.5	15 09.4 99 13 49.4	15 39.1 99 13 49.4	16 08.8 99 13 49.3	16 38.5 99 13 49.2	17 08.2 99 13 49.1	8
9	13 32.4 99 13 48.7	14 02.1 99 13 48.6	14 31.8 99 13 48.6	15 01.6 99 13 48.5	15 31.3 99 13 48.4	16 01.0 99 13 48.3	16 30.7 99 13 48.3	17 00.4 99 13 48.2	9
130	13 24.7 99 13 47.7	13 54.4 99 13 47.7	14 24.1 99 13 47.6	14 53.8 99 13 47.5	15 23.5 99 13 47.4	15 53.2 99 13 47.4	16 23.0 99 13 47.3	16 52.7 99 13 47.2	130
1	13 17.0 99 13 46.8	13 46.7 99 13 46.7	14 16.5 99 13 46.6	14 46.2 99 13 46.6	15 15.9 99 13 46.5	15 45.6 99 13 46.4	16 15.4 99 13 46.4	16 45.1 99 13 46.3	1
2	13 09.5 99 12 45.8	13 39.2 99 12 45.8	14 09.0 99 12 45.7	14 38.7 99 12 45.6	15 08.4 99 12 45.5	15 38.1 99 12 45.5	16 07.9 99 12 45.4	16 37.6 99 12 45.3	2
3	13 02.1 99 12 44.9	13 31.8 99 12 44.8	14 01.6 99 12 44.7	14 31.3 99 12 44.7	15 01.0 99 12 44.6	15 30.8 99 12 44.5	16 00.5 99 12 44.5	16 30.3 99 12 44.4	3
4	12 54.8 99 12 43.9	13 24.5 99 12 43.8	13 54.2 99 12 43.8	14 24.0 99 12 43.7	14 53.8 99 12 43.6	15 23.5 99 12 43.6	15 53.3 99 12 43.5	16 23.0 99 12 43.4	4
135	12 47.6 99 12 43.0	13 17.4 99 12 42.9	13 47.1 99 12 42.8	14 16.9 99 12 42.8	14 46.7 99 12 42.7	15 16.4 99 12 42.6	15 46.2 99 12 42.6	16 15.9 99 12 42.5	135
6	12 40.6 99 12 42.0	13 10.4 99 12 41.9	13 40.1 99 12 41.9	14 09.9 99 12 41.8	14 39.7 99 12 41.7	15 09.4 99 12 41.7	15 39.2 99 12 41.6	16 09.0 99 12 41.5	6
7	12 33.7 99 11 41.0	13 03.5 99 11 41.0	13 33.2 99 11 40.9	14 03.0 99 11 40.9	14 32.8 99 11 40.8	15 02.6 99 11 40.7	15 32.3 99 11 40.7	16 02.1 99 11 40.6	7
8	12 26.9 99 11 40.1	12 56.7 99 11 40.0	13 26.5 99 11 39.9	13 56.3 99 11 39.9	14 26.0 99 11 39.8	14 55.8 99 11 39.8	15 25.6 99 11 39.7	15 55.4 99 11 39.7	8
9	12 20.3 99 11 39.1	12 50.1 99 11 39.1	13 19.9 99 11 39.0	13 49.6 99 11 38.9	14 19.4 99 11 38.9	14 49.2 99 11 38.8	15 19.0 99 11 38.8	15 48.8 99 11 38.7	9
140	12 13.8 99 11 38.2	12 43.6 99 11 38.1	13 13.4 99 11 38.1	13 43.2 99 11 38.0	14 13.0 99 11 37.9	14 42.8 99 11 37.9	15 12.6 99 11 37.8	15 42.4 99 11 37.8	140
1	12 07.4 99 10 37.2	12 37.2 99 10 37.2	13 07.0 99 10 37.1	13 36.8 99 10 37.0	14 06.6 99 10 37.0	14 36.4 99 10 36.9	15 06.2 99 10 36.9	15 36.1 99 10 36.8	1
2	12 01.2 99 10 36.3	12 31.0 99 10 36.2	13 00.8 99 10 36.2	13 30.6 99 10 36.1	14 00.4 99 10 36.0	14 30.2 99 10 36.0	15 00.1 99 10 35.9	15 29.9 99 10 35.9	2
3	11 55.1 99 10 35.3	12 24.9 99 10 35.3	12 54.7 99 10 35.2	13 24.5 99 10 35.1	13 54.4 99 10 35.1	14 24.2 99 10 35.0	14 54.0 99 10 34.9	15 23.9 99 10 34.9	3
4	11 49.1 99 10 34.4	12 18.9 99 10 34.3	12 48.8 99 10 34.2	13 18.6 99 10 34.2	13 48.5 99 10 34.1	14 18.3 99 10 34.1	14 48.1 99 10 34.0	15 17.9 99 10 34.0	4
145	11 43.3 99 09 33.4	12 13.1 99 09 33.3	12 43.0 99 09 33.3	13 12.8 99 09 33.2	13 42.7 99 09 33.2	14 12.5 99 09 33.1	14 42.4 99 09 33.1	15 12.2 99 09 33.0	145
6	11 37.6 1.0 09 32.4	12 07.5 1.0 09 32.4	12 37.3 1.0 09 32.3	13 07.2 1.0 09 32.3	13 37.0 99 09 32.2	14 06.9 99 09 32.2	14 36.7 99 09 32.1	15 06.6 99 09 32.1	6
7	11 32.1 1.0 09 31.5	12 02.0 1.0 09 31.4	12 31.8 1.0 09 31.4	13 01.7 1.0 09 31.3	13 31.6 1.0 09 31.3	14 01.4 1.0 09 31.2	14 31.3 1.0 09 31.2	15 01.1 1.0 09 31.1	7
8	11 26.8 1.0 08 30.5	11 56.6 1.0 09 30.5	12 26.5 1.0 09 30.4	12 56.4 1.0 09 30.4	13 26.2 1.0 09 30.3	13 56.1 1.0 09 30.3	14 26.0 1.0 09 30.2	14 55.8 1.0 09 30.2	8
9	11 21.5 1.0 08 29.6	11 51.4 1.0 08 29.5	12 21.3 1.0 08 29.5	12 51.2 1.0 08 29.4	13 21.0 1.0 08 29.4	13 50.9 1.0 08 29.3	14 20.8 1.0 08 29.3	14 50.7 1.0 08 29.3	9
150	11 16.5 1.0 08 28.6	11 46.4 1.0 08 28.6	12 16.2 1.0 08 28.5	12 46.1 1.0 08 28.5	13 16.0 1.0 08 28.4	13 45.9 1.0 08 28.4	14 15.8 1.0 08 28.4	14 45.6 1.0 08 28.3	150
1	11 11.6 1.0 08 27.7	11 41.4 1.0 08 27.6	12 11.3 1.0 08 27.6	12 41.2 1.0 08 27.5	13 11.1 1.0 08 27.5	13 41.0 1.0 08 27.5	14 10.9 1.0 08 27.4	14 40.8 1.0 08 27.4	1
2	11 06.8 1.0 08 26.7	11 36.7 1.0 08 26.6	12 06.6 1.0 08 26.6	12 36.5 1.0 08 26.6	13 06.4 1.0 08 26.5	13 36.3 1.0 08 26.5	14 06.2 1.0 08 26.4	14 36.1 1.0 08 26.4	2
3	11 02.2 1.0 07 25.8	11 32.1 1.0 07 25.7	12 02.0 1.0 07 25.7	12 31.9 1.0 07 25.6	13 01.8 1.0 07 25.6	13 31.7 1.0 07 25.6	14 01.6 1.0 07 25.5	14 31.5 1.0 07 25.5	3
4	10 57.7 1.0 07 24.8	11 27.6 1.0 07 24.8	11 57.6 1.0 07 24.7	12 27.5 1.0 07 24.7	12 57.4 1.0 07 24.6	13 27.3 1.0 07 24.6	13 57.2 1.0 07 24.6	14 27.1 1.0 07 24.5	4
155	10 53.4 1.0 07 23.9	11 23.4 1.0 07 23.8	11 53.3 1.0 07 23.8	12 23.2 1.0 07 23.7	12 53.1 1.0 07 23.7	13 23.0 1.0 07 23.7	13 52.9 1.0 07 23.6	14 22.8 1.0 07 23.6	155
6	10 49.3 1.0 07 22.9	11 19.2 1.0 07 22.9	11 49.2 1.0 07 22.8	12 19.1 1.0 07 22.8	12 49.0 1.0 07 22.8	13 18.9 1.0 07 22.7	13 48.8 1.0 07 22.7	14 18.8 1.0 07 22.6	6
7	10 45.3 1.0 06 21.9	11 15.3 1.0 06 21.9	11 45.2 1.0 06 21.9	12 15.1 1.0 06 21.8	12 45.0 1.0 06 21.8	13 15.0 1.0 06 21.8	13 44.9 1.0 06 21.7	14 14.8 1.0 06 21.7	7
8	10 41.5 1.0 06 21.0	11 11.5 1.0 06 21.0	11 41.4 1.0 06 20.9	12 11.3 1.0 06 20.9	12 41.3 1.0 06 20.9	13 11.2 1.0 06 20.8	13 41.1 1.0 06 20.8	14 11.1 1.0 06 20.7	8
9	10 37.9 1.0 06 20.0	11 07.8 1.0 06 20.0	11 37.7 1.0 06 20.0	12 07.7 1.0 06 19.9	12 37.6 1.0 06 19.9	13 07.6 1.0 06 19.9	13 37.5 1.0 06 19.8	14 07.4 1.0 06 19.8	9
160	10 34.4 1.0 06 19.1	11 04.3 1.0 06 19.1	11 34.3 1.0 06 19.0	12 04.2 1.0 06 19.0	12 34.2 1.0 06 19.0	13 04.1 1.0 06 18.9	13 34.0 1.0 06 18.9	14 04.0 1.0 06 18.9	160
1	10 31.1 1.0 05 18.1	11 01.0 1.0 05 18.1	11 31.0 1.0 05 18.1	12 00.9 1.0 05 18.0	12 30.9 1.0 05 18.0	13 00.8 1.0 05 18.0	13 30.8 1.0 05 17.9	14 00.7 1.0 05 17.9	1
2	10 27.9 1.0 05 17.2	10 57.9 1.0 05 17.1	11 27.8 1.0 05 17.1	11 57.8 1.0 05 17.1	12 27.7 1.0 05 17.1	12 57.7 1.0 05 17.0	13 27.6 1.0 05 17.0	13 57.6 1.0 05 17.0	2
3	10 24.9 1.0 05 16.2	10 54.9 1.0 05 16.2	11 24.8 1.0 05 16.2	11 54.8 1.0 05 16.1	12 24.7 1.0 05 16.1	12 54.7 1.0 05 16.1	13 24.7 1.0 05 16.1	13 54.6 1.0 05 16.0	3
4	10 22.1 1.0 04 15.3	10 52.0 1.0 04 15.2	11 22.0 1.0 04 15.2	11 52.0 1.0 04 15.2	12 21.9 1.0 04 15.2	12 51.9 1.0 04 15.1	13 21.9 1.0 04 15.1	13 51.8 1.0 04 15.1	4
165	10 19.4 1.0 04 14.3	10 49.4 1.0 04 14.3	11 19.4 1.0 04 14.3	11 49.3 1.0 04 14.2	12 19.3 1.0 04 14.2	12 49.3 1.0 04 14.2	13 19.2 1.0 04 14.2	13 49.2 1.0 04 14.1	165
6	10 16.9 1.0 04 13.4	10 46.9 1.0 04 13.3	11 16.9 1.0 04 13.3	11 46.8 1.0 04 13.3	12 16.8 1.0 04 13.3	12 46.8 1.0 04 13.3	13 16.8 1.0 04 13.2	13 46.8 1.0 04 13.2	6
7	10 14.6 1.0 04 12.4	10 44.6 1.0 04 12.4	11 14.6 1.0 04 12.4	11 44.5 1.0 04 12.3	12 14.5 1.0 04 12.3	12 44.5 1.0 04 12.3	13 14.5 1.0 04 12.3	13 44.4 1.0 04 12.3	7
8	10 12.5 1.0 03 11.5	10 42.4 1.0 03 11.4	11 12.4 1.0 03 11.4	11 42.4 1.0 03 11.4	12 12.4 1.0 03 11.4	12 42.3 1.0 03 11.4	13 12.3 1.0 03 11.3	13 42.3 1.0 03 11.3	8
9	10 10.5 1.0 03 10.5	10 40.5 1.0 03 10.5	11 10.4 1.0 03 10.5	11 40.4 1.0 03 10.5	12 10.4 1.0 03 10.4	12 40.4 1.0 03 10.4	13 10.4 1.0 03 10.4	13 40.3 1.0 03 10.4	9
170	10 08.7 1.0 03 09.5	10 38.6 1.0 03 09.5	11 08.6 1.0 03 09.5	11 38.6 1.0 03 09.5	12 08.6 1.0 03 09.5	12 38.6 1.0 03 09.5	13 08.6 1.0 03 09.4	13 38.6 1.0 03 09.4	170
1	10 07.0 1.0 03 08.6	10 37.0 1.0 03 08.6	11 07.0 1.0 03 08.5	11 37.0 1.0 03 08.5	12 07.0 1.0 03 08.5	12 37.0 1.0 03 08.5	13 06.9 1.0 03 08.5	13 36.9 1.0 03 08.5	1
2	10 05.5 1.0 02 07.6	10 35.5 1.0 02 07.6	11 05.5 1.0 02 07.6	11 35.5 1.0 02 07.6	12 05.5 1.0 02 07.6	12 35.5 1.0 02 07.5	13 05.5 1.0 02 07.5	13 35.5 1.0 02 07.5	2
3	10 04.2 1.0 02 06.7	10 34.2 1.0 02 06.7	11 04.2 1.0 02 06.7	11 34.2 1.0 02 06.6	12 04.2 1.0 02 06.6	12 34.2 1.0 02 06.6	13 04.2 1.0 02 06.6	13 34.2 1.0 02 06.6	3
4	10 03.1 1.0 02 05.7	10 33.1 1.0 02 05.7	11 03.1 1.0 02 05.7	11 33.1 1.0 02 05.7	12 03.1 1.0 02 05.7	12 33.1 1.0 02 05.7	13 03.1 1.0 02 05.7	13 33.1 1.0 02 05.7	4
175	10 02.2 1.0 01 04.8	10 32.2 1.0 01 04.8	11 02.2 1.0 01 04.8	11 32.2 1.0 01 04.7	12 02.2 1.0 01 04.7	12 32.1 1.0 01 04.7	13 02.1 1.0 01 04.7	13 32.1 1.0 01 04.7	175
6	10 01.4 1.0 01 03.8	10 31.4 1.0 01 03.8	11 01.4 1.0 01 03.8	11 31.4 1.0 01 03.8	12 01.4 1.0 01 03.8	12 31.4 1.0 01 03.8	13 01.4 1.0 01 03.8	13 31.4 1.0 01 03.8	6
7	10 00.8 1.0 01 02.9	10 30.8 1.0 01 02.9	11 00.8 1.0 01 02.9	11 30.8 1.0 01 02.8	12 00.8 1.0 01 02.8	12 30.8 1.0 01 02.8	13 00.8 1.0 01 02.8	13 30.8 1.0 01 02.8	7
8	10 00.3 1.0 00 01.9	10 30.3 1.0 00 01.9	11 00.3 1.0 00 01.9	11 30.3 1.0 00 01.9	12 00.3 1.0 00 01.9	12 30.3 1.0 00 01.9	13 00.3 1.0 00 01.9	13 30.3 1.0 00 01.9	8
9	10 00.1 1.0 00 01.0	10 30.1 1.0 00 01.0	11 00.1 1.0 00 01.0	11 30.1 1.0 00 00.9	12 00.1 1.0 00 00.9	12 30.1 1.0 00 00.9	13 00.1 1.0 00 00.9	13 30.1 1.0 00 00.9	9
180	10 00.0 1.0 00 00.0	10 30.0 1.0 00 00.0	11 00.0 1.0 00 00.0	11 30.0 1.0 00 00.0	12 00.0 1.0 00 00.0	12 30.0 1.0 00 00.0	13 00.0 1.0 00 00.0	13 30.0 1.0 00 00.0	180

(Left margin: a partial adjacent column is cut off at the page edge, showing fragments such as "1.0 03 180.0", "1.0 03 178.9", "1.0 03 177.8", … and the label "L 8".)

DECLINATION SAME NAME AS LATITUDE

H.A.	24° 00′ Alt.	Δd Δt	Az.	24° 30′ Alt.	Δd Δt	Az.	25° 00′ Alt.	Δd Δt	Az.	25° 30′ Alt.	Δd Δt	Az.	26° 00′ Alt.	Δd Δt	Az.	26° 30′ Alt.	Δd Δt	Az.	27° 00′ Alt.	Δd Δt	Az.	27° 30′ Alt.	Δd Δt	Az.	H.A.
00	34 00.0	1.00 0	180.0	34 30.0	1.00 0	180.0	35 00.0	1.00 0	180.0	35 30.0	1.00 0	180.0	36 00.0	1.00 0	180.0	36 30.0	1.00 0	180.0	37 00.0	1.00 0	180.0	37 30.0	1.00 0	180.0	00
1	33 59.9	1.00 0	178.9	34 29.9	1.00 0	178.9	34 59.9	1.00 0	178.9	35 29.9	1.00 0	178.9	35 59.9	1.00 0	178.9	36 29.9	1.00 0	178.9	36 59.9	1.00 0	178.9	37 29.9	1.00 0	178.9	1
2	33 59.6	1.00 1	177.8	34 29.6	1.00 1	177.8	34 59.6	1.00 1	177.8	35 29.6	1.00 1	177.8	35 59.6	1.00 1	177.8	36 29.6	1.00 1	177.8	36 59.6	1.00 1	177.8	37 29.6	1.00 1	177.8	2
3	33 59.1	1.00 1	176.7	34 29.1	1.00 1	176.7	34 59.1	1.00 1	176.7	35 29.1	1.00 1	176.7	35 59.1	1.00 1	176.7	36 29.1	1.00 1	176.7	36 59.1	1.00 1	176.7	37 29.1	1.00 1	176.6	3
4	33 58.4	1.00 2	175.6	34 28.4	1.00 2	175.6	34 58.4	1.00 2	175.6	35 28.4	1.00 2	175.6	35 58.4	1.00 2	175.6	36 28.4	1.00 2	175.6	36 58.4	1.00 2	175.5	37 28.4	1.00 2	175.5	4
05	33 57.5	1.00 2	174.5	34 27.5	1.00 2	174.5	34 57.5	1.00 2	174.5	35 27.5	1.00 2	174.5	35 57.5	1.00 2	174.4	36 27.5	1.00 2	174.4	36 57.5	1.00 2	174.4	37 27.5	1.00 2	174.4	05
6	33 56.4	1.00 2	173.4	34 26.4	1.00 2	173.4	34 56.4	1.00 2	173.4	35 26.4	1.00 2	173.4	35 56.4	1.00 2	173.4	36 26.4	1.00 2	173.3	36 56.4	1.00 2	173.3	37 26.4	1.00 2	173.3	6
7	33 55.1	1.00 2	172.3	34 25.1	1.00 2	172.3	34 55.1	1.00 2	172.3	35 25.1	1.00 2	172.3	35 55.1	1.00 3	172.2	36 25.0	1.00 3	172.2	36 55.0	1.00 3	172.2	37 25.0	1.00 3	172.2	7
8	33 53.6	1.00 3	171.2	34 23.6	1.00 3	171.2	34 53.6	1.00 3	171.2	35 23.6	1.00 3	171.1	35 53.5	1.00 3	171.1	36 23.5	1.00 3	171.1	36 53.5	1.00 3	171.1	37 23.5	1.00 3	171.1	8
9	33 51.9	1.00 3	170.1	34 21.9	1.00 3	170.1	34 51.9	1.00 3	170.0	35 21.9	1.00 3	170.0	35 51.8	1.00 3	170.0	36 21.8	1.00 3	170.0	36 51.8	1.00 3	170.0	37 21.8	1.00 3	169.9	9
10	33 50.0	1.00 3	169.0	34 20.0	1.00 4	169.0	34 50.0	1.00 4	168.9	35 20.0	1.00 4	168.9	35 49.9	1.00 4	168.9	36 19.9	1.00 4	168.9	36 49.9	1.00 4	168.9	37 19.9	1.00 4	168.8	10
1	33 47.9	1.00 4	167.9	34 17.9	1.00 4	167.9	34 47.9	1.00 4	167.8	35 17.9	1.00 4	167.8	35 47.8	1.00 4	167.8	36 17.8	1.00 4	167.8	36 47.8	1.00 4	167.7	37 17.8	1.00 4	167.7	1
2	33 45.6	1.00 4	166.8	34 15.6	1.00 4	166.8	34 45.6	1.00 4	166.7	35 15.6	1.00 4	166.7	35 45.5	1.00 4	166.7	36 15.5	1.00 4	166.7	36 45.5	1.00 4	166.6	37 15.4	1.00 4	166.6	2
3	33 43.2	1.00 4	165.7	34 13.1	1.00 4	165.7	34 43.1	1.00 4	165.6	35 13.1	1.00 4	165.6	35 43.0	1.00 4	165.6	36 13.0	1.00 4	165.6	36 43.0	1.00 5	165.5	37 12.9	1.00 5	165.5	3
4	33 40.5	1.00 5	164.6	34 10.5	1.00 5	164.6	34 40.4	1.00 5	164.5	35 10.4	1.00 5	164.5	35 40.3	1.00 5	164.5	36 10.3	1.00 5	164.4	36 40.3	1.00 5	164.4	37 10.2	1.00 5	164.4	4
15	33 37.6	1.00 5	163.5	34 07.6	1.00 5	163.5	34 37.5	1.00 5	163.4	35 07.5	1.00 5	163.4	35 37.4	1.00 5	163.4	36 07.4	1.00 5	163.3	36 37.4	1.00 5	163.3	37 07.3	1.00 5	163.3	15
6	33 34.6	1.00 5	162.4	34 04.5	1.00 5	162.4	34 34.5	1.00 5	162.3	35 04.4	1.00 5	162.3	35 34.4	1.00 5	162.2	36 04.3	1.00 5	162.2	36 34.3	1.00 5	162.2	37 04.2	1.00 5	162.2	6
7	33 31.3	1.00 6	161.3	34 01.3	1.00 6	161.3	34 31.2	1.00 6	161.2	35 01.2	1.00 6	161.2	35 31.1	1.00 6	161.1	36 01.0	1.00 6	161.1	36 31.0	1.00 6	161.1	37 00.9	1.00 6	161.0	7
8	33 27.9	1.00 6	160.2	33 57.8	1.00 6	160.2	34 27.8	1.00 6	160.1	34 57.7	1.00 6	160.1	35 27.7	1.00 6	160.1	35 57.6	1.00 6	160.0	36 27.5	1.00 6	160.0	36 57.5	1.00 6	159.9	8
9	33 24.3	1.00 6	159.1	33 54.2	1.00 6	159.1	34 24.1	1.00 6	159.0	34 54.1	1.00 6	159.0	35 24.0	1.00 6	159.0	35 53.9	1.00 6	158.9	36 23.9	1.00 6	158.9	36 53.8	1.00 6	158.8	9
20	33 20.5	1.00 7	158.0	33 50.4	1.00 7	158.0	34 20.3	1.00 7	157.9	34 50.3	1.00 7	157.9	35 20.2	1.00 7	157.9	35 50.1	1.00 7	157.8	36 20.0	1.00 7	157.7	36 49.9	1.00 7	157.7	20
1	33 16.5	1.00 7	156.9	33 46.4	1.00 7	156.9	34 16.3	1.00 7	156.9	34 46.2	1.00 7	156.8	35 16.2	1.00 7	156.8	35 46.1	1.00 7	156.7	36 16.0	1.00 7	156.7	36 45.9	1.00 7	156.6	1
2	33 12.3	1.00 7	155.9	33 42.2	1.00 7	155.8	34 12.1	1.00 7	155.8	34 42.0	1.00 7	155.7	35 12.0	1.00 7	155.7	35 41.9	1.00 7	155.6	36 11.8	1.00 7	155.6	36 41.7	1.00 7	155.5	2
3	33 08.0	1.00 8	154.8	33 37.9	1.00 8	154.7	34 07.8	1.00 8	154.7	34 37.7	1.00 8	154.6	35 07.6	1.00 8	154.6	35 37.5	1.00 8	154.5	36 07.4	1.00 8	154.5	36 37.3	1.00 8	154.4	3
4	33 03.4	1.00 8	153.7	33 33.3	1.00 8	153.6	34 03.2	1.00 8	153.6	34 33.1	1.00 8	153.5	35 03.0	1.00 8	153.5	35 32.9	1.00 8	153.4	36 02.8	1.00 8	153.4	36 32.7	1.00 8	153.3	4
25	32 58.7	1.00 8	152.6	33 28.6	1.00 8	152.5	33 58.5	1.00 8	152.5	34 28.4	1.00 8	152.4	34 58.3	1.00 8	152.4	35 28.1	1.00 8	152.3	35 58.0	1.00 8	152.2	36 27.9	1.00 8	152.2	25
6	32 53.9	1.00 8	151.5	33 23.7	1.00 8	151.5	33 53.6	1.00 8	151.4	34 23.5	1.00 8	151.3	34 53.3	1.00 8	151.3	35 23.2	1.00 8	151.2	35 53.1	1.00 9	151.1	36 23.0	1.00 9	151.1	6
7	32 48.8	1.00 9	150.4	33 18.7	1.00 9	150.4	33 48.5	1.00 9	150.3	34 18.4	1.00 9	150.2	34 48.3	1.00 9	150.2	35 18.1	1.00 9	150.1	35 48.0	99 00	150.1	36 17.8	99 00	150.0	7
8	32 43.6	1.00 9	149.3	33 13.4	1.00 9	149.3	33 43.3	1.00 9	149.2	34 13.1	1.00 9	149.2	34 43.0	1.00 9	149.1	35 12.8	1.00 9	149.1	35 42.7	99 00	149.0	36 12.5	99 00	148.9	8
9	32 38.2	99 00	148.3	33 08.0	99 00	148.2	33 37.9	99 00	148.1	34 07.7	99 00	148.1	34 37.6	99 00	148.0	35 07.4	99 00	148.0	35 37.2	99 00	147.9	36 07.1	99 00	147.8	9
30	32 32.6	99 10	147.2	33 02.4	99 10	147.1	33 32.3	99 10	147.1	34 02.1	99 10	147.0	34 32.0	99 10	146.9	35 01.8	99 10	146.9	35 31.6	99 10	146.8	36 01.4	99 10	146.7	30
1	32 26.9	99 10	146.1	32 56.7	99 10	146.0	33 26.5	99 10	146.0	33 56.4	99 10	145.9	34 26.2	99 10	145.9	34 56.0	99 10	145.8	35 25.8	99 10	145.7	35 55.6	99 10	145.7	1
2	32 21.0	99 10	145.0	32 50.8	99 10	145.0	33 20.6	99 10	144.9	33 50.4	99 10	144.8	34 20.3	99 10	144.8	34 50.0	99 10	144.7	35 19.9	99 10	144.6	35 49.7	99 10	144.6	2
3	32 14.9	99 10	144.0	32 44.8	99 10	143.9	33 14.6	99 10	143.8	33 44.4	99 10	143.8	34 14.2	99 10	143.7	34 44.0	99 10	143.6	35 13.8	99 10	143.6	35 43.6	99 10	143.5	3
4	32 08.7	99 11	142.9	32 38.5	99 11	142.8	33 08.3	99 11	142.8	33 38.1	99 11	142.7	34 07.9	99 11	142.6	34 37.7	99 11	142.5	35 07.5	99 11	142.5	35 37.3	99 11	142.4	4
35	32 02.4	99 11	141.8	32 32.2	99 11	141.8	33 02.0	99 11	141.7	33 31.7	99 11	141.6	34 01.5	99 11	141.6	34 31.3	99 11	141.5	35 01.1	99 11	141.4	35 30.9	99 11	141.3	35
6	31 55.9	99 11	140.7	32 25.6	99 11	140.7	32 55.4	99 11	140.6	33 25.2	99 11	140.5	33 55.0	99 11	140.5	34 24.7	99 11	140.4	34 54.5	99 11	140.3	35 24.3	99 11	140.2	6
7	31 49.2	99 11	139.7	32 19.0	99 11	139.6	32 48.7	99 11	139.5	33 18.5	99 11	139.5	33 48.3	99 11	139.4	34 18.0	99 11	139.3	34 47.8	99 11	139.2	35 17.5	99 12	139.2	7
8	31 42.4	99 12	138.6	32 12.1	99 12	138.5	32 41.9	99 12	138.5	33 11.6	99 12	138.4	33 41.4	99 12	138.3	34 11.2	99 12	138.2	34 40.9	99 12	138.2	35 10.6	99 12	138.1	8
9	31 35.4	99 12	137.6	32 05.2	99 12	137.5	32 34.9	99 12	137.4	33 04.7	99 12	137.3	33 34.4	99 12	137.2	34 04.1	99 12	137.2	34 33.9	99 12	137.1	35 03.6	99 12	137.0	9
40	31 28.3	99 12	136.5	31 58.1	99 12	136.4	32 27.8	99 12	136.3	32 57.5	99 12	136.3	33 27.3	99 12	136.2	33 57.0	99 12	136.1	34 26.7	99 12	136.0	34 56.4	99 12	135.9	40
1	31 21.1	99 12	135.4	31 50.8	99 12	135.3	32 20.5	99 12	135.3	32 50.2	99 12	135.2	33 20.0	99 12	135.1	33 49.7	99 12	135.0	34 19.4	99 12	134.9	34 49.1	99 12	134.9	1
2	31 13.7	99 13	134.4	31 43.4	99 13	134.3	32 13.1	99 13	134.2	32 42.8	99 13	134.1	33 12.5	99 13	134.0	33 42.3	99 13	134.0	34 12.0	99 13	133.9	34 41.7	99 13	133.8	2
3	31 06.2	99 13	133.3	31 35.9	99 13	133.2	32 05.6	99 13	133.1	32 35.3	99 13	133.1	33 05.0	99 13	133.0	33 34.7	99 13	132.9	34 04.4	99 13	132.8	34 34.1	99 13	132.7	3
4	30 58.5	99 13	132.3	31 28.2	99 13	132.2	31 57.9	99 13	132.1	32 27.6	99 13	132.0	32 57.3	99 13	131.9	33 27.0	99 13	131.8	33 56.7	99 13	131.7	34 26.3	99 13	131.7	4
45	30 50.8	99 13	131.2	31 20.4	99 13	131.1	31 50.1	99 13	131.0	32 19.8	99 13	130.9	32 49.5	99 13	130.9	33 19.2	99 13	130.8	33 48.8	99 13	130.7	34 18.5	99 13	130.6	45
6	30 42.8	99 13	130.1	31 12.5	99 13	130.1	31 42.2	99 13	130.0	32 11.9	99 13	129.9	32 41.5	99 13	129.8	33 11.2	99 13	129.7	33 40.9	99 13	129.6	34 10.5	99 14	129.5	6
7	30 34.8	99 14	129.1	31 04.5	99 14	129.0	31 34.2	99 14	128.9	32 03.8	99 14	128.8	32 33.5	99 14	128.7	33 03.1	99 14	128.7	33 32.8	99 14	128.6	34 02.4	99 14	128.5	7
8	30 26.7	99 14	128.1	30 56.3	99 14	128.0	31 26.0	99 14	127.9	31 55.6	99 14	127.8	32 25.3	99 14	127.7	32 54.9	99 14	127.6	33 24.6	99 14	127.5	33 54.2	99 14	127.4	8
9	30 18.4	99 14	127.0	30 48.1	99 14	127.0	31 17.7	99 14	126.8	31 47.4	99 14	126.7	32 17.0	99 14	126.6	32 46.6	99 14	126.6	33 16.3	99 14	126.4	33 45.9	99 14	126.4	9
50	30 10.0	99 14	126.0	30 39.7	99 14	125.9	31 09.3	99 14	125.8	31 38.9	99 14	125.7	32 08.6	99 14	125.6	32 38.2	99 14	125.5	33 07.8	99 14	125.4	33 37.4	99 14	125.3	50
1	30 01.5	99 14	124.9	30 31.2	99 14	124.8	31 00.8	99 14	124.7	31 30.4	99 14	124.6	32 00.1	99 14	124.5	32 29.7	99 14	124.4	32 59.3	99 14	124.4	33 28.9	99 14	124.3	1
2	29 53.0	99 14	123.9	30 22.6	99 14	123.8	30 52.2	99 15	123.7	31 21.8	99 15	123.6	31 51.4	99 15	123.5	32 21.0	99 15	123.4	32 50.6	99 15	123.3	33 20.2	99 15	123.2	2
3	29 44.2	99 15	122.8	30 13.9	99 15	122.7	30 43.5	99 15	122.6	31 13.1	99 15	122.5	31 42.7	99 15	122.4	32 12.3	99 15	122.4	32 41.9	99 15	122.3	33 11.5	99 15	122.2	3
4	29 35.4	99 15	121.8	30 05.0	99 15	121.7	30 34.6	99 15	121.6	31 04.2	99 15	121.5	31 33.8	99 15	121.4	32 03.4	99 15	121.3	32 33.0	99 15	121.2	33 02.6	99 15	121.1	4
55	29 26.5	99 15	120.8	29 56.1	99 15	120.7	30 25.7	99 15	120.6	30 55.3	99 15	120.5	31 24.9	99 15	120.4	31 54.5	99 15	120.3	32 24.0	99 15	120.2	32 53.6	98 15	120.1	55
6	29 17.5	99 15	119.7	29 47.1	99 15	119.6	30 16.7	99 15	119.5	30 46.3	99 15	119.4	31 15.9	99 15	119.3	31 45.4	99 15	119.2	32 15.0	99 15	119.1	32 44.6	98 15	119.0	6
7	29 08.4	99 15	118.7	29 38.0	99 15	118.6	30 07.6	99 15	118.5	30 37.2	99 15	118.4	31 06.7	99 15	118.3	31 36.3	99 15	118.2	32 05.8	99 15	118.1	32 35.4	98 15	118.0	7
8	28 59.2	99 15	117.7	29 28.8	99 15	117.5	29 58.4	99 15	117.4	30 28.0	99 16	117.3	30 57.5	99 16	117.3	31 27.1	99 16	117.1	31 56.6	99 16	117.1	32 26.2	98 16	116.9	8
9	28 50.0	99 16	116.6	29 19.6	99 16	116.5	29 49.1	99 16	116.4	30 18.7	99 16	116.3	30 48.2	99 16	116.2	31 17.8	99 16	116.1	31 47.3	99 16	116.0	32 16.8	98 16	115.9	9
60	28 40.6	99 16	115.6	29 10.2	99 16	115.5	29 39.7	99 16	115.4	30 09.3	98 16	115.3	30 38.8	99 16	115.2	31 08.4	99 16	115.1	31 37.9	99 16	115.0	32 07.4	98 16	114.9	60
1	28 31.2	98 16	114.6	29 00.7	98 16	114.5	29 30.3	98 16	114.4	29 59.8	98 16	114.3	30 29.4	98 16	114.2	30 58.9	98 16	114.1	31 28.4	98 16	114.0	31 57.9	98 16	113.9	1
2	28 21.7	98 16	113.6	28 51.2	98 16	113.5	29 20.8	98 16	113.4	29 50.3	98 16	113.3	30 19.8	98 16	113.1	30 49.3	98 16	113.1	31 18.9	98 16	112.9	31 48.4	98 16	112.8	2
3	28 12.1	98 16	112.5	28 41.6	98 16	112.4	29 11.2	98 16	112.3	29 40.7	98 16	112.2	30 10.2	98 16	112.1	30 39.7	98 16	112.0	31 09.2	98 16	111.9	31 38.7	98 16	111.8	3
4	28 02.4	98 16	111.5	28 32.0	98 16	111.4	29 01.5	98 16	111.3	29 31.0	98 16	111.2	30 00.5	98 16	111.1	30 30.0	98 16	111.0	30 59.5	98 16	110.9	31 29.0	98 16	110.8	4
65	27 52.7	98 16	110.5	28 22.2	98 16	110.4	28 51.7	98 16	110.3	29 21.3	98 16	110.2	29 50.8	98 16	110.1	30 20.3	98 16	110.0	30 49.8	98 16	109.9	31 19.2	98 16	109.8	65
6	27 42.9	98 16	109.5	28 12.4	98 16	109.4	28 41.9	98 16	109.3	29 11.4	98 16	109.2	29 40.9	98 16	109.1	30 10.4	98 16	109.0	30 39.9	98 16	108.9	31 09.4	98 16	108.8	6
7	27 33.1	98 16	108.5	28 02.6	98 17	108.4	28 32.1	98 17	108.3	29 01.6	98 17	108.2	29 31.1	98 17	108.1	30 00.6	98 17	108.0	30 30.0	98 17	107.8	30 59.5	98 17	107.7	7
8	27 23.2	98 17	107.5	27 52.7	98 17	107.4	28 22.2	98 17	107.3	28 51.6	98 17	107.1	29 21.1	98 17	107.0	29 50.6	98 17	106.9	30 20.1	98 17	106.8	30 49.6	98 17	106.7	8
9	27 13.2	98 17	106.4	27 42.7	98 17	106.3	28 12.2	98 17	106.2	28 41.7	98 17	106.1	29 11.1	98 17	106.0	29 40.6	98 17	105.9	30 10.1	98 17	105.8	30 39.6	98 17	105.7	9
70	27 03.2	98 17	105.4	27 32.7	98 17	105.3	28 02.2	98 17	105.2	28 31.6	98 17	105.1	29 01.1	98 17	105.0	29 30.6	98 17	104.9	30 00.0	98 17	104.8	30 29.5	98 17	104.7	70
1	26 53.1	98 17	104.4	27 22.6	98 17	104.3	27 52.1	98 17	104.2	28 21.6	98 17	104.1	28 51.0	98 17	104.0	29 20.5	98 17	103.9	29 49.9	98 17	103.8	30 19.4	98 17	103.7	1
2	26 43.0	98 17	103.4	27 12.5	98 17	103.3	27 42.0	98 17	103.2	28 11.4	98 17	103.1	28 40.9	98 17	103.0	29 10.4	98 17	102.9	29 39.8	98 17	102.8	30 09.3	98 17	102.7	2
3	26 32.8	98 17	102.4	27 02.3	98 17	102.3	27 31.8	98 17	102.2	28 01.3	98 17	102.1	28 30.7	98 17	102.0	29 00.2	98 17	101.9	29 29.6	98 17	101.8	29 59.1	98 17	101.7	3
4	26 22.6	98 17	101.4	26 52.1	98 17	101.3	27 21.6	98 17	101.2	27 51.1	98 17	101.1	28 20.5	98 17	101.0	28 50.0	98 17	100.9	29 19.4	98 17	100.8	29 48.9	98 17	100.7	4
75	26 12.4	98 17	100.4	26 41.9	98 17	100.3	27 11.4	98 17	100.2	27 40.8	98 17	100.1	28 10.3	98 17	100.0	28 39.7	98 17	99.9	29 09.2	98 17	99.8	29 38.6	98 17	99.7	75
6	26 02.2	98 17	99.4	26 31.6	98 17	99.3	27 01.1	98 17	99.2	27 30.5	98 17	99.1	28 00.0	98 17	99.0	28 29.4	98 17	98.9	28 58.9	98 17	98.8	29 28.3	98 17	98.7	6
7	25 51.9	98 17	98.4	26 21.3	98 17	98.3	26 50.8	98 17	98.2	27 20.2	98 17	98.1	27 49.7	98 17	98.0	28 19.1	98 17	97.9	28 48.6	98 17	97.8	29 18.0	98 17	97.7	7
8	25 41.5	98 17	97.4	26 11.0	98 17	97.3	26 40.5	98 17	97.2	27 09.9	98 17	97.1	27 39.4	98 17	97.0	28 08.8	98 17	96.9	28 38.2	98 17	96.8	29 07.7	98 17	96.7	8
9	25 31.2	98 17	96.4	26 00.7	98 17	96.3	26 30.1	98 17	96.2	26 59.6	98 17	96.1	27 29.0	98 17	96.0	27 58.4	98 17	95.9	28 27.9	98 17	95.8	28 57.3	98 17	95.7	9
80	25 20.8	98 17	95.4	25 50.3	98 17	95.3	26 19.7	98 17	95.2	26 49.2	98 17	95.1	27 18.6	98 17	95.0	27 48.1	98 17	94.9	28 17.5	98 17	94.8	28 46.9	98 17	94.7	80
1	25 10.5	98 17	94.4	25 39.9	98 17	94.3	26 09.4	98 17	94.2	26 38.8	98 17	94.1	27 08.2	98 17	94.0	27 37.7	98 17	93.9	28 07.1	98 17	93.8	28 36.5	98 17	93.7	1
2	25 00.1	98 17	93.5	25 29.5	98 17	93.3	25 58.8	98 17	93.2	26 28.4	98 17	93.1	26 57.8	98 17	93.0	27 27.3	98 17	92.9	27 56.7	98 17	92.8	28 26.1	98 17	92.7	2
3	24 49.7	98 17	92.5	25 19.1	98 17	92.4	25 48.6	98 17	92.3	26 18.0	98 17	92.1	26 47.4	98 17	92.0	27 16.9	98 17	92.0	27 46.3	98 17	91.8	28 15.7	98 17	91.7	3
4	24 39.2	98 17	91.5	25 08.7	98 17	91.4	25 38.1	98 17	91.3	26 07.6	98 17	91.2	26 37.0	98 17	91.1	27 06.5	98 17	90.9	27 35.9	98 17	90.8	28 05.3	98 17	90.7	4
85	24 28.8	98 17	90.5	24 58.3	98 17	90.4	25 27.7	98 17	90.3	25 57.2	98 17	90.2	26 26.6	98 17	90.1	26 56.0	98 17	90.0	27 25.5	98 17	89.8	27 54.9	98 17	89.7	85
6	24 18.4	98 17	89.5	24 47.9	98 17	89.4	25 17.3	98 17	89.3	25 46.8	98 17	89.2	26 16.2	98 17	89.1	26 45.6	98 17	89.0	27 15.0	98 17	88.9	27 44.5	98 17	88.8	6
7	24 07.9	98 17	88.5	24 37.4	98 17	88.4	25 06.8	98 17	88.3	25 36.3	98 17	88.2	26 05.8	98 17	88.1	26 35.2	98 17	88.0	27 04.6	98 17	87.8	27 34.1	98 17	87.8	7
8	23 57.6	98 17	87.5	24 27.0	98 17	87.4	24 56.5	98 17	87.3	25 25.9	98 17	87.2	25 55.4	98 17	87.1	26 24.8	98 17	87.0	26 54.2	98 17	86.9	27 23.6	98 17	86.8	8
9	23 47.2	98 17	86.6	24 16.6	98 17	86.5	24 46.1	98 17	86.3	25 15.5	98 17	86.2	25 45.0	98 17	86.1	26 14.4	98 17	86.0	26 43.8	98 17	85.9	27 13.3	98 17	85.8	9
90	23 36.8	98 17	85.6	24 06.2	98 17	85.5	24 35.7	98 17	85.4	25 05.1	98 17	85.3	25 34.6	98 17	85.2	26 04.0	98 17	85.1	26 33.4	98 17	84.9	27 02.9	98 17	84.8	90

H.A.	24° 00′ Alt.	Δd Δt	Az.	24° 30′ Alt.	Δd Δt	Az.	25° 00′ Alt.	Δd Δt	Az.	25° 30′ Alt.	Δd Δt	Az.	26° 00′ Alt.	Δd Δt	Az.	26° 30′ Alt.	Δd Δt	Az.	27° 00′ Alt.	Δd Δt	Az.	27° 30′ Alt.	Δd Δt	Az.	H.A.
91	23 26.4	98 17	84.6	23 55.9	98 17	84.5	24 25.3	98 17	84.4	24 54.8	98 17	84.3	25 24.2	98 17	84.2	25 53.6	98 17	84.1	26 23.1	98 17	84.0	26 52.5	98 17	83.9	91
2	23 16.0	98 17	83.6	23 45.5	98 17	83.5	24 14.9	98 17	83.4	24 44.4	98 17	83.3	25 13.8	98 17	83.2	25 43.3	98 17	83.1	26 12.7	98 17	83.0	26 42.2	98 17	82.9	2
3	23 05.7	98 17	82.6	23 35.2	98 17	82.5	24 04.6	98 17	82.4	24 34.1	98 17	82.3	25 03.5	98 17	82.2	25 33.0	98 17	82.1	26 02.4	98 17	82.0	26 31.8	98 17	81.9	3
4	22 55.4	98 17	81.7	23 24.8	98 17	81.6	23 54.3	98 17	81.5	24 23.7	98 17	81.4	24 53.2	98 17	81.3	25 22.6	98 17	81.2	25 52.1	98 17	81.0	26 21.5	98 17	80.9	4
95	22 45.1	98 17	80.7	23 14.5	98 17	80.6	23 44.0	98 17	80.5	24 13.5	98 17	80.4	24 42.9	98 17	80.3	25 12.4	98 17	80.2	25 41.8	98 17	80.1	26 11.2	98 17	80.0	95
6	22 34.8	98 17	79.7	23 04.3	98 17	79.6	23 33.7	98 17	79.5	24 03.2	98 17	79.4	24 32.7	98 17	79.3	25 02.1	98 17	79.2	25 31.6	98 17	79.1	26 01.0	98 17	79.0	6
7	22 24.6	98 17	78.8	22 54.0	98 17	78.7	23 23.5	98 17	78.6	23 53.0	98 17	78.5	24 22.4	98 17	78.3	24 51.9	98 17	78.2	25 21.3	98 17	78.1	25 50.8	98 17	78.0	7
8	22 14.4	98 17	77.8	22 43.8	98 17	77.7	23 13.3	98 17	77.6	23 42.8	98 17	77.5	24 12.3	98 17	77.4	24 41.7	98 17	77.3	25 11.2	98 17	77.2	25 40.6	98 17	77.1	8
9	22 04.2	98 17	76.8	22 33.7	98 17	76.7	23 03.2	98 17	76.6	23 32.6	98 17	76.5	24 02.1	98 17	76.4	24 31.6	98 17	76.3	25 01.0	98 17	76.2	25 30.5	98 17	76.1	9
100	21 54.1	98 17	75.8	22 23.6	98 17	75.7	22 53.0	98 17	75.6	23 22.5	98 17	75.5	23 52.0	98 17	75.4	24 21.5	98 17	75.3	24 50.9	98 17	75.2	25 20.4	98 17	75.1	100
1	21 44.0	98 17	74.9	22 13.5	98 17	74.8	22 43.0	98 17	74.7	23 12.5	98 17	74.6	23 41.9	98 17	74.5	24 11.4	98 17	74.4	24 40.9	98 17	74.3	25 10.3	98 17	74.2	1
2	21 34.0	98 17	73.9	22 03.5	98 17	73.8	22 33.0	98 17	73.7	23 02.4	98 17	73.6	23 31.9	98 17	73.5	24 01.4	98 17	73.4	24 30.9	98 17	73.3	25 00.3	98 17	73.2	2
3	21 24.0	98 17	72.9	21 53.5	98 17	72.8	22 23.0	98 17	72.8	22 52.5	98 17	72.7	23 22.0	98 17	72.6	23 51.4	98 17	72.5	24 20.9	98 16	72.4	24 50.4	98 16	72.2	3
4	21 14.0	98 16	72.0	21 43.6	98 16	71.9	22 13.1	98 16	71.8	22 42.6	98 16	71.7	23 12.0	98 16	71.6	23 41.5	98 16	71.5	24 11.0	98 16	71.4	24 40.5	98 16	71.3	4
105	21 04.2	98 16	71.0	21 33.7	98 16	70.9	22 03.2	98 16	70.8	22 32.7	98 16	70.7	23 02.2	98 16	70.6	23 31.7	98 16	70.5	24 01.2	98 16	70.4	24 30.7	98 16	70.3	105
6	20 54.3	98 16	70.1	21 23.9	98 16	70.0	21 53.4	98 16	69.9	22 22.9	98 16	69.8	22 52.4	98 16	69.7	23 21.9	98 16	69.6	23 51.4	98 16	69.5	24 20.9	98 16	69.4	6
7	20 44.6	98 16	69.1	21 14.1	98 16	69.0	21 43.6	98 16	68.9	22 13.1	98 16	68.8	22 42.6	98 16	68.7	23 12.2	98 16	68.6	23 41.7	98 16	68.5	24 11.2	98 16	68.4	7
8	20 34.9	98 16	68.1	21 04.4	98 16	68.0	21 33.9	98 16	67.9	22 03.5	98 16	67.9	22 33.0	98 16	67.8	23 02.5	98 16	67.7	23 32.0	98 16	67.6	24 01.5	98 16	67.5	8
9	20 25.2	98 16	67.2	20 54.8	98 16	67.1	21 24.3	98 16	67.0	21 53.8	98 16	66.9	22 23.4	98 16	66.8	22 52.9	98 16	66.7	23 22.4	98 16	66.6	23 51.9	98 16	66.5	9
110	20 15.7	98 16	66.2	20 45.2	98 16	66.1	21 14.8	98 16	66.0	21 44.3	98 16	65.9	22 13.8	98 16	65.8	22 43.3	98 16	65.7	23 12.9	98 16	65.6	23 42.4	98 16	65.6	110
1	20 06.2	98 16	65.3	20 35.7	98 16	65.2	21 05.3	98 16	65.1	21 34.8	98 16	65.0	22 04.3	98 16	64.9	22 33.9	98 16	64.8	23 03.4	98 16	64.7	23 32.9	98 16	64.6	1
2	19 56.7	98 16	64.3	20 26.3	98 16	64.2	20 55.9	99 16	64.1	21 25.4	98 16	64.0	21 55.0	98 16	63.9	22 24.5	98 16	63.8	22 54.0	98 16	63.7	23 23.6	98 16	63.6	2
3	19 47.4	99 15	63.3	20 17.0	98 15	63.3	20 46.5	99 15	63.2	21 16.1	99 15	63.1	21 45.6	99 15	63.0	22 15.2	98 15	62.9	22 44.7	98 15	62.8	23 14.3	98 15	62.7	3
4	19 38.1	99 15	62.4	20 07.7	99 15	62.3	20 37.3	99 15	62.2	21 06.8	99 15	62.1	21 36.4	99 15	62.0	22 06.0	99 15	61.9	22 35.5	99 15	61.8	23 05.1	99 15	61.7	4
115	19 28.9	99 15	61.4	19 58.5	99 15	61.3	20 28.1	99 15	61.3	20 57.7	99 15	61.2	21 27.2	99 15	61.1	21 56.8	99 15	61.0	22 26.4	99 15	60.9	22 55.9	99 15	60.8	115
6	19 19.8	99 15	60.5	19 49.4	99 15	60.4	20 19.0	99 15	60.3	20 48.6	99 15	60.2	21 18.2	99 15	60.1	21 47.7	99 15	60.0	22 17.3	99 15	59.9	22 46.9	99 15	59.8	6
7	19 10.8	99 15	59.5	19 40.4	99 15	59.4	20 10.0	99 15	59.3	20 39.6	99 15	59.3	21 09.2	99 15	59.2	21 38.7	99 15	59.1	22 08.3	99 15	59.0	22 37.9	99 15	58.9	7
8	19 01.9	99 15	58.6	19 31.5	99 15	58.5	20 01.1	99 15	58.4	20 30.7	99 15	58.3	21 00.3	99 15	58.2	21 29.9	99 15	58.1	21 59.4	99 15	58.0	22 29.0	99 15	58.0	8
9	18 53.0	99 15	57.6	19 22.6	99 15	57.5	19 52.2	99 15	57.4	20 21.8	99 15	57.4	20 51.5	99 15	57.3	21 21.1	99 14	57.2	21 50.6	99 14	57.1	22 20.2	99 14	57.0	9
120	18 44.3	99 14	56.7	19 13.9	99 14	56.6	19 43.5	99 14	56.5	20 13.1	99 14	56.4	20 42.7	99 14	56.3	21 12.3	99 14	56.2	21 41.9	99 14	56.1	22 11.6	99 14	56.1	120
1	18 35.6	99 14	55.7	19 05.2	99 14	55.6	19 34.9	99 14	55.5	20 04.5	99 14	55.5	20 34.1	99 14	55.4	21 03.7	99 14	55.3	21 33.3	99 14	55.2	22 03.0	99 14	55.1	1
2	18 27.1	99 14	54.8	18 56.7	99 14	54.7	19 26.3	99 14	54.6	19 56.0	99 14	54.5	20 25.6	99 14	54.4	20 55.2	99 14	54.3	21 24.8	99 14	54.3	21 54.5	99 14	54.2	2
3	18 18.6	99 14	53.8	18 48.2	99 14	53.7	19 17.9	99 14	53.6	19 47.5	99 14	53.6	20 17.2	99 14	53.5	20 46.8	99 14	53.4	21 16.4	99 14	53.3	21 46.1	99 14	53.3	3
4	18 10.2	99 14	52.9	18 39.9	99 14	52.8	19 09.5	99 14	52.7	19 39.2	99 14	52.6	20 08.8	99 14	52.5	20 38.5	99 14	52.5	21 08.1	99 14	52.4	21 37.8	99 14	52.3	4
125	18 02.0	99 14	51.9	18 31.7	99 14	51.8	19 01.3	99 14	51.7	19 31.0	99 14	51.7	20 00.6	99 14	51.6	20 30.3	99 14	51.5	20 59.9	99 14	51.4	21 29.6	99 13	51.3	125
6	17 53.8	99 13	51.0	18 23.5	99 13	50.9	18 53.2	99 13	50.8	19 22.9	99 13	50.7	19 52.5	99 13	50.6	20 22.2	99 13	50.6	20 51.8	99 13	50.5	21 21.5	99 13	50.4	6
7	17 45.8	99 13	50.0	18 15.5	99 13	49.9	18 45.2	99 13	49.9	19 14.8	99 13	49.8	19 44.5	99 13	49.7	20 14.2	99 13	49.6	20 43.9	99 13	49.5	21 13.5	99 13	49.5	7
8	17 37.9	99 13	49.1	18 07.6	99 13	49.0	18 37.3	99 13	48.9	19 06.9	99 13	48.8	19 36.6	99 13	48.8	20 06.3	99 13	48.7	20 36.0	99 13	48.6	21 05.7	99 13	48.5	8
9	17 30.1	99 13	48.1	17 59.8	99 13	48.0	18 29.5	99 13	48.0	18 59.2	99 13	47.9	19 28.8	99 13	47.8	19 58.5	99 13	47.7	20 28.2	99 13	47.7	20 57.9	99 13	47.6	9
130	17 22.4	99 13	47.2	17 52.1	99 13	47.1	18 21.8	99 13	47.0	18 51.5	99 13	46.9	19 21.2	99 13	46.9	19 50.9	99 13	46.8	20 20.6	99 13	46.7	20 50.3	99 13	46.6	130
1	17 14.8	99 12	46.2	17 44.5	99 12	46.1	18 14.2	99 12	46.1	18 43.9	99 12	46.0	19 13.6	99 12	45.9	19 43.4	99 12	45.8	20 13.1	99 12	45.8	20 42.8	99 12	45.7	1
2	17 07.3	99 12	45.3	17 37.1	99 12	45.2	18 06.8	99 12	45.1	18 36.5	99 12	45.1	19 06.2	99 12	45.0	19 35.9	99 12	44.9	20 05.7	99 12	44.8	20 35.4	99 12	44.8	2
3	17 00.0	99 12	44.3	17 29.7	99 12	44.2	17 59.5	99 12	44.2	18 29.2	99 12	44.1	18 58.9	99 12	44.0	19 28.6	99 12	44.0	19 58.4	99 12	43.9	20 28.1	99 12	43.8	3
4	16 52.8	99 12	43.4	17 22.5	99 12	43.3	17 52.3	99 12	43.2	18 22.0	99 12	43.2	18 51.7	99 12	43.1	19 21.5	99 12	43.0	19 51.2	99 12	43.0	20 20.9	99 12	42.9	4
135	16 45.7	99 12	42.4	17 15.4	99 12	42.4	17 45.2	99 12	42.3	18 14.9	99 12	42.2	18 44.7	99 12	42.2	19 14.4	99 12	42.1	19 44.2	99 12	42.0	20 13.9	99 12	41.9	135
6	16 38.7	99 11	41.5	17 08.5	99 11	41.4	17 38.2	99 11	41.3	18 08.0	99 11	41.3	18 37.7	99 11	41.2	19 07.5	99 11	41.1	19 37.3	99 11	41.1	20 07.0	99 11	41.0	6
7	16 31.9	99 11	40.5	17 01.6	99 11	40.5	17 31.4	99 11	40.4	18 01.2	99 11	40.3	18 30.9	99 11	40.3	19 00.7	99 11	40.2	19 30.5	99 11	40.1	20 00.2	99 11	40.1	7
8	16 25.2	99 11	39.6	16 54.9	99 11	39.5	17 24.7	99 11	39.5	17 54.5	99 11	39.4	18 24.3	99 11	39.3	18 54.1	99 11	39.3	19 23.8	99 11	39.2	19 53.6	99 11	39.1	8
9	16 18.6	99 11	38.6	16 48.4	99 11	38.6	17 18.2	99 11	38.5	17 48.0	99 11	38.5	18 17.7	99 11	38.4	18 47.5	99 11	38.3	19 17.3	99 11	38.3	19 47.1	99 11	38.2	9
140	16 12.2	99 11	37.7	16 42.0	99 10	37.6	17 11.7	99 10	37.6	17 41.5	99 10	37.5	18 11.3	99 10	37.5	18 41.1	99 10	37.4	19 10.9	99 10	37.3	19 40.7	99 10	37.3	140
1	16 05.9	99 10	36.8	16 35.7	99 10	36.7	17 05.5	99 10	36.6	17 35.3	99 10	36.6	18 05.1	99 10	36.5	18 34.9	99 10	36.5	19 04.7	99 10	36.4	19 34.5	99 10	36.3	1
2	15 59.7	99 10	35.8	16 29.5	99 10	35.8	16 59.3	99 10	35.7	17 29.1	99 10	35.6	17 58.9	99 10	35.6	18 28.7	99 10	35.5	18 58.6	99 10	35.5	19 28.4	99 10	35.4	2
3	15 53.7	99 10	34.9	16 23.5	99 10	34.8	16 53.3	99 10	34.8	17 23.1	99 10	34.7	17 52.9	99 10	34.6	18 22.8	99 10	34.6	18 52.6	99 10	34.5	19 22.4	99 10	34.5	3
4	15 47.8	99 10	33.9	16 17.6	99 10	33.9	16 47.4	99 10	33.8	17 17.3	99 10	33.8	17 47.1	99 10	33.7	18 16.9	99 10	33.6	18 46.7	99 10	33.6	19 16.6	99 09	33.5	4
145	15 42.0	99 09	33.0	16 11.9	99 09	32.9	16 41.7	99 09	32.9	17 11.5	99 09	32.8	17 41.4	99 09	32.8	18 11.2	99 09	32.7	18 41.1	99 09	32.6	19 10.9	99 09	32.6	145
6	15 36.4	99 09	32.0	16 06.3	99 09	32.0	16 36.1	99 09	31.9	17 06.0	99 09	31.9	17 35.8	99 09	31.8	18 05.7	99 09	31.8	18 35.5	99 09	31.7	19 05.3	99 09	31.7	6
7	15 31.0	1.00 09	31.1	16 00.8	1.00 09	31.0	16 30.7	1.00 09	31.0	17 00.5	1.00 09	30.9	17 30.4	1.00 09	30.9	18 00.3	1.00 09	30.8	18 30.1	1.00 09	30.8	19 00.0	1.00 09	30.7	7
8	15 25.7	1.00 09	30.1	15 55.5	1.00 09	30.1	16 25.4	1.00 09	30.0	16 55.3	1.00 09	30.0	17 25.1	1.00 09	29.9	17 55.0	1.00 09	29.9	18 24.8	1.00 09	29.8	18 54.7	1.00 08	29.8	8
9	15 20.5	1.00 08	29.2	15 50.4	1.00 08	29.2	16 20.3	1.00 08	29.1	16 50.1	1.00 08	29.1	17 20.0	1.00 08	29.0	17 49.9	1.00 08	29.0	18 19.7	1.00 08	28.9	18 49.6	1.00 08	28.9	9
150	15 15.5	1.00 08	28.3	15 45.4	1.00 08	28.2	16 15.3	1.00 08	28.2	16 45.1	1.00 08	28.1	17 15.0	1.00 08	28.1	17 44.9	1.00 08	28.0	18 14.8	1.00 08	28.0	18 44.6	1.00 08	27.9	150
1	15 10.7	1.00 08	27.3	15 40.5	1.00 08	27.3	16 10.4	1.00 08	27.2	16 40.3	1.00 08	27.2	17 10.2	1.00 08	27.1	17 40.1	1.00 08	27.1	18 10.0	1.00 08	27.0	18 39.8	1.00 08	27.0	1
2	15 06.0	1.00 08	26.4	15 35.8	1.00 08	26.3	16 05.7	1.00 08	26.3	16 35.6	1.00 08	26.2	17 05.5	1.00 08	26.2	17 35.4	1.00 08	26.2	18 05.3	1.00 08	26.1	18 35.2	1.00 08	26.1	2
3	15 01.4	1.00 07	25.4	15 31.3	1.00 07	25.4	16 01.2	1.00 07	25.3	16 31.1	1.00 07	25.3	17 01.0	1.00 07	25.3	17 30.9	1.00 07	25.2	18 00.8	1.00 07	25.2	18 30.7	1.00 07	25.1	3
4	14 57.0	1.00 07	24.5	15 26.9	1.00 07	24.4	15 56.8	1.00 07	24.4	16 26.7	1.00 07	24.4	16 56.6	1.00 07	24.3	17 26.5	1.00 07	24.3	17 56.4	1.00 07	24.2	18 26.3	1.00 07	24.2	4
155	14 52.8	1.00 07	23.5	15 22.7	1.00 07	23.5	15 52.6	1.00 07	23.5	16 22.5	1.00 07	23.4	16 52.4	1.00 07	23.4	17 22.3	1.00 07	23.3	17 52.2	1.00 07	23.3	18 22.1	1.00 07	23.3	155
6	14 48.7	1.00 07	22.6	15 18.6	1.00 07	22.6	15 48.5	1.00 07	22.5	16 18.4	1.00 06	22.5	16 48.4	1.00 06	22.5	17 18.3	1.00 06	22.4	17 48.2	1.00 06	22.4	18 18.1	1.00 06	22.3	6
7	14 44.8	1.00 06	21.7	15 14.7	1.00 06	21.6	15 44.6	1.00 06	21.6	16 14.5	1.00 06	21.6	16 44.5	1.00 06	21.5	17 14.4	1.00 06	21.5	17 44.3	1.00 06	21.4	18 14.2	1.00 06	21.4	7
8	14 41.0	1.00 06	20.7	15 10.9	1.00 06	20.7	15 40.9	1.00 06	20.6	16 10.8	1.00 06	20.6	16 40.7	1.00 06	20.6	17 10.6	1.00 06	20.5	17 40.6	1.00 06	20.5	18 10.5	1.00 06	20.5	8
9	14 37.4	1.00 06	19.8	15 07.3	1.00 06	19.7	15 37.3	1.00 06	19.7	16 07.2	1.00 06	19.7	16 37.1	1.00 06	19.6	17 07.1	1.00 06	19.6	17 37.0	1.00 06	19.6	18 06.9	1.00 06	19.5	9
160	14 33.9	1.00 05	18.8	15 03.9	1.00 05	18.8	15 33.8	1.00 05	18.8	16 03.8	1.00 05	18.7	16 33.7	1.00 05	18.7	17 03.7	1.00 05	18.7	17 33.6	1.00 05	18.6	18 03.5	1.00 05	18.6	160
1	14 30.7	1.00 05	17.9	15 00.6	1.00 05	17.9	15 30.6	1.00 05	17.8	16 00.5	1.00 05	17.8	16 30.4	1.00 05	17.8	17 00.4	1.00 05	17.7	17 30.3	1.00 05	17.7	18 00.3	1.00 05	17.7	1
2	14 27.5	1.00 05	16.9	14 57.5	1.00 05	16.9	15 27.4	1.00 05	16.9	15 57.4	1.00 05	16.9	16 27.3	1.00 05	16.8	16 57.3	1.00 05	16.8	17 27.3	1.00 05	16.8	17 57.2	1.00 05	16.7	2
3	14 24.6	1.00 05	16.0	14 54.5	1.00 05	16.0	15 24.5	1.00 05	16.0	15 54.5	1.00 05	15.9	16 24.4	1.00 05	15.9	16 54.4	1.00 05	15.9	17 24.3	1.00 05	15.8	17 54.3	1.00 05	15.8	3
4	14 21.8	1.00 04	15.1	14 51.8	1.00 04	15.0	15 21.7	1.00 04	15.0	15 51.7	1.00 04	15.0	16 21.6	1.00 04	15.0	16 51.6	1.00 04	14.9	17 21.6	1.00 04	14.9	17 51.5	1.00 04	14.9	4
165	14 19.2	1.00 04	14.1	14 49.1	1.00 04	14.1	15 19.1	1.00 04	14.1	15 49.1	1.00 04	14.1	16 19.0	1.00 04	14.0	16 49.0	1.00 04	14.0	17 19.0	1.00 04	14.0	17 48.9	1.00 04	14.0	165
6	14 16.7	1.00 04	13.2	14 46.7	1.00 04	13.2	15 16.6	1.00 04	13.1	15 46.6	1.00 04	13.1	16 16.6	1.00 04	13.1	16 46.6	1.00 04	13.1	17 16.5	1.00 04	13.0	17 46.5	1.00 04	13.0	6
7	14 14.4	1.00 04	12.2	14 44.4	1.00 04	12.2	15 14.4	1.00 04	12.2	15 44.3	1.00 04	12.2	16 14.3	1.00 04	12.2	16 44.3	1.00 04	12.1	17 14.3	1.00 04	12.1	17 44.2	1.00 04	12.1	7
8	14 12.3	1.00 03	11.3	14 42.3	1.00 03	11.3	15 12.2	1.00 03	11.3	15 42.2	1.00 03	11.2	16 12.2	1.00 03	11.2	16 42.2	1.00 03	11.2	17 12.2	1.00 03	11.2	17 42.1	1.00 03	11.2	8
9	14 10.3	1.00 03	10.4	14 40.3	1.00 03	10.3	15 10.3	1.00 03	10.3	15 40.3	1.00 03	10.3	16 10.3	1.00 03	10.3	16 40.2	1.00 03	10.3	17 10.2	1.00 03	10.2	17 40.2	1.00 03	10.2	9
170	14 08.5	1.00 03	09.4	14 38.5	1.00 03	09.4	15 08.5	1.00 03	09.4	15 38.5	1.00 03	09.4	16 08.5	1.00 03	09.4	16 38.5	1.00 03	09.3	17 08.5	1.00 03	09.3	17 38.4	1.00 03	09.3	170
1	14 06.9	1.00 02	08.5	14 36.9	1.00 02	08.4	15 06.9	1.00 02	08.4	15 36.9	1.00 02	08.4	16 06.9	1.00 02	08.4	16 36.9	1.00 02	08.4	17 06.8	1.00 02	08.4	17 36.8	1.00 02	08.4	1
2	14 05.5	1.00 02	07.5	14 35.5	1.00 02	07.5	15 05.5	1.00 02	07.5	15 35.4	1.00 02	07.5	16 05.4	1.00 02	07.5	16 35.4	1.00 02	07.5	17 05.4	1.00 02	07.4	17 35.4	1.00 02	07.4	2
3	14 04.2	1.00 02	06.6	14 34.2	1.00 02	06.6	15 04.2	1.00 02	06.6	15 34.2	1.00 02	06.6	16 04.2	1.00 02	06.5	16 34.2	1.00 02	06.5	17 04.1	1.00 02	06.5	17 34.1	1.00 02	06.5	3
4	14 03.1	1.00 02	05.6	14 33.1	1.00 02	05.6	15 03.1	1.00 02	05.6	15 33.1	1.00 02	05.6	16 03.1	1.00 02	05.6	16 33.1	1.00 02	05.6	17 03.0	1.00 02	05.6	17 33.0	1.00 02	05.6	4
175	14 02.1	1.00 01	04.7	14 32.1	1.00 01	04.7	15 02.1	1.00 01	04.7	15 32.1	1.00 01	04.7	16 02.1	1.00 01	04.7	16 32.1	1.00 01	04.7	17 02.1	1.00 01	04.7	17 32.1	1.00 01	04.7	175
6	14 01.4	1.00 01	03.8	14 31.4	1.00 01	03.8	15 01.4	1.00 01	03.8	15 31.4	1.00 01	03.7	16 01.4	1.00 01	03.7	16 31.4	1.00 01	03.7	17 01.4	1.00 01	03.7	17 31.4	1.00 01	03.7	6
7	14 00.8	1.00 01	02.8	14 30.8	1.00 01	02.8	15 00.8	1.00 01	02.8	15 30.8	1.00 01	02.8	16 00.8	1.00 01	02.8	16 30.8	1.00 01	02.8	17 00.8	1.00 01	02.8	17 30.8	1.00 01	02.8	7
8	14 00.3	1.00 00	01.9	14 30.3	1.00 00	01.9	15 00.3	1.00 00	01.9	15 30.3	1.00 00	01.9	16 00.3	1.00 00	01.9	16 30.3	1.00 00	01.9	17 00.3	1.00 00	01.9	17 30.3	1.00 00	01.9	8
9	14 00.1	1.00 00	00.9	14 30.1	1.00 00	00.9	15 00.1	1.00 00	00.9	15 30.1	1.00 00	00.9	16 00.1	1.00 00	00.9	16 30.1	1.00 00	00.9	17 00.1	1.00 00	00.9	17 30.1	1.00 00	00.9	9
180	14 00.0	1.00 00	00.0	14 30.0	1.00 00	00.0	15 00.0	1.00 00	00.0	15 30.0	1.00 00	00.0	16 00.0	1.00 00	00.0	16 30.0	1.00 00	00.0	17 00.0	1.00 00	00.0	17 30.0	1.00 00	00.0	180

Lat. 80°

Lat. 81°

Lat. 82°

Lat. 83

La 84

H.A.	28° 00′ (Alt. / Az.)	28° 30′	29° 00′	30° 00′	32° 00′	34° 00′	34° 30′	35° 30′	H.A.
00	38 00.0 1.00 0 180.0	38 30.0 1.00 0 180.0	39 00.0 1.00 0 180.0	40 00.0 1.00 0 180.0	42 00.0 1.00 0 180.0	44 00.0 1.00 0 180.0	44 30.0 1.00 0 180.0	45 30.0 1.00 0 180.0	00
1	37 59.9 1.00 0 178.9	38 29.9 1.00 0 178.9	38 59.9 1.00 0 178.9	39 59.9 1.00 0 178.9	41 59.9 1.00 0 178.9	43 59.9 1.00 0 178.8	44 29.9 1.00 0 178.8	45 29.9 1.00 0 178.8	1
2	37 59.6 1.00 1 177.8	38 29.6 1.00 1 177.8	38 59.6 1.00 1 177.7	39 59.6 1.00 1 177.7	41 59.6 1.00 1 177.7	43 59.6 1.00 1 177.7	44 29.6 1.00 1 177.7	45 29.6 1.00 1 177.7	2
3	37 59.1 1.00 1 176.6	38 29.1 1.00 1 176.6	38 59.1 1.00 1 176.6	39 59.1 1.00 1 176.6	41 59.1 1.00 1 176.6	43 59.1 1.00 1 176.5	44 29.1 1.00 1 176.5	45 29.1 1.00 1 176.5	3
4	37 58.4 1.00 2 175.5	38 28.4 1.00 2 175.5	38 58.4 1.00 2 175.5	39 58.4 1.00 2 175.5	41 58.3 1.00 2 175.4	43 58.3 1.00 2 175.4	44 28.3 1.00 2 175.4	45 28.3 1.00 2 175.4	4
05	37 57.5 1.00 2 174.4	38 27.5 1.00 2 174.4	38 57.4 1.00 2 174.4	39 57.4 1.00 2 174.4	41 57.4 1.00 2 174.3	43 57.4 1.00 2 174.3	44 27.4 1.00 2 174.2	45 27.4 1.00 2 174.2	05
6	37 56.3 1.00 2 173.3	38 26.3 1.00 2 173.3	38 56.3 1.00 2 173.3	39 56.3 1.00 2 173.2	41 56.2 1.00 2 173.2	43 56.2 1.00 2 173.1	44 26.2 1.00 2 173.1	45 26.2 1.00 2 173.0	6
7	37 55.0 1.00 3 172.2	38 25.0 1.00 3 172.1	38 55.0 1.00 3 172.1	39 55.0 1.00 3 172.1	41 54.9 1.00 3 172.0	43 54.9 1.00 3 171.9	44 24.9 1.00 3 171.9	45 24.8 1.00 3 171.9	7
8	37 53.5 1.00 3 171.0	38 23.5 1.00 3 171.0	38 53.5 1.00 3 171.0	39 53.4 1.00 3 171.0	41 53.4 1.00 3 170.9	43 53.3 1.00 3 170.8	44 23.3 1.00 3 170.8	45 23.3 1.00 3 170.7	8
9	37 51.8 1.00 3 169.9	38 21.8 1.00 3 169.9	38 51.7 1.00 3 169.9	39 51.7 1.00 3 169.8	41 51.6 1.00 3 169.7	43 51.5 1.00 3 169.6	44 21.5 1.00 3 169.6	45 21.5 1.00 3 169.6	9
10	37 49.8 1.00 4 168.8	38 19.8 1.00 4 168.8	38 49.8 1.00 4 168.8	39 49.8 1.00 4 168.6	41 49.7 1.00 4 168.6	43 49.6 1.00 4 168.5	44 19.5 1.00 4 168.5	45 19.5 1.00 4 168.4	10
1	37 47.7 1.00 4 167.7	38 17.7 1.00 4 167.7	38 47.7 1.00 4 167.6	39 47.6 1.00 4 167.6	41 47.5 1.00 4 167.5	43 47.4 1.00 4 167.3	44 17.4 1.00 4 167.3	45 17.3 1.00 4 167.2	1
2	37 45.4 1.00 4 166.6	38 15.4 1.00 4 166.5	38 45.3 1.00 4 166.5	39 45.3 1.00 4 166.5	41 45.1 1.00 4 166.3	43 45.0 1.00 4 166.2	44 15.0 1.00 4 166.2	45 14.9 1.00 4 166.1	2
3	37 42.9 1.00 4 165.5	38 12.9 1.00 5 165.4	38 42.8 1.00 5 165.4	39 42.7 1.00 5 165.3	41 42.6 1.00 5 165.2	43 42.4 1.00 5 165.0	44 12.4 1.00 5 165.0	45 12.3 1.00 5 164.9	3
4	37 40.2 1.00 5 164.3	38 10.1 1.00 5 164.3	38 40.1 1.00 5 164.3	39 40.0 1.00 5 164.2	41 39.8 1.00 5 164.1	43 39.6 1.00 5 163.9	44 09.6 1.00 5 163.9	45 09.5 1.00 5 163.8	4
15	37 37.3 1.00 5 163.2	38 07.2 1.00 5 163.2	38 37.2 1.00 5 163.2	39 37.1 1.00 5 163.1	41 36.9 1.00 5 162.9	43 36.6 1.00 5 162.7	44 06.6 1.00 5 162.7	45 06.5 1.00 5 162.6	15
6	37 34.2 1.00 6 162.1	38 04.1 1.00 6 162.1	38 34.1 1.00 6 162.0	39 33.9 1.00 6 162.0	41 33.7 1.00 6 161.8	43 33.4 1.00 6 161.6	44 03.4 1.00 6 161.6	45 03.2 1.00 6 161.5	6
7	37 30.9 1.00 6 161.0	38 00.8 1.00 6 161.0	38 30.7 1.00 6 160.9	39 30.6 1.00 6 160.8	41 30.3 1.00 6 160.7	43 30.1 1.00 6 160.5	44 00.0 1.00 6 160.4	44 59.8 1.00 6 160.3	7
8	37 27.4 1.00 6 159.9	37 57.3 1.00 6 159.9	38 27.2 1.00 6 159.8	39 27.1 1.00 6 159.7	41 26.8 1.00 6 159.5	43 26.5 1.00 6 159.3	43 56.4 1.00 6 159.3	44 56.2 1.00 6 159.2	8
9	37 23.7 1.00 6 158.8	37 53.6 1.00 6 158.7	38 23.6 1.00 6 158.7	39 23.4 1.00 6 158.6	41 23.1 1.00 7 158.4	43 22.7 1.00 7 158.2	43 52.6 1.00 7 158.1	44 52.4 1.00 7 158.0	9
20	37 19.8 1.00 7 157.7	37 49.8 1.00 7 157.6	38 19.7 1.00 7 157.6	39 19.5 1.00 7 157.3	41 19.1 1.00 7 157.1	43 18.7 1.00 7 157.1	43 48.6 1.00 7 157.0	44 48.4 1.00 7 156.9	20
1	37 15.8 1.00 7 156.6	37 45.7 1.00 7 156.5	38 15.6 1.00 7 156.5	39 15.4 1.00 7 156.4	41 15.0 1.00 7 156.2	43 14.6 1.00 7 155.9	43 44.5 1.00 7 155.9	44 44.3 1.00 7 155.7	1
2	37 11.6 1.00 7 155.5	37 41.5 1.00 7 155.4	38 11.4 1.00 7 155.4	39 11.1 1.00 7 155.3	41 10.7 1.00 8 155.0	43 10.2 1.00 8 154.8	43 40.1 1.00 8 154.7	44 39.9 1.00 8 154.6	2
3	37 07.1 1.00 8 154.4	37 37.0 1.00 8 154.3	38 06.9 1.00 8 154.3	39 06.7 1.00 8 154.1	41 06.2 1.00 8 153.9	43 05.7 1.00 8 153.7	43 35.6 1.00 8 153.6	44 35.3 1.00 8 153.5	3
4	37 02.5 1.00 8 153.3	37 32.4 1.00 8 153.2	38 02.3 1.00 8 153.1	39 02.1 1.00 8 153.0	41 01.5 1.00 8 152.8	43 01.0 1.00 8 152.5	43 30.9 1.00 8 152.5	44 30.6 1.00 8 152.3	4
25	36 57.8 1.00 8 152.2	37 27.6 1.00 8 152.1	37 57.5 1.00 8 152.0	38 57.2 1.00 8 151.9	40 56.7 1.00 8 151.7	42 56.1 99 08 151.4	43 26.0 99 08 151.3	44 25.6 99 09 151.1	25
6	36 52.8 1.00 9 151.1	37 22.7 1.00 9 151.0	37 52.5 1.00 9 150.9	38 52.3 1.00 9 150.8	40 51.7 1.00 9 150.6	42 51.0 99 09 150.3	43 20.9 99 09 150.2	44 20.5 99 09 150.1	6
7	36 47.7 1.00 9 150.0	37 17.5 1.00 9 149.9	37 47.4 1.00 9 149.8	38 47.1 99 09 149.7	40 46.5 99 09 149.4	42 45.8 99 09 149.2	43 15.6 99 09 149.1	44 15.2 99 09 148.9	7
8	36 42.4 99 09 148.9	37 12.2 99 09 148.8	37 42.1 99 09 148.7	38 41.7 99 09 148.6	40 41.1 99 09 148.3	42 40.4 99 09 148.0	43 10.2 99 09 148.0	44 09.8 99 09 147.8	8
9	36 36.9 99 09 147.7	37 06.7 99 09 147.7	37 36.6 99 09 147.6	38 36.2 99 09 147.5	40 35.5 99 10 147.2	42 34.8 99 10 146.9	43 04.6 99 10 146.8	44 04.1 99 10 146.7	9
30	36 31.3 99 10 146.7	37 01.1 99 10 146.6	37 30.9 99 10 146.5	38 30.6 99 10 146.4	40 29.8 99 10 146.1	42 29.0 99 10 145.8	42 58.8 99 10 145.7	43 58.3 99 10 145.6	30
1	36 25.5 99 10 145.6	36 55.3 99 10 145.5	37 25.1 99 10 145.4	38 24.7 99 10 145.3	40 23.9 99 10 145.0	42 23.0 99 10 144.7	42 52.8 99 10 144.6	43 52.4 99 10 144.4	1
2	36 19.5 99 10 144.5	36 49.3 99 10 144.4	37 19.1 99 10 144.4	38 18.7 99 10 144.2	40 17.8 99 11 143.9	42 16.9 99 11 143.6	42 46.7 99 11 143.5	43 46.2 99 11 143.3	2
3	36 13.4 99 10 143.4	36 43.2 99 10 143.3	37 12.9 99 11 143.3	38 12.5 99 11 143.1	40 11.6 99 11 142.8	42 10.7 99 11 142.5	42 40.4 99 11 142.4	43 39.9 99 11 142.2	3
4	36 07.1 99 11 142.2	36 36.9 99 11 142.2	37 06.6 99 11 142.2	38 06.2 99 11 142.0	40 05.2 99 11 141.7	42 04.2 99 11 141.4	42 34.0 99 11 141.3	43 33.4 99 11 141.1	4
35	36 00.6 99 11 141.2	36 30.4 99 11 141.1	37 00.2 99 11 141.1	37 59.7 99 11 140.9	39 58.7 99 11 140.6	41 57.7 99 11 140.2	42 27.4 99 11 140.2	43 26.8 99 11 140.0	35
6	35 54.0 99 11 140.2	36 23.8 99 11 140.1	36 53.5 99 11 140.0	37 53.0 99 11 139.8	39 52.0 99 11 139.5	41 50.9 99 12 139.1	42 20.6 99 12 139.1	43 20.0 99 12 138.9	6
7	35 47.3 99 12 139.1	36 17.0 99 12 139.0	36 46.8 99 12 138.9	37 46.3 99 12 138.8	39 45.2 99 12 138.4	41 44.0 99 12 138.0	42 13.7 99 12 137.9	43 13.1 99 12 137.8	7
8	35 40.4 99 12 138.0	36 10.1 99 12 137.9	36 39.9 99 12 137.8	37 39.3 99 12 137.7	39 38.2 99 12 137.3	41 37.0 99 12 136.9	42 06.7 99 12 136.8	43 06.0 99 12 136.7	8
9	35 33.3 99 12 136.8	36 03.0 99 12 136.8	36 32.8 99 12 136.8	37 32.2 99 12 136.6	39 31.0 99 12 136.2	41 29.8 99 12 135.8	41 59.5 99 12 135.7	42 58.8 99 12 135.5	9
40	35 26.2 99 12 135.8	35 55.9 99 12 135.8	36 25.6 99 12 135.7	37 25.0 99 12 135.5	39 23.8 99 12 135.1	41 22.5 99 13 134.8	41 52.1 99 13 134.7	42 51.4 99 13 134.4	40
1	35 18.8 99 12 134.8	35 48.5 99 12 134.7	36 18.2 99 12 134.6	37 17.6 99 13 134.4	39 16.3 99 13 134.1	41 15.0 99 13 133.7	41 44.7 99 13 133.6	42 43.9 99 13 133.4	1
2	35 11.4 99 13 133.7	35 41.1 99 13 133.6	36 10.7 99 13 133.5	37 10.1 99 13 133.3	39 08.8 99 13 133.0	41 07.4 99 13 132.6	41 37.0 99 13 132.5	42 36.3 99 13 132.3	2
3	35 03.8 99 13 132.6	35 33.4 99 13 132.5	36 03.1 99 13 132.5	37 02.5 99 13 132.3	39 01.1 99 13 131.9	40 59.7 99 13 131.5	41 29.3 99 13 131.4	42 28.5 99 13 131.2	3
4	34 56.0 99 13 131.6	35 25.7 99 13 131.5	35 55.4 99 13 131.4	36 54.7 99 13 131.2	38 53.3 99 13 130.8	40 51.8 99 13 130.4	41 21.4 99 13 130.3	42 20.6 99 13 130.1	4
45	34 48.2 99 13 130.5	35 17.8 99 13 130.4	35 47.5 99 13 130.3	36 46.8 99 13 130.1	38 45.3 99 13 129.7	40 43.8 99 14 129.3	41 13.4 99 14 129.2	42 12.6 99 14 129.0	45
6	34 40.2 99 14 129.4	35 09.8 99 14 129.4	35 39.5 99 14 129.3	36 38.8 99 14 129.1	38 37.3 99 14 128.7	40 35.7 99 14 128.2	41 05.3 99 14 128.1	42 04.4 99 14 127.9	6
7	34 32.1 99 14 128.4	35 01.7 99 14 128.3	35 31.4 99 14 128.2	36 30.6 99 14 128.0	38 29.1 99 14 127.6	40 27.4 99 14 127.2	40 57.0 99 14 127.1	41 56.1 99 14 126.8	7
8	34 23.9 99 14 127.3	34 53.5 99 14 127.2	35 23.1 99 14 127.1	36 22.3 99 14 126.9	38 20.7 99 14 126.5	40 19.1 99 14 126.1	40 48.6 99 14 126.0	41 47.7 99 14 125.8	8
9	34 15.5 99 14 126.3	34 45.1 99 14 126.2	35 14.7 99 14 126.1	36 14.0 99 14 125.9	38 12.3 99 14 125.5	40 10.6 99 14 125.0	40 40.1 99 14 124.9	41 39.2 99 14 124.7	9
50	34 07.1 99 14 125.2	34 36.7 99 14 125.1	35 06.3 99 14 125.0	36 05.5 99 14 124.8	38 03.8 99 14 124.4	40 02.0 98 14 124.0	40 31.5 98 15 123.8	41 30.6 98 15 123.6	50
1	33 58.5 99 14 124.2	34 28.1 99 14 124.1	34 57.7 99 15 124.0	35 56.8 99 15 123.8	37 55.1 99 15 123.3	39 53.3 98 15 122.9	40 22.8 98 15 122.8	41 21.9 98 15 122.5	1
2	33 49.8 99 15 123.1	34 19.4 99 15 123.0	34 49.0 99 15 122.9	35 48.1 99 15 122.7	37 46.4 99 15 122.3	39 44.5 98 15 121.8	40 14.0 98 15 121.7	41 13.0 98 15 121.5	2
3	33 41.0 99 15 122.1	34 10.6 99 15 122.0	34 40.2 99 15 121.9	35 39.3 99 15 121.7	37 37.5 98 15 121.2	39 35.6 98 15 120.8	40 05.1 98 15 120.7	41 04.1 98 15 120.4	3
4	33 32.2 99 15 121.0	34 01.7 99 15 120.9	34 31.3 99 15 120.8	35 30.4 99 15 120.6	37 28.6 98 15 120.2	39 26.6 98 15 119.7	39 56.1 98 15 119.6	40 55.1 98 15 119.4	4
55	33 23.2 99 15 120.0	33 52.7 99 15 119.9	34 22.3 99 15 119.8	35 21.4 99 15 119.6	37 19.5 98 15 119.1	39 17.5 98 15 118.7	39 47.0 98 15 118.5	40 45.9 98 15 118.3	55
6	33 14.1 99 15 118.9	33 43.7 99 15 118.8	34 13.2 98 15 118.7	35 12.3 98 15 118.5	37 10.3 98 15 118.1	39 08.3 98 15 117.6	39 37.8 98 15 117.5	40 36.7 98 16 117.2	6
7	33 04.9 98 15 117.9	33 34.5 98 15 117.8	34 04.0 98 15 117.7	35 03.1 98 15 117.5	37 01.1 98 16 117.0	38 59.0 98 16 116.6	39 28.5 98 16 116.4	40 27.4 98 16 116.2	7
8	32 55.7 98 16 116.8	33 25.2 98 16 116.8	33 54.8 98 16 116.7	34 53.8 98 16 116.4	36 51.8 98 16 116.0	38 49.7 98 16 115.5	39 19.1 98 16 115.4	40 18.0 98 16 115.1	8
9	32 46.4 98 16 115.8	33 15.9 98 16 115.7	33 45.4 98 16 115.6	34 44.4 98 16 115.4	36 42.4 98 16 114.9	38 40.2 98 16 114.5	39 09.7 98 16 114.3	40 08.6 98 16 114.1	9
60	32 36.9 98 16 114.8	33 06.5 98 16 114.7	33 36.0 98 16 114.6	34 35.0 98 16 114.4	36 32.9 98 16 113.9	38 30.7 98 16 113.4	39 00.2 98 16 113.3	39 59.0 98 16 113.1	60
1	32 27.4 98 16 113.8	32 56.9 98 16 113.7	33 26.4 98 16 113.5	34 25.4 98 16 113.3	36 23.3 98 16 112.9	38 21.1 98 16 112.4	38 50.5 98 16 112.3	39 49.4 98 16 112.0	1
2	32 17.9 98 16 112.7	32 47.4 98 16 112.6	33 16.9 98 16 112.5	34 15.8 98 16 112.3	36 13.7 98 16 111.8	38 11.5 98 16 111.4	38 40.9 98 16 111.2	39 39.7 98 16 111.0	2
3	32 08.2 98 16 111.7	32 37.7 98 16 111.6	33 07.1 98 16 111.5	34 06.2 98 16 111.3	36 04.0 98 16 110.8	38 01.7 98 16 110.3	38 31.1 98 16 110.2	39 29.9 98 16 109.9	3
4	31 58.5 98 16 110.7	32 28.0 98 16 110.6	32 57.5 98 16 110.5	33 56.4 98 16 110.2	35 54.2 98 16 109.8	37 51.9 98 16 109.3	38 21.3 98 16 109.2	39 20.1 98 16 108.9	4
65	31 48.7 98 16 109.7	32 18.2 98 16 109.6	32 47.7 98 16 109.4	33 46.6 98 16 109.2	35 44.4 98 16 108.8	37 42.0 98 17 108.3	38 11.4 98 17 108.1	39 10.2 98 17 107.9	65
6	31 38.9 98 16 108.6	32 08.4 98 16 108.5	32 37.8 98 16 108.4	33 36.7 98 17 108.2	35 34.5 98 17 107.7	37 32.1 98 17 107.2	38 01.5 98 17 107.1	39 00.3 98 17 106.9	6
7	31 29.0 98 17 107.6	31 58.5 98 17 107.5	32 27.9 98 17 107.4	33 26.8 98 17 107.2	35 24.5 98 17 106.7	37 22.1 98 17 106.2	37 51.5 98 17 106.1	38 50.3 98 17 105.8	7
8	31 19.0 98 17 106.6	31 48.5 98 17 106.5	32 17.9 98 17 106.4	33 16.8 98 17 106.2	35 14.5 98 17 105.7	37 12.1 98 17 105.2	37 41.5 98 17 105.1	38 40.2 98 17 104.8	8
9	31 09.0 98 17 105.6	31 38.5 98 17 105.5	32 07.9 98 17 105.4	33 06.8 98 17 105.1	35 04.5 98 17 104.7	37 02.0 98 17 104.2	37 31.4 98 17 104.0	38 30.1 98 17 103.8	9
70	30 59.0 98 17 104.6	31 28.4 98 17 104.5	31 57.9 98 17 104.4	32 56.7 98 17 104.1	34 54.4 98 17 103.7	36 51.9 98 17 103.2	37 21.3 98 17 103.0	38 20.0 98 17 102.8	70
1	30 48.9 98 17 103.6	31 18.3 98 17 103.5	31 47.7 98 17 103.3	32 46.6 98 17 103.1	34 44.2 98 17 102.6	36 41.7 98 17 102.1	37 11.1 98 17 102.0	38 09.8 98 17 101.8	1
2	30 38.7 98 17 102.6	31 08.1 98 17 102.5	31 37.6 98 17 102.3	32 36.4 98 17 102.1	34 34.0 98 17 101.6	36 31.5 98 17 101.1	37 00.9 98 17 101.0	37 59.6 98 17 100.7	2
3	30 28.5 98 17 101.6	30 58.0 98 17 101.4	31 27.4 98 17 101.3	32 26.2 98 17 101.1	34 23.8 98 17 100.6	36 21.3 98 17 100.1	36 50.7 98 17 100.0	37 49.3 98 17 99.7	3
4	30 18.3 98 17 100.6	30 47.7 98 17 100.4	31 17.1 98 17 100.3	32 16.0 98 17 100.1	34 13.6 98 17 99.6	36 11.0 98 17 99.1	36 40.4 98 17 99.0	37 39.0 98 17 98.7	4
75	30 08.0 98 17 99.6	30 37.5 98 17 99.4	31 06.9 98 17 99.3	32 05.7 98 17 99.1	34 03.3 98 17 98.6	36 00.7 98 17 98.1	36 30.1 98 17 98.0	37 28.7 98 17 97.7	75
6	29 57.7 98 17 98.6	30 27.2 98 17 98.4	30 56.6 98 17 98.3	31 55.4 98 17 98.1	33 53.0 98 17 97.6	35 50.4 98 17 97.1	36 19.7 98 17 97.0	37 18.4 98 17 96.7	6
7	29 47.4 98 17 97.6	30 16.9 98 17 97.4	30 46.3 98 17 97.3	31 45.1 98 17 97.1	33 42.6 98 17 96.6	35 40.1 98 17 96.1	36 09.4 98 17 96.0	37 08.0 98 17 95.7	7
8	29 37.1 98 17 96.6	30 06.5 98 17 96.4	30 35.9 98 17 96.3	31 34.7 98 17 96.1	33 32.3 98 17 95.6	35 29.7 98 17 95.1	35 59.0 98 17 95.0	36 57.7 98 17 94.7	8
9	29 26.7 98 17 95.6	29 56.1 98 17 95.4	30 25.6 98 17 95.3	31 24.4 98 17 95.1	33 21.9 98 17 94.6	35 19.3 98 17 94.1	35 48.6 98 17 94.0	36 47.3 98 17 93.7	9
80	29 16.3 98 17 94.6	29 45.8 98 17 94.5	30 15.2 98 17 94.3	31 14.0 98 17 94.1	33 11.5 98 17 93.6	35 08.9 98 17 93.1	35 38.2 98 17 93.0	36 36.9 98 17 92.7	80
1	29 06.0 98 17 93.6	29 35.4 98 17 93.5	30 04.8 98 17 93.3	31 03.6 98 17 93.1	33 01.1 98 17 92.6	34 58.5 98 17 92.1	35 27.8 98 17 92.0	36 26.5 98 17 91.8	1
2	28 55.6 98 17 92.6	29 25.0 98 17 92.5	29 54.4 98 17 92.4	30 53.2 98 17 92.1	32 50.7 98 17 91.7	34 48.1 98 17 91.1	35 17.4 98 17 91.0	36 16.0 98 17 90.8	2
3	28 45.1 98 17 91.6	29 14.6 98 17 91.5	29 44.0 98 17 91.4	30 42.8 98 17 91.1	32 40.3 98 17 90.7	34 37.7 98 17 90.2	35 07.0 98 17 90.0	36 05.6 98 17 89.8	3
4	28 34.7 98 17 90.6	29 04.1 98 17 90.5	29 33.5 98 17 90.4	30 32.3 98 17 90.2	32 29.8 98 17 89.7	34 27.2 98 17 89.2	34 56.6 98 17 89.1	35 55.2 98 17 88.8	4
85	28 24.3 98 17 89.6	28 53.7 98 17 89.5	29 23.1 98 17 89.4	30 21.9 98 17 89.2	32 19.4 98 17 88.7	34 16.8 98 17 88.2	34 46.2 98 17 88.1	35 44.8 98 17 87.8	85
6	28 13.9 98 17 88.6	28 43.3 98 17 88.5	29 12.7 98 17 88.4	30 11.5 98 17 88.2	32 09.0 98 17 87.7	34 06.4 98 17 87.2	34 35.8 98 17 87.1	35 34.4 98 17 86.8	6
7	28 03.5 98 17 87.7	28 32.9 98 17 87.5	29 02.3 98 17 87.4	30 01.1 98 17 87.2	31 58.6 98 17 86.7	33 56.0 98 17 86.3	34 25.4 98 17 86.1	35 24.0 98 17 85.9	7
8	27 53.1 98 17 86.7	28 22.5 98 17 86.6	28 51.9 98 17 86.5	29 50.7 98 17 86.2	31 48.2 98 17 85.8	33 45.6 98 17 85.3	34 15.0 98 17 85.1	35 13.6 98 17 84.9	8
9	27 42.7 98 17 85.7	28 12.1 98 17 85.6	28 41.5 98 17 85.5	29 40.3 98 17 85.3	31 37.8 98 17 84.8	33 35.2 98 17 84.3	34 04.6 98 17 84.2	35 03.2 98 17 83.9	9
90	27 32.3 98 17 84.7	28 01.7 98 17 84.6	28 31.1 98 17 84.5	29 29.9 98 17 84.3	31 27.5 98 17 83.8	33 24.9 98 17 83.3	33 54.2 98 17 83.2	34 52.9 98 17 82.9	90

Lat. 80°

H.A.	28° 00'	28° 30'	29° 00'	30° 00'	32° 00'	34° 00'	34° 30'	35° 30'	H.A.
	Alt. — Δd Δt — Az.	Alt. — Δd Δt — Az.	Alt. — Δd Δt — Az.	Alt. — Δd Δt — Az.	Alt. — Δd Δt — Az.	Alt. — Δd Δt — Az.	Alt. — Δd Δt — Az.	Alt. — Δd Δt — Az.	
91	27 21.9 98 17 83.7	27 51.3 98 17 83.6	28 20.8 98 17 83.5	29 19.6 98 17 83.3	31 17.1 98 17 82.8	33 14.6 98 17 82.3	33 43.9 98 17 82.2	34 42.6 98 17 82.0	91
2	27 11.6 98 17 82.8	27 41.0 98 17 82.7	28 10.4 98 17 82.3	29 09.2 98 17 82.3	31 06.8 98 17 81.9	33 04.2 98 17 81.4	33 33.6 98 17 81.3	34 32.3 98 17 81.0	2
3	27 01.3 98 17 81.8	27 30.7 98 17 81.7	28 00.1 98 17 81.6	28 58.9 98 17 81.4	30 56.5 98 17 80.9	32 54.0 98 17 80.4	33 23.3 98 17 80.3	34 22.0 98 17 80.0	3
4	26 51.0 98 17 80.8	27 20.4 98 17 80.7	27 49.8 98 17 80.6	28 48.6 98 17 80.4	30 46.2 98 17 79.9	32 43.7 98 17 79.4	33 13.0 98 17 79.3	34 11.7 98 17 79.1	4
95	26 40.7 98 17 79.9	27 10.1 98 17 79.8	27 39.5 98 17 79.6	28 38.4 98 17 79.4	30 36.0 98 17 79.0	32 33.5 98 17 78.5	33 02.8 98 17 78.4	34 01.5 98 17 78.1	95
6	26 30.4 98 17 78.9	26 59.9 98 17 78.8	27 29.3 98 17 78.7	28 28.1 98 17 78.5	30 25.8 98 17 78.0	32 23.3 98 17 77.5	32 52.6 98 17 77.4	33 51.3 98 17 77.2	6
7	26 20.2 98 17 77.9	26 49.7 98 17 77.8	27 19.1 98 17 77.7	28 18.0 98 17 77.5	30 15.6 98 17 77.0	32 13.1 98 17 76.6	32 42.5 98 17 76.4	33 41.2 98 17 76.2	7
8	26 10.1 98 17 77.0	26 39.5 98 17 76.9	27 08.9 98 17 76.7	28 07.8 98 17 76.5	30 05.5 98 17 76.1	32 03.0 98 17 75.6	32 32.4 98 17 75.5	33 31.1 98 17 75.2	8
9	25 59.9 98 17 76.0	26 29.4 98 17 75.9	26 58.8 98 17 75.8	27 57.7 98 17 75.6	29 55.4 98 17 75.1	31 52.9 98 17 74.6	32 22.3 98 17 74.5	33 21.1 98 17 74.3	9
100	25 49.8 98 17 75.0	26 19.3 98 17 74.9	26 48.7 98 17 74.8	27 47.6 98 17 74.6	29 45.3 98 17 74.2	31 42.9 98 17 73.7	32 12.3 98 17 73.6	33 11.1 98 17 73.3	100
1	25 39.8 98 17 74.1	26 09.3 98 17 74.0	26 38.7 98 17 73.9	27 37.6 98 17 73.6	29 35.3 98 17 73.2	31 32.9 98 17 72.7	32 02.3 98 17 72.6	33 01.1 98 17 72.3	1
2	25 29.8 98 17 73.1	25 59.3 98 17 73.0	26 28.7 98 17 72.9	27 27.6 98 17 72.7	29 25.4 98 16 72.2	31 23.0 98 16 71.8	31 52.4 98 16 71.7	32 51.2 98 16 71.4	2
3	25 19.9 98 16 72.1	25 49.3 98 16 72.0	26 18.8 98 16 71.9	27 17.7 98 16 71.7	29 15.5 98 16 71.3	31 13.2 98 16 70.8	31 42.6 98 16 70.7	32 41.3 98 16 70.5	3
4	25 10.0 98 16 71.2	25 39.5 98 16 71.1	26 08.9 98 16 71.0	27 07.8 98 16 70.8	29 05.6 98 16 70.3	31 03.3 98 16 69.9	31 32.7 98 16 69.8	32 31.6 98 16 69.5	4
105	25 00.1 98 16 70.2	25 29.6 98 16 70.1	25 59.1 98 16 70.0	26 58.0 98 16 69.8	28 55.9 98 16 69.4	30 53.6 98 16 68.9	31 23.0 98 16 68.8	32 21.8 98 16 68.6	105
6	24 50.4 98 16 69.3	25 19.9 98 16 69.2	25 49.3 98 16 69.1	26 48.3 98 16 68.9	28 46.1 98 16 68.4	30 43.9 98 16 68.0	31 13.3 98 16 67.9	32 12.2 98 16 67.6	6
7	24 40.7 98 16 68.3	25 10.1 98 16 68.2	25 39.6 98 16 68.1	26 38.6 98 16 67.9	28 36.5 98 16 67.5	30 34.3 98 16 67.0	31 03.7 98 16 66.9	32 02.6 98 16 66.7	7
8	24 31.0 98 16 67.4	25 00.5 98 16 67.3	25 30.0 98 16 67.2	26 29.0 98 16 67.0	28 26.9 98 16 66.5	30 24.7 98 16 66.1	30 54.1 98 16 66.0	31 53.0 98 16 65.8	8
9	24 21.4 98 16 66.4	24 50.9 98 16 66.3	25 20.4 98 16 66.2	26 19.4 98 16 66.0	28 17.4 98 16 65.6	30 15.2 98 16 65.2	30 44.7 98 16 65.0	31 43.6 98 16 64.8	9
110	24 11.9 98 16 65.5	24 41.4 98 16 65.4	25 10.9 98 16 65.3	26 09.9 98 16 65.1	28 07.9 98 16 64.6	30 05.8 98 16 64.2	30 35.3 98 16 64.1	31 34.2 98 16 63.9	110
1	24 02.5 98 16 64.5	24 32.0 98 16 64.4	25 01.5 98 16 64.3	26 00.5 98 16 64.1	27 58.5 98 16 63.7	29 56.5 98 16 63.3	30 25.9 98 16 63.2	31 24.8 98 16 62.9	1
2	23 53.1 98 15 63.6	24 22.6 98 15 63.5	24 52.2 98 15 63.4	25 51.2 98 15 63.2	27 49.2 98 15 62.8	29 47.2 98 15 62.3	30 16.7 98 15 62.2	31 15.6 98 15 62.0	2
3	23 43.8 98 15 62.6	24 13.4 98 15 62.5	24 42.9 98 15 62.4	25 41.9 98 15 62.2	27 40.0 98 15 61.8	29 38.0 98 15 61.4	30 07.5 98 15 61.3	31 06.4 98 15 61.1	3
4	23 34.6 98 15 61.7	24 04.1 98 15 61.6	24 33.7 98 15 61.5	25 32.8 98 15 61.3	27 30.9 98 15 60.9	29 28.9 98 15 60.5	29 58.4 98 15 60.4	30 57.4 98 15 60.1	4
115	23 25.5 99 15 60.7	23 55.0 99 15 60.6	24 24.6 98 15 60.5	25 23.7 98 15 60.3	27 21.8 98 15 59.9	29 19.9 98 15 59.5	29 49.4 98 15 59.4	30 48.4 98 15 59.2	115
6	23 16.4 99 15 59.8	23 46.0 99 15 59.7	24 15.6 99 15 59.6	25 14.7 98 15 59.4	27 12.8 98 15 59.0	29 10.9 98 15 58.6	29 40.4 98 15 58.5	30 39.5 98 15 58.3	6
7	23 07.5 99 15 58.8	23 37.0 99 15 58.7	24 06.6 99 15 58.6	25 05.7 99 15 58.4	27 03.9 98 15 58.1	29 02.1 98 15 57.7	29 31.6 98 15 57.6	30 30.6 98 15 57.3	7
8	22 58.6 99 15 57.9	23 28.2 99 15 57.8	23 57.8 99 15 57.7	24 56.9 99 15 57.5	26 55.2 99 14 57.1	28 53.3 98 14 56.7	29 22.9 98 14 56.6	30 21.9 98 14 56.4	8
9	22 49.8 99 14 56.9	23 19.4 99 14 56.8	23 49.0 99 14 56.7	24 48.2 99 14 56.6	26 46.4 99 14 56.2	28 44.7 98 14 55.8	29 14.2 98 14 55.7	30 13.3 98 14 55.5	9
120	22 41.2 99 14 56.0	23 10.7 99 14 55.9	23 40.3 99 14 55.8	24 39.5 99 14 55.6	26 37.8 99 14 55.2	28 36.1 99 14 54.9	29 05.7 98 14 54.8	30 04.7 98 14 54.6	120
1	22 32.6 99 14 55.0	23 02.2 99 14 54.9	23 31.8 99 14 54.9	24 31.0 99 14 54.7	26 29.3 99 14 54.3	28 27.6 99 14 53.9	28 57.2 99 14 53.8	29 56.3 99 14 53.6	1
2	22 24.1 99 14 54.1	22 53.7 99 14 54.0	23 23.3 99 14 53.9	24 22.5 99 14 53.7	26 20.9 99 14 53.4	28 19.3 99 14 53.0	28 48.8 99 14 52.9	29 48.0 99 14 52.7	2
3	22 15.7 99 14 53.1	22 45.3 99 14 53.1	23 14.9 99 14 53.0	24 14.2 99 14 52.8	26 12.6 99 14 52.4	28 11.0 99 14 52.1	28 40.6 99 14 52.0	29 39.7 99 14 51.8	3
4	22 07.4 99 14 52.2	22 37.0 99 14 52.1	23 06.7 99 14 52.0	24 05.9 99 14 51.9	26 04.4 99 14 51.5	28 02.8 99 13 51.1	28 32.4 99 13 51.1	29 31.6 99 13 50.9	4
125	21 59.2 99 13 51.3	22 28.9 99 13 51.2	22 58.5 99 13 51.1	23 57.8 99 13 50.9	25 56.3 99 13 50.6	27 54.8 99 13 50.2	28 24.4 99 13 50.1	29 23.6 99 13 49.9	125
6	21 51.2 99 13 50.3	22 20.8 99 13 50.2	22 50.5 99 13 50.2	23 49.7 99 13 50.0	25 48.3 99 13 49.6	27 46.8 99 13 49.3	28 16.4 99 13 49.2	29 15.6 99 13 49.0	6
7	21 43.2 99 13 49.4	22 12.9 99 13 49.3	22 42.5 99 13 49.2	23 41.8 99 13 49.1	25 40.4 99 13 48.7	27 39.0 99 13 48.4	28 08.6 99 13 48.3	29 07.8 99 13 48.1	7
8	21 35.3 99 13 48.4	22 05.0 99 13 48.4	22 34.7 99 13 48.3	23 34.0 99 13 48.1	25 32.6 99 13 47.8	27 31.2 99 13 47.4	28 00.9 99 13 47.4	28 59.1 99 13 47.2	8
9	21 27.6 99 13 47.5	21 57.3 99 13 47.4	22 27.0 99 13 47.3	23 26.3 99 13 47.2	25 25.0 99 13 46.9	27 23.6 99 12 46.5	27 53.3 99 12 46.4	28 52.6 99 12 46.3	9
130	21 20.0 99 12 46.6	21 49.7 99 12 46.5	22 19.4 99 12 46.4	23 18.7 99 12 46.3	25 17.4 99 12 45.9	27 16.1 99 12 45.6	27 45.8 99 12 45.5	28 45.1 99 12 45.3	130
1	21 12.5 99 12 45.6	21 42.2 99 12 45.5	22 11.9 99 12 45.5	23 11.3 99 12 45.3	25 10.0 99 12 45.0	27 08.7 99 12 44.7	27 38.4 99 12 44.6	28 37.7 99 12 44.4	1
2	21 05.1 99 12 44.7	21 34.8 99 12 44.6	22 04.5 99 12 44.5	23 03.9 99 12 44.4	25 02.7 99 12 44.1	27 01.5 99 12 43.8	27 31.1 99 12 43.7	28 30.5 99 12 43.5	2
3	20 57.8 99 12 43.8	21 27.5 99 12 43.7	21 57.3 99 12 43.6	22 56.7 99 12 43.5	24 55.5 99 12 43.2	26 54.3 99 12 42.8	27 24.0 99 12 42.8	28 23.4 99 12 42.6	3
4	20 50.7 99 12 42.8	21 20.4 99 12 42.7	21 50.1 99 12 42.7	22 49.6 99 12 42.5	24 48.5 99 12 42.2	26 47.3 99 11 41.9	27 17.0 99 11 41.8	28 16.4 99 11 41.7	4
135	20 43.7 99 11 41.9	21 13.4 99 11 41.8	21 43.1 99 11 41.7	22 42.6 99 11 41.6	24 41.5 99 11 41.3	26 40.4 99 11 41.0	27 10.1 99 11 40.9	28 09.5 99 11 40.8	135
6	20 36.8 99 11 40.9	21 06.5 99 11 40.9	21 36.3 99 11 40.8	22 35.7 99 11 40.7	24 34.7 99 11 40.4	26 33.6 99 11 40.1	27 03.3 99 11 40.0	28 02.8 99 11 39.9	6
7	20 30.0 99 11 40.0	20 59.8 99 11 39.9	21 29.5 99 11 39.7	22 29.0 99 11 39.7	24 28.0 99 11 39.5	26 27.0 99 11 39.2	26 56.7 99 11 39.1	27 56.1 99 11 38.9	7
8	20 23.4 99 11 39.1	20 53.1 99 11 39.0	21 22.9 99 11 38.9	22 22.4 99 11 38.8	24 21.5 99 11 38.5	26 20.5 99 11 38.2	26 50.2 99 11 38.2	27 49.7 99 11 38.0	8
9	20 16.9 99 11 38.1	20 46.6 99 11 38.1	21 16.4 99 11 38.0	22 16.0 99 11 37.9	24 15.0 99 10 37.6	26 14.1 99 10 37.3	26 43.8 99 10 37.3	27 43.3 99 10 37.1	9
140	20 10.5 99 10 37.2	20 40.3 99 10 37.1	21 10.1 99 10 37.1	22 09.6 99 10 36.9	24 08.7 99 10 36.7	26 07.8 99 10 36.4	26 37.6 99 10 36.3	27 37.1 99 10 36.2	140
1	20 04.3 99 10 36.3	20 34.1 99 10 36.2	21 03.9 99 10 36.1	22 03.4 99 10 36.0	24 02.6 99 10 35.8	26 01.7 99 10 35.5	26 31.5 99 10 35.4	27 31.0 99 10 35.3	1
2	19 58.2 99 10 35.3	20 28.0 99 10 35.3	20 57.8 99 10 35.2	21 57.4 99 10 35.1	23 56.6 99 10 34.8	25 55.7 99 10 34.6	26 25.5 99 10 34.5	27 25.1 99 10 34.4	2
3	19 52.2 99 10 34.4	20 22.0 99 10 34.3	20 51.8 99 10 34.3	21 51.5 99 10 34.2	23 50.7 99 10 33.9	25 49.9 99 10 33.7	26 19.7 99 10 33.6	27 19.3 99 09 33.5	3
4	19 46.4 99 09 33.5	20 16.2 99 09 33.4	20 46.0 99 09 33.4	21 45.7 99 09 33.2	23 44.9 99 09 33.0	25 44.2 99 09 32.7	26 14.0 99 09 32.7	27 13.6 99 09 32.6	4
145	19 40.7 99 09 32.5	20 10.6 99 09 32.5	20 40.4 99 09 32.4	21 40.0 99 09 32.3	23 39.3 99 09 32.1	25 38.6 99 09 31.8	26 08.4 99 09 31.8	27 08.1 99 09 31.6	145
6	19 35.2 99 09 31.6	20 05.0 99 09 31.6	20 34.9 99 09 31.4	21 34.5 99 09 31.4	23 33.9 99 09 31.2	25 33.2 99 09 30.9	26 03.0 99 09 30.9	27 02.7 99 09 30.7	6
7	19 29.8 99 09 30.7	19 59.6 99 09 30.6	20 29.5 99 09 30.6	21 29.2 99 09 30.5	23 28.6 99 09 30.2	25 27.9 99 09 30.0	25 57.7 99 08 29.9	26 57.4 99 08 29.8	7
8	19 24.6 1.008 29.7	19 54.4 1.008 29.7	20 24.3 1.008 29.6	21 24.0 1.008 29.5	23 23.4 99 08 29.3	25 22.8 99 08 29.1	25 52.6 99 08 29.0	26 52.3 99 08 28.9	8
9	19 19.5 1.008 28.8	19 49.3 1.008 28.8	20 19.2 1.008 28.7	21 18.9 1.008 28.6	23 18.4 1.008 28.4	25 17.8 1.008 28.2	25 47.6 1.008 28.1	26 47.3 99 08 28.0	9
150	19 14.5 1.008 27.9	19 44.4 1.008 27.8	20 14.3 1.008 27.8	21 14.0 1.008 27.7	23 13.5 1.008 27.5	25 12.9 1.008 27.3	25 42.8 1.008 27.2	26 42.5 1.008 27.1	150
1	19 09.7 1.008 26.9	19 39.6 1.008 26.9	20 09.5 1.008 26.9	21 09.2 1.008 26.8	23 08.7 1.008 26.6	25 08.2 1.008 26.4	25 38.1 1.008 26.3	26 37.8 1.008 26.2	1
2	19 05.1 1.008 26.0	19 35.0 1.007 26.0	20 04.9 1.007 25.9	21 04.6 1.007 25.8	23 04.2 1.007 25.6	25 03.7 1.007 25.4	25 33.6 1.007 25.4	26 33.3 1.007 25.3	2
3	19 00.6 1.007 25.1	19 30.5 1.007 25.0	20 00.4 1.007 25.0	21 00.2 1.007 24.9	22 59.7 1.007 24.7	24 59.3 1.007 24.5	25 29.2 1.007 24.5	26 28.9 1.007 24.4	3
4	18 56.2 1.007 24.2	19 26.1 1.007 24.1	19 56.0 1.007 24.1	20 55.8 1.007 24.0	22 55.4 1.007 23.8	24 55.0 1.007 23.6	25 24.9 1.007 23.6	26 24.7 1.007 23.5	4
155	18 52.1 1.007 23.2	19 22.0 1.007 23.2	19 51.9 1.007 23.1	20 51.7 1.007 23.1	22 51.3 1.007 22.9	24 50.9 1.007 22.7	25 20.8 1.007 22.7	26 20.6 1.007 22.6	155
6	18 48.0 1.006 22.3	19 17.9 1.006 22.3	19 47.9 1.006 22.2	20 47.7 1.006 22.1	22 47.3 1.006 22.0	24 47.0 1.006 21.8	25 16.9 1.006 21.8	26 16.7 1.006 21.7	6
7	18 44.1 1.006 21.4	19 14.1 1.006 21.3	19 44.0 1.006 21.3	20 43.8 1.006 21.2	22 43.5 1.006 21.1	24 43.2 1.006 20.9	25 13.1 1.006 20.9	26 12.9 1.006 20.8	7
8	18 40.4 1.006 20.4	19 10.4 1.006 20.4	19 40.3 1.006 20.4	20 40.1 1.006 20.3	22 39.9 1.006 20.1	24 39.5 1.006 20.0	25 09.5 1.006 19.9	26 09.3 1.006 19.9	8
9	18 36.7 1.006 19.5	19 06.8 1.006 19.4	19 36.7 1.006 19.4	20 36.6 1.006 19.4	22 36.3 1.006 19.2	24 36.1 1.006 19.1	25 06.0 1.006 19.0	26 05.9 1.006 19.0	9
160	18 33.5 1.005 18.6	19 03.4 1.005 18.5	19 33.4 1.005 18.5	20 33.3 1.005 18.4	22 33.0 1.005 18.3	24 32.7 1.005 18.2	25 02.7 1.005 18.1	26 02.5 1.005 18.1	160
1	18 30.2 1.005 17.6	19 00.2 1.005 17.6	19 30.1 1.005 17.6	20 30.0 1.005 17.5	22 29.8 1.005 17.4	24 29.6 1.005 17.3	24 59.5 1.005 17.2	25 59.4 1.005 17.2	1
2	18 27.2 1.005 16.7	18 57.1 1.005 16.7	19 27.1 1.005 16.7	20 27.0 1.005 16.6	22 26.8 1.005 16.5	24 26.6 1.005 16.3	24 56.5 1.005 16.3	25 56.4 1.005 16.2	2
3	18 24.2 1.005 15.8	18 54.2 1.005 15.7	19 24.2 1.005 15.7	20 24.1 1.005 15.7	22 23.9 1.005 15.6	24 23.7 1.005 15.4	24 53.7 1.005 15.4	25 53.6 1.005 15.3	3
4	18 21.5 1.004 14.9	18 51.5 1.004 14.8	19 21.4 1.004 14.8	20 21.3 1.004 14.8	22 21.2 1.004 14.6	24 21.0 1.004 14.5	24 51.0 1.004 14.5	25 50.9 1.004 14.4	4
165	18 18.9 1.004 13.9	18 48.9 1.004 13.9	19 18.8 1.004 13.9	20 18.8 1.004 13.8	22 18.6 1.004 13.7	24 18.5 1.004 13.6	24 48.4 1.004 13.6	25 48.4 1.004 13.5	165
6	18 16.5 1.004 13.0	18 46.4 1.004 13.0	19 16.4 1.004 13.0	20 16.4 1.004 12.9	22 16.2 1.004 12.8	24 16.0 1.004 12.7	24 46.1 1.004 12.7	25 46.0 1.004 12.6	6
7	18 14.2 1.004 12.1	18 44.2 1.003 12.0	19 14.2 1.004 12.0	20 14.1 1.004 12.0	22 14.0 1.003 11.9	24 13.9 1.003 11.8	24 43.9 1.003 11.8	25 43.8 1.003 11.7	7
8	18 12.1 1.003 11.1	18 42.1 1.003 11.1	19 12.0 1.003 11.1	20 12.0 1.003 11.1	22 11.9 1.003 11.0	24 11.8 1.003 11.0	24 41.8 1.003 10.9	25 41.8 1.003 10.8	8
9	18 10.2 1.003 10.2	18 40.2 1.003 10.2	19 10.2 1.003 10.2	20 10.1 1.003 10.1	22 10.0 1.003 10.1	24 10.0 1.003 10.0	24 39.9 1.003 10.0	25 39.9 1.003 09.9	9
170	18 08.4 1.003 09.3	18 38.4 1.003 09.3	19 08.4 1.003 09.3	20 08.4 1.003 09.2	22 08.3 1.003 09.1	24 08.2 1.003 09.1	24 38.2 1.003 09.1	25 38.2 1.003 09.0	170
1	18 06.8 1.002 08.4	18 36.8 1.002 08.3	19 06.8 1.002 08.3	20 06.8 1.002 08.3	22 06.7 1.002 08.2	24 06.7 1.002 08.2	24 36.7 1.002 08.2	25 36.6 1.002 08.1	1
2	18 05.1 1.002 07.4	18 35.1 1.002 07.4	19 05.1 1.002 07.4	20 05.1 1.002 07.4	22 05.1 1.002 07.3	24 05.3 1.002 07.3	24 35.1 1.002 07.2	25 35.2 1.002 07.2	2
3	18 04.1 1.002 06.5	18 34.1 1.002 06.5	19 04.1 1.002 06.5	20 04.1 1.002 06.5	22 04.1 1.002 06.4	24 04.0 1.002 06.4	24 34.0 1.002 06.3	25 34.0 1.002 06.3	3
4	18 03.0 1.002 05.6	18 33.0 1.002 05.6	19 03.0 1.002 05.6	20 03.0 1.002 05.5	22 03.0 1.002 05.5	24 03.0 1.002 05.4	24 33.0 1.002 05.4	25 33.0 1.002 05.4	4
175	18 02.1 1.001 04.6	18 32.1 1.001 04.6	19 02.1 1.001 04.6	20 02.1 1.001 04.6	22 02.1 1.001 04.6	24 02.1 1.001 04.5	24 32.1 1.001 04.5	25 32.0 1.001 04.5	175
6	18 01.3 1.001 03.7	18 31.3 1.001 03.7	19 01.3 1.001 03.7	20 01.3 1.001 03.7	22 01.3 1.001 03.7	24 01.3 1.001 03.6	24 31.3 1.001 03.6	25 31.3 1.001 03.6	6
7	18 00.8 1.001 02.8	18 30.8 1.001 02.8	19 00.8 1.001 02.8	20 00.8 1.001 02.8	22 00.7 1.001 02.7	24 00.7 1.001 02.7	24 30.7 1.001 02.7	25 30.7 1.001 02.7	7
8	18 00.1 1.000 01.9	18 30.1 1.000 01.9	19 00.1 1.000 01.9	20 00.1 1.000 01.8	22 00.1 1.000 01.8	24 00.1 1.000 01.8	24 30.1 1.000 01.8	25 30.1 1.000 01.8	8
9	18 00.1 1.000 00.9	18 30.1 1.000 00.9	19 00.1 1.000 00.9	20 00.1 1.000 00.9	22 00.1 1.000 00.9	24 00.1 1.000 00.9	24 30.1 1.000 00.9	25 30.1 1.000 00.9	9
180	18 00.0 1.000 00.0	18 30.0 1.000 00.0	19 00.0 1.000 00.0	20 00.0 1.000 00.0	22 00.0 1.000 00.0	24 00.0 1.000 00.0	24 30.0 1.000 00.0	25 30.0 1.000 00.0	180

Lat. 81°
Lat. 82°
Lat. 83°

Lat. 30°

H.A.	36° 00' Alt. Δd Δt Az.	37° 00' Alt. Δd Δt Az.	38° 30' Alt. Δd Δt Az.	40° 00' Alt. Δd Δt Az.	42° 00' Alt. Δd Δt Az.	42° 30' Alt. Δd Δt Az.	43° 00' Alt. Δd Δt Az.	45° 00' Alt. Δd Δt Az.	H.A.
00	46 00.0 1.00 180.0	47 00.0 1.000 180.0	48 30.0 1.000 180.0	50 00.0 1.000 180.0	52 00.0 1.000 180.0	52 30.0 1.00 180.0	53 00.0 1.00 180.0	55 00.0 1.00 180.0	00
1	45 59.9 1.00 178.8	46 59.9 1.001 178.8	48 29.9 1.001 178.8	49 59.9 1.001 178.8	51 59.9 1.001 178.8	52 29.9 1.001 178.8	52 59.9 1.001 178.8	54 59.9 1.001 178.8	1
2	45 59.6 1.001 177.7	46 59.6 1.001 177.7	48 29.6 1.001 177.6	49 59.6 1.001 177.6	51 59.6 1.001 177.6	52 29.6 1.001 177.6	52 59.6 1.001 177.6	54 59.6 1.001 177.5	2
3	45 59.0 1.001 176.5	46 59.0 1.001 176.5	48 29.0 1.001 176.5	49 59.0 1.001 176.4	51 59.0 1.001 176.4	52 29.0 1.001 176.4	52 59.0 1.001 176.4	54 59.0 1.001 176.3	3
4	45 58.3 1.02 175.3	46 58.3 1.002 175.3	48 28.3 1.002 175.3	49 58.3 1.002 175.2	51 58.2 1.002 175.2	52 28.2 1.002 175.2	52 58.2 1.002 175.1	54 58.2 1.002 175.1	4
05	45 57.4 1.02 174.2	46 57.3 1.002 174.1	48 27.3 1.002 174.1	49 57.3 1.002 174.0	51 57.3 1.002 174.0	52 27.3 1.002 173.9	52 57.2 1.002 173.9	54 57.2 1.002 173.8	05
6	45 56.5 1.02 173.0	46 56.3 1.002 173.0	48 26.1 1.002 172.9	49 56.1 1.002 172.9	51 56.1 1.002 172.8	52 26.0 1.002 172.7	52 56.0 1.002 172.7	54 56.0 1.002 172.6	6
7	45 54.8 1.03 171.9	46 54.8 1.003 171.8	48 24.7 1.003 171.7	49 54.7 1.003 171.7	51 54.6 1.003 171.6	52 24.6 1.003 171.5	52 54.6 1.003 171.5	54 54.5 1.003 171.4	7
8	45 53.2 1.03 170.7	46 53.2 1.003 170.6	48 23.1 1.003 170.6	49 53.1 1.003 170.5	51 53.0 1.003 170.4	52 23.0 1.003 170.3	52 53.0 1.003 170.3	54 52.8 1.003 170.2	8
9	45 51.5 1.03 169.5	46 51.4 1.003 169.5	48 21.3 1.003 169.4	49 51.3 1.003 169.3	51 51.1 1.003 169.2	52 21.1 1.003 169.1	52 51.1 1.003 169.1	54 51.0 1.004 168.9	9
10	45 49.5 1.04 168.4	46 49.4 1.004 168.2	48 19.3 1.004 168.2	49 49.2 1.004 168.1	51 49.1 1.004 168.0	52 19.0 1.004 167.9	52 49.0 1.004 167.9	54 48.8 1.004 167.7	10
1	45 47.3 1.04 167.2	46 47.2 1.004 167.1	48 17.1 1.004 167.0	49 47.0 1.004 166.9	51 46.8 1.004 166.8	52 16.8 1.004 166.7	52 46.7 1.004 166.7	54 46.5 1.004 166.5	1
2	45 44.8 1.04 166.1	46 44.8 1.004 166.0	48 14.6 1.004 165.9	49 44.5 1.004 165.7	51 44.3 1.004 165.6	52 14.2 1.005 165.5	52 44.2 1.005 165.5	54 44.0 1.005 165.2	2
3	45 42.2 1.05 164.9	46 42.1 1.005 164.8	48 12.0 1.005 164.7	49 41.8 1.005 164.5	51 41.6 1.005 164.4	52 11.5 1.005 164.3	52 41.5 1.005 164.3	54 41.2 1.005 164.0	3
4	45 39.3 1.05 163.7	46 39.3 1.005 163.7	48 09.1 1.005 163.5	49 38.9 1.005 163.4	51 38.7 1.005 163.2	52 08.6 1.005 163.1	52 38.5 1.005 163.1	54 38.2 1.005 162.8	4
15	45 36.4 1.06 162.6	46 36.3 1.005 162.5	48 06.1 1.006 162.3	49 35.9 1.006 162.2	51 35.6 1.006 162.0	52 05.5 1.006 161.8	52 35.4 1.006 161.8	54 35.1 1.006 161.6	15
6	45 33.2 1.06 161.4	46 33.0 1.006 161.3	48 02.8 1.006 161.2	49 32.6 1.006 161.0	51 32.2 1.006 160.8	52 02.1 1.006 160.7	52 32.0 1.006 160.6	54 31.7 1.006 160.4	6
7	45 29.8 1.06 160.3	46 29.6 1.006 160.2	47 59.3 1.006 160.0	49 29.1 1.006 159.8	51 28.7 1.006 159.6	51 58.6 1.006 159.5	52 28.5 1.006 159.4	54 28.1 1.006 159.2	7
8	45 26.1 1.06 159.1	46 26.0 1.006 159.0	47 55.7 1.006 158.8	49 25.4 1.006 158.7	51 25.0 1.007 158.4	51 54.8 1.007 158.3	52 24.7 1.007 158.3	54 24.2 1.007 158.0	8
9	45 22.3 1.07 158.0	46 22.1 1.007 157.9	47 51.8 1.007 157.7	49 21.5 1.007 157.5	51 21.0 1.007 157.2	51 50.9 1.007 157.1	52 20.8 1.007 157.1	54 20.8 1.007 156.7	9
20	45 18.3 1.07 156.8	46 18.1 1.007 156.6	47 47.8 1.007 156.5	49 17.4 1.007 156.3	51 16.9 1.007 155.9	51 46.8 99 08 155.9	52 16.6 1.007 155.7	54 16.0 99 07 155.5	20
1	45 14.1 1.07 155.7	46 13.9 1.007 155.6	47 43.5 1.007 155.4	49 13.1 1.007 155.1	51 12.6 1.008 154.8	51 42.4 99 08 154.8	52 12.3 99 08 154.7	54 11.6 99 08 154.3	1
2	45 09.8 1.08 154.5	46 09.5 1.008 154.4	47 39.1 1.008 154.2	49 08.7 1.008 154.0	51 08.0 99 08 153.7	51 37.9 99 08 153.6	52 07.7 99 08 153.5	54 07.0 99 08 153.1	2
3	45 05.2 1.08 153.4	46 04.9 1.008 153.3	47 34.5 99 08 153.0	49 04.0 99 08 152.8	51 03.3 99 08 152.5	51 33.1 99 08 152.4	52 03.0 99 08 152.3	54 02.2 99 08 151.9	3
4	45 00.4 99 08 152.3	46 00.1 99 08 152.1	47 29.6 99 08 151.9	48 59.1 99 08 151.7	50 58.4 99 08 151.3	51 28.2 99 09 151.2	51 58.0 99 09 151.1	53 57.2 99 09 150.7	4
25	44 55.5 99 09 151.1	45 55.2 99 09 151.0	47 24.6 99 09 150.7	48 54.1 99 09 150.5	50 53.3 99 09 150.1	51 23.1 99 09 150.0	51 52.9 99 09 149.9	53 52.0 99 09 149.5	25
6	44 50.4 99 09 150.0	45 50.0 99 09 149.8	47 19.5 99 09 149.6	48 48.9 99 09 149.3	50 48.0 99 09 149.0	51 17.8 99 09 148.9	51 47.6 99 09 148.8	53 46.6 99 09 148.4	6
7	44 45.1 99 09 148.9	45 44.7 99 09 148.7	47 14.1 99 09 148.4	48 43.5 99 09 148.2	50 42.6 99 09 147.8	51 12.3 99 09 147.7	51 42.1 99 09 147.6	53 41.1 99 10 147.2	7
8	44 39.6 99 09 147.7	45 39.2 99 10 147.6	47 08.6 99 10 147.3	48 37.9 99 10 147.0	50 36.9 99 10 146.6	51 06.7 99 10 146.5	51 36.4 99 10 146.4	53 35.3 99 10 146.0	8
9	44 33.9 99 10 146.6	45 33.5 99 10 146.4	47 02.8 99 10 146.2	48 32.1 99 10 145.9	50 31.1 99 10 145.5	51 00.8 99 10 145.4	51 30.6 99 10 145.3	53 29.4 99 10 144.8	9
30	44 28.1 99 10 145.4	45 27.7 99 10 145.3	46 57.0 99 10 145.0	48 26.2 99 10 144.7	50 25.1 99 10 144.3	50 54.8 99 10 144.2	51 24.6 99 10 144.1	53 23.3 99 10 143.6	30
1	44 22.1 99 10 144.3	45 21.6 99 10 144.2	46 50.9 99 10 143.9	48 20.1 99 10 143.6	50 19.0 99 11 143.2	50 48.7 99 11 143.1	51 18.4 99 11 142.9	53 17.1 99 11 142.5	1
2	44 16.0 99 11 143.2	45 15.5 99 11 143.0	46 44.7 99 11 142.8	48 13.8 99 11 142.5	50 12.6 99 11 142.0	50 42.3 99 11 141.9	51 12.0 99 11 141.8	53 10.6 99 11 141.3	2
3	44 09.7 99 11 142.1	45 09.1 99 11 141.9	46 38.3 99 11 141.6	48 07.4 99 11 141.3	50 06.1 99 11 140.9	50 35.8 99 11 140.8	51 05.5 99 11 140.6	53 04.0 99 11 140.1	3
4	44 03.2 99 11 141.0	45 02.6 99 11 140.8	46 31.7 99 11 140.5	48 00.8 99 11 140.2	49 59.5 99 11 139.7	50 29.1 99 11 139.6	50 58.8 99 11 139.5	52 57.2 99 12 139.0	4
35	43 56.5 99 11 139.9	44 56.0 99 11 139.7	46 25.0 99 11 139.4	47 54.1 99 12 139.1	49 52.7 99 12 138.6	50 22.3 99 12 138.5	50 51.9 99 12 138.3	52 50.4 99 12 137.8	35
6	43 49.7 99 12 138.8	44 49.1 99 12 138.6	46 18.2 99 12 138.3	47 47.2 99 12 137.9	49 45.7 99 12 137.5	50 15.3 99 12 137.3	50 44.9 99 12 137.2	52 43.3 99 12 136.7	6
7	43 42.8 99 12 137.7	44 42.2 99 12 137.5	46 11.2 99 12 137.1	47 40.1 99 12 136.8	49 38.6 99 12 136.3	50 08.2 99 12 136.2	50 37.8 99 12 136.1	52 36.1 99 12 135.5	7
8	43 35.7 99 12 136.5	44 35.0 99 12 136.3	46 04.0 99 12 136.0	47 32.9 99 12 135.7	49 31.3 99 12 135.2	50 00.9 99 12 135.1	50 30.5 99 12 134.9	52 28.7 98 13 134.4	8
9	43 28.5 99 12 135.4	44 27.8 99 12 135.2	45 56.7 99 12 134.9	47 25.5 99 13 134.6	49 23.9 99 13 134.1	49 53.5 99 13 133.9	50 23.0 99 13 133.8	52 21.2 98 13 133.2	9
40	43 21.1 99 13 134.3	44 20.4 99 13 134.1	45 49.2 99 13 133.8	47 18.0 99 13 133.4	49 16.3 99 13 132.9	49 45.9 98 13 132.8	50 15.4 98 13 132.7	52 13.5 98 13 132.1	40
1	43 13.6 99 13 133.2	44 12.8 99 13 133.0	45 41.6 99 13 132.7	47 10.4 99 13 132.3	49 08.6 98 13 131.8	49 38.2 98 13 131.7	50 07.7 98 13 131.5	52 05.7 98 13 131.0	1
2	43 05.9 99 13 132.2	44 05.1 99 13 131.9	45 33.9 99 13 131.6	47 02.6 99 13 131.2	49 00.8 98 13 130.7	49 30.3 98 13 130.6	49 59.8 98 13 130.4	51 57.8 98 13 129.8	2
3	42 58.1 99 13 131.1	43 57.3 99 13 130.8	45 26.1 99 13 130.5	46 54.7 98 13 130.1	48 52.8 98 14 129.6	49 22.4 98 14 129.4	49 51.8 98 14 129.3	51 49.7 98 14 128.7	3
4	42 50.2 99 13 130.0	43 49.4 99 13 129.7	45 18.1 99 14 129.4	46 46.7 98 14 129.0	48 44.8 98 14 128.5	49 14.2 98 14 128.3	49 43.7 98 14 128.2	51 41.5 98 14 127.6	4
45	42 42.2 99 14 128.9	43 41.3 99 14 128.7	45 10.0 98 14 128.3	46 38.5 98 14 127.9	48 36.5 98 14 127.4	49 06.0 98 14 127.2	49 35.5 98 14 127.1	51 33.2 98 14 126.5	45
6	42 34.0 99 14 127.8	43 33.1 99 14 127.6	45 01.7 98 14 127.2	46 30.3 98 14 126.8	48 28.2 98 14 126.3	48 57.7 98 14 126.1	49 27.1 98 14 126.0	51 24.8 98 14 125.4	6
7	42 25.7 99 14 126.7	43 24.8 99 14 126.5	44 53.4 98 14 126.1	46 21.9 98 14 125.7	48 19.7 98 14 125.2	48 49.2 98 14 125.0	49 18.6 98 14 124.9	51 16.2 98 14 124.3	7
8	42 17.3 98 14 125.6	43 16.3 98 14 125.4	44 44.9 98 14 125.0	46 13.3 98 14 124.6	48 11.2 98 14 124.1	48 40.6 98 14 123.9	49 10.0 98 15 123.8	51 07.5 98 15 123.1	8
9	42 08.8 98 14 124.6	43 07.8 98 14 124.3	44 36.3 98 14 123.9	46 04.7 98 15 123.5	48 02.5 98 15 123.0	48 31.9 98 15 122.8	49 01.3 98 15 122.7	50 58.8 98 15 122.0	9
50	42 00.1 98 15 123.5	42 59.1 98 15 123.2	44 27.6 98 15 122.9	45 56.0 98 15 122.5	47 53.7 98 15 121.9	48 23.1 98 15 121.7	48 52.5 98 15 121.6	50 49.9 98 15 120.9	50
1	41 51.4 98 15 122.4	42 50.4 98 15 122.2	44 18.8 98 15 121.8	45 47.1 98 15 121.4	47 44.8 98 15 120.8	48 14.2 98 15 120.7	48 43.5 98 15 120.5	50 40.9 98 15 119.9	1
2	41 42.5 98 15 121.4	42 41.5 98 15 121.1	44 09.9 98 15 120.7	45 38.2 98 15 120.3	47 35.8 98 15 119.7	48 05.2 98 15 119.6	48 34.5 98 15 119.4	50 31.8 98 15 118.8	2
3	41 33.6 98 15 120.3	42 32.5 98 15 120.0	44 00.9 98 15 119.6	45 29.1 98 15 119.2	47 26.7 98 15 118.6	47 56.0 98 16 118.5	48 25.4 98 15 118.3	50 22.6 98 15 117.7	3
4	41 24.5 98 15 119.2	42 23.5 98 15 119.0	43 51.8 98 15 118.6	45 20.0 98 15 118.2	47 17.5 98 16 117.6	47 46.8 98 16 117.4	48 16.2 98 16 117.3	50 13.4 98 16 116.6	4
55	41 15.4 98 15 118.2	42 14.3 98 15 117.9	43 42.6 98 15 117.5	45 10.8 98 16 117.1	47 08.2 98 16 116.5	47 37.6 98 16 116.4	48 06.9 98 16 116.2	50 04.0 98 16 115.5	55
6	41 06.2 98 16 117.1	42 05.1 98 16 116.9	43 33.3 98 16 116.5	45 01.5 98 16 116.0	46 58.9 98 16 115.4	47 28.2 98 16 115.3	47 57.5 98 16 115.1	49 54.6 97 16 114.5	6
7	40 56.9 98 16 116.1	41 55.7 98 16 115.8	43 23.9 98 16 115.4	44 52.1 98 16 115.0	46 49.4 98 16 114.4	47 18.7 98 16 114.2	47 48.0 98 16 114.1	49 45.0 97 16 113.4	7
8	40 47.5 98 16 115.0	41 46.3 98 16 114.8	43 14.5 98 16 114.3	44 42.6 98 16 113.9	46 39.9 98 16 113.3	47 09.2 98 16 113.2	47 38.5 98 16 113.0	49 35.4 97 16 112.3	8
9	40 38.0 98 16 114.0	41 36.8 98 16 113.7	43 04.9 98 16 113.3	44 33.0 98 16 112.9	46 30.3 98 16 112.3	46 59.6 98 16 112.1	47 28.8 98 16 111.9	49 25.8 97 16 111.3	9
60	40 28.4 98 16 112.9	41 27.2 98 16 112.7	42 55.3 98 16 112.2	44 23.4 98 16 111.8	46 20.6 98 16 111.2	46 49.9 98 16 111.0	47 19.1 98 16 110.9	49 16.0 97 16 110.2	60
1	40 18.8 98 16 111.9	41 17.6 98 16 111.6	42 45.7 98 16 111.2	44 13.7 98 16 110.8	46 10.8 98 16 110.2	46 40.1 98 16 110.0	47 09.4 97 16 109.8	49 06.2 97 16 109.2	1
2	40 09.1 98 16 110.8	41 07.8 98 16 110.6	42 35.9 98 16 110.2	44 03.9 98 16 109.7	46 01.0 98 16 109.1	46 30.3 97 16 109.0	46 59.5 97 16 108.8	48 56.3 97 17 108.1	2
3	39 59.3 98 16 109.8	40 58.1 98 16 109.5	42 26.1 98 16 109.1	43 54.1 98 16 108.7	45 51.2 98 16 108.1	46 20.4 97 17 107.9	46 49.6 97 16 107.7	48 46.4 97 17 107.1	3
4	39 49.5 98 16 108.8	40 48.2 98 16 108.5	42 16.2 98 17 108.1	43 44.2 98 16 107.7	45 41.2 97 17 107.0	46 10.5 97 17 106.9	46 39.7 97 17 106.7	48 36.4 97 17 106.0	4
65	39 39.6 98 17 107.7	40 38.3 98 17 107.5	42 06.3 98 17 107.1	43 34.2 98 17 106.6	45 31.2 97 17 106.0	46 00.5 97 17 105.8	46 29.7 97 17 105.7	48 26.4 97 17 105.0	65
6	39 29.6 98 17 106.7	40 28.3 98 17 106.4	41 56.3 98 17 106.0	43 24.2 98 17 105.6	45 21.2 97 17 105.0	45 50.4 97 17 104.8	46 19.6 97 17 104.6	48 16.3 97 17 103.9	6
7	39 19.6 98 17 105.7	40 18.3 98 17 105.4	41 46.3 98 17 105.0	43 14.1 98 17 104.6	45 11.1 97 17 103.9	45 40.3 97 17 103.8	46 09.5 97 17 103.6	48 06.2 97 17 102.9	7
8	39 09.6 98 17 104.7	40 08.2 98 17 104.4	41 36.2 98 17 104.0	43 04.0 98 17 103.5	45 01.0 97 17 102.9	45 30.2 97 17 102.8	45 59.4 97 17 102.6	47 56.0 97 17 101.9	8
9	38 59.5 98 17 103.7	39 58.1 98 17 103.4	41 26.0 98 17 103.0	42 53.9 98 17 102.5	44 50.8 97 17 101.9	45 20.0 97 17 101.7	45 49.2 97 17 101.6	47 45.8 97 17 100.9	9
70	38 49.3 98 17 102.6	39 48.0 98 17 102.4	41 15.9 98 17 101.9	42 43.7 98 17 101.5	44 40.6 97 17 100.9	45 09.8 97 17 100.7	45 39.0 97 17 100.5	47 35.5 97 17 99.9	70
1	38 39.1 98 17 101.6	39 37.8 98 17 101.3	41 05.7 98 17 100.9	42 33.5 98 17 100.5	44 30.3 97 17 99.9	44 59.5 97 17 99.7	45 28.7 97 17 99.5	47 25.2 97 17 98.8	1
2	38 28.9 98 17 100.6	39 27.5 98 17 100.3	40 55.4 98 17 99.9	42 23.2 97 17 99.5	44 20.1 97 17 98.8	44 49.2 97 17 98.7	45 18.4 97 17 98.5	47 14.9 97 17 97.8	2
3	38 18.7 98 17 99.6	39 17.3 98 17 99.3	40 45.1 98 17 98.9	42 12.9 97 17 98.5	44 09.7 97 17 97.8	44 38.9 97 17 97.7	45 08.1 97 17 97.5	47 04.6 97 17 96.8	3
4	38 08.4 98 17 98.6	39 07.0 98 17 98.3	40 34.8 98 17 97.9	42 02.6 97 17 97.5	43 59.4 97 17 96.8	44 28.6 97 17 96.7	44 57.7 97 17 96.5	46 54.2 97 17 95.8	4
75	37 58.1 98 17 97.6	38 56.7 98 17 97.3	40 24.5 98 17 96.9	41 52.2 97 17 96.4	43 49.1 97 17 95.8	44 18.2 97 17 95.7	44 47.4 97 17 95.5	46 43.9 97 17 94.8	75
6	37 47.7 98 17 96.6	38 46.3 98 17 96.3	40 14.1 98 17 95.9	41 41.9 97 17 95.4	43 38.7 97 17 94.8	44 07.8 97 17 94.7	44 37.0 97 17 94.5	46 33.5 97 17 93.8	6
7	37 37.4 98 17 95.6	38 36.0 98 17 95.3	40 03.8 98 17 94.9	41 31.5 97 17 94.4	43 28.3 97 17 93.8	43 57.5 97 17 93.7	44 26.6 97 17 93.5	46 23.1 97 17 92.8	7
8	37 27.0 98 17 94.6	38 25.6 98 17 94.3	39 53.4 98 17 93.9	41 21.1 97 17 93.5	43 17.9 97 17 92.8	43 47.1 97 17 92.7	44 16.2 97 17 92.5	46 12.7 97 17 91.8	8
9	37 16.6 98 17 93.6	38 15.2 98 17 93.3	39 43.0 98 17 92.9	41 10.7 97 17 92.5	43 07.5 97 17 91.8	43 36.6 97 17 91.7	44 05.8 97 17 91.5	46 02.2 97 17 90.8	9
80	37 06.2 98 17 92.6	38 04.8 98 17 92.3	39 32.6 98 17 91.9	41 00.3 97 17 91.5	42 57.1 97 17 90.9	43 26.2 97 17 90.7	43 55.4 97 17 90.5	45 51.8 97 17 89.8	80
1	36 55.8 98 17 91.6	37 54.4 98 17 91.3	39 22.2 98 17 90.9	40 49.9 97 17 90.5	42 46.6 97 17 89.9	43 15.8 97 17 89.7	43 45.0 97 17 89.5	45 41.4 97 17 88.9	1
2	36 45.4 98 17 90.6	37 43.9 98 17 90.4	39 11.7 98 17 89.9	40 39.4 97 17 89.5	42 36.2 97 17 88.9	43 05.4 97 17 88.7	43 34.5 97 17 88.6	45 31.0 97 17 87.9	2
3	36 34.9 98 17 89.6	37 33.5 98 17 89.4	39 01.3 98 17 88.9	40 29.0 97 17 88.5	42 25.8 97 17 87.9	42 55.0 97 17 87.7	43 24.1 97 17 87.6	45 20.6 97 17 86.9	3
4	36 24.5 98 17 88.7	37 23.1 98 17 88.4	38 50.9 98 17 88.0	40 18.6 97 17 87.5	42 15.4 97 17 86.9	42 44.6 97 17 86.8	43 13.7 97 17 86.6	45 10.2 97 17 85.9	4
85	36 14.1 98 17 87.7	37 12.7 98 17 87.4	38 40.5 98 17 87.0	40 08.2 97 17 86.6	42 05.0 97 17 86.0	42 34.2 97 17 85.8	43 03.3 97 17 85.6	44 59.8 97 17 85.0	85
6	36 03.7 98 17 86.7	37 02.3 98 17 86.4	38 30.1 98 17 86.0	39 57.8 97 17 85.6	41 54.6 97 17 85.0	42 23.8 97 17 84.8	42 52.9 97 17 84.7	44 49.4 97 17 84.0	6
7	35 53.3 98 17 85.7	36 51.9 98 17 85.5	38 19.7 98 17 85.1	39 47.4 97 17 84.6	41 44.2 97 17 84.0	42 13.4 97 17 83.9	42 42.6 97 17 83.7	44 39.1 97 17 83.0	7
8	35 42.9 98 17 84.8	36 41.5 98 17 84.5	38 09.3 98 17 84.1	39 37.1 97 17 83.6	41 33.9 97 17 83.0	42 03.1 97 17 82.9	42 32.2 97 17 82.7	44 28.7 97 17 82.1	8
9	35 32.6 98 17 83.8	36 31.2 98 17 83.5	37 59.0 98 17 83.1	39 26.7 97 17 82.7	41 23.6 97 17 82.1	41 52.7 97 17 81.9	42 21.9 97 17 81.8	44 18.4 97 17 81.1	9
90	35 22.2 98 17 82.8	36 20.8 98 17 82.5	37 48.7 98 17 82.1	39 16.4 97 17 81.7	41 13.3 97 17 81.1	41 42.4 97 17 80.9	42 11.6 97 17 80.8	44 08.1 97 17 80.1	90

H.A.	36° 00' Alt / Δd Δt	Az	37° 00' Alt / Δd Δt	Az	38° 30' Alt / Δd Δt	Az	40° 00' Alt / Δd Δt	Az	42° 00' Alt / Δd Δt	Az	42° 30' Alt / Δd Δt	Az	43° 00' Alt / Δd Δt	Az	45° 00' Alt / Δd Δt	Az	H.A.
91	35 11.9 98 17	81.8	36 10.5 98 17	81.6	37 38.3 98 17	81.2	39 06.1 97 17	80.7	41 03.0 97 17	80.2	41 32.2 97 17	80.0	42 01.3 97 17	79.8	43 57.9 97 17	79.2	91
2	35 01.6 98 17	80.9	36 00.2 98 17	80.6	37 28.1 98 17	80.2	38 55.8 97 17	79.8	40 52.7 97 17	79.2	41 21.9 97 17	79.0	41 51.1 97 17	78.9	43 47.7 97 17	78.2	2
3	34 51.3 98 17	79.9	35 49.9 98 17	79.6	37 17.8 98 17	79.2	38 45.6 97 17	78.8	40 42.5 97 17	78.2	41 11.7 97 17	78.1	41 40.9 97 17	77.9	43 37.5 97 17	77.3	3
4	34 41.1 98 17	78.9	35 39.7 98 17	78.7	37 07.6 98 17	78.3	38 35.4 98 17	77.9	40 32.3 97 17	77.3	41 01.5 97 17	77.1	41 30.7 97 17	77.0	43 27.4 97 17	76.3	4
95	34 30.9 98 17	78.0	35 29.5 98 17	77.7	36 57.4 98 17	77.3	38 25.2 98 17	76.9	40 22.2 97 17	76.3	40 51.4 97 17	76.2	41 20.6 97 17	76.0	43 17.3 97 17	75.4	95
6	34 20.7 98 17	77.0	35 19.3 98 17	76.8	36 47.3 98 17	76.4	38 15.1 98 17	76.0	40 12.1 97 17	75.4	40 41.3 97 17	75.2	41 10.5 97 17	75.1	43 07.2 97 17	74.5	6
7	34 10.6 98 17	76.1	35 09.2 98 17	75.8	36 37.2 98 17	75.4	38 05.0 98 17	75.0	40 02.0 97 17	74.4	40 31.2 97 17	74.3	41 00.5 97 17	74.1	42 57.2 97 17	73.5	7
8	34 00.5 98 17	74.9	34 59.1 98 17	74.9	36 27.1 98 17	74.5	37 55.0 98 17	74.1	39 52.0 97 17	73.4	40 21.2 97 17	73.3	40 50.5 97 17	73.2	42 47.2 97 17	72.6	8
9	33 50.4 98 17	74.2	34 49.1 98 17	73.9	36 17.1 98 17	73.5	37 45.0 98 17	73.1	39 42.0 97 17	72.6	40 11.3 97 16	72.4	40 40.5 97 16	72.3	42 37.3 97 16	71.6	9
100	33 40.4 98 17	73.2	34 39.1 98 17	73.0	36 07.1 98 17	72.6	37 35.0 98 16	72.2	39 32.1 98 16	71.6	40 01.4 97 16	71.5	40 30.6 97 16	71.3	42 27.4 97 16	70.7	100
1	33 30.5 98 16	72.3	34 29.2 98 16	72.0	35 57.2 98 16	71.6	37 25.1 98 16	71.2	39 22.3 98 16	70.7	39 51.5 98 16	70.5	40 20.8 97 16	70.4	42 17.6 97 16	69.8	1
2	33 20.6 98 16	71.3	34 19.3 98 16	71.1	35 47.3 98 16	70.7	37 15.3 98 16	70.3	39 12.4 98 16	69.7	39 41.7 98 16	69.6	40 11.0 97 16	69.5	42 07.9 97 16	68.9	2
3	33 10.7 98 16	70.4	34 09.5 98 16	70.1	35 37.5 98 16	69.7	37 05.5 98 16	69.3	39 02.7 98 16	68.8	39 32.0 98 16	68.7	40 01.3 98 16	68.5	41 58.2 97 16	67.9	3
4	33 00.9 98 16	69.4	33 59.7 98 16	69.2	35 27.8 98 16	68.8	36 55.8 98 16	68.4	38 53.0 98 16	67.9	39 22.3 98 16	67.7	39 51.6 98 16	67.6	41 48.6 97 16	67.0	4
105	32 51.2 98 16	68.5	33 50.0 98 16	68.2	35 18.1 98 16	67.9	36 46.2 98 16	67.5	38 43.4 98 16	66.9	39 12.7 98 16	66.8	39 42.0 98 16	66.7	41 39.0 97 16	66.1	105
6	32 41.6 98 16	67.5	33 40.4 98 16	67.3	35 08.5 98 16	66.9	36 36.6 98 16	66.5	38 33.9 98 16	66.0	39 03.2 98 16	65.9	39 32.5 98 16	65.7	41 29.5 97 16	65.2	6
7	32 32.0 98 16	66.6	33 30.8 98 16	66.4	34 58.9 98 16	66.0	36 27.0 98 16	65.6	38 24.4 98 16	65.1	38 53.7 98 16	64.9	39 23.0 98 16	64.8	41 20.1 98 16	64.2	7
8	32 22.4 98 16	65.6	33 21.3 98 16	65.4	34 49.5 98 16	65.1	36 17.6 98 16	64.7	38 15.0 98 16	64.2	38 44.3 98 16	64.0	39 13.6 98 16	63.9	41 10.8 98 15	63.3	8
9	32 13.0 98 16	64.7	33 11.8 98 16	64.5	34 40.1 98 16	64.1	36 08.2 98 16	63.7	38 05.6 98 16	63.2	38 35.0 98 15	63.1	39 04.3 98 15	63.0	41 01.5 98 15	62.4	9
110	32 03.6 98 16	63.8	33 02.5 98 16	63.5	34 30.7 98 16	63.2	35 58.9 98 15	62.8	37 56.4 98 15	62.3	38 25.7 98 15	62.2	38 55.1 98 15	62.0	40 52.3 98 15	61.5	110
1	31 54.3 98 15	62.8	32 53.2 98 15	62.6	34 21.5 98 15	62.3	35 49.7 98 15	61.9	37 47.2 98 15	61.4	38 16.5 98 15	61.3	38 45.9 98 15	61.1	40 43.2 98 15	60.6	1
2	31 45.1 98 15	61.9	32 44.0 98 15	61.7	34 12.3 98 15	61.3	35 40.5 98 15	61.0	37 38.1 98 15	60.5	38 07.4 98 15	60.3	38 36.8 98 15	60.2	40 34.2 98 15	59.7	2
3	31 35.9 98 15	61.0	32 34.8 98 15	60.7	34 03.2 98 15	60.4	35 31.5 98 15	60.0	37 29.1 98 15	59.5	37 58.4 98 15	59.4	38 27.8 98 15	59.3	40 25.2 98 15	58.7	3
4	31 26.8 98 15	60.0	32 25.8 98 15	59.8	33 54.2 98 15	59.5	35 22.5 98 15	59.1	37 20.1 98 15	58.6	37 49.5 98 15	58.5	38 18.9 98 15	58.4	40 16.3 98 15	57.8	4
115	31 17.9 98 15	59.1	32 16.8 98 15	58.9	33 45.2 98 15	58.5	35 13.6 98 15	58.2	37 11.3 98 15	57.7	37 40.7 98 15	57.6	38 10.1 98 15	57.5	40 07.6 98 14	56.9	115
6	31 09.0 98 15	58.2	32 07.9 98 15	58.0	33 36.4 98 15	57.6	35 04.8 98 15	57.3	37 02.5 98 14	56.8	37 31.9 98 14	56.7	38 01.3 98 14	56.6	39 58.9 98 14	56.0	6
7	31 00.2 98 14	57.2	31 59.2 98 14	57.0	33 27.6 98 14	56.7	34 56.0 98 14	56.4	36 53.8 98 14	55.9	37 23.3 98 14	55.8	37 52.7 98 14	55.6	39 50.3 98 14	55.1	7
8	30 51.4 98 14	56.3	31 50.5 98 14	56.1	33 19.0 98 14	55.8	34 47.4 98 14	55.4	36 45.2 98 14	55.0	37 14.7 98 14	54.9	37 44.1 98 14	54.7	39 41.8 98 14	54.2	8
9	30 42.8 98 14	55.4	31 41.9 98 14	55.2	33 10.4 98 14	54.9	34 38.9 98 14	54.5	36 36.8 98 14	54.1	37 06.2 98 14	54.0	37 35.7 98 14	53.8	39 33.4 98 14	53.3	9
120	30 34.3 98 14	54.5	31 33.4 98 14	54.3	33 01.9 98 14	53.9	34 30.4 98 14	53.6	36 28.4 98 14	53.2	36 57.8 98 14	53.0	37 27.3 98 14	52.9	39 25.1 98 14	52.4	120
1	30 25.9 99 14	53.5	31 25.0 99 14	53.3	32 53.6 98 14	53.0	34 22.1 98 14	52.7	36 20.1 98 14	52.3	36 49.6 98 14	52.1	37 19.0 98 14	52.0	39 16.9 98 14	51.5	1
2	30 17.5 99 14	52.6	31 16.6 99 14	52.4	32 45.3 98 14	52.1	34 13.9 98 14	51.8	36 11.9 98 13	51.3	36 41.4 98 13	51.2	37 10.9 98 13	51.1	39 08.8 98 13	50.6	2
3	30 09.3 99 14	51.7	31 08.4 99 14	51.5	32 37.1 99 14	51.2	34 05.7 98 13	50.9	36 03.8 98 13	50.4	36 33.3 98 13	50.3	37 02.8 98 13	50.2	39 00.7 98 13	49.7	3
4	30 01.2 99 13	50.8	31 00.3 99 13	50.6	32 29.0 99 13	50.3	33 57.7 98 13	50.0	35 55.8 98 13	49.5	36 25.4 98 13	49.4	36 54.9 98 13	49.3	38 52.8 98 13	48.9	4
125	29 53.2 99 13	49.9	30 52.3 99 13	49.7	32 21.1 99 13	49.4	33 49.8 99 13	49.1	35 48.0 98 13	48.6	36 17.5 98 13	48.5	36 47.0 98 13	48.4	38 45.1 98 13	48.0	125
6	29 45.3 99 13	48.9	30 44.5 99 13	48.7	32 13.2 99 13	48.5	33 42.0 99 13	48.2	35 40.2 98 12	47.7	36 09.7 98 13	47.6	36 39.3 98 13	47.5	38 37.4 98 12	47.1	6
7	29 37.5 99 13	48.0	30 36.7 99 13	47.8	32 05.5 99 13	47.5	33 34.3 99 13	47.2	35 32.5 99 13	46.8	36 02.1 99 13	46.7	36 31.6 98 13	46.6	38 29.8 98 12	46.2	7
8	29 29.8 99 13	47.1	30 29.0 99 13	46.9	31 57.9 99 13	46.6	33 26.7 99 12	46.3	35 25.0 99 12	45.9	35 54.6 99 12	45.8	36 24.1 99 12	45.7	38 22.3 98 12	45.3	8
9	29 22.2 99 13	46.2	30 21.5 99 12	46.0	31 50.3 99 12	45.7	33 19.2 99 12	45.4	35 17.6 99 12	45.0	35 47.1 99 12	44.9	36 16.7 99 12	44.8	38 15.0 99 12	44.4	9
130	29 14.7 99 12	45.3	30 14.0 99 12	45.1	31 42.9 99 12	44.8	33 11.8 99 12	44.5	35 10.3 99 12	44.1	35 39.8 99 12	44.0	36 09.4 99 12	43.9	38 07.8 99 12	43.5	130
1	29 07.4 99 12	44.3	30 06.7 99 12	44.2	31 35.7 99 12	43.9	33 04.6 99 12	43.6	35 03.1 99 12	43.2	35 32.7 99 12	43.1	36 02.3 99 12	43.0	38 00.6 99 12	42.6	1
2	29 00.2 99 12	43.4	29 59.5 99 12	43.3	31 28.5 99 12	43.0	32 57.4 99 12	42.7	34 56.0 99 12	42.3	35 25.6 99 12	42.3	35 55.2 99 12	42.2	37 53.6 99 11	41.8	2
3	28 53.1 99 12	42.5	29 52.4 99 12	42.3	31 21.4 99 12	42.1	32 50.4 99 11	41.8	34 49.0 99 11	41.5	35 18.7 99 11	41.4	35 48.3 99 11	41.3	37 46.8 99 11	40.9	3
4	28 46.1 99 11	41.6	29 45.5 99 11	41.4	31 14.5 99 11	41.2	32 43.5 99 11	40.9	34 42.2 99 11	40.6	35 11.8 99 11	40.5	35 41.5 99 11	40.4	37 40.0 99 11	40.0	4
135	28 39.2 99 11	40.7	29 38.6 99 11	40.5	31 07.7 99 11	40.3	32 36.8 99 11	40.0	34 35.5 99 11	39.7	35 05.1 99 11	39.6	35 34.8 99 11	39.5	37 33.4 99 11	39.1	135
6	28 32.5 99 11	39.8	29 31.9 99 11	39.6	31 01.0 99 11	39.4	32 30.1 99 11	39.1	34 28.9 99 11	38.8	34 58.6 99 11	38.7	35 28.2 99 11	38.6	37 26.9 99 11	38.2	6
7	28 25.9 99 11	38.9	29 25.4 99 11	38.7	30 54.5 99 11	38.5	32 23.6 99 11	38.2	34 22.4 99 11	37.9	34 52.1 99 11	37.8	35 21.8 99 10	37.7	37 20.5 99 10	37.3	7
8	28 19.4 99 11	37.9	29 18.9 99 11	37.8	30 48.1 99 10	37.6	32 17.2 99 10	37.3	34 16.1 99 10	37.0	34 45.8 99 10	36.9	35 15.5 99 10	36.8	37 14.2 99 10	36.5	8
9	28 13.1 99 10	37.0	29 12.5 99 10	36.9	30 41.8 99 10	36.7	32 11.0 99 10	36.4	34 09.9 99 10	36.1	34 39.6 99 10	36.0	35 09.3 99 10	35.9	37 08.0 99 10	35.6	9
140	28 06.9 99 10	36.1	29 06.4 99 10	36.0	30 35.6 99 10	35.8	32 04.9 99 10	35.5	34 03.8 99 10	35.2	34 33.5 99 10	35.1	35 03.3 99 10	35.0	37 02.1 99 10	34.7	140
1	28 00.9 99 10	35.2	29 00.3 99 10	35.1	30 29.6 99 10	34.9	31 58.9 99 10	34.6	33 57.9 99 10	34.3	34 27.6 99 10	34.2	34 57.3 99 10	34.2	36 56.2 99 10	33.8	1
2	27 54.9 99 10	34.3	28 54.4 99 10	34.2	30 23.7 99 10	34.0	31 53.0 99 10	33.7	33 52.1 99 09	33.4	34 21.8 99 09	33.4	34 51.5 99 09	33.3	36 50.5 99 09	33.0	2
3	27 49.1 99 09	33.4	28 48.6 99 09	33.3	30 18.0 99 09	33.1	31 47.3 99 09	32.8	33 46.4 99 09	32.5	34 16.1 99 09	32.5	34 45.9 99 09	32.4	36 44.9 99 09	32.1	3
4	27 43.4 99 09	32.5	28 43.0 99 09	32.4	30 12.4 99 09	32.2	31 41.7 99 09	32.0	33 40.8 99 09	31.7	34 10.6 99 09	31.6	34 40.4 99 09	31.5	36 39.4 99 09	31.2	4
145	27 37.9 99 09	31.6	28 37.5 99 09	31.5	30 06.9 99 09	31.3	31 36.3 99 09	31.1	33 35.4 99 09	30.8	34 05.2 99 09	30.7	34 35.0 99 09	30.6	36 34.1 99 09	30.3	145
6	27 32.5 99 09	30.7	28 32.1 99 09	30.6	30 01.6 99 09	30.4	31 31.0 99 09	30.2	33 30.2 99 09	29.9	34 00.0 99 09	29.8	34 29.8 99 08	29.8	36 28.9 99 08	29.5	6
7	27 27.2 99 08	29.8	28 26.9 99 08	29.6	29 56.4 99 08	29.5	31 25.8 99 08	29.3	33 25.1 99 08	29.0	33 54.9 99 08	28.9	34 24.7 99 08	28.9	36 23.9 99 08	28.6	7
8	27 22.1 99 08	28.9	28 21.8 99 08	28.7	29 51.3 99 08	28.6	31 20.8 99 08	28.4	33 20.1 99 08	28.1	33 49.9 99 08	28.1	34 19.7 99 08	28.0	36 18.9 99 08	27.7	8
9	27 17.2 99 08	28.0	28 16.9 99 08	27.8	29 46.4 99 08	27.7	31 15.9 99 08	27.5	33 15.2 99 08	27.2	33 45.1 99 08	27.2	34 14.9 99 08	27.1	36 14.2 99 08	26.8	9
150	27 12.4 1.0 08	27.1	28 12.1 1.0 08	26.9	29 41.6 99 08	26.8	31 11.2 99 08	26.6	33 10.5 99 08	26.4	33 40.4 99 08	26.3	34 10.2 99 08	26.2	36 09.5 99 07	26.0	150
1	27 07.7 1.0 08	26.1	28 07.4 1.0 08	26.0	29 37.0 1.0 07	25.9	31 06.6 1.0 07	25.7	33 06.0 99 07	25.5	33 35.8 99 07	25.4	34 05.7 99 07	25.4	36 05.0 99 07	25.1	1
2	27 03.2 1.0 07	25.2	28 02.9 1.0 07	25.1	29 32.5 1.0 07	25.0	31 02.1 1.0 07	24.8	33 01.6 1.0 07	24.6	33 31.4 1.0 07	24.5	34 01.3 1.0 07	24.5	36 00.7 99 07	24.2	2
3	26 58.8 1.0 07	24.2	27 58.6 1.0 07	24.2	29 28.0 1.0 07	24.1	30 57.8 1.0 07	23.9	32 57.3 1.0 07	23.7	33 27.2 1.0 07	23.7	33 57.0 1.0 07	23.6	35 56.5 1.0 07	23.3	3
4	26 54.6 1.0 07	23.4	27 54.4 1.0 07	23.3	29 24.0 1.0 07	23.2	30 53.7 1.0 07	23.0	32 53.2 1.0 07	22.8	33 23.1 1.0 07	22.8	33 53.0 1.0 07	22.7	35 52.4 1.0 07	22.5	4
155	26 50.5 1.0 07	22.5	27 50.3 1.0 06	22.4	29 20.0 1.0 06	22.3	30 49.7 1.0 06	22.1	32 49.2 1.0 06	21.9	33 19.1 1.0 06	21.9	33 49.0 1.0 06	21.8	35 48.5 1.0 06	21.6	155
6	26 46.6 1.0 06	21.6	27 46.4 1.0 06	21.5	29 16.1 1.0 06	21.4	30 45.8 1.0 06	21.3	32 45.4 1.0 06	21.1	33 15.3 1.0 06	21.0	33 45.2 1.0 06	21.0	35 44.8 1.0 06	20.8	6
7	26 42.8 1.0 06	20.7	27 42.7 1.0 06	20.6	29 12.4 1.0 06	20.5	30 42.1 1.0 06	20.4	32 41.7 1.0 06	20.2	33 11.6 1.0 06	20.1	33 41.5 1.0 06	20.1	35 41.1 1.0 06	19.9	7
8	26 39.2 1.0 06	19.8	27 39.1 1.0 06	19.7	29 08.8 1.0 06	19.6	30 38.6 1.0 06	19.5	32 38.2 1.0 06	19.3	33 08.1 1.0 06	19.3	33 38.0 1.0 06	19.2	35 37.7 1.0 06	19.0	8
9	26 35.8 1.0 06	18.9	27 35.6 1.0 06	18.8	29 05.4 1.0 05	18.7	30 35.2 1.0 05	18.6	32 34.9 1.0 05	18.4	33 04.8 1.0 05	18.4	33 34.7 1.0 05	18.3	35 34.3 1.0 05	18.2	9
160	26 32.5 1.0 05	18.0	27 32.3 1.0 05	17.9	29 02.1 1.0 05	17.8	30 31.9 1.0 05	17.7	32 31.6 1.0 05	17.5	33 01.6 1.0 05	17.5	33 31.5 1.0 05	17.5	35 31.2 1.0 05	17.3	160
1	26 29.3 1.0 05	17.1	27 29.2 1.0 05	17.0	28 59.0 1.0 05	16.9	30 28.8 1.0 05	16.8	32 28.6 1.0 05	16.7	32 58.5 1.0 05	16.6	33 28.4 1.0 05	16.6	35 28.2 1.0 05	16.4	1
2	26 26.3 1.0 05	16.1	27 26.2 1.0 05	16.1	28 56.1 1.0 05	16.0	30 25.9 1.0 05	15.9	32 25.7 1.0 05	15.8	32 55.6 1.0 05	15.7	33 25.5 1.0 05	15.6	35 25.3 1.0 05	15.6	2
3	26 23.5 1.0 04	15.3	27 23.4 1.0 04	15.2	28 53.3 1.0 04	15.1	30 23.1 1.0 04	15.0	32 22.9 1.0 04	14.9	32 52.9 1.0 04	14.9	33 22.8 1.0 04	14.8	35 22.6 1.0 04	14.7	3
4	26 20.8 1.0 04	14.4	27 20.8 1.0 04	14.3	28 50.6 1.0 04	14.3	30 20.5 1.0 04	14.2	32 20.3 1.0 04	14.0	32 50.3 1.0 04	14.0	33 20.2 1.0 04	14.0	35 20.0 1.0 04	13.8	4
165	26 18.3 1.0 04	13.5	27 18.3 1.0 04	13.5	28 48.1 1.0 04	13.4	30 18.0 1.0 04	13.3	32 17.9 1.0 04	13.2	32 47.8 1.0 04	13.1	33 17.8 1.0 04	13.1	35 17.6 1.0 04	13.0	165
6	26 16.0 1.0 04	12.6	27 15.9 1.0 04	12.6	28 45.8 1.0 04	12.5	30 15.7 1.0 04	12.4	32 15.6 1.0 04	12.3	32 45.5 1.0 04	12.2	33 15.5 1.0 04	12.2	35 15.3 1.0 04	12.1	6
7	26 13.8 1.0 03	11.7	27 13.7 1.0 03	11.7	28 43.6 1.0 03	11.6	30 13.6 1.0 03	11.5	32 13.4 1.0 03	11.4	32 43.4 1.0 03	11.4	33 13.4 1.0 03	11.3	35 13.2 1.0 03	11.3	7
8	26 11.8 1.0 03	10.8	27 11.7 1.0 03	10.8	28 41.6 1.0 03	10.7	30 11.6 1.0 03	10.6	32 11.4 1.0 03	10.5	32 41.4 1.0 03	10.5	33 11.4 1.0 03	10.4	35 11.3 1.0 03	10.4	8
9	26 09.9 1.0 03	09.9	27 09.8 1.0 03	09.9	28 39.8 1.0 03	09.8	30 09.7 1.0 03	09.7	32 09.6 1.0 03	09.6	32 39.6 1.0 03	09.6	33 09.6 1.0 03	09.6	35 09.5 1.0 03	09.5	9
170	26 08.2 1.0 03	09.0	27 08.1 1.0 03	09.0	28 38.1 1.0 03	08.8	30 08.0 1.0 03	08.8	32 08.0 1.0 03	08.8	32 37.9 1.0 02	08.7	33 07.9 1.0 02	08.7	35 07.8 1.0 02	08.6	170
1	26 06.6 1.0 02	08.1	27 06.6 1.0 02	08.1	28 36.5 1.0 02	08.0	30 06.4 1.0 02	07.9	32 06.4 1.0 02	07.9	32 36.4 1.0 02	07.9	33 06.4 1.0 02	07.8	35 06.3 1.0 02	07.8	1
2	26 05.2 1.0 02	07.2	27 05.2 1.0 02	07.2	28 35.2 1.0 02	07.1	30 05.1 1.0 02	07.1	32 05.1 1.0 02	07.0	32 35.1 1.0 02	07.0	33 05.1 1.0 02	07.0	35 05.0 1.0 02	06.9	2
3	26 04.0 1.0 02	06.3	27 04.0 1.0 02	06.3	28 34.0 1.0 02	06.2	30 03.9 1.0 02	06.2	32 03.9 1.0 02	06.1	32 33.9 1.0 02	06.1	33 03.9 1.0 02	06.1	35 03.8 1.0 02	06.0	3
4	26 02.9 1.0 02	05.4	27 02.9 1.0 02	05.4	28 32.9 1.0 02	05.3	30 02.9 1.0 01	05.3	32 02.9 1.0 01	05.3	32 32.9 1.0 01	05.2	33 02.9 1.0 01	05.2	35 02.8 1.0 01	05.2	4
175	26 02.0 1.0 01	04.5	27 02.0 1.0 01	04.5	28 32.0 1.0 01	04.5	30 02.0 1.0 01	04.4	32 02.0 1.0 01	04.4	32 32.0 1.0 01	04.4	33 02.0 1.0 01	04.3	35 02.0 1.0 01	04.3	175
6	26 01.3 1.0 01	03.6	27 01.3 1.0 01	03.6	28 31.3 1.0 01	03.6	30 01.3 1.0 01	03.5	32 01.3 1.0 01	03.5	32 31.3 1.0 01	03.5	33 01.3 1.0 01	03.5	35 01.3 1.0 01	03.5	6
7	26 00.7 1.0 01	02.7	27 00.7 1.0 01	02.7	28 30.7 1.0 01	02.7	30 00.7 1.0 01	02.7	32 00.7 1.0 01	02.6	32 30.7 1.0 01	02.6	33 00.7 1.0 01	02.6	35 00.7 1.0 01	02.6	7
8	26 00.3 1.0 00	01.8	27 00.3 1.0 00	01.8	28 30.3 1.0 00	01.8	30 00.3 1.0 00	01.8	32 00.3 1.0 00	01.8	32 30.3 1.0 00	01.7	33 00.3 1.0 00	01.7	35 00.3 1.0 00	01.7	8
9	26 00.1 1.0 00	00.9	27 00.1 1.0 00	00.9	28 30.1 1.0 00	00.9	30 00.1 1.0 00	00.9	32 00.1 1.0 00	00.9	32 30.1 1.0 00	00.9	33 00.1 1.0 00	00.9	35 00.1 1.0 00	00.9	9
180	26 00.0 1.0 00	00.0	27 00.0 1.0 00	00.0	28 30.0 1.0 00	00.0	30 00.0 1.0 00	00.0	32 00.0 1.0 00	00.0	32 30.0 1.0 00	00.0	33 00.0 1.0 00	00.0	35 00.0 1.0 00	00.0	180

Lat 81°

Lat 82°

Lat 83°

H.A.	46° 00' Alt.	Δd Δt	Az.	47° 00' Alt.	Δd Δt	Az.	48° 30' Alt.	Δd Δt	Az.	49° 30' Alt.	Δd Δt	Az.	50° 30' Alt.	Δd Δt	Az.	51° 30' Alt.	Δd Δt	Az.	52° 30' Alt.	Δd Δt	Az.	54° 00' Alt.	Δd Δt	Az.	H.A.
00	56 00.0	1.00 0	180.0	57 00.0	1.00 0	180.0	58 30.0	1.00 0	180.0	59 30.0	1.00 0	180.0	60 30.0	1.00 0	180.0	61 30.0	1.00 0	180.0	62 30.0	1.00 0	180.0	64 00.0	1.00 0	180.0	00
1	55 59.9	1.00 1	178.8	56 59.9	1.00 1	178.7	58 29.9	1.00 1	178.7	59 29.9	1.00 1	178.7	60 29.9	1.00 1	178.7	61 29.9	1.00 1	178.7	62 29.9	1.00 1	178.7	63 59.9	1.00 1	178.7	1
2	55 59.5	1.00 1	177.5	56 59.5	1.00 1	177.5	58 29.5	1.00 1	177.5	59 29.5	1.00 1	177.4	60 29.5	1.00 1	177.4	61 29.5	1.00 1	177.4	62 29.5	1.00 1	177.4	63 59.5	1.00 1	177.3	2
3	55 59.0	1.00 1	176.3	56 59.0	1.00 1	176.2	58 29.0	1.00 1	176.2	59 29.0	1.00 1	176.1	60 28.9	1.00 1	176.1	61 28.9	1.00 1	176.1	62 28.9	1.00 1	176.0	63 58.9	1.00 1	176.0	3
4	55 58.2	1.00 2	175.0	56 58.2	1.00 2	175.0	58 28.2	1.00 2	174.9	59 28.1	1.00 2	174.9	60 28.1	1.00 2	174.8	61 28.1	1.00 2	174.8	62 28.1	1.00 2	174.7	63 58.1	1.00 2	174.6	4
05	55 57.2	1.00 2	173.8	56 57.2	1.00 2	173.7	58 27.1	1.00 2	173.7	59 27.1	1.00 2	173.6	60 27.1	1.00 2	173.5	61 27.0	1.00 2	173.5	62 27.0	1.00 2	173.4	63 57.0	1.00 2	173.3	05
6	55 55.9	1.00 2	172.6	56 55.9	1.00 2	172.5	58 25.9	1.00 2	172.4	59 25.8	1.00 2	172.3	60 25.8	1.00 3	172.3	61 25.7	1.00 3	172.2	62 25.7	1.00 3	172.1	63 55.6	1.00 3	172.0	6
7	55 54.5	1.00 3	171.3	56 54.4	1.00 3	171.2	58 24.4	1.00 3	171.1	59 24.3	1.00 3	171.1	60 24.3	1.00 3	171.0	61 24.2	1.00 3	170.9	62 24.1	1.00 3	170.8	63 54.0	1.00 3	170.6	7
8	55 52.8	1.00 3	170.1	56 52.7	1.00 3	170.0	58 22.6	1.00 3	169.9	59 22.6	1.00 3	169.8	60 22.5	1.00 3	169.6	61 22.4	1.00 3	169.6	62 22.4	1.00 3	169.5	63 52.1	1.00 3	169.3	8
9	55 50.9	1.00 4	168.8	56 50.8	1.00 4	168.8	58 20.7	1.00 4	168.6	59 20.6	1.00 4	168.5	60 20.5	1.00 4	168.4	61 20.4	1.00 4	168.3	62 20.3	1.00 4	168.2	63 50.2	1.00 4	168.0	9
10	55 48.8	1.00 4	167.6	56 48.7	1.00 4	167.5	58 18.5	1.00 4	167.3	59 18.4	1.00 4	167.2	60 18.3	1.00 4	167.1	61 18.2	1.00 4	167.0	62 18.1	1.00 4	166.9	63 47.9	1.00 4	166.6	10
1	55 46.4	1.00 4	166.4	56 46.3	1.00 4	166.3	58 16.1	1.00 4	166.1	59 16.0	1.00 4	166.0	60 15.9	1.00 4	165.8	61 15.7	1.00 5	165.7	62 15.6	1.00 5	165.5	63 45.4	1.00 5	165.3	1
2	55 43.9	1.00 5	165.0	56 43.7	1.00 5	164.9	58 13.5	1.00 5	164.8	59 13.4	1.00 5	164.7	60 13.2	1.00 5	164.6	61 13.1	1.00 5	164.4	62 12.9	1.00 5	164.2	63 42.6	1.00 5	164.0	2
3	55 41.1	1.00 5	163.9	56 40.9	1.00 5	163.8	58 10.7	1.00 5	163.6	59 10.5	1.00 5	163.4	60 10.3	1.00 5	163.1	61 10.1	1.00 5	163.1	62 09.9	1.00 5	162.9	63 39.6	1.00 5	162.7	3
4	55 38.1	1.00 5	162.7	56 37.9	1.00 5	162.5	58 07.6	1.00 5	162.3	59 07.4	1.00 6	162.2	60 07.2	1.00 6	162.0	61 07.0	1.00 6	161.8	62 06.8	1.00 6	161.6	63 36.4	1.00 6	161.3	4
15	55 34.9	1.00 6	161.5	56 34.7	1.00 6	161.3	58 04.4	1.00 6	161.1	59 04.1	1.00 6	160.9	60 03.9	1.00 6	160.7	61 03.6	1.00 6	160.6	62 03.4	1.00 6	160.4	63 32.9	99 06	160.0	15
6	55 31.4	1.00 6	160.2	56 31.2	1.00 6	160.1	58 00.9	1.00 6	159.8	59 00.6	1.00 6	159.7	60 00.4	1.00 6	159.5	61 00.1	1.00 6	159.3	61 59.8	99 06	159.1	63 29.3	99 06	158.7	6
7	55 27.8	1.00 7	158.9	56 27.6	1.00 6	158.8	57 57.2	1.00 7	158.6	58 56.9	1.00 7	158.4	59 56.6	99 07	158.2	60 56.3	99 07	158.0	61 55.9	99 07	157.8	63 25.4	99 07	157.4	7
8	55 24.0	1.00 7	157.8	56 23.7	1.00 7	157.6	57 53.3	99 07	157.3	58 53.0	99 07	157.1	59 52.6	99 07	156.9	60 52.3	99 07	156.7	61 51.9	99 07	156.5	63 21.3	99 07	156.1	8
9	55 19.9	1.00 7	156.6	56 19.6	99 07	156.4	57 49.2	99 07	156.1	58 48.8	99 07	155.9	59 48.4	99 07	155.7	60 48.0	99 07	155.5	61 47.6	99 07	155.2	63 16.9	99 07	154.8	9
20	55 15.7	99 07	155.4	56 15.4	99 07	155.2	57 44.8	99 08	154.9	58 44.4	99 08	154.7	59 44.0	99 08	154.4	60 43.6	99 08	154.2	61 43.1	99 08	153.9	63 12.4	99 08	153.5	20
1	55 11.3	99 08	154.1	56 10.9	99 08	154.0	57 40.3	99 08	153.6	58 39.9	99 08	153.4	59 39.4	99 08	153.2	60 39.0	99 08	152.9	61 38.5	99 08	152.7	63 07.7	99 08	152.2	1
2	55 06.6	99 08	152.9	56 06.2	99 08	152.7	57 35.6	99 08	152.4	58 35.1	99 08	152.2	59 34.6	99 08	151.9	60 34.1	99 08	151.7	61 33.6	99 08	151.4	63 02.7	99 09	150.9	2
3	55 01.8	99 08	151.7	56 01.3	99 08	151.5	57 30.7	99 09	151.2	58 30.2	99 09	150.9	59 29.6	99 09	150.7	60 29.1	99 09	150.4	61 28.5	99 09	150.1	62 57.5	99 09	149.7	3
4	54 56.7	99 09	150.5	55 56.3	99 09	150.3	57 25.5	99 09	150.0	58 25.0	99 09	149.7	59 24.4	99 09	149.4	60 23.8	99 09	149.2	61 23.2	99 09	148.9	62 52.2	99 09	148.4	4
25	54 51.5	99 09	149.3	55 51.0	99 09	149.1	57 20.2	99 09	148.7	58 19.6	99 09	148.5	59 19.0	99 09	148.2	60 18.4	99 09	147.9	61 17.7	99 09	147.6	62 46.6	99 10	147.1	25
6	54 46.1	99 09	148.1	55 45.6	99 09	147.9	57 14.7	99 09	147.5	58 14.1	99 10	147.3	59 13.5	99 10	147.0	60 12.8	99 10	146.7	61 12.0	99 10	146.4	62 40.9	99 10	145.8	6
7	54 40.5	99 10	146.9	55 40.0	99 10	146.7	57 09.0	99 10	146.3	58 08.4	99 10	146.0	59 07.7	99 10	145.8	60 07.0	99 10	145.4	61 06.2	99 10	145.1	62 34.9	99 10	144.6	7
8	54 34.8	99 10	145.8	55 34.1	99 10	145.5	57 03.2	99 10	145.1	58 02.5	99 10	144.8	59 01.7	99 10	144.5	60 01.0	99 10	144.2	61 00.1	99 10	143.9	62 28.8	98 11	143.3	8
9	54 28.8	99 10	144.6	55 28.2	99 10	144.3	56 57.1	99 10	143.9	57 56.4	99 10	143.6	58 55.6	99 11	143.3	59 54.8	99 11	143.0	60 53.9	98 11	142.6	62 22.5	98 11	142.1	9
30	54 22.7	99 10	143.4	55 22.0	99 11	143.1	56 50.9	99 11	142.7	57 50.1	99 11	142.4	58 49.3	99 11	142.1	59 48.4	98 11	141.8	60 47.5	98 11	141.4	62 16.0	98 11	140.8	30
1	54 16.4	99 11	142.2	55 15.7	99 11	141.9	56 44.5	99 11	141.5	57 43.7	99 11	141.2	58 42.8	99 11	140.9	59 41.9	98 11	140.5	60 40.9	98 11	140.2	62 09.3	98 11	139.6	1
2	54 09.9	99 11	141.0	55 09.1	99 11	140.8	56 37.9	99 11	140.3	57 37.1	99 11	140.0	58 36.1	99 11	139.7	59 35.2	98 11	139.3	60 34.1	98 12	139.0	62 02.5	98 12	138.4	2
3	54 03.3	99 11	139.9	55 02.5	99 11	139.6	56 31.2	99 12	139.1	57 30.3	99 12	138.8	58 29.3	98 12	138.5	59 28.3	98 12	138.1	60 27.2	98 12	137.8	61 55.5	98 12	137.1	3
4	53 56.5	99 12	138.7	54 55.6	99 12	138.4	56 24.3	98 12	138.0	57 23.3	98 12	137.6	58 22.3	98 12	137.3	59 21.3	98 12	136.9	60 20.1	98 12	136.5	61 48.3	98 12	135.9	4
35	53 49.5	99 12	137.5	54 48.6	98 12	137.3	56 17.2	98 12	136.8	57 16.2	98 12	136.5	58 15.2	98 12	136.1	59 14.1	98 12	135.7	60 12.9	98 12	135.3	61 41.0	97 13	134.7	35
6	53 42.4	99 12	136.4	54 41.5	98 12	136.1	56 10.0	98 13	135.6	57 09.0	98 13	135.3	58 07.9	98 13	134.9	59 06.7	98 12	134.5	60 05.5	98 13	134.1	61 33.5	98 13	133.5	6
7	53 35.2	98 13	135.2	54 34.2	98 12	134.9	56 02.7	98 13	134.4	57 01.6	98 13	134.1	58 00.4	98 13	133.7	58 59.2	98 13	133.3	59 57.9	98 13	132.9	61 25.9	98 13	132.3	7
8	53 27.7	98 13	134.1	54 26.7	98 13	133.8	55 55.2	98 13	133.3	56 54.0	98 13	132.9	57 52.8	98 13	132.6	58 51.6	98 13	132.2	59 50.2	98 13	131.8	61 18.1	97 13	131.1	8
9	53 20.2	98 13	132.9	54 19.1	98 13	132.6	55 47.5	98 13	132.1	56 46.3	98 13	131.8	57 45.1	98 13	131.4	58 43.8	98 13	131.0	59 42.4	98 13	130.6	61 10.2	97 13	129.9	9
40	53 12.5	98 13	131.8	54 11.4	98 13	131.5	55 39.7	98 13	131.0	56 38.5	98 13	130.6	57 37.2	98 13	130.2	58 35.8	98 14	129.8	59 34.4	98 14	129.4	61 02.1	97 14	128.7	40
1	53 04.7	98 13	130.7	54 03.5	98 13	130.3	55 31.8	98 13	129.8	56 30.5	98 14	129.4	57 29.2	98 14	129.1	58 27.8	98 14	128.7	59 26.3	97 14	128.2	60 53.9	97 14	127.5	1
2	52 56.7	98 14	129.5	53 55.5	98 14	129.2	55 23.7	98 14	128.7	56 22.4	98 14	128.3	57 21.0	98 14	127.9	58 19.6	98 14	127.5	59 18.0	97 14	127.1	60 45.6	97 14	126.4	2
3	52 48.6	98 14	128.4	53 47.4	98 14	128.1	55 15.5	98 14	127.5	56 14.2	98 14	127.2	57 12.7	98 14	126.8	58 11.2	97 14	126.4	59 09.7	97 14	125.9	60 37.1	97 14	125.2	3
4	52 40.4	98 14	127.3	53 39.1	98 14	126.9	55 07.2	98 14	126.4	56 05.8	98 14	126.0	57 04.3	98 14	125.6	58 02.8	97 14	125.2	59 01.2	97 14	124.8	60 28.5	97 14	124.0	4
45	52 32.0	98 14	126.1	53 30.7	98 14	125.8	54 58.7	98 14	125.3	55 57.3	98 14	124.9	56 55.8	97 14	124.5	57 54.2	97 14	124.1	58 52.6	97 15	123.6	60 19.9	97 15	122.9	45
6	52 23.5	98 14	125.0	53 22.2	98 14	124.7	54 50.2	98 14	124.1	55 48.7	97 15	123.8	56 47.2	97 15	123.4	57 45.5	97 15	122.9	58 43.8	97 15	122.5	60 11.1	97 15	121.7	6
7	52 14.9	98 14	123.9	53 13.6	98 15	123.6	54 41.5	98 15	123.0	55 40.0	97 15	122.6	56 38.4	97 15	122.2	57 36.7	97 15	121.8	58 35.0	97 15	121.3	60 02.1	97 15	120.6	7
8	52 06.2	98 15	122.8	53 04.9	98 15	122.5	54 32.7	97 15	121.9	55 31.1	97 15	121.5	56 29.5	97 15	121.1	57 27.8	97 15	120.7	58 26.0	97 15	120.2	59 53.1	97 15	119.5	8
9	51 57.4	98 15	121.7	52 56.0	98 15	121.4	54 23.8	97 15	120.8	55 22.2	97 15	120.4	56 20.6	97 15	120.0	57 18.8	97 15	119.5	58 17.0	97 15	119.1	59 44.0	97 15	118.3	9
50	51 48.5	98 15	120.6	52 47.1	98 15	120.3	54 14.8	97 15	119.7	55 13.2	97 15	119.3	56 11.5	97 15	118.9	57 09.7	97 15	118.4	58 07.8	97 15	118.0	59 34.8	96 16	117.2	50
1	51 39.5	98 15	119.5	52 38.0	97 15	119.2	54 05.7	97 16	118.6	55 04.0	97 15	118.3	56 02.3	97 15	117.8	57 00.5	97 16	117.3	57 58.6	97 16	116.9	59 25.5	96 16	116.1	1
2	51 30.4	98 15	118.4	52 28.9	97 15	118.1	53 56.5	97 16	117.5	54 54.8	97 16	117.1	55 53.0	97 16	116.7	56 51.2	97 16	116.2	57 49.2	96 16	115.7	59 16.1	96 16	115.0	2
3	51 21.2	98 16	117.3	52 19.6	97 16	117.0	53 47.2	97 16	116.4	54 45.5	97 16	116.0	55 43.7	97 16	115.6	56 41.8	97 16	115.1	57 39.8	96 16	114.6	59 06.6	96 16	113.9	3
4	51 11.9	97 16	116.3	52 10.3	97 16	115.9	53 37.8	97 16	115.3	54 36.1	97 16	114.9	55 34.2	97 16	114.5	56 32.3	97 16	114.0	57 30.3	96 16	113.5	58 57.0	96 16	112.8	4
55	51 02.5	97 16	115.2	52 00.9	97 16	114.8	53 28.4	97 16	114.2	54 26.6	97 16	113.8	55 24.7	97 16	113.4	56 22.8	97 16	112.9	57 20.7	96 16	112.5	58 47.4	96 16	111.7	55
6	50 53.0	97 16	114.1	51 51.4	97 16	113.7	53 19.0	97 16	113.1	54 17.0	97 16	112.7	55 15.1	97 16	112.3	56 13.1	97 16	111.8	57 11.0	96 16	111.4	58 37.7	96 16	110.6	6
7	50 43.5	97 16	113.0	51 41.8	97 16	112.7	53 09.2	97 16	112.1	54 07.4	97 16	111.7	55 05.4	97 16	111.2	56 03.4	97 16	110.8	57 01.3	96 16	110.3	58 27.9	96 16	109.5	7
8	50 33.8	97 16	112.0	51 32.2	97 16	111.6	52 59.5	97 16	111.0	53 57.7	97 16	110.6	54 55.7	97 16	110.2	55 53.6	96 16	109.7	56 51.5	96 16	109.2	58 18.0	96 17	108.4	8
9	50 24.1	97 16	110.9	51 22.4	97 16	110.5	52 49.8	97 16	109.9	53 47.9	97 16	109.5	54 45.9	97 16	109.1	55 43.8	96 16	108.6	56 41.6	96 17	108.1	58 08.1	96 17	107.4	9
60	50 14.4	97 16	109.8	51 12.7	97 16	109.5	52 39.9	97 16	108.9	53 38.0	97 17	108.5	54 36.0	97 17	108.0	55 33.9	96 17	107.6	56 31.7	96 17	107.1	57 58.1	96 17	106.3	60
1	50 04.5	97 16	108.8	51 02.8	97 17	108.4	52 30.0	97 17	107.8	53 28.1	97 17	107.4	54 26.1	97 17	107.0	55 23.9	96 17	106.5	56 21.7	96 17	106.0	57 48.1	96 17	105.2	1
2	49 54.6	97 17	107.7	50 52.9	97 17	107.4	52 20.1	97 17	106.8	53 18.1	97 17	106.4	54 16.1	96 17	105.9	55 13.9	96 17	105.5	56 11.7	96 17	105.0	57 38.0	96 17	104.2	2
3	49 44.7	97 17	106.7	50 42.9	97 17	106.3	52 10.1	97 17	105.7	53 08.1	97 17	105.3	54 06.0	96 17	104.9	55 03.9	96 17	104.4	56 01.6	96 17	103.9	57 27.9	96 17	103.1	3
4	49 34.7	97 17	105.7	50 32.9	97 17	105.3	52 00.0	97 17	104.7	52 58.0	97 17	104.3	53 55.9	96 17	103.8	54 53.7	96 17	103.4	55 51.4	96 17	102.9	57 17.7	96 17	102.1	4
65	49 24.6	97 17	104.6	50 22.8	97 17	104.2	51 49.9	97 17	103.6	52 47.9	97 17	103.2	53 45.8	96 17	102.8	54 43.6	96 17	102.3	55 41.3	96 17	101.8	57 07.5	96 17	101.1	65
6	49 14.5	97 17	103.6	50 12.7	97 17	103.2	51 39.8	97 17	102.6	52 37.7	97 17	102.2	53 35.6	96 17	101.8	54 33.4	96 17	101.3	55 31.0	96 17	100.8	56 57.3	96 17	100.0	6
7	49 04.4	97 17	102.6	50 02.5	97 17	102.2	51 29.6	97 17	101.6	52 27.5	96 17	101.2	53 25.4	96 17	100.7	54 23.1	96 17	100.3	55 20.8	96 17	99.8	56 47.0	96 17	99.0	7
8	48 54.2	97 17	101.5	49 52.3	97 17	101.1	51 19.4	97 17	100.5	52 17.3	96 17	100.1	53 15.1	96 17	99.7	54 12.9	96 17	99.2	55 10.5	96 17	98.7	56 36.7	96 17	98.0	8
9	48 44.0	97 17	100.5	49 42.1	97 17	100.1	51 09.1	97 17	99.5	52 07.0	96 17	99.1	53 04.9	96 17	98.7	54 02.6	96 17	98.2	55 00.2	96 17	97.7	56 26.4	96 17	97.0	9
70	48 33.7	97 17	99.5	49 31.8	97 17	99.1	50 58.8	97 17	98.5	51 56.7	96 17	98.1	52 54.5	96 17	97.6	53 52.3	96 17	97.2	54 49.9	96 17	96.7	56 16.0	96 17	95.9	70
1	48 23.4	97 17	98.5	49 21.5	97 17	98.1	50 48.5	97 17	97.5	51 46.4	96 17	97.1	52 44.2	96 17	96.6	53 41.9	96 17	96.2	54 39.5	96 17	95.7	56 05.7	96 17	94.9	1
2	48 13.1	97 17	97.5	49 11.2	97 17	97.1	50 38.2	97 17	96.5	51 36.1	96 17	96.1	52 33.8	96 17	95.6	53 31.5	96 17	95.2	54 29.1	96 17	94.7	55 55.3	96 17	93.9	2
3	48 02.7	97 17	96.5	49 00.8	97 17	96.1	50 27.8	97 17	95.5	51 25.7	96 17	95.1	52 23.5	96 17	94.6	53 21.2	96 17	94.2	54 18.7	96 17	93.7	55 44.9	96 17	92.9	3
4	47 52.4	97 17	95.4	48 50.5	97 17	95.1	50 17.4	97 17	94.5	51 15.3	96 17	94.1	52 13.1	96 17	93.6	53 10.8	96 17	93.2	54 08.3	96 17	92.7	55 34.5	96 17	91.9	4
75	47 42.0	97 17	94.4	48 40.1	97 17	94.1	49 56.6	97 17	93.5	50 54.5	96 17	92.1	51 52.3	96 17	92.6	52 49.9	96 17	91.6	53 47.5	96 17	91.7	55 24.0	96 17	90.9	75
6	47 31.6	97 17	93.4	48 29.7	97 17	93.1	49 46.6	97 17	92.5	50 44.1	96 17	92.1	51 41.8	96 17	91.6	52 39.5	96 17	91.2	53 37.1	96 17	89.7	55 03.2	96 17	89.0	6
7	47 21.2	97 17	92.5	48 19.3	97 17	92.1	49 46.2	97 17	91.5	50 44.1	96 17	91.1	51 41.8	96 17	90.6	52 39.5	96 17	90.2	53 37.1	96 17	89.7	55 03.2	96 17	89.0	7
8	47 10.8	97 17	91.5	48 08.9	97 17	91.1	49 35.8	97 17	90.5	50 33.7	96 17	90.1	51 31.4	96 17	89.7	52 29.1	96 17	89.2	53 26.7	96 17	88.7	54 52.8	96 17	88.0	8
9	47 00.4	97 17	90.5	47 58.4	97 17	90.1	49 25.4	97 17	89.5	50 23.2	96 17	89.1	51 21.0	96 17	88.7	52 18.7	96 17	88.2	53 16.2	96 17	87.8	54 42.4	96 17	87.0	9
80	46 50.0	97 17	89.5	47 48.0	97 17	89.1	49 14.9	97 17	88.5	50 12.8	96 17	88.1	51 10.6	96 17	87.7	52 08.3	96 16	87.3	53 05.8	96 16	86.8	54 32.0	96 16	86.1	80
1	46 39.5	97 17	88.5	47 37.6	97 17	88.1	49 04.6	97 17	87.6	50 02.4	96 17	87.1	51 00.2	96 17	86.7	51 57.9	96 16	86.3	52 55.4	96 16	85.8	54 21.6	96 16	85.1	1
2	46 29.1	97 17	87.5	47 27.2	97 17	87.2	48 54.1	97 17	86.6	49 52.0	96 17	86.2	50 49.8	96 17	85.8	51 47.5	96 16	85.3	52 45.1	96 16	84.9	54 11.2	96 16	84.1	2
3	46 18.7	97 17	86.6	47 16.8	97 17	86.2	48 43.8	97 17	85.6	49 41.6	96 17	85.2	50 39.4	96 17	84.8	51 37.1	96 16	84.3	52 34.7	96 16	83.9	54 00.9	96 16	83.2	3
4	46 08.3	97 17	85.6	47 06.4	97 17	85.2	48 33.4	97 17	84.6	49 31.2	96 17	84.2	50 29.0	96 17	83.8	51 26.7	96 16	83.4	52 24.3	96 16	82.9	53 50.5	96 16	82.2	4
85	45 57.9	97 17	84.6	46 56.0	97 17	84.2	48 22.9	97 17	83.7	49 20.9	96 17	83.3	50 18.7	96 17	82.9	51 16.4	96 17	82.4	52 14.0	96 17	82.0	53 40.2	96 17	81.3	85
6	45 47.6	97 17	83.6	46 45.7	97 17	83.3	48 12.7	97 17	82.7	49 10.6	96 17	82.3	50 08.4	96 17	81.9	51 06.1	96 17	81.5	52 03.7	96 17	81.0	53 29.9	96 17	80.3	6
7	45 37.2	97 17	82.7	46 35.3	97 17	82.3	48 02.3	97 17	81.8	49 00.2	96 17	81.4	49 58.1	96 17	80.9	50 55.8	96 17	80.5	51 53.4	96 17	80.1	53 19.7	96 17	79.4	7
8	45 26.9	97 17	81.7	46 25.0	97 17	81.4	47 52.0	97 17	80.8	48 50.0	96 17	80.4	49 47.8	96 17	80.0	50 45.5	96 17	79.6	51 43.2	96 17	79.1	53 09.5	96 17	78.4	8
9	45 16.6	97 17	80.8	46 14.7	97 17	80.4	47 41.8	97 17	79.8	48 39.7	96 17	79.5	49 37.5	96 17	79.0	50 35.3	96 17	78.6	51 33.0	96 17	78.2	52 59.3	96 17	77.5	9
90	45 06.3	97 17	79.8	46 04.5	97 17	79.5	47 31.5	97 17	78.9	48 29.5	96 17	78.5	49 27.3	96 17	78.1	50 25.1	96 17	77.7	51 22.8	96 17	77.2	52 49.1	96 17	76.6	90

H.A.	46° 00' Alt	Δd Δt	Az	47° 00' Alt	Δd Δt	Az	48° 30' Alt	Δd Δt	Az	49° 30' Alt	Δd Δt	Az	50° 30' Alt	Δd Δt	Az	51° 30 Alt	Δd Δt	Az	52° 30' Alt	Δd Δt	Az	54° 00' Alt	Δd Δt	Az	H.A.
91	44 56.1	97 17	78.9	45 54.2	97 17	78.5	47 21.3	97 17	77.9	48 19.3	97 17	77.6	49 17.2	96 17	77.2	50 14.9	96 17	76.7	51 12.6	96 17	76.3	52 39.0	96 17	75.6	91
2	44 45.9	97 17	77.9	45 44.1	97 17	77.6	47 11.1	97 17	77.0	48 09.1	97 17	76.6	49 07.0	97 17	76.2	50 04.8	96 17	75.8	51 02.5	96 17	75.4	52 28.9	96 17	74.7	2
3	44 35.7	97 17	77.0	45 33.9	97 17	76.6	47 01.0	97 17	76.1	47 59.0	97 17	75.7	48 56.9	97 17	75.3	49 54.7	96 17	74.9	50 52.5	96 17	74.5	52 18.9	96 17	73.8	3
4	44 25.6	97 17	76.0	45 23.8	97 17	75.7	46 50.9	97 17	75.1	47 48.9	97 17	74.7	48 46.9	96 17	74.4	49 44.7	96 17	74.0	50 42.5	96 17	73.5	52 08.9	96 17	72.9	4
95	44 15.5	97 17	75.1	45 13.7	97 17	74.7	46 40.9	97 17	74.2	47 38.9	97 17	73.8	48 36.9	97 17	73.4	49 34.7	96 17	73.0	50 32.5	96 17	72.6	51 59.0	96 16	71.9	95
6	44 05.4	97 17	74.1	45 03.7	97 17	73.8	46 30.9	97 17	73.3	47 28.9	97 17	72.9	48 26.9	97 17	72.5	49 24.8	96 16	72.1	50 22.6	96 16	71.7	51 49.1	96 16	71.0	6
7	43 55.5	97 17	73.2	44 53.7	97 17	72.9	46 20.9	97 16	72.3	47 19.0	97 16	72.0	48 17.0	97 16	71.6	49 14.9	96 16	71.2	50 12.7	96 16	70.8	51 39.3	96 16	70.1	7
8	43 45.5	97 16	72.3	44 43.8	97 16	71.9	46 11.0	97 16	71.4	47 09.1	97 16	71.0	48 07.1	97 16	70.7	49 05.1	96 16	70.3	50 02.9	96 16	69.8	51 29.5	96 16	69.2	8
9	43 35.6	97 16	71.3	44 33.9	97 16	71.0	46 01.2	97 16	70.5	46 59.3	97 16	70.1	47 57.3	97 16	69.7	48 55.3	96 16	69.3	49 53.2	96 16	68.9	51 19.8	00 16	68.3	9
100	43 25.8	97 16	70.4	44 24.1	97 16	70.1	45 51.4	97 16	69.5	46 49.5	97 16	69.2	47 47.6	97 16	68.8	48 45.6	97 16	68.4	49 43.5	96 16	68.0	51 10.2	96 16	67.4	100
1	43 16.0	97 16	69.5	44 14.3	97 16	69.1	45 41.7	97 16	68.6	46 39.8	97 16	68.3	47 37.9	97 16	67.9	48 35.9	97 16	67.5	49 33.8	96 16	67.1	51 00.6	96 16	66.5	1
2	43 06.3	97 16	68.5	44 04.6	97 16	68.2	45 32.0	97 16	67.7	46 30.2	97 16	67.4	47 28.3	97 16	67.0	48 26.3	97 16	66.6	49 24.3	96 16	66.2	50 51.0	96 16	65.6	2
3	42 56.6	97 16	67.6	43 55.0	97 16	67.3	45 22.4	97 16	66.8	46 20.6	97 16	66.4	47 18.7	97 16	66.1	48 16.8	97 16	65.7	49 14.8	97 16	65.3	50 41.6	96 16	64.7	3
4	42 47.0	97 16	66.7	43 45.4	97 16	66.4	45 12.8	97 16	65.9	46 11.1	97 16	65.5	47 09.2	97 16	65.2	48 07.3	97 16	64.8	49 05.3	97 16	64.4	50 32.2	96 16	63.8	4
105	42 37.5	97 16	65.8	43 35.9	97 16	65.5	45 03.4	97 16	65.0	46 01.6	97 16	64.6	46 59.8	97 16	64.3	47 57.9	97 16	63.9	48 56.0	97 15	63.5	50 22.9	96 16	62.9	105
6	42 28.0	97 16	64.9	43 26.4	97 16	64.5	44 54.0	97 16	64.1	45 52.2	97 16	63.7	46 50.5	97 16	63.4	47 48.6	97 16	63.0	48 46.7	97 15	62.6	50 13.7	97 15	62.0	6
7	42 18.6	97 16	63.9	43 17.1	97 16	63.6	44 44.6	97 15	63.1	45 42.9	97 15	62.8	46 41.2	97 15	62.5	47 39.4	97 15	62.1	48 37.5	97 15	61.7	50 04.5	97 15	61.1	7
8	42 09.3	97 15	63.0	43 07.8	97 15	62.7	44 35.4	97 15	62.2	45 33.7	97 15	61.9	46 32.0	97 15	61.6	47 30.2	97 15	61.2	48 28.3	97 15	60.8	49 55.4	97 15	60.3	8
9	42 00.0	97 15	62.1	42 58.5	97 15	61.8	44 26.2	97 15	61.3	45 24.5	97 15	61.0	46 22.9	97 15	60.7	47 21.1	97 15	60.3	48 19.3	97 15	60.0	49 46.4	97 15	59.4	9
110	41 50.9	98 15	61.2	42 49.4	98 15	60.9	44 17.1	97 15	60.4	45 15.5	97 15	60.1	46 13.8	97 15	59.8	47 12.1	97 15	59.4	48 10.3	97 15	59.1	49 37.5	97 14	58.5	110
1	41 41.8	98 15	60.3	42 40.3	98 15	60.0	44 08.1	97 15	59.5	45 06.5	97 15	59.2	46 04.8	97 15	58.9	47 03.2	97 15	58.5	48 01.4	97 15	58.2	49 28.6	97 14	57.6	1
2	41 32.8	98 15	59.4	42 31.3	98 15	59.1	43 59.1	97 15	58.6	44 57.6	97 15	58.3	45 56.0	97 15	58.0	46 54.3	97 14	57.7	47 52.6	97 15	57.3	49 19.9	97 14	56.7	2
3	41 23.8	98 15	58.5	42 22.4	98 15	58.2	43 50.3	98 15	57.7	44 48.7	97 15	57.4	45 47.2	97 14	57.1	46 45.6	97 14	56.8	47 43.9	97 14	56.4	49 11.2	97 14	55.9	3
4	41 15.0	98 15	57.6	42 13.6	98 15	57.3	43 41.5	98 14	56.8	44 40.0	97 14	56.5	45 38.5	97 14	56.2	46 36.9	97 14	55.9	47 35.2	97 14	55.5	49 02.6	97 14	55.0	4
115	41 06.3	98 14	56.7	42 04.9	98 14	56.4	43 32.8	98 14	55.9	44 31.4	98 14	55.6	45 29.9	97 14	55.3	46 28.3	97 14	55.0	47 26.7	97 14	54.7	48 54.1	97 14	54.1	115
6	40 57.6	98 14	55.8	41 56.3	98 14	55.5	43 24.2	98 14	55.1	44 22.8	98 14	54.8	45 21.3	98 14	54.4	46 19.8	97 14	54.1	47 18.2	97 14	53.8	48 45.7	97 14	53.3	6
7	40 49.0	98 14	54.9	41 47.7	98 14	54.6	43 15.7	98 14	54.2	44 14.3	98 14	53.9	45 12.9	98 14	53.6	46 11.4	97 14	53.2	47 09.9	97 14	52.9	48 37.4	97 14	52.4	7
8	40 40.6	98 14	54.0	41 39.3	98 14	53.7	43 07.3	98 14	53.3	44 06.0	98 14	53.0	45 04.6	98 14	52.7	46 03.1	98 14	52.4	47 01.6	97 14	52.0	48 29.2	97 14	51.5	8
9	40 32.2	98 14	53.1	41 31.0	98 14	52.8	42 59.0	98 14	52.4	43 57.7	98 14	52.1	44 56.3	98 14	51.8	45 54.9	98 14	51.5	46 53.4	97 13	51.2	48 21.1	97 13	50.7	9
120	40 23.9	98 14	52.2	41 22.7	98 13	51.9	42 50.8	98 14	51.5	43 49.5	98 13	51.2	44 48.2	98 13	50.9	45 46.8	98 13	50.6	46 45.4	98 13	50.3	48 13.1	97 13	49.8	120
1	40 15.7	98 13	51.3	41 14.6	98 13	51.0	42 42.7	98 13	50.6	43 41.5	98 13	50.3	44 40.2	98 13	50.1	45 38.8	98 13	49.8	46 37.4	98 13	49.4	48 05.2	97 13	49.0	1
2	40 07.6	98 13	50.4	41 06.5	98 13	50.1	42 34.7	98 13	49.7	43 33.5	98 13	49.5	44 32.2	98 13	49.2	45 30.9	98 13	48.9	46 29.5	98 13	48.6	47 57.4	98 13	48.1	2
3	39 59.7	98 13	49.5	40 58.6	98 13	49.3	42 26.8	98 13	48.9	43 25.6	98 13	48.6	44 24.4	98 13	48.3	45 23.1	98 13	48.0	46 21.8	98 13	47.7	47 49.7	98 13	47.2	3
4	39 51.8	98 13	48.6	40 50.7	98 13	48.4	42 19.0	98 13	48.0	43 17.9	98 13	47.7	44 16.7	98 13	47.4	45 15.4	98 13	47.2	46 14.1	98 13	46.9	47 42.1	98 13	46.4	4
125	39 44.0	98 13	47.7	40 43.0	98 13	47.5	42 11.3	98 13	47.1	43 10.2	98 13	46.8	44 09.0	98 13	46.6	45 07.8	98 12	46.3	46 06.6	98 12	46.0	47 34.6	98 12	45.5	125
6	39 36.4	98 13	46.8	40 35.4	98 12	46.6	42 03.8	98 12	46.2	43 02.7	98 12	46.0	44 01.5	98 12	45.7	45 00.4	98 12	45.4	45 59.1	98 12	45.1	47 27.2	98 12	44.7	6
7	39 28.8	98 12	46.0	40 27.8	98 12	45.7	41 56.3	98 12	45.3	42 55.2	98 12	45.1	43 54.1	98 12	44.8	44 53.0	98 12	44.6	45 51.8	98 12	44.3	47 20.0	98 12	43.8	7
8	39 21.4	98 12	45.1	40 20.4	98 12	44.8	41 48.9	98 12	44.5	42 47.9	98 12	44.2	43 46.8	98 12	44.0	44 45.7	98 12	43.7	45 44.6	98 12	43.4	47 12.8	98 12	43.0	8
9	39 14.1	98 12	44.2	40 13.2	98 12	44.0	41 41.7	98 12	43.6	42 40.7	98 12	43.4	43 39.7	98 12	43.1	44 38.6	98 12	42.8	45 37.5	98 12	42.6	47 05.7	98 12	42.1	9
130	39 06.9	99 12	43.3	40 06.0	98 12	43.1	41 34.6	98 12	42.7	42 33.6	98 12	42.5	43 32.6	98 12	42.2	44 31.6	98 12	42.0	45 30.5	98 11	41.7	46 58.8	98 11	41.3	130
1	38 59.8	99 12	42.4	39 58.9	99 12	42.2	41 27.6	98 12	41.9	42 26.6	98 11	41.6	43 25.7	98 11	41.4	44 24.7	98 11	41.1	45 23.6	98 11	40.9	46 52.0	98 11	40.5	1
2	38 52.8	99 11	41.5	39 52.0	99 11	41.3	41 20.7	99 11	41.0	42 19.8	98 11	40.8	43 18.8	98 11	40.5	44 17.9	98 11	40.3	45 16.9	98 11	40.0	46 45.3	98 11	39.6	2
3	38 46.0	99 11	40.7	39 45.2	99 11	40.4	41 13.9	99 11	40.1	42 13.0	99 11	39.9	43 12.1	98 11	39.7	44 11.2	98 11	39.4	45 10.2	98 11	39.2	46 38.7	98 11	38.8	3
4	38 39.2	99 11	39.8	39 38.5	99 11	39.6	41 07.2	99 11	39.3	42 06.4	99 11	39.0	43 05.5	99 11	38.8	44 04.6	98 11	38.6	45 03.7	98 11	38.3	46 32.2	98 11	37.9	4
135	38 32.6	99 11	38.9	39 31.9	99 11	38.7	41 00.7	99 11	38.4	41 59.9	99 11	38.2	42 59.1	99 11	37.9	43 58.2	99 11	37.7	44 57.3	98 10	37.5	46 25.9	98 10	37.1	135
6	38 26.2	99 11	38.0	39 25.4	99 11	37.8	40 54.3	99 10	37.5	41 53.5	99 10	37.3	42 52.7	99 10	37.1	43 51.9	99 10	36.9	44 51.0	99 10	36.6	46 19.7	98 10	36.2	6
7	38 19.8	99 10	37.2	39 19.1	99 10	37.0	40 48.0	99 10	36.7	41 47.3	99 10	36.4	42 46.5	99 10	36.2	43 45.7	99 10	36.0	44 44.9	99 10	35.8	46 13.6	99 10	35.4	7
8	38 13.6	99 10	36.3	39 12.9	99 10	36.1	40 41.9	99 10	35.8	41 41.1	99 10	35.6	42 40.4	99 10	35.4	43 39.6	99 10	35.2	44 38.8	99 10	34.9	46 07.6	99 10	34.5	8
9	38 07.5	99 10	35.4	39 06.8	99 10	35.2	40 35.8	99 10	34.9	41 35.1	99 10	34.7	42 34.4	99 10	34.5	43 33.7	99 10	34.3	44 32.9	99 10	34.1	46 01.8	99 10	33.7	9
140	38 01.5	99 10	34.5	39 00.9	99 10	34.3	40 29.9	99 10	34.1	41 29.3	99 10	33.9	42 28.6	99 10	33.7	43 27.9	99 09	33.5	44 27.2	99 09	33.2	45 56.0	99 09	32.9	140
1	37 55.7	99 10	33.7	38 55.1	99 09	33.5	40 24.2	99 09	33.2	41 23.5	99 09	33.0	42 22.9	99 09	32.8	43 22.2	99 09	32.6	44 21.5	99 09	32.4	45 50.4	99 09	32.1	1
2	37 50.0	99 09	32.8	38 49.4	99 09	32.6	40 18.5	99 09	32.3	41 17.9	99 09	32.2	42 17.3	99 09	32.0	43 16.7	99 09	31.8	44 16.0	99 09	31.6	45 45.0	99 09	31.2	2
3	37 44.4	99 09	31.9	38 43.8	99 09	31.7	40 13.0	99 09	31.5	41 12.4	99 09	31.3	42 11.8	99 09	31.1	43 11.2	99 09	30.9	44 10.6	99 09	30.7	45 39.6	99 09	30.4	3
4	37 38.9	99 09	31.0	38 38.4	99 09	30.9	40 07.6	99 09	30.6	41 07.1	99 09	30.4	42 06.5	99 09	30.3	43 06.0	99 09	30.1	44 05.4	99 09	29.9	45 34.4	99 09	29.6	4
145	37 33.6	99 09	30.2	38 33.2	99 09	30.0	40 02.4	99 08	29.8	41 01.9	99 08	29.6	42 01.4	99 08	29.4	43 00.8	99 08	29.2	44 00.2	99 08	29.0	45 29.3	99 08	28.7	145
6	37 28.5	99 08	29.3	38 28.0	99 08	29.1	39 57.3	99 08	28.9	40 56.8	99 08	28.7	41 56.3	99 08	28.6	42 55.8	99 08	28.4	43 55.2	99 08	28.2	45 24.4	99 08	27.9	6
7	37 23.4	99 08	28.4	38 23.0	99 08	28.3	39 52.3	99 08	28.0	40 51.9	99 08	27.9	41 51.4	99 08	27.7	42 50.9	99 08	27.5	43 50.4	99 08	27.4	45 19.6	99 08	27.1	7
8	37 18.5	99 08	27.6	38 18.1	99 08	27.4	39 47.5	99 08	27.2	40 47.1	99 08	27.0	41 46.6	99 08	26.9	42 46.1	99 08	26.7	43 45.7	99 08	26.5	45 14.9	99 08	26.3	8
9	37 13.8	99 08	26.7	38 13.4	99 08	26.6	39 42.8	99 08	26.3	40 42.4	99 08	26.2	41 42.0	99 08	26.0	42 41.5	99 07	25.9	43 41.1	99 07	25.7	45 10.4	99 08	25.4	9
150	37 09.2	99 07	25.8	38 08.8	99 07	25.7	39 38.3	99 07	25.5	40 37.9	99 07	25.3	41 37.5	99 07	25.2	42 37.1	99 07	25.0	43 36.6	99 07	24.9	45 06.0	99 07	24.6	150
1	37 04.7	99 07	25.0	38 04.4	99 07	24.8	39 33.8	99 07	24.6	40 33.5	99 07	24.5	41 33.1	99 07	24.3	42 32.7	99 07	24.2	43 32.3	99 07	24.0	45 01.7	99 07	23.8	1
2	37 00.4	99 07	24.1	38 00.1	99 07	23.9	39 29.6	99 07	23.8	40 29.2	99 07	23.6	41 28.9	99 07	23.5	42 28.5	99 07	23.3	43 28.1	99 07	23.2	44 57.6	99 07	23.0	2
3	36 56.2	1.007	23.2	37 55.9	99 07	23.1	39 25.4	99 07	22.9	40 25.1	99 07	22.8	41 24.8	99 07	22.6	42 24.5	99 07	22.5	43 24.1	99 06	22.4	44 53.6	99 06	22.1	3
4	36 52.2	1.006	22.4	37 51.9	1.006	22.3	39 21.5	1.006	22.1	40 21.2	99 06	21.9	41 20.9	99 06	21.8	42 20.5	99 06	21.7	43 20.2	99 06	21.5	44 49.7	99 06	21.3	4
155	36 48.3	1.006	21.5	37 48.0	1.006	21.4	39 17.6	1.006	21.2	40 17.3	1.006	21.1	41 17.1	1.006	21.0	42 16.8	1.006	20.8	43 16.5	99 06	20.7	44 46.0	99 06	20.5	155
6	36 44.5	1.006	20.6	37 44.3	1.006	20.5	39 13.9	1.006	20.4	40 13.7	1.006	20.2	41 13.4	1.006	20.1	42 13.1	1.006	20.0	43 12.9	1.006	19.9	44 42.4	1.006	19.7	6
7	36 40.9	1.006	19.8	37 40.7	1.006	19.7	39 10.4	1.006	19.5	40 10.1	1.006	19.4	41 09.9	1.006	19.3	42 09.6	1.006	19.2	43 09.4	1.006	19.0	44 39.0	1.006	18.8	7
8	36 37.5	1.006	18.9	37 37.3	1.006	18.8	39 07.0	1.006	18.7	40 06.7	1.006	18.5	41 06.5	1.006	18.4	42 06.3	1.006	18.3	43 06.1	1.006	18.2	44 35.7	1.006	18.0	8
9	36 34.2	1.005	18.1	37 34.0	1.005	18.0	39 03.7	1.005	17.8	40 03.5	1.005	17.7	41 03.3	1.005	17.6	42 03.1	1.005	17.5	43 02.9	1.005	17.4	44 32.5	1.005	17.2	9
160	36 31.0	1.005	17.2	37 30.8	1.005	17.1	39 00.6	1.005	17.0	40 00.4	1.005	16.9	41 00.2	1.005	16.8	42 00.0	1.005	16.6	42 59.8	1.005	16.5	44 29.5	1.005	16.4	160
1	36 28.0	1.005	16.3	37 27.9	1.005	16.2	38 57.6	1.005	16.1	39 57.5	1.005	16.0	40 57.3	1.005	15.9	41 57.1	1.005	15.8	42 57.0	1.005	15.7	44 26.7	1.005	15.5	1
2	36 25.2	1.004	15.5	37 25.0	1.004	15.4	38 54.8	1.004	15.3	39 54.7	1.004	15.2	40 54.5	1.004	15.1	41 54.4	1.004	15.0	42 54.2	1.004	14.9	44 24.0	1.004	14.7	2
3	36 22.5	1.004	14.6	37 22.3	1.004	14.5	38 52.1	1.004	14.4	39 52.0	1.004	14.3	40 51.9	1.004	14.2	41 51.7	1.004	14.1	42 51.6	1.004	14.1	44 21.4	1.004	13.9	3
4	36 19.9	1.004	13.7	37 19.8	1.004	13.7	38 49.6	1.004	13.6	39 49.5	1.004	13.5	40 49.4	1.004	13.4	41 49.3	1.004	13.3	42 49.1	1.004	13.2	44 18.9	1.004	13.1	4
165	36 17.5	1.004	12.9	37 17.4	1.004	12.8	38 47.3	1.004	12.7	39 47.2	1.004	12.6	40 47.1	1.004	12.6	41 46.9	1.004	12.5	42 46.8	1.004	12.4	44 16.7	1.004	12.3	165
6	36 15.2	1.004	12.0	37 15.2	1.003	11.9	38 45.0	1.003	11.9	39 45.0	1.003	11.8	40 44.9	1.003	11.7	41 44.8	1.003	11.6	42 44.7	1.003	11.6	44 14.5	1.003	11.4	6
7	36 13.2	1.003	11.2	37 13.1	1.003	11.1	38 43.0	1.003	11.0	39 42.9	1.003	10.9	40 42.9	1.003	10.9	41 42.8	1.003	10.8	42 42.7	1.003	10.7	44 12.5	1.003	10.6	7
8	36 11.2	1.003	10.3	37 11.2	1.003	10.3	38 41.1	1.003	10.2	39 41.0	1.003	10.1	40 40.9	1.003	10.0	41 40.9	1.003	10.0	42 40.8	1.003	09.9	44 10.7	1.003	09.8	8
9	36 09.4	1.003	09.4	37 09.4	1.003	09.4	38 39.3	1.003	09.3	39 39.2	1.003	09.3	40 39.2	1.003	09.2	41 39.1	1.003	09.1	42 39.1	1.003	09.1	44 09.0	1.003	09.0	9
170	36 07.8	1.002	08.6	37 07.8	1.002	08.5	38 37.7	1.002	08.5	39 37.6	1.002	08.4	40 37.6	1.002	08.3	41 37.5	1.002	08.3	42 37.5	1.002	08.3	44 07.4	1.002	08.2	170
1	36 06.3	1.002	07.7	37 06.3	1.002	07.7	38 36.2	1.002	07.6	39 36.2	1.002	07.6	40 36.2	1.002	07.5	41 36.1	1.002	07.5	42 36.1	1.002	07.4	44 06.0	1.002	07.4	1
2	36 05.0	1.002	06.9	37 05.0	1.002	06.8	38 34.9	1.002	06.8	39 34.9	1.002	06.7	40 34.9	1.002	06.7	41 34.8	1.002	06.7	42 34.8	1.002	06.6	44 04.8	1.002	06.6	2
3	36 03.8	1.002	06.0	37 03.8	1.002	06.0	38 33.8	1.002	05.9	39 33.7	1.002	05.9	40 33.7	1.002	05.9	41 33.7	1.002	05.8	42 33.7	1.002	05.8	44 03.6	1.002	05.7	3
4	36 02.8	1.001	05.2	37 02.8	1.001	05.1	38 32.8	1.001	05.1	39 32.8	1.001	05.1	40 32.7	1.001	05.0	41 32.7	1.001	05.0	42 32.7	1.001	05.0	44 02.7	1.001	04.9	4
175	36 02.0	1.001	04.3	37 01.9	1.001	04.3	38 31.9	1.001	04.2	39 31.9	1.001	04.2	40 31.9	1.001	04.2	41 31.9	1.001	04.2	42 31.9	1.001	04.1	44 01.9	1.001	04.1	175
6	36 01.2	1.001	03.4	37 01.2	1.001	03.4	38 31.2	1.001	03.4	39 31.2	1.001	03.4	40 31.2	1.001	03.3	41 31.2	1.001	03.3	42 31.2	1.001	03.3	44 01.2	1.001	03.3	6
7	36 00.7	1.001	02.6	37 00.7	1.001	02.6	38 30.7	1.001	02.5	39 30.7	1.001	02.5	40 30.7	1.001	02.5	41 30.7	1.001	02.5	42 30.7	1.001	02.5	44 00.7	1.001	02.4	7
8	36 00.3	1.000	01.7	37 00.3	1.000	01.7	38 30.3	1.000	01.7	39 30.3	1.000	01.7	40 30.3	1.000	01.7	41 30.3	1.000	01.7	42 30.3	1.000	01.7	44 00.3	1.000	01.6	8
9	36 00.1	1.000	00.9	37 00.1	1.000	00.9	38 30.1	1.000	00.8	39 30.1	1.000	00.8	40 30.1	1.000	00.8	41 30.1	1.000	00.8	42 30.1	1.000	00.8	44 00.1	1.000	00.8	9
180	36 00.0	1.000	00.0	37 00.0	1.000	00.0	38 30.0	1.000	00.0	39 30.0	1.000	00.0	40 30.0	1.000	00.0	41 30.0	1.000	00.0	42 30.0	1.000	00.0	44 00.0	1.000	00.0	180

H.A.	54° 30' Alt.	Δd Δt	Az.	55° 00' Alt.	Δd Δt	Az.	56° 00' Alt.	Δd Δt	Az.	56° 30' Alt.	Δd Δt	Az.	57° 00' Alt.	Δd Δt	Az.	57° 30' Alt.	Δd Δt	Az.	59° 00' Alt.	Δd Δt	Az.	59° 30' Alt.	Δd Δt	Az.	H.A.
00	64 30.0	1.00 0	180.0	65 00.0	1.00 0	180.0	66 00.0	1.00 0	180.0	66 30.0	1.00 0	180.0	67 00.0	1.00 0	180.0	67 30.0	1.00 0	180.0	69 00.0	1.00 0	180.0	69 30.0	1.00 0	180.0	00
1	64 29.9	1.00 1	178.7	64 59.9	1.00 1	178.6	65 59.9	1.00 1	178.6	66 29.9	1.00 1	178.6	66 59.9	1.00 1	178.6	67 29.9	1.00 1	178.6	68 59.9	1.00 1	178.6	69 29.9	1.00 1	178.6	1
2	64 29.5	1.00 1	177.3	64 59.5	1.00 1	177.3	65 59.5	1.00 1	177.3	66 29.5	1.00 1	177.2	66 59.5	1.00 1	177.2	67 29.5	1.00 1	177.2	68 59.5	1.00 1	177.1	69 29.5	1.00 1	177.1	2
3	64 28.9	1.00 1	176.0	64 58.9	1.00 1	175.9	65 58.9	1.00 1	175.9	66 28.9	1.00 1	175.8	66 58.9	1.00 2	175.8	67 28.9	1.00 1	175.7	68 58.8	1.00 2	175.7	69 28.8	1.00 2	175.7	3
4	64 28.0	1.00 2	174.6	64 58.0	1.00 2	174.6	65 58.0	1.00 2	174.5	66 28.0	1.00 2	174.5	66 58.0	1.00 2	174.4	67 28.0	1.00 2	174.4	68 57.9	1.00 2	174.3	69 27.9	1.00 2	174.2	4
05	64 26.9	1.00 2	173.3	64 56.9	1.00 2	173.2	65 56.9	1.00 2	173.1	66 26.9	1.00 2	173.1	66 56.8	1.00 2	173.0	67 26.8	1.00 2	173.0	68 56.7	1.00 2	172.8	69 26.7	1.00 2	172.8	05
6	64 25.6	1.00 3	171.9	64 55.6	1.00 3	171.9	65 55.5	1.00 3	171.8	66 25.5	1.00 3	171.7	66 55.4	1.00 3	171.6	67 25.4	1.00 3	171.6	68 55.3	1.00 3	171.4	69 25.3	1.00 3	171.3	6
7	64 24.0	1.00 3	170.6	64 54.0	1.00 3	170.5	65 53.9	1.00 3	170.4	66 23.9	1.00 3	170.3	66 53.8	1.00 3	170.2	67 23.8	1.00 3	170.2	68 53.6	1.00 3	170.0	69 23.6	1.00 3	169.9	7
8	64 22.2	1.00 3	169.2	64 52.1	1.00 3	169.2	65 52.0	1.00 4	169.0	66 22.0	1.00 4	169.0	66 51.9	1.00 4	168.9	67 21.9	1.00 4	168.8	68 51.7	1.00 4	168.5	69 21.6	1.00 4	168.4	8
9	64 20.1	1.00 4	167.9	64 50.1	1.00 4	167.8	65 49.9	1.00 4	167.7	66 19.9	1.00 4	167.6	66 49.8	1.00 4	167.5	67 19.7	1.00 4	167.4	68 49.5	1.00 4	167.1	69 19.4	1.00 4	167.0	9
10	64 17.8	1.00 4	166.6	64 47.7	1.00 4	166.5	65 47.6	1.00 4	166.3	66 17.5	1.00 4	166.2	66 47.4	1.00 4	166.1	67 17.3	1.00 4	166.0	68 47.0	1.00 5	165.7	69 16.9	1.00 5	165.6	10
1	64 15.3	1.00 5	165.2	64 45.2	1.00 5	165.1	65 45.0	1.00 5	164.9	66 14.9	1.00 5	164.8	66 44.8	1.00 5	164.7	67 14.7	1.00 5	164.6	68 44.3	1.00 5	164.3	69 14.2	1.00 5	164.1	1
2	64 12.5	1.00 5	163.9	64 42.4	1.00 5	163.8	65 42.2	1.00 5	163.6	66 12.1	1.00 5	163.5	66 41.9	1.00 5	163.4	67 11.8	1.00 5	163.2	68 41.4	1.00 5	162.9	69 11.2	99 05	162.7	2
3	64 09.5	1.00 5	162.6	64 39.4	1.00 5	162.5	65 39.1	1.00 6	162.2	66 09.0	1.00 6	162.1	66 38.8	1.00 6	162.0	67 08.7	99 06	161.9	68 38.2	99 06	161.5	69 08.0	99 06	161.3	3
4	64 06.3	1.00 6	161.2	64 36.1	1.00 6	161.1	65 35.8	99 06	160.9	66 05.7	99 06	160.8	66 35.5	99 06	160.6	67 05.3	99 06	160.5	68 34.8	99 06	160.1	69 04.6	99 06	159.9	4
15	64 02.8	99 06	159.9	64 32.6	99 06	159.8	65 32.3	99 06	159.5	66 02.1	99 06	159.3	66 31.9	99 06	159.3	67 01.7	99 06	159.1	68 31.1	99 07	158.7	69 00.9	99 07	158.5	15
6	63 59.1	99 06	158.6	64 28.9	99 07	158.5	65 28.5	99 07	158.1	65 58.3	99 07	158.1	66 28.1	99 07	157.9	66 57.9	99 07	157.8	68 27.2	99 07	157.3	68 56.9	99 07	157.1	6
7	63 55.2	99 07	157.3	64 25.0	99 07	157.1	65 24.5	99 07	156.9	65 54.3	99 07	156.7	66 24.1	99 07	156.6	66 53.8	99 07	156.4	68 23.0	99 07	155.9	68 52.7	99 07	155.7	7
8	63 51.1	99 07	156.0	64 20.8	99 07	155.8	65 20.3	99 07	155.5	65 50.1	99 07	155.4	66 19.8	99 07	155.2	66 49.6	99 08	155.0	68 18.7	99 08	154.5	68 48.3	99 08	154.3	8
9	63 46.7	99 08	154.7	64 16.5	99 08	154.5	65 15.9	99 08	154.2	65 45.6	99 08	154.0	66 15.4	99 08	153.9	66 45.0	99 08	153.7	68 14.1	99 08	153.1	68 43.7	99 08	152.9	9
20	63 42.1	99 08	153.4	64 11.9	99 08	153.2	65 11.3	99 08	152.7	65 41.0	99 08	152.7	66 10.7	99 08	152.5	66 40.3	99 08	152.4	68 09.2	99 08	151.7	68 38.8	99 08	151.5	20
1	63 37.4	99 08	152.1	64 07.1	99 08	151.9	65 06.4	99 08	151.4	65 36.1	99 08	151.4	66 05.7	99 09	151.2	66 35.4	99 09	151.0	68 04.2	99 09	150.4	68 33.8	99 09	150.2	1
2	63 32.4	99 09	150.8	64 02.0	99 09	150.6	65 01.4	99 09	150.3	65 31.0	99 09	150.1	66 00.6	99 09	149.9	66 30.2	99 09	149.7	67 58.9	98 09	149.0	68 28.5	98 09	148.8	2
3	63 27.2	99 09	149.5	63 56.8	99 09	149.3	64 56.1	99 09	149.0	65 25.7	99 09	148.8	65 55.3	99 09	148.6	66 24.9	99 09	148.4	67 53.5	98 09	147.7	68 23.0	98 09	147.4	3
4	63 21.8	99 09	148.2	63 51.4	99 09	148.0	64 50.6	99 10	147.7	65 20.2	99 10	147.5	65 49.7	99 10	147.2	66 19.3	98 10	147.0	67 47.8	98 10	146.3	68 17.3	98 10	146.1	4
25	63 16.2	99 10	146.9	63 45.8	99 10	146.5	64 44.9	99 10	146.4	65 14.5	99 10	146.2	65 44.0	98 10	145.9	66 13.5	98 10	145.7	67 41.9	98 10	145.0	68 11.3	98 10	144.7	25
6	63 10.4	99 10	145.7	63 40.0	99 10	145.5	64 39.1	98 10	145.1	65 08.6	98 10	144.9	65 38.1	98 10	144.6	66 07.6	98 10	144.4	67 35.8	98 11	143.7	68 05.2	98 11	143.4	6
7	63 04.5	98 10	144.4	63 34.0	98 10	144.2	64 33.0	98 10	143.8	65 02.5	98 10	143.6	65 32.0	98 11	143.3	66 01.4	98 11	143.1	67 29.6	98 11	142.4	67 58.9	98 11	142.1	7
8	62 58.3	98 11	143.1	63 27.8	98 11	142.9	64 26.8	98 11	142.5	64 56.2	98 11	142.3	65 25.6	98 11	142.1	65 55.0	98 11	141.8	67 23.1	98 11	141.0	67 52.4	98 11	140.8	8
9	62 52.0	98 11	141.9	63 21.4	98 11	141.7	64 20.3	98 11	141.2	64 49.7	98 11	141.0	65 19.1	98 11	140.8	65 48.5	98 11	140.5	67 16.5	98 11	139.7	67 45.7	98 11	139.4	9
30	62 45.4	98 11	140.6	63 14.9	98 11	140.4	64 13.7	98 11	140.0	64 43.1	98 11	139.7	65 12.5	98 11	139.5	65 41.8	98 11	139.3	67 09.7	97 12	138.4	67 38.9	97 12	138.1	30
1	62 38.7	98 11	139.4	63 08.2	98 12	139.2	64 06.9	98 12	138.7	64 36.3	98 12	138.5	65 05.6	98 12	138.2	65 34.9	98 12	138.0	67 02.7	97 12	137.1	67 31.8	97 12	136.8	1
2	62 31.9	98 12	138.2	63 01.3	98 12	137.9	64 00.0	98 12	137.5	64 29.3	98 12	137.2	64 58.6	98 12	137.0	65 27.9	98 12	136.7	66 55.5	97 12	135.9	67 24.6	97 12	135.6	2
3	62 24.8	98 12	136.9	62 54.2	98 12	136.7	63 52.8	98 12	136.2	64 22.1	97 12	136.0	64 51.4	97 12	135.7	65 20.6	97 12	135.5	66 48.1	97 12	134.6	67 17.2	97 13	134.3	3
4	62 17.6	98 12	135.7	62 47.0	98 12	135.5	63 45.6	98 12	135.0	64 14.8	97 12	134.7	64 44.0	97 12	134.4	65 13.2	97 13	134.2	66 40.5	97 13	133.3	67 09.7	97 13	133.0	4
35	62 10.3	98 13	134.5	62 39.6	98 13	134.2	63 38.1	97 13	133.8	64 07.3	97 13	133.5	64 36.5	97 13	133.2	65 05.7	97 13	133.0	66 33.0	97 13	132.1	67 02.0	97 13	131.7	35
6	62 02.8	98 13	133.3	62 32.0	98 13	133.0	63 30.5	97 13	132.5	63 59.7	97 13	132.3	64 28.9	97 13	132.0	64 58.0	97 13	131.7	66 25.2	97 13	130.8	66 54.2	97 13	130.5	6
7	61 55.1	98 13	132.1	62 24.4	97 13	131.8	63 22.8	97 13	131.3	63 51.9	97 13	131.1	64 21.0	97 13	130.8	64 50.1	97 13	130.5	66 17.2	97 14	129.6	66 46.2	96 14	129.2	7
8	61 47.3	97 13	130.9	62 16.5	97 13	130.6	63 14.9	97 13	130.1	63 44.0	97 13	129.8	64 13.1	97 14	129.6	64 42.1	97 14	129.3	66 09.2	96 14	128.3	66 38.0	96 14	128.0	8
9	61 39.4	97 13	129.7	62 08.5	97 14	129.4	63 06.8	97 14	128.9	63 35.9	97 14	128.6	64 05.0	97 14	128.4	64 34.0	97 14	128.1	66 00.9	96 14	127.1	66 29.8	96 14	126.8	9
40	61 31.3	97 14	128.5	62 00.4	97 14	128.2	62 58.6	97 14	127.7	63 27.7	97 14	127.4	63 56.7	97 14	127.1	64 25.7	97 14	126.9	65 52.5	96 14	125.9	66 21.3	96 14	125.6	40
1	61 23.1	97 14	127.3	61 52.2	97 14	127.0	62 50.3	97 14	126.5	63 19.4	97 14	126.2	63 48.4	97 14	126.0	64 17.3	97 14	125.7	65 44.0	96 14	124.7	66 12.8	96 14	124.4	1
2	61 14.7	97 14	126.1	61 43.8	97 14	125.9	62 41.9	97 14	125.3	63 10.9	97 14	125.1	63 39.9	97 14	124.8	64 08.8	96 14	124.5	65 35.4	96 15	123.5	66 04.1	96 15	123.2	2
3	61 06.2	97 14	125.0	61 35.3	97 15	124.7	62 33.3	97 14	124.2	63 02.3	97 14	123.6	63 31.3	96 15	123.6	64 00.2	96 15	123.3	65 26.6	96 15	122.3	65 55.4	96 15	122.0	3
4	60 57.6	97 15	123.8	61 26.7	97 15	123.5	62 24.7	97 15	123.0	62 53.6	96 15	122.7	63 22.5	96 15	122.4	63 51.4	96 15	122.1	65 17.8	96 15	121.1	65 46.5	96 15	120.8	4
45	60 48.9	97 15	122.6	61 17.9	97 15	122.4	62 15.9	96 15	121.8	62 44.8	96 15	121.5	63 13.7	96 15	121.2	63 42.5	96 15	120.9	65 08.8	96 15	119.9	65 37.5	96 15	119.6	45
6	60 40.1	97 15	121.5	61 09.1	97 15	121.2	62 07.0	96 15	120.7	62 35.8	96 15	120.4	63 04.7	96 15	120.1	63 33.5	96 15	119.8	64 59.7	96 15	118.8	65 28.3	95 15	118.4	6
7	60 31.1	97 15	120.3	61 00.1	97 15	120.1	61 57.9	96 15	119.5	62 26.8	96 15	119.2	62 55.6	96 15	118.9	63 24.4	96 15	118.6	64 50.5	95 16	117.6	65 19.1	95 16	117.3	7
8	60 22.1	96 15	119.2	60 51.0	96 15	118.9	61 48.8	96 15	118.4	62 17.7	96 15	118.1	62 46.5	96 15	117.8	63 15.2	96 15	117.5	64 41.2	95 16	116.5	65 09.8	95 16	116.1	8
9	60 13.0	96 15	118.1	60 41.9	96 16	117.8	61 39.6	96 16	117.2	62 08.4	96 16	117.0	62 37.2	96 16	116.6	63 05.9	96 16	116.3	64 31.9	95 16	115.3	65 00.4	95 16	115.0	9
50	60 03.7	96 16	117.0	60 32.6	96 16	116.7	61 30.3	96 16	116.1	61 59.1	96 16	115.8	62 27.8	96 16	115.5	62 56.6	96 16	115.2	64 22.4	95 16	114.2	64 50.9	95 16	113.8	50
1	59 54.4	96 16	115.8	60 23.3	96 16	115.6	61 20.9	96 16	115.0	61 49.7	96 16	114.7	62 18.4	96 16	114.4	62 47.1	96 16	114.1	64 12.9	95 16	113.1	64 41.4	95 16	112.7	1
2	59 45.0	96 16	114.7	60 13.8	96 16	114.5	61 11.4	96 16	113.9	61 40.2	96 16	113.6	62 08.9	96 16	113.3	62 37.5	95 16	113.0	64 03.2	95 16	111.9	64 31.7	95 16	111.6	2
3	59 35.5	96 16	113.6	60 04.3	96 16	113.3	61 01.8	96 16	112.8	61 30.6	96 16	112.5	61 59.3	96 16	112.2	62 27.9	95 16	111.8	63 53.5	95 16	110.8	64 22.0	95 16	110.5	3
4	59 25.9	96 16	112.5	59 54.7	96 16	112.2	60 52.2	96 16	111.7	61 20.9	96 16	111.4	61 49.6	95 16	111.1	62 18.2	95 16	110.7	63 43.8	95 16	109.7	64 12.2	95 16	109.3	4
55	59 16.2	96 16	111.4	59 45.0	96 16	111.1	60 42.5	96 16	110.6	61 11.2	96 16	110.3	61 39.8	95 16	110.0	62 08.4	95 16	109.6	63 33.9	95 16	108.6	64 02.3	95 17	108.2	55
6	59 06.5	96 16	110.3	59 35.2	96 16	110.1	60 32.7	96 16	109.5	61 01.4	96 16	109.2	61 30.0	95 16	108.9	61 58.6	95 17	108.5	63 24.0	95 17	107.5	63 52.4	95 17	107.2	6
7	58 56.7	96 16	109.3	59 25.4	96 16	109.0	60 22.8	96 17	108.4	60 51.5	95 17	108.1	61 20.1	95 17	107.8	61 48.7	95 17	107.5	63 14.1	95 17	106.4	63 42.4	94 17	106.1	7
8	58 46.8	96 17	108.2	59 15.5	96 17	107.9	60 12.9	96 17	107.3	60 41.6	95 17	107.0	61 10.1	95 17	106.7	61 38.7	95 17	106.4	63 04.0	95 17	105.4	63 32.4	94 17	105.0	8
9	58 36.9	96 17	107.1	59 05.6	96 17	106.8	60 03.0	95 17	106.2	60 31.6	95 17	105.9	61 00.1	95 17	105.6	61 28.7	95 17	105.3	62 54.0	95 17	104.3	63 22.3	94 17	103.9	9
60	58 26.9	96 17	106.0	58 55.6	96 17	105.8	59 52.9	95 17	105.2	60 21.5	95 17	104.9	60 50.1	95 17	104.6	61 18.6	95 17	104.2	62 43.8	94 17	103.2	63 12.2	94 17	102.9	60
1	58 16.8	96 17	105.0	58 45.5	96 17	104.7	59 42.8	95 17	104.1	60 11.4	95 17	103.8	60 40.0	95 17	103.5	61 08.5	95 17	103.2	62 33.7	94 17	102.2	63 02.0	94 17	101.8	1
2	58 06.6	96 17	103.9	58 35.4	96 17	103.6	59 32.7	95 17	103.1	60 01.3	95 17	102.8	60 29.8	95 17	102.5	60 58.3	95 17	102.1	62 23.5	94 17	101.1	62 51.8	94 17	100.7	2
3	57 56.6	96 17	102.9	58 25.3	96 17	102.6	59 22.5	95 17	102.0	59 51.1	95 17	101.7	60 19.6	95 17	101.4	60 48.1	95 17	101.1	62 13.2	94 17	100.1	62 41.5	94 17	99.7	3
4	57 46.4	96 17	101.8	58 15.1	96 17	101.6	59 12.3	95 17	101.0	59 40.9	95 17	100.7	60 09.4	95 17	100.4	60 37.9	95 17	100.0	62 03.0	94 17	99.0	62 31.2	94 17	98.7	4
65	57 36.2	96 17	100.8	58 04.9	95 17	100.5	59 02.1	95 17	99.9	59 30.6	95 17	99.6	59 59.1	95 17	99.3	60 27.6	95 17	99.0	61 52.7	94 17	98.0	62 20.9	94 17	97.6	65
6	57 26.0	96 17	99.8	57 54.6	95 17	99.5	58 51.8	95 17	98.9	59 20.3	95 17	98.6	59 48.8	95 17	98.3	60 17.3	95 17	98.0	61 42.3	94 17	97.0	62 10.6	94 17	96.6	6
7	57 15.7	96 17	98.7	57 44.3	95 17	98.5	58 41.5	95 17	97.9	59 10.0	95 17	97.6	59 38.5	95 17	97.3	60 06.9	95 17	97.0	61 32.0	94 17	95.9	62 00.2	94 17	95.6	7
8	57 05.4	96 17	97.7	57 34.0	95 17	97.4	58 31.2	95 17	96.9	58 59.7	95 17	96.6	59 28.2	95 17	96.2	59 56.6	95 17	95.9	61 21.6	94 17	94.9	61 49.8	94 17	94.6	8
9	56 55.0	95 17	96.7	57 23.7	95 17	96.4	58 20.8	95 17	95.8	58 49.3	95 17	95.5	59 17.8	95 17	95.2	59 46.2	95 17	94.9	61 11.2	94 17	93.9	61 39.4	94 17	93.6	9
70	56 44.7	95 17	95.7	57 13.3	95 17	95.4	58 10.4	95 17	94.8	58 38.9	95 17	94.5	59 07.4	95 17	94.2	59 35.8	95 17	93.9	61 00.8	94 17	92.9	61 29.0	94 17	92.6	70
1	56 34.3	95 17	94.7	57 02.9	95 17	94.4	58 00.1	95 17	93.8	58 28.6	95 17	93.5	58 57.0	95 17	93.2	59 25.4	95 17	92.9	60 50.4	94 17	91.9	61 18.6	94 17	91.6	1
2	56 23.9	95 17	93.7	56 52.5	95 17	93.4	57 49.7	95 17	92.8	58 18.2	95 17	92.5	58 46.6	95 17	92.2	59 15.0	95 17	91.9	60 40.0	94 17	90.9	61 08.2	94 17	90.6	2
3	56 13.5	95 17	92.7	56 42.1	95 17	92.4	57 39.2	95 17	91.8	58 07.8	95 17	91.5	58 36.2	95 17	91.2	59 04.6	95 17	90.9	60 29.6	94 17	89.9	60 57.8	94 17	89.6	3
4	56 03.1	95 17	91.7	56 31.7	95 17	91.4	57 28.8	95 17	90.8	57 57.3	95 17	90.5	58 25.8	95 17	90.2	58 54.2	95 17	89.9	60 19.1	94 17	89.0	60 47.4	94 17	88.6	4
75	55 52.7	95 17	90.7	56 21.3	95 17	90.4	57 18.4	95 17	89.8	57 46.9	95 17	89.6	58 15.4	95 17	89.3	58 43.8	95 17	89.0	60 08.7	94 17	88.0	60 37.0	94 17	87.6	75
6	55 42.3	95 17	89.7	56 10.9	95 17	89.4	57 08.0	95 17	88.9	57 36.5	95 17	88.6	58 04.9	95 17	88.3	58 33.4	95 17	88.0	59 58.3	94 17	87.0	60 26.5	94 17	86.7	6
7	55 31.9	95 17	88.7	56 00.5	95 17	88.4	56 57.6	95 17	87.9	57 26.1	95 17	87.6	57 54.5	95 17	87.3	58 22.9	95 17	87.0	59 47.9	94 17	86.0	60 16.1	94 17	85.7	7
8	55 21.4	95 17	87.7	55 50.0	95 17	87.5	56 47.2	95 17	86.9	57 15.7	95 17	86.6	57 44.1	95 17	86.3	58 12.5	95 17	86.0	59 37.5	94 17	85.1	60 05.8	94 17	84.7	8
9	55 11.0	95 17	86.8	55 39.6	95 17	86.5	56 36.8	95 17	85.9	57 05.3	95 17	85.7	57 33.7	95 17	85.4	58 02.2	95 17	85.1	59 27.2	94 17	84.1	59 55.4	94 17	83.8	9
80	55 00.6	95 17	85.8	55 29.2	95 17	85.5	56 26.4	95 17	85.0	56 54.9	95 17	84.7	57 23.4	95 17	84.4	57 51.8	95 17	84.1	59 16.8	94 17	83.2	59 45.1	94 17	82.8	80
1	54 50.2	95 17	84.8	55 18.9	95 17	84.6	56 16.0	95 17	84.0	56 44.5	95 17	83.7	57 13.0	95 17	83.5	57 41.4	95 17	83.2	59 06.4	94 17	82.2	59 34.7	94 17	81.9	1
2	54 39.9	95 17	83.9	55 08.5	95 17	83.6	56 05.7	95 17	83.1	56 34.2	95 17	82.8	57 02.7	95 17	82.5	57 31.1	95 17	82.2	58 56.2	94 17	81.3	59 24.4	94 17	80.9	2
3	54 29.5	95 17	82.9	54 58.2	95 17	82.7	55 55.3	95 17	82.1	56 23.9	95 17	81.8	56 52.3	95 17	81.6	57 20.8	95 17	81.3	58 45.9	94 17	80.3	59 14.1	94 17	80.0	3
4	54 19.2	95 17	82.0	54 47.8	95 17	81.7	55 45.0	95 17	81.2	56 13.6	95 17	80.9	56 42.0	95 17	80.6	57 10.5	95 17	80.3	58 35.6	94 17	79.4	59 03.9	94 17	79.1	4
85	54 08.9	95 17	81.0	54 37.5	95 17	80.8	55 34.7	95 17	80.2	56 03.3	95 17	80.0	56 31.8	95 17	79.7	57 00.2	95 17	79.4	58 25.4	94 17	78.5	58 53.7	94 17	78.2	85
6	53 58.6	95 17	80.1	54 27.3	95 17	79.8	55 24.5	95 17	79.3	55 53.0	95 17	79.0	56 21.6	95 17	78.7	56 50.0	95 17	78.4	58 15.2	94 17	77.5	58 43.5	94 17	77.2	6
7	53 48.4	95 17	79.1	54 17.0	95 17	78.9	55 14.3	95 17	78.3	55 42.8	95 17	78.1	56 11.3	95 17	77.8	56 39.7	95 17	77.5	58 05.1	94 17	76.6	58 33.4	94 17	76.3	7
8	53 38.2	95 17	78.2	54 06.8	95 17	77.9	55 04.1	95 17	77.4	55 32.6	95 17	77.1	56 01.2	95 17	76.9	56 29.7	95 17	76.6	57 54.9	94 17	75.7	58 23.3	94 17	75.4	8
9	53 28.0	95 17	77.2	53 56.7	95 17	77.0	54 53.9	95 17	76.5	55 22.5	95 17	76.2	55 51.1	95 17	76.0	56 19.6	95 17	75.7	57 44.9	94 17	74.8	58 13.2	94 17	74.5	9
90	53 17.8	95 17	76.3	53 46.5	95 17	76.1	54 43.8	95 17	75.6	55 12.4	95 17	75.3	55 41.0	95 17	75.0	56 09.5	95 17	74.8	57 34.8	94 17	73.9	58 03.2	94 17	73.6	90

Lat. 80°

H.A.	54°30′ Alt.	Δd Δt	Az.	55°00′ Alt.	Δd Δt	Az.	56°00′ Alt.	Δd Δt	Az.	56°30′ Alt.	Δd Δt	Az.	57°00′ Alt.	Δd Δt	Az.	57°30′ Alt.	Δd Δt	Az.	59°00′ Alt.	Δd Δt	Az.	59°30′ Alt.	Δd Δt	Az.	H.A.
91	53 07.7	96 17	75.4	53 36.4	96 17	75.1	54 33.7	95 17	74.6	55 02.4	95 17	74.4	55 30.9	95 17	74.1	55 59.5	95 17	73.8	57 24.8	95 17	73.0	57 53.2	95 17	72.7	91
2	52 57.7	96 17	74.5	53 26.4	96 17	74.2	54 23.7	95 17	73.7	54 52.3	95 17	73.5	55 20.9	95 17	73.2	55 49.5	95 16	72.9	57 14.9	95 16	72.1	57 43.3	95 16	71.8	2
3	52 47.7	96 17	73.5	53 16.4	96 17	73.3	54 13.7	95 17	72.8	54 42.4	95 17	72.6	55 11.0	95 16	72.3	55 39.5	95 16	72.0	57 05.0	95 16	71.2	57 33.4	95 16	70.9	3
4	52 37.7	96 17	72.6	53 06.4	96 17	72.4	54 03.8	95 16	71.9	54 32.5	95 16	71.6	55 01.1	95 16	71.4	55 29.7	95 16	71.1	56 55.2	95 16	70.3	57 23.6	95 16	70.0	4
95	52 27.8	96 16	71.7	52 56.5	96 16	71.5	53 53.9	96 16	71.0	54 22.6	95 16	70.7	54 51.2	95 16	70.5	55 19.8	95 16	70.2	56 45.4	95 16	69.4	57 13.8	95 16	69.1	95
6	52 17.9	96 16	70.8	52 46.7	96 16	70.6	53 44.1	96 16	70.1	54 12.8	95 16	69.8	54 41.4	95 16	69.6	55 10.1	95 16	69.3	56 35.7	95 16	68.5	57 04.1	95 16	68.2	6
7	52 08.1	96 16	69.9	52 36.9	96 16	69.7	53 34.4	96 16	69.2	54 03.0	96 16	68.9	54 31.7	95 16	68.7	55 00.3	95 16	68.4	56 26.0	95 16	67.6	56 54.5	95 16	67.3	7
8	51 58.3	96 16	69.0	52 27.1	96 16	68.8	53 24.6	96 16	68.3	53 53.4	96 16	68.0	54 22.0	95 16	67.8	54 50.7	95 16	67.5	56 16.4	95 16	66.7	56 44.9	95 16	66.4	8
9	51 48.6	96 16	68.1	52 17.5	96 16	67.9	53 15.0	96 16	67.4	53 43.7	96 16	67.1	54 12.4	95 16	66.9	54 41.1	95 16	66.6	56 06.9	95 16	65.8	56 35.4	95 16	65.6	9
100	51 39.0	96 16	67.2	52 07.8	96 16	67.0	53 05.4	96 16	66.5	53 34.1	96 16	66.2	54 02.9	96 16	66.0	54 31.5	96 16	65.8	55 57.4	96 16	65.0	56 25.9	96 16	64.7	100
1	51 29.4	96 16	66.3	51 58.3	96 16	66.1	52 55.9	96 16	65.6	53 24.6	96 16	65.4	53 53.4	96 16	65.1	54 22.1	96 16	64.9	55 48.0	95 16	64.1	56 16.6	95 16	63.8	1
2	51 19.9	96 16	65.4	51 48.8	96 16	65.2	52 46.4	96 16	64.7	53 15.2	96 16	64.5	53 44.0	96 16	64.2	54 12.7	96 16	64.0	55 38.7	95 16	63.2	56 07.2	95 16	62.9	2
3	51 10.5	96 16	64.5	51 39.4	96 16	64.3	52 37.0	96 16	63.8	53 05.8	96 16	63.6	53 34.6	96 16	63.4	54 03.4	96 15	63.1	55 29.5	96 15	62.3	55 58.0	95 15	62.0	3
4	51 01.1	96 16	63.6	51 30.0	96 16	63.4	52 27.7	96 15	62.9	52 56.5	96 15	62.7	53 25.3	96 15	62.5	53 54.1	96 15	62.2	55 20.2	96 15	61.5	55 48.8	95 15	61.2	4
105	50 51.8	96 15	62.7	51 20.7	96 15	62.5	52 18.5	96 15	62.1	52 47.3	96 15	61.8	53 16.1	96 15	61.6	53 44.9	96 15	61.4	55 11.1	96 15	60.6	55 39.7	96 15	60.4	105
6	50 42.6	96 15	61.8	51 11.5	96 15	61.6	52 09.3	96 15	61.2	52 38.2	96 15	61.0	53 07.0	96 15	60.7	53 35.8	96 15	60.5	55 02.0	96 15	59.8	55 30.7	96 15	59.5	6
7	50 33.5	96 15	60.9	51 02.4	96 15	60.7	52 00.2	96 15	60.3	52 29.1	96 15	60.1	52 58.0	96 15	59.9	53 26.8	96 15	59.6	54 53.1	96 15	58.9	55 21.8	96 15	58.6	7
8	50 24.4	97 15	60.1	50 53.4	97 15	59.9	51 51.2	96 15	59.4	52 20.1	96 15	59.2	52 49.0	96 15	59.0	53 17.8	96 15	58.8	54 44.2	96 15	58.0	55 12.9	96 15	57.8	8
9	50 15.4	97 15	59.2	50 44.4	97 15	59.0	51 42.3	96 15	58.6	52 11.2	96 15	58.3	52 40.1	96 15	58.1	53 09.0	96 15	57.9	54 35.4	96 14	57.2	55 04.2	96 14	56.9	9
110	50 06.5	97 15	58.3	50 35.5	97 15	58.1	51 33.4	96 15	57.7	52 02.4	96 15	57.5	52 31.3	96 15	57.3	53 00.2	96 14	57.0	54 26.7	96 14	56.3	54 55.5	96 14	56.1	110
1	49 57.7	97 15	57.4	50 26.7	97 15	57.2	51 24.7	96 14	56.8	51 53.6	96 14	56.6	52 22.6	96 14	56.4	52 51.5	96 14	56.2	54 18.1	96 14	55.5	54 46.9	96 14	55.2	1
2	49 48.9	97 14	56.6	50 18.0	97 14	56.4	51 16.0	96 14	56.0	51 45.0	97 14	55.8	52 13.9	96 14	55.5	52 42.9	96 14	55.3	54 09.5	96 14	54.6	54 38.4	96 14	54.4	2
3	49 40.3	97 14	55.7	50 09.4	97 14	55.5	51 07.4	97 14	55.1	51 36.4	97 14	54.9	52 05.4	97 14	54.7	52 34.3	96 14	54.5	54 01.1	96 14	53.8	54 29.9	96 14	53.6	3
4	49 31.7	97 14	54.8	50 00.8	97 14	54.6	50 58.9	97 14	54.2	51 27.9	97 14	54.0	51 56.9	97 14	53.8	52 25.9	97 14	53.6	53 52.7	96 14	53.0	54 21.6	96 14	52.7	4
115	49 23.3	97 14	54.0	49 52.4	97 14	53.8	50 50.5	97 14	53.4	51 19.6	97 14	53.2	51 48.6	97 14	53.0	52 17.6	97 14	52.8	53 44.4	96 14	52.1	54 13.3	96 14	51.9	115
6	49 14.9	97 14	53.1	49 44.0	97 14	52.9	50 42.2	97 14	52.5	51 11.3	97 14	52.3	51 40.3	97 14	52.1	52 09.3	97 14	51.9	53 36.3	96 13	51.3	54 05.2	96 13	51.1	6
7	49 06.6	97 14	52.2	49 35.7	97 14	52.0	50 34.0	97 14	51.7	51 03.1	97 14	51.5	51 32.1	97 13	51.3	52 01.2	97 13	51.1	53 28.2	97 13	50.4	53 57.1	96 13	50.2	7
8	48 58.4	97 14	51.4	49 27.6	97 14	51.2	50 25.8	97 13	50.8	50 55.0	97 13	50.6	51 24.0	97 13	50.4	51 53.1	97 13	50.2	53 20.2	97 13	49.6	53 49.2	97 13	49.4	8
9	48 50.3	97 13	50.5	49 19.5	97 13	50.3	50 17.8	97 13	50.0	50 47.0	97 13	49.8	51 16.1	97 13	49.6	51 45.2	97 13	49.4	53 12.3	97 13	48.8	53 41.3	97 13	48.6	9
120	48 42.3	97 13	49.6	49 11.5	97 13	49.5	50 09.9	97 13	49.1	50 39.0	97 13	48.9	51 08.2	97 13	48.7	51 37.3	97 13	48.5	53 04.5	97 13	47.9	53 33.6	97 13	47.7	120
1	48 34.4	97 13	48.8	49 03.7	97 13	48.6	50 02.1	97 13	48.3	50 31.2	97 13	48.1	51 00.4	97 13	47.9	51 29.5	97 13	47.7	52 56.8	97 13	47.1	53 25.9	97 13	46.9	1
2	48 26.7	98 13	47.9	48 55.9	97 13	47.8	49 54.3	97 13	47.4	50 23.5	97 13	47.2	50 52.7	97 13	47.1	51 21.9	97 13	46.9	52 49.3	97 13	46.3	53 18.3	97 13	46.1	2
3	48 19.0	98 13	47.1	48 48.2	98 13	46.9	49 46.7	97 13	46.6	50 15.9	97 12	46.4	50 45.1	97 12	46.2	51 14.3	97 12	46.0	52 41.8	97 12	45.5	53 10.9	97 12	45.3	3
4	48 11.4	98 12	46.2	48 40.7	98 12	46.1	49 39.2	97 12	45.7	50 08.5	97 12	45.6	50 37.7	97 12	45.4	51 06.9	97 12	45.2	52 34.4	97 12	44.6	53 03.5	97 12	44.4	4
125	48 03.9	98 12	45.4	48 33.2	98 12	45.2	49 31.8	98 12	44.9	50 01.1	98 12	44.7	50 30.3	97 12	44.5	50 59.5	97 12	44.4	52 27.1	97 12	43.8	52 56.3	97 12	43.6	125
6	47 56.6	98 12	44.5	48 25.9	98 12	44.4	49 24.5	98 12	44.0	49 53.8	98 12	43.9	50 23.1	98 12	43.7	50 52.3	97 12	43.5	52 19.9	97 12	42.9	52 49.2	97 12	42.8	6
7	47 49.3	98 12	43.7	48 18.7	98 12	43.5	49 17.3	98 12	43.2	49 46.6	98 12	43.0	50 15.9	98 12	42.9	50 45.2	98 12	42.7	52 12.9	97 12	42.2	52 42.1	97 12	42.0	7
8	47 42.2	98 12	42.8	48 11.5	98 12	42.7	49 10.2	98 12	42.4	49 39.6	98 12	42.2	50 08.9	98 12	42.0	50 38.2	98 12	41.9	52 06.0	97 11	41.4	52 35.2	97 11	41.2	8
9	47 35.1	98 12	42.0	48 04.5	98 12	41.8	49 03.3	98 11	41.5	49 32.6	98 11	41.4	50 02.0	98 11	41.2	50 31.3	98 11	41.1	51 59.2	98 11	40.5	52 28.4	98 11	40.4	9
130	47 28.2	98 11	41.2	47 57.6	98 11	41.0	48 56.4	98 11	40.5	49 25.8	98 11	40.5	49 55.2	98 11	40.4	50 24.5	98 11	40.2	51 52.5	98 11	39.7	52 21.7	98 11	39.5	130
1	47 21.4	98 11	40.3	47 50.9	98 11	40.2	48 49.7	98 11	39.9	49 19.1	98 11	39.7	49 48.5	98 11	39.6	50 17.8	98 11	39.4	51 45.9	98 11	38.9	52 15.2	98 11	38.7	1
2	47 14.8	98 11	39.5	47 44.2	98 11	39.3	48 43.1	98 11	39.0	49 12.5	98 11	38.9	49 41.9	98 11	38.7	50 11.3	98 11	38.6	51 39.4	98 11	38.1	52 08.7	98 11	37.9	2
3	47 08.2	98 11	38.6	47 37.7	98 11	38.5	48 36.6	98 11	38.2	49 06.0	98 11	38.1	49 35.4	98 11	37.9	50 04.8	98 11	37.8	51 33.0	98 10	37.3	52 02.4	98 10	37.1	3
4	47 01.7	98 11	37.8	47 31.2	98 11	37.7	48 30.2	98 10	37.4	48 59.6	98 10	37.2	49 29.1	98 10	37.1	49 58.5	98 10	36.9	51 26.7	98 10	36.5	51 56.1	98 10	36.3	4
135	46 55.4	98 10	37.0	47 24.9	98 10	36.8	48 23.9	98 10	36.6	48 53.4	98 10	36.4	49 22.9	98 10	36.3	49 52.3	98 10	36.1	51 20.6	98 10	35.7	51 50.0	98 10	35.5	135
6	46 49.2	98 10	36.1	47 18.7	98 10	36.0	48 17.8	98 10	35.7	48 47.3	98 10	35.6	49 16.8	98 10	35.4	49 46.2	98 10	35.3	51 14.6	98 10	34.9	51 44.0	98 10	34.7	6
7	46 43.1	98 10	35.3	47 12.7	98 10	35.2	48 11.7	98 10	34.9	48 41.3	98 10	34.8	49 10.8	98 10	34.6	49 40.3	98 10	34.5	51 08.7	98 10	34.0	51 38.2	98 10	33.9	7
8	46 37.2	98 10	34.5	47 06.7	98 10	34.3	48 05.8	98 10	34.1	48 35.4	98 10	33.9	49 04.9	98 10	33.8	49 34.4	98 10	33.7	51 02.9	98 09	33.2	51 32.4	98 09	33.1	8
9	46 31.3	98 10	33.6	47 00.9	98 10	33.5	48 00.1	98 09	33.3	48 29.6	98 09	33.0	48 59.2	98 09	33.0	49 28.7	98 09	32.9	50 57.3	98 09	32.4	51 26.8	98 09	32.3	9
140	46 25.6	99 09	32.8	46 55.2	99 09	32.7	47 54.4	99 09	32.4	48 24.0	99 09	32.3	48 53.6	99 09	32.2	49 23.1	99 09	32.0	50 51.8	99 09	31.6	51 21.3	99 09	31.5	140
1	46 20.1	99 09	32.0	46 49.7	99 09	31.8	47 48.9	99 09	31.6	48 18.5	99 09	31.5	48 48.1	99 09	31.4	49 17.7	99 09	31.2	50 46.3	99 09	30.8	51 15.9	99 09	30.7	1
2	46 14.6	99 09	31.1	46 44.2	99 09	31.0	47 43.5	99 09	30.8	48 13.1	99 09	30.7	48 42.7	99 09	30.5	49 12.3	99 09	30.4	50 41.1	99 09	30.0	51 10.6	99 09	29.9	2
3	46 09.3	99 09	30.3	46 38.9	99 09	30.2	47 38.2	99 09	29.8	48 07.9	99 09	29.8	48 37.5	99 08	29.7	49 07.1	99 08	29.6	50 35.9	99 08	29.2	51 05.5	99 08	29.1	3
4	46 04.1	99 09	29.5	46 33.8	99 08	29.4	47 33.1	99 08	29.1	48 02.7	99 08	29.0	48 32.4	99 08	28.9	49 02.0	99 08	28.8	50 30.9	99 08	28.5	51 00.5	99 08	28.3	4
145	45 59.0	99 08	28.6	46 28.7	99 08	28.5	47 28.1	99 08	28.3	47 57.8	99 08	28.2	48 27.4	99 08	28.1	48 57.1	99 08	28.0	50 26.0	99 08	27.6	50 55.6	99 08	27.5	145
6	45 54.1	99 08	27.8	46 23.8	99 08	27.7	47 23.2	99 08	27.5	47 52.9	99 08	27.4	48 22.6	99 08	27.3	48 52.2	99 08	27.2	50 21.2	99 08	26.8	50 50.9	99 08	26.7	6
7	45 49.3	99 08	27.0	46 19.0	99 08	26.9	47 18.5	99 08	26.7	47 48.2	99 08	26.6	48 17.9	99 08	26.5	48 47.6	99 08	26.4	50 16.6	99 08	26.0	50 46.3	99 08	25.9	7
8	45 44.6	99 08	26.2	46 14.4	99 08	26.1	47 13.8	99 07	25.9	47 43.6	99 07	25.8	48 13.3	99 07	25.7	48 43.0	99 07	25.6	50 12.1	99 07	25.2	50 41.8	99 07	25.1	8
9	45 40.1	99 07	25.3	46 09.9	99 07	25.2	47 09.4	99 07	25.1	47 39.1	99 07	25.0	48 08.8	99 07	24.9	48 38.6	99 07	24.8	50 07.7	99 07	24.4	50 37.4	99 07	24.3	9
150	45 35.7	99 07	24.5	46 05.5	99 07	24.4	47 05.0	99 07	24.2	47 34.8	99 07	24.1	48 04.5	99 07	24.1	48 34.3	99 07	24.0	50 03.5	99 07	23.6	50 33.2	99 07	23.5	150
1	45 31.5	99 07	23.7	46 01.3	99 07	23.6	47 00.8	99 07	23.4	47 30.6	99 07	23.3	48 00.3	99 07	23.2	48 30.1	99 07	23.1	49 59.4	99 07	22.9	50 29.1	99 07	22.8	1
2	45 27.4	99 07	22.9	45 57.2	99 07	22.8	46 56.7	99 07	22.6	47 26.5	99 07	22.5	47 56.3	99 07	22.4	48 26.1	99 06	22.3	49 55.4	99 06	22.1	50 25.1	99 06	22.0	2
3	45 23.4	99 06	22.0	45 53.2	99 06	22.0	46 52.8	99 06	21.8	47 22.6	99 06	21.7	47 52.4	99 06	21.6	48 22.2	99 06	21.5	49 51.5	99 06	21.3	50 21.3	99 06	21.2	3
4	45 19.5	99 06	21.2	45 49.4	99 06	21.1	46 49.0	99 06	21.0	47 18.8	99 06	20.9	47 48.6	99 06	20.8	48 18.4	99 06	20.7	49 47.8	99 06	20.5	50 17.6	99 06	20.4	4
155	45 15.8	99 06	20.4	45 45.7	99 06	20.3	46 45.3	99 06	20.2	47 15.2	99 06	20.1	47 45.0	99 06	20.0	48 14.8	99 06	19.9	49 44.2	99 06	19.7	50 14.0	99 06	19.6	155
6	45 12.3	99 06	19.6	45 42.1	99 06	19.5	46 41.8	99 06	19.4	47 11.6	99 06	19.3	47 41.5	99 06	19.2	48 11.3	99 06	19.1	49 40.8	99 05	18.9	50 10.6	99 06	18.8	6
7	45 08.9	99 06	18.8	45 38.7	1.00 05	18.6	46 38.4	1.00 05	18.5	47 08.2	99 06	18.4	47 38.1	99 06	18.4	48 08.0	99 05	18.3	49 37.5	99 05	18.1	50 07.3	99 05	18.0	7
8	45 05.6	1.00 05	17.9	45 35.4	1.00 05	17.9	46 35.0	1.00 05	17.7	47 05.0	1.00 05	17.7	47 34.9	99 05	17.6	48 04.8	99 05	17.5	49 34.3	99 05	17.3	50 04.2	99 05	17.2	8
9	45 02.4	1.00 05	17.1	45 32.3	1.00 05	17.1	46 32.1	1.00 05	16.9	47 01.9	1.00 05	16.9	47 31.8	1.00 05	16.8	48 01.7	1.00 05	16.7	49 31.3	1.00 05	16.5	50 01.2	1.00 05	16.4	9
160	44 59.4	1.00 05	16.3	45 29.3	1.00 05	16.2	46 29.1	1.00 05	16.1	46 59.0	1.00 05	16.1	47 28.9	1.00 05	16.0	47 58.8	1.00 05	15.9	49 28.4	1.00 05	15.7	49 58.3	1.00 05	15.7	160
1	44 56.6	1.00 05	15.5	45 26.5	1.00 04	15.4	46 26.5	1.00 04	15.3	46 56.2	1.00 04	15.3	47 26.1	1.00 04	15.2	47 56.0	1.00 04	15.1	49 25.6	1.00 04	14.9	49 55.5	1.00 04	14.9	1
2	44 53.9	1.00 04	14.7	45 23.8	1.00 04	14.6	46 23.6	1.00 04	14.5	46 53.5	1.00 04	14.5	47 23.4	1.00 04	14.4	47 53.3	1.00 04	14.3	49 23.0	1.00 04	14.1	49 52.9	1.00 04	14.1	2
3	44 51.3	1.00 04	13.9	45 21.2	1.00 04	13.8	46 21.1	1.00 04	13.7	46 51.0	1.00 04	13.6	47 20.9	1.00 04	13.6	47 50.8	1.00 04	13.5	49 20.5	1.00 04	13.4	49 50.5	1.00 04	13.3	3
4	44 48.9	1.00 04	13.0	45 18.8	1.00 04	13.0	46 18.7	1.00 04	12.9	46 48.6	1.00 04	12.8	47 18.5	1.00 04	12.8	47 48.4	1.00 04	12.7	49 18.2	1.00 04	12.6	49 48.1	1.00 04	12.5	4
165	44 46.6	1.00 04	12.2	45 16.5	1.00 04	12.2	46 16.4	1.00 04	12.1	46 46.4	1.00 04	12.0	47 16.3	1.00 03	12.0	47 46.2	1.00 03	11.9	49 16.0	1.00 03	11.8	49 45.9	1.00 03	11.7	165
6	44 44.5	1.00 03	11.4	45 14.4	1.00 03	11.4	46 14.3	1.00 03	11.3	46 44.2	1.00 03	11.2	47 14.2	1.00 03	11.2	47 44.1	1.00 03	11.1	49 14.0	1.00 03	11.0	49 43.9	1.00 03	11.0	6
7	44 42.5	1.00 03	10.6	45 12.4	1.00 03	10.6	46 12.3	1.00 03	10.5	46 42.3	1.00 03	10.4	47 12.2	1.00 03	10.4	47 42.2	1.00 03	10.3	49 12.0	1.00 03	10.2	49 42.0	1.00 03	10.2	7
8	44 40.6	1.00 03	09.8	45 10.6	1.00 03	09.7	46 10.5	1.00 03	09.7	46 40.5	1.00 03	09.6	47 10.4	1.00 03	09.6	47 40.4	1.00 03	09.5	49 10.3	1.00 02	09.4	49 40.2	1.00 02	09.4	8
9	44 38.9	1.00 03	09.0	45 08.9	1.00 03	08.9	46 08.8	1.00 03	08.9	46 38.8	1.00 03	08.8	47 08.8	1.00 03	08.8	47 38.7	1.00 03	08.8	49 08.6	1.00 02	08.6	49 38.6	1.00 02	08.6	9
170	44 37.4	1.00 02	08.1	45 07.4	1.00 02	08.1	46 07.3	1.00 02	08.0	46 37.3	1.00 02	08.0	47 07.2	1.00 02	08.0	47 37.2	1.00 02	08.0	49 07.1	1.00 02	07.9	49 37.1	1.00 02	07.8	170
1	44 36.0	1.00 02	07.3	45 06.0	1.00 02	07.3	46 05.9	1.00 02	07.2	46 35.9	1.00 02	07.2	47 05.9	1.00 02	07.2	47 35.9	1.00 02	07.2	49 05.8	1.00 02	07.1	49 35.7	1.00 02	07.1	1
2	44 34.7	1.00 02	06.5	45 04.7	1.00 02	06.5	46 04.7	1.00 02	06.4	46 34.7	1.00 02	06.4	47 04.6	1.00 02	06.4	47 34.6	1.00 02	06.4	49 04.6	1.00 02	06.3	49 34.5	1.00 02	06.3	2
3	44 33.6	1.00 02	05.7	45 03.6	1.00 02	05.7	46 03.6	1.00 02	05.6	46 33.6	1.00 02	05.6	47 03.6	1.00 02	05.6	47 33.5	1.00 02	05.6	49 03.5	1.00 02	05.5	49 33.5	1.00 02	05.5	3
4	44 32.7	1.00 01	04.9	45 02.7	1.00 01	04.9	46 02.6	1.00 01	04.8	46 32.6	1.00 01	04.8	47 02.6	1.00 01	04.8	47 32.6	1.00 01	04.8	49 02.6	1.00 01	04.7	49 32.6	1.00 01	04.7	4
175	44 31.9	1.00 01	04.1	45 01.8	1.00 01	04.1	46 01.8	1.00 01	04.0	46 31.8	1.00 01	04.0	47 01.8	1.00 01	04.0	47 31.8	1.00 01	04.0	49 01.8	1.00 01	03.9	49 31.8	1.00 01	03.9	175
6	44 31.2	1.00 01	03.3	45 01.2	1.00 01	03.3	46 01.2	1.00 01	03.2	46 31.2	1.00 01	03.2	47 01.2	1.00 01	03.2	47 31.2	1.00 01	03.2	49 01.1	1.00 01	03.1	49 31.1	1.00 01	03.1	6
7	44 30.7	1.00 01	02.4	45 00.7	1.00 01	02.4	46 00.7	1.00 01	02.4	46 30.7	1.00 01	02.4	47 00.7	1.00 01	02.4	47 30.7	1.00 01	02.4	49 00.6	1.00 01	02.4	49 30.6	1.00 01	02.3	7
8	44 30.3	1.00 00	01.6	45 00.3	1.00 00	01.6	46 00.3	1.00 00	01.6	46 30.3	1.00 00	01.6	47 00.3	1.00 00	01.6	47 30.3	1.00 00	01.6	49 00.3	1.00 00	01.6	49 30.3	1.00 00	01.6	8
9	44 30.1	1.00 00	00.8	45 00.1	1.00 00	00.8	46 00.1	1.00 00	00.8	46 30.1	1.00 00	00.8	47 00.1	1.00 00	00.8	47 30.1	1.00 00	00.8	49 00.1	1.00 00	00.8	49 30.1	1.00 00	00.8	9
180	44 30.9	1.00 00	00.0	45 00.0	1.00 00	00.0	46 00.0	1.00 00	00.0	46 30.0	1.00 00	00.0	47 00.0	1.00 00	00.0	47 30.0	1.00 00	00.0	49 00.0	1.00 00	00.0	49 30.0	1.00 00	00.0	180

Right margin latitude labels: Lat. 80°, Lat. 81°, Lat. 82°, Lat. 8…

Lat. 0°

H.A.	60°00' Alt	Δd	Δt	Az	60°30' Alt	Δd	Δt	Az	62°00' Alt	Δd	Δt	Az	62°30' Alt	Δd	Δt	Az	63°00' Alt	Δd	Δt	Az	69°00' Alt	Δd	Δt	Az	69°30' Alt	Δd	Δt	Az	74°30' Alt	Δd	Δt	Az	H.A.
00	70 00.0	1.00	00	180.0	70 30.0	1.00	00	180.0	72 00.0	1.00	00	180.0	72 30.0	1.00	00	180.0	73 00.0	1.00	00	180.0	79 00.0	1.00	00	180.0	79 30.0	1.00	00	180.0	84 30.0	1.00	00	180.0	00
1	69 59.9	1.00	1	178.5	70 29.9	1.00	1	178.5	71 59.9	1.00	1	178.5	72 29.9	1.00	1	178.4	72 59.9	1.00	1	178.4	78 59.8	1.00	1	178.1	79 29.8	1.00	1	178.1	84 29.8	1.00	1	177.2	1
2	69 59.5	1.00	1	177.1	70 29.5	1.00	1	177.1	71 59.4	1.00	1	177.0	72 29.4	1.00	1	176.9	72 59.4	1.00	1	176.9	78 59.3	1.00	1	176.2	79 29.3	1.00	1	176.2	84 29.0	1.00	2	174.4	2
3	69 58.8	1.00	2	175.6	70 28.8	1.00	2	175.6	71 58.8	1.00	2	175.4	72 28.7	1.00	2	175.4	72 58.7	1.00	2	175.3	78 58.5	1.00	2	174.4	79 28.4	1.00	2	174.2	84 27.7	1.00	3	171.7	3
4	69 57.9	1.00	2	174.2	70 27.9	1.00	2	174.1	71 57.8	1.00	2	173.9	72 27.7	1.00	2	173.9	72 57.7	1.00	2	173.8	78 57.3	1.00	3	172.5	79 27.2	1.00	3	172.3	84 26.0	99	04	168.9	4
05	69 56.7	1.00	2	172.7	70 26.7	1.00	2	172.6	71 56.6	1.00	3	172.4	72 26.5	1.00	3	172.3	72 56.5	1.00	3	172.2	78 55.7	1.00	3	170.6	79 25.6	1.00	4	170.4	84 23.7	99	05	166.2	05
6	69 55.2	1.00	3	171.2	70 25.2	1.00	3	171.2	71 55.0	1.00	3	170.9	72 25.0	1.00	3	170.8	72 54.9	1.00	3	170.7	78 53.9	1.00	4	168.8	79 23.7	1.00	4	168.5	84 21.0	98	05	163.5	6
7	69 53.5	1.00	3	169.8	70 23.5	1.00	3	169.7	71 53.3	1.00	3	169.4	72 23.2	1.00	3	169.3	72 53.1	1.00	4	169.2	78 51.7	99	04	166.9	79 21.5	99	04	166.6	84 17.8	98	06	160.9	7
8	69 51.5	1.00	4	168.3	70 21.5	1.00	4	167.9	71 51.2	1.00	4	167.9	72 21.1	1.00	4	167.8	72 51.0	1.00	4	167.6	78 49.2	99	05	165.1	79 18.9	99	05	164.8	84 14.2	97	07	158.3	8
9	69 49.3	1.00	4	166.9	70 19.2	1.00	4	166.8	71 48.9	1.00	4	166.4	72 18.8	1.00	4	166.2	72 48.6	1.00	4	166.1	78 46.3	99	05	163.3	79 16.0	99	05	162.9	84 10.1	96	07	155.7	9
10	69 46.8	1.00	5	165.5	70 16.7	1.00	5	165.3	71 46.3	1.00	5	164.9	72 16.2	1.00	5	164.7	72 46.0	99	05	164.6	78 43.2	99	06	161.4	79 12.8	99	06	161.0	84 05.6	96	08	153.2	10
1	69 44.1	1.00	5	164.0	70 13.9	1.00	5	163.9	71 43.5	99	05	163.4	72 13.3	99	05	163.2	72 43.1	99	05	163.0	78 39.7	99	06	159.6	79 09.3	98	06	159.2	84 00.7	95	09	150.7	1
2	69 41.1	99	05	162.6	70 10.9	99	05	162.4	71 40.4	99	06	161.9	72 10.2	99	06	161.7	72 39.9	99	06	161.5	78 35.9	98	07	157.9	79 05.4	98	07	157.4	83 55.4	94	09	148.3	2
3	69 37.8	99	06	161.1	70 07.6	99	06	161.0	71 37.0	99	06	160.4	72 06.8	99	06	160.2	72 36.5	99	06	160.0	78 31.9	98	07	156.0	79 01.2	98	07	155.6	83 49.8	93	10	146.0	3
4	69 34.3	99	06	159.7	70 04.1	99	06	159.5	71 33.4	99	06	159.0	72 03.1	99	06	158.7	72 32.8	99	07	158.5	78 27.5	98	08	154.3	78 56.8	98	08	153.8	83 43.8	92	11	143.7	4
15	69 30.6	99	07	158.3	70 00.4	99	07	158.1	71 29.5	99	07	157.5	71 59.2	99	07	157.3	72 28.9	99	07	157.0	78 22.8	98	08	152.6	78 52.0	97	08	152.0	83 37.4	91	11	141.5	15
6	69 26.6	99	07	156.9	69 56.4	99	07	156.7	71 25.4	99	07	156.0	71 55.1	99	07	155.8	72 24.7	99	07	155.5	78 17.9	97	09	150.9	78 47.0	97	09	150.2	83 30.8	91	12	139.3	6
7	69 22.4	99	07	155.5	69 52.1	99	07	155.3	71 21.1	99	08	154.6	71 50.7	99	08	154.3	72 20.2	99	08	154.1	78 12.7	97	09	149.1	78 41.7	97	09	148.5	83 23.9	90	12	137.2	7
8	69 18.0	99	08	154.1	69 47.6	99	08	153.9	71 16.5	99	08	153.1	71 46.0	99	08	152.9	72 15.6	98	08	152.6	78 07.2	97	10	147.5	78 36.1	96	10	146.8	83 16.6	89	13	135.1	8
9	69 13.3	99	08	152.7	69 42.9	99	08	152.5	71 11.6	98	08	151.7	71 41.2	98	08	151.4	72 10.7	98	09	151.1	78 01.5	96	10	145.8	78 30.3	96	10	145.1	83 09.2	88	13	133.1	9
20	69 08.4	99	09	151.3	69 38.0	99	09	151.1	71 06.6	98	09	150.3	71 36.1	98	09	150.0	72 05.5	98	09	149.7	77 55.5	96	10	144.1	78 24.2	96	11	143.4	83 01.4	87	13	131.2	20
1	69 03.3	99	09	149.9	69 32.8	98	09	149.7	71 01.3	98	09	148.8	71 30.7	98	09	148.5	72 00.1	98	09	148.2	77 49.3	96	11	142.5	78 17.9	95	11	141.8	82 53.5	86	14	129.3	1
2	68 58.0	98	09	148.5	69 27.5	98	09	148.3	70 55.8	98	10	147.4	71 25.2	98	10	147.1	71 54.5	98	10	146.8	77 42.8	95	11	140.9	78 11.3	95	11	140.1	82 45.3	86	14	127.5	2
3	68 52.4	98	10	147.2	69 21.9	98	10	146.9	70 50.1	98	10	146.0	71 19.4	98	10	145.7	71 48.7	97	10	145.4	77 36.1	95	12	139.3	78 04.5	94	12	138.5	82 37.0	85	14	125.7	3
4	68 46.7	98	10	145.8	69 16.1	98	10	145.5	70 44.2	98	10	144.6	71 13.4	98	10	144.3	71 42.7	97	10	144.0	77 29.2	95	12	137.7	77 57.5	94	12	136.9	82 28.4	84	15	123.9	4
25	68 40.7	98	10	144.5	69 10.1	98	11	144.2	70 38.0	98	11	143.2	71 07.3	97	11	142.9	71 36.5	97	11	142.5	77 22.1	94	12	136.2	77 50.3	94	13	135.4	82 19.7	84	15	122.2	25
6	68 34.6	98	11	143.1	69 03.9	98	11	142.8	70 31.7	97	11	141.9	71 00.9	97	11	141.5	71 30.0	97	11	141.2	77 14.8	94	13	134.6	77 42.9	94	13	133.8	82 10.8	83	15	120.6	6
7	68 28.2	98	11	141.8	68 57.5	98	11	141.5	70 25.2	97	11	140.5	70 54.3	97	11	140.1	71 23.4	97	11	139.8	77 07.3	94	13	133.0	77 35.3	93	13	132.3	82 01.7	82	15	119.0	7
8	68 21.7	98	11	140.5	68 50.9	97	11	140.2	70 18.4	97	12	139.2	70 47.5	97	12	138.8	71 16.6	97	12	138.4	76 59.6	93	13	131.6	77 27.5	93	13	130.8	81 52.6	82	16	117.4	8
9	68 15.0	97	12	139.1	68 44.2	97	12	138.8	70 11.5	97	12	137.8	70 40.6	97	12	137.4	71 09.6	97	12	137.0	76 51.7	93	13	130.1	77 19.5	92	14	129.3	81 43.2	81	16	115.9	9
30	68 08.1	97	12	137.8	68 37.2	97	12	137.5	70 04.4	97	12	136.5	70 33.4	97	12	136.1	71 02.4	96	12	135.7	76 43.7	93	14	128.7	77 11.4	92	14	127.8	81 33.8	81	16	114.4	30
1	68 01.0	97	12	136.5	68 30.1	97	12	136.2	69 57.2	97	12	135.1	70 26.1	96	12	134.8	70 55.0	96	13	134.3	76 35.4	92	14	127.3	77 03.0	92	14	126.4	81 24.3	80	16	112.9	1
2	67 53.7	97	12	135.2	68 22.8	97	12	134.9	69 49.8	96	13	133.8	70 18.6	96	13	133.3	70 47.5	96	13	133.0	76 27.1	92	14	125.9	76 54.6	91	14	125.0	81 14.6	80	16	111.5	2
3	67 46.3	97	13	134.0	68 15.3	97	13	133.6	69 42.2	96	13	132.5	70 11.0	96	13	132.1	70 39.8	96	13	131.7	76 18.6	92	14	124.4	76 46.0	91	15	123.6	81 04.9	79	16	110.1	3
4	67 38.7	97	13	132.7	68 07.7	97	13	132.3	69 34.4	96	13	131.2	70 03.2	96	13	130.8	70 31.9	96	13	130.4	76 09.9	91	15	123.1	76 37.2	91	15	122.2	80 55.1	79	16	108.8	4
35	67 31.0	97	13	131.4	67 59.9	96	13	131.1	69 26.5	96	13	129.9	69 55.2	96	14	129.5	70 23.9	95	14	129.1	76 01.1	91	15	121.7	76 28.3	90	15	120.8	80 45.2	78	17	107.5	35
6	67 23.1	96	13	130.2	67 52.0	96	13	129.8	69 18.4	96	14	128.7	69 47.1	95	14	128.2	70 15.7	95	14	127.8	75 52.2	91	15	120.4	76 19.3	90	15	119.5	80 35.2	78	17	106.2	6
7	67 15.1	96	14	128.9	67 43.9	96	14	128.6	69 10.2	95	14	127.4	69 38.9	95	14	127.0	70 07.4	95	14	126.5	75 43.1	90	15	119.0	76 10.2	90	15	118.2	80 25.2	78	17	104.9	7
8	67 06.9	96	14	127.7	67 35.7	96	14	127.3	69 01.9	95	14	126.1	69 30.5	95	14	125.7	69 59.0	95	14	125.3	75 34.0	90	15	117.7	76 01.0	90	16	116.8	80 15.1	78	17	103.7	8
9	66 58.6	96	14	126.4	67 27.4	96	14	126.1	68 53.4	95	14	124.9	69 21.9	95	14	124.5	69 50.4	95	14	124.0	75 24.7	90	16	116.4	75 51.6	89	16	115.6	80 04.9	77	17	102.5	9
40	66 50.1	96	14	125.2	67 18.9	96	14	124.8	68 44.8	95	15	123.6	69 13.3	95	15	123.2	69 41.7	95	15	122.8	75 15.3	90	16	115.2	75 42.2	89	16	114.3	79 54.7	77	17	101.3	40
1	66 41.6	96	14	124.0	67 10.3	96	15	123.6	68 36.0	95	15	122.4	69 04.5	95	15	122.0	69 32.9	95	15	121.5	75 05.8	90	16	113.9	75 32.6	89	16	113.0	79 44.5	77	17	100.1	1
2	66 32.9	96	15	122.8	67 01.5	96	15	122.4	68 27.2	95	15	121.2	68 55.6	95	15	120.8	69 24.0	94	15	120.3	74 56.2	89	16	112.7	75 23.0	89	16	111.8	79 34.2	77	17	99.0	2
3	66 24.0	95	15	121.6	66 52.7	95	15	121.2	68 18.2	95	15	120.0	68 46.6	94	15	119.6	69 14.9	94	15	119.1	74 46.6	89	16	111.4	75 13.3	89	16	110.6	79 23.9	77	17	97.9	3
4	66 15.1	95	15	120.4	66 43.7	95	15	120.0	68 09.1	94	15	118.8	68 37.5	94	15	118.4	69 05.8	94	15	117.9	74 36.9	89	16	110.2	75 03.5	88	16	109.4	79 13.6	76	17	96.8	4
45	66 06.1	95	15	119.2	66 34.6	95	15	118.8	68 00.0	94	15	117.6	68 28.3	94	16	117.2	68 56.5	94	16	116.7	74 27.0	89	16	109.0	74 53.6	88	17	108.2	79 03.2	76	17	95.7	45
6	65 56.9	95	15	118.1	66 25.5	95	15	117.7	67 50.7	94	16	116.4	68 18.9	94	16	116.0	68 47.1	94	16	115.5	74 17.2	89	17	107.9	74 43.5	88	17	107.0	78 52.8	76	17	94.6	6
7	65 47.7	95	16	116.9	66 16.2	95	16	116.5	67 41.3	94	16	115.3	68 09.5	94	16	114.8	68 37.7	94	16	114.3	74 07.2	89	17	106.7	74 33.7	88	17	105.8	78 42.4	76	17	93.5	7
8	65 38.3	95	16	115.7	66 06.8	95	16	115.3	67 31.8	94	16	114.1	68 00.0	94	16	113.6	68 28.2	94	16	113.2	73 57.2	88	17	105.5	74 23.6	88	17	104.7	78 32.0	76	17	92.5	8
9	65 28.9	95	16	114.6	65 57.4	95	16	114.2	67 22.3	94	16	112.9	67 50.4	94	16	112.5	68 18.5	94	16	112.0	73 47.1	88	17	104.4	74 13.5	88	17	103.5	78 21.6	76	17	91.5	9
50	65 19.4	95	16	113.4	65 47.8	95	16	113.1	67 12.6	94	16	111.8	67 40.8	94	16	111.4	68 08.8	93	16	110.9	73 37.0	88	17	103.3	74 03.4	87	17	102.4	78 11.2	76	17	90.5	50
1	65 09.8	95	16	112.3	65 38.2	94	16	111.9	67 02.9	94	16	110.7	67 31.0	94	16	110.2	67 59.1	93	16	109.7	73 26.9	88	17	102.2	73 53.2	87	17	101.3	78 00.8	76	17	89.5	1
2	65 00.1	95	16	111.2	65 28.5	94	16	110.8	66 53.1	94	16	109.5	67 21.2	93	16	109.1	67 49.2	93	16	108.6	73 16.7	88	17	101.1	73 42.9	87	17	100.2	77 50.4	76	17	88.6	2
3	64 50.4	95	16	110.1	65 18.7	94	16	109.7	66 43.3	94	17	108.4	67 11.3	93	17	108.0	67 39.3	93	17	107.5	73 06.4	88	17	100.0	73 32.7	87	17	99.1	77 39.9	76	17	87.6	3
4	64 40.6	94	16	109.0	65 08.9	94	16	108.6	66 33.4	94	17	107.3	67 01.4	93	17	106.9	67 29.4	93	17	106.4	72 56.1	88	17	98.9	73 22.4	87	17	98.0	77 29.5	76	17	86.7	4
55	64 30.7	94	17	107.9	64 59.0	94	17	107.5	66 23.4	93	17	106.2	66 51.4	93	17	105.8	67 19.3	93	17	105.3	72 45.8	88	17	97.8	73 12.0	87	17	97.0	77 19.1	76	17	85.7	55
6	64 20.7	94	17	106.8	64 49.0	94	17	106.4	66 13.4	93	17	105.1	66 41.4	93	17	104.7	67 09.3	93	17	104.2	72 35.5	88	17	96.8	73 01.7	87	17	95.9	77 08.6	76	17	84.8	6
7	64 10.7	94	17	105.7	64 39.0	94	17	105.3	66 03.3	93	17	104.0	66 31.3	93	17	103.6	66 59.1	93	17	103.1	72 25.1	88	17	95.7	72 51.3	87	17	94.9	76 58.4	76	17	83.9	7
8	64 00.7	94	17	104.6	64 28.9	94	17	104.2	65 53.2	93	17	103.0	66 21.1	93	17	102.5	66 49.0	93	17	102.1	72 14.8	88	17	94.7	72 40.9	87	17	93.9	76 48.0	76	17	83.0	8
9	63 50.6	94	17	103.5	64 18.8	94	17	103.2	65 43.0	93	17	101.9	66 10.9	93	17	101.5	66 38.8	93	17	101.0	72 04.4	88	17	93.7	72 30.5	87	17	92.9	76 37.7	77	17	82.1	9
60	63 40.4	94	17	102.5	64 08.6	94	17	102.1	65 32.8	93	17	100.8	66 00.7	93	17	100.4	66 28.5	93	17	99.9	71 54.0	88	17	92.6	72 20.1	87	17	91.8	76 27.4	77	17	81.2	60
1	63 30.2	94	17	101.4	63 58.4	94	17	101.0	65 22.5	93	17	99.3	65 50.4	93	17	98.9	66 18.2	93	17	98.9	71 43.6	87	17	91.6	72 09.7	87	17	90.9	76 17.1	77	17	80.4	1
2	63 20.0	94	17	100.4	63 48.1	94	17	100.0	65 12.2	93	17	98.7	65 40.1	93	17	98.3	66 07.9	93	17	97.8	71 33.1	87	17	90.6	71 59.3	87	17	89.9	76 06.9	77	17	79.5	2
3	63 09.7	94	17	99.3	63 37.9	94	17	98.9	65 01.9	93	17	97.7	65 29.8	93	17	97.3	65 57.6	93	17	96.8	71 22.7	87	17	89.7	71 48.9	87	17	88.9	75 56.6	77	17	78.6	3
4	62 59.4	94	17	98.3	63 27.6	94	17	97.9	64 51.6	93	17	96.7	65 19.5	93	17	96.2	65 47.2	92	17	95.8	71 12.3	87	17	88.7	71 38.4	87	17	87.9	75 46.4	77	17	77.8	4
65	62 49.1	94	17	97.3	63 17.2	94	17	96.9	64 41.2	93	17	95.6	65 09.1	93	17	95.2	65 36.9	92	17	94.8	71 01.9	87	17	87.7	71 28.0	87	17	87.0	75 36.3	77	17	77.0	65
6	62 38.7	94	17	96.2	63 06.9	94	17	95.9	64 30.8	93	17	94.6	64 58.7	93	17	94.2	65 26.5	92	17	93.7	70 51.5	88	17	86.8	71 17.6	87	17	86.0	75 26.1	78	17	76.1	6
7	62 28.4	94	17	95.2	62 56.5	94	17	94.8	64 20.5	93	17	93.6	64 48.3	93	17	93.2	65 16.1	92	17	92.7	70 41.1	88	17	85.8	71 07.3	87	17	85.1	75 16.0	78	17	75.3	7
8	62 18.0	94	17	94.2	62 46.1	94	17	93.8	64 10.1	93	17	92.6	64 37.9	93	17	92.2	65 05.7	92	17	91.7	70 30.7	88	17	84.9	70 56.9	87	17	84.1	75 06.0	78	17	74.5	8
9	62 07.6	94	17	93.2	62 35.7	94	17	92.8	63 59.6	93	17	91.6	64 27.5	93	17	91.2	64 55.2	92	17	90.7	70 20.3	88	17	83.9	70 46.5	87	17	83.2	74 56.0	78	17	73.7	9
70	61 57.2	94	17	92.2	62 25.3	94	17	91.8	63 49.2	93	17	90.6	64 17.1	93	17	90.2	64 44.8	92	17	89.8	70 10.0	88	17	83.0	70 36.2	87	17	82.3	74 46.0	78	17	72.9	70
1	61 46.8	94	17	91.2	62 14.9	94	17	90.8	63 38.8	93	17	89.6	64 06.6	93	17	89.2	64 34.4	92	17	88.8	69 59.6	88	17	82.1	70 25.9	87	17	81.4	74 36.0	78	16	72.0	1
2	61 36.4	94	17	90.2	62 04.5	94	17	89.8	63 28.4	93	17	88.7	63 56.2	93	17	88.2	64 24.0	92	17	87.8	69 49.3	88	17	81.2	70 15.6	87	17	80.4	74 26.2	79	16	71.3	2
3	61 25.9	94	17	89.2	61 54.0	94	17	88.9	63 18.0	93	17	87.7	63 45.8	93	17	87.3	64 13.6	92	17	86.8	69 39.1	88	17	80.2	70 05.3	87	17	79.5	74 16.3	79	16	70.5	3
4	61 15.5	94	17	88.3	61 43.6	94	17	87.9	63 07.6	93	17	86.7	63 35.4	93	17	86.3	64 03.2	92	17	85.9	69 28.8	88	17	79.3	69 55.1	87	17	78.6	74 06.5	79	16	69.7	4
75	61 05.1	94	17	87.3	61 33.2	94	17	86.9	62 57.2	93	17	85.8	63 25.0	93	17	85.3	63 52.8	92	17	84.9	69 18.6	88	17	78.4	69 44.9	88	17	77.8	73 56.8	80	16	69.0	75
6	60 54.7	94	17	86.3	61 22.8	94	17	86.0	62 46.8	93	17	84.8	63 14.6	93	17	84.4	63 42.4	92	17	84.0	69 08.4	88	17	77.6	69 34.7	88	17	76.9	73 47.1	80	16	68.2	6
7	60 44.3	94	17	85.4	61 12.4	94	17	85.0	62 36.4	93	17	83.8	63 04.2	93	17	83.4	63 32.1	92	17	83.0	68 58.2	88	17	76.7	69 24.6	88	17	76.0	73 37.4	80	16	67.4	7
8	60 33.9	94	17	84.4	61 02.1	94	17	84.0	62 26.1	93	17	82.9	62 53.9	93	17	82.5	63 21.7	92	17	82.1	68 48.1	88	17	75.8	69 14.5	88	17	75.1	73 27.8	80	16	66.7	8
9	60 23.6	94	17	83.4	60 51.7	94	17	83.1	62 15.7	93	17	82.0	62 43.6	93	17	81.6	63 11.4	92	17	81.1	68 38.0	88	17	74.9	69 04.5	88	17	74.3	73 18.3	80	16	65.9	9
80	60 13.2	94	17	82.5	60 41.4	94	17	82.1	62 05.4	93	17	81.0	62 33.3	93	17	80.6	63 01.2	93	17	80.2	68 28.0	89	17	74.1	68 54.5	88	17	73.4	73 08.8	81	16	65.2	80
1	60 02.9	94	17	81.6	60 31.1	94	17	81.2	61 55.2	93	17	80.1	62 23.1	93	17	79.7	62 50.9	93	17	79.3	68 18.0	89	17	73.2	68 44.5	88	17	72.6	72 59.4	81	16	64.5	1
2	59 52.6	94	17	80.6	60 20.8	94	17	80.3	61 44.9	93	17	79.2	62 12.8	93	17	78.8	62 40.7	93	17	78.4	68 08.0	89	17	72.3	68 34.6	88	16	71.7	72 50.0	81	16	63.7	2
3	59 42.4	94	17	79.7	60 10.5	94	17	79.3	61 34.7	93	17	78.2	62 02.6	93	17	77.9	62 30.5	93	17	77.5	67 58.1	89	16	71.5	68 24.7	88	16	70.9	72 40.7	82	15	63.0	3
4	59 32.1	94	17	78.7	60 00.3	94	17	78.4	61 24.5	93	17	77.3	61 52.5	93	17	76.9	62 20.3	93	17	76.5	67 48.3	89	16	70.6	68 14.9	88	16	70.0	72 31.4	82	15	62.3	4
85	59 21.9	94	17	77.8	59 50.1	94	17	77.5	61 14.4	93	17	76.4	61 42.3	93	17	76.0	62 10.2	93	17	75.6	67 38.5	89	16	69.8	68 05.1	89	16	69.2	72 22.2	82	15	61.5	85
6	59 11.8	94	17	76.9	59 40.0	94	17	76.6	61 04.3	93	17	75.5	61 32.2	93	17	75.1	62 00.2	93	17	74.7	67 28.7	89	16	69.0	67 55.4	89	16	68.4	72 13.1	82	15	60.8	6
7	59 01.6	94	17	76.0	59 29.9	94	17	75.7	60 54.2	93	17	74.6	61 22.2	93	17	74.2	61 50.1	93	17	73.8	67 19.0	89	16	68.1	67 45.8	89	16	67.5	72 04.0	83	15	60.1	7
8	58 51.6	94	17	75.1	59 19.8	94	17	74.7	60 44.2	93	17	73.7	61 12.2	93	17	73.3	61 40.1	93	17	73.0	67 09.4	89	16	67.3	67 36.2	89	16	66.7	71 55.0	83	15	59.4	8
9	58 41.5	94	17	74.2	59 09.8	94	17	73.8	60 34.2	94	17	72.8	61 02.2	93	17	72.4	61 30.2	93	16	72.1	66 59.8	89	16	66.5	67 26.7	89	16	65.9	71 46.1	83	15	58.7	9
90	58 31.5	94	17	73.3	58 59.8	94	17	72.9	60 24.3	94	16	71.6	60 52.3	93	16	71.6	61 20.3	93	16	71.2	66 50.3	89	16	65.7	67 17.1	89	15	65.1	71 37.2	83	15	57.9	90

H.A.	60° 00' Alt.	Δd Δt	Az.	60° 30' Alt.	Δd Δt	Az.	62° 00' Alt.	Δd Δt	Az.	62° 30' Alt.	Δd Δt	Az.	63° 00' Alt.	Δd Δt	Az.	69° 00' Alt.	Δd Δt	Az.	69° 30' Alt.	Δd Δt	Az.	74° 30' Alt.	Δd Δt	Az.	H.A.
91	58 21.6	94 16	72.4	58 49.8	94 16	72.0	60 14.4	94 16	71.0	60 42.5	93 16	70.7	61 10.5	93 16	70.3	66 40.8	89 16	64.8	67 07.7	89 16	64.3	71 28.5	84 15	57.2	91
2	58 11.6	94 16	71.5	58 39.9	94 16	71.1	60 04.6	94 16	70.1	60 32.7	94 16	69.8	61 00.7	93 16	69.4	66 31.4	90 16	64.0	66 58.4	90 15	63.5	71 19.7	84 14	56.5	2
3	58 01.8	94 16	70.6	58 30.1	94 16	70.3	59 54.8	94 16	69.3	60 22.9	94 16	68.9	60 51.0	93 16	68.6	66 22.1	90 15	63.2	66 49.1	90 15	62.7	71 11.1	84 14	55.8	3
4	57 52.0	95 16	69.7	58 20.3	94 16	69.4	59 45.1	94 16	68.4	60 13.2	94 16	68.0	60 41.3	94 16	67.7	66 12.8	90 15	62.4	66 39.9	90 15	61.9	71 02.5	85 14	55.1	4
95	57 42.3	95 16	68.8	58 10.6	94 16	68.5	59 35.4	94 16	67.5	60 03.6	94 16	67.2	60 31.7	94 16	66.8	66 03.6	90 15	61.6	66 30.7	90 15	61.1	70 54.5	85 14	54.4	95
6	57 32.6	95 16	67.9	58 01.0	94 16	67.6	59 25.8	94 16	66.6	59 54.0	94 16	66.3	60 22.2	94 16	66.0	65 54.5	91 15	60.8	66 21.6	90 15	60.3	70 45.5	85 14	53.8	6
7	57 22.9	95 16	67.0	57 51.4	95 16	66.7	59 16.3	94 16	65.8	59 44.5	94 16	65.4	60 12.7	94 16	65.1	65 45.4	91 15	60.0	66 12.6	90 15	59.5	70 37.2	85 14	53.1	7
8	57 13.4	95 16	66.1	57 41.8	95 16	65.9	59 06.8	94 16	64.9	59 35.1	94 16	64.6	60 03.3	94 16	64.2	65 36.4	91 15	59.2	66 03.7	91 15	58.7	70 28.9	86 14	52.4	8
9	57 03.9	95 16	65.3	57 32.3	95 16	65.0	58 57.4	94 16	64.1	59 25.7	94 16	63.7	59 53.9	94 15	63.4	65 27.5	91 15	58.5	65 54.8	91 15	57.9	70 20.7	86 14	51.7	9
100	56 54.5	95 16	64.4	57 22.9	95 16	64.1	58 48.1	94 15	63.2	59 16.4	94 15	62.9	59 44.6	94 15	62.5	65 18.7	91 15	57.7	65 46.0	91 15	57.2	70 12.5	86 13	51.0	100
1	56 45.1	95 16	63.5	57 13.6	95 16	63.2	58 38.8	94 15	62.3	59 07.1	94 15	62.0	59 35.4	94 15	61.7	65 09.9	91 14	56.9	65 37.3	91 14	56.4	70 04.5	87 13	50.3	1
2	56 35.8	95 16	62.7	57 04.3	95 15	62.4	58 29.6	95 15	61.5	58 58.0	95 15	61.2	59 26.3	94 15	60.8	65 01.2	92 14	56.1	65 28.6	91 14	55.6	69 56.5	87 13	49.7	2
3	56 26.6	95 16	61.8	56 55.1	95 15	61.5	58 20.5	95 15	60.6	58 48.9	95 15	60.3	59 17.2	94 15	60.0	64 52.6	92 14	55.3	65 20.1	91 14	54.9	69 48.6	87 13	49.0	3
4	56 17.4	95 15	60.9	56 46.0	95 15	60.7	58 11.5	95 15	59.8	58 39.9	95 15	59.5	59 08.2	94 15	59.2	64 44.1	92 14	54.6	65 11.6	92 14	54.0	69 40.8	87 13	48.3	4
105	56 08.4	95 15	60.1	56 37.0	95 15	59.8	58 02.5	95 15	59.0	58 30.9	95 15	58.6	58 59.3	95 15	58.3	64 35.7	92 14	53.8	65 03.2	92 14	53.3	69 33.0	88 13	47.6	105
6	55 59.4	95 15	59.2	56 28.0	95 15	59.0	57 53.6	95 15	58.1	58 22.1	95 15	57.8	58 50.5	95 15	57.5	64 27.3	92 14	53.0	64 54.9	92 14	52.6	69 25.4	88 13	47.0	6
7	55 50.5	96 15	58.4	56 19.1	95 15	58.1	57 44.8	95 15	57.3	58 13.3	95 14	57.0	58 41.8	95 14	56.7	64 19.0	92 14	52.3	64 46.7	92 14	51.8	69 17.8	88 12	46.3	7
8	55 41.6	96 15	57.5	56 10.3	95 15	57.3	57 36.1	95 14	56.4	58 04.6	95 14	56.1	58 33.1	95 14	55.8	64 10.8	93 14	51.5	64 38.5	92 13	51.1	69 10.3	89 12	45.6	8
9	55 32.9	96 14	56.7	56 01.6	96 14	56.4	57 27.4	95 14	55.6	57 56.0	95 14	55.3	58 24.5	95 14	55.0	64 02.7	93 13	50.7	64 30.5	92 13	50.3	69 02.9	89 12	45.0	9
110	55 24.2	96 14	55.8	55 52.9	96 14	55.6	57 18.9	96 14	54.8	57 47.5	95 14	54.5	58 16.0	95 14	54.2	63 54.6	93 13	50.0	64 22.5	93 13	49.5	68 55.6	89 12	44.3	110
1	55 15.6	96 14	55.0	55 44.4	96 14	54.7	57 10.4	95 14	54.0	57 39.0	95 14	53.7	58 07.6	95 14	53.4	63 46.7	93 13	49.2	64 14.6	93 13	48.8	68 48.4	89 12	43.6	1
2	55 07.2	96 14	54.2	55 35.9	96 14	53.9	57 02.0	96 14	53.1	57 30.7	95 14	52.9	57 59.3	95 14	52.6	63 38.9	93 13	48.5	64 06.8	93 13	48.1	68 41.2	90 12	43.0	2
3	54 58.8	96 14	53.3	55 27.6	96 13	53.1	56 53.8	96 14	52.3	57 22.4	96 14	52.0	57 51.1	95 14	51.8	63 31.1	93 13	47.7	63 59.1	93 13	47.3	68 34.1	90 12	42.3	3
4	54 50.4	96 14	52.5	55 19.3	96 14	52.2	56 45.6	96 14	51.5	57 14.3	96 13	51.2	57 42.9	95 13	50.9	63 23.5	94 13	47.0	63 51.5	93 13	46.6	68 27.2	90 11	41.7	4
115	54 42.2	96 13	51.7	55 11.1	96 14	51.4	56 37.5	96 13	50.7	57 06.2	96 13	50.4	57 34.9	96 13	50.1	63 16.0	94 13	46.2	63 44.0	93 12	45.8	68 20.3	90 11	41.0	115
6	54 34.1	96 13	50.8	55 03.0	96 13	50.6	56 29.4	96 13	49.8	56 58.2	96 13	49.6	57 26.9	96 13	49.3	63 08.4	94 12	45.5	63 36.6	94 12	45.1	68 13.5	91 11	40.4	6
7	54 26.1	96 13	50.0	54 55.0	96 13	49.8	56 21.5	96 13	49.0	56 50.3	96 13	48.8	57 19.1	96 13	48.5	63 01.1	94 12	44.7	63 29.2	94 12	44.3	68 06.8	91 11	39.7	7
8	54 18.1	96 13	49.2	54 47.1	96 13	48.9	56 13.7	96 13	48.2	56 42.5	96 13	48.0	57 11.3	96 13	47.7	62 53.8	94 12	44.0	63 22.0	94 12	43.6	68 00.2	91 11	39.0	8
9	54 10.3	96 13	48.3	54 39.3	96 13	48.1	56 06.0	96 13	47.4	56 34.8	96 13	47.2	57 03.7	96 13	46.9	62 46.6	94 12	43.2	63 14.8	94 12	42.9	67 53.7	91 11	38.4	9
120	54 02.6	97 13	47.5	54 31.6	97 13	47.3	55 58.4	96 13	46.6	56 27.3	96 12	46.4	56 56.1	96 12	46.1	62 39.5	94 12	42.5	63 07.8	94 12	42.1	67 47.2	92 11	37.7	120
1	53 54.9	97 13	46.7	54 24.0	97 13	46.5	55 50.8	96 12	45.8	56 19.8	96 12	45.6	56 48.6	96 12	45.3	62 32.5	95 11	41.8	63 00.9	94 11	41.4	67 40.9	92 10	37.1	1
2	53 47.4	97 12	45.9	54 16.5	97 12	45.7	55 43.4	97 12	45.0	56 12.4	96 12	44.8	56 41.3	96 12	44.5	62 25.6	95 11	41.0	62 54.0	95 11	40.7	67 34.7	92 10	36.5	2
3	53 40.0	97 12	45.1	54 09.1	97 12	44.8	55 36.1	97 12	44.2	56 05.1	97 12	44.0	56 34.0	96 12	43.7	62 18.8	95 11	40.3	62 47.3	95 11	40.0	67 28.5	92 10	35.8	3
4	53 32.7	97 12	44.2	54 01.7	97 12	44.0	55 28.9	97 12	43.4	55 57.9	97 12	43.2	56 26.9	97 12	42.9	62 12.1	95 11	39.6	62 40.6	95 11	39.2	67 21.8	93 10	35.2	4
125	53 25.4	97 12	43.4	53 54.6	97 12	43.2	55 21.8	97 12	42.6	55 50.8	97 12	42.4	56 19.8	97 12	42.1	62 05.5	95 11	38.8	62 34.1	95 11	38.5	67 16.5	93 10	34.5	125
6	53 18.3	97 12	42.6	53 47.5	97 12	42.4	55 14.8	97 12	41.8	55 43.9	97 11	41.6	56 12.9	97 11	41.3	61 59.1	95 11	38.1	62 27.7	95 11	37.8	67 10.7	93 10	33.9	6
7	53 11.3	97 11	41.8	53 40.5	97 11	41.6	55 07.9	97 11	41.0	55 37.0	97 11	40.8	56 06.1	97 11	40.5	61 52.7	96 10	37.4	62 21.3	95 10	37.1	67 04.9	93 09	33.2	7
8	53 04.5	97 11	41.0	53 33.7	97 11	40.8	55 01.1	97 11	40.2	55 30.3	97 11	40.0	55 59.4	97 11	39.8	61 46.4	96 10	36.7	62 15.1	96 10	36.4	66 59.3	94 09	32.6	8
9	52 57.7	97 11	40.2	53 26.9	97 11	40.0	54 54.5	97 11	39.4	55 23.6	97 11	39.2	55 52.8	97 11	39.0	61 40.2	96 10	35.9	62 09.0	96 10	35.6	66 53.7	94 09	32.0	9
130	52 51.0	98 11	39.4	53 20.3	97 11	39.2	54 47.9	97 11	38.6	55 17.1	97 11	38.4	55 46.3	97 11	38.2	61 34.2	96 10	35.2	62 03.0	96 10	34.9	66 48.2	94 09	31.3	130
1	52 44.5	98 11	38.6	53 13.7	98 11	38.4	54 41.5	97 11	37.8	55 10.7	97 10	37.6	55 39.9	97 10	37.4	61 28.2	96 10	34.5	61 57.1	96 10	34.2	66 42.9	94 09	30.7	1
2	52 38.0	98 11	37.8	53 07.3	98 10	37.6	54 35.1	97 10	37.0	55 04.4	97 10	36.8	55 33.6	97 10	36.6	61 22.4	96 10	33.8	61 51.3	96 09	33.5	66 37.6	95 09	30.0	2
3	52 31.7	98 10	36.9	53 01.0	98 10	36.8	54 28.9	98 10	36.2	54 58.2	98 10	36.0	55 27.4	97 10	35.8	61 16.6	96 09	33.1	61 45.6	96 09	32.8	66 32.4	95 08	29.4	3
4	52 25.5	98 10	36.1	52 54.9	98 10	36.0	54 22.8	98 10	35.4	54 52.1	98 10	35.3	55 21.4	98 10	35.1	61 11.0	97 09	32.3	61 40.0	96 09	32.1	66 27.4	95 08	28.8	4
135	52 19.4	98 10	35.8	52 48.8	98 10	35.2	54 16.8	98 10	34.7	54 46.2	98 10	34.5	55 15.5	98 10	34.3	61 05.5	97 09	31.6	61 34.5	97 09	31.3	66 22.4	95 08	28.1	135
6	52 13.4	98 10	34.5	52 42.8	98 10	34.4	54 11.0	98 10	33.9	54 40.3	98 10	33.7	55 09.7	98 10	33.5	61 00.1	97 09	30.9	61 29.1	97 09	30.6	66 17.5	95 08	27.5	6
7	52 07.6	98 10	33.7	52 37.0	98 10	33.6	54 05.2	98 09	33.1	54 34.6	98 09	32.9	55 04.0	98 09	32.7	60 54.8	97 09	30.2	61 23.9	97 09	29.9	66 12.8	95 08	26.9	7
8	52 01.9	98 09	32.9	52 31.3	98 09	32.8	53 59.6	98 09	32.3	54 29.0	98 09	32.1	54 58.4	98 09	32.0	60 49.6	97 08	29.5	61 18.7	97 08	29.2	66 08.1	96 08	26.2	8
9	51 56.3	98 09	32.1	52 25.7	98 09	32.0	53 54.1	98 09	31.5	54 23.5	98 09	31.4	54 52.9	98 09	31.2	60 44.5	97 08	28.8	61 13.7	97 08	28.5	66 03.6	96 07	25.6	9
140	51 50.8	98 09	31.3	52 20.3	98 09	31.2	53 48.7	98 09	30.7	54 18.2	98 09	30.6	54 47.6	98 09	30.4	60 39.6	97 08	28.0	61 08.7	97 08	27.8	65 59.1	96 07	25.0	140
1	51 45.4	98 09	30.6	52 15.0	98 09	30.4	53 43.5	98 09	30.0	54 12.9	98 09	29.8	54 42.4	98 09	29.6	60 34.8	97 08	27.3	61 04.0	97 08	27.1	65 54.8	96 07	24.3	1
2	51 40.2	99 08	29.8	52 09.7	98 08	29.6	53 38.3	98 08	29.2	54 07.8	98 08	29.0	54 37.3	98 08	28.9	60 30.0	98 08	26.6	60 59.3	98 08	26.4	65 50.5	97 07	23.7	2
3	51 35.1	99 08	29.0	52 04.6	98 08	28.8	53 33.3	98 08	28.4	54 02.8	98 08	28.2	54 32.3	98 08	28.1	60 25.4	98 08	25.9	60 54.7	98 07	25.7	65 46.4	97 07	23.1	3
4	51 30.1	99 08	28.2	51 59.7	98 08	28.0	53 28.4	98 08	27.6	53 58.0	98 08	27.5	54 27.5	98 08	27.3	60 20.9	98 07	25.2	60 50.2	98 07	25.0	65 42.4	97 07	22.4	4
145	51 25.2	99 08	27.4	51 54.9	99 08	27.3	53 23.6	99 08	26.8	53 53.2	99 08	26.7	54 22.8	99 08	26.6	60 16.5	98 07	24.5	60 45.9	98 07	24.3	65 38.4	97 06	21.8	145
6	51 20.5	99 08	26.6	51 50.1	99 08	26.5	53 19.0	99 08	26.1	53 48.6	99 07	25.9	54 18.2	99 07	25.8	60 12.3	98 07	23.8	60 41.7	98 07	23.6	65 34.6	97 06	21.2	6
7	51 15.9	99 07	25.8	51 45.6	99 07	25.7	53 14.5	99 07	25.3	53 44.1	99 07	25.2	54 13.7	99 07	25.0	60 08.1	98 07	23.1	60 37.6	98 07	22.9	65 30.9	97 06	20.6	7
8	51 11.4	99 07	25.0	51 41.1	99 07	24.9	53 10.1	99 07	24.5	53 39.7	99 07	24.4	54 09.4	99 07	24.3	60 04.1	98 06	22.4	60 33.6	98 06	22.2	65 27.3	98 06	19.9	8
9	51 07.1	99 07	24.2	51 36.8	99 07	24.1	53 05.8	99 07	23.7	53 35.5	99 07	23.6	54 05.1	99 07	23.5	60 00.2	98 06	21.7	60 29.7	98 06	21.5	65 23.8	98 06	19.3	9
150	51 02.9	99 07	23.4	51 32.6	99 07	23.3	53 01.7	99 07	23.0	53 31.4	99 07	22.9	54 01.1	99 07	22.7	59 56.4	98 06	21.0	60 26.0	98 06	20.8	65 20.4	98 05	18.7	150
1	50 58.8	99 07	22.6	51 28.6	99 07	22.5	52 57.7	99 06	22.2	53 27.4	99 06	22.1	53 57.1	99 06	22.0	59 52.8	98 06	20.3	60 22.3	99 06	20.1	65 17.1	98 05	18.1	1
2	50 54.9	99 06	21.9	51 24.6	99 06	21.8	52 53.8	99 06	21.4	53 23.5	99 06	21.3	53 53.3	99 06	21.2	59 49.2	99 06	19.6	60 18.8	99 06	19.4	65 14.0	98 05	17.4	2
3	50 51.1	99 06	21.1	51 20.8	99 06	21.0	52 50.1	99 06	20.7	53 19.8	99 06	20.5	53 49.6	99 06	20.4	59 45.8	99 05	18.8	60 15.4	99 05	18.7	65 10.9	98 05	16.8	3
4	50 47.4	99 06	20.3	51 17.2	99 06	20.2	52 46.5	99 06	19.9	53 16.2	99 06	19.8	53 46.0	99 06	19.7	59 42.5	99 05	18.1	60 12.1	99 05	18.0	65 07.9	98 05	16.2	4
155	50 43.8	99 05	19.5	51 13.6	99 06	19.4	52 43.0	99 06	19.1	53 12.8	99 06	19.0	53 42.5	99 06	18.9	59 39.3	99 05	17.4	60 09.0	99 05	17.3	65 05.1	98 05	15.6	155
6	50 40.4	99 05	18.7	51 10.2	99 05	18.6	52 39.6	99 05	18.4	53 09.4	99 05	18.3	53 39.2	99 05	18.2	59 36.2	99 05	16.7	60 05.9	99 05	16.6	65 02.4	99 04	14.9	6
7	50 37.2	99 05	17.9	51 06.9	99 05	17.8	52 36.4	99 05	17.6	53 06.2	99 05	17.5	53 36.0	99 05	17.4	59 33.3	99 05	16.0	60 03.0	99 05	15.9	64 59.7	99 04	14.3	7
8	50 34.0	99 05	17.2	51 03.9	99 05	17.1	52 33.4	99 05	16.8	53 03.2	99 05	16.7	53 33.0	99 05	16.6	59 30.5	99 04	15.3	60 00.2	99 04	15.2	64 57.2	99 04	13.7	8
9	50 31.0	1.00 05	16.4	51 00.9	99 05	16.3	52 30.4	99 05	16.0	53 00.2	99 05	16.0	53 30.1	99 05	15.9	59 27.8	99 04	14.6	59 57.5	99 04	14.5	64 54.8	99 04	13.1	9
160	50 28.1	1.00 05	15.6	50 58.0	1.00 05	15.5	52 27.6	1.00 04	15.3	52 57.4	1.00 04	15.2	53 27.3	1.00 04	15.1	59 25.2	99 04	13.9	59 55.0	99 04	13.8	64 52.5	99 04	12.4	160
1	50 25.4	1.00 04	14.8	50 55.3	1.00 04	14.7	52 24.9	1.00 04	14.5	52 54.8	1.00 04	14.4	53 24.7	1.00 04	14.4	59 22.8	99 04	13.2	59 52.6	99 04	13.1	64 50.3	99 03	11.8	1
2	50 22.8	1.00 04	14.0	50 52.7	1.00 04	14.0	52 22.4	1.00 04	13.7	52 52.3	1.00 04	13.7	53 22.1	1.00 04	13.6	59 20.4	99 04	12.5	59 50.3	99 04	12.4	64 48.2	99 03	11.2	2
3	50 20.4	1.00 04	13.2	50 50.3	1.00 04	13.2	52 20.0	1.00 04	13.0	52 49.9	1.00 04	12.9	53 19.8	1.00 04	12.8	59 18.2	1.00 03	11.8	59 48.1	99 03	11.7	64 46.3	99 03	10.6	3
4	50 18.0	1.00 04	12.5	50 48.0	1.00 04	12.4	52 17.7	1.00 04	12.2	52 47.6	1.00 04	12.2	53 17.5	1.00 04	12.1	59 16.2	1.00 03	11.1	59 46.0	1.00 03	11.1	64 44.4	99 03	09.9	4
165	50 15.9	1.00 03	11.7	50 45.8	1.00 03	11.6	52 15.6	1.00 03	11.5	52 45.5	1.00 03	11.4	53 15.4	1.00 03	11.3	59 14.2	1.00 03	10.4	59 44.1	1.00 03	10.4	64 42.7	99 03	09.3	165
6	50 13.8	1.00 03	10.9	50 43.8	1.00 03	10.9	52 13.6	1.00 03	10.7	52 43.5	1.00 03	10.6	53 13.4	1.00 03	10.6	59 12.4	1.00 03	09.7	59 42.3	1.00 03	09.7	64 41.0	1.00 03	08.7	6
7	50 11.9	1.00 03	10.1	50 41.9	1.00 03	10.1	52 11.7	1.00 03	09.9	52 41.6	1.00 03	09.9	53 11.6	1.00 03	09.1	59 10.7	1.00 03	09.1	59 40.6	1.00 02	09.0	64 39.5	1.00 02	08.1	7
8	50 10.2	1.00 03	09.3	50 40.1	1.00 03	09.3	52 10.0	1.00 03	09.2	52 39.9	1.00 03	09.1	53 09.9	1.00 03	09.1	59 09.1	1.00 02	08.4	59 39.0	1.00 02	08.3	64 38.1	1.00 02	07.5	8
9	50 08.5	1.00 02	08.6	50 38.5	1.00 02	08.5	52 08.4	1.00 02	08.4	52 38.3	1.00 02	08.3	53 08.3	1.00 02	08.3	59 07.6	1.00 02	07.7	59 37.6	1.00 02	07.6	64 36.8	1.00 02	06.8	9
170	50 07.1	1.00 02	07.8	50 37.0	1.00 02	07.7	52 06.9	1.00 02	07.6	52 36.9	1.00 02	07.6	53 06.8	1.00 02	07.5	59 06.3	1.00 02	07.0	59 36.3	1.00 02	06.9	64 35.6	1.00 02	06.2	170
1	50 05.7	1.00 02	07.0	50 35.7	1.00 02	06.9	52 05.6	1.00 02	06.9	52 35.6	1.00 02	06.8	53 05.7	1.00 02	06.8	59 05.1	1.00 02	06.3	59 35.1	1.00 02	06.2	64 34.5	1.00 02	05.6	1
2	50 04.5	1.00 02	06.2	50 34.5	1.00 02	06.2	52 04.4	1.00 02	06.1	52 34.4	1.00 02	06.1	53 04.4	1.00 02	06.1	59 04.0	1.00 02	05.6	59 34.0	1.00 01	05.6	64 33.6	1.00 01	05.0	2
3	50 03.5	1.00 02	05.4	50 33.4	1.00 02	05.4	52 03.4	1.00 02	05.3	52 33.4	1.00 02	05.3	53 03.4	1.00 02	05.3	59 03.1	1.00 01	04.9	59 33.1	1.00 01	04.8	64 32.8	1.00 01	04.3	3
4	50 02.5	1.00 01	04.7	50 32.5	1.00 01	04.6	52 02.5	1.00 01	04.6	52 32.5	1.00 01	04.6	53 02.5	1.00 01	04.5	59 02.3	1.00 01	04.2	59 32.3	1.00 01	04.1	64 32.0	1.00 01	03.7	4
175	50 01.8	1.00 01	03.9	50 31.8	1.00 01	03.9	52 01.7	1.00 01	03.8	52 31.7	1.00 01	03.8	53 01.7	1.00 01	03.8	59 01.6	1.00 01	03.5	59 31.6	1.00 01	03.5	64 31.4	1.00 01	03.1	175
6	50 01.1	1.00 01	03.1	50 31.1	1.00 01	03.1	52 01.1	1.00 01	03.1	52 31.1	1.00 01	03.0	53 01.1	1.00 01	03.0	59 01.0	1.00 01	02.8	59 31.0	1.00 01	02.8	64 30.9	1.00 01	02.5	6
7	50 00.6	1.00 01	02.3	50 30.6	1.00 01	02.3	52 00.6	1.00 01	02.3	52 30.6	1.00 01	02.3	53 00.6	1.00 01	02.3	59 00.6	1.00 01	02.1	59 30.6	1.00 01	02.1	64 30.5	1.00 01	01.9	7
8	50 00.3	1.00 00	01.6	50 30.3	1.00 00	01.5	52 00.3	1.00 00	01.5	52 30.3	1.00 00	01.5	53 00.3	1.00 00	01.5	59 00.3	1.00 00	01.4	59 30.2	1.00 00	01.4	64 30.2	1.00 00	01.2	8
9	50 00.1	1.00 00	00.8	50 30.1	1.00 00	00.8	52 00.1	1.00 00	00.8	52 30.1	1.00 00	00.8	53 00.1	1.00 00	00.8	59 00.1	1.00 00	00.7	59 30.1	1.00 00	00.7	64 30.1	1.00 00	00.6	9
180	50 00.0	1.00 00	00.0	50 30.0	1.00 00	00.0	52 00.0	1.00 00	00.0	52 30.0	1.00 00	00.0	53 00.0	1.00 00	00.0	59 00.0	1.00 00	00.0	59 30.0	1.00 00	00.0	64 30.0	1.00 00	00.0	180

STAR IDENTIFICATION TABLE

ALTITUDE

AZ.	4° Dec.	4° H.A.	8° Dec.	8° H.A.	12° Dec.	12° H.A.	16° Dec.	16° H.A.	20° Dec.	20° H.A.	24° Dec.	24° H.A.	28° Dec.	28° H.A.	32° Dec.	32° H.A.	36° Dec.	36° H.A.	40° Dec.	40° H.A.	44° Dec.	44° H.A.	AZ.
00	14	180	18	180	22	180	26	180	30	180	34	180	38	180	42	180	46	180	50	180	54	180	00
4	14	176	18	176	22	176	26	176	30	176	34	176	38	176	42	175	46	175	50	175	54	175	4
8	14	172	18	172	22	172	26	171	30	171	34	171	38	171	42	171	46	171	50	170	54	170	8
12	14	168	18	168	22	167	26	167	30	167	34	167	38	167	42	166	46	166	50	166	54	165	12
16	14	164	18	163	22	163	26	163	30	163	34	162	38	162	42	162	46	161	50	161	54	161	16
20	13	159	17	159	21	159	25	159	29	158	33	158	37	158	41	157	45	157	49	156	53	156	20
24	13	155	17	155	21	155	25	154	29	154	33	154	37	153	41	153	45	152	49	152	53	151	24
28	13	151	17	151	21	151	25	150	29	150	33	149	37	149	41	148	45	148	49	147	53	146	28
32	12	147	16	147	20	146	24	146	28	146	32	145	36	144	40	144	44	143	48	142	52	142	32
36	12	143	16	143	20	142	24	142	28	141	32	141	36	140	40	140	44	139	48	138	52	137	36
40	12	139	16	139	20	138	24	138	28	137	31	136	35	136	39	135	43	134	47	133	51	132	40
44	11	135	15	135	19	134	23	133	27	133	31	132	35	132	39	131	43	130	47	129	51	128	44
48	11	131	15	130	19	130	23	129	26	129	30	128	34	127	38	127	42	126	46	125	50	123	48
52	10	127	14	126	18	126	22	125	26	125	30	124	34	123	38	122	42	121	46	120	50	119	52
56	10	123	13	122	17	122	21	121	25	120	29	120	33	119	37	118	41	117	45	116	49	115	56
60	09	119	13	118	17	118	21	117	25	116	29	116	33	115	37	114	40	113	44	112	48	111	60
64	08	115	12	114	16	114	20	113	24	112	28	112	32	111	36	110	40	109	44	108	48	106	64
68	08	111	12	110	16	110	20	109	23	108	27	107	31	107	35	106	39	105	43	104	47	102	68
72	07	107	11	106	15	106	19	105	23	104	27	103	31	103	35	102	38	101	42	99	46	98	72
76	06	103	10	102	14	102	18	101	22	100	26	99	30	99	34	98	38	97	42	95	46	94	76
80	06	99	10	98	14	98	17	97	21	96	25	95	29	95	33	94	37	93	41	91	45	90	80
84	05	95	09	95	13	94	17	93	21	92	25	91	29	91	32	90	36	89	40	88	44	86	84
88	04	91	08	91	12	90	16	89	20	88	24	88	28	87	32	86	36	85	40	84	44	82	88
92	04	87	08	87	11	86	15	85	19	84	23	84	27	83	31	82	35	81	39	80	43	79	92
96	03	83	07	83	11	82	15	81	19	81	23	80	27	79	30	78	34	77	38	76	42	75	96
100	02	79	06	79	10	78	14	77	18	77	22	76	26	75	30	74	34	73	38	72	41	71	100
104	02	76	05	75	09	74	13	73	17	73	21	72	25	71	29	70	33	69	37	68	41	67	104
108	01	72	05	71	09	70	13	70	17	69	21	68	25	67	28	67	32	66	36	65	40	64	108
112	00	68	04	67	08	66	12	66	16	65	20	64	24	64	28	63	32	62	36	61	40	60	112
116	*00*	64	04	63	07	62	11	62	15	61	19	60	23	60	27	59	31	58	35	57	39	56	116
120	*01*	60	03	59	07	59	11	58	15	57	19	57	23	56	27	55	31	54	35	54	38	53	120
124	*02*	56	02	55	06	55	10	54	14	53	18	53	22	52	26	52	30	51	34	50	38	49	124
128	*02*	52	02	51	06	51	10	50	14	50	18	49	22	48	26	48	29	47	33	46	37	46	128
132	*03*	48	01	47	05	47	09	46	13	46	17	45	21	45	25	44	29	43	33	43	37	42	132
136	*03*	44	01	43	05	43	09	42	13	42	17	41	21	41	25	40	29	40	33	39	36	38	136
140	*04*	40	00	40	04	39	08	39	12	38	16	38	20	37	24	37	28	36	32	36	36	35	140
144	*04*	36	*00*	36	04	35	08	35	12	34	16	34	20	33	24	33	28	32	32	32	36	31	144
148	*04*	32	*01*	32	03	31	07	31	11	31	15	30	19	30	23	29	27	29	31	28	35	28	148
152	*05*	28	*01*	28	03	27	07	27	11	27	15	26	19	26	23	26	27	25	31	25	35	24	152
156	*05*	24	*01*	24	03	23	07	23	11	23	15	23	19	22	23	22	27	22	31	21	35	21	156
160	*05*	20	*01*	20	03	20	07	19	11	19	15	19	19	19	23	18	27	18	31	18	35	17	160
164	*06*	16	*02*	16	02	16	*06*	15	10	15	14	15	18	15	22	15	26	14	30	14	34	14	164
168	*06*	12	*02*	12	02	12	*06*	12	10	11	14	11	18	11	22	11	26	11	30	11	34	10	168
172	*06*	08	*02*	08	02	08	*06*	08	10	08	14	08	18	07	22	07	26	07	30	07	34	07	172
176	*06*	04	*02*	04	02	04	*06*	04	10	04	14	04	18	04	22	04	26	04	30	04	34	03	176
180	*06*	00	*02*	00	02	00	*06*	00	10	00	14	00	18	00	22	00	26	00	30	00	34	00	180
	4°		8°		12°		16°		20°		24°		28°		32°		36°		40°		44°		

FIGURES IN ITALICS INDICATE THAT DECLINATION IS OF CONTRARY NAME TO LATITUDE

STAR IDENTIFICATION TABLE

ALTITUDE

AZ.	48°		52°		56°		60°		64°		68°		72°		76°		80°		84°		88°		AZ.
	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	
°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
00	58	180	62	180	66	180	70	180	74	180	78	180	82	180	86	180	90	. ..	86	00	82	00	00
4	58	175	62	175	66	175	70	174	74	174	78	173	82	171	86	166	89	88	86	06	82	01	4
8	58	170	62	170	66	169	70	168	74	167	78	166	82	162	86	153	89	86	86	12	82	02	8
12	58	165	62	164	66	164	70	163	74	161	78	159	82	154	85	142	88	84	86	17	82	03	12
16	58	160	61	159	65	158	69	157	73	155	77	152	81	146	85	132	87	82	85	21	82	04	16
20	57	155	61	154	65	153	69	151	73	149	77	145	81	139	84	124	87	80	85	25	82	05	20
24	57	150	61	149	65	148	69	146	73	143	77	139	80	132	84	117	86	78	85	28	82	06	24
28	57	145	61	144	64	143	68	140	72	138	76	133	80	126	83	110	85	76	85	31	82	07	28
32	56	140	60	139	64	137	68	135	72	132	76	127	79	120	82	105	85	74	84	33	82	07	32
36	56	136	60	134	64	133	67	130	71	127	75	122	79	114	82	100	84	72	84	34	82	08	36
40	55	131	59	130	63	128	67	125	71	122	74	117	78	109	81	95	83	70	83	36	81	09	40
44	55	127	59	125	62	123	66	120	70	117	74	112	77	104	80	91	83	68	83	36	81	09	44
48	54	122	58	120	62	118	66	116	69	112	73	107	77	100	80	87	82	66	83	37	81	10	48
52	53	118	57	116	61	114	65	111	69	108	72	103	76	95	79	83	81	64	82	37	81	10	52
56	53	113	57	112	61	109	64	107	68	103	72	98	75	91	78	80	81	62	82	37	81	11	56
60	52	109	56	107	60	105	64	102	67	99	71	94	74	87	78	77	80	60	81	37	81	11	60
64	52	105	55	103	59	101	63	98	67	95	70	90	74	83	77	74	79	58	81	36	81	11	64
68	51	101	55	99	59	97	62	94	66	91	70	86	73	80	76	71	79	56	80	36	81	11	68
72	50	97	54	95	58	93	62	90	65	87	69	82	72	76	76	68	78	54	80	35	80	12	72
76	49	93	53	91	57	89	61	86	65	83	68	79	72	73	75	65	78	52	80	34	80	12	76
80	49	89	53	87	56	85	60	82	64	79	68	75	71	70	74	62	77	50	79	34	80	12	80
84	48	85	52	83	56	81	60	79	63	76	67	72	70	67	74	59	77	48	79	33	80	12	84
88	47	81	51	79	55	77	59	75	63	72	66	68	70	63	73	56	76	46	79	32	80	11	88
92	47	77	51	76	54	74	58	71	62	69	66	65	69	60	73	54	76	44	78	31	80	11	92
96	46	73	50	72	54	70	58	68	61	65	65	62	69	57	72	51	75	42	78	30	80	11	96
100	45	70	49	68	53	66	57	64	61	62	64	59	68	54	71	49	75	40	77	28	79	11	100
104	45	66	49	65	52	63	56	61	60	59	64	55	67	51	71	46	74	38	77	27	79	11	104
108	44	62	48	61	52	59	56	58	60	55	63	52	67	49	70	44	74	36	77	26	79	10	108
112	43	59	47	57	51	56	55	54	59	52	63	49	66	46	70	41	73	34	77	25	79	10	112
116	43	55	47	54	51	53	55	51	58	49	62	46	66	43	70	39	73	32	76	23	79	09	116
120	42	52	46	50	50	49	54	48	58	46	62	43	65	40	69	36	73	30	76	22	79	09	120
124	42	48	46	47	50	46	54	44	57	42	61	40	65	37	69	34	72	28	76	21	79	09	124
128	41	45	45	44	49	42	53	41	57	39	61	37	65	35	68	31	72	26	76	19	79	08	128
132	41	41	45	40	49	39	53	38	57	36	60	34	64	32	68	29	72	24	75	18	79	08	132
136	40	38	44	37	48	36	52	35	56	33	60	31	64	29	68	26	71	22	75	16	78	07	136
140	40	34	44	33	48	32	52	31	56	30	60	28	64	27	67	24	71	20	75	15	78	06	140
144	40	31	44	30	48	29	52	28	55	27	59	26	63	24	67	21	71	18	75	13	78	06	144
148	39	27	43	27	47	26	51	25	55	24	59	23	63	21	67	19	71	16	75	12	78	05	148
152	39	24	43	23	47	23	51	22	55	21	59	20	63	18	67	17	71	14	74	11	78	05	152
156	39	20	43	20	47	19	51	19	55	18	59	17	63	16	67	14	70	12	74	09	78	04	156
160	39	17	43	17	46	16	50	16	54	15	58	14	62	13	66	12	70	10	74	08	78	03	160
164	38	14	42	13	46	13	50	12	54	12	58	11	62	11	66	10	70	08	74	06	78	03	164
168	38	10	42	10	46	10	50	09	54	09	58	08	62	08	66	07	70	06	74	05	78	02	168
172	38	07	42	07	46	06	50	06	54	06	58	06	62	05	66	05	70	04	74	03	78	01	172
176	38	03	42	03	46	03	50	03	54	03	58	03	62	03	66	02	70	02	74	02	78	01	176
180	38	00	42	00	46	00	50	00	54	00	58	00	62	00	66	00	70	00	74	00	78	00	180

48°	52°	56°	60°	64°	68°	72°	76°	80°	84°	88°

FIGURES IN ITALICS INDICATE THAT DECLINATION IS OF CONTRARY NAME TO LATITUDE

16—49722-1

H.A.	0° 00′ Alt. / Δd Δt / Az.	0° 30′ Alt. / Δd Δt / Az.	1° 00′ Alt. / Δd Δt / Az.	1° 30′ Alt. / Δd Δt / Az.	2° 00′ Alt. / Δd Δt / Az.	2° 30′ Alt. / Δd Δt / Az.	3° 00′ Alt. / Δd Δt / Az.	3° 30′ Alt. / Δd Δt / Az.	H.A.
00	9 00.0 1.0 00 180.0	9 30.0 1.0 00 180.0	10 00.0 1.0 00 180.0	10 30.0 1.0 00 180.0	11 00.0 1.0 00 180.0	11 30.0 1.0 00 180.0	12 00.0 1.0 00 180.0	12 30.0 1.0 00 180.0	00
1	8 59.9 1.0 00 179.0	9 29.9 1.0 00 179.0	9 59.9 1.0 00 179.0	10 29.9 1.0 00 179.0	10 59.9 1.0 00 179.0	11 29.9 1.0 00 179.0	11 59.9 1.0 00 179.0	12 29.9 1.0 00 179.0	1
2	8 59.7 1.0 01 178.0	9 29.7 1.0 01 178.0	9 59.7 1.0 01 178.0	10 29.7 1.0 01 178.0	10 59.7 1.0 01 178.0	11 29.7 1.0 01 178.0	11 59.7 1.0 01 178.0	12 29.7 1.0 01 178.0	2
3	8 59.3 1.0 01 177.0	9 29.3 1.0 01 177.0	9 59.3 1.0 01 177.0	10 29.3 1.0 01 177.0	10 59.2 1.0 01 176.9	11 29.2 1.0 01 176.9	11 59.2 1.0 01 176.9	12 29.2 1.0 01 176.9	3
4	8 58.7 1.0 01 176.0	9 28.7 1.0 01 175.9	9 58.7 1.0 01 175.9	10 28.7 1.0 01 175.9	10 58.7 1.0 01 175.9	11 28.7 1.0 01 175.9	11 58.7 1.0 01 175.9	12 28.7 1.0 01 175.9	4
05	8 57.9 1.0 02 174.9	9 27.9 1.0 02 174.9	9 57.9 1.0 02 174.9	10 27.9 1.0 02 174.9	10 57.9 1.0 02 174.9	11 27.9 1.0 02 174.9	11 57.9 1.0 02 174.9	12 27.9 1.0 02 174.9	05
6	8 57.0 1.0 02 173.9	9 27.0 1.0 02 173.9	9 57.0 1.0 02 173.9	10 27.0 1.0 02 173.9	10 57.0 1.0 02 173.9	11 27.0 1.0 02 173.9	11 57.0 1.0 02 173.9	12 27.0 1.0 02 173.9	6
7	8 55.9 1.0 02 172.9	9 25.9 1.0 02 172.9	9 55.9 1.0 02 172.9	10 25.9 1.0 02 172.9	10 55.9 1.0 02 172.9	11 25.9 1.0 02 172.9	11 55.9 1.0 02 172.8	12 25.9 1.0 02 172.8	7
8	8 54.7 1.0 02 171.9	9 24.7 1.0 02 171.9	9 54.7 1.0 02 171.9	10 24.7 1.0 02 171.9	10 54.7 1.0 02 171.9	11 24.7 1.0 02 171.8	11 54.7 1.0 02 171.8	12 24.7 1.0 02 171.8	8
9	8 53.3 1.0 03 170.9	9 23.3 1.0 03 170.9	9 53.3 1.0 03 170.9	10 23.3 1.0 03 170.9	10 53.3 1.0 03 170.8	11 23.3 1.0 03 170.8	11 53.2 1.0 03 170.8	12 23.2 1.0 03 170.8	9
10	8 51.7 1.0 03 169.9	9 21.7 1.0 03 169.9	9 51.7 1.0 03 169.8	10 21.7 1.0 03 169.8	10 51.7 1.0 03 169.8	11 21.7 1.0 03 169.8	11 51.7 1.0 03 169.8	12 21.6 1.0 03 169.8	10
1	8 50.0 1.0 03 168.9	9 20.0 1.0 03 168.9	9 50.0 1.0 03 168.8	10 20.0 1.0 03 168.8	10 49.9 1.0 03 168.8	11 19.9 1.0 03 168.8	11 49.9 1.0 03 168.8	12 19.9 1.0 03 168.8	1
2	8 48.1 1.0 03 167.9	9 18.1 1.0 03 167.8	9 48.1 1.0 03 167.8	10 18.1 1.0 03 167.8	10 48.0 1.0 03 167.8	11 18.0 1.0 03 167.8	11 48.0 1.0 03 167.8	12 18.0 1.0 03 167.7	2
3	8 46.0 1.0 04 166.8	9 16.0 1.0 04 166.8	9 46.0 1.0 04 166.8	10 16.0 1.0 04 166.8	10 46.0 1.0 04 166.8	11 16.0 1.0 04 166.8	11 45.9 1.0 04 166.7	12 15.9 1.0 04 166.7	3
4	8 43.8 1.0 04 165.8	9 13.8 1.0 04 165.8	9 43.8 1.0 04 165.8	10 13.8 1.0 04 165.8	10 43.7 1.0 04 165.8	11 13.7 1.0 04 165.7	11 43.7 1.0 04 165.7	12 13.7 1.0 04 165.7	4
15	8 41.5 1.0 04 164.8	9 11.4 1.0 04 164.8	9 41.4 1.0 04 164.8	10 11.4 1.0 04 164.8	10 41.4 1.0 04 164.7	11 11.3 1.0 04 164.7	11 41.3 1.0 05 164.7	12 11.3 1.0 04 164.7	15
6	8 38.9 1.0 04 163.8	9 08.9 1.0 04 163.8	9 38.9 1.0 05 163.8	10 08.8 1.0 04 163.7	10 38.8 1.0 04 163.7	11 08.8 1.0 04 163.7	11 38.7 1.0 05 163.7	12 08.7 1.0 05 163.7	6
7	8 36.2 1.0 05 162.8	9 06.2 1.0 05 162.8	9 36.2 1.0 05 162.8	10 06.1 1.0 05 162.7	10 36.1 1.0 05 162.7	11 06.1 1.0 05 162.7	11 36.0 1.0 05 162.6	12 06.0 1.0 05 162.6	7
8	8 33.4 1.0 05 161.8	9 03.3 1.0 05 161.8	9 33.3 1.0 05 161.7	10 03.3 1.0 05 161.7	10 33.2 1.0 05 161.7	11 03.2 1.0 05 161.7	11 33.1 1.0 05 161.6	12 03.1 1.0 05 161.6	8
9	8 30.4 1.0 05 160.8	9 00.3 1.0 05 160.8	9 30.3 1.0 05 160.7	10 00.2 1.0 05 160.7	10 30.2 1.0 05 160.7	11 00.2 1.0 05 160.6	11 30.1 1.0 05 160.6	12 00.1 1.0 05 160.6	9
20	8 27.2 1.0 06 159.8	8 57.1 1.0 06 159.7	9 27.1 1.0 06 159.7	9 57.1 1.0 06 159.7	10 27.0 1.0 06 159.7	10 57.0 1.0 06 159.6	11 26.9 1.0 06 159.6	11 56.9 1.0 06 159.6	20
1	8 23.9 1.0 06 158.8	8 53.8 1.0 06 158.7	9 23.8 1.0 06 158.7	9 53.7 1.0 06 158.7	10 23.7 1.0 06 158.6	10 53.6 1.0 06 158.6	11 23.6 1.0 06 158.6	11 53.5 1.0 06 158.6	1
2	8 20.4 1.0 06 157.8	8 50.3 1.0 06 157.7	9 20.3 1.0 06 157.7	9 50.2 1.0 06 157.7	10 20.2 1.0 06 157.6	10 50.1 1.0 06 157.6	11 20.1 1.0 06 157.6	11 50.0 1.0 06 157.5	2
3	8 16.8 1.0 06 156.7	8 46.7 1.0 06 156.7	9 16.6 1.0 06 156.7	9 46.6 1.0 06 156.6	10 16.5 1.0 06 156.6	10 46.5 1.0 06 156.6	11 16.4 1.0 06 156.6	11 46.4 1.0 06 156.5	3
4	8 13.0 1.0 07 155.7	8 42.9 1.0 07 155.7	9 12.9 1.0 07 155.7	9 42.8 1.0 07 155.6	10 12.7 1.0 07 155.6	10 42.7 1.0 07 155.6	11 12.6 1.0 07 155.5	11 42.5 1.0 07 155.5	4
25	8 09.0 1.0 07 154.7	8 39.0 1.0 07 154.7	9 08.9 1.0 07 154.7	9 38.8 1.0 07 154.6	10 08.8 1.0 07 154.6	10 38.7 1.0 07 154.6	11 08.6 1.0 07 154.5	11 38.6 1.0 07 154.5	25
6	8 05.0 1.0 07 153.7	8 34.9 1.0 07 153.7	9 04.8 1.0 07 153.6	9 34.7 1.0 07 153.6	10 04.7 1.0 07 153.6	10 34.6 1.0 07 153.5	11 04.5 1.0 07 153.5	11 34.5 1.0 07 153.5	6
7	8 00.7 1.0 07 152.7	8 30.7 1.0 07 152.7	9 00.6 1.0 07 152.6	9 30.5 1.0 07 152.6	10 00.4 1.0 07 152.5	10 30.3 1.0 07 152.5	11 00.3 1.0 07 152.5	11 30.2 1.0 07 152.5	7
8	7 56.4 1.0 08 151.7	8 26.3 1.0 08 151.7	8 56.2 1.0 08 151.6	9 26.1 1.0 08 151.6	9 56.0 1.0 08 151.6	10 25.9 1.0 08 151.5	10 55.9 1.0 08 151.5	11 25.8 1.0 08 151.4	8
9	7 51.8 1.0 08 150.7	8 21.7 1.0 08 150.7	8 51.7 1.0 08 150.6	9 21.6 1.0 08 150.6	9 51.5 1.0 08 150.5	10 21.4 1.0 08 150.5	10 51.3 1.0 08 150.5	11 21.2 1.0 08 150.4	9
30	7 47.2 1.0 08 149.7	8 17.1 1.0 08 149.7	8 47.0 1.0 08 149.6	9 16.9 1.0 08 149.6	9 46.8 1.0 08 149.5	10 16.7 1.0 08 149.5	10 46.6 1.0 08 149.5	11 16.5 1.0 08 149.4	30
1	7 42.4 1.0 08 148.7	8 12.3 1.0 08 148.6	8 42.2 1.0 08 148.6	9 12.1 1.0 08 148.6	9 42.0 1.0 08 148.5	10 11.9 1.0 08 148.5	10 41.8 1.0 08 148.4	11 11.7 1.0 08 148.4	1
2	7 37.4 1.0 08 147.7	8 07.3 1.0 08 147.6	8 37.2 1.0 08 147.6	9 07.1 1.0 08 147.6	9 37.0 1.0 08 147.5	10 06.9 1.0 09 147.5	10 36.8 1.0 09 147.4	11 06.7 1.0 09 147.4	2
3	7 32.3 1.0 09 146.7	8 02.2 1.0 09 146.6	8 32.1 1.0 09 146.6	9 02.0 1.0 09 146.5	9 31.9 1.0 09 146.5	10 01.8 1.0 09 146.5	10 31.7 1.0 09 146.4	11 01.5 1.0 09 146.4	3
4	7 27.1 1.0 09 145.7	7 57.0 1.0 09 145.6	8 26.9 1.0 09 145.6	8 56.7 1.0 09 145.5	9 26.6 1.0 09 145.5	9 56.5 1.0 09 145.4	10 26.4 1.0 09 145.4	10 56.3 1.0 09 145.4	4
35	7 21.7 1.0 09 144.7	7 51.6 1.0 09 144.6	8 21.5 1.0 09 144.6	8 51.4 1.0 09 144.5	9 21.2 1.0 09 144.5	9 51.1 1.0 09 144.4	10 21.0 1.0 09 144.4	10 50.9 1.0 09 144.3	35
6	7 16.2 1.0 09 143.7	7 46.1 1.0 09 143.6	8 16.0 1.0 09 143.6	8 45.9 1.0 09 143.5	9 15.7 1.0 09 143.5	9 45.6 1.0 09 143.4	10 15.5 1.0 09 143.4	10 45.3 1.0 09 143.3	6
7	7 10.6 1.0 10 142.7	7 40.5 1.0 10 142.6	8 10.3 1.0 10 142.6	8 40.2 1.0 10 142.5	9 10.1 1.0 10 142.5	9 39.9 1.0 10 142.4	10 09.8 1.0 10 142.4	10 39.7 1.0 10 142.3	7
8	7 04.9 1.0 10 141.7	7 34.7 1.0 10 141.6	8 04.6 1.0 10 141.6	8 34.4 1.0 10 141.5	9 04.3 1.0 10 141.5	9 34.1 1.0 10 141.4	10 04.0 1.0 10 141.4	10 33.9 1.0 10 141.3	8
9	6 59.0 1.0 10 140.7	7 28.8 1.0 10 140.6	7 58.7 1.0 10 140.6	8 28.5 1.0 10 140.5	8 58.4 1.0 10 140.5	9 28.2 1.0 10 140.4	9 58.1 99 10 140.4	10 27.9 99 10 140.3	9
40	6 53.0 99 10 139.6	7 22.8 99 10 139.5	7 52.6 99 10 139.5	8 22.5 99 10 139.5	8 52.3 99 10 139.4	9 22.2 99 10 139.4	9 52.0 99 10 139.3	10 21.9 99 10 139.3	40
1	6 46.8 99 10 138.6	7 16.7 99 10 138.6	7 46.5 99 10 138.5	8 16.3 99 10 138.5	8 46.2 99 10 138.4	9 16.0 99 10 138.4	9 45.8 99 10 138.3	10 15.7 99 10 138.3	1
2	6 40.6 99 11 137.6	7 10.4 99 11 137.6	7 40.2 99 11 137.5	8 10.1 99 11 137.5	8 39.9 99 11 137.4	9 09.7 99 11 137.4	9 39.5 99 11 137.3	10 09.4 99 11 137.3	2
3	6 34.2 99 11 136.6	7 04.0 99 11 136.6	7 33.8 99 11 136.5	8 03.6 99 11 136.5	8 33.5 99 11 136.4	9 03.3 99 11 136.4	9 33.1 99 11 136.3	10 02.9 99 11 136.3	3
4	6 27.7 99 11 135.6	6 57.5 99 11 135.6	7 27.3 99 11 135.5	7 57.1 99 11 135.5	8 26.9 99 11 135.4	8 56.8 99 11 135.4	9 26.6 99 11 135.3	9 56.4 99 11 135.3	4
45	6 21.0 99 11 134.6	6 50.9 99 11 134.6	7 20.7 99 11 134.5	7 50.5 99 11 134.5	8 20.3 99 11 134.4	8 50.1 99 11 134.4	9 19.9 99 11 134.3	9 49.7 99 11 134.3	45
6	6 14.3 99 11 133.6	6 44.1 99 11 133.6	7 13.9 99 11 133.5	7 43.7 99 11 133.4	8 13.5 99 11 133.4	8 43.3 99 11 133.3	9 13.1 99 11 133.3	9 43.0 99 11 133.2	6
7	6 07.5 99 12 132.6	6 37.3 99 12 132.6	7 07.1 99 12 132.5	7 36.9 99 12 132.5	8 06.7 99 12 132.4	8 36.5 99 12 132.4	9 06.3 99 12 132.3	9 36.1 99 12 132.2	7
8	6 00.5 99 12 131.6	6 30.3 99 12 131.6	7 00.1 99 12 131.5	7 29.9 99 12 131.5	7 59.7 99 12 131.4	8 29.5 99 12 131.4	8 59.3 99 12 131.3	9 29.1 99 12 131.2	8
9	5 53.4 99 12 130.6	6 23.2 99 12 130.6	6 53.0 99 12 130.5	7 22.8 99 12 130.5	7 52.6 99 12 130.4	8 22.4 99 12 130.3	8 52.2 99 12 130.3	9 21.9 99 12 130.2	9
50	5 46.3 99 12 129.6	6 16.0 99 12 129.6	6 45.8 99 12 129.5	7 15.6 99 12 129.5	7 45.4 99 12 129.4	8 15.2 99 12 129.3	8 44.9 99 12 129.3	9 14.7 99 12 129.2	50
1	5 39.0 99 12 128.7	6 08.8 99 12 128.6	6 38.5 99 12 128.5	7 08.3 99 12 128.5	7 38.1 99 12 128.4	8 07.9 99 12 128.3	8 37.6 99 12 128.3	9 07.4 99 12 128.2	1
2	5 31.6 99 12 127.7	6 01.4 99 12 127.6	6 31.1 99 12 127.5	7 00.9 99 12 127.5	7 30.7 99 12 127.4	8 00.4 99 13 127.3	8 30.2 99 13 127.3	9 00.0 99 13 127.2	2
3	5 24.1 99 13 126.7	5 53.9 99 13 126.6	6 23.7 99 13 126.5	6 53.4 99 13 126.5	7 23.2 99 13 126.4	7 52.9 99 13 126.3	8 22.7 99 13 126.3	8 52.5 99 13 126.2	3
4	5 16.5 99 13 125.7	5 46.3 99 13 125.6	6 16.1 99 13 125.5	6 45.8 99 13 125.5	7 15.6 99 13 125.4	7 45.3 99 13 125.3	8 15.1 99 13 125.3	8 44.8 99 13 125.2	4
55	5 08.9 99 13 124.7	5 38.6 99 13 124.6	6 08.4 99 13 124.5	6 38.1 99 13 124.4	7 07.9 99 13 124.4	7 37.6 99 13 124.3	8 07.4 99 13 124.3	8 37.1 99 13 124.2	55
6	5 01.1 99 13 123.7	5 30.9 99 13 123.6	6 00.6 99 13 123.5	6 30.3 99 13 123.5	7 00.1 99 13 123.4	7 29.8 99 13 123.3	7 59.6 99 13 123.3	8 29.3 99 13 123.2	6
7		5 23.0 99 13 122.6	5 52.7 99 13 122.5	6 22.5 99 13 122.5	6 52.2 99 13 122.4	7 21.9 99 13 122.3	7 51.7 99 13 122.3	8 21.4 99 13 122.2	7
8		5 15.0 99 13 121.6	5 44.8 99 13 121.5	6 14.5 99 13 121.5	6 44.2 99 13 121.4	7 14.0 99 13 121.3	7 43.7 99 13 121.3	8 13.4 99 13 121.2	8
9		5 07.0 99 14 120.6	5 36.7 99 14 120.5	6 06.5 99 14 120.5	6 36.2 99 14 120.4	7 05.9 99 14 120.3	7 35.6 99 14 120.3	8 05.4 99 14 120.2	9
60			5 28.6 99 14 119.6	5 58.3 99 14 119.5	6 28.0 99 14 119.4	6 57.8 99 14 119.4	7 27.5 99 14 119.3	7 57.2 99 14 119.2	60
1			5 20.4 99 14 118.6	5 50.1 99 14 118.5	6 19.8 99 14 118.4	6 49.5 99 14 118.4	7 19.3 99 14 118.3	7 49.0 99 14 118.2	1
2			5 12.1 99 14 117.6	5 41.8 99 14 117.5	6 11.5 99 14 117.4	6 41.3 99 14 117.4	7 11.0 99 14 117.3	7 40.7 99 14 117.2	2
3			5 03.8 99 14 116.6	5 33.5 99 14 116.5	6 03.2 99 14 116.4	6 32.9 99 14 116.4	7 02.6 99 14 116.3	7 32.3 99 14 116.2	3
4				5 25.0 99 14 115.5	5 54.7 99 14 115.4	6 24.4 99 14 115.4	6 54.1 99 14 115.3	7 23.8 99 14 115.2	4
65				5 16.5 99 14 114.5	5 46.2 99 14 114.4	6 15.9 99 14 114.4	6 45.6 99 14 114.3	7 15.3 99 14 114.2	65
6				5 08.0 99 14 113.5	5 37.6 99 14 113.4	6 07.3 99 14 113.4	6 37.0 99 14 113.3	7 06.7 99 14 113.2	6
7					5 29.0 99 14 112.5	5 58.7 99 15 112.4	6 28.4 99 15 112.3	6 58.1 99 15 112.2	7
8					5 20.3 99 15 111.5	5 50.0 99 15 111.4	6 19.7 99 15 111.3	6 49.3 99 15 111.2	8
9					5 11.5 99 15 110.5	5 41.2 99 15 110.4	6 10.9 99 15 110.3	6 40.6 99 15 110.2	9
70					5 02.7 99 15 109.5	5 32.4 99 15 109.4	6 02.1 99 15 109.3	6 31.7 99 15 109.3	70
1						5 23.5 99 15 108.4	5 53.2 99 15 108.3	6 22.8 99 15 108.3	1
2						5 14.6 99 15 107.4	5 44.2 99 15 107.3	6 13.9 99 15 107.3	2
3						5 05.6 99 15 106.4	5 35.3 99 15 106.3	6 04.9 99 15 106.3	3
4						5 26.2 99 15 105.4	5 55.9 99 15 105.3		4
75						5 17.2 99 15 104.4	5 46.8 99 15 104.3		75
6						5 08.0 99 15 103.4	5 37.7 99 15 103.3		6
7							5 28.5 99 15 102.3		7
8							5 19.3 99 15 101.3		8
9							5 10.1 99 15 100.3		9
80							5 00.9 99 15 99.3		80

Table — Lat. 81°. Each declination column gives Alt. (° ′), Δd, Δt, and Az. (°).

H.A.	Δd	Δt	0°00′ Alt	Az	0°30′ Alt	Az	1°00′ Alt	Az	1°30′ Alt	Az	2°00′ Alt	Az	2°30′ Alt	Az	3°00′ Alt	Az	3°30′ Alt	Az	H.A.
00	1.00	00	9 00.0	180.0	8 30.0	180.0	8 00.0	180.0	7 30.0	180.0	7 00.0	180.0	6 30.0	180.0	6 00.0	180.0	5 30.0	180.0	00
1	1.00	00	8 59.9	179.0	8 29.9	179.0	7 59.9	179.0	7 29.9	179.0	6 59.9	179.0	6 29.9	179.0	5 59.9	179.0	5 29.9	179.0	1
2	1.00	01	8 59.7	178.0	8 29.7	178.0	7 59.7	178.0	7 29.7	178.0	6 59.7	178.0	6 29.7	178.0	5 59.7	178.0	5 29.7	178.0	2
3	1.00	01	8 59.3	177.0	8 29.3	177.0	7 59.3	177.0	7 29.3	177.0	6 59.3	177.0	6 29.3	177.0	5 59.3	177.0	5 29.3	177.0	3
4	1.00	01	8 58.7	176.0	8 28.7	176.0	7 58.7	176.0	7 28.7	176.0	6 58.7	176.0	6 28.7	176.0	5 58.7	176.0	5 28.7	176.0	4
05	1.00	02	8 57.9	174.9	8 27.9	174.9	7 57.9	175.0	7 27.9	175.0	6 57.9	175.0	6 27.9	175.0	5 57.9	175.0	5 27.9	175.0	05
6	1.00	02	8 57.0	173.9	8 27.0	173.9	7 57.0	173.9	7 27.0	174.0	6 57.0	174.0	6 27.0	174.0	5 57.0	174.0	5 27.0	174.0	6
7	1.00	02	8 55.9	172.9	8 25.9	172.9	7 56.0	172.9	7 26.0	172.9	6 56.0	173.0	6 26.0	173.0	5 56.0	173.0	5 26.0	173.0	7
8	1.00	02	8 54.7	171.9	8 24.7	171.9	7 54.7	171.9	7 24.7	171.9	6 54.7	171.9	6 24.7	172.0	5 54.7	172.0	5 24.8	172.0	8
9	1.00	03	8 53.3	170.9	8 23.3	170.9	7 53.3	170.9	7 23.3	170.9	6 53.3	170.9	6 23.3	171.0	5 53.4	171.0	5 23.4	171.0	9
10	1.00	03	8 51.7	169.9	8 21.7	169.9	7 51.8	169.9	7 21.8	169.9	6 51.8	169.9	6 21.8	169.9	5 51.8	170.0	5 21.8	170.0	10
1	1.00	03	8 50.0	168.9	8 20.0	168.9	7 50.0	168.9	7 20.0	168.9	6 50.1	168.9	6 20.1	168.9	5 50.1	169.0	5 20.1	169.0	1
2	1.00	03	8 48.1	167.9	8 18.1	167.9	7 48.1	167.9	7 18.2	167.9	6 48.2	167.9	6 18.2	167.9	5 48.2	168.0	5 18.2	168.0	2
3	1.00	04	8 46.0	166.8	8 16.1	166.9	7 46.1	166.9	7 16.1	166.9	6 46.1	166.9	6 16.1	166.9	5 46.2	167.0	5 16.2	167.0	3
4	1.00	04	8 43.8	165.8	8 13.9	165.9	7 43.9	165.9	7 13.9	165.9	6 43.9	165.9	6 13.9	165.9	5 44.0	165.9	5 14.0	166.0	4
15	1.00	04	8 41.5	164.8	8 11.5	164.8	7 41.5	164.9	7 11.5	164.9	6 41.6	164.9	6 11.6	164.9	5 41.6	164.9	5 11.6	165.0	15
6	1.00	04	8 38.9	163.8	8 08.9	163.8	7 39.0	163.9	7 09.0	163.9	6 39.0	163.9	6 09.1	163.9	5 39.1	163.9	5 09.1	164.0	6
7	1.00	05	8 36.2	162.8	8 06.3	162.8	7 36.3	162.8	7 06.3	162.9	6 36.3	162.9	6 06.4	162.9	5 36.4	162.9	5 06.4	163.0	7
8	1.00	05	8 33.4	161.8	8 03.4	161.8	7 33.4	161.8	7 03.5	161.9	6 33.5	161.9	6 03.5	161.9	5 33.6	161.9	5 03.6	162.0	8
9	1.00	05	8 30.4	160.8	8 00.4	160.8	7 30.4	160.8	7 00.5	160.9	6 30.5	160.9	6 00.6	160.9	5 30.6	160.9	5 00.6	161.0	9
20	1.00	06	8 27.2	159.8	7 57.2	159.8	7 27.3	159.8	6 57.3	159.9	6 27.4	159.9	5 57.4	159.9	5 27.4	159.9			20
1	1.00	06	8 23.9	158.8	7 53.9	158.8	7 24.0	158.8	6 54.0	158.8	6 24.1	158.9	5 54.1	158.9	5 24.2	158.9			1
2	1.00	06	8 20.4	157.8	7 50.4	157.8	7 20.5	157.8	6 50.5	157.8	6 20.6	157.9	5 50.6	157.9	5 20.7	157.9			2
3	1.00	06	8 16.8	156.8	7 46.8	156.8	7 16.9	156.8	6 46.9	156.8	6 17.0	156.9	5 47.0	156.9	5 17.1	156.9			3
4	1.00	07	8 13.0	155.7	7 43.0	155.7	7 13.1	155.8	6 43.2	155.8	6 13.2	155.9	5 43.3	155.9	5 13.3	155.9			4
25	1.00	07	8 09.0	154.7	7 39.1	154.8	7 09.2	154.8	6 39.2	154.8	6 09.3	154.9	5 39.4	154.9	5 09.4	154.9			25
6	1.00	07	8 05.0	153.7	7 35.0	153.8	7 05.1	153.8	6 35.2	153.8	6 05.2	153.9	5 35.3	153.9	5 05.4	153.9			6
7	1.00	07	8 00.7	152.7	7 30.8	152.7	7 00.9	152.8	6 31.0	152.8	6 01.0	152.9	5 31.1	152.9	5 01.2	152.9			7
8	1.00	08	7 56.4	151.7	7 26.4	151.7	6 56.5	151.8	6 26.6	151.8	5 56.7	151.9	5 26.8	151.9					8
9	1.00	08	7 51.8	150.7	7 21.9	150.7	6 52.0	150.8	6 22.1	150.8	5 52.1	150.9	5 22.3	150.9					9
30	1.00	08	7 47.2	149.7	7 17.3	149.7	6 47.4	149.8	6 17.4	149.8	5 47.5	149.9	5 17.6	149.9					30
1	1.00	08	7 42.4	148.7	7 12.5	148.7	6 42.6	148.8	6 12.7	148.8	5 42.8	148.8	5 12.9	148.9					1
2	1.00	08	7 37.4	147.7	7 07.5	147.7	6 37.6	147.8	6 07.7	147.8	5 37.8	147.8	5 07.9	147.9					2
3	1.00	09	7 32.3	146.7	7 02.4	146.7	6 32.5	146.8	6 02.7	146.8	5 32.8	146.8	5 02.9	146.9					3
4	1.00	09	7 27.1	145.7	6 57.2	145.7	6 27.3	145.8	5 57.5	145.8	5 27.6	145.8							4
35	1.00	09	7 21.7	144.7	6 51.9	144.7	6 22.0	144.8	5 52.1	144.8	5 22.2	144.8							35
6	1.00	09	7 16.2	143.7	6 46.4	143.7	6 16.5	143.8	5 46.6	143.8	5 16.8	143.8							6
7	1.00	10	7 10.6	142.7	6 40.8	142.7	6 10.9	142.8	5 41.0	142.8	5 11.2	142.8							7
8	1.00	10	7 04.9	141.7	6 35.0	141.7	6 05.1	141.8	5 35.3	141.8	5 05.4	141.8							8
9	1.00	10	6 59.0	140.7	6 29.1	140.7	5 59.3	140.8	5 29.4	140.8									9
40	0.99	10	6 53.0	139.6	6 23.1	139.7	5 53.3	139.8	5 23.4	139.8									40
1	0.99	10	6 46.8	138.6	6 17.0	138.7	5 47.1	138.8	5 17.3	138.8									1
2	0.99	11	6 40.6	137.6	6 10.7	137.7	5 40.9	137.8	5 11.1	137.8									2
3	0.99	11	6 34.2	136.6	6 04.3	136.7	5 34.5	136.8	5 04.7	136.8									3
4	0.99	11	6 27.7	135.6	5 57.8	135.7	5 28.0	135.8											4
45	0.99	11	6 21.0	134.6	5 51.1	134.7	5 21.4	134.8											45
6	0.99	11	6 14.3	133.6	5 44.5	133.7	5 14.7	133.8											6
7	0.99	12	6 07.5	132.6	5 37.7	132.7	5 07.9	132.8											7
8	0.99	12	6 00.5	131.6	5 30.7	131.7	5 00.9	131.8											8
9	0.99	12	5 53.4	130.6	5 23.7	130.7													9
50	0.99	12	5 46.3	129.7	5 16.5	129.7													50
1	0.99	12	5 39.0	128.7	5 09.2	128.7													1
2	0.99	12	5 31.6	127.7	5 01.8	127.7													2
3	0.99	13	5 24.1	126.7															3
4	0.99	13	5 16.5	125.7															4
55	0.99	13	5 08.9	124.7															55
6	0.99	13	5 01.1	123.7															6

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Each degree column lists: Alt. (° ′) · Δd · Δt · Az. (°)

H.A.	4° 00′	4° 30′	5° 00′	5° 30′	6° 00′	6° 30′	7° 00′	7° 30′	H.A.
00	13 00.0 1.00 0 180.0	13 30.0 1.00 0 180.0	14 00.0 1.00 0 180.0	14 30.0 1.00 0 180.0	15 00.0 1.00 0 180.0	15 30.0 1.00 0 180.0	16 00.0 1.00 0 180.0	16 30.0 1.00 0 180.0	00
1	12 59.9 1.00 0 179.0	13 29.9 1.00 0 179.0	13 59.9 1.00 0 179.0	14 29.9 1.00 0 179.0	14 59.9 1.00 0 179.0	15 29.9 1.00 0 179.0	15 59.9 1.00 0 179.0	16 29.9 1.00 0 179.0	1
2	12 59.7 1.00 1 177.9	13 29.7 1.00 1 177.9	13 59.7 1.00 1 177.9	14 29.7 1.00 1 177.9	14 59.7 1.00 1 177.9	15 29.7 1.00 1 177.9	15 59.7 1.00 1 177.9	16 29.7 1.00 1 177.9	2
3	12 59.2 1.00 1 176.9	13 29.2 1.00 1 176.9	13 59.2 1.00 1 176.9	14 29.2 1.00 1 176.9	14 59.2 1.00 1 176.9	15 29.2 1.00 1 176.9	15 59.2 1.00 1 176.9	16 29.2 1.00 1 176.9	3
4	12 58.7 1.00 1 175.9	13 28.7 1.00 1 175.9	13 58.7 1.00 1 175.9	14 28.7 1.00 1 175.9	14 58.7 1.00 1 175.9	15 28.6 1.00 1 175.9	15 58.6 1.00 1 175.9	16 28.6 1.00 1 175.9	4
05	12 57.9 1.00 2 174.9	13 27.9 1.00 2 174.9	13 57.9 1.00 2 174.9	14 27.9 1.00 2 174.9	14 57.9 1.00 2 174.9	15 27.9 1.00 2 174.8	15 57.9 1.00 2 174.8	16 27.9 1.00 2 174.8	05
6	12 57.0 1.00 2 173.9	13 27.0 1.00 2 173.9	13 57.0 1.00 2 173.8	14 27.0 1.00 2 173.8	14 57.0 1.00 2 173.8	15 27.0 1.00 2 173.8	15 57.0 1.00 2 173.8	16 27.0 1.00 2 173.8	6
7	12 55.9 1.00 2 172.8	13 25.9 1.00 2 172.8	13 55.9 1.00 2 172.8	14 25.9 1.00 2 172.8	14 55.9 1.00 2 172.8	15 25.9 1.00 2 172.8	15 55.9 1.00 2 172.8	16 25.9 1.00 2 172.8	7
8	12 54.6 1.00 2 171.8	13 24.6 1.00 2 171.8	13 54.6 1.00 2 171.8	14 24.6 1.00 2 171.8	14 54.6 1.00 2 171.8	15 24.6 1.00 2 171.8	15 54.6 1.00 2 171.7	16 24.6 1.00 2 171.7	8
9	12 53.2 1.00 3 170.8	13 23.2 1.00 3 170.8	13 53.2 1.00 3 170.7	14 23.2 1.00 3 170.7	14 53.2 1.00 3 170.7	15 23.2 1.00 3 170.7	15 53.2 1.00 3 170.7	16 23.2 1.00 3 170.7	9
10	12 51.6 1.00 3 169.8	13 21.6 1.00 3 169.8	13 51.6 1.00 3 169.7	14 21.6 1.00 3 169.7	14 51.6 1.00 3 169.7	15 21.6 1.00 3 169.7	15 51.6 1.00 3 169.7	16 21.6 1.00 3 169.7	10
1	12 49.9 1.00 3 168.7	13 19.9 1.00 3 168.7	13 49.9 1.00 3 168.7	14 19.8 1.00 3 168.7	14 49.8 1.00 3 168.7	15 19.8 1.00 3 168.7	15 49.8 1.00 3 168.6	16 19.8 1.00 3 168.6	1
2	12 48.0 1.00 3 167.7	13 18.0 1.00 3 167.7	13 47.9 1.00 3 167.7	14 17.9 1.00 3 167.7	14 47.9 1.00 3 167.7	15 17.9 1.00 3 167.6	15 47.9 1.00 4 167.6	16 17.9 1.00 4 167.6	2
3	12 45.9 1.00 4 166.7	13 15.9 1.00 4 166.7	13 45.9 1.00 4 166.7	14 15.8 1.00 4 166.6	14 45.8 1.00 4 166.6	15 15.8 1.00 4 166.6	15 45.8 1.00 4 166.6	16 15.8 1.00 4 166.6	3
4	12 43.7 1.00 4 165.7	13 13.6 1.00 4 165.7	13 43.6 1.00 4 165.6	14 13.6 1.00 4 165.6	14 43.6 1.00 4 165.6	15 13.5 1.00 4 165.6	15 43.5 1.00 4 165.5	16 13.5 1.00 4 165.5	4
15	12 41.3 1.00 4 164.7	13 11.2 1.00 4 164.6	13 41.2 1.00 4 164.6	14 11.2 1.00 4 164.6	14 41.1 1.00 4 164.6	15 11.1 1.00 4 164.5	15 41.1 1.00 4 164.5	16 11.1 1.00 4 164.5	15
6	12 38.7 1.00 5 163.6	13 08.7 1.00 5 163.6	13 38.6 1.00 5 163.6	14 08.6 1.00 5 163.6	14 38.6 1.00 5 163.5	15 08.5 1.00 5 163.5	15 38.5 1.00 5 163.5	16 08.5 1.00 5 163.5	6
7	12 36.0 1.00 5 162.6	13 05.9 1.00 5 162.6	13 35.9 1.00 5 162.6	14 05.9 1.00 5 162.5	14 35.8 1.00 5 162.5	15 05.8 1.00 5 162.5	15 35.8 1.00 5 162.5	16 05.7 1.00 5 162.4	7
8	12 33.1 1.00 5 161.6	13 03.0 1.00 5 161.6	13 33.0 1.00 5 161.5	14 03.0 1.00 5 161.5	14 32.9 1.00 5 161.5	15 02.9 1.00 5 161.5	15 32.9 1.00 5 161.4	16 02.8 1.00 5 161.4	8
9	12 30.0 1.00 5 160.6	13 00.0 1.00 5 160.5	13 30.0 1.00 5 160.5	13 59.9 1.00 5 160.5	14 29.9 1.00 5 160.5	14 59.8 1.00 5 160.4	15 29.8 1.00 5 160.4	15 59.7 1.00 5 160.4	9
20	12 26.8 1.00 6 159.5	12 56.8 1.00 6 159.5	13 26.7 1.00 6 159.5	13 56.7 1.00 6 159.5	14 26.6 1.00 6 159.4	14 56.6 1.00 6 159.4	15 26.6 1.00 6 159.4	15 56.5 1.00 6 159.4	20
1	12 23.5 1.00 6 158.5	12 53.4 1.00 6 158.5	13 23.4 1.00 6 158.5	13 53.3 1.00 6 158.4	14 23.3 1.00 6 158.4	14 53.2 1.00 6 158.4	15 23.2 1.00 6 158.4	15 53.1 1.00 6 158.3	1
2	12 20.0 1.00 6 157.5	12 49.9 1.00 6 157.5	13 19.9 1.00 6 157.4	13 49.8 1.00 6 157.4	14 19.7 1.00 6 157.4	14 49.7 1.00 6 157.4	15 19.6 1.00 6 157.3	15 49.6 1.00 6 157.3	2
3	12 16.3 1.00 6 156.5	12 46.2 1.00 6 156.5	13 16.2 1.00 6 156.4	13 46.1 1.00 6 156.4	14 16.1 1.00 6 156.4	14 46.0 1.00 6 156.3	15 15.9 1.00 6 156.3	15 45.9 1.00 6 156.3	3
4	12 12.5 1.00 7 155.5	12 42.4 1.00 7 155.4	13 12.3 1.00 7 155.4	13 42.3 1.00 7 155.4	14 12.2 1.00 7 155.3	14 42.2 1.00 7 155.3	15 12.1 1.00 7 155.3	15 42.0 1.00 7 155.2	4
25	12 06.5 1.00 7 154.5	12 38.4 1.00 7 154.4	13 08.4 1.00 7 154.4	13 38.3 1.00 7 154.3	14 08.2 1.00 7 154.3	14 38.2 1.00 7 154.3	15 08.1 1.00 7 154.2	15 38.0 1.00 7 154.2	25
6	12 04.4 1.00 7 153.4	12 34.3 1.00 7 153.4	13 04.2 1.00 7 153.4	13 34.2 1.00 7 153.3	14 04.1 1.00 7 153.3	14 34.0 1.00 7 153.3	15 03.9 1.00 7 153.2	15 33.9 1.00 7 153.2	6
7	12 00.1 1.00 7 152.4	12 30.0 1.00 7 152.4	12 59.9 1.00 7 152.3	13 29.9 1.00 7 152.3	13 59.8 1.00 7 152.3	14 29.7 1.00 7 152.2	14 59.6 1.00 7 152.2	15 29.5 1.00 7 152.2	7
8	11 55.7 1.00 8 151.4	12 25.6 1.00 8 151.4	12 55.5 1.00 8 151.3	13 25.4 1.00 8 151.3	13 55.3 1.00 8 151.2	14 25.3 1.00 8 151.2	14 55.2 1.00 8 151.2	15 25.1 1.00 8 151.1	8
9	11 51.1 1.00 8 150.4	12 21.0 1.00 8 150.3	12 50.9 1.00 8 150.3	13 20.9 1.00 8 150.3	13 50.8 1.00 8 150.2	14 20.7 1.00 8 150.2	14 50.6 1.00 8 150.1	15 20.5 1.00 8 150.1	9
30	11 46.4 1.00 8 149.4	12 16.3 1.00 8 149.3	12 46.2 1.00 8 149.3	13 16.1 1.00 8 149.2	13 46.0 1.00 8 149.2	14 15.9 1.00 8 149.2	14 45.8 1.00 8 149.1	15 15.7 1.00 8 149.1	30
1	11 41.6 1.00 8 148.4	12 11.5 1.00 8 148.3	12 41.4 1.00 8 148.3	13 11.3 1.00 8 148.2	13 41.1 1.00 8 148.2	14 11.0 1.00 8 148.1	14 40.9 1.00 8 148.1	15 10.8 1.00 8 148.1	1
2	11 36.6 1.00 9 147.3	12 06.5 1.00 9 147.3	12 36.3 1.00 9 147.3	13 06.2 1.00 9 147.2	13 36.1 1.00 9 147.2	14 06.0 1.00 9 147.1	14 35.9 1.00 9 147.1	15 05.8 1.00 9 147.0	2
3	11 31.4 1.00 9 146.3	12 01.3 1.00 9 146.3	12 31.2 1.00 9 146.2	13 01.1 1.00 9 146.2	13 31.0 1.00 9 146.1	14 00.9 1.00 9 146.1	14 30.7 1.00 9 146.1	15 00.6 1.00 9 146.0	3
4	11 26.2 1.00 9 145.3	11 56.0 1.00 9 145.3	12 25.9 1.00 9 145.2	12 55.8 1.00 9 145.2	13 25.7 1.00 9 145.1	13 55.6 1.00 9 145.1	14 25.4 1.00 9 145.0	14 55.3 1.00 9 145.0	4
35	11 20.7 1.00 9 144.3	11 50.6 1.00 9 144.3	12 20.5 1.00 9 144.2	12 50.4 1.00 9 144.2	13 20.2 1.00 9 144.1	13 50.1 1.00 9 144.1	14 20.0 1.00 9 144.0	14 49.9 1.00 9 144.0	35
6	11 15.2 1.00 9 143.3	11 45.1 1.00 9 143.2	12 14.9 1.00 9 143.2	12 44.8 1.00 10 143.1	13 14.7 1.00 10 143.1	13 44.5 1.00 10 143.0	14 14.4 1.00 10 143.0	14 44.3 1.00 10 142.9	6
7	11 09.5 1.00 10 142.3	11 39.4 1.00 10 142.2	12 09.2 1.00 10 142.1	12 39.1 1.00 10 142.1	13 09.0 1.00 10 142.1	13 38.8 1.00 10 142.0	14 08.7 1.00 10 141.9	14 38.5 1.00 10 141.9	7
8	11 03.7 1.00 10 141.3	11 33.6 1.00 10 141.2	12 03.4 1.00 10 141.1	12 33.3 1.00 10 141.1	13 03.1 1.00 10 141.0	13 33.0 1.00 10 141.0	14 02.8 1.00 10 141.0	14 32.7 1.00 10 140.9	8
9	10 57.8 99 10 140.2	11 27.6 99 10 140.2	11 57.5 99 10 140.1	12 27.3 99 10 140.1	12 57.2 99 10 140.0	13 27.0 99 10 140.0	13 56.9 99 10 139.9	14 26.7 99 10 139.9	9
40	10 51.7 99 10 139.2	11 21.6 99 10 139.2	11 51.4 99 10 139.1	12 21.2 99 10 139.1	12 51.1 99 10 139.0	13 20.9 99 10 139.0	13 50.8 99 10 138.9	14 20.6 99 10 138.9	40
1	10 45.5 99 11 138.2	11 15.4 99 11 138.2	11 45.2 99 11 138.1	12 15.0 99 11 138.1	12 44.9 99 11 138.0	13 14.7 99 11 138.0	13 44.5 99 11 137.9	14 14.4 99 11 137.9	1
2	10 39.2 99 11 137.2	11 09.0 99 11 137.2	11 38.9 99 11 137.1	12 08.7 99 11 137.1	12 38.5 99 11 137.0	13 08.3 99 11 136.9	13 38.2 99 11 136.9	14 08.0 99 11 136.8	2
3	10 32.8 99 11 136.2	11 02.6 99 11 136.2	11 32.4 99 11 136.1	12 02.2 99 11 136.0	12 32.1 99 11 136.0	13 01.9 99 11 135.9	13 31.7 99 11 135.9	14 01.5 99 11 135.8	3
4	10 26.2 99 11 135.2	10 56.0 99 11 135.1	11 25.8 99 11 135.1	11 55.7 99 11 135.0	12 25.5 99 11 135.0	12 55.3 99 11 134.9	13 25.1 99 11 134.9	13 54.9 99 11 134.8	4
45	10 19.5 99 11 134.2	10 49.4 99 11 134.1	11 19.2 99 11 134.1	11 49.0 99 11 134.0	12 18.8 99 11 134.0	12 48.6 99 11 133.9	13 18.4 99 11 133.8	13 48.2 99 11 133.8	45
6	10 12.8 99 12 133.2	10 42.6 99 12 133.1	11 12.4 99 12 133.1	11 42.2 99 12 133.0	12 12.0 99 12 133.0	12 41.8 99 12 132.9	13 11.6 99 12 132.8	13 41.4 99 12 132.8	6
7	10 05.9 99 12 132.2	10 35.7 99 12 132.1	11 05.4 99 12 132.1	11 35.2 99 12 132.0	12 05.0 99 12 131.9	12 34.8 99 12 131.9	13 04.6 99 12 131.8	13 34.4 99 12 131.8	7
8	9 58.8 99 12 131.2	10 28.6 99 12 131.1	10 58.4 99 12 131.1	11 28.2 99 12 131.0	11 58.0 99 12 130.9	12 27.8 99 12 130.9	12 57.6 99 12 130.8	13 27.4 99 12 130.7	8
9	9 51.7 99 12 130.2	10 21.5 99 12 130.1	10 51.3 99 12 130.0	11 21.1 99 12 130.0	11 50.9 99 12 129.9	12 20.6 99 12 129.9	12 50.4 99 12 129.8	13 20.2 99 12 129.7	9
50	9 44.5 99 12 129.2	10 14.3 99 12 129.1	10 44.1 99 12 129.0	11 13.8 99 12 129.0	11 43.6 99 12 128.9	12 13.4 99 12 128.9	12 43.2 99 12 128.8	13 12.9 99 12 128.7	50
1	9 37.2 99 12 128.2	10 06.9 99 12 128.1	10 36.7 99 12 128.0	11 06.5 99 12 128.0	11 36.3 99 12 127.9	12 06.0 99 12 127.8	12 35.8 99 12 127.8	13 05.6 99 12 127.7	1
2	9 29.7 99 13 127.2	9 59.5 99 13 127.1	10 29.3 99 13 127.0	10 59.0 99 13 127.0	11 28.8 99 13 126.9	11 58.6 99 13 126.8	12 28.3 99 13 126.8	12 58.1 99 13 126.7	2
3	9 22.2 99 13 126.2	9 52.0 99 13 126.1	10 21.7 99 13 126.0	10 51.5 99 13 126.0	11 21.2 99 13 125.9	11 51.0 99 13 125.8	12 20.8 99 13 125.8	12 50.5 99 13 125.7	3
4	9 14.6 99 13 125.1	9 44.3 99 13 125.1	10 14.1 99 13 125.0	10 43.8 99 13 125.0	11 13.6 99 13 124.9	11 43.3 99 13 124.8	12 13.1 99 13 124.8	12 42.8 99 13 124.7	4
55	9 06.9 99 13 124.1	9 36.6 99 13 124.1	10 06.4 99 13 124.0	10 36.1 99 13 123.9	11 05.8 99 13 123.9	11 35.6 99 13 123.8	12 05.3 99 13 123.7	12 35.1 99 13 123.7	55
6	8 59.1 99 13 123.1	9 28.8 99 13 123.1	9 58.5 99 13 123.0	10 28.3 99 13 122.9	10 58.0 99 13 122.9	11 27.7 99 13 122.8	11 57.5 99 13 122.7	12 27.2 99 13 122.7	6
7	8 51.1 99 13 122.1	9 20.9 99 13 122.1	9 50.6 99 13 122.0	10 20.3 99 13 121.9	10 50.1 99 13 121.8	11 19.8 99 13 121.8	11 49.5 99 13 121.7	12 19.3 99 13 121.7	7
8	8 43.2 99 13 121.1	9 12.9 99 13 121.1	9 42.6 99 13 121.0	10 12.3 99 13 120.9	10 42.1 99 14 120.9	11 11.8 99 14 120.8	11 41.5 99 14 120.7	12 11.2 99 14 120.7	8
9	8 35.1 99 14 120.1	9 04.8 99 14 120.1	9 34.5 99 14 120.0	10 04.2 99 14 119.9	10 34.0 99 14 119.9	11 03.7 99 14 119.8	11 33.4 99 14 119.7	12 03.1 99 14 119.7	9
60	8 26.9 99 14 119.1	8 56.6 99 14 119.1	9 26.4 99 14 119.0	9 56.1 99 14 118.9	10 25.8 99 14 118.9	10 55.5 99 14 118.8	11 25.2 99 14 118.7	11 54.9 99 14 118.7	60
1	8 18.7 99 14 118.1	8 48.4 99 14 118.1	9 18.1 99 14 118.0	9 47.8 99 14 117.9	10 17.5 99 14 117.9	10 47.2 99 14 117.8	11 16.9 99 14 117.7	11 46.6 99 14 117.7	1
2	8 10.4 99 14 117.1	8 40.1 99 14 117.1	9 09.8 99 14 117.0	9 39.5 99 14 116.9	10 09.2 99 14 116.9	10 38.9 99 14 116.8	11 08.6 99 14 116.7	11 38.3 99 14 116.6	2
3	8 02.0 99 14 116.1	8 31.7 99 14 116.1	9 01.4 99 14 116.0	9 31.1 99 14 115.9	10 00.8 99 14 115.9	10 30.5 99 14 115.8	11 00.2 99 14 115.7	11 29.9 99 14 115.6	3
4	7 53.5 99 14 115.2	8 23.2 99 14 115.1	8 52.9 99 14 115.0	9 22.6 99 14 114.9	9 52.3 99 14 114.9	10 22.0 99 14 114.8	10 51.7 99 14 114.7	11 21.4 99 14 114.6	4
65	7 45.0 99 14 114.2	8 14.7 99 14 114.1	8 44.4 99 14 114.0	9 14.1 99 14 113.9	9 43.8 99 14 113.9	10 13.4 99 14 113.8	10 43.1 99 14 113.7	11 12.8 99 14 113.6	65
6	7 36.4 99 14 113.2	8 06.1 99 14 113.1	8 35.8 99 14 113.0	9 05.5 99 14 112.9	9 35.1 99 14 112.9	10 04.8 99 14 112.8	10 34.5 99 14 112.7	11 04.2 99 14 112.6	6
7	7 27.7 99 15 112.2	7 57.4 99 15 112.1	8 27.1 99 15 112.0	8 56.8 99 15 111.9	9 26.5 99 15 111.9	9 56.1 99 15 111.8	10 25.8 99 15 111.7	10 55.5 99 15 111.6	7
8	7 19.0 99 15 111.2	7 48.7 99 15 111.1	8 18.4 99 15 111.0	8 48.0 99 15 110.9	9 17.7 99 15 110.9	9 47.4 99 15 110.8	10 17.1 99 15 110.7	10 46.7 99 15 110.6	8
9	7 10.2 99 15 110.2	7 39.9 99 15 110.1	8 09.6 99 15 110.0	8 39.2 99 15 109.9	9 08.9 99 15 109.9	9 38.6 99 15 109.8	10 08.3 99 15 109.7	10 37.9 99 15 109.7	9
70	7 01.4 99 15 109.2	7 31.1 99 15 109.1	8 00.7 99 15 109.0	8 30.4 99 15 109.0	9 00.1 99 15 108.9	9 29.7 99 15 108.8	9 59.4 99 15 108.7	10 29.1 99 15 108.7	70
1	6 52.5 99 15 108.2	7 22.2 99 15 108.1	7 51.8 99 15 108.0	8 21.5 99 15 108.0	8 51.2 99 15 107.9	9 20.8 99 15 107.8	9 50.5 99 15 107.7	10 20.1 99 15 107.7	1
2	6 43.6 99 15 107.2	7 13.2 99 15 107.1	7 42.9 99 15 107.0	8 12.5 99 15 107.0	8 42.2 99 15 106.9	9 11.9 99 15 106.8	9 41.5 99 15 106.7	10 11.2 99 15 106.7	2
3	6 34.6 99 15 106.2	7 04.2 99 15 106.1	7 33.9 99 15 106.0	8 03.5 99 15 105.9	8 33.2 99 15 105.9	9 02.8 99 15 105.8	9 32.5 99 15 105.7	10 02.2 99 15 105.7	3
4	6 25.5 99 15 105.2	6 55.2 99 15 105.1	7 24.8 99 15 105.1	7 54.5 99 15 105.0	8 24.1 99 15 104.9	8 53.8 99 15 104.8	9 23.4 99 15 104.7	9 53.1 99 15 104.7	4
75	6 16.5 99 15 104.2	6 46.1 99 15 104.1	7 15.8 99 15 104.1	7 45.4 99 15 104.0	8 15.1 99 15 103.9	8 44.7 99 15 103.8	9 14.3 99 15 103.8	9 44.0 99 15 103.7	75
6	6 07.3 99 15 103.2	6 37.0 99 15 103.1	7 06.6 99 15 103.1	7 36.3 99 15 103.0	8 05.9 99 15 102.9	8 35.6 99 15 102.8	9 05.2 99 15 102.8	9 34.9 99 15 102.7	6
7	5 58.2 99 15 102.2	6 27.8 99 15 102.2	6 57.5 99 15 102.1	7 27.1 99 15 102.0	7 56.8 99 15 101.9	8 26.4 99 15 101.8	8 56.0 99 15 101.8	9 25.7 99 15 101.7	7
8	5 49.0 99 15 101.2	6 18.6 99 15 101.2	6 48.3 99 15 101.1	7 17.9 99 15 101.0	7 47.6 99 15 100.9	8 17.2 99 15 100.9	8 46.8 99 15 100.8	9 16.5 99 15 100.7	8
9	5 39.8 99 15 100.3	6 09.4 99 15 100.2	6 39.0 99 15 100.1	7 08.7 99 15 100.0	7 38.3 99 15 99.9	8 08.0 99 15 99.9	8 37.6 99 15 99.8	9 07.2 99 15 99.7	9
80	5 30.5 99 15 99.3	6 00.2 99 15 99.2	6 29.8 99 15 99.1	6 59.4 99 15 99.0	7 29.1 99 15 98.9	7 58.7 99 15 98.9	8 28.3 99 15 98.8	8 58.0 99 15 98.7	80
1	5 21.2 99 16 98.3	5 50.9 99 16 98.2	6 20.5 99 16 98.1	6 50.1 99 16 98.0	7 19.8 99 16 98.0	7 49.4 99 16 97.9	8 19.0 99 16 97.8	8 48.7 99 16 97.7	1
2	5 11.9 99 16 97.3	5 41.6 99 16 97.2	6 11.2 99 16 97.1	6 40.8 99 16 97.0	7 10.5 99 16 97.0	7 40.1 99 16 96.9	8 09.7 99 16 96.8	8 39.4 99 16 96.7	2
3	5 02.6 99 16 96.3	5 32.3 99 16 96.2	6 01.9 99 16 96.1	6 31.5 99 16 96.0	7 01.2 99 16 96.0	7 30.8 99 16 95.9	8 00.4 99 16 95.8	8 30.0 99 16 95.7	3
4		5 22.9 99 16 95.2	5 52.5 99 16 95.1	6 22.2 99 16 95.1	6 51.8 99 16 95.0	7 21.4 99 16 94.9	7 51.1 99 16 94.8	8 20.7 99 16 94.8	4
85		5 13.6 99 16 94.2	5 43.2 99 16 94.2	6 12.8 99 16 94.1	6 42.5 99 16 94.0	7 12.1 99 16 93.9	7 41.7 99 16 93.8	8 11.3 99 16 93.8	85
6		5 04.2 99 16 93.2	5 33.8 99 16 93.2	6 03.5 99 16 93.1	6 33.1 99 16 93.0	7 02.7 99 16 92.9	7 32.3 99 16 92.9	8 02.0 99 16 92.8	6
7			5 24.4 99 16 92.2	5 54.1 99 16 92.1	6 23.7 99 16 92.0	6 53.3 99 16 91.9	7 23.0 99 16 91.9	7 52.6 99 16 91.8	7
8			5 15.1 99 16 91.2	5 44.7 99 16 91.1	6 14.3 99 16 91.0	6 43.9 99 16 91.0	7 13.6 99 16 90.9	7 43.2 99 16 90.8	8
9			5 05.7 99 16 90.2	5 35.3 99 16 90.1	6 04.9 99 16 90.0	6 34.6 99 16 90.0	7 04.2 99 16 89.9	7 33.8 99 16 89.8	9
90				5 25.9 99 16 89.1	5 55.6 99 16 89.1	6 25.2 99 16 89.0	6 54.8 99 16 88.9	7 24.4 99 16 88.8	90

Lat 81°

H.A.	4° 00' Alt.	Az.	4° 30' Alt.	Az.	5° 00' Alt.	Az.	5° 30' Alt.	Az.	6° 00' Alt.	Az.	6° 30' Alt.	Az.	7° 00' Alt.	Az.	7° 30' Alt.	Az.	H.A.
°	° ' Δd Δt	°	° ' Δd Δt	°	° ' Δd Δt	°	° ' Δd Δt	°	° ' Δd Δt	°	° ' Δd Δt	°	° ' Δd Δt	°	° ' Δd Δt	°	°
91							5 16.5 99 16	88.2	5 46.2 99 16	88.1	6 15.8 99 16	88.0	6 45.4 99 16	87.9	7 15.0 99 16	87.8	91
2							5 07.2 99 16	87.2	5 36.8 99 16	87.1	6 06.4 99 16	87.0	6 36.0 99 16	86.9	7 05.7 99 16	86.8	2
3									5 27.4 99 16	86.1	5 57.1 99 16	86.0	6 26.7 99 16	85.9	6 56.3 99 16	85.9	3
4									5 18.1 99 16	85.1	5 47.7 99 16	85.0	6 17.3 99 16	85.0	6 46.9 99 16	84.9	4
95									5 08.7 99 16	84.1	5 38.3 99 16	84.0	6 08.0 99 16	84.0	6 37.6 99 16	83.9	95
6											5 29.0 99 16	83.1	5 58.7 99 16	83.0	6 28.3 99 16	82.9	6
7											5 19.7 99 15	82.1	5 49.3 99 15	82.0	6 19.0 99 16	81.9	7
8											5 10.4 99 15	81.1	5 40.1 99 15	81.0	6 09.7 99 16	80.9	8
9											5 01.2 99 15	80.1	5 30.8 99 15	80.0	6 00.4 99 15	79.9	9
100													5 21.6 99 15	79.0	5 51.2 99 15	79.0	100
1													5 12.4 99 15	78.1	5 42.0 99 15	78.0	1
2													5 03.2 99 15	77.1	5 32.9 99 15	77.0	2
3															5 23.7 99 15	76.0	3
4															5 14.6 99 15	75.0	4
105															5 05.6 99 15	74.0	105

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H.A.	8° 00' (Alt. / Δd Δt / Az.)	8° 30'	9° 00'	9° 30'	10° 00'	10° 30'	11° 00'	11° 30'	H.A.
00	17 00.0 1.0 00 180.0	17 30.0 1.0 00 180.0	18 00.0 1.0 00 180.0	18 30.0 1.0 00 180.0	19 00.0 1.0 00 180.0	19 30.0 1.0 00 180.0	20 00.0 1.0 00 180.0	20 30.0 1.0 00 180.0	00
1	16 59.9 1.0 00 179.0	17 29.9 1.0 00 179.0	17 59.9 1.0 00 179.0	18 29.9 1.0 00 179.0	18 59.9 1.0 00 179.0	19 29.9 1.0 00 179.0	19 59.9 1.0 00 179.0	20 29.9 1.0 00 179.0	1
2	16 59.7 1.0 01 177.9	17 29.7 1.0 01 177.9	17 59.7 1.0 01 177.9	18 29.7 1.0 01 177.9	18 59.7 1.0 01 177.9	19 29.7 1.0 01 177.9	19 59.7 1.0 01 177.9	20 29.7 1.0 01 177.9	2
3	16 59.2 1.0 01 176.9	17 29.2 1.0 01 176.9	17 59.2 1.0 01 176.9	18 29.2 1.0 01 176.9	18 59.2 1.0 01 176.9	19 29.2 1.0 01 176.9	19 59.2 1.0 01 176.9	20 29.2 1.0 01 176.9	3
4	16 58.6 1.0 01 175.9	17 28.6 1.0 01 175.9	17 58.6 1.0 01 175.8	18 28.6 1.0 01 175.8	18 58.6 1.0 01 175.8	19 28.6 1.0 01 175.8	19 58.6 1.0 01 175.8	20 28.6 1.0 01 175.8	4
05	16 57.9 1.0 02 174.8	17 27.9 1.0 02 174.8	17 57.9 1.0 02 174.8	18 27.9 1.0 02 174.8	18 57.9 1.0 02 174.8	19 27.9 1.0 02 174.8	19 57.9 1.0 02 174.8	20 27.9 1.0 02 174.8	05
6	16 57.0 1.0 02 173.8	17 26.9 1.0 02 173.8	17 56.9 1.0 02 173.8	18 26.9 1.0 02 173.8	18 56.9 1.0 02 173.8	19 26.9 1.0 02 173.7	19 56.9 1.0 02 173.7	20 26.9 1.0 02 173.7	6
7	16 55.8 1.0 02 172.8	17 25.8 1.0 02 172.7	17 55.8 1.0 02 172.7	18 25.8 1.0 02 172.7	18 55.8 1.0 02 172.7	19 25.8 1.0 02 172.7	19 55.8 1.0 02 172.7	20 25.8 1.0 02 172.7	7
8	16 54.6 1.0 02 171.7	17 24.6 1.0 02 171.7	17 54.6 1.0 02 171.7	18 24.6 1.0 02 171.7	18 54.6 1.0 02 171.7	19 24.5 1.0 02 171.7	19 54.5 1.0 02 171.6	20 24.5 1.0 02 171.6	8
9	16 53.1 1.0 03 170.7	17 23.1 1.0 03 170.7	17 53.1 1.0 03 170.7	18 23.1 1.0 03 170.7	18 53.1 1.0 03 170.6	19 23.1 1.0 03 170.6	19 53.1 1.0 03 170.6	20 23.1 1.0 03 170.6	9
10	16 51.5 1.0 03 169.6	17 21.5 1.0 03 169.6	17 51.5 1.0 03 169.6	18 21.5 1.0 03 169.6	18 51.5 1.0 03 169.6	19 21.5 1.0 03 169.6	19 51.5 1.0 03 169.6	20 21.5 1.0 03 169.5	10
1	16 49.8 1.0 03 168.6	17 19.8 1.0 03 168.6	17 49.7 1.0 03 168.6	18 19.7 1.0 03 168.6	18 49.7 1.0 03 168.5	19 19.7 1.0 03 168.5	19 49.7 1.0 03 168.5	20 19.7 1.0 03 168.5	1
2	16 47.8 1.0 04 167.6	17 17.8 1.0 04 167.6	17 47.8 1.0 04 167.5	18 17.8 1.0 04 167.5	18 47.8 1.0 04 167.5	19 17.7 1.0 04 167.5	19 47.7 1.0 04 167.5	20 17.7 1.0 04 167.5	2
3	16 45.7 1.0 04 166.5	17 15.7 1.0 04 166.5	17 45.7 1.0 04 166.5	18 15.7 1.0 04 166.5	18 45.7 1.0 04 166.5	19 15.6 1.0 04 166.4	19 45.6 1.0 04 166.4	20 15.6 1.0 04 166.4	3
4	16 43.5 1.0 04 165.5	17 13.4 1.0 04 165.5	17 43.4 1.0 04 165.5	18 13.4 1.0 04 165.5	18 43.4 1.0 04 165.4	19 13.4 1.0 04 165.4	19 43.3 1.0 04 165.4	20 13.3 1.0 04 165.4	4
15	16 41.0 1.0 04 164.5	17 11.0 1.0 04 164.5	17 41.0 1.0 04 164.4	18 11.0 1.0 04 164.4	18 40.9 1.0 04 164.4	19 10.9 1.0 04 164.4	19 40.9 1.0 04 164.3	20 10.8 1.0 04 164.3	15
6	16 38.4 1.0 05 163.4	17 08.4 1.0 05 163.4	17 38.4 1.0 05 163.4	18 08.4 1.0 05 163.4	18 38.3 1.0 05 163.3	19 08.3 1.0 05 163.3	19 38.3 1.0 05 163.3	20 08.2 1.0 05 163.3	6
7	16 35.7 1.0 05 162.4	17 05.7 1.0 05 162.4	17 35.6 1.0 05 162.4	18 05.6 1.0 05 162.3	18 35.6 1.0 05 162.3	19 05.5 1.0 05 162.3	19 35.5 1.0 05 162.3	20 05.4 1.0 05 162.2	7
8	16 32.8 1.0 05 161.4	17 02.8 1.0 05 161.4	17 32.8 1.0 05 161.3	18 02.7 1.0 05 161.3	18 32.7 1.0 05 161.3	19 02.6 1.0 05 161.3	19 32.6 1.0 05 161.2	20 02.5 1.0 05 161.2	8
9	16 29.5 1.0 05 160.4	16 59.7 1.0 05 160.3	17 29.6 1.0 05 160.3	17 59.6 1.0 05 160.3	18 29.5 1.0 05 160.2	18 59.5 1.0 05 160.2	19 29.4 1.0 05 160.2	19 59.4 1.0 05 160.2	9
20	16 26.5 1.0 06 159.3	16 56.4 1.0 06 159.3	17 26.4 1.0 06 159.3	17 56.3 1.0 06 159.2	18 26.3 1.0 06 159.2	18 56.2 1.0 06 159.2	19 26.2 1.0 06 159.1	19 56.1 1.0 06 159.1	20
1	16 23.1 1.0 06 158.3	16 53.0 1.0 06 158.3	17 23.0 1.0 06 158.2	17 52.9 1.0 06 158.2	18 22.9 1.0 06 158.2	18 52.8 1.0 06 158.1	19 22.8 1.0 06 158.1	19 52.7 1.0 06 158.1	1
2	16 19.5 1.0 06 157.3	16 49.5 1.0 06 157.3	17 19.4 1.0 06 157.2	17 49.4 1.0 06 157.2	18 19.3 1.0 06 157.1	18 49.2 1.0 06 157.1	19 19.2 1.0 06 157.1	19 49.1 1.0 06 157.0	2
3	16 15.8 1.0 06 156.2	16 45.8 1.0 06 156.2	17 15.7 1.0 06 156.2	17 45.6 1.0 06 156.1	18 15.6 1.0 06 156.1	18 45.5 1.0 06 156.1	19 15.4 1.0 06 156.0	19 45.4 1.0 06 156.0	3
4	16 12.0 1.0 07 155.2	16 41.9 1.0 07 155.2	17 11.8 1.0 07 155.1	17 41.8 1.0 07 155.1	18 11.7 1.0 07 155.1	18 41.6 1.0 07 155.0	19 11.6 1.0 07 155.0	19 41.5 1.0 07 155.0	4
25	16 07.9 1.0 07 154.2	16 37.9 1.0 07 154.1	17 07.8 1.0 07 154.1	17 37.7 1.0 07 154.1	18 07.7 1.0 07 154.0	18 37.6 1.0 07 154.0	19 07.5 1.0 07 154.0	19 37.4 1.0 07 153.9	25
6	16 03.8 1.0 07 153.1	16 33.7 1.0 07 153.1	17 03.6 1.0 07 153.1	17 33.5 1.0 07 153.0	18 03.5 1.0 07 153.0	18 33.4 1.0 07 153.0	19 03.3 1.0 07 152.9	19 33.2 1.0 07 152.9	6
7	15 59.5 1.0 07 152.1	16 29.4 1.0 07 152.1	16 59.3 1.0 07 152.0	17 29.2 1.0 07 152.0	17 59.1 1.0 07 152.0	18 29.0 1.0 08 151.9	18 59.0 1.0 08 151.9	19 28.9 1.0 08 151.8	7
8	15 55.0 1.0 08 151.1	16 24.9 1.0 08 151.0	16 54.8 1.0 08 151.0	17 24.7 1.0 08 151.0	17 54.6 1.0 08 150.9	18 24.6 1.0 08 150.9	18 54.5 1.0 08 150.8	19 24.4 1.0 08 150.8	8
9	15 50.4 1.0 08 150.1	16 20.3 1.0 08 150.0	16 50.2 1.0 08 150.0	17 20.1 1.0 08 149.9	17 50.0 1.0 08 149.9	18 19.9 1.0 08 149.9	18 49.8 1.0 08 149.8	19 19.7 1.0 08 149.8	9
30	15 45.6 1.0 08 149.0	16 15.5 1.0 08 149.0	16 45.4 1.0 08 149.0	17 15.3 1.0 08 148.9	17 45.2 1.0 08 148.9	18 15.1 1.0 08 148.8	18 45.0 1.0 08 148.8	19 14.9 1.0 08 148.7	30
1	15 40.7 1.0 08 148.0	16 10.6 1.0 08 148.0	16 40.5 1.0 08 147.9	17 10.4 1.0 08 147.9	17 40.3 1.0 08 147.8	18 10.2 1.0 08 147.8	18 40.1 1.0 08 147.7	19 10.0 1.0 08 147.7	1
2	15 35.7 1.0 09 147.0	16 05.6 1.0 09 146.9	16 35.5 1.0 09 146.9	17 05.4 1.0 09 146.9	17 35.2 1.0 09 146.8	18 05.1 1.0 09 146.7	18 35.0 1.0 09 146.7	19 04.9 1.0 09 146.7	2
3	15 30.5 1.0 09 146.0	16 00.4 1.0 09 145.9	16 30.3 1.0 09 145.9	17 00.2 1.0 09 145.8	17 30.0 1.0 09 145.8	17 59.9 1.0 09 145.7	18 29.8 1.0 09 145.7	18 59.7 1.0 09 145.6	3
4	15 25.2 1.0 09 144.9	15 55.1 1.0 09 144.9	16 24.9 1.0 09 144.8	16 54.8 1.0 09 144.8	17 24.7 1.0 09 144.7	17 54.6 1.0 09 144.7	18 24.4 1.0 09 144.7	18 54.3 1.0 09 144.6	4
35	15 19.7 1.0 09 143.9	15 49.6 1.0 09 143.9	16 19.5 1.0 09 143.8	16 49.3 1.0 09 143.8	17 19.2 1.0 09 143.7	17 49.1 1.0 09 143.7	18 18.9 1.0 09 143.6	18 48.8 1.0 09 143.6	35
6	15 14.1 1.0 10 142.8	15 44.0 1.0 10 142.8	16 13.9 1.0 10 142.8	16 43.7 1.0 10 142.7	17 13.6 1.0 10 142.7	17 43.4 1.0 10 142.6	18 13.3 1.0 10 142.5	18 43.2 1.0 10 142.5	6
7	15 08.4 1.0 10 141.9	15 38.3 1.0 10 141.8	16 08.1 1.0 10 141.8	16 38.0 1.0 10 141.7	17 07.8 1.0 10 141.7	17 37.7 1.0 10 141.6	18 07.5 1.0 10 141.6	18 37.4 1.0 10 141.5	7
8	15 02.5 1.0 10 140.9	15 32.4 99 10 140.8	16 02.2 99 10 140.7	16 32.1 99 10 140.7	17 01.9 99 10 140.6	17 31.8 99 10 140.6	18 01.6 99 10 140.5	18 31.5 99 10 140.5	8
9	14 56.5 99 10 139.8	15 26.4 99 10 139.8	15 56.2 99 10 139.7	16 26.1 99 10 139.7	16 55.9 99 10 139.6	17 25.8 99 10 139.6	17 55.6 99 10 139.5	18 25.4 99 10 139.5	9
40	14 50.4 99 10 138.8	15 20.3 99 10 138.8	15 50.1 99 10 138.7	16 19.9 99 10 138.7	16 49.8 99 10 138.6	17 19.6 99 10 138.5	17 49.4 99 10 138.5	18 19.3 99 10 138.4	40
1	14 44.2 99 11 137.8	15 14.0 99 11 137.7	15 43.8 99 11 137.7	16 13.7 99 11 137.6	16 43.5 99 11 137.6	17 13.3 99 11 137.5	17 43.2 99 11 137.5	18 13.0 99 11 137.4	1
2	14 37.8 99 11 136.8	15 07.6 99 11 136.7	15 37.5 99 11 136.7	16 07.3 99 11 136.6	16 37.1 99 11 136.6	17 06.9 99 11 136.5	17 36.7 99 11 136.4	18 06.6 99 11 136.4	2
3	14 31.3 99 11 135.8	15 01.1 99 11 135.7	15 31.0 99 11 135.6	16 00.8 99 11 135.6	16 30.6 99 11 135.5	17 00.4 99 11 135.5	17 30.2 99 11 135.4	18 00.0 99 11 135.4	3
4	14 24.7 99 11 134.7	14 54.5 99 11 134.7	15 24.3 99 11 134.6	15 54.2 99 11 134.6	16 24.0 99 11 134.5	16 53.8 99 11 134.5	17 23.6 99 11 134.4	17 53.4 99 11 134.3	4
45	14 18.0 99 11 133.7	14 47.8 99 11 133.7	15 17.6 99 11 133.6	15 47.4 99 11 133.6	16 17.2 99 11 133.5	16 47.0 99 11 133.4	17 16.9 99 12 133.4	17 46.6 99 11 133.3	45
6	14 11.2 99 12 132.7	14 41.0 99 12 132.7	15 10.8 99 12 132.6	15 40.5 99 12 132.5	16 10.3 99 12 132.5	16 40.1 99 12 132.4	17 09.9 99 12 132.4	17 39.7 99 12 132.3	6
7	14 04.2 99 12 131.7	14 34.0 99 12 131.6	15 03.8 99 12 131.6	15 33.6 99 12 131.5	16 03.4 99 12 131.5	16 33.1 99 12 131.4	17 02.9 99 12 131.3	17 32.7 99 12 131.3	7
8	13 57.1 99 12 130.7	14 26.9 99 12 130.6	14 56.7 99 12 130.6	15 26.5 99 12 130.5	15 56.3 99 12 130.4	16 26.1 99 12 130.4	16 55.8 99 12 130.3	17 25.6 99 12 130.2	8
9	13 50.0 99 12 129.7	14 19.8 99 12 129.6	14 49.5 99 12 129.5	15 19.3 99 12 129.5	15 49.1 99 12 129.4	16 18.8 99 12 129.3	16 48.6 99 12 129.3	17 18.4 99 12 129.2	9
50	13 42.7 99 12 128.6	14 12.5 99 12 128.6	14 42.2 99 12 128.5	15 12.0 99 12 128.5	15 41.8 99 13 128.4	16 11.5 99 12 128.3	16 41.3 99 12 128.3	17 11.1 99 12 128.2	50
1	13 35.3 99 12 127.7	14 05.1 99 12 127.6	14 34.8 99 12 127.5	15 04.6 99 12 127.5	15 34.4 99 13 127.4	16 04.1 99 13 127.3	16 33.9 99 13 127.3	17 03.6 99 13 127.2	1
2	13 27.8 99 13 126.6	13 57.6 99 13 126.6	14 27.3 99 13 126.5	14 57.1 99 13 126.4	15 26.9 99 13 126.4	15 56.6 99 13 126.3	16 26.4 99 13 126.2	16 56.1 99 13 126.2	2
3	13 20.3 99 13 125.6	13 50.0 99 13 125.6	14 19.8 99 13 125.5	14 49.5 99 13 125.4	15 19.3 99 13 125.4	15 49.0 99 13 125.3	16 18.7 99 13 125.2	16 48.5 99 13 125.2	3
4	13 12.6 99 13 124.6	13 42.3 99 13 124.6	14 12.1 99 13 124.5	14 41.8 99 13 124.4	15 11.6 99 13 124.4	15 41.3 99 13 124.3	16 11.0 99 13 124.2	16 40.8 99 13 124.1	4
55	13 04.8 99 13 123.6	13 34.5 99 13 123.5	14 04.3 99 13 123.5	14 34.0 99 13 123.4	15 03.8 99 13 123.3	15 33.5 99 13 123.3	16 03.2 99 13 123.2	16 33.0 99 13 123.1	55
6	12 56.9 99 13 122.6	13 26.7 99 13 122.5	13 56.4 99 13 122.5	14 26.1 99 13 122.4	14 55.9 99 13 122.3	15 25.6 99 13 122.3	15 55.3 99 13 122.2	16 25.0 99 13 122.1	6
7	12 49.0 99 13 121.6	13 18.7 99 13 121.5	13 48.4 99 13 121.5	14 18.2 99 13 121.4	14 47.9 99 13 121.3	15 17.6 99 13 121.3	15 47.3 99 13 121.2	16 17.1 99 13 121.1	7
8	12 41.0 99 14 120.6	13 10.7 99 14 120.5	13 40.4 99 14 120.5	14 10.1 99 14 120.4	14 39.8 99 14 120.3	15 09.5 99 14 120.2	15 39.3 99 14 120.2	16 09.0 99 14 120.1	8
9	12 32.8 99 14 119.6	13 02.5 99 14 119.5	13 32.3 99 14 119.4	14 02.0 99 14 119.4	14 31.7 99 14 119.3	15 01.4 99 14 119.2	15 31.1 99 14 119.2	16 00.8 99 14 119.1	9
60	12 24.6 99 14 118.6	12 54.3 99 14 118.5	13 24.1 99 14 118.4	13 53.8 99 14 118.4	14 23.5 99 14 118.3	14 53.2 99 14 118.2	15 22.9 99 14 118.2	15 52.6 99 14 118.1	60
1	12 16.4 99 14 117.6	12 46.1 99 14 117.5	13 15.8 99 14 117.4	13 45.5 99 14 117.4	14 15.2 99 14 117.3	14 44.9 99 14 117.2	15 14.6 99 14 117.1	15 44.3 99 14 117.1	1
2	12 08.0 99 14 116.6	12 37.7 99 14 116.5	13 07.4 99 14 116.4	13 37.1 99 14 116.4	14 06.8 99 14 116.3	14 36.5 99 14 116.2	15 06.2 99 14 116.1	15 35.9 99 14 116.1	2
3	11 59.6 99 14 115.6	12 29.3 99 14 115.5	12 59.0 99 14 115.4	13 28.6 99 14 115.4	13 58.3 99 14 115.3	14 28.0 99 14 115.2	14 57.7 99 14 115.1	15 27.4 99 14 115.1	3
4	11 51.1 99 14 114.6	12 20.8 99 14 114.5	12 50.4 99 14 114.4	13 20.1 99 14 114.4	13 49.8 99 14 114.3	14 19.5 99 14 114.2	14 49.2 99 14 114.1	15 18.9 99 14 114.1	4
65	11 42.5 99 14 113.6	12 12.2 99 14 113.5	12 41.9 99 14 113.4	13 11.5 99 14 113.3	13 41.2 99 14 113.3	14 10.9 99 14 113.2	14 40.6 99 14 113.1	15 10.3 99 14 113.0	65
6	11 33.9 99 14 112.6	12 03.5 99 14 112.5	12 33.2 99 14 112.4	13 02.9 99 15 112.3	13 32.6 99 15 112.3	14 02.2 99 15 112.2	14 31.9 99 15 112.1	15 01.6 99 15 112.0	6
7	11 25.2 99 15 111.6	11 54.8 99 15 111.5	12 24.5 99 15 111.4	12 54.2 99 15 111.3	13 23.9 99 15 111.3	13 53.5 99 15 111.2	14 23.2 99 15 111.1	14 52.9 99 15 111.0	7
8	11 16.4 99 15 110.6	11 46.1 99 15 110.5	12 15.7 99 15 110.5	12 45.4 99 15 110.3	13 15.1 99 15 110.3	13 44.7 99 15 110.2	14 14.4 99 15 110.1	14 44.1 99 15 110.0	8
9	11 07.6 99 15 109.6	11 37.3 99 15 109.5	12 06.9 99 15 109.4	12 36.6 99 15 109.3	13 06.2 99 15 109.3	13 35.9 99 15 109.2	14 05.6 99 15 109.1	14 35.2 99 15 109.0	9
70	10 58.7 99 15 108.6	11 28.4 99 15 108.5	11 58.0 99 15 108.4	12 27.7 99 15 108.3	12 57.4 99 15 108.3	13 27.0 99 15 108.2	13 56.7 99 15 108.1	14 26.3 99 15 108.0	70
1	10 49.8 99 15 107.6	11 19.5 99 15 107.5	11 49.1 99 15 107.4	12 18.8 99 15 107.3	12 48.4 99 15 107.3	13 18.1 99 15 107.2	13 47.7 99 15 107.1	14 17.4 99 15 107.0	1
2	10 40.8 99 15 106.6	11 10.5 99 15 106.5	11 40.1 99 15 106.4	12 09.8 99 15 106.4	12 39.4 99 15 106.3	13 09.1 99 15 106.2	13 38.7 99 15 106.1	14 08.4 99 15 106.0	2
3	10 31.8 99 15 105.6	11 01.5 99 15 105.5	11 31.1 99 15 105.4	12 00.8 99 15 105.4	12 30.4 99 15 105.3	13 00.0 99 15 105.2	13 29.7 99 15 105.1	13 59.3 99 15 105.0	3
4	10 22.7 99 15 104.6	10 52.4 99 15 104.5	11 22.0 99 15 104.4	11 51.7 99 15 104.4	12 21.3 99 15 104.3	12 51.0 99 15 104.2	13 20.6 99 15 104.1	13 50.2 99 15 104.0	4
75	10 13.6 99 15 103.6	10 43.3 99 15 103.5	11 12.9 99 15 103.4	11 42.6 99 15 103.4	12 12.2 99 15 103.3	12 41.8 99 15 103.2	13 11.5 99 15 103.1	13 41.1 99 15 103.0	75
6	10 04.5 99 15 102.6	10 34.1 99 15 102.5	11 03.8 99 15 102.4	11 33.4 99 15 102.4	12 03.1 99 15 102.3	12 32.7 99 15 102.2	13 02.3 99 15 102.1	13 32.0 99 15 102.0	6
7	9 55.3 99 15 101.6	10 25.0 99 15 101.5	10 54.6 99 15 101.5	11 24.2 99 15 101.4	11 53.9 99 15 101.3	12 23.5 99 15 101.2	12 53.1 99 15 101.1	13 22.8 99 15 101.1	7
8	9 46.1 99 15 100.6	10 15.8 99 15 100.5	10 45.4 99 15 100.5	11 15.0 99 15 100.3	11 44.6 99 15 100.3	12 14.3 99 15 100.2	12 43.9 99 15 100.1	13 13.5 99 15 100.0	8
9	9 36.9 99 15 99.6	10 06.5 99 15 99.5	10 36.1 99 15 99.5	11 05.8 99 15 99.4	11 35.4 99 15 99.3	12 05.0 99 15 99.2	12 34.7 99 15 99.1	13 04.3 99 15 99.1	9
80	9 27.6 99 15 98.6	9 57.2 99 16 98.6	10 26.9 99 16 98.5	10 56.5 99 16 98.4	11 26.1 99 16 98.3	11 55.7 99 16 98.2	12 25.4 99 16 98.2	12 55.0 99 16 98.1	80
1	9 18.3 99 16 97.6	9 47.9 99 16 97.6	10 17.6 99 16 97.5	10 47.2 99 16 97.4	11 16.8 99 16 97.3	11 46.4 99 16 97.2	12 16.1 99 16 97.2	12 45.7 99 16 97.1	1
2	9 09.0 99 16 96.7	9 38.6 99 16 96.6	10 08.3 99 16 96.5	10 37.9 99 16 96.4	11 07.5 99 16 96.3	11 37.1 99 16 96.3	12 06.7 99 16 96.2	12 36.4 99 16 96.1	2
3	8 59.7 99 16 95.7	9 29.3 99 16 95.6	9 58.9 99 16 95.5	10 28.5 99 16 95.4	10 58.2 99 16 95.3	11 27.8 99 16 95.3	11 57.4 99 16 95.2	12 27.0 99 16 95.1	3
4	8 50.3 99 16 94.7	9 19.9 99 16 94.6	9 49.6 99 16 94.5	10 19.2 99 16 94.4	10 48.8 99 16 94.4	11 18.4 99 16 94.3	11 48.1 99 16 94.2	12 17.7 99 16 94.1	4
85	8 41.0 99 16 93.7	9 10.6 99 16 93.6	9 40.2 99 16 93.5	10 09.8 99 16 93.4	10 39.4 99 16 93.4	11 09.1 99 16 93.3	11 38.7 99 16 93.2	12 08.3 99 16 93.1	85
6	8 31.6 99 16 92.7	9 01.2 99 16 92.6	9 30.8 99 16 92.5	10 00.5 99 16 92.5	10 30.1 99 16 92.4	10 59.7 99 16 92.3	11 29.3 99 16 92.2	11 58.9 99 16 92.1	6
7	8 22.2 99 16 91.7	8 51.8 99 16 91.6	9 21.5 99 16 91.5	9 51.1 99 16 91.5	10 20.7 99 16 91.4	10 50.3 99 16 91.3	11 19.9 99 16 91.2	11 49.5 99 16 91.1	7
8	8 12.8 99 16 90.7	8 42.4 99 16 90.6	9 12.1 99 16 90.6	9 41.7 99 16 90.4	10 11.3 99 16 90.4	10 40.9 99 16 90.3	11 10.5 99 16 90.2	11 40.2 99 16 90.2	8
9	8 03.4 99 16 89.7	8 33.1 99 16 89.6	9 02.7 99 16 89.6	9 32.3 99 16 89.5	10 01.9 99 16 89.4	10 31.5 99 16 89.3	11 01.2 99 16 89.2	11 30.8 99 16 89.2	9
90	7 54.1 99 16 88.7	8 23.7 99 16 88.7	8 53.3 99 16 88.6	9 22.9 99 16 88.5	9 52.5 99 16 88.4	10 22.2 99 16 88.3	10 51.8 99 16 88.3	11 21.4 99 16 88.2	90

H.A.	8° 00' Alt. Δd Δt Az.	8° 30' Alt. Δd Δt Az.	9° 00' Alt. Δd Δt Az.	9° 30' Alt. Δd Δt Az.	10° 00' Alt. Δd Δt Az.	10° 30' Alt. Δd Δt Az.	11° 00' Alt. Δd Δt Az.	11° 30' Alt. Δd Δt Az.	H.A.
91	7 44.7 99 16 87.8	8 14.3 99 16 87.7	8 43.9 99 16 87.6	9 13.5 99 16 87.5	9 43.2 99 16 87.4	10 12.8 99 16 87.4	10 42.4 99 16 87.3	11 12.0 99 16 87.2	91
2	7 35.3 99 16 86.8	8 04.9 99 16 86.7	8 34.5 99 16 86.6	9 04.2 99 16 86.5	9 33.8 99 16 86.4	10 03.4 99 16 86.4	10 33.0 99 16 86.3	11 02.6 99 16 86.2	2
3	7 25.9 99 16 85.8	7 55.6 99 16 85.7	8 25.2 99 16 85.6	8 54.8 99 16 85.5	9 24.4 99 16 85.5	9 54.0 99 16 85.4	10 23.7 99 16 85.3	10 53.3 99 16 85.2	3
4	7 16.6 99 16 84.8	7 46.2 99 16 84.7	8 15.8 99 16 84.6	8 45.5 99 16 84.6	9 15.1 99 16 84.5	9 44.7 99 16 84.4	10 14.3 99 16 84.3	10 43.9 99 16 84.2	4
95	7 07.2 99 16 83.8	7 36.9 99 16 83.7	8 06.5 99 16 83.6	8 36.1 99 16 83.6	9 05.7 99 16 83.5	9 35.4 99 16 83.4	10 05.0 99 16 83.3	10 34.6 99 16 83.2	95
6	6 57.9 99 16 82.8	7 27.5 99 16 82.7	7 57.2 99 16 82.7	8 26.8 99 16 82.6	8 56.4 99 15 82.5	9 26.0 99 16 82.4	9 55.7 99 15 82.3	10 25.3 99 16 82.3	6
7	6 48.6 99 15 81.8	7 18.2 99 15 81.8	7 47.9 99 15 81.7	8 17.5 99 15 81.6	8 47.1 99 15 81.5	9 16.8 99 15 81.4	9 46.4 99 15 81.4	10 16.0 99 15 81.3	7
8	6 39.3 99 15 80.9	7 09.0 99 15 80.8	7 38.6 99 15 80.7	8 08.2 99 15 80.6	8 37.9 99 15 80.5	9 07.5 99 15 80.5	9 37.1 99 15 80.4	10 06.7 99 15 80.3	8
9	6 30.1 99 15 79.9	6 59.7 99 15 79.8	7 29.3 99 15 79.7	7 59.0 99 15 79.6	8 28.6 99 15 79.6	8 58.2 99 15 79.5	9 27.9 99 15 79.4	9 57.5 99 15 79.3	9
100	6 20.9 99 15 78.9	6 50.5 99 15 78.8	7 20.1 99 15 78.7	7 49.8 99 15 78.6	8 19.4 99 15 78.6	8 49.0 99 15 78.5	9 18.7 99 15 78.4	9 48.3 99 15 78.3	100
1	6 11.7 99 15 77.9	6 41.3 99 15 77.8	7 10.9 99 15 77.7	7 40.6 99 15 77.7	8 10.2 99 15 77.6	8 39.8 99 15 77.5	9 09.5 99 15 77.4	9 39.1 99 15 77.4	1
2	6 02.5 99 15 76.9	6 32.1 99 15 76.8	7 01.8 99 15 76.8	7 31.4 99 15 76.7	8 01.1 99 15 76.6	8 30.7 99 15 76.5	9 00.3 99 15 76.4	9 30.0 99 15 76.4	2
3	5 53.4 99 15 75.9	6 23.0 99 15 75.9	6 52.7 99 15 75.8	7 22.3 99 15 75.7	7 52.0 99 15 75.6	8 21.6 99 15 75.5	8 51.2 99 15 75.5	9 20.9 99 15 75.4	3
4	5 44.3 99 15 74.9	6 13.9 99 15 74.9	6 43.6 99 15 74.8	7 13.2 99 15 74.7	7 42.9 99 15 74.6	8 12.5 99 15 74.6	8 42.2 99 15 74.5	9 11.8 99 15 74.4	4
105	5 35.2 99 15 74.0	6 04.9 99 15 73.9	6 34.6 99 15 73.8	7 04.2 99 15 73.7	7 33.9 99 15 73.7	8 03.5 99 15 73.6	8 33.1 99 15 73.5	9 02.8 99 15 73.4	105
6	5 26.3 99 15 73.0	5 55.9 99 15 72.9	6 25.6 99 15 72.8	6 55.2 99 15 72.8	7 24.9 99 15 72.7	7 54.5 99 15 72.6	8 24.2 99 15 72.5	8 53.8 99 15 72.4	6
7	5 17.3 99 15 72.0	5 47.0 99 15 71.9	6 16.6 99 15 71.8	6 46.3 99 15 71.8	7 15.9 99 15 71.7	7 45.6 99 15 71.6	8 15.2 99 15 71.5	8 44.9 99 15 71.5	7
8	5 08.4 99 15 71.0	5 38.1 99 15 70.9	6 07.7 99 15 70.9	6 37.4 99 15 70.8	7 07.0 99 15 70.7	7 36.7 99 15 70.6	8 06.4 99 15 70.6	8 36.0 99 15 70.5	8
9		5 29.2 99 15 70.0	5 58.9 99 15 69.9	6 28.5 99 15 69.8	6 58.2 99 15 69.7	7 27.9 99 15 69.7	7 57.5 99 15 69.6	8 27.2 99 15 69.5	9
110		5 20.4 99 15 69.0	5 50.1 99 15 68.9	6 19.8 99 15 68.8	6 49.4 99 15 68.8	7 19.1 99 14 68.7	7 48.8 99 15 68.6	8 18.4 99 15 68.5	110
1		5 11.7 99 14 68.0	5 41.4 99 14 67.9	6 11.0 99 14 67.8	6 40.7 99 14 67.8	7 10.4 99 14 67.7	7 40.1 99 14 67.6	8 09.7 99 14 67.5	1
2		5 03.0 99 14 67.0	5 32.7 99 14 66.9	6 02.4 99 14 66.9	6 32.1 99 14 66.8	7 01.7 99 14 66.7	7 31.4 99 14 66.6	8 01.1 99 14 66.6	2
3			5 24.1 99 14 66.0	5 53.8 99 14 65.9	6 23.5 99 14 65.8	6 53.2 99 14 65.7	7 22.8 99 14 65.7	7 52.5 99 14 65.6	3
4			5 15.6 99 14 65.0	5 45.3 99 14 64.9	6 14.9 99 14 64.8	6 44.6 99 14 64.8	7 14.3 99 14 64.7	7 44.0 99 14 64.6	4
115			5 07.1 99 14 64.0	5 36.8 99 14 63.9	6 06.5 99 14 63.8	6 36.2 99 14 63.8	7 05.9 99 14 63.7	7 35.6 99 14 63.6	115
6				5 28.4 99 14 62.9	5 58.1 99 14 62.9	6 27.8 99 14 62.8	6 57.5 99 14 62.7	7 27.2 99 14 62.7	6
7				5 20.1 99 14 62.0	5 49.8 99 14 61.9	6 19.5 99 14 61.8	6 49.2 99 14 61.7	7 18.9 99 14 61.7	7
8				5 11.8 99 14 61.0	5 41.5 99 14 60.9	6 11.2 99 14 60.8	6 41.0 99 14 60.8	7 10.7 99 14 60.7	8
9				5 03.7 99 14 60.0	5 33.4 99 13 59.9	6 03.1 99 13 59.9	6 32.8 99 13 59.8	7 02.5 99 13 59.7	9
120					5 25.3 99 13 58.9	5 55.0 99 13 58.9	6 24.7 99 13 58.8	6 54.4 99 13 58.7	120
1					5 17.3 99 13 58.0	5 47.0 99 13 57.9	6 16.7 99 13 57.8	6 46.5 99 13 57.8	1
2					5 09.4 99 13 57.0	5 39.1 99 13 56.9	6 08.8 99 13 56.8	6 38.6 99 13 56.8	2
3					5 01.5 99 13 56.0	5 31.3 99 13 55.9	6 01.0 99 13 55.9	6 30.8 99 13 55.8	3
4						5 23.6 99 13 55.0	5 53.3 99 13 54.9	6 23.0 99 13 54.8	4
125						5 15.9 99 13 54.0	5 45.7 99 13 53.9	6 15.4 99 13 53.9	125
6						5 08.4 99 12 53.0	5 38.1 99 12 52.9	6 07.9 99 12 52.9	6
7						5 00.9 99 12 52.0	5 30.7 99 12 52.0	6 00.4 99 12 51.9	7
8							5 23.3 99 12 51.0	5 53.1 99 12 50.9	8
9							5 16.1 99 12 50.0	5 45.9 99 12 49.9	9
130							5 09.0 99 12 49.0	5 38.7 99 12 49.0	130
1							5 01.9 99 11 48.0	5 31.7 99 12 48.0	1
2								5 24.8 99 11 47.0	2
3								5 18.0 99 11 46.0	3
4								5 11.3 99 11 45.1	4
135								5 04.7 99 11 44.1	135

H.A.	12°00' Alt.	Δd Δt	Az.	12°30' Alt.	Δd Δt	Az.	13°00' Alt.	Δd Δt	Az.	13°30' Alt.	Δd Δt	Az.	14°00' Alt.	Δd Δt	Az.	14°30' Alt.	Δd Δt	Az.	15°00' Alt.	Δd Δt	Az.	15°30' Alt.	Δd Δt	Az.	H.A.
00	21 00.0	1.00 0	180.0	21 30.0	1.00 0	180.0	22 00.0	1.00 0	180.0	22 30.0	1.00 0	180.0	23 00.0	1.00 0	180.0	23 30.0	1.00 0	180.0	24 00.0	1.00 0	180.0	24 30.0	1.00 0	180.0	00
1	20 59.9	1.00 0	179.0	21 29.9	1.00 0	179.0	21 59.9	1.00 0	178.9	22 29.9	1.00 0	178.9	22 59.9	1.00 0	178.9	23 29.9	1.00 0	178.9	23 59.9	1.00 0	178.9	24 29.9	1.00 0	178.9	1
2	20 59.7	1.00 1	177.9	21 29.7	1.00 1	177.9	21 59.7	1.00 1	177.9	22 29.7	1.00 1	177.9	22 59.7	1.00 1	177.9	23 29.7	1.00 1	177.9	23 59.7	1.00 1	177.9	24 29.7	1.00 1	177.9	2
3	20 59.2	1.00 1	176.9	21 29.2	1.00 1	176.9	21 59.2	1.00 1	176.8	22 29.2	1.00 1	176.8	22 59.2	1.00 1	176.8	23 29.2	1.00 1	176.8	23 59.2	1.00 1	176.8	24 29.2	1.00 1	176.8	3
4	20 58.6	1.00 1	175.8	21 28.6	1.00 1	175.8	21 58.6	1.00 1	175.8	22 28.6	1.00 1	175.8	22 58.6	1.00 1	175.8	23 28.6	1.00 1	175.8	23 58.6	1.00 1	175.8	24 28.6	1.00 1	175.8	4
05	20 57.9	1.00 2	174.8	21 27.9	1.00 2	174.8	21 57.8	1.00 2	174.7	22 27.8	1.00 2	174.7	22 57.8	1.00 2	174.7	23 27.8	1.00 2	174.7	23 57.8	1.00 2	174.7	24 27.8	1.00 2	174.7	05
6	20 56.9	1.00 2	173.7	21 26.9	1.00 2	173.7	21 56.9	1.00 2	173.7	22 26.9	1.00 2	173.7	22 56.9	1.00 2	173.7	23 26.9	1.00 2	173.7	23 56.9	1.00 2	173.7	24 26.9	1.00 2	173.6	6
7	20 55.8	1.00 2	172.7	21 25.8	1.00 2	172.7	21 55.8	1.00 2	172.6	22 25.8	1.00 2	172.6	22 55.8	1.00 2	172.6	23 25.8	1.00 2	172.6	23 55.8	1.00 2	172.6	24 25.8	1.00 2	172.6	7
8	20 54.5	1.00 2	171.6	21 24.5	1.00 2	171.6	21 54.5	1.00 2	171.6	22 24.5	1.00 2	171.6	22 54.5	1.00 2	171.6	23 24.5	1.00 2	171.6	23 54.5	1.00 2	171.5	24 24.5	1.00 2	171.5	8
9	20 53.1	1.00 3	170.6	21 23.1	1.00 3	170.6	21 53.0	1.00 3	170.5	22 23.0	1.00 3	170.5	22 53.0	1.00 3	170.5	23 23.0	1.00 3	170.5	23 53.0	1.00 3	170.5	24 23.0	1.00 3	170.5	9
10	20 51.4	1.00 3	169.5	21 21.4	1.00 3	169.5	21 51.4	1.00 3	169.5	22 21.4	1.00 3	169.5	22 51.4	1.00 3	169.5	23 21.4	1.00 3	169.4	23 51.4	1.00 3	169.4	24 21.4	1.00 3	169.4	10
1	20 49.7	1.00 3	168.5	21 19.6	1.00 3	168.5	21 49.6	1.00 3	168.4	22 19.6	1.00 3	168.4	22 49.6	1.00 3	168.4	23 19.6	1.00 3	168.4	23 49.6	1.00 3	168.4	24 19.5	1.00 3	168.4	1
2	20 47.7	1.00 4	167.4	21 17.7	1.00 4	167.4	21 47.7	1.00 4	167.4	22 17.6	1.00 4	167.4	22 47.6	1.00 4	167.4	23 17.6	1.00 4	167.3	23 47.6	1.00 4	167.3	24 17.6	1.00 4	167.3	2
3	20 45.6	1.00 4	166.4	21 15.5	1.00 4	166.4	21 45.5	1.00 4	166.3	22 15.5	1.00 4	166.3	22 45.5	1.00 4	166.3	23 15.5	1.00 4	166.3	23 45.4	1.00 4	166.3	24 15.4	1.00 4	166.2	3
4	20 43.3	1.00 4	165.3	21 13.3	1.00 4	165.3	21 43.2	1.00 4	165.3	22 13.2	1.00 4	165.3	22 43.2	1.00 4	165.3	23 13.2	1.00 4	165.2	23 43.1	1.00 4	165.2	24 13.1	1.00 4	165.2	4
15	20 40.8	1.00 4	164.3	21 10.8	1.00 4	164.3	21 40.8	1.00 4	164.3	22 10.7	1.00 4	164.2	22 40.7	1.00 4	164.2	23 10.7	1.00 4	164.2	23 40.6	1.00 4	164.2	24 10.6	1.00 4	164.1	15
6	20 38.2	1.00 5	163.3	21 08.2	1.00 5	163.2	21 38.1	1.00 5	163.2	22 08.1	1.00 5	163.2	22 38.1	1.00 5	163.2	23 08.0	1.00 5	163.1	23 38.0	1.00 5	163.1	24 08.0	1.00 5	163.1	6
7	20 35.4	1.00 5	162.2	21 05.4	1.00 5	162.2	21 35.3	1.00 5	162.2	22 05.3	1.00 5	162.1	22 35.3	1.00 5	162.1	23 05.2	1.00 5	162.1	23 35.2	1.00 5	162.1	24 05.2	1.00 5	162.0	7
8	20 32.5	1.00 5	161.2	21 02.4	1.00 5	161.1	21 32.4	1.00 5	161.1	22 02.3	1.00 5	161.1	22 32.3	1.00 5	161.1	23 02.3	1.00 5	161.0	23 32.2	1.00 5	161.0	24 02.2	1.00 5	161.0	8
9	20 29.4	1.00 5	160.1	20 59.3	1.00 5	160.1	21 29.3	1.00 5	160.1	21 59.2	1.00 5	160.0	22 29.2	1.00 5	160.0	22 59.1	1.00 6	160.0	23 29.1	1.00 6	159.9	23 59.0	1.00 6	159.9	9
20	20 26.1	1.00 6	159.1	20 56.0	1.00 6	159.1	21 26.0	1.00 6	159.0	21 55.9	1.00 6	159.0	22 25.9	1.00 6	159.0	22 55.8	1.00 6	158.9	23 25.8	1.00 6	158.9	23 55.7	1.00 6	158.9	20
1	20 22.7	1.00 6	158.0	20 52.6	1.00 6	158.0	21 22.5	1.00 6	158.0	21 52.5	1.00 6	157.9	22 22.4	1.00 6	157.9	22 52.4	1.00 6	157.9	23 22.3	1.00 6	157.8	23 52.3	1.00 6	157.8	1
2	20 19.1	1.00 6	157.0	20 49.0	1.00 6	157.0	21 18.9	1.00 6	156.9	21 48.9	1.00 6	156.9	22 18.8	1.00 6	156.9	22 48.8	1.00 6	156.8	23 18.7	1.00 6	156.8	23 48.6	1.00 6	156.8	2
3	20 15.3	1.00 6	156.0	20 45.3	1.00 6	155.9	21 15.2	1.00 7	155.9	21 45.1	1.00 7	155.9	22 15.1	1.00 7	155.8	22 45.0	1.00 7	155.8	23 14.9	1.00 7	155.7	23 44.9	1.00 7	155.7	3
4	20 11.4	1.00 7	154.9	20 41.3	1.00 7	154.9	21 11.3	1.00 7	154.8	21 41.2	1.00 7	154.8	22 11.1	1.00 7	154.8	22 41.1	1.00 7	154.7	23 11.0	1.00 7	154.7	23 40.9	1.00 7	154.7	4
25	20 07.4	1.00 7	153.9	20 37.3	1.00 7	153.8	21 07.2	1.00 7	153.8	21 37.1	1.00 7	153.8	22 07.1	1.00 7	153.7	22 37.0	1.00 7	153.7	23 06.9	1.00 7	153.6	23 36.8	1.00 7	153.6	25
6	20 03.2	1.00 7	152.8	20 33.1	1.00 7	152.8	21 03.0	1.00 7	152.7	21 32.9	1.00 7	152.7	22 02.8	1.00 7	152.7	22 32.7	1.00 7	152.6	23 02.7	1.00 7	152.6	23 32.6	1.00 7	152.6	6
7	19 58.8	1.00 8	151.8	20 28.7	1.00 8	151.8	20 58.6	1.00 8	151.7	21 28.5	1.00 8	151.7	21 58.4	1.00 8	151.6	22 28.4	1.00 8	151.6	22 58.3	1.00 8	151.6	23 28.2	1.00 8	151.5	7
8	19 54.3	1.00 8	150.8	20 24.2	1.00 8	150.7	20 54.1	1.00 8	150.7	21 24.0	1.00 8	150.6	21 53.9	1.00 8	150.6	22 23.8	1.00 8	150.6	22 53.7	1.00 8	150.5	23 23.6	1.00 8	150.5	8
9	19 49.6	1.00 8	149.7	20 19.5	1.00 8	149.7	20 49.4	1.00 8	149.6	21 19.3	1.00 8	149.6	21 49.2	1.00 8	149.6	22 19.1	1.00 8	149.5	22 49.0	1.00 8	149.5	23 18.9	1.00 8	149.4	9
30	19 44.8	1.00 8	148.7	20 14.7	1.00 8	148.6	20 44.6	1.00 8	148.6	21 14.5	1.00 8	148.6	21 44.4	1.00 8	148.5	22 14.3	1.00 8	148.5	22 44.2	1.00 8	148.4	23 14.1	1.00 8	148.4	30
1	19 39.9	1.00 8	147.6	20 09.8	1.00 8	147.6	20 39.6	1.00 9	147.6	21 09.5	1.00 9	147.5	21 39.4	1.00 9	147.5	22 09.3	1.00 9	147.4	22 39.2	1.00 9	147.4	23 09.1	1.00 9	147.3	1
2	19 34.8	1.00 9	146.6	20 04.7	1.00 9	146.6	20 34.5	1.00 9	146.5	21 04.4	1.00 9	146.5	21 34.3	1.00 9	146.4	22 04.2	1.00 9	146.4	22 34.1	1.00 9	146.3	23 03.9	1.00 9	146.3	2
3	19 29.5	1.00 9	145.6	19 59.4	1.00 9	145.5	20 29.3	1.00 9	145.5	20 59.2	1.00 9	145.4	21 29.0	1.00 9	145.4	21 58.9	1.00 9	145.3	22 28.8	1.00 9	145.3	22 58.7	1.00 9	145.2	3
4	19 24.2	1.00 9	144.6	19 54.0	1.00 9	144.5	20 23.9	1.00 9	144.5	20 53.8	1.00 9	144.4	21 23.6	1.00 9	144.4	21 53.5	1.00 9	144.3	22 23.4	1.00 9	144.3	22 53.2	1.00 9	144.2	4
35	19 18.7	1.00 9	143.5	19 48.5	1.00 9	143.5	20 18.4	1.00 9	143.4	20 48.2	1.00 9	143.4	21 18.1	1.00 9	143.3	21 48.0	1.00 9	143.3	22 17.8	1.00 10	143.2	22 47.7	1.00 10	143.2	35
6	19 13.0	1.00 10	142.4	19 42.9	1.00 10	142.4	20 12.7	1.00 10	142.4	20 42.6	1.00 10	142.3	21 12.4	1.00 10	142.3	21 42.3	1.00 10	142.2	22 12.1	1.00 10	142.2	22 42.0	1.00 10	142.1	6
7	19 07.2	.99 10	141.5	19 37.1	.99 10	141.4	20 06.9	.99 10	141.4	20 36.8	.99 10	141.3	21 06.6	.99 10	141.2	21 36.5	.99 10	141.2	22 06.3	.99 10	141.1	22 36.2	.99 10	141.1	7
8	19 01.3	.99 10	140.4	19 31.2	.99 10	140.4	20 01.0	.99 10	140.3	20 30.8	.99 10	140.3	21 00.7	.99 10	140.2	21 30.5	.99 10	140.2	22 00.4	.99 10	140.1	22 30.2	.99 10	140.0	8
9	18 55.3	.99 10	139.4	19 25.1	.99 10	139.3	19 54.9	.99 10	139.3	20 24.8	.99 10	139.2	20 54.6	.99 10	139.2	21 24.4	.99 10	139.1	21 54.3	.99 10	139.1	22 24.1	.99 10	139.0	9
40	18 49.1	.99 10	138.4	19 18.9	.99 10	138.3	19 48.8	.99 11	138.3	20 18.6	.99 11	138.2	20 48.4	.99 11	138.1	21 18.2	.99 11	138.1	21 48.1	.99 11	138.0	22 17.9	.99 11	138.0	40
1	18 42.8	.99 11	137.3	19 12.6	.99 11	137.3	19 42.4	.99 11	137.2	20 12.3	.99 11	137.2	20 42.1	.99 11	137.1	21 11.9	.99 11	137.1	21 41.7	.99 11	137.0	22 11.5	.99 11	136.9	1
2	18 36.4	.99 11	136.3	19 06.2	.99 11	136.3	19 36.0	.99 11	136.2	20 05.8	.99 11	136.1	20 35.6	.99 11	136.1	21 05.5	.99 11	136.0	21 35.3	.99 11	136.0	22 05.1	.99 11	135.9	2
3	18 29.8	.99 11	135.3	18 59.6	.99 11	135.2	19 29.5	.99 11	135.2	19 59.3	.99 11	135.1	20 29.1	.99 11	135.1	20 58.9	.99 11	135.0	21 28.7	.99 11	134.9	21 58.5	.99 11	134.9	3
4	18 23.2	.99 11	134.3	18 53.0	.99 11	134.2	19 22.8	.99 11	134.2	19 52.6	.99 11	134.1	20 22.4	.99 11	134.0	20 52.2	.99 11	134.0	21 22.0	.99 11	133.9	21 51.8	.99 11	133.8	4
45	18 16.4	.99 12	133.2	18 46.2	.99 12	133.2	19 16.0	.99 12	133.1	19 45.8	.99 12	133.1	20 15.6	.99 12	133.0	20 45.4	.99 12	132.9	21 15.2	.99 12	132.9	21 44.9	.99 12	132.8	45
6	18 09.5	.99 12	132.2	18 39.3	.99 12	132.1	19 09.1	.99 12	132.1	19 38.9	.99 12	132.0	20 08.7	.99 12	132.0	20 38.4	.99 12	131.9	21 08.2	.99 12	131.8	21 38.0	.99 12	131.8	6
7	18 02.5	.99 12	131.2	18 32.3	.99 12	131.1	19 02.1	.99 12	131.1	19 31.8	.99 12	131.0	20 01.6	.99 12	130.9	20 31.4	.99 12	130.9	21 01.2	.99 12	130.8	21 30.9	.99 12	130.8	7
8	17 55.4	.99 12	130.2	18 25.2	.99 12	130.1	18 54.9	.99 12	130.1	19 24.7	.99 12	130.0	19 54.5	.99 12	129.9	20 24.2	.99 12	129.9	20 54.0	.99 12	129.8	21 23.8	.99 12	129.7	8
9	17 48.2	.99 12	129.2	18 17.9	.99 12	129.1	18 47.7	.99 12	129.0	19 17.5	.99 12	129.0	19 47.2	.99 12	128.9	20 17.0	.99 12	128.8	20 46.7	.99 12	128.8	21 16.5	.99 12	128.7	9
50	17 40.8	.99 12	128.1	18 10.6	.99 12	128.1	18 40.4	.99 13	128.0	19 10.1	.99 13	127.9	19 39.9	.99 13	127.9	20 09.6	.99 13	127.8	20 39.4	.99 13	127.7	21 09.1	.99 13	127.7	50
1	17 33.4	.99 13	127.1	18 03.2	.99 13	127.1	18 32.9	.99 13	127.0	19 02.7	.99 13	126.9	19 32.4	.99 13	126.9	20 02.2	.99 13	126.8	20 31.9	.99 13	126.7	21 01.6	.99 13	126.6	1
2	17 25.9	.99 13	126.1	17 55.6	.99 13	126.0	18 25.4	.99 13	126.0	18 55.1	.99 13	125.9	19 24.8	.99 13	125.8	19 54.6	.99 13	125.8	20 24.3	.99 13	125.7	20 54.1	.99 13	125.6	2
3	17 18.2	.99 13	125.1	17 48.0	.99 13	125.0	18 17.7	.99 13	125.0	18 47.5	.99 13	124.9	19 17.2	.99 13	124.8	19 46.9	.99 13	124.7	20 16.7	.99 13	124.7	20 46.4	.99 13	124.6	3
4	17 10.5	.99 13	124.1	17 40.2	.99 13	124.0	18 10.0	.99 13	124.0	18 39.7	.99 13	123.9	19 09.4	.99 13	123.8	19 39.2	.99 13	123.7	20 08.9	.99 13	123.7	20 38.6	.99 13	123.6	4
55	17 02.7	.99 13	123.1	17 32.4	.99 13	123.0	18 02.1	.99 13	122.9	18 31.9	.99 13	122.9	19 01.6	.99 13	122.8	19 31.3	.99 13	122.7	20 01.0	.99 13	122.6	20 30.8	.99 13	122.6	55
6	16 54.8	.99 13	122.1	17 24.5	.99 13	122.0	17 54.2	.99 13	121.9	18 23.9	.99 13	121.8	18 53.7	.99 13	121.8	19 23.4	.99 13	121.7	19 53.1	.99 13	121.6	20 22.8	.99 13	121.5	6
7	16 46.8	.99 13	121.0	17 16.5	.99 13	121.0	17 46.2	.99 14	120.9	18 15.9	.99 14	120.8	18 45.6	.99 14	120.7	19 15.3	.99 14	120.7	19 45.0	.99 14	120.6	20 14.8	.99 14	120.5	7
8	16 38.7	.99 14	120.0	17 08.4	.99 14	120.0	17 38.1	.99 14	119.9	18 07.8	.99 14	119.8	18 37.5	.99 14	119.7	19 07.2	.99 14	119.7	19 36.9	.99 14	119.6	20 06.6	.99 14	119.5	8
9	16 30.5	.99 14	119.0	17 00.2	.99 14	118.9	17 29.9	.99 14	118.9	17 59.6	.99 14	118.8	18 29.3	.99 14	118.8	18 59.0	.99 14	118.7	19 28.7	.99 14	118.6	19 58.4	.99 14	118.5	9
60	16 22.3	.99 14	118.0	16 52.0	.99 14	117.9	17 21.7	.99 14	117.9	17 51.4	.99 14	117.8	18 21.1	.99 14	117.7	18 50.8	.99 14	117.6	19 20.4	.99 14	117.6	19 50.1	.99 14	117.5	60
1	16 13.9	.99 14	117.0	16 43.6	.99 14	116.9	17 13.3	.99 14	116.8	17 43.0	.99 14	116.8	18 12.7	.99 14	116.7	18 42.4	.99 14	116.6	19 12.1	.99 14	116.5	19 41.8	.99 14	116.5	1
2	16 05.5	.99 14	116.0	16 35.2	.99 14	115.9	17 04.9	.99 14	115.8	17 34.6	.99 14	115.8	18 04.3	.99 14	115.7	18 34.0	.99 14	115.6	19 03.6	.99 14	115.5	19 33.3	.99 14	115.5	2
3	15 57.1	.99 14	114.9	16 26.8	.99 14	114.9	16 56.4	.99 14	114.8	17 26.1	.99 14	114.8	17 55.8	.99 14	114.7	18 25.5	.99 14	114.6	18 55.1	.99 14	114.5	19 24.8	.99 14	114.4	3
4	15 48.5	.99 14	114.0	16 18.2	.99 14	113.9	16 47.9	.99 14	113.8	17 17.6	.99 14	113.7	17 47.2	.99 14	113.7	18 16.9	.99 14	113.6	18 46.6	.99 14	113.5	19 16.2	.99 14	113.4	4
65	15 39.9	.99 14	113.0	16 09.6	.99 14	112.9	16 39.3	.99 14	112.8	17 08.9	.99 14	112.7	17 38.6	.99 14	112.7	18 08.3	.99 14	112.6	18 37.9	.99 14	112.5	19 07.6	.99 15	112.4	65
6	15 31.3	.99 15	112.0	16 00.9	.99 15	111.9	16 30.6	.99 15	111.8	17 00.2	.99 15	111.7	17 29.9	.99 15	111.7	17 59.6	.99 15	111.6	18 29.2	.99 15	111.5	18 58.9	.99 15	111.4	6
7	15 22.5	.99 15	111.0	15 52.2	.99 15	110.9	16 21.8	.99 15	110.8	16 51.5	.99 15	110.7	17 21.2	.99 15	110.7	17 50.8	.99 15	110.6	18 20.5	.99 15	110.5	18 50.1	.99 15	110.4	7
8	15 13.6	.99 15	110.0	15 43.3	.99 15	109.9	16 13.0	.99 15	109.8	16 42.6	.99 15	109.7	17 12.3	.99 15	109.6	17 42.0	.99 15	109.6	18 11.6	.99 15	109.5	18 41.3	.99 15	109.4	8
9	15 04.9	.99 15	109.0	15 34.5	.99 15	108.9	16 04.2	.99 15	108.8	16 33.8	.99 15	108.7	17 03.5	.99 15	108.6	17 33.1	.99 15	108.6	18 02.8	.99 15	108.5	18 32.4	.99 15	108.4	9
70	14 56.0	.99 15	108.0	15 25.6	.99 15	107.9	15 55.3	.99 15	107.8	16 24.9	.99 15	107.7	16 54.6	.99 15	107.6	17 24.2	.99 15	107.6	17 53.8	.99 15	107.5	18 23.5	.99 15	107.4	70
1	14 47.0	.99 15	107.0	15 16.7	.99 15	106.9	15 46.3	.99 15	106.8	16 15.9	.99 15	106.7	16 45.6	.99 15	106.6	17 15.2	.99 15	106.6	17 44.9	.99 15	106.5	18 14.5	.99 15	106.4	1
2	14 38.0	.99 15	106.0	15 07.7	.99 15	105.9	15 37.3	.99 15	105.8	16 06.9	.99 15	105.7	16 36.6	.99 15	105.6	17 06.2	.99 15	105.5	17 35.8	.99 15	105.5	18 05.5	.99 15	105.4	2
3	14 29.0	.99 15	105.0	14 58.6	.99 15	104.9	15 28.2	.99 15	104.8	15 57.9	.99 15	104.7	16 27.5	.99 15	104.6	16 57.1	.99 15	104.6	17 26.8	.99 15	104.5	17 56.4	.99 15	104.4	3
4	14 19.9	.99 15	104.0	14 49.5	.99 15	103.9	15 19.1	.99 15	103.8	15 48.8	.99 15	103.7	16 18.4	.99 15	103.6	16 48.0	.99 15	103.6	17 17.7	.99 15	103.5	17 47.3	.99 15	103.4	4
75	14 10.8	.99 15	103.0	14 40.4	.99 15	102.9	15 10.0	.99 15	102.8	15 39.6	.99 15	102.7	16 09.3	.99 15	102.6	16 38.9	.99 15	102.6	17 08.5	.99 15	102.5	17 38.1	.99 15	102.4	75
6	14 01.6	.99 15	102.0	14 31.2	.99 15	101.9	15 00.8	.99 15	101.8	15 30.5	.99 15	101.7	16 00.1	.99 15	101.6	16 29.7	.99 15	101.6	16 59.3	.99 15	101.5	17 29.0	.99 15	101.4	6
7	13 52.4	.99 15	101.0	14 22.0	.99 15	100.9	14 51.6	.99 15	100.8	15 21.3	.99 15	100.7	15 50.9	.99 15	100.6	16 20.5	.99 15	100.5	16 50.1	.99 15	100.5	17 19.7	.99 15	100.4	7
8	13 43.2	.99 15	100.0	14 12.8	.99 15	99.9	14 42.4	.99 15	99.8	15 12.0	.99 15	99.7	15 41.6	.99 15	99.7	16 11.3	.99 15	99.6	16 40.9	.99 15	99.5	17 10.5	.99 15	99.4	8
9	13 33.9	.99 15	99.0	14 03.5	.99 15	98.9	14 33.1	.99 15	98.8	15 02.8	.99 15	98.7	15 32.4	.99 16	98.7	16 02.0	.99 16	98.6	16 31.6	.99 16	98.5	17 01.2	.99 16	98.4	9
80	13 24.6	.99 16	98.0	13 54.2	.99 16	97.9	14 23.9	.99 16	97.8	14 53.5	.99 16	97.7	15 23.1	.99 16	97.7	15 52.7	.99 16	97.6	16 22.3	.99 16	97.5	16 51.9	.99 16	97.4	80
1	13 15.3	.99 16	97.0	13 44.9	.99 16	96.9	14 14.5	.99 16	96.8	14 44.2	.99 16	96.8	15 13.8	.99 16	96.7	15 43.4	.99 16	96.6	16 13.0	.99 16	96.5	16 42.6	.99 16	96.4	1
2	13 06.0	.99 16	96.0	13 35.6	.99 16	95.9	14 05.2	.99 16	95.8	14 34.8	.99 16	95.8	15 04.4	.99 16	95.7	15 34.1	.99 16	95.6	16 03.7	.99 16	95.5	16 33.3	.99 16	95.4	2
3	12 56.6	.99 16	95.0	13 26.3	.99 16	94.9	13 55.9	.99 16	94.9	14 25.5	.99 16	94.8	14 55.1	.99 16	94.7	15 24.7	.99 16	94.6	15 54.3	.99 16	94.5	16 23.9	.99 16	94.4	3
4	12 47.3	.99 16	94.0	13 16.9	.99 16	93.9	13 46.5	.99 16	93.9	14 16.1	.99 16	93.8	14 45.7	.99 16	93.7	15 15.3	.99 16	93.6	15 45.0	.99 16	93.5	16 14.6	.99 16	93.4	4
85	12 37.9	.99 16	93.0	13 07.5	.99 16	93.0	13 37.1	.99 16	92.9	14 06.8	.99 16	92.8	14 36.4	.99 16	92.7	15 06.0	.99 16	92.6	15 35.6	.99 16	92.5	16 05.2	.99 16	92.5	85
6	12 28.5	.99 16	92.0	12 58.2	.99 16	92.0	13 27.8	.99 16	91.9	13 57.4	.99 16	91.8	14 27.0	.99 16	91.7	14 56.6	.99 16	91.6	15 26.2	.99 16	91.5	15 55.8	.99 16	91.5	6
7	12 19.2	.99 16	91.0	12 48.8	.99 16	91.0	13 18.4	.99 16	90.9	13 48.0	.99 16	90.8	14 17.6	.99 16	90.7	14 47.2	.99 16	90.6	15 16.8	.99 16	90.6	15 46.4	.99 16	90.5	7
8	12 09.8	.99 16	90.1	12 39.4	.99 16	90.0	13 09.0	.99 16	89.9	13 38.6	.99 16	89.8	14 08.2	.99 16	89.7	14 37.8	.99 16	89.7	15 07.4	.99 16	89.6	15 37.0	.99 16	89.5	8
9	12 00.4	.99 16	89.1	12 30.0	.99 16	89.0	12 59.6	.99 16	88.9	13 29.2	.99 16	88.8	13 58.8	.99 16	88.8	14 28.4	.99 16	88.7	14 58.0	.99 16	88.6	15 27.6	.99 16	88.5	9
90	11 51.0	.99 16	88.1	12 20.6	.99 16	88.0	12 50.2	.99 16	87.9	13 19.8	.99 16	87.8	13 49.5	.99 16	87.8	14 19.1	.99 16	87.7	14 48.7	.99 16	87.6	15 18.3	.99 16	87.5	90

Lat. 81°

Each declination cell is formatted: Alt. (° ′) · Δd · Δt · Az. (°)

H.A.	12° 00′	12° 30′	13° 00′	13° 30′	14° 00′	14° 30′	15° 00′	15° 30′	H.A.
91	11 41.6 99 16 87.1	12 11.2 99 16 87.0	12 40.9 99 16 86.9	13 10.5 99 16 86.9	13 40.1 99 16 86.8	14 09.7 99 16 86.7	14 39.3 99 16 86.6	15 08.9 99 16 86.5	91
2	11 32.3 99 16 86.1	12 01.9 99 16 86.0	12 31.5 99 16 86.0	13 01.1 99 16 85.9	13 30.7 99 16 85.8	14 00.3 99 16 85.7	14 29.9 99 16 85.6	14 59.5 99 16 85.5	2
3	11 22.9 99 16 85.1	11 52.5 99 16 85.1	12 22.1 99 16 85.0	12 51.7 99 16 84.9	13 21.4 99 16 84.8	13 51.0 99 16 84.7	14 20.6 99 16 84.6	14 50.2 99 16 84.6	3
4	11 13.6 99 16 84.2	11 43.2 99 16 84.1	12 12.8 99 16 84.0	12 42.4 99 16 83.9	13 12.0 99 16 83.8	13 41.6 99 16 83.7	14 11.2 99 16 83.7	14 40.8 99 16 83.6	4
95	11 04.2 99 16 83.2	11 33.8 99 16 83.1	12 03.5 99 16 83.0	12 33.1 99 16 82.9	13 02.7 99 16 82.8	13 32.3 99 16 82.8	14 01.9 99 16 82.7	14 31.5 99 16 82.6	95
6	10 54.9 99 15 82.2	11 24.5 99 15 82.1	11 54.2 99 15 82.0	12 23.8 99 15 81.9	12 53.4 99 15 81.9	13 23.0 99 15 81.8	13 52.6 99 15 81.7	14 22.2 99 15 81.6	6
7	10 45.6 99 15 81.2	11 15.3 99 15 81.1	11 44.9 99 15 81.0	12 14.5 99 15 81.0	12 44.1 99 15 80.9	13 13.7 99 15 80.8	13 43.3 99 15 80.7	14 13.0 99 15 80.6	7
8	10 36.4 99 15 80.2	11 06.0 99 15 80.1	11 35.6 99 15 80.1	12 05.2 99 15 80.0	12 34.8 99 15 79.9	13 04.5 99 15 79.8	13 34.1 99 15 79.7	14 03.7 99 15 79.7	8
9	10 27.1 99 15 79.2	10 56.8 99 15 79.2	11 26.4 99 15 79.1	11 56.0 99 15 79.0	12 25.6 99 15 78.9	12 55.3 99 15 78.8	13 24.9 99 15 78.8	13 54.5 99 15 78.7	9
100	10 17.9 99 15 78.3	10 47.6 99 15 78.2	11 17.2 99 15 78.1	11 46.8 99 15 78.0	12 16.4 99 15 77.9	12 46.1 99 15 77.9	13 15.7 99 15 77.8	13 45.3 99 15 77.7	100
1	10 08.8 99 15 77.3	10 38.4 99 15 77.2	11 08.0 99 15 77.1	11 37.6 99 15 77.0	12 07.3 99 15 77.0	12 36.9 99 15 76.9	13 06.5 99 15 76.8	13 36.2 99 15 76.7	1
2	9 59.6 99 15 76.3	10 29.3 99 15 76.2	10 58.9 99 15 76.1	11 28.5 99 15 76.1	11 58.1 99 15 76.0	12 27.8 99 15 75.9	12 57.4 99 15 75.8	13 27.0 99 15 75.7	2
3	9 50.5 99 15 75.3	10 20.2 99 15 75.2	10 49.8 99 15 75.2	11 19.4 99 15 75.1	11 49.1 99 15 75.0	12 18.7 99 15 74.9	12 48.3 99 15 74.8	13 18.0 99 15 74.8	3
4	9 41.5 99 15 74.3	10 11.1 99 15 74.3	10 40.7 99 15 74.2	11 10.4 99 15 74.1	11 40.0 99 15 74.0	12 09.7 99 15 73.9	12 39.3 99 15 73.9	13 08.9 99 15 73.8	4
105	9 32.4 99 15 73.3	10 02.1 99 15 73.3	10 31.7 99 15 73.2	11 01.4 99 15 73.1	11 31.0 99 15 73.0	12 00.7 99 15 73.0	12 30.3 99 15 72.9	12 59.9 99 15 72.8	105
6	9 23.5 99 15 72.4	9 53.1 99 15 72.3	10 22.8 99 15 72.2	10 52.4 99 15 72.1	11 22.1 99 15 72.1	11 51.7 99 15 72.0	12 21.4 99 15 71.9	12 51.0 99 15 71.8	6
7	9 14.6 99 15 71.4	9 44.2 99 15 71.3	10 13.9 99 15 71.2	10 43.5 99 15 71.2	11 13.2 99 15 71.1	11 42.8 99 15 71.0	12 12.5 99 15 70.9	12 42.1 99 15 70.8	7
8	9 05.7 99 15 70.4	9 35.3 99 15 70.3	10 05.0 99 15 70.3	10 34.7 99 15 70.2	11 04.3 99 15 70.1	11 34.0 99 15 70.0	12 03.6 99 15 69.9	12 33.3 99 15 69.9	8
9	8 56.9 99 15 69.4	9 26.5 99 15 69.4	9 56.2 99 15 69.3	10 25.9 99 15 69.2	10 55.5 99 15 69.1	11 25.2 99 15 69.0	11 54.8 99 15 69.0	12 24.5 99 15 68.9	9
110	8 48.1 99 14 68.5	9 17.8 99 14 68.4	9 47.4 99 14 68.3	10 17.1 99 14 68.2	10 46.8 99 14 68.2	11 16.4 99 14 68.1	11 46.1 99 14 68.0	12 15.7 99 14 67.9	110
1	8 39.4 99 14 67.5	9 09.1 99 14 67.4	9 38.7 99 14 67.3	10 08.4 99 14 67.2	10 38.1 99 14 67.2	11 07.8 99 14 67.1	11 37.4 99 14 67.0	12 07.1 99 14 66.9	1
2	8 30.8 99 14 66.5	9 00.4 99 14 66.4	9 30.1 99 14 66.3	9 59.8 99 14 66.3	10 29.5 99 14 66.2	10 59.1 99 14 66.1	11 28.8 99 14 66.0	11 58.5 99 14 66.0	2
3	8 22.2 99 14 65.5	8 51.9 99 14 65.4	9 21.6 99 14 65.3	9 51.2 99 14 65.3	10 20.9 99 14 65.2	10 50.6 99 14 65.1	11 20.3 99 14 65.1	11 49.9 99 14 65.0	3
4	8 13.7 99 14 64.5	8 43.4 99 14 64.5	9 13.1 99 14 64.4	9 42.7 99 14 64.3	10 12.4 99 14 64.2	10 42.1 99 14 64.2	11 11.8 99 14 64.1	11 41.5 99 14 64.0	4
115	8 05.2 99 14 63.6	8 34.9 99 14 63.5	9 04.6 99 14 63.4	9 34.3 99 14 63.3	10 04.0 99 14 63.3	10 33.7 99 14 63.2	11 03.4 99 14 63.1	11 33.1 99 14 63.1	115
6	7 56.9 99 14 62.6	8 26.6 99 14 62.5	8 56.3 99 14 62.4	9 26.0 99 14 62.4	9 55.7 99 14 62.3	10 25.3 99 14 62.2	10 55.0 99 14 62.2	11 24.7 99 14 62.1	6
7	7 48.6 99 14 61.6	8 18.3 99 14 61.5	8 48.0 99 14 61.5	9 17.7 99 14 61.4	9 47.4 99 14 61.3	10 17.1 99 14 61.2	10 46.8 99 14 61.2	11 16.5 99 14 61.1	7
8	7 40.4 99 14 60.6	8 10.1 99 14 60.6	8 39.8 99 14 60.4	9 09.5 99 14 60.4	9 39.2 99 14 60.3	10 08.9 99 14 60.3	10 38.6 99 14 60.2	11 08.3 99 14 60.1	8
9	7 32.2 99 13 59.7	8 01.9 99 13 59.6	8 31.7 99 13 59.5	9 01.4 99 13 59.4	9 31.1 99 13 59.4	10 00.8 99 13 59.3	10 30.5 99 13 59.2	11 00.2 99 13 59.2	9
120	7 24.2 99 13 58.7	7 53.9 99 13 58.6	8 23.6 99 13 58.5	8 53.3 99 13 58.5	9 23.0 99 13 58.4	9 52.8 99 13 58.3	10 22.5 99 13 58.3	10 52.2 99 13 58.2	120
1	7 16.2 99 13 57.7	7 45.9 99 13 57.6	8 15.6 99 13 57.6	8 45.4 99 13 57.5	9 15.1 99 13 57.4	9 44.8 99 13 57.4	10 14.5 99 13 57.3	10 44.2 99 13 57.2	1
2	7 08.3 99 13 56.7	7 38.0 99 13 56.7	8 07.8 99 13 56.6	8 37.5 99 13 56.5	9 07.2 99 13 56.4	9 36.9 99 13 56.4	10 06.7 99 13 56.3	10 36.4 99 13 56.2	2
3	7 00.5 99 13 55.7	7 30.2 99 13 55.7	8 00.0 99 13 55.6	8 29.7 99 13 55.5	8 59.4 99 13 55.5	9 29.2 99 13 55.4	9 58.9 99 13 55.3	10 28.6 99 13 55.3	3
4	6 52.8 99 13 54.8	7 22.5 99 13 54.7	7 52.3 99 13 54.6	8 22.0 99 13 54.6	8 51.8 99 13 54.5	9 21.5 99 13 54.4	9 51.2 99 13 54.4	10 21.0 99 13 54.3	4
125	6 45.2 99 13 53.8	7 14.9 99 13 53.7	7 44.7 99 13 53.7	8 14.4 99 13 53.6	8 44.2 99 12 53.5	9 13.9 99 12 53.5	9 43.7 99 12 53.4	10 13.4 99 12 53.3	125
6	6 37.6 99 12 52.8	7 07.4 99 12 52.7	7 37.2 99 12 52.7	8 06.9 99 12 52.6	8 36.7 99 12 52.6	9 06.4 99 12 52.5	9 36.2 99 12 52.4	10 05.9 99 12 52.4	6
7	6 30.2 99 12 51.8	7 00.0 99 12 51.8	7 29.7 99 12 51.7	7 59.5 99 12 51.6	8 29.3 99 12 51.6	8 59.0 99 12 51.5	9 28.8 99 12 51.5	9 58.5 99 12 51.4	7
8	6 22.9 99 12 50.9	6 52.7 99 12 50.8	7 22.4 99 12 50.7	7 52.2 99 12 50.7	8 22.0 99 12 50.6	8 51.7 99 12 50.5	9 21.5 99 12 50.5	9 51.2 99 12 50.4	8
9	6 15.7 99 12 49.9	6 45.4 99 12 49.8	7 15.2 99 12 49.8	7 45.0 99 12 49.7	8 14.7 99 12 49.6	8 44.5 99 12 49.6	9 14.3 99 12 49.5	9 44.1 99 12 49.4	9
130	6 08.5 99 12 48.9	6 38.3 99 12 48.8	7 08.1 99 12 48.8	7 37.9 99 12 48.7	8 07.6 99 12 48.7	8 37.4 99 12 48.6	9 07.2 99 12 48.5	9 37.0 99 12 48.5	130
1	6 01.5 99 12 47.9	6 31.3 99 12 47.9	7 01.1 99 12 47.8	7 30.9 99 11 47.7	8 00.7 99 11 47.7	8 30.4 99 11 47.6	9 00.2 99 11 47.6	9 30.0 99 11 47.5	1
2	5 54.6 99 11 47.0	6 24.4 99 11 46.9	6 54.2 99 11 46.8	7 24.0 99 11 46.8	7 53.8 99 11 46.7	8 23.6 99 11 46.6	8 53.4 99 11 46.6	9 23.1 99 11 46.5	2
3	5 47.8 99 11 46.0	6 17.6 99 11 45.9	6 47.4 99 11 45.9	7 17.2 99 11 45.8	7 47.0 99 11 45.7	8 16.8 99 11 45.7	8 46.6 99 11 45.6	9 16.4 99 11 45.6	3
4	5 41.1 99 11 45.0	6 10.9 99 11 44.9	6 40.7 99 11 44.9	7 10.5 99 11 44.8	7 40.3 99 11 44.8	8 10.1 99 11 44.7	8 39.9 99 11 44.7	9 09.7 99 11 44.6	4
135	5 34.5 99 11 44.0	6 04.3 99 11 44.0	6 34.1 99 11 43.9	7 04.0 99 11 43.9	7 33.8 99 11 43.8	8 03.6 99 11 43.7	8 33.4 99 11 43.7	9 03.2 99 11 43.6	135
6	5 28.1 99 11 43.0	5 57.9 99 11 43.0	6 27.7 99 11 42.9	6 57.5 99 11 42.9	7 27.3 99 11 42.8	7 57.2 99 11 42.8	8 27.0 99 10 42.7	8 56.8 99 10 42.7	6
7	5 21.7 99 10 42.1	5 51.5 99 10 42.0	6 21.4 99 10 42.0	6 51.2 99 10 41.9	7 21.0 99 10 41.9	7 50.8 99 10 41.8	8 20.7 99 10 41.7	8 50.5 99 10 41.7	7
8	5 15.5 99 10 41.1	5 45.3 99 10 41.0	6 15.1 99 10 41.0	6 45.0 99 10 40.9	7 14.8 99 10 40.9	7 44.6 99 10 40.8	8 14.5 99 10 40.8	8 44.3 99 10 40.7	8
9	5 09.4 99 10 40.1	5 39.2 99 10 40.1	6 09.0 99 10 40.0	6 38.9 99 10 40.0	7 08.7 99 10 39.9	7 38.6 99 10 39.9	8 08.4 99 10 39.8	8 38.2 99 10 39.8	9
140	5 03.4 99 10 39.1	5 33.2 99 10 39.1	6 03.1 99 10 39.0	6 32.9 99 10 39.0	7 02.8 99 10 38.9	7 32.6 99 10 38.9	8 02.5 99 10 38.8	8 32.3 99 10 38.8	140
1		5 27.4 1.0 10 38.1	5 57.2 1.0 10 38.1	6 27.1 1.0 10 38.0	6 56.9 1.0 10 37.9	7 26.8 1.0 10 37.9	7 56.6 1.0 10 37.9	8 26.5 1.0 10 37.8	1
2		5 21.6 1.0 09 37.1	5 51.5 1.0 09 37.1	6 21.4 1.0 09 37.0	6 51.2 1.0 09 37.0	7 21.1 1.0 09 36.9	7 50.9 1.0 09 36.9	8 20.8 1.0 09 36.8	2
3		5 16.0 1.0 09 36.2	5 45.9 1.0 09 36.1	6 15.8 1.0 09 36.1	6 45.6 1.0 09 36.0	7 15.5 1.0 09 36.0	7 45.4 1.0 09 35.9	8 15.2 1.0 09 35.9	3
4		5 10.6 1.0 09 35.2	5 40.4 1.0 09 35.1	6 10.3 1.0 09 35.1	6 40.2 1.0 09 35.0	7 10.1 1.0 09 35.0	7 39.9 1.0 09 35.0	8 09.8 1.0 09 34.9	4
145		5 05.2 1.0 09 34.2	5 35.1 1.0 09 34.2	6 05.0 1.0 09 34.1	6 34.9 1.0 09 34.1	7 04.7 1.0 09 34.0	7 34.6 1.0 09 34.0	8 04.5 1.0 09 33.9	145
6		5 00.0 1.0 08 33.2	5 29.9 1.0 08 33.2	5 59.8 1.0 08 33.1	6 29.7 1.0 08 33.1	6 59.5 1.0 08 33.1	7 29.4 1.0 08 33.0	7 59.3 1.0 08 33.0	6
7			5 24.8 1.0 08 32.2	5 54.7 1.0 08 32.2	6 24.6 1.0 08 32.1	6 54.5 1.0 08 32.1	7 24.4 1.0 08 32.0	7 54.5 1.0 08 32.0	7
8			5 19.9 1.0 08 31.2	5 49.8 1.0 08 31.2	6 19.7 1.0 08 31.2	6 49.6 1.0 08 31.1	7 19.5 1.0 08 31.1	7 49.4 1.0 08 31.0	8
9			5 15.1 1.0 08 30.3	5 45.0 1.0 08 30.2	6 14.9 1.0 08 30.2	6 44.8 1.0 08 30.1	7 14.7 1.0 08 30.1	7 44.6 1.0 08 30.1	9
150			5 10.4 1.0 08 29.3	5 40.3 1.0 08 29.2	6 10.2 1.0 08 29.2	6 40.2 1.0 08 29.2	7 10.1 1.0 08 29.1	7 40.0 1.0 08 29.1	150
1			5 05.8 1.0 07 28.3	5 35.8 1.0 07 28.3	6 05.7 1.0 07 28.2	6 35.6 1.0 07 28.2	7 05.6 1.0 07 28.2	7 35.5 1.0 07 28.1	1
2			5 01.5 1.0 07 27.3	5 31.4 1.0 07 27.3	6 01.4 1.0 07 27.3	6 31.3 1.0 07 27.2	7 01.2 1.0 07 27.2	7 31.1 1.0 07 27.2	2
3				5 27.2 1.0 07 26.3	5 57.1 1.0 07 26.3	6 27.1 1.0 07 26.3	6 57.0 1.0 07 26.2	7 26.9 1.0 07 26.2	3
4				5 23.1 1.0 07 25.4	5 53.0 1.0 07 25.3	6 23.0 1.0 07 25.3	6 52.9 1.0 07 25.2	7 22.8 1.0 07 25.2	4
155				5 19.2 1.0 06 24.4	5 49.1 1.0 06 24.3	6 19.0 1.0 06 24.3	6 49.0 1.0 06 24.3	7 18.9 1.0 06 24.2	155
6				5 15.4 1.0 06 23.4	5 45.3 1.0 06 23.4	6 15.3 1.0 06 23.3	6 45.2 1.0 06 23.3	7 15.1 1.0 06 23.3	6
7				5 11.7 1.0 06 22.4	5 41.7 1.0 06 22.4	6 11.6 1.0 06 22.4	6 41.5 1.0 06 22.3	7 11.5 1.0 06 22.3	7
8				5 08.2 1.0 06 21.5	5 38.2 1.0 06 21.4	6 08.1 1.0 06 21.4	6 38.1 1.0 06 21.4	7 08.0 1.0 06 21.3	8
9				5 04.9 1.0 05 20.5	5 34.8 1.0 05 20.4	6 04.8 1.0 05 20.4	6 34.7 1.0 05 20.4	7 04.7 1.0 05 20.4	9
160				5 01.6 1.0 05 19.5	5 31.6 1.0 05 19.5	6 01.5 1.0 05 19.4	6 31.5 1.0 05 19.4	7 01.5 1.0 05 19.4	160
1					5 28.5 1.0 05 18.5	5 58.5 1.0 05 18.5	6 28.5 1.0 05 18.5	6 58.4 1.0 05 18.4	1
2					5 25.6 1.0 05 17.5	5 55.6 1.0 05 17.5	6 25.6 1.0 05 17.5	6 55.5 1.0 05 17.5	2
3					5 22.9 1.0 04 16.6	5 52.9 1.0 04 16.5	6 22.8 1.0 04 16.5	6 52.8 1.0 04 16.5	3
4					5 20.3 1.0 04 15.6	5 50.3 1.0 04 15.6	6 20.2 1.0 04 15.6	6 50.2 1.0 04 15.5	4
165					5 17.9 1.0 04 14.6	5 47.8 1.0 04 14.6	6 17.8 1.0 04 14.6	6 47.7 1.0 04 14.5	165
6					5 15.6 1.0 04 13.6	5 45.5 1.0 04 13.6	6 15.5 1.0 04 13.6	6 45.5 1.0 04 13.6	6
7					5 13.4 1.0 03 12.7	5 43.4 1.0 03 12.6	6 13.4 1.0 03 12.6	6 43.4 1.0 03 12.6	7
8					5 11.4 1.0 03 11.7	5 41.4 1.0 03 11.7	6 11.4 1.0 03 11.6	6 41.4 1.0 03 11.6	8
9					5 09.6 1.0 03 10.7	5 39.6 1.0 03 10.7	6 09.6 1.0 03 10.7	6 39.6 1.0 03 10.7	9
170					5 08.0 1.0 03 09.7	5 37.9 1.0 03 09.7	6 07.9 1.0 02 09.7	6 37.9 1.0 03 09.7	170
1					5 06.4 1.0 02 08.8	5 36.4 1.0 02 08.7	6 06.4 1.0 02 08.7	6 36.4 1.0 02 08.7	1
2					5 05.1 1.0 02 07.8	5 35.1 1.0 02 07.8	6 05.1 1.0 02 07.8	6 35.1 1.0 02 07.8	2
3					5 03.9 1.0 02 06.8	5 33.9 1.0 02 06.8	6 03.9 1.0 02 06.8	6 33.9 1.0 02 06.8	3
4					5 02.9 1.0 01 05.8	5 32.9 1.0 01 05.8	6 02.9 1.0 01 05.8	6 32.9 1.0 01 05.8	4
175					5 02.0 1.0 01 04.9	5 32.0 1.0 01 04.9	6 02.0 1.0 01 04.9	6 32.0 1.0 01 04.8	175
6					5 01.3 1.0 01 03.9	5 31.3 1.0 01 03.9	6 01.3 1.0 01 03.9	6 31.3 1.0 01 03.9	6
7					5 00.7 1.0 01 02.9	5 30.7 1.0 01 02.9	6 00.7 1.0 01 02.9	6 30.7 1.0 01 02.9	7
8					5 00.3 1.0 00 01.9	5 30.3 1.0 00 01.9	6 00.3 1.0 00 01.9	6 30.3 1.0 00 01.9	8
9					5 00.1 1.0 00 01.0	5 30.1 1.0 00 01.0	6 00.1 1.0 00 01.0	6 30.1 1.0 00 01.0	9
180					5 00.0 1.0 00 00.0	5 30.0 1.0 00 00.0	6 00.0 1.0 00 00.0	6 30.0 1.0 00 00.0	180

Note: Within each declination block the columns are Alt., d, Δt (headed "Ad Δt"), and Az. The d and Δt values are common to each H.A. row across all declinations and are given in the shared **d** and **Δt** columns below.

H.A.	d	Δt	16° 00′ Alt	Az	16° 30′ Alt	Az	17° 00′ Alt	Az	17° 30′ Alt	Az	18° 00′ Alt	Az	18° 30′ Alt	Az	19° 00′ Alt	Az	19° 30′ Alt	Az	H.A.
00	1.00	00	25 00.0	180.0	25 30.0	180.0	26 00.0	180.0	26 30.0	180.0	27 00.0	180.0	27 30.0	180.0	28 00.0	180.0	28 30.0	180.0	00
1	1.00	00	24 59.9	178.9	25 29.9	178.9	25 59.9	178.9	26 29.9	178.9	26 59.9	178.9	27 29.9	178.9	27 59.9	178.9	28 29.9	178.9	1
2	1.00	01	24 59.7	177.9	25 29.7	177.9	25 59.7	177.9	26 29.7	177.9	26 59.7	177.9	27 29.6	177.9	27 59.6	177.9	28 29.6	177.9	2
3	1.00	01	24 59.2	176.8	25 29.2	176.8	25 59.2	176.8	26 29.2	176.8	26 59.2	176.8	27 29.2	176.8	27 59.2	176.8	28 29.2	176.8	3
4	1.00	01	24 58.6	175.8	25 28.6	175.8	25 58.6	175.7	26 28.6	175.7	26 58.6	175.7	27 28.6	175.7	27 58.6	175.7	28 28.6	175.7	4
05	1.00	02	24 57.8	174.7	25 27.8	174.7	25 57.8	174.7	26 27.8	174.7	26 57.8	174.7	27 27.8	174.7	27 57.8	174.6	28 27.8	174.6	05
6	1.00	02	24 56.9	173.6	25 26.9	173.6	25 56.9	173.6	26 26.9	173.6	26 56.9	173.6	27 26.9	173.6	27 56.9	173.6	28 26.8	173.6	6
7	1.00	02	24 55.7	172.6	25 25.7	172.6	25 55.7	172.6	26 25.7	172.5	26 55.7	172.5	27 25.7	172.5	27 55.7	172.5	28 25.7	172.5	7
8	1.00	02	24 54.5	171.5	25 24.4	171.5	25 54.4	171.5	26 24.4	171.5	26 54.4	171.5	27 24.4	171.5	27 54.4	171.4	28 24.4	171.4	8
9	1.00	03	24 53.0	170.5	25 23.0	170.5	25 53.0	170.4	26 22.9	170.4	26 52.9	170.4	27 22.9	170.4	27 52.9	170.4	28 22.9	170.4	9
10	1.00	03	24 51.3	169.4	25 21.3	169.4	25 51.3	169.4	26 21.3	169.3	26 51.3	169.3	27 21.3	169.3	27 51.3	169.3	28 21.2	169.3	10
1	1.00	03	24 49.5	168.3	25 19.5	168.3	25 49.5	168.3	26 19.5	168.3	26 49.5	168.3	27 19.4	168.2	27 49.4	168.2	28 19.4	168.2	1
2	1.00	04	24 47.5	167.3	25 17.5	167.3	25 47.5	167.2	26 17.5	167.2	26 47.5	167.2	27 17.4	167.2	27 47.4	167.2	28 17.4	167.1	2
3	1.00	04	24 45.4	166.2	25 15.4	166.2	25 45.4	166.2	26 15.3	166.1	26 45.3	166.1	27 15.3	166.1	27 45.3	166.1	28 15.2	166.1	3
4	1.00	04	24 43.1	165.2	25 13.1	165.1	25 43.0	165.1	26 13.0	165.1	26 43.0	165.1	27 12.9	165.0	27 42.9	165.0	28 12.9	165.0	4
15	1.00	04	24 40.6	164.1	25 10.6	164.1	25 40.5	164.1	26 10.5	164.0	26 40.5	164.0	27 10.4	164.0	27 40.4	164.0	28 10.4	163.9	15
6	1.00	05	24 37.9	163.1	25 07.9	163.0	25 37.9	163.0	26 07.8	163.0	26 37.8	162.9	27 07.8	162.9	27 37.7	162.9	28 07.7	162.9	6
7	1.00	05	24 35.1	162.0	25 05.1	162.0	25 35.0	161.9	26 05.0	161.9	26 35.0	161.9	27 04.9	161.9	27 34.9	161.8	28 04.8	161.8	7
8	1.00	05	24 32.1	160.9	25 02.1	160.9	25 32.0	160.9	26 02.0	160.9	26 32.0	160.8	27 01.9	160.8	27 31.9	160.8	28 01.8	160.7	8
9	1.00	06	24 29.0	159.9	24 58.9	159.9	25 28.9	159.8	25 58.8	159.8	26 28.8	159.8	26 58.7	159.7	27 28.7	159.7	27 58.6	159.7	9
20	1.00	06	24 25.7	158.8	24 55.6	158.8	25 25.6	158.8	25 55.5	158.7	26 25.5	158.7	26 55.4	158.7	27 25.4	158.6	27 55.3	158.6	20
1	1.00	06	24 22.2	157.8	24 52.2	157.7	25 22.1	157.7	25 52.0	157.7	26 22.0	157.6	26 51.9	157.6	27 21.9	157.6	27 51.8	157.5	1
2	1.00	06	24 18.6	156.7	24 48.5	156.7	25 18.5	156.7	25 48.4	156.6	26 18.3	156.6	26 48.3	156.6	27 18.2	156.5	27 48.1	156.5	2
3	1.00	07	24 14.8	155.7	24 44.7	155.6	25 14.7	155.6	25 44.6	155.6	26 14.5	155.5	26 44.4	155.5	27 14.4	155.4	27 44.3	155.4	3
4	1.00	07	24 10.8	154.6	24 40.8	154.6	25 10.7	154.5	25 40.6	154.5	26 10.6	154.5	26 40.5	154.4	27 10.4	154.4	27 40.3	154.3	4
25	1.00	07	24 06.7	153.6	24 36.7	153.5	25 06.6	153.5	25 36.5	153.5	26 06.4	153.4	26 36.3	153.4	27 06.3	153.3	27 36.2	153.3	25
6	1.00	07	24 02.5	152.5	24 32.4	152.5	25 02.3	152.4	25 32.2	152.4	26 02.2	152.4	26 32.1	152.3	27 02.0	152.3	27 31.9	152.2	6
7	1.00	08	23 58.1	151.4	24 28.0	151.4	24 57.9	151.4	25 27.8	151.3	25 57.7	151.3	26 27.6	151.3	26 57.5	151.2	27 27.4	151.2	7
8	1.00	08	23 53.5	150.4	24 23.4	150.4	24 53.3	150.3	25 23.2	150.3	25 53.1	150.2	26 23.0	150.2	26 52.9	150.2	27 22.8	150.1	8
9	1.00	08	23 48.8	149.4	24 18.7	149.3	24 48.6	149.3	25 18.5	149.2	25 48.4	149.2	26 18.3	149.1	26 48.2	149.1	27 18.1	149.0	9
30	1.00	08	23 44.0	148.3	24 13.9	148.3	24 43.7	148.2	25 13.6	148.2	25 43.5	148.1	26 13.4	148.1	26 43.3	148.0	27 13.2	148.0	30
1	1.00	09	23 39.0	147.3	24 08.8	147.2	24 38.7	147.2	25 08.5	147.1	25 38.5	147.1	26 08.4	147.0	26 38.3	147.0	27 08.1	146.9	1
2	1.00	09	23 33.8	146.2	24 03.7	146.2	24 33.6	146.1	25 03.4	146.1	25 33.3	146.0	26 03.2	146.0	26 33.1	145.9	27 02.9	145.9	2
3	1.00	09	23 28.5	145.2	23 58.4	145.1	24 28.3	145.1	24 58.1	145.0	25 28.0	145.0	25 57.9	144.9	26 27.7	144.9	26 57.6	144.8	3
4	1.00	09	23 23.1	144.2	23 53.0	144.1	24 22.8	144.0	24 52.7	144.0	25 22.6	143.9	25 52.4	143.9	26 22.3	143.8	26 52.1	143.8	4
35	1.0	10	23 17.5	143.1	23 47.4	143.1	24 17.3	143.0	24 47.1	142.9	25 17.0	142.9	25 46.8	142.8	26 16.7	142.8	26 46.5	142.7	35
6	.99	10	23 11.8	142.0	23 41.7	142.0	24 11.5	141.9	24 41.4	141.9	25 11.2	141.8	25 41.1	141.8	26 10.9	141.7	26 40.8	141.7	6
7	.99	10	23 06.0	141.0	23 35.9	141.0	24 05.7	140.9	24 35.5	140.9	25 05.4	140.8	25 35.2	140.7	26 05.0	140.7	26 34.9	140.6	7
8	.99	10	23 00.0	140.0	23 29.9	139.9	23 59.7	139.9	24 29.5	139.8	24 59.4	139.8	25 29.2	139.7	25 59.0	139.6	26 28.9	139.6	8
9	.99	10	22 53.9	139.0	23 23.8	138.9	23 53.6	138.8	24 23.4	138.8	24 53.2	138.7	25 23.1	138.7	25 52.9	138.6	26 22.7	138.5	9
40	.99	11	22 47.7	137.9	23 17.5	137.9	23 47.3	137.8	24 17.2	137.7	24 47.0	137.7	25 16.8	137.6	25 46.6	137.6	26 16.4	137.5	40
1	.99	11	22 41.4	136.9	23 11.2	136.8	23 41.0	136.8	24 10.8	136.7	24 40.6	136.6	25 10.4	136.6	25 40.2	136.5	26 10.0	136.4	1
2	.99	11	22 34.0	135.8	23 04.7	135.8	23 34.5	135.7	24 04.3	135.7	24 34.1	135.6	25 03.9	135.5	25 33.7	135.5	26 03.5	135.4	2
3	.99	11	22 28.3	134.8	22 58.1	134.7	23 27.9	134.7	23 57.7	134.6	24 27.5	134.6	24 57.3	134.5	25 27.0	134.4	25 56.8	134.4	3
4	.99	11	22 21.6	133.8	22 51.4	133.7	23 21.1	133.6	23 50.9	133.6	24 20.7	133.5	24 50.5	133.5	25 20.3	133.4	25 50.1	133.3	4
45	.99	12	22 14.7	132.7	22 44.5	132.7	23 14.3	132.6	23 44.1	132.6	24 13.9	132.5	24 43.6	132.4	25 13.4	132.4	25 43.2	132.3	45
6	.99	12	22 07.8	131.7	22 37.6	131.6	23 07.3	131.6	23 37.1	131.5	24 06.9	131.4	24 36.6	131.4	25 06.4	131.3	25 36.2	131.2	6
7	.99	12	22 00.7	130.7	22 30.5	130.6	23 00.3	130.6	23 30.0	130.5	23 59.8	130.4	24 29.5	130.3	24 59.3	130.3	25 29.1	130.2	7
8	.99	12	21 53.5	129.7	22 23.3	129.6	22 53.1	129.5	23 22.8	129.5	23 52.6	129.4	24 22.3	129.3	24 52.1	129.2	25 21.8	129.2	8
9	.99	12	21 46.3	128.6	22 16.0	128.6	22 45.8	128.5	23 15.5	128.4	23 45.3	128.4	24 15.0	128.3	24 44.8	128.2	25 14.5	128.1	9
50	.99	13	21 38.9	127.6	22 08.6	127.5	22 38.4	127.5	23 08.1	127.4	23 37.9	127.3	24 07.6	127.3	24 37.3	127.2	25 07.1	127.1	50
1	.99	13	21 31.4	126.6	22 01.1	126.5	22 30.9	126.4	23 00.6	126.4	23 30.3	126.3	24 00.1	126.2	24 29.8	126.1	24 59.5	126.1	1
2	.99	13	21 23.8	125.6	21 53.5	125.5	22 23.3	125.4	22 53.0	125.3	23 22.7	125.3	23 52.5	125.2	24 22.2	125.1	24 51.9	125.0	2
3	.99	13	21 16.1	124.5	21 45.8	124.5	22 15.6	124.4	22 45.3	124.3	23 15.0	124.2	23 44.7	124.2	24 14.5	124.1	24 44.2	124.0	3
4	.99	13	21 08.3	123.5	21 38.1	123.4	22 07.8	123.4	22 37.5	123.3	23 07.2	123.2	23 36.9	123.1	24 06.6	123.1	24 36.3	123.0	4
55	.99	13	21 00.5	122.5	21 30.2	122.4	21 59.9	122.3	22 29.6	122.3	22 59.3	122.2	23 29.0	122.1	23 58.7	122.0	24 28.4	122.0	55
6	.99	14	20 52.5	121.5	21 22.2	121.4	21 51.9	121.3	22 21.6	121.2	22 51.3	121.2	23 21.0	121.1	23 50.7	121.0	24 20.4	120.9	6
7	.99	14	20 44.5	120.5	21 14.2	120.4	21 43.9	120.3	22 13.6	120.2	22 43.3	120.1	23 12.9	120.1	23 42.6	120.0	24 12.3	119.9	7
8	.99	14	20 36.3	119.4	21 06.0	119.4	21 35.7	119.3	22 05.4	119.2	22 35.1	119.1	23 04.8	119.0	23 34.5	119.0	24 04.2	118.9	8
9	.99	14	20 27.8	118.4	20 57.5	118.3	21 27.2	118.2	21 56.9	118.2	22 26.6	118.1	22 56.5	118.0	23 26.2	118.0	23 55.9	117.9	9
60	.99	14	20 19.8	117.4	20 49.5	117.3	21 19.2	117.2	21 48.9	117.2	22 18.5	117.1	22 48.2	117.0	23 17.9	116.9	23 47.6	116.9	60
1	.99	14	20 11.4	116.4	20 41.1	116.3	21 10.8	116.2	21 40.5	116.2	22 10.1	116.1	22 39.8	116.0	23 09.5	115.9	23 39.1	115.8	1
2	.99	14	20 03.0	115.4	20 32.7	115.3	21 02.3	115.2	21 32.0	115.1	22 01.7	115.1	22 31.3	115.0	23 01.0	114.9	23 30.7	114.8	2
3	.99	14	19 54.5	114.4	20 24.2	114.3	20 53.8	114.2	21 23.5	114.1	21 53.1	114.0	22 22.8	114.0	22 52.5	113.9	23 22.1	113.8	3
4	.99	14	19 45.9	113.4	20 15.6	113.3	20 45.2	113.2	21 14.9	113.1	21 44.5	113.0	22 14.2	113.0	22 43.8	112.9	23 13.5	112.8	4
65	.99	15	19 37.3	112.3	20 06.9	112.3	20 36.6	112.2	21 06.2	112.1	21 35.9	112.0	22 05.5	111.9	22 35.2	111.9	23 04.8	111.8	65
6	.99	15	19 28.5	111.3	19 58.2	111.3	20 27.8	111.2	20 57.5	111.1	21 27.1	111.0	21 56.8	110.9	22 26.4	110.8	22 56.1	110.8	6
7	.99	15	19 19.8	110.3	19 49.4	110.2	20 19.1	110.2	20 48.7	110.1	21 18.3	110.0	21 48.0	109.9	22 17.6	109.8	22 47.3	109.8	7
8	.99	15	19 10.9	109.3	19 40.6	109.2	20 10.2	109.2	20 39.9	109.1	21 09.5	109.0	21 39.1	108.9	22 08.8	108.8	22 38.4	108.7	8
9	.99	15	19 02.1	108.3	19 31.7	108.2	20 01.3	108.2	20 31.0	108.1	21 00.6	108.0	21 30.2	107.9	21 59.9	107.8	22 29.5	107.7	9
70	.99	15	18 53.1	107.3	19 22.8	107.2	19 52.4	107.1	20 22.0	107.1	20 51.6	107.0	21 21.3	106.9	21 50.9	106.8	22 20.5	106.7	70
1	.99	15	18 44.1	106.3	19 13.8	106.2	19 43.4	106.1	20 13.0	106.1	20 42.6	106.0	21 12.3	105.9	21 41.9	105.8	22 11.5	105.7	1
2	.99	15	18 35.1	105.3	19 04.7	105.2	19 34.4	105.1	20 04.0	105.1	20 33.6	105.0	21 03.2	104.9	21 32.8	104.8	22 02.4	104.7	2
3	.99	15	18 26.0	104.3	18 55.7	104.2	19 25.3	104.1	19 54.9	104.1	20 24.5	104.0	20 54.1	103.9	21 23.7	103.9	21 53.3	103.8	3
4	.99	15	18 16.9	103.3	18 46.5	103.2	19 16.2	103.1	19 45.8	103.1	20 15.4	103.0	20 45.0	102.9	21 14.6	102.8	21 44.2	102.7	4
75	.99	15	18 07.8	102.3	18 37.4	102.2	19 07.0	102.1	19 36.6	102.1	20 06.2	102.0	20 35.8	101.9	21 05.4	101.8	21 35.0	101.7	75
6	.99	15	17 58.6	101.3	18 28.2	101.2	18 57.8	101.1	19 27.4	101.1	19 57.0	101.0	20 26.6	100.9	20 56.2	100.8	21 25.8	100.7	6
7	.99	15	17 49.4	100.3	18 19.0	100.2	18 48.6	100.1	19 18.2	100.1	19 47.8	100.0	20 17.4	99.9	20 47.0	99.8	21 16.6	99.7	7
8	.99	15	17 40.1	99.3	18 09.7	99.2	18 39.3	99.1	19 08.9	99.1	19 38.5	99.0	20 08.1	98.9	20 37.7	98.8	21 07.3	98.7	8
9	.99	16	17 30.8	98.3	18 00.4	98.2	18 30.0	98.2	18 59.6	98.1	19 29.2	98.0	19 58.8	97.9	20 28.4	97.8	20 58.0	97.7	9
80	.99	16	17 21.5	97.3	17 51.1	97.2	18 20.7	97.2	18 50.3	97.1	19 19.9	97.0	19 49.5	96.9	20 19.1	96.8	20 48.7	96.7	80
1	.99	16	17 12.2	96.3	17 41.8	96.3	18 11.4	96.2	18 41.0	96.1	19 10.6	96.0	19 40.2	95.9	20 09.8	95.8	20 39.4	95.7	1
2	.99	16	17 02.9	95.3	17 32.5	95.3	18 02.1	95.2	18 31.7	95.1	19 01.3	95.0	19 30.9	94.9	20 00.5	94.8	20 30.0	94.7	2
3	.99	16	16 53.5	94.4	17 23.1	94.3	17 52.7	94.2	18 22.3	94.1	18 51.9	94.0	19 21.5	93.9	19 51.1	93.8	20 20.7	93.7	3
4	.99	16	16 44.2	93.4	17 13.8	93.3	17 43.4	93.2	18 13.0	93.1	18 42.5	93.0	19 12.1	92.9	19 41.7	92.8	20 11.3	92.8	4
85	.99	16	16 34.8	92.4	17 04.4	92.3	17 34.0	92.2	18 03.6	92.1	18 33.2	92.0	19 02.8	91.9	19 32.4	91.9	20 01.9	91.8	85
6	.99	16	16 25.4	91.4	16 55.0	91.3	17 24.6	91.2	17 54.2	91.1	18 23.8	91.0	18 53.4	91.0	19 23.0	90.9	19 52.6	90.8	6
7	.99	16	16 16.0	90.4	16 45.6	90.3	17 15.2	90.2	17 44.8	90.1	18 14.4	90.1	18 44.0	90.0	19 13.6	89.9	19 43.2	89.8	7
8	.99	16	16 06.6	89.4	16 36.2	89.3	17 05.8	89.2	17 35.4	89.1	18 05.0	89.1	18 34.6	89.0	19 04.2	88.9	19 33.8	88.8	8
9	.99	16	15 57.3	88.4	16 26.8	88.3	16 56.4	88.2	17 26.0	88.2	17 55.6	88.1	18 25.2	88.0	18 54.8	87.9	19 24.4	87.8	9
90	.99	16	15 47.9	87.4	16 17.5	87.3	16 47.1	87.3	17 16.7	87.2	17 46.3	87.1	18 15.8	87.0	18 45.4	86.9	19 15.0	86.8	90

H.A.	16° 00′ Alt.	Az.	16° 30′ Alt.	Az.	17° 00′ Alt.	Az.	17° 30′ Alt.	Az.	18° 00′ Alt.	Az.	18° 30′ Alt.	Az.	19° 00′ Alt.	Az.	19° 30′ Alt.	Az.	H.A.
91	15 38.5 99 16	86.4	16 08.1 99 16	86.4	16 37.7 99 16	86.3	17 07.3 99 16	86.2	17 36.9 99 16	86.1	18 06.5 99 16	86.0	18 36.1 99 16	85.9	19 05.7 99 16	85.8	91
2	15 29.1 99 16	85.5	15 58.7 99 16	85.4	16 28.3 99 16	85.3	16 57.9 99 16	85.2	17 27.5 99 16	85.1	17 57.1 99 16	85.0	18 26.7 99 16	84.9	18 56.3 99 16	84.9	2
3	15 19.8 99 16	84.5	15 49.4 99 16	84.4	16 19.0 99 16	84.3	16 48.6 99 16	84.2	17 18.2 99 16	84.1	17 47.8 99 16	84.1	18 17.4 99 16	84.0	18 47.0 99 16	83.9	3
4	15 10.5 99 16	83.5	15 40.1 99 16	83.4	16 09.7 99 16	83.3	16 39.3 99 16	83.2	17 08.9 99 16	83.2	17 38.5 99 16	83.1	18 08.0 99 16	83.0	18 37.6 99 16	82.9	4
95	15 01.1 99 16	82.5	15 30.7 99 16	82.4	16 00.3 99 16	82.3	16 29.9 99 16	82.3	16 59.5 99 15	82.2	17 29.1 99 15	82.1	17 58.7 99 15	82.0	18 28.3 99 15	81.9	95
6	14 51.8 99 15	81.5	15 21.4 99 16	81.4	15 51.1 99 16	81.4	16 20.6 99 15	81.3	16 50.3 99 15	81.2	17 19.9 99 15	81.1	17 49.5 99 15	81.0	18 19.1 99 15	80.9	6
7	14 42.6 99 15	80.5	15 12.2 99 15	80.5	15 41.8 99 15	80.4	16 11.4 99 15	80.3	16 41.0 99 15	80.2	17 10.6 99 15	80.1	17 40.2 99 15	80.0	18 09.8 99 15	80.0	7
8	14 33.3 99 15	79.6	15 02.9 99 15	79.5	15 32.5 99 15	79.4	16 02.2 99 15	79.3	16 31.8 99 15	79.2	17 01.4 99 15	79.1	17 31.0 99 15	79.1	18 00.6 99 15	79.0	8
9	14 24.1 99 15	78.6	14 53.7 99 15	78.5	15 23.3 99 15	78.4	15 52.9 99 15	78.3	16 22.6 99 15	78.3	16 52.2 99 15	78.2	17 21.8 99 15	78.1	17 51.4 99 15	78.0	9
100	14 14.9 99 15	77.6	14 44.5 99 15	77.5	15 14.2 99 15	77.4	15 43.8 99 15	77.4	16 13.4 99 15	77.3	16 43.0 99 15	77.2	17 12.6 99 15	77.1	17 42.2 99 15	77.0	100
1	14 05.8 99 15	76.6	14 35.4 99 15	76.5	15 05.0 99 15	76.5	15 34.6 99 15	76.4	16 04.2 99 15	76.3	16 33.9 99 15	76.2	17 03.5 99 15	76.1	17 33.1 99 15	76.0	1
2	13 56.7 99 15	75.7	14 26.3 99 15	75.6	14 55.9 99 15	75.5	15 25.5 99 15	75.4	15 55.1 99 15	75.3	16 24.8 99 15	75.2	16 54.4 99 15	75.2	17 24.0 99 15	75.1	2
3	13 47.6 99 15	74.7	14 17.2 99 15	74.6	14 46.8 99 15	74.5	15 16.5 99 15	74.4	15 46.1 99 15	74.3	16 15.7 99 15	74.3	16 45.3 99 15	74.2	17 14.9 99 15	74.1	3
4	13 38.6 99 15	73.7	14 08.2 99 15	73.6	14 37.8 99 15	73.5	15 07.4 99 15	73.5	15 37.1 99 15	73.4	16 06.7 99 15	73.3	16 36.3 99 15	73.2	17 05.9 99 15	73.1	4
105	13 29.6 99 15	72.7	13 59.2 99 15	72.6	14 28.8 99 15	72.6	14 58.5 99 15	72.5	15 28.1 99 15	72.4	15 57.7 99 15	72.3	16 27.4 99 15	72.2	16 57.0 99 15	72.2	105
6	13 20.6 99 15	71.7	13 50.3 99 15	71.7	14 19.9 99 15	71.6	14 49.5 99 15	71.5	15 19.2 99 15	71.4	15 48.8 99 15	71.3	16 18.4 99 15	71.3	16 48.1 99 15	71.2	6
7	13 11.7 99 15	70.8	13 41.4 99 15	70.7	14 11.0 99 15	70.6	14 40.7 99 15	70.5	15 10.3 99 15	70.5	15 39.9 99 15	70.4	16 09.6 99 15	70.3	16 39.2 99 15	70.2	7
8	13 02.9 99 15	69.8	13 32.6 99 15	69.7	14 02.2 99 15	69.6	14 31.8 99 15	69.6	15 01.5 99 15	69.5	15 31.1 99 15	69.4	16 00.8 99 15	69.3	16 30.4 99 15	69.2	8
9	12 54.1 99 15	68.8	13 23.8 99 15	68.7	13 53.4 99 15	68.7	14 23.1 99 15	68.6	14 52.7 99 14	68.5	15 22.4 99 14	68.4	15 52.0 99 14	68.3	16 21.7 99 14	68.3	9
110	12 45.4 99 14	67.8	13 15.1 99 14	67.8	13 44.7 99 14	67.7	14 14.4 99 14	67.6	14 44.0 99 14	67.5	15 13.7 99 14	67.5	15 43.3 99 14	67.4	16 13.0 99 14	67.3	110
1	12 36.7 99 14	66.9	13 06.4 99 14	66.8	13 36.1 99 14	66.7	14 05.7 99 14	66.6	14 35.4 99 14	66.6	15 05.0 99 14	66.5	15 34.7 99 14	66.4	16 04.3 99 14	66.3	1
2	12 28.1 99 14	65.9	12 57.8 99 14	65.8	13 27.5 99 14	65.7	13 57.1 99 14	65.7	14 26.8 99 14	65.6	14 56.5 99 14	65.5	15 26.1 99 14	65.4	15 55.8 99 14	65.4	2
3	12 19.6 99 14	64.9	12 49.3 99 14	64.8	13 19.0 99 14	64.8	13 48.6 99 14	64.7	14 18.3 99 14	64.6	14 48.0 99 14	64.5	15 17.6 99 14	64.5	15 47.3 99 14	64.4	3
4	12 11.1 99 14	63.9	12 40.8 99 14	63.9	13 10.5 99 14	63.8	13 40.2 99 14	63.7	14 09.8 99 14	63.6	14 39.5 99 14	63.6	15 09.2 99 14	63.5	15 38.9 99 14	63.4	4
115	12 02.7 99 14	63.0	12 32.4 99 14	62.9	13 02.1 99 14	62.8	13 31.8 99 14	62.8	14 01.5 99 14	62.7	14 31.1 99 14	62.6	15 00.8 99 14	62.5	15 30.5 99 14	62.4	115
6	11 54.4 99 14	62.0	12 24.1 99 14	61.9	12 53.8 99 14	61.9	13 23.5 99 14	61.8	13 53.2 99 14	61.7	14 22.8 99 14	61.6	14 52.5 99 14	61.6	15 22.2 99 14	61.5	6
7	11 46.2 99 14	61.0	12 15.9 99 14	61.0	12 45.6 99 14	60.9	13 15.2 99 14	60.8	13 44.9 99 14	60.7	14 14.6 99 14	60.7	14 44.3 99 14	60.6	15 14.0 99 14	60.5	7
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9	11 29.9 99 13	59.1	11 59.6 99 13	59.0	12 29.3 99 13	58.9	12 59.0 99 13	58.9	13 28.7 99 13	58.8	13 58.4 99 13	58.7	14 28.1 99 13	58.7	14 57.8 99 13	58.6	9
120	11 21.9 99 13	58.1	11 51.6 99 13	58.0	12 21.3 99 13	58.0	12 51.0 99 13	57.9	13 20.7 99 13	57.8	13 50.4 99 13	57.8	14 20.1 99 13	57.7	14 49.9 99 13	57.6	120
1	11 14.0 99 13	57.1	11 43.7 99 13	57.1	12 13.4 99 13	57.0	12 43.1 99 13	56.9	13 12.8 99 13	56.9	13 42.5 99 13	56.8	14 12.3 99 13	56.7	14 42.0 99 13	56.7	1
2	11 06.1 99 13	56.2	11 35.8 99 13	56.1	12 05.6 99 13	56.0	12 35.3 99 13	56.0	13 05.0 99 13	55.9	13 34.7 99 13	55.8	14 04.5 99 13	55.8	14 34.2 99 13	55.7	2
3	10 58.4 99 13	55.2	11 28.1 99 13	55.1	11 57.8 99 13	55.1	12 27.6 99 13	55.0	12 57.3 99 13	54.9	13 27.0 99 13	54.9	13 56.7 99 13	54.8	14 26.5 99 13	54.7	3
4	10 50.7 99 13	54.2	11 20.4 99 13	54.2	11 50.2 99 13	54.1	12 19.9 99 13	54.0	12 49.7 99 13	54.0	13 19.4 99 13	53.9	13 49.1 99 13	53.8	14 18.8 99 13	53.8	4
125	10 43.1 99 12	53.3	11 12.9 99 12	53.2	11 42.6 99 12	53.1	12 12.4 99 12	53.1	12 42.1 99 12	53.0	13 11.8 99 12	52.9	13 41.6 99 12	52.9	14 11.3 99 12	52.8	125
6	10 35.7 99 12	52.3	11 05.4 99 12	52.2	11 35.2 99 12	52.2	12 04.9 99 12	52.1	12 34.7 99 12	52.0	13 04.4 99 12	52.0	13 34.2 99 12	51.9	14 03.9 99 12	51.8	6
7	10 28.3 99 12	51.3	10 58.0 99 12	51.3	11 27.8 99 12	51.2	11 57.6 99 12	51.1	12 27.3 99 12	51.1	12 57.1 99 12	51.0	13 26.8 99 12	50.9	13 56.6 99 12	50.9	7
8	10 21.0 99 12	50.4	10 50.8 99 12	50.3	11 20.5 99 12	50.2	11 50.3 99 12	50.2	12 20.1 99 12	50.1	12 49.8 99 12	50.0	13 19.6 99 12	50.0	13 49.3 99 12	49.9	8
9	10 13.8 99 12	49.4	10 43.6 99 12	49.3	11 13.4 99 12	49.3	11 43.2 99 12	49.2	12 12.9 99 12	49.1	12 42.7 99 12	49.1	13 12.4 99 12	49.0	13 42.2 99 12	48.9	9
130	10 06.8 99 12	48.4	10 36.5 99 12	48.4	11 06.3 99 12	48.3	11 36.1 99 12	48.2	12 05.9 99 12	48.2	12 35.6 99 12	48.1	13 05.4 99 12	48.0	13 35.2 99 12	48.0	130
1	9 59.8 99 11	47.4	10 29.6 99 11	47.4	10 59.4 99 11	47.3	11 29.1 99 11	47.3	11 58.9 99 11	47.2	12 28.7 99 11	47.1	12 58.5 99 11	47.1	13 28.3 99 11	47.0	1
2	9 52.9 99 11	46.5	10 22.7 99 11	46.4	10 52.5 99 11	46.4	11 22.3 99 11	46.3	11 52.1 99 11	46.2	12 21.9 99 11	46.2	12 51.7 99 11	46.1	13 21.4 99 11	46.1	2
3	9 46.2 99 11	45.5	10 16.0 99 11	45.5	10 45.8 99 11	45.4	11 15.6 99 11	45.3	11 45.4 99 11	45.3	12 15.2 99 11	45.2	12 45.0 99 11	45.2	13 14.7 99 11	45.1	3
4	9 39.5 99 11	44.5	10 09.3 99 11	44.5	10 39.1 99 11	44.4	11 08.9 99 11	44.4	11 38.8 99 11	44.3	12 08.6 99 11	44.3	12 38.4 99 11	44.2	13 08.2 99 11	44.1	4
135	9 33.0 99 11	43.6	10 02.8 99 11	43.5	10 32.6 99 11	43.5	11 02.4 99 11	43.4	11 32.3 99 11	43.3	12 02.1 99 11	43.3	12 31.9 99 11	43.2	13 01.7 99 11	43.2	135
6	9 26.6 99 10	42.6	9 56.4 99 10	42.5	10 26.2 99 10	42.5	10 56.1 99 10	42.4	11 25.9 99 10	42.4	11 55.7 99 10	42.3	12 25.5 99 10	42.3	12 55.3 99 10	42.2	6
7	9 20.3 99 10	41.6	9 50.1 99 10	41.6	10 20.0 99 10	41.5	10 49.8 99 10	41.5	11 19.6 99 10	41.4	11 49.4 99 10	41.4	12 19.2 99 10	41.3	12 49.1 99 10	41.2	7
8	9 14.1 99 10	40.7	9 44.0 99 10	40.6	10 13.8 99 10	40.6	10 43.6 99 10	40.5	11 13.5 99 10	40.5	11 43.3 99 10	40.4	12 13.1 99 10	40.3	12 42.9 99 10	40.3	8
9	9 08.1 99 10	39.7	9 37.9 99 10	39.6	10 07.8 99 10	39.6	10 37.6 99 10	39.5	11 07.4 99 10	39.5	11 37.3 99 10	39.4	12 07.1 99 10	39.4	12 36.9 99 10	39.3	9
140	9 02.1 99 10	38.7	9 32.0 99 10	38.7	10 01.8 99 10	38.6	10 31.7 99 10	38.6	11 01.5 99 10	38.5	11 31.4 99 10	38.5	12 01.2 99 10	38.4	12 31.0 99 10	38.4	140
1	8 56.3 1.0 09	37.8	9 26.2 1.0 09	37.7	9 56.0 99 09	37.7	10 25.9 99 09	37.6	10 55.7 99 09	37.6	11 25.6 99 09	37.5	11 55.4 99 09	37.5	12 25.3 99 09	37.4	1
2	8 50.6 1.0 09	36.8	9 20.5 1.0 09	36.7	9 50.4 1.0 09	36.7	10 20.2 1.0 09	36.6	10 50.1 1.0 09	36.6	11 19.9 1.0 09	36.5	11 49.8 1.0 09	36.5	12 19.6 1.0 09	36.4	2
3	8 45.1 1.0 09	35.8	9 15.0 1.0 09	35.8	9 44.8 1.0 09	35.7	10 14.7 1.0 09	35.7	10 44.5 1.0 09	35.6	11 14.4 1.0 09	35.6	11 44.3 1.0 09	35.5	12 14.1 1.0 09	35.5	3
4	8 39.7 1.0 09	34.9	9 09.5 1.0 09	34.8	9 39.4 1.0 09	34.8	10 09.3 1.0 09	34.7	10 39.1 1.0 09	34.7	11 09.0 1.0 09	34.6	11 38.9 1.0 09	34.6	12 08.7 1.0 09	34.5	4
145	8 34.4 1.0 09	33.9	9 04.2 1.0 09	33.8	9 34.1 1.0 09	33.8	10 04.0 1.0 09	33.8	10 33.9 1.0 09	33.7	11 03.7 1.0 09	33.7	11 33.6 1.0 09	33.6	12 03.5 1.0 09	33.6	145
6	8 29.2 1.0 08	32.9	8 59.1 1.0 08	32.9	9 29.0 1.0 08	32.8	9 58.8 1.0 08	32.8	10 28.7 1.0 08	32.7	10 58.6 1.0 08	32.7	11 28.5 1.0 08	32.7	11 58.4 1.0 08	32.6	6
7	8 24.2 1.0 08	32.0	8 54.0 1.0 08	31.9	9 23.9 1.0 08	31.9	9 53.8 1.0 08	31.8	10 23.7 1.0 08	31.8	10 53.6 1.0 08	31.7	11 23.5 1.0 08	31.7	11 53.4 1.0 08	31.6	7
8	8 19.3 1.0 08	31.0	8 49.2 1.0 08	30.9	9 19.0 1.0 08	30.9	9 48.9 1.0 08	30.9	10 18.8 1.0 08	30.8	10 48.7 1.0 08	30.8	11 18.6 1.0 08	30.7	11 48.5 1.0 08	30.7	8
9	8 14.5 1.0 08	30.0	8 44.4 1.0 08	30.0	9 14.3 1.0 08	29.9	9 44.2 1.0 08	29.9	10 14.1 1.0 08	29.9	10 44.0 1.0 08	29.8	11 13.9 1.0 08	29.8	11 43.8 1.0 08	29.7	9
150	8 09.9 1.0 07	29.0	8 39.8 1.0 07	29.0	9 09.7 1.0 07	29.0	9 39.6 1.0 07	28.9	10 09.5 1.0 07	28.9	10 39.4 1.0 07	28.8	11 09.3 1.0 07	28.8	11 39.2 1.0 07	28.8	150
1	8 05.4 1.0 07	28.1	8 35.3 1.0 07	28.0	9 05.2 1.0 07	28.0	9 35.1 1.0 07	28.0	10 05.0 1.0 07	27.9	10 34.9 1.0 07	27.9	11 04.8 1.0 07	27.8	11 34.8 1.0 07	27.8	1
2	8 01.0 1.0 07	27.1	8 31.0 1.0 07	27.1	9 00.9 1.0 07	27.0	9 30.8 1.0 07	27.0	10 00.7 1.0 07	27.0	10 30.6 1.0 07	26.9	11 00.5 1.0 07	26.9	11 30.4 1.0 07	26.8	2
3	7 56.8 1.0 07	26.1	8 26.7 1.0 06	26.1	8 56.7 1.0 06	26.1	9 26.6 1.0 06	26.0	9 56.5 1.0 06	26.0	10 26.4 1.0 06	26.0	10 56.4 1.0 06	25.9	11 26.3 1.0 06	25.9	3
4	7 52.8 1.0 07	25.2	8 22.7 1.0 06	25.1	8 52.6 1.0 06	25.1	9 22.5 1.0 07	25.1	9 52.5 1.0 06	25.0	10 22.4 1.0 06	25.0	10 52.3 1.0 06	25.0	11 22.3 1.0 06	24.9	4
155	7 48.8 1.0 06	24.2	8 18.8 1.0 06	24.2	8 48.7 1.0 06	24.1	9 18.6 1.0 06	24.1	9 48.6 1.0 06	24.1	10 18.5 1.0 06	24.0	10 48.4 1.0 06	24.0	11 18.4 1.0 06	24.0	155
6	7 45.1 1.0 06	23.2	8 15.0 1.0 06	23.2	8 44.9 1.0 06	23.2	9 14.9 1.0 06	23.1	9 44.8 1.0 06	23.1	10 14.8 1.0 06	23.1	10 44.7 1.0 06	23.0	11 14.6 1.0 06	23.0	6
7	7 41.4 1.0 06	22.3	8 11.4 1.0 06	22.2	8 41.3 1.0 06	22.2	9 11.3 1.0 06	22.2	9 41.2 1.0 06	22.1	10 11.1 1.0 06	22.1	10 41.1 1.0 06	22.1	11 11.0 1.0 06	22.1	7
8	7 38.0 1.0 06	21.3	8 07.9 1.0 06	21.3	8 37.8 1.0 06	21.2	9 07.8 1.0 06	21.2	9 37.7 1.0 06	21.2	10 07.7 1.0 06	21.2	10 37.6 1.0 06	21.1	11 07.6 1.0 06	21.1	8
9	7 34.6 1.0 05	20.3	8 04.6 1.0 05	20.3	8 34.5 1.0 05	20.3	9 04.5 1.0 05	20.2	9 34.4 1.0 05	20.2	10 04.4 1.0 05	20.2	10 34.3 1.0 05	20.2	11 04.3 1.0 05	20.1	9
160	7 31.4 1.0 05	19.4	8 01.4 1.0 05	19.3	8 31.3 1.0 05	19.3	9 01.3 1.0 05	19.3	9 31.3 1.0 05	19.3	10 01.2 1.0 05	19.2	10 31.2 1.0 05	19.2	11 01.1 1.0 05	19.2	160
1	7 28.4 1.0 05	18.4	7 58.4 1.0 05	18.4	8 28.3 1.0 05	18.3	8 58.3 1.0 05	18.3	9 28.2 1.0 05	18.3	9 58.2 1.0 05	18.3	10 28.2 1.0 05	18.2	10 58.1 1.0 05	18.2	1
2	7 25.5 1.0 05	17.4	7 55.5 1.0 05	17.4	8 25.4 1.0 05	17.4	8 55.4 1.0 05	17.4	9 25.4 1.0 05	17.3	9 55.3 1.0 05	17.3	10 25.3 1.0 05	17.3	10 55.3 1.0 05	17.3	2
3	7 22.8 1.0 04	16.5	7 52.7 1.0 04	16.4	8 22.7 1.0 04	16.4	8 52.7 1.0 04	16.4	9 22.6 1.0 04	16.4	9 52.6 1.0 04	16.3	10 22.6 1.0 04	16.3	10 52.5 1.0 04	16.3	3
4	7 20.2 1.0 04	15.5	7 50.2 1.0 04	15.5	8 20.1 1.0 04	15.5	8 50.1 1.0 04	15.4	9 20.1 1.0 04	15.4	9 50.0 1.0 04	15.4	10 20.0 1.0 04	15.4	10 50.0 1.0 04	15.3	4
165	7 17.8 1.0 04	14.5	7 47.7 1.0 04	14.5	8 17.7 1.0 04	14.5	8 47.7 1.0 04	14.5	9 17.7 1.0 04	14.4	9 47.6 1.0 04	14.4	10 17.6 1.0 04	14.4	10 47.6 1.0 04	14.4	165
6	7 15.5 1.0 04	13.6	7 45.5 1.0 04	13.5	8 15.4 1.0 04	13.5	8 45.4 1.0 04	13.5	9 15.4 1.0 04	13.5	9 45.4 1.0 04	13.5	10 15.3 1.0 04	13.4	10 45.3 1.0 04	13.4	6
7	7 13.4 1.0 03	12.6	7 43.3 1.0 03	12.6	8 13.3 1.0 03	12.6	8 43.3 1.0 03	12.5	9 13.3 1.0 03	12.5	9 43.3 1.0 03	12.5	10 13.2 1.0 03	12.5	10 43.2 1.0 03	12.5	7
8	7 11.4 1.0 03	11.6	7 41.3 1.0 03	11.6	8 11.4 1.0 03	11.6	8 41.3 1.0 03	11.6	9 11.3 1.0 03	11.6	9 41.3 1.0 03	11.5	10 11.3 1.0 03	11.5	10 41.3 1.0 03	11.5	8
9	7 09.6 1.0 03	10.7	7 39.6 1.0 03	10.6	8 09.5 1.0 03	10.6	8 39.5 1.0 03	10.6	9 09.5 1.0 03	10.6	9 39.5 1.0 03	10.6	10 09.5 1.0 03	10.6	10 39.5 1.0 03	10.5	9
170	7 07.9 1.0 02	09.7	7 37.9 1.0 02	09.7	8 07.9 1.0 02	09.7	8 37.9 1.0 02	09.6	9 07.9 1.0 02	09.6	9 37.9 1.0 02	09.6	10 07.8 1.0 02	09.6	10 37.8 1.0 02	09.6	170
1	7 06.4 1.0 02	08.7	7 36.4 1.0 02	08.7	8 06.4 1.0 02	08.7	8 36.4 1.0 02	08.7	9 06.4 1.0 02	08.7	9 36.4 1.0 02	08.6	10 06.3 1.0 02	08.6	10 36.3 1.0 02	08.6	1
2	7 05.1 1.0 02	07.7	7 35.1 1.0 02	07.7	8 05.1 1.0 02	07.7	8 35.1 1.0 02	07.7	9 05.0 1.0 02	07.7	9 35.0 1.0 02	07.7	10 05.0 1.0 02	07.7	10 35.0 1.0 02	07.7	2
3	7 03.9 1.0 02	06.8	7 33.9 1.0 02	06.8	8 03.9 1.0 02	06.8	8 33.9 1.0 02	06.7	9 03.9 1.0 02	06.7	9 33.9 1.0 02	06.7	10 03.8 1.0 02	06.7	10 33.8 1.0 02	06.7	3
4	7 02.9 1.0 01	05.8	7 32.8 1.0 01	05.8	8 02.8 1.0 01	05.8	8 32.8 1.0 01	05.8	9 02.8 1.0 01	05.8	9 32.8 1.0 01	05.8	10 02.8 1.0 01	05.8	10 32.8 1.0 01	05.8	4
175	7 02.0 1.0 01	04.8	7 32.0 1.0 01	04.8	8 02.0 1.0 01	04.8	8 32.0 1.0 01	04.8	9 02.0 1.0 01	04.8	9 32.0 1.0 01	04.8	10 02.0 1.0 01	04.8	10 32.0 1.0 01	04.8	175
6	7 01.3 1.0 01	03.9	7 31.3 1.0 01	03.9	8 01.3 1.0 01	03.9	8 31.3 1.0 01	03.9	9 01.3 1.0 01	03.9	9 31.3 1.0 01	03.9	10 01.3 1.0 01	03.8	10 31.3 1.0 01	03.8	6
7	7 00.7 1.0 01	02.9	7 30.7 1.0 01	02.9	8 00.7 1.0 01	02.9	8 30.7 1.0 01	02.9	9 00.7 1.0 01	02.9	9 30.7 1.0 01	02.9	10 00.7 1.0 01	02.9	10 30.7 1.0 01	02.9	7
8	7 00.3 1.0 00	01.9	7 30.3 1.0 00	01.9	8 00.3 1.0 00	01.9	8 30.3 1.0 00	01.9	9 00.3 1.0 00	01.9	9 30.3 1.0 00	01.9	10 00.3 1.0 00	01.9	10 30.3 1.0 00	01.9	8
9	7 00.1 1.0 00	01.0	7 30.1 1.0 00	01.0	8 00.1 1.0 00	01.0	8 30.1 1.0 00	01.0	9 00.1 1.0 00	01.0	9 30.1 1.0 00	01.0	10 00.1 1.0 00	01.0	10 30.1 1.0 00	01.0	9
180	7 00.0 1.0 00	00.0	7 30.0 1.0 00	00.0	8 00.0 1.0 00	00.0	8 30.0 1.0 00	00.0	9 00.0 1.0 00	00.0	9 30.0 1.0 00	00.0	10 00.0 1.0 00	00.0	10 30.0 1.0 00	00.0	180

Lat. 31°

H.A.	20° 00' (Alt. Δd Δt — Az.)	20° 30'	21° 00'	21° 30'	22° 00'	22° 30'	23° 00'	23° 30'	H.A.
00	29 00.9 1 00 180.0	29 30.9 1 00 180.0	30 00.9 1 00 180.0	30 30.9 1 00 180.0	31 00.9 1 00 180.0	31 30.9 1 00 180.0	32 00.9 1 00 180.0	32 30.9 1 00 180.0	00
1	28 59.9 1 00 178.9	29 29.9 1 00 178.9	29 59.9 1 00 178.9	30 29.9 1 00 178.9	30 59.9 1 00 178.9	31 29.9 1 00 178.9	31 59.9 1 00 178.9	32 29.9 1 00 178.9	1
2	28 59.6 1 01 177.7	29 29.6 1 01 177.7	29 59.6 1 01 177.7	30 29.6 1 01 177.7	30 59.6 1 01 177.7	31 29.6 1 01 177.7	31 59.6 1 01 177.7	32 29.6 1 01 177.7	2
3	28 59.2 1 01 176.8	29 29.2 1 01 176.8	29 59.2 1 01 176.8	30 29.2 1 01 176.8	30 59.2 1 01 176.8	31 29.2 1 01 176.7	31 59.2 1 01 176.7	32 29.2 1 01 176.7	3
4	28 58.6 1 01 175.7	29 28.6 1 01 175.7	29 58.6 1 01 175.7	30 28.6 1 01 175.7	30 58.6 1 01 175.7	31 28.6 1 01 175.7	31 58.6 1 01 175.7	32 28.6 1 01 175.7	4
05	28 57.8 1 02 174.6	29 27.8 1 02 174.6	29 57.8 1 02 174.6	30 27.8 1 02 174.6	30 57.8 1 02 174.6	31 27.8 1 02 174.6	31 57.8 1 02 174.6	32 27.8 1 02 174.6	05
6	28 56.8 1 02 173.6	29 26.8 1 02 173.5	29 56.8 1 02 173.5	30 26.8 1 02 173.5	30 56.8 1 02 173.5	31 26.8 1 02 173.5	31 56.8 1 02 173.5	32 26.8 1 02 173.5	6
7	28 55.7 1 02 172.5	29 25.7 1 02 172.5	29 55.7 1 02 172.5	30 25.7 1 02 172.4	30 55.7 1 02 172.4	31 25.7 1 02 172.4	31 55.6 1 02 172.4	32 25.6 1 02 172.4	7
8	28 54.4 1 02 171.4	29 24.4 1 02 171.4	29 54.4 1 02 171.4	30 24.4 1 02 171.4	30 54.3 1 02 171.4	31 24.3 1 02 171.3	31 54.3 1 02 171.3	32 24.3 1 02 171.3	8
9	28 52.9 1 03 170.3	29 22.9 1 03 170.3	29 52.9 1 03 170.3	30 22.9 1 03 170.3	30 52.8 1 03 170.3	31 22.8 1 03 170.3	31 52.8 1 03 170.2	32 22.8 1 03 170.2	9
10	28 51.2 1 03 169.3	29 21.2 1 03 169.2	29 51.2 1 03 169.2	30 21.2 1 03 169.2	30 51.2 1 03 169.2	31 21.2 1 03 169.2	31 51.1 1 03 169.2	32 21.1 1 03 169.1	10
1	28 49.4 1 03 168.2	29 19.4 1 03 168.2	29 49.3 1 03 168.1	30 19.3 1 03 168.1	30 49.3 1 03 168.1	31 19.3 1 03 168.1	31 49.3 1 03 168.1	32 19.3 1 03 168.0	1
2	28 47.4 1 04 167.1	29 17.4 1 04 167.1	29 47.3 1 04 167.1	30 17.3 1 04 167.1	30 47.3 1 04 167.0	31 17.3 1 04 167.0	31 47.3 1 04 167.0	32 17.2 1 04 167.0	2
3	28 45.2 1 04 166.0	29 15.2 1 04 166.0	29 45.2 1 04 166.0	30 15.1 1 04 166.0	30 45.1 1 04 166.0	31 15.1 1 04 165.9	31 45.1 1 04 165.9	32 15.0 1 04 165.9	3
4	28 42.9 1 04 165.0	29 12.8 1 04 165.0	29 42.8 1 04 164.9	30 12.8 1 04 164.9	30 42.7 1 04 164.9	31 12.7 1 04 164.9	31 42.7 1 04 164.8	32 12.7 1 04 164.8	4
15	28 40.3 1 04 163.9	29 10.3 1 04 163.9	29 40.3 1 04 163.8	30 10.2 1 04 163.8	30 40.2 1 05 163.8	31 10.1 1 05 163.7	31 40.1 1 05 163.7	32 10.1 1 05 163.7	15
6	28 37.7 1 05 162.8	29 07.6 1 05 162.8	29 37.6 1 05 162.8	30 07.5 1 05 162.8	30 37.5 1 05 162.7	31 07.5 1 05 162.7	31 37.4 1 05 162.7	32 07.4 1 05 162.6	6
7	28 34.8 1 05 161.8	29 04.8 1 05 161.7	29 34.7 1 05 161.7	30 04.7 1 05 161.7	30 34.6 1 05 161.6	31 04.6 1 05 161.6	31 34.6 1 05 161.6	32 04.5 1 05 161.6	7
8	28 31.8 1 05 160.7	29 01.7 1 05 160.7	29 31.7 1 05 160.6	30 01.6 1 05 160.6	30 31.6 1 05 160.6	31 01.6 1 05 160.5	31 31.5 1 05 160.5	32 01.5 1 05 160.5	8
9	28 28.6 1 06 159.6	28 58.5 1 06 159.6	29 28.5 1 06 159.6	29 58.4 1 06 159.5	30 28.4 1 06 159.5	30 58.3 1 06 159.5	31 28.3 1 06 159.4	31 58.2 1 06 159.4	9
20	28 25.3 1 06 158.6	28 55.2 1 06 158.5	29 25.2 1 06 158.5	29 55.1 1 06 158.5	30 25.0 1 06 158.4	30 55.0 1 06 158.4	31 24.9 1 06 158.4	31 54.8 1 06 158.3	20
1	28 21.7 1 06 157.5	28 51.1 1 06 157.5	29 21.6 1 06 157.4	29 51.6 1 06 157.4	30 21.5 1 06 157.4	30 51.4 1 06 157.3	31 21.4 1 06 157.3	31 51.3 1 06 157.2	1
2	28 18.1 1 06 156.4	28 48.0 1 06 156.4	29 17.9 1 06 156.4	29 47.9 1 07 156.3	30 17.8 1 07 156.3	30 47.7 1 07 156.2	31 17.7 1 07 156.2	31 47.6 1 07 156.2	2
3	28 14.2 1 07 155.4	28 44.2 1 07 155.3	29 14.1 1 07 155.3	29 44.0 1 07 155.2	30 13.9 1 07 155.2	30 43.9 1 07 155.2	31 13.8 1 07 155.1	31 43.7 1 07 155.1	3
4	28 10.2 1 07 154.3	28 40.2 1 07 154.3	29 10.1 1 07 154.2	29 40.0 1 07 154.2	30 09.9 1 07 154.1	30 39.8 1 07 154.1	31 09.8 1 07 154.1	31 39.7 1 07 154.0	4
25	28 06.1 1 07 153.2	28 36.0 1 07 153.2	29 05.9 1 07 153.1	29 35.8 1 07 153.1	30 05.8 1 07 153.1	30 35.7 1 07 153.0	31 05.6 1 07 153.0	31 35.5 1 07 152.9	25
6	28 01.8 1 07 152.2	28 31.7 1 07 152.1	29 01.6 1 07 152.1	29 31.5 1 07 152.0	30 01.4 1 07 152.0	30 31.3 1 07 152.0	31 01.2 1 07 151.9	31 31.1 1 07 151.9	6
7	27 57.3 1 08 151.1	28 27.2 1 08 151.1	28 57.1 1 08 151.0	29 27.0 1 08 151.0	29 56.9 1 08 150.9	30 26.8 1 08 150.9	30 56.7 1 08 150.8	31 26.6 1 08 150.8	7
8	27 52.7 1 08 150.1	28 22.6 1 08 150.0	28 52.5 1 08 150.0	29 22.4 1 08 149.9	29 52.3 1 08 149.9	30 22.2 1 08 149.8	30 52.1 1 08 149.8	31 22.0 1 08 149.7	8
9	27 48.0 1 08 149.0	28 17.9 1 08 149.0	28 47.7 1 08 148.9	29 17.6 1 08 148.9	29 47.5 1 08 148.8	30 17.4 1 08 148.8	30 47.3 1 08 148.7	31 17.2 1 08 148.7	9
30	27 43.1 1 08 147.9	28 12.9 1 08 147.9	28 42.8 1 08 147.8	29 12.7 1 08 147.8	29 42.6 1 08 147.7	30 12.5 1 08 147.7	30 42.3 1 08 147.6	31 12.2 1 08 147.6	30
1	27 38.0 1 09 146.9	28 07.9 1 09 146.8	28 37.8 1 09 146.8	29 07.6 1 09 146.7	29 37.5 1 09 146.7	30 07.4 1 09 146.6	30 37.2 1 09 146.6	31 07.1 1 09 146.5	1
2	27 32.8 1 09 145.8	28 02.7 1 09 145.8	28 32.5 1 09 145.7	29 02.4 1 09 145.7	29 32.3 1 09 145.6	30 02.1 1 09 145.6	30 32.0 1 09 145.5	31 01.9 1 09 145.4	2
3	27 27.5 1 09 144.8	27 57.3 1 09 144.7	28 27.2 1 09 144.7	28 57.0 1 09 144.6	29 26.9 1 09 144.6	29 56.8 1 09 144.5	30 26.6 1 09 144.4	30 56.5 1 09 144.4	3
4	27 22.0 1 09 143.7	27 51.8 1 09 143.7	28 21.7 1 09 143.6	28 51.5 1 09 143.6	29 21.4 1 09 143.5	29 51.2 99 10 143.4	30 21.1 99 10 143.4	30 50.9 1 09 143.3	4
35	27 16.4 99 10 142.7	27 46.2 99 10 142.6	28 16.0 99 10 142.6	28 45.9 99 10 142.5	29 15.7 99 10 142.4	29 45.6 99 10 142.4	30 15.4 99 10 142.3	30 45.2 99 10 142.3	35
6	27 10.6 99 10 141.6	27 40.4 99 10 141.6	28 10.3 99 10 141.5	28 40.1 99 10 141.4	29 09.9 99 10 141.4	29 39.8 99 10 141.3	30 09.6 99 10 141.3	30 39.4 99 10 141.2	6
7	27 04.7 99 10 140.6	27 34.5 99 10 140.5	28 04.4 99 10 140.4	28 34.2 99 10 140.4	29 04.0 99 10 140.3	29 33.8 99 10 140.3	30 03.7 99 10 140.2	30 33.5 99 10 140.1	7
8	26 58.7 99 10 139.5	27 28.5 99 10 139.5	27 58.3 99 10 139.4	28 28.1 99 10 139.3	28 58.0 99 10 139.3	29 27.8 99 10 139.2	29 57.6 99 10 139.1	30 27.4 99 10 139.1	8
9	26 52.5 99 10 138.5	27 22.3 99 10 138.4	27 52.1 99 10 138.3	28 22.0 99 11 138.3	28 51.8 99 11 138.2	29 21.6 99 11 138.2	29 51.4 99 11 138.1	30 21.2 99 11 138.0	9
40	26 46.2 99 11 137.4	27 16.0 99 11 137.4	27 45.8 99 11 137.3	28 15.7 99 11 137.2	28 45.5 99 11 137.2	29 15.3 99 11 137.1	29 45.1 99 11 137.0	30 14.9 99 11 137.0	40
1	26 39.8 99 11 136.4	27 09.6 99 11 136.3	27 39.4 99 11 136.3	28 09.2 99 11 136.2	28 39.0 99 11 136.1	29 08.8 99 11 136.1	29 38.6 99 11 136.0	30 08.4 99 11 135.9	1
2	26 33.3 99 11 135.3	27 03.1 99 11 135.3	27 32.9 99 11 135.2	28 02.7 99 11 135.1	28 32.4 99 11 135.1	29 02.2 99 11 135.0	29 32.0 99 11 134.9	30 01.8 99 11 134.9	2
3	26 26.6 99 11 134.3	26 56.4 99 11 134.2	27 26.2 99 12 134.2	27 56.0 99 12 134.1	28 25.8 99 12 134.0	28 55.5 99 12 134.0	29 25.3 99 12 133.9	29 55.1 99 12 133.9	3
4	26 19.8 99 12 133.3	26 49.6 99 12 133.2	27 19.4 99 12 133.1	27 49.2 99 12 133.0	28 18.9 99 12 133.0	28 48.7 99 12 132.9	29 18.5 99 12 132.8	29 48.2 99 12 132.8	4
45	26 13.0 99 12 132.2	26 42.7 99 12 132.1	27 12.5 99 12 132.1	27 42.3 99 12 132.0	28 12.0 99 12 131.9	28 41.8 99 12 131.9	29 11.5 99 12 131.8	29 41.3 99 12 131.7	45
6	26 05.9 99 12 131.2	26 35.7 99 12 131.1	27 05.5 99 12 131.0	27 35.2 99 12 131.0	28 05.0 99 12 130.9	28 34.7 99 12 130.8	29 04.5 99 12 130.7	29 34.2 99 12 130.7	6
7	25 58.8 99 12 130.1	26 28.6 99 12 130.1	26 58.3 99 12 130.0	27 28.1 99 12 129.9	27 57.8 99 12 129.8	28 27.6 99 12 129.7	28 57.3 99 12 129.7	29 27.0 99 12 129.6	7
8	25 51.6 99 12 129.1	26 21.3 99 12 129.0	26 51.1 99 12 129.0	27 20.8 99 12 128.9	27 50.6 99 12 128.8	28 20.3 99 12 128.7	28 50.0 99 12 128.7	29 19.8 99 12 128.6	8
9	25 44.3 99 12 128.1	26 14.0 99 12 128.0	26 43.7 99 12 127.9	27 13.5 99 12 127.8	27 43.2 99 12 127.8	28 12.9 99 12 127.7	28 42.7 99 12 127.6	29 12.4 99 12 127.5	9
50	25 36.8 99 13 127.0	26 06.5 99 13 127.0	26 36.3 99 13 126.9	27 06.0 99 13 126.8	27 35.7 99 13 126.7	28 05.5 99 13 126.7	28 35.2 99 13 126.6	29 04.9 99 13 126.5	50
1	25 29.3 99 13 126.0	25 59.0 99 13 125.9	26 28.7 99 13 125.8	26 58.4 99 13 125.8	27 28.2 99 13 125.7	27 57.9 99 13 125.6	28 27.6 99 13 125.5	28 57.3 99 13 125.5	1
2	25 21.6 99 13 125.0	25 51.3 99 13 124.9	26 21.1 99 13 124.8	26 50.8 99 13 124.7	27 20.5 99 13 124.7	27 50.2 99 13 124.6	28 19.9 99 13 124.5	28 49.6 99 13 124.4	2
3	25 13.9 99 13 123.9	25 43.6 99 13 123.9	26 13.3 99 13 123.8	26 43.0 99 13 123.7	27 12.7 99 13 123.6	27 42.4 99 13 123.5	28 12.1 99 13 123.5	28 41.8 99 13 123.4	3
4	25 06.1 99 13 122.9	25 35.8 99 13 122.8	26 05.5 99 13 122.8	26 35.2 99 13 122.7	27 04.9 99 13 122.6	27 34.6 99 13 122.5	28 04.2 99 13 122.4	28 33.9 99 13 122.4	4
55	24 58.1 99 13 121.9	25 27.8 99 13 121.8	25 57.5 99 13 121.7	26 27.2 99 13 121.6	26 56.9 99 13 121.6	27 26.6 99 13 121.5	27 56.3 99 13 121.4	28 26.0 99 13 121.3	55
6	24 50.1 99 14 120.9	25 19.8 99 14 120.8	25 49.5 99 14 120.7	26 19.2 99 14 120.6	26 48.9 99 14 120.5	27 18.5 99 14 120.5	27 48.2 99 14 120.4	28 17.9 99 14 120.3	6
7	24 42.0 99 14 119.8	25 11.7 99 14 119.8	25 41.4 99 14 119.6	26 11.1 99 14 119.6	26 40.7 99 14 119.5	27 10.4 99 14 119.3	27 40.1 99 14 119.3	28 09.7 99 14 119.3	7
8	24 33.8 99 14 118.8	25 03.5 99 14 118.7	25 33.2 99 14 118.7	26 02.9 99 14 118.6	26 32.5 99 14 118.5	27 02.2 99 14 118.4	27 31.9 99 14 118.3	28 01.5 99 14 118.2	8
9	24 25.6 99 14 117.8	24 55.2 99 14 117.7	25 24.9 99 14 117.6	25 54.6 99 14 117.5	26 24.2 99 14 117.5	26 53.9 99 14 117.4	27 23.6 99 14 117.3	27 53.2 99 14 117.2	9
60	24 17.2 99 14 116.8	24 46.9 99 14 116.7	25 16.6 99 14 116.6	25 46.2 99 14 116.5	26 15.9 99 14 116.4	26 45.5 99 14 116.4	27 15.2 99 14 116.3	27 44.8 99 14 116.2	60
1	24 08.8 99 14 115.8	24 38.5 99 14 115.7	25 08.1 99 14 115.6	25 37.8 99 14 115.5	26 07.4 99 14 115.5	26 37.1 99 14 115.3	27 06.7 99 14 115.2	27 36.4 99 14 115.2	1
2	24 00.3 99 14 114.7	24 30.0 99 14 114.7	24 59.6 99 14 114.6	25 29.3 99 14 114.5	25 58.9 99 14 114.4	26 28.6 99 14 114.3	26 58.2 99 14 114.2	27 27.8 99 14 114.1	2
3	23 51.8 99 14 113.7	24 21.4 99 14 113.6	24 51.1 99 14 113.6	25 20.7 99 14 113.5	25 50.3 99 14 113.4	26 20.0 99 14 113.3	26 49.6 99 14 113.2	27 19.2 99 14 113.1	3
4	23 43.1 99 14 112.7	24 12.8 99 14 112.6	24 42.4 99 14 112.5	25 12.1 99 14 112.4	25 41.7 99 14 112.4	26 11.3 99 14 112.3	26 40.9 99 15 112.2	27 10.6 99 15 112.1	4
65	23 34.4 99 15 111.7	24 04.1 99 15 111.6	24 33.7 99 15 111.5	25 03.3 99 15 111.4	25 33.0 99 15 111.3	26 02.6 99 15 111.3	26 32.2 99 15 111.2	27 01.8 99 15 111.1	65
6	23 25.7 99 15 110.7	23 55.3 99 15 110.6	24 25.0 99 15 110.5	24 54.6 99 15 110.4	25 24.2 99 15 110.3	25 53.8 99 15 110.2	26 23.4 99 15 110.2	26 53.1 99 15 110.1	6
7	23 16.9 99 15 109.7	23 46.5 99 15 109.6	24 16.1 99 15 109.5	24 45.8 99 15 109.4	25 15.4 99 15 109.3	25 45.0 99 15 109.2	26 14.6 99 15 109.1	26 44.2 99 15 109.1	7
8	23 08.0 99 15 108.7	23 37.6 99 15 108.6	24 07.3 99 15 108.5	24 36.9 99 15 108.4	25 06.5 99 15 108.3	25 36.1 99 15 108.2	26 05.7 99 15 108.1	26 35.3 99 15 108.0	8
9	22 59.1 99 15 107.6	23 28.7 99 15 107.6	23 58.3 99 15 107.5	24 27.9 99 15 107.4	24 57.5 99 15 107.3	25 27.2 99 15 107.2	25 56.8 99 15 107.1	26 26.4 99 15 107.0	9
70	22 50.1 99 15 106.6	23 19.7 99 15 106.6	23 49.4 99 15 106.5	24 19.0 99 15 106.4	24 48.6 99 15 106.3	25 18.2 99 15 106.2	25 47.8 99 15 106.1	26 17.4 99 15 106.0	70
1	22 41.1 99 15 105.6	23 10.7 99 15 105.5	23 40.3 99 15 105.5	24 09.9 99 15 105.4	24 39.5 99 15 105.3	25 09.1 99 15 105.2	25 38.7 99 15 105.1	26 08.3 99 15 105.0	1
2	22 32.1 99 15 104.6	23 01.7 99 15 104.5	23 31.3 99 15 104.5	24 00.9 99 15 104.4	24 30.5 99 15 104.3	25 00.1 99 15 104.2	25 29.6 99 15 104.1	25 59.2 99 15 104.0	2
3	22 23.0 99 15 103.6	22 52.6 99 15 103.5	23 22.2 99 15 103.5	23 51.8 99 15 103.4	24 21.3 99 15 103.3	24 50.9 99 15 103.2	25 20.5 99 15 103.1	25 50.1 99 15 103.0	3
4	22 13.8 99 15 102.6	22 43.4 99 15 102.5	23 13.0 99 15 102.4	23 42.6 99 15 102.4	24 12.2 99 15 102.3	24 41.8 99 15 102.2	25 11.4 99 15 102.1	25 40.9 99 15 102.0	4
75	22 04.6 99 15 101.6	22 34.2 99 15 101.5	23 03.8 99 15 101.4	23 33.4 99 15 101.4	24 03.0 99 15 101.3	24 32.6 99 15 101.2	25 02.2 99 15 101.1	25 31.7 99 15 101.0	75
6	21 55.4 99 16 100.6	22 25.0 99 16 100.5	22 54.6 99 15 100.4	23 24.2 99 15 100.4	23 53.8 99 15 100.3	24 23.4 99 15 100.2	24 52.9 99 15 100.1	25 22.5 99 15 100.0	6
7	21 46.2 99 16 99.6	22 15.8 99 16 99.5	22 45.4 99 15 99.4	23 14.9 99 15 99.4	23 44.5 99 15 99.3	24 14.1 99 15 99.2	24 43.7 99 15 99.1	25 13.3 99 15 99.0	7
8	21 36.9 99 16 98.6	22 06.5 99 16 98.5	22 36.1 99 16 98.4	23 05.7 99 16 98.4	23 35.3 99 16 98.3	24 04.8 99 16 98.2	24 34.4 99 16 98.1	25 04.0 99 16 98.0	8
9	21 27.6 99 16 97.6	21 57.2 99 16 97.5	22 26.8 99 16 97.5	22 56.4 99 16 97.4	23 26.0 99 16 97.3	23 55.5 99 16 97.2	24 25.1 99 16 97.1	24 54.7 99 16 97.0	9
80	21 18.3 99 16 96.6	21 47.9 99 16 96.6	22 17.5 99 16 96.5	22 47.1 99 16 96.4	23 16.6 99 16 96.3	23 46.2 99 16 96.2	24 15.8 99 16 96.1	24 45.3 99 16 96.0	80
1	21 09.0 99 16 95.6	21 38.6 99 16 95.6	22 08.1 99 16 95.5	22 37.7 99 16 95.4	23 07.3 99 16 95.3	23 36.9 99 16 95.2	24 06.4 99 16 95.1	24 36.0 99 16 95.0	1
2	20 59.6 99 16 94.6	21 29.2 99 16 94.6	21 58.8 99 16 94.5	22 28.4 99 16 94.4	22 57.9 99 16 94.3	23 27.5 99 16 94.2	23 57.1 99 16 94.1	24 26.6 99 16 94.0	2
3	20 50.3 99 16 93.7	21 19.9 99 16 93.6	21 49.4 99 16 93.5	22 19.0 99 16 93.4	22 48.6 99 16 93.3	23 18.1 99 16 93.2	23 47.7 99 16 93.1	24 17.3 99 16 93.0	3
4	20 40.9 99 16 92.7	21 10.5 99 16 92.6	21 40.1 99 16 92.5	22 09.6 99 16 92.4	22 39.2 99 16 92.3	23 08.8 99 16 92.2	23 38.3 99 16 92.1	24 07.9 99 16 92.0	4
85	20 31.5 99 16 91.7	21 01.1 99 16 91.6	21 30.7 99 16 91.5	22 00.3 99 16 91.4	22 29.8 99 16 91.3	22 59.4 99 16 91.2	23 29.0 99 16 91.1	23 58.5 99 16 91.0	85
6	20 22.1 99 16 90.7	20 51.7 99 16 90.6	21 21.3 99 16 90.5	21 50.9 99 16 90.4	22 20.4 99 16 90.3	22 50.0 99 16 90.2	23 19.6 99 16 90.1	23 49.1 99 16 90.0	6
7	20 12.7 99 16 89.7	20 42.3 99 16 89.6	21 11.9 99 16 89.5	21 41.5 99 16 89.4	22 11.1 99 16 89.3	22 40.6 99 16 89.2	23 10.2 99 16 89.2	23 39.7 99 16 89.1	7
8	20 03.4 99 16 88.7	20 32.9 99 16 88.6	21 02.5 99 16 88.5	21 32.1 99 16 88.4	22 01.7 99 16 88.4	22 31.2 99 16 88.3	23 00.8 99 16 88.2	23 30.4 99 16 88.1	8
9	19 54.0 99 16 87.7	20 23.6 99 16 87.6	20 53.1 99 16 87.5	21 22.7 99 16 87.5	21 52.3 99 16 87.4	22 21.9 99 16 87.3	22 51.4 99 16 87.2	23 21.0 99 16 87.1	9
90	19 44.6 99 16 86.7	20 14.2 99 16 86.7	20 43.8 99 16 86.6	21 13.3 99 16 86.5	21 42.9 99 16 86.4	22 12.5 99 16 86.3	22 42.1 99 16 86.2	23 11.6 99 16 86.1	90

H.A.	20° 00' Alt.	ΔdΔt	Az.	20° 30' Alt.	ΔdΔt	Az.	21° 00' Alt.	ΔdΔt	Az.	21° 30' Alt.	ΔdΔt	Az.	22° 00' Alt.	ΔdΔt	Az.	22° 30' Alt.	ΔdΔt	Az.	23° 00' Alt.	ΔdΔt	Az.	23° 30' Alt.	ΔdΔt	Az.	H.A.
91	19 35.2	99 16	85.8	20 04.8	99 16	85.7	20 34.4	99 16	85.6	21 04.0	99 16	85.5	21 33.6	99 16	85.4	22 03.1	99 16	85.3	22 32.7	99 16	85.2	23 02.3	99 16	85.1	91
2	19 25.9	99 16	84.8	19 55.5	99 16	84.7	20 25.1	99 16	84.6	20 54.6	99 16	84.5	21 24.2	99 16	84.4	21 53.8	99 16	84.3	22 23.3	99 16	84.2	22 52.9	99 16	84.1	2
3	19 16.5	99 16	83.8	19 46.1	99 16	83.7	20 15.7	99 16	83.6	20 45.3	99 16	83.5	21 14.9	99 16	83.4	21 44.4	99 16	83.3	22 14.0	99 16	83.3	22 43.6	99 16	83.2	3
4	19 07.2	99 16	82.8	19 36.8	99 16	82.7	20 06.4	99 16	82.6	20 36.0	99 16	82.5	21 05.6	99 16	82.5	21 35.1	99 16	82.4	22 04.7	99 16	82.3	22 34.3	99 16	82.2	4
95	18 57.9	99 15	81.8	19 27.5	99 15	81.7	19 57.1	99 15	81.7	20 26.7	99 15	81.6	20 56.3	99 15	81.5	21 55.4	99 15	81.3	21 55.4	99 15	81.3	22 25.0	99 15	81.2	95
6	18 48.6	99 15	80.9	19 18.2	99 15	80.8	19 47.8	99 15	80.7	20 17.4	99 15	80.6	20 47.0	99 15	80.5	21 16.6	99 15	80.4	21 46.2	99 15	80.3	22 15.7	99 15	80.2	6
7	18 39.4	99 15	79.9	19 09.0	99 15	79.8	19 38.6	99 15	79.7	20 08.2	99 15	79.6	20 37.7	99 15	79.5	21 07.3	99 15	79.4	21 36.9	99 15	79.3	22 06.5	99 16	79.3	7
8	18 30.2	99 15	78.9	18 59.8	99 15	78.8	19 29.4	99 15	78.7	19 58.9	99 15	78.5	20 28.5	99 15	78.5	20 58.1	99 15	78.5	21 27.7	99 15	78.4	21 57.3	99 15	78.3	8
9	18 21.0	99 15	77.9	18 50.6	99 15	77.8	19 20.2	99 15	77.7	19 49.8	99 15	77.7	20 19.4	99 15	77.6	20 48.9	99 15	77.5	21 18.5	99 15	77.4	21 48.1	99 15	77.3	9
100	18 11.8	99 15	76.9	18 41.4	99 15	76.9	19 11.0	99 15	76.8	19 40.6	99 15	76.7	20 10.2	99 15	76.6	20 39.8	99 15	76.5	21 09.4	99 15	76.4	21 39.0	99 15	76.3	100
1	18 02.7	99 15	76.0	18 32.3	99 15	75.9	19 01.9	99 15	75.8	19 31.5	99 15	75.7	20 01.1	99 15	75.6	20 30.7	99 15	75.5	21 00.3	99 15	75.4	21 29.9	99 15	75.4	1
2	17 53.6	99 15	75.0	18 23.2	99 15	74.9	18 52.8	99 15	74.8	19 22.4	99 15	74.7	19 52.0	99 15	74.6	20 21.6	99 15	74.6	20 51.2	99 15	74.5	21 20.8	99 15	74.4	2
3	17 44.6	99 15	74.0	18 14.2	99 15	73.9	18 43.8	99 15	73.8	19 13.4	99 15	73.7	19 43.0	99 15	73.7	20 12.6	99 15	73.6	20 42.2	99 15	73.5	21 11.8	99 15	73.4	3
4	17 35.6	99 15	73.0	18 05.2	99 15	73.0	18 34.8	99 15	72.9	19 04.4	99 15	72.8	19 34.0	99 15	72.7	20 03.6	99 15	72.6	20 33.2	99 15	72.5	21 02.8	99 15	72.4	4
105	17 26.6	99 15	72.1	17 56.2	99 15	72.0	18 25.8	99 15	71.9	18 55.5	99 15	71.8	19 25.1	99 15	71.7	19 54.7	99 15	71.6	20 24.3	99 15	71.6	20 53.9	99 15	71.5	105
6	17 17.7	99 15	71.1	17 47.3	99 15	71.0	18 16.9	99 15	70.9	18 46.6	99 15	70.8	19 16.2	99 15	70.8	19 45.8	99 15	70.7	20 15.4	99 15	70.6	20 45.0	99 15	70.5	6
7	17 08.8	99 15	70.1	17 38.5	99 15	70.0	18 08.1	99 15	70.0	18 37.7	99 15	69.9	19 07.3	99 15	69.8	19 37.0	99 15	69.7	20 06.6	99 15	69.6	20 36.2	99 15	69.5	7
8	17 00.0	99 15	69.2	17 29.7	99 15	69.1	17 59.3	99 15	69.0	18 28.9	99 15	68.9	18 58.6	99 15	68.8	19 28.2	99 15	68.7	19 57.8	99 15	68.7	20 27.4	99 14	68.6	8
9	16 51.3	99 14	68.2	17 20.9	99 14	68.1	17 50.6	99 14	68.0	18 20.2	99 14	67.9	18 49.8	99 14	67.9	19 19.5	99 14	67.8	19 49.1	99 14	67.7	20 18.7	99 14	67.6	9
110	16 42.6	99 14	67.2	17 12.3	99 14	67.1	17 41.9	99 14	67.1	18 11.5	99 14	67.0	18 41.2	99 14	66.9	19 10.8	99 14	66.8	19 40.4	99 14	66.7	20 10.1	99 14	66.6	110
1	16 34.0	99 14	66.2	17 03.6	99 14	66.2	17 33.3	99 14	66.1	18 02.9	99 14	66.0	18 32.6	99 14	65.9	19 02.2	99 14	65.8	19 31.9	99 14	65.8	20 01.5	99 14	65.7	1
2	16 25.4	99 14	65.3	16 55.1	99 14	65.2	17 24.7	99 14	65.1	17 54.4	99 14	65.0	18 24.0	99 14	65.0	18 53.7	99 14	64.9	19 23.3	99 14	64.8	19 53.0	99 14	64.7	2
3	16 16.9	99 14	64.3	16 46.6	99 14	64.2	17 16.3	99 14	64.2	17 45.9	99 14	64.1	18 15.6	99 14	64.0	18 45.2	99 14	63.9	19 14.9	99 14	63.8	19 44.5	99 14	63.7	3
4	16 08.5	99 14	63.3	16 38.2	99 14	63.3	17 07.8	99 14	63.2	17 37.5	99 14	63.1	18 07.2	99 14	63.0	18 36.8	99 14	62.9	19 06.5	99 14	62.9	19 36.1	99 14	62.8	4
115	16 00.2	99 14	62.4	16 29.8	99 14	62.3	16 59.5	99 14	62.2	17 29.2	99 14	62.1	17 58.8	99 14	62.1	18 28.5	99 14	62.0	18 58.2	99 14	61.9	19 27.8	99 14	61.8	115
6	15 51.9	99 14	61.4	16 21.6	99 14	61.3	16 51.2	99 14	61.3	17 20.9	99 14	61.2	17 50.6	99 14	61.1	18 20.3	99 14	61.0	18 49.9	99 14	60.9	19 19.6	99 14	60.9	6
7	15 43.7	99 14	60.4	16 13.4	99 14	60.4	16 43.1	99 14	60.3	17 12.7	99 14	60.2	17 42.4	99 14	60.1	18 12.1	99 14	60.1	18 41.8	99 14	60.0	19 11.4	99 13	59.9	7
8	15 35.6	99 13	59.5	16 05.2	99 13	59.4	16 34.9	99 13	59.3	17 04.6	99 13	59.2	17 34.3	99 13	59.2	18 04.0	99 13	59.1	18 33.7	99 13	59.0	19 03.3	99 13	58.9	8
9	15 27.5	99 13	58.5	15 57.2	99 13	58.4	16 26.9	99 13	58.4	16 56.6	99 13	58.3	17 26.3	99 13	58.2	17 56.0	99 13	58.1	18 25.7	99 13	58.1	18 55.4	99 13	58.0	9
120	15 19.6	99 13	57.5	15 49.3	99 13	57.5	16 19.0	99 13	57.4	16 48.7	99 13	57.3	17 18.4	99 13	57.3	17 48.0	99 13	57.2	18 17.7	99 13	57.1	18 47.4	99 13	57.0	120
1	15 11.7	99 13	56.6	15 41.4	99 13	56.5	16 11.1	99 13	56.4	16 40.8	99 13	56.4	17 10.5	99 13	56.3	17 40.2	99 13	56.2	18 09.9	99 13	56.1	18 39.6	99 13	56.1	1
2	15 03.9	99 13	55.6	15 33.6	99 13	55.5	16 03.3	99 13	55.5	16 33.0	99 13	55.4	17 02.7	99 13	55.3	17 32.4	99 13	55.3	18 02.2	99 13	55.2	18 31.9	99 13	55.1	2
3	14 56.2	99 13	54.7	15 25.9	99 13	54.6	15 55.6	99 13	54.5	16 25.3	99 13	54.4	16 55.1	99 13	54.4	17 24.8	99 13	54.3	17 54.5	99 13	54.2	18 24.2	99 13	54.2	3
4	14 48.6	99 13	53.7	15 18.3	99 12	53.6	15 48.0	99 12	53.5	16 17.8	99 12	53.5	16 47.5	99 12	53.4	17 17.2	99 12	53.3	17 46.9	99 12	53.3	18 16.6	99 12	53.2	4
125	14 41.1	99 12	52.7	15 10.8	99 12	52.7	15 40.5	99 12	52.6	16 10.3	99 12	52.5	16 40.0	99 12	52.4	17 09.7	99 12	52.4	17 39.4	99 12	52.3	18 09.2	99 12	52.2	125
6	14 33.6	99 12	51.8	15 03.3	99 12	51.7	15 33.1	99 12	51.6	16 02.9	99 12	51.6	16 32.6	99 12	51.5	17 02.3	99 12	51.4	17 32.1	99 12	51.4	18 01.8	99 12	51.3	6
7	14 26.3	99 12	50.8	14 56.1	99 12	50.7	15 25.8	99 12	50.7	15 55.6	99 12	50.6	16 25.3	99 12	50.5	16 55.0	99 12	50.5	17 24.8	99 12	50.4	17 54.5	99 12	50.3	7
8	14 19.1	99 12	49.8	14 48.8	99 12	49.8	15 18.6	99 12	49.7	15 48.4	99 12	49.6	16 18.1	99 12	49.6	16 47.9	99 12	49.5	17 17.6	99 12	49.4	17 47.4	99 12	49.4	8
9	14 12.0	99 12	48.9	14 41.7	99 12	48.8	15 11.5	99 12	48.7	15 41.3	99 12	48.7	16 11.0	99 12	48.6	16 40.8	99 12	48.5	17 10.5	99 12	48.5	17 40.3	99 12	48.4	9
130	14 05.0	99 12	47.9	14 34.7	99 12	47.9	15 04.5	99 11	47.8	15 34.3	99 11	47.7	16 04.0	99 11	47.7	16 33.8	99 11	47.6	17 03.6	99 11	47.5	17 33.3	99 11	47.5	130
1	13 58.0	99 11	47.0	14 27.8	99 11	46.9	14 57.6	99 11	46.8	15 27.4	99 11	46.8	15 57.1	99 11	46.7	16 26.9	99 11	46.6	16 56.7	99 11	46.6	17 26.5	99 11	46.5	1
2	13 51.2	99 11	46.0	14 21.0	99 11	45.9	14 50.8	99 11	45.9	15 20.6	99 11	45.8	15 50.4	99 11	45.7	16 20.1	99 11	45.7	16 49.9	99 11	45.6	17 19.7	99 11	45.6	2
3	13 44.5	99 11	45.0	14 14.3	99 11	45.0	14 44.1	99 11	44.9	15 13.9	99 11	44.8	15 43.7	99 11	44.8	16 13.5	99 11	44.7	16 43.3	99 11	44.7	17 13.1	99 11	44.6	3
4	13 38.0	99 11	44.1	14 07.8	99 11	44.0	14 37.5	99 11	44.0	15 07.3	99 11	43.9	15 37.1	99 11	43.8	16 06.9	99 11	43.8	16 36.7	99 11	43.7	17 06.5	99 11	43.6	4
135	13 31.5	99 11	43.1	14 01.3	99 11	43.1	14 31.1	99 10	43.0	15 00.9	99 11	42.9	15 30.7	99 11	42.9	16 00.5	99 11	42.8	16 30.3	99 11	42.8	17 00.1	99 11	42.7	135
6	13 25.1	99 10	42.2	13 54.9	99 10	42.1	14 24.7	99 10	42.0	14 54.6	99 10	41.9	15 24.4	99 10	41.9	15 54.2	99 10	41.9	16 24.0	99 10	41.8	16 53.8	99 10	41.7	6
7	13 18.9	99 10	41.2	13 48.7	99 10	41.1	14 18.5	99 10	41.1	14 48.3	99 10	41.0	15 18.2	99 10	41.0	15 48.0	99 10	40.9	16 17.8	99 10	40.8	16 47.6	99 10	40.8	7
8	13 12.8	99 10	40.2	13 42.6	99 10	40.2	14 12.4	99 10	40.1	14 42.2	99 10	40.1	15 12.1	99 10	40.0	15 41.9	99 10	40.0	16 11.7	99 10	39.9	16 41.5	99 10	39.8	8
9	13 06.8	99 10	39.3	13 36.6	99 10	39.2	14 06.4	99 10	39.2	14 36.3	99 10	39.1	15 06.1	99 10	39.1	15 35.9	99 10	39.0	16 05.7	99 10	38.9	16 35.6	99 10	38.9	9
140	14 00.9	99 10	38.3	13 30.7	99 10	38.3	14 00.6	99 09	38.2	14 30.4	99 10	38.2	15 00.2	99 10	38.1	15 30.1	99 10	38.0	15 59.9	99 10	38.0	16 29.7	99 10	37.9	140
1	12 55.1	99 09	37.4	13 25.0	99 09	37.3	13 54.8	99 09	37.2	14 24.7	99 09	37.2	14 54.5	99 09	37.1	15 24.3	99 09	37.1	15 54.2	99 09	37.0	16 24.0	99 09	36.9	1
2	12 49.5	1.0 09	36.4	13 19.3	1.0 09	36.3	13 49.2	1.0 09	36.3	14 19.0	1.0 09	36.2	14 48.9	1.0 09	36.2	15 18.8	1.0 09	36.1	15 48.6	99 09	36.1	16 18.4	99 09	36.0	2
3	12 44.0	1.0 09	35.4	13 13.8	1.0 09	35.4	13 43.7	1.0 09	35.3	14 13.6	1.0 09	35.3	14 43.4	1.0 09	35.2	15 13.3	1.0 09	35.2	15 43.1	1.0 09	35.1	16 13.0	1.0 09	35.1	3
4	12 38.6	1.0 09	34.5	13 08.5	1.0 09	34.4	13 38.3	1.0 09	34.4	14 08.2	1.0 09	34.3	14 38.1	1.0 09	34.3	15 07.9	1.0 09	34.2	15 37.8	1.0 09	34.2	16 07.7	1.0 09	34.1	4
145	12 33.4	1.0 08	33.5	13 03.2	1.0 08	33.5	13 33.1	1.0 08	33.4	14 03.0	1.0 08	33.3	14 32.8	1.0 08	33.3	15 02.7	1.0 08	33.3	15 32.6	1.0 08	33.2	16 02.5	1.0 08	33.2	145
6	12 28.2	1.0 08	32.6	12 58.1	1.0 08	32.5	13 28.0	1.0 08	32.5	13 57.9	1.0 08	32.4	14 27.8	1.0 08	32.4	14 57.6	1.0 08	32.3	15 27.5	1.0 08	32.3	15 57.4	1.0 08	32.2	6
7	12 23.3	1.0 08	31.6	12 53.1	1.0 08	31.6	13 23.0	1.0 08	31.5	13 52.9	1.0 08	31.5	14 22.8	1.0 08	31.4	14 52.7	1.0 08	31.4	15 22.6	1.0 08	31.3	15 52.4	1.0 08	31.3	7
8	12 18.4	1.0 08	30.6	12 48.3	1.0 08	30.6	13 18.2	1.0 08	30.6	13 48.1	1.0 08	30.5	14 18.0	1.0 08	30.5	14 47.9	1.0 08	30.4	15 17.7	1.0 08	30.4	15 47.6	1.0 08	30.3	8
9	12 13.7	1.0 08	29.7	12 43.6	1.0 08	29.6	13 13.5	1.0 08	29.6	13 43.4	1.0 08	29.6	14 13.3	1.0 08	29.5	14 43.2	1.0 08	29.5	15 13.1	1.0 08	29.4	15 43.0	1.0 08	29.4	9
150	12 09.1	1.0 07	28.7	12 39.0	1.0 07	28.7	13 08.9	1.0 07	28.6	13 38.8	1.0 07	28.6	14 08.7	1.0 07	28.6	14 38.6	1.0 07	28.5	15 08.5	1.0 07	28.5	15 38.4	1.0 07	28.4	150
1	12 04.7	1.0 07	27.8	12 34.6	1.0 07	27.7	13 04.5	1.0 07	27.7	13 34.4	1.0 07	27.6	14 04.3	1.0 07	27.6	14 34.2	1.0 07	27.6	15 04.1	1.0 07	27.5	15 34.0	1.0 07	27.5	1
2	12 00.4	1.0 07	26.8	12 30.3	1.0 07	26.8	13 00.2	1.0 07	26.7	13 30.1	1.0 07	26.7	14 00.0	1.0 07	26.7	14 29.9	1.0 07	26.6	14 59.9	1.0 07	26.6	15 29.8	1.0 07	26.5	2
3	11 56.2	1.0 07	25.9	12 26.1	1.0 07	25.8	12 56.0	1.0 07	25.7	13 26.0	1.0 07	25.7	13 55.9	1.0 07	25.7	14 25.8	1.0 07	25.7	14 55.7	1.0 07	25.6	15 25.6	1.0 07	25.6	3
4	11 52.2	1.0 06	24.9	12 22.1	1.0 06	24.9	12 52.0	1.0 06	24.8	13 22.0	1.0 06	24.8	13 51.9	1.0 06	24.7	14 21.8	1.0 06	24.7	14 51.7	1.0 06	24.7	15 21.7	1.0 06	24.6	4
155	11 48.3	1.0 06	23.9	12 18.2	1.0 06	23.9	12 48.2	1.0 06	23.9	13 18.1	1.0 06	23.8	13 48.0	1.0 06	23.8	14 18.0	1.0 06	23.8	14 47.9	1.0 06	23.7	15 17.8	1.0 06	23.7	155
6	11 44.6	1.0 06	23.0	12 14.5	1.0 06	22.9	12 44.4	1.0 06	22.9	13 14.4	1.0 06	22.9	13 44.3	1.0 06	22.8	14 14.2	1.0 06	22.8	14 44.2	1.0 06	22.8	15 14.1	1.0 06	22.7	6
7	11 41.0	1.0 06	22.0	12 10.9	1.0 06	22.0	12 40.9	1.0 06	22.0	13 10.8	1.0 06	21.9	13 40.7	1.0 06	21.9	14 10.7	1.0 06	21.9	14 40.6	1.0 06	21.8	15 10.6	1.0 06	21.8	7
8	11 37.5	1.0 06	21.1	12 07.5	1.0 05	21.0	12 37.4	1.0 05	21.0	13 07.4	1.0 05	21.0	13 37.3	1.0 05	20.9	14 07.3	1.0 05	20.9	14 37.2	1.0 05	20.9	15 07.1	1.0 05	20.8	8
9	11 34.2	1.0 05	20.1	12 04.1	1.0 05	20.1	12 34.1	1.0 05	20.0	13 04.1	1.0 05	20.0	13 34.0	1.0 05	20.0	14 04.0	1.0 05	20.0	14 33.9	1.0 05	19.9	15 03.9	1.0 05	19.9	9
160	11 31.1	1.0 05	19.1	12 01.0	1.0 05	19.1	12 31.0	1.0 05	19.1	13 00.9	1.0 05	19.1	13 30.9	1.0 05	19.0	14 00.8	1.0 05	19.0	14 30.8	1.0 05	19.0	15 00.8	1.0 05	18.9	160
1	11 28.1	1.0 05	18.2	11 58.0	1.0 05	18.2	12 28.0	1.0 05	18.1	12 57.9	1.0 05	18.1	13 27.9	1.0 05	18.1	13 57.9	1.0 05	18.1	14 27.8	1.0 05	18.0	14 57.8	1.0 05	18.0	1
2	11 25.2	1.0 04	17.2	11 55.2	1.0 04	17.2	12 25.1	1.0 04	17.2	12 55.1	1.0 04	17.2	13 25.1	1.0 04	17.1	13 55.0	1.0 04	17.1	14 25.0	1.0 04	17.1	14 55.0	1.0 04	17.1	2
3	11 22.5	1.0 04	16.3	11 52.5	1.0 04	16.3	12 22.4	1.0 04	16.2	12 52.4	1.0 04	16.2	13 22.4	1.0 04	16.2	13 52.3	1.0 04	16.2	14 22.3	1.0 04	16.1	14 52.3	1.0 04	16.1	3
4	11 20.0	1.0 04	15.3	11 49.9	1.0 04	15.3	12 19.9	1.0 04	15.3	12 49.9	1.0 04	15.2	13 19.8	1.0 04	15.2	13 49.8	1.0 04	15.2	14 19.8	1.0 04	15.2	14 49.7	1.0 04	15.2	4
165	11 17.6	1.0 04	14.4	11 47.5	1.0 04	14.3	12 17.5	1.0 04	14.3	12 47.5	1.0 04	14.3	13 17.4	1.0 04	14.3	13 47.4	1.0 04	14.3	14 17.4	1.0 04	14.2	14 47.4	1.0 04	14.2	165
6	11 15.3	1.0 04	13.4	11 45.3	1.0 04	13.4	12 15.3	1.0 04	13.4	12 45.2	1.0 04	13.3	13 15.2	1.0 03	13.3	13 45.2	1.0 03	13.3	14 15.2	1.0 03	13.3	14 45.1	1.0 03	13.3	6
7	11 13.2	1.0 03	12.4	11 43.2	1.0 03	12.4	12 13.2	1.0 03	12.4	12 43.1	1.0 03	12.4	13 13.1	1.0 03	12.4	13 43.1	1.0 03	12.4	14 13.1	1.0 03	12.3	14 43.1	1.0 03	12.3	7
8	11 11.3	1.0 03	11.5	11 41.2	1.0 03	11.5	12 11.2	1.0 03	11.5	12 41.2	1.0 03	11.4	13 11.2	1.0 03	11.4	13 41.2	1.0 03	11.4	14 11.2	1.0 03	11.4	14 41.1	1.0 03	11.4	8
9	11 09.5	1.0 03	10.5	11 39.4	1.0 03	10.5	12 09.4	1.0 03	10.5	12 39.4	1.0 03	10.5	13 09.4	1.0 03	10.5	13 39.4	1.0 03	10.5	14 09.4	1.0 03	10.4	14 39.4	1.0 03	10.4	9
170	11 07.8	1.0 02	09.6	11 37.8	1.0 02	09.6	12 07.8	1.0 02	09.5	12 37.8	1.0 02	09.5	13 07.8	1.0 02	09.5	13 37.8	1.0 02	09.5	14 07.8	1.0 02	09.5	14 37.7	1.0 02	09.5	170
1	11 06.3	1.0 02	08.6	11 36.3	1.0 02	08.6	12 06.3	1.0 02	08.6	12 36.3	1.0 02	08.6	13 06.3	1.0 02	08.6	13 36.3	1.0 02	08.6	14 06.3	1.0 02	08.5	14 36.3	1.0 02	08.5	1
2	11 05.0	1.0 02	07.7	11 35.0	1.0 02	07.6	12 05.0	1.0 02	07.6	12 35.0	1.0 02	07.6	13 05.0	1.0 02	07.6	13 35.0	1.0 02	07.6	14 05.0	1.0 02	07.6	14 35.0	1.0 02	07.6	2
3	11 03.8	1.0 02	06.7	11 33.8	1.0 02	06.7	12 03.8	1.0 02	06.7	12 33.8	1.0 02	06.7	13 03.8	1.0 02	06.7	13 33.8	1.0 02	06.6	14 03.8	1.0 02	06.6	14 33.8	1.0 02	06.6	3
4	11 02.8	1.0 01	05.7	11 32.8	1.0 01	05.7	12 02.8	1.0 01	05.7	12 32.8	1.0 01	05.7	13 02.8	1.0 01	05.7	13 32.8	1.0 01	05.7	14 02.8	1.0 01	05.7	14 32.8	1.0 01	05.7	4
175	11 02.0	1.0 01	04.8	11 32.0	1.0 01	04.8	12 02.0	1.0 01	04.8	12 32.0	1.0 01	04.8	13 01.9	1.0 01	04.8	13 31.9	1.0 01	04.8	14 01.9	1.0 01	04.7	14 31.9	1.0 01	04.7	175
6	11 01.3	1.0 01	03.8	11 31.3	1.0 01	03.8	12 01.2	1.0 01	03.8	12 31.2	1.0 01	03.8	13 01.2	1.0 01	03.8	13 31.2	1.0 01	03.8	14 01.2	1.0 01	03.8	14 31.2	1.0 01	03.8	6
7	11 00.7	1.0 01	02.9	11 30.7	1.0 01	02.9	12 00.7	1.0 01	02.9	12 30.7	1.0 01	02.9	13 00.7	1.0 01	02.9	13 30.7	1.0 01	02.9	14 00.7	1.0 01	02.8	14 30.7	1.0 01	02.8	7
8	11 00.3	1.0 00	01.9	11 30.3	1.0 00	01.9	12 00.3	1.0 00	01.9	12 30.3	1.0 00	01.9	13 00.3	1.0 00	01.9	13 30.3	1.0 00	01.9	14 00.3	1.0 00	01.9	14 30.3	1.0 00	01.9	8
9	11 00.1	1.0 00	01.0	11 30.1	1.0 00	01.0	12 00.1	1.0 00	01.0	12 30.1	1.0 00	01.0	13 00.1	1.0 00	01.0	13 30.1	1.0 00	01.0	14 00.1	1.0 00	00.9	14 30.1	1.0 00	00.9	9
180	11 00.0	1.0 00	00.0	11 30.0	1.0 00	00.0	12 00.0	1.0 00	00.0	12 30.0	1.0 00	00.0	13 00.0	1.0 00	00.0	13 30.0	1.0 00	00.0	14 00.0	1.0 00	00.0	14 30.0	1.0 00	00.0	180

H.A.	24° 00' Alt.	Δd	Δt	Az.	24° 30' Alt.	Δd	Δt	Az.	25° 00' Alt.	Δd	Δt	Az.	25° 30' Alt.	Δd	Δt	Az.	26° 00' Alt.	Δd	Δt	Az.	26° 30' Alt.	Δd	Δt	Az.	27° 00' Alt.	Δd	Δt	Az.	27° 30' Alt.	Δd	Δt	Az.	H.A.
00	33 00.9	1.00	0	180.0	33 30.0	1.00	0	180.0	34 00.0	1.00	0	180.0	34 30.0	1.00	0	180.0	35 00.0	1.00	0	180.0	35 30.0	1.00	0	180.0	36 00.0	1.00	0	180.0	36 30.0	1.00	0	180.0	00
1	32 59.9	1.00	0	178.9	33 29.9	1.00	0	178.9	33 59.9	1.00	0	178.9	34 29.9	1.00	0	178.9	34 59.9	1.00	0	178.9	35 29.9	1.00	0	178.9	35 59.9	1.00	0	178.9	36 29.9	1.00	0	178.9	1
2	32 59.6	1.00	1	177.8	33 29.6	1.00	1	177.8	33 59.6	1.00	1	177.8	34 29.6	1.00	1	177.8	34 59.6	1.00	1	177.8	35 29.6	1.00	1	177.8	35 59.6	1.00	1	177.8	36 29.6	1.00	1	177.8	2
3	32 59.2	1.00	1	176.7	33 29.2	1.00	1	176.7	33 59.2	1.00	1	176.7	34 29.2	1.00	1	176.7	34 59.2	1.00	1	176.7	35 29.2	1.00	1	176.7	35 59.2	1.00	1	176.7	36 29.2	1.00	1	176.7	3
4	32 58.6	1.00	1	175.6	33 28.6	1.00	1	175.6	33 58.6	1.00	1	175.6	34 28.6	1.00	1	175.6	34 58.6	1.00	1	175.6	35 28.6	1.00	1	175.6	35 58.6	1.00	1	175.6	36 28.6	1.00	1	175.6	4
05	32 57.8	1.00	2	174.6	33 27.8	1.00	2	174.5	33 57.8	1.00	2	174.5	34 27.8	1.00	2	174.5	34 57.8	1.00	2	174.5	35 27.8	1.00	2	174.5	35 57.7	1.00	2	174.5	36 27.7	1.00	2	174.5	05
6	32 56.8	1.00	2	173.5	33 26.8	1.00	2	173.5	33 56.8	1.00	2	173.4	34 26.8	1.00	2	173.4	34 56.8	1.00	2	173.4	35 26.8	1.00	2	173.4	35 56.8	1.00	2	173.4	36 26.8	1.00	2	173.4	6
7	32 55.6	1.00	2	172.4	33 25.6	1.00	2	172.4	33 55.6	1.00	2	172.4	34 25.6	1.00	2	172.3	34 55.6	1.00	2	172.3	35 25.6	1.00	2	172.3	35 55.6	1.00	2	172.3	36 25.6	1.00	2	172.3	7
8	32 54.3	1.00	3	171.3	33 24.3	1.00	3	171.3	33 54.3	1.00	3	171.3	34 24.3	1.00	3	171.2	34 54.3	1.00	3	171.2	35 24.3	1.00	3	171.2	35 54.2	1.00	3	171.2	36 24.2	1.00	3	171.2	8
9	32 52.8	1.00	3	170.2	33 22.8	1.00	3	170.2	33 52.8	1.00	3	170.2	34 22.8	1.00	3	170.1	34 52.7	1.00	3	170.1	35 22.7	1.00	3	170.1	35 52.7	1.00	3	170.1	36 22.7	1.00	3	170.1	9
10	32 51.1	1.00	3	169.1	33 21.1	1.00	3	169.1	33 51.1	1.00	3	169.1	34 21.1	1.00	3	169.1	34 51.0	1.00	3	169.0	35 21.0	1.00	3	169.0	35 51.0	1.00	3	169.0	36 21.0	1.00	3	169.0	10
1	32 49.2	1.00	3	168.0	33 19.2	1.00	3	168.0	33 49.2	1.00	3	168.0	34 19.2	1.00	3	168.0	34 49.2	1.00	3	167.9	35 19.2	1.00	3	167.9	35 49.1	1.00	3	167.9	36 19.1	1.00	3	167.9	1
2	32 47.2	1.00	4	166.9	33 17.2	1.00	4	166.9	33 47.2	1.00	4	166.9	34 17.1	1.00	4	166.9	34 47.1	1.00	4	166.8	35 17.1	1.00	4	166.8	35 47.1	1.00	4	166.8	36 17.1	1.00	4	166.8	2
3	32 45.0	1.00	4	165.9	33 15.0	1.00	4	165.8	33 45.0	1.00	4	165.8	34 14.9	1.00	4	165.8	34 44.9	1.00	4	165.8	35 14.9	1.00	4	165.7	35 44.8	1.00	4	165.7	36 14.8	1.00	4	165.7	3
4	32 42.6	1.00	4	164.8	33 12.6	1.00	4	164.7	33 42.6	1.00	4	164.7	34 12.5	1.00	4	164.7	34 42.5	1.00	4	164.7	35 12.5	1.00	4	164.6	35 42.4	1.00	4	164.6	36 12.4	1.00	4	164.6	4
15	32 40.1	1.00	5	163.7	33 10.0	1.00	5	163.7	33 40.0	1.00	5	163.6	34 10.0	1.00	5	163.6	34 39.9	1.00	5	163.6	35 09.9	1.00	5	163.5	35 39.9	1.00	5	163.5	36 09.8	1.00	5	163.5	15
6	32 37.4	1.00	5	162.6	33 07.3	1.00	5	162.6	33 37.3	1.00	5	162.5	34 07.2	1.00	5	162.5	34 37.2	1.00	5	162.5	35 07.2	1.00	5	162.4	35 37.1	1.00	5	162.4	36 07.1	1.00	5	162.4	6
7	32 34.5	1.00	5	161.5	33 04.4	1.00	5	161.5	33 34.4	1.00	5	161.5	34 04.3	1.00	5	161.4	34 34.3	1.00	5	161.4	35 04.2	1.00	5	161.4	35 34.2	1.00	5	161.3	36 04.1	1.00	5	161.3	7
8	32 31.4	1.00	6	160.4	33 01.4	1.00	6	160.4	33 31.3	1.00	6	160.4	34 01.3	1.00	6	160.3	34 31.2	1.00	6	160.3	35 01.2	1.00	6	160.3	35 31.1	1.00	6	160.2	36 01.0	1.00	6	160.2	8
9	32 28.2	1.00	6	159.4	32 58.1	1.00	6	159.3	33 28.1	1.00	6	159.3	33 58.0	1.00	6	159.2	34 28.0	1.00	6	159.2	34 57.9	1.00	6	159.2	35 27.8	1.00	6	159.1	35 57.8	1.00	6	159.1	9
20	32 24.8	1.00	6	158.3	32 54.7	1.00	6	158.2	33 24.7	1.00	6	158.2	33 54.6	1.00	6	158.2	34 24.5	1.00	6	158.1	34 54.5	1.00	6	158.1	35 24.4	1.00	6	158.0	35 54.3	1.00	6	158.0	20
1	32 21.2	1.00	6	157.2	32 51.2	1.00	6	157.2	33 21.1	1.00	6	157.1	33 51.0	1.00	6	157.1	34 21.0	1.00	6	157.0	34 50.9	1.00	6	157.0	35 20.8	1.00	7	157.0	35 50.8	1.00	7	156.9	1
2	32 17.5	1.00	6	156.1	32 47.4	1.00	6	156.1	33 17.4	1.00	6	156.0	33 47.3	1.00	6	156.0	34 17.2	1.00	6	156.0	34 47.1	1.00	7	155.9	35 17.1	1.00	7	155.9	35 47.0	1.00	7	155.8	2
3	32 13.6	1.00	7	155.0	32 43.6	1.00	7	155.0	33 13.5	1.00	7	155.0	33 43.4	1.00	7	154.9	34 13.3	1.00	7	154.9	34 43.2	1.00	7	154.8	35 13.1	1.00	7	154.8	35 43.1	1.00	7	154.7	3
4	32 09.6	1.00	7	154.0	32 39.5	1.00	7	153.9	33 09.4	1.00	7	153.9	33 39.3	1.00	7	153.8	34 09.2	1.00	7	153.8	34 39.2	1.00	7	153.7	35 09.1	1.00	7	153.7	35 39.0	1.00	7	153.6	4
25	32 05.4	1.00	7	152.9	32 35.3	1.00	7	152.8	33 05.2	1.00	7	152.8	33 35.1	1.00	7	152.7	34 05.0	1.00	7	152.7	34 34.9	1.00	7	152.7	35 04.8	1.00	7	152.6	35 34.7	1.00	7	152.6	25
6	32 01.0	1.00	8	151.8	32 30.9	1.00	8	151.8	33 00.8	1.00	8	151.7	33 30.7	1.00	8	151.7	34 00.6	1.00	8	151.6	34 30.5	1.00	8	151.6	35 00.4	1.00	8	151.5	35 30.3	1.00	8	151.5	6
7	31 56.5	1.00	8	150.7	32 26.4	1.00	8	150.7	32 56.3	1.00	8	150.6	33 26.2	1.00	8	150.6	33 56.1	1.00	8	150.5	34 26.0	1.00	8	150.5	34 55.9	1.00	8	150.4	35 25.8	1.00	8	150.4	7
8	31 51.9	1.00	8	149.7	32 21.8	1.00	8	149.6	32 51.6	1.00	8	149.5	33 21.5	1.00	8	149.5	33 51.4	1.00	8	149.5	34 21.3	1.00	8	149.4	34 51.2	1.00	8	149.3	35 21.0	1.00	8	149.3	8
9	31 47.1	1.00	8	148.6	32 16.9	1.00	8	148.5	32 46.8	1.00	8	148.5	33 16.7	1.00	8	148.4	33 46.6	1.00	8	148.4	34 16.4	1.00	8	148.3	34 46.3	1.00	8	148.3	35 16.2	1.00	8	148.2	9
30	31 42.1	1.00	9	147.5	32 12.0	1.00	9	147.5	32 41.8	1.00	9	147.4	33 11.7	1.00	9	147.4	33 41.6	1.00	9	147.3	34 11.4	1.00	9	147.3	34 41.3	1.00	9	147.2	35 11.2	1.00	9	147.1	30
1	31 37.0	1.00	9	146.5	32 06.8	1.00	9	146.4	32 36.7	1.00	9	146.3	33 06.6	1.00	9	146.3	33 36.4	1.00	9	146.2	34 06.3	1.00	9	146.2	34 36.1	1.00	9	146.1	35 06.0	1.00	9	146.1	1
2	31 31.7	1.00	9	145.4	32 01.6	1.00	9	145.3	32 31.4	1.00	9	145.3	33 01.3	1.00	9	145.2	33 31.1	1.00	9	145.2	34 01.0	99	9	145.1	34 30.8	99	9	145.0	35 00.7	99	9	145.0	2
3	31 26.3	1.00	9	144.4	31 56.2	99	9	144.3	32 26.0	99	9	144.2	32 55.9	99	9	144.2	33 25.7	99	9	144.1	33 55.5	99	9	144.0	34 25.4	99	9	144.0	34 55.2	99	9	143.9	3
4	31 20.8	99	9	143.3	31 50.6	99	10	143.2	32 20.4	99	10	143.1	32 50.3	99	10	143.1	33 20.1	99	10	143.0	33 50.0	99	10	143.0	34 19.8	99	10	142.9	34 49.6	99	10	142.8	4
35	31 15.1	99	10	142.2	31 44.9	99	10	142.1	32 14.7	99	10	142.1	32 44.6	99	10	142.0	33 14.4	99	10	141.9	33 44.2	99	10	141.9	34 14.1	99	10	141.8	34 43.9	99	10	141.8	35
6	31 09.3	99	10	141.1	31 39.1	99	10	141.1	32 08.9	99	10	141.0	32 38.7	99	10	140.9	33 08.6	99	10	140.9	33 38.4	99	10	140.8	34 08.2	99	10	140.7	34 38.0	99	10	140.7	6
7	31 03.3	99	10	140.1	31 33.1	99	10	140.0	32 02.9	99	10	139.9	32 32.8	99	10	139.9	33 02.6	99	10	139.8	33 32.4	99	10	139.7	34 02.2	99	10	139.7	34 32.0	99	10	139.6	7
8	30 57.2	99	10	139.0	31 27.0	99	10	139.0	31 56.8	99	10	138.9	32 26.6	99	10	138.8	32 56.4	99	10	138.7	33 26.2	99	10	138.7	33 56.0	99	10	138.6	34 25.8	99	10	138.5	8
9	30 51.0	99	11	138.0	31 20.8	99	11	137.9	31 50.6	99	11	137.8	32 20.4	99	11	137.8	32 50.2	99	11	137.7	33 20.0	99	11	137.6	33 49.8	99	11	137.5	34 19.6	99	11	137.5	9
40	30 44.6	99	11	136.9	31 14.4	99	11	136.8	31 44.2	99	11	136.8	32 14.0	99	11	136.7	32 43.8	99	11	136.6	33 13.6	99	11	136.6	33 43.4	99	11	136.5	34 13.1	99	11	136.4	40
1	30 38.2	99	11	135.8	31 08.0	99	11	135.8	31 37.7	99	11	135.7	32 07.5	99	11	135.6	32 37.3	99	11	135.6	33 07.1	99	11	135.5	33 36.8	99	11	135.4	34 06.6	99	11	135.3	1
2	30 31.6	99	11	134.8	31 01.3	99	11	134.7	31 31.1	99	11	134.7	32 00.9	99	11	134.6	32 30.7	99	11	134.5	33 00.4	99	11	134.4	33 30.2	99	11	134.4	34 00.0	99	11	134.3	2
3	30 24.8	99	11	133.7	30 54.6	99	11	133.7	31 24.4	99	11	133.6	31 54.1	99	11	133.5	32 23.9	99	11	133.4	32 53.7	99	11	133.4	33 23.4	99	11	133.3	33 53.2	99	11	133.2	3
4	30 18.0	99	12	132.7	30 47.8	99	12	132.6	31 17.5	99	12	132.5	31 47.3	99	12	132.5	32 17.0	99	12	132.4	32 46.8	99	12	132.3	33 16.5	99	12	132.2	33 46.3	99	12	132.2	4
45	30 11.1	99	12	131.6	30 40.8	99	12	131.6	31 10.6	99	12	131.5	31 40.3	99	12	131.4	32 10.0	99	12	131.3	32 39.8	99	12	131.3	33 09.5	99	12	131.2	33 39.3	99	12	131.1	45
6	30 04.0	99	12	130.6	30 33.7	99	12	130.5	31 03.5	99	12	130.4	31 33.2	99	12	130.4	32 02.9	99	12	130.3	32 32.7	99	12	130.2	33 02.4	99	12	130.1	33 32.1	99	12	130.1	6
7	29 56.8	99	12	129.5	30 26.5	99	12	129.5	30 56.3	99	12	129.3	31 26.0	99	12	129.3	31 55.7	99	12	129.2	32 25.5	99	12	129.1	32 55.2	99	12	129.1	33 24.9	99	12	129.0	7
8	29 49.5	99	12	128.5	30 19.2	99	12	128.4	30 49.0	99	12	128.4	31 18.7	99	12	128.3	31 48.4	99	12	128.2	32 18.1	99	12	128.1	32 47.8	99	12	128.0	33 17.5	99	12	127.9	8
9	29 42.1	99	13	127.5	30 11.8	99	13	127.4	30 41.5	99	13	127.3	31 11.3	99	13	127.2	31 41.0	99	13	127.1	32 10.7	99	13	127.1	32 40.4	99	13	127.0	33 10.1	99	13	126.9	9
50	29 34.6	99	13	126.4	30 04.3	99	13	126.3	30 34.0	99	13	126.3	31 03.7	99	13	126.2	31 33.4	99	13	126.1	32 03.1	99	13	126.0	32 32.8	99	13	125.9	33 02.5	99	13	125.8	50
1	29 27.0	99	13	125.4	29 56.7	99	13	125.3	30 26.4	99	13	125.2	30 56.1	99	13	125.1	31 25.8	99	13	125.1	31 55.5	99	13	125.0	32 25.2	99	13	124.9	32 54.9	99	13	124.8	1
2	29 19.3	99	13	124.3	29 49.0	99	13	124.3	30 18.7	99	13	124.2	30 48.4	99	13	124.1	31 18.1	99	13	124.0	31 47.8	99	13	123.9	32 17.4	99	13	123.8	32 47.1	99	13	123.8	2
3	29 11.5	99	13	123.3	29 41.2	99	13	123.2	30 10.9	99	13	123.1	30 40.6	99	13	123.1	31 10.2	99	13	123.0	31 39.9	99	13	122.9	32 09.6	99	13	122.8	32 39.3	99	13	122.7	3
4	29 03.6	99	13	122.3	29 33.3	99	13	122.2	30 03.0	99	13	122.1	30 32.7	99	13	122.0	31 02.3	99	13	121.9	31 32.0	99	13	121.8	32 01.7	99	13	121.8	32 31.3	99	13	121.7	4
55	28 55.6	99	13	121.2	29 25.3	99	13	121.2	29 55.0	99	13	121.1	30 24.7	99	13	121.0	30 54.3	99	14	120.9	31 24.0	99	14	120.8	31 53.6	99	14	120.7	32 23.3	99	14	120.6	55
6	28 47.6	99	14	120.2	29 17.2	99	14	120.1	29 46.9	99	14	120.0	30 16.6	99	14	119.9	30 46.2	99	14	119.9	31 15.9	99	14	119.8	31 45.5	99	14	119.6	32 15.2	99	14	119.6	6
7	28 39.4	99	14	119.2	29 09.1	99	14	119.1	29 38.7	99	14	119.0	30 08.4	99	14	118.9	30 38.0	99	14	118.8	31 07.7	99	14	118.7	31 37.3	99	14	118.7	32 07.0	99	14	118.6	7
8	28 31.2	99	14	118.1	29 00.8	99	14	118.1	29 30.5	99	14	118.0	30 00.1	99	14	117.9	30 29.8	99	14	117.8	30 59.4	99	14	117.7	31 29.1	99	14	117.6	31 58.7	99	14	117.5	8
9	28 22.9	99	14	117.1	28 52.5	99	14	117.0	29 22.2	99	14	116.9	29 51.8	99	14	116.9	30 21.4	99	14	116.8	30 51.1	99	14	116.7	31 20.7	99	14	116.6	31 50.3	99	14	116.5	9
60	28 14.5	99	14	116.1	28 44.1	99	14	116.0	29 13.7	99	14	115.9	29 43.4	99	14	115.8	30 13.0	99	14	115.7	30 42.6	99	14	115.7	31 12.3	99	14	115.6	31 41.9	99	14	115.5	60
1	28 06.0	99	14	115.1	28 35.6	99	14	115.0	29 05.3	99	14	114.9	29 34.9	99	14	114.8	30 04.5	99	14	114.7	30 34.1	99	14	114.6	31 03.8	99	14	114.5	31 33.4	99	14	114.4	1
2	27 57.5	99	14	114.0	28 27.1	99	14	114.0	28 56.7	99	14	113.9	29 26.3	99	14	113.8	29 56.0	99	14	113.7	30 25.6	99	14	113.6	30 55.2	99	14	113.5	31 24.8	99	14	113.4	2
3	27 48.9	99	14	113.0	28 18.5	99	14	112.9	28 48.1	99	14	112.8	29 17.7	99	14	112.8	29 47.3	99	14	112.7	30 16.9	99	14	112.6	30 46.5	99	14	112.5	31 16.1	99	15	112.4	3
4	27 40.2	99	15	112.0	28 09.8	99	15	111.9	28 39.4	99	15	111.8	29 09.0	99	15	111.7	29 38.6	99	15	111.6	30 08.2	99	15	111.6	30 37.8	99	15	111.5	31 07.4	99	15	111.4	4
65	27 31.5	99	15	111.0	28 01.1	99	15	110.9	28 30.7	99	15	110.8	29 00.3	99	15	110.7	29 29.9	99	15	110.6	29 59.5	99	15	110.5	30 29.1	99	15	110.4	30 58.7	99	15	110.3	65
6	27 22.7	99	15	110.0	27 52.3	99	15	109.9	28 21.9	99	15	109.8	28 51.5	99	15	109.7	29 21.1	99	15	109.6	29 50.7	99	15	109.5	30 20.3	99	15	109.4	30 49.8	99	15	109.3	6
7	27 13.8	99	15	109.0	27 43.4	99	15	108.9	28 13.0	99	15	108.8	28 42.6	99	15	108.7	29 12.2	99	15	108.6	29 41.8	99	15	108.5	30 11.4	99	15	108.4	30 41.0	99	15	108.3	7
8	27 04.9	99	15	107.9	27 34.5	99	15	107.9	28 04.1	99	15	107.8	28 33.7	99	15	107.7	29 03.3	99	15	107.6	29 32.9	99	15	107.5	30 02.4	99	15	107.4	30 32.0	99	15	107.3	8
9	26 56.0	99	15	106.9	27 25.6	99	15	106.8	27 55.1	99	15	106.8	28 24.7	99	15	106.7	28 54.3	99	15	106.6	29 23.9	99	15	106.5	29 53.5	99	15	106.4	30 23.0	99	15	106.3	9
70	26 47.0	99	15	105.9	27 16.5	99	15	105.8	27 46.1	99	15	105.7	28 15.7	99	15	105.6	28 45.3	99	15	105.6	29 14.9	99	15	105.5	29 44.4	99	15	105.4	30 14.0	99	15	105.3	70
1	26 37.9	99	15	104.9	27 07.5	99	15	104.8	27 37.1	99	15	104.7	28 06.7	99	15	104.6	28 36.2	99	15	104.5	29 05.8	99	15	104.4	29 35.4	99	15	104.3	30 04.9	99	15	104.2	1
2	26 28.8	99	15	103.9	26 58.4	99	15	103.8	27 28.0	99	15	103.7	27 57.6	99	15	103.6	28 27.1	99	15	103.5	28 56.7	99	15	103.4	29 26.2	99	15	103.3	29 55.8	99	15	103.2	2
3	26 19.7	99	15	102.9	26 49.3	99	15	102.8	27 18.8	99	15	102.7	27 48.4	99	15	102.6	28 18.0	99	15	102.5	28 47.5	99	15	102.4	29 17.1	99	15	102.3	29 46.6	99	15	102.2	3
4	26 10.5	99	15	101.9	26 40.1	99	15	101.8	27 09.7	99	15	101.7	27 39.2	99	15	101.6	28 08.8	99	15	101.5	28 38.4	99	15	101.4	29 07.9	99	15	101.3	29 37.5	99	15	101.2	4
75	26 01.3	99	15	100.9	26 30.9	99	15	100.8	27 00.5	99	15	100.7	27 30.0	99	15	100.6	27 59.6	99	15	100.5	28 29.1	99	16	100.4	28 58.7	99	16	100.3	29 28.2	98	16	100.2	75
6	25 52.1	99	15	99.9	26 21.7	99	15	99.8	26 51.2	99	15	99.7	27 20.8	99	15	99.6	27 50.3	99	15	99.5	28 19.9	99	16	99.4	28 49.4	98	16	99.3	29 19.0	98	16	99.2	6
7	25 42.8	99	15	98.9	26 12.4	99	15	98.8	26 42.0	99	15	98.7	27 11.5	99	16	98.6	27 41.1	99	16	98.5	28 10.6	99	16	98.4	28 40.2	98	16	98.3	29 09.7	98	16	98.2	7
8	25 33.5	99	16	97.9	26 03.1	99	16	97.8	26 32.7	99	16	97.7	27 02.2	99	16	97.6	27 31.8	99	16	97.5	28 01.3	99	16	97.4	28 30.9	98	16	97.3	29 00.4	98	16	97.2	8
9	25 24.2	99	16	96.9	25 53.8	99	16	96.8	26 23.4	99	16	96.7	26 52.9	99	16	96.6	27 22.5	99	16	96.5	27 52.0	99	16	96.4	28 21.5	98	16	96.3	28 51.1	98	16	96.2	9
80	25 14.9	99	16	95.9	25 44.5	99	16	95.8	26 14.0	99	16	95.7	26 43.6	99	16	95.6	27 13.1	98	16	95.5	27 42.7	98	16	95.4	28 12.2	98	16	95.3	28 41.7	98	16	95.2	80
1	25 05.6	99	16	94.9	25 35.1	99	16	94.8	26 04.7	99	16	94.7	26 34.2	98	16	94.6	27 03.8	98	16	94.5	27 33.3	98	16	94.4	28 02.9	98	16	94.3	28 32.4	98	16	94.2	1
2	24 56.2	99	16	93.9	25 25.8	99	16	93.8	25 55.3	99	16	93.7	26 24.9	98	16	93.6	26 54.4	98	16	93.5	27 24.0	98	16	93.4	27 53.5	98	16	93.3	28 23.0	98	16	93.2	2
3	24 46.8	99	16	92.9	25 16.4	99	16	92.8	25 45.9	99	16	92.7	26 15.5	98	16	92.6	26 45.0	98	16	92.5	27 14.6	98	16	92.4	27 44.1	98	16	92.3	28 13.7	98	16	92.2	3
4	24 37.5	99	16	91.9	25 07.0	99	16	91.8	25 36.6	99	16	91.7	26 06.1	98	16	91.6	26 35.7	98	16	91.5	27 05.2	98	16	91.5	27 34.7	98	16	91.4	28 04.3	98	16	91.3	4
85	24 28.1	99	16	90.9	24 57.6	99	16	90.9	25 27.2	98	16	90.8	25 56.7	98	16	90.7	26 26.3	98	16	90.6	26 55.8	98	16	90.5	27 25.3	98	16	90.4	27 54.9	98	16	90.3	85
6	24 18.7	99	16	90.0	24 48.2	99	16	89.9	25 17.8	98	16	89.8	25 47.3	98	16	89.7	26 16.9	98	16	89.6	26 46.4	98	16	89.5	27 16.0	98	16	89.4	27 45.5	98	16	89.3	6
7	24 09.3	99	16	89.0	24 38.9	99	16	88.9	25 08.4	98	16	88.8	25 38.0	98	16	88.7	26 07.5	98	16	88.6	26 37.0	98	16	88.5	27 06.6	98	16	88.4	27 36.1	98	16	88.3	7
8	23 59.9	99	16	88.0	24 29.5	99	16	87.9	24 59.0	98	16	87.8	25 28.6	98	16	87.7	25 58.1	98	16	87.6	26 27.7	98	16	87.5	26 57.2	98	16	87.4	27 26.7	98	16	87.3	8
9	23 50.5	99	16	87.0	24 20.1	99	16	86.9	24 49.7	99	16	86.8	25 19.2	98	16	86.7	25 48.8	98	16	86.6	26 18.3	98	16	86.5	26 47.8	98	16	86.4	27 17.4	98	16	86.3	9
90	23 41.2	99	16	86.0	24 10.7	99	16	85.9	24 40.3	99	16	85.8	25 09.8	98	16	85.7	25 39.4	98	16	85.6	26 08.9	98	16	85.5	26 38.5	98	16	85.4	27 08.0	98	16	85.3	90

H.A.	24° 00′			24° 30′			25° 00′			25° 30′			26° 00′			26° 30′			27° 00′			27° 30′			H.A.
	Alt.		Az.	Alt.		Az.	Alt.		Az.	Alt.		Az.	Alt.		Az.	Alt.		Az.	Alt.		Az.	Alt.		Az.	
°	° ′	Δd Δt	°	° ′	Δd Δt	°	° ′	Δd Δt	°	° ′	Δd Δt	°	° ′	Δd Δt	°	° ′	Δd Δt	°	° ′	Δd Δt	°	° ′	Δd Δt	°	°
91	23 31.8	99 16	85.0	24 01.4	99 16	84.9	24 30.9	99 16	84.8	25 00.5	98 16	84.8	25 30.0	98 16	84.7	25 59.6	98 16	84.6	26 29.1	98 16	84.5	26 58.7	98 16	84.4	91
2	23 22.5	99 16	84.1	23 52.0	99 16	84.0	24 21.6	99 16	83.9	24 51.1	99 16	83.8	25 20.7	98 16	83.7	25 50.2	98 16	83.6	26 19.8	98 16	83.5	26 49.3	98 16	83.4	2
3	23 13.2	99 16	83.1	23 42.7	99 16	83.0	24 12.3	99 16	82.9	24 41.8	99 16	82.8	25 11.4	98 16	82.7	25 40.9	98 16	82.6	26 10.5	98 16	82.5	26 40.0	98 16	82.4	3
4	23 03.8	99 15	82.1	23 33.4	99 15	82.0	24 03.0	99 15	81.9	24 32.5	99 15	81.8	25 02.1	99 15	81.7	25 31.6	98 15	81.6	26 01.2	98 15	81.5	26 30.7	98 15	81.4	4
95	22 54.6	99 15	81.1	23 24.1	99 15	81.0	23 53.7	99 15	80.9	24 23.2	99 15	80.8	24 52.8	99 15	80.7	25 22.4	99 15	80.6	25 51.9	98 15	80.6	26 21.4	98 15	80.5	95
6	22 45.3	99 15	80.1	23 14.9	99 15	80.0	23 44.4	99 15	80.0	24 14.0	99 15	79.9	24 43.6	99 15	79.8	25 13.1	99 15	79.7	25 42.7	98 15	79.6	26 12.2	98 15	79.5	6
7	22 36.1	99 15	79.2	23 05.6	99 15	79.1	23 35.2	99 15	79.0	24 04.8	99 15	78.9	24 34.3	99 15	78.8	25 03.9	99 15	78.7	25 33.4	99 15	78.6	26 03.0	98 15	78.5	7
8	22 26.9	99 15	78.2	22 56.4	99 15	78.1	23 26.0	99 15	78.0	23 55.6	99 15	77.9	24 25.1	99 15	77.8	24 54.7	99 15	77.7	25 24.3	99 15	77.6	25 53.8	99 15	77.5	8
9	22 17.7	99 15	77.2	22 47.3	99 15	77.1	23 16.8	99 15	77.0	23 46.4	99 15	76.9	24 16.0	99 15	76.8	24 45.5	99 15	76.8	25 15.1	99 15	76.7	25 44.7	99 15	76.6	9
100	22 08.6	99 15	76.2	22 38.1	99 15	76.1	23 07.7	99 15	76.1	23 37.3	99 15	76.0	24 06.9	99 15	75.9	24 36.4	99 15	75.8	25 06.0	99 15	75.7	25 35.6	99 15	75.6	100
1	21 59.5	99 15	75.3	22 29.0	99 15	75.2	22 58.6	99 15	75.1	23 28.2	99 15	75.0	23 57.8	99 15	74.9	24 27.3	99 15	74.8	24 56.9	99 15	74.7	25 26.5	99 15	74.6	1
2	21 50.4	99 15	74.3	22 20.0	99 15	74.2	22 49.6	99 15	74.1	23 19.2	99 15	74.0	23 48.7	99 15	73.9	24 18.3	99 15	73.8	24 47.9	99 15	73.8	25 17.5	99 15	73.7	2
3	21 41.4	99 15	73.3	22 11.0	99 15	73.2	22 40.6	99 15	73.1	23 10.2	99 15	73.1	23 39.7	99 15	73.0	24 09.3	99 15	72.9	24 38.9	99 15	72.8	25 08.5	99 15	72.7	3
4	21 32.4	99 15	72.4	22 02.0	99 15	72.3	22 31.6	99 15	72.2	23 01.2	99 15	72.1	23 30.8	99 15	72.0	24 00.4	99 15	71.9	24 30.0	99 15	71.8	24 59.5	99 15	71.7	4
105	21 23.5	99 15	71.4	21 53.1	99 15	71.3	22 22.7	99 15	71.2	22 52.3	99 15	71.1	23 21.9	99 15	71.0	23 51.5	99 15	70.9	24 21.1	99 15	70.9	24 50.6	99 15	70.8	105
6	21 14.6	99 15	70.4	21 44.2	99 15	70.3	22 13.8	99 15	70.2	22 43.4	99 15	70.2	23 13.0	99 15	70.1	23 42.6	99 15	70.0	24 12.2	99 15	69.9	24 41.8	99 15	69.8	6
7	21 05.8	99 15	69.5	21 35.4	99 15	69.4	22 05.0	99 15	69.3	22 34.6	99 15	69.2	23 04.2	99 15	69.1	23 33.8	99 15	69.0	24 03.4	99 15	68.9	24 33.0	99 15	68.8	7
8	20 57.1	99 14	68.5	21 26.7	99 14	68.4	21 56.3	99 14	68.3	22 25.9	99 14	68.2	22 55.5	99 14	68.1	23 25.1	99 14	68.1	23 54.7	99 14	68.0	24 24.3	99 14	67.9	8
9	20 48.4	99 14	67.5	21 18.0	99 14	67.4	21 47.6	99 14	67.4	22 17.2	99 14	67.3	22 46.8	99 14	67.2	23 16.4	99 14	67.1	23 46.0	99 14	67.0	24 15.6	99 14	66.9	9
110	20 39.7	99 14	66.6	21 09.3	99 14	66.5	21 39.0	99 14	66.4	22 08.6	99 14	66.3	22 38.2	99 14	66.2	23 07.8	99 14	66.1	23 37.4	99 14	66.0	24 07.0	99 14	66.0	110
1	20 31.1	99 14	65.6	21 00.8	99 14	65.5	21 30.4	99 14	65.4	22 00.0	99 14	65.3	22 29.6	99 14	65.3	22 59.3	99 14	65.2	23 28.9	99 14	65.1	23 58.5	99 14	65.0	1
2	20 22.6	99 14	64.6	20 52.3	99 14	64.5	21 21.9	99 14	64.5	21 51.5	99 14	64.4	22 21.1	99 14	64.3	22 50.8	99 14	64.2	23 20.4	99 14	64.1	23 50.0	99 14	64.0	2
3	20 14.2	99 14	63.7	20 43.8	99 14	63.6	21 13.5	99 14	63.5	21 43.1	99 14	63.4	22 12.7	99 14	63.3	22 42.4	99 14	63.3	23 12.0	99 14	63.2	23 41.6	99 14	63.1	3
4	20 05.8	99 14	62.7	20 35.4	99 14	62.6	21 05.1	99 14	62.5	21 34.7	99 14	62.5	22 04.4	99 14	62.4	22 34.0	99 14	62.3	23 03.7	99 14	62.2	23 33.3	99 14	62.1	4
115	19 57.5	99 14	61.7	20 27.1	99 14	61.7	20 56.8	99 14	61.6	21 26.4	99 14	61.5	21 56.1	99 14	61.4	22 25.7	99 14	61.3	22 55.4	99 14	61.3	23 25.0	99 14	61.2	115
6	19 49.3	99 14	60.8	20 18.9	99 14	60.7	20 48.6	99 14	60.6	21 18.2	99 14	60.5	21 47.9	99 14	60.5	22 17.5	99 14	60.4	22 47.2	99 14	60.3	23 16.8	99 14	60.2	6
7	19 41.1	99 13	59.8	20 10.8	99 13	59.7	20 40.4	99 13	59.7	21 10.1	99 13	59.6	21 39.8	99 13	59.5	22 09.4	99 13	59.4	22 39.1	99 13	59.3	23 08.7	99 13	59.3	7
8	19 33.0	99 13	58.9	20 02.7	99 13	58.8	20 32.4	99 13	58.7	21 02.0	99 13	58.6	21 31.7	99 13	58.6	22 01.4	99 13	58.5	22 31.0	99 13	58.4	23 00.7	99 13	58.3	8
9	19 25.0	99 13	57.9	19 54.7	99 13	57.8	20 24.4	99 13	57.8	20 54.1	99 13	57.7	21 23.7	99 13	57.6	21 53.4	99 13	57.5	22 23.1	99 13	57.4	22 52.8	99 13	57.4	9
120	19 17.1	99 13	56.9	19 46.8	99 13	56.9	20 16.5	99 13	56.8	20 46.2	99 13	56.7	21 15.9	99 13	56.6	21 45.5	99 13	56.6	22 15.2	99 13	56.5	22 44.9	99 13	56.4	120
1	19 09.3	99 13	56.0	19 39.0	99 13	55.9	20 08.7	99 13	55.8	20 38.4	99 13	55.8	21 08.1	99 13	55.7	21 37.8	99 13	55.6	22 07.4	99 13	55.5	22 37.1	99 13	55.5	1
2	19 01.6	99 13	55.0	19 31.3	99 13	55.0	20 01.0	99 13	54.9	20 30.7	99 13	54.8	21 00.4	99 13	54.7	21 30.1	99 13	54.7	21 59.7	99 13	54.6	22 29.4	99 13	54.5	2
3	18 53.9	99 13	54.1	19 23.6	99 13	54.0	19 53.3	99 13	53.9	20 23.0	99 13	53.9	20 52.7	99 13	53.8	21 22.4	99 13	53.7	21 52.1	99 13	53.6	22 21.8	99 13	53.6	3
4	18 46.4	99 12	53.1	19 16.1	99 12	53.0	19 45.8	99 12	53.0	20 15.5	99 12	52.9	20 45.2	99 12	52.8	21 14.9	99 12	52.8	21 44.6	99 12	52.7	22 14.3	99 12	52.6	4
125	18 38.9	99 12	52.2	19 08.6	99 12	52.1	19 38.3	99 12	52.0	20 08.1	99 12	52.0	20 37.8	99 12	51.9	21 07.5	99 12	51.8	21 37.2	99 12	51.7	22 06.9	99 12	51.7	125
6	18 31.5	99 12	51.2	19 01.3	99 12	51.1	19 31.0	99 12	51.1	20 00.7	99 12	51.0	20 30.5	99 12	50.9	21 00.2	99 12	50.9	21 29.9	99 12	50.8	21 59.6	99 12	50.7	6
7	18 24.3	99 12	50.3	18 54.0	99 12	50.2	19 23.7	99 12	50.1	19 53.5	99 12	50.0	20 23.2	99 12	50.0	20 52.9	99 12	49.9	21 22.7	99 12	49.8	21 52.4	99 12	49.8	7
8	18 17.1	99 12	49.3	18 46.8	99 12	49.2	19 16.6	99 12	49.2	19 46.3	99 12	49.1	20 16.1	99 12	49.0	20 45.8	99 12	49.0	21 15.6	99 12	48.9	21 45.3	99 12	48.8	8
9	18 10.0	99 12	48.3	18 39.8	99 12	48.3	19 09.5	99 12	48.2	19 39.3	99 12	48.1	20 09.0	99 12	48.1	20 38.8	99 12	48.0	21 08.5	99 12	47.9	21 38.3	99 12	47.9	9
130	18 03.1	99 11	47.4	18 32.8	99 11	47.3	19 02.6	99 11	47.3	19 32.4	99 11	47.2	20 02.1	99 11	47.1	20 31.9	99 11	47.1	21 01.6	99 11	47.0	21 31.4	99 11	46.9	130
1	17 56.2	99 11	46.4	18 26.0	99 11	46.4	18 55.8	99 11	46.3	19 25.5	99 11	46.2	19 55.3	99 11	46.2	20 25.0	99 11	46.1	20 54.8	99 11	46.0	21 24.6	99 11	46.0	1
2	17 49.5	99 11	45.5	18 19.2	99 11	45.4	18 49.0	99 11	45.4	19 18.8	99 11	45.3	19 48.6	99 11	45.2	20 18.3	99 11	45.2	20 48.1	99 11	45.1	21 17.9	99 11	45.0	2
3	17 42.8	99 11	44.5	18 12.6	99 11	44.5	18 42.4	99 11	44.4	19 12.2	99 11	44.3	19 42.0	99 11	44.3	20 11.7	99 11	44.2	20 41.5	99 11	44.2	21 11.3	99 11	44.1	3
4	17 36.3	99 11	43.6	18 06.1	99 11	43.5	18 35.9	99 11	43.5	19 05.7	99 11	43.4	19 35.5	99 11	43.3	20 05.2	99 11	43.3	20 35.0	99 11	43.2	21 04.8	99 11	43.1	4
135	17 29.9	99 10	42.6	17 59.7	99 10	42.6	18 29.5	99 10	42.5	18 59.3	99 10	42.5	19 29.1	99 10	42.4	19 58.9	99 10	42.3	20 28.7	99 10	42.3	20 58.4	99 10	42.2	135
6	17 23.6	99 10	41.7	17 53.4	99 10	41.6	18 23.2	99 10	41.6	18 53.0	99 10	41.5	19 22.8	99 10	41.4	19 52.6	99 10	41.4	20 22.4	99 10	41.3	20 52.2	99 10	41.3	6
7	17 17.4	99 10	40.7	17 47.2	99 10	40.7	18 17.0	99 10	40.6	18 46.8	99 10	40.6	19 16.7	99 10	40.5	19 46.5	99 10	40.4	20 16.3	99 10	40.4	20 46.1	99 10	40.3	7
8	17 11.3	99 10	39.8	17 41.2	99 10	39.7	18 11.0	99 10	39.7	18 40.8	99 10	39.6	19 10.6	99 10	39.6	19 40.4	99 10	39.5	20 10.2	99 10	39.4	20 40.1	99 10	39.4	8
9	17 05.4	99 10	38.8	17 35.2	99 10	38.8	18 05.1	99 10	38.7	18 34.9	99 10	38.7	19 04.7	99 10	38.6	19 34.5	99 10	38.5	20 04.3	99 10	38.5	20 34.2	99 10	38.4	9
140	16 59.6	99 10	37.9	17 29.4	99 10	37.8	17 59.2	99 09	37.8	18 29.1	99 09	37.7	18 58.9	99 09	37.7	19 28.7	99 09	37.6	19 58.6	99 09	37.5	20 28.4	99 09	37.5	140
1	16 53.9	99 09	36.9	17 23.7	99 09	36.9	17 53.6	99 09	36.8	18 23.4	99 09	36.8	18 53.2	99 09	36.7	19 23.1	99 09	36.7	19 52.9	99 09	36.6	20 22.7	99 09	36.5	1
2	16 48.3	99 09	36.0	17 18.1	99 09	35.9	17 48.0	99 09	35.9	18 17.8	99 09	35.8	18 47.7	99 09	35.8	19 17.5	99 09	35.7	19 47.4	99 09	35.7	20 17.2	99 09	35.6	2
3	16 42.8	1.0 09	35.0	17 12.7	1.0 09	35.0	17 42.6	1.0 09	34.9	18 12.4	1.0 09	34.9	18 42.3	1.0 09	34.8	19 12.1	1.0 09	34.8	19 42.0	99 09	34.7	20 11.8	99 09	34.7	3
4	16 37.5	1.0 09	34.1	17 07.4	1.0 09	34.0	17 37.2	1.0 09	34.0	18 07.1	1.0 09	33.9	18 37.0	1.0 09	33.9	19 06.8	1.0 09	33.8	19 36.7	1.0 09	33.8	20 06.5	1.0 09	33.7	4
145	16 32.3	1.0 08	33.1	17 02.2	1.0 08	33.1	17 32.1	1.0 08	33.0	18 01.9	1.0 08	33.0	18 31.8	1.0 08	32.9	19 01.7	1.0 08	32.9	19 31.5	1.0 08	32.8	20 01.4	1.0 08	32.8	145
6	16 27.3	1.0 08	32.2	16 57.1	1.0 08	32.1	17 27.0	1.0 08	32.1	17 56.9	1.0 08	32.0	18 26.8	1.0 08	32.0	18 56.6	1.0 08	31.9	19 26.5	1.0 08	31.9	19 56.4	1.0 08	31.8	6
7	16 22.3	1.0 08	31.2	16 52.2	1.0 08	31.2	17 22.1	1.0 08	31.1	17 52.0	1.0 08	31.1	18 21.8	1.0 08	31.0	18 51.7	1.0 08	31.0	19 21.6	1.0 08	31.0	19 51.5	1.0 08	30.9	7
8	16 17.5	1.0 08	30.3	16 47.4	1.0 08	30.2	17 17.3	1.0 08	30.2	17 47.2	1.0 08	30.2	18 17.1	1.0 08	30.1	18 47.0	1.0 08	30.1	19 16.8	1.0 08	30.0	19 46.7	1.0 08	30.0	8
9	16 12.9	1.0 08	29.3	16 42.8	1.0 08	29.3	17 12.6	1.0 08	29.3	17 42.5	1.0 08	29.2	18 12.4	1.0 08	29.2	18 42.3	1.0 08	29.1	19 12.2	1.0 08	29.1	19 42.1	1.0 07	29.0	9
150	16 08.3	1.0 07	28.4	16 38.2	1.0 07	28.4	17 08.1	1.0 07	28.3	17 38.0	1.0 07	28.3	18 07.9	1.0 07	28.2	18 37.8	1.0 07	28.2	19 07.7	1.0 07	28.1	19 37.6	1.0 07	28.1	150
1	16 03.9	1.0 07	27.4	16 33.8	1.0 07	27.4	17 03.7	1.0 07	27.4	17 33.7	1.0 07	27.3	18 03.6	1.0 07	27.3	18 33.5	1.0 07	27.2	19 03.4	1.0 07	27.2	19 33.3	1.0 07	27.2	1
2	15 59.7	1.0 07	26.5	16 29.6	1.0 07	26.5	16 59.5	1.0 07	26.4	17 29.4	1.0 07	26.4	17 59.3	1.0 07	26.3	18 29.2	1.0 07	26.3	18 59.1	1.0 07	26.3	19 29.1	1.0 07	26.2	2
3	15 55.6	1.0 07	25.5	16 25.5	1.0 07	25.5	16 55.4	1.0 07	25.5	17 25.3	1.0 07	25.4	17 55.2	1.0 07	25.4	18 25.1	1.0 07	25.4	18 55.1	1.0 07	25.3	19 25.0	1.0 07	25.3	3
4	15 51.6	1.0 06	24.6	16 21.5	1.0 06	24.6	16 51.4	1.0 06	24.5	17 21.3	1.0 06	24.5	17 51.3	1.0 06	24.5	18 21.2	1.0 06	24.4	18 51.1	1.0 06	24.4	19 21.0	1.0 06	24.3	4
155	15 47.7	1.0 06	23.7	16 17.7	1.0 06	23.6	16 47.6	1.0 06	23.6	17 17.5	1.0 06	23.5	17 47.5	1.0 06	23.5	18 17.4	1.0 06	23.5	18 47.3	1.0 06	23.4	19 17.2	1.0 06	23.4	155
6	15 44.0	1.0 06	22.7	16 14.0	1.0 06	22.7	16 43.9	1.0 06	22.6	17 13.9	1.0 06	22.6	17 43.8	1.0 06	22.6	18 13.7	1.0 06	22.5	18 43.6	1.0 06	22.5	19 13.6	1.0 06	22.5	6
7	15 40.5	1.0 06	21.8	16 10.4	1.0 06	21.7	16 40.4	1.0 06	21.7	17 10.3	1.0 06	21.7	17 40.3	1.0 06	21.6	18 10.2	1.0 06	21.6	18 40.1	1.0 06	21.6	19 10.1	1.0 06	21.5	7
8	15 37.1	1.0 05	20.8	16 07.0	1.0 05	20.8	16 37.0	1.0 05	20.8	17 06.9	1.0 05	20.7	17 36.9	1.0 05	20.7	18 06.8	1.0 05	20.7	18 36.8	1.0 05	20.6	19 06.7	1.0 05	20.6	8
9	15 33.8	1.0 05	19.9	16 03.8	1.0 05	19.8	16 33.7	1.0 05	19.8	17 03.7	1.0 05	19.8	17 33.6	1.0 05	19.7	18 03.6	1.0 05	19.7	18 33.5	1.0 05	19.7	19 03.5	1.0 05	19.7	9
160	15 30.7	1.0 05	18.9	16 00.7	1.0 05	18.9	16 30.6	1.0 05	18.9	17 00.6	1.0 05	18.8	17 30.5	1.0 05	18.8	18 00.5	1.0 05	18.8	18 30.4	1.0 05	18.7	19 00.4	1.0 05	18.7	160
1	15 27.7	1.0 05	18.0	15 57.7	1.0 05	17.9	16 27.7	1.0 05	17.9	16 57.6	1.0 05	17.9	17 27.6	1.0 05	17.9	17 57.5	1.0 05	17.8	18 27.5	1.0 05	17.8	18 57.4	1.0 05	17.8	1
2	15 24.9	1.0 04	17.0	15 54.9	1.0 04	17.0	16 24.8	1.0 04	17.0	16 54.8	1.0 04	16.9	17 24.8	1.0 04	16.9	17 54.7	1.0 04	16.9	18 24.7	1.0 04	16.9	18 54.6	1.0 04	16.8	2
3	15 22.2	1.0 04	16.1	15 52.2	1.0 04	16.1	16 22.2	1.0 04	16.0	16 52.1	1.0 04	16.0	17 22.1	1.0 04	16.0	17 52.1	1.0 04	16.0	18 22.0	1.0 04	15.9	18 52.0	1.0 04	15.9	3
4	15 19.7	1.0 04	15.1	15 49.7	1.0 04	15.1	16 19.7	1.0 04	15.1	16 49.6	1.0 04	15.1	17 19.6	1.0 04	15.0	17 49.6	1.0 04	15.0	18 19.5	1.0 04	15.0	18 49.5	1.0 04	15.0	4
165	15 17.3	1.0 04	14.2	15 47.3	1.0 04	14.2	16 17.3	1.0 04	14.1	16 47.3	1.0 04	14.1	17 17.2	1.0 04	14.1	17 47.2	1.0 04	14.1	18 17.2	1.0 04	14.1	18 47.2	1.0 04	14.0	165
6	15 15.1	1.0 03	13.2	15 45.1	1.0 03	13.2	16 15.1	1.0 03	13.2	16 45.0	1.0 03	13.2	17 15.0	1.0 03	13.2	17 45.0	1.0 03	13.1	18 15.0	1.0 03	13.1	18 45.0	1.0 03	13.1	6
7	15 13.0	1.0 03	12.3	15 43.0	1.0 03	12.3	16 13.0	1.0 03	12.3	16 43.0	1.0 03	12.2	17 13.0	1.0 03	12.2	17 42.9	1.0 03	12.2	18 12.9	1.0 03	12.2	18 42.9	1.0 03	12.2	7
8	15 11.1	1.0 03	11.4	15 41.1	1.0 03	11.3	16 11.1	1.0 03	11.3	16 41.1	1.0 03	11.3	17 11.1	1.0 03	11.3	17 41.0	1.0 03	11.3	18 11.0	1.0 03	11.2	18 41.0	1.0 03	11.2	8
9	15 09.3	1.0 03	10.4	15 39.3	1.0 03	10.4	16 09.3	1.0 03	10.4	16 39.3	1.0 03	10.4	17 09.3	1.0 03	10.3	17 39.3	1.0 03	10.3	18 09.3	1.0 03	10.3	18 39.2	1.0 03	10.3	9
170	15 07.7	1.0 02	09.5	15 37.7	1.0 02	09.4	16 07.7	1.0 02	09.4	16 37.7	1.0 02	09.4	17 07.7	1.0 02	09.4	17 37.7	1.0 02	09.4	18 07.7	1.0 02	09.4	18 37.6	1.0 02	09.4	170
1	15 06.3	1.0 02	08.5	15 36.3	1.0 02	08.5	16 06.2	1.0 02	08.5	16 36.2	1.0 02	08.5	17 06.2	1.0 02	08.5	17 36.2	1.0 02	08.4	18 06.2	1.0 02	08.4	18 36.2	1.0 02	08.4	1
2	15 05.0	1.0 02	07.6	15 34.9	1.0 02	07.6	16 04.9	1.0 02	07.5	16 34.9	1.0 02	07.5	17 04.9	1.0 02	07.5	17 34.9	1.0 02	07.5	18 04.9	1.0 02	07.5	18 34.9	1.0 02	07.5	2
3	15 03.8	1.0 02	06.6	15 33.8	1.0 02	06.6	16 03.8	1.0 02	06.6	16 33.8	1.0 02	06.6	17 03.8	1.0 02	06.6	17 33.8	1.0 02	06.6	18 03.8	1.0 02	06.6	18 33.8	1.0 02	06.5	3
4	15 02.8	1.0 01	05.7	15 32.8	1.0 01	05.7	16 02.8	1.0 01	05.7	16 32.8	1.0 01	05.6	17 02.8	1.0 01	05.6	17 32.8	1.0 01	05.6	18 02.8	1.0 01	05.6	18 32.8	1.0 01	05.6	4
175	15 01.9	1.0 01	04.7	15 31.9	1.0 01	04.7	16 01.9	1.0 01	04.7	16 31.9	1.0 01	04.7	17 01.9	1.0 01	04.7	17 31.9	1.0 01	04.7	18 01.9	1.0 01	04.7	18 31.9	1.0 01	04.7	175
6	15 01.2	1.0 01	03.8	15 31.2	1.0 01	03.8	16 01.2	1.0 01	03.8	16 31.2	1.0 01	03.8	17 01.2	1.0 01	03.8	17 31.2	1.0 01	03.8	18 01.2	1.0 01	03.7	18 31.2	1.0 01	03.7	6
7	15 00.7	1.0 01	02.8	15 30.7	1.0 01	02.8	16 00.7	1.0 01	02.8	16 30.7	1.0 01	02.8	17 00.7	1.0 01	02.8	17 30.7	1.0 01	02.8	18 00.7	1.0 01	02.8	18 30.7	1.0 01	02.8	7
8	15 00.3	1.0 00	01.9	15 30.3	1.0 00	01.9	16 00.3	1.0 00	01.9	16 30.3	1.0 00	01.9	17 00.3	1.0 00	01.9	17 30.3	1.0 00	01.9	18 00.3	1.0 00	01.9	18 30.3	1.0 00	01.9	8
9	15 00.1	1.0 00	00.9	15 30.1	1.0 00	00.9	16 00.1	1.0 00	00.9	16 30.1	1.0 00	00.9	17 00.1	1.0 00	00.9	17 30.1	1.0 00	00.9	18 00.1	1.0 00	00.9	18 30.1	1.0 00	00.9	9
180	15 00.0	1.0 00	00.0	15 30.0	1.0 00	00.0	16 00.0	1.0 00	00.0	16 30.0	1.0 00	00.0	17 00.0	1.0 00	00.0	17 30.0	1.0 00	00.0	18 00.0	1.0 00	00.0	18 30.0	1.0 00	00.0	180

Lat. 1°

H.A.	28° 00' (Alt. / Δd Δt / Az.)	28° 30'	29° 00'	30° 00'	32° 00'	34° 00'	34° 30'	35° 30'	H.A.
00	37 00.0 1.00 0 180.0	37 30.0 1.00 0 180.0	38 00.0 1.00 0 180.0	39 00.0 1.00 0 180.0	41 00.0 1.00 0 180.0	43 00.0 1.00 0 180.0	43 30.0 1.00 0 180.0	44 30.0 1.00 0 180.0	00
1	36 59.9 1.00 0 178.9	37 29.9 1.00 0 178.9	37 59.9 1.00 0 178.9	38 59.9 1.00 0 178.9	40 59.9 1.00 0 178.9	42 59.9 1.00 0 178.9	43 29.9 1.00 0 178.9	44 29.9 1.00 0 178.9	1
2	36 59.6 1.00 1 177.7	37 29.6 1.00 1 177.7	37 59.6 1.00 1 177.8	38 59.6 1.00 1 177.8	40 59.6 1.00 1 177.8	42 59.6 1.00 1 177.7	43 29.6 1.00 1 177.7	44 29.6 1.00 1 177.7	2
3	36 59.2 1.00 1 176.7	37 29.2 1.00 1 176.7	37 59.2 1.00 1 176.7	38 59.2 1.00 1 176.7	40 59.2 1.00 1 176.6	42 59.2 1.00 1 176.6	43 29.2 1.00 1 176.6	44 29.2 1.00 1 176.6	3
4	36 58.6 1.00 1 175.6	37 28.5 1.00 1 175.6	37 58.5 1.00 1 175.6	38 58.5 1.00 1 175.5	40 58.5 1.00 1 175.5	42 58.5 1.00 1 175.5	43 28.5 1.00 1 175.5	44 28.5 1.00 1 175.4	4
05	36 57.7 1.00 2 174.5	37 27.7 1.00 2 174.5	37 57.7 1.00 2 174.5	38 57.7 1.00 2 174.4	40 57.7 1.00 2 174.4	42 57.7 1.00 2 174.3	43 27.7 1.00 2 174.3	44 27.7 1.00 2 174.3	05
6	36 56.7 1.00 2 173.4	37 26.7 1.00 2 173.4	37 56.7 1.00 2 173.3	38 56.7 1.00 2 173.3	40 56.7 1.00 2 173.3	42 56.7 1.00 2 173.2	43 26.7 1.00 2 173.2	44 26.6 1.00 2 173.2	6
7	36 55.5 1.00 2 172.3	37 25.5 1.00 2 172.2	37 55.5 1.00 2 172.2	38 55.5 1.00 2 172.2	40 55.5 1.00 2 172.1	42 55.5 1.00 2 172.1	43 25.4 1.00 2 172.1	44 25.4 1.00 2 172.0	7
8	36 54.2 1.00 3 171.1	37 24.2 1.00 3 171.1	37 54.2 1.00 3 171.1	38 54.2 1.00 3 171.1	40 54.1 1.00 3 171.0	42 54.1 1.00 3 170.9	43 24.1 1.00 3 170.9	44 24.0 1.00 3 170.9	8
9	36 52.7 1.00 3 170.1	37 22.7 1.00 3 170.0	37 52.7 1.00 3 170.0	38 52.6 1.00 3 170.0	40 52.6 1.00 3 169.9	42 52.5 1.00 3 169.8	43 22.5 1.00 3 169.8	44 22.4 1.00 3 169.7	9
10	36 51.0 1.00 3 169.0	37 21.0 1.00 3 168.9	37 50.9 1.00 3 168.9	38 50.9 1.00 3 168.9	40 50.8 1.00 3 168.8	42 50.7 1.00 3 168.7	43 20.7 1.00 3 168.7	44 20.7 1.00 3 168.6	10
1	36 49.1 1.00 3 167.9	37 19.1 1.00 3 167.8	37 49.0 1.00 3 167.8	38 49.0 1.00 3 167.8	40 48.9 1.00 4 167.7	42 48.8 1.00 4 167.5	43 18.8 1.00 4 167.5	44 18.7 1.00 4 167.5	1
2	36 47.0 1.00 4 166.7	37 17.0 1.00 4 166.7	37 47.0 1.00 4 166.7	38 46.9 1.00 4 166.6	40 46.8 1.00 4 166.5	42 46.7 1.00 4 166.4	43 16.7 1.00 4 166.4	44 16.6 1.00 4 166.3	2
3	36 44.8 1.00 4 165.6	37 14.8 1.00 4 165.6	37 44.7 1.00 4 165.6	38 44.7 1.00 4 165.5	40 44.5 1.00 4 165.4	42 44.4 1.00 4 165.3	43 14.4 1.00 4 165.3	44 14.3 1.00 4 165.2	3
4	36 42.4 1.00 4 164.5	37 12.3 1.00 4 164.5	37 42.3 1.00 4 164.5	38 42.2 1.00 4 164.4	40 42.1 1.00 4 164.3	42 41.9 1.00 4 164.2	43 11.9 1.00 4 164.1	44 11.8 1.00 4 164.1	4
15	36 39.8 1.00 5 163.4	37 09.7 1.00 5 163.4	37 39.7 1.00 5 163.4	38 39.6 1.00 5 163.3	40 39.5 1.00 5 163.2	42 39.3 1.00 5 163.0	43 09.2 1.00 5 163.0	44 09.1 1.00 5 162.9	15
6	36 37.0 1.00 5 162.3	37 07.0 1.00 5 162.3	37 36.9 1.00 5 162.3	38 36.8 1.00 5 162.2	40 36.7 1.00 5 162.1	42 36.5 1.00 5 161.9	43 06.4 1.00 5 161.9	44 06.3 1.00 5 161.8	6
7	36 34.1 1.00 5 161.3	37 04.0 1.00 5 161.2	37 34.0 1.00 5 161.2	38 33.9 1.00 5 161.1	40 33.7 1.00 5 161.0	42 33.5 1.00 5 160.8	43 03.4 1.00 5 160.7	44 03.3 1.00 5 160.7	7
8	36 31.0 1.00 6 160.2	37 00.9 1.00 6 160.1	37 30.9 1.00 6 160.1	38 30.8 1.00 6 160.0	40 30.5 1.00 6 159.8	42 30.3 1.00 6 159.7	43 00.2 1.00 6 159.6	44 00.1 1.00 6 159.5	8
9	36 27.7 1.00 6 159.1	36 57.7 1.00 6 159.0	37 27.6 1.00 6 159.0	38 27.5 1.00 6 158.9	40 27.2 1.00 6 158.7	42 26.9 1.00 6 158.5	42 56.9 1.00 6 158.5	43 56.7 1.00 6 158.4	9
20	36 24.3 1.00 6 158.0	36 54.2 1.00 6 157.9	37 24.1 1.00 6 157.9	38 24.0 1.00 6 157.8	40 23.7 1.00 6 157.6	42 23.4 1.00 6 157.4	42 53.3 1.00 6 157.4	43 53.2 1.00 6 157.3	20
1	36 20.7 1.00 6 156.9	36 50.6 1.00 6 156.8	37 20.5 1.00 6 156.8	38 20.4 1.00 6 156.7	40 20.1 1.00 6 156.5	42 19.7 1.00 6 156.3	42 49.6 1.00 6 156.3	43 49.5 1.00 6 156.1	1
2	36 16.9 1.00 7 155.8	36 46.8 1.00 7 155.7	37 16.7 1.00 7 155.7	38 16.6 1.00 7 155.6	40 16.2 1.00 7 155.4	42 15.9 1.00 7 155.1	42 45.8 1.00 7 155.1	43 45.6 1.00 7 155.0	2
3	36 13.0 1.00 7 154.7	36 42.9 1.00 7 154.6	37 12.8 1.00 7 154.6	38 12.6 1.00 7 154.5	40 12.2 1.00 7 154.3	42 11.9 1.00 7 154.1	42 41.7 1.00 7 154.0	43 41.5 1.00 7 153.9	3
4	36 08.9 1.00 7 153.6	36 38.8 1.00 7 153.5	37 08.7 1.00 7 153.5	38 08.5 1.00 7 153.4	40 08.1 1.00 7 153.2	42 07.7 1.00 7 153.0	42 37.6 1.00 7 152.9	43 37.3 1.00 7 152.8	4
25	36 04.6 1.00 7 152.5	36 34.5 1.00 7 152.5	37 04.4 1.00 7 152.4	38 04.2 1.00 7 152.3	40 03.8 1.00 7 152.1	42 03.3 1.00 8 151.8	42 33.2 1.00 8 151.8	43 33.0 1.00 8 151.7	25
6	36 00.2 1.00 8 151.4	36 30.1 1.00 8 151.3	37 00.0 1.00 8 151.3	37 59.8 1.00 8 151.2	39 59.3 1.00 8 151.0	41 58.8 1.00 8 150.7	42 28.7 1.00 8 150.7	43 28.4 1.00 8 150.5	6
7	35 55.6 1.00 8 150.3	36 25.5 1.00 8 150.3	36 55.4 1.00 8 150.2	37 55.2 1.00 8 150.1	39 54.7 1.00 8 149.9	41 54.1 1.00 8 149.6	42 24.0 1.00 8 149.6	43 23.7 1.00 8 149.4	7
8	35 50.9 1.00 8 149.2	36 20.8 1.00 8 149.2	36 50.7 1.00 8 149.1	37 50.4 1.00 8 149.0	39 49.9 1.00 8 148.8	41 49.3 1.00 8 148.5	42 19.2 1.00 8 148.4	43 18.9 99 08 148.3	8
9	35 46.0 1.00 8 148.2	36 15.9 1.00 8 148.1	36 45.8 1.00 8 148.0	37 45.5 1.00 8 147.9	39 44.9 1.00 8 147.7	41 44.3 99 09 147.4	42 14.2 99 09 147.3	43 13.9 99 09 147.2	9
30	35 41.0 1.00 9 147.1	36 10.9 1.00 9 147.0	36 40.7 1.00 9 147.0	37 40.4 1.00 9 146.8	39 39.8 99 09 146.6	41 39.2 99 09 146.3	42 09.0 99 09 146.2	43 08.7 99 09 146.1	30
1	35 35.8 1.00 9 145.9	36 05.7 1.00 9 145.9	36 35.5 99 09 145.9	37 35.2 99 09 145.7	39 34.6 99 09 145.5	41 33.9 99 09 145.2	42 03.7 99 09 145.0	43 03.4 99 09 145.0	1
2	35 30.5 99 09 144.9	36 00.4 99 09 144.9	36 30.2 99 09 144.8	37 29.9 99 09 144.7	39 29.2 99 09 144.4	41 28.5 99 09 144.1	41 58.3 99 09 144.0	42 57.9 99 09 143.9	2
3	35 25.1 99 00 143.8	35 54.9 99 00 143.8	36 24.7 99 09 143.7	37 24.4 99 09 143.6	39 23.7 99 10 143.3	41 22.9 99 10 143.0	41 52.7 99 10 142.9	42 52.3 99 10 142.8	3
4	35 19.4 99 10 142.8	35 49.3 99 10 142.7	36 19.1 99 10 142.6	37 18.7 99 10 142.5	39 18.0 99 10 142.2	41 17.2 99 10 141.9	41 47.0 99 10 141.8	42 46.6 99 10 141.7	4
35	35 13.7 99 10 141.7	35 43.5 99 10 141.6	36 13.3 99 10 141.5	37 13.0 99 10 141.4	39 12.2 99 10 141.1	41 11.3 99 10 140.8	41 41.1 99 10 140.7	42 40.7 99 10 140.6	35
6	35 07.8 99 10 140.6	35 37.6 99 10 140.5	36 07.4 99 10 140.3	37 07.0 99 10 140.0	39 06.2 99 10 140.0	41 05.3 99 10 139.7	41 35.1 99 10 139.6	42 34.6 99 10 139.5	6
7	35 01.8 99 10 139.5	35 31.6 99 10 139.5	36 01.4 99 10 139.4	37 01.0 99 10 139.3	39 00.1 99 10 138.9	40 59.2 99 10 138.6	41 29.0 99 10 138.5	42 28.5 99 10 138.4	7
8	34 55.6 99 10 138.5	35 25.4 99 10 138.4	35 55.2 99 11 138.3	36 54.8 99 11 138.2	38 53.9 99 11 137.9	40 52.9 99 11 137.5	41 22.7 99 11 137.5	42 22.2 99 11 137.3	8
9	34 49.3 99 11 137.4	35 19.1 99 11 137.3	35 48.9 99 11 137.3	36 48.5 99 11 137.1	38 47.5 99 11 136.8	40 46.5 99 11 136.5	41 16.3 99 11 136.4	42 15.7 99 11 136.2	9
40	34 42.9 99 11 136.3	35 12.7 99 11 136.3	35 42.5 99 11 136.2	36 42.0 99 11 136.0	38 41.0 99 11 135.7	40 40.0 99 11 135.4	41 09.8 99 11 135.3	42 09.2 99 11 135.1	40
1	34 36.4 99 11 135.2	35 06.1 99 11 135.2	35 35.9 99 11 135.1	36 35.4 99 11 135.0	38 34.4 99 11 134.6	40 33.3 99 11 134.3	41 03.1 99 11 134.2	42 02.5 99 11 134.0	1
2	34 29.7 99 11 134.2	34 59.5 99 11 134.1	35 29.2 99 11 134.0	36 28.7 99 11 133.9	38 27.7 99 11 133.6	40 26.6 99 12 133.2	40 56.3 99 12 133.1	41 55.7 99 12 132.9	2
3	34 22.9 99 12 133.1	34 52.7 99 12 133.1	35 22.4 99 12 133.0	36 21.9 99 12 132.8	38 20.8 99 12 132.5	40 19.7 99 12 132.1	40 49.4 99 12 132.0	41 48.8 99 12 131.8	3
4	34 16.0 99 12 132.1	34 45.8 99 12 132.0	35 15.5 99 12 131.9	36 14.9 99 12 131.8	38 13.8 99 12 131.4	40 12.6 99 12 131.1	40 42.3 99 12 131.0	41 41.7 99 12 130.8	4
45	34 09.0 99 12 131.0	34 38.7 99 12 130.9	35 08.4 99 12 130.9	36 07.9 99 12 130.7	38 06.7 99 12 130.3	40 05.5 99 12 130.0	40 35.2 99 12 129.9	41 34.5 99 12 129.7	45
6	34 01.9 99 12 130.0	34 31.6 99 12 129.9	35 01.3 99 12 129.8	36 00.7 99 12 129.6	37 59.5 99 12 129.3	39 58.3 99 12 128.9	40 27.9 99 12 128.8	41 27.3 99 12 128.6	6
7	33 54.6 99 12 128.9	34 24.3 99 12 128.8	34 54.0 99 12 128.7	35 53.4 99 12 128.6	37 52.2 99 12 128.2	39 50.9 99 12 127.8	40 20.6 99 12 127.7	41 19.9 99 12 127.5	7
8	33 47.2 99 12 127.9	34 17.0 99 12 127.8	34 46.7 99 12 127.7	35 46.0 99 12 127.5	37 44.8 99 13 127.2	39 43.4 99 13 126.8	40 13.1 99 13 126.7	41 12.4 99 13 126.5	8
9	33 39.8 99 13 126.7	34 09.5 99 13 126.7	34 39.1 99 13 126.6	35 38.5 99 13 126.5	37 37.2 99 13 126.1	39 35.9 99 13 125.7	40 05.5 99 13 125.6	41 04.8 99 13 125.4	9
50	33 32.2 99 13 125.8	34 01.9 99 13 125.7	34 31.6 99 13 125.6	35 30.9 99 13 125.4	37 29.6 99 13 125.0	39 28.2 99 13 124.6	39 57.8 99 13 124.5	40 57.1 99 13 124.3	50
1	33 24.6 99 13 124.7	33 54.2 99 13 124.6	34 23.9 99 13 124.5	35 23.2 99 13 124.4	37 21.9 99 13 124.0	39 20.4 99 13 123.6	39 50.0 99 13 123.5	40 49.3 99 13 123.3	1
2	33 16.8 99 13 123.7	33 46.5 99 13 123.6	34 16.1 99 13 123.5	35 15.4 99 13 123.3	37 14.0 99 13 122.9	39 12.6 99 13 122.5	39 42.2 99 13 122.4	40 41.4 99 13 122.2	2
3	33 08.9 99 13 122.6	33 38.6 99 13 122.5	34 08.3 99 13 122.4	35 07.6 99 13 122.3	37 06.1 99 13 121.9	39 04.6 99 13 121.5	39 34.2 99 13 121.4	40 33.4 99 13 121.2	3
4	33 01.0 99 13 121.6	33 30.6 99 13 121.5	34 00.3 99 13 121.4	34 59.6 99 13 121.2	36 58.1 99 14 120.8	38 56.5 99 14 120.4	39 26.1 99 14 120.3	40 25.3 99 14 120.1	4
55	32 52.9 99 14 120.5	33 22.6 99 14 120.5	33 52.2 99 14 120.4	34 51.5 99 14 120.2	36 50.0 99 14 119.8	38 48.4 99 14 119.4	39 18.0 99 14 119.3	40 17.2 99 14 119.0	55
6	32 44.8 99 14 119.5	33 14.5 99 14 119.4	33 44.1 99 14 119.3	34 43.3 99 14 119.1	36 41.8 99 14 118.7	38 40.2 99 14 118.3	39 09.8 99 14 118.2	40 08.9 99 14 118.0	6
7	32 36.6 99 14 118.5	33 06.2 99 14 118.4	33 35.9 99 14 118.3	34 35.1 99 14 118.1	36 33.5 99 14 117.7	38 31.9 99 14 117.3	39 01.5 99 14 117.2	40 00.6 99 14 116.9	7
8	32 28.3 99 14 117.4	32 57.9 99 14 117.3	33 27.6 99 14 117.2	34 26.8 99 14 117.1	36 25.2 99 14 116.7	38 23.5 99 14 116.2	38 53.1 99 14 116.1	39 52.2 99 14 115.9	8
9	32 19.9 99 14 116.4	32 49.6 99 14 116.3	33 19.2 99 14 116.2	34 18.4 99 14 116.0	36 16.8 99 14 115.6	38 15.0 99 14 115.2	38 44.6 99 14 115.1	39 43.7 98 14 114.9	9
60	32 11.5 99 14 115.4	32 41.1 99 14 115.3	33 10.7 99 14 115.2	34 09.9 99 14 115.0	36 08.3 99 14 114.6	38 06.5 99 14 114.2	38 36.1 98 14 114.0	39 35.1 98 14 113.8	60
1	32 03.0 99 14 114.3	32 32.6 99 14 114.2	33 02.2 99 14 114.1	34 01.4 99 14 114.0	35 59.7 99 14 113.5	37 57.9 98 14 113.1	38 27.5 98 14 113.0	39 26.5 98 14 112.8	1
2	31 54.4 99 14 113.3	32 24.0 99 14 113.2	32 53.6 99 14 113.1	33 52.8 99 14 112.9	35 51.1 99 14 112.5	37 49.2 98 15 112.1	38 18.8 98 15 112.0	39 17.8 98 15 111.7	2
3	31 45.7 99 15 112.3	32 15.3 99 15 112.2	32 44.9 99 15 112.1	33 44.1 99 15 111.9	35 42.3 99 15 111.5	37 40.5 98 15 111.0	38 10.0 98 15 110.9	39 09.1 98 15 110.7	3
4	31 37.0 99 15 111.3	32 06.6 99 15 111.2	32 36.2 99 15 111.1	33 35.3 99 15 110.9	35 33.6 98 15 110.5	37 31.7 98 15 110.0	38 01.3 98 15 109.9	39 00.3 98 15 109.7	4
65	31 28.3 99 15 110.2	31 57.8 99 15 110.1	32 27.4 99 15 110.0	33 26.5 99 15 109.8	35 24.8 98 15 109.4	37 22.9 98 15 109.0	37 52.4 98 15 108.9	38 51.4 98 15 108.6	65
6	31 19.4 99 15 109.2	31 49.0 99 15 109.1	32 18.6 99 15 109.0	33 17.7 99 15 108.8	35 15.9 98 15 108.4	37 14.0 98 15 108.0	37 43.5 98 15 107.9	38 42.5 98 15 107.6	6
7	31 10.5 99 15 108.2	31 40.1 99 15 108.1	32 09.7 99 15 108.0	33 08.8 99 15 107.8	35 06.9 98 15 107.4	37 05.0 98 15 106.9	37 34.5 98 15 106.8	38 33.5 98 15 106.6	7
8	31 01.6 99 15 107.2	31 31.1 99 15 107.1	32 00.7 99 15 107.0	32 59.8 99 15 106.8	34 58.0 98 15 106.3	36 56.0 98 15 105.9	37 25.5 98 15 105.8	38 24.5 98 15 105.6	8
9	30 52.6 99 15 106.2	31 22.2 99 15 106.1	31 51.7 99 15 106.0	32 50.8 98 15 105.8	34 48.9 98 15 105.3	36 47.0 98 15 104.9	37 16.5 98 15 104.8	38 15.4 98 15 104.6	9
70	30 43.6 99 15 105.2	31 13.1 99 15 105.1	31 42.7 99 15 105.0	32 41.8 98 15 104.8	34 39.9 98 15 104.3	36 37.9 98 15 103.9	37 07.4 98 15 103.8	38 06.3 98 15 103.5	70
1	30 34.5 99 15 104.2	31 04.0 99 15 104.0	31 33.6 98 15 103.9	32 32.7 98 15 103.7	34 30.8 98 15 103.3	36 28.8 98 15 102.9	36 58.2 98 15 102.8	37 57.2 98 15 102.5	1
2	30 25.4 99 15 103.1	30 54.9 99 15 103.0	31 24.4 98 15 102.9	32 23.5 98 15 102.7	34 21.6 98 15 102.3	36 19.6 98 15 101.9	36 49.1 98 15 101.7	37 48.0 98 15 101.5	2
3	30 16.2 98 15 102.1	30 45.7 98 15 102.0	31 15.3 98 15 101.9	32 14.3 98 15 101.7	34 12.4 98 15 101.3	36 10.4 98 15 100.8	36 39.9 98 15 100.7	37 38.8 98 15 100.5	3
4	30 07.0 98 15 101.1	30 36.5 98 15 101.0	31 06.1 98 15 100.9	32 05.1 98 15 100.7	34 03.2 98 15 100.3	36 01.1 98 15 99.8	36 30.6 98 15 99.7	37 29.6 98 15 99.5	4
75	29 57.8 98 15 100.1	30 27.3 98 15 100.0	30 56.9 98 15 99.9	31 55.9 98 15 99.7	33 53.9 98 15 99.3	35 51.9 98 15 98.8	36 21.4 98 16 98.7	37 20.3 98 16 98.5	75
6	29 48.5 98 16 99.1	30 18.1 98 16 99.0	30 47.6 98 16 98.9	31 46.6 98 16 98.7	33 44.7 98 16 98.3	35 42.6 98 16 97.8	36 12.1 98 16 97.7	37 11.0 98 16 97.5	6
7	29 39.2 98 16 98.1	30 08.8 98 16 98.0	30 38.3 98 16 97.9	31 37.3 98 16 97.7	33 35.4 98 16 97.3	35 33.3 98 16 96.8	36 02.8 98 16 96.7	37 01.7 98 16 96.5	7
8	29 29.9 98 16 97.1	29 59.5 98 16 97.0	30 29.0 98 16 96.9	31 28.0 98 16 96.7	33 26.0 98 16 96.3	35 24.0 98 16 95.8	35 53.4 98 16 95.7	36 52.3 98 16 95.5	8
9	29 20.6 98 16 96.1	29 50.1 98 16 96.0	30 19.7 98 16 95.9	31 18.7 98 16 95.7	33 16.7 98 16 95.3	35 14.6 98 16 94.8	35 44.1 98 16 94.7	36 43.0 98 16 94.5	9
80	29 11.3 98 16 95.1	29 40.8 98 16 95.0	30 10.3 98 16 94.9	31 09.4 98 16 94.7	33 07.4 98 16 94.3	35 05.3 98 16 93.8	35 34.7 98 16 93.7	36 33.6 98 16 93.5	80
1	29 01.9 98 16 94.1	29 31.4 98 16 94.0	30 01.0 98 16 93.9	31 00.0 98 16 93.7	32 58.0 98 16 93.3	34 55.9 98 16 92.8	35 25.3 98 16 92.7	36 24.2 98 16 92.5	1
2	28 52.6 98 16 93.1	29 22.1 98 16 93.0	29 51.6 98 16 92.9	30 50.6 98 16 92.7	32 48.6 98 16 92.3	34 46.5 98 16 91.8	35 15.9 98 16 91.7	36 14.8 98 16 91.5	2
3	28 43.2 98 16 92.1	29 12.7 98 16 92.0	29 42.2 98 16 91.9	30 41.2 98 16 91.7	32 39.2 98 16 91.3	34 37.1 98 16 90.9	35 06.6 98 16 90.7	36 05.5 98 16 90.5	3
4	28 33.8 98 16 91.2	29 03.3 98 16 91.1	29 32.8 98 16 91.0	30 31.9 98 16 90.7	32 29.8 98 16 90.3	34 27.7 98 16 89.9	34 57.2 98 16 89.8	35 56.1 98 16 89.5	4
85	28 24.4 98 16 90.2	28 53.9 98 16 90.1	29 23.5 98 16 90.0	30 22.5 98 16 89.8	32 20.5 98 16 89.3	34 18.4 98 16 88.9	34 47.8 98 16 88.8	35 46.7 98 16 88.5	85
6	28 15.0 98 16 89.2	28 44.6 98 16 89.1	29 14.1 98 16 89.0	30 13.1 98 16 88.8	32 11.1 98 16 88.3	34 09.0 98 16 87.9	34 38.4 98 16 87.8	35 37.3 98 16 87.6	6
7	28 05.6 98 16 88.2	28 35.2 98 16 88.1	29 04.7 98 16 88.0	30 03.7 98 16 87.8	32 01.7 98 16 87.4	33 59.6 98 16 86.9	34 29.1 98 16 86.8	35 28.0 98 16 86.6	7
8	27 56.3 98 16 87.2	28 25.8 98 16 87.1	28 55.3 98 16 87.0	29 54.3 98 16 86.8	31 52.3 98 16 86.4	33 50.2 98 16 85.9	34 19.7 98 16 85.8	35 18.6 98 16 85.6	8
9	27 46.9 98 16 86.2	28 16.4 98 16 86.1	28 45.9 98 16 86.0	29 45.0 98 16 85.8	31 43.0 98 16 85.4	33 40.9 98 16 85.0	34 10.3 98 16 84.8	35 09.2 98 16 84.6	9
90	27 37.5 98 16 85.2	28 07.1 98 16 85.1	28 36.6 98 16 85.0	29 35.6 98 16 84.8	31 33.6 98 16 84.4	33 31.5 98 16 84.0	34 01.0 98 16 83.9	34 59.9 98 16 83.6	90

H.A.	28° 00′				28° 30′				29° 00′				30° 00′				32° 00′				34° 00′				34° 30′				35° 30′				H.A.
	Alt.			Az.	Alt.			Az.	Alt.			Az.	Alt.			Az.	Alt.			Az.	Alt.			Az.	Alt.			Az.	Alt.			Az.	
°	° ′	Δd	Δt	°	° ′	Δd	Δt	°	° ′	Δd	Δt	°	° ′	Δd	Δt	°	° ′	Δd	Δt	°	° ′	Δd	Δt	°	° ′	Δd	Δt	°	° ′	Δd	Δt	°	°
91	27 28.2	98	16	84.3	27 57.7	98	16	84.2	28 27.2	98	16	84.1	29 26.3	98	16	83.9	31 24.3	98	16	83.4	33 22.2	98	16	83.0	33 51.7	98	16	82.9	34 50.6	98	16	82.7	91
2	27 18.9	98	16	83.3	27 48.4	98	16	83.2	28 17.9	98	16	83.1	29 17.0	98	16	82.9	31 15.0	98	16	82.5	33 12.9	98	15	82.0	33 42.4	98	15	81.9	34 41.3	98	15	81.7	2
3	27 09.5	98	16	82.3	27 39.1	98	16	82.2	28 08.6	98	15	82.1	29 07.6	98	15	81.9	31 05.7	98	15	81.5	33 03.6	98	15	81.1	33 33.1	98	15	80.9	34 32.0	98	15	80.7	3
4	27 00.3	98	15	81.3	27 29.8	98	15	81.2	27 59.3	98	15	81.1	28 58.4	98	15	80.9	30 56.4	98	15	80.5	32 54.4	98	15	80.1	33 23.8	98	15	80.0	34 22.8	98	15	79.7	4
95	26 51.0	98	15	80.4	27 20.5	98	15	80.3	27 50.1	98	15	80.2	28 49.1	98	15	80.0	30 47.2	98	15	79.5	32 45.1	98	15	79.1	33 14.6	98	15	79.0	34 13.5	98	15	78.8	95
6	26 41.7	98	15	79.4	27 11.3	98	15	79.3	27 40.8	98	15	79.2	28 39.9	98	15	79.0	30 37.9	98	15	78.6	32 35.9	98	15	78.1	33 05.4	98	15	78.0	34 04.3	98	15	77.8	6
7	26 32.5	98	15	78.4	27 02.1	98	15	78.3	27 31.6	98	15	78.2	28 30.7	98	15	78.0	30 28.8	98	15	77.6	32 26.8	98	15	77.2	32 56.2	98	15	77.1	33 55.2	98	15	76.8	7
8	26 23.4	98	15	77.4	26 52.9	98	15	77.3	27 22.4	98	15	77.2	28 21.5	98	15	77.0	30 19.6	98	15	76.6	32 17.6	98	15	76.2	32 47.1	98	15	76.1	33 46.1	98	15	75.9	8
9	26 14.2	99	15	76.5	26 43.8	98	15	76.4	27 13.3	98	15	76.3	28 12.4	98	15	76.1	30 10.5	98	15	75.7	32 08.5	98	15	75.3	32 38.0	98	15	75.1	33 37.0	98	15	74.9	9
100	26 05.1	99	15	75.5	26 34.7	99	15	75.4	27 04.2	98	15	75.3	28 03.3	98	15	75.1	30 01.4	98	15	74.7	31 59.5	98	15	74.3	32 29.0	98	15	74.2	33 27.9	98	15	74.0	100
1	25 56.0	99	15	74.5	26 25.6	99	15	74.4	26 55.2	99	15	74.3	27 54.2	98	15	74.1	29 52.4	98	15	73.7	31 50.5	98	15	73.3	32 20.0	98	15	73.2	33 18.9	98	15	73.0	1
2	25 47.0	99	15	73.6	26 16.6	99	15	73.5	26 46.1	99	15	73.4	27 45.2	98	15	73.2	29 43.4	98	15	72.8	31 41.5	98	15	72.4	32 11.0	98	15	72.3	33 10.0	98	15	72.0	2
3	25 38.0	99	15	72.6	26 07.6	99	15	72.5	26 37.2	99	15	72.4	27 36.3	99	15	72.2	29 34.5	98	15	71.8	31 32.6	98	15	71.4	32 02.1	98	15	71.3	33 01.1	98	15	71.1	3
4	25 29.1	99	15	71.6	25 58.7	99	15	71.5	26 28.2	99	15	71.4	27 27.4	99	15	71.3	29 25.6	98	15	70.9	31 23.7	98	15	70.5	31 53.2	98	15	70.4	32 52.2	98	15	70.1	4
105	25 20.2	99	15	70.7	25 49.8	99	15	70.6	26 19.4	99	15	70.5	27 18.5	99	15	70.3	29 16.7	98	15	69.9	31 14.9	98	15	69.5	31 44.4	98	15	69.4	32 43.4	98	15	69.2	105
6	25 11.4	99	15	69.7	25 41.0	99	15	69.6	26 10.6	99	15	69.5	27 09.7	99	15	69.3	29 07.9	99	15	68.9	31 06.1	98	15	68.5	31 35.6	98	15	68.4	32 34.7	98	14	68.2	6
7	25 02.6	99	15	68.7	25 32.2	99	15	68.7	26 01.8	99	14	68.6	27 00.9	99	14	68.4	28 59.2	99	14	68.0	30 57.4	98	14	67.6	31 26.9	98	14	67.5	32 26.0	98	14	67.3	7
8	24 53.9	99	14	67.8	25 23.5	99	14	67.7	25 53.1	99	14	67.6	26 52.2	99	14	67.4	28 50.5	99	14	67.0	30 48.8	98	14	66.6	31 18.3	98	14	66.5	32 17.4	98	14	66.3	8
9	24 45.2	99	14	66.8	25 14.8	99	14	66.7	25 44.4	99	14	66.6	26 43.6	99	14	66.5	28 41.9	99	14	66.1	30 40.2	99	14	65.7	31 09.7	98	14	65.6	32 08.8	98	14	65.4	9
110	24 36.6	99	14	65.9	25 06.2	99	14	65.8	25 35.8	99	14	65.7	26 35.0	99	14	65.5	28 33.4	99	14	65.1	30 31.6	99	14	64.7	31 01.2	99	14	64.6	32 00.3	98	14	64.4	110
1	24 28.1	99	14	64.9	24 57.7	99	14	64.8	25 27.3	99	14	64.7	26 26.5	99	14	64.6	28 24.9	99	14	64.2	30 23.2	99	14	63.8	30 52.8	99	14	63.7	31 51.9	99	14	63.5	1
2	24 19.6	99	14	64.0	24 49.3	99	14	63.9	25 18.9	99	14	63.8	26 18.1	99	14	63.6	28 16.5	99	14	63.2	30 14.8	99	14	62.8	30 44.4	99	14	62.8	31 43.5	99	14	62.6	2
3	24 11.2	99	14	63.0	24 40.9	99	14	62.9	25 10.5	99	14	62.8	26 09.7	99	14	62.6	28 08.1	99	14	62.3	30 06.5	99	14	61.9	30 36.1	99	14	61.8	31 35.2	99	14	61.6	3
4	24 02.9	99	14	62.0	24 32.5	99	14	62.0	25 02.2	99	14	61.9	26 01.4	99	14	61.7	27 59.9	99	14	61.3	29 58.2	99	14	61.0	30 27.8	99	14	60.9	31 27.0	99	14	60.7	4
115	23 54.7	99	14	61.1	24 24.3	99	14	61.0	24 53.9	99	14	60.9	25 53.2	99	14	60.7	27 51.7	99	14	60.4	29 50.1	99	14	60.0	30 19.7	99	13	59.9	31 18.9	99	13	59.7	115
6	23 46.5	99	14	60.1	24 16.1	99	14	60.0	24 45.8	99	13	60.0	25 45.0	99	13	59.8	27 43.5	99	13	59.4	29 42.0	99	13	59.1	30 11.6	99	13	59.0	31 10.8	99	13	58.8	6
7	23 38.4	99	13	59.2	24 08.0	99	13	59.1	24 37.7	99	13	59.0	25 37.0	99	13	58.8	27 35.5	99	13	58.5	29 34.0	99	13	58.1	30 03.6	99	13	58.0	31 02.8	99	13	57.9	7
8	23 30.4	99	13	58.2	24 00.0	99	13	58.1	24 29.7	99	13	58.1	25 29.0	99	13	57.9	27 27.5	99	13	57.5	29 26.0	99	13	57.2	29 55.7	99	13	57.1	30 54.9	99	13	56.9	8
9	23 22.4	99	13	57.3	23 52.1	99	13	57.2	24 21.8	99	13	57.1	25 21.1	99	13	56.9	27 19.7	99	13	56.6	29 18.2	99	13	56.3	29 47.8	99	13	56.2	30 47.1	99	13	56.0	9
120	23 14.6	99	13	56.3	23 44.2	99	13	56.2	24 13.9	99	13	56.2	25 13.2	99	13	56.0	27 11.9	99	13	55.7	29 10.4	99	13	55.3	29 40.1	99	13	55.2	30 39.3	99	13	55.0	120
1	23 06.8	99	13	55.4	23 36.5	99	13	55.3	24 06.2	99	13	55.2	25 05.5	99	13	55.1	27 04.2	99	13	54.7	29 02.8	99	13	54.4	29 32.4	99	13	54.3	30 31.7	99	13	54.1	1
2	22 59.1	99	13	54.4	23 28.8	99	13	54.3	23 58.5	99	13	54.3	24 57.9	99	13	54.1	26 56.5	99	13	53.8	28 55.2	99	12	53.4	29 24.8	99	12	53.4	30 24.1	99	12	53.2	2
3	22 51.5	99	12	53.5	23 21.2	99	12	53.4	23 50.9	99	12	53.3	24 50.3	99	12	53.2	26 49.0	99	12	52.8	28 47.7	99	12	52.5	29 17.3	99	12	52.4	30 16.7	99	12	52.2	3
4	22 44.0	99	12	52.5	23 13.7	99	12	52.5	23 43.4	99	12	52.4	24 42.8	99	12	52.2	26 41.6	99	12	51.9	28 40.3	99	12	51.6	29 10.0	99	12	51.5	30 09.3	99	12	51.3	4
125	22 36.6	99	12	51.6	23 06.3	99	12	51.5	23 36.1	99	12	51.4	24 35.5	99	12	51.3	26 34.2	99	12	51.0	28 33.0	99	12	50.6	29 02.7	99	12	50.6	30 02.0	99	12	50.4	125
6	22 29.3	99	12	50.6	22 59.1	99	12	50.6	23 28.8	99	12	50.5	24 28.2	99	12	50.3	26 27.0	99	12	50.0	28 25.8	99	12	49.7	28 55.5	99	12	49.6	29 54.8	99	12	49.5	6
7	22 22.1	99	12	49.7	22 51.9	99	12	49.6	23 21.6	99	12	49.5	24 21.0	99	12	49.4	26 19.9	99	12	49.1	28 18.7	99	12	48.8	28 48.4	99	12	48.7	29 47.7	99	12	48.5	7
8	22 15.0	99	12	48.7	22 44.8	99	12	48.7	23 14.5	99	12	48.6	24 13.9	99	12	48.5	26 12.8	99	12	48.1	28 11.7	99	12	47.8	28 41.4	99	12	47.8	29 40.8	99	11	47.6	8
9	22 08.0	99	12	47.8	22 37.8	99	11	47.7	23 07.5	99	11	47.7	24.07.0	99	11	47.5	26 05.9	99	11	47.2	28 04.8	99	11	46.9	28 34.5	99	11	46.8	29 33.9	99	11	46.7	9
130	22 01.1	99	11	46.9	22 30.9	99	11	46.8	23 00.6	99	11	46.7	24 00.1	99	11	46.6	25 59.0	99	11	46.3	27 58.0	99	11	46.0	28 27.7	99	11	45.9	29 27.1	99	11	45.7	130
1	21 54.3	99	11	45.9	22 24.1	99	11	45.8	22 53.8	99	11	45.8	23 53.3	99	11	45.6	25 52.3	99	11	45.3	27 51.3	99	11	45.0	28 21.0	99	11	45.0	29 20.4	99	11	44.8	1
2	21 47.6	99	11	45.0	22 17.4	99	11	44.9	22 47.2	99	11	44.8	23 46.7	99	11	44.7	25 45.7	99	11	44.4	27 44.7	99	11	44.1	28 14.4	99	11	44.0	29 13.9	99	11	43.9	2
3	21 41.1	99	11	44.0	22 10.8	99	11	44.0	22 40.6	99	11	43.9	23 40.1	99	11	43.8	25 39.2	99	11	43.5	27 38.2	99	11	43.2	28 07.9	99	11	43.1	29 07.4	99	11	43.0	3
4	21 34.6	99	11	43.1	22 04.4	99	11	43.0	22 34.1	99	11	42.9	23 33.7	99	11	42.8	25 32.8	99	10	42.5	27 31.8	99	10	42.3	28 01.6	99	10	42.2	29 01.1	99	10	42.0	4
135	21 28.2	99	10	42.1	21 58.0	99	10	42.1	22 27.8	99	10	42.0	23 27.4	99	10	41.9	25 26.5	99	10	41.6	27 25.6	99	10	41.3	27 55.3	99	10	41.3	28 54.9	99	10	41.1	135
6	21 22.0	99	10	41.2	21 51.8	99	10	41.1	22 21.6	99	10	41.1	23 21.2	99	10	40.9	25 20.3	99	10	40.7	27 19.4	99	10	40.4	27 49.2	99	10	40.3	28 48.7	99	10	40.2	6
7	21 15.9	99	10	40.3	21 45.7	99	10	40.2	22 15.5	99	10	40.1	23 15.1	99	10	40.0	25 14.2	99	10	39.7	27 13.4	99	10	39.5	27 43.2	99	10	39.4	28 42.7	99	10	39.3	7
8	21 09.9	99	10	39.3	21 39.7	99	10	39.3	22 09.5	99	10	39.2	23 09.1	99	10	39.1	25 08.3	99	10	38.8	27 07.5	99	10	38.6	27 37.3	99	10	38.5	28 36.9	99	10	38.4	8
9	21 04.0	99	10	38.4	21 33.8	99	10	38.3	22 03.6	99	10	38.3	23 03.2	99	10	38.1	25 02.5	99	10	37.9	27 01.7	99	09	37.6	27 31.5	99	09	37.6	28 31.1	99	09	37.4	9
140	20 58.2	99	09	37.4	21 28.0	99	09	37.4	21 57.9	99	09	37.3	22 57.5	99	09	37.2	24 56.8	99	09	37.0	26 56.0	99	09	36.7	27 25.8	99	09	36.6	28 25.4	99	09	36.5	140
1	20 52.6	99	09	36.5	21 22.4	99	09	36.4	21 52.2	99	09	36.4	22 51.9	99	09	36.3	24 51.2	99	09	36.0	26 50.5	99	09	35.8	27 20.3	99	09	35.7	28 19.9	99	09	35.6	1
2	20 47.1	99	09	35.6	21 16.9	99	09	35.5	21 46.7	99	09	35.4	22 46.4	99	09	35.3	24 45.7	99	09	35.1	26 45.0	99	09	34.9	27 14.9	99	09	34.8	28 14.5	99	09	34.7	2
3	20 41.7	99	09	34.6	21 11.5	99	09	34.6	21 41.3	99	09	34.5	22 41.0	99	09	34.4	24 40.4	99	09	34.2	26 39.7	99	09	33.9	27 09.6	99	09	33.9	28 09.2	99	09	33.8	3
4	20 36.4	1.0	09	33.7	21 06.2	1.0	09	33.6	21 36.1	1.0	09	33.6	22 35.8	1.0	09	33.5	24 35.2	99	08	33.2	26 34.6	99	08	33.0	27 04.4	99	08	33.0	28 04.1	99	08	32.8	4
145	20 31.2	1.0	08	32.7	21 01.1	1.0	08	32.7	21 31.0	1.0	08	32.6	22 30.7	1.0	08	32.5	24 30.1	1.0	08	32.3	26 29.5	99	08	32.1	26 59.4	99	08	32.0	27 59.1	99	08	31.9	145
6	20 26.2	1.0	08	31.8	20 56.1	1.0	08	31.7	21 26.0	1.0	08	31.7	22 25.7	1.0	08	31.6	24 25.2	1.0	08	31.4	26 24.6	1.0	08	31.2	26 54.5	1.0	08	31.1	27 54.2	1.0	08	31.0	6
7	20 21.4	1.0	08	30.9	20 51.2	1.0	08	30.8	21 21.1	1.0	08	30.8	22 20.9	1.0	08	30.7	24 20.3	1.0	08	30.5	26 19.8	1.0	08	30.3	26 49.7	1.0	08	30.2	27 49.4	1.0	08	30.1	7
8	20 16.6	1.0	08	29.9	20 46.5	1.0	08	29.9	21 16.4	1.0	08	29.8	22 16.1	1.0	08	29.7	24 15.6	1.0	08	29.5	26 15.1	1.0	08	29.3	26 45.0	1.0	08	29.3	27 44.7	1.0	08	29.2	8
9	20 12.0	1.0	07	29.0	20 41.9	1.0	07	28.9	21 11.8	1.0	07	28.9	22 11.5	1.0	07	28.8	24 11.1	1.0	07	28.6	26 10.6	1.0	07	28.4	26 40.5	1.0	07	28.4	27 40.2	1.0	07	28.3	9
150	20 07.5	1.0	07	28.0	20 37.4	1.0	07	28.0	21 07.3	1.0	07	28.0	22 07.1	1.0	07	27.9	24 06.7	1.0	07	27.7	26 06.2	1.0	07	27.5	26 36.1	1.0	07	27.4	27 35.9	1.0	07	27.3	150
1	20 03.2	1.0	07	27.1	20 33.1	1.0	07	27.1	21 03.0	1.0	07	27.0	22 02.8	1.0	07	26.9	24 02.4	1.0	07	26.8	26 01.9	1.0	07	26.6	26 31.8	1.0	07	26.5	27 31.6	1.0	07	26.4	1
2	19 59.0	1.0	07	26.2	20 28.9	1.0	07	26.1	20 58.8	1.0	07	26.1	21 58.6	1.0	07	26.0	23 58.2	1.0	07	25.8	25 57.8	1.0	07	25.7	26 27.7	1.0	07	25.6	27 27.5	1.0	07	25.5	2
3	19 54.9	1.0	07	25.2	20 24.8	1.0	07	25.2	20 54.7	1.0	07	25.2	21 54.5	1.0	06	25.1	23 54.2	1.0	06	24.9	25 53.8	1.0	06	24.7	26 23.7	1.0	06	24.7	27 23.5	1.0	06	24.6	3
4	19 51.0	1.0	06	24.3	20 20.9	1.0	06	24.3	20 50.8	1.0	06	24.2	21 50.6	1.0	06	24.1	23 50.3	1.0	06	24.0	25 50.0	1.0	06	23.8	26 19.9	1.0	06	23.8	27 19.7	1.0	06	23.7	4
155	19 47.2	1.0	06	23.4	20 17.1	1.0	06	23.3	20 47.0	1.0	06	23.3	21 46.9	1.0	06	23.2	23 46.6	1.0	06	23.1	25 46.2	1.0	06	22.9	26 16.2	1.0	06	22.9	27 16.0	1.0	06	22.8	155
6	19 43.5	1.0	06	22.4	20 13.4	1.0	06	22.4	20 43.4	1.0	06	22.4	21 43.2	1.0	06	22.3	23 43.0	1.0	06	22.1	25 42.7	1.0	06	22.0	26 12.6	1.0	06	21.9	27 12.4	1.0	06	21.9	6
7	19 40.0	1.0	06	21.5	20 09.9	1.0	06	21.5	20 39.9	1.0	06	21.4	21 39.7	1.0	06	21.4	23 39.5	1.0	06	21.2	25 39.2	1.0	06	21.1	26 09.1	1.0	06	21.0	27 09.0	1.0	05	20.9	7
8	19 36.6	1.0	05	20.6	20 06.6	1.0	05	20.5	20 36.5	1.0	05	20.5	21 36.4	1.0	05	20.4	23 36.2	1.0	05	20.3	25 35.9	1.0	05	20.1	26 05.8	1.0	05	20.1	27 05.7	1.0	05	20.0	8
9	19 33.4	1.0	05	19.6	20 03.4	1.0	05	19.6	20 33.3	1.0	05	19.6	21 33.2	1.0	05	19.5	23 33.0	1.0	05	19.4	25 32.7	1.0	05	19.2	26 02.7	1.0	05	19.2	27 02.6	1.0	05	19.1	9
160	19 30.3	1.0	05	18.7	20 00.3	1.0	05	18.7	20 30.2	1.0	05	18.6	21 30.1	1.0	05	18.6	23 29.9	1.0	05	18.4	25 29.7	1.0	05	18.3	25 59.7	1.0	05	18.3	26 59.6	1.0	05	18.2	160
1	19 27.4	1.0	05	17.8	19 57.4	1.0	05	17.7	20 27.3	1.0	05	17.7	21 27.2	1.0	05	17.6	23 27.0	1.0	05	17.5	25 26.9	1.0	05	17.4	25 56.8	1.0	05	17.4	26 56.7	1.0	05	17.3	1
2	19 24.6	1.0	04	16.8	19 54.6	1.0	04	16.8	20 24.5	1.0	04	16.8	21 24.5	1.0	04	16.7	23 24.3	1.0	04	16.6	25 24.1	1.0	04	16.5	25 54.1	1.0	04	16.4	26 54.0	1.0	04	16.4	2
3	19 22.0	1.0	04	15.9	19 51.9	1.0	04	15.9	20 21.9	1.0	04	15.8	21 21.8	1.0	04	15.8	23 21.7	1.0	04	15.7	25 21.5	1.0	04	15.6	25 51.5	1.0	04	15.5	26 51.4	1.0	04	15.5	3
4	19 19.5	1.0	04	14.9	19 49.4	1.0	01	14.9	20 19.4	1.0	04	14.9	21 19.3	1.0	04	14.8	23 19.2	1.0	04	14.7	25 19.1	1.0	04	14.6	25 49.0	1.0	04	14.6	26 49.0	1.0	04	14.6	4
165	19 17.1	1.0	04	14.0	19 47.1	1.0	04	14.0	20 17.1	1.0	04	14.0	21 17.0	1.0	04	13.9	23 16.9	1.0	04	13.8	25 16.8	1.0	04	13.7	25 46.8	1.0	04	13.7	26 46.7	1.0	04	13.7	165
6	19 14.9	1.0	03	13.1	19 44.9	1.0	03	13.1	20 14.9	1.0	03	13.0	21 14.8	1.0	03	13.0	23 14.7	1.0	03	12.9	25 14.6	1.0	03	12.8	25 44.6	1.0	03	12.8	26 44.5	1.0	03	12.7	6
7	19 12.9	1.0	03	12.1	19 42.9	1.0	03	12.1	20 12.8	1.0	03	12.1	21 12.8	1.0	03	12.1	23 12.7	1.0	03	12.0	25 12.6	1.0	03	11.9	25 42.6	1.0	03	11.9	26 42.5	1.0	03	11.8	7
8	19 11.0	1.0	03	11.2	19 41.0	1.0	03	11.2	20 10.9	1.0	03	11.2	21 10.9	1.0	03	11.1	23 10.8	1.0	03	11.1	25 10.8	1.0	03	11.0	25 40.7	1.0	03	11.0	26 40.7	1.0	03	10.9	8
9	19 09.2	1.0	03	10.3	19 39.2	1.0	03	10.3	20 09.2	1.0	03	10.2	21 09.2	1.0	03	10.2	23 09.1	1.0	03	10.1	25 09.0	1.0	03	10.1	25 39.0	1.0	03	10.0	26 39.0	1.0	03	10.0	9
170	19 07.6	1.0	02	09.3	19 37.6	1.0	02	09.3	20 07.6	1.0	02	09.3	21 07.6	1.0	02	09.3	23 07.5	1.0	02	09.2	25 07.5	1.0	02	09.1	25 37.5	1.0	02	09.1	26 37.4	1.0	02	09.1	170
1	19 06.2	1.0	02	08.4	19 36.2	1.0	02	08.4	20 06.2	1.0	02	08.4	21 06.1	1.0	02	08.3	23 06.1	1.0	02	08.3	25 06.1	1.0	02	08.2	25 36.0	1.0	02	08.2	26 36.0	1.0	02	08.2	1
2	19 04.9	1.0	02	07.5	19 34.9	1.0	02	07.5	20 04.9	1.0	02	07.4	21 04.9	1.0	02	07.4	23 04.8	1.0	02	07.4	25 04.8	1.0	02	07.3	25 34.8	1.0	02	07.3	26 34.8	1.0	02	07.3	2
3	19 03.7	1.0	02	06.5	19 33.7	1.0	02	06.5	20 03.7	1.0	02	06.5	21 03.7	1.0	02	06.5	23 03.7	1.0	02	06.4	25 03.7	1.0	02	06.4	25 33.7	1.0	02	06.4	26 33.6	1.0	02	06.4	3
4	19 02.8	1.0	01	05.6	19 32.7	1.0	01	05.6	20 02.7	1.0	01	05.6	21 02.7	1.0	01	05.6	23 02.7	1.0	01	05.5	25 02.7	1.0	01	05.5	25 32.7	1.0	01	05.5	26 32.7	1.0	01	05.5	4
175	19 01.9	1.0	01	04.7	19 31.9	1.0	01	04.7	20 01.9	1.0	01	04.7	21 01.9	1.0	01	04.6	23 01.9	1.0	01	04.6	25 01.9	1.0	01	04.6	25 31.9	1.0	01	04.6	26 31.9	1.0	01	04.5	175
6	19 01.2	1.0	01	03.7	19 31.2	1.0	01	03.7	20 01.2	1.0	01	03.7	21 01.2	1.0	01	03.7	23 01.2	1.0	01	03.7	25 01.2	1.0	01	03.7	25 31.2	1.0	01	03.7	26 31.2	1.0	01	03.6	6
7	19 00.7	1.0	01	02.8	19 30.7	1.0	01	02.8	20 00.7	1.0	01	02.8	21 00.7	1.0	01	02.8	23 00.7	1.0	01	02.8	25 00.7	1.0	01	02.7	25 30.7	1.0	01	02.7	26 30.7	1.0	01	02.7	7
8	19 00.3	1.0	00	01.9	19 30.3	1.0	00	01.9	20 00.3	1.0	00	01.9	21 00.3	1.0	00	01.9	23 00.3	1.0	00	01.8	25 00.3	1.0	00	01.8	25 30.3	1.0	00	01.8	26 30.3	1.0	00	01.8	8
9	19 00.1	1.0	00	00.9	19 30.1	1.0	00	00.9	20 00.1	1.0	00	00.9	21 00.1	1.0	00	00.9	23 00.1	1.0	00	00.9	25 00.1	1.0	00	00.9	25 30.1	1.0	00	00.9	26 30.1	1.0	00	00.9	9
180	19 00.0	1.0	00	00.0	19 30.0	1.0	00	00.0	20 00.0	1.0	00	00.0	21 00.0	1.0	00	00.0	23 00.0	1.0	00	00.0	25 00.0	1.0	00	00.0	25 30.0	1.0	00	00.0	26 30.0	1.0	00	00.0	180

H.A.	36° 00' Alt. Δd Δt Az.	37° 00' Alt. Δd Δt Az.	38° 30' Alt. Δd Δt Az.	40° 00' Alt. Δd Δt Az.	42° 00' Alt. Δd Δt Az.	42° 30' Alt. Δd Δt Az.	43° 00' Alt. Δd Δt Az.	45° 00' Alt. Δd Δt Az.	H.A.
00	45 00.0 1 00 180.0	46 00.0 1 00 180.0	47 30.0 1 00 180.0	49 00.0 1 00 180.0	51 00.0 1 00 180.0	51 30.0 1 00 180.0	52 00.0 1 00 180.0	54 00.0 1 00 180.0	00
1	44 59.9 1 00 178.9	45 59.9 1 00 178.9	47 29.9 1 00 178.8	48 59.9 1 00 178.8	50 59.9 1 00 178.8	51 29.9 1 00 178.8	51 59.9 1 00 178.8	53 59.9 1 00 178.8	1
2	44 59.6 1 01 177.7	45 59.6 1 01 177.7	47 29.6 1 01 177.7	48 59.6 1 01 177.7	50 59.6 1 01 177.6	51 29.6 1 01 177.6	51 59.6 1 01 177.6	53 59.6 1 01 177.6	2
3	44 59.2 1 01 176.6	45 59.2 1 01 176.6	47 29.1 1 01 176.5	48 59.1 1 01 176.5	50 59.1 1 01 176.5	51 29.1 1 01 176.4	51 59.1 1 01 176.4	53 59.1 1 01 176.4	3
4	44 58.5 1 01 175.4	45 58.5 1 01 175.4	47 28.5 1 01 175.4	48 58.5 1 01 175.3	50 58.5 1 01 175.3	51 28.4 1 01 175.3	51 58.4 1 01 175.2	53 58.4 1 02 175.2	4
05	44 57.7 1 02 174.3	45 57.6 1 02 174.3	47 27.6 1 02 174.2	48 57.6 1 02 174.2	50 57.6 1 02 174.1	51 27.6 1 02 174.1	51 57.6 1 02 174.1	53 57.5 1 02 174.0	05
6	44 56.6 1 02 173.1	45 56.6 1 02 173.1	47 26.6 1 02 173.1	48 56.6 1 02 173.0	50 56.5 1 02 172.9	51 26.5 1 02 172.9	51 56.5 1 02 172.9	53 56.5 1 02 172.8	6
7	44 55.4 1 02 172.0	45 55.4 1 02 172.0	47 25.4 1 02 171.9	48 55.3 1 02 171.8	50 55.3 1 02 171.7	51 25.3 1 02 171.7	51 55.2 1 02 171.7	53 55.2 1 02 171.6	7
8	44 54.0 1 03 170.8	45 54.0 1 03 170.8	47 23.9 1 03 170.7	48 53.9 1 03 170.7	50 53.8 1 03 170.6	51 23.8 1 03 170.5	51 53.8 1 03 170.5	53 53.7 1 03 170.4	8
9	44 52.4 1 03 169.7	45 52.4 1 03 169.7	47 22.3 1 03 169.6	48 52.3 1 03 169.5	50 52.2 1 03 169.4	51 22.2 1 03 169.4	51 52.1 1 03 169.3	53 52.0 1 03 169.2	9
10	44 50.7 1 03 168.6	45 50.6 1 03 168.5	47 20.5 1 03 168.4	48 50.5 1 03 168.3	50 50.4 1 03 168.2	51 20.3 1 03 168.2	51 50.3 1 03 168.1	53 50.2 1 03 168.0	10
1	44 48.7 1 04 167.4	45 48.7 1 04 167.4	47 18.6 1 04 167.3	48 48.5 1 04 167.2	50 48.4 1 04 167.0	51 18.3 1 04 167.0	51 48.3 1 04 167.0	53 48.1 1 04 166.8	1
2	44 46.6 1 04 166.3	45 46.5 1 04 166.2	47 16.4 1 04 166.1	48 46.3 1 04 166.0	50 46.2 1 04 165.9	51 16.1 1 04 165.8	51 46.1 1 04 165.8	53 45.9 1 04 165.6	2
3	44 44.3 1 04 165.1	45 44.2 1 04 165.1	47 14.1 1 04 165.0	48 43.9 1 04 164.7	50 43.8 1 04 164.7	51 13.7 1 04 164.6	51 43.7 1 04 164.6	53 43.5 1 04 164.4	3
4	44 41.8 1 04 164.0	45 41.7 1 04 163.9	47 11.6 1 04 163.8	48 41.4 1 05 163.7	50 41.2 1 05 163.5	51 11.1 1 05 163.5	51 41.1 1 05 163.4	53 40.9 1 05 163.2	4
15	44 39.1 1 05 162.9	45 39.0 1 05 162.8	47 08.8 1 05 162.7	48 38.7 1 05 162.5	50 38.4 1 05 162.3	51 08.4 1 05 162.3	51 38.3 1 05 162.2	53 38.1 1 05 162.0	15
6	44 36.2 1 05 161.7	45 36.1 1 05 161.7	47 06.0 1 05 161.5	48 35.8 1 05 161.4	50 35.5 1 05 161.2	51 05.4 1 05 161.1	51 35.4 1 05 161.1	53 35.1 1 05 160.8	6
7	44 33.2 1 05 160.6	45 33.1 1 05 160.5	47 02.9 1 05 160.4	48 32.7 1 05 160.2	50 32.4 1 06 160.0	51 02.3 1 06 160.0	51 32.2 1 06 159.9	53 31.9 1 06 159.6	7
8	44 30.0 1 06 159.5	45 29.9 1 06 159.4	46 59.7 1 06 159.2	48 29.4 1 06 159.1	50 29.1 1 06 158.8	50 59.0 1 06 158.8	51 28.9 1 06 158.7	53 28.5 1 06 158.5	8
9	44 26.6 1 06 158.4	45 26.5 1 06 158.2	46 56.2 1 06 158.1	48 26.0 1 06 157.9	50 25.6 1 06 157.7	50 55.5 1 06 157.6	51 25.4 1 06 157.6	53 25.0 1 06 157.3	9
20	44 23.1 1 06 157.2	45 22.9 1 06 157.1	46 52.7 1 06 156.9	48 22.4 1 06 156.8	50 22.0 1 06 156.5	50 51.9 1 06 156.5	51 21.7 1 06 156.4	53 21.3 1 06 156.1	20
1	44 19.4 1 06 156.1	45 19.2 1 07 156.0	46 48.9 1 07 155.8	48 18.6 1 07 155.6	50 18.1 1 07 155.4	50 48.0 1 07 155.3	51 17.9 1 07 155.2	53 17.4 1 07 154.9	1
2	44 15.5 1 07 155.0	45 15.3 1 07 154.9	46 45.0 1 07 154.7	48 14.6 1 07 154.5	50 14.1 1 07 154.2	50 44.0 1 07 154.1	51 13.8 1 07 154.1	53 13.3 1 07 153.7	2
3	44 11.4 1 07 153.8	45 11.2 1 07 153.7	46 40.9 1 07 153.5	48 10.5 1 07 153.3	50 10.0 1 07 153.0	50 39.8 1 07 153.0	51 09.7 1 07 152.9	53 09.1 1 07 152.6	3
4	44 07.2 1 07 152.7	45 07.0 1 07 152.6	46 36.6 1 07 152.4	48 06.2 1 07 152.2	50 05.6 1 08 151.9	50 35.5 99 08 151.8	51 05.3 99 08 151.7	53 04.7 99 08 151.4	4
25	44 02.8 1 08 151.6	45 02.6 1 08 151.5	46 32.2 1 08 151.3	48 01.7 1 08 151.0	50 01.1 99 08 150.7	50 31.0 99 08 150.7	51 00.8 99 08 150.6	53 00.1 99 08 150.2	25
6	43 58.3 1 08 150.5	44 58.0 1 08 150.3	46 27.6 1 08 150.1	47 57.1 99 08 149.9	49 56.5 99 08 149.6	50 26.3 99 08 149.5	50 56.1 99 08 149.4	52 55.4 99 08 149.1	6
7	43 53.6 1 08 149.4	44 53.3 1 08 149.2	46 22.8 99 08 149.0	47 52.3 99 08 148.8	49 51.6 99 08 148.4	50 21.4 99 08 148.4	50 51.2 99 08 148.3	52 50.4 99 08 147.9	7
8	43 48.7 99 09 148.2	44 48.4 99 08 148.1	46 17.9 99 08 147.9	47 47.4 99 09 147.6	49 46.6 99 09 147.3	50 16.4 99 09 147.2	50 46.2 99 09 147.1	52 45.4 99 09 146.7	8
9	43 43.7 99 09 147.1	44 43.4 99 09 147.0	46 12.8 99 09 146.7	47 42.3 99 09 146.5	49 41.5 99 09 146.2	50 11.3 99 09 146.1	50 41.1 99 09 146.0	52 40.2 99 09 145.6	9
30	43 38.5 99 09 146.0	44 38.2 99 09 145.9	46 07.6 99 09 145.6	47 37.0 99 09 145.4	49 36.2 99 09 145.0	50 06.0 99 09 144.9	50 35.7 99 09 144.8	52 34.8 99 09 144.4	30
1	43 33.2 99 09 144.9	44 32.8 99 09 144.7	46 02.2 99 09 144.5	47 31.6 99 09 144.2	49 30.7 99 09 143.9	50 00.5 99 09 143.8	50 30.2 99 09 143.7	52 29.2 99 09 143.3	1
2	43 27.7 99 09 143.6	44 27.3 99 09 143.6	45 56.7 99 09 143.4	47 26.0 99 10 143.1	49 25.1 99 10 142.7	49 54.9 99 10 142.6	50 24.6 99 10 142.5	52 23.5 99 10 142.1	2
3	43 22.1 99 10 142.7	44 21.7 99 10 142.5	45 51.0 99 10 142.3	47 20.3 99 10 142.0	49 19.4 99 10 141.6	49 49.1 99 10 141.5	50 18.8 99 10 141.4	52 17.7 99 10 141.0	3
4	43 16.4 99 10 141.6	44 15.9 99 10 141.4	45 45.2 99 10 141.2	47 14.5 99 10 140.9	49 13.5 99 10 140.5	49 43.2 99 10 140.4	50 12.9 99 10 140.3	52 11.7 99 10 139.8	4
35	43 10.5 99 10 140.5	44 10.0 99 10 140.3	45 39.3 99 10 140.0	47 08.5 99 10 139.8	49 07.4 99 10 139.4	49 37.1 99 10 139.3	50 06.8 99 10 139.1	52 05.6 99 10 138.7	35
6	43 04.4 99 10 139.4	44 03.9 99 10 139.2	45 33.2 99 10 138.8	47 02.4 99 10 138.6	49 01.2 99 11 138.2	49 30.9 99 11 138.1	50 00.6 99 11 138.0	51 59.3 99 11 137.6	6
7	42 58.2 99 11 138.1	43 57.7 99 11 138.1	45 26.9 99 11 137.8	46 56.1 99 11 137.5	48 54.9 99 11 137.1	49 24.6 99 11 137.0	49 54.3 99 11 136.8	51 52.9 99 11 136.4	7
8	42 51.9 99 11 137.2	43 51.4 99 11 137.0	45 20.6 99 11 136.7	46 49.7 99 11 136.4	48 48.5 99 11 136.0	49 18.1 99 11 135.9	49 47.8 99 11 135.8	51 46.4 99 11 135.3	8
9	42 45.5 99 11 136.1	43 44.9 99 11 135.9	45 14.1 99 11 135.6	46 43.2 99 11 135.3	48 41.9 99 11 134.9	49 11.5 99 11 134.8	49 41.2 99 11 134.7	51 39.7 99 11 134.2	9
40	42 38.9 99 11 135.0	43 38.3 99 11 134.8	45 07.4 99 11 134.5	46 36.5 99 11 134.2	48 35.2 99 11 133.8	49 04.8 99 11 133.7	49 34.4 99 11 133.5	51 32.9 99 12 133.0	40
1	42 32.2 99 11 133.9	43 31.6 99 11 133.7	45 00.7 99 11 133.4	46 29.7 99 12 133.1	48 28.3 99 12 132.7	48 57.9 99 12 132.5	49 27.6 99 12 132.4	51 26.0 99 12 131.9	1
2	42 25.4 99 12 132.8	43 24.8 99 12 132.6	44 53.8 99 12 132.3	46 22.8 99 12 132.0	48 21.3 99 12 131.6	48 51.0 99 12 131.4	49 20.6 99 12 131.3	51 19.0 99 12 130.8	2
3	42 18.4 99 12 131.7	43 17.8 99 12 131.6	44 46.8 99 12 131.2	46 15.8 99 12 130.9	48 14.3 99 12 130.5	48 43.9 99 12 130.3	49 13.5 99 12 130.2	51 11.8 99 12 129.7	3
4	42 11.4 99 12 130.7	43 10.7 99 12 130.5	44 39.7 99 12 130.2	46 08.6 99 12 129.8	48 07.1 99 12 129.4	48 36.7 99 12 129.2	49 06.2 99 12 129.1	51 04.5 98 12 128.6	4
45	42 04.2 99 12 129.6	43 03.5 99 12 129.4	44 32.5 99 12 129.1	46 01.3 99 12 128.7	47 59.7 99 12 128.3	48 29.3 99 12 128.1	48 58.9 99 12 128.0	50 57.1 98 12 127.5	45
6	41 56.9 99 12 128.5	42 56.2 99 12 128.3	44 25.1 99 12 128.0	45 54.0 99 12 127.6	47 52.3 99 13 127.2	48 21.9 99 13 127.0	48 51.5 99 13 126.9	50 49.6 98 13 126.4	6
7	41 49.5 99 13 127.4	42 48.8 99 13 127.2	44 17.7 99 13 126.9	45 46.5 99 13 126.6	47 44.8 99 13 126.1	48 14.3 99 13 125.9	48 43.9 99 13 125.8	50 42.0 98 13 125.3	7
8	41 42.0 99 13 126.4	42 41.3 99 13 126.2	44 10.1 99 13 125.8	45 38.9 99 13 125.5	47 37.2 99 13 125.0	48 06.7 98 13 124.9	48 36.2 99 13 124.7	50 34.3 98 13 124.2	8
9	41 34.4 99 13 125.3	42 33.6 99 13 125.1	44 02.4 99 13 124.7	45 31.2 99 13 124.4	47 29.4 99 13 123.9	47 58.9 99 13 123.8	48 28.5 99 13 123.6	50 26.5 98 13 123.1	9
50	41 26.7 99 13 124.2	42 25.9 99 13 124.0	43 54.7 99 13 123.7	45 23.4 99 13 123.3	47 21.6 99 13 122.8	47 51.1 98 13 122.7	48 20.6 98 13 122.6	50 18.6 98 13 122.0	50
1	41 18.9 99 13 123.2	42 18.1 99 13 122.9	43 46.8 99 13 122.6	45 15.5 98 13 122.2	47 13.6 99 13 121.7	47 43.1 98 13 121.6	48 12.6 98 13 121.5	50 10.6 98 14 120.9	1
2	41 11.0 99 13 122.1	42 10.2 99 13 121.9	43 38.9 99 13 121.5	45 07.5 99 13 121.2	47 05.6 99 14 120.7	47 35.1 98 14 120.5	48 04.6 98 14 120.4	50 02.5 98 14 119.8	2
3	41 03.0 99 13 121.0	42 02.1 99 14 120.8	43 30.8 99 14 120.5	44 59.4 99 14 120.1	46 57.5 99 14 119.6	47 27.0 98 14 119.5	47 56.5 98 14 119.3	49 54.3 98 14 118.7	3
4	40 54.9 99 14 120.0	41 54.0 99 14 119.8	43 22.7 99 14 119.4	44 51.3 99 14 119.0	46 49.3 98 14 118.5	47 18.8 98 14 118.4	47 48.2 98 14 118.2	49 46.0 98 14 117.7	4
55	40 46.7 99 14 118.9	41 45.8 99 14 118.7	43 14.5 99 14 118.4	44 43.0 98 14 118.0	46 41.0 98 14 117.5	47 10.5 98 14 117.3	47 39.9 98 14 117.2	49 37.6 98 14 116.6	55
6	40 38.5 99 14 117.9	41 37.6 98 14 117.7	43 06.2 99 14 117.3	44 34.7 98 14 116.9	46 32.6 98 14 116.4	47 02.1 98 14 116.3	47 31.5 98 14 116.1	49 29.2 98 14 115.5	6
7	40 30.1 98 14 116.8	41 29.2 98 14 116.6	42 57.8 98 14 116.2	44 26.3 98 14 115.9	46 24.2 98 14 115.3	46 53.6 98 14 115.2	47 23.1 98 14 115.1	49 20.7 98 14 114.5	7
8	40 21.7 98 14 115.8	41 20.8 98 14 115.6	42 49.3 98 14 115.2	44 17.8 98 14 114.8	46 15.7 98 14 114.3	46 45.1 98 14 114.1	47 14.5 98 14 114.0	49 12.1 98 14 113.4	8
9	40 13.2 98 14 114.7	41 12.3 98 14 114.5	42 40.8 98 14 114.1	44 09.3 98 14 113.8	46 07.1 98 14 113.2	46 36.5 98 14 113.1	47 05.9 98 14 112.9	49 03.5 98 15 112.3	9
60	40 04.7 98 14 113.7	41 03.7 98 14 113.5	42 32.2 98 14 113.1	44 00.6 98 14 112.7	45 58.4 98 15 112.2	46 27.8 98 15 112.0	46 57.2 98 15 111.9	48 54.8 98 15 111.3	60
1	39 56.0 98 14 112.6	40 55.0 98 15 112.4	42 23.5 98 15 112.1	43 51.9 98 15 111.7	45 49.7 98 15 111.1	46 19.1 98 15 111.0	46 48.4 98 15 110.8	48 46.0 98 15 110.2	1
2	39 47.3 98 15 111.6	40 46.4 98 15 111.4	42 14.8 98 15 111.0	43 43.2 98 15 110.6	45 40.9 98 15 110.1	46 10.3 98 15 109.9	46 39.7 98 15 109.8	48 37.2 98 15 109.2	2
3	39 38.6 98 15 110.6	40 37.6 98 15 110.4	42 06.0 98 15 110.0	43 34.4 98 15 109.6	45 32.1 98 15 109.0	46 01.5 98 15 108.9	46 30.8 98 15 108.8	48 28.3 98 15 108.1	3
4	39 29.8 98 15 109.6	40 28.8 98 15 109.3	41 57.2 98 15 108.9	43 25.5 98 15 108.6	45 23.2 98 15 108.0	45 52.5 98 15 107.9	46 21.9 98 15 107.7	48 19.3 98 15 107.1	4
65	39 20.9 98 15 108.5	40 19.9 98 15 108.3	41 48.3 98 15 107.9	43 16.6 98 15 107.5	45 14.2 98 15 107.0	45 43.6 98 15 106.8	46 13.0 98 15 106.7	48 10.3 98 15 106.1	65
6	39 12.0 98 15 107.5	40 10.9 98 15 107.3	41 39.3 98 15 106.9	43 07.6 98 15 106.5	45 05.2 98 15 105.9	45 34.6 98 15 105.8	46 03.9 98 15 105.6	48 01.3 98 15 105.0	6
7	39 03.0 98 15 106.5	40 01.9 98 15 106.2	41 30.3 98 15 105.9	42 58.6 98 15 105.5	44 56.2 98 15 104.9	45 25.5 98 15 104.8	45 54.9 98 15 104.6	47 52.2 98 15 104.0	7
8	38 54.0 98 15 105.5	39 52.9 98 15 105.2	41 21.3 98 15 104.8	42 49.5 98 15 104.4	44 47.1 98 15 103.9	45 16.4 98 15 103.7	45 45.8 98 15 103.6	47 43.1 98 15 103.0	8
9	38 44.9 98 15 104.4	39 43.8 98 15 104.2	41 12.2 98 15 103.8	42 40.4 98 15 103.4	44 37.9 98 15 102.9	45 07.3 98 15 102.7	45 36.6 98 15 102.6	47 33.9 98 15 101.9	9
70	38 35.8 98 15 103.4	39 34.7 98 15 103.2	41 03.0 98 15 102.8	42 31.3 98 15 102.4	44 28.8 98 15 101.8	44 58.1 98 15 101.7	45 27.5 98 15 101.5	47 24.7 98 15 100.9	70
1	38 26.7 98 15 102.4	39 25.6 98 15 102.2	40 53.9 98 15 101.8	42 22.1 98 15 101.4	44 19.6 98 15 100.8	44 48.9 98 15 100.7	45 18.2 98 15 100.5	47 15.5 98 15 99.9	1
2	38 17.5 98 15 101.4	39 16.4 98 15 101.1	40 44.6 98 15 100.8	42 12.9 98 15 100.4	44 10.3 98 15 99.8	44 39.7 98 15 99.7	45 09.0 98 15 99.5	47 06.2 98 16 98.9	2
3	38 08.2 98 15 100.4	39 07.1 98 15 100.1	40 35.4 98 15 99.8	42 03.6 98 15 99.4	44 01.1 98 15 98.8	44 30.4 98 15 98.6	44 59.7 98 16 98.5	46 56.9 98 16 97.9	3
4	37 59.0 98 15 99.4	38 57.9 98 16 99.1	40 26.1 98 15 98.7	41 54.3 98 16 98.3	43 51.8 98 16 97.8	44 21.1 98 16 97.6	44 50.4 98 16 97.5	46 47.6 98 16 96.9	4
75	37 49.7 98 16 98.4	38 48.6 98 16 98.1	40 16.9 98 16 97.7	41 45.0 98 16 97.3	43 42.5 98 16 96.8	44 11.8 98 16 96.6	44 41.1 98 16 96.5	46 38.3 98 16 95.9	75
6	37 40.4 98 16 97.4	38 39.3 98 16 97.1	40 07.5 98 16 96.7	41 35.7 98 16 96.3	43 33.1 98 16 95.8	44 02.5 98 16 95.6	44 31.8 98 16 95.5	46 28.9 98 16 94.9	6
7	37 31.1 98 16 96.4	38 30.0 98 16 96.1	39 58.2 98 16 95.7	41 26.4 98 16 95.3	43 23.8 98 16 94.8	43 53.1 98 16 94.6	44 22.4 98 16 94.5	46 19.6 98 16 93.9	7
8	37 21.8 98 16 95.4	38 20.6 98 16 95.1	39 48.9 98 16 94.7	41 17.0 98 16 94.3	43 14.4 98 16 93.8	43 43.8 98 16 93.6	44 13.1 98 16 93.5	46 10.2 98 16 92.9	8
9	37 12.4 98 16 94.4	38 11.3 98 16 94.1	39 39.5 98 16 93.7	41 07.7 98 16 93.3	43 05.1 98 16 92.8	43 34.4 98 16 92.6	44 03.7 98 16 92.5	46 00.9 98 16 91.9	9
80	37 03.1 98 16 93.4	38 01.9 98 16 93.1	39 30.1 98 16 92.7	40 58.3 98 16 92.3	42 55.7 98 16 91.8	43 25.0 98 16 91.6	43 54.3 98 16 91.5	45 51.4 98 16 90.9	80
1	36 53.7 98 16 92.4	37 52.5 98 16 92.1	39 20.8 98 16 91.7	40 48.9 98 16 91.3	42 46.3 98 16 90.8	43 15.6 98 16 90.6	43 44.9 98 16 90.5	45 42.1 98 16 89.9	1
2	36 44.3 98 16 91.4	37 43.2 98 16 91.1	39 11.4 98 16 90.8	40 39.5 98 16 90.4	42 36.9 98 16 89.8	43 06.2 98 16 89.7	43 35.5 98 16 89.5	45 32.7 98 16 88.9	2
3	36 34.9 98 16 90.4	37 33.8 98 16 90.1	39 02.0 98 16 89.8	40 30.1 98 16 89.4	42 27.5 98 16 88.8	42 56.9 98 16 88.7	43 26.2 98 16 88.5	45 23.3 98 16 87.9	3
4	36 25.5 98 16 89.4	37 24.4 98 16 89.2	38 52.6 98 16 88.8	40 20.8 98 16 88.4	42 18.1 98 16 87.8	42 47.5 98 16 87.7	43 16.8 98 16 87.5	45 13.9 98 16 86.9	4
85	36 16.1 98 16 88.4	37 15.0 98 16 88.2	38 43.2 98 16 87.8	40 11.4 98 16 87.4	42 08.8 98 16 86.9	42 38.1 98 16 86.7	43 07.4 98 16 86.6	45 04.5 98 16 86.0	85
6	36 06.8 98 16 87.4	37 05.6 98 16 87.2	38 33.8 98 16 86.8	40 02.0 98 16 86.4	41 59.4 98 16 85.9	42 28.7 98 16 85.7	42 58.0 98 16 85.6	44 55.2 98 16 85.0	6
7	35 57.4 98 16 86.4	36 56.3 98 16 86.2	38 24.5 98 16 85.8	39 52.6 98 16 85.4	41 50.0 98 16 84.9	42 19.4 98 16 84.8	42 48.7 98 16 84.6	44 45.8 98 16 84.0	7
8	35 48.0 98 16 85.5	36 46.9 98 16 85.2	38 15.1 98 16 84.9	39 43.3 98 16 84.5	41 40.7 98 16 83.9	42 10.0 98 16 83.8	42 39.4 98 16 83.6	44 36.5 98 16 83.0	8
9	35 38.7 98 16 84.5	36 37.5 98 16 84.3	38 05.8 98 16 83.9	39 34.0 98 16 83.5	41 31.4 98 16 83.0	42 00.7 98 16 82.7	42 30.0 98 16 82.7	44 27.1 98 16 82.1	9
90	35 29.3 98 16 83.5	36 28.2 98 16 83.3	37 56.5 98 16 82.9	39 24.6 98 16 82.5	41 22.1 98 16 82.0	41 51.4 98 15 81.8	42 20.7 98 16 81.7	44 17.9 98 15 81.1	90

H.A.	36°00′ Alt	Δd Δt	Az	37°00′ Alt	Δd Δt	Az	38°30′ Alt	Δd Δt	Az	40°00′ Alt	Δd Δt	Az	42°00′ Alt	Δd Δt	Az	42°30′ Alt	Δd Δt	Az	43°00′ Alt	Δd Δt	Az	45°00′ Alt	Δd Δt	Az	H.A.
91	35 20.0	98 15	82.5	36 18.9	98 15	82.3	37 47.2	98 15	81.9	39 15.3	98 15	81.6	41 12.8	98 15	81.0	41 42.1	98 15	80.9	42 11.5	98 15	80.7	44 08.7	98 15	80.1	91
2	35 10.7	98 15	81.6	36 09.6	98 15	81.3	37 37.9	98 15	81.0	39 06.4	98 15	80.6	41 03.5	98 15	80.1	41 32.9	98 15	79.9	42 02.2	98 15	79.8	43 59.4	98 15	79.2	2
3	35 01.5	98 15	80.6	36 00.3	98 15	80.4	37 28.6	98 15	80.0	38 56.8	98 15	79.6	40 54.3	98 15	79.1	41 23.7	98 15	78.9	41 53.0	98 15	78.8	43 50.2	98 15	78.2	3
4	34 52.2	98 15	79.6	35 51.1	98 15	79.4	37 19.4	98 15	79.0	38 47.6	98 15	78.7	40 45.1	98 15	78.1	41 14.5	98 15	78.0	41 43.8	98 15	77.9	43 41.1	98 15	77.3	4
95	34 43.0	98 15	78.7	35 41.9	98 15	78.4	37 10.2	98 15	78.1	38 38.4	98 15	77.7	40 35.9	98 15	77.2	41 05.3	98 15	77.0	41 34.6	98 15	76.9	43 31.9	98 15	76.3	95
6	34 33.8	98 15	77.7	35 32.7	98 15	77.5	37 01.0	98 15	77.1	38 29.3	98 15	76.7	40 26.8	98 15	76.2	40 56.2	98 15	76.1	41 25.5	98 15	75.9	43 22.8	98 15	75.4	6
7	34 24.7	98 15	76.7	35 23.6	98 15	76.5	36 51.9	98 15	76.1	38 20.1	98 15	75.8	40 17.7	98 15	75.3	40 47.1	98 15	75.1	41 16.4	98 15	75.0	43 13.8	98 15	74.4	7
8	34 15.5	98 15	75.8	35 14.5	98 15	75.5	36 42.8	98 15	75.2	38 11.1	98 15	74.8	40 08.7	98 15	74.3	40 38.0	98 15	74.2	41 07.4	98 15	74.0	43 04.7	98 15	73.5	8
9	34 06.5	98 15	74.8	35 05.4	98 15	74.6	36 33.7	98 15	74.2	38 02.0	98 15	73.9	39 59.6	98 15	73.4	40 29.0	98 15	73.2	40 58.4	98 15	73.1	42 55.8	98 15	72.5	9
100	33 57.4	98 15	73.9	34 56.4	98 15	73.6	36 24.7	98 15	73.3	37 53.0	98 15	72.9	39 50.7	98 15	72.4	40 20.1	98 15	72.3	40 49.4	98 15	72.1	42 46.8	98 15	71.6	100
1	33 48.4	98 15	72.9	34 47.4	98 15	72.7	36 15.8	98 15	72.3	37 44.1	98 15	72.0	39 41.7	98 15	71.5	40 11.1	98 15	71.3	40 40.5	98 15	71.2	42 38.0	98 15	70.6	1
2	33 39.5	98 15	71.9	34 38.5	98 15	71.7	36 06.9	98 15	71.4	37 35.2	98 15	71.0	39 32.8	98 15	70.5	40 02.3	98 15	70.4	40 31.7	98 15	70.2	42 29.1	98 15	69.7	2
3	33 30.6	98 15	71.0	34 29.6	98 15	70.8	35 58.0	98 15	70.4	37 26.3	98 15	70.1	39 24.0	98 15	69.6	39 53.5	98 15	69.4	40 22.9	98 15	69.3	42 20.4	98 15	68.8	3
4	33 21.7	98 15	70.0	34 20.7	98 15	69.8	35 49.2	98 15	69.5	37 17.5	98 15	69.1	39 15.3	98 15	68.6	39 44.7	98 15	68.5	40 14.1	98 14	68.4	42 11.6	98 14	67.8	4
105	33 12.9	98 15	69.1	34 11.9	98 15	68.9	35 40.4	98 14	68.5	37 08.8	98 14	68.2	39 06.6	98 14	67.7	39 36.0	98 14	67.6	40 05.4	98 14	67.4	42 03.0	98 14	66.9	105
6	33 04.2	98 14	68.1	34 03.2	98 14	67.9	35 31.7	98 14	67.6	37 00.1	98 14	67.2	38 57.9	98 14	66.7	39 27.3	98 14	66.6	39 56.8	98 14	66.5	41 54.4	98 14	66.0	6
7	32 55.5	98 14	67.2	33 54.6	98 14	67.0	35 23.1	98 14	66.6	36 51.5	98 14	66.3	38 49.3	98 14	65.8	39 18.8	98 14	65.7	39 48.2	98 14	65.6	41 45.8	98 14	65.0	7
8	32 46.9	98 14	66.2	33 45.9	98 14	66.0	35 14.5	98 14	65.7	36 42.9	98 14	65.3	38 40.8	98 14	64.9	39 10.2	98 14	64.7	39 39.7	98 14	64.6	41 37.3	98 14	64.1	8
9	32 38.3	98 14	65.3	33 37.4	98 14	65.1	35 05.9	98 14	64.7	36 34.4	98 14	64.4	38 32.3	98 14	63.9	39 01.8	98 14	63.8	39 31.2	98 14	63.7	41 28.9	98 14	63.2	9
110	32 29.9	98 14	64.3	33 28.9	98 14	64.1	34 57.5	98 14	63.8	36 26.0	98 14	63.5	38 23.9	98 14	63.0	38 53.4	98 14	62.9	39 22.8	98 14	62.8	41 20.6	98 14	62.3	110
1	32 21.4	98 14	63.4	33 20.5	98 14	63.2	34 49.1	98 14	62.9	36 17.6	98 14	62.5	38 15.6	98 14	62.1	38 45.1	98 14	62.0	39 14.5	98 14	61.8	41 12.3	98 14	61.3	1
2	32 13.1	98 14	62.5	33 12.2	98 14	62.2	34 40.8	98 14	61.9	36 09.3	98 14	61.6	38 07.3	98 14	61.1	38 36.8	98 14	61.0	39 06.3	98 14	60.9	41 04.1	98 14	60.4	2
3	32 04.8	98 14	61.5	33 03.9	98 14	61.3	34 32.5	98 14	61.0	36 01.1	98 14	60.7	37 59.2	98 14	60.2	38 28.6	98 14	60.1	38 58.1	98 13	60.0	40 56.0	98 13	59.5	3
4	31 56.6	98 14	60.6	32 55.7	98 14	60.4	34 24.4	98 14	60.1	35 53.0	98 13	59.7	37 51.0	98 13	59.3	38 20.6	98 14	59.2	38 50.0	98 13	59.1	40 47.9	98 13	58.6	4
115	31 48.4	99 13	59.6	32 47.6	99 13	59.4	34 16.3	99 13	59.1	35 44.9	98 13	58.8	37 43.0	98 13	58.4	38 12.5	98 13	58.3	38 42.0	98 13	58.1	40 40.0	98 13	57.7	115
6	31 40.4	99 13	58.7	32 39.5	99 13	58.5	34 08.3	99 13	58.2	35 36.9	98 13	57.9	37 35.1	98 13	57.4	38 04.6	98 13	57.3	38 34.1	98 13	57.2	40 32.1	98 13	56.7	6
7	31 32.4	99 13	57.8	32 31.6	99 13	57.6	34 00.3	99 13	57.3	35 29.0	98 13	57.0	37 27.2	98 13	56.5	37 56.7	98 13	56.4	38 26.3	98 13	56.3	40 24.3	98 13	55.8	7
8	31 24.5	99 13	56.8	32 23.7	99 13	56.6	33 52.5	99 13	56.3	35 21.2	98 13	56.0	37 19.4	98 13	55.6	37 49.0	98 13	55.5	38 18.5	98 13	55.4	40 16.6	98 13	54.9	8
9	31 16.7	99 13	55.9	32 15.9	99 13	55.7	33 44.7	99 13	55.4	35 13.4	98 13	55.1	37 11.7	98 13	54.7	37 41.3	98 13	54.6	38 10.8	98 13	54.5	40 08.9	98 13	54.0	9
120	31 09.0	99 13	55.0	32 08.2	99 13	54.8	33 37.0	99 13	54.5	35 05.8	99 13	54.2	37 04.1	99 13	53.8	37 33.7	99 13	53.7	38 03.2	99 13	53.5	40 01.4	99 12	53.1	120
1	31 01.3	99 13	54.0	32 00.6	99 13	53.8	33 29.4	99 12	53.5	34 58.2	99 12	53.3	36 56.6	99 12	52.8	37 26.1	99 12	52.7	37 55.7	99 12	52.6	39 53.9	99 12	52.2	1
2	30 53.8	99 12	53.1	31 53.0	99 12	52.9	33 21.9	99 12	52.6	34 50.8	99 12	52.3	36 49.1	99 12	51.9	37 18.7	99 12	51.8	37 48.3	99 12	51.7	39 46.5	99 12	51.3	2
3	30 46.3	99 12	52.2	31 45.6	99 12	52.0	33 14.5	99 12	51.7	34 43.4	99 12	51.4	36 41.8	99 12	51.0	37 11.4	99 12	50.9	37 41.0	99 12	50.8	39 39.3	99 12	50.4	3
4	30 38.9	99 12	51.2	31 38.3	99 12	51.0	33 07.2	99 12	50.8	34 36.1	99 12	50.5	36 34.5	99 12	50.1	37 04.1	99 12	50.0	37 33.7	99 12	49.9	39 32.1	99 12	49.5	4
125	30 31.7	99 12	50.3	31 31.0	99 12	50.1	33 00.0	99 12	49.9	34 28.9	99 12	49.6	36 27.4	99 12	49.2	36 57.0	99 12	49.1	37 26.6	99 12	49.0	39 25.0	99 12	48.6	125
6	30 24.5	99 12	49.4	31 23.8	99 12	49.2	32 52.8	99 12	48.9	34 21.8	99 12	48.7	36 20.3	99 12	48.3	36 50.0	99 12	48.2	37 19.6	99 12	48.1	39 18.0	99 12	47.7	6
7	30 17.4	99 12	48.4	31 16.8	99 12	48.3	32 45.8	99 12	48.0	34 14.8	99 11	47.7	36 13.4	99 11	47.4	36 43.0	99 11	47.3	37 12.6	99 11	47.2	39 11.1	99 11	46.8	7
8	30 10.5	99 11	47.5	31 09.8	99 11	47.3	32 38.9	99 11	47.1	34 07.9	99 11	46.8	36 06.5	99 11	46.5	36 36.2	99 11	46.4	37 05.8	99 11	46.3	39 04.3	99 11	45.9	8
9	30 03.6	99 11	46.6	31 03.0	99 11	46.4	32 32.1	99 11	46.2	34 01.1	99 11	45.9	35 59.8	99 11	45.5	36 29.4	99 11	45.5	36 59.1	99 11	45.4	38 57.6	99 11	45.0	9
130	29 56.8	99 11	45.7	30 56.2	99 11	45.5	32 25.3	99 11	45.3	33 54.4	99 11	45.0	35 53.1	99 11	44.6	36 22.8	99 11	44.5	36 52.5	99 11	44.5	38 51.1	99 11	44.1	130
1	29 50.2	99 11	44.7	30 49.6	99 11	44.6	32 18.7	99 11	44.3	33 47.8	99 11	44.1	35 46.6	99 11	43.7	36 16.3	99 11	43.6	36 45.9	99 11	43.6	38 44.6	99 11	43.2	1
2	29 43.6	99 11	43.8	30 43.1	99 11	43.7	32 12.2	99 11	43.4	33 41.4	99 11	43.2	35 40.1	99 11	42.8	36 09.8	99 11	42.7	36 39.5	99 10	42.6	38 38.2	99 10	42.3	2
3	29 37.2	99 11	42.9	30 36.6	99 11	42.7	32 05.8	99 10	42.5	33 35.0	99 10	42.3	35 33.8	99 10	41.9	36 03.5	99 10	41.8	36 33.2	99 10	41.7	38 32.0	99 10	41.4	3
4	29 30.8	99 10	42.0	30 30.3	99 10	41.8	31 59.5	99 10	41.6	33 28.7	99 10	41.4	35 27.6	99 10	41.0	35 57.3	99 10	40.9	36 27.0	99 10	40.8	38 25.8	99 10	40.5	4
135	29 24.6	99 10	41.0	30 24.1	99 10	40.9	31 53.4	99 10	40.7	33 22.6	99 10	40.4	35 21.5	99 10	40.1	35 51.2	99 10	40.0	36 20.9	99 10	39.9	38 19.8	99 10	39.6	135
6	29 18.5	99 10	40.1	30 18.0	99 10	39.8	31 47.3	99 10	39.8	33 16.6	99 10	39.5	35 15.4	99 10	39.2	35 45.2	99 10	39.1	36 15.0	99 10	39.0	38 13.8	99 10	38.7	6
7	29 12.5	99 10	39.2	30 12.1	99 10	39.1	31 41.4	99 10	38.8	33 10.6	99 10	38.6	35 09.6	99 10	38.3	35 39.4	99 10	38.2	36 09.1	99 10	38.2	38 08.0	99 10	37.8	7
8	29 06.6	99 10	38.3	30 06.2	99 10	38.1	31 35.5	99 10	37.9	33 04.8	99 09	37.7	35 03.9	99 09	37.4	35 33.6	99 09	37.3	36 03.4	99 09	37.3	38 02.3	99 09	36.9	8
9	29 00.9	99 09	37.4	30 00.5	99 09	37.2	31 29.8	99 09	37.0	32 59.2	99 09	36.8	34 58.2	99 09	36.5	35 28.0	99 09	36.4	35 57.8	99 09	36.4	37 56.8	99 09	36.0	9
140	28 55.2	99 09	36.5	29 54.8	99 09	36.3	31 24.2	99 09	36.1	32 53.6	99 09	35.9	34 52.7	99 09	35.6	35 22.5	99 09	35.5	35 52.2	99 09	35.5	37 51.3	99 09	35.1	140
1	28 49.7	99 09	35.6	29 49.3	99 09	35.4	31 18.8	99 09	35.2	32 48.1	99 09	35.0	34 47.3	99 09	34.7	35 17.1	99 09	34.6	35 46.9	99 09	34.6	37 46.0	99 09	34.3	1
2	28 44.3	99 09	34.6	29 44.0	99 09	34.5	31 13.4	99 09	34.3	32 42.8	99 09	34.1	34 42.0	99 09	33.8	35 11.8	99 09	33.7	35 41.6	99 09	33.7	37 40.7	99 08	33.4	2
3	28 39.1	99 09	33.7	29 38.7	99 09	33.6	31 08.2	99 08	33.4	32 37.6	99 08	33.2	34 36.9	99 08	32.9	35 06.7	99 08	32.8	35 36.5	99 08	32.8	37 35.6	99 08	32.5	3
4	28 33.9	99 08	32.8	29 33.6	99 08	32.7	31 03.1	99 08	32.5	32 32.5	99 08	32.3	34 31.8	99 08	32.0	35 01.6	99 08	32.0	35 31.4	99 08	31.9	37 30.6	99 08	31.6	4
145	28 28.9	99 08	31.9	29 28.6	99 08	31.7	30 58.1	99 08	31.6	32 27.6	99 08	31.4	34 26.9	99 08	31.1	34 56.7	99 08	31.1	35 26.5	99 08	31.0	37 25.8	99 08	30.7	145
6	28 24.0	1.00 08	30.8	29 23.7	1.00 08	30.8	30 53.2	1.00 08	30.7	32 22.8	99 08	30.5	34 22.1	99 08	30.2	34 51.9	99 08	30.2	35 21.8	99 08	30.1	37 21.1	99 08	29.8	6
7	28 19.2	1.00 08	30.0	29 19.0	1.00 08	29.9	30 48.5	1.00 08	29.8	32 18.1	99 08	29.6	34 17.5	99 09	29.3	34 47.3	99 09	29.3	35 17.1	99 08	29.2	37 16.5	99 07	28.9	7
8	28 14.6	1.00 08	29.1	29 14.3	1.00 07	29.0	30 43.9	1.00 07	28.8	32 13.5	1.00 07	28.7	34 12.9	99 07	28.4	34 42.8	99 07	28.4	35 12.6	99 07	28.3	37 12.0	99 07	28.1	8
9	28 10.1	1.00 07	28.2	29 09.9	1.00 07	28.1	30 39.5	1.00 07	27.9	32 09.1	1.00 07	27.8	34 08.5	1.00 07	27.5	34 38.4	1.00 07	27.5	35 08.2	1.00 07	27.4	37 07.6	99 07	27.2	9
150	28 05.7	1.00 07	27.3	29 05.5	1.00 07	27.2	30 35.1	1.00 07	27.0	32 04.8	1.00 07	26.9	34 04.2	1.00 07	26.7	34 34.1	1.00 07	26.6	35 04.0	1.00 07	26.5	37 03.4	1.00 07	26.3	150
1	28 01.5	1.00 07	26.4	29 01.3	1.00 07	26.3	30 30.9	1.00 07	26.1	32 00.6	1.00 07	26.0	34 00.1	1.00 07	25.8	34 30.0	1.00 07	25.7	34 59.8	1.00 07	25.6	36 59.3	1.00 07	25.4	1
2	27 57.4	1.00 07	25.5	28 57.2	1.00 07	25.4	30 26.7	1.00 07	25.2	31 56.5	1.00 06	25.1	33 56.1	1.00 06	24.9	34 26.0	1.00 06	24.8	34 55.8	1.00 06	24.8	36 55.3	1.00 06	24.5	2
3	27 53.4	1.00 06	24.6	28 53.2	1.00 06	24.5	30 22.9	1.00 06	24.3	31 52.6	1.00 06	24.2	33 52.2	1.00 06	24.0	34 22.1	1.00 06	23.9	34 52.0	1.00 06	23.9	36 51.5	1.00 06	23.7	3
4	27 49.6	1.00 06	23.6	28 49.4	1.00 06	23.6	30 19.1	1.00 06	23.4	31 48.8	1.00 06	23.3	33 48.4	1.00 06	23.1	34 18.3	1.00 06	23.0	34 48.2	1.00 06	23.0	36 47.8	1.00 06	22.8	4
155	27 45.9	1.00 06	22.7	28 45.7	1.00 06	22.6	30 15.5	1.00 06	22.5	31 45.2	1.00 06	22.4	33 44.8	1.00 06	22.2	34 14.7	1.00 06	22.1	34 44.6	1.00 06	22.1	36 44.2	1.00 06	21.9	155
6	27 42.4	1.00 06	21.8	28 42.2	1.00 06	21.7	30 12.0	1.00 06	21.6	31 41.7	1.00 06	21.5	33 41.4	1.00 06	21.3	34 11.3	1.00 06	21.3	34 41.2	1.00 06	21.2	36 40.8	1.00 06	21.0	6
7	27 39.0	1.00 05	20.9	28 38.8	1.00 05	20.7	30 08.6	1.00 05	20.7	31 38.3	1.00 05	20.6	33 38.0	1.00 05	20.4	34 07.9	1.00 05	20.4	34 37.9	1.00 05	20.3	36 37.5	1.00 05	20.1	7
8	27 35.7	1.00 05	20.0	28 35.5	1.00 05	19.9	30 05.4	1.00 05	19.8	31 35.1	1.00 05	19.7	33 34.8	1.00 05	19.5	34 04.7	1.00 05	19.5	34 34.7	1.00 05	19.4	36 34.4	1.00 05	19.3	8
9	27 32.5	1.00 05	19.1	28 32.4	1.00 05	19.0	30 02.2	1.00 05	18.9	31 32.0	1.00 05	18.8	33 31.7	1.00 05	18.6	34 01.7	1.00 05	18.6	34 31.6	1.00 05	18.6	36 31.3	1.00 05	18.4	9
160	27 29.5	1.00 05	18.2	28 29.4	1.00 05	18.1	29 59.2	1.00 05	18.0	31 29.1	1.00 05	17.9	33 28.8	1.00 05	17.7	33 58.8	1.00 05	17.7	34 28.7	1.00 05	17.7	36 28.4	1.00 05	17.5	160
1	27 26.7	1.00 04	17.3	28 26.6	1.00 04	17.2	29 56.4	1.00 04	17.1	31 26.2	1.00 04	17.0	33 26.0	1.00 04	16.9	33 56.0	1.00 04	16.8	34 25.9	1.00 04	16.8	36 25.7	1.00 04	16.6	1
2	27 23.9	1.00 04	16.4	28 23.8	1.00 04	16.3	29 53.7	1.00 04	16.2	31 23.6	1.00 04	16.1	33 23.4	1.00 04	16.0	33 53.3	1.00 04	15.9	34 23.3	1.00 04	15.9	36 23.1	1.00 04	15.7	2
3	27 21.4	1.00 04	15.4	28 21.3	1.00 04	15.4	29 51.2	1.00 04	15.3	31 21.0	1.00 04	15.2	33 20.9	1.00 04	15.1	33 50.8	1.00 04	15.0	34 20.8	1.00 04	15.0	36 20.6	1.00 04	14.9	3
4	27 18.9	1.00 04	14.5	28 18.9	1.00 04	14.5	29 48.8	1.00 04	14.4	31 18.6	1.00 04	14.3	33 18.5	1.00 04	14.2	33 48.5	1.00 04	14.2	34 18.4	1.00 04	14.1	36 18.2	1.00 04	14.0	4
165	27 16.7	1.00 04	13.6	28 16.6	1.00 04	13.6	29 46.5	1.00 04	13.5	31 16.4	1.00 04	13.4	33 16.3	1.00 04	13.3	33 46.2	1.00 04	13.3	34 16.2	1.00 03	13.2	36 16.0	1.00 03	13.1	165
6	27 14.5	1.00 03	12.7	28 14.5	1.00 03	12.7	29 44.4	1.00 03	12.6	31 14.3	1.00 03	12.5	33 14.2	1.00 03	12.4	33 44.1	1.00 03	12.4	34 14.1	1.00 03	12.4	36 14.0	1.00 03	12.2	6
7	27 12.5	1.00 03	11.8	28 12.4	1.00 03	11.8	29 42.4	1.00 03	11.7	31 12.3	1.00 03	11.6	33 12.2	1.00 03	11.5	33 42.2	1.00 03	11.5	34 12.2	1.00 03	11.5	36 12.1	1.00 03	11.4	7
8	27 10.7	1.00 03	10.9	28 10.6	1.00 03	10.9	29 40.6	1.00 03	10.8	31 10.5	1.00 03	10.7	33 10.4	1.00 03	10.6	33 40.4	1.00 03	10.6	34 10.4	1.00 03	10.6	36 10.3	1.00 03	10.5	8
9	27 09.0	1.00 03	10.0	28 08.9	1.00 03	10.0	29 38.9	1.00 03	09.9	31 08.8	1.00 03	09.8	33 08.8	1.00 03	09.8	33 38.7	1.00 03	09.7	34 08.7	1.00 02	09.7	36 08.6	1.00 02	09.6	9
170	27 07.4	1.00 02	09.1	28 07.4	1.00 02	09.0	29 37.4	1.00 02	09.0	31 07.3	1.00 02	08.9	33 07.2	1.00 02	08.9	33 37.2	1.00 02	08.8	34 07.2	1.00 02	08.8	36 07.1	1.00 02	08.7	170
1	27 06.0	1.00 02	08.2	28 06.0	1.00 02	08.1	29 36.0	1.00 02	08.1	31 05.9	1.00 02	08.0	33 05.9	1.00 02	08.0	33 35.9	1.00 02	08.0	34 05.8	1.00 02	07.9	36 05.8	1.00 02	07.9	1
2	27 04.8	1.00 02	07.2	28 04.8	1.00 02	07.2	29 34.7	1.00 02	07.2	31 04.7	1.00 02	07.1	33 04.7	1.00 02	07.1	33 34.7	1.00 02	07.1	34 04.6	1.00 02	07.1	36 04.6	1.00 02	07.0	2
3	27 03.6	1.00 02	06.4	28 03.6	1.00 02	06.3	29 33.6	1.00 02	06.3	31 03.6	1.00 02	06.3	33 03.6	1.00 02	06.2	33 33.5	1.00 02	06.2	34 03.5	1.00 02	06.2	36 03.5	1.00 02	06.1	3
4	27 02.7	1.00 01	05.4	28 02.7	1.00 01	05.4	29 32.6	1.00 01	05.4	31 02.6	1.00 01	05.4	33 02.6	1.00 01	05.3	33 32.6	1.00 01	05.3	34 02.6	1.00 01	05.3	36 02.6	1.00 01	05.2	4
175	27 01.9	1.00 01	04.5	28 01.9	1.00 01	04.5	29 31.8	1.00 01	04.5	31 01.8	1.00 01	04.5	33 01.8	1.00 01	04.4	33 31.8	1.00 01	04.4	34 01.8	1.00 01	04.4	36 01.8	1.00 01	04.4	175
6	27 01.2	1.00 01	03.6	28 01.2	1.00 01	03.6	29 31.2	1.00 01	03.6	31 01.2	1.00 01	03.6	33 01.2	1.00 01	03.5	33 31.2	1.00 01	03.5	34 01.2	1.00 01	03.5	36 01.1	1.00 01	03.5	6
7	27 00.7	1.00 01	02.7	28 00.7	1.00 01	02.7	29 30.7	1.00 01	02.7	31 00.7	1.00 01	02.7	33 00.7	1.00 01	02.7	33 30.7	1.00 01	02.7	34 00.7	1.00 01	02.6	36 00.6	1.00 01	02.6	7
8	27 00.3	1.00 00	01.8	28 00.3	1.00 00	01.8	29 30.3	1.00 00	01.8	31 00.3	1.00 00	01.8	33 00.3	1.00 00	01.8	33 30.3	1.00 00	01.8	34 00.3	1.00 00	01.8	36 00.3	1.00 00	01.7	8
9	27 00.1	1.00 00	00.9	28 00.1	1.00 00	00.9	29 30.1	1.00 00	00.9	31 00.1	1.00 00	00.9	33 00.1	1.00 00	00.9	33 30.1	1.00 00	00.9	34 00.1	1.00 00	00.9	36 00.1	1.00 00	00.9	9
180	27 00.0	1.00 00	00.0	28 00.0	1.00 00	00.0	29 30.0	1.00 00	00.0	31 00.0	1.00 00	00.0	33 00.0	1.00 00	00.0	33 30.0	1.00 00	00.0	34 00.0	1.00 00	00.0	36 00.0	1.00 00	00.0	180

H.A.	46° 00' (Alt. / Δd Δt / Az.)	47° 00'	48° 30'	49° 30'	50° 30'	51° 30'	52° 30'	54° 00'	H.A.
00	55 00.0 1.00 0 180.0	56 00.0 1.00 0 180.0	57 30.0 1.00 0 180.0	58 30.0 1.00 0 180.0	59 30.0 1.00 0 180.0	60 30.0 1.00 0 180.0	61 30.0 1.00 0 180.0	63 30.0 1.00 0 180.0	00
1	54 59.9 1.00 0 178.8	55 59.9 1.00 0 178.8	57 29.9 1.00 0 178.8	58 29.9 1.00 0 178.8	59 29.9 1.00 1 178.7	60 29.9 1.00 1 178.7	61 29.9 1.00 1 178.7	62 59.9 1.00 1 178.7	1
2	54 59.6 1.00 1 177.6	55 59.6 1.00 1 177.6	57 29.6 1.00 1 177.5	58 29.6 1.00 1 177.5	59 29.6 1.00 1 177.5	60 29.6 1.00 1 177.5	61 29.6 1.00 1 177.4	62 59.5 1.00 1 177.4	2
3	54 59.1 1.00 1 176.4	55 59.1 1.00 1 176.3	57 29.1 1.00 1 176.3	58 29.1 1.00 1 176.3	59 29.1 1.00 1 176.2	60 29.1 1.00 1 176.2	61 29.1 1.00 1 176.2	62 59.0 1.00 1 176.1	3
4	54 58.4 1.00 2 175.1	55 58.4 1.00 2 175.1	57 28.4 1.00 2 175.0	58 28.4 1.00 2 175.0	59 28.3 1.00 2 174.9	60 28.3 1.00 2 174.9	61 28.3 1.00 2 174.9	62 58.3 1.00 2 174.8	4
05	54 57.5 1.00 2 173.9	55 57.5 1.00 2 173.9	57 27.5 1.00 2 173.8	58 27.5 1.00 2 173.8	59 27.4 1.00 2 173.7	60 27.4 1.00 2 173.7	61 27.4 1.00 2 173.6	62 57.4 1.00 2 173.5	05
6	54 56.4 1.00 2 172.7	55 56.4 1.00 2 172.7	57 26.4 1.00 2 172.6	58 26.3 1.00 2 172.5	59 26.3 1.00 2 172.5	60 26.3 1.00 2 172.4	61 26.2 1.00 2 172.4	62 56.2 1.00 2 172.2	6
7	54 55.2 1.00 3 171.5	55 55.1 1.00 3 171.5	57 25.1 1.00 3 171.4	58 25.0 1.00 3 171.3	59 25.0 1.00 3 171.2	60 24.9 1.00 3 171.2	61 24.9 1.00 3 171.1	62 54.8 1.00 3 170.9	7
8	54 53.7 1.00 3 170.3	55 53.6 1.00 3 170.3	57 23.6 1.00 3 170.1	58 23.5 1.00 3 170.1	59 23.5 1.00 3 170.0	60 23.4 1.00 3 169.9	61 23.3 1.00 3 169.8	62 53.2 1.00 3 169.7	8
9	54 52.0 1.00 3 169.0	55 51.9 1.00 3 169.0	57 21.8 1.00 3 168.9	58 21.8 1.00 3 168.8	59 21.7 1.00 3 168.8	60 21.6 1.00 3 168.6	61 21.6 1.00 3 168.5	62 51.4 1.00 3 168.4	9
10	54 50.1 1.00 3 167.9	55 50.1 1.00 3 167.8	57 19.9 1.00 4 167.7	58 19.9 1.00 4 167.6	59 19.8 1.00 4 167.5	60 19.7 1.00 4 167.4	61 19.6 1.00 4 167.3	62 49.5 1.00 4 167.1	10
1	54 48.1 1.00 4 166.7	55 48.0 1.00 4 166.6	57 17.8 1.00 4 166.5	58 17.8 1.00 4 166.4	59 17.7 1.00 4 166.2	60 17.5 1.00 4 166.1	61 17.4 1.00 4 166.0	62 47.3 1.00 4 165.8	1
2	54 45.8 1.00 4 165.5	55 45.7 1.00 4 165.4	57 15.6 1.00 4 165.2	58 15.4 1.00 4 165.1	59 15.3 1.00 4 165.0	60 15.2 1.00 4 164.9	61 15.1 1.00 4 164.7	62 44.8 1.00 4 164.5	2
3	54 43.4 1.00 4 164.2	55 43.2 1.00 4 164.2	57 13.1 1.00 4 164.0	58 12.9 1.00 4 163.9	59 12.8 1.00 5 163.8	60 12.5 1.00 5 163.5	61 12.5 1.00 5 163.5	62 42.2 1.00 5 163.2	3
4	54 40.7 1.00 5 163.1	55 40.6 1.00 5 163.0	57 10.4 1.00 5 162.8	58 10.2 1.00 5 162.7	59 10.1 1.00 5 162.5	60 09.9 1.00 5 162.4	61 09.7 1.00 5 162.2	62 39.4 1.00 5 162.0	4
15	54 37.9 1.00 5 161.9	55 37.8 1.00 5 161.8	57 07.5 1.00 5 161.6	58 07.3 1.00 5 161.4	59 07.2 1.00 5 161.3	60 07.0 1.00 5 161.1	61 06.8 1.00 5 161.0	62 36.4 1.00 5 160.7	15
6	54 34.9 1.00 6 160.7	55 34.7 1.00 6 160.6	57 04.5 1.00 6 160.4	58 04.3 1.00 6 160.2	59 04.1 1.00 6 160.1	60 03.8 1.00 6 159.9	61 03.6 1.00 6 159.7	62 33.2 1.00 6 159.4	6
7	54 31.7 1.00 6 159.5	55 31.5 1.00 6 159.4	57 01.2 1.00 6 159.2	58 01.0 1.00 6 159.0	59 00.8 1.00 6 158.8	60 00.5 1.00 6 158.6	61 00.3 1.00 6 158.5	62 29.8 1.00 6 158.2	7
8	54 28.3 1.00 6 158.3	55 28.1 1.00 6 158.2	56 57.8 1.00 6 157.9	57 57.5 1.00 6 157.6	58 57.3 1.00 6 157.6	59 57.0 1.00 6 157.4	60 56.7 1.00 7 157.2	62 26.0 1.00 6 156.9	8
9	54 24.8 1.00 6 157.1	55 24.5 1.00 6 157.0	56 54.2 1.00 6 156.7	57 53.9 1.00 6 156.6	58 53.6 1.00 6 156.4	59 53.3 99 07 156.2	60 53.0 99 07 156.0	62 22.5 99 07 155.5	9
20	54 21.0 1.00 7 155.9	55 20.8 1.00 7 155.8	56 50.4 1.00 7 155.5	57 50.1 99 07 155.3	58 49.8 99 07 155.1	59 49.4 99 07 154.9	60 49.1 99 07 154.7	62 18.5 99 07 154.4	20
1	54 17.1 1.00 7 154.8	55 16.8 1.00 7 154.6	56 46.4 99 07 154.3	57 46.1 99 07 154.1	58 45.7 99 07 153.9	59 45.4 99 07 153.7	60 45.0 99 07 153.5	62 14.3 99 07 153.1	1
2	54 13.0 99 07 153.6	55 12.7 99 07 153.4	56 42.2 99 07 153.1	57 41.9 99 07 152.9	58 41.5 99 07 152.7	59 41.1 99 07 152.5	60 40.7 99 07 152.2	62 10.0 99 08 151.9	2
3	54 08.8 99 07 152.4	55 08.6 99 07 152.2	56 37.9 99 08 151.9	57 37.5 99 08 151.7	58 37.1 99 08 151.5	59 36.7 99 08 151.3	60 36.2 99 08 151.0	62 05.5 99 08 150.6	3
4	54 04.3 99 08 151.2	55 04.0 99 08 150.7	56 33.4 99 08 150.7	57 33.0 99 08 150.5	58 32.5 99 08 150.3	59 32.1 99 08 150.0	60 31.6 99 08 149.8	62 00.8 99 08 149.4	4
25	53 59.7 99 08 150.0	54 59.3 99 08 149.8	56 28.7 99 08 149.5	57 28.3 99 08 149.3	58 27.8 99 08 149.1	59 27.3 99 08 148.8	60 26.8 99 08 148.6	61 55.9 99 08 148.1	25
6	53 55.0 99 08 148.9	54 54.5 99 08 148.7	56 23.9 99 08 148.3	57 23.4 99 08 148.1	58 22.9 99 08 147.9	59 22.4 99 09 147.6	60 21.8 99 09 147.3	61 50.9 99 09 146.9	6
7	53 50.0 99 08 147.7	54 49.6 99 09 147.5	56 18.9 99 09 147.2	57 18.4 99 09 146.9	58 17.8 99 09 146.7	59 17.3 99 09 146.4	60 16.7 99 09 146.1	61 45.7 99 09 145.7	7
8	53 44.9 99 09 146.5	54 44.5 99 09 146.3	56 13.7 99 09 146.0	57 13.2 99 09 145.7	58 12.6 99 09 145.5	59 12.0 99 09 145.2	60 11.3 99 09 144.9	61 40.3 99 09 144.4	8
9	53 39.7 99 09 145.4	54 39.2 99 09 145.1	56 08.4 99 09 144.8	57 07.8 99 09 144.5	58 07.2 99 09 144.3	59 06.5 99 09 144.0	60 05.9 99 09 143.7	61 34.8 99 10 143.2	9
30	53 34.3 99 09 144.2	54 33.7 99 09 144.0	56 02.9 99 09 143.6	57 02.3 99 09 143.4	58 01.6 99 10 143.1	59 00.9 99 10 142.8	60 00.2 99 10 142.5	61 29.1 99 10 142.0	30
1	53 28.7 99 10 143.0	54 28.1 99 10 142.8	55 57.2 99 10 142.4	56 56.6 99 10 142.2	57 55.9 99 10 141.9	58 55.2 99 10 141.6	59 54.4 99 10 141.3	61 23.2 99 10 140.8	1
2	53 23.0 99 10 141.7	54 22.4 99 10 141.7	55 51.4 99 10 141.3	56 50.8 99 10 141.0	57 50.0 99 10 140.7	58 49.3 99 10 140.4	59 48.5 99 10 140.1	61 17.2 99 10 139.6	2
3	53 17.1 99 10 140.7	54 16.5 99 10 140.5	55 45.5 99 10 140.1	56 44.8 99 10 139.8	57 44.0 99 10 139.5	58 43.2 99 10 139.2	59 42.4 99 10 138.9	61 11.0 99 11 138.4	3
4	53 11.1 99 10 139.6	54 10.4 99 10 139.3	55 39.4 99 10 138.9	56 38.6 99 10 138.7	57 37.9 99 11 138.4	58 37.0 99 11 138.1	59 36.2 99 11 137.7	61 04.7 99 11 137.2	4
35	53 04.9 99 10 138.4	54 04.3 99 11 138.2	55 33.2 99 11 137.8	56 32.4 99 11 137.5	57 31.6 99 11 137.2	58 30.7 99 11 136.9	59 29.8 99 11 136.5	60 58.3 99 11 136.0	35
6	52 58.6 99 11 137.3	53 57.9 99 11 137.0	55 26.8 99 11 136.6	56 26.0 99 11 136.3	57 25.1 99 11 136.0	58 24.2 99 11 135.7	59 23.2 99 11 135.4	60 51.7 99 11 134.8	6
7	52 52.2 99 11 136.2	53 51.5 99 11 135.9	55 20.3 99 11 135.5	56 19.4 99 11 135.2	57 18.5 99 11 134.9	58 17.6 99 11 134.5	59 16.6 99 11 134.2	60 45.0 99 11 133.6	7
8	52 45.6 99 11 135.0	53 44.9 99 11 134.8	55 13.6 99 11 134.3	56 12.7 99 11 134.0	57 11.8 99 11 133.7	58 10.8 99 11 133.4	59 09.8 99 12 133.0	60 38.1 99 12 132.4	8
9	52 38.9 99 11 133.9	53 38.1 99 11 133.6	55 06.8 99 12 133.2	56 05.9 99 12 132.9	57 05.0 99 12 132.6	58 03.9 99 12 132.2	59 02.9 99 12 131.9	60 31.1 99 12 131.3	9
40	52 32.1 99 12 132.8	53 31.3 99 12 132.5	54 59.9 99 12 132.0	55 59.0 99 12 131.7	56 58.0 99 12 131.4	57 56.9 99 12 131.1	58 55.8 99 12 130.7	60 24.0 99 12 130.1	40
1	52 25.2 99 12 131.6	53 24.3 99 12 131.4	54 52.9 99 12 130.9	55 51.9 99 12 130.6	56 50.9 99 12 130.3	57 49.8 99 12 129.9	58 48.6 99 12 129.5	60 16.8 99 12 128.9	1
2	52 18.1 99 12 130.5	53 17.2 99 12 130.2	54 45.7 99 12 129.8	55 44.7 99 12 129.5	56 43.7 99 12 129.1	57 42.5 99 12 128.8	58 41.3 99 12 128.4	60 09.4 99 12 127.8	2
3	52 10.9 99 12 129.4	53 10.0 99 12 129.1	54 38.5 99 12 128.7	55 37.4 99 13 128.3	56 36.3 99 13 128.0	57 35.1 99 13 127.6	58 33.9 99 13 127.2	60 01.9 99 13 126.6	3
4	52 03.6 99 12 128.3	53 02.6 99 12 128.0	54 31.1 99 12 127.5	55 30.0 99 13 127.2	56 28.9 99 13 126.9	57 27.7 99 13 126.5	58 26.4 99 13 126.1	59 54.3 99 13 125.5	4
45	51 56.2 99 13 127.2	52 55.2 99 13 126.9	54 23.6 99 13 126.4	55 22.5 99 13 126.1	56 21.3 99 13 125.7	57 20.1 99 13 125.4	58 18.7 99 13 125.0	59 46.6 99 13 124.3	45
6	51 48.6 99 13 126.1	52 47.6 99 13 125.8	54 16.0 99 13 125.3	55 14.8 99 13 125.0	56 13.6 99 13 124.6	57 12.3 99 13 124.2	58 11.0 99 13 123.8	59 38.8 99 13 123.2	6
7	51 41.0 99 13 125.0	52 39.9 99 13 124.7	54 08.3 99 13 124.2	55 07.1 99 13 123.8	56 05.8 99 13 123.5	57 04.5 99 13 123.1	58 03.2 99 13 122.7	59 30.9 99 13 122.1	7
8	51 33.3 99 13 123.9	52 32.2 99 13 123.6	54 00.5 99 13 123.1	54 59.2 99 13 122.7	55 58.0 99 13 122.4	56 56.6 99 13 122.0	57 55.2 99 13 121.6	59 22.9 99 14 120.9	8
9	51 25.4 99 13 122.8	52 24.3 99 13 122.5	53 52.5 99 13 122.0	54 51.3 99 13 121.6	55 50.0 99 13 121.3	56 48.6 99 14 120.9	57 47.2 99 14 120.5	59 14.8 99 14 119.8	9
50	51 17.5 99 13 121.7	52 16.3 99 13 121.4	53 44.5 99 14 120.9	54 43.3 99 14 120.5	55 41.9 99 14 120.2	56 40.5 99 14 119.8	57 39.0 99 14 119.4	59 06.6 99 14 118.7	50
1	51 09.4 99 14 120.6	52 06.9 99 14 120.3	53 36.4 99 14 119.8	54 35.1 99 14 119.4	55 33.8 99 14 119.1	56 32.3 99 14 118.7	57 30.8 99 14 118.3	58 58.4 99 14 117.6	1
2	51 01.3 99 14 119.5	52 00.1 99 14 119.2	53 28.2 99 14 118.7	54 26.9 99 14 118.3	55 25.5 99 14 118.0	56 24.0 99 14 117.6	57 22.5 99 14 117.2	58 50.0 99 14 116.5	2
3	50 53.1 99 14 118.4	51 51.9 99 14 118.1	53 20.0 99 14 117.6	54 18.6 99 14 117.2	55 17.2 99 14 116.9	56 15.7 99 14 116.5	57 14.1 99 14 116.1	58 41.6 99 14 115.4	3
4	50 44.8 99 14 117.4	51 43.6 99 14 117.0	53 11.6 99 14 116.5	54 10.2 99 14 116.2	55 08.8 99 14 115.8	56 07.2 99 14 115.4	57 05.6 99 14 115.0	58 33.0 99 14 114.3	4
55	50 36.4 99 14 116.3	51 35.2 99 14 116.0	53 03.2 99 14 115.4	54 01.8 99 14 115.1	55 00.3 99 14 114.7	55 58.7 99 14 114.3	56 57.1 99 14 113.9	58 24.5 99 14 113.2	55
6	50 28.0 99 14 115.2	51 26.7 99 14 114.9	52 54.7 99 14 114.4	53 53.2 99 14 114.0	54 51.7 99 14 113.6	55 50.1 99 14 113.2	56 48.5 99 14 112.8	58 15.8 99 14 112.1	6
7	50 19.4 99 14 114.1	51 18.1 99 14 113.8	52 46.1 99 14 113.3	53 44.6 99 14 112.9	54 43.1 99 15 112.5	55 41.5 99 15 112.1	56 39.8 99 15 111.7	58 07.1 99 15 111.0	7
8	50 10.8 99 14 113.1	51 09.5 99 14 112.8	52 37.4 99 15 112.2	53 35.9 99 15 111.9	54 34.4 99 15 111.5	55 32.7 99 15 111.1	56 31.0 99 15 110.6	57 58.3 99 15 110.0	8
9	50 02.2 99 15 112.0	51 00.8 99 15 111.7	52 28.7 99 15 111.2	53 27.2 99 15 110.8	54 25.6 99 15 110.4	55 24.0 99 15 110.0	56 22.2 99 15 109.6	57 49.4 99 15 108.9	9
60	49 53.4 99 15 111.0	50 52.1 99 15 110.6	52 19.9 99 15 110.1	53 18.4 99 15 109.7	54 16.8 99 15 109.3	55 15.1 99 15 108.9	56 13.3 99 15 108.5	57 40.5 99 15 107.8	60
1	49 44.7 99 15 109.9	50 43.3 99 15 109.6	52 11.1 99 15 109.1	53 09.5 99 15 108.7	54 07.9 99 15 108.3	55 06.2 99 15 107.9	56 04.4 99 15 107.5	57 31.6 99 15 106.8	1
2	49 35.8 99 15 108.9	50 34.4 99 15 108.5	52 02.2 99 15 108.0	53 00.6 99 15 107.6	53 59.0 99 15 107.2	54 57.2 99 15 106.8	55 55.4 99 15 106.4	57 22.5 99 15 105.7	2
3	49 26.9 99 15 107.8	50 25.5 99 15 107.5	51 53.2 99 15 107.0	52 51.6 99 15 106.6	53 50.0 99 15 106.2	54 48.2 99 15 105.8	55 46.4 99 15 105.3	57 13.5 99 15 104.7	3
4	49 17.9 99 15 106.8	50 16.5 99 15 106.4	51 44.2 99 15 105.9	52 42.6 99 15 105.5	53 40.9 99 15 105.1	54 39.2 99 15 104.7	55 37.3 99 15 104.3	57 04.4 99 15 103.6	4
65	49 08.9 99 15 105.7	50 07.5 99 15 105.4	51 35.2 99 15 104.9	52 33.5 99 15 104.5	53 31.9 99 15 104.1	54 30.1 99 15 103.7	55 28.2 99 15 103.3	56 55.2 99 15 102.6	65
6	48 59.9 99 15 104.7	49 58.4 99 15 104.4	51 26.1 99 15 103.8	52 24.4 99 15 103.5	53 22.7 99 15 103.1	54 20.9 99 15 102.7	55 19.1 99 15 102.2	56 46.1 99 15 101.5	6
7	48 50.8 99 15 103.7	49 49.3 99 15 103.3	51 16.9 99 15 102.8	52 15.3 99 15 102.4	53 13.6 99 15 102.0	54 11.8 99 15 101.6	55 09.9 99 15 101.2	56 36.9 99 15 100.5	7
8	48 41.6 99 15 102.6	49 40.1 99 15 102.3	51 07.8 99 15 101.8	52 06.1 99 15 101.4	53 04.4 99 15 101.0	54 02.6 99 15 100.6	55 00.6 99 15 100.2	56 27.6 96 15 99.5	8
9	48 32.4 99 15 101.6	49 30.9 99 15 101.3	50 58.6 99 15 100.7	51 56.9 99 15 100.4	52 55.1 99 15 100.0	53 53.3 99 15 99.6	54 51.4 99 15 99.1	56 18.3 96 16 98.4	9
70	48 23.2 99 15 100.6	49 21.7 99 15 100.3	50 49.3 99 15 99.7	51 47.6 99 15 99.3	52 45.9 99 15 99.0	53 44.0 99 15 98.5	54 42.1 99 16 98.1	56 09.0 96 16 97.4	70
1	48 14.0 99 16 99.6	49 12.5 99 15 99.2	50 40.1 99 15 98.7	51 38.4 99 16 98.3	52 36.6 99 16 97.9	53 34.7 99 16 97.5	54 32.8 99 16 97.1	55 59.7 96 16 96.4	1
2	48 04.7 99 16 98.6	49 03.2 99 16 98.2	50 30.8 99 16 97.7	51 29.1 99 16 97.3	52 27.3 99 16 96.9	53 25.4 99 16 96.5	54 23.5 99 16 96.1	55 50.4 96 16 95.4	2
3	47 55.4 99 16 97.6	48 53.9 99 16 97.2	50 21.5 99 16 96.7	51 19.7 99 16 96.3	52 18.0 99 16 95.9	53 16.1 99 16 95.5	54 14.1 99 16 95.1	55 41.0 96 16 94.4	3
4	47 46.1 99 16 96.5	48 44.6 99 16 96.2	50 12.1 99 16 95.7	51 10.4 99 16 95.3	52 08.6 99 16 94.9	53 06.7 99 16 94.5	54 04.8 99 16 94.1	55 31.7 96 16 93.4	4
75	47 36.8 99 16 95.5	48 35.2 99 16 95.2	50 02.8 99 16 94.7	51 01.1 99 16 94.3	51 59.3 99 16 93.9	52 57.4 99 16 93.5	53 55.4 99 16 93.1	55 22.3 96 16 92.4	75
6	47 27.4 99 16 94.5	48 25.9 99 16 94.2	49 53.4 99 16 93.7	50 51.7 99 16 93.3	51 49.9 99 16 92.9	52 48.0 99 16 92.5	53 46.0 99 16 92.1	55 12.9 96 16 91.4	6
7	47 18.1 99 16 93.5	48 16.5 99 16 93.2	49 44.0 99 16 92.7	50 42.3 99 16 92.3	51 40.5 99 16 91.9	52 38.6 99 16 91.5	53 36.7 99 16 91.1	55 03.5 96 16 90.4	7
8	47 06.7 99 16 92.5	48 07.1 99 16 92.2	49 34.7 99 16 91.7	50 32.9 99 16 91.3	51 31.1 99 16 90.9	52 29.2 99 16 90.5	53 27.3 99 16 90.1	54 54.1 96 16 89.4	8
9	46 59.3 99 16 91.5	47 57.8 99 16 91.2	49 25.3 99 16 90.7	50 23.5 99 16 90.3	51 21.7 99 16 89.9	52 19.9 99 16 89.5	53 17.9 99 16 89.1	54 44.8 96 16 88.4	9
80	46 49.9 99 16 90.6	47 48.4 99 16 90.2	49 15.9 99 16 89.7	50 14.2 99 16 89.3	51 12.4 99 16 88.9	52 10.5 99 16 88.5	53 08.5 99 16 88.1	54 35.4 96 16 87.5	80
1	46 40.5 97 16 89.6	47 39.0 97 16 89.2	49 06.5 97 16 88.7	50 04.8 97 16 88.3	51 03.0 97 16 88.0	52 01.1 97 16 87.6	52 59.1 97 16 87.1	54 26.0 96 16 86.5	1
2	46 31.2 97 16 88.6	47 29.6 97 16 88.2	48 57.1 97 16 87.7	49 55.4 97 16 87.4	50 53.6 97 16 87.0	51 51.7 97 16 86.6	52 49.8 97 16 86.2	54 16.6 96 16 85.5	2
3	46 21.8 97 16 87.6	47 20.2 97 16 87.3	48 47.8 97 16 86.7	49 46.0 97 16 86.4	50 44.2 97 16 86.0	51 42.4 97 16 85.6	52 40.4 97 16 85.2	54 07.3 96 16 84.5	3
4	46 12.4 97 16 86.6	47 10.8 97 16 86.3	48 38.4 97 16 85.8	49 36.7 97 16 85.4	50 34.9 97 16 85.0	51 33.0 97 16 84.6	52 31.1 97 16 84.2	53 58.0 96 16 83.6	4
85	46 03.0 97 16 85.6	47 01.5 97 16 85.3	48 29.0 97 16 84.8	49 27.3 97 16 84.4	50 25.5 97 16 84.1	51 23.7 97 16 83.7	52 21.7 97 15 83.3	53 48.6 96 15 82.6	85
6	45 53.7 97 16 84.7	46 52.1 97 16 84.3	48 19.7 97 16 83.8	49 18.0 97 16 83.5	50 16.2 97 16 83.1	51 14.3 97 16 82.7	52 12.4 97 15 82.3	53 39.2 96 15 81.6	6
7	45 44.4 97 16 83.7	46 42.8 97 16 83.4	48 10.4 97 16 82.9	49 08.7 97 16 82.5	50 06.9 97 16 82.1	51 05.0 97 15 81.7	52 03.1 97 15 81.3	53 30.1 96 15 80.7	7
8	45 35.0 97 15 82.7	46 33.5 97 15 82.4	48 01.1 97 15 81.9	48 59.4 97 15 81.5	49 57.6 97 15 81.2	50 55.8 97 15 80.8	51 53.9 97 15 80.4	53 20.8 97 15 79.7	8
9	45 25.7 97 15 81.8	46 24.2 97 15 81.4	47 51.8 97 15 80.9	48 50.1 97 15 80.6	49 48.3 97 15 80.2	50 46.5 97 15 79.8	51 44.6 97 15 79.4	53 11.6 97 15 78.8	9
90	45 16.5 97 15 80.8	46 14.9 97 15 80.5	47 42.5 97 15 80.0	48 40.9 97 15 79.6	49 39.1 97 15 79.3	50 37.3 97 15 78.9	51 35.4 97 15 78.5	53 02.4 97 15 78.8	90

H.A.	46° 00' Alt.	46° 00' Az.	47° 00' Alt.	47° 00' Az.	48° 30' Alt.	48° 30' Az.	49° 30' Alt.	49° 30' Az.	50° 30' Alt.	50° 30' Az.	51° 30' Alt.	51° 30' Az.	52° 30' Alt.	52° 30' Az.	54° 00' Alt.	54° 00' Az.	H.A.
91	45 07.2 98 15	79.8	46 05.7 97 15	79.5	47 33.3 97 15	79.0	48 31.6 97 15	78.7	49 29.9 97 15	78.3	50 28.1 97 15	77.9	51 26.2 07 15	77.5	52 53.2 97 15	76.9	91
2	44 58.0 98 15	78.9	45 56.5 97 15	78.6	47 24.1 97 15	78.1	48 22.4 97 15	77.7	49 20.7 97 15	77.4	50 18.9 97 15	77.0	51 17.1 97 15	76.6	52 44.1 97 15	76.0	2
3	44 48.8 98 15	77.9	45 47.3 97 15	77.6	47 14.9 97 15	77.1	48 13.3 97 15	76.8	49 11.6 97 15	76.4	50 09.8 97 15	76.0	51 08.0 97 15	75.6	52 35.0 97 15	75.0	3
4	44 39.6 98 15	77.0	45 38.1 97 15	76.7	47 05.8 97 15	76.2	48 04.2 97 15	75.8	49 02.5 97 15	75.5	50 00.7 97 15	75.1	50 58.9 97 15	74.7	52 26.0 97 15	74.1	4
95	44 30.5 98 15	76.0	45 29.0 97 15	75.7	46 56.7 97 15	75.2	47 55.1 97 15	74.9	48 53.4 97 15	74.5	49 51.7 97 15	74.2	50 49.9 97 15	73.8	52 17.0 97 15	73.2	95
6	44 21.4 98 15	75.1	45 19.9 98 15	74.8	46 47.7 97 15	74.3	47 46.1 97 15	73.9	48 44.4 97 15	73.6	49 42.7 97 15	73.2	50 40.9 97 15	72.8	52 08.0 97 15	72.2	6
7	44 12.4 98 15	74.1	45 10.9 98 15	73.8	46 38.6 97 15	73.3	47 37.1 97 15	73.0	48 35.4 97 15	72.6	49 33.7 97 15	72.3	50 31.9 97 15	71.9	51 59.1 97 15	71.3	7
8	44 03.4 98 15	73.2	45 01.9 98 15	72.9	46 29.7 97 15	72.4	47 28.1 97 15	72.1	48 26.5 97 15	71.7	49 24.8 97 15	71.4	50 23.0 97 15	71.0	51 50.2 97 15	70.4	8
9	43 54.4 98 15	72.2	44 53.0 98 15	71.9	46 20.7 97 15	71.5	47 19.2 97 15	71.1	48 17.6 97 15	70.8	49 15.9 97 15	70.4	50 14.2 97 15	70.1	51 41.4 97 15	69.5	9
100	43 45.5 98 15	71.3	44 44.1 98 15	71.0	46 11.9 97 15	70.5	47 10.3 97 15	70.2	48 08.8 97 15	69.9	49 07.1 97 15	69.5	50 05.4 97 15	69.1	51 32.7 97 14	68.6	100
1	43 36.6 98 15	70.4	44 35.2 98 15	70.1	46 03.1 98 15	69.6	47 01.5 97 15	69.3	48 00.0 97 15	68.9	48 58.3 97 14	68.6	49 56.6 97 14	68.2	51 24.0 97 14	67.6	1
2	43 27.8 98 15	69.4	44 26.4 98 15	69.1	45 54.3 98 15	68.7	46 52.8 97 14	68.3	47 51.2 97 14	68.0	48 49.6 97 14	67.7	49 47.9 97 14	67.3	51 15.3 97 14	66.7	2
3	43 19.0 98 14	68.5	44 17.7 98 14	68.2	45 45.6 98 14	67.7	46 44.1 97 14	67.4	47 42.6 97 14	67.1	48 41.0 97 14	66.7	49 39.3 97 14	66.4	51 06.7 97 14	65.8	3
4	43 10.3 98 14	67.5	44 09.0 98 14	67.3	45 36.9 98 14	66.8	46 35.5 98 14	66.5	47 33.9 97 14	66.2	48 32.4 97 14	65.8	49 30.7 97 14	65.5	50 58.2 97 14	64.9	4
105	43 01.7 98 14	66.6	44 00.4 98 14	66.3	45 28.3 98 14	65.9	46 26.9 98 14	65.6	47 25.4 97 14	65.2	48 23.8 97 14	64.9	49 22.2 97 14	64.6	50 49.7 97 14	64.0	105
6	42 53.1 98 14	65.7	43 51.8 98 14	65.4	45 19.8 98 14	65.0	46 18.4 98 14	64.7	47 16.9 98 14	64.3	48 15.4 97 14	64.0	49 13.8 97 14	63.7	50 41.3 97 14	63.1	6
7	42 44.6 98 14	64.8	43 43.3 98 14	64.5	45 11.3 98 14	64.0	46 09.9 98 14	63.7	47 08.5 98 14	63.4	48 07.0 97 14	63.1	49 05.4 97 14	62.7	50 33.0 97 14	62.2	7
8	42 36.1 98 14	63.8	43 34.9 98 14	63.6	45 02.9 98 14	63.1	46 01.5 98 14	62.8	47 00.1 98 14	62.5	47 58.6 98 14	62.2	48 57.1 97 14	61.8	50 24.7 97 14	61.3	8
9	42 27.7 98 14	62.9	43 26.5 98 14	62.6	44 54.6 98 14	62.2	45 53.2 98 14	61.9	46 51.8 98 14	61.6	47 50.4 98 14	61.3	48 48.9 97 14	60.9	50 16.5 97 14	60.4	9
110	42 19.4 98 14	62.0	43 18.2 98 14	61.7	44 46.3 98 14	61.3	45 45.0 98 14	61.0	46 43.6 98 14	60.7	47 42.2 98 14	60.4	48 40.7 97 14	60.0	50 08.4 97 13	59.5	110
1	42 11.2 98 14	61.1	43 10.0 98 14	60.8	44 38.1 98 14	60.4	45 36.8 98 14	60.1	46 35.5 98 13	59.8	47 34.1 98 13	59.5	48 32.6 98 13	59.1	50 00.3 97 13	58.6	1
2	42 03.0 98 14	60.2	43 01.8 98 13	59.9	44 30.0 98 13	59.5	45 28.7 98 13	59.2	46 27.4 98 13	58.9	47 26.0 98 13	58.6	48 24.6 98 13	58.2	49 52.3 97 13	57.7	2
3	41 54.9 98 13	59.2	42 53.7 98 13	59.0	44 21.9 98 13	58.6	45 20.7 98 13	58.3	46 19.4 98 13	58.0	47 18.0 98 13	57.7	48 16.6 98 13	57.4	49 44.4 98 13	56.8	3
4	41 46.9 98 12	58.3	42 45.7 98 13	58.1	44 14.0 98 13	57.7	45 12.7 98 13	57.4	46 11.5 98 13	57.1	47 10.1 98 13	56.8	48 08.8 98 13	56.5	49 36.6 98 13	56.0	4
115	41 38.9 98 13	57.4	42 37.8 98 13	57.2	44 06.1 98 13	56.7	45 04.9 98 13	56.5	46 03.6 98 13	56.2	47 02.3 98 13	55.9	48 01.0 98 13	55.6	49 28.9 98 13	55.1	115
6	41 31.0 98 13	56.5	42 30.0 98 13	56.3	43 58.3 98 13	55.8	44 57.1 98 13	55.6	45 55.9 98 13	55.3	46 54.6 98 13	55.0	47 53.3 98 13	54.7	49 21.2 98 13	54.2	6
7	41 23.3 98 13	55.6	42 22.2 98 13	55.3	43 50.5 98 13	54.9	44 49.4 98 13	54.7	45 48.2 98 13	54.4	46 47.0 98 13	54.1	47 45.7 98 13	53.8	49 13.7 98 13	53.3	7
8	41 15.6 98 13	54.7	42 14.5 98 13	54.4	43 42.9 98 13	54.0	44 41.8 98 13	53.8	45 40.6 98 13	53.5	46 39.4 98 13	53.2	47 38.2 98 13	52.9	49 06.2 98 12	52.4	8
9	41 07.9 98 13	53.8	42 06.9 98 12	53.5	43 35.3 98 12	53.1	44 34.2 98 12	52.9	45 33.1 98 12	52.6	46 31.9 98 12	52.3	47 30.7 98 12	52.0	48 58.8 98 12	51.6	9
120	41 00.4 98 12	52.9	41 59.4 98 12	52.6	43 27.9 98 12	52.2	44 26.8 98 12	52.0	45 25.7 98 12	51.7	46 24.5 98 12	51.4	47 23.4 98 12	51.1	48 51.5 98 12	50.7	120
1	40 52.8 98 12	52.0	41 52.0 98 12	51.7	43 20.5 98 12	51.3	44 19.5 98 12	51.1	45 18.4 98 12	50.8	46 17.3 98 12	50.5	47 16.1 98 12	50.3	48 44.3 98 12	49.8	1
2	40 45.6 98 12	51.1	41 44.7 98 12	50.8	43 13.2 98 12	50.5	44 12.2 98 12	50.2	45 11.1 98 12	49.9	46 10.1 98 12	49.7	47 06.9 98 12	49.4	48 37.1 98 12	48.9	2
3	40 38.4 98 12	50.2	41 37.5 98 12	49.9	43 06.0 98 12	49.6	44 05.0 98 12	49.3	45 04.0 98 12	49.1	46 02.9 98 12	48.8	47 01.8 98 12	48.5	48 30.1 98 12	48.1	3
4	40 31.2 98 12	49.3	41 30.3 98 12	49.0	42 58.9 98 12	48.7	43 58.0 98 12	48.4	44 57.0 98 12	48.2	45 55.9 98 12	47.9	46 54.9 98 12	47.6	48 23.2 98 11	47.2	4
125	40 24.2 99 12	48.4	41 23.3 99 12	48.1	42 51.9 98 12	47.8	43 51.0 98 11	47.5	44 50.0 98 11	47.3	45 49.0 98 11	47.0	46 48.0 98 11	46.8	48 16.3 98 11	46.3	125
6	40 17.2 99 11	47.5	41 16.3 99 11	47.2	42 45.0 99 11	46.9	43 44.1 98 11	46.7	44 43.2 98 11	46.4	45 42.2 98 11	46.1	46 41.2 98 11	45.9	48 09.6 98 11	45.5	6
7	40 10.3 99 11	46.6	41 09.5 99 11	46.3	42 38.2 99 11	46.0	43 37.3 98 11	45.8	44 36.4 98 11	45.5	45 35.5 98 11	45.3	46 34.5 98 11	45.0	48 02.9 98 11	44.6	7
8	40 03.6 99 11	45.7	41 02.8 99 11	45.4	42 31.5 99 11	45.1	43 30.7 99 11	44.9	44 29.8 99 11	44.6	45 28.9 98 11	44.4	46 27.9 98 11	44.1	47 56.4 98 11	43.7	8
9	39 56.9 99 11	44.8	40 56.1 99 11	44.6	42 24.9 99 11	44.2	43 24.1 99 11	44.0	44 23.2 99 11	43.8	45 22.3 98 11	43.5	46 21.4 98 11	43.3	47 50.0 98 11	42.9	9
130	39 50.3 99 11	43.9	40 49.6 99 11	43.7	42 18.4 99 11	43.3	43 17.6 99 11	43.1	44 16.8 99 11	42.9	45 15.9 99 10	42.7	46 15.0 98 10	42.4	47 43.6 98 10	42.0	130
1	39 43.9 99 11	43.0	40 43.2 99 11	42.8	42 12.0 99 10	42.5	43 11.3 99 10	42.2	44 10.5 99 10	42.0	45 09.6 99 10	41.8	46 08.8 99 10	41.5	47 37.4 98 10	41.2	1
2	39 37.5 99 10	42.1	40 36.8 99 10	41.9	42 05.8 99 10	41.6	43 05.0 99 10	41.4	44 04.2 99 10	41.1	45 03.4 99 10	40.9	46 02.6 99 10	40.7	47 31.3 99 10	40.3	2
3	39 31.3 99 10	41.2	40 30.6 99 10	41.0	41 59.6 99 10	40.7	42 58.9 99 10	40.5	43 58.1 99 10	40.3	44 57.3 99 10	40.0	45 56.5 99 10	39.8	47 25.3 99 10	39.4	3
4	39 25.2 99 10	40.3	40 24.5 99 10	40.1	41 53.5 99 10	39.8	42 52.8 99 10	39.6	43 52.1 99 10	39.4	44 51.3 99 10	39.2	45 50.6 99 10	38.9	47 19.4 99 10	38.6	4
135	39 19.2 99 10	39.4	40 18.5 99 10	39.2	41 47.6 99 10	38.9	42 46.9 99 10	38.7	43 46.2 99 10	38.5	44 45.5 99 10	38.3	45 44.7 99 10	38.1	47 13.6 99 10	37.7	135
6	39 13.3 99 10	38.5	40 12.7 99 10	38.3	41 41.7 99 10	38.1	42 41.1 99 10	37.9	43 40.4 99 09	37.7	44 39.7 99 09	37.4	45 39.0 99 09	37.2	47 07.9 99 09	36.9	6
7	39 07.5 99 09	37.6	40 06.9 99 09	37.5	41 36.0 99 09	37.2	42 35.4 99 09	37.0	43 34.7 99 09	36.8	44 34.1 99 09	36.6	45 33.4 99 09	36.4	47 02.3 99 09	36.0	7
8	39 01.8 99 09	36.8	40 01.2 99 09	36.6	41 30.4 99 09	36.3	42 29.8 99 09	36.1	43 29.2 99 09	35.9	44 28.5 99 09	35.7	45 27.9 99 09	35.5	46 56.8 99 09	35.2	8
9	38 56.2 99 09	35.9	39 55.7 99 09	35.7	41 24.9 99 09	35.4	42 24.3 99 09	35.2	43 23.7 99 09	35.1	44 23.1 99 09	34.9	45 22.5 99 09	34.6	46 51.5 99 09	34.3	9
140	38 50.8 99 09	35.0	39 50.3 99 09	34.8	41 19.5 99 09	34.6	42 19.0 99 09	34.4	43 18.4 99 09	34.2	44 17.8 99 09	34.0	45 17.2 99 09	33.8	46 46.2 99 09	33.5	140
1	38 45.5 99 09	34.1	39 45.0 99 09	33.9	41 14.2 99 09	33.7	42 13.7 99 09	33.5	43 13.2 99 08	33.3	44 12.6 99 08	33.1	45 12.0 99 08	32.9	46 41.1 99 08	32.6	1
2	38 40.3 99 08	33.2	39 39.8 99 08	33.1	41 09.1 99 08	32.8	42 08.6 99 08	32.6	43 08.1 99 08	32.5	44 07.5 99 08	32.3	45 07.0 99 08	32.1	46 36.1 99 08	31.8	2
3	38 35.2 99 08	32.3	39 34.8 99 08	32.2	41 04.1 99 08	31.9	42 03.6 99 08	31.8	43 03.1 99 08	31.6	44 02.6 99 08	31.4	45 02.1 99 08	31.2	46 31.2 99 08	30.9	3
4	38 30.2 99 08	31.5	39 29.8 99 08	31.3	40 59.2 99 08	31.1	41 58.7 99 08	30.9	42 58.2 99 08	30.7	43 57.8 99 08	30.6	44 57.3 99 08	30.4	46 26.5 99 08	30.1	4
145	38 25.4 99 08	30.6	39 25.0 99 08	30.4	40 54.4 99 08	30.2	41 54.0 99 08	30.0	42 53.5 99 08	29.9	43 53.0 99 08	29.7	44 52.6 99 08	29.5	46 21.8 99 08	29.2	145
6	38 20.7 99 08	29.7	39 20.3 99 08	29.5	40 49.7 99 08	29.3	41 49.3 99 08	29.2	42 48.9 99 07	29.0	43 48.5 99 07	28.8	44 48.0 99 07	28.7	46 17.3 99 07	28.4	6
7	38 16.1 99 07	28.8	39 15.7 99 07	28.7	40 45.2 99 07	28.5	41 44.8 99 07	28.3	42 44.4 99 07	28.1	43 44.0 99 07	28.0	44 43.6 99 07	27.8	46 12.9 99 07	27.6	7
8	38 11.6 99 07	27.9	39 11.3 99 07	27.8	40 40.8 99 07	27.6	41 40.4 99 07	27.4	42 40.0 99 07	27.3	43 39.6 99 07	27.1	44 39.2 99 07	27.0	46 08.6 99 07	26.7	8
9	38 07.3 99 07	27.1	39 07.0 99 07	26.9	40 36.5 99 07	26.7	41 36.2 99 07	26.6	42 35.8 99 07	26.4	43 35.4 99 07	26.3	44 35.1 99 07	26.1	46 04.5 99 07	25.9	9
150	38 03.1 1.0 07	26.2	39 02.8 1.0 07	26.0	40 32.3 99 07	25.8	41 32.0 99 07	25.7	42 31.7 99 07	25.6	43 31.3 99 07	25.4	44 31.0 99 07	25.3	46 00.4 99 07	25.0	150
1	37 59.0 1.0 07	25.3	38 58.8 1.0 07	25.2	40 28.3 1.0 06	25.0	41 28.0 99 06	24.8	42 27.7 99 06	24.7	43 27.4 99 06	24.6	44 27.0 99 06	24.4	45 56.5 99 06	24.2	1
2	37 55.1 1.0 06	24.4	38 54.8 1.0 06	24.3	40 24.4 1.0 06	24.1	41 24.1 1.0 06	24.0	42 23.8 1.0 06	23.9	43 23.5 99 06	23.7	44 23.2 99 06	23.6	45 52.7 99 06	23.4	2
3	37 51.3 1.0 06	23.5	38 51.0 1.0 06	23.4	40 20.6 1.0 06	23.2	41 20.4 1.0 06	23.1	42 20.1 1.0 06	23.0	43 19.8 1.0 06	22.9	44 19.5 1.0 06	22.7	45 49.1 99 06	22.5	3
4	37 47.6 1.0 06	22.7	38 47.4 1.0 06	22.6	40 17.0 1.0 06	22.4	41 16.8 1.0 06	22.3	42 16.5 1.0 06	22.1	43 16.2 1.0 06	22.0	44 16.0 1.0 06	21.9	45 45.5 1.0 06	21.7	4
155	37 44.0 1.0 06	21.8	38 43.8 1.0 06	21.7	40 13.5 1.0 06	21.5	41 13.3 1.0 06	21.4	42 13.0 1.0 06	21.3	43 12.8 1.0 06	21.2	44 12.5 1.0 06	21.0	45 42.1 1.0 06	20.8	155
6	37 40.6 1.0 06	20.9	38 40.4 1.0 05	20.8	40 10.1 1.0 05	20.7	41 09.9 1.0 05	20.5	42 09.7 1.0 05	20.4	43 09.5 1.0 05	20.3	44 09.2 1.0 05	20.2	45 38.9 1.0 05	20.0	6
7	37 37.3 1.0 05	20.0	38 37.2 1.0 05	19.9	40 06.9 1.0 05	19.8	41 06.7 1.0 05	19.7	42 06.5 1.0 05	19.6	43 06.3 1.0 05	19.5	44 06.1 1.0 05	19.3	45 35.7 1.0 05	19.2	7
8	37 34.2 1.0 05	19.2	38 34.0 1.0 05	19.1	40 03.8 1.0 05	18.9	41 03.6 1.0 05	18.8	42 03.4 1.0 05	18.7	43 03.2 1.0 05	18.6	44 03.0 1.0 05	18.5	45 32.7 1.0 05	18.3	8
9	37 31.2 1.0 05	18.3	38 31.0 1.0 05	18.2	40 00.8 1.0 05	18.1	41 00.6 1.0 05	18.0	42 00.5 1.0 05	17.9	43 00.3 1.0 05	17.8	44 00.1 1.0 05	17.7	45 29.8 1.0 05	17.5	9
160	37 28.3 1.0 06	17.4	38 28.2 1.0 04	17.3	39 57.9 1.0 04	17.2	40 57.8 1.0 04	17.1	41 57.6 1.0 04	17.0	42 57.5 1.0 04	16.9	43 57.3 1.0 04	16.8	45 27.1 1.0 04	16.7	160
1	37 25.6 1.0 04	16.5	38 25.4 1.0 04	16.5	39 55.2 1.0 04	16.3	40 55.1 1.0 04	16.2	41 55.0 1.0 04	16.2	42 54.8 1.0 04	16.1	43 54.7 1.0 04	16.0	45 24.4 1.0 04	15.9	1
2	37 23.0 1.0 04	15.7	38 22.8 1.0 04	15.6	39 52.7 1.0 04	15.5	40 52.5 1.0 04	15.4	41 52.4 1.0 04	15.3	42 52.3 1.0 04	15.2	43 52.2 1.0 04	15.1	45 22.0 1.0 04	15.0	2
3	37 20.5 1.0 04	14.8	38 20.4 1.0 04	14.7	39 50.2 1.0 04	14.6	40 50.1 1.0 04	14.5	41 50.0 1.0 04	14.5	42 49.9 1.0 04	14.4	43 49.8 1.0 04	14.3	45 19.6 1.0 04	14.1	3
4	37 18.2 1.0 04	13.9	38 18.1 1.0 04	13.9	39 47.9 1.0 04	13.8	40 47.8 1.0 04	13.7	41 47.7 1.0 04	13.6	42 47.6 1.0 04	13.5	43 47.5 1.0 04	13.4	45 17.4 1.0 04	13.3	4
165	37 16.0 1.0 03	13.1	38 15.9 1.0 03	13.0	39 45.8 1.0 03	12.9	40 45.7 1.0 03	12.8	41 45.6 1.0 03	12.8	42 45.5 1.0 03	12.7	43 45.4 1.0 03	12.6	45 15.3 1.0 03	12.5	165
6	37 13.9 1.0 03	12.2	38 13.8 1.0 03	12.1	39 43.7 1.0 03	12.0	40 43.7 1.0 03	12.0	41 43.6 1.0 03	11.9	42 43.5 1.0 03	11.8	43 43.4 1.0 03	11.8	45 13.3 1.0 03	11.6	6
7	37 12.0 1.0 03	11.3	38 11.9 1.0 03	11.3	39 41.9 1.0 03	11.2	40 41.8 1.0 03	11.1	41 41.7 1.0 03	11.0	42 41.7 1.0 03	11.0	43 41.6 1.0 03	10.9	45 11.5 1.0 03	10.8	7
8	37 10.2 1.0 03	10.4	38 10.2 1.0 03	10.4	39 40.1 1.0 03	10.3	40 40.0 1.0 03	10.3	41 40.0 1.0 03	10.2	42 39.9 1.0 03	10.1	43 39.9 1.0 03	10.1	45 09.8 1.0 03	10.0	8
9	37 08.6 1.0 02	09.6	38 08.6 1.0 02	09.5	39 38.5 1.0 02	09.5	40 38.4 1.0 02	09.4	41 38.4 1.0 02	09.3	42 38.4 1.0 02	09.3	43 38.3 1.0 02	09.2	45 08.2 1.0 02	09.1	9
170	37 07.1 1.0 02	08.7	38 07.1 1.0 02	08.7	39 37.0 1.0 02	08.6	40 37.0 1.0 02	08.5	41 36.9 1.0 02	08.5	42 36.9 1.0 02	08.4	43 36.9 1.0 02	08.4	45 06.8 1.0 02	08.3	170
1	37 05.8 1.0 02	07.8	38 05.7 1.0 02	07.7	39 35.7 1.0 02	07.7	40 35.7 1.0 02	07.6	41 35.6 1.0 02	07.6	42 35.6 1.0 02	07.6	43 35.6 1.0 02	07.5	45 05.5 1.0 02	07.5	1
2	37 04.6 1.0 02	07.0	38 04.5 1.0 02	06.9	39 34.5 1.0 02	06.9	40 34.5 1.0 02	06.8	41 34.4 1.0 02	06.8	42 34.4 1.0 02	06.8	43 34.4 1.0 02	06.7	45 04.4 1.0 02	06.7	2
3	37 03.5 1.0 02	06.1	38 03.5 1.0 02	06.1	39 33.4 1.0 02	06.0	40 33.4 1.0 02	06.0	41 33.4 1.0 02	05.9	42 33.4 1.0 02	05.9	43 33.4 1.0 02	05.9	45 03.3 1.0 01	05.8	3
4	37 02.6 1.0 01	05.2	38 02.6 1.0 01	05.2	39 32.5 1.0 01	05.2	40 32.5 1.0 01	05.1	41 32.5 1.0 01	05.1	42 32.5 1.0 01	05.1	43 32.5 1.0 01	05.0	45 02.4 1.0 01	05.0	4
175	37 01.8 1.0 01	04.3	38 01.8 1.0 01	04.3	39 31.8 1.0 01	04.3	40 31.7 1.0 01	04.3	41 31.7 1.0 01	04.2	42 31.7 1.0 01	04.2	43 31.7 1.0 01	04.2	45 01.7 1.0 01	04.2	175
6	37 01.1 1.0 01	03.5	38 01.1 1.0 01	03.5	39 31.1 1.0 01	03.4	40 31.1 1.0 01	03.4	41 31.1 1.0 01	03.4	42 31.1 1.0 01	03.4	43 31.1 1.0 01	03.4	45 01.1 1.0 01	03.3	6
7	37 00.5 1.0 01	02.6	38 00.6 1.0 01	02.6	39 30.6 1.0 01	02.6	40 30.6 1.0 01	02.6	41 30.6 1.0 01	02.5	42 30.6 1.0 01	02.5	43 30.6 1.0 01	02.5	45 00.6 1.0 01	02.5	7
8	37 00.3 1.0 00	01.7	38 00.3 1.0 00	01.7	39 30.3 1.0 00	01.7	40 30.3 1.0 00	01.7	41 30.3 1.0 00	01.7	42 30.3 1.0 00	01.7	43 30.3 1.0 00	01.7	45 00.3 1.0 00	01.7	8
9	37 00.1 1.0 00	00.9	38 00.1 1.0 00	00.9	39 30.1 1.0 00	00.9	40 30.1 1.0 00	00.9	41 30.1 1.0 00	00.8	42 30.1 1.0 00	00.8	43 30.1 1.0 00	00.8	45 00.1 1.0 00	00.8	9
180	37 00.0 1.0 00	00.0	38 00.0 1.0 00	00.0	39 30.0 1.0 00	00.0	40 30.0 1.0 00	00.0	41 30.0 1.0 00	00.0	42 30.0 1.0 00	00.0	43 30.0 1.0 00	00.0	45 00.0 1.0 00	00.0	180

DECLINATION SAME NAME AS LATITUDE

Each column group lists: Alt. | Δd Δt | Az.

H.A.	54° 30'	55° 00'	56° 00'	56° 30'	57° 00'	57° 30'	59° 00'	59° 30'	H.A.
00	63 30.0 1.0 00 180.0	64 00.0 1.0 00 180.0	65 00.0 1.0 00 180.0	65 30.0 1.0 00 180.0	66 00.0 1.0 00 180.0	66 30.0 1.0 00 180.0	68 00.0 1.0 00 180.0	68 30.0 1.0 00 180.0	00
1	63 29.9 1.0 01 178.7	63 59.9 1.0 01 178.7	64 59.9 1.0 01 178.7	65 29.9 1.0 01 178.7	65 59.9 1.0 01 178.7	66 29.9 1.0 01 178.7	67 59.9 1.0 01 178.6	68 29.9 1.0 01 178.6	1
2	63 29.6 1.0 01 177.4	63 59.6 1.0 01 177.4	64 59.6 1.0 01 177.3	65 29.6 1.0 01 177.3	65 59.6 1.0 01 177.3	66 29.6 1.0 01 177.3	67 59.5 1.0 01 177.2	68 29.5 1.0 01 177.2	2
3	63 29.0 1.0 01 176.1	63 59.0 1.0 01 176.1	64 59.0 1.0 01 176.0	65 29.0 1.0 01 176.0	65 59.0 1.0 01 176.0	66 29.0 1.0 01 176.0	67 59.0 1.0 01 175.9	68 29.0 1.0 01 175.8	3
4	63 28.3 1.0 02 174.8	63 58.3 1.0 02 174.8	64 58.3 1.0 02 174.7	65 28.3 1.0 02 174.7	65 58.2 1.0 02 174.6	66 28.2 1.0 02 174.6	67 58.2 1.0 02 174.5	68 28.2 1.0 02 174.5	4
05	63 27.3 1.0 02 173.5	63 57.3 1.0 02 173.5	64 57.3 1.0 02 173.4	65 27.3 1.0 02 173.4	65 57.3 1.0 02 173.3	66 27.2 1.0 02 173.3	67 57.2 1.0 02 173.1	68 27.2 1.0 02 173.1	05
6	63 26.2 1.0 02 172.2	63 56.2 1.0 02 172.2	64 56.1 1.0 02 172.1	65 26.1 1.0 02 172.0	65 56.1 1.0 02 172.0	66 26.0 1.0 02 171.9	67 56.0 1.0 02 171.8	68 25.9 1.0 02 171.7	6
7	63 24.8 1.0 03 170.9	63 54.8 1.0 03 170.9	64 54.7 1.0 03 170.8	65 24.7 1.0 03 170.7	65 54.6 1.0 03 170.6	66 24.5 1.0 03 170.6	67 54.5 1.0 03 170.4	68 24.5 1.0 03 170.3	7
8	63 23.2 1.0 03 169.6	63 53.2 1.0 03 169.6	64 53.1 1.0 03 169.4	65 23.0 1.0 03 169.4	65 53.0 1.0 03 169.3	66 23.0 1.0 03 169.2	67 52.8 1.0 03 169.0	68 22.8 1.0 03 168.9	8
9	63 21.4 1.0 03 168.3	63 51.4 1.0 03 168.3	64 51.3 1.0 03 168.1	65 21.2 1.0 03 168.1	65 51.2 1.0 03 168.0	66 21.1 1.0 03 167.9	67 50.9 1.0 04 167.7	68 20.9 1.0 04 167.6	9
10	63 19.4 1.0 04 167.0	63 49.3 1.0 04 167.0	64 49.2 1.0 04 166.8	65 19.2 1.0 04 166.7	65 49.1 1.0 04 166.7	66 19.0 1.0 04 166.6	67 48.8 1.0 04 166.3	68 18.7 1.0 04 166.2	10
1	63 17.2 1.0 04 165.7	63 47.1 1.0 04 165.7	64 47.0 1.0 04 165.5	65 16.9 1.0 04 165.4	65 46.8 1.0 04 165.3	66 16.7 1.0 04 165.2	67 46.5 1.0 04 164.9	68 16.4 1.0 04 164.8	1
2	63 14.8 1.0 04 164.4	63 44.7 1.0 04 164.4	64 44.5 1.0 04 164.2	65 14.4 1.0 04 164.1	65 44.3 1.0 04 164.0	66 14.2 1.0 04 163.9	67 43.9 1.0 05 163.6	68 13.8 1.0 05 163.5	2
3	63 12.1 1.0 05 163.2	63 42.1 1.0 05 163.1	64 41.9 1.0 05 162.9	65 11.8 1.0 05 162.8	65 41.7 1.0 05 162.7	66 11.5 1.0 05 162.6	67 41.2 1.0 05 162.2	68 11.0 1.0 05 162.1	3
4	63 09.3 1.0 05 161.9	63 39.2 1.0 05 161.8	64 39.0 1.0 05 161.6	65 08.9 1.0 05 161.5	65 38.8 1.0 05 161.4	66 08.6 1.0 05 161.3	67 38.2 1.0 05 160.9	68 08.1 .99 05 160.8	4
15	63 06.3 1.0 05 160.6	63 36.2 1.0 05 160.5	64 35.9 1.0 05 160.3	65 05.8 1.0 05 160.2	65 35.7 1.0 06 160.1	66 05.5 .99 06 159.9	67 35.0 .99 06 159.5	68 04.9 .99 06 159.4	15
6	63 03.1 1.0 06 159.3	63 33.0 1.0 06 159.2	64 32.7 .99 06 159.0	65 02.5 .99 06 158.9	65 32.4 .99 06 158.8	66 02.2 .99 06 158.6	67 31.6 .99 06 158.2	68 01.5 .99 06 158.0	6
7	62 59.7 .99 06 158.0	63 29.5 .99 06 157.9	64 29.2 .99 06 157.7	64 59.0 .99 06 157.6	65 28.9 .99 06 157.4	65 58.7 .99 06 157.3	67 28.1 .99 06 156.9	67 57.8 .99 06 156.7	7
8	62 56.1 .99 06 156.8	63 25.9 .99 06 156.7	64 25.5 .99 06 156.4	64 55.4 .99 06 156.3	65 25.2 .99 06 156.1	65 54.9 .99 07 156.0	67 24.3 .99 07 155.5	67 54.0 .99 07 155.4	8
9	62 52.3 .99 07 155.5	63 22.1 .99 07 155.4	64 21.7 .99 07 155.1	64 51.5 .99 07 155.0	65 21.3 .99 07 154.8	65 51.0 .99 07 154.7	67 20.3 .99 07 154.2	67 50.0 .99 07 154.0	9
20	62 48.3 .99 07 154.2	63 18.1 .99 07 154.1	64 17.6 .99 07 153.8	64 47.4 .99 07 153.7	65 17.2 .99 07 153.5	65 46.9 .99 07 153.4	67 16.1 .99 07 152.9	67 45.8 .99 07 152.7	20
1	62 44.1 .99 07 152.9	63 13.9 .99 07 152.8	64 13.4 .99 07 152.6	64 43.2 .99 07 152.4	65 12.9 .99 07 152.1	65 42.6 .99 07 152.1	67 11.7 .99 08 151.6	67 41.4 .99 08 151.4	1
2	62 39.8 .99 08 151.7	63 09.5 .99 08 151.6	64 09.0 .99 08 151.3	64 38.7 .99 08 151.1	65 08.4 .99 08 151.0	65 38.1 .99 08 150.8	67 07.2 .99 08 150.2	67 36.8 .99 08 150.1	2
3	62 35.2 .99 08 150.5	63 05.0 .99 08 150.3	64 04.4 .99 08 150.0	64 34.1 .99 08 149.9	65 03.8 .99 08 149.7	65 33.5 .99 08 149.5	67 02.4 .99 08 148.9	67 32.0 .99 08 148.7	3
4	62 30.5 .99 08 149.2	63 00.2 .99 08 149.1	63 59.6 .99 08 148.8	64 29.3 .99 08 148.6	64 59.0 .99 08 148.4	65 28.6 .99 08 148.2	66 57.5 .99 09 147.6	67 27.1 .99 09 147.4	4
25	62 25.6 .99 08 148.0	62 55.3 .99 08 147.8	63 54.7 .99 09 147.5	64 24.3 .99 09 147.3	64 54.0 .99 09 147.1	65 23.6 .99 09 147.0	66 52.4 .99 09 146.3	67 21.9 .99 09 146.1	25
6	62 20.6 .99 09 146.7	62 50.2 .99 09 146.6	63 49.5 .99 09 146.2	64 19.2 .99 09 146.1	64 48.8 .99 09 145.9	65 18.4 .99 09 145.7	66 47.1 .98 09 145.1	67 16.6 .98 09 144.8	6
7	62 15.3 .99 09 145.5	62 45.0 .99 09 145.3	63 44.2 .99 09 145.0	64 13.8 .99 09 144.8	64 43.4 .99 09 144.6	65 13.0 .99 09 144.4	66 41.6 .98 09 143.8	67 11.1 .98 09 143.5	7
8	62 09.9 .99 09 144.3	62 39.6 .99 09 144.1	63 38.8 .99 09 143.7	64 08.3 .99 09 143.6	64 37.9 .99 09 143.4	65 07.5 .98 10 143.2	66 36.0 .98 10 142.5	67 05.5 .98 10 142.3	8
9	62 04.4 .99 10 143.0	62 34.0 .99 10 142.9	63 33.1 .99 10 142.5	64 02.7 .98 10 142.3	64 32.2 .98 10 142.1	65 01.7 .98 10 141.9	66 30.2 .98 10 141.2	66 59.6 .98 10 141.0	9
30	61 58.7 .99 10 141.8	62 28.2 .99 10 141.6	63 27.3 .98 10 141.3	63 56.9 .98 10 141.1	64 26.4 .98 10 140.9	64 55.9 .98 10 140.7	66 24.2 .98 10 140.0	66 53.6 .98 10 139.7	30
1	61 52.8 .99 10 140.6	62 22.3 .98 10 140.4	63 21.4 .98 10 140.0	63 50.9 .98 10 139.8	64 20.4 .98 10 139.6	64 49.8 .98 10 139.4	66 18.1 .98 10 138.7	66 47.5 .98 10 138.4	1
2	61 46.7 .98 10 139.4	62 16.3 .98 10 139.2	63 15.3 .98 10 138.8	63 44.8 .98 10 138.6	64 14.2 .98 10 138.4	64 43.7 .98 11 138.2	66 11.8 .98 11 137.4	66 41.2 .98 11 137.2	2
3	61 40.6 .98 11 138.2	62 10.1 .98 11 138.0	63 09.0 .98 11 137.6	63 38.5 .98 11 137.4	64 07.9 .98 11 137.2	64 37.3 .98 11 136.9	66 05.4 .98 11 136.2	66 34.7 .98 11 135.9	3
4	61 34.2 .98 11 137.0	62 03.7 .98 11 136.8	63 02.6 .98 11 136.4	63 32.0 .98 11 136.2	64 01.5 .98 11 135.9	64 30.8 .98 11 135.7	65 58.8 .98 11 135.0	66 28.1 .98 11 134.7	4
35	61 27.8 .98 11 135.8	61 57.2 .98 11 135.6	62 56.1 .98 11 135.2	63 25.5 .98 11 135.0	63 54.9 .98 11 134.7	64 24.2 .98 11 134.5	65 52.1 .98 11 133.7	66 21.4 .97 11 133.5	35
6	61 21.1 .98 11 134.6	61 50.6 .98 11 134.4	62 49.4 .98 11 134.0	63 18.8 .98 11 133.8	63 48.1 .98 11 133.6	64 17.4 .98 12 133.3	65 45.3 .97 12 132.5	66 14.5 .97 12 132.2	6
7	61 14.4 .98 11 133.4	61 43.8 .98 12 133.2	62 42.6 .98 12 132.8	63 11.9 .98 12 132.6	63 41.2 .98 12 132.3	64 10.5 .98 12 132.1	65 38.3 .97 12 131.3	66 07.5 .97 12 131.0	7
8	61 07.5 .98 12 132.2	61 36.9 .98 12 132.0	62 35.6 .98 12 131.6	63 04.9 .98 12 131.4	63 34.2 .98 12 131.1	64 03.5 .98 12 130.9	65 31.2 .97 12 130.1	66 00.3 .97 12 129.8	8
9	61 00.5 .98 12 131.1	61 29.9 .98 12 130.8	62 28.5 .98 12 130.4	62 57.8 .98 12 130.2	63 27.1 .98 12 129.9	63 56.4 .97 12 129.7	65 23.9 .97 12 128.9	65 53.1 .97 12 128.6	9
40	60 53.4 .98 12 129.9	61 22.7 .98 12 129.7	62 21.3 .98 12 129.2	62 50.6 .98 12 129.0	63 19.8 .97 12 128.7	63 49.1 .97 12 128.5	65 16.6 .97 12 127.7	65 45.7 .97 13 127.4	40
1	60 46.1 .98 12 128.7	61 15.4 .98 12 128.5	62 14.0 .98 13 128.0	62 43.2 .97 12 127.8	63 12.5 .97 13 127.6	63 41.7 .97 13 127.3	65 09.1 .97 13 126.5	65 38.2 .97 13 126.2	1
2	60 38.7 .98 12 127.6	61 08.0 .98 13 127.3	62 06.5 .97 13 126.9	62 35.8 .97 13 126.6	63 05.0 .97 13 126.4	63 34.1 .97 13 126.1	65 01.5 .97 13 125.3	65 30.5 .97 13 125.0	2
3	60 31.2 .98 13 126.4	61 00.5 .98 13 126.2	61 59.0 .97 13 125.7	62 28.2 .97 13 125.5	62 57.4 .97 13 125.2	63 26.5 .97 13 125.0	64 53.8 .97 13 124.1	65 22.8 .97 13 123.8	3
4	60 23.6 .98 13 125.3	60 52.9 .97 13 125.0	61 51.3 .97 13 124.6	62 20.5 .97 13 124.3	62 49.6 .97 13 124.1	63 18.8 .97 13 123.8	64 45.9 .97 13 122.9	65 14.9 .97 13 122.6	4
45	60 15.9 .97 13 124.1	60 45.1 .97 13 123.8	61 43.5 .97 13 123.4	62 12.7 .97 13 123.2	62 41.8 .97 13 122.9	63 10.9 .97 13 122.6	64 38.0 .97 14 121.8	65 07.0 .96 14 121.5	45
6	60 08.1 .97 13 123.0	60 37.3 .97 13 122.8	61 35.6 .97 13 122.3	62 04.8 .97 13 122.0	62 33.9 .97 14 121.8	63 02.9 .97 14 121.5	64 30.0 .96 14 120.6	64 58.9 .96 14 120.3	6
7	60 00.1 .97 13 121.8	60 29.3 .97 13 121.6	61 27.6 .97 13 121.1	61 56.8 .97 14 120.9	62 25.8 .97 14 120.6	62 54.9 .97 14 120.3	64 21.9 .96 14 119.5	64 50.8 .96 14 119.2	7
8	59 52.1 .97 14 120.7	60 21.3 .97 14 120.5	61 19.6 .97 14 120.0	61 48.7 .97 14 119.7	62 17.7 .97 14 119.5	62 46.7 .97 14 119.2	64 13.6 .96 14 118.3	64 42.5 .96 14 118.0	8
9	59 44.0 .97 14 119.6	60 13.2 .97 14 119.4	61 11.4 .97 14 118.9	61 40.5 .97 14 118.6	62 09.5 .97 14 118.3	62 38.5 .97 14 118.1	64 05.3 .96 14 117.2	64 34.2 .96 14 116.9	9
50	59 35.9 .97 14 118.5	60 04.9 .97 14 118.2	61 03.1 .97 14 117.7	61 32.2 .97 14 117.5	62 01.2 .97 14 117.2	62 30.2 .97 14 116.9	63 56.9 .96 14 116.1	64 25.8 .96 15 115.7	50
1	59 27.5 .97 14 117.4	59 56.6 .97 14 117.1	60 54.8 .97 14 116.6	61 23.8 .97 14 116.4	61 52.8 .96 14 116.1	62 21.8 .96 14 115.8	63 48.5 .96 14 114.9	64 17.3 .96 14 114.6	1
2	59 19.1 .97 14 116.3	59 48.2 .97 14 116.0	60 46.3 .97 14 115.5	61 15.4 .97 14 115.3	61 44.3 .96 14 115.0	62 13.3 .96 14 114.7	63 39.9 .96 14 113.8	64 08.7 .96 14 113.5	2
3	59 10.7 .97 14 115.2	59 39.8 .97 14 114.9	60 37.8 .97 14 114.4	61 06.8 .97 14 114.1	61 35.8 .96 14 113.9	62 04.7 .96 14 113.6	63 31.3 .96 15 112.7	64 00.1 .96 15 112.4	3
4	59 02.1 .97 14 114.1	59 31.2 .97 14 113.8	60 29.2 .97 14 113.3	60 58.2 .97 14 113.0	61 27.2 .96 14 112.8	61 56.1 .96 14 112.5	63 22.6 .96 15 111.6	63 51.4 .96 15 111.3	4
55	58 53.5 .97 14 113.0	59 22.6 .97 14 112.7	60 20.6 .97 15 112.2	60 49.6 .96 15 112.0	61 18.5 .96 15 111.7	61 47.4 .96 15 111.4	63 13.8 .96 15 110.5	63 42.6 .96 15 110.2	55
6	58 44.9 .97 15 111.9	59 13.9 .97 15 111.6	60 11.9 .97 15 111.1	60 40.8 .96 15 110.9	61 09.7 .96 15 110.6	61 38.6 .96 15 110.3	63 05.0 .96 15 109.4	63 33.7 .96 15 109.1	6
7	58 36.1 .97 15 110.8	59 05.1 .97 15 110.6	60 03.1 .96 15 110.0	60 32.0 .96 15 109.8	61 00.9 .96 15 109.5	61 29.8 .96 15 109.2	62 56.1 .96 15 108.3	63 24.8 .96 15 108.0	7
8	58 27.3 .97 15 109.7	58 56.3 .97 15 109.5	59 54.2 .96 15 109.0	60 23.2 .96 15 108.7	60 52.0 .96 15 108.4	61 20.9 .96 15 108.1	62 47.2 .96 15 107.2	63 15.9 .96 15 106.9	8
9	58 18.4 .97 15 108.5	58 47.4 .97 15 108.4	59 45.3 .96 15 107.9	60 14.2 .96 15 107.6	60 43.1 .96 15 107.4	61 11.9 .96 15 107.1	62 38.2 .95 15 106.2	63 06.9 .95 15 105.8	9
60	58 09.5 .97 15 107.6	58 38.5 .97 15 107.3	59 36.4 .96 15 106.8	60 05.3 .96 15 106.6	60 34.1 .96 15 106.0	61 02.9 .96 15 106.0	62 29.2 .95 15 105.1	62 57.8 .95 15 104.8	60
1	58 00.6 .97 15 106.5	58 29.5 .97 15 106.3	59 27.4 .96 15 105.8	59 56.2 .96 15 105.5	60 25.1 .96 15 105.2	60 53.9 .96 15 104.9	62 20.1 .95 15 104.0	62 48.7 .95 15 103.7	1
2	57 51.5 .97 15 105.5	58 20.5 .96 15 105.2	59 18.3 .96 15 104.7	59 47.2 .96 15 104.4	60 16.0 .96 15 104.2	60 44.8 .96 15 103.9	62 11.0 .95 15 103.0	62 39.6 .95 15 102.6	2
3	57 42.5 .97 15 104.4	58 11.4 .96 15 104.2	59 09.2 .96 15 103.7	59 38.1 .96 15 103.4	60 06.9 .96 15 103.1	60 35.7 .96 15 102.8	62 01.8 .95 15 101.9	62 30.4 .95 15 101.6	3
4	57 33.4 .97 15 103.4	58 02.3 .96 15 103.1	59 00.1 .96 15 102.6	59 28.9 .96 15 102.3	59 57.7 .96 15 102.1	60 26.5 .96 15 101.8	61 52.6 .95 16 100.8	62 21.2 .95 15 100.6	4
65	57 24.2 .96 15 102.3	57 53.1 .96 15 102.1	58 51.0 .96 15 101.5	59 19.7 .96 15 101.3	59 48.5 .96 15 101.0	60 17.3 .96 15 100.7	61 43.4 .95 15 99.8	62 12.0 .95 15 99.5	65
6	57 15.0 .96 15 101.3	57 43.9 .96 15 101.0	58 41.7 .96 15 100.5	59 10.5 .96 15 100.3	59 39.3 .96 15 100.0	60 08.1 .96 15 99.7	61 34.1 .95 16 98.8	62 02.7 .95 15 98.5	6
7	57 05.8 .96 15 100.3	57 34.7 .96 15 100.0	58 32.4 .96 15 99.5	59 01.3 .96 15 99.2	59 30.0 .96 15 99.0	59 58.8 .96 15 98.7	61 24.8 .95 16 97.8	61 53.4 .95 16 97.4	7
8	56 56.5 .96 15 99.2	57 25.4 .96 15 99.0	58 23.2 .96 16 98.5	58 52.0 .96 16 98.2	59 20.8 .96 16 97.9	59 49.5 .96 16 97.6	61 15.5 .96 16 96.7	61 44.1 .95 16 96.4	8
9	56 47.3 .96 15 98.2	57 16.2 .96 15 98.0	58 13.9 .96 16 97.4	58 42.7 .96 16 97.2	59 11.5 .96 16 96.9	59 40.2 .96 16 96.6	61 06.2 .95 16 95.7	61 34.7 .95 16 95.4	9
70	56 38.0 .96 16 97.2	57 06.9 .96 16 96.9	58 04.6 .96 16 96.4	58 33.4 .96 16 96.2	59 02.1 .96 16 95.9	59 30.9 .96 16 95.6	60 56.8 .96 16 94.7	61 25.4 .95 16 94.4	70
1	56 28.6 .96 16 96.2	56 57.5 .96 16 95.9	57 55.2 .96 16 95.4	58 24.0 .96 16 95.1	58 52.8 .96 16 94.9	59 21.5 .96 16 94.6	60 47.5 .96 16 93.7	61 16.0 .96 16 93.4	1
2	56 19.3 .96 16 95.2	56 48.2 .96 16 94.9	57 45.9 .96 16 94.4	58 14.7 .96 16 94.1	58 43.4 .96 16 93.9	59 12.1 .96 16 93.6	60 38.1 .96 16 92.7	61 06.6 .96 16 92.4	2
3	56 09.9 .96 16 94.2	56 38.8 .96 16 93.9	57 36.5 .96 16 93.4	58 05.3 .96 16 93.1	58 34.1 .96 16 92.9	59 02.8 .96 16 92.6	60 28.5 .96 16 91.7	60 57.0 .95 16 91.4	3
4	56 00.6 .96 16 93.2	56 29.5 .96 16 92.9	57 27.1 .96 16 92.4	57 55.9 .96 16 92.1	58 24.7 .96 16 91.9	58 53.4 .96 16 91.6	60 19.3 .95 16 90.7	60 47.9 .95 16 90.4	4
75	55 51.2 .96 16 92.2	56 20.1 .96 16 91.9	57 17.8 .96 16 91.4	57 46.5 .96 16 91.1	58 15.3 .96 16 90.9	58 44.0 .96 16 90.6	60 09.9 .95 16 89.7	60 38.5 .95 16 89.4	75
6	55 41.8 .96 16 91.2	56 10.7 .96 16 90.9	57 08.4 .96 16 90.4	57 37.2 .96 16 90.2	58 05.9 .96 16 89.9	58 34.6 .96 16 89.6	60 00.6 .95 16 88.7	60 29.1 .95 16 88.4	6
7	55 32.4 .96 16 90.2	56 01.3 .96 16 89.9	56 59.0 .96 16 89.4	57 27.8 .96 16 89.2	57 56.5 .96 16 88.9	58 25.2 .96 16 88.6	59 51.2 .95 16 87.8	60 19.7 .95 16 87.4	7
8	55 23.0 .96 16 89.2	55 51.9 .96 16 88.9	56 49.6 .96 16 88.4	57 18.4 .96 16 88.1	57 47.1 .96 16 87.9	58 15.8 .96 16 87.6	59 41.8 .95 16 86.8	60 10.4 .95 16 86.5	8
9	55 13.7 .96 16 88.2	55 42.5 .96 16 88.0	56 40.2 .96 16 87.5	57 09.0 .96 16 87.2	57 37.8 .96 16 86.9	58 06.5 .96 16 86.7	59 32.4 .95 16 85.8	60 01.0 .95 16 85.5	9
80	55 04.3 .96 16 87.2	55 33.2 .96 16 87.0	56 30.8 .96 16 86.5	56 59.6 .96 16 86.2	57 28.4 .96 16 86.0	57 57.1 .96 16 85.7	59 23.1 .95 16 84.8	59 51.6 .95 16 84.5	80
1	54 54.9 .96 16 86.2	55 23.8 .96 16 86.0	56 21.5 .96 16 85.5	56 50.3 .96 16 85.3	57 19.0 .96 16 85.0	57 47.8 .96 16 84.7	59 13.7 .95 16 83.9	59 42.3 .95 16 83.6	1
2	54 45.6 .96 16 85.3	55 14.4 .96 16 85.0	56 12.1 .96 16 84.6	56 40.9 .96 16 84.3	57 09.7 .96 16 84.0	57 38.4 .96 16 83.8	59 04.4 .95 16 82.9	59 33.0 .95 16 82.6	2
3	54 36.2 .96 16 84.3	55 05.1 .96 16 84.1	56 02.8 .96 16 83.6	56 31.6 .96 16 83.3	57 00.4 .96 16 83.1	57 29.1 .96 16 82.8	58 55.1 .95 16 81.9	59 23.7 .95 16 81.7	3
4	54 26.9 .96 16 83.3	54 55.8 .96 16 83.1	55 53.5 .96 16 82.6	56 22.3 .96 16 82.4	56 51.1 .96 16 82.1	57 19.8 .96 15 81.9	58 45.8 .95 15 81.0	59 14.4 .95 15 80.7	4
85	54 17.6 .96 15 82.4	54 46.5 .96 15 82.2	55 44.2 .96 15 81.7	56 13.0 .96 15 81.4	56 41.8 .96 15 81.2	57 10.5 .96 15 80.9	58 36.6 .95 15 80.1	59 05.2 .95 15 79.8	85
6	54 08.3 .96 15 81.4	54 37.2 .96 15 81.2	55 34.9 .96 15 80.7	56 03.7 .96 15 80.5	56 32.5 .96 15 80.2	57 01.3 .96 15 80.0	58 27.3 .95 15 79.1	58 55.9 .95 15 78.8	6
7	53 59.0 .96 15 80.5	54 27.9 .96 15 80.2	55 25.6 .96 15 79.8	55 54.5 .96 15 79.5	56 23.3 .96 15 79.3	56 52.0 .96 15 79.0	58 18.1 .95 15 78.2	58 46.8 .95 15 77.9	7
8	53 49.8 .96 15 79.5	54 18.7 .96 15 79.3	55 16.4 .96 15 78.8	55 45.2 .96 15 78.6	56 14.1 .96 15 78.3	56 42.8 .96 15 78.1	58 09.0 .95 15 77.3	58 37.6 .95 15 77.0	8
9	53 40.5 .96 15 78.6	54 09.5 .96 15 78.3	55 07.2 .96 15 77.9	55 36.1 .96 15 77.6	56 04.9 .96 15 77.4	56 33.7 .96 15 77.1	57 59.8 .95 15 76.3	58 28.5 .95 15 76.1	9
0	53 31.4 .96 15 77.6	54 00.3 .96 15 77.4	54 58.1 .96 15 76.9	55 26.9 .96 15 76.7	55 53.7 .96 15 76.5	56 24.5 .96 15 76.2	57 50.7 .95 15 75.4	58 19.4 .95 15 75.1	90

H.A.	54° 30′ Alt.	Δd Δt	Az.	55° 00′ Alt.	Δd Δt	Az.	56° 00′ Alt.	Δd Δt	Az.	56° 30′ Alt.	Δd Δt	Az.	57° 00′ Alt.	Δd Δt	Az.	57° 30′ Alt.	Δd Δt	Az.	59° 00′ Alt.	Δd Δt	Az.	59° 30′ Alt.	Δd Δt	Az.	H.A.
91	53 22.2	97 15	76.7	53 51.1	96 15	76.5	54 48.9	96 15	76.0	55 17.8	96 15	75.8	55 46.6	96 15	75.5	56 15.4	96 15	75.3	57 41.7	96 15	74.5	58 10.3	96 15	74.2	91
2	53 13.1	97 15	75.8	53 42.0	96 15	75.5	54 39.9	96 15	75.1	55 08.7	96 15	74.8	55 37.6	96 15	74.6	56 06.4	96 15	74.3	57 32.6	96 15	73.6	58 01.3	96 15	73.3	2
3	53 04.0	97 15	74.8	53 33.0	96 15	74.6	54 30.8	96 15	74.1	54 59.7	96 15	73.9	55 28.5	96 15	73.7	55 57.4	96 15	73.4	57 23.6	96 15	72.6	57 52.3	96 15	72.4	3
4	52 55.0	97 15	73.9	53 23.9	96 15	73.7	54 21.8	96 15	73.2	54 50.7	96 15	73.0	55 19.6	96 15	72.7	55 48.4	96 15	72.5	57 14.7	96 15	71.7	57 43.4	96 15	71.5	4
95	52 46.0	97 15	73.0	53 15.0	96 15	72.7	54 12.8	96 15	72.3	54 41.7	96 15	72.1	55 10.6	96 15	71.8	55 39.5	96 15	71.6	57 05.8	96 15	70.8	57 34.5	96 15	70.6	95
6	52 37.0	97 15	72.0	53 06.0	96 15	71.8	54 03.9	96 15	71.4	54 32.8	96 15	71.1	55 01.7	96 15	70.9	55 30.6	96 15	70.7	56 57.0	96 15	69.9	57 25.7	96 15	69.7	6
7	52 28.1	97 15	71.1	52 57.1	96 15	70.9	53 55.0	96 15	70.5	54 24.0	96 15	70.2	54 52.9	96 15	70.0	55 21.7	96 15	69.8	56 48.2	96 15	69.0	57 16.9	96 15	68.8	7
8	52 19.3	97 15	70.2	52 48.3	97 15	70.0	53 46.2	96 14	69.5	54 15.2	96 15	69.3	54 44.1	96 14	69.1	55 13.0	96 14	68.9	56 39.5	96 14	68.1	57 08.2	96 14	67.9	8
9	52 10.5	97 15	69.3	52 39.5	97 15	69.1	53 37.5	97 15	68.6	54 06.4	96 14	68.4	54 35.3	96 14	68.2	55 04.2	96 14	68.0	56 30.8	96 14	67.2	56 59.6	96 14	67.0	9
100	52 01.7	97 14	68.4	52 30.7	97 14	68.1	53 28.8	97 14	67.7	53 57.7	97 14	67.5	54 26.7	96 14	67.3	54 55.6	96 14	67.0	56 22.2	96 14	66.3	56 51.0	96 14	66.1	100
1	51 53.0	97 14	67.4	52 22.1	97 14	67.2	53 20.1	97 14	66.8	53 49.1	97 14	66.6	54 18.0	96 14	66.4	54 47.0	96 14	66.1	56 13.6	96 14	65.4	56 42.4	96 14	65.2	1
2	51 44.4	97 14	66.5	52 13.4	97 14	66.3	53 11.5	97 14	65.9	53 40.5	97 14	65.7	54 09.5	96 14	65.5	54 38.4	96 14	65.3	56 05.1	96 14	64.5	56 33.9	96 14	64.3	2
3	51 35.8	97 14	65.6	52 04.8	97 14	65.4	53 03.0	97 14	65.0	53 32.0	97 14	64.8	54 01.0	97 14	64.6	54 29.9	96 14	64.4	55 56.6	96 14	63.7	56 25.5	96 14	63.4	3
4	51 27.3	97 14	64.7	51 56.4	97 14	64.5	52 54.5	97 14	64.1	53 23.5	97 14	63.9	53 52.5	97 14	63.7	54 21.5	97 14	63.5	55 48.3	96 14	62.8	56 17.1	96 14	62.5	4
105	51 18.8	97 14	63.8	51 47.9	97 14	63.6	52 46.1	97 14	63.2	53 15.1	97 14	63.0	53 44.1	97 14	62.8	54 13.1	97 14	62.6	55 39.9	96 14	61.9	56 08.8	96 14	61.6	105
6	51 10.4	97 14	62.9	51 39.6	97 14	62.7	52 37.7	97 14	62.3	53 06.8	97 14	62.1	53 35.8	97 14	61.9	54 04.8	97 14	61.7	55 31.7	96 14	61.0	56 00.6	96 14	60.8	6
7	51 02.1	97 14	62.0	51 31.2	97 14	61.8	52 29.4	97 14	61.4	52 58.5	97 14	61.2	53 27.6	97 14	61.0	53 56.6	97 14	60.8	55 23.5	96 14	60.1	55 52.5	96 13	59.9	7
8	50 53.9	97 14	61.1	51 23.0	97 14	60.9	52 21.2	97 14	60.5	52 50.3	97 14	60.3	53 19.4	97 14	60.1	53 48.4	97 13	59.9	55 15.4	97 13	59.3	55 44.4	96 13	59.0	8
9	50 45.7	97 14	60.2	51 14.8	97 14	60.0	52 13.1	97 13	59.7	52 42.2	97 13	59.5	53 11.3	97 13	59.3	53 40.3	97 13	59.0	55 07.4	97 13	58.4	55 36.4	97 13	58.2	9
110	50 37.6	97 13	59.3	51 06.7	97 13	59.2	52 05.0	97 13	58.8	52 34.2	97 13	58.6	53 03.3	97 13	58.4	53 32.3	97 13	58.2	54 59.4	97 13	57.5	55 28.4	97 13	57.3	110
1	50 29.5	97 13	58.4	50 58.7	97 13	58.3	51 57.0	97 13	57.9	52 26.2	97 13	57.7	52 55.3	97 13	57.5	53 24.4	97 13	57.3	54 51.6	97 13	56.7	55 20.6	97 13	56.4	1
2	50 21.6	97 13	57.6	50 50.8	97 13	57.4	51 49.1	97 13	57.0	52 18.3	97 13	56.8	52 47.4	97 13	56.6	53 16.5	97 13	56.4	54 43.8	97 13	55.8	55 12.8	97 13	55.6	2
3	50 13.7	97 13	56.7	50 42.9	97 13	56.5	51 41.3	97 13	56.1	52 10.5	97 13	55.9	52 39.6	97 13	55.7	53 08.8	97 13	55.5	54 36.0	97 13	54.9	55 05.1	97 13	54.7	3
4	50 05.9	97 13	55.8	50 35.1	97 13	55.6	51 33.6	97 13	55.3	52 02.7	97 13	55.1	52 31.9	97 13	54.9	53 01.1	97 13	54.7	54 28.4	97 13	54.1	54 57.5	97 13	53.9	4
115	49 58.2	98 13	54.9	50 27.4	97 13	54.7	51 25.9	97 13	54.4	51 55.1	97 13	54.2	52 24.3	97 13	54.0	52 53.4	97 13	53.8	54 20.8	97 12	53.2	54 49.9	97 12	53.0	115
6	49 50.5	98 13	54.0	50 19.8	98 13	53.9	51 18.3	97 13	53.5	51 47.5	97 13	53.3	52 16.7	97 12	53.1	52 45.9	97 12	53.0	54 13.4	97 12	52.4	54 42.5	97 12	52.1	6
7	49 43.0	98 12	53.2	50 12.3	98 12	53.0	51 10.8	97 12	52.6	51 40.0	97 12	52.5	52 09.3	97 12	52.3	52 38.5	97 12	52.1	54 06.0	97 12	51.5	54 35.1	97 12	51.3	7
8	49 35.5	98 12	52.3	50 04.8	98 12	52.1	51 03.4	98 12	51.8	51 32.6	97 12	51.6	52 01.9	97 12	51.4	52 31.1	97 12	51.2	53 58.7	97 12	50.6	54 27.8	97 12	50.4	8
9	49 28.1	98 12	51.4	49 57.4	98 12	51.2	50 56.0	98 12	50.9	51 25.3	98 12	50.7	51 54.6	98 12	50.5	52 23.8	97 12	50.4	53 51.5	97 12	49.8	54 20.6	97 12	49.6	9
120	49 20.8	98 12	50.5	49 50.2	98 12	50.4	50 48.8	98 12	50.0	51 18.1	98 12	49.9	51 47.4	98 12	49.7	52 16.6	98 12	49.5	53 44.3	97 12	48.9	54 13.5	97 12	48.8	120
1	49 13.6	98 12	49.7	49 43.0	98 12	49.5	50 41.7	98 12	49.2	51 11.0	98 12	49.0	51 40.3	98 12	48.8	52 09.5	98 12	48.7	53 37.3	97 12	48.1	54 06.5	97 12	47.9	1
2	49 06.5	98 12	48.8	49 35.9	98 12	48.6	50 34.6	98 12	48.3	51 03.9	98 12	48.1	51 33.2	98 12	48.0	52 02.5	98 12	47.8	53 30.4	97 11	47.3	53 59.6	97 11	47.1	2
3	48 59.5	98 12	47.9	49 28.9	98 12	47.8	50 27.6	98 11	47.4	50 57.0	98 11	47.3	51 26.3	98 11	47.1	51 55.6	98 11	46.9	53 23.5	98 11	46.4	53 52.8	97 11	46.2	3
4	48 52.6	98 11	47.1	49 22.0	98 11	46.9	50 20.8	98 11	46.6	50 50.1	98 11	46.4	51 19.5	98 11	46.3	51 48.8	98 11	46.1	53 16.8	98 11	45.6	53 46.0	98 11	45.4	4
125	48 45.8	98 11	46.2	49 15.2	98 11	46.0	50 14.0	98 11	45.7	50 43.4	98 11	45.6	51 12.8	98 11	45.4	51 42.1	98 11	45.2	53 10.1	98 11	44.7	53 39.4	98 11	44.6	125
6	48 39.0	98 11	45.3	49 08.5	98 11	45.2	50 07.3	98 11	44.9	50 36.7	98 11	44.7	51 06.1	98 11	44.6	51 35.5	98 11	44.4	53 03.6	98 11	43.9	53 32.9	98 11	43.7	6
7	48 32.4	98 11	44.5	49 01.9	98 11	44.3	50 00.8	98 11	44.0	50 30.2	98 11	43.9	50 59.6	98 11	43.7	51 29.0	98 11	43.6	52 57.1	98 11	43.1	53 26.4	98 11	42.9	7
8	48 25.9	98 11	43.6	48 55.4	98 11	43.5	49 54.3	98 11	43.2	50 23.7	98 10	43.0	50 53.2	98 11	42.9	51 22.6	98 11	42.7	52 50.7	98 10	42.2	53 20.1	98 10	42.0	8
9	48 19.5	98 11	42.7	48 49.0	98 10	42.6	49 47.9	98 10	42.3	50 17.4	98 10	42.2	50 46.8	98 10	42.0	51 16.2	98 10	41.9	52 44.5	98 10	41.4	53 13.9	98 10	41.2	9
130	48 13.2	98 10	41.9	48 42.7	98 10	41.7	49 41.6	98 10	41.5	50 11.1	98 10	41.3	50 40.6	98 10	41.2	51 10.0	98 10	41.0	52 38.3	98 10	40.6	53 07.7	98 10	40.4	130
1	48 06.9	98 10	41.0	48 36.5	98 10	40.9	49 35.5	98 10	40.6	50 05.0	98 10	40.5	50 34.5	98 10	40.3	51 03.9	98 10	40.2	52 32.3	98 10	39.7	53 01.7	98 10	39.6	1
2	48 00.8	98 10	40.2	48 30.4	98 10	40.0	49 29.4	98 10	39.8	49 58.9	98 10	39.6	50 28.4	98 10	39.5	50 57.9	98 10	39.3	52 26.3	98 10	38.9	52 55.8	98 10	38.7	2
3	47 54.8	98 10	39.3	48 24.4	98 10	39.2	49 23.5	98 10	38.9	49 53.0	98 10	38.8	50 22.5	98 10	38.7	50 52.0	98 10	38.5	52 20.5	98 10	38.1	52 50.0	98 10	37.9	3
4	47 48.9	99 10	38.5	48 18.5	99 10	38.3	49 17.6	98 10	38.1	49 47.2	98 10	37.9	50 16.7	98 10	37.8	50 46.2	98 09	37.7	52 14.8	98 09	37.2	52 44.2	98 09	37.1	4
135	47 43.2	99 09	37.6	48 12.7	99 09	37.5	49 11.9	99 09	37.2	49 41.5	99 09	37.1	50 11.0	98 09	37.0	50 40.6	98 09	36.8	52 09.1	98 09	36.4	52 38.6	98 09	36.3	135
6	47 37.5	99 09	36.8	48 07.1	99 09	36.6	49 06.3	99 09	36.4	49 35.9	99 09	36.3	50 05.4	99 09	36.1	50 35.0	99 09	36.0	52 03.6	98 09	35.6	52 33.1	98 09	35.4	6
7	47 31.9	99 09	35.9	48 01.5	99 09	35.8	49 00.8	99 09	35.6	49 30.4	99 09	35.4	49 59.9	99 09	35.3	50 29.5	99 09	35.2	51 58.2	98 09	34.8	52 27.7	98 09	34.6	7
8	47 26.5	99 09	35.1	47 56.1	99 09	34.7	48 55.3	99 09	34.7	49 25.0	99 09	34.6	49 54.6	99 09	34.5	50 24.2	99 09	34.3	51 52.9	98 09	33.9	52 22.5	98 09	33.8	8
9	47 21.1	99 09	34.2	47 50.8	99 09	34.1	48 50.1	99 09	33.9	49 19.7	99 08	33.8	49 49.3	99 08	33.6	50 18.9	99 08	33.5	51 47.7	99 08	33.1	52 17.3	99 08	33.0	9
140	47 15.9	99 08	33.4	47 45.6	99 08	33.3	48 44.9	99 08	33.0	49 14.5	99 08	32.9	49 44.2	99 08	32.8	50 13.8	99 08	32.7	51 42.7	99 08	32.3	52 12.3	99 08	32.2	140
1	47 10.8	99 08	32.5	47 40.5	99 08	32.4	48 39.8	99 08	32.2	49 09.5	99 08	32.1	49 39.2	99 08	32.0	50 08.8	99 08	31.8	51 37.7	99 08	31.5	52 07.3	99 08	31.3	1
2	47 05.8	99 08	31.7	47 35.5	99 08	31.6	48 34.9	99 08	31.4	49 04.6	99 08	31.2	49 34.2	99 08	31.1	50 03.9	99 08	31.0	51 32.9	99 08	30.7	52 02.5	99 08	30.5	2
3	47 01.0	99 08	30.8	47 30.7	99 08	30.7	48 30.1	99 08	30.5	48 59.8	99 08	30.4	49 29.4	99 08	30.2	49 59.1	99 08	30.2	51 28.1	99 08	29.8	51 57.8	99 08	29.7	3
4	46 56.2	99 08	30.0	47 25.9	99 08	29.9	48 25.4	99 08	29.7	48 55.1	99 08	29.6	49 24.8	99 08	29.5	49 54.5	99 08	29.4	51 23.5	99 08	29.0	51 53.2	99 07	28.9	4
145	46 51.6	99 08	29.2	47 21.3	99 08	29.1	48 20.8	99 08	28.9	48 50.5	99 07	28.8	49 20.2	99 07	28.6	49 49.9	99 07	28.5	51 19.0	99 07	28.2	51 48.7	99 07	28.1	145
6	46 47.1	99 07	28.3	47 16.8	99 07	28.2	48 16.3	99 07	28.0	48 46.0	99 07	27.9	49 15.8	99 07	27.8	49 45.5	99 07	27.7	51 14.6	99 07	27.4	51 44.3	99 07	27.3	6
7	46 42.7	99 07	27.5	47 12.4	99 07	27.4	48 12.0	99 07	27.2	48 41.7	99 07	27.1	49 11.4	99 07	27.0	49 41.2	99 07	26.9	51 10.4	99 07	26.6	51 40.1	99 07	26.5	7
8	46 38.4	99 07	26.6	47 08.2	99 07	26.5	48 07.7	99 07	26.4	48 37.5	99 07	26.3	49 07.2	99 07	26.2	49 37.0	99 07	26.1	51 06.2	99 06	25.8	51 36.0	99 06	25.7	8
9	46 34.3	99 07	25.8	47 04.0	99 07	25.7	48 03.6	99 07	25.5	48 33.4	99 07	25.4	49 03.2	99 07	25.3	49 32.9	99 07	25.2	51 02.1	99 06	25.0	51 32.0	99 06	24.8	9
150	46 30.2	99 06	25.0	47 00.0	99 06	24.9	47 59.6	99 06	24.7	48 29.4	99 06	24.6	48 59.2	99 06	24.5	49 29.0	99 06	24.4	50 58.3	99 06	24.1	51 28.1	99 06	24.0	150
1	46 26.3	99 06	24.1	46 56.2	99 06	24.0	47 55.8	99 06	23.9	48 25.6	99 06	23.8	48 55.4	99 06	23.7	49 25.2	99 06	23.6	50 54.5	99 06	23.3	51 24.3	99 06	23.2	1
2	46 22.6	99 06	23.3	46 52.4	99 06	23.2	47 52.0	99 06	23.0	48 21.9	99 06	22.9	48 51.7	99 06	22.9	49 21.5	99 06	22.8	50 50.9	99 06	22.5	51 20.7	99 06	22.4	2
3	46 18.9	99 06	22.4	46 48.8	99 06	22.4	47 48.4	99 06	22.2	48 18.3	99 06	22.1	48 48.1	99 06	22.0	49 17.9	99 06	22.0	50 47.4	99 06	21.7	51 17.2	99 06	21.6	3
4	46 15.4	1.0 06	21.6	46 45.2	99 06	21.5	47 44.9	99 06	21.4	48 14.8	99 06	21.3	48 44.6	99 06	21.2	49 14.5	99 06	21.1	50 43.9	99 05	20.9	51 13.8	99 05	20.8	4
155	46 12.0	1.0 05	20.8	46 41.9	1.0 05	20.7	47 41.6	1.0 05	20.6	48 11.4	1.0 05	20.5	48 41.3	99 05	20.4	49 11.1	1.0 05	20.3	50 40.7	99 05	20.1	51 10.5	99 05	20.0	155
6	46 08.7	1.0 05	19.9	46 38.6	1.0 05	19.9	47 38.4	1.0 05	19.7	48 08.2	1.0 05	19.7	48 38.1	1.0 05	19.6	49 07.9	1.0 05	19.5	50 37.5	99 05	19.3	51 07.3	99 05	19.2	6
7	46 05.6	1.0 05	19.1	46 35.5	1.0 05	19.0	47 35.2	1.0 05	18.9	48 05.1	1.0 05	18.8	48 35.0	1.0 05	18.8	49 04.9	1.0 05	18.7	50 34.3	1.0 05	18.5	51 04.1	1.0 05	18.4	7
8	46 02.6	1.0 05	18.3	46 32.5	1.0 05	18.2	47 32.4	1.0 05	18.1	48 02.3	1.0 05	18.0	48 32.0	1.0 05	17.9	49 01.9	1.0 05	17.9	50 31.6	1.0 05	17.7	51 01.4	1.0 05	17.6	8
9	45 59.7	1.0 05	17.4	46 29.6	1.0 05	17.4	47 29.4	1.0 05	17.3	47 59.3	1.0 04	17.2	48 29.2	1.0 04	17.1	48 59.1	1.0 04	17.1	50 28.8	1.0 04	16.9	50 58.6	1.0 04	16.8	9
160	45 57.0	1.0 04	16.6	46 26.9	1.0 04	16.5	47 26.7	1.0 04	16.4	47 56.6	1.0 04	16.4	48 26.5	1.0 04	16.3	48 56.4	1.0 04	16.2	50 26.1	1.0 04	16.1	50 56.0	1.0 04	16.0	160
1	45 54.4	1.0 04	15.8	46 24.3	1.0 04	15.7	47 24.1	1.0 04	15.6	47 54.0	1.0 04	15.5	48 23.9	1.0 04	15.5	48 53.9	1.0 04	15.4	50 23.5	1.0 04	15.4	50 53.5	1.0 04	15.2	1
2	45 51.9	1.0 04	14.9	46 21.8	1.0 04	14.9	47 21.7	1.0 04	14.8	47 51.6	1.0 04	14.7	48 21.5	1.0 04	14.7	48 51.4	1.0 04	14.6	50 21.1	1.0 04	14.4	50 51.1	1.0 04	14.4	2
3	45 49.5	1.0 04	14.1	46 19.5	1.0 04	14.1	47 19.3	1.0 04	14.0	47 49.3	1.0 04	13.9	48 19.2	1.0 04	13.9	48 49.1	1.0 04	13.8	50 18.9	1.0 04	13.6	50 48.8	1.0 04	13.6	3
4	45 47.3	1.0 03	13.3	46 17.2	1.0 03	13.2	47 17.1	1.0 03	13.1	47 47.1	1.0 03	13.1	48 17.0	1.0 03	13.0	48 46.9	1.0 03	13.0	50 16.7	1.0 03	12.8	50 46.7	1.0 03	12.8	4
165	45 45.2	1.0 03	12.4	46 15.2	1.0 03	12.4	47 15.1	1.0 03	12.3	47 45.0	1.0 03	12.3	48 15.0	1.0 03	12.2	48 44.9	1.0 03	12.2	50 14.7	1.0 03	12.0	50 44.7	1.0 03	12.0	165
6	45 43.1	1.0 03	11.6	46 13.1	1.0 03	11.6	47 13.1	1.0 03	11.5	47 43.1	1.0 03	11.4	48 13.0	1.0 03	11.4	48 43.0	1.0 03	11.4	50 12.8	1.0 03	11.2	50 42.8	1.0 03	11.2	6
7	45 41.4	1.0 03	10.8	46 11.4	1.0 03	10.7	47 11.3	1.0 03	10.7	47 41.3	1.0 03	10.6	48 11.2	1.0 03	10.6	48 41.2	1.0 03	10.5	50 11.1	1.0 03	10.4	50 41.0	1.0 03	10.4	7
8	45 39.8	1.0 03	09.9	46 09.7	1.0 03	09.9	47 09.6	1.0 03	09.8	47 39.6	1.0 03	09.8	48 09.6	1.0 03	09.8	48 39.5	1.0 03	09.7	50 09.4	1.0 02	09.6	50 39.4	1.0 02	09.6	8
9	45 38.2	1.0 02	09.1	46 08.2	1.0 02	09.1	47 08.1	1.0 02	09.0	47 38.1	1.0 02	09.0	48 08.1	1.0 02	09.0	48 38.0	1.0 02	08.9	50 07.9	1.0 02	08.8	50 37.9	1.0 02	08.8	9
170	45 36.8	1.0 02	08.3	46 06.8	1.0 02	08.3	47 06.7	1.0 02	08.2	47 36.7	1.0 02	08.2	48 06.7	1.0 02	08.1	48 36.6	1.0 02	08.1	50 06.6	1.0 02	08.0	50 36.5	1.0 02	08.0	170
1	45 35.5	1.0 02	07.5	46 05.5	1.0 02	07.4	47 05.4	1.0 02	07.4	47 35.4	1.0 02	07.3	48 05.4	1.0 02	07.3	48 35.4	1.0 02	07.3	50 05.3	1.0 02	07.2	50 35.3	1.0 02	07.2	1
2	45 34.3	1.0 02	06.6	46 04.3	1.0 02	06.6	47 04.3	1.0 02	06.6	47 34.3	1.0 02	06.5	48 04.3	1.0 02	06.5	48 34.2	1.0 02	06.5	50 04.2	1.0 02	06.4	50 34.2	1.0 02	06.4	2
3	45 33.3	1.0 01	05.8	46 03.3	1.0 01	05.8	47 03.3	1.0 01	05.7	47 33.3	1.0 01	05.7	48 03.3	1.0 01	05.7	48 33.3	1.0 01	05.7	50 03.2	1.0 01	05.6	50 33.2	1.0 01	05.6	3
4	45 32.4	1.0 01	05.0	46 02.4	1.0 01	05.0	47 02.4	1.0 01	04.9	47 32.4	1.0 01	04.9	48 02.4	1.0 01	04.9	48 32.4	1.0 01	04.9	50 02.4	1.0 01	04.8	50 32.4	1.0 01	04.8	4
175	45 31.7	1.0 01	04.1	46 01.7	1.0 01	04.1	47 01.7	1.0 01	04.1	47 31.7	1.0 01	04.1	48 01.7	1.0 01	04.1	48 31.7	1.0 01	04.1	50 01.6	1.0 01	04.0	50 31.6	1.0 01	04.0	175
6	45 31.1	1.0 01	03.3	46 01.1	1.0 01	03.3	47 01.1	1.0 01	03.3	47 31.1	1.0 01	03.3	48 01.1	1.0 01	03.2	48 31.1	1.0 01	03.2	50 01.0	1.0 01	03.2	50 31.0	1.0 01	03.2	6
7	45 30.6	1.0 01	02.5	46 00.6	1.0 01	02.5	47 00.6	1.0 01	02.5	47 30.6	1.0 01	02.4	48 00.6	1.0 01	02.4	48 30.6	1.0 01	02.4	50 00.6	1.0 01	02.4	50 30.6	1.0 01	02.4	7
8	45 30.3	1.0 00	01.7	46 00.3	1.0 00	01.7	47 00.3	1.0 00	01.6	47 30.3	1.0 00	01.6	48 00.3	1.0 00	01.6	48 30.3	1.0 00	01.6	50 00.3	1.0 00	01.6	50 30.3	1.0 00	01.6	8
9	45 30.1	1.0 00	00.8	46 00.1	1.0 00	00.8	47 00.1	1.0 00	00.8	47 30.1	1.0 00	00.8	48 00.1	1.0 00	00.8	48 30.1	1.0 00	00.8	50 00.1	1.0 00	00.8	50 30.1	1.0 00	00.8	9
180	45 30.0	1.0 00	00.0	46 00.0	1.0 00	00.0	47 00.0	1.0 00	00.0	47 30.0	1.0 00	00.0	48 00.0	1.0 00	00.0	48 30.0	1.0 00	00.0	50 00.0	1.0 00	00.0	50 30.0	1.0 00	00.0	180

Lat. 81°

H.A.	60° 00' Alt. (Δd Δt)	Az.	60° 30' Alt. (Δd Δt)	Az.	62° 00' Alt. (Δd Δt)	Az.	62° 30' Alt. (Δd Δt)	Az.	63° 00' Alt. (Δd Δt)	Az.	69° 00' Alt. (Δd Δt)	Az.	69° 30' Alt. (Δd Δt)	Az.	74° 30' Alt. (Δd Δt)	Az.	H.A.
00	69 00.0 1.0 00	180.0	69 30.0 1.0 00	180.0	71 00.9 1.0 00	180.0	71 30.0 1.0 00	180.0	72 00.9 1.0 00	180.0	78 00.9 1.0 00	180.0	78 30.0 1.0 00	180.0	83 30.0 1.0 00	180.0	00
1	68 59.9 1.0 01	178.6	69 29.9 1.0 01	178.6	70 59.9 1.0 01	178.6	71 29.9 1.0 01	178.5	71 59.9 1.0 01	178.5	77 59.9 1.0 01	178.3	78 29.9 1.0 01	178.2	83 29.8 1.0 01	177.6	1
2	68 59.5 1.0 01	177.2	69 29.5 1.0 01	177.2	70 59.5 1.0 01	177.1	71 29.5 1.0 01	177.1	71 59.5 1.0 01	177.1	77 59.4 1.0 01	176.6	78 29.4 1.0 01	176.5	83 29.2 1.0 02	175.3	2
3	68 59.0 1.0 01	175.8	69 29.0 1.0 01	175.8	70 58.9 1.0 01	175.7	71 28.9 1.0 01	175.6	71 58.9 1.0 01	175.6	77 58.7 1.0 02	174.8	78 28.7 1.0 02	174.7	83 28.3 1.0 03	172.9	3
4	68 58.2 1.0 02	174.4	69 28.2 1.0 02	174.4	70 58.1 1.0 02	174.2	71 28.1 1.0 02	174.2	71 58.1 1.0 02	174.1	77 57.7 1.0 02	173.1	78 27.7 1.0 02	173.0	83 26.9 1.0 03	170.6	4
05	68 57.1 1.0 02	173.0	69 27.1 1.0 02	173.0	70 57.1 1.0 02	172.8	71 27.0 1.0 02	172.7	71 57.0 1.0 02	172.7	77 56.5 1.0 03	171.4	78 26.4 1.0 03	171.2	83 25.2 99 04	168.3	05
6	68 55.9 1.0 02	171.6	69 25.9 1.0 02	171.6	70 55.8 1.0 03	171.4	71 25.7 1.0 03	171.3	71 55.7 1.0 03	171.2	77 54.9 1.0 03	169.7	78 24.8 1.0 03	169.5	83 23.1 99 04	166.0	6
7	68 54.4 1.0 03	170.3	69 24.4 1.0 03	170.2	70 54.2 1.0 03	169.9	71 24.2 1.0 03	169.8	71 54.1 1.0 04	168.0	77 53.1 1.0 04	168.0	78 23.0 1.0 04	167.8	83 20.9 99 05	163.7	7
8	68 52.7 1.0 03	168.9	69 22.7 1.0 03	168.8	70 52.5 1.0 03	168.5	71 22.4 1.0 04	168.4	71 52.3 1.0 04	168.3	77 51.0 99 04	166.3	78 20.9 1.0 04	166.0	83 17.8 98 05	161.4	8
9	68 50.8 1.0 04	167.5	69 20.7 1.0 04	167.4	70 50.5 1.0 04	167.1	71 20.4 1.0 04	167.0	71 50.3 1.0 04	166.8	77 48.7 99 04	164.6	78 18.5 99 04	164.3	83 14.7 98 05	159.2	9
10	68 48.6 1.0 04	166.1	69 18.6 1.0 04	166.0	70 48.3 1.0 04	165.6	71 18.2 1.0 04	165.5	71 48.1 1.0 04	165.4	77 46.0 99 05	162.9	78 15.8 99 05	162.6	83 11.2 97 06	157.0	10
1	68 46.3 1.0 04	164.7	69 16.2 1.0 04	164.6	70 45.8 1.0 04	164.1	71 15.7 1.0 04	164.1	71 45.6 1.0 05	163.9	77 43.2 99 05	161.2	78 12.9 99 05	160.9	83 07.3 97 07	154.8	1
2	68 43.7 1.0 05	163.3	69 13.6 1.0 05	163.2	70 43.2 1.0 05	162.8	71 13.0 99 05	162.7	71 42.9 99 05	162.5	77 40.0 99 06	159.6	78 09.7 99 06	159.2	82 58.7 96 08	152.7	2
3	68 40.9 1.0 05	162.0	69 10.8 1.0 05	161.8	70 40.3 99 05	161.4	71 10.1 99 05	161.2	71 39.9 99 05	161.1	77 36.6 99 06	157.9	78 06.2 99 06	157.5	82 54.0 96 08	150.5	3
4	68 37.9 99 05	160.6	69 07.7 99 05	160.5	70 37.2 99 06	160.0	71 07.0 99 06	159.8	71 36.8 99 06	159.6	77 33.0 98 06	156.3	78 02.5 98 07	155.9	82 54.0 96 08	148.5	4
15	68 34.7 99 06	159.2	69 04.5 99 06	159.1	70 33.9 99 06	158.6	71 03.6 99 06	158.4	71 33.4 99 06	158.2	77 29.1 98 07	154.7	77 58.5 98 07	154.2	82 48.9 95 09	146.4	15
6	68 31.2 99 06	157.9	69 01.0 99 06	157.7	70 30.3 99 06	157.2	71 00.1 99 06	157.0	71 29.8 99 06	156.8	77 24.9 98 07	153.0	77 54.3 98 07	152.6	82 43.5 94 09	144.4	6
7	68 27.6 99 06	156.5	68 57.4 99 06	156.4	70 26.6 99 07	155.8	70 56.3 99 07	155.6	71 26.0 99 07	155.4	77 20.6 98 08	151.4	77 49.9 98 08	150.9	82 38.0 93 10	142.5	7
8	68 23.8 99 07	155.2	68 53.5 99 07	155.0	70 22.6 99 07	154.4	70 52.3 99 07	154.2	71 22.0 99 07	154.0	77 16.0 98 08	149.8	77 45.2 97 08	149.3	82 32.1 93 10	140.5	8
9	68 19.7 99 07	153.8	68 49.4 99 07	153.7	70 18.5 99 07	153.0	70 48.1 99 07	152.8	71 17.8 99 07	152.6	77 11.1 97 08	148.3	77 40.3 97 09	147.7	82 26.0 92 11	138.6	9
20	68 15.5 99 07	152.5	68 45.2 99 07	152.3	70 14.1 99 08	151.7	70 43.7 99 08	151.4	71 13.3 99 08	151.2	77 06.1 97 09	146.7	77 35.2 97 09	146.1	82 19.7 92 11	136.8	20
1	68 11.1 99 08	151.2	68 40.7 99 08	150.3	70 09.6 99 08	150.0	70 39.1 99 08	150.0	71 08.7 98 08	149.8	77 00.8 97 09	145.1	77 29.8 97 09	144.6	82 13.1 91 11	135.0	1
2	68 06.4 99 08	149.8	68 36.1 99 08	149.6	70 04.8 99 08	148.9	70 34.4 98 08	148.7	71 03.9 98 08	148.4	76 55.4 97 09	143.6	77 24.3 96 10	143.0	82 06.5 90 12	133.2	2
3	68 01.6 99 08	148.5	68 31.2 99 08	148.3	69 59.9 98 09	147.6	70 29.4 98 09	147.3	70 58.9 98 09	147.0	76 49.7 96 10	142.1	77 18.6 96 10	141.5	81 59.5 90 12	131.5	3
4	67 56.6 99 09	147.2	68 26.2 99 09	147.0	69 54.8 98 09	146.2	70 24.2 98 09	145.9	70 53.7 98 09	145.7	76 43.8 96 10	140.6	77 12.6 96 10	140.0	81 52.4 89 12	129.7	4
25	67 51.5 98 09	145.9	68 21.0 98 09	145.7	69 49.4 98 09	144.9	70 18.9 98 09	144.6	70 48.3 98 09	144.3	76 37.8 96 10	139.1	77 06.5 95 11	138.4	81 45.1 89 12	128.1	25
6	67 46.1 98 09	144.6	68 15.6 98 09	144.4	69 44.0 98 09	143.6	70 13.3 98 10	143.3	70 42.7 98 10	143.0	76 31.5 95 11	137.6	77 00.2 95 11	137.0	81 37.5 88 13	126.4	6
7	67 40.6 98 10	143.3	68 10.1 98 10	143.0	69 38.3 98 10	142.2	70 07.6 98 10	141.9	70 37.0 98 10	141.6	76 25.1 95 11	136.1	76 53.7 94 11	135.5	81 30.0 88 13	124.8	7
8	67 34.9 98 10	142.0	68 04.3 98 10	141.8	69 32.5 98 10	140.9	70 01.8 98 10	140.6	70 31.0 98 10	140.3	76 18.5 95 11	134.7	76 47.0 94 11	134.0	81 22.2 87 13	123.3	8
9	67 29.0 98 10	140.7	67 58.4 98 10	140.5	69 26.5 98 10	139.6	69 55.7 98 10	139.3	70 25.0 97 10	139.0	76 11.8 95 12	133.3	76 40.2 94 12	132.6	81 14.3 87 13	121.7	9
30	67 23.0 98 10	139.5	67 52.4 98 10	139.2	69 20.3 97 11	138.3	69 49.5 97 11	138.0	70 18.7 97 11	137.6	76 04.9 95 12	131.8	76 33.2 94 12	131.2	81 06.2 86 14	120.2	30
1	67 16.8 98 11	138.2	67 46.2 98 11	137.9	69 14.0 97 11	137.0	69 43.2 97 11	136.7	70 12.3 97 11	136.3	75 57.8 94 12	130.4	76 26.0 94 12	129.7	80 58.1 86 14	118.7	1
2	67 10.5 98 11	136.9	67 39.8 98 11	136.6	69 07.5 97 11	135.7	69 36.6 97 11	135.4	70 05.8 97 11	135.0	75 50.6 94 12	129.1	76 18.7 93 13	128.3	80 49.8 85 14	117.3	2
3	67 04.0 98 11	135.7	67 33.3 97 11	135.4	69 00.9 97 11	134.4	69 30.0 97 11	134.1	69 59.1 97 11	133.7	75 43.2 94 12	127.7	76 11.3 93 13	127.0	80 41.4 85 14	115.9	3
4	66 57.4 97 11	134.4	67 26.6 97 11	134.1	68 54.1 97 12	133.2	69 23.2 97 12	132.8	69 52.2 97 12	132.5	75 35.7 94 13	126.3	76 03.7 93 13	125.6	80 32.9 84 14	114.5	4
35	66 50.6 97 12	133.2	67 19.8 97 12	132.9	68 47.2 97 12	131.9	69 16.2 97 12	131.6	69 45.2 97 12	131.2	75 28.1 93 13	125.0	75 56.0 93 13	124.3	80 24.3 84 14	113.1	35
6	66 43.7 97 12	131.9	67 12.9 97 12	131.6	68 40.1 97 12	130.7	69 09.1 97 12	130.3	69 38.1 96 12	129.9	75 20.4 93 13	123.7	75 48.2 93 13	122.9	80 15.6 84 15	111.8	6
7	66 36.7 97 12	130.7	67 05.8 97 12	130.4	68 32.9 97 12	129.4	69 01.9 96 12	129.1	69 30.8 96 12	128.7	75 12.5 93 13	122.4	75 40.3 93 13	121.6	80 06.9 84 15	110.5	7
8	66 29.5 97 12	129.5	66 58.6 97 12	129.2	68 25.6 97 12	128.2	68 54.6 96 12	127.8	69 23.4 96 13	127.4	75 04.5 93 14	121.1	75 32.2 92 14	120.3	79 58.1 83 15	109.2	8
9	66 22.2 97 12	128.3	66 51.2 97 12	128.0	68 18.2 96 13	126.9	68 47.1 96 13	126.6	69 15.9 96 13	126.2	74 56.4 93 14	119.8	75 24.1 92 14	119.0	79 49.2 83 15	107.9	9
40	66 14.7 97 13	127.1	66 43.8 97 13	126.8	68 10.6 96 13	125.7	68 39.5 96 13	125.4	69 08.3 96 13	125.0	74 48.2 92 14	118.5	75 15.8 92 14	117.8	79 40.2 83 15	106.7	40
1	66 07.2 97 13	125.9	66 36.2 97 13	125.6	68 02.9 96 13	124.5	68 31.8 96 13	124.1	69 00.5 96 13	123.8	74 39.9 92 14	117.2	75 07.5 92 14	116.5	79 31.2 83 15	105.5	1
2	65 59.5 97 13	124.7	66 28.5 96 13	124.4	67 55.2 96 13	123.3	68 23.9 96 13	122.9	68 52.7 96 13	122.5	74 31.5 92 14	116.0	74 59.0 91 14	115.3	79 22.1 82 15	104.2	2
3	65 51.8 97 13	123.5	66 20.7 96 13	123.2	67 47.3 96 13	122.1	68 16.0 96 13	121.7	68 44.7 96 13	121.3	74 23.0 92 14	114.8	74 50.5 91 14	114.0	79 13.0 82 15	103.1	3
4	65 43.9 96 13	122.3	66 12.8 96 13	122.0	67 39.3 96 14	120.9	68 08.0 96 14	120.5	68 36.6 95 14	120.1	74 14.5 92 14	113.6	74 41.9 91 14	112.8	79 03.8 82 15	101.9	4
45	65 35.9 96 13	121.2	66 04.8 96 14	120.8	67 31.2 96 14	119.8	67 59.9 96 14	119.4	68 28.5 95 14	119.0	74 05.8 91 15	112.4	74 33.1 91 15	111.6	78 54.6 82 16	100.8	45
6	65 27.8 96 14	120.0	65 56.7 96 14	119.7	67 23.0 96 14	118.6	67 51.6 96 14	118.2	68 20.2 95 14	117.8	73 57.1 91 15	111.2	74 24.4 91 15	110.4	78 45.4 82 16	99.6	6
7	65 19.6 96 14	118.8	65 48.5 96 14	118.5	67 14.7 96 14	117.4	67 43.3 95 14	117.0	68 11.9 95 14	116.6	73 48.3 91 15	110.0	74 15.6 91 15	109.2	78 36.1 82 16	98.5	7
8	65 11.4 96 14	117.7	65 40.2 96 14	117.4	67 06.3 95 14	116.3	67 34.9 95 14	115.9	68 03.4 95 14	115.5	73 39.5 91 15	108.8	74 06.7 91 15	108.1	78 26.8 81 16	97.4	8
9	65 03.0 96 14	116.5	65 31.8 96 14	116.2	66 57.8 95 14	115.1	67 26.4 95 14	114.7	67 54.9 95 14	114.3	73 30.6 91 15	107.7	73 57.8 91 16	106.9	78 17.5 81 16	96.3	9
50	64 54.6 96 14	115.4	65 23.3 96 14	115.1	66 49.3 95 14	114.0	67 17.8 95 14	113.6	67 46.3 95 14	113.2	73 21.6 91 15	106.5	73 48.8 90 16	105.8	78 08.2 81 16	95.3	50
1	64 46.1 96 14	114.3	65 14.8 96 14	113.9	66 40.7 96 14	112.8	67 09.2 95 15	112.4	67 37.7 95 15	112.0	73 12.6 90 15	105.4	73 39.7 90 16	104.7	77 58.8 81 16	94.2	1
2	64 37.5 96 14	113.2	65 06.2 96 14	112.8	66 32.0 95 15	111.7	67 00.5 95 15	111.3	67 28.9 95 15	110.9	73 03.5 90 15	104.3	73 30.6 90 15	103.5	77 49.4 81 16	93.2	2
3	64 28.8 96 15	112.0	64 57.5 96 15	111.7	66 23.2 95 15	110.6	66 51.7 95 15	110.2	67 20.1 95 15	109.8	72 54.4 90 15	103.2	73 21.4 90 15	102.4	77 40.1 81 16	92.2	3
4	64 20.1 96 15	110.9	64 48.7 96 15	110.6	66 14.4 95 15	109.5	66 42.9 95 15	109.1	67 11.3 95 15	108.7	72 45.2 90 15	102.1	73 12.3 90 15	101.3	77 30.7 81 16	91.2	4
55	64 11.3 96 15	109.8	64 39.9 96 15	109.5	66 05.6 95 15	108.4	66 34.0 95 15	108.0	67 02.4 94 15	107.6	72 36.0 90 15	101.0	73 03.0 90 15	100.2	77 21.3 81 16	90.2	55
6	64 02.4 96 15	108.7	64 31.0 96 15	108.4	65 56.6 95 15	107.3	66 25.0 95 15	106.9	66 53.4 94 15	106.5	72 26.8 90 15	99.9	72 53.8 90 16	99.2	77 11.9 81 16	89.2	6
7	63 53.5 95 15	107.7	64 22.1 95 15	107.3	65 47.6 95 15	106.2	66 16.0 95 15	105.8	66 44.4 94 15	105.4	72 17.5 90 15	98.8	72 44.5 90 16	98.1	77 02.5 81 16	88.2	7
8	63 44.5 95 15	106.6	64 13.1 95 15	106.2	65 38.6 95 15	105.1	66 07.0 94 15	104.7	66 35.3 94 15	104.3	72 08.2 90 16	97.8	72 35.2 90 16	97.1	76 53.2 81 16	87.3	8
9	63 35.5 95 15	105.5	64 04.0 95 15	105.2	65 29.5 95 15	104.0	65 57.9 94 15	103.7	66 26.2 94 15	103.3	71 58.9 90 16	96.7	72 25.9 90 16	96.0	76 43.8 81 16	86.3	9
60	63 26.4 95 15	104.4	63 55.0 95 15	104.1	65 20.4 95 15	103.0	65 48.7 94 15	102.6	66 17.0 94 15	102.2	71 49.6 90 16	95.7	72 16.5 90 16	95.0	76 34.4 81 16	85.4	60
1	63 17.3 95 15	103.4	63 45.9 95 15	103.0	65 11.2 95 15	101.9	65 39.6 94 15	101.5	66 07.8 94 15	101.1	71 40.2 90 16	94.7	72 07.2 90 16	94.0	76 25.1 81 16	84.4	1
2	63 08.2 95 15	102.3	63 36.7 95 15	102.0	65 02.0 94 15	100.9	65 30.3 94 15	100.5	65 58.6 94 15	100.1	71 30.9 90 16	93.6	71 57.8 89 16	92.9	76 15.7 81 16	83.5	2
3	62 59.0 95 15	101.3	63 27.5 95 15	100.9	64 52.8 94 15	99.8	65 21.1 94 15	99.4	65 49.3 94 15	99.0	71 21.5 90 16	92.6	71 48.4 89 16	91.9	76 06.4 81 16	82.6	3
4	62 49.8 95 15	100.2	63 18.3 95 15	99.9	64 43.5 94 15	98.8	65 11.8 94 15	98.4	65 40.1 94 15	98.0	71 12.1 90 16	91.6	71 39.1 89 16	90.9	75 57.1 82 15	81.7	4
65	62 40.5 95 15	99.2	63 09.0 95 16	98.8	64 34.2 94 16	97.7	65 02.5 94 16	97.4	65 30.7 94 16	96.9	71 02.8 90 16	90.6	71 29.7 89 16	89.9	75 47.8 82 15	80.8	65
6	62 31.2 95 16	98.1	62 59.7 95 16	97.8	64 24.9 94 16	96.7	64 53.2 94 16	96.3	65 21.4 94 15	95.9	70 53.4 90 16	89.6	71 20.3 89 16	89.0	75 38.6 82 15	79.9	6
7	62 21.9 95 16	97.1	62 50.4 95 16	96.8	64 15.6 94 16	95.7	64 43.9 94 16	95.3	65 12.1 94 16	94.9	70 44.0 90 16	88.7	71 10.9 89 16	88.0	75 29.4 82 15	79.0	7
8	62 12.6 95 16	96.1	62 41.1 95 16	95.8	64 06.2 94 16	94.7	64 34.5 94 16	94.3	65 02.7 94 16	93.9	70 34.6 90 16	87.7	71 01.5 89 16	87.0	75 20.2 82 15	78.2	8
9	62 03.3 95 16	95.1	62 31.8 95 16	94.7	63 56.9 94 16	93.7	64 25.1 94 16	93.3	64 53.3 94 16	92.9	70 25.2 90 16	86.7	70 52.2 89 16	86.1	75 11.0 82 15	77.3	9
70	61 53.9 95 16	94.1	62 22.4 95 16	93.7	63 47.5 94 16	92.7	64 15.8 94 16	92.3	64 44.0 94 16	91.9	70 15.9 90 16	85.8	70 42.8 90 16	85.1	75 01.8 82 15	76.5	70
1	61 44.5 95 16	93.1	62 13.0 95 16	92.7	63 38.1 94 16	91.7	64 06.4 94 16	91.3	64 34.6 94 16	90.9	70 06.5 90 16	84.8	70 33.5 90 16	84.2	74 52.7 82 15	75.6	1
2	61 35.2 95 16	92.1	62 03.6 95 16	91.7	63 28.7 94 16	90.7	63 57.0 94 16	90.3	64 25.2 94 16	89.9	69 57.2 90 16	83.9	70 24.1 90 16	83.2	74 43.7 83 15	74.8	2
3	61 25.8 95 16	91.1	61 54.3 95 16	90.7	63 19.4 94 16	89.7	63 47.6 94 16	89.3	64 15.8 94 16	88.9	69 47.8 90 16	82.9	70 14.8 90 16	82.3	74 34.6 83 15	73.9	3
4	61 16.4 95 16	90.1	61 44.9 95 16	89.7	63 10.0 94 16	88.7	63 38.2 94 16	88.3	64 06.4 94 16	87.9	69 38.5 90 16	82.0	70 05.5 90 16	81.4	74 25.6 83 15	73.1	4
75	61 07.0 95 16	89.1	61 35.5 95 16	88.8	63 00.6 94 16	87.7	63 28.9 94 16	87.3	63 57.1 94 16	87.0	69 29.3 90 15	81.1	69 56.3 90 15	80.4	74 16.7 83 15	72.3	75
6	60 57.6 95 16	88.1	61 26.1 95 16	87.8	62 51.2 94 16	86.7	63 19.5 94 16	86.4	63 47.7 94 16	86.0	69 20.0 90 15	80.1	69 47.0 90 15	79.5	74 07.7 83 15	71.5	6
7	60 48.3 95 16	87.1	61 16.7 95 16	86.8	62 41.9 94 16	85.8	63 10.1 94 16	85.4	63 38.3 94 16	85.0	69 10.8 90 15	79.2	69 37.8 90 15	78.6	73 58.9 83 15	70.7	7
8	60 38.9 95 16	86.2	61 07.4 95 16	85.8	62 32.5 94 16	84.8	63 00.7 94 16	84.4	63 28.8 94 16	84.1	69 01.5 90 15	78.3	69 28.5 90 15	77.7	73 50.0 84 15	69.9	8
9	60 29.5 95 16	85.2	60 58.0 95 16	84.9	62 23.2 94 16	83.9	62 51.4 94 16	83.5	63 19.7 94 16	83.1	68 52.2 90 15	77.4	69 19.5 90 15	76.8	73 41.2 84 15	69.1	9
80	60 20.2 95 16	84.2	60 48.7 95 16	83.9	62 13.8 94 16	82.9	62 42.1 94 16	82.5	63 10.3 94 15	82.2	68 43.2 91 15	76.5	69 10.3 90 15	75.9	73 32.5 84 14	68.3	80
1	60 10.8 95 16	83.3	60 39.3 95 16	83.0	62 04.5 94 16	81.9	62 32.8 94 16	81.6	63 01.1 94 15	81.2	68 34.1 91 15	75.6	69 01.2 90 15	75.0	73 23.8 84 14	67.5	1
2	60 01.5 95 16	82.3	60 29.9 95 15	82.0	61 55.2 94 15	81.0	62 23.6 94 15	80.7	62 51.8 94 15	80.3	68 25.0 91 15	74.7	68 52.2 90 15	74.2	73 15.2 84 14	66.7	2
3	59 52.2 95 15	81.4	60 20.8 95 15	81.1	61 46.0 94 15	80.1	62 14.3 94 15	79.7	62 42.6 94 15	79.3	68 16.0 91 15	73.9	68 43.2 90 15	73.3	73 06.6 85 14	65.9	3
4	59 43.0 95 15	80.4	60 11.5 95 15	80.1	61 36.8 94 15	79.1	62 05.1 94 15	78.8	62 33.3 94 15	78.4	68 07.0 91 15	73.0	68 34.2 90 15	72.4	72 58.0 85 14	65.1	4
85	59 33.7 95 15	79.5	60 02.3 95 15	79.2	61 27.6 95 15	78.2	61 55.9 94 15	77.9	62 24.2 94 15	77.5	67 58.1 91 15	72.1	68 25.3 91 15	71.6	72 49.5 85 14	64.4	85
6	59 24.5 95 15	78.5	59 53.1 95 15	78.2	61 18.4 95 15	77.3	61 46.7 94 15	76.9	62 15.0 94 15	76.6	67 49.2 91 15	71.2	68 16.4 91 15	70.7	72 41.1 85 14	63.6	6
7	59 15.3 95 15	77.6	59 43.9 95 15	77.3	61 09.2 95 15	76.3	61 37.6 94 15	76.0	62 05.9 94 15	75.7	67 40.3 91 15	70.4	68 07.6 91 15	69.8	72 32.6 86 14	62.8	7
8	59 06.2 95 15	76.7	59 34.7 95 15	76.4	61 00.1 95 15	75.4	61 28.5 94 15	75.1	61 56.8 94 15	74.7	67 31.5 91 15	69.5	67 58.8 91 15	69.0	72 24.4 86 14	62.1	8
9	58 57.1 95 15	75.8	59 25.6 95 15	75.5	60 51.1 95 15	74.5	61 19.5 95 15	74.2	61 47.8 94 15	73.8	67 22.7 91 15	68.7	67 50.1 91 14	68.1	72 16.1 86 14	61.3	9
90	58 48.0 95 15	74.8	59 16.6 95 15	74.5	60 42.1 95 15	73.6	61 10.5 94 15	73.3	61 38.6 94 15	72.9	67 14.0 91 14	67.8	67 41.4 91 14	67.3	72 07.9 86 14	60.6	90

La
8I

H.A.	60° 00' Alt.	Δd Δt	Az.	60° 30' Alt.	Δd Δt	Az.	62° 00' Alt.	Δd Δt	Az.	62° 30' Alt.	Δd Δt	Az.	63° 00' Alt.	Δd Δt	Az.	69° 00' Alt.	Δd Δt	Az.	69° 30' Alt.	Δd Δt	Az.	74° 30' Alt.	Δd Δt	Az.	H.A.
91	58 39.0	95 15	73.9	59 07.5	95 15	73.6	60 33.1	95 15	72.7	61 01.5	95 15	72.4	61 29.9	94 15	72.0	67 05.3	92 14	67.0	67 32.7	91 14	66.5	71 59.8	86 13	59.8	91
2	58 30.0	95 15	73.0	58 58.6	95 15	72.7	60 24.1	95 15	71.8	60 52.6	95 15	71.5	61 21.0	95 15	71.1	66 57.6	92 14	66.1	67 24.2	91 14	65.6	71 51.7	86 13	59.1	2
3	58 21.0	95 15	72.1	58 49.6	95 15	71.8	60 15.2	95 15	70.9	60 43.7	95 15	70.6	61 12.1	95 15	70.2	66 48.1	92 14	65.3	67 15.6	91 14	64.8	71 43.7	87 13	58.3	3
4	58 12.1	96 15	71.2	58 40.7	95 15	70.9	60 06.4	96 15	70.0	60 34.9	95 15	69.7	61 03.3	95 15	69.4	66 39.7	92 14	64.5	67 07.2	92 14	64.0	71 35.7	87 13	57.6	4
95	58 03.2	96 15	70.3	58 31.9	95 15	70.0	59 57.6	95 14	69.1	60 26.1	95 15	68.8	60 54.5	95 15	68.5	66 31.2	92 14	63.6	66 58.8	92 14	63.1	71 27.8	87 13	56.9	95
6	57 54.4	96 15	69.4	58 23.1	95 15	69.1	59 48.9	95 14	68.2	60 17.4	95 14	67.9	60 45.8	95 15	67.6	66 22.8	92 14	62.8	66 50.4	92 14	62.3	71 20.0	87 13	56.1	6
7	57 45.7	96 14	68.5	58 14.3	96 15	68.2	59 40.2	95 14	67.3	60 08.7	95 14	67.0	60 37.2	95 14	66.7	66 14.5	92 14	62.0	66 42.1	92 14	61.5	71 12.2	88 13	55.4	7
8	57 37.0	96 14	67.6	58 05.7	96 14	67.3	59 31.5	95 14	66.4	60 00.1	95 14	66.1	60 28.6	95 14	65.8	66 06.3	92 14	61.2	66 33.9	92 14	60.7	71 04.5	88 13	54.7	8
9	57 28.3	96 14	66.7	57 57.0	96 14	66.4	59 23.0	95 14	65.6	59 51.5	95 14	65.3	60 20.0	95 14	65.0	65 58.1	93 14	60.4	66 25.8	92 13	59.9	70 56.9	88 13	54.0	9
100	57 19.7	96 14	65.8	57 48.5	96 14	65.5	59 14.4	95 14	64.7	59 43.0	95 14	64.4	60 11.6	95 14	64.1	65 49.9	93 13	59.5	66 17.7	92 13	59.1	70 49.4	88 12	53.2	100
1	57 11.2	96 14	64.9	57 39.9	96 14	64.7	59 06.0	95 14	63.8	59 34.6	95 14	63.5	60 03.2	95 14	63.2	65 41.9	93 13	58.7	66 09.7	93 13	58.3	70 41.9	89 12	52.5	1
2	57 02.7	96 14	64.0	57 31.5	96 14	63.8	58 57.6	95 14	62.9	59 26.2	95 14	62.7	59 54.8	95 14	62.4	65 33.9	93 13	57.9	66 01.7	93 13	57.5	70 34.5	89 12	51.8	2
3	56 54.3	96 14	63.2	57 23.1	96 14	62.9	58 49.3	96 14	62.1	59 17.9	95 14	61.8	59 46.5	95 14	61.5	65 26.0	93 13	57.1	65 53.9	93 13	56.7	70 27.1	89 12	51.1	3
4	56 46.0	96 14	62.3	57 14.8	96 14	62.0	58 41.0	96 14	61.2	59 09.7	96 14	60.9	59 38.3	95 14	60.6	65 18.1	93 13	56.3	65 46.0	93 13	55.9	70 19.9	89 12	50.4	4
105	56 37.7	96 14	61.4	57 06.5	96 14	61.1	58 32.8	96 14	60.3	59 01.5	96 14	60.1	59 30.2	95 13	59.8	65 10.4	93 13	55.5	65 38.3	93 13	55.1	70 12.7	89 12	49.7	105
6	56 29.5	96 14	60.5	56 58.3	96 14	60.3	58 24.7	96 13	59.5	58 53.4	96 13	59.2	59 22.1	96 13	58.9	65 02.7	93 13	54.7	65 30.6	93 13	54.3	70 05.5	90 12	49.0	6
7	56 21.4	96 13	59.7	56 50.2	96 13	59.4	58 16.7	96 13	58.6	58 45.4	96 13	58.4	59 14.1	96 13	58.1	64 55.0	94 13	53.9	65 23.1	93 13	53.5	69 58.5	90 12	48.3	7
8	56 13.3	96 13	58.8	56 42.2	96 13	58.5	58 08.7	96 13	57.8	58 37.4	96 13	57.5	59 06.2	96 13	57.2	64 47.5	94 12	53.2	65 15.6	93 12	52.7	69 51.5	90 11	47.6	8
9	56 05.3	96 13	57.9	56 34.2	96 13	57.7	58 00.8	96 13	56.9	58 29.6	96 13	56.7	58 58.3	96 13	56.4	64 40.0	94 12	52.4	65 08.1	94 12	52.0	69 44.6	90 11	46.9	9
110	55 57.4	96 13	57.1	56 26.3	96 13	56.8	57 52.9	96 13	56.1	58 21.8	96 13	55.8	58 50.5	96 13	55.5	64 32.6	94 12	51.6	65 00.8	94 12	51.2	69 37.8	91 11	46.2	110
1	55 49.5	97 13	56.2	56 18.5	96 13	56.0	57 45.2	96 13	55.2	58 14.0	96 13	55.0	58 42.8	96 13	54.7	64 25.3	94 12	50.8	64 53.5	94 12	50.4	69 31.1	91 11	45.5	1
2	55 41.8	97 13	55.3	56 10.8	97 13	55.1	57 37.5	96 13	54.4	58 06.4	96 13	54.1	58 35.2	96 13	53.9	64 18.1	94 12	50.0	64 46.3	94 12	49.6	69 24.5	91 11	44.8	2
3	55 34.1	97 13	54.5	56 03.1	97 13	54.3	57 29.9	96 12	53.5	57 58.8	96 13	53.3	58 27.7	96 13	53.0	64 10.9	94 12	49.2	64 39.2	94 12	48.9	69 17.9	91 11	44.1	3
4	55 26.5	97 13	53.6	55 55.7	97 13	53.4	57 22.4	96 12	52.7	57 51.3	96 12	52.5	58 20.2	96 12	52.2	64 03.8	94 12	48.5	64 32.2	94 12	48.1	69 11.4	92 11	43.4	4
115	55 19.0	97 12	52.8	55 48.0	97 12	52.6	57 15.0	97 12	51.9	57 43.9	96 12	51.6	58 12.8	96 12	51.4	63 56.9	95 12	47.7	64 25.2	94 11	47.3	69 05.0	92 11	42.7	115
6	55 11.6	97 12	51.9	55 40.6	97 12	51.7	57 07.7	97 12	51.0	57 36.6	96 12	50.8	58 05.6	96 12	50.5	63 50.0	95 11	46.9	64 18.4	95 11	46.6	68 58.7	92 10	42.0	6
7	55 04.2	97 12	51.1	55 33.3	97 12	50.9	57 00.4	97 12	50.2	57 29.4	97 12	50.0	57 58.4	96 12	49.7	63 43.2	95 11	46.2	64 11.6	95 11	45.8	68 52.4	92 10	41.3	7
8	54 56.9	97 12	50.2	55 26.1	97 12	50.0	56 53.2	97 12	49.4	57 22.3	97 12	49.1	57 51.2	97 12	48.9	63 36.4	95 11	45.4	64 04.9	95 11	45.0	68 46.3	92 10	40.7	8
9	54 49.8	97 12	49.4	55 18.9	97 12	49.2	56 46.2	97 12	48.5	57 15.2	97 12	48.3	57 44.2	97 12	48.1	63 29.8	95 11	44.6	63 58.3	95 11	44.3	68 40.2	93 10	40.0	9
120	54 42.7	97 12	48.6	55 11.8	97 12	48.3	56 39.2	97 12	47.7	57 08.2	97 11	47.5	57 37.3	97 11	47.2	63 23.2	95 11	43.9	63 51.8	95 11	43.5	68 34.2	93 10	39.3	120
1	54 35.7	97 11	47.7	55 04.9	97 11	47.5	56 32.3	97 11	46.9	57 01.4	97 11	46.6	57 30.4	97 11	46.4	63 16.8	95 11	43.1	63 45.4	95 11	42.8	68 28.3	93 10	38.6	1
2	54 28.8	97 11	46.9	54 58.0	97 11	46.7	56 25.5	97 11	46.0	56 54.6	97 11	45.8	57 23.7	97 11	45.6	63 10.4	96 10	42.3	63 39.1	95 10	42.0	68 22.5	93 10	37.9	2
3	54 22.0	97 11	46.0	54 51.2	97 11	45.8	56 18.8	97 11	45.2	56 47.9	97 11	45.0	57 17.0	97 11	44.8	63 04.1	96 10	41.6	63 32.8	96 10	41.2	68 16.8	94 09	37.2	3
4	54 15.3	98 11	45.2	54 44.5	97 11	45.0	56 12.1	97 11	44.4	56 41.3	97 11	44.2	57 10.5	97 11	44.0	62 58.0	96 10	40.8	63 26.7	96 10	40.5	68 11.1	94 09	36.6	4
125	54 08.7	98 11	44.4	54 38.0	98 11	44.2	56 05.6	97 11	43.6	56 34.8	97 11	43.4	57 04.0	97 11	43.2	62 51.9	96 10	40.1	63 20.6	96 10	39.8	68 05.6	94 09	35.9	125
6	54 02.2	98 11	43.5	54 31.5	98 11	43.3	55 59.2	97 11	42.8	56 28.4	97 10	42.6	56 57.6	97 10	42.3	62 45.9	96 10	39.3	63 14.7	96 10	39.0	68 00.1	94 09	35.3	6
7	53 55.8	98 10	42.7	54 25.1	98 10	42.5	55 52.9	97 10	41.9	56 22.1	97 10	41.7	56 51.3	97 10	41.5	62 40.0	96 10	38.6	63 08.8	96 10	38.3	67 54.7	94 09	34.6	7
8	53 49.4	98 10	41.8	54 18.8	98 10	41.7	55 46.7	98 10	41.1	56 15.9	98 10	40.9	56 45.2	97 10	40.7	62 34.2	96 09	37.9	63 03.1	96 09	37.5	67 49.4	96 09	33.9	8
9	53 43.2	98 10	41.0	54 12.6	98 10	40.9	55 40.5	98 10	40.3	56 09.8	98 10	40.1	56 39.1	98 10	39.9	62 28.5	96 09	37.1	62 57.4	96 09	36.8	67 44.2	96 08	33.2	9
130	53 37.1	98 10	40.2	54 06.5	98 10	40.0	55 34.5	98 10	39.5	56 03.8	98 10	39.3	56 33.1	98 10	39.1	62 22.9	97 09	36.3	62 51.8	96 09	36.0	67 39.1	95 08	32.6	130
1	53 31.1	98 10	39.4	54 00.5	98 10	39.2	55 28.6	98 10	38.7	55 57.9	98 10	38.5	56 27.2	98 10	38.3	62 17.4	97 09	35.6	62 46.4	97 09	35.3	67 34.1	95 08	31.9	1
2	53 25.2	98 10	38.6	53 54.6	98 10	38.4	55 22.8	98 10	37.9	55 52.1	98 09	37.7	56 21.5	98 09	37.5	62 12.0	97 09	34.8	62 41.0	97 09	34.5	67 29.2	95 08	31.2	2
3	53 19.4	98 10	37.7	53 48.8	98 10	37.6	55 17.1	98 09	37.1	55 46.5	98 09	36.9	56 15.8	98 09	36.7	62 06.6	97 09	34.1	62 35.7	97 09	33.8	67 24.4	95 08	30.6	3
4	53 13.7	98 09	36.9	53 43.2	98 09	36.8	55 11.5	98 09	36.3	55 40.9	98 09	36.1	56 10.3	98 09	35.9	62 01.4	97 08	33.3	62 30.5	97 08	33.1	67 19.7	96 08	29.9	4
135	53 08.1	98 09	36.1	53 37.6	98 09	36.0	55 06.0	98 09	35.5	55 35.4	98 09	35.3	56 04.8	98 09	35.1	61 56.3	97 08	32.6	62 25.5	97 08	32.3	67 15.0	96 08	29.3	135
6	53 02.6	98 09	35.3	53 32.1	98 09	35.1	55 00.6	98 09	34.7	55 30.0	98 09	34.5	55 59.5	98 09	34.3	61 51.3	97 08	31.9	62 20.5	97 08	31.6	67 10.5	96 07	28.6	6
7	52 57.3	98 09	34.5	53 26.8	98 09	34.3	54 55.3	98 09	33.9	55 24.8	98 09	33.7	55 54.2	98 09	33.5	61 46.4	97 08	31.1	62 15.6	97 08	30.9	67 06.1	96 07	27.9	7
8	52 52.0	98 09	33.7	53 21.6	98 09	33.5	54 50.1	98 08	33.1	55 19.6	98 08	32.9	55 49.1	98 08	32.7	61 41.6	98 08	30.4	62 10.9	97 08	30.1	67 01.7	96 07	27.3	8
9	52 46.9	98 08	32.8	53 16.4	98 08	32.7	54 45.1	98 08	32.3	55 14.6	98 08	32.1	55 44.1	98 08	31.9	61 36.9	98 08	29.6	62 06.2	98 08	29.4	66 57.5	97 07	26.6	9
140	52 41.8	99 08	32.0	53 11.4	99 08	31.9	54 40.1	98 08	31.5	55 09.6	98 08	31.3	55 39.2	98 08	31.1	61 32.3	98 07	28.9	62 01.6	98 07	28.7	66 53.3	97 07	26.0	140
1	52 36.9	99 08	31.2	53 06.5	99 08	31.1	54 35.3	98 08	30.7	55 04.8	98 08	30.5	55 34.4	98 08	30.4	61 27.9	98 07	28.2	61 57.2	98 07	28.0	66 49.2	97 07	25.3	1
2	52 32.1	99 08	30.4	53 01.7	99 08	30.3	54 30.5	98 08	29.9	55 00.1	98 08	29.7	55 29.7	98 08	29.6	61 23.5	98 07	27.4	61 52.9	98 07	27.2	66 45.3	97 06	24.6	2
3	52 27.4	99 08	29.6	52 57.1	99 08	29.5	54 25.9	98 08	29.1	54 55.5	99 07	28.9	55 25.1	98 07	28.8	61 19.2	98 07	26.7	61 48.6	98 07	26.5	66 41.4	97 06	24.0	3
4	52 22.8	99 07	28.8	52 52.5	99 07	28.7	54 21.4	99 07	28.3	54 51.0	99 07	28.1	55 20.6	99 07	28.0	61 15.0	98 07	26.0	61 44.5	98 07	25.8	66 37.7	97 06	23.3	4
145	52 18.4	99 07	28.0	52 48.1	99 07	27.9	54 17.0	99 07	27.5	54 46.7	99 07	27.3	55 16.3	99 07	27.2	61 11.0	98 07	25.2	61 40.4	98 07	25.0	66 34.0	97 06	22.7	145
6	52 14.0	99 07	27.2	52 43.7	99 07	27.0	54 12.7	99 07	26.7	54 42.4	99 07	26.5	55 12.1	99 07	26.4	61 07.0	98 06	24.5	61 36.5	98 06	24.3	66 30.4	98 06	22.0	6
7	52 09.8	99 07	26.4	52 39.5	99 07	26.2	54 08.6	99 07	25.9	54 38.3	99 07	25.8	55 07.9	99 07	25.6	61 03.2	98 06	23.8	61 32.7	98 06	23.6	66 26.9	98 06	21.4	7
8	52 05.7	99 07	25.5	52 35.4	99 07	25.4	54 04.6	99 07	25.1	54 34.2	99 06	25.0	55 03.9	99 06	24.8	60 59.5	98 06	23.1	61 29.0	98 06	22.9	66 23.6	98 05	20.7	8
9	52 01.7	99 06	24.7	52 31.5	99 06	24.6	54 00.6	99 06	24.3	54 30.3	99 06	24.2	55 00.1	99 06	24.1	60 55.8	99 06	22.4	61 25.4	99 06	22.2	66 20.3	98 05	20.1	9
150	51 57.8	99 06	23.9	52 27.6	99 06	23.8	53 56.8	99 06	23.5	54 26.6	99 06	23.4	54 56.3	99 06	23.3	60 52.3	99 06	21.6	61 21.9	99 06	21.4	66 17.1	98 05	19.4	150
1	51 54.1	99 06	23.1	52 23.9	99 06	23.0	53 53.1	99 06	22.7	54 22.9	99 06	22.6	54 52.6	99 06	22.5	60 48.9	99 05	20.9	61 18.6	99 05	20.7	66 14.1	98 05	18.8	1
2	51 50.5	99 06	22.3	52 20.3	99 06	22.2	53 49.6	99 06	21.9	54 19.3	99 06	21.8	54 49.1	99 06	21.7	60 45.6	99 05	20.1	61 15.3	99 05	20.0	66 11.1	98 05	18.1	2
3	51 47.0	99 06	21.5	52 16.8	99 06	21.4	53 46.1	99 06	21.1	54 15.8	99 06	21.0	54 45.7	99 05	20.9	60 42.5	99 05	19.4	61 12.1	99 05	19.3	66 08.2	98 05	17.5	3
4	51 43.6	99 05	20.7	52 13.4	99 05	20.6	53 42.8	99 05	20.3	54 12.6	99 05	20.3	54 42.4	99 05	20.1	60 39.4	99 05	18.7	61 09.1	99 05	18.6	66 05.5	99 04	16.8	4
155	51 40.3	99 05	19.9	52 10.2	99 05	19.8	53 39.6	99 05	19.6	54 09.4	99 05	19.5	54 39.2	99 05	19.4	60 36.4	99 05	18.0	61 06.2	99 05	17.8	66 02.8	99 04	16.2	155
6	51 37.2	99 05	19.1	52 07.0	99 05	19.0	53 36.5	99 05	18.8	54 06.4	99 05	18.7	54 36.2	99 05	18.6	60 33.6	99 05	17.3	61 03.4	99 04	17.1	66 00.3	99 04	15.5	6
7	51 34.2	1.0 05	18.3	52 04.0	1.0 05	18.2	53 33.6	99 05	18.0	54 03.5	99 05	17.9	54 33.2	99 05	17.8	60 30.9	99 04	16.5	61 00.6	99 04	16.4	65 57.8	99 04	14.9	7
8	51 31.3	1.0 05	17.5	52 01.2	1.0 05	17.4	53 30.7	1.0 05	17.2	54 00.6	1.0 04	17.1	54 30.4	99 04	17.0	60 28.3	99 04	15.8	60 58.1	99 04	15.7	65 55.4	99 04	14.2	8
9	51 28.5	1.0 04	16.7	51 58.4	1.0 04	16.6	53 28.0	1.0 04	16.4	53 57.9	1.0 04	16.3	54 27.7	1.0 04	16.3	60 25.8	99 04	15.1	60 55.6	99 04	15.0	65 53.2	99 04	13.6	9
160	51 25.9	1.0 04	15.9	51 55.8	1.0 04	15.9	53 25.4	1.0 04	15.6	53 55.3	1.0 04	15.6	54 25.2	1.0 04	15.5	60 23.4	99 04	14.4	60 53.2	99 04	14.3	65 51.0	99 03	12.9	160
1	51 23.4	1.0 04	15.1	51 53.3	1.0 04	15.1	53 23.0	1.0 04	14.8	53 52.8	1.0 04	14.8	54 22.7	1.0 04	14.7	60 21.1	99 04	13.6	60 51.0	99 04	13.5	65 49.0	99 03	12.3	1
2	51 21.0	1.0 04	14.3	51 50.9	1.0 04	14.3	53 20.6	1.0 04	14.1	53 50.5	1.0 04	14.0	54 20.4	1.0 04	13.9	60 19.0	1.0 03	12.9	60 48.8	1.0 03	12.8	65 47.1	99 03	11.6	2
3	51 18.7	1.0 04	13.5	51 48.7	1.0 04	13.5	53 18.4	1.0 04	13.3	53 48.3	1.0 03	13.2	54 18.2	1.0 03	13.1	60 16.9	1.0 03	12.2	60 46.8	1.0 03	12.1	65 45.2	99 03	11.0	3
4	51 16.6	1.0 03	12.7	51 46.5	1.0 03	12.7	53 16.3	1.0 03	12.5	53 46.2	1.0 03	12.4	54 16.1	1.0 03	12.4	60 15.0	1.0 03	11.4	60 44.9	1.0 03	11.4	65 43.5	99 03	10.3	4
165	51 14.6	1.0 03	11.9	51 44.5	1.0 03	11.9	53 14.3	1.0 03	11.7	53 44.3	1.0 03	11.7	54 14.2	1.0 03	11.6	60 13.2	1.0 03	10.8	60 43.1	1.0 03	10.7	65 41.9	1.0 03	09.7	165
6	51 12.7	1.0 03	11.1	51 42.7	1.0 03	11.1	53 12.5	1.0 03	10.9	53 42.4	1.0 03	10.9	54 12.4	1.0 03	10.8	60 11.5	1.0 03	10.0	60 41.4	1.0 03	10.0	65 40.3	1.0 02	09.0	6
7	51 11.0	1.0 03	10.3	51 40.9	1.0 03	10.3	53 10.8	1.0 03	10.1	53 40.7	1.0 03	10.1	54 10.7	1.0 03	10.0	60 09.9	1.0 02	09.3	60 39.8	1.0 02	09.3	65 38.9	1.0 02	08.4	7
8	51 09.4	1.0 02	09.5	51 39.3	1.0 02	09.5	53 09.1	1.0 02	09.3	53 39.1	1.0 02	09.3	54 09.1	1.0 02	09.3	60 08.4	1.0 02	08.6	60 38.4	1.0 02	08.5	65 37.6	1.0 02	07.7	8
9	51 07.9	1.0 02	08.7	51 37.8	1.0 02	08.7	53 07.7	1.0 02	08.6	53 37.7	1.0 02	08.5	54 07.6	1.0 02	08.5	60 07.1	1.0 02	07.9	60 37.1	1.0 02	07.8	65 36.4	1.0 02	07.1	9
170	51 06.5	1.0 02	07.9	51 36.5	1.0 02	07.9	53 06.4	1.0 02	07.8	53 36.4	1.0 02	07.8	54 06.3	1.0 02	07.7	60 05.9	1.0 02	07.2	60 35.8	1.0 02	07.1	65 35.3	1.0 02	06.4	170
1	51 05.3	1.0 02	07.2	51 35.2	1.0 02	07.1	53 05.2	1.0 02	07.0	53 35.1	1.0 02	07.0	54 05.1	1.0 02	07.0	60 04.8	1.0 02	06.5	60 34.7	1.0 02	06.4	65 34.3	1.0 01	05.8	1
2	51 04.2	1.0 02	06.4	51 34.1	1.0 02	06.3	53 04.1	1.0 02	06.2	53 34.1	1.0 02	06.2	54 04.0	1.0 02	06.2	60 03.8	1.0 01	05.7	60 33.7	1.0 01	05.7	65 33.4	1.0 01	05.2	2
3	51 03.2	1.0 01	05.6	51 33.2	1.0 01	05.5	53 03.1	1.0 01	05.5	53 33.1	1.0 01	05.4	54 03.1	1.0 01	05.4	60 02.9	1.0 01	05.0	60 32.9	1.0 01	05.0	65 32.6	1.0 01	04.5	3
4	51 02.3	1.0 01	04.8	51 32.3	1.0 01	04.7	53 02.3	1.0 01	04.7	53 32.3	1.0 01	04.7	54 02.3	1.0 01	04.6	60 02.1	1.0 01	04.3	60 32.1	1.0 01	04.3	65 31.9	1.0 01	03.9	4
175	51 01.6	1.0 01	04.0	51 31.6	1.0 01	04.0	53 01.6	1.0 01	03.9	53 31.6	1.0 01	03.9	54 01.6	1.0 01	03.9	60 01.5	1.0 01	03.6	60 31.5	1.0 01	03.6	65 31.3	1.0 01	03.2	175
6	51 01.0	1.0 01	03.2	51 31.0	1.0 01	03.2	53 01.0	1.0 01	03.1	53 31.0	1.0 01	03.1	54 01.0	1.0 01	03.1	60 00.9	1.0 01	02.9	60 30.9	1.0 01	02.8	65 30.8	1.0 01	02.6	6
7	51 00.6	1.0 01	02.4	51 30.6	1.0 01	02.4	53 00.6	1.0 01	02.3	53 30.6	1.0 01	02.3	54 00.6	1.0 01	02.3	60 00.5	1.0 00	02.2	60 30.5	1.0 00	02.1	65 30.5	1.0 00	01.9	7
8	51 00.3	1.0 00	01.6	51 30.3	1.0 00	01.6	53 00.3	1.0 00	01.6	53 30.3	1.0 00	01.6	54 00.3	1.0 00	01.5	60 00.2	1.0 00	01.4	60 30.2	1.0 00	01.4	65 30.2	1.0 00	01.3	8
9	51 00.1	1.0 00	00.8	51 30.1	1.0 00	00.8	53 00.1	1.0 00	00.8	53 30.1	1.0 00	00.8	54 00.1	1.0 00	00.8	60 00.1	1.0 00	00.7	60 30.1	1.0 00	00.7	65 30.1	1.0 00	00.6	9
180	51 00.0	1.0 00	00.0	51 30.0	1.0 00	00.0	53 00.0	1.0 00	00.0	53 30.0	1.0 00	00.0	54 00.0	1.0 00	00.0	60 00.0	1.0 00	00.0	60 30.0	1.0 00	00.0	65 30.0	1.0 00	00.0	180

STAR IDENTIFICATION TABLE

ALTITUDE

AZ.	4° Dec.	4° H.A.	8° Dec.	8° H.A.	12° Dec.	12° H.A.	16° Dec.	16° H.A.	20° Dec.	20° H.A.	24° Dec.	24° H.A.	28° Dec.	28° H.A.	32° Dec.	32° H.A.	36° Dec.	36° H.A.	40° Dec.	40° H.A.	44° Dec.	44° H.A.	AZ.
00	13	180	17	180	21	180	25	180	29	180	33	180	37	180	41	180	45	180	49	180	53	180	00
4	13	176	17	176	21	176	25	176	29	176	33	176	37	176	41	176	45	175	49	175	53	175	4
8	13	172	17	172	21	172	25	172	29	171	33	171	37	171	41	171	45	171	49	171	53	170	8
12	13	168	17	168	21	167	25	167	29	167	33	167	37	167	41	167	45	166	49	166	53	166	12
16	13	164	17	163	21	163	25	163	29	163	33	163	37	162	41	162	45	162	49	161	53	161	16
20	12	160	16	159	20	159	24	159	28	159	32	158	36	158	40	158	44	157	48	157	52	156	20
24	12	155	16	155	20	155	24	155	28	154	32	154	36	154	40	153	44	153	48	152	52	152	24
28	12	151	16	151	20	151	24	150	28	150	32	150	36	149	40	149	44	148	48	148	52	147	28
32	12	147	16	147	20	147	24	146	28	146	32	145	36	145	39	144	43	144	47	143	51	142	32
36	11	143	15	143	19	142	23	142	27	142	31	141	35	141	39	140	43	139	47	139	51	138	36
40	11	139	15	139	19	138	23	138	27	137	31	137	35	136	39	136	43	135	47	134	51	133	40
44	10	135	14	135	18	134	22	134	26	133	30	133	34	132	38	131	42	131	46	130	50	129	44
48	10	131	14	131	18	130	22	130	26	129	30	129	34	128	38	127	42	126	46	125	50	124	48
52	09	127	13	127	17	126	21	126	25	125	29	124	33	124	37	123	41	122	45	121	49	120	52
56	09	123	13	123	17	122	21	121	25	121	29	120	33	120	37	119	41	118	45	117	49	116	56
60	08	119	12	119	16	118	20	117	24	117	28	116	32	115	36	115	40	114	44	113	48	112	60
64	08	115	12	115	16	114	20	113	24	113	28	112	32	111	36	110	39	110	43	109	47	107	64
68	07	111	11	111	15	110	19	109	23	109	27	108	31	107	35	106	39	105	43	104	47	103	68
72	07	107	11	107	15	106	19	105	23	105	26	104	30	103	34	102	38	101	42	100	46	99	72
76	06	103	10	103	14	102	18	101	22	101	26	100	30	99	34	98	38	97	42	96	46	95	76
80	06	99	09	99	13	98	17	97	21	97	25	96	29	95	33	94	37	93	41	92	45	91	80
84	05	95	09	95	13	94	17	93	21	93	25	92	29	91	32	90	36	89	40	88	44	87	84
88	04	91	08	91	12	90	16	89	20	89	24	88	28	87	32	86	36	85	40	84	44	83	88
92	04	87	08	87	12	86	15	85	19	85	23	84	27	83	31	82	35	82	39	81	43	79	92
96	03	83	07	83	11	82	15	82	19	81	23	80	27	79	31	79	35	78	38	77	42	76	96
100	02	80	06	79	10	78	14	78	18	77	22	76	26	75	30	75	34	74	38	73	42	72	100
104	02	76	06	75	10	74	14	74	18	73	22	72	25	72	29	71	33	70	37	69	41	68	104
108	01	72	05	71	09	70	13	70	17	69	21	68	25	68	29	67	33	66	37	65	41	64	108
112	01	68	05	67	09	66	12	66	16	65	20	65	24	64	28	63	32	62	36	62	40	61	112
116	00	64	04	63	08	63	12	62	16	61	20	61	24	60	28	59	32	59	36	58	40	57	116
120	*01*	60	03	59	07	59	11	58	15	58	19	57	23	56	27	56	31	55	35	54	39	53	120
124	*01*	56	03	55	07	55	11	54	15	54	19	53	23	53	27	52	31	51	35	50	39	50	124
128	*02*	52	02	51	06	51	10	50	14	50	18	49	22	49	26	48	30	48	34	47	38	46	128
132	*02*	48	02	47	06	47	10	46	14	46	18	45	22	45	26	44	30	44	34	43	38	42	132
136	*02*	44	01	43	05	43	09	43	13	42	17	42	21	41	25	41	29	40	33	40	37	39	136
140	*03*	40	01	40	05	39	09	39	13	38	17	38	21	37	25	37	29	36	33	36	37	35	140
144	*03*	36	01	36	05	35	09	35	13	34	17	34	21	34	25	33	29	33	33	32	37	32	144
148	*04*	32	00	32	04	31	08	31	12	31	16	30	20	30	24	30	28	29	32	29	36	28	148
152	*04*	28	00	28	04	27	08	27	12	27	16	26	20	26	24	26	28	25	32	25	36	25	152
156	*04*	24	*00*	24	04	23	08	23	12	23	16	23	20	22	24	22	28	22	32	21	36	21	156
160	*04*	20	*00*	20	04	20	08	19	12	19	16	19	20	19	23	18	27	18	31	18	35	18	160
164	*05*	16	*01*	16	03	16	07	15	11	15	15	15	19	15	23	15	27	15	31	14	35	14	164
168	*05*	12	*01*	12	03	12	07	12	11	11	15	11	19	11	23	11	27	11	31	11	35	11	168
172	*05*	08	*01*	08	03	08	07	08	11	08	15	08	19	07	23	07	27	07	31	07	35	07	172
176	*05*	04	*01*	04	03	04	07	04	11	04	15	04	19	04	23	04	27	04	31	04	35	04	176
180	*05*	00	*01*	00	03	00	07	00	11	00	15	00	19	00	23	00	27	00	31	00	35	00	180

4°	8°	12°	16°	20°	24°	28°	32°	36°	40°	44°

FIGURES IN ITALICS INDICATE THAT DECLINATION IS OF CONTRARY NAME TO LATITUDE

10—49722-1

STAR IDENTIFICATION TABLE

ALTITUDE

AZ.	48° Dec.	48° H.A.	52° Dec.	52° H.A.	56° Dec.	56° H.A.	60° Dec.	60° H.A.	64° Dec.	64° H.A.	68° Dec.	68° H.A.	72° Dec.	72° H.A.	76° Dec.	76° H.A.	80° Dec.	80° H.A.	84° Dec.	84° H.A.	88° Dec.	88° H.A.	AZ.
00	57	180	61	180	65	180	69	180	73	180	77	180	81	180	85	180	89	180	87	00	83	00	00
4	57	175	61	175	65	175	69	174	73	174	77	173	81	172	85	169	89	145	87	08	83	01	4
8	57	170	61	170	65	169	69	169	73	168	77	167	81	164	85	158	88	123	87	15	83	02	8
12	57	165	61	165	65	164	69	163	73	162	77	160	81	157	84	148	88	111	87	22	83	03	12
16	57	160	61	160	65	159	69	158	72	156	76	154	80	150	84	139	87	103	86	27	83	04	16
20	56	156	60	155	64	154	68	153	72	151	76	148	80	143	84	131	87	97	86	31	83	06	20
24	56	151	60	150	64	149	68	147	72	145	76	142	80	136	83	124	86	92	86	35	83	06	24
28	56	146	60	145	64	144	68	142	71	140	75	136	79	130	83	118	85	88	85	37	83	07	28
32	55	141	59	140	63	139	67	137	71	134	75	130	79	124	82	112	85	85	85	39	83	08	32
36	55	137	59	136	63	134	67	132	71	129	74	125	78	118	81	106	84	81	85	40	83	09	36
40	55	132	58	131	62	129	66	127	70	124	74	120	78	113	81	101	83	79	84	41	82	10	40
44	54	128	58	126	62	125	66	122	70	119	73	115	77	108	80	97	83	76	84	42	82	10	44
48	54	123	57	122	61	120	65	118	69	115	73	110	76	104	80	93	82	73	83	42	82	11	48
52	53	119	57	117	61	116	65	113	68	110	72	106	76	99	79	89	82	70	83	42	82	12	52
56	52	115	56	113	60	111	64	109	68	106	72	101	75	95	78	85	81	68	82	42	82	12	56
60	52	110	56	109	60	107	63	104	67	101	71	97	74	91	78	81	80	66	82	41	82	12	60
64	51	106	55	105	59	103	63	100	67	97	70	93	74	87	77	78	80	63	82	40	82	13	64
68	51	102	55	100	58	98	62	96	66	93	70	89	73	83	77	74	79	61	81	40	82	13	68
72	50	98	54	96	58	94	62	92	65	89	69	85	73	80	76	71	79	59	81	39	81	13	72
76	49	94	53	92	57	90	61	88	65	85	68	81	72	76	75	68	78	56	80	38	81	13	76
80	49	90	53	88	57	86	60	84	64	81	68	78	71	73	75	65	78	54	80	37	81	13	80
84	48	86	52	84	56	83	60	80	63	78	67	74	71	69	74	62	77	52	80	36	81	13	84
88	48	82	51	81	55	79	59	77	63	74	67	71	70	66	74	59	77	50	79	35	81	13	88
92	47	78	51	77	55	75	58	73	62	70	66	67	70	63	73	56	76	47	79	33	81	12	92
96	46	74	50	73	54	71	58	69	62	67	65	64	69	60	73	54	76	45	79	32	81	12	96
100	46	71	50	69	53	68	57	66	61	63	65	60	69	56	72	51	75	43	78	31	80	12	100
104	45	67	49	66	53	64	57	62	61	60	64	57	68	53	72	48	75	41	78	29	80	12	104
108	45	63	48	62	52	61	56	59	60	57	64	54	68	50	71	46	75	39	78	28	80	11	108
112	44	60	48	58	52	57	56	55	60	53	63	51	67	47	71	43	74	36	77	27	80	11	112
116	43	56	47	55	51	54	55	52	59	50	63	48	67	45	70	40	74	34	77	25	80	10	116
120	43	52	47	51	51	50	55	49	59	47	62	45	66	42	70	38	74	32	77	24	80	10	120
124	42	49	46	48	50	47	54	45	58	44	62	41	66	39	70	35	73	30	77	22	80	09	124
128	42	45	46	44	50	43	54	42	58	40	62	38	65	36	69	33	73	28	76	21	80	09	128
132	42	42	46	41	49	40	53	39	57	37	61	35	65	33	69	30	73	26	76	19	80	08	132
136	41	38	45	37	49	36	53	35	57	34	61	32	65	30	69	27	72	23	76	18	79	08	136
140	41	35	45	34	49	33	53	32	57	31	61	29	64	27	68	25	72	21	76	16	79	07	140
144	40	31	44	30	48	30	52	29	56	28	60	26	64	25	68	22	72	19	76	14	79	06	144
148	40	28	44	27	48	26	52	26	56	25	60	23	64	22	68	20	72	17	76	13	79	06	148
152	40	24	44	24	48	23	52	22	56	21	60	20	64	19	68	17	72	15	75	11	79	05	152
156	40	21	44	20	48	20	52	19	56	18	60	18	64	16	67	15	71	13	75	10	79	04	156
160	39	17	43	17	47	16	51	16	55	15	59	15	63	14	67	12	71	11	75	08	79	04	160
164	39	14	43	13	47	13	51	13	55	12	59	12	63	11	67	10	71	09	75	06	79	03	164
168	39	10	43	10	47	10	51	10	55	09	59	09	63	08	67	07	71	06	75	05	79	02	168
172	39	07	43	07	47	07	51	06	55	06	59	06	63	05	67	05	71	04	75	03	79	01	172
176	39	03	43	03	47	03	51	03	55	03	59	03	63	03	67	02	71	02	75	02	79	01	176
180	39	00	43	00	47	00	51	00	55	00	59	00	63	00	67	00	71	00	75	00	79	00	180
	48°		52°		56°		60°		64°		68°		72°		76°		80°		84°		88°	

FIGURES IN ITALICS INDICATE THAT DECLINATION IS OF CONTRARY NAME TO LATITUDE

Each cell shows: Alt. (° ′) · Δd Δt · Az. (°)

H.A.	0° 00′	0° 30′	1° 00′	1° 30′	2° 00′	2° 30′	3° 00′	3° 30′	H.A.
00	8 00.0 1.00 0 180.0	8 30.0 1.00 0 180.0	9 00.0 1.00 0 180.0	9 30.0 1.00 0 180.0	10 00.0 1.00 0 180.0	10 30.0 1.00 0 180.0	11 00.0 1.00 0 180.0	11 30.0 1.00 0 180.0	00
1	7 59.9 1.00 0 179.0	8 29.9 1.00 0 179.0	8 59.9 1.00 0 179.0	9 29.9 1.00 0 179.0	9 59.9 1.00 0 179.0	10 29.9 1.00 0 179.0	10 59.9 1.00 0 179.0	11 29.9 1.00 0 179.0	1
2	7 59.7 1.00 1 178.0	8 29.7 1.00 1 178.0	8 59.7 1.00 1 178.0	9 29.7 1.00 1 178.0	9 59.7 1.00 1 178.0	10 29.7 1.00 1 178.0	10 59.7 1.00 1 178.0	11 29.7 1.00 1 178.0	2
3	7 59.3 1.00 1 177.0	8 29.3 1.00 1 177.0	8 59.3 1.00 1 177.0	9 29.3 1.00 1 177.0	9 59.3 1.00 1 177.0	10 29.3 1.00 1 176.9	10 59.3 1.00 1 176.9	11 29.3 1.00 1 176.9	3
4	7 58.8 1.00 1 176.0	8 28.8 1.00 1 176.0	8 58.8 1.00 1 176.0	9 28.8 1.00 1 175.9	9 58.8 1.00 1 175.9	10 28.8 1.00 1 175.9	10 58.8 1.00 1 175.9	11 28.8 1.00 1 175.9	4
05	7 58.2 1.00 1 175.0	8 28.2 1.00 1 174.9	8 58.2 1.00 1 174.9	9 28.2 1.00 1 174.9	9 58.2 1.00 1 174.9	10 28.2 1.00 1 174.9	10 58.1 1.00 1 174.9	11 28.1 1.00 1 174.9	05
6	7 57.4 1.00 2 173.9	8 27.4 1.00 2 173.9	8 57.3 1.00 2 173.9	9 27.3 1.00 2 173.9	9 57.3 1.00 2 173.9	10 27.3 1.00 2 173.9	10 57.3 1.00 2 173.9	11 27.3 1.00 2 173.9	6
7	7 56.4 1.00 2 172.9	8 26.4 1.00 2 172.9	8 56.4 1.00 2 172.9	9 26.4 1.00 2 172.9	9 56.4 1.00 2 172.9	10 26.4 1.00 2 172.9	10 56.4 1.00 2 172.9	11 26.4 1.00 2 172.9	7
8	7 55.3 1.00 2 171.9	8 25.3 1.00 2 171.9	8 55.3 1.00 2 171.9	9 25.3 1.00 2 171.9	9 55.3 1.00 2 171.9	10 25.3 1.00 2 171.9	10 55.3 1.00 2 171.9	11 25.3 1.00 2 171.9	8
9	7 54.1 1.00 2 170.9	8 24.0 1.00 2 170.9	8 54.0 1.00 2 170.9	9 24.0 1.00 2 170.9	9 54.0 1.00 2 170.9	10 24.0 1.00 2 170.9	10 54.0 1.00 2 170.8	11 24.0 1.00 2 170.8	9
10	7 52.7 1.00 3 169.9	8 22.7 1.00 3 169.9	8 52.6 1.00 3 169.9	9 22.6 1.00 3 169.9	9 52.6 1.00 3 169.9	10 22.6 1.00 3 169.8	10 52.6 1.00 3 169.8	11 22.6 1.00 3 169.8	10
1	7 51.1 1.00 3 168.9	8 21.1 1.00 3 168.9	8 51.1 1.00 3 168.9	9 21.1 1.00 3 168.9	9 51.1 1.00 3 168.8	10 21.1 1.00 3 168.8	10 51.1 1.00 3 168.8	11 21.0 1.00 3 168.8	1
2	7 49.4 1.00 3 167.9	8 19.4 1.00 3 167.9	8 49.4 1.00 3 167.9	9 19.4 1.00 3 167.8	9 49.4 1.00 3 167.8	10 19.4 1.00 3 167.8	10 49.4 1.00 3 167.8	11 19.4 1.00 3 167.8	2
3	7 47.6 1.00 3 166.9	8 17.6 1.00 3 166.9	8 47.6 1.00 3 166.8	9 17.6 1.00 3 166.8	9 47.6 1.00 3 166.8	10 17.5 1.00 3 166.8	10 47.5 1.00 3 166.8	11 17.5 1.00 3 166.8	3
4	7 45.7 1.00 4 165.9	8 15.6 1.00 4 165.9	8 45.6 1.00 4 165.8	9 15.6 1.00 4 165.8	9 45.6 1.00 4 165.8	10 15.6 1.00 4 165.8	10 45.5 1.00 4 165.8	11 15.5 1.00 4 165.7	4
15	7 43.5 1.00 4 164.9	8 13.5 1.00 4 164.8	8 43.5 1.00 4 164.8	9 13.5 1.00 4 164.8	9 43.5 1.00 4 164.8	10 13.4 1.00 4 164.8	10 43.4 1.00 4 164.7	11 13.4 1.00 4 164.7	15
6	7 41.3 1.00 4 163.9	8 11.3 1.00 4 163.8	8 41.2 1.00 4 163.8	9 11.2 1.00 4 163.8	9 41.2 1.00 4 163.8	10 11.2 1.00 4 163.8	10 41.2 1.00 4 163.7	11 11.1 1.00 4 163.7	6
7	7 38.9 1.00 4 162.8	8 08.9 1.00 4 162.8	8 38.8 1.00 4 162.8	9 08.8 1.00 4 162.8	9 38.8 1.00 4 162.8	10 08.8 1.00 4 162.7	10 38.7 1.00 4 162.7	11 08.7 1.00 4 162.7	7
8	7 36.4 1.00 4 161.8	8 06.3 1.00 4 161.8	8 36.3 1.00 4 161.8	9 06.3 1.00 4 161.8	9 36.3 1.00 4 161.7	10 06.2 1.00 4 161.7	10 36.2 1.00 4 161.7	11 06.2 1.00 4 161.7	8
9	7 33.7 1.00 5 160.8	8 03.7 1.00 5 160.8	8 33.6 1.00 5 160.8	9 03.6 1.00 5 160.8	9 33.6 1.00 5 160.7	10 03.5 1.00 5 160.7	10 33.5 1.00 5 160.7	11 03.5 1.00 5 160.7	9
20	7 30.9 1.00 5 159.8	8 00.8 1.00 5 159.8	8 30.8 1.00 5 159.8	9 00.8 1.00 5 159.7	9 30.7 1.00 5 159.7	10 00.7 1.00 5 159.7	10 30.7 1.00 5 159.7	11 00.6 1.00 5 159.6	20
1	7 27.9 1.00 5 158.8	7 57.9 1.00 5 158.8	8 27.9 1.00 5 158.8	8 57.8 1.00 5 158.7	9 27.8 1.00 5 158.7	9 57.7 1.00 5 158.7	10 27.7 1.00 5 158.7	10 57.7 1.00 5 158.6	1
2	7 24.8 1.00 5 157.8	7 54.8 1.00 5 157.8	8 24.8 1.00 5 157.7	8 54.7 1.00 5 157.7	9 24.7 1.00 5 157.7	9 54.6 1.00 5 157.7	10 24.6 1.00 5 157.6	10 54.6 1.00 5 157.6	2
3	7 21.6 1.00 6 156.8	7 51.6 1.00 6 156.8	8 21.5 1.00 6 156.7	8 51.5 1.00 6 156.7	9 21.4 1.00 6 156.7	9 51.4 1.00 6 156.7	10 21.3 1.00 6 156.6	10 51.3 1.00 6 156.6	3
4	7 18.3 1.00 6 155.8	7 48.2 1.00 6 155.8	8 18.2 1.00 6 155.7	8 48.1 1.00 6 155.7	9 18.1 1.00 6 155.7	9 48.0 1.00 6 155.6	10 18.0 1.00 6 155.6	10 47.9 1.00 6 155.6	4
25	7 14.8 1.00 6 154.8	7 44.7 1.00 6 154.7	8 14.7 1.00 6 154.7	8 44.6 1.00 6 154.7	9 14.6 1.00 6 154.7	9 44.5 1.00 6 154.6	10 14.5 1.00 6 154.6	10 44.4 1.00 6 154.6	25
6	7 11.1 1.00 6 153.8	7 41.1 1.00 6 153.7	8 11.0 1.00 6 153.7	8 41.0 1.00 6 153.7	9 10.9 1.00 6 153.7	9 40.9 1.00 6 153.6	10 10.8 1.00 6 153.6	10 40.7 1.00 6 153.6	6
7	7 07.4 1.00 6 152.8	7 37.3 1.00 6 152.7	8 07.3 1.00 6 152.7	8 37.2 1.00 6 152.6	9 07.2 1.00 6 152.6	9 37.1 1.00 6 152.6	10 07.0 1.00 7 152.6	10 37.0 1.00 7 152.5	7
8	7 03.5 1.00 7 151.8	7 33.4 1.00 7 151.7	8 03.4 1.00 7 151.7	8 33.3 1.00 7 151.7	9 03.2 1.00 7 151.6	9 33.2 1.00 7 151.6	10 03.1 1.00 7 151.6	10 33.1 1.00 7 151.5	8
9	6 59.5 1.00 7 150.8	7 29.4 1.00 7 150.7	7 59.4 1.00 7 150.7	8 29.3 1.00 7 150.7	8 59.2 1.00 7 150.6	9 29.1 1.00 7 150.6	9 59.1 1.00 7 150.6	10 29.0 1.00 7 150.5	9
30	6 55.4 1.00 7 149.8	7 25.3 1.00 7 149.7	7 55.2 1.00 7 149.7	8 25.1 1.00 7 149.7	8 55.1 1.00 7 149.6	9 25.0 1.00 7 149.6	9 54.9 1.00 7 149.5	10 24.8 1.00 7 149.5	30
1	6 51.1 1.00 7 148.8	7 21.0 1.00 7 148.7	7 50.9 1.00 7 148.7	8 20.8 1.00 7 148.6	8 50.8 1.00 7 148.6	9 20.7 1.00 7 148.6	9 50.6 1.00 7 148.5	10 20.5 1.00 7 148.5	1
2	6 46.7 1.00 8 147.7	7 16.6 1.00 8 147.7	7 46.5 1.00 8 147.7	8 16.4 1.00 8 147.6	8 46.4 1.00 8 147.6	9 16.3 1.00 8 147.6	9 46.2 1.00 8 147.5	10 16.1 1.00 8 147.5	2
3	6 42.2 1.00 8 146.7	7 12.1 1.00 8 146.7	7 42.0 1.00 8 146.7	8 11.9 1.00 8 146.6	8 41.8 1.00 8 146.6	9 11.7 1.00 8 146.6	9 41.6 1.00 8 146.5	10 11.6 1.00 8 146.5	3
4	6 37.5 1.00 8 145.7	7 07.4 1.00 8 145.7	7 37.3 1.00 8 145.7	8 07.3 1.00 8 145.6	8 37.2 1.00 8 145.6	9 07.1 1.00 8 145.5	9 37.0 1.00 8 145.5	10 06.9 1.00 8 145.5	4
35	6 32.8 1.00 8 144.7	7 02.7 1.00 8 144.7	7 32.6 1.00 8 144.7	8 02.5 1.00 8 144.6	8 32.4 1.00 8 144.6	9 02.3 1.00 8 144.5	9 32.2 1.00 8 144.5	10 02.1 1.00 8 144.5	35
6	6 27.9 1.00 8 143.7	6 57.8 1.00 8 143.7	7 27.7 1.00 8 143.6	7 57.6 1.00 8 143.6	8 27.5 1.00 8 143.6	8 57.4 1.00 8 143.5	9 27.3 1.00 8 143.5	9 57.2 1.00 8 143.4	6
7	6 22.9 1.00 9 142.7	6 52.8 1.00 9 142.7	7 22.7 1.00 9 142.6	7 52.6 1.00 9 142.6	8 22.5 1.00 9 142.5	8 52.4 1.00 9 142.5	9 22.2 1.00 9 142.5	9 52.1 1.00 9 142.4	7
8	6 17.8 1.00 9 141.7	6 47.7 1.00 9 141.7	7 17.6 1.00 9 141.6	7 47.4 1.00 9 141.6	8 17.3 1.00 9 141.6	8 47.2 1.00 9 141.5	9 17.1 1.00 9 141.5	9 47.0 1.00 9 141.4	8
9	6 12.5 1.00 9 140.7	6 42.4 1.00 9 140.7	7 12.3 1.00 9 140.6	7 42.2 1.00 9 140.6	8 12.1 1.00 9 140.5	8 42.0 1.00 9 140.5	9 11.8 1.00 9 140.5	9 41.7 1.00 9 140.4	9
40	6 07.2 1.00 9 139.7	6 37.1 1.00 9 139.7	7 07.0 1.00 9 139.6	7 36.8 1.00 9 139.6	8 06.7 1.00 9 139.5	8 36.6 1.00 9 139.5	9 06.5 1.00 9 139.5	9 36.3 1.00 9 139.4	40
1	6 01.8 1.00 9 138.7	6 31.6 1.00 9 138.7	7 01.5 1.00 9 138.6	7 31.4 1.00 9 138.6	8 01.2 1.00 9 138.5	8 31.1 1.00 9 138.5	9 01.0 1.00 9 138.4	9 30.9 1.00 9 138.4	1
2	5 56.2 1.00 9 137.7	6 26.1 1.00 9 137.7	6 55.9 1.00 9 137.6	7 25.8 1.00 9 137.6	7 55.7 1.01 0 137.5	8 25.5 1.01 0 137.5	8 55.4 1.01 0 137.4	9 25.3 1.01 0 137.4	2
3	5 50.5 1.01 0 136.7	6 20.4 1.01 0 136.7	6 50.2 1.01 0 136.6	7 20.1 1.01 0 136.6	7 50.0 1.01 0 136.5	8 19.8 1.01 0 136.5	8 49.7 1.01 0 136.4	9 19.6 1.01 0 136.4	3
4	5 44.7 1.01 0 135.7	6 14.6 1.01 0 135.7	6 44.5 1.01 0 135.6	7 14.3 1.01 0 135.6	7 44.2 1.01 0 135.5	8 14.0 1.01 0 135.5	8 43.9 1.01 0 135.4	9 13.7 1.01 0 135.4	4
45	5 38.9 1.01 0 134.7	6 08.7 1.01 0 134.7	6 38.6 1.01 0 134.6	7 08.4 1.01 0 134.6	7 38.3 1.01 0 134.5	8 08.1 1.01 0 134.5	8 38.0 1.01 0 134.4	9 07.8 1.01 0 134.4	45
6	5 32.9 .99 10 133.7	6 02.7 .99 10 133.7	6 32.6 .99 10 133.6	7 02.4 .99 10 133.5	7 32.3 .99 10 133.5	8 02.1 .99 10 133.5	8 32.0 .99 10 133.4	9 01.8 .99 10 133.3	6
7	5 26.8 .99 10 132.7	5 56.6 .99 10 132.6	6 26.5 .99 10 132.6	6 56.3 .99 10 132.6	7 26.2 .99 10 132.5	7 56.0 .99 10 132.5	8 25.8 .99 10 132.4	8 55.7 .99 10 132.4	7
8	5 20.6 .99 10 131.7	5 50.4 .99 10 131.7	6 20.3 .99 10 131.6	6 50.1 .99 10 131.6	7 20.0 .99 10 131.5	7 49.8 .99 10 131.5	8 19.6 .99 11 131.4	8 49.5 .99 11 131.4	8
9	5 14.3 .99 11 130.7	5 44.2 .99 11 130.7	6 14.0 .99 11 130.6	6 43.8 .99 11 130.6	7 13.7 .99 11 130.5	7 43.5 .99 11 130.5	8 13.3 .99 11 130.4	8 43.1 .99 11 130.3	9
50	5 07.9 .99 11 129.7	5 37.8 .99 11 129.7	6 07.6 .99 11 129.6	6 37.4 .99 11 129.6	7 07.3 .99 11 129.5	7 37.1 .99 11 129.5	8 06.9 .99 11 129.4	8 36.7 .99 11 129.3	50
1	5 01.5 .99 11 128.7	5 31.3 .99 11 128.7	6 01.1 .99 11 128.6	6 30.9 .99 11 128.6	7 00.8 .99 11 128.5	7 30.6 .99 11 128.5	8 00.4 .99 11 128.4	8 30.2 .99 11 128.3	1
2		5 24.7 .99 11 127.7	5 54.6 .99 11 127.6	6 24.4 .99 11 127.6	6 54.2 .99 11 127.5	7 24.0 .99 11 127.5	7 53.8 .99 11 127.4	8 23.6 .99 11 127.3	2
3		5 18.1 .99 11 126.7	5 47.9 .99 11 126.6	6 17.7 .99 11 126.6	6 47.5 .99 11 126.5	7 17.3 .99 11 126.5	7 47.1 .99 11 126.4	8 17.0 .99 11 126.3	3
4		5 11.3 .99 11 125.7	5 41.2 .99 11 125.6	6 11.0 .99 11 125.6	6 40.8 .99 11 125.5	7 10.6 .99 11 125.4	7 40.4 .99 11 125.4	8 10.2 .99 11 125.3	4
55		5 04.5 .99 12 124.7	5 34.3 .99 12 124.6	6 04.1 .99 12 124.6	6 33.9 .99 12 124.5	7 03.7 .99 12 124.4	7 33.5 .99 12 124.4	8 03.3 .99 12 124.3	55
6			5 27.4 .99 12 123.6	5 57.2 .99 12 123.6	6 27.0 .99 12 123.5	6 56.8 .99 12 123.4	7 26.6 .99 12 123.4	7 56.4 .99 12 123.3	6
7			5 20.4 .99 12 122.6	5 50.2 .99 12 122.6	6 20.0 .99 12 122.5	6 49.8 .99 12 122.5	7 19.6 .99 12 122.4	7 49.4 .99 12 122.3	7
8			5 13.3 .99 12 121.6	5 43.1 .99 12 121.6	6 12.9 .99 12 121.5	6 42.7 .99 12 121.5	7 12.5 .99 12 121.4	7 42.3 .99 12 121.3	8
9			5 06.2 .99 12 120.6	5 36.0 .99 12 120.6	6 05.8 .99 12 120.5	6 35.5 .99 12 120.5	7 05.3 .99 12 120.4	7 35.1 .99 12 120.3	9
60				5 28.8 .99 12 119.6	5 58.5 .99 12 119.5	6 28.3 .99 12 119.5	6 58.1 .99 12 119.4	7 27.9 .99 12 119.3	60
1				5 21.5 .99 12 118.6	5 51.2 .99 12 118.5	6 21.0 .99 12 118.5	6 50.8 .99 12 118.4	7 20.6 .99 12 118.3	1
2				5 14.1 .99 12 117.6	5 43.9 .99 12 117.5	6 13.6 .99 12 117.5	6 43.4 .99 12 117.4	7 13.2 .99 12 117.3	2
3				5 06.7 .99 12 116.6	5 36.4 .99 12 116.5	6 06.2 .99 12 116.5	6 36.0 .99 13 116.4	7 05.7 .99 13 116.3	3
4					5 28.9 .99 13 115.5	5 58.7 .99 13 115.5	6 28.4 .99 13 115.4	6 58.2 .99 13 115.3	4
65					5 21.4 .99 13 114.5	5 51.1 .99 13 114.5	6 20.9 .99 13 114.4	6 50.6 .99 13 114.3	65
6					5 13.7 .99 13 113.5	5 43.5 .99 13 113.5	6 13.2 .99 13 113.3	6 43.0 .99 13 113.3	6
7					5 06.0 .99 13 112.5	5 35.8 .99 13 112.5	6 05.5 .99 13 112.4	6 35.3 .99 13 112.3	7
8						5 28.0 .99 13 111.5	5 57.8 .99 13 111.4	6 27.5 .99 13 111.4	8
9						5 20.3 .99 13 110.5	5 50.0 .99 13 110.4	6 19.7 .99 13 110.4	9
70						5 12.4 .99 13 109.5	5 42.1 .99 13 109.4	6 11.9 .99 13 109.4	70
1						5 04.5 .99 13 108.5	5 34.2 .99 13 108.4	6 04.0 .99 13 108.4	1
2							5 26.3 .99 13 107.4	5 56.0 .99 13 107.4	2
3							5 18.3 .99 13 106.4	5 48.0 .99 13 106.4	3
4							5 10.3 .99 13 105.4	5 40.9 .99 13 105.4	4
75							5 02.2 .99 14 104.5	5 31.9 .99 14 104.4	75
6								5 23.8 .99 14 103.4	6
7								5 15.7 .99 14 102.4	7
8								5 07.5 .99 14 101.4	8

L 8

H.A.	0° 00' Alt. Δd Δt Az.	0° 30' Alt. Δd Δt Az.	1° 00' Alt. Δd Δt Az.	1° 30' Alt. Δd Δt Az.	2° 00' Alt. Δd Δt Az.	2° 30' Alt. Δd Δt Az.	3° 00' Alt. Δd Δt Az.	3° 30' Alt. Δd Δt Az.	H.A.
00	8 00.0 1.0 00 180.0	7 30.0 1.0 00 180.0	7 00.0 1.0 00 180.0	6 30.0 1.0 00 180.0	6 00.0 1.0 00 180.0	5 30.0 1.0 00 180.0	5 00.0 1.0 00 180.0		00
1	7 59.9 1.0 00 179.0	7 29.9 1.0 00 179.0	6 59.9 1.0 00 179.0	6 29.9 1.0 00 179.0	5 59.9 1.0 00 179.0	5 29.9 1.0 00 179.0			1
2	7 59.7 1.0 01 178.0	7 29.7 1.0 01 178.0	6 59.7 1.0 01 178.0	6 29.7 1.0 01 178.0	5 59.7 1.0 01 178.0	5 29.7 1.0 01 178.0			2
3	7 59.3 1.0 01 177.0	7 29.3 1.0 01 177.0	6 59.3 1.0 01 177.0	6 29.3 1.0 01 177.0	5 59.3 1.0 01 177.0	5 29.3 1.0 01 177.0			3
4	7 58.8 1.0 01 176.0	7 28.8 1.0 01 176.0	6 58.8 1.0 01 176.0	6 28.8 1.0 01 176.0	5 58.8 1.0 01 176.0	5 28.8 1.0 01 176.0			4
05	7 58.2 1.0 01 175.0	7 28.2 1.0 01 175.0	6 58.2 1.0 01 175.0	6 28.2 1.0 01 175.0	5 58.2 1.0 01 175.0	5 28.2 1.0 01 175.0			05
6	7 57.4 1.0 02 173.9	7 27.4 1.0 02 173.9	6 57.4 1.0 02 174.0	6 27.4 1.0 02 174.0	5 57.4 1.0 02 174.0	5 27.4 1.0 02 174.0			6
7	7 56.4 1.0 02 172.9	7 26.4 1.0 02 172.9	6 56.4 1.0 02 172.9	6 26.4 1.0 02 173.0	5 56.4 1.0 02 173.0	5 26.4 1.0 02 173.0			7
8	7 55.3 1.0 02 171.9	7 25.3 1.0 02 171.9	6 55.3 1.0 02 171.9	6 25.3 1.0 02 172.0	5 55.3 1.0 02 172.0	5 25.3 1.0 02 172.0			8
9	7 54.1 1.0 02 170.9	7 24.1 1.0 02 170.9	6 54.1 1.0 02 170.9	6 24.1 1.0 02 170.9	5 54.1 1.0 02 171.0	5 24.1 1.0 02 171.0			9
10	7 52.7 1.0 03 169.9	7 22.7 1.0 03 169.9	6 52.7 1.0 03 169.9	6 22.7 1.0 03 169.9	5 52.7 1.0 03 170.0	5 22.7 1.0 03 170.0			10
1	7 51.1 1.0 03 168.9	7 21.1 1.0 03 168.9	6 51.1 1.0 03 168.9	6 21.2 1.0 03 168.9	5 51.1 1.0 03 168.9	5 21.2 1.0 03 169.0			1
2	7 49.4 1.0 03 167.9	7 19.5 1.0 03 167.9	6 49.5 1.0 03 167.9	6 19.5 1.0 03 167.9	5 49.5 1.0 03 167.9	5 19.5 1.0 03 168.0			2
3	7 47.6 1.0 03 166.9	7 17.6 1.0 03 166.9	6 47.7 1.0 03 166.9	6 17.7 1.0 03 166.9	5 47.7 1.0 03 166.9	5 17.7 1.0 03 167.0			3
4	7 45.7 1.0 04 165.9	7 15.7 1.0 04 165.9	6 45.7 1.0 04 165.9	6 15.7 1.0 04 165.9	5 45.7 1.0 04 165.9	5 15.7 1.0 04 166.0			4
15	7 43.5 1.0 04 164.9	7 13.6 1.0 04 164.9	6 43.6 1.0 04 164.9	6 13.6 1.0 04 164.9	5 43.6 1.0 04 164.9	5 13.6 1.0 04 165.0			15
6	7 41.3 1.0 04 163.9	7 11.3 1.0 04 163.9	6 41.3 1.0 04 163.9	6 11.4 1.0 04 163.9	5 41.4 1.0 04 163.9	5 11.4 1.0 04 163.9			6
7	7 38.9 1.0 04 162.9	7 08.9 1.0 04 162.9	6 38.9 1.0 04 162.9	6 09.0 1.0 04 162.9	5 39.0 1.0 04 162.9	5 09.0 1.0 04 162.9			7
8	7 36.4 1.0 04 161.8	7 06.4 1.0 04 161.9	6 36.4 1.0 04 161.9	6 06.4 1.0 04 161.9	5 36.5 1.0 04 161.9	5 06.5 1.0 04 161.9			8
9	7 33.7 1.0 05 160.8	7 03.7 1.0 05 160.8	6 33.8 1.0 05 160.9	6 03.8 1.0 05 160.9	5 33.8 1.0 05 160.9	5 03.8 1.0 05 160.9			9
20	7 30.9 1.0 05 159.8	7 00.9 1.0 05 159.8	6 30.9 1.0 05 159.9	6 01.0 1.0 05 159.9	5 31.0 1.0 05 159.9	5 01.1 1.0 05 159.9			20
1	7 27.9 1.0 05 158.8	6 58.0 1.0 05 158.8	6 28.0 1.0 05 158.9	5 58.0 1.0 05 158.9	5 28.1 1.0 05 158.9				1
2	7 24.8 1.0 05 157.8	6 54.9 1.0 05 157.8	6 24.9 1.0 05 157.9	5 55.0 1.0 05 157.9	5 25.0 1.0 05 157.9				2
3	7 21.6 1.0 06 156.8	6 51.7 1.0 06 156.8	6 21.7 1.0 06 156.9	5 51.8 1.0 06 156.9	5 21.8 1.0 06 156.9				3
4	7 18.3 1.0 06 155.8	6 48.3 1.0 06 155.8	6 18.4 1.0 06 155.8	5 48.4 1.0 06 155.9	5 18.5 1.0 06 155.9				4
25	7 14.8 1.0 06 154.8	6 44.8 1.0 06 154.8	6 14.9 1.0 06 154.8	5 44.9 1.0 06 154.9	5 15.0 1.0 06 154.9				25
6	7 11.1 1.0 06 153.8	6 41.2 1.0 06 153.8	6 11.3 1.0 06 153.8	5 41.3 1.0 06 153.9	5 11.4 1.0 06 153.9				6
7	7 07.4 1.0 06 152.8	6 37.5 1.0 06 152.8	6 07.5 1.0 06 152.8	5 37.6 1.0 06 152.9	5 07.6 1.0 06 152.9				7
8	7 03.5 1.0 07 151.8	6 33.6 1.0 07 151.8	6 03.6 1.0 07 151.8	5 33.7 1.0 07 151.9	5 03.8 1.0 07 151.9				8
9	6 59.5 1.0 07 150.8	6 29.6 1.0 07 150.8	5 59.6 1.0 07 150.8	5 29.7 1.0 07 150.9					9
30	6 55.4 1.0 07 149.8	6 25.4 1.0 07 149.8	5 55.5 1.0 07 149.8	5 25.6 1.0 07 149.9					30
1	6 51.1 1.0 07 148.8	6 21.2 1.0 07 148.8	5 51.2 1.0 07 148.8	5 21.3 1.0 07 148.9					1
2	6 46.7 1.0 08 147.7	6 16.8 1.0 08 147.8	5 46.9 1.0 08 147.8	5 16.9 1.0 08 147.9					2
3	6 42.2 1.0 08 146.7	6 12.3 1.0 08 146.8	5 42.3 1.0 08 146.8	5 12.4 1.0 08 146.9					3
4	6 37.5 1.0 08 145.7	6 07.6 1.0 08 145.8	5 37.7 1.0 08 145.8	5 07.8 1.0 08 145.9					4
35	6 32.8 1.0 08 144.7	6 02.9 1.0 08 144.8	5 33.0 1.0 08 144.8	5 03.1 1.0 08 144.9					35
6	6 27.9 1.0 08 143.7	5 58.0 1.0 08 143.8	5 28.1 1.0 08 143.8						6
7	6 22.9 1.0 09 142.7	5 53.0 1.0 09 142.8	5 23.1 1.0 08 142.8						7
8	6 17.8 1.0 09 141.7	5 47.9 1.0 09 141.8	5 18.0 1.0 09 141.8						8
9	6 12.5 1.0 09 140.7	5 42.7 1.0 09 140.8	5 12.8 1.0 09 140.8						9
40	6 07.2 1.0 09 139.7	5 37.3 1.0 09 139.8	5 07.4 1.0 09 139.8						40
1	6 01.8 1.0 09 138.7	5 31.9 1.0 09 138.8	5 02.0 1.0 09 138.8						1
2	5 56.2 1.0 09 137.7	5 26.3 1.0 09 137.8							2
3	5 50.5 1.0 10 136.7	5 20.7 1.0 10 136.8							3
4	5 44.7 1.0 10 135.7	5 14.9 1.0 10 135.8							4
45	5 38.9 1.0 10 134.7	5 09.0 1.0 10 134.8							45
6	5 32.9 99 10 133.7	5 03.0 99 10 133.8							6
7	5 26.8 99 10 132.7								7
8	5 20.6 99 10 131.7								8
9	5 14.3 99 11 130.7								9
50	5 07.9 99 11 129.7								50
1	5 01.5 99 11 128.7								1

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H.A.	4° 00'	4° 30'	5° 00'	5° 30'	6° 00'	6° 30'	7° 00'	7° 30'	H.A.
	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	
00	12 00.0 1.0 00 180.0	12 30.0 1.0 00 180.0	13 00.0 1.0 00 180.0	13 30.0 1.0 00 180.0	14 00.0 1.0 00 180.0	14 30.0 1.0 00 180.0	15 00.0 1.0 00 180.0	15 30.0 1.0 00 180.0	00
1	11 59.9 1.0 00 179.0	12 29.9 1.0 00 179.0	12 59.9 1.0 00 179.0	13 29.9 1.0 00 179.0	13 59.9 1.0 00 179.0	14 29.9 1.0 00 179.0	14 59.9 1.0 00 179.0	15 29.9 1.0 00 179.0	1
2	11 59.7 1.0 01 178.0	12 29.7 1.0 01 178.0	12 59.7 1.0 01 178.0	13 29.7 1.0 01 178.0	13 59.7 1.0 01 177.9	14 29.7 1.0 01 177.9	14 59.7 1.0 01 177.9	15 29.7 1.0 01 177.9	2
3	11 59.3 1.0 01 176.9	12 29.3 1.0 01 176.9	12 59.3 1.0 01 176.9	13 29.3 1.0 01 176.9	13 59.3 1.0 01 176.9	14 29.3 1.0 01 176.9	14 59.3 1.0 01 176.9	15 29.3 1.0 01 176.9	3
4	11 58.8 1.0 01 175.9	12 28.8 1.0 01 175.9	12 58.8 1.0 01 175.9	13 28.8 1.0 01 175.9	13 58.8 1.0 01 175.9	14 28.8 1.0 01 175.9	14 58.8 1.0 01 175.9	15 28.8 1.0 01 175.9	4
05	11 58.1 1.0 01 174.9	12 28.1 1.0 01 174.9	12 58.1 1.0 01 174.9	13 28.1 1.0 01 174.9	13 58.1 1.0 01 174.9	14 28.1 1.0 01 174.9	14 58.1 1.0 01 174.9	15 28.1 1.0 01 174.9	05
6	11 57.3 1.0 02 173.9	12 27.3 1.0 02 173.9	12 57.3 1.0 02 173.9	13 27.3 1.0 02 173.9	13 57.3 1.0 02 173.9	14 27.3 1.0 02 173.8	14 57.3 1.0 02 173.8	15 27.3 1.0 02 173.8	6
7	11 56.4 1.0 02 172.9	12 26.4 1.0 02 172.9	12 56.4 1.0 02 172.8	13 26.4 1.0 02 172.8	13 56.3 1.0 02 172.8	14 26.3 1.0 02 172.8	14 56.3 1.0 02 172.8	15 26.3 1.0 02 172.8	7
8	11 55.3 1.0 02 171.8	12 25.2 1.0 02 171.8	12 55.2 1.0 02 171.8	13 25.2 1.0 02 171.8	13 55.2 1.0 02 171.8	14 25.2 1.0 02 171.8	14 55.2 1.0 02 171.8	15 25.2 1.0 02 171.8	8
9	11 54.0 1.0 02 170.8	12 24.0 1.0 02 170.8	12 54.0 1.0 02 170.8	13 24.0 1.0 02 170.8	13 54.0 1.0 02 170.8	14 24.0 1.0 02 170.8	14 53.9 1.0 02 170.8	15 23.9 1.0 02 170.7	9
10	11 52.6 1.0 03 169.8	12 22.6 1.0 03 169.8	12 52.6 1.0 03 169.8	13 22.6 1.0 03 169.8	13 52.6 1.0 03 169.8	14 22.5 1.0 03 169.7	14 52.5 1.0 03 169.7	15 22.5 1.0 03 169.7	10
1	11 51.0 1.0 03 168.8	12 21.0 1.0 03 168.8	12 51.0 1.0 03 168.7	13 21.0 1.0 03 168.7	13 51.0 1.0 03 168.7	14 21.0 1.0 03 168.7	14 51.0 1.0 03 168.7	15 21.0 1.0 03 168.7	1
2	11 49.3 1.0 03 167.8	12 19.3 1.0 03 167.8	12 49.3 1.0 03 167.7	13 19.3 1.0 03 167.7	13 49.3 1.0 03 167.7	14 19.3 1.0 03 167.7	14 49.3 1.0 03 167.7	15 19.2 1.0 03 167.7	2
3	11 47.5 1.0 03 166.7	12 17.5 1.0 03 166.7	12 47.5 1.0 03 166.7	13 17.5 1.0 03 166.7	13 47.4 1.0 03 166.7	14 17.4 1.0 03 166.7	14 47.4 1.0 03 166.6	15 17.4 1.0 03 166.6	3
4	11 45.5 1.0 04 165.7	12 15.5 1.0 04 165.7	12 45.5 1.0 04 165.7	13 15.5 1.0 04 165.7	13 45.4 1.0 04 165.7	14 15.4 1.0 04 165.6	14 45.4 1.0 04 165.6	15 15.4 1.0 04 165.6	4
15	11 43.4 1.0 04 164.7	12 13.4 1.0 04 164.7	12 43.3 1.0 04 164.7	13 13.3 1.0 04 164.7	13 43.3 1.0 04 164.6	14 13.3 1.0 04 164.6	14 43.3 1.0 04 164.6	15 13.2 1.0 04 164.6	15
6	11 41.1 1.0 04 163.7	12 11.1 1.0 04 163.7	12 41.1 1.0 04 163.7	13 11.0 1.0 04 163.6	13 41.0 1.0 04 163.6	14 11.0 1.0 04 163.6	14 41.0 1.0 04 163.6	15 10.9 1.0 04 163.6	6
7	11 38.7 1.0 04 162.7	12 08.7 1.0 04 162.7	12 38.6 1.0 04 162.6	13 08.6 1.0 04 162.6	13 38.6 1.0 04 162.6	14 08.6 1.0 04 162.6	14 38.5 1.0 04 162.5	15 08.5 1.0 04 162.5	7
8	11 36.1 1.0 04 161.7	12 06.1 1.0 04 161.6	12 36.1 1.0 05 161.6	13 06.0 1.0 05 161.6	13 36.0 1.0 05 161.6	14 06.0 1.0 05 161.5	14 36.0 1.0 05 161.5	15 05.9 1.0 05 161.5	8
9	11 33.4 1.0 05 160.6	12 03.4 1.0 05 160.6	12 33.4 1.0 05 160.6	13 03.3 1.0 05 160.6	13 33.3 1.0 05 160.5	14 03.3 1.0 05 160.5	14 33.2 1.0 05 160.5	15 03.2 1.0 05 160.5	9
20	11 30.6 1.0 05 159.6	12 00.6 1.0 05 159.6	12 30.5 1.0 05 159.6	13 00.5 1.0 05 159.5	13 30.5 1.0 05 159.5	14 00.4 1.0 05 159.5	14 30.4 1.0 05 159.5	15 00.3 1.0 05 159.4	20
1	11 27.6 1.0 05 158.6	11 57.6 1.0 05 158.6	12 27.5 1.0 05 158.6	12 57.5 1.0 05 158.5	13 27.5 1.0 05 158.5	13 57.4 1.0 05 158.5	14 27.4 1.0 05 158.4	14 57.3 1.0 05 158.4	1
2	11 24.5 1.0 05 157.6	11 54.5 1.0 05 157.6	12 24.4 1.0 05 157.5	12 54.4 1.0 05 157.5	13 24.3 1.0 05 157.5	13 54.3 1.0 05 157.5	14 24.3 1.0 05 157.4	14 54.2 1.0 05 157.4	2
3	11 21.3 1.0 06 156.6	11 51.2 1.0 06 156.5	12 21.2 1.0 06 156.5	12 51.1 1.0 06 156.5	13 21.1 1.0 06 156.5	13 51.0 1.0 06 156.4	14 21.0 1.0 06 156.4	14 50.9 1.0 06 156.4	3
4	11 17.9 1.0 06 155.6	11 47.8 1.0 06 155.5	12 17.8 1.0 06 155.5	12 47.7 1.0 06 155.5	13 17.7 1.0 06 155.4	13 47.6 1.0 06 155.4	14 17.6 1.0 06 155.4	14 47.5 1.0 06 155.4	4
25	11 14.3 1.0 06 154.5	11 44.3 1.0 06 154.5	12 14.2 1.0 06 154.5	12 44.2 1.0 06 154.5	13 14.1 1.0 06 154.4	13 44.1 1.0 06 154.4	14 14.0 1.0 06 154.4	14 44.0 1.0 06 154.3	25
6	11 10.7 1.0 06 153.5	11 40.6 1.0 06 153.5	12 10.6 1.0 06 153.5	12 40.5 1.0 06 153.4	13 10.5 1.0 06 153.4	13 40.4 1.0 06 153.4	14 10.3 1.0 06 153.3	14 40.3 1.0 06 153.3	6
7	11 06.9 1.0 07 152.5	11 36.8 1.0 07 152.5	12 06.8 1.0 07 152.4	12 36.7 1.0 07 152.4	13 06.7 1.0 07 152.4	13 36.6 1.0 07 152.3	14 06.5 1.0 07 152.3	14 36.5 1.0 07 152.3	7
8	11 03.0 1.0 07 151.5	11 32.9 1.0 07 151.5	12 02.9 1.0 07 151.4	12 32.8 1.0 07 151.4	13 02.7 1.0 07 151.4	13 32.6 1.0 07 151.3	14 02.6 1.0 07 151.3	14 32.5 1.0 07 151.3	8
9	10 58.9 1.0 07 150.5	11 28.9 1.0 07 150.4	11 58.8 1.0 07 150.4	12 28.7 1.0 07 150.4	12 58.6 1.0 07 150.3	13 28.6 1.0 07 150.3	13 58.5 1.0 07 150.3	14 28.4 1.0 07 150.2	9
30	10 54.8 1.0 07 149.5	11 24.7 1.0 07 149.4	11 54.6 1.0 07 149.4	12 24.5 1.0 07 149.4	12 54.5 1.0 07 149.3	13 24.4 1.0 07 149.3	13 54.3 1.0 07 149.3	14 24.2 1.0 07 149.2	30
1	10 50.5 1.0 07 148.5	11 20.4 1.0 07 148.4	11 50.3 1.0 07 148.4	12 20.2 1.0 07 148.3	12 50.1 1.0 07 148.3	13 20.0 1.0 07 148.3	13 50.0 1.0 07 148.2	14 19.9 1.0 07 148.2	1
2	10 46.0 1.0 08 147.4	11 15.9 1.0 08 147.4	11 45.8 1.0 08 147.4	12 15.8 1.0 08 147.3	12 45.7 1.0 08 147.3	13 15.6 1.0 08 147.3	13 45.5 1.0 08 147.2	14 15.4 1.0 08 147.2	2
3	10 41.5 1.0 08 146.4	11 11.4 1.0 08 146.4	11 41.3 1.0 08 146.4	12 11.2 1.0 08 146.3	12 41.1 1.0 08 146.3	13 11.0 1.0 08 146.2	13 40.9 1.0 08 146.2	14 10.8 1.0 08 146.2	3
4	10 36.8 1.0 08 145.4	11 06.7 1.0 08 145.4	11 36.6 1.0 08 145.3	12 06.5 1.0 08 145.3	12 36.4 1.0 08 145.3	13 06.3 1.0 08 145.2	13 36.2 1.0 08 145.2	14 06.1 1.0 08 145.1	4
35	10 32.0 1.0 08 144.4	11 01.9 1.0 08 144.4	11 31.8 1.0 08 144.3	12 01.7 1.0 08 144.3	12 31.6 1.0 08 144.2	13 01.5 1.0 08 144.2	13 31.4 1.0 08 144.2	14 01.3 1.0 08 144.1	35
6	10 27.1 1.0 09 143.4	10 57.0 1.0 09 143.3	11 26.9 1.0 09 143.3	11 56.8 1.0 09 143.3	12 26.6 1.0 09 143.2	12 56.5 1.0 09 143.2	13 26.4 1.0 09 143.1	13 56.3 1.0 09 143.1	6
7	10 22.0 1.0 09 142.4	10 51.9 1.0 09 142.3	11 21.8 1.0 09 142.3	11 51.7 1.0 09 142.3	12 21.6 1.0 09 142.2	12 51.5 1.0 09 142.2	13 21.4 1.0 09 142.1	13 51.3 1.0 09 142.1	7
8	10 16.9 1.0 09 141.4	10 46.8 1.0 09 141.3	11 16.6 1.0 09 141.3	11 46.5 1.0 09 141.2	12 16.4 1.0 09 141.2	12 46.3 1.0 09 141.2	13 16.2 1.0 09 141.1	13 46.1 1.0 09 141.1	8
9	10 11.6 1.0 09 140.4	10 41.5 1.0 09 140.3	11 11.4 1.0 09 140.3	11 41.2 1.0 09 140.2	12 11.1 1.0 09 140.2	12 41.0 1.0 09 140.1	13 10.9 1.0 09 140.1	13 40.8 1.0 09 140.0	9
40	10 06.2 1.0 09 139.4	10 36.1 1.0 09 139.3	11 06.0 1.0 09 139.3	11 35.8 1.0 09 139.2	12 05.7 1.0 09 139.2	12 35.6 1.0 09 139.1	13 05.5 1.0 09 139.1	13 35.3 1.0 09 139.0	40
1	10 00.7 1.0 09 138.3	10 30.6 1.0 09 138.3	11 00.5 1.0 09 138.3	11 30.3 1.0 09 138.2	12 00.2 1.0 09 138.2	12 30.1 1.0 09 138.1	12 59.9 1.0 09 138.1	13 29.8 1.0 09 138.0	1
2	9 55.1 1.0 10 137.3	10 25.0 1.0 10 137.3	10 54.9 1.0 10 137.2	11 24.7 1.0 10 137.2	11 54.6 1.0 10 137.1	12 24.4 1.0 10 137.1	12 54.3 1.0 10 137.1	13 24.2 1.0 10 137.0	2
3	9 49.4 1.0 10 136.3	10 19.3 1.0 10 136.3	10 49.1 1.0 10 136.2	11 19.0 1.0 10 136.2	11 48.9 1.0 10 136.1	12 18.7 1.0 10 136.1	12 48.6 1.0 10 136.0	13 18.4 1.0 10 136.0	3
4	9 43.6 1.0 10 135.3	10 13.4 1.0 10 135.3	10 43.3 1.0 10 135.2	11 13.1 1.0 10 135.2	11 43.0 1.0 10 135.1	12 12.9 1.0 10 135.1	12 42.7 1.0 10 135.0	13 12.6 1.0 10 135.0	4
45	9 37.7 1.0 10 134.3	10 07.5 99 10 134.3	10 37.4 99 10 134.2	11 07.2 99 10 134.2	11 37.1 99 10 134.1	12 06.9 99 10 134.1	12 36.8 99 10 134.0	13 06.6 99 10 134.0	45
6	9 31.6 99 10 133.3	10 01.5 99 10 133.3	10 31.3 99 10 133.2	11 01.2 99 10 133.2	11 31.0 99 10 133.1	12 00.9 99 10 133.1	12 30.7 99 10 133.0	13 00.5 99 10 132.9	6
7	9 25.5 99 10 132.3	9 55.4 99 10 132.3	10 25.2 99 10 132.2	10 55.0 99 10 132.1	11 24.9 99 10 132.1	11 54.7 99 10 132.0	12 24.6 99 10 132.0	12 54.4 99 10 131.9	7
8	9 19.3 99 11 131.3	9 49.1 99 11 131.3	10 19.0 99 11 131.2	10 48.8 99 11 131.1	11 18.6 99 11 131.1	11 48.5 99 11 131.0	12 18.3 99 11 131.0	12 48.1 99 11 130.9	8
9	9 13.0 99 11 130.3	9 42.8 99 11 130.2	10 12.6 99 11 130.2	10 42.5 99 11 130.1	11 12.3 99 11 130.1	11 42.1 99 11 130.0	12 11.9 99 11 130.0	12 41.8 99 11 129.9	9
50	9 06.6 99 11 129.3	9 36.4 99 11 129.2	10 06.2 99 11 129.2	10 36.0 99 11 129.1	11 05.9 99 11 129.1	11 35.7 99 11 129.0	12 05.5 99 11 129.0	12 35.3 99 11 128.9	50
1	9 00.0 99 11 128.3	9 29.9 99 11 128.2	9 59.7 99 11 128.2	10 29.5 99 11 128.1	10 59.3 99 11 128.1	11 29.1 99 11 128.0	11 59.0 99 11 128.0	12 28.8 99 11 127.9	1
2	8 53.4 99 11 127.3	9 23.3 99 11 127.2	9 53.1 99 11 127.2	10 22.9 99 11 127.1	10 52.7 99 11 127.1	11 22.5 99 11 127.0	11 52.3 99 11 126.9	12 22.1 99 11 126.9	2
3	8 46.8 99 11 126.3	9 16.6 99 11 126.2	9 46.4 99 11 126.2	10 16.2 99 11 126.1	10 46.0 99 11 126.0	11 15.8 99 11 126.0	11 45.6 99 11 125.9	12 15.4 99 11 125.9	3
4	8 40.0 99 11 125.3	9 09.8 99 11 125.2	9 39.6 99 11 125.2	10 09.4 99 11 125.1	10 39.2 99 11 125.0	11 09.0 99 11 125.0	11 38.8 99 11 124.9	12 08.6 99 11 124.9	4
55	8 33.1 99 12 124.3	9 02.9 99 12 124.2	9 32.7 99 12 124.1	10 02.5 99 12 124.1	10 32.3 99 12 124.0	11 02.1 99 12 124.0	11 31.9 99 12 123.9	12 01.7 99 12 123.9	55
6	8 26.2 99 12 123.3	8 56.0 99 12 123.2	9 25.8 99 12 123.2	9 55.6 99 12 123.1	10 25.4 99 12 123.0	10 55.2 99 12 123.0	11 24.9 99 12 122.9	11 54.7 99 12 122.9	6
7	8 19.2 99 12 122.3	8 49.0 99 12 122.2	9 18.7 99 12 122.2	9 48.5 99 12 122.1	10 18.3 99 12 122.0	10 48.1 99 12 122.0	11 17.9 99 12 121.9	11 47.7 99 12 121.9	7
8	8 12.1 99 12 121.3	8 41.9 99 12 121.2	9 11.6 99 12 121.2	9 41.4 99 12 121.1	10 11.2 99 12 121.0	10 41.0 99 12 121.0	11 10.8 99 12 120.9	11 40.6 99 12 120.8	8
9	8 04.9 99 12 120.3	8 34.7 99 12 120.2	9 04.5 99 12 120.1	9 34.2 99 12 120.1	10 04.0 99 12 120.0	10 33.8 99 12 120.0	11 03.6 99 12 119.9	11 33.3 99 12 119.9	9
60	7 57.6 99 12 119.3	8 27.4 99 12 119.2	8 57.2 99 12 119.1	9 27.0 99 12 119.1	9 56.7 99 12 119.0	10 26.5 99 12 119.0	10 56.3 99 12 118.9	11 26.1 99 12 118.8	60
1	7 50.3 99 12 118.3	8 20.1 99 12 118.2	8 49.9 99 12 118.1	9 19.6 99 12 118.1	9 49.4 99 12 118.0	10 19.2 99 12 118.0	10 49.0 99 12 117.9	11 18.7 99 12 117.8	1
2	7 42.9 99 12 117.3	8 12.7 99 12 117.2	8 42.5 99 12 117.1	9 12.2 99 12 117.1	9 42.0 99 12 117.0	10 11.8 99 12 117.0	10 41.5 99 12 116.9	11 11.3 99 12 116.8	2
3	7 35.5 99 13 116.3	8 05.2 99 13 116.2	8 35.0 99 13 116.1	9 04.8 99 13 116.1	9 34.5 99 13 116.0	10 04.3 99 13 116.0	10 34.1 99 13 115.9	11 03.8 99 13 115.8	3
4	7 28.0 99 13 115.3	7 57.7 99 13 115.2	8 27.5 99 13 115.1	8 57.2 99 13 115.1	9 27.0 99 13 115.0	9 56.8 99 13 115.0	10 26.5 99 13 114.9	10 56.3 99 13 114.8	4
65	7 20.4 99 13 114.3	7 50.1 99 13 114.2	8 19.9 99 13 114.1	8 49.6 99 13 114.1	9 19.4 99 13 114.0	9 49.2 99 13 114.0	10 18.9 99 13 113.9	10 48.7 99 13 113.8	65
6	7 12.7 99 13 113.3	7 42.5 99 13 113.2	8 12.2 99 13 113.1	8 42.0 99 13 113.1	9 11.7 99 13 113.0	9 41.5 99 13 113.0	10 11.2 99 13 112.9	10 41.0 99 13 112.8	6
7	7 05.0 99 13 112.3	7 34.8 99 13 112.2	8 04.5 99 13 112.2	8 34.3 99 13 112.1	9 04.0 99 13 112.0	9 33.8 99 13 112.0	10 03.5 99 13 111.9	10 33.3 99 13 111.8	7
8	6 57.3 99 13 111.3	7 27.0 99 13 111.2	7 56.8 99 13 111.2	8 26.5 99 13 111.1	8 56.3 99 13 111.0	9 26.0 99 13 111.0	9 55.7 99 13 110.9	10 25.5 99 13 110.8	8
9	6 49.5 99 13 110.3	7 19.2 99 13 110.2	7 49.0 99 13 110.2	8 18.7 99 13 110.1	8 48.4 99 13 110.0	9 18.2 99 13 110.0	9 47.9 99 13 109.9	10 17.7 99 13 109.8	9
70	6 41.6 99 13 109.3	7 11.4 99 13 109.2	7 41.1 99 13 109.2	8 10.8 99 13 109.1	8 40.6 99 13 109.0	9 10.3 99 13 109.0	9 40.0 99 13 108.9	10 09.8 99 13 108.8	70
1	6 33.7 99 13 108.3	7 03.5 99 13 108.2	7 33.2 99 13 108.2	8 02.9 99 13 108.1	8 32.7 99 13 108.0	9 02.4 99 13 108.0	9 32.1 99 13 107.9	10 01.9 99 13 107.8	1
2	6 25.8 99 13 107.3	6 55.5 99 13 107.2	7 25.2 99 13 107.2	7 55.0 99 13 107.1	8 24.7 99 13 107.0	8 54.4 99 13 107.0	9 24.2 99 13 106.9	9 53.9 99 13 106.8	2
3	6 17.8 99 13 106.3	6 47.5 99 13 106.2	7 17.2 99 13 106.2	7 47.0 99 13 106.1	8 16.7 99 13 106.0	8 46.4 99 13 106.0	9 16.1 99 13 105.9	9 45.9 99 13 105.8	3
4	6 09.7 99 13 105.3	6 39.5 99 13 105.2	7 09.2 99 13 105.2	7 38.9 99 13 105.1	8 08.6 99 13 105.0	8 38.4 99 13 105.0	9 08.1 99 14 104.9	9 37.8 99 14 104.8	4
75	6 01.7 99 14 104.3	6 31.4 99 14 104.3	7 01.1 99 14 104.2	7 30.8 99 14 104.1	8 00.6 99 14 104.0	8 30.3 99 14 104.0	9 00.0 99 14 103.9	9 29.7 99 14 103.8	75
6	5 53.6 99 14 103.3	6 23.3 99 14 103.3	6 53.0 99 14 103.2	7 22.7 99 14 103.1	7 52.4 99 14 103.0	8 22.2 99 14 103.0	8 51.9 99 14 102.9	9 21.6 99 14 102.8	6
7	5 45.4 99 14 102.3	6 15.1 99 14 102.3	6 44.9 99 14 102.2	7 14.6 99 14 102.1	7 44.3 99 14 102.0	8 14.0 99 14 102.0	8 43.7 99 14 101.9	9 13.4 99 14 101.8	7
8	5 37.2 99 14 101.3	6 07.0 99 14 101.3	6 36.7 99 14 101.2	7 06.4 99 14 101.1	7 36.1 99 14 101.0	8 05.8 99 14 101.0	8 35.5 99 14 100.9	9 05.3 99 14 100.8	8
9	5 29.0 99 14 100.3	5 58.8 99 14 100.3	6 28.5 99 14 100.2	6 58.2 99 14 100.1	7 27.9 99 14 100.1	7 57.6 99 14 100.0	8 27.3 99 14 99.9	8 57.0 99 14 99.9	9
80	5 20.8 99 14 99.4	5 50.5 99 14 99.3	6 20.2 99 14 99.2	6 50.0 99 14 99.1	7 19.7 99 14 99.1	7 49.4 99 14 99.0	8 19.1 99 14 98.9	8 48.8 99 14 98.9	80
1	5 12.6 99 14 98.4	5 42.3 99 14 98.3	6 12.0 99 14 98.2	6 41.7 99 14 98.2	7 11.4 99 14 98.1	7 41.1 99 14 98.0	8 10.8 99 14 97.9	8 40.5 99 14 97.9	1
2	5 04.3 99 14 97.4	5 34.0 99 14 97.3	6 03.7 99 14 97.2	6 33.4 99 14 97.2	7 03.1 99 14 97.1	7 32.8 99 14 97.0	8 02.6 99 14 97.0	8 32.3 99 14 96.9	2
3		5 25.7 99 14 96.3	5 55.4 99 14 96.2	6 25.1 99 14 96.2	6 54.8 99 14 96.1	7 24.5 99 14 96.0	7 54.3 99 14 96.0	8 24.0 99 14 95.9	3
4		5 17.4 99 14 95.3	5 47.1 99 14 95.2	6 16.8 99 14 95.2	6 46.5 99 14 95.1	7 16.2 99 14 95.0	7 45.9 99 14 95.0	8 15.6 99 14 94.9	4
85		5 09.1 99 14 94.3	5 38.8 99 14 94.3	6 08.5 99 14 94.2	6 38.2 99 14 94.1	7 07.9 99 14 94.0	7 37.6 99 14 94.0	8 07.3 99 14 93.9	85
6		5 00.8 99 14 93.3	5 30.5 99 14 93.3	6 00.2 99 14 93.2	6 29.9 99 14 93.1	6 59.6 99 14 93.1	7 29.3 99 14 93.0	7 59.0 99 14 92.9	6
7			5 22.1 99 14 92.3	5 51.8 99 14 92.2	6 21.5 99 14 92.1	6 51.2 99 14 92.1	7 20.9 99 14 92.0	7 50.6 99 14 91.9	7
8			5 13.8 99 14 91.3	5 43.5 99 14 91.2	6 13.2 99 14 91.1	6 42.9 99 14 91.1	7 12.6 99 14 91.0	7 42.3 99 14 90.9	8
9			5 05.4 99 14 90.3	5 35.1 99 14 90.2	6 04.8 99 14 90.1	6 34.5 99 14 90.1	7 04.2 99 14 90.0	7 33.9 99 14 89.9	9
90				5 26.8 99 14 89.2	5 56.5 99 14 89.2	6 26.2 99 14 89.1	6 55.9 99 14 89.0	7 25.6 99 14 89.0	90

H.A.	4° 00' Alt.	Az.	4° 30' Alt.	Az.	5° 00' Alt.	Az.	5° 30' Alt.	Az.	6° 00' Alt.	Az.	6° 30' Alt.	Az.	7° 00' Alt.	Az.	7° 30' Alt.	Az.	H.A.
°	° ' Δd Δt	°	° ' Δd Δt	°	° ' Δd Δt	°	° ' Δd Δt	°	° ' Δd Δt	°	° ' Δd Δt	°	° ' Δd Δt	°	° ' Δd Δt	°	°
91							5 18.4 99 14	88.2	5 48.1 99 14	88.2	6 17.8 99 14	88.1	6 47.5 99 14	88.0	7 17.2 99 14	88.0	91
2							5 10.1 99 14	87.3	5 39.8 99 14	87.2	6 09.5 99 14	87.1	6 39.2 99 14	87.0	7 08.9 99 14	87.0	2
3							5 01.8 99 14	86.3	5 31.5 99 14	86.2	6 01.2 99 14	86.1	6 30.9 99 14	86.1	7 00.6 99 14	86.0	3
4									5 23.1 99 14	85.2	5 52.8 99 14	85.1	6 22.5 99 14	85.1	6 52.2 99 14	85.0	4
95									5 14.8 99 14	84.2	5 44.5 99 14	84.1	6 14.2 99 14	84.1	6 43.9 99 14	84.0	95
6									5 06.5 99 14	83.2	5 36.2 99 14	83.2	6 05.9 99 14	83.1	6 35.6 99 14	83.0	6
7											5 27.9 99 14	82.2	5 57.7 99 14	82.1	6 27.4 99 14	82.0	7
8											5 19.7 99 14	81.2	5 49.4 99 14	81.1	6 19.1 99 14	81.0	8
9											5 11.4 99 14	80.2	5 41.2 99 14	80.1	6 10.9 99 14	80.1	9
100											5 03.2 99 14	79.2	5 32.9 99 14	79.1	6 02.7 99 14	79.1	100
1													5 24.8 99 14	78.1	5 54.5 99 14	78.1	1
2													5 16.6 99 14	77.2	5 46.3 99 14	77.1	2
3													5 08.5 99 13	76.2	5 38.2 99 13	76.1	3
4													5 00.4 99 13	75.2	5 30.1 99 13	75.1	4
105															5 22.0 99 13	74.1	105
6															5 14.0 99 13	73.1	6
7															5 06.1 99 13	72.2	7

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Each declination cell lists: Alt. | Δd Δt | Az.

H.A.	8° 00'	8° 30'	9° 00'	9° 30'	10° 00'	10° 30'	11° 00'	11° 30'	H.A.
00	16 00.0 1.0 00 180.0	16 30.0 1.0 00 180.0	17 00.0 1.0 00 180.0	17 30.0 1.0 00 180.0	18 00.0 1.0 00 180.0	18 30.0 1.0 00 180.0	19 00.0 1.0 00 180.0	19 30.0 1.0 00 180.0	00
1	15 59.9 1.0 00 179.0	16 29.9 1.0 00 179.0	16 59.9 1.0 00 179.0	17 29.9 1.0 00 179.0	17 59.9 1.0 00 179.0	18 29.9 1.0 00 179.0	18 59.9 1.0 00 179.0	19 29.9 1.0 00 179.0	1
2	15 59.7 1.0 01 177.9	16 29.7 1.0 01 177.9	16 59.7 1.0 01 177.9	17 29.7 1.0 01 177.9	17 59.7 1.0 01 177.9	18 29.7 1.0 01 177.9	18 59.7 1.0 01 177.9	19 29.7 1.0 01 177.9	2
3	15 59.3 1.0 01 176.9	16 29.3 1.0 01 176.9	16 59.3 1.0 01 176.9	17 29.3 1.0 01 176.9	17 59.3 1.0 01 176.9	18 29.3 1.0 01 176.9	18 59.3 1.0 01 176.9	19 29.3 1.0 01 176.9	3
4	15 58.8 1.0 01 175.9	16 28.8 1.0 01 175.9	16 58.8 1.0 01 175.9	17 28.8 1.0 01 175.9	17 58.8 1.0 01 175.9	18 28.8 1.0 01 175.9	18 58.8 1.0 01 175.8	19 28.8 1.0 01 175.8	4
05	15 58.1 1.0 01 174.8	16 28.1 1.0 01 174.8	16 58.1 1.0 01 174.8	17 28.1 1.0 01 174.8	17 58.1 1.0 01 174.8	18 28.1 1.0 01 174.8	18 58.1 1.0 01 174.8	19 28.1 1.0 01 174.8	05
6	15 57.3 1.0 02 173.8	16 27.3 1.0 02 173.8	16 57.3 1.0 02 173.8	17 27.3 1.0 02 173.8	17 57.3 1.0 02 173.8	18 27.3 1.0 02 173.8	18 57.3 1.0 02 173.8	19 27.3 1.0 02 173.8	6
7	15 56.3 1.0 02 172.8	16 26.3 1.0 02 172.8	16 56.3 1.0 02 172.8	17 26.3 1.0 02 172.8	17 56.3 1.0 02 172.8	18 26.3 1.0 02 172.7	18 56.3 1.0 02 172.7	19 26.3 1.0 02 172.7	7
8	15 55.2 1.0 02 171.8	16 25.2 1.0 02 171.7	16 55.2 1.0 02 171.7	17 25.2 1.0 02 171.7	17 55.2 1.0 02 171.7	18 25.2 1.0 02 171.7	18 55.2 1.0 02 171.7	19 25.2 1.0 02 171.7	8
9	15 53.9 1.0 02 170.7	16 23.9 1.0 02 170.7	16 53.9 1.0 02 170.7	17 23.9 1.0 02 170.7	17 53.9 1.0 02 170.7	18 23.9 1.0 02 170.7	18 53.9 1.0 02 170.7	19 23.9 1.0 02 170.6	9
10	15 52.5 1.0 03 169.7	16 22.5 1.0 03 169.7	16 52.5 1.0 03 169.7	17 22.5 1.0 03 169.7	17 52.5 1.0 03 169.6	18 22.5 1.0 03 169.6	18 52.5 1.0 03 169.6	19 22.4 1.0 03 169.6	10
1	15 50.9 1.0 03 168.7	16 20.9 1.0 03 168.7	16 50.9 1.0 03 168.6	17 20.9 1.0 03 168.6	17 50.9 1.0 03 168.6	18 20.9 1.0 03 168.6	18 50.9 1.0 03 168.6	19 20.9 1.0 03 168.6	1
2	15 49.2 1.0 03 167.6	16 19.2 1.0 03 167.6	16 49.2 1.0 03 167.6	17 19.2 1.0 03 167.6	17 49.2 1.0 03 167.6	18 19.2 1.0 03 167.6	18 49.2 1.0 03 167.5	19 19.1 1.0 03 167.5	2
3	15 47.4 1.0 04 166.6	16 17.4 1.0 04 166.6	16 47.3 1.0 04 166.6	17 17.3 1.0 04 166.6	17 47.3 1.0 04 166.5	18 17.3 1.0 04 166.5	18 47.3 1.0 04 166.5	19 17.3 1.0 04 166.5	3
4	15 45.4 1.0 04 165.6	16 15.3 1.0 04 165.6	16 45.3 1.0 04 165.6	17 15.3 1.0 04 165.5	17 45.3 1.0 04 165.5	18 15.3 1.0 04 165.5	18 45.3 1.0 04 165.5	19 15.2 1.0 04 165.5	4
15	15 43.2 1.0 04 164.6	16 13.2 1.0 04 164.5	16 43.2 1.0 04 164.5	17 13.2 1.0 04 164.5	17 43.1 1.0 04 164.5	18 13.1 1.0 04 164.5	18 43.1 1.0 04 164.4	19 13.1 1.0 04 164.4	15
6	15 40.9 1.0 04 163.5	16 10.9 1.0 04 163.5	16 40.9 1.0 04 163.5	17 10.9 1.0 04 163.5	17 40.8 1.0 04 163.4	18 10.8 1.0 04 163.4	18 40.8 1.0 04 163.4	19 10.8 1.0 04 163.4	6
7	15 38.5 1.0 05 162.5	16 08.5 1.0 05 162.5	16 38.4 1.0 04 162.4	17 08.4 1.0 04 162.4	17 38.4 1.0 04 162.4	18 08.3 1.0 04 162.4	18 38.3 1.0 04 162.4	19 08.3 1.0 04 162.3	7
8	15 35.9 1.0 05 161.5	16 05.9 1.0 05 161.5	16 35.8 1.0 05 161.4	17 05.8 1.0 05 161.4	17 35.8 1.0 05 161.4	18 05.7 1.0 05 161.3	18 35.7 1.0 05 161.3	19 05.7 1.0 05 161.3	8
9	15 33.2 1.0 05 160.5	16 03.1 1.0 05 160.4	16 33.1 1.0 05 160.4	17 03.1 1.0 05 160.4	17 33.0 1.0 05 160.4	18 03.0 1.0 05 160.3	18 33.0 1.0 05 160.3	19 02.9 1.0 05 160.3	9
20	15 30.3 1.0 05 159.4	16 00.3 1.0 05 159.4	16 30.2 1.0 05 159.4	17 00.2 1.0 05 159.3	17 30.2 1.0 05 159.3	18 00.1 1.0 05 159.3	18 30.1 1.0 05 159.3	19 00.1 1.0 05 159.2	20
1	15 27.3 1.0 06 158.4	15 57.3 1.0 06 158.4	16 27.2 1.0 06 158.3	16 57.2 1.0 06 158.3	17 27.1 1.0 06 158.3	17 57.1 1.0 06 158.3	18 27.1 1.0 06 158.2	18 57.0 1.0 06 158.2	1
2	15 24.2 1.0 06 157.4	15 54.1 1.0 06 157.3	16 24.1 1.0 06 157.3	16 54.0 1.0 06 157.3	17 24.0 1.0 06 157.3	17 53.9 1.0 06 157.2	18 23.9 1.0 06 157.2	18 53.9 1.0 06 157.2	2
3	15 20.9 1.0 06 156.3	15 50.8 1.0 06 156.3	16 20.8 1.0 06 156.3	16 50.7 1.0 06 156.3	17 20.7 1.0 06 156.2	17 50.6 1.0 06 156.2	18 20.6 1.0 06 156.2	18 50.5 1.0 06 156.1	3
4	15 17.5 1.0 06 155.3	15 47.4 1.0 06 155.3	16 17.4 1.0 06 155.3	16 47.3 1.0 06 155.2	17 17.3 1.0 06 155.2	17 47.2 1.0 06 155.2	18 17.1 1.0 06 155.1	18 47.1 1.0 06 155.1	4
25	15 13.9 1.0 06 154.3	15 43.9 1.0 06 154.3	16 13.8 1.0 06 154.2	16 43.7 1.0 06 154.2	17 13.7 1.0 06 154.2	17 43.6 1.0 06 154.1	18 13.6 1.0 06 154.1	18 43.5 1.0 06 154.1	25
6	15 10.2 1.0 06 153.3	15 40.2 1.0 06 153.2	16 10.1 1.0 06 153.2	16 40.0 1.0 06 153.2	17 10.0 1.0 06 153.1	17 39.9 1.0 06 153.1	18 09.9 1.0 06 153.1	18 39.8 1.0 06 153.0	6
7	15 06.4 1.0 07 152.2	15 36.3 1.0 07 152.2	16 06.3 1.0 07 152.2	16 36.2 1.0 07 152.1	17 06.1 1.0 07 152.1	17 36.1 1.0 07 152.1	18 06.0 1.0 07 152.0	18 35.9 1.0 07 152.0	7
8	15 02.4 1.0 07 151.2	15 32.4 1.0 07 151.2	16 02.3 1.0 07 151.1	16 32.2 1.0 07 151.1	17 02.2 1.0 07 151.1	17 32.1 1.0 07 151.0	18 02.0 1.0 07 151.0	18 32.0 1.0 07 151.0	8
9	14 58.4 1.0 07 150.2	15 28.3 1.0 07 150.2	15 58.2 1.0 07 150.1	16 28.1 1.0 07 150.1	16 58.1 1.0 07 150.1	17 28.0 1.0 07 150.0	17 57.9 1.0 07 150.0	18 27.8 1.0 07 149.9	9
30	14 54.1 1.0 07 149.2	15 24.1 1.0 07 149.1	15 54.0 1.0 07 149.1	16 23.9 1.0 07 149.1	16 53.8 1.0 07 149.0	17 23.7 1.0 07 149.0	17 53.7 1.0 07 149.0	18 23.6 1.0 07 148.9	30
1	14 49.8 1.0 08 148.2	15 19.7 1.0 07 148.1	15 49.6 1.0 07 148.1	16 19.6 1.0 07 148.0	16 49.5 1.0 07 148.0	17 19.4 1.0 08 148.0	17 49.3 1.0 08 147.9	18 19.2 1.0 08 147.9	1
2	14 45.3 1.0 08 147.1	15 15.2 1.0 08 147.1	15 45.2 1.0 08 147.1	16 15.1 1.0 08 147.0	16 45.0 1.0 08 147.0	17 14.9 1.0 08 146.9	17 44.8 1.0 08 146.9	18 14.7 1.0 08 146.9	2
3	14 40.7 1.0 08 146.1	15 10.6 1.0 08 146.1	15 40.6 1.0 08 146.0	16 10.5 1.0 08 146.0	16 40.4 1.0 08 146.0	17 10.3 1.0 08 145.9	17 40.2 1.0 08 145.9	18 10.1 1.0 08 145.8	3
4	14 36.0 1.0 08 145.1	15 05.9 1.0 08 145.1	15 35.8 1.0 08 145.0	16 05.7 1.0 08 145.0	16 35.6 1.0 08 144.9	17 05.5 1.0 08 144.9	17 35.4 1.0 08 144.8	18 05.3 1.0 08 144.8	4
35	14 31.2 1.0 08 144.1	15 01.1 1.0 08 144.0	15 31.0 1.0 08 144.0	16 00.9 1.0 08 143.9	16 30.8 1.0 08 143.9	17 00.7 1.0 08 143.9	17 30.6 1.0 08 143.8	18 00.5 1.0 08 143.8	35
6	14 26.2 1.0 08 143.1	14 56.1 1.0 08 143.0	15 26.0 1.0 08 142.9	15 55.9 1.0 08 142.9	16 25.8 1.0 08 142.9	16 55.7 1.0 08 142.8	17 25.6 1.0 09 142.8	17 55.5 1.0 09 142.7	6
7	14 21.1 1.0 09 142.0	14 51.0 1.0 09 142.0	15 20.9 1.0 09 141.9	15 50.8 1.0 09 141.9	16 20.7 1.0 09 141.9	16 50.6 1.0 09 141.8	17 20.5 1.0 09 141.8	17 50.3 1.0 09 141.7	7
8	14 16.0 1.0 09 141.0	14 45.8 1.0 09 141.0	15 15.7 1.0 09 140.9	15 45.6 1.0 09 140.9	16 15.5 1.0 09 140.8	16 45.4 1.0 09 140.8	17 15.2 1.0 09 140.7	17 45.1 1.0 09 140.7	8
9	14 10.6 1.0 09 140.0	14 40.5 1.0 09 140.0	15 10.4 1.0 09 139.9	15 40.3 1.0 09 139.9	16 10.1 1.0 09 139.8	16 40.0 1.0 09 139.8	17 09.9 1.0 09 139.7	17 39.8 1.0 09 139.7	9
40	14 05.2 1.0 09 139.0	14 35.1 1.0 09 138.9	15 05.0 1.0 09 138.9	15 34.8 1.0 09 138.8	16 04.7 1.0 09 138.8	16 34.6 1.0 09 138.7	17 04.4 1.0 09 138.7	17 34.3 1.0 09 138.6	40
1	13 59.7 1.0 09 138.0	14 29.5 1.0 09 137.9	14 59.4 1.0 09 137.9	15 29.3 1.0 09 137.8	15 59.1 1.0 09 137.8	16 29.0 1.0 09 137.7	16 58.9 1.0 09 137.7	17 28.7 1.0 09 137.6	1
2	13 54.0 1.0 10 137.0	14 23.9 1.0 10 136.9	14 53.8 1.0 10 136.9	15 23.6 1.0 10 136.8	15 53.5 1.0 10 136.8	16 23.3 1.0 10 136.7	16 53.2 1.0 10 136.7	17 23.0 1.0 10 136.6	2
3	13 48.3 1.0 10 135.9	14 18.1 1.0 10 135.9	14 48.0 1.0 10 135.8	15 17.8 1.0 10 135.8	15 47.7 1.0 10 135.7	16 17.6 1.0 10 135.7	16 47.4 1.0 10 135.6	17 17.3 1.0 10 135.6	3
4	13 42.4 1.0 10 134.9	14 12.3 1.0 10 134.9	14 42.1 99 10 134.8	15 12.0 99 10 134.8	15 41.8 99 10 134.7	16 11.7 99 10 134.7	16 41.5 99 10 134.6	17 11.4 99 10 134.6	4
45	13 36.5 99 10 133.9	14 06.3 99 10 133.9	14 36.1 99 10 133.8	15 06.0 99 10 133.8	15 35.8 99 10 133.7	16 05.7 99 10 133.6	16 35.5 99 10 133.6	17 05.4 99 10 133.5	45
6	13 30.4 99 10 132.9	14 00.2 99 10 132.8	14 30.1 99 10 132.8	14 59.9 99 10 132.7	15 29.7 99 10 132.7	15 59.6 99 10 132.6	16 29.4 99 10 132.6	16 59.3 99 10 132.5	6
7	13 24.2 99 10 131.9	13 54.1 99 10 131.8	14 23.9 99 10 131.8	14 53.7 99 10 131.7	15 23.6 99 10 131.7	15 53.4 99 10 131.6	16 23.2 99 10 131.6	16 53.1 99 10 131.5	7
8	13 18.0 99 11 130.9	13 47.8 99 11 130.8	14 17.6 99 11 130.8	14 47.4 99 11 130.7	15 17.3 99 11 130.7	15 47.1 99 11 130.6	16 16.9 99 11 130.5	16 46.7 99 11 130.5	8
9	13 11.6 99 11 129.9	13 41.4 99 11 129.8	14 11.2 99 11 129.7	14 41.1 99 11 129.7	15 10.9 99 11 129.6	15 40.7 99 11 129.6	16 10.5 99 11 129.5	16 40.3 99 11 129.5	9
50	13 05.1 99 11 128.8	13 35.0 99 11 128.8	14 04.8 99 11 128.7	14 34.6 99 11 128.7	15 04.4 99 11 128.6	15 34.2 99 11 128.6	16 04.0 99 11 128.5	16 33.9 99 11 128.4	50
1	12 58.6 99 11 127.8	13 28.4 99 11 127.8	13 58.2 99 11 127.7	14 28.0 99 11 127.7	14 57.8 99 11 127.6	15 27.7 99 11 127.5	15 57.5 99 11 127.5	16 27.3 99 11 127.4	1
2	12 51.9 99 11 126.8	13 21.8 99 11 126.8	13 51.6 99 11 126.7	14 21.4 99 11 126.7	14 51.2 99 11 126.6	15 21.0 99 11 126.5	15 50.8 99 11 126.5	16 20.6 99 11 126.4	2
3	12 45.2 99 11 125.8	13 15.0 99 11 125.8	13 44.8 99 11 125.7	14 14.6 99 11 125.6	14 44.4 99 11 125.6	15 14.2 99 11 125.5	15 44.0 99 11 125.5	16 13.8 99 11 125.4	3
4	12 38.4 99 11 124.8	13 08.2 99 12 124.8	13 38.0 99 12 124.7	14 07.8 99 12 124.6	14 37.6 99 12 124.5	15 07.4 99 12 124.5	15 37.2 99 12 124.5	16 07.0 99 12 124.4	4
55	12 31.5 99 12 123.8	13 01.3 99 12 123.7	13 31.1 99 12 123.7	14 00.9 99 12 123.6	14 30.7 99 12 123.6	15 00.5 99 12 123.5	15 30.3 99 12 123.4	16 00.1 99 12 123.4	55
6	12 24.5 99 12 122.8	12 54.3 99 12 122.7	13 24.1 99 12 122.7	13 53.9 99 12 122.6	14 23.7 99 12 122.6	14 53.5 99 12 122.5	15 23.3 99 12 122.4	15 53.0 99 12 122.4	6
7	12 17.5 99 12 121.8	12 47.3 99 12 121.7	13 17.0 99 12 121.7	13 46.8 99 12 121.6	14 16.6 99 12 121.5	14 46.4 99 12 121.5	15 16.2 99 12 121.4	15 45.9 99 12 121.4	7
8	12 10.3 99 12 120.8	12 40.1 99 12 120.7	13 09.9 99 12 120.7	13 39.7 99 12 120.6	14 09.4 99 12 120.5	14 39.2 99 12 120.5	15 09.0 99 12 120.4	15 38.8 99 12 120.3	8
9	12 03.1 99 12 119.8	12 32.9 99 12 119.7	13 02.7 99 12 119.7	13 32.4 99 12 119.6	14 02.2 99 12 119.5	14 32.0 99 12 119.5	15 01.8 99 12 119.4	15 31.5 99 12 119.3	9
60	11 55.8 99 12 118.8	12 25.6 99 12 118.7	12 55.4 99 12 118.6	13 25.2 99 12 118.6	13 54.9 99 12 118.5	14 24.7 99 12 118.5	14 54.5 99 12 118.4	15 24.2 99 13 118.3	60
1	11 48.5 99 13 117.8	12 18.3 99 13 117.7	12 48.0 99 13 117.6	13 17.8 99 13 117.6	13 47.5 99 13 117.5	14 17.3 99 13 117.4	14 47.1 99 13 117.4	15 16.8 99 13 117.3	1
2	11 41.1 99 13 116.8	12 10.8 99 13 116.7	12 40.6 99 13 116.6	13 10.3 99 13 116.6	13 40.1 99 13 116.5	14 09.9 99 13 116.4	14 39.6 99 13 116.4	15 09.4 99 13 116.3	2
3	11 33.6 99 13 115.8	12 03.3 99 13 115.7	12 33.1 99 13 115.6	13 02.8 99 13 115.6	13 32.6 99 13 115.5	14 02.4 99 13 115.4	14 32.1 99 13 115.4	15 01.9 99 13 115.3	3
4	11 25.8 99 13 114.8	11 55.8 99 13 114.7	12 25.5 99 13 114.6	12 55.3 99 13 114.6	13 25.0 99 13 114.5	13 54.8 99 13 114.4	14 24.5 99 13 114.4	14 54.3 99 13 114.3	4
65	11 18.4 99 13 113.8	11 48.2 99 13 113.7	12 17.9 99 13 113.6	12 47.7 99 13 113.6	13 17.4 99 13 113.5	13 47.2 99 13 113.4	14 16.9 99 13 113.4	14 46.6 99 13 113.3	65
6	11 10.7 99 13 112.8	11 40.5 99 13 112.7	12 10.2 99 13 112.6	12 40.0 99 13 112.6	13 09.7 99 13 112.5	13 39.5 99 13 112.4	14 09.2 99 13 112.4	14 38.9 99 13 112.3	6
7	11 03.0 99 13 111.8	11 32.8 99 13 111.7	12 02.5 99 13 111.6	12 32.2 99 13 111.6	13 02.0 99 15 111.5	13 31.7 99 13 111.4	14 01.5 99 13 111.4	14 31.2 99 13 111.3	7
8	10 55.2 99 13 110.8	11 25.0 99 13 110.7	11 54.7 99 13 110.6	12 24.4 99 13 110.6	12 54.2 99 13 110.5	13 23.9 99 13 110.4	13 53.7 99 13 110.4	14 23.4 99 13 110.3	8
9	10 47.4 99 13 109.8	11 17.1 99 13 109.7	11 46.9 99 13 109.6	12 16.6 99 13 109.6	12 46.3 99 13 109.5	13 16.1 99 13 109.4	13 45.8 99 13 109.3	14 15.5 99 13 109.3	9
70	10 39.5 99 13 108.8	11 09.2 99 13 108.7	11 39.0 99 13 108.6	12 08.7 99 13 108.6	12 38.4 99 13 108.5	13 08.2 99 13 108.4	13 37.9 99 13 108.3	14 07.6 99 13 108.3	70
1	10 31.6 99 13 107.8	11 01.3 99 13 107.7	11 31.0 99 13 107.6	12 00.8 99 13 107.6	12 30.5 99 13 107.5	13 00.2 99 13 107.4	13 29.9 99 13 107.3	13 59.7 99 13 107.3	1
2	10 23.6 99 13 106.8	10 53.3 99 13 106.7	11 23.1 99 13 106.6	11 52.8 99 13 106.6	12 22.5 99 13 106.5	12 52.2 99 13 106.4	13 22.0 99 13 106.3	13 51.7 99 13 106.3	2
3	10 15.6 99 13 105.8	10 45.3 99 13 105.7	11 15.0 99 13 105.6	11 44.8 99 13 105.6	12 14.5 99 13 105.5	12 44.2 99 13 105.4	13 13.9 99 13 105.3	13 43.6 99 13 105.3	3
4	10 07.5 99 14 104.8	10 37.3 99 14 104.7	11 07.0 99 14 104.6	11 36.7 99 14 104.6	12 06.4 99 14 104.5	12 36.1 99 14 104.4	13 05.8 99 14 104.4	13 35.6 99 14 104.3	4
75	9 59.4 99 14 103.8	10 29.2 99 14 103.7	10 58.9 99 14 103.6	11 28.6 99 14 103.6	11 58.3 99 14 103.5	12 28.0 99 14 103.4	12 57.7 99 14 103.4	13 27.5 99 14 103.3	75
6	9 51.3 99 14 102.8	10 21.0 99 14 102.7	10 50.7 99 14 102.6	11 20.5 99 14 102.6	11 50.2 99 14 102.5	12 19.9 99 14 102.4	12 49.6 99 14 102.4	13 19.3 99 14 102.3	6
7	9 43.2 99 14 101.8	10 12.9 99 14 101.7	10 42.6 99 14 101.6	11 12.3 99 14 101.6	11 42.0 99 14 101.5	12 11.7 99 14 101.4	12 41.4 99 14 101.4	13 11.1 99 14 101.3	7
8	9 35.0 99 14 100.8	10 04.7 99 14 100.7	10 34.4 99 14 100.6	11 04.0 99 14 100.6	11 33.8 99 14 100.5	12 03.4 99 14 100.4	12 33.2 99 14 100.3	13 02.9 99 14 100.3	8
9	9 26.8 99 14 99.8	9 56.5 99 14 99.7	10 26.2 99 14 99.7	10 55.9 99 14 99.6	11 25.6 99 14 99.5	11 55.3 99 14 99.4	12 25.0 99 14 99.4	12 54.7 99 14 99.3	9
80	9 18.5 99 14 98.8	9 48.2 99 14 98.7	10 17.9 99 14 98.7	10 47.6 99 14 98.6	11 17.3 99 14 98.5	11 47.0 99 14 98.4	12 16.8 99 14 98.4	12 46.5 99 14 98.3	80
1	9 10.2 99 14 97.8	9 40.0 99 14 97.7	10 09.7 99 14 97.7	10 39.4 99 14 97.6	11 09.1 99 14 97.5	11 38.8 99 14 97.4	12 08.5 99 14 97.4	12 38.2 99 14 97.3	1
2	9 02.0 99 14 96.8	9 31.7 99 14 96.7	10 01.4 99 14 96.7	10 31.1 99 14 96.6	11 00.8 99 14 96.5	11 30.5 99 14 96.5	12 00.2 99 14 96.4	12 29.9 99 14 96.3	2
3	8 53.7 99 14 95.8	9 23.4 99 14 95.7	9 53.1 99 14 95.7	10 22.8 99 14 95.6	10 52.5 99 14 95.5	11 22.2 99 14 95.5	11 51.9 99 14 95.4	12 21.6 99 14 95.3	3
4	8 45.4 99 14 94.8	9 15.1 99 14 94.8	9 44.8 99 14 94.6	10 14.5 99 14 94.6	10 44.2 99 14 94.5	11 13.9 99 14 94.4	11 43.6 99 14 94.4	12 13.3 99 14 94.3	4
85	8 37.0 99 14 93.8	9 06.7 99 14 93.8	9 36.4 99 14 93.7	10 06.1 99 14 93.6	10 35.8 99 14 93.5	11 05.5 99 14 93.5	11 35.2 99 14 93.4	12 04.9 99 14 93.3	85
6	8 28.7 99 14 92.8	8 58.4 99 14 92.8	9 28.1 99 14 92.7	9 57.8 99 14 92.6	10 27.5 99 14 92.6	10 57.2 99 14 92.5	11 26.9 99 14 92.4	11 56.6 99 14 92.3	6
7	8 20.3 99 14 91.9	8 50.0 99 14 91.8	9 19.7 99 14 91.7	9 49.4 99 14 91.6	10 19.1 99 14 91.6	10 48.8 99 14 91.5	11 18.5 99 14 91.4	11 48.2 99 14 91.3	7
8	8 12.0 99 14 90.9	8 41.7 99 14 90.8	9 11.4 99 14 90.7	9 41.1 99 14 90.6	10 10.8 99 14 90.6	10 40.5 99 14 90.5	11 10.2 99 14 90.4	11 39.9 99 14 90.4	8
9	8 03.6 99 14 89.9	8 33.3 99 14 89.8	9 03.1 99 14 89.7	9 32.8 99 14 89.7	10 02.5 99 14 89.6	10 32.1 99 14 89.5	11 01.8 99 14 89.4	11 31.5 99 14 89.4	9
90	7 55.3 99 14 88.9	8 25.0 99 14 88.8	8 54.7 99 14 88.7	9 24.4 99 14 88.7	9 54.1 99 14 88.6	10 23.8 99 14 88.5	10 53.5 99 14 88.5	11 23.2 99 14 88.4	90

H.A.	8° 00′ (Alt. / Δd Δt / Az.)	8° 30′	9° 00′	9° 30′	10° 00′	10° 30′	11° 00′	11° 30′	H.A.
91	7 47.0 99 14 87.9	8 16.7 99 14 87.8	8 46.4 99 14 87.7	9 16.1 99 14 87.7	9 45.8 99 14 87.6	10 15.5 99 14 87.5	10 45.2 99 14 87.5	11 14.9 99 14 87.4	91
2	7 38.6 99 14 86.9	8 08.3 99 14 86.8	8 38.0 99 14 86.8	9 07.7 99 14 86.7	9 37.4 99 14 86.6	10 07.1 99 14 86.5	10 36.8 99 14 86.5	11 06.5 99 14 86.4	2
3	7 30.3 99 14 85.9	8 00.0 99 14 85.8	8 29.7 99 14 85.8	8 59.4 99 14 85.7	9 29.1 99 14 85.6	9 58.8 99 14 85.6	10 28.5 99 14 85.5	10 58.2 99 14 85.4	3
4	7 22.0 99 14 84.9	7 51.7 99 14 84.9	8 21.4 99 14 84.8	8 51.1 99 14 84.7	9 20.8 99 14 84.6	9 50.5 99 14 84.6	10 20.2 99 14 84.5	10 49.9 99 14 84.4	4
95	7 13.6 99 14 83.9	7 43.3 99 14 83.9	8 13.1 99 14 83.8	8 42.8 99 14 83.7	9 12.5 99 14 83.7	9 42.2 99 14 83.6	10 11.9 99 14 83.5	10 41.6 99 14 83.4	95
6	7 05.3 99 14 82.9	7 35.1 99 14 82.9	8 04.8 99 14 82.8	8 34.5 99 14 82.7	9 04.2 99 14 82.7	9 33.9 99 14 82.6	10 03.6 99 14 82.5	10 33.3 99 14 82.4	6
7	6 57.1 99 14 82.0	7 26.8 99 14 81.9	7 56.5 99 14 81.8	8 26.2 99 14 81.7	8 55.9 99 14 81.7	9 25.6 99 14 81.6	9 55.3 99 14 81.5	10 25.0 99 14 81.5	7
8	6 48.8 99 14 81.0	7 18.5 99 14 80.9	7 48.2 99 14 80.8	8 17.9 99 14 80.8	8 47.6 99 14 80.7	9 17.4 99 14 80.6	9 47.1 99 14 80.5	10 16.8 99 14 80.5	8
9	6 40.6 99 14 80.0	7 10.3 99 14 79.9	7 40.0 99 14 79.9	8 09.7 99 14 79.8	8 39.4 99 14 79.7	9 09.1 99 14 79.6	9 38.8 99 14 79.6	10 08.5 99 14 79.5	9
100	6 32.4 99 14 79.0	7 02.1 99 14 78.9	7 31.8 99 14 78.9	8 01.5 99 14 78.8	8 31.2 99 14 78.7	9 00.9 99 14 78.6	9 30.6 99 14 78.6	10 00.3 99 14 78.5	100
1	6 24.2 99 14 78.0	6 53.9 99 14 77.9	7 23.6 99 14 77.9	7 53.3 99 14 77.8	8 23.0 99 14 77.7	8 52.7 99 14 77.7	9 22.5 99 14 77.6	9 52.2 99 14 77.5	1
2	6 16.0 99 14 77.0	6 45.7 99 14 77.0	7 15.5 99 14 76.9	7 45.2 99 14 76.8	8 14.9 99 14 76.7	8 44.6 99 14 76.7	9 14.3 99 14 76.6	9 44.0 99 14 76.5	2
3	6 07.9 99 13 76.0	6 37.6 99 13 76.0	7 07.3 99 13 75.9	7 37.1 99 13 75.8	8 06.8 99 13 75.8	8 36.5 99 13 75.7	9 06.2 99 13 75.6	9 35.9 99 13 75.6	3
4	5 59.8 99 14 75.0	6 29.5 99 13 75.0	6 59.3 99 13 74.9	7 29.0 99 13 74.8	7 58.7 99 13 74.8	8 28.4 99 13 74.7	8 58.1 99 13 74.6	9 27.9 99 13 74.6	4
105	5 51.8 99 13 74.1	6 21.5 99 13 74.0	6 51.2 99 13 73.9	7 20.9 99 13 73.9	7 50.7 99 13 73.8	8 20.4 99 13 73.7	8 50.1 99 13 73.7	9 19.8 99 13 73.6	105
6	5 43.8 99 13 73.1	6 13.5 99 13 73.0	6 43.2 99 13 72.9	7 12.9 99 13 72.9	7 42.7 99 13 72.8	8 12.4 99 13 72.7	8 42.1 99 13 72.7	9 11.8 99 13 72.6	6
7	5 35.8 99 13 72.1	6 05.5 99 13 72.0	6 35.3 99 13 72.0	7 05.0 99 13 71.9	7 34.7 99 13 71.8	8 04.4 99 13 71.8	8 34.2 99 13 71.7	9 03.9 99 13 71.6	7
8	5 27.9 99 13 71.1	5 57.6 99 13 71.0	6 27.3 99 13 71.0	6 57.1 99 13 70.9	7 26.8 99 13 70.8	7 56.5 99 13 70.8	8 26.3 99 13 70.7	8 56.0 99 13 70.6	8
9	5 20.0 99 13 70.1	5 49.7 99 13 70.1	6 19.5 99 13 70.0	6 49.2 99 13 69.9	7 18.9 99 13 69.9	7 48.7 99 13 69.8	8 18.4 99 13 69.7	8 48.1 99 13 69.6	9
110	5 12.2 99 13 69.1	5 41.9 99 13 69.1	6 11.6 99 13 69.0	6 41.4 99 13 68.9	7 11.1 99 13 68.9	7 40.9 99 13 68.8	8 10.6 99 13 68.7	8 40.3 99 13 68.7	110
1	5 04.4 99 13 68.1	5 34.1 99 13 68.1	6 03.9 99 13 68.0	6 33.6 99 13 67.9	7 03.4 99 13 67.9	7 33.1 99 13 67.8	8 02.8 99 13 67.8	8 32.6 99 13 67.7	1
2		5 26.4 99 13 67.1	5 56.2 99 13 67.0	6 25.9 99 13 67.0	6 55.7 99 13 66.9	7 25.4 99 13 66.8	7 55.1 99 13 66.8	8 24.9 99 13 66.7	2
3		5 18.8 99 13 66.1	5 48.5 99 13 66.0	6 18.3 99 13 66.0	6 48.0 99 13 65.9	7 17.8 99 13 65.8	7 47.5 99 13 65.8	8 17.2 99 13 65.7	3
4		5 11.1 99 13 65.1	5 40.9 99 13 65.1	6 10.7 99 13 65.0	6 40.4 99 13 64.9	7 10.2 99 13 64.9	7 39.9 99 13 64.8	8 09.7 99 13 64.7	4
115		5 03.6 99 12 64.1	5 33.4 99 12 64.1	6 03.1 99 12 64.0	6 32.9 99 12 63.9	7 02.6 99 12 63.9	7 32.4 99 12 63.8	8 02.1 99 12 63.8	115
6			5 25.9 99 12 63.1	5 55.6 99 12 63.0	6 25.4 99 12 63.0	6 55.2 99 12 62.9	7 24.9 99 12 62.8	7 54.7 99 12 62.8	6
7			5 18.5 99 12 62.1	5 48.2 99 12 62.0	6 18.0 99 12 62.0	6 47.8 99 12 61.9	7 17.5 99 12 61.9	7 47.3 99 12 61.8	7
8			5 11.1 99 12 61.1	5 40.9 99 12 61.0	6 10.7 99 12 61.0	6 40.9 99 12 60.9	7 10.2 99 12 60.9	7 40.0 99 12 60.8	8
9			5 03.8 99 12 60.1	5 33.6 99 12 60.1	6 03.4 99 12 60.0	6 33.2 99 12 60.0	7 02.9 99 12 59.9	7 32.7 99 12 59.8	9
120				5 26.4 99 12 59.1	5 56.2 99 12 59.0	6 26.0 99 12 59.0	6 55.8 99 12 58.9	7 25.5 99 12 58.9	120
1				5 19.3 99 12 58.1	5 49.1 99 12 58.1	6 18.9 99 12 58.0	6 48.6 99 12 57.9	7 18.4 99 12 57.9	1
2				5 12.2 99 12 57.1	5 42.0 99 12 57.1	6 11.8 99 12 57.0	6 41.6 99 12 56.9	7 11.4 99 12 56.9	2
3				5 05.3 99 12 56.1	5 35.1 99 12 56.1	6 04.9 99 11 56.0	6 34.6 99 11 55.9	7 04.4 99 11 55.9	3
4					5 28.2 99 11 55.1	5 58.0 99 11 55.0	6 27.8 99 11 55.0	6 57.6 99 11 54.9	4
125					5 21.4 99 11 54.1	5 51.2 99 11 54.1	6 21.0 99 11 54.0	6 50.8 99 11 53.9	125
6					5 14.6 99 11 53.1	5 44.4 99 11 53.1	6 14.3 99 11 53.0	6 44.1 99 11 53.0	6
7					5 08.0 99 11 52.2	5 37.8 99 11 52.1	6 07.6 99 11 52.0	6 37.4 99 11 52.0	7
8					5 01.5 99 11 51.2	5 31.3 99 11 51.1	6 01.1 99 11 51.1	6 30.9 99 11 51.0	8
9						5 24.8 99 11 50.1	5 54.6 99 11 50.1	6 24.5 99 11 50.0	9
130						5 18.5 99 10 49.2	5 48.3 99 10 49.1	6 18.1 99 10 49.0	130
1						5 12.2 99 10 48.2	5 42.0 99 10 48.1	6 11.8 99 10 48.1	1
2						5 06.0 99 10 47.2	5 35.8 99 10 47.1	6 05.7 99 10 47.1	2
3							5 29.8 99 10 46.2	5 59.6 99 10 46.1	3
4							5 23.8 99 10 45.2	5 53.6 99 10 45.1	4
135							5 17.9 1.0 10 44.2	5 47.8 1.0 10 44.1	135
6							5 12.2 1.0 09 43.2	5 42.0 1.0 09 43.2	6
7							5 06.5 1.0 09 42.2	5 36.4 1.0 09 42.2	7
8							5 00.9 1.0 09 41.3	5 30.8 1.0 09 41.2	8
9								5 25.4 1.0 09 40.2	9
140								5 20.0 1.0 09 39.2	140
1								5 14.8 1.0 09 38.3	1
2								5 09.7 1.0 08 37.3	2
3								5 04.7 1.0 08 36.3	3

DECLINATION SAME NAME AS LATITUDE

Each cell gives **Alt.** (° ′ Δd Δt) and **Az.** (°).

H.A.	12° 00′	12° 30′	13° 00′	13° 30′	14° 00′	14° 30′	15° 00′	15° 30′	H.A.
00	20 00.0 1.0 00 180.0	20 30.0 1.0 00 180.0	21 00.0 1.0 00 180.0	21 30.0 1.0 00 180.0	22 00.0 1.0 00 180.0	22 30.0 1.0 00 180.0	23 00.0 1.0 00 180.0	23 30.0 1.0 00 180.0	00
1	19 59.9 1.0 00 179.0	20 29.9 179.0	20 59.9 179.0	21 29.9 179.0	21 59.9 179.0	22 29.9 179.0	22 59.9 179.0	23 29.9 178.9	1
2	19 59.7 1.0 01 177.9	20 29.7 177.9	20 59.7 177.9	21 29.7 177.9	21 59.7 177.9	22 29.7 177.9	22 59.7 177.9	23 29.7 177.9	2
3	19 59.3 1.0 01 176.9	20 29.3 176.9	20 59.3 176.9	21 29.3 176.9	21 59.3 176.9	22 29.3 176.9	22 59.3 176.9	23 29.3 176.8	3
4	19 58.8 1.0 01 175.8	20 28.8 175.8	20 58.8 175.8	21 28.8 175.8	21 58.8 175.8	22 28.8 175.8	22 58.8 175.8	23 28.8 175.8	4
05	19 58.1 1.0 01 174.8	20 28.1 174.8	20 58.1 174.8	21 28.1 174.8	21 58.1 174.8	22 28.1 174.8	22 58.1 174.8	23 28.1 174.7	05
6	19 57.3 1.0 02 173.8	20 27.3 173.7	20 57.3 173.7	21 27.3 173.7	21 57.3 173.7	22 27.3 173.7	22 57.3 173.7	23 27.2 173.7	6
7	19 56.3 1.0 02 172.7	20 26.3 172.7	20 56.3 172.7	21 26.3 172.7	21 56.3 172.7	22 26.3 172.7	22 56.3 172.7	23 26.3 172.6	7
8	19 55.2 1.0 02 171.7	20 25.1 171.7	20 55.1 171.7	21 25.1 171.6	21 55.1 171.6	22 25.1 171.6	22 55.1 171.6	23 25.1 171.6	8
9	19 53.9 1.0 02 170.6	20 23.9 170.6	20 53.9 170.6	21 23.9 170.6	21 53.9 170.6	22 23.8 170.6	22 53.8 170.5	23 23.8 170.5	9
10	19 52.4 1.0 03 169.6	20 22.4 169.6	20 52.4 169.6	21 22.4 169.6	21 52.4 169.5	22 22.4 169.5	22 52.4 169.5	23 22.4 169.5	10
1	19 50.9 1.0 03 168.6	20 20.8 168.5	20 50.8 168.5	21 20.8 168.5	21 50.8 168.5	22 20.8 168.5	22 50.8 168.5	23 20.8 168.4	1
2	19 49.1 1.0 03 167.5	20 19.1 167.5	20 49.1 167.5	21 19.1 167.5	21 49.1 167.4	22 19.1 167.4	22 49.0 167.4	23 19.0 167.4	2
3	19 47.2 1.0 04 166.5	20 17.2 166.5	20 47.2 166.4	21 17.2 166.4	21 47.2 166.4	22 17.2 166.4	22 47.1 166.4	23 17.1 166.3	3
4	19 45.2 1.0 04 165.4	20 15.2 165.4	20 45.2 165.4	21 15.2 165.4	21 45.1 165.4	22 15.1 165.4	22 45.1 165.3	23 15.1 165.3	4
15	19 43.0 1.0 04 164.4	20 13.0 164.4	20 43.0 164.4	21 13.0 164.3	21 43.0 164.3	22 12.9 164.3	22 42.9 164.3	23 12.9 164.3	15
6	19 40.7 1.0 04 163.4	20 10.7 163.3	20 40.7 163.3	21 10.7 163.3	21 40.6 163.3	22 10.6 163.3	22 40.6 163.2	23 10.5 163.2	6
7	19 38.3 1.0 04 162.3	20 08.2 162.3	20 38.2 162.3	21 08.2 162.3	21 38.1 162.2	22 08.1 162.2	22 38.1 162.2	23 08.1 162.2	7
8	19 35.7 1.0 05 161.3	20 05.6 161.3	20 35.6 161.2	21 05.6 161.2	21 35.5 161.2	22 05.5 161.2	22 35.5 161.1	23 05.4 161.1	8
9	19 32.9 1.0 05 160.2	20 02.9 160.2	20 32.8 160.2	21 02.8 160.2	21 32.8 160.1	22 02.7 160.1	22 32.7 160.1	23 02.7 160.1	9
20	19 30.0 1.0 05 159.2	20 00.0 159.2	20 29.9 159.2	20 59.9 159.1	21 29.9 159.1	21 59.8 159.1	22 29.8 159.0	22 59.7 159.0	20
1	19 27.0 1.0 05 158.2	19 56.9 158.1	20 26.9 158.1	20 56.9 158.1	21 26.8 158.1	21 56.8 158.0	22 26.7 158.0	22 56.7 158.0	1
2	19 23.8 1.0 06 157.1	19 53.8 157.1	20 23.7 157.1	20 53.7 157.1	21 23.6 157.0	21 53.6 157.0	22 23.5 157.0	22 53.5 156.9	2
3	19 20.5 1.0 06 156.1	19 50.4 156.1	20 20.4 156.0	20 50.3 156.0	21 20.3 156.0	21 50.2 156.0	22 20.2 155.9	22 50.1 155.9	3
4	19 17.0 1.0 06 155.1	19 47.0 155.0	20 16.9 155.0	20 46.9 155.0	21 16.8 154.9	21 46.8 154.9	22 16.7 154.9	22 46.7 154.8	4
25	19 13.5 1.0 06 154.0	19 43.4 154.0	20 13.3 154.0	20 43.3 153.9	21 13.2 153.9	21 43.2 153.9	22 13.1 153.8	22 43.0 153.8	25
6	19 09.7 1.0 06 153.0	19 39.7 153.0	20 09.6 152.9	20 39.5 152.9	21 09.5 152.9	21 39.4 152.8	22 09.3 152.8	22 39.3 152.8	6
7	19 05.9 1.0 07 152.0	19 35.8 151.9	20 05.7 151.9	20 35.7 151.9	21 05.6 151.8	21 35.5 151.8	22 05.5 151.7	22 35.4 151.7	7
8	19 01.9 1.0 07 150.9	19 31.8 150.9	20 01.7 150.9	20 31.7 150.8	21 01.6 150.8	21 31.5 150.8	22 01.4 150.7	22 31.4 150.7	8
9	18 57.8 1.0 07 149.9	19 27.7 149.9	19 57.6 149.8	20 27.5 149.8	20 57.5 149.8	21 27.4 149.7	21 57.3 149.7	22 27.2 149.6	9
30	18 53.5 1.0 07 148.9	19 23.4 148.8	19 53.3 148.8	20 23.3 148.8	20 53.2 148.7	21 23.1 148.7	21 53.0 148.6	22 22.9 148.6	30
1	18 49.1 1.0 08 147.8	19 19.0 147.8	19 49.0 147.8	20 18.9 147.7	20 48.8 147.7	21 18.7 147.6	21 48.6 147.6	22 18.5 147.6	1
2	18 44.6 1.0 08 146.8	19 14.5 146.8	19 44.4 146.7	20 14.3 146.7	20 44.2 146.6	21 14.2 146.6	21 44.1 146.6	22 14.0 146.5	2
3	18 40.0 1.0 08 145.8	19 09.9 145.7	19 39.8 145.7	20 09.7 145.7	20 39.6 145.6	21 09.5 145.6	21 39.4 145.5	22 09.3 145.5	3
4	18 35.2 1.0 08 144.8	19 05.1 144.7	19 35.0 144.7	20 04.9 144.6	20 34.8 144.6	21 04.7 144.5	21 34.6 144.5	22 04.5 144.4	4
35	18 30.3 1.0 08 143.7	19 00.2 143.7	19 30.1 143.6	20 00.0 143.6	20 29.9 143.5	20 59.8 143.5	21 29.7 143.5	21 59.6 143.4	35
6	18 25.3 1.0 09 142.7	18 55.2 142.7	19 25.1 142.6	19 55.0 142.6	20 24.9 142.5	20 54.8 142.5	21 24.7 142.4	21 54.5 142.4	6
7	18 20.2 1.0 09 141.6	18 50.1 141.6	19 20.0 141.6	19 49.9 141.5	20 19.8 141.5	20 49.6 141.4	21 19.5 141.4	21 49.4 141.3	7
8	18 15.0 1.0 09 140.6	18 44.9 140.6	19 14.7 140.6	19 44.6 140.5	20 14.5 140.5	20 44.4 140.4	21 14.2 140.4	21 44.1 140.3	8
9	18 09.6 1.0 09 139.6	18 39.5 139.6	19 09.4 139.5	19 39.3 139.5	20 09.1 139.4	20 39.0 139.4	21 08.9 139.3	21 38.7 139.3	9
40	18 04.2 1.0 09 138.6	18 34.0 138.5	19 03.9 138.5	19 33.8 138.4	20 03.6 138.4	20 33.5 138.3	21 03.4 138.3	21 33.2 138.2	40
1	17 58.6 1.0 10 137.6	18 28.5 137.5	18 58.3 137.5	19 28.2 137.4	19 58.0 137.4	20 27.9 137.3	20 57.7 137.3	21 27.6 137.2	1
2	17 52.9 1.0 10 136.5	18 22.8 136.5	18 52.6 136.4	19 22.5 136.4	19 52.3 136.3	20 22.2 136.3	20 52.0 136.2	21 21.9 136.2	2
3	17 47.1 1.0 10 135.5	18 17.0 135.5	18 46.8 135.4	19 16.7 135.4	19 46.5 135.3	20 16.4 135.3	20 46.2 135.2	21 16.0 135.2	3
4	17 41.2 99 10 134.5	18 11.1 134.5	18 40.9 134.4	19 10.7 134.3	19 40.6 134.3	20 10.4 134.2	20 40.3 134.2	21 10.1 134.1	4
45	17 35.2 99 10 133.5	18 05.0 133.4	18 34.9 133.4	19 04.7 133.3	19 34.6 133.3	20 04.4 133.2	20 34.2 133.2	21 04.1 133.1	45
6	17 29.1 99 10 132.4	17 58.9 132.4	18 28.8 132.4	18 58.6 132.3	19 28.4 132.3	19 58.2 132.2	20 28.1 132.2	20 57.9 132.1	6
7	17 22.9 99 11 131.4	17 52.7 131.4	18 22.5 131.3	18 52.4 131.3	19 22.2 131.2	19 52.0 131.2	20 21.8 131.1	20 51.7 131.0	7
8	17 16.6 99 11 130.4	17 46.4 130.4	18 16.2 130.3	18 46.0 130.3	19 15.9 130.2	19 45.7 130.1	20 15.5 130.1	20 45.3 130.0	8
9	17 10.2 99 11 129.4	17 40.0 129.4	18 09.8 129.3	18 39.6 129.2	19 09.4 129.2	19 39.2 129.1	20 09.1 129.1	20 38.9 129.0	9
50	17 03.7 99 11 128.4	17 33.5 128.3	18 03.3 128.3	18 33.1 128.2	19 02.9 128.2	19 32.7 128.1	20 02.5 128.0	20 32.3 128.0	50
1	16 57.1 99 11 127.4	17 26.9 127.3	17 56.7 127.3	18 26.5 127.2	18 56.3 127.1	19 26.1 127.1	19 55.9 127.0	20 25.7 127.0	1
2	16 50.4 99 11 126.4	17 20.2 126.3	17 50.0 126.3	18 19.8 126.2	18 49.6 126.1	19 19.4 126.1	19 49.2 126.0	20 19.0 125.9	2
3	16 43.6 99 11 125.3	17 13.4 125.3	17 43.2 125.2	18 13.0 125.2	18 42.8 125.1	19 12.6 125.0	19 42.4 125.0	20 12.2 124.9	3
4	16 36.8 99 12 124.3	17 06.6 124.3	17 36.4 124.2	18 06.1 124.1	18 35.9 124.1	19 05.7 124.0	19 35.5 124.0	20 05.3 123.9	4
55	16 29.8 99 12 123.3	16 59.6 123.3	17 29.4 123.2	17 59.2 123.1	18 29.0 123.1	18 58.8 123.0	19 28.5 122.9	19 58.3 122.9	55
6	16 22.8 99 12 122.3	16 52.6 122.2	17 22.4 122.2	17 52.2 122.1	18 21.9 122.1	18 51.7 122.0	19 21.5 121.9	19 51.3 121.9	6
7	16 15.7 99 12 121.3	16 45.5 121.2	17 15.3 121.2	17 45.1 121.1	18 14.8 121.0	18 44.6 121.0	19 14.4 120.9	19 44.1 120.8	7
8	16 08.5 99 12 120.3	16 38.3 120.2	17 08.1 120.2	17 37.9 120.1	18 07.6 120.0	18 37.4 120.0	19 07.2 119.9	19 36.9 119.8	8
9	16 01.3 99 12 119.3	16 31.1 119.2	17 00.8 119.1	17 30.6 119.1	18 00.4 119.0	18 30.1 118.9	18 59.9 118.9	19 29.6 118.8	9
60	15 54.0 99 12 118.3	16 23.7 118.2	16 53.5 118.1	17 23.3 118.1	17 53.0 118.0	18 22.8 117.9	18 52.5 117.9	19 22.3 117.8	60
1	15 46.6 99 12 117.3	16 16.4 117.2	16 46.1 117.1	17 15.9 117.1	17 45.6 117.0	18 15.4 116.9	18 45.1 116.9	19 14.9 116.8	1
2	15 39.1 99 13 116.2	16 08.9 116.2	16 38.6 116.1	17 08.4 116.0	17 38.1 116.0	18 07.9 115.9	18 37.6 115.8	19 07.4 115.8	2
3	15 31.6 99 13 115.2	16 01.4 115.2	16 31.1 115.1	17 00.9 115.0	17 30.6 115.0	18 00.4 114.9	18 30.1 114.8	18 59.8 114.8	3
4	15 24.0 99 13 114.2	15 53.8 114.2	16 23.5 114.1	16 53.3 114.0	17 23.0 114.0	17 52.7 113.9	18 22.5 113.8	18 52.2 113.8	4
65	15 16.4 99 13 113.2	15 46.1 113.2	16 15.9 113.1	16 45.6 113.0	17 15.3 113.0	17 45.1 112.9	18 14.8 112.8	18 44.5 112.7	65
6	15 08.7 99 13 112.2	15 38.4 112.2	16 08.2 112.1	16 37.9 112.0	17 07.6 111.9	17 37.4 111.9	18 07.1 111.8	18 36.8 111.7	6
7	15 00.9 99 13 111.2	15 30.7 111.1	16 00.4 111.1	16 30.1 111.0	16 59.9 110.9	17 29.6 110.9	17 59.3 110.8	18 29.0 110.7	7
8	14 53.1 99 13 110.2	15 22.8 110.1	15 52.6 110.1	16 22.3 110.0	16 52.0 109.9	17 21.8 109.9	17 51.5 109.8	18 21.2 109.7	8
9	14 45.3 99 13 109.2	15 15.0 109.1	15 44.7 109.1	16 14.4 109.0	16 44.2 108.9	17 13.9 108.9	17 43.6 108.8	18 13.3 108.7	9
70	14 37.3 99 13 108.2	15 07.1 108.1	15 36.8 108.0	16 06.5 107.9	16 36.2 107.9	17 06.0 107.9	17 35.7 107.8	18 05.4 107.7	70
1	14 29.4 99 13 107.2	14 59.1 107.1	15 28.8 107.1	15 58.6 107.0	16 28.3 106.9	16 58.0 106.9	17 27.7 106.8	17 57.4 106.7	1
2	14 21.4 99 13 106.2	14 51.1 106.1	15 20.8 106.1	15 50.5 106.0	16 20.3 105.9	16 50.0 105.9	17 19.7 105.8	17 49.4 105.7	2
3	14 13.4 99 13 105.2	14 43.1 105.1	15 12.8 105.1	15 42.5 105.0	16 12.2 104.9	16 41.9 104.8	17 11.6 104.8	17 41.3 104.7	3
4	14 05.3 99 14 104.2	14 35.0 104.1	15 04.7 104.1	15 34.4 104.0	16 04.1 103.9	16 33.8 103.8	17 03.5 103.8	17 33.2 103.7	4
75	13 57.2 99 14 103.2	14 26.9 103.1	14 56.6 103.0	15 26.3 103.0	15 56.0 102.9	16 25.7 102.8	16 55.4 102.8	17 25.1 102.7	75
6	13 49.0 99 14 102.2	14 18.7 102.1	14 48.4 102.1	15 18.1 102.0	15 47.8 101.9	16 17.5 101.8	16 47.2 101.8	17 16.9 101.7	6
7	13 40.8 99 14 101.2	14 10.6 101.1	14 40.3 101.1	15 10.0 101.0	15 39.7 100.9	16 09.4 100.9	16 39.1 100.8	17 08.8 100.7	7
8	13 32.6 99 14 100.2	14 02.3 100.1	14 32.0 100.1	15 01.7 100.0	15 31.4 99.9	16 01.1 99.9	16 30.8 99.8	17 00.5 99.7	8
9	13 24.3 99 14 99.2	13 54.1 99.2	14 23.8 99.1	14 53.5 99.0	15 23.2 98.9	15 52.9 98.9	16 22.6 98.8	16 52.3 98.7	9
80	13 16.2 99 14 98.2	13 45.9 98.2	14 15.6 98.1	14 45.3 98.0	15 14.9 97.9	15 44.6 97.9	16 14.3 97.8	16 44.0 97.7	80
1	13 07.9 99 14 97.2	13 37.6 97.2	14 07.3 97.1	14 37.0 97.0	15 06.7 96.9	15 36.4 96.9	16 06.1 96.8	16 35.7 96.7	1
2	12 59.6 99 14 96.2	13 29.3 96.2	13 59.0 96.1	14 28.7 96.0	14 58.4 95.9	15 28.1 95.9	15 57.8 95.8	16 27.4 95.7	2
3	12 51.3 99 14 95.2	13 21.0 95.2	13 50.7 95.1	14 20.4 95.0	14 50.1 95.0	15 19.8 94.9	15 49.4 94.8	16 19.1 94.7	3
4	12 43.0 99 14 94.3	13 12.7 94.2	13 42.3 94.1	14 12.0 94.0	14 41.7 94.0	15 11.4 93.9	15 41.1 93.8	16 10.8 93.7	4
85	12 34.6 99 14 93.3	13 04.3 93.2	13 34.0 93.1	14 03.7 93.0	14 33.4 93.0	15 03.1 92.9	15 32.8 92.8	16 02.5 92.7	85
6	12 26.3 99 14 92.3	12 56.0 92.2	13 25.7 92.1	13 55.4 92.0	14 25.1 92.0	14 54.7 91.9	15 24.4 91.8	15 54.1 91.7	6
7	12 17.9 99 14 91.3	12 47.6 91.2	13 17.3 91.1	13 47.0 91.1	14 16.7 91.0	14 46.4 90.9	15 16.1 90.8	15 45.8 90.8	7
8	12 09.6 99 14 90.3	12 39.3 90.2	13 09.0 90.1	13 38.7 90.1	14 08.4 90.0	14 38.0 89.9	15 07.7 89.8	15 37.4 89.8	8
9	12 01.2 99 14 89.3	12 30.9 89.2	13 00.6 89.1	13 30.3 89.1	14 00.0 89.0	14 29.7 89.0	14 59.4 88.9	15 29.1 88.8	9
90	11 52.9 99 14 88.3	12 22.6 88.2	12 52.3 88.2	13 22.0 88.1	13 51.7 88.0	14 21.4 87.9	14 51.0 87.9	15 20.7 87.8	90

H.A.	12° 00' Alt.	Δd Δt	Az.	12° 30' Alt.	Δd Δt	Az.	13° 00' Alt.	Δd Δt	Az.	13° 30' Alt.	Δd Δt	Az.	14° 00' Alt.	Δd Δt	Az.	14° 30' Alt.	Δd Δt	Az.	15° 00' Alt.	Δd Δt	Az.	15° 30' Alt.	Δd Δt	Az.	H.A.
91	11 44.5	99 14	87.3	12 14.2	99 14	87.2	12 43.9	99 14	87.2	13 13.6	99 14	87.1	13 43.3	99 14	87.0	14 13.0	99 14	87.0	14 42.7	99 14	86.9	15 12.4	99 14	86.8	91
2	11 36.2	99 14	86.3	12 05.9	99 14	86.3	12 35.6	99 14	86.2	13 05.3	99 14	86.1	13 35.0	99 14	86.0	14 04.7	99 14	86.0	14 34.4	99 14	85.9	15 04.1	99 14	85.8	2
3	11 27.9	99 14	85.3	11 57.6	99 14	85.3	12 27.3	99 14	85.2	12 57.0	99 14	85.1	13 26.7	99 14	85.0	13 56.4	99 14	85.0	14 26.0	99 14	84.9	14 55.7	99 14	84.8	3
4	11 19.6	99 14	84.4	11 49.3	99 14	84.3	12 19.0	99 14	84.2	12 48.7	99 14	84.1	13 18.3	99 14	84.1	13 48.0	99 14	84.0	14 17.7	99 14	83.9	14 47.4	99 14	83.8	4
95	11 11.3	99 14	83.4	11 41.0	99 14	83.3	12 10.7	99 14	83.2	12 40.4	99 14	83.1	13 10.0	99 14	83.1	13 39.7	99 14	83.0	14 09.4	99 14	82.9	14 39.1	99 14	82.9	95
6	11 03.0	99 14	82.4	11 32.7	99 14	82.3	12 02.4	99 14	82.2	12 32.1	99 14	82.2	13 01.8	99 14	82.1	13 31.5	99 14	82.0	14 01.2	99 14	81.9	14 30.8	99 14	81.9	6
7	10 54.7	99 14	81.4	11 24.4	99 14	81.3	11 54.1	99 14	81.2	12 23.8	99 14	81.2	12 53.5	99 14	81.1	13 23.2	99 14	81.0	13 52.9	99 14	81.0	14 22.6	99 14	80.9	7
8	10 46.5	99 14	80.4	11 16.2	99 14	80.3	11 45.9	99 14	80.3	12 15.6	99 14	80.2	12 45.3	99 14	80.1	13 15.0	99 14	80.0	13 44.7	99 14	80.0	14 14.4	99 14	79.9	8
9	10 38.2	99 14	79.4	11 07.9	99 14	79.3	11 37.7	99 14	79.3	12 07.4	99 14	79.2	12 37.1	99 14	79.1	13 06.8	99 14	79.1	13 36.5	99 14	79.0	14 06.2	99 14	78.9	9
100	10 30.0	99 14	78.4	10 59.8	99 14	78.4	11 29.5	99 14	78.3	11 59.2	99 14	78.2	12 28.9	99 14	78.1	12 58.6	99 14	78.1	13 28.3	99 14	78.0	13 58.0	99 14	77.9	100
1	10 21.9	99 14	77.4	10 51.6	99 14	77.4	11 21.3	99 14	77.3	11 51.0	99 14	77.2	12 20.7	99 14	77.2	12 50.4	99 14	77.1	13 20.1	99 14	77.0	13 49.8	99 14	76.9	1
2	10 13.7	99 14	76.5	10 43.5	99 13	76.4	11 13.2	99 14	76.3	11 42.9	99 14	76.3	12 12.6	99 13	76.2	12 42.3	99 14	76.1	13 12.0	99 13	76.0	13 41.7	99 13	76.0	2
3	10 05.6	99 13	75.5	10 35.4	99 13	75.4	11 05.1	99 13	75.3	11 34.8	99 13	75.3	12 04.5	99 13	75.2	12 34.2	99 13	75.1	13 03.9	99 13	75.1	13 33.6	99 13	75.0	3
4	9 57.6	99 13	74.5	10 27.3	99 13	74.4	10 57.0	99 13	74.4	11 26.7	99 13	74.3	11 56.4	99 13	74.2	12 26.2	99 13	74.1	12 55.9	99 13	74.1	13 25.6	99 13	74.0	4
105	9 49.6	99 13	73.5	10 19.3	99 13	73.4	10 49.0	99 13	73.4	11 18.7	99 13	73.3	11 48.4	99 13	73.2	12 18.1	99 13	73.2	12 47.9	99 13	73.1	13 17.6	99 13	73.0	105
6	9 41.6	99 13	72.5	10 11.3	99 13	72.5	10 41.0	99 13	72.4	11 10.7	99 13	72.3	11 40.4	99 13	72.3	12 10.2	99 13	72.2	12 39.9	99 13	72.1	13 09.6	99 13	72.0	6
7	9 33.6	99 13	71.5	10 03.3	99 13	71.4	10 33.1	99 13	71.4	11 02.8	99 13	71.3	11 32.5	99 13	71.3	12 02.2	99 13	71.2	12 32.0	99 13	71.1	13 01.7	99 13	71.1	7
8	9 25.7	99 13	70.6	9 55.5	99 13	70.5	10 25.2	99 13	70.4	10 54.9	99 13	70.4	11 24.6	99 13	70.3	11 54.4	99 13	70.2	12 24.1	99 13	70.2	12 53.8	99 13	70.1	8
9	9 17.9	99 13	69.6	9 47.6	99 13	69.5	10 17.3	99 13	69.4	10 47.1	99 13	69.4	11 16.8	99 13	69.3	11 46.5	99 13	69.2	12 16.3	99 13	69.2	12 46.0	99 13	69.1	9
110	9 10.1	99 13	68.6	9 39.8	99 13	68.5	10 09.5	99 13	68.5	10 39.3	99 13	68.4	11 09.0	99 13	68.3	11 38.7	99 13	68.3	12 08.5	99 13	68.2	12 38.2	99 13	68.1	110
1	9 02.3	99 13	67.6	9 32.1	99 13	67.6	10 01.8	99 13	67.5	10 31.5	99 13	67.4	11 01.3	99 13	67.3	11 31.0	99 13	67.3	12 00.7	99 13	67.2	12 30.5	99 13	67.1	1
2	8 54.6	99 13	66.6	9 24.4	99 13	66.6	9 54.1	99 13	66.5	10 23.9	99 13	66.4	10 53.6	99 13	66.4	11 23.3	99 13	66.3	11 53.1	99 13	66.2	12 22.8	99 13	66.2	2
3	8 47.0	99 13	65.7	9 16.7	99 13	65.6	9 46.5	99 13	65.5	10 16.2	99 13	65.5	10 46.0	99 13	65.3	11 15.7	99 13	65.3	11 45.5	99 13	65.3	12 15.2	99 13	65.2	3
4	8 39.4	99 13	64.7	9 09.2	99 13	64.6	9 38.9	99 12	64.5	10 08.7	99 12	64.5	10 38.4	99 12	64.4	11 08.2	99 12	64.3	11 37.9	99 12	64.3	12 07.7	99 12	64.2	4
115	8 31.9	99 12	63.7	9 01.7	99 12	63.6	9 31.4	99 12	63.6	10 01.2	99 12	63.5	10 30.9	99 12	63.4	11 00.7	99 12	63.4	11 30.4	99 12	63.3	12 00.2	99 12	63.2	115
6	8 24.4	99 12	62.7	8 54.2	99 12	62.6	9 24.0	99 12	62.6	9 53.7	99 12	62.5	10 23.5	99 12	62.5	10 53.2	99 12	62.4	11 23.0	99 12	62.3	11 52.7	99 12	62.3	6
7	8 17.1	99 12	61.7	8 46.8	99 12	61.6	9 16.6	99 12	61.6	9 46.3	99 12	61.5	10 16.1	99 12	61.5	10 45.9	99 12	61.4	11 15.6	99 12	61.3	11 45.4	99 12	61.3	7
8	8 09.7	99 12	60.7	8 39.5	99 12	60.7	9 09.3	99 12	60.6	9 39.0	99 12	60.6	10 08.8	99 12	60.4	10 38.6	99 12	60.4	11 08.3	99 12	60.4	11 38.1	99 12	60.3	8
9	8 02.5	99 12	59.8	8 32.3	99 12	59.7	9 02.0	99 12	59.6	9 31.8	99 12	59.6	10 01.6	99 12	59.5	10 31.3	99 12	59.5	11 01.1	99 12	59.4	11 30.9	99 12	59.3	9
120	7 55.3	99 12	58.8	8 25.1	99 12	58.7	8 54.9	99 12	58.7	9 24.6	99 12	58.6	9 54.4	99 12	58.5	10 24.2	99 12	58.5	10 54.0	99 12	58.4	11 23.7	99 12	58.4	120
1	7 48.2	99 12	57.8	8 18.0	99 12	57.7	8 47.8	99 12	57.7	9 17.5	99 12	57.6	9 47.3	99 12	57.6	10 17.1	99 12	57.5	10 46.9	99 12	57.4	11 16.7	99 12	57.4	1
2	7 41.2	99 12	56.8	8 11.0	99 12	56.7	8 40.8	99 12	56.7	9 10.5	99 12	56.6	9 40.3	99 12	56.6	10 10.1	99 12	56.5	10 39.9	99 12	56.5	11 09.7	99 12	56.4	2
3	7 34.2	99 11	55.8	8 04.0	99 11	55.8	8 33.8	99 11	55.7	9 03.6	99 11	55.7	9 33.4	99 11	55.6	10 03.2	99 11	55.5	10 33.0	99 11	55.5	11 02.8	99 11	55.4	3
4	7 27.4	99 11	54.9	7 57.2	99 11	54.8	8 26.9	99 11	54.8	8 56.7	99 11	54.7	9 26.5	99 11	54.6	9 56.3	99 11	54.6	10 26.1	99 11	54.5	10 55.9	99 11	54.5	4
125	7 20.6	99 11	53.9	7 50.4	99 11	53.8	8 20.2	99 11	53.8	8 50.0	99 11	53.7	9 19.8	99 11	53.7	9 49.6	99 11	53.6	10 19.4	99 11	53.5	10 49.2	99 11	53.5	125
6	7 13.9	99 11	52.9	7 43.7	99 11	52.9	8 13.5	99 11	52.8	8 43.3	99 11	52.7	9 13.1	99 11	52.7	9 42.9	99 11	52.6	10 12.7	99 11	52.6	10 42.5	99 11	52.5	6
7	7 07.2	99 11	51.9	7 37.1	99 11	51.9	8 06.9	99 11	51.8	8 36.7	99 11	51.8	9 06.5	99 11	51.7	9 36.3	99 11	51.6	10 06.1	99 11	51.6	10 35.9	99 11	51.5	7
8	7 00.7	99 11	51.0	7 30.5	99 11	50.9	8 00.4	99 11	50.8	8 30.2	99 11	50.8	9 00.0	99 11	50.7	9 29.8	99 11	50.7	9 59.6	99 11	50.6	10 29.4	99 11	50.6	8
9	6 54.3	99 11	50.0	7 24.1	99 11	49.9	7 53.9	99 11	49.9	8 23.7	99 11	49.8	8 53.6	99 11	49.8	9 23.4	99 11	49.7	9 53.2	99 11	49.6	10 23.0	99 11	49.6	9
130	6 47.9	99 10	49.0	7 17.8	99 10	48.9	7 47.6	99 10	48.9	8 17.4	99 10	48.8	8 47.2	99 10	48.8	9 17.1	99 10	48.7	9 46.9	99 10	48.7	10 16.7	99 10	48.6	130
1	6 41.7	99 10	48.0	7 11.5	99 10	48.0	7 41.3	99 10	47.9	8 11.2	99 10	47.9	8 41.0	99 10	47.8	9 10.8	99 10	47.7	9 40.7	99 10	47.7	10 10.5	99 10	47.6	1
2	6 35.5	99 10	47.0	7 05.4	99 10	47.0	7 35.2	99 10	46.9	8 05.0	99 10	46.9	8 34.9	99 10	46.8	9 04.7	99 10	46.8	9 34.5	99 10	46.7	10 04.4	99 10	46.7	2
3	6 29.5	99 10	46.1	6 59.3	99 10	46.0	7 29.1	99 10	46.0	7 59.0	99 10	45.9	8 28.8	99 10	45.8	8 58.7	99 10	45.8	9 28.5	99 10	45.7	9 58.3	99 10	45.7	3
4	6 23.5	99 10	45.1	6 53.3	99 10	45.0	7 23.2	99 10	45.0	7 53.0	99 10	44.9	8 22.9	99 10	44.9	8 52.7	99 10	44.8	9 22.6	99 10	44.8	9 52.4	99 10	44.7	4
135	6 17.6	1.0 10	44.1	6 47.5	1.0 10	44.0	7 17.3	1.0 10	44.0	7 47.2	1.0 10	43.9	8 17.0	1.0 10	43.9	8 46.9	1.0 10	43.8	9 16.7	1.0 10	43.8	9 46.6	1.0 10	43.7	135
6	6 11.9	1.0 09	43.1	6 41.7	1.0 09	43.1	7 11.6	1.0 09	43.0	7 41.4	1.0 09	43.0	8 11.3	1.0 09	42.9	8 41.2	1.0 09	42.9	9 11.0	1.0 09	42.8	9 40.9	1.0 09	42.8	6
7	6 06.2	1.0 09	42.1	6 36.1	1.0 09	42.0	7 05.9	1.0 09	42.0	7 35.8	1.0 09	42.0	8 05.7	1.0 09	41.9	8 35.5	1.0 09	41.9	9 05.4	1.0 09	41.8	9 35.3	1.0 09	41.8	7
8	6 00.7	1.0 09	41.2	6 30.5	1.0 09	41.1	7 00.4	1.0 09	41.1	7 30.3	1.0 09	41.0	8 00.1	1.0 09	40.9	8 30.0	1.0 09	40.9	8 59.9	1.0 09	40.9	9 29.7	1.0 09	40.8	8
9	5 55.2	1.0 09	40.2	6 25.1	1.0 09	40.1	6 55.0	1.0 09	40.1	7 24.8	1.0 09	40.0	7 54.7	1.0 09	40.0	8 24.6	1.0 09	39.9	8 54.5	1.0 09	39.9	9 24.3	1.0 09	39.9	9
140	5 49.9	1.0 09	39.2	6 19.8	1.0 09	39.2	6 49.7	1.0 09	39.1	7 19.5	1.0 09	39.1	7 49.4	1.0 09	39.0	8 19.3	1.0 09	39.0	8 49.2	1.0 09	38.9	9 19.0	1.0 09	38.9	140
1	5 44.7	1.0 09	38.2	6 14.6	1.0 09	38.2	6 44.4	1.0 08	38.1	7 14.3	1.0 08	38.1	7 44.2	1.0 08	38.0	8 14.1	1.0 08	38.0	8 44.0	1.0 08	38.0	9 13.9	1.0 08	37.9	1
2	5 39.6	1.0 08	37.2	6 09.5	1.0 08	37.2	6 39.3	1.0 08	37.2	7 09.2	1.0 08	37.1	7 39.1	1.0 08	37.1	8 09.0	1.0 08	37.0	8 38.9	1.0 08	36.9	9 08.8	1.0 08	36.9	2
3	5 34.6	1.0 08	36.3	6 04.5	1.0 08	36.2	6 34.4	1.0 08	36.2	7 04.2	1.0 08	36.1	7 34.1	1.0 08	36.1	8 04.0	1.0 08	36.0	8 33.9	1.0 08	36.0	9 03.8	1.0 08	36.0	3
4	5 29.7	1.0 08	35.3	5 59.6	1.0 08	35.2	6 29.5	1.0 08	35.2	6 59.4	1.0 08	35.2	7 29.3	1.0 08	35.1	7 59.2	1.0 08	35.1	8 29.1	1.0 08	35.0	8 59.0	1.0 08	35.0	4
145	5 24.9	1.0 08	34.3	5 54.8	1.0 08	34.3	6 24.7	1.0 08	34.2	6 54.6	1.0 08	34.2	7 24.5	1.0 08	34.1	7 54.4	1.0 08	34.1	8 24.3	1.0 08	34.1	8 54.2	1.0 08	34.0	145
6	5 20.3	1.0 08	33.3	5 50.2	1.0 08	33.3	6 20.1	1.0 08	33.2	6 50.0	1.0 08	33.2	7 19.9	1.0 08	33.2	7 49.8	1.0 08	33.1	8 19.7	1.0 08	33.1	8 49.6	1.0 08	33.0	6
7	5 15.7	1.0 07	32.3	5 45.7	1.0 07	32.3	6 15.6	1.0 07	32.3	6 45.5	1.0 07	32.2	7 15.4	1.0 07	32.2	7 45.3	1.0 07	32.2	8 15.2	1.0 07	32.1	8 45.1	1.0 07	32.1	7
8	5 11.3	1.0 07	31.4	5 41.3	1.0 07	31.3	6 11.2	1.0 07	31.3	6 41.1	1.0 07	31.3	7 11.0	1.0 07	31.2	7 40.9	1.0 07	31.2	8 10.8	1.0 07	31.1	8 40.8	1.0 07	31.1	8
9	5 07.1	1.0 07	30.4	5 37.0	1.0 07	30.3	6 06.9	1.0 07	30.3	6 36.8	1.0 07	30.3	7 06.7	1.0 07	30.2	7 36.7	1.0 07	30.2	8 06.6	1.0 07	30.2	8 36.5	1.0 07	30.1	9
150	5 02.9	1.0 07	29.4	5 32.8	1.0 07	29.4	6 02.7	1.0 07	29.3	6 32.7	1.0 07	29.3	7 02.6	1.0 07	29.3	7 32.5	1.0 07	29.2	8 02.5	1.0 07	29.2	8 32.4	1.0 07	29.2	150
1				5 28.8	1.0 06	28.4	5 58.7	1.0 06	28.4	6 28.7	1.0 06	28.3	6 58.6	1.0 06	28.3	7 28.5	1.0 06	28.3	7 58.4	1.0 06	28.2	8 28.4	1.0 06	28.2	1
2				5 24.9	1.0 06	27.4	5 54.8	1.0 06	27.3	6 24.8	1.0 06	27.3	6 54.7	1.0 06	27.3	7 24.6	1.0 06	27.3	7 54.6	1.0 06	27.3	8 24.5	1.0 06	27.2	2
3				5 21.1	1.0 06	26.4	5 51.0	1.0 06	26.4	6 21.0	1.0 06	26.4	6 50.9	1.0 06	26.3	7 20.9	1.0 06	26.3	7 50.8	1.0 06	26.3	8 20.7	1.0 06	26.2	3
4				5 17.4	1.0 06	25.5	5 47.4	1.0 06	25.4	6 17.3	1.0 06	25.4	6 47.3	1.0 06	25.4	7 17.2	1.0 06	25.3	7 47.2	1.0 06	25.3	8 17.1	1.0 06	25.3	4
155				5 13.9	1.0 06	24.5	5 43.9	1.0 06	24.4	6 13.8	1.0 06	24.4	6 43.8	1.0 06	24.4	7 13.7	1.0 06	24.4	7 43.7	1.0 06	24.3	8 13.6	1.0 06	24.3	155
6				5 10.5	1.0 05	23.5	5 40.5	1.0 05	23.5	6 10.4	1.0 05	23.4	6 40.4	1.0 05	23.4	7 10.3	1.0 05	23.4	7 40.3	1.0 05	23.4	8 10.2	1.0 05	23.3	6
7				5 07.3	1.0 05	22.5	5 37.2	1.0 05	22.5	6 07.2	1.0 05	22.5	6 37.1	1.0 05	22.4	7 07.1	1.0 05	22.4	7 37.0	1.0 05	22.4	8 07.0	1.0 05	22.4	7
8				5 04.1	1.0 05	21.5	5 34.1	1.0 05	21.5	6 04.0	1.0 05	21.5	6 34.0	1.0 05	21.5	7 04.0	1.0 05	21.4	7 33.9	1.0 05	21.4	8 03.9	1.0 05	21.4	8
9				5 01.1	1.0 05	20.6	5 31.1	1.0 05	20.5	6 01.1	1.0 05	20.5	6 31.0	1.0 05	20.5	7 01.0	1.0 05	20.5	7 30.9	1.0 05	20.4	8 00.9	1.0 05	20.4	9
160							5 28.2	1.0 05	19.6	5 58.2	1.0 05	19.5	6 28.2	1.0 05	19.5	6 58.1	1.0 05	19.5	7 28.1	1.0 05	19.5	7 58.1	1.0 05	19.4	160
1							5 25.5	1.0 04	18.6	5 55.5	1.0 04	18.6	6 25.4	1.0 04	18.5	6 55.4	1.0 04	18.5	7 25.4	1.0 04	18.5	7 55.3	1.0 04	18.5	1
2							5 22.9	1.0 04	17.6	5 52.9	1.0 04	17.6	6 22.9	1.0 04	17.6	6 52.8	1.0 04	17.5	7 22.8	1.0 04	17.5	7 52.8	1.0 04	17.5	2
3							5 20.5	1.0 04	16.6	5 50.4	1.0 04	16.6	6 20.4	1.0 04	16.6	6 50.4	1.0 04	16.6	7 20.4	1.0 04	16.5	7 50.3	1.0 04	16.5	3
4							5 18.1	1.0 04	15.6	5 48.1	1.0 04	15.6	6 18.1	1.0 04	15.6	6 48.1	1.0 04	15.6	7 18.0	1.0 04	15.6	7 48.0	1.0 04	15.6	4
165							5 15.9	1.0 03	14.7	5 45.9	1.0 03	14.7	6 15.9	1.0 03	14.6	6 45.9	1.0 03	14.6	7 15.9	1.0 03	14.6	7 45.9	1.0 03	14.6	165
6							5 13.9	1.0 03	13.7	5 43.9	1.0 03	13.7	6 13.9	1.0 03	13.7	6 43.9	1.0 03	13.6	7 13.8	1.0 03	13.6	7 43.8	1.0 03	13.6	6
7							5 12.0	1.0 03	12.7	5 42.0	1.0 03	12.7	6 12.0	1.0 03	12.7	6 42.0	1.0 03	12.7	7 11.9	1.0 03	12.7	7 41.9	1.0 03	12.6	7
8							5 10.2	1.0 03	11.7	5 40.2	1.0 03	11.7	6 10.2	1.0 03	11.7	6 40.2	1.0 03	11.7	7 10.2	1.0 03	11.7	7 40.2	1.0 03	11.7	8
9							5 08.6	1.0 02	10.8	5 38.6	1.0 02	10.7	6 08.6	1.0 02	10.7	6 38.6	1.0 02	10.7	7 08.6	1.0 02	10.7	7 38.5	1.0 02	10.7	9
170							5 07.1	1.0 02	09.8	5 37.1	1.0 02	09.8	6 07.1	1.0 02	09.8	6 37.1	1.0 02	09.7	7 07.1	1.0 02	09.7	7 37.1	1.0 02	09.7	170
1							5 05.8	1.0 02	08.8	5 35.8	1.0 02	08.8	6 05.7	1.0 02	08.8	6 35.7	1.0 02	08.8	7 05.7	1.0 02	08.7	7 35.7	1.0 02	08.7	1
2							5 04.6	1.0 02	07.8	5 34.5	1.0 02	07.8	6 04.5	1.0 02	07.8	6 34.5	1.0 02	07.8	7 04.5	1.0 02	07.8	7 34.5	1.0 02	07.8	2
3							5 03.5	1.0 02	06.8	5 33.5	1.0 02	06.8	6 03.5	1.0 02	06.8	6 33.5	1.0 02	06.8	7 03.5	1.0 02	06.8	7 33.5	1.0 02	06.8	3
4							5 02.6	1.0 01	05.9	5 32.6	1.0 01	05.9	6 02.6	1.0 01	05.9	6 32.6	1.0 01	05.8	7 02.6	1.0 01	05.8	7 32.5	1.0 01	05.8	4
175							5 01.8	1.0 01	04.9	5 31.8	1.0 01	04.9	6 01.8	1.0 01	04.9	6 31.8	1.0 01	04.9	7 01.8	1.0 01	04.9	7 31.8	1.0 01	04.9	175
6							5 01.1	1.0 01	03.9	5 31.1	1.0 01	03.9	6 01.1	1.0 01	03.9	6 31.1	1.0 01	03.9	7 01.1	1.0 01	03.9	7 31.1	1.0 01	03.9	6
7							5 00.6	1.0 01	02.9	5 30.6	1.0 01	02.9	6 00.6	1.0 01	02.9	6 30.6	1.0 01	02.9	7 00.6	1.0 01	02.9	7 30.6	1.0 01	02.9	7
8							5 00.3	1.0 00	02.0	5 30.3	1.0 00	02.0	6 00.3	1.0 00	01.9	6 30.3	1.0 00	01.9	7 00.3	1.0 00	01.9	7 30.3	1.0 00	01.9	8
9							5 00.1	1.0 00	01.0	5 30.1	1.0 00	01.0	6 00.1	1.0 00	01.0	6 30.1	1.0 00	01.0	7 00.1	1.0 00	01.0	7 30.1	1.0 00	01.0	9
180							5 00.0	1.0 00	00.0	5 30.0	1.0 00	00.0	6 00.0	1.0 00	00.0	6 30.0	1.0 00	00.0	7 00.0	1.0 00	00.0	7 30.0	1.0 00	00.0	180

H.A.	16° 00′ Alt. / Az.	16° 30′ Alt. / Az.	17° 00′ Alt. / Az.	17° 30′ Alt. / Az.	18° 00′ Alt. / Az.	18° 30′ Alt. / Az.	19° 00′ Alt. / Az.	19° 30′ Alt. / Az.	H.A.
00	24 00.0 1.000 180.0	24 30.0 1.000 180.0	25 00.0 1.000 180.0	25 30.0 1.000 180.0	26 00.0 1.000 180.0	26 30.0 1.000 180.0	27 00.0 1.000 180.0	27 30.0 1.000 180.0	00
1	23 59.9 1.000 178.9	24 29.9 1.000 178.9	24 59.9 1.000 178.9	25 29.9 1.000 178.9	25 59.9 1.000 178.9	26 29.9 1.000 178.9	26 59.9 1.000 178.9	27 29.9 1.000 178.9	1
2	23 59.7 1.001 177.7	24 29.7 1.001 177.7	24 59.7 1.001 177.7	25 29.7 1.001 177.7	25 59.7 1.001 177.7	26 29.7 1.001 177.7	26 59.7 1.001 177.7	27 29.7 1.001 177.7	2
3	23 59.3 1.001 176.8	24 29.3 1.001 176.8	24 59.3 1.001 176.8	25 29.3 1.001 176.8	25 59.3 1.001 176.8	26 29.3 1.001 176.8	26 59.3 1.001 176.8	27 29.3 1.001 176.8	3
4	23 58.8 1.001 175.8	24 28.8 1.001 175.8	24 58.8 1.001 175.8	25 28.8 1.001 175.8	25 58.8 1.001 175.8	26 28.8 1.001 175.8	26 58.8 1.001 175.8	27 28.8 1.001 175.7	4
05	23 58.1 1.001 174.7	24 28.1 1.001 174.7	24 58.1 1.001 174.7	25 28.1 1.001 174.7	25 58.1 1.001 174.7	26 28.1 1.001 174.7	26 58.1 1.001 174.7	27 28.1 1.001 174.7	05
6	23 57.2 1.002 173.7	24 27.2 1.002 173.7	24 57.2 1.002 173.7	25 27.2 1.002 173.7	25 57.2 1.002 173.6	26 27.2 1.002 173.6	26 57.2 1.002 173.6	27 27.2 1.002 173.6	6
7	23 56.2 1.002 172.6	24 26.2 1.002 172.6	24 56.2 1.002 172.6	25 26.2 1.002 172.6	25 56.2 1.002 172.6	26 26.2 1.002 172.6	26 56.2 1.002 172.6	27 26.2 1.002 172.6	7
8	23 55.1 1.002 171.6	24 25.1 1.002 171.6	24 55.1 1.002 171.6	25 25.1 1.002 171.5	25 55.1 1.002 171.5	26 25.1 1.002 171.5	26 55.1 1.002 171.5	27 25.1 1.002 171.5	8
9	23 53.8 1.002 170.5	24 23.8 1.002 170.5	24 53.8 1.002 170.5	25 23.8 1.002 170.5	25 53.8 1.002 170.5	26 23.8 1.002 170.5	26 53.8 1.002 170.5	27 23.7 1.002 170.4	9
10	23 52.4 1.003 169.5	24 22.3 1.003 169.5	24 52.3 1.003 169.5	25 22.3 1.003 169.4	25 52.3 1.003 169.4	26 22.3 1.003 169.4	26 52.3 1.003 169.4	27 22.3 1.003 169.4	10
1	23 50.7 1.003 168.4	24 20.7 1.003 168.4	24 50.7 1.003 168.4	25 20.7 1.003 168.4	25 50.7 1.003 168.4	26 20.7 1.003 168.3	26 50.7 1.003 168.3	27 20.7 1.003 168.3	1
2	23 49.0 1.003 167.4	24 19.0 1.003 167.4	24 49.0 1.003 167.3	25 19.0 1.003 167.3	25 48.9 1.003 167.3	26 18.9 1.003 167.3	26 48.9 1.003 167.3	27 18.9 1.003 167.3	2
3	23 47.1 1.003 166.3	24 17.1 1.003 166.3	24 47.1 1.003 166.3	25 17.1 1.003 166.3	25 47.0 1.003 166.3	26 17.0 1.003 166.2	26 47.0 1.003 166.2	27 17.0 1.003 166.2	3
4	23 45.1 1.004 165.3	24 15.0 1.004 165.3	24 45.0 1.004 165.2	25 15.0 1.004 165.2	25 45.0 1.004 165.2	26 15.0 1.004 165.2	26 44.9 1.004 165.2	27 14.9 1.004 165.1	4
15	23 42.9 1.004 164.2	24 12.8 1.004 164.2	24 42.8 1.004 164.2	25 12.8 1.004 164.1	25 42.8 1.004 164.1	26 12.7 1.004 164.1	26 42.7 1.004 164.1	27 12.7 1.004 164.1	15
6	23 40.5 1.004 163.2	24 10.5 1.004 163.2	24 40.5 1.004 163.1	25 10.4 1.004 163.1	25 40.4 1.004 163.1	26 10.4 1.004 163.1	26 40.4 1.004 163.0	27 10.3 1.004 163.0	6
7	23 38.0 1.004 162.1	24 08.0 1.004 162.1	24 38.0 1.004 162.1	25 07.9 1.004 162.1	25 37.9 1.004 162.0	26 07.9 1.004 162.0	26 37.9 1.004 162.0	27 07.8 1.004 162.0	7
8	23 35.4 1.005 161.1	24 05.4 1.005 161.1	24 35.3 1.005 161.0	25 05.3 1.005 161.0	25 35.3 1.005 161.0	26 05.2 1.005 161.0	26 35.2 1.005 160.9	27 05.2 1.005 160.9	8
9	23 32.6 1.005 160.0	24 02.6 1.005 160.0	24 32.5 1.005 160.0	25 02.5 1.005 160.0	25 32.5 1.005 159.9	26 02.4 1.005 159.9	26 32.4 1.005 159.9	27 02.4 1.005 159.8	9
20	23 29.7 1.005 159.0	23 59.7 1.005 159.0	24 29.6 1.005 158.9	24 59.6 1.005 158.9	25 29.5 1.005 158.9	25 59.5 1.005 158.8	26 29.5 1.005 158.8	26 59.4 1.005 158.8	20
1	23 26.6 1.005 157.9	23 56.6 1.005 157.9	24 26.5 1.005 157.9	24 56.5 1.005 157.9	25 26.5 1.005 157.8	25 56.4 1.005 157.8	26 26.4 1.005 157.8	26 56.3 1.005 157.7	1
2	23 23.4 1.006 156.9	23 53.4 1.006 156.9	24 23.3 1.006 156.8	24 53.3 1.006 156.8	25 23.2 1.006 156.8	25 53.2 1.006 156.7	26 23.1 1.006 156.7	26 53.1 1.006 156.7	2
3	23 20.1 1.006 155.9	23 50.0 1.006 155.8	24 20.0 1.006 155.8	24 49.9 1.006 155.8	25 19.9 1.006 155.7	25 49.8 1.006 155.7	26 19.8 1.006 155.7	26 49.7 1.006 155.6	3
4	23 16.6 1.006 154.8	23 46.5 1.006 154.8	24 16.5 1.006 154.7	24 46.4 1.006 154.7	25 16.4 1.006 154.7	25 46.3 1.006 154.6	26 16.2 1.006 154.6	26 46.2 1.006 154.6	4
25	23 13.0 1.006 153.8	23 42.9 1.006 153.7	24 12.8 1.006 153.7	24 42.8 1.006 153.7	25 12.7 1.006 153.6	25 42.7 1.006 153.6	26 12.6 1.006 153.6	26 42.5 1.006 153.5	25
6	23 09.2 1.006 152.7	23 39.1 1.006 152.7	24 09.1 1.006 152.6	24 39.0 1.007 152.6	25 08.9 1.007 152.6	25 38.9 1.007 152.5	26 08.8 1.007 152.5	26 38.7 1.007 152.5	6
7	23 05.3 1.007 151.7	23 35.2 1.007 151.6	24 05.2 1.007 151.6	24 35.1 1.007 151.6	25 05.0 1.007 151.5	25 35.0 1.007 151.5	26 04.9 1.007 151.5	26 34.8 1.007 151.4	7
8	23 01.3 1.007 150.6	23 31.2 1.007 150.6	24 01.1 1.007 150.6	24 31.1 1.007 150.5	25 01.0 1.007 150.5	25 30.9 1.007 150.4	26 00.8 1.007 150.4	26 30.7 1.007 150.4	8
9	22 57.1 1.007 149.6	23 27.1 1.007 149.6	23 57.0 1.007 149.5	24 26.9 1.007 149.5	24 56.8 1.007 149.4	25 26.7 1.007 149.4	25 56.6 1.007 149.4	26 26.6 1.007 149.3	9
30	22 52.8 1.007 148.6	23 22.8 1.007 148.5	23 52.7 1.007 148.5	24 22.6 1.007 148.4	24 52.5 1.007 148.4	25 22.4 1.007 148.3	25 52.3 1.007 148.3	26 22.2 1.007 148.3	30
1	22 48.4 1.008 147.5	23 18.3 1.008 147.5	23 48.2 1.008 147.4	24 18.1 1.008 147.4	24 48.1 1.008 147.3	25 18.0 1.008 147.3	25 47.9 1.008 147.3	26 17.8 1.008 147.2	1
2	22 43.9 1.008 146.5	23 13.8 1.008 146.4	23 43.7 1.008 146.4	24 13.6 1.008 146.3	24 43.5 1.008 146.3	25 13.4 1.008 146.3	25 43.3 1.008 146.2	26 13.2 1.008 146.2	2
3	22 39.2 1.008 145.4	23 09.1 1.008 145.4	23 39.0 1.008 145.3	24 08.9 1.008 145.3	24 38.8 1.008 145.3	25 08.7 1.008 145.2	25 38.6 1.008 145.2	26 08.5 1.008 145.1	3
4	22 34.4 1.008 144.4	23 04.3 1.008 144.4	23 34.2 1.008 144.3	24 04.1 1.008 144.3	24 34.0 1.008 144.2	25 03.9 1.008 144.2	25 33.7 1.008 144.1	26 03.6 1.008 144.1	4
35	22 29.5 1.008 143.4	22 59.4 1.008 143.3	23 29.2 1.008 143.3	23 59.1 1.008 143.2	24 29.0 1.009 143.2	24 58.9 1.009 143.1	25 28.8 1.008 143.1	25 58.7 1.008 143.0	35
6	22 24.4 1.009 142.3	22 54.3 1.009 142.3	23 24.2 1.009 142.2	23 54.1 1.009 142.2	24 24.0 1.009 142.1	24 53.8 1.009 142.1	25 23.7 1.009 142.0	25 53.6 1.009 142.0	6
7	22 19.3 1.009 141.3	22 49.1 1.009 141.2	23 19.0 1.009 141.2	23 48.9 1.009 141.1	24 18.8 1.009 141.1	24 48.6 1.009 141.0	25 18.5 1.009 141.0	25 48.4 1.009 140.9	7
8	22 14.1 1.009 140.3	22 43.9 1.009 140.2	23 13.7 1.009 140.2	23 43.6 1.009 140.1	24 13.5 1.009 140.1	24 43.3 1.009 140.0	25 13.2 1.009 140.0	25 43.1 1.009 139.9	8
9	22 08.6 1.009 139.2	22 38.5 1.009 139.2	23 08.3 1.009 139.1	23 38.2 1.009 139.1	24 08.0 1.009 139.0	24 37.9 1.009 139.0	25 07.8 1.009 138.9	25 37.6 1.009 138.9	9
40	22 03.1 1.009 138.2	22 32.9 1.009 138.1	23 02.8 1.009 138.1	23 32.7 1.009 138.0	24 02.5 1.009 138.0	24 32.4 1.009 137.9	25 02.2 1.009 137.9	25 32.1 1.009 137.8	40
1	21 57.5 1.0 10 137.2	22 27.3 1.0 10 137.1	22 57.2 1.0 10 137.1	23 27.0 1.0 10 137.0	23 56.9 99 10 136.9	24 26.7 99 10 136.9	24 56.6 99 10 136.8	25 26.4 99 10 136.8	1
2	21 51.7 99 10 136.1	22 21.6 99 10 136.1	22 51.4 99 10 136.0	23 21.3 99 10 136.0	23 51.1 99 10 135.9	24 21.0 99 10 135.9	24 50.8 99 10 135.8	25 20.6 99 10 135.7	2
3	21 45.8 99 10 135.1	22 15.7 99 10 135.0	22 45.6 99 10 135.0	23 15.4 99 10 134.9	23 45.2 99 10 134.8	24 15.1 99 10 134.8	24 44.9 99 10 134.8	25 14.8 99 10 134.7	3
4	21 39.9 99 10 134.1	22 09.8 99 10 134.0	22 39.6 99 10 134.0	23 09.4 99 10 133.9	23 39.3 99 10 133.9	24 09.1 99 10 133.8	24 38.9 99 10 133.7	25 08.8 99 10 133.7	4
45	21 33.9 99 10 133.0	22 03.7 99 10 133.0	22 33.5 99 10 132.9	23 03.4 99 10 132.9	23 33.2 99 10 132.8	24 03.0 99 10 132.8	24 32.9 99 10 132.7	25 02.7 99 10 132.6	45
6	21 27.7 99 10 132.0	21 57.6 99 10 132.0	22 27.4 99 10 131.9	22 57.2 99 10 131.8	23 27.0 99 10 131.8	23 56.8 99 10 131.7	24 26.7 99 11 131.7	24 56.5 99 11 131.6	6
7	21 21.5 99 11 131.0	21 51.3 99 11 130.9	22 21.1 99 11 130.9	22 50.9 99 11 130.8	23 20.8 99 11 130.7	23 50.6 99 11 130.7	24 20.4 99 11 130.6	24 50.2 99 11 130.6	7
8	21 15.1 99 11 130.0	21 44.9 99 11 129.9	22 14.8 99 11 129.8	22 44.6 99 11 129.8	23 14.4 99 11 129.7	23 44.2 99 11 129.6	24 14.0 99 11 129.6	24 43.8 99 11 129.5	8
9	21 08.7 99 11 128.9	21 38.5 99 11 128.9	22 08.3 99 11 128.8	22 38.1 99 11 128.8	23 07.9 99 11 128.7	23 37.7 99 11 128.6	24 07.5 99 11 128.6	24 37.3 99 11 128.5	9
50	21 02.1 99 11 127.9	21 31.9 99 11 127.9	22 01.7 99 11 127.8	22 31.5 99 11 127.7	23 01.3 99 11 127.7	23 31.1 99 11 127.6	24 00.9 99 11 127.5	24 30.7 99 11 127.5	50
1	20 55.5 99 11 126.9	21 25.3 99 11 126.8	21 55.1 99 11 126.8	22 24.9 99 11 126.7	22 54.7 99 11 126.6	23 24.5 99 11 126.6	23 54.3 99 11 126.5	24 24.1 99 11 126.4	1
2	20 48.8 99 11 125.9	21 18.6 99 11 125.8	21 48.4 99 11 125.7	22 18.2 99 11 125.7	22 47.9 99 11 125.6	23 17.7 99 11 125.5	23 47.5 99 11 125.5	24 17.3 99 11 125.4	2
3	20 42.1 99 12 124.8	21 11.8 99 12 124.8	21 41.5 99 12 124.7	22 11.3 99 12 124.7	22 41.1 99 12 124.6	23 10.9 99 12 124.5	23 40.7 99 12 124.5	24 10.4 99 12 124.4	3
4	20 35.1 99 12 123.8	21 04.9 99 12 123.8	21 34.6 99 12 123.7	22 04.4 99 12 123.6	22 34.2 99 12 123.6	23 04.0 99 12 123.5	23 33.7 99 12 123.4	24 03.5 99 12 123.4	4
55	20 28.1 99 12 122.8	20 57.9 99 12 122.7	21 27.6 99 12 122.7	21 57.4 99 12 122.6	22 27.2 99 12 122.5	22 57.0 99 12 122.5	23 26.7 99 12 122.4	23 56.5 99 12 122.3	55
6	20 21.0 99 12 121.8	20 50.8 99 12 121.7	21 20.6 99 12 121.7	21 50.3 99 12 121.6	22 20.1 99 12 121.5	22 49.9 99 12 121.5	23 19.6 99 12 121.4	23 49.4 99 12 121.3	6
7	20 13.9 99 12 120.8	20 43.7 99 12 120.7	21 13.4 99 12 120.6	21 43.2 99 12 120.6	22 13.0 99 12 120.5	22 42.7 99 12 120.4	23 12.5 99 12 120.4	23 42.2 99 12 120.3	7
8	20 06.7 99 12 119.8	20 36.5 99 12 119.7	21 06.2 99 12 119.6	21 36.0 99 12 119.6	22 05.7 99 12 119.5	22 35.5 99 12 119.4	23 05.2 99 12 119.3	23 35.0 99 12 119.3	8
9	19 59.4 99 12 118.7	20 29.2 99 12 118.7	20 58.9 99 12 118.6	21 28.7 99 12 118.5	21 58.4 99 12 118.5	22 28.2 99 12 118.4	22 57.9 99 12 118.3	23 27.7 99 12 118.3	9
60	19 52.0 99 12 117.7	20 21.8 99 12 117.7	20 51.6 99 12 117.6	21 21.3 99 12 117.5	21 51.0 99 12 117.5	22 20.8 99 12 117.4	22 50.5 99 13 117.3	23 20.3 99 13 117.2	60
1	19 44.6 99 12 116.7	20 14.4 99 12 116.6	20 44.1 99 12 116.6	21 13.9 99 13 116.5	21 43.6 99 13 116.4	22 13.3 99 13 116.4	22 43.1 99 13 116.3	23 12.8 99 13 116.2	1
2	19 37.1 99 13 115.7	20 06.9 99 13 115.6	20 36.6 99 13 115.6	21 06.4 99 13 115.5	21 36.1 99 13 115.4	22 05.8 99 13 115.3	22 35.6 99 13 115.3	23 05.3 99 13 115.2	2
3	19 29.6 99 13 114.7	19 59.3 99 13 114.6	20 29.1 99 13 114.6	20 58.8 99 13 114.5	21 28.5 99 13 114.4	21 58.3 99 13 114.4	22 28.0 99 13 114.3	22 57.7 99 13 114.3	3
4	19 22.0 99 13 113.7	19 51.7 99 13 113.6	20 21.4 99 13 113.5	20 51.2 99 13 113.5	21 20.9 99 13 113.4	21 50.6 99 13 113.3	22 20.3 99 13 113.3	22 50.1 99 13 113.2	4
65	19 14.3 99 13 112.7	19 44.0 99 13 112.6	20 13.7 99 13 112.5	20 43.5 99 13 112.5	21 13.2 99 13 112.4	21 42.9 99 13 112.3	22 12.6 99 13 112.2	22 42.4 99 13 112.2	65
6	19 06.5 99 13 111.7	19 36.3 99 13 111.6	20 06.0 99 13 111.5	20 35.7 99 13 111.4	21 05.4 99 13 111.4	21 35.2 99 13 111.3	22 04.9 99 13 111.2	22 34.6 99 13 111.2	6
7	18 58.8 99 13 110.7	19 28.5 99 13 110.6	19 58.2 99 13 110.5	20 27.9 99 13 110.4	20 57.6 99 13 110.4	21 27.4 99 13 110.3	21 57.1 99 13 110.2	22 26.8 99 13 110.1	7
8	18 50.9 99 13 109.6	19 20.6 99 13 109.6	19 50.4 99 13 109.5	20 20.1 99 13 109.4	20 49.8 99 13 109.4	21 19.5 99 13 109.3	21 49.2 99 13 109.2	22 18.9 99 13 109.1	8
9	18 43.0 99 13 108.6	19 12.7 99 13 108.6	19 42.5 99 13 108.5	20 12.2 99 13 108.4	20 41.9 99 13 108.4	21 11.6 99 13 108.3	21 41.3 99 13 108.2	22 11.0 99 13 108.1	9
70	18 35.1 99 13 107.6	19 04.8 99 13 107.6	19 34.5 99 13 107.5	20 04.2 99 13 107.4	20 33.9 99 13 107.3	21 03.6 99 13 107.3	21 33.3 99 13 107.2	22 03.0 99 13 107.1	70
1	18 27.1 99 13 106.6	18 56.8 99 13 106.6	19 26.5 99 13 106.5	19 56.2 99 13 106.4	20 25.9 99 13 106.3	20 55.6 99 13 106.3	21 25.3 99 13 106.2	21 55.0 99 13 106.1	1
2	18 19.1 99 13 105.6	18 48.8 99 13 105.5	19 18.5 99 13 105.5	19 48.2 99 13 105.4	20 17.9 99 13 105.3	20 47.6 99 13 105.3	21 17.3 99 13 105.2	21 47.0 99 13 105.1	2
3	18 11.0 99 14 104.6	18 40.7 99 14 104.5	19 10.4 99 14 104.5	19 40.1 99 14 104.4	20 09.8 99 14 104.3	20 39.5 99 14 104.3	21 09.2 99 14 104.2	21 38.9 99 14 104.1	3
4	18 02.9 99 14 103.6	18 32.6 99 14 103.5	19 02.3 99 14 103.5	19 32.0 99 14 103.4	20 01.7 99 14 103.3	20 31.4 99 14 103.3	21 01.1 99 14 103.2	21 30.8 99 14 103.1	4
75	17 54.8 99 14 102.6	18 24.5 99 14 102.6	18 54.2 99 14 102.5	19 23.9 99 14 102.4	19 53.6 99 14 102.3	20 23.3 99 14 102.3	20 53.0 99 14 102.2	21 22.7 99 14 102.1	75
6	17 46.6 99 14 101.6	18 16.3 99 14 101.6	18 46.0 99 14 101.5	19 15.7 99 14 101.4	19 45.4 99 14 101.3	20 15.1 99 14 101.2	20 44.8 99 14 101.2	21 14.5 99 14 101.1	6
7	17 38.4 99 14 100.6	18 08.1 99 14 100.6	18 37.8 99 14 100.5	19 07.5 99 14 100.4	19 37.2 99 14 100.3	20 06.9 99 14 100.2	20 36.6 99 14 100.2	21 06.3 99 14 100.1	7
8	17 30.2 99 14 99.6	17 59.9 99 14 99.6	18 29.6 99 14 99.5	18 59.3 99 14 99.4	19 29.0 99 14 99.3	19 58.7 99 14 99.3	20 28.4 99 14 99.2	20 58.0 99 14 99.1	8
9	17 22.0 99 14 98.6	17 51.7 99 14 98.6	18 21.4 99 14 98.5	18 51.1 99 14 98.4	19 20.7 99 14 98.3	19 50.4 99 14 98.3	20 20.1 99 14 98.2	20 49.8 99 14 98.1	9
80	17 13.7 99 14 97.6	17 43.4 99 14 97.6	18 13.1 99 14 97.5	18 42.8 99 14 97.4	19 12.5 99 14 97.3	19 42.1 99 14 97.3	20 11.8 99 14 97.2	20 41.5 99 14 97.1	80
1	17 05.4 99 14 96.6	17 35.1 99 14 96.6	18 04.8 99 14 96.5	18 34.5 99 14 96.4	19 04.2 99 14 96.3	19 33.9 99 14 96.3	20 03.5 99 14 96.2	20 33.2 99 14 96.1	1
2	16 57.1 99 14 95.6	17 26.8 99 14 95.6	17 56.5 99 14 95.5	18 26.2 99 14 95.4	18 55.9 99 14 95.3	19 25.5 99 14 95.3	19 55.2 99 14 95.2	20 24.9 99 14 95.1	2
3	16 48.8 99 14 94.7	17 18.5 99 14 94.6	17 48.2 99 14 94.5	18 17.9 99 14 94.4	18 47.5 99 14 94.3	19 17.2 99 14 94.3	19 46.9 99 14 94.2	20 16.6 99 14 94.1	3
4	16 40.5 99 14 93.7	17 10.2 99 14 93.6	17 39.9 99 14 93.5	18 09.5 99 14 93.4	18 39.2 99 14 93.4	19 08.9 99 14 93.3	19 38.6 99 14 93.2	20 08.2 99 14 93.1	4
85	16 32.1 99 14 92.7	17 01.8 99 14 92.6	17 31.5 99 14 92.5	18 01.2 99 14 92.4	18 30.9 99 14 92.4	19 00.6 99 14 92.3	19 30.2 99 14 92.2	19 59.9 99 14 92.1	85
6	16 23.8 99 14 91.7	16 53.5 99 14 91.6	17 23.2 99 14 91.5	17 52.8 99 14 91.4	18 22.5 99 14 91.4	18 52.2 99 14 91.3	19 21.9 99 14 91.2	19 51.6 99 14 91.1	6
7	16 15.5 99 14 90.7	16 45.1 99 14 90.6	17 14.8 99 14 90.5	17 44.5 99 14 90.4	18 14.2 99 14 90.4	18 43.9 99 14 90.3	19 13.5 99 14 90.2	19 43.2 99 14 90.1	7
8	16 07.1 99 14 89.7	16 36.8 99 14 89.6	17 06.5 99 14 89.5	17 36.2 99 14 89.4	18 05.8 99 14 89.4	18 35.5 99 14 89.3	19 05.2 99 14 89.2	19 34.9 99 14 89.2	8
9	15 58.8 99 14 88.7	16 28.4 99 14 88.6	16 58.1 99 14 88.6	17 27.8 99 14 88.5	17 57.5 99 14 88.4	18 27.2 99 14 88.3	18 56.8 99 14 88.2	19 26.5 99 14 88.2	9
90	15 50.4 99 14 87.7	16 20.1 99 14 87.6	16 49.8 99 14 87.6	17 19.5 99 14 87.5	17 49.1 99 14 87.4	18 18.8 99 14 87.3	18 48.5 99 14 87.3	19 18.2 99 14 87.2	90

H.A.	16° 00′ Alt.	Δd Δt	Az.	16° 30′ Alt.	Δd Δt	Az.	17° 00′ Alt.	Δd Δt	Az.	17° 30′ Alt.	Δd Δt	Az.	18° 00′ Alt.	Δd Δt	Az.	18° 30′ Alt.	Δd Δt	Az.	19° 00′ Alt.	Δd Δt	Az.	19° 30′ Alt.	Δd Δt	Az.	H.A.
91	15 42.1	99 14	86.7	16 11.8	99 14	86.7	16 41.4	99 14	86.6	17 11.1	99 14	86.5	17 40.8	99 14	86.4	18 10.5	99 14	86.3	18 40.2	99 14	86.3	19 09.8	99 14	86.2	91
2	15 33.7	99 14	85.7	16 03.4	99 14	85.7	16 33.1	99 14	85.6	17 02.8	99 14	85.5	17 32.5	99 14	85.4	18 02.1	99 14	85.4	18 31.8	99 14	85.3	19 01.5	99 14	85.2	2
3	15 25.4	99 14	84.8	15 55.1	99 14	84.7	16 24.8	99 14	84.6	16 54.5	99 14	84.5	17 24.2	99 14	84.4	17 53.8	99 14	84.4	18 23.5	99 14	84.3	18 53.2	99 14	84.2	3
4	15 17.1	99 14	83.8	15 46.8	99 14	83.7	16 16.5	99 14	83.6	16 46.2	99 14	83.5	17 15.8	99 14	83.5	17 45.5	99 14	83.4	18 15.2	99 14	83.3	18 44.9	99 14	83.2	4
95	15 08.8	99 14	82.8	15 38.5	99 14	82.7	16 08.2	99 14	82.6	16 37.9	99 14	82.6	17 07.6	99 14	82.5	17 37.2	99 14	82.4	18 06.9	99 14	82.3	18 36.6	99 14	82.2	95
6	15 00.5	99 14	81.8	15 30.2	99 14	81.7	15 59.9	99 14	81.6	16 29.6	99 14	81.6	16 59.3	99 14	81.5	17 29.0	99 14	81.4	17 58.7	99 14	81.3	18 28.3	99 14	81.3	6
7	14 52.3	99 14	80.8	15 22.0	99 14	80.7	15 51.7	99 14	80.7	16 21.4	99 14	80.6	16 51.0	99 14	80.5	17 20.7	99 14	80.4	17 50.4	99 14	80.4	18 20.1	99 14	80.3	7
8	14 44.1	99 14	79.8	15 13.7	99 14	79.8	15 43.4	99 14	79.7	16 13.1	99 14	79.6	16 42.8	99 14	79.5	17 12.5	99 14	79.5	17 42.2	99 14	79.4	18 11.9	99 14	79.3	8
9	14 35.8	99 14	78.8	15 05.5	99 14	78.8	15 35.2	99 14	78.7	16 04.9	99 14	78.6	16 34.6	99 14	78.5	17 04.3	99 14	78.5	17 34.0	99 14	78.4	18 03.7	99 14	78.3	9
100	14 27.7	99 14	77.9	14 57.4	99 14	77.8	15 27.1	99 14	77.7	15 56.8	99 14	77.6	16 26.5	99 14	77.6	16 56.1	99 14	77.5	17 25.8	99 14	77.4	17 55.5	99 14	77.3	100
1	14 19.5	99 14	76.9	14 49.2	99 14	76.8	15 18.9	99 14	76.7	15 48.6	99 14	76.7	16 18.3	99 14	76.6	16 48.0	99 14	76.5	17 17.7	99 14	76.4	17 47.4	99 14	76.4	1
2	14 11.4	99 13	75.9	14 41.1	99 14	75.8	15 10.8	99 13	75.7	15 40.5	99 13	75.7	16 10.2	99 13	75.6	16 39.9	99 13	75.5	17 09.6	99 13	75.5	17 39.3	99 13	75.4	2
3	14 03.3	99 13	74.9	14 33.0	99 13	74.8	15 02.7	99 13	74.7	15 32.4	99 13	74.7	16 02.1	99 13	74.6	16 31.8	99 13	74.5	17 01.5	99 13	74.5	17 31.2	99 13	74.4	3
4	13 55.3	99 13	73.9	14 25.0	99 13	73.9	14 54.7	99 13	73.8	15 24.4	99 13	73.7	15 54.1	99 13	73.6	16 23.8	99 13	73.6	16 53.5	99 13	73.5	17 23.2	99 13	73.4	4
105	13 47.3	99 13	73.0	14 17.0	99 13	72.9	14 46.7	99 13	72.8	15 16.4	99 13	72.7	15 46.1	99 13	72.7	16 15.8	99 13	72.6	16 45.5	99 13	72.5	17 15.2	99 13	72.4	105
6	13 39.3	99 13	72.0	14 09.0	99 13	71.9	14 38.7	99 13	71.8	15 08.5	99 13	71.8	15 38.2	99 13	71.7	16 07.9	99 13	71.6	16 37.6	99 13	71.5	17 07.3	99 13	71.5	6
7	13 31.4	99 13	71.0	14 01.1	99 13	70.9	14 30.8	99 13	70.9	15 00.5	99 13	70.8	15 30.3	99 13	70.7	16 00.0	99 13	70.6	16 29.7	99 13	70.6	16 59.4	99 13	70.5	7
8	13 23.5	99 13	70.0	13 53.2	99 13	69.9	14 23.0	99 13	69.9	14 52.7	99 13	69.8	15 22.4	99 13	69.7	15 52.1	99 13	69.7	16 21.8	99 13	69.6	16 51.5	99 13	69.5	8
9	13 15.7	99 13	69.0	13 45.4	99 13	69.0	14 15.2	99 13	68.9	14 44.9	99 13	68.8	15 14.6	99 13	68.8	15 44.3	99 13	68.7	16 14.0	99 13	68.6	16 43.7	99 13	68.5	9
110	13 07.9	99 13	68.1	13 37.7	99 13	68.0	14 07.4	99 13	67.9	14 37.1	99 13	67.8	15 06.8	99 13	67.8	15 36.6	99 13	67.7	16 06.3	99 13	67.6	16 36.0	99 13	67.6	110
1	13 00.2	99 13	67.1	13 29.9	99 13	67.0	13 59.7	99 13	66.9	14 29.4	99 13	66.9	14 59.1	99 13	66.8	15 28.9	99 13	66.7	15 58.6	99 13	66.7	16 28.3	99 13	66.6	1
2	12 52.6	99 13	66.1	13 22.3	99 13	66.0	13 52.0	99 13	66.0	14 21.8	99 13	65.9	14 51.5	99 13	65.8	15 21.2	99 13	65.8	15 50.9	99 13	65.7	16 20.7	99 13	65.6	2
3	12 44.9	99 13	65.1	13 14.7	99 13	65.1	13 44.4	99 13	65.0	14 14.2	99 13	64.9	14 43.9	99 13	64.9	15 13.6	99 13	64.8	15 43.4	99 13	64.7	16 13.1	99 13	64.6	3
4	12 37.4	99 12	64.1	13 07.2	99 12	64.1	13 36.9	99 12	64.0	14 06.6	99 12	63.9	14 36.4	99 12	63.9	15 06.1	99 12	63.8	15 35.8	99 12	63.7	16 05.6	99 12	63.7	4
115	12 29.9	99 12	63.2	12 59.7	99 12	63.1	13 29.4	99 12	63.0	13 59.2	99 12	63.0	14 28.9	99 12	62.9	14 58.6	99 12	62.8	15 28.4	99 12	62.8	15 58.1	99 12	62.7	115
6	12 22.5	99 12	62.2	12 52.3	99 12	62.1	13 22.0	99 12	62.1	13 51.8	99 12	62.0	14 21.5	99 12	61.9	14 51.3	99 12	61.9	15 21.0	99 12	61.8	15 50.7	99 12	61.7	6
7	12 15.1	99 12	61.2	12 44.9	99 12	61.2	13 14.7	99 12	61.1	13 44.4	99 12	61.0	14 14.2	99 12	61.0	14 43.9	99 12	60.9	15 13.7	99 12	60.8	15 43.4	99 12	60.8	7
8	12 07.9	99 12	60.2	12 37.6	99 12	60.2	13 07.4	99 12	60.1	13 37.1	99 12	60.0	14 06.9	99 12	60.0	14 36.7	99 12	59.9	15 06.4	99 12	59.9	15 36.2	99 12	59.8	8
9	12 00.6	99 12	59.2	12 30.4	99 12	59.2	13 00.2	99 12	59.1	13 29.9	99 12	59.1	13 59.7	99 12	59.0	14 29.5	99 12	58.9	14 59.2	99 12	58.9	15 29.0	99 12	58.8	9
120	11 53.5	99 12	58.3	12 23.3	99 12	58.2	12 53.0	99 12	58.2	13 22.8	99 12	58.1	13 52.6	99 12	58.0	14 22.4	99 12	58.0	14 52.1	99 12	57.9	15 21.9	99 12	57.8	120
1	11 46.4	99 12	57.3	12 16.2	99 12	57.3	12 46.0	99 12	57.2	13 15.8	99 12	57.1	13 45.5	99 12	57.1	14 15.3	99 12	57.0	14 45.1	99 12	56.9	15 14.9	99 12	56.9	1
2	11 39.5	99 12	56.3	12 09.2	99 12	56.3	12 39.0	99 12	56.2	13 08.8	99 12	56.2	13 38.6	99 11	56.1	14 08.3	99 11	56.0	14 38.1	99 11	56.0	15 07.9	99 11	55.9	2
3	11 32.5	99 11	55.4	12 02.3	99 11	55.3	12 32.1	99 11	55.2	13 01.9	99 11	55.2	13 31.7	99 11	55.1	14 01.5	99 11	55.1	14 31.2	99 11	55.0	15 01.0	99 11	54.9	3
4	11 25.7	99 11	54.4	11 55.5	99 11	54.3	12 25.3	99 11	54.3	12 55.1	99 11	54.2	13 24.9	99 11	54.2	13 54.7	99 11	54.1	14 24.4	99 11	54.0	14 54.2	99 11	54.0	4
125	11 19.0	99 11	53.4	11 48.8	99 11	53.4	12 18.6	99 11	53.3	12 48.3	99 11	53.2	13 18.1	99 11	53.2	13 47.9	99 11	53.1	14 17.7	99 11	53.1	14 47.5	99 11	53.0	125
6	11 12.3	99 11	52.4	11 42.1	99 11	52.4	12 11.9	99 11	52.3	12 41.7	99 11	52.3	13 11.5	99 11	52.2	13 41.3	99 11	52.2	14 11.1	99 11	52.1	14 40.9	99 11	52.0	6
7	11 05.7	99 11	51.5	11 35.5	99 11	51.4	12 05.3	99 11	51.4	12 35.1	99 11	51.3	13 04.9	99 11	51.2	13 34.7	99 11	51.2	14 04.6	99 11	51.1	14 34.4	99 11	51.1	7
8	10 59.2	99 11	50.5	11 29.0	99 11	50.4	11 58.9	99 11	50.4	12 28.7	99 11	50.3	12 58.5	99 11	50.3	13 28.3	99 11	50.2	13 58.1	99 11	50.2	14 27.9	99 11	50.1	8
9	10 52.8	99 10	49.5	11 22.7	99 10	49.5	11 52.5	99 10	49.4	12 22.3	99 10	49.4	12 52.1	99 10	49.3	13 21.9	99 10	49.2	13 51.7	99 10	49.2	14 21.5	99 10	49.1	9
130	10 46.5	99 10	48.6	11 16.4	99 10	48.5	11 46.2	99 10	48.4	12 16.0	99 10	48.4	12 45.8	99 10	48.3	13 15.6	99 10	48.3	13 45.5	99 10	48.2	14 15.3	99 10	48.2	130
1	10 40.3	99 10	47.6	11 10.1	99 10	47.5	11 40.0	99 10	47.5	12 09.8	99 10	47.4	12 39.6	99 10	47.4	13 09.5	99 10	47.3	13 39.3	99 10	47.3	14 09.1	99 10	47.2	1
2	10 34.2	99 10	46.6	11 04.0	99 10	46.6	11 33.9	99 10	46.5	12 03.7	99 10	46.4	12 33.5	99 10	46.4	13 03.4	99 10	46.3	13 33.2	99 10	46.3	14 03.0	99 10	46.2	2
3	10 28.2	99 10	45.6	10 58.0	99 10	45.6	11 27.9	99 10	45.5	11 57.7	99 10	45.5	12 27.5	99 10	45.4	12 57.4	99 10	45.4	13 27.2	99 10	45.3	13 57.1	99 10	45.3	3
4	10 22.3	99 10	44.7	10 52.1	99 10	44.6	11 22.0	99 10	44.6	11 51.8	99 10	44.5	12 21.6	99 10	44.5	12 51.5	99 10	44.4	13 21.3	99 10	44.4	13 51.2	99 10	44.3	4
135	10 16.4	99 10	43.7	10 46.3	99 10	43.6	11 16.1	99 10	43.6	11 46.0	99 10	43.5	12 15.8	99 09	43.5	12 45.7	99 09	43.4	13 15.5	99 09	43.4	13 45.4	99 09	43.3	135
6	10 10.7	1.009	42.7	10 40.6	1.009	42.7	11 10.4	1.009	42.6	11 40.3	1.009	42.6	12 10.1	1.009	42.5	12 40.0	1.009	42.5	13 09.8	1.009	42.4	13 39.7	1.009	42.4	6
7	10 05.1	1.009	41.7	10 35.0	1.009	41.7	11 04.8	1.009	41.7	11 34.7	1.009	41.6	12 04.6	1.009	41.6	12 34.4	1.009	41.5	13 04.3	1.009	41.5	13 34.1	1.009	41.4	7
8	9 59.6	1.009	40.8	10 29.5	1.009	40.7	10 59.3	1.009	40.7	11 29.2	1.009	40.6	11 59.1	1.009	40.6	12 28.9	1.009	40.5	12 58.8	1.009	40.5	13 28.7	1.009	40.4	8
9	9 54.2	1.009	39.8	10 24.1	1.009	39.8	10 53.9	1.009	39.7	11 23.8	1.009	39.7	11 53.7	1.009	39.6	12 23.6	1.009	39.6	12 53.4	1.009	39.5	13 23.3	1.009	39.5	9
140	9 48.9	1.009	38.8	10 18.8	1.009	38.8	10 48.7	1.009	38.7	11 18.5	1.009	38.7	11 48.4	1.009	38.6	12 18.3	1.009	38.6	12 48.2	1.009	38.6	13 18.0	1.009	38.5	140
1	9 43.7	1.008	37.9	10 13.6	1.008	37.8	10 43.5	1.008	37.8	11 13.4	1.008	37.7	11 43.3	1.008	37.7	12 13.1	1.008	37.6	12 43.0	1.008	37.6	13 12.9	1.008	37.5	1
2	9 38.7	1.008	36.9	10 08.6	1.008	36.8	10 38.4	1.008	36.8	11 08.3	1.008	36.8	11 38.2	1.008	36.7	12 08.1	1.008	36.7	12 38.0	1.008	36.6	13 07.9	1.008	36.6	2
3	9 33.7	1.008	35.9	10 03.6	1.008	35.9	10 33.5	1.008	35.8	11 03.4	1.008	35.8	11 33.3	1.008	35.7	12 03.2	1.008	35.7	12 33.1	1.008	35.7	13 02.9	1.008	35.6	3
4	9 28.9	1.008	34.9	9 58.8	1.008	34.9	10 28.7	1.008	34.9	10 58.6	1.008	34.8	11 28.5	1.008	34.8	11 58.3	1.008	34.7	12 28.2	1.008	34.7	12 58.1	1.008	34.7	4
145	9 24.1	1.008	34.0	9 54.0	1.008	33.9	10 23.9	1.008	33.9	10 53.8	1.008	33.9	11 23.7	1.008	33.8	11 53.6	1.008	33.8	12 23.5	1.008	33.7	12 53.4	1.008	33.7	145
6	9 19.5	1.007	33.0	9 49.4	1.008	33.0	10 19.3	1.007	32.9	10 49.3	1.007	32.9	11 19.2	1.007	32.8	11 49.1	1.007	32.8	12 19.0	1.007	32.8	12 48.9	1.007	32.7	6
7	9 15.0	1.007	32.0	9 45.0	1.007	32.0	10 14.9	1.007	32.0	10 44.8	1.007	31.9	11 14.7	1.007	31.9	11 44.6	1.007	31.8	12 14.5	1.007	31.8	12 44.4	1.007	31.8	7
8	9 10.7	1.007	31.1	9 40.6	1.007	31.0	10 10.5	1.007	31.0	10 40.4	1.007	31.0	11 10.3	1.007	30.9	11 40.2	1.007	30.9	12 10.1	1.007	30.8	12 40.1	1.007	30.8	8
9	9 06.4	1.007	30.1	9 36.4	1.007	30.1	10 06.3	1.007	30.0	10 36.2	1.007	30.0	11 06.1	1.007	29.9	11 36.0	1.007	29.9	12 06.0	1.007	29.9	12 35.9	1.007	29.8	9
150	9 02.3	1.007	29.1	9 32.2	1.007	29.1	10 02.2	1.007	29.1	10 32.1	1.007	29.0	11 02.0	1.007	29.0	11 31.9	1.007	28.9	12 01.9	1.007	28.9	12 31.8	1.007	28.9	150
1	8 58.3	1.006	28.2	9 28.2	1.006	28.1	9 58.2	1.006	28.1	10 28.1	1.006	28.0	10 58.0	1.006	28.0	11 27.9	1.006	28.0	11 57.9	1.006	27.9	12 27.8	1.006	27.9	1
2	8 54.4	1.006	27.2	9 24.4	1.006	27.1	9 54.3	1.006	27.1	10 24.2	1.006	27.1	10 54.2	1.006	27.0	11 24.1	1.006	27.0	11 54.0	1.006	27.0	12 24.0	1.006	26.9	2
3	8 50.7	1.006	26.2	9 20.6	1.006	26.2	9 50.6	1.006	26.1	10 20.5	1.006	26.1	10 50.4	1.006	26.1	11 20.4	1.006	26.0	11 50.3	1.006	26.0	12 20.2	1.006	26.0	3
4	8 47.1	1.006	25.2	9 17.0	1.006	25.2	9 46.9	1.006	25.2	10 16.9	1.006	25.1	10 46.8	1.006	25.1	11 16.8	1.006	25.1	11 46.7	1.006	25.0	12 16.6	1.006	25.0	4
155	8 43.6	1.006	24.3	9 13.5	1.006	24.2	9 43.4	1.006	24.2	10 13.4	1.006	24.2	10 43.3	1.006	24.1	11 13.3	1.006	24.1	11 43.2	1.006	24.1	12 13.2	1.006	24.1	155
6	8 40.2	1.005	23.3	9 10.1	1.005	23.3	9 40.1	1.005	23.2	10 10.0	1.005	23.2	10 40.0	1.005	23.2	11 09.9	1.005	23.2	11 39.9	1.005	23.1	12 09.8	1.005	23.1	6
7	8 36.9	1.005	22.3	9 06.9	1.005	22.3	9 36.9	1.005	22.3	10 06.8	1.005	22.2	10 36.8	1.005	22.2	11 06.7	1.005	22.2	11 36.7	1.005	22.2	12 06.6	1.005	22.1	7
8	8 33.8	1.005	21.4	9 03.8	1.005	21.3	9 33.8	1.005	21.3	10 03.7	1.005	21.3	10 33.7	1.005	21.2	11 03.6	1.005	21.2	11 33.6	1.005	21.2	12 03.5	1.005	21.2	8
9	8 30.9	1.005	20.4	9 00.8	1.005	20.4	9 30.8	1.005	20.3	10 00.8	1.005	20.3	10 30.7	1.005	20.3	11 00.7	1.005	20.3	11 30.6	1.005	20.2	12 00.6	1.005	20.2	9
160	8 28.0	1.004	19.4	8 58.0	1.004	19.4	9 28.0	1.004	19.4	9 57.9	1.004	19.3	10 27.9	1.004	19.3	10 57.8	1.004	19.3	11 27.8	1.004	19.3	11 57.8	1.004	19.2	160
1	8 25.3	1.004	18.4	8 55.3	1.004	18.4	9 25.3	1.004	18.4	9 55.2	1.004	18.4	10 25.2	1.004	18.4	10 55.2	1.004	18.3	11 25.1	1.004	18.3	11 55.1	1.004	18.3	1
2	8 22.7	1.004	17.5	8 52.7	1.004	17.4	9 22.7	1.004	17.4	9 52.7	1.004	17.4	10 22.6	1.004	17.4	10 52.6	1.004	17.4	11 22.6	1.004	17.3	11 52.5	1.004	17.3	2
3	8 20.3	1.004	16.5	8 50.3	1.004	16.5	9 20.3	1.004	16.5	9 50.2	1.004	16.4	10 20.2	1.004	16.4	10 50.2	1.004	16.4	11 20.1	1.004	16.4	11 50.1	1.004	16.4	3
4	8 18.0	1.004	15.5	8 48.0	1.004	15.5	9 18.0	1.004	15.5	9 47.9	1.004	15.5	10 17.9	1.004	15.4	10 47.9	1.004	15.4	11 17.9	1.004	15.4	11 47.8	1.004	15.4	4
165	8 15.8	1.003	14.6	8 45.8	1.003	14.5	9 15.8	1.003	14.5	9 45.8	1.003	14.5	10 15.8	1.003	14.5	10 45.7	1.003	14.5	11 15.7	1.003	14.4	11 45.7	1.003	14.4	165
6	8 13.8	1.003	13.6	8 43.8	1.003	13.6	9 13.8	1.003	13.6	9 43.7	1.003	13.5	10 13.7	1.003	13.5	10 43.7	1.003	13.5	11 13.7	1.003	13.5	11 43.7	1.003	13.5	6
7	8 11.9	1.003	12.6	8 41.9	1.003	12.6	9 11.9	1.003	12.6	9 41.9	1.003	12.6	10 11.8	1.003	12.6	10 41.8	1.003	12.5	11 11.8	1.003	12.5	11 41.8	1.003	12.5	7
8	8 10.2	1.003	11.6	8 40.1	1.003	11.6	9 10.1	1.003	11.6	9 40.1	1.003	11.6	10 10.1	1.003	11.6	10 40.1	1.003	11.6	11 10.1	1.003	11.5	11 40.1	1.003	11.5	8
9	8 08.5	1.002	10.7	8 38.5	1.002	10.7	9 08.5	1.002	10.7	9 38.5	1.002	10.6	10 08.5	1.002	10.6	10 38.5	1.002	10.6	11 08.5	1.002	10.6	11 38.5	1.002	10.6	9
170	8 07.1	1.002	09.7	8 37.0	1.002	09.7	9 07.0	1.002	09.7	9 37.0	1.002	09.7	10 07.0	1.002	09.7	10 37.0	1.002	09.6	11 07.0	1.002	09.6	11 37.0	1.002	09.6	170
1	8 05.7	1.002	08.7	8 35.7	1.002	08.7	9 05.7	1.002	08.7	9 35.7	1.002	08.7	10 05.7	1.002	08.7	10 35.7	1.002	08.7	11 05.7	1.002	08.7	11 35.7	1.002	08.7	1
2	8 04.5	1.002	07.8	8 34.5	1.002	07.8	9 04.5	1.002	07.7	9 34.5	1.002	07.7	10 04.5	1.002	07.7	10 34.5	1.002	07.7	11 04.5	1.002	07.7	11 34.5	1.002	07.7	2
3	8 03.5	1.002	06.8	8 33.5	1.002	06.8	9 03.5	1.002	06.8	9 33.4	1.002	06.8	10 03.4	1.002	06.8	10 33.4	1.002	06.8	11 03.4	1.002	06.7	11 33.4	1.002	06.7	3
4	8 02.5	1.001	05.8	8 32.5	1.001	05.8	9 02.5	1.001	05.8	9 32.5	1.001	05.8	10 02.5	1.001	05.8	10 32.5	1.001	05.8	11 02.5	1.001	05.8	11 32.5	1.001	05.8	4
175	8 01.8	1.001	04.9	8 31.8	1.001	04.8	9 01.8	1.001	04.8	9 31.8	1.001	04.8	10 01.8	1.001	04.8	10 31.8	1.001	04.8	11 01.8	1.001	04.8	11 31.8	1.001	04.8	175
6	8 01.1	1.001	03.9	8 31.1	1.001	03.9	9 01.1	1.001	03.9	9 31.1	1.001	03.9	10 01.1	1.001	03.9	10 31.1	1.001	03.9	11 01.1	1.001	03.8	11 31.1	1.001	03.8	6
7	8 00.6	1.001	02.9	8 30.6	1.001	02.9	9 00.6	1.001	02.9	9 30.6	1.001	02.9	10 00.6	1.001	02.9	10 30.6	1.001	02.9	11 00.6	1.001	02.9	11 30.6	1.001	02.9	7
8	8 00.3	1.000	01.9	8 30.3	1.000	01.9	9 00.3	1.000	01.9	9 30.3	1.000	01.9	10 00.3	1.000	01.9	10 30.3	1.000	01.9	11 00.3	1.000	01.9	11 30.3	1.000	01.9	8
9	8 00.1	1.000	01.0	8 30.1	1.000	01.0	9 00.1	1.000	01.0	9 30.1	1.000	01.0	10 00.1	1.000	01.0	10 30.1	1.000	01.0	11 00.1	1.000	01.0	11 30.1	1.000	01.0	9
180	8 00.0	1.000	00.0	8 30.0	1.000	00.0	9 00.0	1.000	00.0	9 30.0	1.000	00.0	10 00.0	1.000	00.0	10 30.0	1.000	00.0	11 00.0	1.000	00.0	11 30.0	1.000	00.0	180

H.A.	20° 00' Alt.	Δd Δt	Az.	20° 30' Alt.	Δd Δt	Az.	21° 00' Alt.	Δd Δt	Az.	21° 30' Alt.	Δd Δt	Az.	22° 00' Alt.	Δd Δt	Az.	22° 30' Alt.	Δd Δt	Az.	23° 00' Alt.	Δd Δt	Az.	23° 30' Alt.	Δd Δt	Az.	H.A.
00	28 00.0	1.0 00	180.0	28 30.0	1.0 00	180.0	29 00.0	1.0 00	180.0	29 30.0	1.0 00	180.0	30 00.0	1.0 00	180.0	30 30.0	1.0 00	180.0	31 00.0	1.0 00	180.0	31 30.0	1.0 00	180.0	00
1	27 59.9	1.0 00	178.9	28 29.9	1.0 00	178.9	28 59.9	1.0 00	178.9	29 29.9	1.0 00	178.9	29 59.9	1.0 00	178.9	30 29.9	1.0 00	178.9	30 59.9	1.0 00	178.9	31 29.9	1.0 00	178.9	1
2	27 59.7	1.0 01	177.9	28 29.7	1.0 01	177.9	28 59.7	1.0 01	177.9	29 29.7	1.0 01	177.9	29 59.7	1.0 01	177.9	30 29.7	1.0 01	177.9	30 59.7	1.0 01	177.9	31 29.7	1.0 01	177.8	2
3	27 59.3	1.0 01	176.8	28 29.3	1.0 01	176.8	28 59.3	1.0 01	176.8	29 29.3	1.0 01	176.8	29 59.3	1.0 01	176.8	30 29.3	1.0 01	176.8	30 59.3	1.0 01	176.8	31 29.3	1.0 01	176.8	3
4	27 58.8	1.0 01	175.7	28 28.8	1.0 01	175.7	28 58.8	1.0 01	175.7	29 28.8	1.0 01	175.7	29 58.8	1.0 01	175.7	30 28.7	1.0 01	175.7	30 58.7	1.0 01	175.7	31 28.7	1.0 01	175.7	4
05	27 58.1	1.0 01	174.7	28 28.1	1.0 01	174.7	28 58.1	1.0 01	174.7	29 28.1	1.0 01	174.7	29 58.1	1.0 01	174.6	30 28.0	1.0 01	174.6	30 58.0	1.0 01	174.6	31 28.0	1.0 01	174.6	05
6	27 57.2	1.0 02	173.6	28 27.2	1.0 02	173.6	28 57.2	1.0 02	173.6	29 27.2	1.0 02	173.6	29 57.2	1.0 02	173.6	30 27.2	1.0 02	173.6	30 57.2	1.0 02	173.5	31 27.2	1.0 02	173.5	6
7	27 56.2	1.0 02	172.6	28 26.2	1.0 02	172.5	28 56.2	1.0 02	172.5	29 26.2	1.0 02	172.5	29 56.2	1.0 02	172.5	30 26.2	1.0 02	172.5	30 56.2	1.0 02	172.5	31 26.2	1.0 02	172.5	7
8	27 55.0	1.0 02	171.5	28 25.0	1.0 02	171.5	28 55.0	1.0 02	171.5	29 25.0	1.0 02	171.5	29 55.0	1.0 02	171.4	30 25.0	1.0 02	171.4	30 55.0	1.0 02	171.4	31 25.0	1.0 02	171.4	8
9	27 53.7	1.0 02	170.4	28 23.7	1.0 02	170.4	28 53.7	1.0 02	170.4	29 23.7	1.0 02	170.4	29 53.7	1.0 02	170.4	30 23.7	1.0 02	170.4	30 53.7	1.0 02	170.3	31 23.7	1.0 02	170.3	9
10	27 52.3	1.0 03	169.4	28 22.3	1.0 03	169.3	28 52.2	1.0 03	169.3	29 22.2	1.0 03	169.3	29 52.2	1.0 03	169.3	30 22.1	1.0 03	169.3	30 52.2	1.0 03	169.3	31 22.2	1.0 03	169.3	10
1	27 50.7	1.0 03	168.3	28 20.6	1.0 03	168.3	28 50.6	1.0 03	168.2	29 20.6	1.0 03	168.2	29 50.6	1.0 03	168.2	30 20.6	1.0 03	168.2	30 50.6	1.0 03	168.2	31 20.6	1.0 03	168.2	1
2	27 48.9	1.0 03	167.2	28 18.9	1.0 03	167.2	28 48.8	1.0 03	167.2	29 18.8	1.0 03	167.2	29 48.8	1.0 03	167.2	30 18.7	1.0 03	167.1	30 48.8	1.0 03	167.1	31 18.8	1.0 03	167.1	2
3	27 47.0	1.0 03	166.2	28 16.9	1.0 03	166.2	28 46.9	1.0 03	166.1	29 16.9	1.0 03	166.1	29 46.9	1.0 03	166.1	30 16.9	1.0 03	166.1	30 46.8	1.0 04	166.1	31 16.8	1.0 04	166.0	3
4	27 44.9	1.0 04	165.1	28 14.9	1.0 04	165.1	28 44.8	1.0 04	165.1	29 14.8	1.0 04	165.1	29 44.8	1.0 04	165.0	30 14.8	1.0 04	165.0	30 44.8	1.0 04	165.0	31 14.7	1.0 04	165.0	4
15	27 42.7	1.0 04	164.1	28 12.6	1.0 04	164.0	28 42.6	1.0 04	164.0	29 12.6	1.0 04	164.0	29 42.6	1.0 04	164.0	30 12.5	1.0 04	163.9	30 42.5	1.0 04	163.9	31 12.5	1.0 04	163.9	15
6	27 40.3	1.0 04	163.0	28 10.2	1.0 04	162.9	28 40.2	1.0 04	162.9	29 10.1	1.0 04	162.9	29 40.1	1.0 04	162.9	30 10.1	1.0 04	162.8	30 40.1	1.0 04	162.8	31 10.1	1.0 04	162.8	6
7	27 37.8	1.0 04	161.9	28 07.8	1.0 04	161.9	28 37.7	1.0 04	161.9	29 07.7	1.0 04	161.9	29 37.7	1.0 04	161.8	30 07.6	1.0 04	161.8	30 37.6	1.0 04	161.8	31 07.6	1.0 04	161.7	7
8	27 35.1	1.0 05	160.9	28 05.1	1.0 05	160.8	28 35.1	1.0 05	160.8	29 05.0	1.0 05	160.8	29 35.0	1.0 05	160.8	30 04.9	1.0 05	160.7	30 34.9	1.0 05	160.7	31 04.9	1.0 05	160.7	8
9	27 32.3	1.0 05	159.8	28 02.3	1.0 05	159.8	28 32.2	1.0 05	159.8	29 02.2	1.0 05	159.7	29 32.2	1.0 05	159.7	30 02.1	1.0 05	159.7	30 32.1	1.0 05	159.6	31 02.0	1.0 05	159.6	9
20	27 29.4	1.0 05	158.8	27 59.3	1.0 05	158.7	28 29.3	1.0 05	158.7	28 59.2	1.0 05	158.7	29 29.2	1.0 05	158.6	29 59.1	1.0 05	158.6	30 29.1	1.0 05	158.6	30 59.1	1.0 05	158.5	20
1	27 26.3	1.0 05	157.7	27 56.2	1.0 05	157.7	28 26.2	1.0 05	157.6	28 56.1	1.0 05	157.6	29 26.1	1.0 05	157.6	29 56.0	1.0 05	157.5	30 26.0	1.0 05	157.5	30 55.9	1.0 05	157.5	1
2	27 23.0	1.0 06	156.6	27 53.0	1.0 06	156.6	28 22.9	1.0 06	156.6	28 52.9	1.0 06	156.5	29 22.8	1.0 06	156.5	29 52.8	1.0 06	156.5	30 22.7	1.0 06	156.4	30 52.7	1.0 06	156.4	2
3	27 19.6	1.0 06	155.6	27 49.6	1.0 06	155.6	28 19.5	1.0 06	155.5	28 49.5	1.0 06	155.5	29 19.4	1.0 06	155.4	29 49.4	1.0 06	155.4	30 19.3	1.0 06	155.4	30 49.2	1.0 06	155.3	3
4	27 16.1	1.0 06	154.5	27 46.1	1.0 06	154.5	28 16.0	1.0 06	154.5	28 45.9	1.0 06	154.4	29 15.9	1.0 06	154.4	29 45.8	1.0 06	154.3	30 15.7	1.0 06	154.3	30 45.7	1.0 06	154.3	4
25	27 12.5	1.0 06	153.5	27 42.4	1.0 06	153.4	28 12.3	1.0 06	153.4	28 42.3	1.0 06	153.4	29 12.2	1.0 06	153.3	29 42.1	1.0 06	153.3	30 12.1	1.0 06	153.2	30 42.0	1.0 06	153.2	25
6	27 08.7	1.0 07	152.4	27 38.6	1.0 07	152.4	28 08.5	1.0 07	152.3	28 38.5	1.0 07	152.3	29 08.4	1.0 07	152.3	29 38.3	1.0 07	152.2	30 08.3	1.0 07	152.2	30 38.2	1.0 07	152.1	6
7	27 04.7	1.0 07	151.4	27 34.7	1.0 07	151.3	28 04.6	1.0 07	151.3	28 34.5	1.0 07	151.3	29 04.4	1.0 07	151.2	29 34.3	1.0 07	151.2	30 04.3	1.0 07	151.1	30 34.2	1.0 07	151.1	7
8	27 00.7	1.0 07	150.3	27 30.6	1.0 07	150.3	28 00.5	1.0 07	150.2	28 30.4	1.0 07	150.2	29 00.3	1.0 07	150.2	29 30.3	1.0 07	150.1	30 00.2	1.0 07	150.1	30 30.1	1.0 07	150.0	8
9	26 56.5	1.0 07	149.3	27 26.4	1.0 07	149.2	27 56.3	1.0 07	149.2	28 26.2	1.0 07	149.1	28 56.1	1.0 07	149.1	29 25.9	1.0 07	149.0	29 55.9	1.0 07	149.0	30 25.8	1.0 07	149.0	9
30	26 52.1	1.0 07	148.2	27 22.0	1.0 07	148.2	27 51.9	1.0 07	148.1	28 21.8	1.0 07	148.1	28 51.8	1.0 08	148.0	29 21.7	1.0 08	148.0	29 51.6	1.0 08	147.9	30 21.5	1.0 08	147.9	30
1	26 47.7	1.0 08	147.2	27 17.6	1.0 08	147.1	27 47.5	1.0 08	147.1	28 17.4	1.0 08	147.0	28 47.3	1.0 08	147.0	29 17.2	1.0 08	146.9	29 47.1	1.0 08	146.9	30 17.0	1.0 08	146.8	1
2	26 43.1	1.0 08	146.1	27 13.0	1.0 08	146.1	27 42.9	1.0 08	146.0	28 12.8	1.0 08	146.0	28 42.7	1.0 08	145.9	29 12.6	1.0 08	145.9	29 42.4	1.0 08	145.8	30 12.3	1.0 08	145.8	2
3	26 38.4	1.0 08	145.1	27 08.3	1.0 08	145.0	27 38.1	1.0 08	145.0	28 08.0	1.0 08	144.9	28 37.9	1.0 08	144.9	29 07.8	1.0 08	144.8	29 37.7	1.0 08	144.8	30 07.6	1.0 08	144.7	3
4	26 33.5	1.0 08	144.0	27 03.4	1.0 08	144.0	27 33.3	1.0 08	143.9	28 03.2	1.0 08	143.9	28 33.1	1.0 08	143.8	29 02.9	1.0 08	143.8	29 32.8	1.0 08	143.7	30 02.7	1.0 08	143.7	4
35	26 28.6	1.0 09	143.0	26 58.4	1.0 09	142.9	27 28.3	1.0 09	142.8	27 58.1	1.0 09	142.8	28 28.1	1.0 09	142.7	28 57.9	1.0 09	142.7	29 27.9	1.0 09	142.7	29 57.7	1.0 09	142.6	35
6	26 23.5	1.0 09	141.9	26 53.3	1.0 09	141.9	27 23.2	1.0 09	141.8	27 53.1	1.0 09	141.8	28 23.0	1.0 09	141.7	28 52.8	1.0 09	141.7	29 22.7	1.0 09	141.6	29 52.6	1.0 09	141.6	6
7	26 18.3	1.0 09	140.9	26 48.1	1.0 09	140.8	27 18.0	1.0 09	140.8	27 47.9	1.0 09	140.7	28 17.7	1.0 09	140.7	28 47.6	1.0 09	140.6	29 17.4	1.0 09	140.6	29 47.3	1.0 09	140.5	7
8	26 12.9	1.0 09	139.8	26 42.8	1.0 09	139.8	27 12.6	1.0 09	139.7	27 42.5	1.0 09	139.7	28 12.4	1.0 09	139.6	28 42.2	1.0 09	139.6	29 12.1	1.0 09	139.5	29 41.9	1.0 09	139.5	8
9	26 07.5	1.0 09	138.8	26 37.3	1.0 09	138.7	27 07.1	1.0 09	138.7	27 37.0	1.0 09	138.6	28 06.9	1.0 09	138.6	28 36.8	1.0 09	138.5	29 06.6	99 09	138.4	29 36.4	99 09	138.4	9
40	26 01.9	99 09	137.7	26 31.8	99 09	137.7	27 01.6	99 09	137.6	27 31.5	99 09	137.6	28 01.3	99 09	137.5	28 31.2	99 10	137.5	29 01.0	99 10	137.4	29 30.9	99 10	137.4	40
1	25 56.3	99 10	136.7	26 26.1	99 10	136.6	26 55.9	99 10	136.6	27 25.8	99 10	136.5	27 55.6	99 10	136.4	28 25.5	99 10	136.4	28 55.3	99 10	136.4	29 25.1	99 10	136.3	1
2	25 50.5	99 10	135.7	26 20.3	99 10	135.6	26 50.2	99 10	135.6	27 20.0	99 10	135.5	27 49.8	99 10	135.4	28 19.7	99 10	135.4	28 49.5	99 10	135.3	29 19.3	99 10	135.3	2
3	25 44.6	99 10	134.6	26 14.4	99 10	134.6	26 44.3	99 10	134.5	27 14.1	99 10	134.5	27 43.9	99 10	134.4	28 13.7	99 10	134.3	28 43.6	99 10	134.3	29 13.4	99 10	134.2	3
4	25 38.6	99 10	133.5	26 08.4	99 10	133.5	26 38.2	99 10	133.4	27 08.1	99 10	133.4	27 37.9	99 10	133.4	28 07.7	99 10	133.3	28 37.5	99 10	133.2	29 07.3	99 10	133.2	4
45	25 32.5	99 10	132.5	26 02.3	99 10	132.5	26 32.1	99 10	132.5	27 02.0	99 10	132.4	27 31.8	99 10	132.3	28 01.6	99 10	132.3	28 31.4	99 10	132.2	29 01.2	99 10	132.1	45
6	25 26.3	99 10	131.5	25 56.1	99 11	131.5	26 25.9	99 11	131.4	26 55.7	99 11	131.4	27 25.5	99 11	131.3	27 55.4	99 11	131.3	28 25.2	99 11	131.2	28 55.0	99 11	131.1	6
7	25 20.0	99 11	130.5	25 49.8	99 11	130.4	26 19.6	99 11	130.3	26 49.4	99 11	130.3	27 19.2	99 11	130.2	27 49.0	99 11	130.2	28 18.8	99 11	130.1	28 48.6	99 11	130.1	7
8	25 13.6	99 11	129.4	25 43.4	99 11	129.4	26 13.2	99 11	129.3	26 43.0	99 11	129.2	27 12.8	99 11	129.2	27 42.6	99 11	129.1	28 12.4	99 11	129.1	28 42.2	99 11	129.0	8
9	25 07.1	99 11	128.4	25 36.9	99 11	128.3	26 06.7	99 11	128.3	26 36.5	99 11	128.2	27 06.3	99 11	128.2	27 36.1	99 11	128.1	28 05.9	99 11	128.0	28 35.6	99 11	128.0	9
50	25 00.5	99 11	127.4	25 30.3	99 11	127.3	26 00.1	99 11	127.3	26 29.9	99 11	127.2	26 59.7	99 11	127.1	27 29.5	99 11	127.1	27 59.2	99 11	127.0	28 29.0	99 11	126.9	50
1	24 53.8	99 11	126.4	25 23.6	99 11	126.3	25 53.4	99 11	126.2	26 23.2	99 11	126.2	26 53.0	99 11	126.1	27 22.7	99 11	126.0	27 52.5	99 11	126.0	28 22.3	99 11	125.9	1
2	24 47.1	99 11	125.4	25 16.9	99 11	125.3	25 46.6	99 11	125.2	26 16.4	99 11	125.2	26 46.2	99 11	125.1	27 16.0	99 11	125.0	27 45.7	99 11	124.9	28 15.5	99 11	124.9	2
3	24 40.2	99 12	124.3	25 10.0	99 12	124.3	25 39.8	99 12	124.2	26 09.5	99 12	124.1	26 39.3	99 12	124.1	27 09.1	99 12	124.0	27 38.8	99 12	123.9	28 08.6	99 12	123.8	3
4	24 33.2	99 12	123.3	25 03.1	99 12	123.2	25 32.8	99 12	123.1	26 02.6	99 12	123.0	26 32.3	99 12	123.0	27 02.1	99 12	122.9	27 31.9	99 12	123.0	28 01.6	99 12	123.8	4
55	24 26.3	99 12	122.3	24 56.0	99 12	122.2	25 25.8	99 12	122.1	25 55.5	99 12	122.1	26 25.3	99 12	122.0	26 55.1	99 12	121.9	27 24.8	99 12	121.9	27 54.6	99 12	121.8	55
6	24 19.2	99 12	121.3	24 48.9	99 12	121.2	25 18.7	99 12	121.1	25 48.4	99 12	121.0	26 18.2	99 12	121.0	26 47.9	99 12	120.9	27 17.7	99 12	120.8	27 47.4	99 12	120.8	6
7	24 12.0	99 12	120.2	24 41.7	99 12	120.2	25 11.5	99 12	120.1	25 41.2	99 12	120.0	26 11.0	99 12	119.9	26 40.7	99 12	119.9	27 10.5	99 12	119.8	27 40.2	99 12	119.7	7
8	24 04.7	99 12	119.2	24 34.5	99 12	119.1	25 04.2	99 12	119.0	25 34.0	99 12	119.0	26 03.7	99 12	118.9	26 33.4	99 12	118.8	27 03.2	99 12	118.8	27 32.9	99 12	118.7	8
9	23 57.4	99 12	118.2	24 27.2	99 12	118.1	24 56.9	99 12	118.0	25 26.6	99 12	118.0	25 56.4	99 12	117.9	26 26.1	99 12	117.8	26 55.8	99 12	117.7	27 25.6	99 12	117.7	9
60	23 50.0	99 12	117.2	24 19.8	99 12	117.1	24 49.5	99 12	117.0	25 19.2	99 12	117.0	25 49.0	99 12	116.9	26 18.7	99 12	116.8	26 48.4	99 12	116.7	27 18.1	99 12	116.6	60
1	23 42.6	99 13	116.2	24 12.3	99 13	116.1	24 42.0	99 13	116.0	25 11.7	99 13	115.9	25 41.5	99 13	115.9	26 11.2	99 13	115.8	26 40.9	99 13	115.7	27 10.6	99 13	115.6	1
2	23 35.0	99 13	115.1	24 04.8	99 13	115.1	24 34.5	99 13	115.0	25 04.2	99 13	114.9	25 33.9	99 13	114.8	26 03.6	99 13	114.7	26 33.4	99 13	114.7	27 03.1	99 13	114.6	2
3	23 27.4	99 13	114.1	23 57.2	99 13	114.0	24 26.9	99 13	113.9	24 56.6	99 13	113.9	25 26.3	99 13	113.8	25 56.0	99 13	113.7	26 25.7	99 13	113.7	26 55.5	99 13	113.6	3
4	23 19.8	99 13	113.1	23 49.5	99 13	113.0	24 19.2	99 13	113.0	24 48.9	99 13	112.9	25 18.6	99 13	112.8	25 48.4	99 13	112.7	26 18.1	99 13	112.6	26 47.8	99 13	112.6	4
65	23 12.1	99 13	112.1	23 41.8	99 13	112.0	24 11.5	99 13	111.9	24 41.2	99 13	111.9	25 10.9	99 13	111.8	25 40.6	99 13	111.7	26 10.3	99 13	111.6	26 40.0	99 13	111.6	65
6	23 04.3	99 13	111.1	23 34.0	99 13	111.0	24 03.7	99 13	110.9	24 33.4	99 13	110.9	25 03.1	99 13	110.8	25 32.8	99 13	110.7	26 02.5	99 13	110.6	26 32.2	99 13	110.5	6
7	22 56.5	99 13	110.1	23 26.2	99 13	110.0	23 55.9	99 13	109.9	24 25.6	99 13	109.8	24 55.3	99 13	109.8	25 25.0	99 13	109.7	25 54.7	99 13	109.6	26 24.4	99 13	109.5	7
8	22 48.6	99 13	109.1	23 18.3	99 13	109.0	23 48.0	99 13	108.9	24 17.7	99 13	108.8	24 47.4	99 13	108.7	25 17.1	99 13	108.6	25 46.8	99 13	108.6	26 16.5	99 13	108.5	8
9	22 40.7	99 13	108.1	23 10.4	99 13	108.0	23 40.1	99 13	107.9	24 09.8	99 13	107.8	24 39.5	99 13	107.7	25 09.2	99 13	107.7	25 38.9	99 13	107.6	26 08.6	99 13	107.5	9
70	22 32.7	99 13	107.0	23 02.4	99 13	107.0	23 32.1	99 13	106.9	24 01.8	99 13	106.8	24 31.5	99 13	106.7	25 01.2	99 13	106.7	25 30.9	99 13	106.6	26 00.6	99 13	106.5	70
1	22 24.7	99 13	106.0	22 54.4	99 13	106.0	23 24.1	99 13	105.9	23 53.8	99 13	105.8	24 23.5	99 13	105.7	24 53.2	99 13	105.6	25 22.9	99 13	105.6	25 52.5	99 13	105.5	1
2	22 16.7	99 13	105.0	22 46.4	99 13	105.0	23 16.1	99 13	104.9	23 45.8	99 14	104.8	24 15.4	99 14	104.7	24 45.1	99 13	104.6	25 14.8	99 14	104.6	25 44.5	99 14	104.5	2
3	22 08.7	99 14	103.9	22 38.3	99 14	103.9	23 07.7	99 14	103.9	23 37.7	99 14	103.8	24 07.3	99 14	103.7	25 06.7	99 14	103.6	25 06.7	99 14	103.6	25 36.4	99 14	103.5	3
4	22 00.5	99 14	103.0	22 30.2	99 14	102.9	22 59.9	99 14	102.9	23 29.5	99 14	102.8	23 59.2	99 14	102.7	24 28.9	99 14	102.6	24 58.6	99 14	102.5	25 28.2	99 14	102.5	4
75	21 52.3	99 14	102.0	22 22.0	99 14	101.9	22 51.7	99 14	101.9	23 21.4	99 14	101.8	23 51.1	99 14	101.7	24 20.7	99 14	101.6	24 50.4	99 14	101.5	25 20.1	99 14	101.5	75
6	21 44.2	99 14	101.0	22 13.8	99 14	100.9	22 43.5	99 14	100.9	23 13.2	99 14	100.8	23 42.9	99 14	100.7	24 12.5	99 14	100.6	24 42.2	99 14	100.5	25 11.9	99 14	100.5	6
7	21 35.9	99 14	100.0	22 05.6	99 14	99.9	22 35.3	99 14	99.9	23 04.9	99 14	99.8	23 34.6	99 14	99.7	24 04.3	99 14	99.6	24 34.0	99 14	99.5	25 03.6	99 14	99.5	7
8	21 27.7	99 14	99.0	21 57.4	99 14	98.9	22 27.1	99 14	98.9	22 56.7	99 14	98.8	23 26.4	99 14	98.7	23 56.1	99 14	98.6	24 25.7	99 14	98.5	24 55.4	99 14	98.5	8
9	21 19.5	99 14	98.0	21 49.1	99 14	97.9	22 18.8	99 14	97.8	22 48.5	99 14	97.8	23 18.1	99 14	97.7	23 47.8	99 14	97.6	24 17.5	99 14	97.5	24 47.1	99 14	97.5	9
80	21 11.2	99 14	97.0	21 40.8	99 14	96.9	22 10.5	99 14	96.9	22 40.2	99 14	96.8	23 09.9	99 14	96.7	23 39.5	99 14	96.6	24 09.2	99 14	96.5	24 38.8	99 14	96.5	80
1	21 02.9	99 14	96.0	21 32.6	99 14	95.9	22 02.2	99 14	95.9	22 31.9	99 14	95.8	23 01.6	99 14	95.7	23 31.2	99 14	95.6	24 00.9	99 14	95.5	24 30.5	99 14	95.5	1
2	20 54.6	99 14	95.0	21 24.2	99 14	95.0	22 23.6	99 14	94.9	22 53.3	99 14	94.8	22 44.9	99 14	94.7	23 22.9	99 14	94.6	23 52.6	99 14	94.5	24 22.2	99 14	94.5	2
3	20 46.2	99 14	94.0	21 15.9	99 14	94.0	21 45.6	99 14	93.9	22 15.2	99 14	93.8	22 44.9	99 14	93.7	23 14.6	99 14	93.6	23 44.2	99 14	93.6	24 13.9	99 14	93.5	3
4	20 37.9	99 14	93.0	21 07.6	99 14	93.0	21 37.2	99 14	92.9	22 06.9	99 14	92.8	22 36.6	99 14	92.7	23 06.2	99 14	92.6	23 35.9	99 14	92.6	24 05.5	99 14	92.5	4
85	20 29.6	99 14	92.1	20 59.2	99 14	92.0	21 28.9	99 14	91.9	21 58.6	99 14	91.8	22 28.2	99 14	91.7	22 57.9	99 14	91.6	23 27.5	99 14	91.6	23 57.2	99 14	91.5	85
6	20 21.2	99 14	91.1	20 50.9	99 14	91.0	21 20.6	99 14	90.9	21 50.2	99 14	90.8	22 19.9	99 14	90.7	22 49.5	99 14	90.7	23 19.2	99 14	90.6	23 48.8	99 14	90.5	6
7	20 12.9	99 14	90.1	20 42.5	99 14	90.0	21 41.9	99 14	89.9	21 41.9	99 14	89.8	22 11.5	99 14	89.7	22 41.2	99 14	89.7	23 10.8	99 14	89.6	23 40.5	99 14	89.5	7
8	20 04.5	99 14	89.1	20 34.2	99 14	89.0	21 03.9	99 14	88.9	21 33.5	99 14	88.8	22 03.2	99 14	88.8	22 32.8	99 14	88.7	23 02.5	99 14	88.6	23 32.2	99 14	88.5	8
9	19 56.2	99 14	88.1	20 25.8	99 14	88.0	20 55.5	99 14	87.9	21 25.2	99 14	87.8	21 54.8	99 14	87.8	22 24.5	99 14	87.7	22 54.2	99 14	87.6	23 23.8	99 14	87.5	9
90	19 47.8	99 14	87.1	20 17.5	99 14	87.0	20 47.2	99 14	86.9	21 16.8	99 14	86.9	21 46.5	99 14	86.8	22 16.2	99 14	86.7	22 45.8	99 14	86.6	23 15.5	99 14	86.5	90

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H.A.	20° 00' Alt.	Δd Δt	Az.	20° 30' Alt.	Δd Δt	Az.	21° 00' Alt.	Δd Δt	Az.	21° 30' Alt.	Δd Δt	Az.	22° 00' Alt.	Δd Δt	Az.	22° 30' Alt.	Δd Δt	Az.	23° 00' Alt.	Δd Δt	Az.	23° 30' Alt.	Δd Δt	Az.	H.A.
91	19 39.5	99 14	86.1	20 09.2	99 14	86.0	20 38.8	99 14	86.0	21 08.5	99 14	85.9	21 38.2	99 14	85.8	22 07.8	99 14	85.7	22 37.5	99 14	85.6	23 07.1	99 14	85.6	91
2	19 31.2	99 14	85.1	20 00.8	99 14	85.0	20 30.5	99 14	85.0	21 00.2	99 14	84.9	21 29.8	99 14	84.8	21 59.5	99 14	84.7	22 29.2	99 14	84.6	22 58.8	99 14	84.6	2
3	19 22.9	99 14	84.1	19 52.5	99 14	84.1	20 22.2	99 14	84.0	20 51.9	99 14	83.9	21 21.5	99 14	83.8	21 51.2	99 14	83.7	22 20.9	99 14	83.7	22 50.5	99 14	83.6	3
4	19 14.6	99 14	83.2	19 44.2	99 14	83.1	20 13.9	99 14	83.0	20 43.6	99 14	82.9	21 13.2	99 14	82.8	21 42.9	99 14	82.8	22 12.6	99 14	82.7	22 42.2	99 14	82.6	4
95	19 06.3	99 14	82.2	19 35.9	99 14	82.1	20 05.6	99 14	82.0	20 35.3	99 14	81.9	21 05.0	99 14	81.9	21 34.6	99 14	81.8	22 04.3	99 14	81.7	22 34.0	99 14	81.6	95
6	18 58.0	99 14	81.2	19 27.7	99 14	81.1	19 57.4	99 14	81.0	20 27.0	99 14	81.0	20 56.7	99 14	80.9	21 26.4	99 14	80.8	21 56.0	99 14	80.7	22 25.7	99 14	80.6	6
7	18 49.8	99 14	80.2	19 19.4	99 14	80.1	19 49.1	99 14	80.1	20 18.8	99 14	80.0	20 48.5	99 14	79.9	21 18.1	99 14	79.8	21 47.8	99 14	79.7	22 17.5	99 14	79.7	7
8	18 41.6	99 14	79.2	19 11.2	99 14	79.1	19 40.9	99 14	79.1	20 10.6	99 14	79.0	20 40.3	99 14	78.9	21 09.9	99 14	78.8	21 39.6	99 14	78.8	22 09.3	99 14	78.7	8
9	18 33.4	99 14	78.2	19 03.0	99 14	78.2	19 32.7	99 14	78.1	20 02.4	99 14	78.0	20 32.1	99 14	77.9	21 01.8	99 14	77.9	21 31.4	99 14	77.8	22 01.1	99 14	77.7	9
100	18 25.2	99 14	77.3	18 54.9	99 14	77.2	19 24.6	99 14	77.1	19 54.3	99 14	77.0	20 23.9	99 14	77.0	20 53.6	99 14	76.9	21 23.3	99 14	76.8	21 53.0	99 14	76.7	100
1	18 17.1	99 14	76.3	18 46.8	99 14	76.2	19 16.4	99 13	76.1	19 46.1	99 13	76.1	20 15.8	99 13	76.0	20 45.5	99 13	75.9	21 15.2	99 13	75.8	21 44.8	99 13	75.7	1
2	18 09.0	99 13	75.3	18 38.7	99 13	75.2	19 08.4	99 13	75.2	19 38.0	99 13	75.1	20 07.7	99 13	75.0	20 37.4	99 13	74.9	21 07.1	99 13	74.8	21 36.8	99 13	74.8	2
3	18 00.9	99 13	74.3	18 30.6	99 13	74.3	19 00.3	99 13	74.2	19 30.0	99 13	74.1	19 59.7	99 13	74.0	20 29.4	99 13	73.9	20 59.0	99 13	73.9	21 28.7	99 13	73.8	3
4	17 52.9	99 13	73.3	18 22.6	99 13	73.3	18 52.3	99 13	73.2	19 22.0	99 13	73.1	19 51.7	99 13	73.0	20 21.4	99 13	73.0	20 51.0	99 13	72.9	21 20.7	99 13	72.8	4
105	17 44.9	99 13	72.4	18 14.6	99 13	72.3	18 44.3	99 13	72.2	19 14.0	99 13	72.1	19 43.7	99 13	72.1	20 13.4	99 13	72.0	20 43.1	99 13	71.9	21 12.8	99 13	71.8	105
6	17 36.9	99 13	71.4	18 06.7	99 13	71.3	18 36.4	99 13	71.2	19 06.1	99 13	71.2	19 35.8	99 13	71.1	20 05.5	99 13	71.0	20 35.2	99 13	70.9	21 04.9	99 13	70.9	6
7	17 29.1	99 13	70.4	17 58.8	99 13	70.3	18 28.5	99 13	70.3	18 58.2	99 13	70.2	19 27.9	99 13	70.1	19 57.6	99 13	70.0	20 27.3	99 13	70.0	20 57.0	99 13	69.9	7
8	17 21.3	99 13	69.4	17 51.0	99 13	69.4	18 20.7	99 13	69.3	18 50.4	99 13	69.2	19 20.1	99 13	69.1	19 49.8	99 13	69.1	20 19.5	99 13	69.0	20 49.2	99 13	68.9	8
9	17 13.5	99 13	68.5	17 43.2	99 13	68.4	18 12.9	99 13	68.3	18 42.6	99 13	68.3	19 12.3	99 13	68.2	19 42.0	99 13	68.1	20 11.7	99 13	68.0	20 41.4	99 13	68.0	9
110	17 05.7	99 13	67.5	17 35.4	99 13	67.4	18 05.2	99 13	67.4	18 34.9	99 13	67.3	19 04.6	99 13	67.2	19 34.3	99 13	67.1	20 04.0	99 13	67.1	20 33.7	99 13	67.0	110
1	16 58.0	99 13	66.5	17 27.8	99 13	66.4	17 57.5	99 13	66.4	18 27.2	99 13	66.3	18 56.9	99 13	66.2	19 26.6	99 13	66.2	19 56.3	99 13	66.1	20 26.0	99 13	66.0	1
2	16 50.4	99 13	65.5	17 20.1	99 13	65.5	17 49.9	99 13	65.4	18 19.6	99 13	65.3	18 49.3	99 13	65.3	19 19.0	99 13	65.2	19 48.7	99 13	65.1	20 18.4	99 13	65.0	2
3	16 42.8	99 12	64.6	17 12.6	99 13	64.5	17 42.3	99 13	64.4	18 12.0	99 12	64.4	18 41.7	99 12	64.3	19 11.5	99 12	64.2	19 41.2	99 12	64.1	20 10.9	99 12	64.1	3
4	16 35.3	99 12	63.6	17 05.1	99 12	63.5	17 34.8	99 12	63.5	18 04.5	99 12	63.4	18 34.2	99 12	63.3	19 04.0	99 12	63.3	19 33.7	99 12	63.2	20 03.4	99 12	63.1	4
115	16 27.9	99 12	62.6	16 57.6	99 12	62.6	17 27.3	99 12	62.5	17 57.1	99 12	62.4	18 26.8	99 12	62.4	18 56.6	99 12	62.3	19 26.3	99 12	62.2	19 56.0	99 12	62.1	115
6	16 20.5	99 12	61.7	16 50.2	99 12	61.6	17 20.0	99 12	61.5	17 49.7	99 12	61.5	18 19.5	99 12	61.4	18 49.2	99 12	61.3	19 18.9	99 12	61.2	19 48.7	99 12	61.2	6
7	16 13.0	99 12	60.7	16 42.9	99 12	60.6	17 12.7	99 12	60.6	17 42.4	99 12	60.5	18 12.2	99 12	60.4	18 41.9	99 12	60.3	19 11.6	99 12	60.3	19 41.4	99 12	60.2	7
8	16 05.9	99 12	59.7	16 35.7	99 12	59.7	17 05.4	99 12	59.6	17 35.2	99 12	59.5	18 04.9	99 12	59.4	18 34.7	99 12	59.4	19 04.4	99 12	59.3	19 34.2	99 12	59.2	8
9	15 58.8	99 12	58.8	16 28.5	99 12	58.7	16 58.3	99 12	58.6	17 28.0	99 12	58.6	17 57.8	99 12	58.5	18 27.5	99 12	58.4	18 57.3	99 12	58.3	19 27.0	99 12	58.3	9
120	15 51.7	99 12	57.8	16 21.4	99 12	57.7	16 51.2	99 12	57.6	17 20.9	99 12	57.6	17 50.7	99 12	57.5	18 20.5	99 12	57.4	18 50.2	99 12	57.4	19 20.0	99 12	57.3	120
1	15 44.6	99 12	56.8	16 14.4	99 12	56.7	16 44.2	99 12	56.7	17 13.9	99 12	56.6	17 43.7	99 12	56.6	18 13.5	99 12	56.5	18 43.2	99 12	56.4	19 13.0	99 12	56.4	1
2	15 37.7	99 11	55.8	16 07.4	99 11	55.8	16 37.2	99 11	55.7	17 07.0	99 11	55.6	17 36.8	99 11	55.6	18 06.5	99 11	55.5	18 36.3	99 11	55.5	19 06.1	99 11	55.4	2
3	15 30.8	99 11	54.9	16 00.6	99 11	54.8	16 30.4	99 11	54.7	17 00.1	99 11	54.7	17 29.9	99 11	54.6	17 59.7	99 11	54.6	18 29.5	99 11	54.5	18 59.2	99 11	54.4	3
4	15 24.0	99 11	53.9	15 53.8	99 11	53.8	16 23.6	99 11	53.8	16 53.4	99 11	53.7	17 23.1	99 11	53.7	17 52.9	99 11	53.6	18 22.7	99 11	53.5	18 52.5	99 11	53.5	4
125	15 17.3	99 11	52.9	15 47.1	99 11	52.9	16 16.9	99 11	52.8	16 46.7	99 11	52.8	17 16.5	99 11	52.7	17 46.2	99 11	52.6	18 16.0	99 11	52.6	18 45.8	99 11	52.5	125
6	15 10.7	99 11	52.0	15 40.5	99 11	51.9	16 10.3	99 11	51.9	16 40.1	99 11	51.8	17 09.9	99 11	51.7	17 39.7	99 11	51.7	18 09.4	99 11	51.6	18 39.2	99 11	51.5	6
7	15 04.2	99 11	51.0	15 34.0	99 11	50.9	16 03.8	99 11	50.9	16 33.6	99 11	50.8	17 03.3	99 11	50.8	17 33.1	99 11	50.7	18 02.9	99 11	50.6	18 32.7	99 11	50.6	7
8	14 57.7	99 11	50.0	15 27.5	99 11	50.0	15 57.3	99 11	49.9	16 27.1	99 11	49.9	16 56.9	99 11	49.8	17 26.7	99 11	49.7	17 56.5	99 11	49.7	18 26.3	99 11	49.6	8
9	14 51.4	99 10	49.1	15 21.2	99 10	49.0	15 51.0	99 10	49.0	16 20.8	99 10	48.9	16 50.6	99 10	48.8	17 20.4	99 10	48.8	17 50.2	99 10	48.7	18 20.0	99 10	48.7	9
130	14 45.1	99 10	48.1	15 14.9	99 10	48.0	15 44.7	99 10	48.0	16 14.5	99 10	47.9	16 44.4	99 10	47.9	17 14.2	99 10	47.8	17 44.0	99 10	47.8	18 13.8	99 10	47.7	130
1	14 38.9	99 10	47.1	15 08.7	99 10	47.1	15 38.6	99 10	47.0	16 08.4	99 10	47.0	16 38.2	99 10	46.9	17 08.0	99 10	46.9	17 37.8	99 10	46.8	18 07.7	99 10	46.7	1
2	14 32.9	99 10	46.2	15 02.7	99 10	46.1	15 32.5	99 10	46.1	16 02.3	99 10	46.0	16 32.2	99 10	46.0	17 02.0	99 10	45.9	17 31.8	99 10	45.8	18 01.6	99 10	45.8	2
3	14 26.9	99 10	45.2	14 56.7	99 10	45.2	15 26.5	99 10	45.1	15 56.4	99 10	45.0	16 26.2	99 10	45.0	16 56.0	99 10	44.9	17 25.9	99 10	44.9	17 55.7	99 10	44.8	3
4	14 21.0	99 10	44.2	14 50.8	99 10	44.2	15 20.7	99 10	44.1	15 50.5	99 10	44.1	16 20.4	99 10	44.0	16 50.2	99 10	44.0	17 20.0	99 10	43.9	17 49.9	99 10	43.9	4
135	14 15.2	99 09	43.3	14 45.1	99 09	43.2	15 14.9	99 09	43.2	15 44.8	99 09	43.1	16 14.6	99 09	43.1	16 44.4	99 09	43.0	17 14.3	99 09	43.0	17 44.1	99 09	42.9	135
6	14 09.5	1.0 09	42.3	14 39.4	99 09	42.3	15 09.2	99 09	42.2	15 39.1	99 09	42.2	16 08.9	99 09	42.1	16 38.8	99 09	42.1	17 08.6	99 09	42.0	17 38.5	99 09	42.0	6
7	14 04.0	1.0 09	41.4	14 33.8	1.0 09	41.3	15 03.7	1.0 09	41.3	15 33.5	1.0 09	41.2	16 03.4	1.0 09	41.1	16 33.3	1.0 09	41.1	17 03.1	1.0 09	41.0	17 33.0	1.0 09	41.0	7
8	13 58.5	1.0 09	40.4	14 28.4	1.0 09	40.3	14 58.2	1.0 09	40.3	15 28.1	1.0 09	40.2	15 58.0	1.0 09	40.2	16 27.8	1.0 09	40.1	16 57.7	1.0 09	40.1	17 27.5	1.0 09	40.0	8
9	13 53.2	1.0 09	39.4	14 23.0	1.0 09	39.4	14 52.9	1.0 09	39.3	15 22.8	1.0 09	39.3	15 52.6	1.0 09	39.2	16 22.5	1.0 09	39.2	16 52.4	1.0 09	39.1	17 22.2	1.0 09	39.1	9
140	13 47.9	1.0 09	38.5	14 17.8	1.0 09	38.4	14 47.7	1.0 09	38.4	15 17.5	1.0 09	38.3	15 47.4	1.0 09	38.3	16 17.3	1.0 09	38.2	16 47.1	1.0 08	38.2	17 17.0	1.0 08	38.1	140
1	13 42.8	1.0 09	37.5	14 12.7	1.0 08	37.5	14 42.5	1.0 08	37.4	15 12.4	1.0 08	37.4	15 42.3	1.0 08	37.3	16 12.2	1.0 08	37.3	16 42.0	1.0 08	37.2	17 11.9	1.0 08	37.2	1
2	13 37.7	1.0 08	36.5	14 07.6	1.0 08	36.5	14 37.5	1.0 08	36.4	15 07.4	1.0 08	36.4	15 37.3	1.0 08	36.4	16 07.2	1.0 08	36.3	16 37.0	1.0 08	36.3	17 06.9	1.0 08	36.2	2
3	13 32.8	1.0 08	35.6	14 02.7	1.0 08	35.5	14 32.6	1.0 08	35.5	15 02.5	1.0 08	35.4	15 32.4	1.0 08	35.4	16 02.3	1.0 08	35.3	16 32.2	1.0 08	35.3	17 02.0	1.0 08	35.3	3
4	13 28.0	1.0 08	34.6	13 57.9	1.0 08	34.6	14 27.8	1.0 08	34.5	14 57.7	1.0 08	34.5	15 27.6	1.0 08	34.4	15 57.5	1.0 08	34.4	16 27.4	1.0 08	34.3	16 57.3	1.0 08	34.3	4
145	13 23.3	1.0 08	33.6	13 53.2	1.0 08	33.6	14 23.1	1.0 08	33.5	14 53.0	1.0 08	33.5	15 22.9	1.0 08	33.5	15 52.8	1.0 08	33.4	16 22.7	1.0 08	33.4	16 52.6	1.0 08	33.3	145
6	13 18.8	1.0 07	32.7	13 48.7	1.0 07	32.6	14 18.6	1.0 07	32.6	14 48.5	1.0 07	32.6	15 18.4	1.0 07	32.5	15 48.3	1.0 07	32.5	16 18.2	1.0 07	32.4	16 48.1	1.0 07	32.4	6
7	13 14.3	1.0 07	31.7	13 44.2	1.0 07	31.7	14 14.1	1.0 07	31.6	14 44.1	1.0 07	31.6	15 14.0	1.0 07	31.6	15 43.9	1.0 07	31.5	16 13.8	1.0 07	31.5	16 43.7	1.0 07	31.4	7
8	13 10.0	1.0 07	30.8	13 39.9	1.0 07	30.7	14 09.8	1.0 07	30.7	14 39.7	1.0 07	30.6	15 09.7	1.0 07	30.6	15 39.6	1.0 07	30.6	16 09.5	1.0 07	30.5	16 39.4	1.0 07	30.5	8
9	13 05.8	1.0 07	29.8	13 35.7	1.0 07	29.8	14 05.6	1.0 07	29.7	14 35.5	1.0 07	29.7	15 05.5	1.0 07	29.6	15 35.4	1.0 07	29.6	16 05.3	1.0 07	29.6	16 35.2	1.0 07	29.5	9
150	13 01.7	1.0 07	28.8	13 31.6	1.0 07	28.8	14 01.5	1.0 07	28.8	14 31.5	1.0 07	28.7	15 01.4	1.0 07	28.7	15 31.3	1.0 07	28.6	16 01.2	1.0 07	28.6	16 31.2	1.0 07	28.6	150
1	12 57.7	1.0 06	27.9	13 27.7	1.0 06	27.8	13 57.6	1.0 06	27.8	14 27.5	1.0 06	27.8	14 57.4	1.0 06	27.7	15 27.4	1.0 06	27.7	15 57.3	1.0 06	27.7	16 27.2	1.0 06	27.6	1
2	12 53.9	1.0 06	26.9	13 23.8	1.0 06	26.9	13 53.8	1.0 06	26.8	14 23.7	1.0 06	26.8	14 53.6	1.0 06	26.8	15 23.6	1.0 06	26.7	15 53.5	1.0 06	26.7	16 23.4	1.0 06	26.7	2
3	12 50.2	1.0 06	25.9	13 20.1	1.0 06	25.9	13 50.0	1.0 06	25.9	14 20.0	1.0 06	25.8	14 49.9	1.0 06	25.8	15 19.9	1.0 06	25.8	15 49.8	1.0 06	25.7	16 19.7	1.0 06	25.7	3
4	12 46.6	1.0 06	25.0	13 16.5	1.0 06	25.0	13 46.5	1.0 06	24.9	14 16.4	1.0 06	24.9	14 46.3	1.0 06	24.9	15 16.3	1.0 06	24.8	15 46.2	1.0 06	24.8	16 16.2	1.0 06	24.8	4
155	12 43.1	1.0 06	24.0	13 13.0	1.0 06	24.0	13 43.0	1.0 06	23.9	14 13.0	1.0 06	23.9	14 42.9	1.0 06	23.9	15 12.8	1.0 06	23.9	15 42.8	1.0 06	23.8	16 12.7	1.0 06	23.8	155
6	12 39.6	1.0 05	23.1	13 09.7	1.0 05	23.0	13 39.7	1.0 05	23.0	14 09.6	1.0 05	23.0	14 39.6	1.0 05	22.9	15 09.5	1.0 05	22.9	15 39.5	1.0 05	22.9	16 09.4	1.0 05	22.9	6
7	12 36.6	1.0 05	22.1	13 06.5	1.0 05	22.1	13 36.5	1.0 05	22.0	14 06.4	1.0 05	22.0	14 36.4	1.0 05	22.0	15 06.3	1.0 05	22.0	15 36.3	1.0 05	21.9	16 06.2	1.0 05	21.9	7
8	12 33.5	1.0 05	21.1	13 03.5	1.0 05	21.1	13 33.4	1.0 05	21.1	14 03.4	1.0 05	21.1	14 33.3	1.0 05	21.0	15 03.3	1.0 05	21.0	15 33.2	1.0 05	21.0	16 03.2	1.0 05	20.9	8
9	12 30.6	1.0 05	20.2	13 00.5	1.0 05	20.2	13 30.5	1.0 05	20.1	14 00.4	1.0 05	20.1	14 30.4	1.0 05	20.1	15 00.4	1.0 05	20.0	15 30.3	1.0 05	20.0	16 00.3	1.0 05	20.0	9
160	12 27.7	1.0 04	19.2	12 57.7	1.0 04	19.2	13 27.7	1.0 04	19.2	13 57.6	1.0 04	19.1	14 27.6	1.0 04	19.1	14 57.6	1.0 04	19.1	15 27.5	1.0 04	19.1	15 57.5	1.0 04	19.0	160
1	12 25.1	1.0 04	18.3	12 55.0	1.0 04	18.2	13 25.0	1.0 04	18.2	13 55.0	1.0 04	18.2	14 24.9	1.0 04	18.2	14 54.9	1.0 04	18.1	15 24.9	1.0 04	18.1	15 54.8	1.0 04	18.1	1
2	12 22.5	1.0 04	17.3	12 52.5	1.0 04	17.3	13 22.5	1.0 04	17.2	13 52.4	1.0 04	17.2	14 22.4	1.0 04	17.2	14 52.4	1.0 04	17.2	15 22.3	1.0 04	17.2	15 52.3	1.0 04	17.1	2
3	12 20.1	1.0 04	16.3	12 50.1	1.0 04	16.3	13 20.0	1.0 04	16.3	13 50.0	1.0 04	16.3	14 20.0	1.0 04	16.2	14 50.0	1.0 04	16.2	15 19.9	1.0 04	16.2	15 49.9	1.0 04	16.2	3
4	12 17.8	1.0 04	15.4	12 47.8	1.0 04	15.3	13 17.8	1.0 04	15.3	13 47.7	1.0 04	15.3	14 17.7	1.0 04	15.3	14 47.7	1.0 04	15.3	15 17.7	1.0 04	15.3	15 47.7	1.0 04	15.2	4
165	12 15.7	1.0 03	14.4	12 45.6	1.0 03	14.4	13 15.6	1.0 03	14.4	13 45.6	1.0 03	14.4	14 15.6	1.0 03	14.3	14 45.6	1.0 03	14.3	15 15.5	1.0 03	14.3	15 45.5	1.0 03	14.3	165
6	12 13.6	1.0 03	13.5	12 43.6	1.0 03	13.4	13 13.6	1.0 03	13.4	13 43.6	1.0 03	13.4	14 13.6	1.0 03	13.4	14 43.6	1.0 03	13.3	15 13.6	1.0 03	13.3	15 43.5	1.0 03	13.3	6
7	12 11.8	1.0 03	12.5	12 41.8	1.0 03	12.5	13 11.8	1.0 03	12.5	13 41.7	1.0 03	12.4	14 11.7	1.0 03	12.4	14 41.7	1.0 03	12.4	15 11.7	1.0 03	12.4	15 41.7	1.0 03	12.4	7
8	12 10.0	1.0 03	11.5	12 40.0	1.0 03	11.5	13 10.0	1.0 03	11.5	13 40.0	1.0 03	11.5	14 10.0	1.0 03	11.5	14 40.0	1.0 03	11.5	15 10.0	1.0 03	11.4	15 40.0	1.0 03	11.4	8
9	12 08.4	1.0 02	10.6	12 38.4	1.0 02	10.6	13 08.4	1.0 02	10.5	13 38.4	1.0 02	10.5	14 08.4	1.0 02	10.5	14 38.4	1.0 02	10.5	15 08.4	1.0 02	10.5	15 38.4	1.0 02	10.5	9
170	12 07.0	1.0 02	09.6	12 37.0	1.0 02	09.6	13 07.0	1.0 02	09.6	13 37.0	1.0 02	09.6	14 06.9	1.0 02	09.6	14 36.9	1.0 02	09.5	15 06.9	1.0 02	09.5	15 36.9	1.0 02	09.5	170
1	12 05.7	1.0 02	08.6	12 35.7	1.0 02	08.6	13 05.6	1.0 02	08.6	13 35.6	1.0 02	08.6	14 05.6	1.0 02	08.6	14 35.6	1.0 02	08.6	15 05.6	1.0 02	08.6	15 35.6	1.0 02	08.6	1
2	12 04.5	1.0 02	07.7	12 34.5	1.0 02	07.7	13 04.5	1.0 02	07.7	13 34.5	1.0 02	07.7	14 04.4	1.0 02	07.6	14 34.4	1.0 02	07.6	15 04.4	1.0 02	07.6	15 34.4	1.0 02	07.6	2
3	12 03.4	1.0 02	06.7	12 33.4	1.0 02	06.7	13 03.4	1.0 02	06.7	13 33.4	1.0 02	06.7	14 03.4	1.0 02	06.7	14 33.4	1.0 02	06.7	15 03.4	1.0 02	06.7	15 33.4	1.0 02	06.7	3
4	12 02.5	1.0 01	05.8	12 32.5	1.0 01	05.8	13 02.5	1.0 01	05.7	13 32.5	1.0 01	05.7	14 02.5	1.0 01	05.7	14 32.5	1.0 01	05.7	15 02.5	1.0 01	05.7	15 32.5	1.0 01	05.7	4
175	12 01.7	1.0 01	04.8	12 31.7	1.0 01	04.8	13 01.7	1.0 01	04.8	13 31.7	1.0 01	04.8	14 01.7	1.0 01	04.8	14 31.7	1.0 01	04.8	15 01.7	1.0 01	04.8	15 31.7	1.0 01	04.8	175
6	12 01.1	1.0 01	03.8	12 31.1	1.0 01	03.8	13 01.1	1.0 01	03.8	13 31.1	1.0 01	03.8	14 01.1	1.0 01	03.8	14 31.1	1.0 01	03.8	15 01.1	1.0 01	03.8	15 31.1	1.0 01	03.8	6
7	12 00.6	1.0 01	02.9	12 30.6	1.0 01	02.9	13 00.6	1.0 01	02.9	13 30.6	1.0 01	02.9	14 00.6	1.0 01	02.9	14 30.6	1.0 01	02.9	15 00.6	1.0 01	02.9	15 30.6	1.0 01	02.9	7
8	12 00.3	1.0 00	01.9	12 30.3	1.0 00	01.9	13 00.3	1.0 00	01.9	13 30.3	1.0 00	01.9	14 00.3	1.0 00	01.9	14 30.3	1.0 00	01.9	15 00.3	1.0 00	01.9	15 30.3	1.0 00	01.9	8
9	12 00.1	1.0 00	01.0	12 30.1	1.0 00	01.0	13 00.1	1.0 00	01.0	13 30.1	1.0 00	01.0	14 00.1	1.0 00	01.0	14 30.1	1.0 00	01.0	15 00.1	1.0 00	01.0	15 30.1	1.0 00	01.0	9
180	12 00.0	1.0 00	00.0	12 30.0	1.0 00	00.0	13 00.0	1.0 00	00.0	13 30.0	1.0 00	00.0	14 00.0	1.0 00	00.0	14 30.0	1.0 00	00.0	15 00.0	1.0 00	00.0	15 30.0	1.0 00	00.0	180

DECLINATION SAME NAME AS LATITUDE

Each cell lists: Alt. (° ′) · Δd · Δt · Az. (°)

H.A.	24° 00′	24° 30′	25° 00′	25° 30′	26° 00′	26° 30′	27° 00′	27° 30′	H.A.
00	32 06.0 1.0 00 180.0	32 30.0 1.0 00 180.0	33 00.0 1.0 00 180.0	33 30.0 1.0 00 180.0	34 00.0 1.0 00 180.0	34 30.0 1.0 00 180.0	35 00.0 1.0 00 180.0	35 30.0 1.0 00 180.0	00
1	31 59.9 1.0 00 178.9	32 29.9 1.0 00 178.9	32 59.9 1.0 00 178.9	33 29.9 1.0 00 178.9	33 59.9 1.0 00 178.9	34 29.9 1.0 00 178.9	34 59.9 1.0 00 178.9	35 29.9 1.0 00 178.9	1
2	31 59.7 1.0 01 177.8	32 29.7 1.0 01 177.8	32 59.7 1.0 01 177.8	33 29.7 1.0 01 177.8	33 59.7 1.0 01 177.7	34 29.7 1.0 01 177.7	34 59.7 1.0 01 177.7	35 29.7 1.0 01 177.7	2
3	31 59.3 1.0 01 176.8	32 29.3 1.0 01 176.8	32 59.3 1.0 01 176.8	33 29.3 1.0 01 176.8	33 59.3 1.0 01 176.7	34 29.3 1.0 01 176.7	34 59.3 1.0 01 176.7	35 29.3 1.0 01 176.7	3
4	31 58.7 1.0 01 175.7	32 28.7 1.0 01 175.7	32 58.7 1.0 01 175.7	33 28.7 1.0 01 175.7	33 58.7 1.0 01 175.7	34 28.7 1.0 01 175.7	34 58.7 1.0 01 175.6	35 28.7 1.0 01 175.6	4
05	31 58.0 1.0 01 174.6	32 28.0 1.0 01 174.6	32 58.0 1.0 01 174.6	33 28.0 1.0 01 174.6	33 58.0 1.0 01 174.6	34 28.0 1.0 01 174.6	34 58.0 1.0 01 174.6	35 28.0 1.0 01 174.6	05
6	31 57.2 1.0 02 173.5	32 27.2 1.0 02 173.5	32 57.2 1.0 02 173.5	33 27.2 1.0 02 173.5	33 57.2 1.0 02 173.5	34 27.2 1.0 02 173.5	34 57.2 1.0 02 173.5	35 27.1 1.0 02 173.5	6
7	31 56.2 1.0 02 172.5	32 26.2 1.0 02 172.4	32 56.1 1.0 02 172.4	33 26.1 1.0 02 172.4	33 56.1 1.0 02 172.4	34 26.1 1.0 02 172.4	34 56.1 1.0 02 172.4	35 26.1 1.0 02 172.4	7
8	31 55.0 1.0 02 171.4	32 25.0 1.0 02 171.4	32 55.0 1.0 02 171.4	33 25.0 1.0 02 171.4	33 55.0 1.0 02 171.3	34 24.9 1.0 02 171.3	34 54.9 1.0 02 171.3	35 24.9 1.0 02 171.3	8
9	31 53.7 1.0 02 170.3	32 23.6 1.0 02 170.3	32 53.6 1.0 02 170.3	33 23.6 1.0 02 170.3	33 53.6 1.0 02 170.2	34 23.6 1.0 02 170.2	34 53.6 1.0 02 170.2	35 23.6 1.0 02 170.2	9
10	31 52.2 1.0 03 169.2	32 22.2 1.0 03 169.2	32 52.2 1.0 03 169.2	33 22.1 1.0 03 169.2	33 52.1 1.0 03 169.2	34 22.1 1.0 03 169.1	34 52.1 1.0 03 169.1	35 22.1 1.0 03 169.1	10
1	31 50.5 1.0 03 168.2	32 20.5 1.0 03 168.1	32 50.5 1.0 03 168.1	33 20.5 1.0 03 168.1	33 50.5 1.0 03 168.1	34 20.5 1.0 03 168.0	34 50.4 1.0 03 168.0	35 20.4 1.0 03 168.0	1
2	31 48.7 1.0 03 167.1	32 18.7 1.0 03 167.1	32 48.7 1.0 03 167.0	33 18.7 1.0 03 167.0	33 48.7 1.0 03 167.0	34 18.7 1.0 03 167.0	34 48.6 1.0 03 167.0	35 18.6 1.0 03 166.9	2
3	31 46.8 1.0 03 166.0	32 16.8 1.0 04 166.0	32 46.8 1.0 04 166.0	33 16.7 1.0 04 165.9	33 46.7 1.0 04 165.9	34 16.7 1.0 04 165.9	34 46.7 1.0 04 165.9	35 16.7 1.0 04 165.9	3
4	31 44.7 1.0 04 164.9	32 14.7 1.0 04 164.9	32 44.7 1.0 04 164.9	33 14.6 1.0 04 164.9	33 44.6 1.0 04 164.8	34 14.6 1.0 04 164.8	34 44.6 1.0 04 164.8	35 14.5 1.0 04 164.8	4
15	31 42.5 1.0 04 163.9	32 12.4 1.0 04 163.8	32 42.4 1.0 04 163.8	33 12.4 1.0 04 163.8	33 42.4 1.0 04 163.8	34 12.3 1.0 04 163.7	34 42.3 1.0 04 163.7	35 12.3 1.0 04 163.7	15
6	31 40.1 1.0 04 162.8	32 10.0 1.0 04 162.8	32 40.0 1.0 04 162.7	33 10.0 1.0 04 162.7	33 39.9 1.0 04 162.7	34 09.9 1.0 04 162.6	34 39.9 1.0 04 162.6	35 09.8 1.0 04 162.6	6
7	31 37.5 1.0 05 161.7	32 07.5 1.0 04 161.7	32 37.5 1.0 04 161.7	33 07.4 1.0 04 161.6	33 37.4 1.0 04 161.6	34 07.3 1.0 05 161.6	34 37.3 1.0 05 161.5	35 07.3 1.0 05 161.5	7
8	31 34.8 1.0 05 160.6	32 04.8 1.0 05 160.6	32 34.8 1.0 05 160.6	33 04.7 1.0 05 160.6	33 34.7 1.0 05 160.5	34 04.6 1.0 05 160.5	34 34.6 1.0 05 160.5	35 04.6 1.0 05 160.4	8
9	31 32.0 1.0 05 159.6	32 01.9 1.0 05 159.5	32 31.9 1.0 05 159.5	33 01.9 1.0 05 159.5	33 31.8 1.0 05 159.4	34 01.8 1.0 05 159.4	34 31.7 1.0 05 159.4	35 01.7 1.0 05 159.3	9
20	31 29.0 1.0 05 158.5	31 59.0 1.0 05 158.5	32 28.9 1.0 05 158.4	32 58.9 1.0 05 158.4	33 28.8 1.0 05 158.4	33 58.8 1.0 05 158.3	34 28.7 1.0 05 158.3	34 58.7 1.0 05 158.3	20
1	31 25.9 1.0 05 157.4	31 55.8 1.0 05 157.4	32 25.5 1.0 06 157.3	32 55.7 1.0 06 157.3	33 25.7 1.0 06 157.3	33 55.6 1.0 06 157.3	34 25.6 1.0 06 157.2	34 55.5 1.0 06 157.2	1
2	31 22.6 1.0 06 156.4	31 52.5 1.0 06 156.3	32 22.5 1.0 06 156.3	32 52.4 1.0 06 156.3	33 22.4 1.0 06 156.2	33 52.3 1.0 06 156.2	34 22.3 1.0 06 156.1	34 52.2 1.0 06 156.1	2
3	31 19.2 1.0 06 155.3	31 49.1 1.0 06 155.3	32 19.1 1.0 06 155.2	32 49.0 1.0 06 155.2	33 18.9 1.0 06 155.1	33 48.9 1.0 06 155.1	34 18.8 1.0 06 155.1	34 48.7 1.0 06 155.0	3
4	31 15.6 1.0 06 154.2	31 45.6 1.0 06 154.2	32 15.5 1.0 06 154.2	32 45.4 1.0 06 154.1	33 15.4 1.0 06 154.1	33 45.3 1.0 06 154.0	34 15.2 1.0 06 154.0	34 45.1 1.0 06 154.0	4
25	31 11.9 1.0 06 153.2	31 41.8 1.0 06 153.1	32 11.8 1.0 06 153.1	32 41.7 1.0 06 153.0	33 11.6 1.0 06 153.0	33 41.6 1.0 06 153.0	34 11.5 1.0 06 152.9	34 41.4 1.0 06 152.9	25
6	31 08.1 1.0 07 152.1	31 38.0 1.0 07 152.1	32 07.9 1.0 07 152.0	32 37.8 1.0 07 152.0	33 07.8 1.0 07 151.9	33 37.7 1.0 07 151.9	34 07.6 1.0 07 151.8	34 37.5 1.0 07 151.8	6
7	31 04.1 1.0 07 151.0	31 34.0 1.0 07 151.0	32 03.9 1.0 07 151.0	32 33.9 1.0 07 150.9	33 03.8 1.0 07 150.9	33 33.7 1.0 07 150.8	34 03.6 1.0 07 150.8	34 33.5 1.0 07 150.7	7
8	31 00.0 1.0 07 150.0	31 29.9 1.0 07 149.9	31 59.8 1.0 07 149.9	32 29.7 1.0 07 149.8	32 59.6 1.0 07 149.8	33 29.5 1.0 07 149.7	33 59.5 1.0 07 149.7	34 29.4 1.0 07 149.7	8
9	30 55.8 1.0 07 148.9	31 25.7 1.0 07 148.9	31 55.6 1.0 07 148.8	32 25.5 1.0 07 148.8	32 55.4 1.0 07 148.7	33 25.3 1.0 07 148.7	33 55.2 1.0 07 148.6	34 25.1 1.0 07 148.6	9
30	30 51.4 1.0 08 147.9	31 21.3 1.0 08 147.8	31 51.2 1.0 08 147.8	32 21.1 1.0 08 147.7	32 51.0 1.0 08 147.7	33 20.9 1.0 08 147.6	33 50.8 1.0 08 147.6	34 20.7 1.0 08 147.5	30
1	30 46.9 1.0 08 146.8	31 16.8 1.0 08 146.7	31 46.7 1.0 08 146.7	32 16.5 1.0 08 146.6	32 46.4 1.0 08 146.6	33 16.3 1.0 08 146.5	33 46.2 1.0 08 146.5	34 16.1 1.0 08 146.4	1
2	30 42.2 1.0 08 145.7	31 12.1 1.0 08 145.7	31 42.0 1.0 08 145.6	32 11.9 1.0 08 145.6	32 41.8 1.0 08 145.5	33 11.7 1.0 08 145.5	33 41.5 1.0 08 145.4	34 11.4 1.0 08 145.4	2
3	30 37.5 1.0 08 144.7	31 07.3 1.0 08 144.6	31 37.2 1.0 08 144.6	32 07.1 1.0 08 144.5	32 37.0 1.0 08 144.5	33 06.9 1.0 08 144.4	33 36.7 1.0 08 144.4	34 06.6 1.0 08 144.3	3
4	30 32.6 1.0 08 143.6	31 02.4 1.0 08 143.6	31 32.3 1.0 08 143.5	32 02.2 1.0 08 143.5	32 32.1 1.0 08 143.4	33 01.9 1.0 08 143.3	33 31.8 1.0 08 143.3	34 01.7 1.0 08 143.2	4
35	30 27.6 1.0 09 142.6	30 57.4 1.0 09 142.5	31 27.3 1.0 09 142.4	31 57.1 1.0 09 142.4	32 27.0 1.0 09 142.3	32 56.9 1.0 09 142.3	33 26.8 1.0 09 142.2	33 56.6 1.0 09 142.1	35
6	30 22.4 1.0 09 141.5	30 52.3 1.0 09 141.5	31 22.1 1.0 09 141.4	31 52.0 1.0 09 141.3	32 21.9 1.0 09 141.3	32 51.7 1.0 09 141.2	33 21.6 1.0 09 141.2	33 51.4 1.0 09 141.1	6
7	30 17.2 1.0 09 140.5	30 47.0 1.0 09 140.4	31 16.9 1.0 09 140.3	31 46.7 1.0 09 140.3	32 16.6 1.0 09 140.2	32 46.4 1.0 09 140.2	33 16.3 99 09 140.1	33 46.1 99 09 140.0	7
8	30 11.8 1.0 09 139.4	30 41.6 1.0 09 139.3	31 11.5 99 09 139.3	31 41.3 99 09 139.2	32 11.2 99 09 139.2	32 41.0 99 09 139.1	33 10.9 99 09 139.0	33 40.7 99 09 139.0	8
9	30 06.3 99 09 138.4	30 36.1 99 09 138.3	31 06.0 99 09 138.2	31 35.8 99 09 138.2	32 05.7 99 09 138.1	32 35.5 99 09 138.1	33 05.3 99 09 138.0	33 35.2 99 09 137.9	9
40	30 00.7 99 10 137.3	30 30.5 99 10 137.2	31 00.4 99 10 137.2	31 30.2 99 10 137.1	32 00.0 99 10 137.1	32 29.8 99 10 137.0	32 59.7 99 10 136.9	33 29.5 99 10 136.9	40
1	29 55.0 99 10 136.3	30 24.8 99 10 136.2	30 54.6 99 10 136.1	31 24.5 99 10 136.1	31 54.3 99 10 136.0	32 24.1 99 10 135.9	32 53.9 99 10 135.9	33 23.8 99 10 135.8	1
2	29 49.1 99 10 135.2	30 19.0 99 10 135.1	30 48.8 99 10 135.1	31 18.6 99 10 135.0	31 48.4 99 10 135.0	32 18.3 99 10 134.9	32 48.1 99 10 134.8	33 17.9 99 10 134.8	2
3	29 43.2 99 10 134.2	30 13.0 99 10 134.1	30 42.8 99 10 134.0	31 12.7 99 10 134.0	31 42.5 99 10 133.9	32 12.3 99 10 133.8	32 42.1 99 10 133.8	33 11.9 99 10 133.7	3
4	29 37.2 99 10 133.1	30 07.0 99 10 133.0	30 36.8 99 10 133.0	31 06.6 99 10 132.9	31 36.4 99 10 132.9	32 06.2 99 10 132.8	32 36.0 99 10 132.7	33 05.8 99 10 132.6	4
45	29 31.0 99 11 132.1	30 00.8 99 10 132.0	30 30.6 99 10 131.9	31 00.4 99 10 131.9	31 30.2 99 10 131.8	32 00.0 99 10 131.7	32 29.8 99 10 131.7	32 59.6 99 10 131.6	45
6	29 24.8 99 11 131.0	29 54.6 99 11 131.0	30 24.4 99 11 130.9	30 54.2 99 11 130.8	31 24.0 99 11 130.8	31 53.7 99 11 130.7	32 23.5 99 11 130.6	32 53.3 99 11 130.5	6
7	29 18.4 99 11 130.0	29 48.2 99 11 129.9	30 18.0 99 11 129.9	30 47.8 99 11 129.8	31 17.6 99 11 129.7	31 47.4 99 11 129.6	32 17.1 99 11 129.6	32 46.9 99 11 129.5	7
8	29 12.0 99 11 128.9	29 41.8 99 11 128.9	30 11.5 99 11 128.8	30 41.3 99 11 128.7	31 11.1 99 11 128.7	31 40.9 99 11 128.6	32 10.7 99 11 128.5	32 40.4 99 11 128.5	8
9	29 05.4 99 11 127.9	29 35.2 99 11 127.8	30 05.0 99 11 127.8	30 34.8 99 11 127.7	31 04.5 99 11 127.6	31 34.3 99 11 127.6	32 04.1 99 11 127.5	32 33.9 99 11 127.4	9
50	28 58.8 99 11 126.9	29 28.6 99 11 126.8	29 58.3 99 11 126.7	30 28.1 99 11 126.7	30 57.9 99 11 126.6	31 27.6 99 11 126.5	31 57.4 99 11 126.4	32 27.2 99 12 126.4	50
1	28 52.1 99 11 125.9	29 21.8 99 11 125.8	29 51.6 99 11 125.7	30 21.4 99 11 125.6	30 51.1 99 11 125.5	31 20.9 99 11 125.5	31 50.6 99 11 125.4	32 20.4 99 11 125.3	1
2	28 45.3 99 12 124.8	29 15.0 99 12 124.7	29 44.8 99 12 124.7	30 14.5 99 12 124.6	30 44.3 99 12 124.5	31 14.0 99 12 124.4	31 43.8 99 12 124.4	32 13.5 99 12 124.3	2
3	28 38.4 99 12 123.8	29 08.1 99 12 123.7	29 37.9 99 12 123.6	30 07.6 99 12 123.5	30 37.4 99 12 123.5	31 07.1 99 12 123.4	31 36.9 99 12 123.3	32 06.6 99 12 123.2	3
4	28 31.4 99 12 122.7	29 01.1 99 12 122.7	29 30.9 99 12 122.6	30 00.6 99 12 122.5	30 30.4 99 12 122.4	31 00.1 99 12 122.4	31 29.8 99 12 122.3	31 59.6 99 12 122.2	4
55	28 24.3 99 12 121.7	28 54.1 99 12 121.6	29 23.8 99 12 121.6	29 53.5 99 12 121.5	30 23.3 99 12 121.4	30 53.0 99 12 121.3	31 22.7 99 12 121.3	31 52.5 99 12 121.2	55
6	28 17.2 99 12 120.7	28 46.9 99 12 120.6	29 16.6 99 12 120.5	29 46.4 99 12 120.5	30 16.1 99 12 120.4	30 45.8 99 12 120.3	31 15.6 99 12 120.2	31 45.3 99 12 120.1	6
7	28 09.9 99 12 119.6	28 39.7 99 12 119.6	29 09.4 99 12 119.5	29 39.1 99 12 119.4	30 08.9 99 12 119.3	30 38.6 99 12 119.3	31 08.3 99 12 119.2	31 38.0 99 12 119.1	7
8	28 02.7 99 12 118.6	28 32.4 99 12 118.5	29 02.1 99 12 118.5	29 31.8 99 12 118.4	30 01.6 99 12 118.3	30 31.3 99 12 118.2	31 01.0 99 12 118.2	31 30.7 99 12 118.1	8
9	27 55.3 99 12 117.6	28 25.0 99 12 117.5	28 54.7 99 12 117.4	29 24.5 99 12 117.4	29 54.2 99 12 117.3	30 23.9 99 12 117.3	30 53.6 99 12 117.2	31 23.3 99 12 117.0	9
60	27 47.9 99 12 116.6	28 17.6 99 12 116.5	28 47.3 99 12 116.4	29 17.0 99 13 116.3	29 46.7 99 13 116.3	30 16.4 99 13 116.2	30 46.1 99 13 116.1	31 15.8 99 13 116.0	60
1	27 40.4 99 13 115.6	28 10.1 99 13 115.5	28 39.8 99 13 115.4	29 09.5 99 13 115.3	29 39.2 99 13 115.2	30 08.9 99 13 115.2	30 38.6 99 13 115.1	31 08.3 99 13 115.0	1
2	27 32.8 99 13 114.5	28 02.5 99 13 114.5	28 32.2 99 13 114.4	29 01.9 99 13 114.3	29 31.6 99 13 114.2	30 01.3 99 13 114.1	30 31.0 99 13 114.0	31 00.7 99 13 114.0	2
3	27 25.2 99 13 113.5	27 54.9 99 13 113.4	28 24.5 99 13 113.4	28 54.3 99 13 113.3	29 24.0 99 13 113.2	29 53.7 99 13 113.1	30 23.3 99 13 113.0	30 53.0 99 13 112.9	3
4	27 17.5 99 13 112.5	27 47.2 99 13 112.4	28 16.9 99 13 112.3	28 46.6 99 13 112.3	29 16.3 99 13 112.2	29 45.9 99 13 112.1	30 15.6 99 13 112.0	30 45.3 99 13 111.9	4
65	27 09.7 99 13 111.5	27 39.4 99 13 111.4	28 09.1 99 13 111.3	28 38.8 99 13 111.2	29 08.5 99 13 111.1	29 38.2 99 13 111.1	30 07.9 99 13 111.0	30 37.5 99 13 110.9	65
6	27 01.9 99 13 110.5	27 31.6 99 13 110.4	28 01.3 99 13 110.3	28 31.0 99 13 110.2	29 00.7 99 13 110.1	29 30.4 99 13 110.0	30 00.0 99 13 110.0	30 29.7 99 13 109.9	6
7	26 54.1 99 13 109.4	27 23.8 99 13 109.4	27 53.5 99 13 109.3	28 23.1 99 13 109.2	28 52.8 99 13 109.1	29 22.5 99 13 109.0	29 52.2 99 13 108.9	30 21.8 99 13 108.9	7
8	26 46.2 99 13 108.4	27 15.9 99 13 108.3	27 45.5 99 13 108.3	28 15.2 99 13 108.2	28 44.9 99 13 108.1	29 14.5 99 13 108.0	29 44.2 99 13 107.9	30 13.9 99 13 107.8	8
9	26 38.2 99 13 107.4	27 07.9 99 13 107.3	27 37.6 99 13 107.3	28 07.3 99 13 107.2	28 36.9 99 13 107.1	29 06.6 99 13 107.0	29 36.3 99 13 106.9	30 05.9 99 13 106.8	9
70	26 30.3 99 13 106.4	26 59.9 99 13 106.3	27 29.6 99 13 106.2	27 59.3 99 13 106.2	28 28.9 99 13 106.1	28 58.6 99 13 106.0	29 28.3 99 13 105.9	29 57.9 99 13 105.8	70
1	26 22.2 99 13 105.4	26 51.9 99 13 105.3	27 21.6 99 13 105.2	27 51.2 99 13 105.2	28 20.9 99 13 105.1	28 50.6 99 13 105.0	29 20.2 99 13 104.9	29 49.9 99 13 104.8	1
2	26 14.2 99 14 104.4	26 43.8 99 14 104.3	27 13.5 99 14 104.2	27 43.2 99 14 104.1	28 12.8 99 14 104.1	28 42.5 99 14 104.0	29 12.1 99 14 103.9	29 41.8 99 14 103.8	2
3	26 06.1 99 14 103.4	26 35.7 99 14 103.3	27 05.4 99 14 103.2	27 35.0 99 14 103.1	28 04.7 99 14 103.0	28 34.4 99 14 103.0	29 04.0 99 14 103.0	29 33.7 99 14 102.8	3
4	25 57.9 99 14 102.4	26 27.6 99 14 102.3	26 57.2 99 14 102.2	27 26.9 99 14 102.1	27 56.5 99 14 102.1	28 26.2 99 14 102.0	28 55.9 99 14 101.9	29 25.5 99 14 101.8	4
75	25 49.7 99 14 101.4	26 19.4 99 14 101.3	26 49.1 99 14 101.2	27 18.7 99 14 101.1	27 48.4 99 14 101.0	28 18.0 99 14 101.0	28 47.7 99 14 100.9	29 17.3 99 14 100.8	75
6	25 41.5 99 14 100.4	26 11.2 99 14 100.3	26 40.8 99 14 100.2	27 10.5 99 14 100.1	27 40.2 99 14 100.0	28 09.8 99 14 99.9	28 39.4 99 14 99.9	29 09.1 99 14 99.8	6
7	25 33.3 99 14 99.3	26 02.9 99 14 99.3	26 32.6 99 14 99.2	27 02.3 99 14 99.1	27 31.9 99 14 99.0	28 01.6 99 14 98.9	28 31.2 99 14 98.9	29 00.8 99 14 98.8	7
8	25 25.1 99 14 98.4	25 54.7 99 14 98.3	26 24.4 99 14 98.2	26 54.0 99 14 98.2	27 23.7 99 14 98.0	27 53.3 99 14 97.9	28 22.9 99 14 97.9	28 52.6 99 14 97.8	8
9	25 16.8 99 14 97.4	25 46.4 99 14 97.3	26 16.1 99 14 97.2	26 45.7 99 14 97.1	27 15.4 99 14 97.0	27 45.0 99 14 96.9	28 14.7 99 14 96.9	28 44.3 99 14 96.8	9
80	25 08.5 99 14 96.4	25 38.1 99 14 96.3	26 07.8 99 14 96.2	26 37.4 99 14 96.1	27 07.1 99 14 96.0	27 36.7 99 14 95.9	28 06.4 99 14 95.9	28 36.0 99 14 95.8	80
1	25 00.2 99 14 95.4	25 29.8 99 14 95.3	25 59.5 99 14 95.2	26 29.1 99 14 95.1	26 58.8 99 14 95.0	27 28.4 99 14 94.9	27 58.1 99 14 94.9	28 27.7 99 14 94.8	1
2	24 51.9 99 14 94.4	25 21.5 99 14 94.3	25 51.2 99 14 94.2	26 20.8 99 14 94.1	26 50.5 99 14 94.0	27 20.1 99 14 94.0	27 49.7 99 14 93.9	28 19.4 99 14 93.8	2
3	24 43.5 99 14 93.4	25 13.2 99 14 93.3	25 42.8 99 14 93.2	26 12.5 99 14 93.1	26 42.1 99 14 93.0	27 11.8 99 14 93.0	27 41.4 99 14 92.9	28 11.0 99 14 92.8	3
4	24 35.2 99 14 92.4	25 04.8 99 14 92.3	25 34.5 99 14 92.2	26 04.1 99 14 92.1	26 33.8 99 14 92.1	27 03.4 99 14 92.0	27 33.0 99 14 91.9	28 02.7 99 14 91.8	4
85	24 26.9 99 14 91.4	24 56.5 99 14 91.3	25 26.1 99 14 91.2	25 55.8 99 14 91.1	26 25.4 99 14 91.1	26 55.1 99 14 91.0	27 24.7 99 14 90.9	27 54.3 99 14 90.8	85
6	24 18.5 99 14 90.4	24 48.1 99 14 90.3	25 17.8 99 14 90.2	25 47.4 99 14 90.2	26 17.1 99 14 90.1	26 46.7 99 14 90.0	27 16.3 99 14 89.9	27 46.0 99 14 89.8	6
7	24 10.2 99 14 89.4	24 39.8 99 14 89.3	25 09.4 99 14 89.2	25 39.1 99 14 89.2	26 08.7 99 14 89.1	26 38.4 99 14 89.0	27 08.0 99 14 88.9	27 37.6 99 14 88.8	7
8	24 01.8 99 14 88.4	24 31.5 99 14 88.3	25 01.1 99 14 88.3	25 30.7 99 14 88.2	26 00.4 99 14 88.1	26 30.0 99 14 88.0	26 59.7 99 14 87.9	27 29.3 99 14 87.8	8
9	23 53.5 99 14 87.4	24 23.1 99 14 87.4	24 52.8 99 14 87.3	25 22.4 99 14 87.2	25 52.0 99 14 87.1	26 21.7 99 14 87.0	26 51.3 99 14 86.9	27 20.9 99 14 86.8	9
90	23 45.1 99 14 86.5	24 14.8 99 14 86.4	24 44.4 99 14 86.3	25 14.1 99 14 86.2	25 43.7 99 14 86.1	26 13.3 99 14 86.0	26 43.0 99 14 85.9	27 12.6 99 14 85.9	90

H.A.	24°00' Alt.	Az.	24°30' Alt.	Az.	25°00' Alt.	Az.	25°30' Alt.	Az.	26°00' Alt.	Az.	26°30' Alt.	Az.	27°00' Alt.	Az.	27°30' Alt.	Az.	H.A.
91	23 36.8 99 14	85.5	24 06.4 99 14	85.4	24 36.1 99 14	85.3	25 05.7 99 14	85.2	25 35.4 99 14	85.1	26 05.0 99 14	85.0	26 34.7 99 14	85.0	27 04.3 99 14	84.9	91
2	23 28.5 99 14	84.5	23 58.1 99 14	84.4	24 27.8 99 14	84.3	24 57.4 99 14	84.2	25 27.1 99 14	84.1	25 56.7 99 14	84.1	26 26.3 99 14	84.0	26 56.0 99 14	83.9	2
3	23 20.2 99 14	83.5	23 49.8 99 14	83.4	24 19.5 99 14	83.3	24 49.1 99 14	83.2	25 18.8 99 14	83.2	25 48.4 99 14	83.1	26 18.0 99 14	83.0	26 47.7 99 14	82.9	3
4	23 11.9 99 14	82.5	23 41.5 99 14	82.4	24 11.2 99 14	82.4	24 40.8 99 14	82.3	25 10.5 99 14	82.2	25 40.1 99 14	82.1	26 09.8 99 14	82.0	26 39.4 99 14	81.9	4
95	23 03.6 99 14	81.5	23 33.3 99 14	81.5	24 02.9 99 14	81.4	24 32.6 99 14	81.3	25 02.2 99 14	81.2	25 31.9 99 14	81.1	26 01.5 99 14	81.0	26 31.1 99 14	80.9	95
6	22 55.4 99 14	80.5	23 25.0 99 14	80.5	23 54.7 99 14	80.4	24 24.3 99 14	80.3	24 54.0 99 14	80.2	25 23.6 99 14	80.1	25 53.3 99 14	80.1	26 22.9 99 14	80.0	6
7	22 47.1 99 14	79.6	23 16.8 99 14	79.5	23 46.5 99 14	79.4	24 16.1 99 14	79.3	24 45.8 99 14	79.2	25 15.4 99 14	79.2	25 45.1 99 14	79.1	26 14.7 99 14	79.0	7
8	22 38.9 99 14	78.6	23 08.6 99 14	78.5	23 38.3 99 14	78.4	24 07.9 99 14	78.3	24 37.6 99 14	78.3	25 07.2 99 14	78.2	25 36.9 99 14	78.1	26 06.5 99 14	78.0	8
9	22 30.8 99 14	77.6	23 00.4 99 14	77.5	23 30.1 99 14	77.5	23 59.8 99 14	77.4	24 29.4 99 14	77.3	24 59.1 99 14	77.2	25 28.7 99 14	77.1	25 58.4 99 14	77.0	9
100	22 22.6 99 14	76.6	22 52.3 99 14	76.6	23 22.0 99 14	76.5	23 51.6 99 14	76.4	24 21.3 99 14	76.3	24 50.9 99 13	76.2	25 20.6 99 14	76.1	25 50.2 99 14	76.1	100
1	22 14.5 99 13	75.7	22 44.2 99 13	75.6	23 13.9 99 13	75.5	23 43.5 99 13	75.4	24 13.2 99 13	75.3	24 42.8 99 13	75.3	25 12.5 99 13	75.2	25 42.2 99 13	75.1	1
2	22 06.4 99 13	74.7	22 36.1 99 13	74.6	23 05.8 99 13	74.5	23 35.5 99 13	74.4	24 05.1 99 13	74.4	24 34.8 99 13	74.3	25 04.4 99 13	74.2	25 34.1 99 13	74.1	2
3	21 58.4 99 13	73.7	22 28.1 99 13	73.6	22 57.8 99 13	73.6	23 27.4 99 13	73.5	23 57.1 99 13	73.4	24 26.8 99 13	73.3	24 56.4 99 13	73.2	25 26.1 99 13	73.1	3
4	21 50.4 99 13	72.7	22 20.1 99 13	72.7	22 49.8 99 13	72.6	23 19.4 99 13	72.5	23 49.1 99 13	72.4	24 18.8 99 13	72.3	24 48.5 99 13	72.3	25 18.1 99 13	72.2	4
105	21 42.5 99 13	71.8	22 12.1 99 13	71.7	22 41.8 99 13	71.6	23 11.5 99 13	71.5	23 41.2 99 13	71.4	24 10.9 99 13	71.4	24 40.5 99 13	71.3	25 10.2 99 13	71.2	105
6	21 34.6 99 13	70.8	22 04.2 99 13	70.7	22 33.9 99 13	70.6	23 03.6 99 13	70.6	23 33.3 99 13	70.5	24 03.0 99 13	70.4	24 32.6 99 13	70.3	25 02.3 99 13	70.2	6
7	21 26.7 99 13	69.8	21 56.4 99 13	69.7	22 26.1 99 13	69.7	22 55.8 99 13	69.6	23 25.4 99 13	69.5	23 55.1 99 13	69.4	24 24.8 99 13	69.3	24 54.5 99 13	69.3	7
8	21 18.9 99 13	68.8	21 48.6 99 13	68.8	22 18.3 99 13	68.7	22 48.0 99 13	68.6	23 17.6 99 13	68.5	23 47.3 99 13	68.5	24 17.0 99 13	68.4	24 46.7 99 13	68.3	8
9	21 11.1 99 13	67.9	21 40.8 99 13	67.8	22 10.5 99 13	67.7	22 40.2 99 13	67.6	23 09.9 99 13	67.6	23 39.6 99 13	67.5	24 09.3 99 13	67.4	24 39.0 99 13	67.3	9
110	21 03.4 99 13	66.9	21 33.1 99 13	66.8	22 02.8 99 13	66.8	22 32.5 99 13	66.7	23 02.2 99 13	66.6	23 31.9 99 13	66.5	24 01.6 99 13	66.4	24 31.3 99 13	66.4	110
1	20 55.8 99 13	65.9	21 25.5 99 13	65.9	21 55.2 99 13	65.8	22 24.9 99 13	65.7	22 54.6 99 13	65.6	23 24.3 99 13	65.6	23 54.0 99 12	65.5	24 23.7 99 12	65.4	1
2	20 48.2 99 13	65.0	21 17.9 99 13	64.9	21 47.6 99 13	64.8	22 17.3 99 13	64.7	22 47.0 99 13	64.7	23 16.7 99 12	64.6	23 46.4 99 12	64.5	24 16.1 99 12	64.4	2
3	20 40.6 99 12	64.0	21 10.3 99 12	63.9	21 40.1 99 12	63.9	22 09.8 99 12	63.8	22 39.5 99 12	63.7	23 09.2 99 12	63.6	23 38.9 99 12	63.6	24 08.6 99 12	63.5	3
4	20 33.2 99 12	63.0	21 02.9 99 12	62.9	21 32.6 99 12	62.9	22 02.3 99 12	62.8	22 32.0 99 12	62.7	23 01.7 99 12	62.7	23 31.4 99 12	62.6	24 01.2 99 12	62.5	4
115	20 25.7 99 12	62.1	20 55.5 99 12	62.0	21 25.2 99 12	61.9	21 54.9 99 12	61.9	22 24.6 99 12	61.8	22 54.4 99 12	61.7	23 24.1 99 12	61.6	23 53.8 99 12	61.6	115
6	20 18.4 99 12	61.1	20 48.1 99 12	61.0	21 17.9 99 12	61.0	21 47.6 99 12	60.9	22 17.3 99 12	60.8	22 47.0 99 12	60.7	23 16.8 99 12	60.7	23 46.5 99 12	60.6	6
7	20 11.1 99 12	60.1	20 40.9 99 12	60.1	21 10.6 99 12	60.0	21 40.3 99 12	59.9	22 10.1 99 12	59.9	22 39.8 99 12	59.8	23 09.5 99 12	59.7	23 39.2 99 12	59.6	7
8	20 03.9 99 12	59.2	20 33.7 99 12	59.1	21 03.4 99 12	59.0	21 33.1 99 12	59.0	22 02.9 99 12	58.9	22 32.6 99 12	58.8	23 02.3 99 12	58.7	23 32.1 99 12	58.7	8
9	19 56.8 99 12	58.2	20 26.5 99 12	58.1	20 56.3 99 12	58.1	21 26.0 99 12	58.0	21 55.8 99 12	57.9	22 25.5 99 12	57.9	22 55.2 99 12	57.8	23 25.0 99 12	57.7	9
120	19 49.7 99 12	57.2	20 19.5 99 12	57.2	20 49.2 99 12	57.1	21 19.0 99 12	57.0	21 48.7 99 12	57.0	22 18.5 99 12	56.9	22 48.2 99 12	56.8	23 17.9 99 12	56.8	120
1	19 42.7 99 13	56.3	20 12.5 99 12	56.2	20 42.2 99 12	56.1	21 12.0 99 11	56.1	21 41.8 99 11	56.0	22 11.5 99 11	55.9	22 41.3 99 11	55.9	23 11.0 99 11	55.8	1
2	19 35.8 99 11	55.3	20 05.6 99 11	55.3	20 35.4 99 11	55.2	21 05.1 99 11	55.1	21 34.9 99 11	55.1	22 04.6 99 11	55.0	22 34.4 99 11	54.9	23 04.1 99 11	54.8	2
3	19 29.0 99 11	54.4	19 58.8 99 11	54.3	20 28.5 99 11	54.2	20 58.3 99 11	54.1	21 28.1 99 11	54.1	21 57.8 99 11	54.0	22 27.6 99 11	54.0	22 57.3 99 11	53.9	3
4	19 22.3 99 11	53.4	19 52.0 99 11	53.3	20 21.8 99 11	53.3	20 51.6 99 11	53.2	21 21.3 99 11	53.1	21 51.1 99 11	53.1	22 20.9 99 11	53.0	22 50.6 99 11	52.9	4
125	19 15.6 99 11	52.4	19 45.4 99 11	52.4	20 15.2 99 11	52.3	20 44.9 99 11	52.2	21 14.7 99 11	52.2	21 44.5 99 11	52.1	22 14.2 99 11	52.0	22 44.0 99 11	52.0	125
6	19 09.0 99 11	51.5	19 38.8 99 11	51.4	20 08.6 99 11	51.4	20 38.4 99 11	51.3	21 08.1 99 11	51.2	21 37.9 99 11	51.2	22 07.7 99 11	51.1	22 37.5 99 11	51.0	6
7	19 02.5 99 11	50.5	19 32.3 99 11	50.5	20 02.1 99 11	50.4	20 31.8 99 11	50.3	21 01.7 99 11	50.3	21 31.5 99 11	50.2	22 01.3 99 11	50.1	22 31.0 99 11	50.1	7
8	18 56.1 99 10	49.6	19 25.9 99 10	49.5	19 55.7 99 10	49.4	20 25.5 99 10	49.4	20 55.3 99 10	49.3	21 25.1 99 10	49.2	21 54.9 99 10	49.2	22 24.7 99 10	49.1	8
9	18 49.8 99 10	48.6	19 19.6 99 10	48.5	19 49.4 99 10	48.5	20 19.2 99 10	48.4	20 49.0 99 10	48.4	21 18.8 99 10	48.3	21 48.6 99 10	48.2	22 18.4 99 10	48.2	9
130	18 43.6 99 10	47.6	19 13.4 99 10	47.6	19 43.2 99 10	47.5	20 13.0 99 10	47.5	20 42.8 99 10	47.4	21 12.6 99 10	47.3	21 42.4 99 10	47.3	22 12.2 99 10	47.2	130
1	18 37.5 99 10	46.7	19 07.3 99 10	46.6	19 37.1 99 10	46.6	20 06.9 99 10	46.5	20 36.7 99 10	46.4	21 06.5 99 10	46.4	21 36.3 99 10	46.3	22 06.2 99 10	46.3	1
2	18 31.4 99 10	45.7	19 01.3 99 10	45.7	19 31.1 99 10	45.6	20 00.9 99 10	45.6	20 30.7 99 10	45.5	21 00.5 99 10	45.4	21 30.4 99 10	45.4	22 00.2 99 10	45.3	2
3	18 25.5 99 10	44.8	18 55.3 99 10	44.7	19 25.2 99 10	44.7	19 55.0 99 10	44.6	20 24.8 99 10	44.5	20 54.6 99 10	44.5	21 24.5 99 10	44.4	21 54.3 99 10	44.4	3
4	18 19.7 99 10	43.8	18 49.5 99 10	43.8	19 19.4 99 10	43.7	19 49.2 99 10	43.6	20 19.0 99 10	43.6	20 48.8 99 10	43.5	21 18.7 99 10	43.5	21 48.5 99 09	43.4	4
135	18 14.0 99 09	42.9	18 43.8 99 09	42.8	19 13.6 99 09	42.7	19 43.5 99 09	42.7	20 13.3 99 09	42.6	20 43.1 99 09	42.6	21 13.0 99 09	42.5	21 42.8 99 09	42.5	135
6	18 08.3 99 09	41.9	18 38.2 99 09	41.8	19 08.0 99 09	41.8	19 37.9 99 09	41.7	20 07.7 99 09	41.7	20 37.5 99 09	41.6	21 07.4 99 09	41.6	21 37.2 99 09	41.5	6
7	18 02.8 1.009	40.9	18 32.7 99 09	40.9	19 02.5 99 09	40.8	19 32.4 99 09	40.8	20 02.2 99 09	40.7	20 32.9 99 09	40.7	21 01.9 99 09	40.6	21 31.7 99 09	40.6	7
8	17 57.4 1.009	40.0	18 27.2 1.009	39.9	18 57.1 1.009	39.9	19 27.0 1.009	39.8	19 56.8 1.009	39.8	20 26.7 1.009	39.7	20 56.5 1.009	39.7	21 26.4 99 09	39.6	8
9	17 52.1 1.009	39.0	18 21.9 1.009	39.0	18 51.8 1.009	38.9	19 21.7 1.009	38.8	19 51.5 1.009	38.8	20 21.4 1.009	38.8	20 51.2 1.009	38.7	21 21.1 1.009	38.7	9
140	17 46.9 1.008	38.1	18 16.7 1.008	38.0	18 46.6 1.008	38.0	19 16.5 1.008	37.9	19 46.3 1.008	37.9	20 16.2 1.008	37.8	20 46.1 1.008	37.8	21 15.9 1.008	37.7	140
1	17 41.8 1.008	37.1	18 11.7 1.008	37.1	18 41.5 1.008	37.0	19 11.4 1.008	37.0	19 41.3 1.008	36.9	20 11.1 1.008	36.9	20 41.0 1.008	36.8	21 10.9 1.008	36.8	1
2	17 36.8 1.008	36.2	18 06.7 1.008	36.1	18 36.5 1.008	36.1	19 06.4 1.008	36.0	19 36.3 1.008	36.0	20 06.2 1.008	35.9	20 36.1 1.008	35.9	21 05.9 1.008	35.8	2
3	17 31.9 1.008	35.2	18 01.8 1.008	35.2	18 31.7 1.008	35.1	19 01.6 1.008	35.1	19 31.5 1.008	35.0	20 01.3 1.008	35.0	20 31.2 1.008	34.9	21 01.1 1.008	34.9	3
4	17 27.2 1.008	34.3	17 57.1 1.008	34.2	18 26.9 1.008	34.2	18 56.8 1.008	34.1	19 26.7 1.008	34.1	19 56.6 1.008	34.0	20 26.5 1.008	34.0	20 56.4 1.008	33.9	4
145	17 22.5 1.008	33.3	17 52.4 1.008	33.3	18 22.3 1.008	33.2	18 52.2 1.008	33.2	19 22.1 1.008	33.1	19 52.0 1.008	33.1	20 21.9 1.008	33.0	20 51.8 1.007	33.0	145
6	17 18.0 1.007	32.3	17 47.9 1.007	32.3	18 17.8 1.007	32.3	18 47.7 1.007	32.2	19 17.6 1.007	32.2	19 47.5 1.007	32.1	20 17.4 1.007	32.1	20 47.3 1.007	32.0	6
7	17 13.6 1.007	31.4	17 43.5 1.007	31.4	18 13.4 1.007	31.3	18 43.3 1.007	31.3	19 13.2 1.007	31.2	19 43.1 1.007	31.2	20 13.0 1.007	31.1	20 42.9 1.007	31.1	7
8	17 09.2 1.007	30.4	17 39.2 1.007	30.4	18 09.1 1.007	30.4	18 39.0 1.007	30.3	19 08.9 1.007	30.3	19 38.8 1.007	30.2	20 08.7 1.007	30.2	20 38.7 1.007	30.1	8
9	17 05.1 1.007	29.5	17 35.0 1.007	29.4	18 05.0 1.007	29.4	18 34.9 1.007	29.4	19 04.8 1.007	29.3	19 34.7 1.007	29.3	20 04.6 1.007	29.2	20 34.5 1.007	29.2	9
150	17 01.1 1.007	28.5	17 31.0 1.007	28.5	18 00.9 1.007	28.5	18 30.8 1.007	28.4	19 00.8 1.006	28.4	19 30.7 1.006	28.3	20 00.6 1.006	28.3	20 30.5 1.006	28.3	150
1	16 57.1 1.006	27.6	17 27.1 1.006	27.5	17 57.0 1.006	27.5	18 26.9 1.006	27.5	18 56.8 1.006	27.4	19 26.8 1.006	27.4	19 56.7 1.006	27.4	20 26.6 1.006	27.3	1
2	16 53.3 1.006	26.6	17 23.2 1.006	26.6	17 53.2 1.006	26.6	18 23.1 1.006	26.5	18 53.1 1.006	26.5	19 23.0 1.006	26.4	19 52.9 1.006	26.4	20 22.8 1.006	26.4	2
3	16 49.7 1.006	25.7	17 19.6 1.006	25.6	17 49.5 1.006	25.6	18 19.5 1.006	25.6	18 49.4 1.006	25.6	19 19.3 1.006	25.5	19 49.3 1.006	25.5	20 19.2 1.006	25.4	3
4	16 46.1 1.006	24.7	17 16.0 1.006	24.7	17 46.0 1.006	24.7	18 15.9 1.006	24.6	18 45.9 1.006	24.6	19 15.8 1.006	24.6	19 45.7 1.006	24.5	20 15.7 1.006	24.5	4
155	16 42.7 1.006	23.8	17 12.6 1.006	23.7	17 42.6 1.006	23.7	18 12.5 1.005	23.7	18 42.4 1.005	23.6	19 12.4 1.005	23.6	19 42.3 1.005	23.6	20 12.3 1.005	23.5	155
6	16 39.4 1.005	22.8	17 09.3 1.005	22.8	17 39.3 1.005	22.8	18 09.2 1.005	22.7	18 39.2 1.005	22.7	19 09.1 1.005	22.7	19 39.1 1.005	22.6	20 09.0 1.005	22.6	6
7	16 36.2 1.005	21.9	17 06.2 1.005	21.8	17 36.1 1.005	21.8	18 06.1 1.005	21.8	18 36.0 1.005	21.7	19 06.0 1.005	21.7	19 35.9 1.005	21.7	20 05.9 1.005	21.7	7
8	16 33.2 1.005	20.9	17 03.1 1.005	20.9	17 33.1 1.005	20.9	18 03.0 1.005	20.8	18 33.0 1.005	20.8	19 02.9 1.005	20.8	19 32.9 1.005	20.7	20 02.8 1.005	20.7	8
9	16 30.2 1.005	20.0	17 00.2 1.005	19.9	17 30.2 1.005	19.9	18 00.1 1.005	19.9	18 30.1 1.005	19.9	19 00.0 1.005	19.8	19 30.0 1.005	19.8	19 59.9 1.005	19.8	9
160	16 27.5 1.004	19.0	16 57.4 1.004	19.0	17 27.4 1.004	19.0	17 57.3 1.004	18.9	18 27.3 1.004	18.9	18 57.3 1.004	18.9	19 27.2 1.004	18.9	19 57.2 1.004	18.8	160
1	16 24.8 1.004	18.1	16 54.8 1.004	18.0	17 24.7 1.004	18.0	17 54.7 1.004	18.0	18 24.7 1.004	17.9	18 54.6 1.004	17.9	19 24.6 1.004	17.9	19 54.6 1.004	17.9	1
2	16 22.3 1.004	17.1	16 52.2 1.004	17.1	17 22.2 1.004	17.1	17 52.2 1.004	17.0	18 22.2 1.004	17.0	18 52.1 1.004	17.0	19 22.1 1.004	17.0	19 52.1 1.004	16.9	2
3	16 19.9 1.004	16.2	16 49.9 1.004	16.1	17 19.9 1.004	16.1	17 49.8 1.004	16.1	18 19.8 1.004	16.1	18 49.7 1.004	16.0	19 19.7 1.004	16.0	19 49.7 1.004	16.0	3
4	16 17.6 1.004	15.2	16 47.6 1.004	15.2	17 17.6 1.004	15.2	17 47.6 1.004	15.1	18 17.5 1.004	15.1	18 47.5 1.004	15.1	19 17.5 1.004	15.1	19 47.5 1.004	15.1	4
165	16 15.5 1.003	14.3	16 45.5 1.003	14.2	17 15.5 1.003	14.2	17 45.4 1.003	14.2	18 15.4 1.003	14.2	18 45.4 1.003	14.2	19 15.4 1.003	14.1	19 45.4 1.003	14.1	165
6	16 13.5 1.003	13.3	16 43.5 1.003	13.3	17 13.5 1.003	13.3	17 43.5 1.003	13.2	18 13.4 1.003	13.2	18 43.4 1.003	13.2	19 13.4 1.003	13.2	19 43.4 1.003	13.2	6
7	16 11.7 1.003	12.4	16 41.6 1.003	12.3	17 11.6 1.003	12.3	17 41.6 1.003	12.3	18 11.6 1.003	12.3	18 41.6 1.003	12.3	19 11.6 1.003	12.3	19 41.5 1.003	12.2	7
8	16 09.9 1.003	11.4	16 39.9 1.003	11.4	17 09.9 1.003	11.4	17 39.9 1.003	11.4	18 09.9 1.003	11.3	18 39.9 1.003	11.3	19 09.9 1.003	11.3	19 39.8 1.003	11.3	8
9	16 08.4 1.002	10.5	16 38.3 1.002	10.4	17 08.3 1.002	10.4	17 38.3 1.002	10.4	18 08.3 1.002	10.4	18 38.3 1.002	10.4	19 08.3 1.002	10.4	19 38.3 1.002	10.4	9
170	16 06.9 1.002	09.5	16 36.9 1.002	09.5	17 06.9 1.002	09.5	17 36.9 1.002	09.5	18 06.9 1.002	09.5	18 36.9 1.002	09.4	19 06.9 1.002	09.4	19 36.8 1.002	09.4	170
1	16 05.6 1.002	08.6	16 35.6 1.002	08.5	17 05.6 1.002	08.5	17 35.6 1.002	08.5	18 05.6 1.002	08.5	18 35.6 1.002	08.5	19 05.6 1.002	08.5	19 35.5 1.002	08.5	1
2	16 04.4 1.002	07.6	16 34.4 1.002	07.6	17 04.4 1.002	07.6	17 34.4 1.002	07.6	18 04.4 1.002	07.6	18 34.4 1.002	07.6	19 04.4 1.002	07.5	19 34.4 1.001	07.5	2
3	16 03.4 1.002	06.7	16 33.4 1.002	06.6	17 03.4 1.002	06.6	17 33.4 1.002	06.6	18 03.4 1.001	06.6	18 33.4 1.001	06.6	19 03.4 1.001	06.6	19 33.4 1.001	06.6	3
4	16 02.5 1.001	05.7	16 32.5 1.001	05.7	17 02.5 1.001	05.7	17 32.5 1.001	05.7	18 02.5 1.001	05.7	18 32.5 1.001	05.7	19 02.5 1.001	05.7	19 32.5 1.001	05.6	4
175	16 01.7 1.001	04.8	16 31.7 1.001	04.7	17 01.7 1.001	04.7	17 31.7 1.001	04.7	18 01.7 1.001	04.7	18 31.7 1.001	04.7	19 01.7 1.001	04.7	19 31.7 1.001	04.7	175
6	16 01.1 1.001	03.8	16 31.1 1.001	03.8	17 01.1 1.001	03.8	17 31.1 1.001	03.8	18 01.1 1.001	03.8	18 31.1 1.001	03.8	19 01.1 1.001	03.8	19 31.1 1.001	03.8	6
7	16 00.6 1.001	02.9	16 30.6 1.001	02.8	17 00.6 1.001	02.8	17 30.6 1.000	02.8	18 00.6 1.000	02.8	18 30.6 1.000	02.8	19 00.6 1.000	02.8	19 30.6 1.000	02.8	7
8	16 00.3 1.000	01.9	16 30.3 1.000	01.9	17 00.3 1.000	01.9	17 30.3 1.000	01.9	18 00.3 1.000	01.9	18 30.3 1.000	01.9	19 00.3 1.000	01.9	19 30.3 1.000	01.9	8
9	16 00.1 1.000	01.0	16 30.1 1.000	00.9	17 00.1 1.000	00.9	17 30.1 1.000	00.9	18 00.1 1.000	00.9	18 30.1 1.000	00.9	19 00.1 1.000	00.9	19 30.1 1.000	00.9	9
180	16 00.0 1.000	00.0	16 30.0 1.000	00.0	17 00.0 1.000	00.0	17 30.0 1.000	00.0	18 00.0 1.000	00.0	18 30.0 1.000	00.0	19 00.0 1.000	00.0	19 30.0 1.000	00.0	180

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Lat. 82°

H.A.	28°00' Alt	Δd Δt	Az	28°30' Alt	Δd Δt	Az	29°00' Alt	Δd Δt	Az	30°00' Alt	Δd Δt	Az	32°00' Alt	Δd Δt	Az	34°00' Alt	Δd Δt	Az	34°30' Alt	Δd Δt	Az	35°30' Alt	Δd Δt	Az	H.A.
00	36 00.0	1.00 0	180.0	36 30.0	1.00 0	180.0	37 00.0	1.00 0	180.0	38 00.0	1.00 0	180.0	40 00.0	1.00 0	180.0	42 00.0	1.00 0	180.0	42 30.0	1.00 0	180.0	43 30.0	1.00 0	180.0	00
1	35 59.9	1.00 0	178.9	36 29.9	1.00 0	178.9	36 59.9	1.00 0	178.9	37 59.9	1.00 0	178.9	39 59.9	1.00 0	178.9	41 59.9	1.00 0	178.9	42 29.9	1.00 0	178.9	43 29.9	1.00 0	178.9	1
2	35 59.7	1.00 1	177.8	36 29.7	1.00 1	177.8	36 59.7	1.00 1	177.8	37 59.7	1.00 1	177.8	39 59.7	1.00 1	177.8	41 59.7	1.00 1	177.8	42 29.7	1.00 1	177.8	43 29.7	1.00 1	177.8	2
3	35 59.3	1.00 1	176.7	36 29.3	1.00 1	176.7	36 59.3	1.00 1	176.7	37 59.3	1.00 1	176.7	39 59.3	1.00 1	176.7	41 59.3	1.00 1	176.7	42 29.3	1.00 1	176.6	43 29.3	1.00 1	176.6	3
4	35 58.7	1.00 1	175.6	36 28.7	1.00 1	175.6	36 58.7	1.00 1	175.6	37 58.7	1.00 1	175.6	39 58.7	1.00 1	175.6	41 58.7	1.00 1	175.5	42 28.7	1.00 1	175.5	43 28.7	1.00 1	175.5	4
05	35 58.0	1.00 1	174.5	36 28.0	1.00 1	174.5	36 58.0	1.00 1	174.5	37 58.0	1.00 1	174.5	39 58.0	1.00 1	174.5	41 58.0	1.00 1	174.4	42 28.0	1.00 2	174.4	43 28.0	1.00 2	174.4	05
6	35 57.1	1.00 2	173.5	36 27.1	1.00 2	173.4	36 57.1	1.00 2	173.4	37 57.1	1.00 2	173.4	39 57.1	1.00 2	173.4	41 57.1	1.00 2	173.3	42 27.1	1.00 2	173.3	43 27.1	1.00 2	173.3	6
7	35 56.1	1.00 2	172.4	36 26.1	1.00 2	172.3	36 56.1	1.00 2	172.3	37 56.1	1.00 2	172.3	39 56.1	1.00 2	172.2	41 56.0	1.00 2	172.2	42 26.0	1.00 2	172.2	43 26.0	1.00 2	172.1	7
8	35 54.9	1.00 2	171.3	36 24.9	1.00 2	171.3	36 54.9	1.00 2	171.2	37 54.9	1.00 2	171.2	39 54.8	1.00 2	171.1	41 54.8	1.00 2	171.1	42 24.8	1.00 2	171.1	43 24.8	1.00 2	171.0	8
9	35 53.6	1.00 2	170.2	36 23.6	1.00 2	170.2	36 53.6	1.00 2	170.1	37 53.5	1.00 3	170.1	39 53.5	1.00 3	170.0	41 53.4	1.00 3	170.0	42 23.4	1.00 3	169.9	43 23.4	1.00 3	169.9	9
10	35 52.1	1.00 3	169.1	36 22.1	1.00 3	169.1	36 52.0	1.00 3	169.1	37 52.0	1.00 3	169.0	39 52.0	1.00 3	168.9	41 51.9	1.00 3	168.8	42 21.9	1.00 3	168.8	43 21.9	1.00 3	168.8	10
1	35 50.4	1.00 3	168.0	36 20.4	1.00 3	168.0	36 50.4	1.00 3	168.0	37 50.3	1.00 3	167.9	39 50.3	1.00 3	167.8	41 50.2	1.00 3	167.7	42 20.2	1.00 3	167.7	43 20.1	1.00 3	167.7	1
2	35 48.6	1.00 3	166.9	36 18.6	1.00 3	166.9	36 48.6	1.00 3	166.9	37 48.5	1.00 3	166.8	39 48.4	1.00 3	166.7	41 48.4	1.00 3	166.6	42 18.3	1.00 3	166.6	43 18.3	1.00 3	166.6	2
3	35 46.6	1.00 4	165.8	36 16.6	1.00 4	165.8	36 46.6	1.00 4	165.8	37 46.5	1.00 4	165.7	39 46.4	1.00 4	165.6	41 46.3	1.00 4	165.5	42 16.3	1.00 4	165.5	43 16.3	1.00 4	165.4	3
4	35 44.5	1.00 4	164.7	36 14.5	1.00 4	164.7	36 44.5	1.00 4	164.7	37 44.4	1.00 4	164.6	39 44.3	1.00 4	164.4	41 44.2	1.00 4	164.4	42 14.1	1.00 4	164.4	43 14.1	1.00 4	164.3	4
15	35 42.1	1.00 4	163.7	36 12.2	1.00 4	163.6	36 42.2	1.00 4	163.6	37 42.1	1.00 4	163.5	39 42.0	1.00 4	163.4	41 41.9	1.00 4	163.3	42 11.8	1.00 4	163.3	43 11.7	1.00 4	163.2	15
6	35 39.8	1.00 4	162.6	36 09.8	1.00 4	162.5	36 39.7	1.00 4	162.5	37 39.7	1.00 4	162.4	39 39.5	1.00 4	162.3	41 39.4	1.00 4	162.2	42 09.3	1.00 4	162.2	43 09.3	1.00 4	162.1	6
7	35 37.2	1.00 5	161.5	36 07.2	1.00 5	161.5	36 37.2	1.00 5	161.4	37 37.1	1.00 5	161.4	39 36.9	1.00 5	161.2	41 36.7	1.00 5	161.1	42 06.7	1.00 5	161.0	43 06.6	1.00 5	161.0	7
8	35 34.5	1.00 5	160.4	36 04.5	1.00 5	160.4	36 34.4	1.00 5	160.3	37 34.3	1.00 5	160.3	39 34.2	1.00 5	160.1	41 34.0	1.00 5	160.0	42 03.9	1.00 5	159.9	43 03.8	1.00 5	159.9	8
9	35 31.6	1.00 5	159.3	36 01.6	1.00 5	159.3	36 31.5	1.00 5	159.2	37 31.4	1.00 5	159.2	39 31.2	1.00 5	159.0	41 31.0	1.00 5	158.9	42 01.0	1.00 5	158.8	43 00.9	1.00 5	158.8	9
20	35 28.6	1.00 5	158.2	35 58.6	1.00 5	158.2	36 28.5	1.00 5	158.2	37 28.4	1.00 5	158.1	39 28.2	1.00 5	157.9	41 27.9	1.00 5	157.8	41 57.9	1.00 5	157.7	42 57.8	1.00 5	157.6	20
1	35 25.4	1.00 6	157.2	35 55.4	1.00 6	157.1	36 25.3	1.00 6	157.1	37 25.2	1.00 6	157.0	39 25.0	1.00 6	156.8	41 24.7	1.00 6	156.7	41 54.6	1.00 6	156.6	42 54.5	1.00 6	156.5	1
2	35 22.1	1.00 6	156.1	35 52.1	1.00 6	156.0	36 22.0	1.00 6	156.0	37 21.9	1.00 6	155.9	39 21.6	1.00 6	155.7	41 21.3	1.00 6	155.6	41 51.3	1.00 6	155.5	42 51.1	1.00 6	155.4	2
3	35 18.7	1.00 6	155.0	35 48.6	1.00 6	154.9	36 18.5	1.00 6	154.9	37 18.4	1.00 6	154.8	39 18.1	1.00 6	154.6	41 17.7	1.00 6	154.5	41 47.7	1.00 6	154.4	42 47.6	1.00 6	154.3	3
4	35 15.1	1.00 6	153.9	35 45.0	1.00 6	153.9	36 14.9	1.00 6	153.8	37 14.8	1.00 6	153.7	39 14.5	1.00 6	153.6	41 14.1	1.00 6	153.4	41 44.0	1.00 6	153.3	42 43.9	1.00 6	153.2	4
25	35 11.3	1.00 6	152.8	35 41.2	1.00 6	152.8	36 11.2	1.00 6	152.7	37 11.0	1.00 6	152.7	39 10.7	1.00 7	152.5	41 10.3	1.00 7	152.3	41 40.2	1.00 7	152.2	42 40.0	1.00 7	152.1	25
6	35 07.4	1.00 7	151.8	35 37.4	1.00 7	151.7	36 07.3	1.00 7	151.7	37 07.1	1.00 7	151.6	39 06.7	1.00 7	151.4	41 06.4	1.00 7	151.2	41 36.3	1.00 7	151.1	42 36.1	1.00 7	151.0	6
7	35 03.4	1.00 7	150.7	35 33.3	1.00 7	150.6	36 03.2	1.00 7	150.6	37 03.1	1.00 7	150.5	39 02.7	1.00 7	150.3	41 02.3	1.00 7	150.1	41 32.2	1.00 7	150.0	42 31.9	1.00 7	149.9	7
8	34 59.2	1.00 7	149.6	35 29.2	1.00 7	149.5	35 59.1	1.00 7	149.5	36 58.9	1.00 7	149.4	38 58.5	1.00 7	149.2	40 58.0	1.00 7	149.0	41 27.7	1.00 7	148.9	42 27.7	1.00 7	148.8	8
9	34 55.0	1.00 7	148.5	35 24.9	1.00 7	148.5	35 54.8	1.00 7	148.3	36 54.6	1.00 7	148.3	38 54.1	1.00 7	148.1	40 53.7	1.00 7	147.9	41 23.5	1.00 8	147.8	42 23.3	1.00 8	147.7	9
30	34 50.5	1.00 8	147.5	35 20.4	1.00 8	147.4	35 50.3	1.00 8	147.4	36 50.1	1.00 8	147.2	38 49.6	1.00 8	147.0	40 49.1	1.00 8	146.8	41 19.0	1.00 8	146.7	42 18.8	1.00 8	146.6	30
1	34 46.0	1.00 8	146.4	35 15.9	1.00 8	146.3	35 45.8	1.00 8	146.3	36 45.5	1.00 8	146.2	38 45.0	1.00 8	145.9	40 44.5	1.00 8	145.7	41 14.4	1.00 8	145.6	42 14.1	1.00 8	145.5	1
2	34 41.3	1.00 8	145.3	35 11.2	1.00 8	145.3	35 41.1	1.00 8	145.2	36 40.8	1.00 8	145.1	38 40.3	1.00 8	144.9	40 39.7	1.00 8	144.6	41 09.6	1.00 8	144.5	42 09.3	1.00 8	144.4	2
3	34 36.5	1.00 8	144.2	35 06.4	1.00 8	144.2	35 36.3	1.00 8	144.0	36 36.0	1.00 8	144.0	38 35.4	1.00 8	143.8	40 34.7	1.00 9	143.6	41 04.7	1.00 8	143.5	42 04.4	1.00 8	143.3	3
4	34 31.5	1.00 8	143.2	35 01.4	1.00 8	143.1	35 31.3	1.00 8	143.1	36 31.0	1.00 8	142.9	38 30.4	1.00 9	142.7	40 29.8	99 09	142.4	40 59.6	99 09	142.4	41 59.3	99 09	142.2	4
35	34 26.5	1.00 9	142.1	34 56.3	1.00 9	142.1	35 26.2	1.00 9	142.0	36 25.9	1.00 9	141.9	38 25.3	99 09	141.6	40 24.7	99 09	141.4	40 54.5	99 09	141.3	41 54.1	99 09	141.1	35
6	34 21.3	1.00 9	141.0	34 51.1	1.00 9	141.0	35 21.0	99 09	140.9	36 20.7	99 09	140.8	38 20.0	99 09	140.5	40 19.4	99 09	140.3	40 49.2	99 09	140.2	41 48.8	99 09	140.1	6
7	34 16.0	99 09	140.0	34 45.8	99 09	139.9	35 15.7	99 09	139.9	36 15.3	99 09	139.7	38 14.7	99 09	139.5	40 14.0	99 09	139.2	40 43.8	99 09	139.1	41 43.4	99 09	139.0	7
8	34 10.6	99 09	138.9	34 40.4	99 09	138.9	35 10.2	99 09	138.8	36 09.9	99 09	138.7	38 09.2	99 09	138.4	40 08.5	99 09	138.1	40 38.3	99 09	138.0	41 37.9	99 09	137.9	8
9	34 05.0	99 09	137.9	34 34.8	99 09	137.8	35 04.7	99 09	137.7	36 04.3	99 09	137.6	38 03.6	99 10	137.3	40 02.8	99 10	137.0	40 32.6	99 10	137.0	41 32.2	99 10	136.8	9
40	33 59.4	99 10	136.8	34 29.2	99 10	136.7	34 59.0	99 10	136.7	35 58.6	99 10	136.5	37 57.9	99 10	136.3	39 57.1	99 10	136.0	40 26.9	99 10	135.9	41 26.5	99 10	135.7	40
1	33 53.6	99 10	135.7	34 23.4	99 10	135.7	34 53.2	99 10	135.6	35 52.8	99 10	135.5	37 52.0	99 10	135.2	39 51.2	99 10	134.9	40 21.0	99 10	134.8	41 20.6	99 10	134.6	1
2	33 47.7	99 10	134.7	34 17.5	99 10	134.6	34 47.3	99 10	134.6	35 46.9	99 10	134.4	37 46.1	99 10	134.1	39 45.2	99 10	133.8	40 15.0	99 10	133.7	41 14.6	99 10	133.6	2
3	33 41.7	99 10	133.6	34 11.5	99 10	133.6	34 41.3	99 10	133.5	35 40.9	99 10	133.4	37 40.1	99 10	133.1	39 39.2	99 10	132.7	40 08.9	99 10	132.7	41 08.5	99 11	132.5	3
4	33 35.6	99 10	132.6	34 05.4	99 10	132.5	34 35.2	99 10	132.4	35 34.8	99 10	132.3	37 33.9	99 10	132.0	39 33.0	99 10	131.7	40 02.7	99 10	131.6	41 02.3	99 11	131.4	4
45	33 29.4	99 11	131.5	33 59.2	99 11	131.5	34 29.0	99 11	131.4	35 28.6	99 11	131.2	37 27.6	99 11	130.9	39 26.7	99 11	130.6	39 56.5	99 11	130.5	40 55.9	99 11	130.4	45
6	33 23.1	99 11	130.5	33 52.9	99 11	130.4	34 22.7	99 11	130.3	35 22.2	99 11	130.2	37 21.3	99 11	129.9	39 20.3	99 11	129.5	39 50.1	99 11	129.5	40 49.5	99 11	129.3	6
7	33 16.7	99 11	129.4	33 46.5	99 11	129.4	34 16.3	99 11	129.3	35 15.8	99 11	129.1	37 14.8	99 11	128.8	39 13.8	99 11	128.5	39 43.6	99 11	128.4	40 43.0	99 11	128.2	7
8	33 10.2	99 11	128.4	33 40.0	99 11	128.3	34 09.7	99 11	128.2	35 09.3	99 11	128.1	37 08.3	99 11	127.8	39 07.2	99 11	127.4	39 37.0	99 11	127.3	40 36.4	99 11	127.2	8
9	33 03.6	99 11	127.3	33 33.4	99 11	127.3	34 03.1	99 11	127.2	35 02.6	99 11	127.0	37 01.6	99 11	126.7	39 00.6	99 11	126.4	39 30.3	99 11	126.3	40 29.7	99 11	126.1	9
50	32 56.9	99 11	126.3	33 26.7	99 11	126.2	33 56.4	99 11	126.1	34 55.9	99 11	126.0	36 54.9	99 11	125.7	38 53.8	99 11	125.3	39 23.5	99 11	125.2	40 22.9	99 11	125.0	50
1	32 50.2	99 11	125.2	33 19.9	99 11	125.2	33 49.7	99 11	125.1	34 49.1	99 11	124.9	36 48.1	99 12	124.6	38 46.9	99 12	124.3	39 16.6	99 12	124.2	40 16.0	99 12	124.0	1
2	32 43.3	99 12	124.2	33 13.0	99 12	124.1	33 42.8	99 12	124.1	34 42.2	99 12	123.9	36 41.1	99 12	123.6	38 40.0	99 12	123.3	39 09.7	99 12	123.1	40 09.1	99 12	122.9	2
3	32 36.3	99 12	123.2	33 06.1	99 12	123.1	33 35.8	99 12	123.0	34 35.3	99 12	122.8	36 34.1	99 12	122.5	38 33.0	99 12	122.2	39 02.7	99 12	122.1	40 02.0	99 12	121.9	3
4	32 29.3	99 12	122.1	32 59.0	99 12	122.0	33 28.8	99 12	122.0	34 28.2	99 12	121.8	36 27.1	99 12	121.5	38 25.9	99 12	121.1	38 55.5	99 12	121.0	39 54.9	99 12	120.8	4
55	32 22.2	99 12	121.1	32 51.9	99 12	121.0	33 21.6	99 12	120.9	34 21.1	99 12	120.8	36 19.9	99 12	120.4	38 18.7	99 12	120.1	38 48.3	99 12	120.0	39 47.7	99 12	119.8	55
6	32 15.0	99 12	120.1	32 44.7	99 12	120.0	33 14.4	99 12	119.9	34 13.9	99 12	119.7	36 12.7	99 12	119.4	38 11.4	99 12	119.0	38 41.1	99 12	118.9	39 40.4	99 12	118.7	6
7	32 07.7	99 12	119.0	32 37.5	99 12	118.9	33 07.2	99 12	118.8	34 06.6	99 12	118.7	36 05.3	99 12	118.3	38 04.1	99 12	118.0	38 33.7	99 12	117.9	39 33.0	99 12	117.7	7
8	32 00.4	99 12	118.0	32 30.1	99 12	117.9	32 59.8	99 12	117.8	33 59.2	99 12	117.7	35 58.0	99 12	117.3	37 56.6	99 12	116.9	38 26.3	99 12	116.8	39 25.6	99 12	116.6	8
9	31 53.0	99 12	117.0	32 22.7	99 12	116.9	32 52.4	99 12	116.8	33 51.8	99 12	116.6	35 50.5	99 13	116.3	37 49.2	99 13	115.9	38 18.8	99 13	115.8	39 18.1	99 13	115.6	9
60	31 45.5	99 13	115.9	32 15.2	99 13	115.8	32 44.9	99 13	115.8	33 44.3	99 13	115.6	35 43.0	99 13	115.2	37 41.6	99 13	114.9	38 11.3	99 13	114.8	39 10.6	99 13	114.6	60
1	31 38.0	99 13	114.9	32 07.7	99 13	114.8	32 37.4	99 13	114.6	33 36.7	99 13	114.6	35 35.4	99 13	114.2	37 34.0	99 13	113.8	38 03.7	99 13	113.7	39 02.9	99 13	113.5	1
2	31 30.4	99 13	113.9	32 00.1	99 13	113.8	32 29.7	99 13	113.7	33 29.1	99 13	113.5	35 27.8	99 13	113.2	37 26.3	99 13	112.8	37 56.0	99 13	112.7	38 55.2	99 13	112.5	2
3	31 22.7	99 13	112.9	31 52.4	99 13	112.8	32 22.1	99 13	112.7	33 21.4	99 13	112.5	35 20.1	99 13	112.1	37 18.6	99 13	111.8	37 48.3	99 13	111.7	38 47.5	99 13	111.5	3
4	31 15.0	99 13	111.8	31 44.7	99 13	111.7	32 14.3	99 13	111.7	33 13.7	99 13	111.5	35 12.3	99 13	111.1	37 10.8	99 13	110.7	37 40.5	99 13	110.6	38 39.7	99 13	110.4	4
65	31 07.2	99 13	110.8	31 36.9	99 13	110.7	32 06.5	99 13	110.6	33 05.9	99 13	110.5	35 04.5	99 13	110.1	37 03.0	99 13	109.7	37 32.6	99 13	109.6	38 31.8	99 13	109.4	65
6	30 59.4	99 13	109.8	31 29.0	99 13	109.7	31 58.7	99 13	109.6	32 58.0	99 13	109.4	34 56.5	99 13	109.1	36 55.1	99 13	108.7	37 24.7	99 13	108.6	38 23.9	99 13	108.4	6
7	30 51.5	99 13	108.8	31 21.2	99 13	108.7	31 50.8	99 13	108.6	32 50.1	99 13	108.4	34 48.7	99 13	108.1	36 47.2	99 13	107.7	37 16.8	99 13	107.6	38 16.0	99 13	107.4	7
8	30 43.6	99 13	107.8	31 13.2	99 13	107.7	31 42.9	99 13	107.6	32 42.2	99 13	107.4	34 40.7	99 13	107.0	36 39.2	99 13	106.6	37 08.8	99 13	106.5	38 08.0	99 13	106.3	8
9	30 35.6	99 13	106.7	31 05.2	99 13	106.7	31 34.9	99 13	106.6	32 34.2	99 13	106.4	34 32.7	99 13	106.0	36 31.2	99 13	105.6	37 00.8	99 13	105.5	38 00.0	99 13	105.3	9
70	30 27.6	99 13	105.7	30 57.2	99 13	105.6	31 26.9	99 13	105.6	32 26.2	99 13	105.4	34 24.7	99 14	105.0	36 23.1	99 14	104.6	36 52.7	99 14	104.5	37 51.9	99 14	104.3	70
1	30 19.5	99 13	104.7	30 49.2	99 14	104.6	31 18.8	99 14	104.5	32 18.1	99 14	104.4	34 16.6	99 14	104.0	36 15.0	99 14	103.6	36 44.6	99 14	103.5	37 43.8	99 14	103.3	1
2	30 11.4	99 14	103.7	30 41.1	99 14	103.6	31 10.7	99 14	103.5	32 10.0	99 14	103.3	34 08.5	99 14	103.0	36 06.9	99 14	102.6	36 36.5	99 14	102.5	37 35.6	99 14	102.3	2
3	30 03.3	99 14	102.7	30 32.9	99 14	102.6	31 02.6	99 14	102.5	32 01.8	99 14	102.3	34 00.3	99 14	102.0	35 58.7	99 14	101.6	36 28.3	99 14	101.5	37 27.5	99 14	101.3	3
4	29 55.1	99 14	101.7	30 24.8	99 14	101.6	30 54.4	99 14	101.5	31 53.7	99 14	101.3	33 52.1	99 14	101.0	35 50.5	99 14	100.6	36 20.1	99 14	100.5	37 19.3	99 14	100.2	4
75	29 46.9	99 14	100.7	30 16.6	99 14	100.6	30 46.2	99 14	100.5	31 45.5	99 14	100.3	33 43.9	99 14	99.9	35 42.3	99 14	99.5	36 11.9	99 14	99.4	37 11.0	99 14	99.2	75
6	29 38.7	99 14	99.7	30 08.4	99 14	99.6	30 38.0	99 14	99.5	31 37.2	99 14	99.3	33 35.7	99 14	98.9	35 34.1	99 14	98.5	36 03.6	99 14	98.4	37 02.8	99 14	98.2	6
7	29 30.5	99 14	98.7	30 00.1	99 14	98.6	30 29.7	99 14	98.5	31 29.0	99 14	98.3	33 27.4	99 14	97.9	35 25.8	99 14	97.5	35 55.4	99 14	97.4	36 54.5	99 14	97.2	7
8	29 22.2	99 14	97.7	29 51.8	99 14	97.6	30 21.5	99 14	97.5	31 20.7	99 14	97.3	33 19.1	99 14	96.9	35 17.5	99 14	96.5	35 47.1	99 14	96.4	36 46.2	99 14	96.2	8
9	29 13.9	99 14	96.7	29 43.6	99 14	96.6	30 13.2	99 14	96.5	31 12.4	99 14	96.3	33 10.8	99 14	95.9	35 09.2	99 14	95.5	35 38.8	99 14	95.4	36 37.9	99 14	95.2	9
80	29 05.6	99 14	95.7	29 35.3	99 14	95.6	30 04.9	99 14	95.5	31 04.1	99 14	95.3	33 02.5	99 14	94.9	35 00.9	99 14	94.5	35 30.5	99 14	94.4	36 29.6	99 14	94.2	80
1	28 57.3	99 14	94.7	29 26.9	99 14	94.6	29 56.6	99 14	94.5	30 55.8	99 14	94.3	32 54.2	99 14	93.9	34 52.6	99 14	93.5	35 22.1	99 14	93.4	36 21.3	99 14	93.2	1
2	28 49.0	99 14	93.7	29 18.6	99 14	93.6	29 48.2	99 14	93.5	30 47.5	99 14	93.3	32 45.9	99 14	92.9	34 44.2	99 14	92.5	35 13.8	99 14	92.4	36 12.9	99 14	92.2	2
3	28 40.6	99 14	92.7	29 10.3	99 14	92.6	29 39.9	99 14	92.5	30 39.1	99 14	92.3	32 37.5	99 14	91.9	34 35.9	99 14	91.5	35 05.4	99 14	91.4	36 04.6	99 14	91.2	3
4	28 32.3	99 14	91.7	29 01.9	99 14	91.6	29 31.5	99 14	91.5	30 30.8	99 14	91.3	32 29.2	99 14	91.0	34 27.5	99 14	90.6	34 57.1	99 14	90.5	35 56.2	99 14	90.2	4
85	28 24.0	99 14	90.7	28 53.6	99 14	90.6	29 23.2	99 14	90.5	30 22.4	99 14	90.3	32 20.8	99 14	90.0	34 19.2	99 14	89.6	34 48.7	99 14	89.5	35 47.9	99 14	89.3	85
6	28 15.6	99 14	89.7	28 45.2	99 14	89.6	29 14.8	99 14	89.4	30 14.1	99 14	89.4	32 12.5	99 14	89.0	34 10.8	99 14	88.6	34 40.4	99 14	88.5	35 39.5	99 14	88.3	6
7	28 07.3	99 14	88.7	28 36.9	99 14	88.6	29 06.5	99 14	88.5	30 05.7	99 14	88.4	32 04.1	99 14	88.0	34 02.5	99 14	87.6	34 32.0	99 14	87.5	35 31.2	99 14	87.3	7
8	27 58.9	99 14	87.7	28 28.5	99 14	87.7	28 58.2	99 14	87.6	29 57.4	99 14	87.4	31 55.8	99 14	87.0	33 54.1	99 14	86.6	34 23.7	99 14	86.5	35 22.8	99 14	86.3	8
9	27 50.6	99 14	86.8	28 20.2	99 14	86.7	28 49.8	99 14	86.6	29 49.0	99 14	86.4	31 47.5	99 14	86.0	33 45.8	99 14	85.6	34 15.4	99 14	85.5	35 14.5	99 14	85.3	9
90	27 42.2	99 14	85.8	28 11.9	99 14	85.7	28 41.5	99 14	85.6	29 40.7	99 14	85.4	31 39.1	99 14	85.0	33 37.5	99 14	84.6	34 07.1	99 14	84.5	35 06.2	99 14	84.3	90

H.A.	28° 00' Alt. / Δd Δt — Az.	28° 30' Alt. / Δd Δt — Az.	29° 00' Alt. / Δd Δt — Az.	30° 00' Alt. / Δd Δt — Az.	32° 00' Alt. / Δd Δt — Az.	34° 00' Alt. / Δd Δt — Az.	34° 30' Alt. / Δd Δt — Az.	35° 30' Alt. / Δd Δt — Az.	H.A.
91	27 33.9 99 14 — 84.8	28 03.5 99 14 — 84.7	28 33.2 99 14 — 84.6	29 32.4 99 14 — 84.4	31 31.9 99 14 — 84.0	33 29.2 99 14 — 83.7	33 58.8 99 14 — 83.6	34 57.9 99 14 — 83.4	91
2	27 25.6 99 14 — 83.8	27 55.2 99 14 — 83.7	28 24.9 99 14 — 83.6	29 24.1 99 14 — 83.4	31 22.5 99 14 — 83.1	33 20.9 99 14 — 82.7	33 50.5 99 14 — 82.6	34 49.6 99 14 — 82.4	2
3	27 17.3 99 14 — 82.8	27 46.9 99 14 — 82.7	28 16.6 99 14 — 82.6	29 15.8 99 14 — 82.5	31 14.2 99 14 — 82.1	33 12.6 99 14 — 81.7	33 42.2 99 14 — 81.6	34 41.3 99 14 — 81.4	3
4	27 09.0 99 14 — 81.8	27 38.7 99 14 — 81.8	28 08.3 99 14 — 81.7	29 07.5 99 14 — 81.5	31 06.0 99 14 — 81.1	33 04.4 99 14 — 80.7	33 33.9 99 14 — 80.6	34 33.1 99 14 — 80.4	4
95	27 00.8 99 14 — 80.9	27 30.4 99 14 — 80.8	28 00.0 99 14 — 80.7	28 59.3 99 14 — 80.5	30 57.7 99 14 — 80.1	32 56.1 99 14 — 79.7	33 25.7 99 14 — 79.6	34 24.9 99 14 — 79.4	95
6	26 52.5 99 14 — 79.9	27 22.2 99 14 — 79.8	27 51.8 99 14 — 79.7	28 51.1 99 14 — 79.5	30 49.5 99 14 — 79.2	32 47.9 99 14 — 78.8	33 17.5 99 14 — 78.7	34 16.7 99 14 — 78.5	6
7	26 44.3 99 14 — 78.9	27 14.0 99 14 — 78.8	27 43.6 99 14 — 78.7	28 42.9 99 14 — 78.6	30 41.3 99 14 — 78.2	32 39.8 99 14 — 77.8	33 09.3 99 14 — 77.7	34 08.5 99 14 — 77.5	7
8	26 36.2 99 14 — 77.9	27 05.8 99 14 — 77.8	27 35.4 99 14 — 77.7	28 34.7 99 14 — 77.6	30 33.2 99 14 — 77.2	32 31.6 99 14 — 76.8	33 01.2 99 14 — 76.7	34 00.4 99 14 — 76.5	8
9	26 28.0 99 14 — 77.0	26 57.7 99 14 — 76.9	27 27.3 99 14 — 76.8	28 26.6 99 14 — 76.6	30 25.1 99 14 — 76.2	32 23.5 99 13 — 75.9	32 53.1 99 13 — 75.8	33 52.3 99 13 — 75.6	9
100	26 19.9 99 14 — 76.0	26 49.5 99 13 — 75.9	27 19.2 99 13 — 75.8	28 18.5 99 13 — 75.6	30 17.0 99 13 — 75.3	32 15.4 99 13 — 74.9	32 45.0 99 13 — 74.8	33 44.2 99 13 — 74.6	100
1	26 11.8 99 13 — 75.0	26 41.5 99 13 — 74.9	27 11.1 99 13 — 74.8	28 10.4 99 13 — 74.7	30 08.9 99 13 — 74.3	32 07.4 99 13 — 73.9	32 37.0 99 13 — 73.8	33 36.2 99 13 — 73.6	1
2	26 03.8 99 13 — 74.0	26 33.4 99 13 — 73.9	27 03.1 99 13 — 73.9	28 02.3 99 13 — 73.7	30 00.9 99 13 — 73.3	31 59.4 99 13 — 73.0	32 29.0 99 13 — 72.9	33 28.2 99 13 — 72.7	2
3	25 55.8 99 13 — 73.1	26 25.4 99 13 — 73.0	26 55.1 99 13 — 72.9	27 54.4 99 13 — 72.7	29 52.9 99 13 — 72.4	31 51.4 99 13 — 72.0	32 21.0 99 13 — 71.9	33 20.2 99 13 — 71.7	3
4	25 47.8 99 13 — 72.1	26 17.4 99 13 — 72.0	26 47.1 99 13 — 71.9	27 46.4 99 13 — 71.8	29 45.0 99 13 — 71.4	31 43.5 99 13 — 71.0	32 13.1 99 13 — 70.9	33 12.3 99 13 — 70.8	4
105	25 39.9 99 13 — 71.1	26 09.5 99 13 — 71.0	26 39.2 99 13 — 71.0	27 38.5 99 13 — 70.8	29 37.1 99 13 — 70.4	31 35.6 99 13 — 70.1	32 05.2 99 13 — 70.0	33 04.5 99 13 — 69.8	105
6	25 32.0 99 13 — 70.2	26 01.6 99 13 — 70.1	26 31.3 99 13 — 70.0	27 30.6 99 13 — 69.8	29 29.2 99 13 — 69.5	31 27.8 99 13 — 69.1	31 57.4 99 13 — 69.0	32 56.6 99 13 — 68.8	6
7	25 24.2 99 13 — 69.2	25 53.8 99 13 — 69.1	26 23.5 99 13 — 69.0	27 22.8 99 13 — 68.9	29 21.4 99 13 — 68.5	31 20.0 99 13 — 68.2	31 49.6 99 13 — 68.1	32 48.9 99 13 — 67.9	7
8	25 16.4 99 13 — 68.2	25 46.0 99 13 — 68.1	26 15.7 99 13 — 68.1	27 15.1 99 13 — 67.9	29 13.7 99 13 — 67.6	31 12.3 99 13 — 67.2	31 41.9 99 13 — 67.1	32 41.2 99 13 — 66.9	8
9	25 08.6 99 13 — 67.3	25 38.3 99 13 — 67.2	26 08.0 99 13 — 67.1	27 07.3 99 13 — 66.9	29 06.0 99 13 — 66.6	31 04.6 99 13 — 66.2	31 34.3 99 13 — 66.1	32 33.5 99 13 — 66.0	9
110	25 01.0 99 13 — 66.3	25 30.7 99 13 — 66.2	26 00.3 99 13 — 66.1	26 59.7 99 13 — 66.0	28 58.4 99 13 — 65.6	30 57.0 99 13 — 65.3	31 26.6 99 13 — 65.2	32 25.9 99 13 — 65.0	110
1	24 53.4 99 13 — 65.3	25 23.0 99 13 — 65.2	25 52.7 99 13 — 65.2	26 52.1 99 13 — 65.0	28 50.8 99 12 — 64.7	30 49.4 99 12 — 64.3	31 19.1 99 12 — 64.2	32 18.4 99 12 — 64.1	1
2	24 45.8 99 12 — 64.4	25 15.5 99 12 — 64.3	25 45.2 99 12 — 64.2	26 44.6 99 12 — 64.0	28 43.3 99 12 — 63.7	30 41.9 99 12 — 63.4	31 11.6 99 12 — 63.3	32 10.9 99 12 — 63.1	2
3	24 38.3 99 12 — 63.4	25 08.0 99 12 — 63.3	25 37.7 99 12 — 63.2	26 37.1 99 12 — 63.1	28 35.8 99 12 — 62.8	30 34.5 99 12 — 62.4	31 04.2 99 12 — 62.3	32 03.5 99 12 — 62.2	3
4	24 30.9 99 12 — 62.4	25 00.6 99 12 — 62.4	25 30.3 99 12 — 62.3	26 29.7 99 12 — 62.1	28 28.4 99 12 — 61.8	30 27.1 99 12 — 61.5	30 56.8 99 12 — 61.4	31 56.1 99 12 — 61.2	4
115	24 23.5 99 12 — 61.5	24 53.2 99 12 — 61.4	25 22.9 99 12 — 61.3	26 22.3 99 12 — 61.2	28 21.1 99 12 — 60.9	30 19.8 99 12 — 60.5	30 49.5 99 12 — 60.4	31 48.9 99 12 — 60.3	115
6	24 16.2 99 12 — 60.5	24 45.9 99 12 — 60.4	25 15.6 99 12 — 60.4	26 15.0 99 12 — 60.2	28 13.8 99 12 — 59.9	30 12.6 99 12 — 59.6	30 42.3 99 12 — 59.5	31 41.6 99 12 — 59.3	6
7	24 09.0 99 12 — 59.6	24 38.7 99 12 — 59.5	25 08.4 99 12 — 59.4	26 07.8 99 12 — 59.3	28 06.7 99 12 — 58.9	30 05.4 99 12 — 58.6	30 35.1 99 12 — 58.5	31 34.5 99 12 — 58.4	7
8	24 01.8 99 12 — 58.6	24 31.5 99 12 — 58.5	25 01.2 99 12 — 58.5	26 00.7 99 12 — 58.3	27 59.5 99 12 — 58.0	29 58.3 99 12 — 57.7	30 28.0 99 12 — 57.6	31 27.4 99 12 — 57.4	8
9	23 54.7 99 12 — 57.6	24 24.4 99 12 — 57.6	24 54.2 99 12 — 57.5	25 53.6 99 12 — 57.3	27 52.5 99 12 — 57.0	29 51.3 99 12 — 56.7	30 21.0 99 12 — 56.6	31 20.4 99 12 — 56.5	9
120	23 47.7 99 12 — 56.7	24 17.4 99 11 — 56.6	24 47.2 99 12 — 56.5	25 46.6 99 12 — 56.4	27 45.5 99 11 — 56.1	29 44.4 99 11 — 55.8	30 14.1 99 11 — 55.7	31 13.5 99 11 — 55.5	120
1	23 40.7 99 11 — 55.7	24 10.5 99 11 — 55.7	24 40.2 99 11 — 55.6	25 39.7 99 11 — 55.4	27 38.6 99 11 — 55.1	29 37.5 99 11 — 54.8	30 07.2 99 11 — 54.8	31 06.7 99 11 — 54.6	1
2	23 33.9 99 11 — 54.8	24 03.6 99 11 — 54.7	24 33.4 99 11 — 54.6	25 32.9 99 11 — 54.5	27 31.8 99 11 — 54.2	29 30.7 99 11 — 53.9	30 00.5 99 11 — 53.8	30 59.9 99 11 — 53.7	2
3	23 27.1 99 11 — 53.8	23 56.9 99 11 — 53.8	24 26.6 99 11 — 53.7	25 26.1 99 11 — 53.5	27 25.1 99 11 — 53.2	29 24.0 99 11 — 52.9	29 53.8 99 11 — 52.9	30 53.2 99 11 — 52.7	3
4	23 20.4 99 11 — 52.9	23 50.2 99 11 — 52.8	24 19.9 99 11 — 52.7	25 19.4 99 11 — 52.6	27 18.4 99 11 — 52.3	29 17.4 99 11 — 52.0	29 47.1 99 11 — 51.9	30 46.6 99 11 — 51.8	4
125	23 13.8 99 11 — 51.9	23 43.6 99 11 — 51.8	24 13.3 99 11 — 51.8	25 12.8 99 11 — 51.6	27 11.9 99 11 — 51.4	29 10.9 99 11 — 51.1	29 40.6 99 11 — 51.0	30 40.1 99 11 — 50.8	125
6	23 07.3 99 11 — 51.0	23 37.0 99 11 — 50.9	24 06.8 99 11 — 50.8	25 06.3 99 11 — 50.7	27 05.4 99 11 — 50.4	29 04.4 99 11 — 50.1	29 34.2 99 11 — 50.0	30 33.7 99 11 — 49.9	6
7	23 00.8 99 11 — 50.0	23 30.6 99 11 — 49.9	24 00.4 99 11 — 49.9	24 59.9 99 11 — 49.7	26 59.0 99 11 — 49.5	28 58.1 99 11 — 49.2	29 27.8 99 11 — 49.1	30 27.3 99 11 — 49.0	7
8	22 54.5 99 10 — 49.1	23 24.3 99 10 — 49.0	23 54.0 99 10 — 48.9	24 53.6 99 10 — 48.8	26 52.7 99 10 — 48.5	28 51.8 99 10 — 48.2	29 21.5 99 10 — 48.2	30 21.1 99 10 — 48.0	8
9	22 48.2 99 10 — 48.1	23 18.0 99 10 — 48.0	23 47.8 99 10 — 48.0	24 47.4 99 10 — 47.8	26 46.5 99 10 — 47.6	28 45.6 99 10 — 47.3	29 15.4 99 10 — 47.2	30 14.9 99 10 — 47.1	9
130	22 42.0 99 10 — 47.2	23 11.8 99 10 — 47.1	23 41.6 99 10 — 47.0	24 41.2 99 10 — 46.9	26 40.4 99 10 — 46.6	28 39.5 99 10 — 46.4	29 09.3 99 10 — 46.3	30 08.8 99 10 — 46.2	130
1	22 36.0 99 10 — 46.2	23 05.8 99 10 — 46.1	23 35.6 99 10 — 46.1	24 35.2 99 10 — 46.0	26 34.4 99 10 — 45.7	28 33.5 99 10 — 45.4	29 03.3 99 10 — 45.4	30 02.9 99 10 — 45.2	1
2	22 30.0 99 10 — 45.3	22 59.8 99 10 — 45.2	23 29.6 99 10 — 45.1	24 29.2 99 10 — 45.0	26 28.4 99 10 — 44.8	28 27.6 99 10 — 44.5	28 57.4 99 10 — 44.4	29 57.0 99 10 — 44.3	2
3	22 24.1 99 10 — 44.3	22 53.9 99 10 — 44.2	23 23.7 99 10 — 44.2	24 23.4 99 10 — 44.1	26 22.6 99 10 — 43.8	28 21.8 99 10 — 43.6	28 51.6 99 10 — 43.5	29 51.2 99 09 — 43.4	3
4	22 18.3 99 09 — 43.4	22 48.1 99 09 — 43.3	23 18.0 99 09 — 43.2	24 17.6 99 09 — 43.1	26 16.9 99 09 — 42.9	28 16.1 99 09 — 42.6	28 45.9 99 09 — 42.6	29 45.5 99 09 — 42.4	4
135	22 12.6 99 09 — 42.4	22 42.5 99 09 — 42.3	23 12.3 99 09 — 42.3	24 11.9 99 09 — 42.2	26 11.2 99 09 — 41.9	28 10.5 99 09 — 41.7	28 40.3 99 09 — 41.6	29 39.9 99 09 — 41.5	135
6	22 07.1 99 09 — 41.5	22 36.9 99 09 — 41.4	23 06.7 99 09 — 41.3	24 06.4 99 09 — 41.2	26 05.7 99 09 — 41.0	28 05.0 99 09 — 40.7	28 34.8 99 09 — 40.7	29 34.4 99 09 — 40.6	6
7	22 01.6 99 09 — 40.5	22 31.4 99 09 — 40.5	23 01.3 99 09 — 40.3	24 00.9 99 09 — 40.3	26 00.3 99 09 — 40.1	27 59.6 99 09 — 39.8	28 29.4 99 09 — 39.8	29 29.1 99 09 — 39.6	7
8	21 56.2 99 09 — 39.6	22 26.1 99 09 — 39.5	22 55.9 99 09 — 39.5	23 55.6 99 09 — 39.3	25 55.0 99 09 — 39.1	27 54.3 99 09 — 38.9	28 24.1 99 09 — 38.8	29 23.8 99 09 — 38.7	8
9	21 50.9 1.00 — 38.6	22 20.8 1.00 — 38.6	22 50.6 1.00 — 38.5	23 50.4 1.00 — 38.4	25 49.7 99 08 — 38.2	27 49.1 99 08 — 37.9	28 19.0 99 08 — 37.9	29 18.6 99 08 — 37.8	9
140	21 45.8 1.008 — 37.7	22 15.6 1.008 — 37.6	22 45.5 1.008 — 37.6	23 45.2 1.008 — 37.5	25 44.6 1.008 — 37.2	27 44.0 99 08 — 37.0	28 13.9 99 08 — 37.0	29 13.6 99 08 — 36.8	140
1	21 40.7 1.008 — 36.7	22 10.6 1.008 — 36.7	22 40.5 1.008 — 36.6	23 40.2 1.008 — 36.5	25 39.6 1.008 — 36.3	27 39.1 1.008 — 36.1	28 08.9 1.008 — 36.0	29 08.6 99 08 — 35.9	1
2	21 35.8 1.008 — 35.8	22 05.7 1.008 — 35.7	22 35.5 1.008 — 35.7	23 35.3 1.008 — 35.6	25 34.7 1.008 — 35.4	27 34.2 1.008 — 35.2	28 04.1 1.008 — 35.1	29 03.8 1.008 — 35.0	2
3	21 31.0 1.008 — 34.8	22 00.8 1.008 — 34.8	22 30.7 1.008 — 34.7	23 30.5 1.008 — 34.6	25 30.0 1.008 — 34.4	27 29.4 1.008 — 34.2	27 59.3 1.008 — 34.2	28 59.0 1.008 — 34.1	3
4	21 26.3 1.008 — 33.9	21 56.1 1.008 — 33.8	22 26.0 1.008 — 33.8	23 25.8 1.008 — 33.7	25 25.3 1.008 — 33.5	27 24.8 1.008 — 33.3	27 54.7 1.008 — 33.2	28 54.4 1.008 — 33.1	4
145	21 21.7 1.007 — 32.9	21 51.6 1.007 — 32.9	22 21.4 1.007 — 32.8	23 21.2 1.007 — 32.8	25 20.8 1.007 — 32.6	27 20.3 1.007 — 32.4	27 50.2 1.007 — 32.3	28 49.9 1.007 — 32.2	145
6	21 17.2 1.007 — 32.0	21 47.1 1.007 — 32.0	22 17.0 1.007 — 31.9	23 16.8 1.007 — 31.8	25 16.3 1.007 — 31.6	27 15.9 1.007 — 31.4	27 45.7 1.007 — 31.4	28 45.5 1.007 — 31.3	6
7	21 12.8 1.007 — 31.1	21 42.7 1.007 — 31.0	22 12.6 1.007 — 30.9	23 12.4 1.007 — 30.9	25 12.0 1.007 — 30.7	27 11.6 1.007 — 30.5	27 41.5 1.007 — 30.5	28 41.2 1.007 — 30.4	7
8	21 08.6 1.007 — 30.1	21 38.5 1.007 — 30.1	22 08.4 1.007 — 30.0	23 08.2 1.007 — 29.9	25 07.8 1.007 — 29.8	27 07.4 1.007 — 29.6	27 37.3 1.007 — 29.5	28 37.1 1.007 — 29.5	8
9	21 04.4 1.007 — 29.2	21 34.3 1.007 — 29.1	22 04.3 1.007 — 29.1	23 04.1 1.007 — 29.0	25 03.7 1.007 — 28.8	27 03.3 1.007 — 28.6	27 33.2 1.007 — 28.6	28 33.0 1.007 — 28.5	9
150	21 00.4 1.006 — 28.2	21 30.3 1.006 — 28.2	22 00.3 1.006 — 28.1	23 00.1 1.006 — 28.1	24 59.7 1.006 — 27.9	26 59.4 1.006 — 27.7	27 29.3 1.006 — 27.7	28 29.1 1.006 — 27.6	150
1	20 56.5 1.006 — 27.3	21 26.5 1.006 — 27.2	21 56.4 1.006 — 27.2	22 56.2 1.006 — 27.1	24 55.9 1.006 — 27.0	26 55.6 1.006 — 26.8	27 25.5 1.006 — 26.8	28 25.3 1.006 — 26.7	1
2	20 52.8 1.006 — 26.3	21 22.7 1.006 — 26.3	21 52.6 1.006 — 26.3	22 52.5 1.006 — 26.2	24 52.2 1.006 — 26.0	26 51.8 1.006 — 25.9	27 21.8 1.006 — 25.8	28 21.6 1.006 — 25.7	2
3	20 49.1 1.006 — 25.4	21 19.1 1.006 — 25.4	21 49.0 1.006 — 25.3	22 48.8 1.006 — 25.2	24 48.6 1.006 — 25.1	26 48.3 1.006 — 24.9	27 18.2 1.006 — 24.9	28 18.0 1.006 — 24.9	3
4	20 45.6 1.006 — 24.5	21 15.5 1.006 — 24.4	21 45.5 1.006 — 24.4	22 45.4 1.006 — 24.3	24 45.1 1.006 — 24.2	26 44.8 1.006 — 24.0	27 14.7 1.006 — 24.0	28 14.6 1.006 — 23.9	4
155	20 42.2 1.005 — 23.5	21 12.2 1.005 — 23.5	21 42.1 1.005 — 23.4	22 42.0 1.005 — 23.4	24 41.7 1.005 — 23.2	26 41.5 1.005 — 23.1	27 11.4 1.005 — 23.1	28 11.3 1.005 — 23.0	155
6	20 38.9 1.005 — 22.6	21 08.9 1.005 — 22.5	21 38.8 1.005 — 22.5	22 38.7 1.005 — 22.4	24 38.5 1.005 — 22.3	26 38.3 1.005 — 22.2	27 08.2 1.005 — 22.1	28 08.1 1.005 — 22.1	6
7	20 35.8 1.005 — 21.6	21 05.8 1.005 — 21.6	21 35.7 1.005 — 21.6	22 35.6 1.005 — 21.5	24 35.4 1.005 — 21.4	26 35.2 1.005 — 21.2	27 05.1 1.005 — 21.2	28 05.0 1.005 — 21.2	7
8	20 32.8 1.005 — 20.7	21 02.7 1.005 — 20.7	21 32.7 1.005 — 20.6	22 32.6 1.005 — 20.6	24 32.4 1.005 — 20.4	26 32.2 1.005 — 20.3	27 02.2 1.005 — 20.3	28 02.1 1.005 — 20.2	8
9	20 29.9 1.005 — 19.7	20 59.9 1.005 — 19.7	21 29.8 1.005 — 19.7	22 29.7 1.005 — 19.6	24 29.6 1.005 — 19.5	26 29.4 1.004 — 19.4	26 59.3 1.004 — 19.4	27 59.2 1.004 — 19.3	9
160	20 27.2 1.004 — 18.8	20 57.1 1.004 — 18.8	21 27.1 1.004 — 18.7	22 27.0 1.004 — 18.7	24 26.8 1.004 — 18.6	26 26.7 1.004 — 18.5	26 56.6 1.004 — 18.4	27 56.5 1.004 — 18.4	160
1	20 24.5 1.004 — 17.9	20 54.5 1.004 — 17.8	21 24.5 1.004 — 17.8	22 24.4 1.004 — 17.8	24 24.2 1.004 — 17.6	26 24.1 1.004 — 17.5	26 54.0 1.004 — 17.5	27 54.0 1.004 — 17.5	1
2	20 22.0 1.004 — 16.9	20 52.0 1.004 — 16.9	21 22.0 1.004 — 16.9	22 21.9 1.004 — 16.8	24 21.8 1.004 — 16.7	26 21.6 1.004 — 16.6	26 51.6 1.004 — 16.6	27 51.5 1.004 — 16.5	2
3	20 19.7 1.004 — 16.0	20 49.6 1.004 — 16.0	21 19.6 1.004 — 15.9	22 19.6 1.004 — 15.9	24 19.4 1.004 — 15.8	26 19.3 1.004 — 15.7	26 49.3 1.004 — 15.7	27 49.2 1.004 — 15.6	3
4	20 17.4 1.004 — 15.0	20 47.4 1.003 — 15.0	21 17.4 1.004 — 15.0	22 17.3 1.004 — 15.0	24 17.2 1.003 — 14.9	26 17.1 1.003 — 14.8	26 47.1 1.003 — 14.7	27 47.0 1.003 — 14.7	4
165	20 15.3 1.003 — 14.1	20 45.3 1.003 — 14.1	21 15.3 1.003 — 14.1	22 15.2 1.003 — 14.0	24 15.1 1.003 — 13.9	26 15.1 1.003 — 13.8	26 45.0 1.003 — 13.8	27 45.0 1.003 — 13.8	165
6	20 13.4 1.003 — 13.2	20 43.3 1.003 — 13.1	21 13.3 1.003 — 13.1	22 13.3 1.003 — 13.1	24 13.2 1.003 — 13.0	26 13.1 1.003 — 12.9	26 43.1 1.003 — 12.9	27 43.1 1.003 — 12.9	6
7	20 11.5 1.003 — 12.2	20 41.5 1.003 — 12.2	21 11.5 1.003 — 12.2	22 11.5 1.003 — 12.1	24 11.4 1.003 — 12.0	26 11.3 1.003 — 12.0	26 41.3 1.003 — 11.9	27 41.3 1.003 — 11.9	7
8	20 09.8 1.002 — 11.3	20 39.8 1.002 — 11.3	21 09.8 1.003 — 11.2	22 09.8 1.003 — 11.2	24 09.7 1.003 — 11.1	26 09.7 1.003 — 11.1	26 39.6 1.003 — 11.0	27 39.6 1.003 — 11.0	8
9	20 08.3 1.002 — 10.3	20 38.3 1.002 — 10.3	21 08.2 1.002 — 10.3	22 08.2 1.002 — 10.3	24 08.2 1.002 — 10.2	26 08.1 1.002 — 10.1	26 38.1 1.002 — 10.1	27 38.1 1.002 — 10.1	9
170	20 06.8 1.002 — 09.4	20 36.8 1.002 — 09.4	21 06.8 1.002 — 09.4	22 06.8 1.002 — 09.3	24 06.8 1.002 — 09.3	26 06.7 1.002 — 09.2	26 36.7 1.002 — 09.2	27 36.7 1.002 — 09.2	170
1	20 05.5 1.002 — 08.5	20 35.5 1.002 — 08.4	21 05.5 1.002 — 08.4	22 05.5 1.002 — 08.4	24 05.5 1.002 — 08.4	26 05.4 1.002 — 08.3	26 35.4 1.002 — 08.3	27 35.4 1.002 — 08.3	1
2	20 04.4 1.002 — 07.5	20 34.4 1.002 — 07.5	21 04.4 1.002 — 07.5	22 04.4 1.002 — 07.5	24 04.3 1.002 — 07.4	26 04.3 1.002 — 07.4	26 34.3 1.002 — 07.4	27 34.3 1.002 — 07.4	2
3	20 03.4 1.001 — 06.6	20 33.3 1.001 — 06.6	21 03.3 1.001 — 06.6	22 03.3 1.001 — 06.5	24 03.3 1.001 — 06.5	26 03.3 1.001 — 06.5	26 33.3 1.001 — 06.4	27 33.3 1.001 — 06.4	3
4	20 02.5 1.001 — 05.6	20 32.5 1.001 — 05.6	21 02.5 1.001 — 05.6	22 02.4 1.001 — 05.6	24 02.4 1.001 — 05.6	26 02.4 1.001 — 05.5	26 32.4 1.001 — 05.5	27 32.4 1.001 — 05.5	4
175	20 01.7 1.001 — 04.7	20 31.7 1.001 — 04.7	21 01.7 1.001 — 04.7	22 01.7 1.001 — 04.7	24 01.7 1.001 — 04.6	26 01.7 1.001 — 04.6	26 31.7 1.001 — 04.6	27 31.7 1.001 — 04.6	175
6	20 01.1 1.001 — 03.8	20 31.1 1.001 — 03.8	21 01.1 1.001 — 03.7	22 01.1 1.001 — 03.7	24 01.1 1.001 — 03.7	26 01.1 1.001 — 03.7	26 31.1 1.001 — 03.7	27 31.1 1.001 — 03.7	6
7	20 00.7 1.000 — 02.8	20 30.6 1.001 — 02.8	21 00.6 1.001 — 02.8	22 00.6 1.001 — 02.8	24 00.6 1.001 — 02.8	26 00.6 1.001 — 02.8	26 30.6 1.001 — 02.8	27 30.6 1.001 — 02.8	7
8	20 00.3 1.000 — 01.9	20 30.3 1.000 — 01.9	21 00.3 1.000 — 01.9	22 00.3 1.000 — 01.9	24 00.3 1.000 — 01.9	26 00.3 1.000 — 01.8	26 30.3 1.000 — 01.8	27 30.3 1.000 — 01.8	8
9	20 00.1 1.000 — 00.9	20 30.1 1.000 — 00.9	21 00.1 1.000 — 00.9	22 00.1 1.000 — 00.9	24 00.1 1.000 — 00.9	26 00.1 1.000 — 00.9	26 30.1 1.000 — 00.9	27 30.1 1.000 — 00.9	9
180	20 00.0 1.000 — 00.0	20 30.0 1.000 — 00.0	21 00.0 1.000 — 00.0	22 00.0 1.000 — 00.0	24 00.0 1.000 — 00.0	26 00.0 1.000 — 00.0	26 30.0 1.000 — 00.0	27 30.0 1.000 — 00.0	180

H.A.	36° 00′ Alt.	Δd Δt	Az.	37° 00′ Alt.	Δd Δt	Az.	38° 30′ Alt.	Δd Δt	Az.	40° 00′ Alt.	Δd Δt	Az.	42° 00′ Alt.	Δd Δt	Az.	42° 30′ Alt.	Δd Δt	Az.	43° 00′ Alt.	Δd Δt	Az.	45° 00′ Alt.	Δd Δt	Az.	H.A.
00	44 00.0	1.0 00	180.0	45 00.0	1.0 00	180.0	46 30.0	1.0 00	180.0	48 00.0	1.0 00	180.0	50 00.0	1.0 00	180.0	50 30.0	1.0 00	180.0	51 00.0	1.0 00	180.0	53 00.0	1.0 00	180.0	00
1	43 59.9	1.0 00	178.9	44 59.9	1.0 00	178.9	46 29.9	1.0 00	178.9	47 59.9	1.0 00	178.9	49 59.9	1.0 00	178.8	50 29.9	1.0 00	178.8	50 59.9	1.0 00	178.8	52 59.9	1.0 00	178.8	1
2	43 59.7	1.0 01	177.8	44 59.7	1.0 01	177.7	46 29.7	1.0 01	177.7	47 59.7	1.0 01	177.7	49 59.2	1.0 01	177.7	50 29.2	1.0 01	177.7	50 59.2	1.0 01	177.7	52 59.7	1.0 01	177.7	2
3	43 59.3	1.0 01	176.6	44 59.3	1.0 01	176.6	46 29.3	1.0 01	176.6	47 59.2	1.0 01	176.6	49 59.2	1.0 01	176.5	50 29.2	1.0 01	176.5	50 59.2	1.0 01	176.5	52 59.2	1.0 01	176.5	3
4	43 58.7	1.0 01	175.6	44 58.7	1.0 01	175.5	46 28.7	1.0 01	175.5	47 58.7	1.0 01	175.4	49 58.7	1.0 01	175.4	50 28.6	1.0 01	175.4	50 58.6	1.0 01	175.4	52 58.6	1.0 01	175.3	4
05	43 58.0	1.0 02	174.4	44 57.9	1.0 02	174.4	46 27.9	1.0 02	174.3	47 57.9	1.0 02	174.3	49 57.9	1.0 02	174.2	50 27.9	1.0 02	174.2	50 57.9	1.0 02	174.2	52 57.9	1.0 02	174.1	05
6	43 57.1	1.0 02	173.3	44 57.0	1.0 02	173.2	46 27.0	1.0 02	173.2	47 57.0	1.0 02	173.1	49 57.0	1.0 02	173.1	50 27.0	1.0 02	173.0	50 57.0	1.0 02	173.0	52 56.9	1.0 02	173.0	6
7	43 56.0	1.0 02	172.1	44 56.0	1.0 02	172.1	46 25.9	1.0 02	172.0	47 55.9	1.0 02	172.0	49 55.9	1.0 02	171.9	50 25.9	1.0 02	171.9	50 55.9	1.0 02	171.9	52 55.8	1.0 02	171.8	7
8	43 54.8	1.0 02	171.0	44 54.7	1.0 02	171.0	46 24.7	1.0 02	170.9	47 54.7	1.0 02	170.8	49 54.6	1.0 02	170.8	50 24.6	1.0 02	170.7	50 54.6	1.0 02	170.7	52 54.5	1.0 02	170.6	8
9	43 53.4	1.0 03	169.9	44 53.4	1.0 03	169.8	46 23.3	1.0 03	169.8	47 53.3	1.0 03	169.7	49 53.2	1.0 03	169.6	50 23.2	1.0 03	169.6	50 53.2	1.0 03	169.6	52 53.1	1.0 03	169.4	9
10	43 51.8	1.0 03	168.8	44 51.8	1.0 03	168.7	46 21.7	1.0 03	168.6	47 51.7	1.0 03	168.6	49 51.6	1.0 03	168.5	50 21.6	1.0 03	168.4	50 51.6	1.0 03	168.4	52 51.5	1.0 03	168.3	10
1	43 50.1	1.0 03	167.6	44 50.1	1.0 03	167.6	46 20.0	1.0 03	167.5	47 50.0	1.0 03	167.4	49 49.9	1.0 03	167.3	50 19.8	1.0 03	167.3	50 49.8	1.0 03	167.2	52 49.7	1.0 03	167.1	1
2	43 48.3	1.0 03	166.5	44 48.2	1.0 03	166.5	46 18.1	1.0 03	166.4	47 48.1	1.0 03	166.3	49 47.9	1.0 03	166.2	50 17.9	1.0 03	166.1	50 47.9	1.0 03	166.1	52 47.7	1.0 04	165.9	2
3	43 46.2	1.0 04	165.3	44 46.2	1.0 04	165.3	46 16.1	1.0 04	165.2	47 46.0	1.0 04	165.1	49 45.9	1.0 04	165.0	50 15.8	1.0 04	165.0	50 45.8	1.0 04	164.9	52 45.6	1.0 04	164.8	3
4	43 44.1	1.0 04	164.3	44 44.0	1.0 04	164.2	46 13.9	1.0 04	164.1	47 43.8	1.0 04	164.0	49 43.6	1.0 04	163.9	50 13.6	1.0 04	163.8	50 43.5	1.0 04	163.8	52 43.4	1.0 04	163.6	4
15	43 41.7	1.0 04	163.2	44 41.6	1.0 04	163.1	46 11.5	1.0 04	163.0	47 41.4	1.0 04	162.9	49 41.2	1.0 04	162.7	50 11.2	1.0 04	162.7	50 41.1	1.0 04	162.6	52 40.9	1.0 04	162.4	15
6	43 39.2	1.0 04	161.9	44 39.1	1.0 04	161.9	46 09.0	1.0 04	161.7	47 38.9	1.0 04	161.7	49 38.7	1.0 05	161.6	50 08.6	1.0 05	161.5	50 38.5	1.0 05	161.5	52 38.3	1.0 05	161.3	6
7	43 36.6	1.0 05	160.7	44 36.5	1.0 05	160.6	46 06.3	1.0 05	160.6	47 36.2	1.0 05	160.6	49 35.9	1.0 05	160.4	50 05.9	1.0 05	160.4	50 35.8	1.0 05	160.3	52 35.6	1.0 05	160.1	7
8	43 33.8	1.0 05	159.8	44 33.7	1.0 05	159.7	46 03.5	1.0 05	159.6	47 33.3	1.0 05	159.5	49 33.1	1.0 05	159.3	50 03.0	1.0 05	159.2	50 32.9	1.0 05	159.2	52 32.6	1.0 05	158.9	8
9	43 30.8	1.0 05	158.7	44 30.7	1.0 05	158.6	46 00.5	1.0 05	158.5	47 30.3	1.0 05	158.3	49 30.0	1.0 05	158.1	49 59.9	1.0 05	158.1	50 29.9	1.0 05	158.0	52 29.6	1.0 05	157.8	9
20	43 27.7	1.0 05	157.6	44 27.6	1.0 05	157.5	45 57.4	1.0 06	157.4	47 27.1	1.0 06	157.2	49 26.8	1.0 06	157.0	49 56.8	1.0 06	156.9	50 26.7	1.0 06	156.9	52 26.3	1.0 06	156.6	20
1	43 24.4	1.0 06	156.5	44 24.3	1.0 06	156.4	45 54.1	1.0 06	156.2	47 23.8	1.0 06	156.1	49 23.5	1.0 06	155.8	49 53.4	1.0 06	155.8	50 23.3	1.0 06	155.7	52 22.9	1.0 06	155.5	1
2	43 21.0	1.0 06	155.4	44 20.9	1.0 06	155.3	45 50.6	1.0 06	155.1	47 20.4	1.0 06	154.9	49 20.0	1.0 06	154.7	49 49.9	1.0 06	154.6	50 19.8	1.0 06	154.6	52 19.4	1.0 06	154.3	2
3	43 17.5	1.0 06	154.3	44 17.3	1.0 06	154.2	45 47.0	1.0 06	154.0	47 16.8	1.0 06	153.8	49 16.4	1.0 06	153.6	49 46.3	1.0 06	153.5	50 16.1	1.0 06	153.4	52 15.7	1.0 07	153.2	3
4	43 13.8	1.0 06	153.2	44 13.6	1.0 06	153.0	45 43.3	1.0 06	152.9	47 13.0	1.0 06	152.7	49 12.6	1.0 07	152.4	49 42.5	1.0 07	152.4	50 12.3	1.0 07	152.3	52 11.8	1.0 07	152.0	4
25	43 09.9	1.0 07	152.0	44 09.7	1.0 07	151.9	45 39.4	1.0 07	151.8	47 09.1	1.0 07	151.6	49 08.6	1.0 07	151.3	49 38.5	1.0 07	151.2	50 08.4	1.0 07	151.2	52 07.9	1.0 07	150.9	25
6	43 06.0	1.0 07	150.9	44 05.7	1.0 07	150.8	45 35.4	1.0 07	150.6	47 05.0	1.0 07	150.5	49 04.5	1.0 07	150.2	49 34.4	1.0 07	150.2	50 04.3	1.0 07	150.1	52 03.7	1.0 07	149.7	6
7	43 01.8	1.0 07	149.8	44 01.6	1.0 07	149.7	45 31.2	1.0 07	149.5	47 00.9	1.0 07	149.3	49 00.3	1.0 07	149.0	49 30.2	1.0 07	149.0	50 00.9	99 08	148.9	51 59.4	99 08	148.6	7
8	42 57.6	1.0 07	148.7	43 57.3	1.0 07	148.6	45 26.9	1.0 07	148.4	46 56.5	1.0 07	148.2	48 56.0	1.0 08	147.9	49 25.8	99 08	147.8	49 55.7	99 08	147.8	51 55.0	99 08	147.4	8
9	42 53.2	1.0 08	147.6	43 52.9	1.0 08	147.5	45 22.5	1.0 08	147.3	46 52.1	1.0 08	147.1	48 51.5	99 08	146.8	49 21.3	99 08	146.7	49 51.1	99 08	146.6	51 50.4	99 08	146.3	9
30	42 48.6	1.0 08	146.5	43 48.3	1.0 08	146.4	45 17.9	1.0 08	146.2	46 47.5	99 08	146.0	48 46.8	99 08	145.7	49 16.6	99 08	145.6	49 46.5	99 08	145.5	51 45.7	99 08	145.2	30
1	42 43.9	1.0 08	145.4	43 43.7	1.0 08	145.3	45 13.2	99 08	145.1	46 42.7	99 08	144.9	48 42.0	99 08	144.6	49 11.9	99 08	144.5	49 41.7	99 08	144.4	51 40.9	99 08	144.0	1
2	42 39.1	99 08	144.3	43 38.8	99 08	144.2	45 08.4	99 08	144.0	46 37.9	99 08	143.8	48 37.1	99 08	143.4	49 06.9	99 08	143.4	49 36.7	99 08	143.3	51 35.9	99 08	142.9	2
3	42 34.2	99 08	143.3	43 33.9	99 08	143.1	45 03.4	99 08	142.9	46 32.9	99 09	142.7	48 32.1	99 09	142.3	49 01.9	99 09	142.2	49 31.7	99 09	142.1	51 30.8	99 09	141.8	3
4	42 29.2	99 08	142.2	43 28.8	99 09	142.0	44 58.3	99 09	141.8	46 27.7	99 09	141.5	48 26.9	99 09	141.2	48 56.7	99 09	141.1	49 26.5	99 09	141.0	51 25.6	99 09	140.6	4
35	42 24.0	99 09	141.1	43 23.6	99 09	140.7	44 53.1	99 09	140.7	46 22.5	99 09	140.4	48 21.6	99 09	140.1	48 51.4	99 09	139.9	49 21.2	99 09	139.9	51 20.2	99 09	139.5	35
6	42 18.7	99 09	140.0	43 18.3	99 09	139.8	44 47.7	99 09	139.6	46 17.1	99 09	139.3	48 16.2	99 09	139.0	48 46.0	99 09	138.9	49 15.7	99 09	138.8	51 14.8	99 09	138.4	6
7	42 13.2	99 09	138.9	43 12.8	99 09	138.7	44 42.2	99 09	138.5	46 11.6	99 09	138.2	48 10.7	99 09	137.9	48 40.4	99 09	137.8	49 10.2	99 09	137.7	51 09.2	99 10	137.3	7
8	42 07.7	99 09	137.8	43 07.3	99 09	137.7	44 36.6	99 10	137.4	46 06.0	99 10	137.1	48 05.0	99 10	136.8	48 34.8	99 10	136.7	49 04.5	99 10	136.6	51 03.4	99 10	136.2	8
9	42 02.0	99 10	136.7	43 01.6	99 10	136.6	44 30.9	99 10	136.3	46 00.2	99 10	136.0	47 59.2	99 10	135.7	48 29.0	99 10	135.6	48 58.7	99 10	135.5	50 57.5	99 10	135.0	9
40	41 56.2	99 10	135.6	42 55.9	99 10	135.5	44 25.1	99 10	135.2	45 54.4	99 10	135.0	47 53.3	99 10	134.6	48 23.1	99 10	134.5	48 52.8	99 10	134.4	50 51.6	99 10	133.9	40
1	41 50.3	99 10	134.6	42 49.9	99 10	134.4	44 19.2	99 10	134.1	45 48.4	99 10	133.9	47 47.3	99 10	133.5	48 17.1	99 10	133.4	48 46.8	99 10	133.3	50 45.6	99 10	132.8	1
2	41 44.3	99 10	133.5	42 43.9	99 10	133.3	44 13.1	99 10	133.1	45 42.3	99 10	132.8	47 41.2	99 10	132.4	48 10.9	99 10	132.3	48 40.6	99 10	132.2	50 39.4	99 10	131.7	2
3	41 38.2	99 10	132.4	42 37.7	99 10	132.2	44 07.0	99 10	132.0	45 36.2	99 10	131.7	47 35.0	99 10	131.3	48 04.7	99 11	131.2	48 34.4	99 11	131.1	50 33.1	99 11	130.6	3
4	41 32.0	99 11	131.3	42 31.5	99 11	131.2	44 00.7	99 11	130.9	45 29.9	99 11	130.6	47 28.7	99 11	130.3	47 58.4	99 11	130.1	48 28.0	99 11	130.0	50 26.7	99 11	129.5	4
45	41 25.7	99 11	130.3	42 25.2	99 11	130.1	43 54.3	99 11	129.8	45 23.5	99 11	129.5	47 22.2	99 11	129.1	47 51.9	99 11	129.0	48 21.6	99 11	128.9	50 20.2	99 11	128.4	45
6	41 19.3	99 11	129.2	42 18.7	99 11	129.0	43 47.9	99 11	128.7	45 17.0	99 11	128.4	47 15.7	99 11	128.0	47 45.4	99 11	127.9	48 15.0	99 11	127.8	50 13.6	99 11	127.3	6
7	41 12.8	99 11	128.1	42 12.2	99 11	128.0	43 41.3	99 11	127.7	45 10.4	99 11	127.4	47 09.1	99 11	126.9	47 38.8	99 11	126.8	48 08.4	99 11	126.7	50 06.9	99 11	126.2	7
8	41 06.1	99 11	127.1	42 05.6	99 11	126.9	43 34.7	99 11	126.6	45 03.7	99 11	126.3	47 02.4	99 11	125.9	47 32.0	99 12	125.8	48 01.7	99 11	125.6	50 00.2	99 11	125.2	8
9	40 59.4	99 11	126.0	41 58.9	99 11	125.8	43 27.9	99 12	125.5	44 56.9	99 12	125.2	46 55.6	99 12	124.8	47 25.2	99 12	124.7	47 54.8	99 12	124.6	49 53.3	99 12	124.1	9
50	40 52.6	99 12	125.0	41 52.0	99 12	124.8	43 21.1	99 12	124.5	44 50.1	99 12	124.2	46 48.7	99 12	123.7	47 18.3	99 12	123.6	47 47.9	99 12	123.5	49 46.3	99 12	123.0	50
1	40 45.7	99 12	123.9	41 45.1	99 12	123.7	43 14.1	99 12	123.4	44 43.1	99 12	123.1	46 41.7	99 12	122.6	47 11.3	99 12	122.5	47 40.9	99 12	122.4	49 39.3	99 12	121.9	1
2	40 38.8	99 12	122.8	41 38.1	99 12	122.6	43 07.1	99 12	122.3	44 36.1	99 12	122.0	46 34.6	99 12	121.6	47 04.2	99 12	121.5	47 33.8	99 12	121.3	49 32.2	99 12	120.8	2
3	40 31.7	99 12	121.8	41 31.1	99 12	121.6	43 00.0	99 12	121.3	44 29.0	99 12	121.0	46 27.4	99 12	120.5	46 57.0	99 12	120.4	47 26.6	99 12	120.3	49 24.9	99 12	119.8	3
4	40 24.6	99 12	120.7	41 23.9	99 12	120.5	42 52.9	99 12	120.2	44 21.8	99 12	119.9	46 20.2	99 12	119.4	46 49.8	99 12	119.3	47 19.4	99 12	119.2	49 17.7	99 12	118.7	4
55	40 17.4	99 12	119.7	41 16.7	99 12	119.5	42 45.6	99 12	119.2	44 14.5	99 12	118.8	46 12.9	99 12	118.4	46 42.5	99 12	118.3	47 12.1	99 12	118.1	49 10.3	99 12	117.6	55
6	40 10.1	99 12	118.6	41 09.4	99 12	118.4	42 38.3	99 12	118.1	44 07.1	99 12	117.8	46 05.5	99 12	117.3	46 35.1	99 12	117.2	47 04.7	99 12	117.1	49 02.9	99 12	116.6	6
7	40 02.7	99 12	117.6	41 02.0	99 12	117.4	42 30.9	99 12	117.1	43 59.7	99 12	116.7	45 58.1	99 13	116.3	46 27.6	99 13	116.2	46 57.2	99 13	116.0	48 55.4	99 13	115.5	7
8	39 55.3	99 13	116.5	40 54.5	99 13	116.3	42 23.4	99 13	116.0	43 52.2	99 13	115.7	45 50.5	99 13	115.2	46 20.1	99 13	115.1	46 49.7	99 13	115.0	48 47.8	99 13	114.5	8
9	39 47.8	99 13	115.5	40 47.0	99 13	115.3	42 15.9	99 13	115.0	43 44.7	99 13	114.6	45 43.0	99 13	114.2	46 12.5	99 13	114.0	46 42.1	99 13	113.9	48 40.2	99 13	113.4	9
60	39 40.2	99 13	114.5	40 39.4	99 13	114.3	42 08.3	99 13	113.9	43 37.0	99 13	113.6	45 35.3	99 13	113.1	46 04.9	98 13	113.0	46 34.4	98 13	112.9	48 32.5	98 13	112.3	60
1	39 32.6	99 13	113.4	40 31.8	99 13	113.2	42 00.6	99 13	112.9	43 29.4	99 13	112.6	45 27.6	98 13	112.1	45 57.1	98 13	112.0	46 26.7	98 13	111.8	48 24.7	98 13	111.3	1
2	39 24.9	99 13	112.4	40 24.1	99 13	112.2	41 52.9	99 13	111.9	43 21.6	98 13	111.5	45 19.8	98 13	111.0	45 49.4	98 13	110.9	46 18.9	98 13	110.8	48 16.9	98 13	110.3	2
3	39 17.1	99 13	111.4	40 16.3	99 13	111.1	41 45.1	99 13	110.8	43 13.8	98 13	110.5	45 12.0	98 13	110.0	45 41.5	98 13	109.9	46 11.1	98 13	109.7	48 09.0	98 13	109.2	3
4	39 09.3	99 13	110.3	40 08.5	99 13	110.1	41 37.3	99 13	109.8	43 06.0	99 13	109.4	45 04.1	98 13	109.0	45 33.7	98 13	108.8	46 03.2	98 13	108.7	48 01.1	98 13	108.2	4
65	39 01.5	99 13	109.3	40 00.6	99 13	109.1	41 29.4	99 13	108.8	42 58.1	99 13	108.4	44 56.2	98 13	107.9	45 25.7	98 13	107.8	45 55.2	98 13	107.7	47 53.2	98 13	107.1	65
6	38 53.6	99 13	108.3	39 52.7	99 13	108.1	41 21.5	99 13	107.7	42 50.1	98 13	107.4	44 48.2	98 13	106.9	45 17.8	98 13	106.8	45 47.3	98 13	106.6	47 45.2	98 13	106.1	6
7	38 45.6	99 13	107.2	39 44.8	99 13	107.0	41 13.5	99 13	106.7	42 42.1	98 13	106.4	44 40.2	98 13	105.9	45 09.7	98 13	105.7	45 39.2	98 14	105.6	47 37.1	98 14	105.1	7
8	38 37.6	99 13	106.2	39 36.8	99 13	106.0	41 05.5	99 14	105.7	42 34.1	98 14	105.3	44 32.2	98 14	104.8	45 01.7	98 14	104.7	45 31.2	98 14	104.6	47 29.0	98 14	104.0	8
9	38 29.6	99 13	105.2	39 28.7	99 13	105.0	40 57.4	99 14	104.7	42 26.0	98 14	104.3	44 24.1	98 14	103.8	44 53.6	98 14	103.7	45 23.1	98 14	103.6	47 20.9	98 14	103.0	9
70	38 21.5	99 14	104.2	39 20.6	99 14	104.0	40 49.3	99 14	103.6	42 17.9	98 14	103.3	44 16.0	98 14	102.8	44 45.5	98 14	102.7	45 14.9	98 14	102.5	47 12.8	98 14	102.0	70
1	38 13.4	99 14	103.2	39 12.5	99 14	103.0	40 41.2	98 14	102.6	42 09.8	98 14	102.3	44 07.8	98 14	101.8	44 37.3	98 14	101.6	45 06.8	98 14	101.5	47 04.6	98 14	100.9	1
2	38 05.2	99 14	102.2	39 04.4	99 14	101.9	40 33.0	98 14	101.6	42 01.6	98 14	101.3	43 59.6	98 14	100.8	44 29.1	98 14	100.6	44 58.6	98 14	100.5	46 56.4	98 14	100.0	2
3	37 57.0	99 14	101.1	38 56.2	99 14	100.9	40 24.8	98 14	100.6	41 53.4	98 14	100.2	43 51.4	98 14	99.7	44 20.9	98 14	99.6	44 50.4	98 14	99.5	46 48.1	98 14	98.9	3
4	37 48.8	99 14	100.1	38 48.0	99 14	99.9	40 16.6	98 14	99.6	41 45.2	98 14	99.2	43 43.2	98 14	98.7	44 12.6	98 14	98.6	44 42.1	98 14	98.5	46 39.9	98 14	97.9	4
75	37 40.6	99 14	99.1	38 39.7	99 14	98.9	40 08.4	98 14	98.6	41 36.9	98 14	98.2	43 34.9	98 14	97.7	44 04.4	98 14	97.6	44 33.8	98 14	97.5	46 31.6	98 14	96.9	75
6	37 32.4	99 14	98.1	38 31.5	99 14	97.9	40 00.1	98 14	97.6	41 28.6	98 14	97.2	43 26.6	98 14	96.7	43 56.1	98 14	96.6	44 25.5	98 14	96.5	46 23.3	98 14	95.9	6
7	37 24.1	99 14	97.1	38 23.2	98 14	96.9	39 51.8	98 14	96.6	41 20.3	98 14	96.2	43 18.3	98 14	95.7	43 47.8	98 14	95.6	44 17.2	98 14	95.5	46 15.0	98 14	94.9	7
8	37 15.8	99 14	96.1	38 14.9	98 14	95.9	39 43.5	98 14	95.6	41 12.0	98 14	95.2	43 10.0	98 14	94.7	43 39.5	98 14	94.6	44 08.9	98 14	94.4	46 06.7	98 14	93.9	8
9	37 07.5	99 14	95.1	38 06.6	98 14	94.9	39 35.2	98 14	94.6	41 03.7	98 14	94.2	43 01.7	98 14	93.7	43 31.1	98 14	93.6	44 00.6	98 14	93.4	45 58.3	98 14	92.9	9
80	36 59.1	99 14	94.1	37 58.2	98 14	93.9	39 26.8	98 14	93.6	40 55.4	98 14	93.2	42 53.3	98 14	92.7	43 22.8	98 14	92.6	43 52.3	98 14	92.5	45 50.0	98 14	91.9	80
1	36 50.8	99 14	93.1	37 49.9	98 14	92.9	39 18.5	98 14	92.6	40 47.0	98 14	92.2	42 45.0	98 14	91.7	43 14.5	98 14	91.6	43 43.9	98 14	91.5	45 41.6	98 14	90.9	1
2	36 42.5	99 14	92.1	37 41.6	98 14	91.9	39 10.2	98 14	91.6	40 38.7	98 14	91.2	42 36.6	98 14	90.7	43 06.1	98 14	90.6	43 35.6	98 14	90.5	45 33.3	98 14	89.9	2
3	36 34.1	99 14	91.1	37 33.2	98 14	90.9	39 01.8	98 14	90.6	40 30.3	98 14	90.2	42 28.3	98 14	89.7	42 57.8	98 14	89.6	43 27.2	98 14	89.5	45 24.9	98 14	88.9	3
4	36 25.8	99 14	90.1	37 24.9	98 14	89.9	38 53.5	98 14	89.6	40 22.0	98 14	89.2	42 19.9	98 14	88.7	42 49.4	98 14	88.6	43 18.9	98 14	88.5	45 16.6	98 14	87.9	4
85	36 17.4	99 14	89.1	37 16.5	98 14	88.9	38 45.1	98 14	88.6	40 13.6	98 14	88.2	42 11.6	98 14	87.8	42 41.1	98 14	87.6	43 10.5	98 14	87.5	45 08.3	98 14	87.0	85
6	36 09.1	99 14	88.1	37 08.2	98 14	87.9	38 36.8	98 14	87.6	40 05.3	98 14	87.3	42 03.3	98 14	86.8	42 32.7	98 14	86.6	43 02.2	98 14	86.5	44 59.9	98 14	86.0	6
7	36 00.7	99 14	87.2	36 59.8	98 14	87.0	38 28.4	98 14	86.6	39 57.0	98 14	86.3	41 54.9	98 14	85.8	42 24.4	98 14	85.7	42 53.8	98 14	85.5	44 51.6	98 14	85.0	7
8	35 52.4	99 14	86.2	36 51.5	98 14	86.0	38 20.1	98 14	85.6	39 48.6	98 14	85.3	41 46.6	98 14	84.8	42 16.1	98 14	84.7	42 45.5	98 14	84.6	44 43.3	98 14	84.0	8
9	35 44.1	99 14	85.2	36 43.2	98 14	85.0	38 11.8	98 14	84.7	39 40.3	98 14	84.3	41 38.3	98 14	83.8	42 07.8	98 14	83.6	42 37.2	98 14	83.6	44 35.0	98 14	83.0	9
90	35 35.8	99 14	84.2	36 34.9	98 14	84.0	38 03.5	98 14	83.7	39 32.0	98 14	83.3	41 30.0	98 14	82.9	41 59.5	98 14	82.7	42 28.9	98 14	82.6	44 26.7	98 14	82.1	90

Lat. 82°

H.A.	36°00' Alt	Δd Δt	Az.	37°00' Alt	Δd Δt	Az.	38°30' Alt	Δd Δt	Az.	40°00' Alt	Δd Δt	Az.	42°00' Alt	Δd Δt	Az.	42°30' Alt	Δd Δt	Az.	43°00' Alt	Δd Δt	Az.	45°00' Alt	Δd Δt	Az.	H.A.
91	35 27.5	98 14	83.2	36 26.6	98 14	83.0	37 55.2	98 14	82.7	39 23.7	98 14	82.4	41 21.7	98 14	81.9	41 51.2	98 14	81.8	42 20.7	98 14	81.6	44 18.4	98 14	81.1	91
2	35 19.2	99 14	82.3	36 18.3	98 14	82.1	37 46.9	98 14	81.7	39 15.5	98 14	81.4	41 13.5	98 14	80.9	41 42.9	98 14	80.8	42 12.4	98 14	80.7	44 10.2	98 14	80.1	2
3	35 10.9	99 14	81.3	36 10.0	99 14	81.1	37 38.7	98 14	80.8	39 07.2	98 14	80.4	41 05.2	98 14	79.9	41 34.7	98 14	79.8	42 04.2	98 14	79.7	44 02.0	98 14	79.2	3
4	35 02.7	99 14	80.3	36 01.8	99 14	80.1	37 30.4	98 14	79.8	38 59.0	98 14	79.4	40 57.0	98 14	79.0	41 26.5	98 14	78.9	41 56.0	98 14	78.7	43 53.8	98 14	78.2	4
95	34 54.4	99 14	79.3	35 53.6	99 14	79.1	37 22.2	98 14	78.8	38 50.8	98 14	78.5	40 48.8	98 14	78.0	41 18.3	98 14	77.9	41 47.8	98 14	77.8	43 45.6	98 14	77.2	95
6	34 46.3	99 14	78.4	35 45.4	99 14	78.2	37 14.0	98 14	77.8	38 42.6	98 14	77.5	40 40.7	98 14	77.0	41 10.2	98 14	76.9	41 39.7	98 14	76.8	43 37.5	98 14	76.3	6
7	34 38.1	99 14	77.4	35 37.2	99 14	77.2	37 05.9	98 14	76.9	38 34.5	98 14	76.5	40 32.6	98 14	76.1	41 02.1	98 13	76.0	41 31.5	98 13	75.8	43 29.4	98 13	75.3	7
8	34 30.0	99 14	76.4	35 29.1	99 14	76.2	36 57.8	98 13	75.9	38 26.4	98 13	75.6	40 24.5	98 13	75.1	40 54.0	98 13	75.0	41 23.5	98 13	74.9	43 21.4	98 13	74.4	8
9	34 21.9	99 13	75.5	35 21.0	99 13	75.3	36 49.7	98 13	74.9	38 18.3	98 13	74.6	40 16.4	98 13	74.2	40 45.9	98 13	74.0	41 15.4	98 13	73.9	43 13.3	98 13	73.4	9
100	34 13.8	99 13	74.5	35 12.9	99 13	74.3	36 41.6	99 13	74.0	38 10.3	98 13	73.7	40 08.4	98 13	73.2	40 37.9	98 13	73.1	41 07.4	98 13	73.0	43 05.4	98 13	72.5	100
1	34 05.8	99 13	73.5	35 04.9	99 13	73.3	36 33.6	99 13	73.0	38 02.3	98 13	72.7	40 00.4	98 13	72.2	40 29.9	98 13	72.1	40 59.5	98 13	72.0	42 57.4	98 13	71.5	1
2	33 57.8	99 13	72.6	34 56.9	99 13	72.4	36 25.7	99 13	72.1	37 54.4	99 13	71.7	39 52.5	98 13	71.3	40 22.0	98 13	71.2	40 51.5	98 13	71.1	42 49.5	98 13	70.6	2
3	33 49.8	99 13	71.6	34 49.0	99 13	71.4	36 17.8	99 13	71.1	37 46.4	99 13	70.8	39 44.6	98 13	70.3	40 14.1	98 13	70.2	40 43.7	98 13	70.1	42 41.7	98 13	69.6	3
4	33 41.9	99 13	70.7	34 41.1	99 13	70.5	36 09.9	99 13	70.2	37 38.6	99 13	69.8	39 36.8	98 13	69.4	40 06.3	98 13	69.3	40 35.8	98 13	69.2	42 33.9	98 13	68.7	4
105	33 34.1	99 13	69.7	34 33.3	99 13	69.5	36 02.0	99 13	69.2	37 30.8	99 13	68.9	39 29.0	98 13	68.4	39 58.5	98 13	68.3	40 28.1	98 13	68.2	42 26.1	98 13	67.7	105
6	33 26.3	99 13	68.7	34 25.5	99 13	68.5	35 54.3	99 13	68.2	37 23.0	99 13	67.9	39 21.2	98 13	67.5	39 50.8	98 13	67.4	40 20.3	98 13	67.3	42 18.4	98 13	66.8	6
7	33 18.5	99 13	67.8	34 17.7	99 13	67.6	35 46.5	99 13	67.3	37 15.3	99 13	67.0	39 13.6	98 13	66.5	39 43.1	98 13	66.4	40 12.7	98 13	66.3	42 10.8	98 13	65.9	7
8	33 10.8	99 13	66.8	34 10.0	99 13	66.6	35 38.9	99 13	66.3	37 07.6	99 13	66.0	39 05.9	98 13	65.6	39 35.5	98 13	65.5	40 05.0	98 13	65.4	42 03.2	98 13	64.9	8
9	33 03.2	99 13	65.9	34 02.4	99 13	65.7	35 31.2	99 13	65.4	37 00.0	99 13	65.1	38 58.3	98 13	64.7	39 27.9	99 13	64.6	39 57.5	99 13	64.4	41 55.6	98 13	64.0	9
110	32 55.6	99 13	64.9	33 54.8	99 13	64.7	35 23.7	99 12	64.4	36 52.5	99 12	64.1	38 50.8	99 12	63.7	39 20.4	99 12	63.6	39 50.0	99 12	63.5	41 48.2	98 12	63.0	110
1	32 48.0	99 12	64.0	33 47.3	99 12	63.8	35 16.2	99 12	63.5	36 45.0	99 12	63.2	38 43.4	99 12	62.8	39 13.0	99 12	62.7	39 42.5	99 12	62.6	41 40.7	98 12	62.1	1
2	32 40.6	99 12	63.0	33 39.8	99 12	62.8	35 08.7	99 12	62.5	36 37.6	99 12	62.3	38 36.0	99 12	61.8	39 05.6	99 12	61.7	39 35.1	99 12	61.6	41 33.4	99 12	61.2	2
3	32 33.1	99 12	62.1	33 32.4	99 12	61.9	35 01.4	99 12	61.6	36 30.2	99 12	61.3	38 28.6	99 12	60.9	38 58.2	99 12	60.8	39 27.8	99 12	60.7	41 26.1	99 12	60.3	3
4	32 25.8	99 12	61.1	33 25.1	99 12	60.9	34 54.0	99 12	60.7	36 22.9	99 12	60.4	38 21.4	99 12	60.0	38 51.0	99 12	59.9	39 20.6	99 12	59.8	41 18.9	99 12	59.3	4
115	32 18.5	99 12	60.2	33 17.8	99 12	60.0	34 46.8	99 12	59.7	36 15.7	99 12	59.4	38 14.2	99 12	59.0	38 43.8	99 12	58.9	39 13.4	99 12	58.8	41 11.8	99 12	58.4	115
6	32 11.3	99 12	59.2	33 10.6	99 12	59.1	34 39.6	99 12	58.8	36 08.6	99 12	58.5	38 07.1	99 12	58.1	38 36.7	99 12	58.0	39 06.3	99 12	57.9	41 04.7	99 12	57.5	6
7	32 04.2	99 12	58.3	33 03.5	99 12	58.1	34 32.5	99 12	57.8	36 01.5	99 12	57.6	38 00.0	99 12	57.2	38 29.6	99 12	57.1	38 59.3	99 12	57.0	40 57.7	99 12	56.5	7
8	31 57.1	99 12	57.3	32 56.5	99 12	57.2	34 25.5	99 11	56.9	35 54.5	99 11	56.6	37 53.0	99 12	56.2	38 22.7	99 11	56.1	38 52.3	99 11	56.0	40 50.7	99 11	55.6	8
9	31 50.1	99 12	56.4	32 49.5	99 11	56.2	34 18.5	99 11	56.0	35 47.5	99 11	55.7	37 46.1	99 11	55.3	38 15.8	99 11	55.2	38 45.4	99 11	55.1	40 43.9	99 11	54.7	9
120	31 43.2	99 11	55.5	32 42.6	99 11	55.3	34 11.6	99 11	55.0	35 40.7	99 11	54.8	37 39.3	99 11	54.4	38 09.0	99 11	54.3	38 38.6	99 11	54.2	40 37.1	99 11	53.8	120
1	31 36.4	99 11	54.5	32 35.8	99 11	54.3	34 04.8	99 11	54.1	35 33.9	99 11	53.8	37 32.6	99 11	53.5	38 02.2	99 11	53.4	38 31.9	99 11	53.3	40 30.4	99 11	52.9	1
2	31 29.6	99 11	53.6	32 29.0	99 11	53.4	33 58.1	99 11	53.2	35 27.2	99 11	52.9	37 25.9	99 11	52.5	37 55.6	99 11	52.4	38 25.2	99 11	52.3	40 23.8	99 11	51.9	2
3	31 22.9	99 11	52.6	32 22.4	99 11	52.4	33 51.4	99 11	52.2	35 20.6	99 11	52.0	37 19.3	99 11	51.6	37 49.0	99 11	51.5	38 18.6	99 11	51.4	40 17.3	99 11	51.0	3
4	31 16.3	99 11	51.7	32 15.8	99 11	51.5	33 44.9	99 11	51.3	35 14.0	99 11	51.0	37 12.8	99 11	50.7	37 42.5	99 11	50.6	38 12.2	99 11	50.5	40 10.8	99 11	50.1	4
125	31 09.8	99 11	50.8	32 09.3	99 11	50.6	33 38.4	99 11	50.4	35 07.6	99 11	50.1	37 06.4	99 11	49.8	37 36.1	99 11	49.7	38 05.8	99 10	49.6	40 04.5	99 10	49.2	125
6	31 03.4	99 11	49.8	32 02.9	99 11	49.7	33 32.1	99 10	49.4	35 01.2	99 10	49.2	37 00.0	99 10	48.8	37 29.7	99 10	48.7	37 59.4	99 10	48.7	39 58.2	99 10	48.3	6
7	30 57.1	99 10	48.9	31 56.5	99 10	48.7	33 25.8	99 10	48.5	34 54.9	99 10	48.3	36 53.8	99 10	47.9	37 23.5	99 10	47.8	37 53.2	99 10	47.7	39 52.0	99 10	47.4	7
8	30 50.8	99 10	47.9	31 50.3	99 10	47.8	33 19.6	99 10	47.6	34 48.8	99 10	47.3	36 47.7	99 10	47.0	37 17.4	99 10	46.9	37 47.1	99 10	46.8	39 45.9	99 10	46.5	8
9	30 44.7	99 10	47.0	31 44.2	99 10	46.9	33 13.4	99 10	46.6	34 42.7	99 10	46.4	36 41.6	99 10	46.1	37 11.3	99 10	46.0	37 41.0	99 10	45.9	39 39.9	99 10	45.6	9
130	30 38.6	99 10	46.1	31 38.1	99 10	45.9	33 07.4	99 10	45.7	34 36.7	99 10	45.5	36 35.6	99 10	45.2	37 05.4	99 10	45.1	37 35.1	99 10	45.0	39 34.0	99 10	44.6	130
1	30 32.6	99 10	45.1	31 32.2	99 10	45.0	33 01.5	99 10	44.8	34 30.8	99 10	44.6	36 29.8	99 10	44.2	36 59.5	99 10	44.2	37 29.2	99 10	44.1	39 28.1	99 10	43.7	1
2	30 26.8	99 10	44.2	31 26.3	99 10	44.1	32 55.6	99 10	43.9	34 24.9	99 10	43.6	36 24.0	99 09	43.3	36 53.7	99 09	43.2	37 23.5	99 09	43.2	39 22.4	99 09	42.8	2
3	30 21.0	99 09	43.3	31 20.6	99 09	43.1	32 49.9	99 09	42.9	34 19.2	99 09	42.7	36 18.3	99 09	42.4	36 48.1	99 09	42.3	37 17.8	99 09	42.3	39 16.8	99 09	41.9	3
4	30 15.3	99 09	42.4	31 14.9	99 09	42.2	32 44.3	99 09	42.0	34 13.6	99 09	41.8	36 12.7	99 09	41.5	36 42.5	99 09	41.4	37 12.2	99 09	41.3	39 11.3	99 09	41.0	4
135	30 09.7	99 09	41.4	31 09.3	99 09	41.3	32 38.7	99 09	41.1	34 08.1	99 09	40.9	36 07.2	99 09	40.6	36 37.0	99 09	40.5	37 06.8	99 09	40.4	39 05.8	99 09	40.1	135
6	30 04.3	99 09	40.5	31 03.9	99 09	40.4	32 33.3	99 09	40.2	34 02.7	99 09	40.0	36 01.8	99 09	39.7	36 31.6	99 09	39.6	37 01.4	99 09	39.5	39 00.5	99 09	39.2	6
7	29 58.9	99 09	39.6	30 58.5	99 09	39.4	32 28.0	99 09	39.2	33 57.4	99 09	39.0	35 56.6	99 09	38.8	36 26.4	99 09	38.7	36 56.2	99 09	38.6	38 55.3	99 09	38.3	7
8	29 53.6	99 09	38.6	30 53.3	99 09	38.5	32 22.7	99 09	38.3	33 52.2	99 09	38.1	35 51.4	99 08	37.8	36 21.2	99 08	37.8	36 51.0	99 08	37.7	38 50.2	99 08	37.4	8
9	29 48.5	99 08	37.7	30 48.1	99 08	37.6	32 17.6	99 08	37.4	33 47.1	99 08	37.2	35 46.3	99 08	36.9	36 16.1	99 08	36.9	36 45.9	99 08	36.8	38 45.1	99 08	36.5	9
140	29 43.4	99 08	36.8	30 43.1	99 08	36.7	32 12.6	99 08	36.5	33 42.1	99 08	36.3	35 41.4	99 08	36.0	36 11.2	99 08	36.0	36 41.0	99 08	35.9	38 40.2	99 08	35.6	140
1	29 38.5	99 08	35.9	30 38.2	99 08	35.7	32 07.7	99 08	35.6	33 37.2	99 08	35.4	35 36.5	99 08	35.1	36 06.3	99 08	35.0	36 36.1	99 08	35.0	38 35.4	99 08	34.7	1
2	29 33.6	99 08	34.9	30 33.3	99 08	34.8	32 02.8	99 08	34.6	33 32.4	99 08	34.5	35 31.8	99 08	34.2	36 01.6	99 08	34.1	36 31.4	99 08	34.1	38 30.7	99 08	33.8	2
3	29 28.9	1.0 08	34.0	30 28.6	1.0 08	33.9	31 58.2	1.0 08	33.7	33 27.7	99 08	33.5	35 27.1	99 08	33.3	35 57.0	99 08	33.2	36 26.8	99 08	33.2	38 26.1	99 07	32.9	3
4	29 24.3	1.0 08	33.1	30 24.0	1.0 07	33.0	31 53.6	1.0 07	32.8	33 23.2	1.0 07	32.6	35 22.6	99 07	32.4	35 52.4	99 07	32.3	36 22.3	99 07	32.3	38 21.6	99 07	32.0	4
145	29 19.8	1.0 07	32.2	30 19.5	1.0 07	32.1	31 49.1	1.0 07	31.9	33 18.7	1.0 07	31.7	35 18.2	1.0 07	31.5	35 48.0	1.0 07	31.4	36 17.9	1.0 07	31.4	38 17.3	99 07	31.1	145
6	29 15.4	1.0 07	31.2	30 15.2	1.0 07	31.1	31 44.8	1.0 07	31.0	33 14.4	1.0 07	30.8	35 13.9	1.0 07	30.6	35 43.7	1.0 07	30.5	36 13.6	1.0 07	30.5	38 13.0	1.0 07	30.2	6
7	29 11.1	1.0 07	30.3	30 11.0	1.0 07	30.1	31 40.5	1.0 07	30.1	33 10.2	1.0 07	29.9	35 09.7	1.0 07	29.7	35 39.5	1.0 07	29.6	36 09.4	1.0 07	29.6	38 08.9	1.0 07	29.3	7
8	29 07.0	1.0 07	29.4	30 06.7	1.0 07	29.3	31 36.4	1.0 07	29.1	33 06.1	1.0 07	29.0	35 05.6	1.0 07	28.8	35 35.5	1.0 07	28.7	36 05.3	1.0 07	28.7	38 04.8	1.0 07	28.4	8
9	29 02.9	1.0 07	28.5	30 02.7	1.0 06	28.4	31 32.4	1.0 06	28.2	33 02.1	1.0 06	28.1	35 01.6	1.0 06	27.9	35 31.5	1.0 06	27.8	36 01.4	1.0 07	27.8	38 00.9	1.0 06	27.5	9
150	28 59.0	1.0 06	27.5	29 58.8	1.0 06	27.5	31 28.5	1.0 06	27.3	32 58.2	1.0 06	27.2	34 57.8	1.0 06	27.0	35 27.7	1.0 06	26.9	35 57.6	1.0 06	26.9	37 57.1	1.0 06	26.6	150
1	28 55.2	1.0 06	26.6	29 55.0	1.0 06	26.5	31 24.7	1.0 06	26.4	32 54.5	1.0 06	26.3	34 54.1	1.0 06	26.1	35 24.0	1.0 06	26.0	35 53.9	1.0 06	26.0	37 53.4	1.0 06	25.7	1
2	28 51.5	1.0 06	25.7	29 51.3	1.0 06	25.6	31 21.1	1.0 06	25.5	32 50.8	1.0 06	25.3	34 50.4	1.0 06	25.2	35 20.4	1.0 06	25.1	35 50.3	1.0 06	25.1	37 49.9	1.0 06	24.9	2
3	28 48.0	1.0 06	24.8	29 47.8	1.0 06	24.7	31 17.6	1.0 06	24.6	32 47.3	1.0 06	24.4	34 47.0	1.0 06	24.3	35 16.9	1.0 06	24.2	35 46.8	1.0 06	24.2	37 46.4	1.0 06	24.0	3
4	28 44.5	1.0 06	23.9	29 44.4	1.0 06	23.8	31 14.1	1.0 05	23.7	32 43.9	1.0 05	23.5	34 43.6	1.0 05	23.4	35 13.5	1.0 05	23.3	35 43.4	1.0 05	23.3	37 43.1	1.0 05	23.1	4
155	28 41.2	1.0 05	22.9	29 41.1	1.0 05	22.9	31 10.9	1.0 05	22.7	32 40.6	1.0 05	22.6	34 40.3	1.0 05	22.5	35 10.3	1.0 05	22.4	35 40.2	1.0 05	22.4	37 39.9	1.0 05	22.2	155
6	28 38.0	1.0 05	22.0	29 37.9	1.0 05	21.9	31 07.7	1.0 05	21.8	32 37.5	1.0 05	21.7	34 37.2	1.0 05	21.5	35 07.1	1.0 05	21.5	35 37.1	1.0 05	21.5	37 36.8	1.0 05	21.3	6
7	28 34.9	1.0 05	21.1	29 34.8	1.0 05	20.9	31 04.6	1.0 05	20.9	32 34.5	1.0 05	20.8	34 34.2	1.0 05	20.6	35 04.2	1.0 05	20.6	35 34.1	1.0 05	20.6	37 33.8	1.0 05	20.4	7
8	28 32.0	1.0 05	20.2	29 31.9	1.0 05	20.1	31 01.7	1.0 05	20.0	32 31.6	1.0 05	19.9	34 31.3	1.0 05	19.7	35 01.3	1.0 05	19.7	35 31.2	1.0 05	19.7	37 31.0	1.0 05	19.5	8
9	28 29.2	1.0 04	19.3	29 29.1	1.0 04	19.2	30 58.9	1.0 04	19.1	32 28.8	1.0 04	19.0	34 28.6	1.0 04	18.8	34 58.5	1.0 04	18.8	35 28.5	1.0 04	18.8	37 28.2	1.0 04	18.6	9
160	28 26.5	1.0 04	18.3	29 26.4	1.0 04	18.3	30 56.3	1.0 04	18.2	32 26.1	1.0 04	18.1	34 25.9	1.0 04	17.9	34 55.9	1.0 04	17.9	35 25.8	1.0 04	17.9	37 25.6	1.0 04	17.7	160
1	28 23.9	1.0 04	17.4	29 23.8	1.0 04	17.4	30 53.7	1.0 04	17.3	32 23.6	1.0 04	17.2	34 23.4	1.0 04	17.0	34 53.4	1.0 04	17.0	35 23.3	1.0 04	17.0	37 23.1	1.0 04	16.8	1
2	28 21.5	1.0 04	16.5	29 21.4	1.0 04	16.4	30 51.3	1.0 04	16.4	32 21.2	1.0 04	16.3	34 21.0	1.0 04	16.1	34 51.0	1.0 04	16.1	35 21.0	1.0 04	16.1	37 20.8	1.0 04	16.0	2
3	28 19.2	1.0 04	15.6	29 19.1	1.0 04	15.5	30 49.0	1.0 04	15.5	32 18.9	1.0 04	15.4	34 18.8	1.0 04	15.3	34 48.7	1.0 04	15.2	35 18.7	1.0 04	15.2	37 18.5	1.0 04	15.1	3
4	28 17.0	1.0 03	14.7	29 16.9	1.0 03	14.6	30 46.9	1.0 03	14.5	32 16.8	1.0 03	14.5	34 16.6	1.0 03	14.4	34 46.6	1.0 03	14.3	35 16.6	1.0 03	14.3	37 16.4	1.0 03	14.2	4
165	28 15.0	1.0 03	13.8	29 14.9	1.0 03	13.7	30 44.8	1.0 03	13.6	32 14.7	1.0 03	13.6	34 14.6	1.0 03	13.5	34 44.6	1.0 03	13.4	35 14.6	1.0 03	13.4	37 14.5	1.0 03	13.3	165
6	28 13.0	1.0 03	12.8	29 12.9	1.0 03	12.8	30 42.9	1.0 03	12.7	32 12.9	1.0 03	12.7	34 12.8	1.0 03	12.6	34 42.7	1.0 03	12.5	35 12.7	1.0 03	12.5	37 12.6	1.0 03	12.4	6
7	28 11.2	1.0 03	11.9	29 11.2	1.0 03	11.9	30 41.1	1.0 03	11.8	32 11.1	1.0 03	11.7	34 11.0	1.0 03	11.7	34 41.0	1.0 03	11.6	35 11.0	1.0 03	11.6	37 10.9	1.0 03	11.5	7
8	28 09.6	1.0 02	11.0	29 09.6	1.0 02	11.0	30 39.5	1.0 02	10.9	32 09.5	1.0 02	10.8	34 09.4	1.0 02	10.8	34 39.4	1.0 02	10.7	35 09.3	1.0 02	10.7	37 09.3	1.0 02	10.6	8
9	28 08.1	1.0 02	10.1	29 08.0	1.0 02	10.0	30 38.0	1.0 02	10.0	32 07.9	1.0 02	09.9	34 07.9	1.0 02	09.9	34 37.9	1.0 02	09.8	35 07.9	1.0 02	09.8	37 07.8	1.0 02	09.7	9
170	28 06.7	1.0 02	09.2	29 06.6	1.0 02	09.1	30 36.6	1.0 02	09.1	32 06.6	1.0 02	09.0	34 06.5	1.0 02	09.0	34 36.5	1.0 02	08.9	35 06.5	1.0 02	08.9	37 06.4	1.0 02	08.9	170
1	28 05.4	1.0 02	08.2	29 05.3	1.0 02	08.2	30 35.3	1.0 02	08.2	32 05.3	1.0 02	08.1	34 05.2	1.0 02	08.1	34 35.2	1.0 02	08.1	35 05.3	1.0 02	08.0	37 05.2	1.0 02	08.0	1
2	28 04.3	1.0 02	07.3	29 04.3	1.0 02	07.3	30 34.2	1.0 02	07.3	32 04.2	1.0 02	07.2	34 04.2	1.0 02	07.2	34 34.2	1.0 02	07.2	35 04.2	1.0 02	07.1	37 04.1	1.0 02	07.1	2
3	28 03.3	1.0 01	06.4	29 03.3	1.0 01	06.4	30 33.2	1.0 01	06.4	32 03.2	1.0 01	06.3	34 03.2	1.0 01	06.3	34 33.2	1.0 01	06.3	35 03.2	1.0 01	06.3	37 03.2	1.0 01	06.2	3
4	28 02.4	1.0 01	05.5	29 02.4	1.0 01	05.5	30 32.4	1.0 01	05.5	32 02.4	1.0 01	05.4	34 02.3	1.0 01	05.4	34 32.3	1.0 01	05.4	35 02.3	1.0 01	05.4	37 02.3	1.0 01	05.3	4
175	28 01.7	1.0 01	04.6	29 01.7	1.0 01	04.6	30 31.7	1.0 01	04.5	32 01.6	1.0 01	04.5	34 01.6	1.0 01	04.5	34 31.6	1.0 01	04.5	35 01.6	1.0 01	04.5	37 01.6	1.0 01	04.4	175
6	28 01.1	1.0 01	03.7	29 01.1	1.0 01	03.7	30 31.1	1.0 01	03.6	32 01.1	1.0 01	03.6	34 01.0	1.0 01	03.6	34 31.0	1.0 01	03.6	35 01.0	1.0 01	03.6	37 01.0	1.0 01	03.5	6
7	28 00.6	1.0 01	02.7	29 00.6	1.0 01	02.7	30 30.6	1.0 01	02.7	32 00.6	1.0 01	02.7	34 00.6	1.0 01	02.7	34 30.6	1.0 01	02.7	35 00.6	1.0 01	02.7	37 00.6	1.0 01	02.7	7
8	28 00.3	1.0 00	01.8	29 00.3	1.0 00	01.8	30 30.3	1.0 00	01.8	32 00.3	1.0 00	01.8	34 00.3	1.0 00	01.8	34 30.3	1.0 00	01.8	35 00.3	1.0 00	01.8	37 00.3	1.0 00	01.8	8
9	28 00.1	1.0 00	00.9	29 00.1	1.0 00	00.9	30 30.1	1.0 00	00.9	32 00.1	1.0 00	00.9	34 00.1	1.0 00	00.9	34 30.1	1.0 00	00.9	35 00.1	1.0 00	00.9	37 00.1	1.0 00	00.9	9
180	28 00.0	1.0 00	00.0	29 00.0	1.0 00	00.0	30 30.0	1.0 00	00.0	32 00.0	1.0 00	00.0	34 00.0	1.0 00	00.0	34 30.0	1.0 00	00.0	35 00.0	1.0 00	00.0	37 00.0	1.0 00	00.0	180

H.A.	46° 00' Alt. / Az.	47° 00' Alt. / Az.	48° 30' Alt. / Az.	49° 30' Alt. / Az.	50° 30' Alt. / Az.	51° 30' Alt. / Az.	52° 30' Alt. / Az.	54° 00' Alt. / Az.	H.A.
00	54 00.0 1.00 180.0	55 00.0 1.00 180.0	56 30.0 1.00 180.0	57 30.0 1.00 180.0	58 30.0 1.00 180.0	59 30.0 1.00 180.0	60 30.0 1.00 180.0	62 00.0 1.00 180.0	00
1	53 59.9 1.00 178.8	54 59.9 1.00 178.8	56 29.9 1.00 178.8	57 29.9 1.00 178.8	58 29.9 1.00 178.8	59 29.9 1.00 178.8	60 29.9 1.00 178.8	61 59.9 1.00 178.7	1
2	53 59.7 1.001 177.6	54 59.7 1.001 177.6	56 29.7 1.001 177.6	57 29.6 1.001 177.6	58 29.6 1.001 177.6	59 29.6 1.001 177.5	60 29.6 1.001 177.5	61 59.6 1.001 177.5	2
3	53 59.2 1.001 176.5	54 59.2 1.001 176.4	56 29.2 1.001 176.4	57 29.2 1.001 176.4	58 29.2 1.001 176.3	59 29.2 1.001 176.3	60 29.2 1.001 176.3	61 59.2 1.001 176.2	3
4	53 58.6 1.001 175.3	54 58.6 1.001 175.2	56 28.6 1.001 175.2	57 28.6 1.001 175.2	58 28.6 1.001 175.1	59 28.6 1.001 175.1	60 28.6 1.001 175.1	61 58.5 1.001 175.0	4
05	53 57.8 1.002 174.1	54 57.8 1.002 174.1	56 27.8 1.002 174.0	57 27.8 1.002 174.0	58 27.8 1.002 173.9	59 27.8 1.002 173.9	60 27.8 1.002 173.8	61 57.7 1.002 173.7	05
6	53 56.9 1.002 172.9	54 56.9 1.002 172.9	56 26.9 1.002 172.8	57 26.8 1.002 172.8	58 26.8 1.002 172.7	59 26.8 1.002 172.7	60 26.8 1.002 172.6	61 56.7 1.002 172.5	6
7	53 55.8 1.002 171.7	54 55.8 1.002 171.7	56 25.7 1.002 171.6	57 25.7 1.002 171.5	58 25.7 1.002 171.5	59 25.6 1.002 171.4	60 25.6 1.002 171.4	61 55.5 1.002 171.2	7
8	53 54.5 1.002 170.6	54 54.5 1.002 170.5	56 24.4 1.002 170.4	57 24.4 1.002 170.3	58 24.3 1.003 170.3	59 24.3 1.003 170.2	60 24.3 1.003 170.1	61 54.2 1.003 170.0	8
9	53 53.0 1.003 169.4	54 53.0 1.003 169.3	56 22.9 1.003 169.2	57 22.9 1.003 169.1	58 22.8 1.003 169.1	59 22.8 1.003 169.0	60 22.7 1.003 168.9	61 52.6 1.003 168.8	9
10	53 51.4 1.003 168.2	54 51.4 1.003 168.1	56 21.3 1.003 168.0	57 21.2 1.003 167.9	58 21.2 1.003 167.8	59 21.1 1.003 167.8	60 21.0 1.003 167.7	61 50.9 1.003 167.5	10
1	53 49.6 1.003 167.0	54 49.6 1.003 166.9	56 19.5 1.003 166.8	57 19.4 1.003 166.7	58 19.3 1.003 166.6	59 19.2 1.003 166.5	60 19.2 1.003 166.4	61 49.0 1.003 166.3	1
2	53 47.7 1.004 165.8	54 47.6 1.004 165.8	56 17.5 1.004 165.6	57 17.4 1.004 165.5	58 17.3 1.004 165.4	59 17.2 1.004 165.3	60 17.1 1.004 165.2	61 47.0 1.004 165.0	2
3	53 45.6 1.004 164.7	54 45.5 1.004 164.6	56 15.3 1.004 164.4	57 15.2 1.004 164.3	58 15.1 1.004 164.2	59 15.0 1.004 164.1	60 14.9 1.004 164.0	61 44.7 1.004 163.8	3
4	53 43.3 1.004 163.5	54 43.2 1.004 163.4	56 13.0 1.004 163.2	57 12.9 1.004 163.1	58 12.8 1.004 163.0	59 12.6 1.004 162.9	60 12.5 1.004 162.8	61 42.3 1.004 162.5	4
15	53 40.8 1.004 162.2	54 40.7 1.004 162.2	56 10.5 1.004 162.1	57 10.4 1.004 161.9	58 10.2 1.004 161.8	59 10.1 1.004 161.7	60 09.9 1.005 161.5	61 39.7 1.005 161.3	15
6	53 38.2 1.005 161.2	54 38.1 1.005 161.0	56 07.9 1.005 160.9	57 07.7 1.005 160.7	58 07.6 1.005 160.6	59 07.4 1.005 160.5	60 07.2 1.005 160.3	61 36.9 1.005 160.1	6
7	53 35.4 1.005 160.0	54 35.3 1.005 159.9	56 05.0 1.005 159.7	57 04.9 1.005 159.5	58 04.7 1.005 159.4	59 04.5 1.005 159.3	60 04.3 1.005 159.1	61 34.0 1.005 158.8	7
8	53 32.5 1.005 158.8	54 32.3 1.005 158.7	56 02.1 1.005 158.5	57 01.9 1.005 158.4	58 01.7 1.005 158.2	59 01.5 1.005 158.1	60 01.3 1.005 157.9	61 30.9 1.005 157.6	8
9	53 29.4 1.005 157.7	54 29.2 1.005 157.5	55 58.9 1.006 157.3	56 58.7 1.006 157.2	57 58.5 1.006 157.0	58 58.3 1.006 156.8	59 58.0 1.006 156.7	61 27.6 1.006 156.4	9
20	53 26.1 1.006 156.5	54 25.9 1.006 156.4	55 55.6 1.006 156.1	56 55.5 1.006 156.0	57 55.2 1.006 155.8	58 54.9 1.006 155.5	59 54.5 1.006 155.3	61 24.2 1.006 155.2	20
1	53 22.7 1.006 155.3	54 22.5 1.006 155.2	55 52.2 1.006 155.0	56 51.9 1.006 154.8	57 51.7 1.006 154.6	58 51.4 1.006 154.4	59 51.1 1.006 154.3	61 20.6 99 06 153.9	1
2	53 19.2 1.006 154.2	54 18.9 1.006 154.0	55 48.6 1.006 153.8	56 48.3 1.006 153.6	57 48.0 1.006 153.4	58 47.7 99 06 153.2	59 47.4 99 06 153.0	61 16.9 99 06 152.7	2
3	53 15.4 1.006 153.0	54 15.2 1.006 152.9	55 44.8 1.007 152.6	56 44.5 1.007 152.4	57 44.2 99 07 152.3	58 43.9 99 07 152.1	59 43.5 99 07 151.8	61 13.0 99 07 151.5	3
4	53 11.6 1.007 151.9	54 11.3 1.007 151.7	55 40.9 99 07 151.4	56 40.6 99 07 151.3	57 40.2 99 07 151.1	58 39.9 99 07 150.9	59 39.5 99 07 150.6	61 08.9 99 07 150.3	4
25	53 07.6 99 07 150.5	54 07.3 99 07 150.4	55 36.8 99 07 150.1	56 36.4 99 07 150.0	57 36.1 99 07 149.9	58 35.7 99 07 149.7	59 35.3 99 07 149.5	61 04.7 99 07 149.1	25
6	53 03.4 99 07 149.6	54 03.1 99 07 149.4	55 32.6 99 07 149.1	56 32.2 99 07 148.9	57 31.9 99 07 148.7	58 31.5 99 07 148.5	59 31.0 99 07 148.3	61 00.3 99 08 147.9	6
7	52 59.1 99 07 148.4	53 58.8 99 07 148.2	55 28.2 99 08 147.9	56 27.8 99 08 147.7	57 27.4 99 08 147.5	58 27.0 99 08 147.3	59 26.6 99 08 147.1	60 55.8 99 08 146.7	7
8	52 54.7 99 08 147.3	53 54.3 99 08 147.1	55 23.7 99 08 146.8	56 23.3 99 08 146.6	57 22.9 99 08 146.4	58 22.4 99 08 146.1	59 22.0 99 08 145.9	60 51.2 99 08 145.5	8
9	52 50.1 99 08 146.1	53 49.7 99 08 145.9	55 19.1 99 08 145.6	56 18.6 99 08 145.4	57 18.2 99 08 145.2	58 17.7 99 08 145.0	59 17.2 99 08 144.7	60 46.4 99 08 144.3	9
30	52 45.4 99 08 145.0	53 44.9 99 08 144.8	55 14.3 99 08 144.4	56 13.8 99 08 144.3	57 13.4 99 08 144.0	58 12.8 99 09 143.8	59 12.3 99 09 143.5	60 41.4 99 08 143.1	30
1	52 40.5 99 08 143.8	53 40.1 99 08 143.6	55 09.4 99 08 143.3	56 08.9 99 08 143.1	57 08.4 99 09 142.9	58 07.8 99 09 142.6	59 07.3 99 09 142.3	60 36.3 99 09 141.9	1
2	52 35.5 99 09 142.7	53 35.0 99 09 142.5	55 04.3 99 09 142.2	56 03.8 99 09 141.9	57 03.3 99 09 141.7	58 02.7 99 09 141.4	59 02.1 99 09 141.2	60 31.1 99 09 140.7	2
3	52 30.4 99 09 141.6	53 29.9 99 09 141.4	54 59.1 99 09 141.0	55 58.6 99 09 140.8	56 58.0 99 09 140.5	57 57.4 99 09 140.3	58 56.8 99 09 140.0	60 25.8 99 09 139.6	3
4	52 25.1 99 09 140.4	53 24.6 99 09 140.2	54 53.8 99 09 139.9	55 53.3 99 09 139.7	56 52.7 99 09 139.4	57 52.0 99 09 139.1	58 51.4 99 09 138.8	60 20.3 99 09 138.4	4
35	52 19.7 99 09 139.3	53 19.2 99 09 139.1	54 48.4 99 09 138.7	55 47.8 99 09 138.5	56 47.2 99 09 138.2	57 46.5 99 09 138.0	58 45.8 99 09 137.7	60 14.7 99 10 137.2	35
6	52 14.2 99 09 138.2	53 13.7 99 09 138.0	54 42.8 99 10 137.6	55 42.2 99 10 137.4	56 41.5 99 10 137.1	57 40.8 99 10 136.8	58 40.1 99 10 136.5	60 09.0 99 10 136.0	6
7	52 08.6 99 10 137.1	53 08.0 99 10 136.8	54 37.1 99 10 136.5	55 36.5 99 10 136.2	56 35.8 99 10 135.9	57 35.1 99 10 135.7	58 34.3 99 10 135.4	60 03.1 99 10 134.9	7
8	52 02.9 99 10 135.9	53 02.3 99 10 135.7	54 31.3 99 10 135.3	55 30.6 99 10 135.1	56 29.9 99 10 134.8	57 29.2 99 10 134.5	58 28.4 99 10 134.2	59 57.1 99 10 133.7	8
9	51 57.0 99 10 134.6	52 56.4 99 10 134.5	54 25.4 99 10 134.2	55 24.7 99 10 133.8	56 23.9 99 10 133.7	57 23.2 99 10 133.3	58 22.3 99 10 133.1	59 51.0 99 10 132.6	9
40	51 51.0 99 10 133.7	52 50.4 99 10 133.5	54 19.3 99 10 133.1	55 18.6 99 10 132.8	56 17.8 99 10 132.5	57 17.0 99 10 132.2	58 16.2 99 10 131.9	59 44.8 99 11 131.4	40
1	51 44.9 99 10 132.6	52 44.3 99 10 132.4	54 13.2 99 10 132.0	55 12.4 99 10 131.7	56 11.6 99 11 131.4	57 10.8 99 11 131.1	58 09.9 98 11 130.8	59 38.5 98 11 130.3	1
2	51 38.7 99 10 131.5	52 38.0 99 11 131.2	54 06.9 99 11 130.9	55 06.1 99 11 130.6	56 05.3 99 11 130.3	57 04.5 99 11 130.0	58 03.5 98 11 129.6	59 32.1 98 11 129.1	2
3	51 32.4 99 11 130.4	52 31.7 99 11 130.1	54 00.6 99 11 129.7	54 59.7 99 11 129.5	55 58.9 99 11 129.2	56 58.0 98 11 128.8	57 57.1 98 11 128.5	59 25.5 98 11 128.0	3
4	51 26.0 99 11 129.3	52 25.3 99 11 129.0	53 54.1 99 11 128.6	54 53.2 98 11 128.3	55 52.2 98 11 128.0	56 51.5 98 11 127.6	57 50.5 98 11 127.4	59 18.9 98 11 126.9	4
45	51 19.5 99 11 128.2	52 18.7 99 11 127.9	53 47.5 99 11 127.5	54 46.6 99 11 127.2	55 45.7 98 11 126.9	56 44.8 98 11 126.6	57 43.8 98 11 126.3	59 12.2 98 11 125.7	45
6	51 12.9 99 11 127.1	52 12.1 99 11 126.8	53 40.8 99 11 126.4	54 40.0 98 11 126.1	55 39.0 98 11 125.8	56 38.0 98 11 125.5	57 37.0 98 11 125.2	59 05.4 98 12 124.6	6
7	51 06.2 99 11 126.0	52 05.4 99 11 125.7	53 34.1 99 11 125.3	54 33.2 98 12 125.0	55 32.2 98 12 124.7	56 31.2 98 12 124.4	57 30.1 98 12 124.0	58 58.4 98 12 123.5	7
8	50 59.4 99 12 124.9	51 58.5 99 12 124.6	53 27.2 98 12 124.2	54 26.3 98 12 123.9	55 25.3 98 12 123.6	56 24.3 98 12 123.3	57 23.2 98 12 122.9	58 51.4 98 12 122.4	8
9	50 52.5 99 12 123.8	51 51.6 99 12 123.5	53 20.3 98 12 123.1	54 19.3 98 12 122.8	55 18.3 98 12 122.5	56 17.2 98 12 122.2	57 16.1 98 12 121.8	58 44.3 98 12 121.3	9
50	50 45.5 99 12 122.7	51 44.6 99 12 122.5	53 13.2 98 12 122.0	54 12.2 98 12 121.7	55 11.2 98 12 121.4	56 10.1 98 12 121.1	57 09.0 98 12 120.7	58 37.2 98 12 120.2	50
1	50 38.4 99 12 121.7	51 37.5 98 12 121.4	53 06.1 98 12 120.9	54 05.1 98 12 120.6	55 04.0 98 12 120.3	56 02.9 98 12 120.0	57 01.8 98 12 119.6	58 29.9 98 12 119.0	1
2	50 31.3 99 12 120.6	51 30.4 98 12 120.3	52 58.9 98 12 119.9	53 57.9 98 12 119.5	54 56.8 98 12 119.2	55 55.7 98 12 118.9	56 54.5 98 12 118.5	58 22.6 98 12 118.0	2
3	50 24.0 98 12 119.5	51 23.1 98 12 119.2	52 51.6 98 12 118.8	53 50.6 98 12 118.5	54 49.5 98 12 118.1	55 48.3 98 12 117.8	56 47.1 98 12 117.4	58 15.1 98 12 116.9	3
4	50 16.7 98 12 118.4	51 15.8 98 12 118.1	52 44.3 98 12 117.7	53 43.2 98 12 117.4	54 42.1 98 12 117.1	55 40.9 98 12 116.7	56 39.6 98 13 116.3	58 07.7 98 13 115.8	4
55	50 09.4 98 12 117.4	51 08.4 98 12 117.1	52 36.8 98 12 116.6	53 35.7 98 13 116.3	54 34.6 98 13 116.0	55 33.4 98 13 115.6	56 32.1 98 13 115.3	58 00.1 98 13 114.7	55
6	50 01.9 98 13 116.3	51 00.9 98 13 116.0	52 29.3 98 13 115.6	53 28.2 98 13 115.2	54 27.1 98 13 114.9	55 25.8 98 13 114.6	56 24.5 98 13 114.2	57 52.5 98 13 113.6	6
7	49 54.4 98 13 115.2	50 53.4 98 13 114.9	52 21.8 98 13 114.5	53 20.6 98 13 114.2	54 19.4 98 13 113.8	55 18.2 98 13 113.5	56 16.9 98 13 113.1	57 44.8 98 13 112.5	7
8	49 46.6 98 13 113.9	50 45.8 98 13 113.9	52 14.1 98 13 113.4	53 13.0 98 13 113.1	54 11.8 98 13 112.8	55 10.5 98 13 112.4	56 09.2 98 13 112.0	57 37.1 98 13 111.5	8
9	49 39.2 98 13 113.1	50 38.1 98 13 112.8	52 06.4 98 13 112.4	53 05.3 98 13 112.0	54 04.0 98 13 111.7	55 02.8 98 13 111.4	56 01.4 98 13 111.0	57 29.3 98 13 110.4	9
60	49 31.4 98 13 112.1	50 30.4 98 13 111.8	51 58.7 98 13 111.3	52 57.5 98 13 111.0	53 56.3 98 13 110.6	54 55.0 98 13 110.3	55 53.6 98 13 109.9	57 21.4 97 13 109.3	60
1	49 23.7 98 13 111.0	50 22.6 98 13 110.7	51 50.9 98 13 110.3	52 49.7 98 13 109.9	53 48.4 98 13 109.6	54 47.1 98 13 109.2	55 45.7 98 13 108.9	57 13.5 97 13 108.3	1
2	49 15.9 98 13 110.0	50 14.8 98 13 109.7	51 43.0 98 13 109.2	52 41.8 98 13 108.9	53 40.5 98 13 108.5	54 39.2 98 13 108.2	55 37.8 98 13 107.8	57 05.5 97 13 107.2	2
3	49 08.0 98 13 108.9	50 06.9 98 13 108.6	51 35.1 98 13 108.2	52 33.9 98 13 107.8	53 32.6 98 13 107.5	54 31.2 98 13 107.1	55 29.8 98 13 106.8	56 57.5 97 13 106.1	3
4	49 00.1 98 13 107.9	49 58.9 98 13 107.6	51 27.2 98 13 107.1	52 25.9 98 13 106.8	53 24.6 98 13 106.4	54 23.2 98 13 106.1	55 21.8 98 13 105.7	56 49.5 97 13 105.1	4
65	48 52.1 98 13 106.8	49 50.9 98 13 106.5	51 19.2 98 13 106.1	52 17.9 98 13 105.7	53 16.6 98 13 105.4	54 15.2 98 13 105.0	55 13.7 98 13 104.7	56 41.4 97 14 104.1	65
6	48 44.1 98 13 105.8	49 42.9 98 13 105.5	51 11.1 98 13 105.0	52 09.8 98 14 104.7	53 08.5 98 14 104.4	54 07.1 98 14 104.0	55 05.6 98 13 103.6	56 33.3 97 14 103.0	6
7	48 36.0 98 14 104.8	49 34.9 98 14 104.5	51 03.0 98 14 104.0	52 01.7 98 14 103.7	53 00.4 98 14 103.3	53 59.0 98 14 103.0	54 57.5 97 14 102.6	56 25.2 97 14 102.0	7
8	48 27.9 98 14 103.7	49 26.8 98 14 103.4	50 54.9 98 14 103.0	51 53.6 98 14 102.7	52 52.3 98 14 102.3	53 50.8 98 14 101.9	54 49.3 97 14 101.6	56 17.0 97 14 101.0	8
9	48 19.8 98 14 102.7	49 18.6 98 14 102.4	50 46.8 98 14 102.0	51 45.4 98 14 101.6	52 44.1 98 14 101.3	53 42.6 98 14 100.9	54 41.1 97 14 100.5	56 08.8 97 14 99.9	9
70	48 11.6 98 14 101.7	49 10.4 98 14 101.4	50 38.6 98 14 100.9	51 37.3 98 14 100.6	52 35.9 98 14 100.2	53 34.4 98 14 99.9	54 32.9 97 14 99.5	56 00.5 97 14 98.9	70
1	48 03.4 98 14 100.7	49 02.2 98 14 100.4	50 30.4 98 14 99.9	51 29.0 98 14 99.6	52 27.6 98 14 99.2	53 26.2 98 14 98.9	54 24.7 97 14 98.5	55 52.3 97 14 97.9	1
2	47 55.2 98 14 99.7	48 54.0 98 14 99.4	50 22.1 98 14 98.9	51 20.8 98 14 98.6	52 19.4 98 14 98.2	53 17.9 98 14 97.8	54 16.4 97 14 97.5	55 44.0 97 14 96.9	2
3	47 47.0 98 14 98.7	48 45.8 98 14 98.3	50 13.9 98 14 97.9	51 12.5 98 14 97.6	52 11.1 98 14 97.2	53 09.7 98 14 96.8	54 08.1 97 14 96.5	55 35.7 97 14 95.8	3
4	47 38.7 98 14 97.6	48 37.5 98 14 97.3	50 05.6 98 14 96.9	51 04.2 98 14 96.5	52 02.8 98 14 96.2	53 01.4 97 14 95.8	53 59.8 97 14 95.4	55 27.4 97 14 94.8	4
75	47 30.4 98 14 96.6	48 29.2 98 14 96.3	49 57.3 98 14 95.9	50 55.9 98 14 95.5	51 54.5 98 14 95.2	52 53.0 97 14 94.8	53 51.5 97 14 94.4	55 19.0 97 14 93.8	75
6	47 22.1 98 14 95.6	48 20.9 98 14 95.3	49 49.0 98 14 94.8	50 47.6 98 14 94.5	51 46.2 98 14 94.2	52 44.7 97 14 93.8	53 43.2 97 14 93.4	55 10.7 97 14 92.8	6
7	47 13.8 98 14 94.6	48 12.6 98 14 94.3	49 40.6 98 14 93.9	50 39.3 98 14 93.5	51 37.9 98 14 93.2	52 36.4 97 14 92.8	53 34.8 97 14 92.4	55 02.4 97 14 91.8	7
8	47 05.5 98 14 93.6	48 04.2 98 14 93.3	49 32.3 98 14 92.8	50 30.9 98 14 92.5	51 29.5 98 14 92.2	52 28.0 97 14 91.8	53 26.5 97 14 91.4	54 54.0 97 14 90.8	8
9	46 57.1 98 14 92.6	47 55.9 98 14 92.3	49 24.0 98 14 91.8	50 22.6 98 14 91.5	51 21.2 98 14 91.2	52 19.7 97 14 90.8	53 18.1 97 14 90.4	54 45.7 97 14 89.8	9
80	46 48.8 98 14 91.6	47 47.6 98 14 91.3	49 15.6 98 14 90.9	50 14.2 98 14 90.5	51 12.8 98 14 90.2	52 11.3 97 14 89.8	53 09.8 97 14 89.5	54 37.3 97 14 88.9	80
1	46 40.4 98 14 90.6	47 39.2 98 14 90.3	49 07.3 98 14 89.9	50 05.9 98 14 89.5	51 04.5 98 14 89.2	52 03.0 97 14 88.8	53 01.4 97 14 88.5	54 29.0 97 14 87.9	1
2	46 32.1 98 14 89.6	47 30.9 98 14 89.3	48 58.9 98 14 88.9	49 57.5 98 14 88.5	50 56.1 98 14 88.2	51 54.6 97 14 87.9	52 53.1 97 14 87.5	54 20.6 97 14 86.9	2
3	46 23.7 98 14 88.6	47 22.5 98 14 88.4	48 50.6 98 14 87.9	49 49.2 98 14 87.6	50 47.8 98 14 87.2	51 46.3 97 14 86.9	52 44.7 97 14 86.5	54 12.3 97 14 85.9	3
4	46 15.4 98 14 87.7	47 14.2 98 14 87.4	48 42.2 98 14 86.9	49 40.9 98 14 86.6	50 39.4 98 14 86.2	51 38.0 97 14 85.9	52 36.4 97 14 85.5	54 04.0 97 14 84.9	4
85	46 07.1 98 14 86.7	47 05.8 98 14 86.4	48 33.9 98 14 85.9	49 32.5 98 14 85.6	50 31.1 98 14 85.3	51 29.6 97 14 84.9	52 28.1 97 14 84.5	53 55.7 97 14 84.0	85
6	45 58.7 98 14 85.7	46 57.5 98 14 85.4	48 25.6 98 14 84.9	49 24.2 98 14 84.6	50 22.8 98 14 84.3	51 21.3 97 14 83.9	52 19.8 97 14 83.6	53 47.4 97 14 83.0	6
7	45 50.4 98 14 84.7	46 49.2 98 14 84.4	48 17.3 98 14 83.9	49 15.9 98 14 83.7	50 14.5 98 14 83.3	51 13.0 97 14 83.0	52 11.5 97 14 82.6	53 39.1 97 14 82.0	7
8	45 42.1 98 14 83.7	46 40.9 98 14 83.5	48 09.0 98 14 83.0	49 07.6 98 14 82.7	50 06.2 98 14 82.3	51 04.8 97 14 82.0	52 03.2 97 14 81.6	53 30.8 97 14 81.1	8
9	45 33.8 98 14 82.8	46 32.6 98 14 82.5	48 00.7 98 14 82.0	48 59.3 98 14 81.7	49 57.9 98 14 81.4	50 56.5 98 14 81.0	51 55.0 97 14 80.7	53 22.6 97 14 80.1	9
90	45 25.5 98 14 81.8	46 24.3 98 14 81.5	47 52.4 98 14 81.1	48 51.1 98 14 80.7	49 49.7 98 14 80.4	50 48.3 98 14 80.1	51 46.8 97 14 79.7	53 14.4 97 14 79.2	90

Lat. 82°

H.A.	46° 00' Alt. (Δd Δt)	Az.	47° 00' Alt. (Δd Δt)	Az.	48° 30' Alt. (Δd Δt)	Az.	49° 30' Alt. (Δd Δt)	Az.	50° 30' Alt. (Δd Δt)	Az.	51° 30' Alt. (Δd Δt)	Az.	52° 30' Alt. (Δd Δt)	Az.	54° 00' Alt. (Δd Δt)	Az.	H.A.
91	45 17.3 98 14	80.8	46 16.1 98 14	80.5	47 44.2 98 14	80.1	48 42.9 98 14	79.8	49 41.5 98 14	79.5	50 40.0 98 14	79.1	51 38.6 97 14	78.8	53 06.2 97 14	78.2	91
2	45 09.0 98 14	79.9	46 07.8 98 14	79.6	47 36.0 98 14	79.1	48 34.6 98 14	78.8	49 33.3 98 14	78.5	50 31.9 98 14	78.2	51 30.4 97 14	77.8	52 58.0 97 14	77.3	2
3	45 00.8 98 14	78.9	45 59.6 98 14	78.6	47 27.8 98 14	78.2	48 26.5 98 14	77.9	49 25.1 98 14	77.5	50 23.7 98 14	77.2	51 22.2 97 14	76.9	52 49.9 97 13	76.3	3
4	44 52.7 98 14	77.9	45 51.5 98 14	77.7	47 19.6 98 14	77.2	48 18.3 98 14	76.9	49 17.0 98 14	76.6	50 15.6 98 13	76.3	51 14.1 98 13	75.9	52 41.8 97 13	75.4	4
95	44 44.5 98 14	77.0	45 43.3 98 14	76.7	47 11.5 98 14	76.3	48 10.2 98 14	76.0	49 08.9 98 14	75.6	50 07.5 98 14	75.3	51 06.0 98 14	75.0	52 33.7 97 13	74.4	95
6	44 36.4 98 13	76.0	45 35.2 98 13	75.7	47 03.4 98 13	75.3	48 02.1 98 13	75.0	49 00.8 98 13	74.7	49 59.4 98 13	74.4	50 58.0 98 13	74.0	52 25.7 97 13	73.5	6
7	44 28.3 98 13	75.1	45 27.1 98 13	74.8	46 55.3 98 13	74.4	47 54.1 98 13	74.1	48 52.8 98 13	73.7	49 51.4 98 13	73.4	50 50.0 98 13	73.1	52 17.7 97 13	72.5	7
8	44 20.3 98 13	74.1	45 19.1 98 13	73.8	46 47.3 98 13	73.4	47 46.1 98 13	73.1	48 44.8 98 13	72.8	49 43.4 98 13	72.5	50 42.0 98 13	72.1	52 09.8 97 13	71.6	8
9	44 12.2 98 13	73.2	45 11.1 98 13	72.9	46 39.3 98 13	72.5	47 38.1 98 13	72.2	48 36.8 98 13	71.9	49 35.5 98 13	71.5	50 34.0 98 13	71.2	52 01.9 97 13	70.7	9
100	44 04.3 98 13	72.2	45 03.2 98 13	71.9	46 31.4 98 13	71.5	47 30.2 98 13	71.2	48 28.9 98 13	70.9	49 27.6 98 13	70.6	50 26.2 98 13	70.3	51 54.0 98 13	69.7	100
1	43 56.3 98 13	71.3	44 55.2 98 13	71.0	46 23.5 98 13	70.6	47 22.3 98 13	70.3	48 21.0 98 13	70.0	49 19.7 98 13	69.7	50 18.4 98 13	69.3	51 46.2 98 13	68.8	1
2	43 48.5 98 13	70.3	44 47.4 98 13	70.0	46 15.6 98 13	69.6	47 14.4 98 13	69.3	48 13.2 98 13	69.0	49 11.9 98 13	68.7	50 10.6 98 13	68.4	51 38.4 98 13	67.9	2
3	43 40.6 98 13	69.4	44 39.5 98 13	69.1	46 07.8 98 13	68.7	47 06.7 98 13	68.4	48 05.4 98 13	68.1	49 04.2 98 13	67.8	50 02.8 98 13	67.5	51 30.7 98 13	67.0	3
4	43 32.8 98 13	68.4	44 31.8 98 13	68.2	46 00.1 98 13	67.8	46 58.9 98 13	67.5	47 57.7 98 13	67.2	48 56.5 98 13	66.9	49 55.1 98 13	66.5	51 23.1 98 13	66.0	4
105	43 25.1 98 13	67.5	44 24.0 98 13	67.2	45 52.4 98 13	66.8	46 51.2 98 13	66.5	47 50.0 98 13	66.2	48 48.8 98 13	65.9	49 47.5 98 13	65.6	51 15.5 98 13	65.1	105
6	43 17.4 98 13	66.5	44 16.4 98 13	66.3	45 44.7 98 13	65.9	46 43.6 98 13	65.6	47 42.4 98 13	65.3	48 41.2 98 13	65.0	49 39.9 98 12	64.7	51 07.9 98 12	64.2	6
7	43 09.8 98 13	65.6	44 08.7 98 13	65.4	45 37.1 98 13	65.0	46 36.0 98 13	64.7	47 34.9 98 13	64.4	48 33.7 98 12	64.1	49 32.4 98 12	63.8	51 00.4 98 12	63.3	7
8	43 02.2 98 12	64.7	44 01.2 98 12	64.4	45 29.5 98 12	64.0	46 28.5 98 12	63.8	47 27.4 98 12	63.5	48 26.2 98 12	63.2	49 25.0 98 12	62.9	50 53.0 98 12	62.4	8
9	42 54.7 98 12	63.7	43 53.7 98 12	63.5	45 22.1 98 12	63.1	46 21.0 98 12	62.8	47 19.9 98 12	62.5	48 18.8 98 12	62.3	49 17.6 98 12	62.0	50 45.6 98 12	61.5	9
110	42 47.2 98 12	62.8	43 46.2 98 12	62.6	45 14.7 98 12	62.2	46 13.6 98 12	61.9	47 12.5 98 12	61.6	48 11.4 98 12	61.3	49 10.2 98 12	61.0	50 38.3 98 12	60.6	110
1	42 39.8 98 12	61.9	43 38.9 98 12	61.6	45 07.4 98 12	61.2	46 06.3 98 12	61.0	47 05.2 98 12	60.7	48 04.1 98 12	60.4	49 02.9 98 12	60.1	50 31.1 98 12	59.7	1
2	42 32.5 98 12	60.9	43 31.5 98 12	60.7	45 00.1 98 12	60.3	45 59.0 98 12	60.1	46 58.0 98 12	59.8	47 56.9 98 12	59.5	48 55.7 98 12	59.2	50 23.9 98 12	58.8	2
3	42 25.2 98 12	60.0	43 24.3 98 12	59.8	44 52.8 98 12	59.4	45 51.8 98 12	59.1	46 50.8 98 12	58.9	47 49.7 98 12	58.6	48 48.6 98 12	58.3	50 16.8 98 12	57.9	3
4	42 18.0 99 12	59.1	43 17.1 98 12	58.9	44 45.7 98 12	58.5	45 44.7 98 12	58.2	46 43.7 98 12	58.0	47 42.6 98 12	57.7	48 41.5 98 12	57.4	50 09.8 98 12	57.0	4
115	42 10.9 98 12	58.2	43 10.0 98 12	57.9	44 38.6 98 12	57.6	45 37.6 98 12	57.3	46 36.6 98 12	57.1	47 35.6 98 12	56.8	48 34.5 98 12	56.5	50 02.8 98 11	56.1	115
6	42 03.8 98 12	57.2	43 03.0 98 12	57.0	44 31.6 98 12	56.7	45 30.7 98 12	56.4	46 29.7 98 12	56.1	47 28.7 98 11	55.9	48 27.6 98 11	55.6	49 55.9 98 11	55.2	6
7	41 56.8 99 12	56.3	42 56.0 99 12	56.1	44 24.7 98 11	55.7	45 23.7 98 11	55.5	46 22.8 98 11	55.2	47 21.8 98 11	55.0	48 20.7 98 11	54.7	49 49.1 98 11	54.3	7
8	41 49.9 99 11	55.4	42 49.1 99 11	55.2	44 17.8 99 11	54.8	45 16.9 98 11	54.6	46 16.0 98 11	54.3	47 15.0 98 11	54.1	48 14.0 98 11	53.8	49 42.4 98 11	53.4	8
9	41 43.1 99 11	54.5	42 42.3 99 11	54.3	44 11.0 99 11	53.9	45 10.1 98 11	53.7	46 09.2 98 11	53.4	47 08.3 98 11	53.2	48 07.3 98 11	52.9	49 35.7 98 11	52.5	9
120	41 36.3 99 11	53.6	42 35.5 99 11	53.3	44 04.3 99 11	53.0	45 03.4 99 11	52.8	46 02.5 98 11	52.5	47 01.6 98 11	52.3	48 00.6 98 11	52.0	49 29.1 98 11	51.6	120
1	41 29.7 99 11	52.7	42 28.9 99 11	52.4	43 57.7 99 11	52.1	44 56.8 99 11	51.9	45 56.0 99 11	51.6	46 55.0 98 11	51.4	47 54.1 98 11	51.1	49 22.6 98 11	50.7	1
2	41 23.1 99 11	51.7	42 22.3 99 11	51.5	43 51.1 99 11	51.2	44 50.3 99 11	51.0	45 49.4 99 11	50.7	46 48.6 99 11	50.5	47 47.6 98 11	50.2	49 16.2 98 11	49.8	2
3	41 16.6 99 11	50.8	42 15.8 99 11	50.6	43 44.7 99 11	50.3	44 43.9 99 11	50.1	45 43.0 99 11	49.8	46 42.2 99 11	49.6	47 41.3 98 10	49.3	49 09.9 98 10	48.9	3
4	41 10.1 99 11	49.9	42 09.4 99 11	49.7	43 38.3 99 10	49.4	44 37.5 99 10	49.2	45 36.7 99 10	48.9	46 35.9 99 10	48.7	47 35.0 99 10	48.4	49 03.6 98 10	48.0	4
125	41 03.8 99 10	49.0	42 03.1 99 10	48.8	43 32.0 99 10	48.5	44 31.2 99 10	48.3	45 30.4 99 10	48.0	46 29.6 99 10	47.8	47 28.8 99 10	47.5	48 57.5 98 10	47.2	125
6	40 57.5 99 10	48.1	41 56.8 99 10	47.9	43 25.8 99 10	47.6	44 25.0 99 10	47.4	45 24.3 99 10	47.1	46 23.5 99 10	46.9	47 22.7 99 10	46.7	48 51.4 99 10	46.3	6
7	40 51.3 99 10	47.2	41 50.7 99 10	47.0	43 19.6 99 10	46.7	44 18.9 99 10	46.5	45 18.2 99 10	46.2	46 17.4 99 10	46.0	47 16.6 99 10	45.8	48 45.4 99 10	45.4	7
8	40 45.3 99 10	46.3	41 44.6 99 10	46.1	43 13.6 99 10	45.8	44 12.9 99 10	45.6	45 12.2 99 10	45.3	46 11.5 99 10	45.1	47 10.7 99 10	44.9	48 39.5 99 10	44.5	8
9	40 39.3 99 10	45.4	41 38.7 99 10	45.2	43 07.7 99 10	44.9	44 07.0 99 10	44.7	45 06.3 99 10	44.5	46 05.6 99 10	44.2	47 04.8 99 10	44.0	48 33.7 99 10	43.6	9
130	40 33.4 99 10	44.5	41 32.8 99 10	44.3	43 01.8 99 10	44.0	44 01.2 99 10	43.8	45 00.5 99 10	43.6	45 59.8 99 09	43.3	46 59.1 99 09	43.1	48 28.0 99 09	42.8	130
1	40 27.6 99 10	43.6	41 27.0 99 10	43.4	42 56.1 99 09	43.1	43 55.5 99 09	42.9	44 54.8 99 09	42.7	45 54.1 99 09	42.5	46 53.4 99 09	42.2	48 22.3 99 09	41.9	1
2	40 21.9 99 09	42.7	41 21.3 99 09	42.5	42 50.4 99 09	42.2	43 49.8 99 09	42.0	44 49.2 99 09	41.8	45 48.5 99 09	41.6	46 47.8 99 09	41.4	48 16.8 99 09	41.0	2
3	40 16.3 99 09	41.7	41 15.7 99 09	41.6	42 44.9 99 09	41.3	43 44.3 99 09	41.1	44 43.7 99 09	40.9	45 43.0 99 09	40.7	46 42.4 99 09	40.5	48 11.4 99 09	40.2	3
4	40 10.8 99 09	40.8	41 10.2 99 09	40.7	42 39.4 99 09	40.4	43 38.8 99 09	40.2	44 38.3 99 09	40.0	45 37.6 99 09	39.8	46 37.0 99 09	39.6	48 06.0 99 09	39.3	4
135	40 05.3 99 09	39.9	41 04.8 99 09	39.8	42 34.0 99 09	39.5	43 33.5 99 09	39.3	44 32.9 99 09	39.1	45 32.4 99 09	38.9	46 31.7 99 09	38.7	48 00.8 99 09	38.4	135
6	40 00.0 99 09	39.0	40 59.5 99 09	38.9	42 28.8 99 09	38.6	43 28.3 99 09	38.4	44 27.7 99 09	38.2	45 27.2 99 08	38.1	46 26.6 99 08	37.9	47 55.7 99 08	37.5	6
7	39 54.8 99 08	38.1	40 54.4 99 08	38.0	42 23.6 99 08	37.7	43 23.1 99 08	37.6	44 22.6 99 08	37.4	45 22.1 99 08	37.2	46 21.5 99 08	37.0	47 50.6 99 08	36.7	7
8	39 49.7 99 08	37.2	40 49.3 99 08	37.1	42 18.6 99 08	36.8	43 18.1 99 08	36.7	44 17.6 99 08	36.5	45 17.1 99 08	36.3	46 16.5 99 08	36.1	47 45.7 99 08	35.8	8
9	39 44.7 99 08	36.4	40 44.3 99 08	36.2	42 13.6 99 08	35.9	43 13.1 99 08	35.8	44 12.7 99 08	35.6	45 12.2 99 08	35.4	46 11.7 99 08	35.2	47 40.8 99 08	34.9	9
140	39 39.8 99 08	35.5	40 39.4 99 08	35.3	42 08.8 99 08	35.1	43 08.3 99 08	34.9	44 07.9 99 08	34.7	45 07.4 99 08	34.5	46 06.9 99 08	34.4	47 36.1 99 08	34.1	140
1	39 35.0 99 08	34.6	40 34.6 99 08	34.4	42 04.0 99 08	34.2	43 03.6 99 08	34.0	44 03.2 99 08	33.8	45 02.7 99 08	33.7	46 02.2 99 08	33.5	47 31.5 99 08	33.2	1
2	39 30.3 99 08	33.7	40 30.0 99 08	33.5	41 59.4 99 08	33.3	42 59.0 99 08	33.1	43 58.6 99 08	33.0	44 58.1 99 07	32.8	45 57.7 99 07	32.6	47 27.0 99 07	32.4	2
3	39 25.8 99 07	32.8	40 25.4 99 07	32.6	41 54.9 99 07	32.4	42 54.5 99 07	32.2	43 54.1 99 07	32.1	44 53.7 99 07	31.9	45 53.2 99 07	31.8	47 22.6 99 07	31.5	3
4	39 21.3 99 07	31.9	40 21.0 99 07	31.7	41 50.4 99 07	31.5	42 50.1 99 07	31.4	43 49.7 99 07	31.2	44 49.3 99 07	31.1	45 48.9 99 07	30.9	47 18.2 99 07	30.6	4
145	39 17.0 99 07	31.0	40 16.6 99 07	30.8	41 46.1 99 07	30.6	42 45.8 99 07	30.5	43 45.4 99 07	30.3	44 45.0 99 07	30.2	45 44.7 99 07	30.0	47 14.0 99 07	29.8	145
6	39 12.7 99 07	30.1	40 12.4 99 07	30.0	41 41.9 99 07	29.8	42 41.6 99 07	29.6	43 41.2 99 07	29.5	44 40.9 99 07	29.3	45 40.5 99 07	29.2	47 10.0 99 07	28.9	6
7	39 08.6 1.0 06	29.2	40 08.3 1.0 06	29.1	41 37.8 99 07	28.9	42 37.5 99 07	28.7	43 37.2 99 07	28.6	44 36.9 99 07	28.4	45 36.5 99 06	28.3	47 06.0 99 06	28.1	7
8	39 04.6 1.0 06	28.3	40 04.3 1.0 06	28.2	41 33.9 1.0 06	28.0	42 33.6 99 06	27.9	43 33.3 99 06	27.7	44 32.9 99 06	27.6	45 32.6 99 06	27.4	47 02.1 99 06	27.2	8
9	39 00.7 1.0 06	27.4	40 00.4 1.0 06	27.3	41 30.0 1.0 06	27.1	42 29.7 1.0 06	27.0	43 29.4 1.0 06	26.8	44 29.1 99 06	26.7	45 28.8 99 06	26.6	46 58.3 99 06	26.3	9
150	38 56.9 1.0 06	26.5	39 56.6 1.0 06	26.4	41 26.3 1.0 06	26.2	42 26.0 1.0 06	26.1	43 25.7 1.0 06	26.0	44 25.4 1.0 06	25.8	45 25.1 1.0 06	25.7	46 54.7 99 06	25.5	150
1	38 53.2 1.0 06	25.6	39 53.0 1.0 06	25.5	41 22.6 1.0 06	25.3	42 22.4 1.0 06	25.2	43 22.1 1.0 06	25.1	44 21.9 1.0 06	25.0	45 21.6 1.0 06	24.8	46 51.2 1.0 06	24.6	1
2	38 49.6 1.0 06	24.7	39 49.4 1.0 06	24.6	41 19.1 1.0 06	24.5	42 18.9 1.0 06	24.4	43 18.6 1.0 06	24.2	44 18.4 1.0 06	24.1	45 18.1 1.0 06	24.0	46 47.7 1.0 06	23.8	2
3	38 46.2 1.0 06	23.9	39 46.0 1.0 06	23.8	41 15.7 1.0 05	23.6	42 15.5 1.0 05	23.5	43 15.3 1.0 05	23.4	44 15.0 1.0 05	23.2	45 14.8 1.0 05	23.1	46 44.4 1.0 05	22.9	3
4	38 42.9 1.0 05	23.0	39 42.7 1.0 05	22.9	41 12.4 1.0 05	22.7	42 12.2 1.0 05	22.6	43 12.0 1.0 05	22.5	44 11.8 1.0 05	22.4	45 11.6 1.0 05	22.3	46 41.2 1.0 05	22.1	4
155	38 39.7 1.0 05	22.1	39 39.5 1.0 05	22.0	41 09.3 1.0 05	21.8	42 09.1 1.0 05	21.7	43 08.9 1.0 05	21.6	44 08.7 1.0 05	21.5	45 08.5 1.0 05	21.4	46 38.2 1.0 05	21.2	155
6	38 36.6 1.0 05	21.2	39 36.5 1.0 05	21.1	41 06.2 1.0 05	21.0	42 05.9 1.0 05	20.9	43 05.9 1.0 05	20.8	44 05.7 1.0 06	20.6	45 05.5 1.0 05	20.5	46 35.2 1.0 06	20.4	6
7	38 33.7 1.0 05	20.3	39 33.5 1.0 05	20.2	41 03.3 1.0 05	20.1	42 03.1 1.0 05	20.0	43 03.0 1.0 05	19.9	44 02.8 1.0 05	19.8	45 02.6 1.0 05	19.7	46 32.3 1.0 05	19.5	7
8	38 30.8 1.0 05	19.4	39 30.7 1.0 04	19.3	41 00.5 1.0 04	19.2	42 00.3 1.0 04	19.1	43 00.2 1.0 04	19.0	44 00.0 1.0 04	18.9	44 59.9 1.0 04	18.8	46 29.6 1.0 04	18.7	8
9	38 28.1 1.0 04	18.5	39 28.0 1.0 04	18.5	40 57.8 1.0 04	18.3	41 57.7 1.0 04	18.2	42 57.5 1.0 04	18.1	43 57.4 1.0 04	18.1	44 57.2 1.0 04	18.0	46 27.0 1.0 04	17.8	9
160	38 25.5 1.0 04	17.7	39 25.4 1.0 04	17.6	40 55.2 1.0 04	17.5	41 55.1 1.0 04	17.4	42 55.0 1.0 04	17.3	43 54.8 1.0 04	17.2	44 54.7 1.0 04	17.1	46 24.5 1.0 04	17.0	160
1	38 23.0 1.0 04	16.8	39 22.9 1.0 04	16.7	40 52.8 1.0 04	16.6	41 52.7 1.0 04	16.5	42 52.6 1.0 04	16.4	43 52.4 1.0 04	16.4	44 52.3 1.0 04	16.2	46 22.1 1.0 04	16.1	1
2	38 20.7 1.0 04	15.9	39 20.6 1.0 04	15.8	40 50.5 1.0 04	15.7	41 50.4 1.0 04	15.6	42 50.3 1.0 04	15.5	43 50.2 1.0 04	15.5	44 50.0 1.0 04	15.4	46 19.9 1.0 04	15.3	2
3	38 18.5 1.0 04	15.0	39 18.4 1.0 03	14.9	40 48.3 1.0 03	14.8	41 48.2 1.0 03	14.8	42 48.1 1.0 03	14.7	43 48.0 1.0 03	14.6	44 47.9 1.0 03	14.5	46 17.7 1.0 03	14.4	3
4	38 16.4 1.0 03	14.1	39 16.3 1.0 03	14.1	40 46.2 1.0 03	14.0	41 46.1 1.0 03	13.9	42 46.0 1.0 03	13.8	43 45.9 1.0 03	13.7	44 45.9 1.0 03	13.7	46 15.7 1.0 03	13.6	4
165	38 14.4 1.0 03	13.2	39 14.3 1.0 03	13.2	40 44.2 1.0 03	13.1	41 44.2 1.0 03	13.0	42 44.1 1.0 03	13.0	43 44.0 1.0 03	12.9	44 43.9 1.0 03	12.8	46 13.8 1.0 03	12.7	165
6	38 12.5 1.0 03	12.3	39 12.5 1.0 03	12.3	40 42.4 1.0 03	12.2	41 42.3 1.0 03	12.1	42 42.3 1.0 03	12.1	43 42.2 1.0 03	12.0	44 42.2 1.0 03	12.0	46 12.0 1.0 03	11.9	6
7	38 10.8 1.0 02	11.5	39 10.8 1.0 02	11.4	40 40.7 1.0 02	11.3	41 40.6 1.0 02	11.3	42 40.6 1.0 02	11.2	43 40.5 1.0 02	11.2	44 40.5 1.0 02	11.1	46 10.4 1.0 02	11.0	7
8	38 09.2 1.0 02	10.6	39 09.2 1.0 02	10.5	40 39.1 1.0 02	10.5	41 39.1 1.0 02	10.4	42 39.0 1.0 02	10.4	43 39.0 1.0 02	10.3	44 38.9 1.0 02	10.2	46 08.9 1.0 02	10.2	8
9	38 07.8 1.0 02	09.7	39 07.7 1.0 02	09.7	40 37.7 1.0 02	09.6	41 37.6 1.0 02	09.5	42 37.6 1.0 02	09.5	43 37.6 1.0 02	09.4	44 37.5 1.0 02	09.4	46 07.4 1.0 02	09.3	9
170	38 06.4 1.0 02	08.8	39 06.4 1.0 02	08.8	40 36.3 1.0 02	08.7	41 36.3 1.0 02	08.7	42 36.3 1.0 02	08.6	43 36.2 1.0 02	08.6	44 36.2 1.0 02	08.5	46 06.2 1.0 02	08.5	170
1	38 05.2 1.0 02	07.9	39 05.2 1.0 02	07.9	40 35.1 1.0 02	07.8	41 35.1 1.0 02	07.8	42 35.1 1.0 02	07.8	43 35.1 1.0 02	07.7	44 35.1 1.0 02	07.7	46 05.0 1.0 02	07.6	1
2	38 04.1 1.0 02	07.1	39 04.1 1.0 02	07.0	40 34.1 1.0 02	07.0	41 34.0 1.0 02	06.9	42 34.0 1.0 02	06.9	43 34.0 1.0 02	06.9	44 34.0 1.0 02	06.8	46 03.9 1.0 02	06.8	2
3	38 03.1 1.0 01	06.2	39 03.1 1.0 01	06.1	40 33.1 1.0 01	06.1	41 33.1 1.0 01	06.1	42 33.1 1.0 01	06.0	43 33.1 1.0 01	06.0	44 33.0 1.0 01	06.0	46 03.0 1.0 01	05.9	3
4	38 02.3 1.0 01	05.3	39 02.3 1.0 01	05.3	40 32.3 1.0 01	05.2	41 32.3 1.0 01	05.2	42 32.3 1.0 01	05.2	43 32.2 1.0 01	05.2	44 32.2 1.0 01	05.1	46 02.2 1.0 01	05.1	4
175	38 01.6 1.0 01	04.4	39 01.6 1.0 01	04.4	40 31.6 1.0 01	04.4	41 31.6 1.0 01	04.3	42 31.6 1.0 01	04.3	43 31.6 1.0 01	04.3	44 31.6 1.0 01	04.3	46 01.5 1.0 01	04.2	175
6	38 01.0 1.0 01	03.5	39 01.0 1.0 01	03.5	40 31.0 1.0 01	03.5	41 31.0 1.0 01	03.5	42 31.0 1.0 01	03.5	43 31.0 1.0 01	03.4	44 31.0 1.0 01	03.4	46 01.0 1.0 01	03.4	6
7	38 00.6 1.0 01	02.6	39 00.6 1.0 01	02.6	40 30.6 1.0 01	02.6	41 30.6 1.0 01	02.6	42 30.6 1.0 01	02.6	43 30.6 1.0 01	02.6	44 30.6 1.0 01	02.6	46 00.6 1.0 01	02.5	7
8	38 00.3 1.0 00	01.8	39 00.3 1.0 00	01.8	40 30.3 1.0 00	01.7	41 30.3 1.0 00	01.7	42 30.3 1.0 00	01.7	43 30.2 1.0 00	01.7	44 30.2 1.0 00	01.7	46 00.2 1.0 00	01.7	8
9	38 00.1 1.0 00	00.9	39 00.1 1.0 00	00.9	40 30.1 1.0 00	00.9	41 30.1 1.0 00	00.9	42 30.1 1.0 00	00.9	43 30.1 1.0 00	00.9	44 30.1 1.0 00	00.9	46 00.1 1.0 00	00.8	9
180	38 00.0 1.0 00	00.0	39 00.0 1.0 00	00.0	40 39.0 1.0 00	00.0	41 30.0 1.0 00	00.0	42 30.0 1.0 00	00.0	43 30.0 1.0 00	00.0	44 30.0 1.0 00	00.0	46 00.0 1.0 00	00.0	180

H.A.	54° 30' Alt.	ΔdΔt	Az.	55° 00' Alt.	ΔdΔt	Az.	56° 00' Alt.	ΔdΔt	Az.	56° 30' Alt.	ΔdΔt	Az.	57° 00' Alt.	ΔdΔt	Az.	57° 30' Alt.	ΔdΔt	Az.	59° 00' Alt.	ΔdΔt	Az.	59° 30' Alt.	ΔdΔt	Az.	H.A.
00	62 30.0	1.0 00	180.0	63 00.0	1.0 00	180.0	64 00.0	1.0 00	180.0	64 30.0	1.0 00	180.0	65 00.0	1.0 00	180.0	65 30.0	1.0 00	180.0	67 00.0	1.0 00	180.0	67 30.0	1 00	180.0	00
1	62 29.9	1.0 00	178.7	62 59.9	1.0 00	178.7	63 59.9	1.0 00	178.7	64 29.9	1.0 00	178.7	64 59.9	1.0 00	178.7	65 29.9	1.0 00	178.7	66 59.9	1.0 00	178.7	67 29.9	1 00	178.7	1
2	62 29.6	1.0 01	177.5	62 59.6	1.0 01	177.5	63 59.6	1.0 01	177.4	64 29.6	1.0 01	177.4	64 59.6	1.0 01	177.4	65 29.6	1.0 01	177.4	66 59.6	1.0 01	177.4	67 29.6	1.0 01	177.3	2
3	62 29.2	1.0 01	176.2	62 59.2	1.0 01	176.2	63 59.2	1.0 01	176.2	64 29.2	1.0 01	176.2	64 59.2	1.0 01	176.1	65 29.2	1.0 01	176.1	66 59.1	1.0 01	176.1	67 29.1	1.0 01	176.0	3
4	62 28.5	1.0 01	175.0	62 58.5	1.0 01	174.9	63 58.5	1.0 01	174.9	64 28.5	1.0 01	174.9	64 58.5	1.0 01	174.8	65 28.5	1.0 01	174.8	66 58.5	1.0 01	174.7	67 28.5	1.0 01	174.7	4
05	62 27.7	1.0 02	173.7	62 57.7	1.0 02	173.7	63 57.7	1.0 02	173.6	64 27.7	1.0 02	173.6	64 57.7	1.0 02	173.6	65 27.6	1.0 02	173.5	66 57.6	1.0 02	173.4	67 27.6	1.0 02	173.4	05
6	62 26.7	1.0 02	172.5	62 56.7	1.0 02	172.4	63 56.7	1.0 02	172.4	64 26.6	1.0 02	172.3	64 56.6	1.0 02	172.3	65 26.6	1.0 02	172.2	66 56.6	1.0 02	172.1	67 26.5	1.0 02	172.1	6
7	62 25.5	1.0 02	171.2	62 55.5	1.0 02	171.2	63 55.5	1.0 02	171.1	64 25.4	1.0 02	171.0	64 55.4	1.0 02	171.0	65 25.4	1.0 02	170.9	66 55.3	1.0 02	170.8	67 25.3	1.0 02	170.7	7
8	62 24.1	1.0 03	170.0	62 54.1	1.0 03	169.9	63 54.0	1.0 03	169.8	64 24.0	1.0 03	169.8	64 54.0	1.0 03	169.7	65 24.0	1.0 03	169.7	66 53.9	1.0 03	169.5	67 23.8	1.0 03	169.4	8
9	62 22.6	1.0 03	168.7	62 52.6	1.0 03	168.6	63 52.5	1.0 03	168.5	64 22.5	1.0 03	168.5	64 52.4	1.0 03	168.4	65 22.3	1.0 03	168.4	66 52.3	1.0 03	168.2	67 22.2	1.0 03	168.1	9
10	62 20.9	1.0 03	167.5	62 50.8	1.0 03	167.4	63 50.8	1.0 03	167.3	64 20.7	1.0 03	167.2	64 50.7	1.0 03	167.1	65 20.6	1.0 03	167.1	66 50.4	1.0 03	166.9	67 20.4	1.0 03	166.8	10
1	62 19.0	1.0 03	166.2	62 48.9	1.0 04	166.1	63 48.8	1.0 04	166.0	64 18.8	1.0 04	165.9	64 48.7	1.0 04	165.9	65 18.6	1.0 04	165.8	66 48.5	1.0 04	165.5	67 18.4	1.0 04	165.5	1
2	62 16.9	1.0 04	165.0	62 46.8	1.0 04	164.9	63 46.7	1.0 04	164.7	64 16.6	1.0 04	164.7	64 46.6	1.0 04	164.6	65 16.5	1.0 04	164.5	66 46.3	1.0 04	164.2	67 16.2	1.0 04	164.2	2
3	62 14.6	1.0 04	163.7	62 44.6	1.0 04	163.6	63 44.4	1.0 04	163.4	64 14.4	1.0 04	163.4	64 44.3	1.0 04	163.3	65 14.2	1.0 04	163.2	66 43.9	1.0 04	162.9	67 13.8	1.0 04	162.8	3
4	62 12.2	1.0 04	162.5	62 42.1	1.0 04	162.4	63 42.0	1.0 04	162.2	64 11.9	1.0 04	162.1	64 41.8	1.0 04	162.0	65 11.7	1.0 04	162.0	66 41.4	1.0 05	161.6	67 11.3	1.0 05	161.5	4
15	62 09.6	1.0 05	161.2	62 39.5	1.0 05	161.1	63 39.3	1.0 05	161.0	64 09.2	1.0 05	160.9	64 39.1	1.0 05	160.8	65 09.0	1.0 05	160.7	66 38.7	1.0 05	160.4	67 08.5	1.0 05	160.2	15
6	62 06.8	1.0 05	160.0	62 36.7	1.0 05	159.9	63 36.5	1.0 05	159.7	64 06.4	1.0 05	159.6	64 36.3	1.0 05	159.5	65 06.2	1.0 05	159.4	66 35.8	1.0 05	159.1	67 05.6	1.0 05	158.9	6
7	62 03.9	1.0 05	158.8	62 33.8	1.0 05	158.7	63 33.5	1.0 05	158.5	64 03.4	1.0 05	158.4	64 33.3	1.0 05	158.2	65 03.1	1.0 05	158.1	66 32.7	99 05	157.8	67 02.5	99 05	157.6	7
8	62 00.8	1.0 05	157.5	62 30.7	1.0 06	157.4	63 30.4	1.0 06	157.2	64 00.2	1.0 06	157.1	64 30.1	99 06	157.0	64 59.9	99 06	156.9	66 29.5	99 06	156.3	66 59.3	99 06	156.3	8
9	61 57.5	1.0 06	156.3	62 27.4	1.0 06	156.2	63 27.1	99 06	156.0	63 56.9	99 06	155.8	64 26.8	99 06	155.7	64 56.6	99 06	155.6	66 26.0	99 06	155.2	66 55.8	99 06	155.1	9
20	61 54.1	99 06	155.1	62 23.9	99 06	154.9	63 23.6	99 06	154.7	63 53.4	99 06	154.6	64 23.2	99 06	154.5	64 53.0	99 06	154.3	66 22.4	99 06	153.9	66 52.2	99 06	153.8	20
1	61 50.5	99 06	153.8	62 20.3	99 06	153.7	63 19.9	99 06	153.5	63 49.8	99 06	153.4	64 19.6	99 06	153.2	64 49.4	99 06	153.1	66 18.7	99 07	152.7	66 48.5	99 07	152.5	1
2	61 46.7	99 07	152.6	62 16.5	99 07	152.5	63 16.1	99 07	152.2	63 45.9	99 07	152.1	64 15.7	99 07	152.0	64 45.5	99 07	151.8	66 14.8	99 07	151.4	66 44.5	99 07	151.2	2
3	61 42.8	99 07	151.4	62 12.6	99 07	151.3	63 12.2	99 07	151.0	63 41.9	99 07	150.9	64 11.7	99 07	150.7	64 41.5	99 07	150.6	66 10.7	99 07	150.1	66 40.4	99 07	149.9	3
4	61 38.7	99 07	150.2	62 08.5	99 07	150.0	63 08.0	99 07	149.8	63 37.8	99 07	149.6	64 07.6	99 07	149.5	64 37.3	99 07	149.3	66 06.5	99 07	148.9	66 36.2	99 07	148.7	4
25	61 34.5	99 07	149.0	62 04.2	99 07	148.8	63 03.8	99 07	148.6	63 33.5	99 07	148.4	64 03.2	99 07	148.3	64 33.0	99 07	148.1	66 02.1	99 08	147.6	66 31.7	99 08	147.4	25
6	61 30.1	99 08	147.8	61 59.9	99 08	147.6	62 59.3	99 08	147.3	63 29.0	99 08	147.2	63 58.8	99 08	147.0	64 28.5	99 08	146.9	65 57.5	99 08	146.3	66 27.2	99 08	146.2	6
7	61 25.6	99 08	146.6	61 55.3	99 08	146.4	62 54.7	99 08	146.1	63 24.5	99 08	146.0	63 54.1	99 08	145.8	64 23.8	99 08	145.6	65 52.8	99 08	145.1	66 22.4	99 08	144.9	7
8	61 20.9	99 08	145.3	61 50.6	99 08	145.2	62 50.0	99 08	144.9	63 19.7	99 08	144.7	63 49.4	99 08	144.6	64 19.0	99 08	144.4	65 48.0	99 08	143.9	66 17.6	99 08	143.7	8
9	61 16.1	99 08	144.2	61 45.8	99 08	144.0	62 45.1	99 08	143.7	63 14.8	99 08	143.5	63 44.5	99 08	143.4	64 14.1	99 08	143.2	65 43.0	99 09	142.6	66 12.5	99 09	142.4	9
30	61 11.1	99 08	143.0	61 40.8	99 09	142.8	62 40.1	99 09	142.5	63 09.8	99 09	142.3	63 39.4	99 09	142.1	64 09.0	99 09	142.0	65 37.8	99 09	141.4	66 07.4	99 09	141.2	30
1	61 06.0	99 09	141.8	61 35.7	99 09	141.6	62 35.0	99 09	141.3	63 04.6	99 09	141.1	63 34.2	99 09	140.9	63 58.5	99 09	140.7	65 32.5	98 09	140.2	66 02.1	98 09	139.9	1
2	61 00.8	99 09	140.6	61 30.4	99 09	140.4	62 29.7	99 09	139.9	62 59.3	99 09	139.9	63 28.9	99 09	139.7	63 58.5	99 09	139.5	65 27.1	98 09	138.9	65 56.6	98 09	138.7	2
3	60 55.4	99 09	139.4	61 25.0	99 09	139.2	62 24.3	99 09	138.9	62 53.8	99 09	138.7	63 23.4	99 09	138.5	63 53.0	99 09	138.3	65 21.6	98 09	137.7	65 51.1	98 10	137.5	3
4	60 49.9	99 09	138.2	61 19.5	99 09	138.1	62 18.7	99 09	137.7	62 48.3	99 10	137.5	63 17.8	98 10	137.3	63 47.4	98 10	137.1	65 15.9	98 10	136.5	65 45.3	98 10	136.3	4
35	60 44.3	99 10	137.0	61 13.9	99 10	136.9	62 13.0	99 10	136.5	62 42.6	98 10	136.3	63 12.1	98 10	136.1	63 41.6	98 10	135.9	65 10.1	98 10	135.3	65 39.5	98 10	135.1	35
6	60 38.5	99 10	135.9	61 08.1	98 10	135.7	62 07.2	98 10	135.3	62 36.7	98 10	135.2	63 06.3	98 10	135.0	63 35.8	98 10	134.8	65 04.1	98 10	134.1	65 33.6	98 10	133.9	6
7	60 32.7	99 10	134.7	61 02.2	98 10	134.5	62 01.3	98 10	134.2	62 30.8	98 10	134.0	63 00.3	98 10	133.8	63 29.8	98 10	133.6	64 58.1	98 10	132.9	65 27.5	98 10	132.7	7
8	60 26.7	98 10	133.5	60 56.2	98 10	133.4	61 55.2	98 10	133.0	62 24.7	98 10	132.8	62 54.2	98 10	132.6	63 23.7	98 10	132.4	64 51.9	98 10	131.7	65 21.3	98 11	131.5	8
9	60 20.6	98 10	132.4	60 50.1	98 10	132.2	61 49.1	98 10	131.8	62 18.5	98 10	131.6	62 48.0	98 11	131.4	63 17.4	98 11	131.2	64 45.6	98 11	130.5	65 15.0	98 11	130.3	9
40	60 14.3	98 11	131.2	60 43.8	98 11	131.1	61 42.8	98 11	130.7	62 12.2	98 11	130.5	62 41.7	98 11	130.3	63 11.1	98 11	130.0	64 39.2	98 11	129.3	65 08.5	98 11	129.1	40
1	60 08.0	98 11	130.1	60 37.5	98 11	129.9	61 36.4	98 11	129.5	62 05.8	98 11	129.3	62 35.3	98 11	129.1	63 04.6	98 11	128.9	64 32.7	98 11	128.2	65 02.0	98 11	127.9	1
2	60 01.6	98 11	128.9	60 31.0	98 11	128.8	61 29.9	98 11	128.4	61 59.3	98 11	128.2	62 28.7	98 11	127.9	62 58.1	98 11	127.7	64 26.1	98 11	127.0	64 55.4	98 11	126.7	2
3	59 55.0	98 11	127.8	60 24.5	98 11	127.6	61 23.3	98 11	127.2	61 52.7	98 11	127.0	62 22.1	98 11	126.8	62 51.4	98 11	126.6	64 19.4	98 11	125.8	64 48.6	97 11	125.6	3
4	59 48.4	98 11	126.7	60 17.8	98 11	126.5	61 16.6	98 11	126.1	61 46.0	98 11	125.9	62 15.3	98 11	125.6	62 44.7	98 11	125.4	64 12.5	98 12	124.7	64 41.8	97 12	124.4	4
45	59 41.6	98 11	125.5	60 11.0	98 11	125.3	61 09.8	98 12	124.9	61 39.2	98 12	124.7	62 08.5	98 12	124.5	62 37.8	98 12	124.3	64 05.6	97 12	123.5	64 34.8	97 12	123.3	45
6	59 34.7	98 11	124.4	60 04.2	98 12	124.2	61 02.9	98 12	123.8	61 32.3	98 12	123.6	62 01.6	98 12	123.4	62 30.9	98 12	123.1	63 58.6	97 12	122.4	64 27.8	97 12	122.1	6
7	59 27.8	98 12	123.3	59 57.2	98 12	123.1	60 55.9	98 12	122.7	61 25.3	98 12	122.5	61 54.6	98 12	122.2	62 23.8	98 12	122.0	63 51.5	97 12	121.2	64 20.7	97 12	121.0	7
8	59 20.8	98 12	122.2	59 50.2	98 12	122.0	60 48.9	98 12	121.6	61 18.2	98 12	121.3	61 47.5	98 12	121.1	62 16.7	97 12	120.9	63 44.3	97 12	120.1	64 13.5	97 12	119.8	8
9	59 13.7	98 12	121.1	59 43.1	98 12	120.9	60 41.7	98 12	120.4	61 11.0	98 12	120.2	61 40.3	98 12	120.0	62 09.5	97 12	119.7	63 37.1	97 12	119.0	64 06.2	97 12	118.7	9
50	59 06.5	98 12	120.0	59 35.8	98 12	119.7	60 34.5	98 12	119.3	61 03.7	98 12	119.1	61 33.0	97 12	118.9	62 02.2	97 12	118.6	63 29.7	97 12	117.9	63 58.9	97 12	117.6	50
1	58 59.2	98 12	118.8	59 28.6	98 12	118.6	60 27.1	98 12	118.2	60 56.4	97 12	118.0	61 25.6	97 12	117.8	61 54.8	97 12	117.5	63 22.3	97 12	116.7	63 51.4	97 13	116.5	1
2	58 51.9	98 12	117.7	59 21.2	98 12	117.5	60 19.7	98 12	117.1	60 49.0	97 12	116.9	61 18.2	97 12	116.6	61 47.4	97 13	116.4	63 14.8	97 13	115.6	63 43.9	97 13	115.4	2
3	58 44.5	98 12	116.7	59 13.8	98 13	116.4	60 12.3	98 13	116.0	60 41.5	97 13	115.8	61 10.7	97 13	115.5	61 39.9	97 13	115.3	63 07.3	97 13	114.5	63 36.3	97 13	114.2	3
4	58 37.0	98 13	115.6	59 06.2	98 13	115.4	60 04.7	97 13	114.9	60 34.0	97 13	114.7	61 03.1	97 13	114.4	61 32.3	97 13	114.2	62 59.6	97 13	113.4	63 28.7	97 13	113.1	4
55	58 29.4	98 13	114.5	58 58.7	98 13	114.3	59 57.1	97 13	113.8	60 26.3	97 13	113.6	60 55.5	97 13	113.4	61 24.7	97 13	113.1	62 51.9	97 13	112.3	63 21.0	97 13	112.0	55
6	58 21.8	98 13	113.4	58 51.0	97 13	113.3	59 49.5	97 13	112.7	60 18.6	97 13	112.5	60 47.8	97 13	112.3	61 16.9	97 13	112.0	62 44.2	97 13	111.2	63 13.2	97 13	111.0	6
7	58 14.1	98 13	112.3	58 43.3	97 13	112.1	59 41.7	97 13	111.7	60 10.9	97 13	111.4	60 40.1	97 13	111.2	61 09.2	97 13	110.9	62 36.4	97 13	110.1	63 05.4	97 13	109.9	7
8	58 06.3	97 13	111.2	58 35.5	97 13	111.0	59 33.9	97 13	110.6	60 03.1	97 13	110.3	60 32.2	97 13	110.1	61 01.3	97 13	109.9	62 28.5	97 13	109.1	62 57.5	97 13	108.8	8
9	57 58.5	97 13	110.2	58 27.7	97 13	110.0	59 26.1	97 13	109.5	59 55.2	97 13	109.3	60 24.4	97 13	109.0	60 53.5	97 13	108.8	62 20.6	97 13	108.0	62 49.6	97 13	107.7	9
60	57 50.6	97 13	109.1	58 19.8	97 13	108.9	59 18.2	97 13	108.4	59 47.3	97 13	108.2	60 16.5	97 13	108.0	60 45.5	97 13	107.7	62 12.6	97 13	106.9	62 41.6	96 13	106.6	60
1	57 42.7	97 13	108.0	58 11.9	97 13	107.8	59 10.3	97 13	107.4	59 39.4	97 13	107.1	60 08.5	97 13	106.9	60 37.6	97 13	106.7	62 04.6	97 13	105.9	62 33.6	96 13	105.6	1
2	57 34.8	97 13	107.0	58 03.9	97 13	106.8	59 02.3	97 13	106.3	59 31.4	97 13	106.1	60 00.5	97 13	105.8	60 29.5	97 13	105.6	61 56.6	97 13	104.8	62 25.5	96 14	104.5	2
3	57 26.8	97 13	105.9	57 55.9	97 13	105.7	58 54.2	97 13	105.3	59 23.3	97 13	105.0	59 52.4	97 13	104.8	60 21.5	97 13	104.5	61 48.5	96 14	103.7	62 17.4	96 14	103.5	3
4	57 18.7	97 13	104.9	57 47.9	97 13	104.7	58 46.1	97 14	104.2	59 15.2	97 14	104.0	59 44.3	97 14	103.7	60 13.4	97 14	103.5	61 40.3	96 14	102.7	62 09.3	96 14	102.4	4
65	57 10.6	97 14	103.8	57 39.8	97 14	103.6	58 38.0	97 14	103.2	59 07.1	97 14	102.9	59 36.2	97 14	102.7	60 05.2	97 14	102.4	61 32.2	96 14	101.7	62 01.1	96 14	101.4	65
6	57 02.5	97 14	102.8	57 31.6	97 14	102.6	58 29.9	97 14	102.1	58 59.0	97 14	101.9	59 28.0	97 14	101.7	59 57.1	97 14	101.4	61 24.0	96 14	100.6	61 52.9	96 14	100.3	6
7	56 54.3	97 14	101.8	57 23.5	97 14	101.6	58 21.7	97 14	101.1	58 50.8	97 14	100.9	59 19.8	97 14	100.6	59 48.9	97 14	100.4	61 15.8	96 14	99.6	61 44.7	96 14	99.3	7
8	56 46.1	97 14	100.7	57 15.3	97 14	100.5	58 13.5	97 14	100.1	58 42.6	97 14	99.8	59 11.6	97 14	99.6	59 40.6	97 14	99.3	61 07.5	96 14	98.5	61 36.4	96 14	98.3	8
9	56 37.9	97 14	99.7	57 07.1	97 14	99.5	58 05.3	97 14	99.0	58 34.3	97 14	98.8	59 03.4	97 14	98.6	59 32.4	97 14	98.3	60 59.2	96 14	97.5	61 28.1	96 14	97.2	9
70	56 29.6	97 14	98.7	56 58.8	97 14	98.5	57 57.0	97 14	98.0	58 26.1	97 14	97.8	58 55.1	97 14	97.5	59 24.1	97 14	97.3	60 51.0	96 14	96.5	61 19.8	96 14	96.2	70
1	56 21.4	97 14	97.7	56 50.5	97 14	97.4	57 48.7	97 14	97.0	58 17.8	97 14	96.8	58 46.8	97 14	96.3	59 15.8	97 14	96.3	60 42.6	96 14	95.5	61 11.5	96 14	95.2	1
2	56 13.1	97 14	96.7	56 42.3	97 14	96.4	57 40.4	97 14	96.0	58 09.5	97 14	95.7	58 38.5	97 14	95.5	59 07.5	97 14	95.3	60 34.3	96 14	94.5	61 03.2	96 14	94.2	2
3	56 04.8	97 14	95.6	56 33.9	97 14	95.4	57 32.1	97 14	95.0	58 01.2	97 14	94.7	58 30.2	97 14	94.5	58 59.2	97 14	94.3	60 26.0	96 14	93.5	60 54.9	96 14	93.2	3
4	55 56.5	97 14	94.6	56 25.6	97 14	94.4	57 23.8	97 14	94.0	57 52.8	97 14	93.7	58 21.9	97 14	93.5	58 50.9	97 14	93.2	60 17.7	96 14	92.5	60 46.5	96 14	92.2	4
75	55 48.2	97 14	93.6	56 17.3	97 14	93.4	57 15.5	97 14	93.0	57 44.5	97 14	92.7	58 13.5	97 14	92.5	58 42.5	97 14	92.2	60 09.3	96 14	91.5	60 38.2	96 14	91.2	75
6	55 39.8	97 14	92.6	56 09.0	97 14	92.4	57 07.1	97 14	92.0	57 36.2	97 14	91.7	58 05.2	97 14	91.5	58 34.2	97 14	91.2	60 01.0	96 14	90.5	60 29.8	96 14	90.2	6
7	55 31.5	97 14	91.6	56 00.6	97 14	91.4	56 58.8	97 14	91.0	57 27.8	97 14	90.7	57 56.8	97 14	90.5	58 25.8	97 14	90.3	59 52.6	96 14	89.5	60 21.5	96 14	89.2	7
8	55 23.1	97 14	90.6	55 52.3	97 14	90.4	56 50.4	97 14	90.0	57 19.5	97 14	89.7	57 48.5	97 14	89.5	58 17.5	97 14	89.3	59 44.3	96 14	88.5	60 13.1	96 14	88.2	8
9	55 14.8	97 14	89.6	55 43.9	97 14	89.4	56 42.1	97 14	89.0	57 11.1	97 14	88.8	57 40.1	97 14	88.5	58 09.1	97 14	88.3	59 35.9	96 14	87.5	60 04.7	96 14	87.2	9
80	55 06.4	97 14	88.7	55 35.6	97 14	88.4	56 33.7	97 14	88.0	57 02.8	97 14	87.8	57 31.8	97 14	87.5	57 52.4	97 14	87.3	59 27.6	96 14	86.5	59 56.5	96 14	86.3	80
1	54 58.1	97 14	87.7	55 27.2	97 14	87.5	56 25.4	97 14	87.0	56 54.4	97 14	86.8	57 23.4	97 14	86.6	57 52.4	97 14	86.3	59 19.3	96 14	85.6	59 48.1	96 14	85.3	1
2	54 49.8	97 14	86.7	55 18.9	97 14	86.5	56 17.0	97 14	86.0	56 46.1	97 14	85.8	57 15.1	97 14	85.6	57 44.1	97 14	85.3	59 10.9	96 14	84.6	59 39.8	96 14	84.3	2
3	54 41.4	97 14	85.7	55 10.6	97 14	85.5	56 08.7	97 14	85.1	56 37.8	97 14	84.8	57 06.8	97 14	84.6	57 35.8	97 14	84.4	59 02.6	96 14	83.6	59 31.5	96 14	83.4	3
4	54 33.1	97 14	84.7	55 02.2	97 14	84.5	56 00.4	97 14	84.1	56 29.5	97 14	83.9	56 58.5	97 14	83.6	57 27.5	97 14	83.4	58 54.3	96 14	82.7	59 23.2	96 14	82.4	4
85	54 24.8	97 14	83.8	54 53.9	97 14	83.6	55 52.1	97 14	83.1	56 21.2	97 14	82.9	56 50.2	97 14	82.7	57 19.2	97 14	82.4	58 46.1	96 14	81.7	59 15.0	96 14	81.4	85
6	54 16.5	97 14	82.8	54 45.6	97 14	82.6	55 43.8	97 14	82.2	56 12.9	97 14	81.9	56 41.9	97 14	81.7	57 10.9	97 14	81.5	58 37.8	96 14	80.7	59 06.7	96 14	80.5	6
7	54 08.2	97 14	81.8	54 37.4	97 14	81.6	55 35.6	97 14	81.2	56 04.6	97 14	81.0	56 33.7	97 14	80.8	57 02.7	97 14	80.5	58 29.6	96 14	79.8	58 58.5	96 14	79.5	7
8	54 00.0	97 14	80.9	54 29.1	97 14	80.7	55 27.3	97 14	80.2	55 56.4	97 14	80.0	56 25.4	97 14	79.8	56 54.5	97 14	79.6	58 21.4	96 14	78.8	58 50.2	96 14	78.6	8
9	53 51.7	97 14	79.9	54 20.9	97 14	79.7	55 19.1	97 14	79.3	55 48.2	97 14	79.1	56 17.2	97 14	78.9	56 46.3	97 14	78.6	58 13.2	96 14	77.9	58 42.1	96 14	77.6	9
90	53 43.5	97 14	79.0	54 12.7	97 14	78.8	55 10.9	97 14	78.3	55 40.0	97 14	78.1	56 09.1	97 14	77.9	56 38.1	97 14	77.7	58 05.0	96 14	77.0	58 34.0	96 14	76.7	90

Lat. 82°

H.A.	54° 30′ Alt.	Δd Δt	Az.	55° 00′ Alt.	Δd Δt	Az.	56° 00′ Alt.	Δd Δt	Az.	56° 30′ Alt.	Δd Δt	Az.	57° 00′ Alt.	Δd Δt	Az.	57° 30′ Alt.	Δd Δt	Az.	59° 00′ Alt.	Δd Δt	Az.	59° 30′ Alt.	Δd Δt	Az.	H.A.
91	53 35.4	97 14	78.0	54 04.5	97 14	77.8	55 02.8	97 14	77.4	55 31.8	97 14	77.2	56 00.9	97 14	77.0	56 30.0	97 14	76.7	57 56.9	97 13	76.0	58 25.9	96 13	75.8	91
2	53 27.2	97 14	77.1	53 56.4	97 14	76.9	54 54.6	97 14	76.4	55 23.7	97 14	76.2	55 52.8	97 14	76.0	56 21.8	97 13	75.8	57 48.8	97 13	75.1	58 17.8	96 13	74.8	2
3	53 19.1	97 14	76.1	53 48.2	97 14	75.9	54 46.5	97 13	75.5	55 15.6	97 13	75.3	55 44.7	97 13	75.1	56 13.8	97 13	74.9	57 40.8	97 13	74.2	58 09.7	96 13	73.9	3
4	53 11.0	97 13	75.2	53 40.2	97 13	75.0	54 38.4	97 13	74.6	55 07.6	97 13	74.4	55 36.7	97 13	74.1	56 05.7	97 13	73.9	57 32.8	97 13	73.2	58 01.7	97 13	73.0	4
95	53 02.9	97 13	74.2	53 32.1	97 13	74.0	54 30.4	97 13	73.6	54 59.5	97 13	73.4	55 28.6	97 13	73.2	55 57.7	97 13	73.0	57 24.8	97 13	72.3	57 53.8	97 13	72.1	95
6	52 54.9	97 13	73.3	53 24.1	97 13	73.1	54 22.4	97 13	72.7	54 51.6	97 13	72.5	55 20.7	97 13	72.3	55 49.8	97 13	72.1	57 16.9	97 13	71.4	57 45.9	97 13	71.1	6
7	52 46.9	97 13	72.4	53 16.1	97 13	72.2	54 14.5	97 13	71.8	54 43.6	97 13	71.6	55 12.7	97 13	71.4	55 41.8	97 13	71.1	57 09.0	97 13	70.5	57 38.0	97 13	70.2	7
8	52 39.0	97 13	71.4	53 08.2	97 13	71.2	54 06.6	97 13	70.8	54 35.7	97 13	70.6	55 04.8	97 13	70.4	55 34.0	97 13	70.2	57 01.1	97 13	69.5	57 30.1	97 13	69.3	8
9	52 31.1	97 13	70.5	53 00.3	97 13	70.3	53 58.7	97 13	69.9	54 27.9	97 13	69.7	54 57.0	97 13	69.5	55 26.1	97 13	69.3	56 53.3	97 13	68.6	57 22.4	97 13	68.4	9
100	52 23.3	97 13	69.6	52 52.5	97 13	69.4	53 50.9	97 13	69.0	54 20.1	97 13	68.8	54 49.2	97 13	68.6	55 18.3	97 13	68.4	56 45.6	97 13	67.7	57 14.6	97 13	67.5	100
1	52 15.5	97 13	68.6	52 44.7	97 13	68.4	53 43.1	97 13	68.1	54 12.3	97 13	67.9	54 41.5	97 13	67.7	55 10.6	97 13	67.5	56 37.9	97 13	66.8	57 06.9	97 13	66.6	1
2	52 07.7	97 13	67.7	52 37.0	97 13	67.5	53 35.4	97 13	67.1	54 04.6	97 13	67.0	54 33.8	97 13	66.8	55 02.9	97 13	66.5	56 30.2	97 13	65.9	56 59.3	97 13	65.7	2
3	52 00.0	97 13	66.8	52 29.3	97 13	66.6	53 27.7	97 13	66.2	53 56.9	97 13	66.0	54 26.1	97 13	65.8	54 55.3	97 13	65.6	56 22.6	97 13	65.0	56 51.7	97 13	64.8	3
4	51 52.4	97 13	65.9	52 21.6	98 13	65.7	53 20.1	97 13	65.3	53 49.3	97 13	65.1	54 18.5	97 13	64.9	54 47.7	97 13	64.7	56 15.1	97 12	64.1	56 44.2	97 12	63.9	4
105	51 44.8	98 13	65.0	52 14.0	98 13	64.8	53 12.5	97 12	64.4	53 41.8	97 12	64.2	54 11.0	97 12	64.0	54 40.2	97 12	63.8	56 07.6	97 12	63.2	56 36.7	97 12	63.0	105
6	51 37.2	98 13	64.0	52 06.5	98 13	63.9	53 05.0	98 12	63.5	53 34.3	97 12	63.3	54 03.5	97 12	63.1	54 32.7	97 12	62.9	56 00.0	97 12	62.3	56 29.3	97 12	62.1	6
7	51 29.8	98 13	63.1	51 59.1	98 12	63.0	52 57.6	98 12	62.6	53 26.9	97 12	62.4	53 56.1	97 12	62.2	54 25.3	97 12	62.0	55 52.8	97 12	61.4	56 22.0	97 12	61.2	7
8	51 22.3	98 12	62.2	51 51.6	98 12	62.0	52 50.2	98 12	61.7	53 19.5	98 12	61.5	53 48.7	97 12	61.3	54 18.0	97 12	61.1	55 45.5	97 12	60.5	56 14.7	97 12	60.3	8
9	51 15.0	98 12	61.3	51 44.3	98 12	61.1	52 42.9	98 12	60.8	53 12.2	98 12	60.6	53 41.4	97 12	60.4	54 11.7	97 12	60.2	55 38.3	97 12	59.6	56 07.4	97 12	59.4	9
110	51 07.7	98 12	60.4	51 37.0	98 12	60.2	52 35.6	98 12	59.9	53 04.9	98 12	59.7	53 34.2	98 12	59.5	54 03.5	97 12	59.3	55 31.1	97 12	58.7	56 00.3	97 12	58.5	110
1	51 00.5	98 12	59.5	51 29.8	98 12	59.3	52 28.5	98 12	59.0	52 57.8	98 12	58.8	53 27.0	98 12	58.6	53 56.3	98 12	58.4	55 24.0	97 12	57.9	55 53.2	97 12	57.7	1
2	50 53.3	98 12	58.6	51 22.7	98 12	58.4	52 21.3	98 12	58.1	52 50.6	98 12	57.9	53 19.9	98 12	57.7	53 49.2	98 12	57.6	55 17.0	97 12	57.0	55 46.2	97 12	56.8	2
3	50 46.2	98 12	57.7	51 15.6	98 12	57.5	52 14.3	98 12	57.2	52 43.6	98 12	57.0	53 12.9	98 12	56.8	53 42.2	98 12	56.7	55 10.0	97 11	56.1	55 39.2	97 11	55.9	3
4	50 39.2	98 12	56.8	51 08.6	98 12	56.6	52 07.3	98 12	56.3	52 36.6	98 12	56.1	53 06.0	98 11	56.0	53 35.3	98 11	55.8	55 03.1	98 11	55.2	55 32.4	97 11	55.0	4
115	50 32.2	98 11	55.9	51 01.6	98 11	55.7	52 00.4	98 11	55.4	52 29.7	98 11	55.2	52 59.1	98 11	55.1	53 28.4	98 11	54.9	54 56.3	98 11	54.3	55 25.5	97 11	54.2	115
6	50 25.4	98 11	55.0	50 54.8	98 11	54.8	51 53.5	98 11	54.5	52 22.9	98 11	54.4	52 52.3	98 11	54.2	53 21.6	98 11	54.0	54 49.5	98 11	53.5	55 18.8	98 11	53.3	6
7	50 18.6	98 11	54.1	50 48.0	98 11	54.0	51 46.8	98 11	53.6	52 16.2	98 11	53.5	52 45.5	98 11	53.3	53 14.9	98 11	53.1	54 42.9	98 11	52.6	55 12.2	98 11	52.4	7
8	50 11.8	98 11	53.2	50 41.3	98 11	53.1	51 40.1	98 11	52.8	52 09.5	98 11	52.6	52 38.9	98 11	52.4	53 08.3	98 11	52.3	54 36.3	98 11	51.7	55 05.6	98 11	51.5	8
9	50 05.2	98 11	52.3	50 34.6	98 11	52.2	51 33.4	98 11	51.9	52 02.8	98 11	51.7	52 32.3	98 11	51.6	53 01.7	98 11	51.4	54 29.8	98 11	50.9	54 59.1	98 11	50.7	9
120	49 58.6	98 11	51.4	50 28.1	98 11	51.3	51 27.0	98 11	51.0	51 56.4	98 11	50.8	52 25.8	98 11	50.7	52 55.2	98 11	50.5	54 23.3	98 10	50.0	54 52.7	98 11	49.8	120
1	49 52.1	98 11	50.6	50 21.6	98 11	50.4	51 20.5	98 11	50.1	51 50.0	98 11	50.0	52 19.4	98 11	49.8	52 48.8	98 11	49.6	54 17.0	98 10	49.1	54 46.3	98 10	49.0	1
2	49 45.7	98 11	49.7	50 15.2	98 11	49.5	51 14.1	98 10	49.2	51 43.6	98 10	49.1	52 13.0	98 10	48.9	52 42.5	98 10	48.8	54 10.7	98 10	48.3	54 40.1	98 10	48.1	2
3	49 39.4	98 10	48.8	50 08.9	98 10	48.6	51 07.9	98 10	48.4	51 37.3	98 10	48.2	52 06.8	98 10	48.1	52 36.2	98 10	47.9	54 04.5	98 10	47.4	54 33.9	98 10	47.2	3
4	49 33.1	98 10	47.9	50 02.7	98 10	47.8	51 01.7	98 10	47.5	51 31.1	98 10	47.3	52 00.6	98 10	47.2	52 30.1	98 10	47.0	53 58.4	98 10	46.5	54 27.8	98 10	46.4	4
125	49 27.0	98 10	47.0	49 56.5	98 10	46.9	50 55.6	98 10	46.6	51 25.1	98 10	46.5	51 54.5	98 10	46.3	52 24.0	98 10	46.2	53 52.4	98 10	45.7	54 21.8	98 10	45.5	125
6	49 20.9	98 10	46.2	49 50.5	98 10	46.0	50 49.5	98 10	45.7	51 19.0	98 10	45.6	51 48.5	98 10	45.5	52 18.0	98 10	45.3	53 46.4	98 10	44.8	54 15.9	98 10	44.7	6
7	49 14.9	99 10	45.3	49 44.5	99 10	45.1	50 43.6	98 10	44.9	51 13.1	98 10	44.7	51 42.6	98 10	44.6	52 12.1	98 10	44.4	53 40.6	98 10	44.0	54 10.1	98 10	43.8	7
8	49 09.1	99 10	44.4	49 38.6	99 10	44.3	50 37.7	98 10	44.0	51 07.3	98 10	43.9	51 36.8	98 10	43.7	52 06.3	98 10	43.6	53 34.8	98 09	43.1	54 04.3	98 09	43.0	8
9	49 03.3	99 10	43.5	49 32.8	99 10	43.4	50 32.0	99 09	43.1	51 01.5	99 09	43.0	51 31.1	98 09	42.9	52 00.6	98 09	42.7	53 29.2	98 09	42.3	53 58.7	98 09	42.2	9
130	48 57.6	99 09	42.6	49 27.2	99 09	42.5	50 26.3	99 09	42.3	50 55.9	99 09	42.1	51 25.5	99 09	42.0	51 55.0	98 09	41.9	53 23.6	98 09	41.4	53 53.1	98 09	41.3	130
1	48 51.9	99 09	41.8	49 21.6	99 09	41.7	50 20.8	99 09	41.4	50 50.3	99 09	41.3	51 19.9	99 09	41.1	51 49.5	99 09	41.0	53 18.1	98 09	40.6	53 47.7	98 09	40.4	1
2	48 46.4	99 09	40.9	49 16.1	99 09	40.8	50 15.3	99 09	40.5	50 44.9	99 09	40.4	51 14.5	99 09	40.3	51 44.1	99 09	40.1	53 12.8	98 09	39.7	53 42.3	98 09	39.6	2
3	48 41.0	99 09	40.0	49 10.7	99 09	39.9	50 09.9	99 09	39.7	50 39.5	99 09	39.6	51 09.1	99 09	39.4	51 38.7	99 09	39.3	53 07.5	98 09	38.9	53 37.0	99 09	38.7	3
4	48 35.7	99 09	39.2	49 05.3	99 09	39.1	50 04.6	99 09	38.8	50 34.2	99 09	38.7	51 03.9	99 09	38.6	51 33.5	99 09	38.4	53 02.3	99 08	38.0	53 31.8	99 08	37.8	4
135	48 30.5	99 09	38.3	49 00.1	99 09	38.2	49 59.4	99 08	38.0	50 29.1	99 08	37.8	50 58.7	99 08	37.7	51 28.3	99 08	37.6	52 57.2	99 08	37.2	53 26.8	99 08	37.1	135
6	48 25.3	99 08	37.4	48 55.0	99 08	37.3	49 54.4	99 08	37.1	50 24.0	99 08	37.0	50 53.7	99 08	36.9	51 23.3	99 08	36.7	52 52.2	99 08	36.3	53 21.8	99 08	36.2	6
7	48 20.3	99 08	36.6	48 50.0	99 08	36.5	49 49.4	99 08	36.2	50 19.0	99 08	36.1	50 48.7	99 08	36.0	51 18.4	99 08	35.9	52 47.3	99 08	35.5	53 16.9	99 08	35.4	7
8	48 15.4	99 08	35.7	48 45.1	99 08	35.6	49 44.5	99 08	35.4	50 14.2	99 08	35.3	50 43.8	99 08	35.2	51 13.5	99 08	35.0	52 42.5	99 08	34.7	53 12.1	99 08	34.5	8
9	48 10.6	99 08	34.8	48 40.3	99 08	34.7	49 39.7	99 08	34.5	50 09.4	99 08	34.4	50 39.1	99 08	34.3	51 08.8	99 08	34.2	52 37.8	99 08	33.8	53 07.4	99 08	33.7	9
140	48 05.8	99 08	34.0	48 35.6	99 08	33.9	49 35.0	99 08	33.7	50 04.7	99 08	33.6	50 34.4	99 08	33.5	51 04.1	99 08	33.3	52 33.2	99 08	33.0	53 02.8	99 07	32.9	140
1	48 01.2	99 08	33.1	48 31.0	99 07	33.0	49 30.4	99 07	32.8	50 00.2	99 07	32.7	50 29.9	99 07	32.6	50 59.6	99 07	32.5	52 28.7	99 07	32.2	52 58.4	99 07	32.0	1
2	47 56.7	99 07	32.3	48 26.5	99 07	32.2	49 26.0	99 07	32.0	49 55.7	99 07	31.9	50 25.4	99 07	31.8	50 55.2	99 07	31.6	52 24.3	99 07	31.3	52 54.0	99 07	31.2	2
3	47 52.3	99 07	31.4	48 22.1	99 07	31.3	49 21.6	99 07	31.1	49 51.3	99 07	31.0	50 21.1	99 07	30.9	50 50.8	99 07	30.8	52 20.0	99 07	30.5	52 49.7	99 07	30.4	3
4	47 48.0	99 07	30.5	48 17.8	99 07	30.4	49 17.3	99 07	30.3	49 47.1	99 07	30.2	50 16.8	99 07	30.1	50 46.6	99 07	30.0	52 15.8	99 07	29.6	52 45.5	99 07	29.5	4
145	47 43.8	99 07	29.7	48 13.6	99 07	29.6	49 13.2	99 07	29.4	49 43.0	99 07	29.3	50 12.7	99 07	29.2	50 42.5	99 07	29.1	52 11.7	99 07	28.8	52 41.5	99 07	28.7	145
6	47 39.8	99 07	28.8	48 09.6	99 07	28.7	49 09.1	99 07	28.6	49 38.9	99 07	28.5	50 08.7	99 07	28.4	50 38.5	99 06	28.3	52 07.8	99 06	28.0	52 37.5	99 06	27.9	6
7	47 35.8	99 06	28.0	48 05.6	99 06	27.9	49 05.2	99 06	27.7	49 35.0	99 06	27.6	50 04.8	99 06	27.5	50 34.6	99 06	27.4	52 03.9	99 06	27.1	52 33.7	99 06	27.0	7
8	47 31.9	99 06	27.1	48 01.7	99 06	27.0	49 01.4	99 06	26.9	49 31.2	99 06	26.8	50 01.0	99 06	26.7	50 30.8	99 06	26.6	52 00.0	99 06	26.3	52 29.9	99 06	26.2	8
9	47 28.2	99 06	26.3	47 58.0	99 06	26.2	48 57.6	99 06	26.0	49 27.5	99 06	25.9	49 57.3	99 06	25.8	50 27.1	99 06	25.8	51 56.5	99 06	25.5	52 26.3	99 06	25.4	9
150	47 24.5	99 06	25.4	47 54.4	99 06	25.3	48 54.0	99 06	25.2	49 23.9	99 06	25.1	49 53.7	99 06	25.0	50 23.5	99 06	24.9	51 53.0	99 06	24.7	52 22.8	99 06	24.6	150
1	47 21.0	1.00 06	24.6	47 50.9	99 06	24.5	48 50.5	99 06	24.3	49 20.4	99 06	24.2	49 50.2	99 06	24.2	50 20.1	99 06	24.1	51 49.5	99 06	23.8	52 19.4	99 06	23.7	1
2	47 17.6	1.00 06	23.7	47 47.5	1.00 05	23.6	48 47.2	1.00 05	23.5	49 17.0	99 05	23.4	49 46.9	99 05	23.3	50 16.7	99 05	23.2	51 46.2	99 05	23.0	52 16.0	99 05	22.9	2
3	47 14.3	1.00 05	22.8	47 44.2	1.00 05	22.8	48 43.9	1.00 05	22.6	49 13.8	1.00 05	22.6	49 43.6	1.00 05	22.5	50 13.5	1.00 05	22.4	51 43.0	99 05	22.2	52 12.9	99 05	22.1	3
4	47 11.1	1.00 05	22.0	47 41.0	1.00 05	21.9	48 40.7	1.00 05	21.8	49 10.6	1.00 05	21.7	49 40.5	1.00 05	21.7	50 10.3	1.00 05	21.6	51 39.9	1.00 05	21.3	52 09.8	1.00 05	21.3	4
155	47 08.0	1.00 05	21.1	47 37.9	1.00 05	21.1	48 37.7	1.00 05	21.0	49 07.6	1.00 05	20.9	49 37.4	1.00 05	20.8	50 07.3	1.00 05	20.7	51 36.9	1.00 05	20.5	52 06.8	1.00 05	20.4	155
6	47 05.1	1.00 05	20.3	47 35.0	1.00 05	20.2	48 34.8	1.00 05	20.1	49 04.7	1.00 05	20.0	49 34.5	1.00 05	20.0	50 04.4	1.00 05	19.9	51 34.1	1.00 05	19.7	52 03.9	1.00 05	19.6	6
7	47 02.2	1.00 05	19.4	47 32.1	1.00 05	19.4	48 32.0	1.00 04	19.3	49 01.8	1.00 04	19.2	49 31.7	1.00 04	19.1	50 01.6	1.00 04	19.1	51 31.3	1.00 04	18.9	52 01.2	1.00 04	18.8	7
8	46 59.5	1.00 04	18.6	47 29.4	1.00 04	18.5	48 29.3	1.00 04	18.4	48 59.2	1.00 04	18.4	49 29.1	1.00 04	18.3	49 59.0	1.00 04	18.2	51 28.7	1.00 04	18.0	51 58.6	1.00 04	18.0	8
9	46 56.9	1.00 04	17.7	47 26.8	1.00 04	17.7	48 26.7	1.00 04	17.6	48 56.6	1.00 04	17.5	49 26.5	1.00 04	17.5	49 56.4	1.00 04	17.4	51 26.1	1.00 04	17.2	51 56.0	1.00 04	17.2	9
160	46 54.4	1.00 04	16.9	47 24.4	1.00 04	16.8	48 24.2	1.00 04	16.7	48 54.1	1.00 04	16.7	49 24.0	1.00 04	16.6	49 54.0	1.00 04	16.6	51 23.7	1.00 04	16.4	51 53.6	1.00 04	16.3	160
1	46 52.1	1.00 04	16.1	47 22.0	1.00 04	16.0	48 21.9	1.00 04	15.9	48 51.8	1.00 04	15.9	49 21.7	1.00 04	15.8	49 51.6	1.00 04	15.7	51 21.4	1.00 04	15.6	51 51.3	1.00 04	15.5	1
2	46 49.8	1.00 04	15.2	47 19.8	1.00 04	15.2	48 19.6	1.00 04	15.1	48 49.6	1.00 04	15.0	49 19.5	1.00 04	15.0	49 49.4	1.00 03	14.9	51 19.2	1.00 03	14.8	51 49.2	1.00 03	14.7	2
3	46 47.7	1.00 03	14.4	47 17.6	1.00 03	14.3	48 17.5	1.00 03	14.2	48 47.5	1.00 03	14.2	49 17.4	1.00 03	14.1	49 47.3	1.00 03	14.1	51 17.2	1.00 03	13.9	51 47.1	1.00 03	13.9	3
4	46 45.7	1.00 03	13.5	47 15.6	1.00 03	13.5	48 15.5	1.00 03	13.4	48 45.5	1.00 03	13.3	49 15.4	1.00 03	13.3	49 45.4	1.00 03	13.3	51 15.2	1.00 03	13.1	51 45.2	1.00 03	13.1	4
165	46 43.8	1.00 03	12.7	47 13.7	1.00 03	12.6	48 13.7	1.00 03	12.5	48 43.6	1.00 03	12.5	49 13.6	1.00 03	12.5	49 43.5	1.00 03	12.4	51 13.4	1.00 03	12.3	51 43.3	1.00 03	12.2	165
6	46 42.0	1.00 03	11.8	47 12.0	1.00 03	11.8	48 11.9	1.00 03	11.7	48 41.9	1.00 03	11.7	49 11.8	1.00 03	11.6	49 41.8	1.00 03	11.6	51 11.7	1.00 03	11.5	51 41.6	1.00 03	11.4	6
7	46 40.4	1.00 03	11.0	47 10.3	1.00 03	10.9	48 10.3	1.00 03	10.9	48 40.2	1.00 03	10.8	49 10.2	1.00 02	10.8	49 40.2	1.00 02	10.8	51 10.1	1.00 02	10.6	51 40.0	1.00 02	10.6	7
8	46 38.8	1.00 02	10.1	47 08.8	1.00 02	10.1	48 08.8	1.00 02	10.0	48 38.7	1.00 02	10.0	49 08.7	1.00 02	10.0	49 38.7	1.00 02	09.9	51 08.6	1.00 02	09.8	51 38.5	1.00 02	09.8	8
9	46 37.4	1.00 02	09.3	47 07.4	1.00 02	09.3	48 07.4	1.00 02	09.2	48 37.3	1.00 02	09.2	49 07.3	1.00 02	09.1	49 37.3	1.00 02	09.1	51 07.2	1.00 02	09.0	51 37.2	1.00 02	09.0	9
170	46 36.1	1.00 02	08.4	47 06.1	1.00 02	08.4	48 06.1	1.00 02	08.4	48 36.1	1.00 02	08.3	49 06.0	1.00 02	08.3	49 36.0	1.00 02	08.3	51 06.0	1.00 02	08.2	51 35.9	1.00 02	08.2	170
1	46 35.0	1.00 02	07.6	47 05.0	1.00 02	07.6	48 04.9	1.00 02	07.5	48 34.9	1.00 02	07.5	49 04.9	1.00 02	07.5	49 34.9	1.00 02	07.4	51 04.8	1.00 02	07.4	51 34.8	1.00 02	07.3	1
2	46 33.9	1.00 02	06.8	47 03.9	1.00 02	06.7	48 03.9	1.00 01	06.7	48 33.9	1.00 01	06.7	49 03.9	1.00 02	06.6	49 33.9	1.00 02	06.6	51 03.8	1.00 01	06.5	51 33.8	1.00 01	06.5	2
3	46 33.0	1.00 01	05.9	47 03.0	1.00 01	05.9	48 03.0	1.00 01	05.8	48 33.0	1.00 01	05.8	49 03.0	1.00 01	05.8	49 33.0	1.00 01	05.8	51 02.9	1.00 01	05.7	51 32.9	1.00 01	05.7	3
4	46 32.2	1.00 01	05.1	47 02.2	1.00 01	05.0	48 02.2	1.00 01	05.0	48 32.2	1.00 01	05.0	49 02.2	1.00 01	05.0	49 32.2	1.00 01	05.0	51 02.1	1.00 01	04.9	51 32.1	1.00 01	04.9	4
175	46 31.5	1.00 01	04.2	47 01.5	1.00 01	04.2	48 01.5	1.00 01	04.2	48 31.5	1.00 01	04.2	49 01.5	1.00 01	04.2	49 31.5	1.00 01	04.1	51 01.5	1.00 01	04.1	51 31.5	1.00 01	04.1	175
6	46 31.0	1.00 01	03.4	47 01.0	1.00 01	03.4	48 01.0	1.00 01	03.3	48 31.0	1.00 01	03.3	49 01.0	1.00 01	03.3	49 31.0	1.00 01	03.3	51 01.0	1.00 01	03.3	51 31.0	1.00 01	03.3	6
7	46 30.6	1.00 00	02.5	47 00.6	1.00 00	02.5	48 00.5	1.00 00	02.5	48 30.5	1.00 00	02.5	49 00.5	1.00 00	02.5	49 30.5	1.00 00	02.5	51 00.5	1.00 00	02.5	51 30.5	1.00 00	02.5	7
8	46 30.2	1.00 00	01.7	47 00.2	1.00 00	01.7	48 00.2	1.00 00	01.7	48 30.2	1.00 00	01.7	49 00.2	1.00 00	01.7	49 30.2	1.00 00	01.7	51 00.2	1.00 00	01.6	51 30.2	1.00 00	01.6	8
9	46 30.1	1.00 00	00.8	47 00.1	1.00 00	00.8	48 00.1	1.00 00	00.8	48 30.1	1.00 00	00.8	49 00.1	1.00 00	00.8	49 30.1	1.00 00	00.8	51 00.1	1.00 00	00.8	51 30.1	1.00 00	00.8	9
180	46 30.0	1.00 00	00.0	47 00.0	1.00 00	00.0	48 00.0	1.00 00	00.0	48 30.0	1.00 00	00.0	49 00.0	1.00 00	00.0	49 30.0	1.00 00	00.0	51 00.0	1.00 00	00.0	51 30.0	1.00 00	00.0	180

H.A.	60°00' Alt	Δd Δt	Az	60°30' Alt	Δd Δt	Az	62°00' Alt	Δd Δt	Az	62°30' Alt	Δd Δt	Az	63°00' Alt	Δd Δt	Az	69°00' Alt	Δd Δt	Az	69°30' Alt	Δd Δt	Az	74°30' Alt	Δd Δt	Az	H.A.
00	68 00.0	1.00 00	180.0	68 30.0	1.00 00	180.0	70 00.0	1.00 00	180.0	70 30.0	1.00 00	180.0	71 00.0	1.00 00	180.0	77 00.0	1.00 00	180.0	77 30.0	1.00 00	180.0	82 30.0	1.00 00	180.0	00
1	67 59.9	1.00 00	178.7	68 29.9	1.00 00	178.7	69 59.9	1.00 00	178.6	70 29.9	1.00 00	178.6	70 59.9	1.00 00	178.4	76 59.9	1.00 00	178.4	77 29.9	1.00 01	178.4	82 29.8	1.00 01	178.0	1
2	67 59.6	1.00 01	177.3	68 29.6	1.00 01	177.3	69 59.6	1.00 01	177.3	70 29.6	1.00 01	177.2	70 59.6	1.00 01	176.8	76 59.5	1.00 01	176.8	77 29.5	1.00 01	176.8	82 29.4	1.00 02	175.9	2
3	67 59.1	1.00 01	176.0	68 29.1	1.00 01	176.0	69 59.1	1.00 01	175.9	70 29.1	1.00 01	175.9	70 59.1	1.00 01	175.8	76 59.0	1.00 01	175.2	77 28.9	1.00 01	175.1	82 28.7	1.00 02	173.9	3
4	67 58.4	1.00 01	174.7	68 28.4	1.00 01	174.6	69 58.4	1.00 02	174.5	70 28.4	1.00 02	174.5	70 58.4	1.00 02	174.4	76 58.1	1.00 02	173.6	77 28.1	1.00 02	173.5	82 27.6	1.00 02	171.8	4
05	67 57.6	1.00 02	173.3	68 27.6	1.00 02	173.3	69 57.5	1.00 02	173.1	70 27.5	1.00 02	173.1	70 57.5	1.00 02	173.0	76 57.1	1.00 02	172.0	77 27.1	1.00 02	171.9	82 26.3	1.00 03	169.8	05
6	67 56.5	1.00 02	172.0	68 26.5	1.00 02	171.9	69 56.4	1.00 02	171.8	70 26.4	1.00 02	171.7	70 56.4	1.00 02	171.6	76 55.8	1.00 02	170.5	77 25.8	1.00 03	170.3	82 24.7	99 04	167.8	6
7	67 55.2	1.00 02	170.7	68 25.2	1.00 02	170.6	69 55.1	1.00 02	170.4	70 25.1	1.00 02	170.3	70 55.0	1.00 03	170.3	76 54.3	1.00 03	168.9	77 24.2	1.00 03	168.7	82 22.8	99 04	165.8	7
8	67 53.8	1.00 03	169.3	68 23.8	1.00 03	169.3	69 53.6	1.00 03	169.0	70 23.6	1.00 03	169.0	70 53.5	1.00 03	168.9	76 52.6	1.00 03	167.3	77 22.5	1.00 03	167.1	82 20.6	99 04	163.8	8
9	67 52.2	1.00 03	168.0	68 22.1	1.00 03	167.9	69 51.9	1.00 03	167.7	70 21.9	1.00 03	167.6	70 51.8	1.00 03	167.5	76 50.7	1.00 04	165.7	77 20.5	1.00 04	165.5	82 18.1	99 05	161.8	9
10	67 50.3	1.00 03	166.7	68 20.3	1.00 03	166.6	69 50.1	1.00 03	166.3	70 20.0	1.00 03	166.2	70 49.9	1.00 04	166.1	76 48.5	99 04	164.2	77 18.3	99 04	163.9	82 15.4	98 05	159.9	10
1	67 48.3	1.00 04	165.4	68 18.2	1.00 04	165.3	69 48.0	1.00 04	165.0	70 17.7	1.00 04	164.8	70 47.8	1.00 04	164.7	76 46.1	99 04	162.6	77 15.9	99 04	162.4	82 12.4	98 05	157.9	1
2	67 46.1	1.00 04	164.1	68 16.0	1.00 04	163.9	69 45.7	1.00 04	163.6	70 15.6	1.00 04	163.5	70 45.5	1.00 04	163.4	76 43.5	99 05	161.1	77 13.3	99 05	160.8	82 09.1	98 06	156.0	2
3	67 43.7	1.00 04	162.7	68 13.6	1.00 04	162.6	69 43.3	1.00 04	162.3	70 13.2	1.00 04	162.1	70 43.0	1.00 04	162.0	76 40.7	99 05	159.5	77 10.4	99 05	159.2	82 05.6	97 06	154.1	3
4	67 41.2	1.00 05	161.4	68 11.0	1.00 05	161.3	69 40.6	1.00 05	160.9	70 10.5	1.00 05	160.8	70 40.3	1.00 05	160.6	76 37.7	99 05	158.0	77 07.3	99 05	157.7	82 01.8	97 07	152.2	4
15	67 38.4	1.00 05	160.0	68 08.3	99 05	159.6	69 37.8	99 05	159.4	70 07.7	99 05	159.3	70 37.5	99 05	159.3	76 34.4	99 06	156.5	77 04.1	99 06	156.1	81 57.8	97 07	150.4	15
6	67 35.5	99 05	158.7	68 05.3	99 05	158.7	69 34.8	99 05	158.2	70 04.6	99 05	158.1	70 34.4	99 05	157.9	76 31.0	99 06	154.9	77 00.6	99 06	154.6	81 53.5	96 07	148.5	6
7	67 32.4	99 05	157.5	68 02.2	99 06	157.4	69 31.6	99 06	156.9	70 01.4	99 06	156.7	70 31.2	99 06	156.5	76 27.4	98 06	153.4	76 56.9	98 06	153.0	81 49.0	96 07	146.7	7
8	67 29.1	99 06	156.2	67 58.9	99 06	156.1	69 28.3	99 06	155.6	69 58.0	99 06	155.4	70 27.8	99 06	155.2	76 23.5	98 07	151.9	76 53.0	98 07	151.5	81 44.4	95 08	144.9	8
9	67 25.6	99 06	154.9	67 55.4	99 06	154.8	69 24.7	99 06	154.2	69 54.5	99 06	154.0	70 24.2	99 06	153.9	76 19.5	98 07	150.4	76 48.9	98 07	150.0	81 39.4	95 08	143.2	9
20	67 22.0	99 06	153.6	67 51.8	99 06	153.5	69 21.0	99 07	152.7	69 50.7	99 07	152.7	70 20.4	99 07	152.7	76 15.3	98 07	148.9	76 44.7	98 07	148.5	81 34.3	95 09	141.4	20
1	67 18.2	99 07	152.3	67 48.0	99 07	152.2	69 17.1	99 07	151.6	69 46.8	99 07	151.4	70 16.5	99 07	151.2	76 10.9	98 08	147.5	76 40.2	98 08	147.0	81 29.0	94 09	139.7	1
2	67 14.3	99 07	151.0	67 44.0	99 07	150.9	69 13.1	99 07	150.3	69 42.7	99 07	150.1	70 12.4	99 07	149.9	76 06.3	98 08	146.0	76 35.6	98 08	145.5	81 23.6	94 09	138.0	2
3	67 10.1	99 07	149.8	67 39.8	99 07	149.6	69 08.8	99 07	149.0	69 38.5	99 07	148.8	70 08.1	99 07	148.5	76 01.6	97 08	144.6	76 30.8	97 08	144.1	81 17.9	93 10	136.4	3
4	67 05.8	99 07	148.5	67 35.5	99 07	148.3	69 04.5	99 08	147.7	69 34.1	99 08	147.5	70 03.7	99 08	147.2	75 56.6	97 08	143.1	76 25.8	97 09	142.6	81 12.0	93 10	134.7	4
25	67 01.4	99 08	147.2	67 31.1	99 08	147.0	68 59.9	99 08	146.4	69 29.5	99 08	146.2	69 59.1	99 08	145.9	75 51.5	97 09	141.2	76 20.6	97 09	141.2	81 06.0	92 10	133.1	25
6	66 56.8	99 08	146.0	67 26.4	99 08	145.8	68 55.2	98 08	145.1	69 24.7	98 08	144.9	69 54.3	98 08	144.6	75 46.3	97 09	140.3	76 15.3	97 09	139.7	80 59.6	92 11	131.5	6
7	66 52.1	99 08	144.7	67 21.7	99 08	144.5	68 50.4	98 08	143.8	69 19.9	98 08	143.6	69 49.4	98 08	143.3	75 40.9	97 09	138.9	76 09.8	96 09	138.3	80 53.5	92 11	130.0	7
8	66 47.2	99 08	143.5	67 16.7	99 08	143.2	68 45.3	98 09	142.5	69 14.8	98 09	142.3	69 44.3	98 09	142.0	75 35.3	96 10	137.5	76 04.2	96 10	136.9	80 47.0	91 11	128.4	8
9	66 42.1	99 09	142.2	67 11.7	99 08	142.0	68 40.2	98 09	141.3	69 09.7	98 09	141.0	69 39.1	98 09	140.7	75 29.6	96 10	136.0	75 58.4	96 10	135.5	80 40.4	91 11	126.9	9
30	66 36.9	98 09	141.0	67 06.4	98 09	140.7	68 34.9	98 09	140.0	69 04.3	98 09	139.7	69 33.8	98 09	139.5	75 23.7	96 10	134.7	75 52.5	96 10	134.1	80 33.7	91 11	125.4	30
1	66 31.6	98 09	139.7	67 01.1	98 09	139.5	68 29.5	98 09	138.7	68 58.9	98 09	138.5	69 28.2	98 09	138.2	75 17.7	96 10	133.4	75 46.4	96 10	132.8	80 26.8	90 12	124.0	1
2	66 26.1	98 09	138.5	66 55.6	98 09	138.3	68 23.9	98 10	137.5	68 53.3	98 10	137.2	69 22.6	98 10	136.9	75 11.6	96 10	132.0	75 40.3	95 11	131.4	80 19.8	90 12	122.5	2
3	66 20.5	98 10	137.3	66 50.0	98 10	137.0	68 18.2	98 10	136.2	68 47.5	98 10	136.0	69 16.8	98 10	135.7	75 05.3	96 11	130.7	75 33.9	95 11	130.1	80 12.7	90 12	121.1	3
4	66 14.8	98 10	136.0	66 44.2	98 10	135.8	68 12.3	98 10	135.0	68 41.7	98 10	134.7	69 10.9	98 10	134.4	74 58.9	95 11	129.3	75 27.5	95 11	128.7	80 05.5	90 12	119.7	4
35	66 08.9	98 10	134.8	66 38.3	98 10	134.6	68 06.4	98 10	133.8	68 35.7	98 10	133.5	69 04.9	97 10	133.2	74 52.4	95 11	128.0	75 20.9	95 11	127.4	79 58.2	89 12	118.3	35
6	66 02.9	98 10	133.6	66 32.3	98 10	133.4	68 00.3	98 10	132.5	68 29.5	97 10	132.2	68 58.8	97 10	131.9	74 45.8	95 11	126.7	75 14.2	95 11	126.1	79 50.8	89 12	117.0	6
7	65 56.8	98 10	132.4	66 26.2	98 10	132.2	67 54.1	97 11	131.3	68 23.3	97 11	131.0	68 52.5	97 11	130.7	74 39.0	95 11	125.4	75 07.4	95 12	124.8	79 43.4	88 13	115.7	7
8	65 50.6	98 11	131.2	66 19.9	98 11	131.0	67 47.7	97 11	130.1	68 16.9	97 11	129.8	68 46.1	97 11	129.4	74 32.1	95 12	124.2	75 00.5	94 12	123.5	79 35.8	88 13	114.3	8
9	65 44.3	98 11	130.0	66 13.6	98 11	129.8	67 41.3	97 11	128.9	68 10.5	97 11	128.6	68 39.6	97 11	128.3	74 25.2	94 12	122.9	74 53.5	94 12	122.3	79 28.1	88 13	113.0	9
40	65 37.8	98 11	128.8	66 07.1	98 11	128.6	67 34.7	97 11	127.7	68 03.9	97 11	127.4	68 33.0	97 11	127.1	74 18.1	94 12	121.6	74 46.4	94 12	121.0	79 20.4	88 13	111.8	40
1	65 31.3	98 11	127.7	66 00.5	97 11	127.4	67 28.1	97 11	126.5	67 57.2	97 11	126.2	68 26.3	97 11	125.9	74 11.0	94 12	120.4	74 39.2	94 12	119.8	79 12.6	87 13	110.5	1
2	65 24.6	97 11	126.5	65 53.8	97 11	126.2	67 21.3	97 11	125.3	67 50.4	97 11	125.0	68 19.5	97 12	124.7	74 03.7	94 12	119.2	74 31.9	94 12	118.5	79 04.8	87 13	109.3	2
3	65 17.8	97 11	125.4	65 47.0	97 11	125.0	67 14.5	97 12	124.1	67 43.5	97 12	123.8	68 12.5	97 12	123.5	73 56.4	94 12	117.9	74 24.5	94 12	117.3	78 56.9	87 13	108.1	3
4	65 11.0	97 12	124.2	65 40.2	97 12	123.9	67 07.5	97 12	122.9	67 36.5	97 12	122.6	68 05.5	97 12	122.3	73 49.0	94 12	116.7	74 17.0	93 13	116.1	78 48.9	86 14	106.9	4
45	65 04.0	97 12	123.0	65 33.2	97 12	122.7	67 00.4	97 12	121.8	67 29.5	97 12	121.5	67 58.4	96 12	121.1	73 41.5	94 13	115.5	74 09.5	93 13	114.9	78 40.9	87 13	105.7	45
6	64 57.0	97 12	121.8	65 26.1	97 12	121.6	66 53.3	97 12	120.6	67 22.3	97 12	120.3	67 51.2	96 12	120.0	73 33.9	93 13	114.3	74 01.9	93 13	113.7	78 32.8	86 14	104.5	6
7	64 49.8	97 12	120.7	65 19.0	97 12	120.4	66 46.1	97 12	119.5	67 15.0	96 12	119.2	67 44.0	96 12	118.8	73 26.3	93 13	113.2	73 54.2	93 13	112.5	78 24.7	86 14	103.3	7
8	64 42.6	97 12	119.6	65 11.7	97 12	119.3	66 38.8	97 12	118.3	67 07.7	96 12	118.0	67 36.6	96 12	117.7	73 18.5	93 13	112.0	73 46.5	93 13	111.3	78 16.6	86 14	102.2	8
9	64 35.3	97 12	118.4	65 04.4	97 12	118.1	66 31.4	96 12	117.2	67 00.3	96 12	116.9	67 29.2	96 13	116.5	73 10.8	93 13	110.8	73 38.7	93 13	110.2	78 08.4	86 14	101.1	9
50	64 27.9	97 12	117.3	64 57.0	97 12	117.0	66 23.9	96 13	116.1	66 52.8	96 13	115.7	67 21.7	96 13	115.4	73 02.9	93 13	109.7	73 30.8	93 13	109.0	78 00.2	86 14	100.0	50
1	64 20.5	97 13	116.2	64 49.5	97 13	115.9	66 16.4	96 13	114.9	66 45.3	96 13	114.6	67 14.1	96 13	114.2	72 55.0	93 13	108.5	73 22.9	93 13	107.9	77 52.0	86 14	98.9	1
2	64 13.0	97 13	115.1	64 42.0	97 13	114.8	66 08.8	96 13	113.8	66 37.6	96 13	113.5	67 06.4	96 13	113.1	72 47.1	93 13	107.4	73 14.9	93 13	106.8	77 43.7	86 14	97.8	2
3	64 05.4	97 13	114.0	64 34.4	97 13	113.7	66 01.1	96 13	112.7	66 29.9	96 13	112.4	66 58.7	96 13	112.0	72 39.1	93 13	106.3	73 06.9	92 13	105.6	77 35.4	86 14	96.7	3
4	63 57.7	97 13	112.9	64 26.7	97 13	112.6	65 53.4	96 13	111.6	66 22.2	96 13	111.3	66 51.0	96 13	110.9	72 31.1	93 13	105.2	72 58.8	92 14	104.5	77 27.1	86 14	95.7	4
55	63 50.0	97 13	111.8	64 18.9	96 13	111.5	65 45.6	96 13	110.5	66 14.4	96 13	110.2	66 43.1	96 13	109.8	72 23.0	93 14	104.1	72 50.7	92 14	103.4	77 18.8	85 14	94.6	55
6	63 42.2	97 13	110.7	64 11.1	96 13	110.4	65 37.7	96 13	109.4	66 06.5	96 13	109.1	66 35.2	96 13	108.7	72 14.9	92 14	103.0	72 42.6	92 14	102.4	77 10.5	85 14	93.6	6
7	63 34.3	96 13	109.6	64 03.3	96 13	109.3	65 29.8	96 13	108.3	65 58.6	96 13	108.0	66 27.3	96 13	107.6	72 06.7	92 14	101.9	72 34.4	92 14	101.3	77 02.1	85 14	92.6	7
8	63 26.4	96 13	108.6	63 55.4	96 13	108.2	65 21.9	96 13	107.2	65 50.6	96 13	106.9	66 19.3	96 13	106.5	71 58.5	92 14	100.8	72 26.2	92 14	100.2	76 53.8	85 14	91.5	8
9	63 18.5	96 13	107.4	63 47.4	96 13	107.1	65 13.9	96 13	106.2	65 42.6	96 13	105.8	66 11.3	96 13	105.4	71 50.3	92 14	99.8	72 18.0	92 14	99.1	76 45.4	85 14	90.5	9
60	63 10.5	96 13	106.4	63 39.4	96 13	106.0	65 05.8	96 13	105.1	65 34.6	96 13	104.7	66 03.2	95 14	104.4	71 42.1	92 14	98.7	72 09.7	92 14	98.1	76 37.1	85 14	89.6	60
1	63 02.5	96 13	105.3	63 31.4	96 13	105.0	64 57.8	96 14	104.0	65 26.5	96 14	103.7	65 55.1	95 14	103.3	71 33.8	92 14	97.7	72 01.4	92 14	97.0	76 28.7	85 14	88.6	1
2	62 54.4	96 14	104.2	63 23.3	96 14	103.9	64 49.6	96 14	103.0	65 18.3	96 14	102.6	65 47.0	95 14	102.3	71 25.5	92 14	96.6	71 53.1	92 14	96.0	76 20.4	85 14	87.6	2
3	62 46.3	96 14	103.2	63 15.1	96 14	102.9	64 41.5	96 14	101.9	65 10.2	96 14	101.6	65 38.8	95 14	101.2	71 17.2	92 14	95.6	71 44.7	92 14	95.0	76 12.0	85 14	86.6	3
4	62 38.1	96 14	102.1	63 07.0	96 14	101.8	64 33.3	96 14	100.9	65 02.0	96 14	100.5	65 30.6	95 14	100.2	71 08.9	92 14	94.6	71 36.5	92 14	93.9	76 03.7	85 14	85.7	4
65	62 30.0	96 14	101.1	62 58.8	96 14	100.8	64 25.1	96 14	99.8	64 53.7	95 14	99.5	65 22.4	95 14	99.1	71 00.6	92 14	93.5	71 28.2	92 14	92.9	75 55.4	86 14	84.7	65
6	62 21.8	96 14	100.0	62 50.6	96 14	99.7	64 16.8	96 14	98.8	64 45.5	95 14	98.4	65 14.1	95 14	98.1	70 52.2	92 14	92.5	71 19.8	92 14	91.9	75 47.1	86 14	83.8	6
7	62 13.5	96 14	99.0	62 42.3	96 14	98.7	64 08.6	96 14	97.7	64 37.2	95 14	97.4	65 05.8	95 14	97.0	70 43.9	92 14	91.5	71 11.5	92 14	90.9	75 38.8	86 14	82.9	7
8	62 05.3	96 14	98.0	62 34.1	96 14	97.7	64 00.3	96 14	96.7	64 28.9	95 14	96.4	64 57.5	95 14	96.0	70 35.5	92 14	90.5	71 03.0	92 14	89.9	75 30.5	86 14	82.0	8
9	61 57.0	96 14	97.0	62 25.8	96 14	96.7	63 52.0	96 14	95.7	64 20.6	95 14	95.4	64 49.2	95 14	95.0	70 27.2	92 14	89.5	70 54.8	92 14	88.9	75 22.3	86 14	81.1	9
70	61 48.7	96 14	95.9	62 17.5	96 14	95.6	63 43.7	96 14	94.7	64 12.3	95 14	94.3	64 40.9	95 14	94.0	70 18.8	92 14	88.5	70 46.4	92 14	88.0	75 14.0	86 14	80.2	70
1	61 40.4	96 14	94.9	62 09.2	96 14	94.6	63 35.3	96 14	93.7	64 04.0	95 14	93.3	64 32.6	95 14	93.0	70 10.5	92 14	87.6	70 38.1	92 14	87.0	75 05.8	86 14	79.3	1
2	61 32.0	96 14	93.9	62 00.8	96 14	93.6	63 27.0	96 14	92.7	63 55.6	95 14	92.3	64 24.2	95 14	92.0	70 02.2	92 14	86.6	70 29.8	92 14	86.0	74 57.5	86 14	78.4	2
3	61 23.7	96 14	92.9	61 52.5	96 14	92.6	63 18.7	96 14	91.7	63 47.3	95 14	91.3	64 15.9	95 14	91.0	69 53.8	92 14	85.6	70 21.4	92 14	85.1	74 49.4	86 14	77.5	3
4	61 15.4	96 14	91.9	61 44.2	96 14	91.6	63 10.3	96 14	90.7	63 38.9	95 14	90.3	64 07.5	95 14	90.0	69 45.5	92 14	84.7	70 13.1	92 14	84.1	74 41.3	86 14	76.6	4
75	61 07.0	96 14	90.9	61 35.8	96 14	90.6	63 02.0	96 14	89.7	63 30.6	95 14	89.3	63 59.2	95 14	89.0	69 37.2	92 14	83.7	70 04.8	92 14	83.2	74 33.2	86 13	75.7	75
6	60 58.7	96 14	89.9	61 27.5	96 14	89.6	62 53.6	96 14	88.7	63 22.2	95 14	88.4	63 50.8	95 14	88.0	69 28.9	92 14	82.8	69 56.5	92 14	82.2	74 25.1	86 13	74.9	6
7	60 50.3	96 14	88.9	61 19.1	96 14	88.6	62 45.3	96 14	87.7	63 13.9	95 14	87.4	63 42.5	95 14	87.0	69 20.6	92 14	81.8	69 48.3	92 14	81.3	74 17.1	87 13	74.0	7
8	60 42.0	96 14	87.9	61 10.8	96 14	87.7	62 36.9	96 14	86.7	63 05.6	95 14	86.4	63 34.1	95 14	86.1	69 12.4	92 14	80.9	69 40.0	92 14	80.3	74 09.0	87 13	73.2	8
9	60 33.6	96 14	87.0	61 02.4	96 14	86.7	62 28.6	96 14	85.8	62 57.2	95 14	85.4	63 25.8	95 14	85.1	69 04.1	92 14	80.0	69 31.8	92 14	79.4	74 01.1	87 13	72.3	9
80	60 25.3	96 14	86.0	60 54.1	96 14	85.7	62 20.3	96 14	84.8	62 48.9	95 14	84.5	63 17.5	95 14	84.1	68 55.9	92 14	79.0	69 23.6	92 14	78.5	73 53.2	87 13	71.5	80
1	60 17.0	96 14	85.0	60 45.8	96 14	84.7	62 12.0	96 14	83.8	62 40.6	95 14	83.5	63 09.2	95 14	83.2	68 47.7	92 14	78.1	69 15.4	92 14	77.6	73 45.3	87 13	70.6	1
2	60 08.7	96 14	84.0	60 37.5	96 14	83.8	62 03.7	96 14	82.9	62 32.3	95 14	82.5	63 00.9	95 14	82.2	68 39.6	92 14	77.2	69 07.3	92 14	76.7	73 37.4	87 13	69.8	2
3	60 00.4	96 14	83.1	60 29.2	96 14	82.8	61 55.4	96 14	81.9	62 24.0	95 14	81.6	62 52.7	95 14	81.3	68 31.5	92 14	76.3	68 59.2	92 13	75.8	73 29.6	87 13	69.0	3
4	59 52.1	96 14	82.1	60 20.9	96 14	81.8	61 47.1	96 14	81.0	62 15.8	95 14	80.6	62 44.4	95 14	80.3	68 23.4	93 13	75.4	68 51.1	92 13	74.9	73 21.8	88 13	68.2	4
85	59 43.8	96 14	81.2	60 12.6	96 14	80.9	61 38.9	96 14	80.0	62 07.6	95 14	79.7	62 36.2	95 14	79.4	68 15.3	93 13	74.5	68 43.1	92 13	74.0	73 14.1	88 13	67.4	85
6	59 35.6	96 14	80.2	60 04.4	96 14	79.9	61 30.7	96 14	79.1	61 59.4	95 14	78.8	62 28.0	95 14	78.4	68 07.3	93 13	73.6	68 35.1	92 13	73.1	73 06.4	88 13	66.5	6
7	59 27.4	96 14	79.3	59 56.2	96 14	79.0	61 22.5	96 14	78.1	61 51.2	95 14	77.8	62 19.8	95 14	77.5	67 59.3	93 13	72.7	68 27.1	93 13	72.2	72 58.8	88 13	65.7	7
8	59 19.2	96 14	78.3	59 48.0	96 14	78.1	61 14.3	96 14	77.2	61 43.0	95 14	76.9	62 11.7	95 14	76.6	67 51.3	93 13	71.8	68 19.2	93 13	71.3	72 51.2	88 13	64.9	8
9	59 11.0	96 14	77.4	59 39.9	96 14	77.1	61 06.2	96 14	76.3	61 34.9	96 13	76.0	62 03.6	95 13	75.6	67 43.4	93 13	70.9	68 11.3	93 13	70.5	72 43.6	88 12	64.1	9
90	59 02.9	96 14	76.4	59 31.7	96 13	76.2	60 58.1	96 13	75.3	61 26.8	96 13	75.0	61 55.5	96 13	74.7	67 35.5	93 13	70.1	68 03.4	93 13	69.6	72 36.1	89 12	63.4	90

H.A.	60°00' Alt.	Δd Δt	Az.	60°30' Alt.	Δd Δt	Az.	62°00' Alt.	Δd Δt	Az.	62°30' Alt.	Δd Δt	Az.	63°00' Alt.	Δd Δt	Az.	69°00' Alt.	Δd Δt	Az.	69°30' Alt.	Δd Δt	Az.	74°30' Alt.	Δd Δt	Az.	H.A.
91	58 54.8	96 13	75.5	59 23.6	96 13	75.2	60 50.1	96 13	74.4	61 18.8	96 13	74.1	61 47.5	96 13	73.8	67 27.7	93 13	69.2	67 55.6	93 13	68.7	72 28.7	89 12	62.6	91
2	58 46.7	96 13	74.6	59 15.6	96 13	74.3	60 42.0	96 13	73.5	61 10.8	96 13	73.2	61 39.5	96 13	72.9	67 19.9	93 13	68.3	67 47.9	93 13	67.9	72 21.3	89 12	61.8	2
3	58 38.7	96 13	73.7	59 07.6	96 13	73.4	60 34.0	96 13	72.6	61 02.8	96 13	72.3	61 31.5	96 13	72.0	67 12.2	93 13	67.5	67 40.2	93 13	67.0	72 14.0	89 12	61.0	3
4	58 30.7	96 13	72.7	58 59.6	96 13	72.5	60 26.1	96 13	71.7	60 54.9	96 13	71.4	61 23.6	96 13	71.1	67 04.5	93 13	66.6	67 32.5	93 13	66.1	72 06.7	89 12	60.2	4
95	58 22.7	96 13	71.8	58 51.6	96 13	71.6	60 18.2	96 13	70.7	60 47.0	96 13	70.5	61 15.7	96 13	70.2	66 56.9	94 13	65.7	67 24.9	93 13	65.3	71 59.5	89 12	59.4	95
6	58 14.8	96 13	70.9	58 43.7	96 13	70.6	60 10.3	96 13	69.8	60 39.1	96 13	69.5	61 07.9	96 13	69.3	66 49.3	94 13	64.9	67 17.3	93 13	64.4	71 52.3	90 12	58.7	6
7	58 06.9	97 13	70.0	58 35.9	96 13	69.7	60 02.5	96 13	68.9	60 31.3	96 13	68.6	61 00.1	96 13	68.4	66 41.7	94 13	64.0	67 09.8	93 13	63.6	71 45.2	90 12	57.9	7
8	57 59.1	97 13	69.1	58 28.1	96 13	68.8	59 54.8	96 13	68.0	60 23.6	96 13	67.7	60 52.4	96 13	67.5	66 34.3	94 12	63.2	67 02.4	94 12	62.7	71 38.2	90 12	57.1	8
9	57 51.3	97 13	68.2	58 20.3	97 13	67.9	59 47.0	96 13	67.1	60 15.9	96 13	66.9	60 44.7	96 13	66.6	66 26.8	94 12	62.3	66 55.0	94 12	61.9	71 31.2	90 12	56.4	9
100	57 43.6	97 13	67.2	58 12.6	97 13	67.0	59 39.4	96 13	66.2	60 08.2	96 13	66.0	60 37.0	96 13	65.7	66 19.5	94 12	61.5	66 47.6	94 12	61.1	71 24.3	90 11	55.6	100
1	57 35.9	97 13	66.3	58 04.9	97 13	66.1	59 31.8	96 13	65.3	60 00.6	96 13	65.1	60 29.5	96 13	64.8	66 12.2	94 12	60.7	66 40.4	94 12	60.2	71 17.4	90 11	54.9	1
2	57 28.3	97 13	65.4	57 57.3	97 13	65.2	59 24.2	96 12	64.4	59 53.1	96 13	64.2	60 21.9	96 12	63.9	66 04.9	94 12	59.8	66 33.1	94 12	59.4	71 10.6	90 11	54.1	2
3	57 20.8	97 12	64.5	57 49.8	97 12	64.3	59 16.7	96 12	63.6	59 45.6	96 12	63.3	60 14.5	96 12	63.0	65 57.7	94 12	59.0	66 26.0	94 12	58.6	71 03.9	91 11	53.4	3
4	57 13.2	97 12	63.6	57 42.3	97 12	63.4	59 09.2	96 12	62.7	59 38.2	96 12	62.4	60 07.1	96 12	62.1	65 50.6	94 12	58.2	66 18.9	94 12	57.8	70 57.2	91 11	52.6	4
105	57 05.8	97 12	62.8	57 34.8	97 12	62.5	59 01.8	97 12	61.8	59 30.8	96 12	61.5	59 59.7	96 12	61.3	65 43.5	95 12	57.4	66 11.8	94 12	56.9	70 50.6	91 11	51.9	105
6	56 58.4	97 12	61.9	57 27.5	97 12	61.6	58 54.5	96 12	60.9	59 23.5	96 12	60.7	59 52.4	96 12	60.4	65 36.5	95 12	56.5	66 04.9	94 12	56.1	70 44.1	91 11	51.1	6
7	56 51.1	97 12	61.0	57 20.2	97 12	60.8	58 47.3	97 12	60.0	59 16.2	97 12	59.8	59 45.2	96 12	59.5	65 29.6	95 11	55.7	65 58.0	95 11	55.3	70 37.6	92 11	50.4	7
8	56 43.8	97 12	60.1	57 12.9	97 12	59.9	58 40.1	97 12	59.2	59 09.0	97 12	58.9	59 38.0	97 12	58.7	65 22.7	95 11	54.9	65 51.1	95 11	54.5	70 31.2	92 11	49.7	8
9	56 36.6	97 12	59.2	57 05.7	97 12	59.0	58 32.9	97 12	58.3	59 01.9	97 12	58.0	59 30.9	97 12	57.8	65 15.9	95 11	54.1	65 44.4	95 11	53.7	70 24.9	92 10	48.9	9
110	56 29.4	97 12	58.3	56 58.6	97 12	58.1	58 25.8	97 12	57.4	58 54.9	97 12	57.2	59 23.9	97 12	56.9	65 09.2	95 11	53.3	65 37.7	95 11	52.9	70 18.6	92 10	48.2	110
1	56 22.4	97 12	57.4	56 51.6	97 12	57.2	58 18.8	97 12	56.6	58 48.1	97 11	56.3	59 16.9	97 11	56.1	65 02.6	95 11	52.5	65 31.1	95 11	52.1	70 12.4	92 10	47.5	1
2	56 15.4	97 12	56.6	56 44.5	97 12	56.4	58 11.9	97 11	55.7	58 41.0	97 11	55.5	59 10.0	97 11	55.2	64 56.0	95 11	51.7	65 24.5	95 11	51.3	70 06.3	93 10	46.7	2
3	56 08.4	97 11	55.7	56 37.6	97 11	55.5	58 05.0	97 11	54.8	58 34.1	97 11	54.6	59 03.2	97 11	54.4	64 49.5	95 11	50.8	65 18.0	95 11	50.5	70 00.3	93 10	46.0	3
4	56 01.6	97 11	54.8	56 30.8	97 11	54.6	57 58.3	97 11	54.0	58 27.4	97 11	53.7	58 56.5	97 11	53.5	64 43.0	95 11	50.0	65 11.6	95 11	49.7	69 54.3	93 10	45.3	4
115	55 54.8	97 11	54.0	56 24.0	97 11	53.8	57 51.5	97 11	53.1	58 20.7	97 11	52.9	58 49.8	97 11	52.7	64 36.7	96 10	49.2	65 05.3	95 10	48.9	69 48.4	93 10	44.6	115
6	55 48.1	97 11	53.1	56 17.3	97 11	52.9	57 44.9	97 11	52.3	58 14.1	97 11	52.0	58 43.2	97 11	51.8	64 30.4	96 10	48.4	64 59.0	96 10	48.1	69 42.6	93 10	43.8	6
7	55 41.4	98 11	52.2	56 10.7	97 11	52.0	57 38.3	97 11	51.4	58 07.5	97 11	51.2	58 36.7	97 11	51.0	64 24.2	96 10	47.7	64 52.9	96 10	47.3	69 36.8	93 09	43.1	7
8	55 34.9	98 11	51.4	56 04.1	98 11	51.2	57 31.8	97 11	50.5	58 01.0	97 11	50.3	58 30.2	97 11	50.1	64 18.0	96 10	46.9	64 46.8	96 10	46.5	69 31.2	94 09	42.4	8
9	55 28.4	98 11	50.5	55 57.7	98 11	50.3	57 25.4	97 11	49.7	57 54.7	97 10	49.5	58 23.8	97 10	49.3	64 12.0	96 10	46.1	64 40.8	96 10	45.7	69 25.6	94 09	41.7	9
120	55 22.0	98 11	49.6	55 51.3	98 10	49.4	57 19.1	97 10	48.8	57 48.3	97 10	48.6	58 17.6	97 10	48.4	64 06.0	96 10	45.3	64 34.8	96 10	45.0	69 20.1	94 09	41.0	120
1	55 15.7	98 10	48.8	55 45.0	98 10	48.6	57 12.9	98 10	48.0	57 42.1	97 10	47.8	58 11.4	97 10	47.6	64 00.1	96 10	44.5	64 28.9	96 10	44.2	69 14.6	94 09	40.3	1
2	55 09.4	98 10	47.9	55 38.8	98 10	47.7	57 06.7	98 10	47.2	57 36.0	98 10	47.0	58 05.2	97 10	46.7	63 54.3	96 10	43.7	64 23.2	96 09	43.4	69 09.3	94 09	39.6	2
3	55 03.3	98 10	47.1	55 32.6	98 10	46.9	57 00.6	98 10	46.3	57 29.9	98 10	46.1	57 59.2	98 10	45.9	63 48.6	96 09	42.9	64 17.5	96 09	42.6	69 04.0	95 09	38.9	3
4	54 57.2	98 10	46.2	55 26.6	98 10	46.0	56 54.6	98 10	45.5	57 23.9	98 10	45.3	57 53.2	98 10	45.1	63 42.9	97 09	42.1	64 11.9	96 09	41.8	68 58.8	95 09	38.1	4
125	54 51.2	98 10	45.4	55 20.6	98 10	45.2	56 48.7	98 10	44.6	57 18.1	98 10	44.4	57 47.4	98 10	44.2	63 37.4	97 09	41.4	64 06.3	97 09	41.1	68 53.7	95 08	37.4	125
6	54 45.3	98 10	44.5	55 14.7	98 10	44.3	56 42.9	98 10	43.8	57 12.2	98 10	43.6	57 41.6	98 10	43.4	63 31.9	97 09	40.6	64 00.9	97 09	40.3	68 48.6	95 08	36.7	6
7	54 39.5	98 10	43.7	55 08.9	98 10	43.5	56 37.2	98 09	43.0	57 06.5	98 09	42.8	57 35.9	98 09	42.6	63 26.5	97 09	39.8	63 55.5	97 09	39.5	68 43.7	95 08	36.0	7
8	54 33.8	98 09	42.8	55 03.2	98 09	42.6	56 31.5	98 09	42.1	57 00.9	98 09	41.9	57 30.3	98 09	41.8	63 21.2	97 09	39.0	63 50.3	97 09	38.7	68 38.8	96 08	35.3	8
9	54 28.2	98 09	42.0	54 57.6	98 09	41.8	56 26.0	98 09	41.3	56 55.4	98 09	41.1	57 24.8	98 09	40.9	63 16.0	97 09	38.3	63 45.1	97 08	38.0	68 34.0	96 08	34.6	9
130	54 22.6	98 09	41.1	54 52.1	98 09	41.0	56 20.5	98 09	40.5	56 49.9	98 09	40.3	57 19.3	98 09	40.1	63 10.9	97 08	37.5	63 40.0	97 08	37.2	68 29.3	96 08	33.9	130
1	54 17.2	98 09	40.3	54 46.7	98 09	40.1	56 15.1	98 09	39.6	56 44.6	98 09	39.5	57 14.0	98 09	39.3	63 05.8	97 08	36.7	63 35.0	97 08	36.4	68 24.7	96 08	33.2	1
2	54 11.8	98 09	39.4	54 41.4	98 09	39.3	56 09.8	98 09	38.8	56 39.3	98 09	38.6	57 08.8	98 09	38.5	63 00.9	97 08	35.9	63 30.1	97 08	35.7	68 20.2	96 07	32.5	2
3	54 06.6	98 09	38.6	54 36.1	98 09	38.4	56 04.7	98 08	38.0	56 34.1	98 08	37.8	57 03.6	98 08	37.6	62 56.0	97 08	35.2	63 25.2	97 08	34.9	68 15.7	96 07	31.9	3
4	54 01.4	99 08	37.8	54 31.0	98 08	37.6	55 59.6	98 08	37.1	56 29.1	98 08	37.0	56 58.6	98 08	36.8	62 51.3	98 08	34.4	63 20.5	98 08	34.2	68 11.4	96 07	31.2	4
135	53 56.3	99 08	36.9	54 25.9	99 08	36.8	55 54.6	98 08	36.3	56 24.1	98 08	36.2	56 53.6	98 08	36.0	62 46.6	98 08	33.6	63 15.9	98 08	33.4	68 07.1	96 07	30.5	135
6	53 51.4	99 08	36.1	54 21.0	99 08	35.9	55 49.7	99 08	35.5	56 19.2	98 08	35.3	56 48.8	98 08	35.2	62 42.0	98 07	32.9	63 11.3	98 07	32.6	68 02.9	97 07	29.8	6
7	53 46.5	99 08	35.2	54 16.1	99 08	35.1	55 44.9	99 08	34.7	56 14.4	99 08	34.5	56 44.0	98 08	34.4	62 37.5	98 07	32.1	63 06.9	98 07	31.9	67 58.8	97 07	29.1	7
8	53 41.7	99 08	34.4	54 11.4	99 08	34.3	55 40.2	99 08	33.7	56 09.8	99 08	33.7	56 39.3	99 08	33.5	62 33.1	98 07	31.3	63 02.5	98 07	31.1	67 54.8	97 07	28.4	8
9	53 37.1	99 08	33.6	54 06.7	99 08	33.4	55 35.6	99 08	33.0	56 05.2	99 07	32.9	56 34.8	99 07	32.7	62 28.8	98 07	30.6	62 58.2	98 07	30.4	67 50.8	97 06	27.7	9
140	53 32.5	99 07	32.7	54 02.2	99 07	32.6	55 31.1	99 07	32.2	56 00.7	99 07	32.1	56 30.3	99 07	31.9	62 24.6	98 07	29.8	62 54.1	98 07	29.6	67 47.0	97 06	27.0	140
1	53 28.0	99 07	31.9	53 57.7	99 07	31.8	55 26.7	99 07	31.4	55 56.3	99 07	31.3	56 25.9	99 07	31.1	62 20.5	98 07	29.1	62 50.0	98 07	28.9	67 43.3	97 06	26.3	1
2	53 23.7	99 07	31.1	53 53.4	99 07	31.0	55 22.4	99 07	30.6	55 52.0	99 07	30.4	56 21.7	99 07	30.3	62 16.5	98 07	28.3	62 46.0	98 06	28.1	67 39.6	97 06	25.6	2
3	53 19.4	99 07	30.3	53 49.1	99 07	30.1	55 18.2	99 07	29.8	55 47.8	99 07	29.6	56 17.5	99 07	29.5	62 12.6	98 06	27.6	62 42.1	98 06	27.4	67 36.0	98 06	25.0	3
4	53 15.3	99 07	29.4	53 45.0	99 07	29.3	55 14.1	99 07	28.9	55 43.8	99 07	28.8	56 13.4	99 07	28.7	62 08.8	08 06	26.8	62 38.3	98 06	26.6	67 32.6	98 06	24.3	4
145	53 11.2	99 07	28.6	53 41.0	99 07	28.5	55 10.1	99 06	28.1	55 39.8	99 06	28.0	56 09.5	99 06	27.9	62 05.1	99 06	26.0	62 34.6	98 06	25.9	67 29.2	98 06	23.6	145
6	53 07.3	99 06	27.8	53 37.0	99 06	27.7	55 06.2	99 06	27.3	55 35.9	99 06	27.2	56 05.6	99 06	27.1	62 01.5	99 06	25.3	62 31.0	99 06	25.1	67 25.9	98 05	22.9	6
7	53 03.4	99 06	26.9	53 33.2	99 06	26.8	55 02.4	99 06	26.5	55 32.2	99 06	26.4	56 01.9	99 06	26.3	61 57.9	99 06	24.5	62 27.5	99 06	24.4	67 22.7	98 05	22.2	7
8	52 59.7	99 06	26.1	53 29.5	99 06	26.0	54 58.8	99 06	25.7	55 28.5	99 06	25.6	55 58.3	99 06	25.5	61 54.5	99 06	23.8	62 24.1	99 06	23.6	67 19.5	98 05	21.6	8
9	52 56.1	99 06	25.3	53 25.9	99 06	25.2	54 55.2	99 06	24.9	55 25.0	99 06	24.8	55 54.7	99 06	24.7	61 51.2	99 05	23.0	62 20.8	99 05	22.9	67 16.5	98 05	20.9	9
150	52 52.6	99 06	24.5	53 22.4	99 06	24.4	54 51.7	99 06	24.1	55 21.5	99 06	24.0	55 51.3	99 06	23.9	61 48.0	99 05	22.3	62 17.7	99 05	22.1	67 13.6	98 05	20.2	150
1	52 49.2	99 06	23.6	53 19.0	99 06	23.6	54 48.4	99 06	23.3	55 18.2	99 05	23.2	55 48.0	99 05	23.1	61 44.9	99 05	21.5	62 14.6	99 05	21.4	67 10.8	98 05	19.5	1
2	52 45.9	99 05	22.8	53 15.7	99 05	22.7	54 45.1	99 05	22.5	55 14.9	99 05	22.4	55 44.7	99 05	22.3	61 41.7	99 05	20.8	62 11.6	99 05	20.6	67 08.0	99 04	18.8	2
3	52 42.7	99 05	22.0	53 12.5	99 05	21.9	54 42.0	99 05	21.6	55 11.8	99 05	21.5	55 41.6	99 05	21.4	61 38.9	99 05	20.0	62 08.7	99 05	19.9	67 05.4	99 04	18.2	3
4	52 39.6	99 05	21.2	53 09.5	99 05	21.1	54 39.0	99 05	20.8	55 08.8	99 05	20.7	55 38.6	99 05	20.6	61 36.1	99 04	19.3	62 05.9	99 04	19.2	67 02.8	99 04	17.5	4
155	52 36.7	1.00 05	20.4	53 06.5	1.00 05	20.3	54 36.1	99 05	20.0	55 05.9	99 05	19.9	55 35.7	99 05	19.9	61 33.4	99 04	18.5	62 03.2	99 04	18.4	67 00.4	99 04	16.8	155
6	52 33.8	1.00 05	19.5	53 03.7	1.00 05	19.5	54 33.3	1.00 04	19.2	55 03.1	1.00 04	19.1	55 33.0	99 04	19.1	61 30.8	99 04	17.8	62 00.6	99 04	17.7	66 58.0	99 04	16.1	6
7	52 31.1	1.00 04	18.7	53 00.9	1.00 04	18.7	54 30.6	1.00 04	18.4	55 00.4	1.00 04	18.3	55 30.3	1.00 04	18.3	61 28.3	99 04	17.0	61 58.1	99 04	16.9	66 55.7	99 04	15.5	7
8	52 28.4	1.00 04	17.9	52 58.3	1.00 04	17.8	54 28.0	1.00 04	17.6	54 57.9	1.00 04	17.5	55 27.7	1.00 04	17.5	61 25.9	99 04	16.3	61 55.7	99 04	16.2	66 53.5	99 03	14.8	8
9	52 25.9	1.00 04	17.1	52 55.8	1.00 04	17.0	54 25.5	1.00 04	16.8	54 55.4	1.00 04	16.7	55 25.3	1.00 04	16.7	61 23.6	99 04	15.6	61 53.5	99 04	15.4	66 51.5	99 03	14.1	9
160	52 23.5	1.00 04	16.2	52 53.4	1.00 04	16.0	54 23.2	1.00 04	15.9	54 53.1	1.00 04	15.9	55 22.9	1.00 04	15.9	61 21.4	1.00 03	14.7	61 51.3	99 03	14.7	66 49.5	99 03	13.4	160
1	52 21.3	1.00 04	15.5	52 51.2	1.00 04	15.4	54 20.9	1.00 04	15.2	54 50.8	1.00 04	15.1	55 20.7	1.00 04	15.1	61 19.4	1.00 03	14.1	61 49.2	1.00 03	14.0	66 47.6	99 03	12.8	1
2	52 19.1	1.00 03	14.6	52 49.0	1.00 03	14.6	54 18.8	1.00 03	14.4	54 48.7	1.00 03	14.3	55 18.6	1.00 03	14.3	61 17.4	1.00 03	13.3	61 47.3	1.00 03	13.2	66 45.8	99 03	12.1	2
3	52 17.0	1.00 03	13.8	52 47.0	1.00 03	13.8	54 16.8	1.00 03	13.6	54 46.7	1.00 03	13.5	55 16.6	1.00 03	13.5	61 15.5	1.00 03	12.6	61 45.4	1.00 03	12.5	66 44.1	1.00 03	11.4	3
4	52 15.1	1.00 03	13.0	52 45.0	1.00 03	12.9	54 14.8	1.00 03	12.8	54 44.8	1.00 03	12.7	55 14.7	1.00 03	12.7	61 13.7	1.00 03	11.8	61 43.7	1.00 03	11.8	66 42.5	1.00 02	10.7	4
165	52 13.3	1.00 03	12.2	52 43.2	1.00 03	12.1	54 13.1	1.00 03	12.0	54 43.0	1.00 03	11.9	55 12.9	1.00 03	11.9	61 12.1	1.00 02	11.1	61 42.0	1.00 02	11.0	66 41.0	1.00 02	10.0	165
6	52 11.6	1.00 03	11.4	52 41.5	1.00 03	11.3	54 11.4	1.00 03	11.2	54 41.3	1.00 03	11.1	55 11.3	1.00 03	11.1	61 10.5	1.00 02	10.4	61 40.5	1.00 02	10.3	66 39.6	1.00 02	09.4	6
7	52 10.0	1.00 02	10.6	52 39.9	1.00 02	10.5	54 09.8	1.00 02	10.4	54 39.8	1.00 02	10.3	55 09.7	1.00 02	10.3	61 09.1	1.00 02	09.6	61 39.0	1.00 02	09.5	66 38.2	1.00 02	08.7	7
8	52 08.5	1.00 02	09.8	52 38.5	1.00 02	09.7	54 08.4	1.00 02	09.6	54 38.3	1.00 02	09.5	55 08.3	1.00 02	09.5	61 07.7	1.00 02	08.9	61 37.7	1.00 02	08.8	66 37.0	1.00 02	08.0	8
9	52 07.1	1.00 02	08.9	52 37.1	1.00 02	08.8	54 07.0	1.00 02	08.8	54 37.0	1.00 02	08.8	55 07.0	1.00 02	08.7	61 06.5	1.00 02	08.1	61 36.5	1.00 02	08.1	66 35.9	1.00 02	07.4	9
170	52 05.9	1.00 02	08.1	52 35.9	1.00 02	08.1	54 05.8	1.00 02	08.0	54 35.8	1.00 02	08.0	55 05.8	1.00 02	07.9	61 05.4	1.00 02	07.4	61 35.3	1.00 02	07.3	66 34.9	1.00 01	06.7	170
1	52 04.8	1.00 02	07.3	52 34.8	1.00 02	07.3	54 04.7	1.00 02	07.2	54 34.7	1.00 02	07.2	55 04.7	1.00 02	07.1	61 04.4	1.00 02	06.7	61 34.3	1.00 02	06.6	66 34.0	1.00 01	06.0	1
2	52 03.8	1.00 01	06.5	52 33.8	1.00 01	06.5	54 03.7	1.00 01	06.4	54 33.7	1.00 01	06.4	55 03.7	1.00 01	06.3	61 03.4	1.00 01	05.9	61 33.4	1.00 01	05.9	66 33.1	1.00 01	05.4	2
3	52 02.9	1.00 01	05.7	52 32.9	1.00 01	05.7	54 02.8	1.00 01	05.6	54 32.8	1.00 01	05.6	55 02.8	1.00 01	05.5	61 02.6	1.00 01	05.2	61 32.6	1.00 01	05.1	66 32.4	1.00 01	04.7	3
4	52 02.1	1.00 01	04.9	52 32.1	1.00 01	04.9	54 02.1	1.00 01	04.8	54 32.1	1.00 01	04.8	55 02.1	1.00 01	04.8	61 01.9	1.00 01	04.4	61 31.9	1.00 01	04.4	66 31.8	1.00 01	04.0	4
175	52 01.5	1.00 01	04.1	52 31.5	1.00 01	04.0	54 01.5	1.00 01	04.0	54 31.4	1.00 01	04.0	55 01.4	1.00 01	04.0	61 01.3	1.00 01	03.7	61 31.3	1.00 01	03.7	66 31.2	1.00 01	03.4	175
6	52 00.9	1.00 01	03.2	52 30.9	1.00 01	03.2	54 00.9	1.00 01	03.2	54 30.9	1.00 01	03.2	55 00.9	1.00 01	03.2	61 00.9	1.00 01	03.0	61 30.9	1.00 01	02.9	66 30.8	1.00 01	02.7	6
7	52 00.5	1.00 00	02.4	52 30.5	1.00 00	02.4	54 00.5	1.00 00	02.4	54 30.5	1.00 00	02.4	55 00.5	1.00 00	02.4	61 00.5	1.00 00	02.2	61 30.5	1.00 00	02.2	66 30.4	1.00 00	02.0	7
8	52 00.2	1.00 00	01.6	52 30.2	1.00 00	01.6	54 00.2	1.00 00	01.6	54 30.2	1.00 00	01.6	55 00.2	1.00 00	01.6	61 00.2	1.00 00	01.5	61 30.2	1.00 00	01.5	66 30.2	1.00 00	01.3	8
9	52 00.1	1.00 00	00.8	52 30.1	1.00 00	00.8	54 00.1	1.00 00	00.8	54 30.1	1.00 00	00.8	55 00.1	1.00 00	00.8	61 00.1	1.00 00	00.7	61 30.1	1.00 00	00.7	66 30.1	1.00 00	00.7	9
180	52 00.0	1.00 00	00.0	52 30.0	1.00 00	00.0	54 00.0	1.00 00	00.0	54 30.0	1.00 00	00.0	55 00.0	1.00 00	00.0	61 00.0	1.00 00	00.0	61 30.0	1.00 00	00.0	66 30.0	1.00 00	00.0	

Right margin latitude labels: Lat. 82° · Lat. 83° · Lat. 84° · Lat. 85° · Lat. 86°

ALTITUDE

AZ.	4° Dec.	4° H.A.	8° Dec.	8° H.A.	12° Dec.	12° H.A.	16° Dec.	16° H.A.	20° Dec.	20° H.A.	24° Dec.	24° H.A.	28° Dec.	28° H.A.	32° Dec.	32° H.A.	36° Dec.	36° H.A.	40° Dec.	40° H.A.	44° Dec.	44° H.A.	AZ.
00	12	180	16	180	20	180	24	180	28	180	32	180	36	180	40	180	44	180	48	180	52	180	00
4	12	176	16	176	20	176	24	176	28	176	32	176	36	176	40	176	44	176	48	175	52	175	4
8	12	172	16	172	20	172	24	172	28	171	32	171	36	171	40	171	44	171	48	171	52	171	8
12	12	168	16	168	20	168	24	167	28	167	32	167	36	167	40	167	44	167	48	166	52	166	12
16	12	164	16	164	20	163	24	163	28	163	32	163	36	163	40	162	44	162	48	162	52	161	16
20	12	160	16	159	20	159	23	159	27	159	31	159	35	158	39	158	43	158	47	157	51	157	20
24	11	156	15	155	19	155	23	155	27	155	31	154	35	154	39	154	43	153	47	153	51	152	24
28	11	151	15	151	19	151	23	151	27	150	31	150	35	150	39	149	43	149	47	148	51	148	28
32	11	147	15	147	19	147	23	146	27	146	31	146	35	145	39	145	43	144	47	144	51	143	32
36	10	143	14	143	18	143	22	142	26	142	30	142	34	141	38	141	42	140	46	139	50	139	36
40	10	139	14	139	18	139	22	138	26	138	30	137	34	137	38	136	42	136	46	135	50	134	40
44	10	135	14	135	18	135	22	134	26	134	30	133	34	133	38	132	42	131	45	131	49	130	44
48	09	131	13	131	17	130	21	130	25	129	29	129	33	128	37	128	41	127	45	126	49	125	48
52	09	127	13	127	17	126	21	126	25	125	29	125	33	124	37	124	41	123	45	122	49	121	52
56	08	123	12	123	16	122	20	122	24	121	28	121	32	120	36	119	40	119	44	118	48	117	56
60	08	119	12	119	16	118	20	118	24	117	28	117	32	116	36	115	40	114	44	114	48	113	60
64	07	115	11	115	15	114	19	114	23	113	27	112	31	112	35	111	39	110	43	109	47	108	64
68	07	111	11	111	15	110	19	110	23	109	27	108	31	108	35	107	39	106	43	105	47	104	68
72	06	107	10	107	14	106	18	106	22	105	26	104	30	104	34	103	38	102	42	101	46	100	72
76	06	103	10	103	14	102	18	102	22	101	26	100	30	100	34	99	38	98	41	97	45	96	76
80	05	99	09	99	13	98	17	98	21	97	25	96	29	96	33	95	37	94	41	93	45	92	80
84	05	95	09	95	13	94	17	94	21	93	25	92	29	92	32	91	36	90	40	89	44	88	84
88	04	91	08	91	12	90	16	90	20	89	24	88	28	88	32	87	36	86	40	85	44	84	88
92	04	87	08	87	12	86	16	86	20	85	23	84	27	84	31	83	35	82	39	81	43	80	92
96	03	84	07	83	11	82	15	82	19	81	23	81	27	80	31	79	35	78	39	78	43	77	96
100	03	80	07	79	11	78	14	78	18	77	22	77	26	76	30	75	34	75	38	74	42	73	100
104	02	76	06	75	10	74	14	74	18	73	22	73	26	72	30	71	34	71	38	70	42	69	104
108	02	72	05	71	09	71	13	70	17	69	21	69	25	68	29	68	33	67	37	66	41	65	108
112	01	68	05	67	09	67	13	66	17	66	21	65	25	64	29	64	33	63	37	62	41	61	112
116	00	64	04	63	08	63	12	62	16	62	20	61	24	61	28	60	32	59	36	58	40	58	116
120	*00*	60	04	59	08	59	12	58	16	58	20	57	24	57	28	56	32	55	36	55	40	54	120
124	*00*	56	03	55	07	55	11	54	15	54	19	53	23	53	27	52	31	52	35	51	39	50	124
128	*01*	52	03	51	07	51	11	51	15	50	19	50	23	49	27	49	31	48	35	47	39	47	128
132	*01*	48	03	47	07	47	11	47	15	46	19	46	22	45	26	45	30	44	34	44	38	*43*	132
136	*02*	44	02	44	06	43	10	43	14	42	18	42	22	41	26	41	30	40	34	40	38	39	136
140	*02*	40	02	40	06	39	10	39	14	38	18	38	22	38	26	37	30	37	34	36	38	36	140
144	*02*	36	02	36	05	35	09	35	13	35	17	34	21	34	25	33	29	33	33	33	37	32	144
148	*03*	32	01	32	05	31	09	31	13	31	17	30	21	30	25	30	29	29	33	29	37	29	148
152	*03*	28	01	28	05	27	09	27	13	27	17	27	21	26	25	26	29	26	33	25	37	25	152
156	*03*	24	01	24	05	24	09	23	13	23	17	23	21	23	25	22	29	22	33	22	37	21	156
160	*04*	20	00	20	04	20	08	19	12	19	16	19	20	19	24	19	28	18	32	18	36	18	160
164	*04*	16	00	16	04	16	08	16	12	15	16	15	20	15	24	15	28	15	32	14	36	14	164
168	*04*	12	00	12	04	12	08	12	12	12	16	11	20	11	24	11	28	11	32	11	36	11	168
172	*04*	08	00	08	04	08	08	08	12	08	16	08	20	08	24	07	28	07	32	07	36	07	172
176	*04*	04	00	04	04	04	08	04	12	04	16	04	20	04	24	04	28	04	32	04	36	04	176
180	*04*	00	00	00	04	00	08	00	12	00	16	00	20	00	24	00	28	00	32	00	36	00	180
	4°		8°		12°		16°		20°		24°		28°		32°		36°		40°		44°		

FIGURES IN ITALICS INDICATE THAT DECLINATION IS OF CONTRARY NAME TO LATITUDE

L.
82

AZ.	48°		52°		56°		60°		64°		68°		72°		76°		80°		84°		88°		AZ.
	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	
°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	•	°
00	56	180	60	180	64	180	68	180	72	180	76	180	80	180	84	180	88	180	88	00	84	00	00
4	56	175	60	175	64	175	68	175	72	174	76	174	80	173	84	171	88	161	88	12	84	01	4
8	56	170	60	170	64	170	68	169	72	169	76	168	80	166	84	162	88	144	88	22	84	03	8
12	56	166	60	165	64	165	68	164	72	163	76	162	80	159	84	153	87	131	88	30	84	04	12
16	56	161	60	160	64	160	68	159	72	158	76	156	79	152	83	145	87	121	87	37	84	05	16
20	55	156	59	156	63	155	67	154	71	152	75	150	79	146	83	137	86	112	87	41	84	06	20
24	55	152	59	151	63	150	67	148	71	147	75	144	79	140	83	130	86	106	86	44	84	08	24
28	55	147	59	146	63	145	67	143	71	141	75	138	78	134	82	124	85	100	86	46	84	09	28
32	55	142	59	141	62	140	66	138	70	136	74	133	78	128	82	118	85	95	86	48	84	10	32
36	54	138	58	137	62	135	66	134	70	131	74	128	78	122	81	112	84	91	85	48	84	10	36
40	54	133	58	132	62	131	66	129	70	126	73	123	77	117	81	107	84	87	85	49	83	11	40
44	53	129	57	128	61	126	65	124	69	122	73	118	77	112	80	103	83	84	84	49	83	12	44
48	53	124	57	123	61	122	65	120	69	117	72	113	76	107	80	98	82	80	84	48	83	13	48
52	52	120	56	119	60	117	64	115	68	112	72	109	76	103	79	94	82	77	84	48	83	13	52
56	52	116	56	114	60	113	64	111	68	108	71	104	75	99	78	90	81	74	83	47	83	14	56
60	51	111	55	110	59	108	63	106	67	104	71	100	74	94	78	86	81	71	83	46	83	14	60
64	51	107	55	106	59	104	63	102	66	99	70	96	74	90	77	82	80	68	82	45	83	14	64
68	50	103	54	102	58	100	62	98	66	95	70	92	73	86	77	79	80	66	82	44	83	14	68
72	50	99	54	98	58	96	62	94	65	91	69	88	73	83	76	75	79	63	82	43	82	14	72
76	49	95	53	94	57	92	61	90	65	87	69	84	72	79	76	72	79	60	81	42	82	15	76
80	49	91	53	90	57	88	60	86	64	83	68	80	72	75	75	69	78	58	81	41	82	14	80
84	48	87	52	86	56	84	60	82	64	80	67	76	71	72	75	65	78	55	81	39	82	14	84
88	48	83	52	82	55	80	59	78	63	76	67	73	71	68	74	62	77	53	80	38	82	14	88
92	47	79	51	78	55	76	59	75	63	72	66	69	70	65	74	59	77	50	80	36	82	14	92
96	47	75	50	74	54	73	58	71	62	69	66	66	70	62	73	56	77	48	80	35	82	14	96
100	46	72	50	70	54	69	58	67	62	65	65	62	69	59	73	53	76	46	79	33	81	13	100
104	46	68	49	67	53	65	57	64	61	62	65	59	69	55	72	51	76	43	79	32	81	13	104
108	45	64	49	63	53	62	57	60	61	58	64	56	68	52	72	48	75	41	79	30	81	12	108
112	45	60	48	59	52	58	56	57	60	55	64	52	68	49	71	45	75	39	78	29	81	12	112
116	44	57	48	56	52	55	56	53	60	51	64	49	67	46	71	42	75	36	78	27	81	11	116
120	44	53	48	52	51	51	55	50	59	48	63	46	67	43	71	39	74	34	78	25	81	11	120
124	43	49	47	49	51	47	55	46	59	45	63	43	67	40	70	37	74	32	78	24	81	10	124
128	43	46	47	45	51	44	55	43	58	41	62	40	66	37	70	34	74	29	77	22	81	10	128
132	42	42	46	41	50	41	54	39	58	38	62	36	66	34	70	31	74	27	77	21	81	09	132
136	42	39	46	38	50	37	54	36	58	35	62	33	66	31	69	29	73	25	77	19	80	08	136
140	42	35	46	34	50	34	54	33	57	32	61	30	65	28	69	26	73	23	77	17	80	08	140
144	41	32	45	31	49	30	53	29	57	28	61	27	65	26	69	23	73	20	77	15	80	07	144
148	41	28	45	28	49	27	53	26	57	25	61	24	65	23	69	21	73	18	77	14	80	06	148
152	41	25	45	24	49	23	53	23	57	22	61	21	65	20	69	18	73	16	76	12	80	06	152
156	41	21	45	21	49	20	53	20	57	19	61	18	64	17	68	16	72	14	76	10	80	05	156
160	40	17	44	17	48	17	52	16	56	16	60	15	64	14	68	13	72	11	76	09	80	04	160
164	40	14	44	14	48	13	52	.13	56	13	60	12	64	11	68	10	72	09	76	07	80	03	164
168	40	10	44	10	48	10	52	10	56	09	60	09	64	08	68	08	72	07	76	05	80	02	168
172	40	07	44	07	48	07	52	06	56	06	60	06	64	06	68	05	72	04	76	03	80	02	172
176	40	03	44	03	48	03	52	03	56	03	60	03	64	03	68	03	72	02	76	02	80	01	176
180	40	00	44	00	48	00	52	00	56	00	60	00	64	00	68	00	72	00	76	00	80	00	180
	48°		52°		56°		60°		64°		68°		72°		76°		80°		84°		88°		

FIGURES IN ITALICS INDICATE THAT DECLINATION IS OF CONTRARY NAME TO LATITUDE

10—48722-1

H.A.	0° 00' Alt. Δd Δt Az.	0° 30' Alt. Δd Δt Az.	1° 00' Alt. Δd Δt Az.	1° 30' Alt. Δd Δt Az.	2° 00' Alt. Δd Δt Az.	2° 30' Alt. Δd Δt Az.	3° 00' Alt. Δd Δt Az.	3° 30' Alt. Δd Δt Az.	H.A.
00	7 00.0 1.00 180.0	7 30.0 1.00 180.0	8 00.0 1.00 180.0	8 30.0 1.00 180.0	9 00.0 1.00 180.0	9 30.0 1.00 180.0	10 00.0 1.00 180.0	10 30.0 1.00 180.0	00
1	6 59.9 1.00 179.0	7 29.9 1.00 179.0	7 59.9 1.00 179.0	8 29.9 1.00 179.0	8 59.9 1.00 179.0	9 29.9 1.00 179.0	9 59.9 1.00 179.0	10 29.9 1.00 179.0	1
2	6 59.7 1.01 178.0	7 29.7 1.01 178.0	7 59.7 1.01 178.0	8 29.7 1.01 178.0	8 59.7 1.01 178.0	9 29.7 1.01 178.0	9 59.7 1.01 178.0	10 29.7 1.01 178.0	2
3	6 59.4 1.01 177.0	7 29.4 1.01 177.0	7 59.4 1.01 177.0	8 29.4 1.01 177.0	8 59.4 1.01 177.0	9 29.4 1.01 177.0	9 59.4 1.01 177.0	10 29.4 1.01 177.0	3
4	6 59.0 1.01 176.0	7 29.0 1.01 176.0	7 59.0 1.01 176.0	8 29.0 1.01 176.0	8 59.0 1.01 176.0	9 29.0 1.01 175.9	9 59.0 1.01 175.9	10 29.0 1.01 175.9	4
05	6 58.4 1.01 175.0	7 28.4 1.01 175.0	7 58.4 1.01 175.0	8 28.4 1.01 174.9	8 58.4 1.01 174.9	9 28.4 1.01 174.9	9 58.4 1.01 174.9	10 28.4 1.01 174.9	05
6	6 57.7 1.01 174.0	7 27.7 1.01 173.9	7 57.7 1.01 173.9	8 27.7 1.01 173.9	8 57.7 1.01 173.9	9 27.7 1.01 173.9	9 57.7 1.01 173.9	10 27.7 1.01 173.9	6
7	6 56.9 1.02 172.9	7 26.9 1.02 172.9	7 56.8 1.02 172.9	8 26.8 1.02 172.9	8 56.8 1.02 172.9	9 26.8 1.02 172.9	9 56.8 1.02 172.9	10 26.8 1.02 172.9	7
8	6 55.9 1.02 171.9	7 25.9 1.02 171.9	7 55.9 1.02 171.9	8 25.9 1.03 171.9	8 55.9 1.02 171.9	9 25.9 1.02 171.9	9 55.9 1.02 171.9	10 25.9 1.02 171.9	8
9	6 54.8 1.02 170.9	7 24.8 1.02 170.9	7 54.8 1.02 170.9	8 24.8 1.02 170.9	8 54.8 1.02 170.9	9 24.8 1.02 170.9	9 54.8 1.02 170.9	10 24.8 1.02 170.9	9
10	6 53.6 1.02 169.9	7 23.6 1.02 169.9	7 53.6 1.02 169.9	8 23.6 1.02 169.9	8 53.6 1.02 169.9	9 23.6 1.02 169.9	9 53.5 1.02 169.9	10 23.5 1.02 169.9	10
1	6 52.2 1.02 168.9	7 22.2 1.02 168.9	7 52.2 1.02 168.9	8 22.2 1.02 168.9	8 52.2 1.02 168.9	9 22.2 1.02 168.9	9 52.2 1.02 168.8	10 22.2 1.02 168.8	1
2	6 50.7 1.03 167.9	7 20.8 1.03 167.9	7 50.8 1.03 167.9	8 20.7 1.03 167.9	8 50.7 1.03 167.9	9 20.7 1.03 167.8	9 50.7 1.03 167.8	10 20.7 1.03 167.8	2
3	6 49.2 1.03 166.9	7 19.2 1.03 166.9	7 49.2 1.03 166.9	8 19.1 1.03 166.9	8 49.1 1.03 166.8	9 19.1 1.03 166.8	9 49.1 1.03 166.8	10 19.1 1.03 166.8	3
4	6 47.5 1.03 165.9	7 17.5 1.03 165.9	7 47.4 1.03 165.9	8 17.4 1.03 165.9	8 47.4 1.03 165.8	9 17.4 1.03 165.8	9 47.4 1.03 165.8	10 17.4 1.03 165.8	4
15	6 45.6 1.03 164.9	7 15.6 1.03 164.9	7 45.6 1.03 164.9	8 15.6 1.03 164.8	8 45.6 1.03 164.8	9 15.5 1.03 164.8	9 45.5 1.04 164.8	10 15.5 1.03 164.8	15
6	6 43.7 1.03 163.9	7 13.6 1.03 163.9	7 43.6 1.04 163.9	8 13.6 1.04 163.8	8 43.6 1.04 163.8	9 13.6 1.04 163.8	9 43.5 1.04 163.8	10 13.5 1.04 163.8	6
7	6 41.6 1.04 162.9	7 11.5 1.04 162.9	7 41.5 1.04 162.8	8 11.5 1.04 162.8	8 41.5 1.04 162.8	9 11.5 1.04 162.8	9 41.4 1.04 162.8	10 11.4 1.04 162.8	7
8	6 39.3 1.04 161.9	7 09.3 1.04 161.9	7 39.3 1.04 161.8	8 09.3 1.04 161.8	8 39.3 1.04 161.8	9 09.2 1.04 161.8	9 39.2 1.04 161.8	10 09.2 1.04 161.7	8
9	6 37.0 1.04 160.9	7 07.0 1.04 160.8	7 37.0 1.04 160.8	8 06.9 1.04 160.8	8 36.9 1.04 160.8	9 06.9 1.04 160.8	9 36.9 1.04 160.7	10 06.8 1.04 160.7	9
20	6 34.6 1.04 159.9	7 04.5 1.04 159.8	7 34.5 1.04 159.8	8 04.5 1.04 159.8	8 34.4 1.04 159.8	9 04.4 1.04 159.8	9 34.4 1.04 159.7	10 04.4 1.04 159.7	20
1	6 32.0 1.04 158.9	7 01.9 1.04 158.8	7 31.9 1.04 158.8	8 01.9 1.04 158.8	8 31.9 1.05 158.8	9 01.8 1.05 158.7	9 31.8 1.05 158.7	10 01.8 1.05 158.7	1
2	6 29.3 1.05 157.9	6 59.2 1.05 157.8	7 29.2 1.05 157.8	7 59.2 1.05 157.8	8 29.2 1.05 157.8	8 59.1 1.05 157.7	9 29.1 1.05 157.7	9 59.1 1.05 157.7	2
3	6 26.5 1.05 156.8	6 56.4 1.05 156.8	7 26.4 1.05 156.8	7 56.4 1.05 156.8	8 26.3 1.05 156.7	8 56.3 1.05 156.7	9 26.3 1.05 156.7	9 56.2 1.05 156.7	3
4	6 23.5 1.05 155.8	6 53.5 1.05 155.8	7 23.5 1.05 155.8	7 53.4 1.05 155.8	8 23.4 1.05 155.7	8 53.3 1.05 155.7	9 23.3 1.05 155.7	9 53.3 1.05 155.7	4
25	6 20.5 1.05 154.8	6 50.4 1.05 154.8	7 20.4 1.05 154.8	7 50.4 1.05 154.8	8 20.3 1.05 154.7	8 50.3 1.05 154.7	9 20.2 1.05 154.7	9 50.2 1.05 154.7	25
6	6 17.3 1.05 153.8	6 47.3 1.05 153.8	7 17.2 1.05 153.8	7 47.2 1.05 153.7	8 17.1 1.05 153.7	8 47.1 1.06 153.7	9 17.0 1.06 153.7	9 47.0 1.06 153.6	6
7	6 14.0 1.06 152.8	6 44.0 1.06 152.8	7 13.9 1.06 152.8	7 43.9 1.06 152.7	8 13.8 1.06 152.7	8 43.8 1.06 152.7	9 13.7 1.06 152.7	9 43.7 1.06 152.6	7
8	6 10.6 1.06 151.8	6 40.6 1.06 151.8	7 10.5 1.06 151.8	7 40.5 1.06 151.7	8 10.4 1.06 151.7	8 40.4 1.06 151.7	9 10.3 1.06 151.6	9 40.3 1.06 151.6	8
9	6 07.1 1.06 150.8	6 37.1 1.06 150.8	7 07.0 1.06 150.8	7 37.0 1.06 150.7	8 06.9 1.06 150.7	8 36.9 1.06 150.7	9 06.8 1.06 150.6	9 36.8 1.06 150.6	9
30	6 03.5 1.06 149.8	6 33.4 1.06 149.8	7 03.4 1.06 149.8	7 33.3 1.06 149.7	8 03.3 1.06 149.7	8 33.2 1.06 149.7	9 03.2 1.06 149.6	9 33.1 1.06 149.6	30
1	5 59.8 1.06 148.8	6 29.7 1.06 148.8	6 59.7 1.06 148.7	7 29.6 1.06 148.7	7 59.5 1.06 148.7	8 29.5 1.06 148 7	8 59.4 1.06 148.6	9 29.3 1.06 148.6	1
2	5 55.9 1.07 147.8	6 25.9 1.07 147.8	6 55.8 1.07 147.7	7 25.7 1.07 147.7	7 55.7 1.07 147.7	8 25.6 1.07 147.6	8 55.5 1.07 147.6	9 25.5 1.07 147.6	2
3	5 52.0 1.07 146.8	6 21.9 1.07 146.8	6 51.8 1.07 146.7	7 21.8 1.07 146.7	7 51.7 1.07 146.7	8 21.6 1.07 146.6	8 51.6 1.07 146.6	9 21.5 1.07 146.6	3
4	5 47.9 1.07 145.8	6 17.9 1.07 145.8	6 47.8 1.07 145.7	7 17.7 1.07 145.7	7 47.6 1.07 145.7	8 17.6 1.07 145.6	8 47.5 1.07 145.6	9 17.4 1.07 145.6	4
35	5 43.8 1.07 144.8	6 13.7 1.07 144.8	6 43.6 1.07 144.7	7 13.5 1.07 144.7	7 43.5 1.07 144.7	8 13.4 1.07 144.6	8 43.3 1.07 144.6	9 13.2 1.07 144.5	35
6	5 39.5 1.07 143.8	6 09.4 1.07 143.8	6 39.3 1.07 143.7	7 09.3 1.07 143.7	7 39.2 1.07 143.7	8 09.1 1.07 143.6	8 39.0 1.07 143.6	9 08.9 1.07 143.5	6
7	5 35.1 1.07 142.8	6 05.0 1.07 142.8	6 35.0 1.07 142.7	7 04.9 1.07 142.7	7 34.8 1.08 142.6	8 04.7 1.08 142.6	8 34.6 1.08 142.6	9 04.5 1.08 142.5	7
8	5 30.7 1.08 141.8	6 00.6 1.08 141.8	6 30.5 1.08 141.7	7 00.4 1.08 141.7	7 30.3 1.08 141.6	8 00.2 1.08 141.6	8 30.1 1.08 141.6	9 00.0 1.08 141.5	8
9	5 26.1 1.08 140.8	5 56.0 1.08 140.8	6 25.9 1.08 140.7	6 55.8 1.08 140.7	7 25.7 1.08 140.6	7 55.6 1.08 140.6	8 25.5 1.08 140.6	8 55.5 1.08 140.5	9
40	5 21.4 1.08 139.8	5 51.3 1.08 139.7	6 21.2 1.08 139.7	6 51.1 1.08 139.7	7 21.0 1.08 139.6	7 50.9 1.08 139.6	8 20.8 1.08 139.6	8 50.8 1.08 139.5	40
1	5 16.6 1.08 138.8	5 46.5 1.08 138.7	6 16.4 1.08 138.7	6 46.3 1.08 138.7	7 16.2 1.08 138.6	7 46.2 1.08 138.6	8 16.1 1.08 138.5	8 46.0 1.08 138.5	1
2	5 11.8 1.08 137.8	5 41.7 1.08 137.7	6 11.6 1.08 137.7	6 41.5 1.08 137.7	7 11.4 1.08 137.6	7 41.3 1.08 137.6	8 11.2 1.08 137.5	8 41.1 1.08 137.5	2
3	5 06.8 1.08 136.8	5 36.7 1.08 136.7	6 06.6 1.08 136.7	6 36.5 1.08 136.7	7 06.4 1.08 136.6	7 36.3 1.08 136.6	8 06.2 1.08 136.5	8 36.1 1.08 136.5	3
4	5 01.8 1.09 135.8	5 31.6 1.09 135.7	6 01.5 1.09 135.7	6 31.4 1.09 135.7	7 01.3 1.09 135.6	7 31.2 1.09 135.6	8 01.1 1.09 135.5	8 31.0 1.09 135.5	4
45		5 26.5 1.09 134.7	5 56.4 1.09 134.7	6 26.3 1.09 134.7	6 56.2 1.09 134.6	7 26.0 1.09 134.6	7 55.9 1.09 134.5	8 25.8 1.09 134.5	45
6		5 21.3 1.09 133.7	5 51.1 1.09 133.7	6 21.0 1.09 133.6	6 50.9 1.09 133.6	7 20.8 1.09 133.6	7 50.7 1.09 133.5	8 20.6 1.09 133.5	6
7		5 15.9 1.09 132.7	5 45.8 1.09 132.7	6 15.7 1.09 132.7	6 45.6 1.09 132.6	7 15.5 1.09 132.6	7 45.3 1.09 132.5	8 15.2 1.09 132.5	7
8		5 10.5 1.09 131.7	5 40.4 1.09 131.7	6 10.3 1.09 131.6	6 40.1 1.09 131.6	7 10.0 1.09 131.6	7 39.9 1.09 131.5	8 09.8 1.09 131.5	8
9		5 05.0 1.09 130.7	5 34.9 1.09 130.7	6 04.8 1.09 130.6	6 34.6 1.09 130.6	7 04.5 1.09 130.6	7 34.4 1.09 130.5	8 04.3 1.09 130.5	9
50			5 29.3 1.09 129.7	5 59.2 1.09 129.6	6 29.0 1.09 129.6	6 58.9 1.09 129.6	7 28.8 1.09 129.5	7 58.6 1.09 129.5	50
1			5 23.6 1.10 128.7	5 53.5 1.10 128.6	6 23.4 1.10 128.6	6 53.2 1.10 128.6	7 23.1 1.10 128.5	7 53.0 1.10 128.5	1
2			5 17.9 1.10 127.7	5 47.8 1.10 127.6	6 17.6 1.10 127.6	6 47.5 1.10 127.6	7 17.3 1.10 127.5	7 47.2 1.10 127.5	2
3			5 12.1 1.10 126.7	5 41.9 1.10 126.6	6 11.8 1.10 126.6	6 41.6 1.10 126.5	7 11.5 1.10 126.5	7 41.4 1.10 126.4	3
4			5 06.2 1.10 125.7	5 36.0 1.10 125.6	6 05.9 1.10 125.6	6 35.7 1.10 125.5	7 05.6 1.10 125.5	7 35.4 1.10 125.4	4
55			5 00.2 99 10 124.7	5 30.0 99 10 124.6	5 59.9 99 10 124.6	6 29.7 99 10 124.5	6 59.6 99 10 124.5	7 29.4 99 10 124.4	55
6				5 24.0 99 10 123.6	5 53.8 99 10 123.6	6 23.7 99 10 123.5	6 53.5 99 10 123.5	7 23.4 99 10 123.4	6
7				5 17.9 99 10 122.7	5 47.7 99 10 122.6	6 17.6 99 10 122.5	6 47.4 99 10 122.5	7 17.2 99 10 122.4	7
8				5 11.7 99 10 121.7	5 41.5 99 10 121.6	6 11.4 99 10 121.5	6 41.2 99 10 121.5	7 11.0 99 10 121.4	8
9				5 05.4 99 11 120.7	5 35.3 99 11 120.6	6 05.1 99 11 120.5	6 34.9 99 11 120.5	7 04.8 99 11 120.4	9
60					5 28.9 99 11 119.6	5 58.8 99 11 119.5	6 28.6 99 11 119.5	6 58.4 99 11 119.4	60
1					5 22.5 99 11 118.6	5 52.4 99 11 118.6	6 22.2 99 11 118.5	6 52.0 99 11 118.4	1
2					5 16.1 99 11 117.6	5 45.9 99 11 117.6	6 15.7 99 11 117.5	6 45.6 99 11 117.4	2
3					5 09.6 99 11 116.6	5 39.4 99 11 116.6	6 09.2 99 11 116.5	6 39.0 99 11 116.4	3
4					5 03.0 99 11 115.6	5 32.8 99 11 115.6	6 02.7 99 11 115.5	6 32.5 99 11 115.4	4
65						5 26.2 99 11 114.6	5 56.0 99 11 114.5	6 25.8 99 11 114.4	65
6						5 19.5 99 11 113.6	5 49.3 99 11 113.5	6 19.2 99 11 113.4	6
7						5 12.8 99 11 112.6	5 42.6 99 11 112.5	6 12.4 99 11 112.5	7
8						5 06.0 99 11 111.6	5 35.8 99 11 111.5	6 05.6 99 11 111.5	8
9							5 29.0 99 11 110.5	5 58.8 99 11 110.5	9
70							5 22.1 99 12 109.5	5 51.9 99 12 109.5	70
1							5 15.2 99 12 108.5	5 45.0 99 12 108.5	1
2							5 08.3 99 12 107.5	5 38.1 99 12 107.5	2
3							5 01.3 99 12 106.5	5 31.1 99 12 106.5	3
4								5 24.0 99 12 105.5	4
75								5 17.0 99 12 104.5	75
6								5 09.9 99 12 103.5	6
7								5 02.8 99 12 102.5	7

H.A.	0° 00' Alt. Az.	0° 30' Alt. Az.	1° 00' Alt. Az.	1° 30' Alt. Az.	2° 00' Alt. Az.	2° 30' Alt. Az.	3° 00' Alt. Az.	3° 30' Alt. Az.	H.A.
°	° ' Δd Δt °	° ' Δd Δt °	° ' Δd Δt °	° ' Δd Δt °	° ' Δd Δt °	° ' Δd Δt °	° ' Δd Δt °	° ' Δd Δt °	°
00	7 00.0 1.0 00 180.0	6 30.0 1.0 00 180.0	6 00.0 1.0 00 180.0	5 30.0 1.0 00 180.0	5 00.0 1.0 00 180.0				00
1	6 59.9 1.0 00 179.0	6 29.9 1.0 00 179.0	5 59.9 1.0 00 179.0	5 29.9 1.0 00 179.0					1
2	6 59.7 1.0 01 178.0	6 29.7 1.0 01 178.0	5 59.7 1.0 01 178.0	5 29.7 1.0 01 178.0					2
3	6 59.4 1.0 01 177.0	6 29.4 1.0 01 177.0	5 59.4 1.0 01 177.0	5 29.4 1.0 01 177.0					3
4	6 59.0 1.0 01 176.0	6 29.0 1.0 01 176.0	5 59.0 1.0 01 176.0	5 29.0 1.0 01 176.0					4
05	6 58.4 1.0 01 175.0	6 28.4 1.0 01 175.0	5 58.4 1.0 01 175.0	5 28.4 1.0 01 175.0					05
6	6 57.7 1.0 01 174.0	6 27.7 1.0 01 174.0	5 57.7 1.0 01 174.0	5 27.7 1.0 01 174.0					6
7	6 56.9 1.0 02 172.9	6 26.9 1.0 02 173.0	5 56.9 1.0 02 173.0	5 26.9 1.0 02 173.0					7
8	6 55.9 1.0 02 171.9	6 25.9 1.0 02 171.9	5 55.9 1.0 02 172.0	5 25.9 1.0 02 172.0					8
9	6 54.8 1.0 02 170.9	6 24.8 1.0 02 170.9	5 54.8 1.0 02 171.0	5 24.8 1.0 02 171.0					9
10	6 53.6 1.0 02 169.9	6 23.6 1.0 02 169.9	5 53.6 1.0 02 169.9	5 23.6 1.0 02 170.0					10
1	6 52.2 1.0 02 168.9	6 22.3 1.0 02 168.9	5 52.3 1.0 02 168.9	5 22.3 1.0 02 169.0					1
2	6 50.8 1.0 03 167.9	6 20.8 1.0 03 167.9	5 50.8 1.0 03 168.0	5 20.8 1.0 03 168.0					2
3	6 49.2 1.0 03 166.9	6 19.2 1.0 03 166.9	5 49.2 1.0 03 166.9	5 19.2 1.0 03 166.9					3
4	6 47.5 1.0 03 165.9	6 17.5 1.0 03 165.9	5 47.5 1.0 03 165.9	5 17.5 1.0 03 165.9					4
15	6 45.6 1.0 03 164.9	6 15.6 1.0 03 164.9	5 45.7 1.0 03 164.9	5 15.7 1.0 03 164.9					15
6	6 43.7 1.0 03 163.9	6 13.7 1.0 03 163.9	5 43.7 1.0 03 163.9	5 13.7 1.0 03 163.9					6
7	6 41.6 1.0 04 162.9	6 11.6 1.0 04 162.9	5 41.6 1.0 04 162.9	5 11.6 1.0 04 162.9					7
8	6 39.3 1.0 04 161.9	6 09.4 1.0 04 161.9	5 39.4 1.0 04 161.9	5 09.4 1.0 04 161.9					8
9	6 37.0 1.0 04 160.9	6 07.0 1.0 04 160.9	5 37.1 1.0 04 160.9	5 07.1 1.0 04 160.9					9
20	6 34.6 1.0 04 159.9	6 04.6 1.0 04 159.9	5 34.6 1.0 04 159.9	5 04.6 1.0 04 159.9					20
1	6 32.0 1.0 04 158.9	6 02.0 1.0 04 158.9	5 32.0 1.0 04 158.9	5 02.1 1.0 04 158.9					1
2	6 29.3 1.0 05 157.9	5 59.3 1.0 05 157.9	5 29.3 1.0 05 157.9						2
3	6 26.5 1.0 05 156.8	5 56.5 1.0 05 156.9	5 26.5 1.0 05 156.9						3
4	6 23.5 1.0 05 155.8	5 53.6 1.0 05 155.9	5 23.6 1.0 05 155.9						4
25	6 20.5 1.0 05 154.8	5 50.5 1.0 05 154.9	5 20.6 1.0 05 154.9						25
6	6 17.3 1.0 05 153.8	5 47.4 1.0 05 153.9	5 17.4 1.0 05 153.9						6
7	6 14.0 1.0 06 152.8	5 44.1 1.0 06 152.9	5 14.1 1.0 06 152.9						7
8	6 10.6 1.0 06 151.8	5 40.7 1.0 06 151.9	5 10.7 1.0 06 151.9						8
9	6 07.1 1.0 06 150.8	5 37.2 1.0 06 150.8	5 07.2 1.0 06 150.9						9
30	6 03.5 1.0 06 149.8	5 33.6 1.0 06 149.8	5 03.6 1.0 06 149.9						30
1	5 59.8 1.0 06 148.8	5 29.8 1.0 06 148.8							1
2	5 55.9 1.0 07 147.8	5 26.0 1.0 07 147.8							2
3	5 52.0 1.0 07 146.8	5 22.0 1.0 07 146.8							3
4	5 47.9 1.0 07 145.8	5 18.0 1.0 07 145.8							4
35	5 43.8 1.0 07 144.8	5 13.8 1.0 07 144.8							35
6	5 39.5 1.0 07 143.8	5 09.6 1.0 07 143.8							6
7	5 35.1 1.0 07 142.8	5 05.2 1.0 07 142.8							7
8	5 30.7 1.0 08 141.8	5 00.7 1.0 08 141.8							8
9	5 26.1 1.0 08 140.8								9
40	5 21.4 1.0 08 139.8								40
1	5 16.6 1.0 08 138.8								1
2	5 11.8 1.0 08 137.8								2
3	5 06.8 1.0 08 136.8								3
4	5 01.8 1.0 09 135.8								4

Each cell lists: **Alt.** (° ′) · **Δd Δt** · **Az.** (°)

H.A.	4° 00′	4° 30′	5° 00′	5° 30′	6° 00′	6° 30′	7° 00′	7° 30′	H.A.
00	11 00.0 1.000 180.0	11 30.0 1.000 180.0	12 00.0 1.000 180.0	12 30.0 1.000 180.0	13 00.0 1.000 180.0	13 30.0 1.000 180.0	14 00.0 1.000 180.0	14 30.0 1.000 180.0	00
1	10 59.9 1.000 179.0	11 29.9 1.000 179.0	11 59.9 1.000 179.0	12 29.9 1.000 179.0	12 59.9 1.000 179.0	13 29.9 1.000 179.0	13 59.9 1.000 179.0	14 29.9 1.000 179.0	1
2	10 59.7 1.001 178.0	11 29.7 1.001 178.0	11 59.7 1.001 178.0	12 29.7 1.001 178.0	12 59.7 1.001 178.0	13 29.7 1.001 178.0	13 59.7 1.001 178.0	14 29.7 1.001 178.0	2
3	10 59.4 1.001 177.0	11 29.4 1.001 176.9	11 59.4 1.001 176.9	12 29.4 1.001 176.9	12 59.4 1.001 176.9	13 29.4 1.001 176.9	13 59.4 1.001 176.9	14 29.4 1.001 176.9	3
4	10 59.0 1.001 175.9	11 29.0 1.001 175.9	11 59.0 1.001 175.9	12 29.0 1.001 175.9	12 59.0 1.001 175.9	13 29.0 1.001 175.9	13 59.0 1.001 175.9	14 29.0 1.001 175.9	4
05	10 58.4 1.001 174.9	11 28.4 1.001 174.9	11 58.4 1.001 174.9	12 28.4 1.001 174.9	12 58.4 1.001 174.9	13 28.4 1.001 174.9	13 58.4 1.001 174.9	14 28.4 1.001 174.9	05
6	10 57.7 1.001 173.9	11 27.7 1.001 173.9	11 57.7 1.001 173.9	12 27.7 1.001 173.9	12 57.7 1.001 173.9	13 27.7 1.001 173.9	13 57.7 1.001 173.9	14 27.6 1.001 173.9	6
7	10 56.8 1.002 172.9	11 26.8 1.002 172.9	11 56.8 1.002 172.9	12 26.8 1.002 172.9	12 56.8 1.002 172.9	13 26.8 1.002 172.8	13 56.8 1.002 172.8	14 26.8 1.002 172.8	7
8	10 55.9 1.002 171.9	11 25.9 1.002 171.9	11 55.8 1.002 171.9	12 25.8 1.002 171.8	12 55.8 1.002 171.8	13 25.8 1.002 171.8	13 55.8 1.002 171.8	14 25.8 1.002 171.8	8
9	10 54.8 1.002 170.9	11 24.8 1.002 170.8	11 54.8 1.002 170.8	12 24.7 1.002 170.8	12 54.7 1.002 170.8	13 24.7 1.002 170.8	13 54.7 1.002 170.8	14 24.7 1.002 170.8	9
10	10 53.5 1.002 169.8	11 23.5 1.002 169.8	11 53.5 1.002 169.8	12 23.5 1.002 169.8	12 53.5 1.002 169.8	13 23.5 1.002 169.8	13 53.5 1.002 169.8	14 23.5 1.002 169.8	10
1	10 52.2 1.002 168.8	11 22.2 1.002 168.8	11 52.2 1.002 168.8	12 22.2 1.002 168.8	12 52.1 1.002 168.8	13 22.1 1.002 168.8	13 52.1 1.002 168.8	14 22.1 1.002 168.7	1
2	10 50.7 1.003 167.8	11 20.7 1.003 167.8	11 50.7 1.003 167.8	12 20.7 1.003 167.8	12 50.7 1.003 167.8	13 20.6 1.003 167.7	13 50.6 1.003 167.7	14 20.6 1.003 167.7	2
3	10 49.1 1.003 166.8	11 19.1 1.003 166.8	11 49.1 1.003 166.8	12 19.1 1.003 166.7	12 49.0 1.003 166.7	13 19.0 1.003 166.7	13 49.0 1.003 166.7	14 19.0 1.003 166.7	3
4	10 47.3 1.003 165.8	11 17.3 1.003 165.7	11 47.3 1.003 165.7	12 17.3 1.003 165.7	12 47.3 1.003 165.7	13 17.3 1.003 165.7	13 47.3 1.003 165.7	14 17.3 1.003 165.7	4
15	10 45.5 1.003 164.8	11 15.5 1.003 164.7	11 45.5 1.003 164.7	12 15.5 1.003 164.7	12 45.4 1.003 164.7	13 15.4 1.003 164.7	13 45.4 1.003 164.7	14 15.4 1.003 164.6	15
6	10 43.5 1.004 163.7	11 13.5 1.004 163.7	11 43.5 1.004 163.7	12 13.5 1.004 163.7	12 43.4 1.004 163.7	13 13.4 1.004 163.7	13 43.4 1.004 163.6	14 13.4 1.004 163.6	6
7	10 41.4 1.004 162.7	11 11.4 1.004 162.7	11 41.4 1.004 162.7	12 11.3 1.004 162.7	12 41.3 1.004 162.7	13 11.3 1.004 162.6	13 41.3 1.004 162.6	14 11.3 1.004 162.6	7
8	10 39.0 1.004 161.7	11 09.0 1.004 161.7	11 39.1 1.004 161.7	12 09.1 1.004 161.7	12 39.0 1.004 161.6	13 09.1 1.004 161.6	13 39.0 1.004 161.6	14 09.0 1.004 161.6	8
9	10 36.8 1.004 160.7	11 06.8 1.004 160.7	11 36.8 1.004 160.7	12 06.7 1.004 160.7	12 36.7 1.004 160.6	13 06.7 1.004 160.6	13 36.7 1.004 160.6	14 06.6 1.004 160.6	9
20	10 34.3 1.004 159.7	11 04.3 1.004 159.7	11 34.3 1.004 159.6	12 04.3 1.004 159.6	12 34.2 1.004 159.6	13 04.2 1.004 159.6	13 34.2 1.004 159.6	14 04.2 1.004 159.5	20
1	10 31.7 1.005 158.7	11 01.7 1.005 158.7	11 31.7 1.005 158.6	12 01.7 1.005 158.6	12 31.6 1.005 158.6	13 01.6 1.005 158.6	13 31.6 1.005 158.5	14 01.5 1.005 158.5	1
2	10 29.0 1.005 157.7	10 59.0 1.005 157.6	11 29.0 1.005 157.6	11 58.9 1.005 157.6	12 28.9 1.005 157.6	12 58.9 1.005 157.5	13 28.8 1.005 157.5	13 58.8 1.005 157.5	2
3	10 26.2 1.005 156.7	10 56.2 1.005 156.6	11 26.1 1.005 156.6	11 56.1 1.005 156.6	12 26.0 1.005 156.6	12 56.0 1.005 156.5	13 26.0 1.005 156.5	13 55.9 1.005 156.5	3
4	10 23.2 1.005 155.6	10 53.2 1.005 155.6	11 23.2 1.005 155.6	11 53.1 1.005 155.6	12 23.1 1.005 155.5	12 53.0 1.005 155.5	13 23.0 1.005 155.5	13 53.0 1.005 155.5	4
25	10 20.2 1.005 154.6	10 50.1 1.005 154.6	11 20.1 1.005 154.6	11 50.0 1.005 154.5	12 20.0 1.005 154.5	12 49.9 1.005 154.5	13 19.9 1.005 154.5	13 49.9 1.005 154.4	25
6	10 17.0 1.006 153.6	10 46.9 1.006 153.6	11 16.9 1.006 153.6	11 46.8 1.006 153.5	12 16.8 1.006 153.5	12 46.7 1.006 153.5	13 16.7 1.006 153.4	13 46.6 1.006 153.4	6
7	10 13.7 1.006 152.6	10 43.6 1.006 152.6	11 13.6 1.006 152.5	11 43.5 1.006 152.5	12 13.5 1.006 152.5	12 43.4 1.006 152.4	13 13.4 1.006 152.4	13 43.3 1.006 152.4	7
8	10 10.2 1.006 151.6	10 40.2 1.006 151.6	11 10.1 1.006 151.5	11 40.1 1.006 151.5	12 10.0 1.006 151.5	12 40.0 1.006 151.4	13 09.9 1.006 151.4	13 39.9 1.006 151.4	8
9	10 06.7 1.006 150.6	10 36.6 1.006 150.5	11 06.6 1.006 150.5	11 36.5 1.006 150.5	12 06.5 1.006 150.5	12 36.4 1.006 150.4	13 06.4 1.006 150.4	13 36.3 1.006 150.4	9
30	10 03.0 1.006 149.6	10 33.0 1.006 149.5	11 02.9 1.006 149.5	11 32.9 1.006 149.5	12 02.8 1.006 149.4	12 32.8 1.006 149.4	13 02.7 1.006 149.4	13 32.6 1.006 149.3	30
1	9 59.3 1.006 148.6	10 29.2 1.006 148.5	10 59.2 1.006 148.5	11 29.1 1.006 148.5	11 59.0 1.006 148.4	12 29.0 1.006 148.4	12 58.9 1.006 148.4	13 28.9 1.006 148.3	1
2	9 55.4 1.007 147.5	10 25.4 1.007 147.5	10 55.3 1.007 147.4	11 25.2 1.007 147.4	11 55.2 1.007 147.4	12 25.1 1.007 147.3	12 55.0 1.007 147.3	13 25.0 1.007 147.3	2
3	9 51.4 1.007 146.5	10 21.4 1.007 146.5	10 51.3 1.007 146.5	11 21.2 1.007 146.4	11 51.2 1.007 146.4	12 21.1 1.007 146.4	12 51.0 1.007 146.3	13 21.0 1.007 146.3	3
4	9 47.4 1.007 145.5	10 17.3 1.007 145.5	10 47.2 1.007 145.5	11 17.1 1.007 145.4	11 47.1 1.007 145.4	12 17.0 1.007 145.3	12 46.9 1.007 145.3	13 16.8 1.007 145.3	4
35	9 43.2 1.007 144.5	10 13.1 1.007 144.5	10 43.0 1.007 144.4	11 12.9 1.007 144.4	11 42.9 1.007 144.3	12 12.8 1.007 144.3	12 42.7 1.007 144.3	13 12.6 1.007 144.3	35
6	9 38.9 1.007 143.5	10 08.8 1.007 143.5	10 38.7 1.007 143.4	11 08.6 1.007 143.4	11 38.5 1.007 143.4	12 08.5 1.007 143.3	12 38.4 1.007 143.3	13 08.3 1.007 143.2	6
7	9 34.5 1.008 142.5	10 04.4 1.008 142.5	10 34.3 1.008 142.4	11 04.2 1.008 142.4	11 34.1 1.008 142.3	12 04.0 1.008 142.3	12 34.0 1.008 142.3	13 03.9 1.008 142.2	7
8	9 30.0 1.008 141.5	9 59.9 1.008 141.4	10 29.8 1.008 141.4	10 59.7 1.008 141.4	11 29.6 1.008 141.3	11 59.5 1.008 141.3	12 29.4 1.008 141.3	12 59.3 1.008 141.2	8
9	9 25.4 1.008 140.5	9 55.3 1.008 140.4	10 25.2 1.008 140.4	10 55.1 1.008 140.4	11 25.0 1.008 140.3	11 54.9 1.008 140.3	12 24.8 1.008 140.2	12 54.7 1.008 140.2	9
40	9 20.7 1.008 139.5	9 50.6 1.008 139.4	10 20.5 1.008 139.4	10 50.4 1.008 139.3	11 20.3 1.008 139.3	11 50.2 1.008 139.3	12 20.1 1.008 139.2	12 50.0 1.008 139.2	40
1	9 15.9 1.008 138.5	9 45.8 1.008 138.4	10 15.7 1.008 138.4	10 45.6 1.008 138.3	11 15.5 1.008 138.3	11 45.4 1.008 138.3	12 15.3 1.008 138.2	12 45.2 1.008 138.2	1
2	9 11.0 1.008 137.5	9 40.9 1.008 137.4	10 10.8 1.008 137.4	10 40.7 1.008 137.3	11 10.5 1.008 137.3	11 40.4 1.008 137.2	12 10.3 1.008 137.2	12 40.2 1.008 137.2	2
3	9 06.0 1.008 136.4	9 35.9 1.008 136.4	10 05.8 1.008 136.4	10 35.6 1.008 136.3	11 05.5 1.008 136.3	11 35.4 1.008 136.2	12 05.3 1.008 136.2	12 35.2 1.008 136.1	3
4	9 00.9 1.009 135.4	9 30.8 1.009 135.4	10 00.7 1.009 135.4	10 30.6 1.009 135.3	11 00.4 1.009 135.3	11 30.3 1.009 135.2	12 00.2 1.009 135.2	12 30.1 1.009 135.1	4
45	8 55.7 1.009 134.4	9 25.6 1.009 134.4	9 55.5 1.009 134.3	10 25.4 1.009 134.3	10 55.2 1.009 134.3	11 25.1 1.009 134.2	11 55.0 1.009 134.2	12 24.9 1.009 134.1	45
6	8 50.4 1.009 133.4	9 20.3 1.009 133.4	9 50.2 1.009 133.3	10 20.1 1.009 133.3	10 50.0 1.009 133.2	11 19.8 1.009 133.2	11 49.7 1.009 133.2	12 19.6 1.009 133.1	6
7	8 45.1 1.009 132.4	9 15.0 1.009 132.4	9 44.8 1.009 132.3	10 14.7 1.009 132.3	10 44.6 1.009 132.2	11 14.5 1.009 132.2	11 44.3 1.009 132.1	12 14.2 1.009 132.1	7
8	8 39.6 1.009 131.4	9 09.5 1.009 131.4	9 39.4 1.009 131.3	10 09.3 1.009 131.3	10 39.1 1.009 131.2	11 09.0 1.009 131.2	11 38.9 1.009 131.1	12 08.8 1.009 131.1	8
9	8 34.1 1.009 130.4	9 04.0 1.009 130.4	9 33.9 1.009 130.3	10 03.7 1.009 130.3	10 33.6 1.009 130.2	11 03.5 1.009 130.2	11 33.3 1.009 130.1	12 03.2 1.009 130.1	9
50	8 28.5 1.010 129.4	8 58.4 1.010 129.4	9 28.2 1.010 129.3	9 58.1 1.010 129.3	10 28.0 1.010 129.2	10 57.8 1.010 129.2	11 27.7 1.010 129.1	11 57.6 1.010 129.1	50
1	8 22.8 1.010 128.4	8 52.7 1.010 128.4	9 22.5 1.010 128.3	9 52.4 1.010 128.3	10 22.3 1.010 128.2	10 52.1 1.010 128.2	11 22.0 1.010 128.1	11 51.8 1.010 128.1	1
2	8 17.1 1.010 127.4	8 46.9 1.010 127.4	9 16.8 1.010 127.3	9 46.6 1.010 127.3	10 16.5 1.010 127.2	10 46.3 1.010 127.2	11 16.2 1.010 127.1	11 46.1 1.010 127.1	2
3	8 11.2 1.010 126.4	8 41.1 1.010 126.4	9 10.9 1.010 126.3	9 40.8 1.010 126.2	10 10.6 1.010 126.2	10 40.5 1.010 126.1	11 10.3 1.010 126.1	11 40.2 1.010 126.0	3
4	8 05.3 1.010 125.4	8 35.1 1.010 125.4	9 05.0 1.010 125.3	9 34.8 1.010 125.2	10 04.7 99 10 125.2	10 34.5 99 10 125.1	11 04.4 99 10 125.1	11 34.2 99 10 125.0	4
55	7 59.3 99 10 124.4	8 29.1 99 10 124.3	8 59.0 99 10 124.3	9 28.8 99 10 124.2	9 58.7 99 10 124.2	10 28.5 99 10 124.1	10 58.4 99 10 124.1	11 28.2 99 10 124.0	55
6	7 53.2 99 10 123.4	8 23.1 99 10 123.3	8 52.9 99 10 123.3	9 22.7 99 10 123.2	9 52.6 99 10 123.2	10 22.4 99 10 123.1	10 52.3 99 10 123.1	11 22.1 99 10 123.0	6
7	7 47.1 99 10 122.4	8 16.9 99 10 122.3	8 46.8 99 10 122.3	9 16.6 99 10 122.2	9 46.4 99 10 122.2	10 16.3 99 10 122.1	10 46.1 99 10 122.1	11 15.9 99 10 122.0	7
8	7 40.9 99 10 121.4	8 10.7 99 10 121.3	8 40.5 99 10 121.3	9 10.4 99 10 121.2	9 40.2 99 10 121.2	10 10.0 99 10 121.1	10 39.9 99 10 121.1	11 09.7 99 10 121.0	8
9	7 34.6 99 11 120.4	8 04.4 99 11 120.3	8 34.3 99 11 120.3	9 04.1 99 11 120.2	9 33.9 99 11 120.2	10 03.8 99 11 120.1	10 33.6 99 11 120.1	11 03.4 99 11 120.0	9
60	7 28.3 99 11 119.4	7 58.1 99 11 119.3	8 27.9 99 11 119.3	8 57.7 99 11 119.2	9 27.6 99 11 119.2	9 57.4 99 11 119.1	10 27.2 99 11 119.1	10 57.1 99 11 119.0	60
1	7 21.9 99 11 118.4	7 51.7 99 11 118.3	8 21.5 99 11 118.3	8 51.3 99 11 118.2	9 21.2 99 11 118.2	9 51.0 99 11 118.1	10 20.8 99 11 118.1	10 50.6 99 11 118.0	1
2	7 15.4 99 11 117.4	7 45.2 99 11 117.3	8 15.0 99 11 117.3	8 44.9 99 11 117.2	9 14.7 99 11 117.2	9 44.5 99 11 117.1	10 14.3 99 11 117.1	10 44.1 99 11 117.0	2
3	7 08.9 99 11 116.4	7 38.7 99 11 116.3	8 08.5 99 11 116.3	8 38.3 99 11 116.2	9 08.1 99 11 116.2	9 38.0 99 11 116.1	10 07.8 99 11 116.1	10 37.6 99 11 116.0	3
4	7 02.3 99 11 115.4	7 32.1 99 11 115.3	8 01.9 99 11 115.3	8 31.7 99 11 115.2	9 01.6 99 11 115.2	9 31.4 99 11 115.1	10 01.2 99 11 115.1	10 31.0 99 11 115.0	4
65	6 55.7 99 11 114.4	7 25.5 99 11 114.3	7 55.3 99 11 114.3	8 25.1 99 11 114.2	8 54.9 99 11 114.2	9 24.7 99 11 114.1	9 54.5 99 11 114.1	10 24.3 99 11 114.0	65
6	6 49.0 99 11 113.4	7 18.8 99 11 113.3	7 48.6 99 11 113.3	8 18.4 99 11 113.2	8 48.2 99 11 113.2	9 18.0 99 11 113.1	9 47.8 99 11 113.0	10 17.6 99 11 113.0	6
7	6 42.2 99 11 112.4	7 12.0 99 11 112.3	7 41.8 99 11 112.3	8 11.7 99 11 112.2	8 41.5 99 11 112.2	9 11.3 99 11 112.1	9 41.1 99 11 112.1	10 10.9 99 11 112.0	7
8	6 35.5 99 11 111.4	7 05.3 99 11 111.3	7 35.1 99 11 111.3	8 04.9 99 11 111.2	8 34.7 99 11 111.2	9 04.5 99 11 111.1	9 34.3 99 11 111.0	10 04.1 99 11 111.0	8
9	6 28.6 99 11 110.4	6 58.4 99 11 110.3	7 28.2 99 11 110.3	7 58.0 99 11 110.2	8 27.8 99 11 110.2	8 57.6 99 11 110.1	9 27.4 99 12 110.1	9 57.2 99 12 110.0	9
70	6 21.7 99 12 109.4	6 51.5 99 12 109.3	7 21.3 99 12 109.3	7 51.1 99 12 109.2	8 20.9 99 12 109.2	8 50.7 99 12 109.1	9 20.5 99 12 109.1	9 50.3 99 12 109.0	70
1	6 14.8 99 12 108.4	6 44.6 99 12 108.3	7 14.4 99 12 108.3	7 44.2 99 12 108.2	8 14.0 99 12 108.2	8 43.8 99 12 108.1	9 13.6 99 12 108.1	9 43.4 99 12 108.0	1
2	6 07.9 99 12 107.4	6 37.7 99 12 107.3	7 07.5 99 12 107.3	7 37.3 99 12 107.2	8 07.0 99 12 107.2	8 36.8 99 12 107.1	9 06.6 99 12 107.1	9 36.4 99 12 107.0	2
3	6 00.9 99 12 106.4	6 30.7 99 12 106.4	7 00.5 99 12 106.3	7 30.3 99 12 106.2	8 00.0 99 12 106.2	8 29.8 99 12 106.1	8 59.6 99 12 106.1	9 29.4 99 12 106.0	3
4	5 53.8 99 12 105.4	6 23.6 99 12 105.4	6 53.4 99 12 105.3	7 23.2 99 12 105.2	7 53.0 99 12 105.2	8 22.8 99 12 105.1	8 52.6 99 12 105.1	9 22.4 99 12 105.0	4
75	5 46.8 99 12 104.4	6 16.6 99 12 104.4	6 46.4 99 12 104.3	7 16.1 99 12 104.2	7 45.9 99 12 104.2	8 15.7 99 12 104.1	8 45.5 99 12 104.1	9 15.3 99 12 104.0	75
6	5 39.7 99 12 103.4	6 09.5 99 12 103.3	6 39.3 99 12 103.3	7 09.0 99 12 103.2	7 38.8 99 12 103.2	8 08.6 99 12 103.1	8 38.4 99 12 103.1	9 08.2 99 12 103.0	6
7	5 32.6 99 12 102.4	6 02.3 99 12 102.4	6 32.1 99 12 102.3	7 01.9 99 12 102.2	7 31.7 99 12 102.2	8 01.5 99 12 102.1	8 31.3 99 12 102.1	9 01.0 99 12 102.0	7
8	5 25.4 99 12 101.4	5 55.2 99 12 101.4	6 25.0 99 12 101.3	6 54.7 99 12 101.3	7 24.5 99 12 101.2	7 54.3 99 12 101.1	8 24.1 99 12 101.1	8 53.9 99 12 101.0	8
9	5 18.2 99 12 100.4	5 48.0 99 12 100.4	6 17.8 99 12 100.3	6 47.6 99 12 100.3	7 17.3 99 12 100.2	7 47.1 99 12 100.1	8 16.9 99 12 100.1	8 46.7 99 12 100.0	9
80	5 11.0 99 12 99.4	5 40.8 99 12 99.4	6 10.6 99 12 99.3	6 40.4 99 12 99.3	7 10.1 99 12 99.2	7 39.9 99 12 99.1	8 09.7 99 12 99.1	8 39.5 99 12 99.0	80
1	5 03.8 99 12 98.5	5 33.6 99 12 98.4	6 03.4 99 12 98.3	6 33.1 99 12 98.3	7 02.9 99 12 98.2	7 32.7 99 12 98.1	8 02.5 99 12 98.1	8 32.2 99 12 98.0	1
2		5 26.3 99 12 97.4	5 56.1 99 12 97.3	6 25.9 99 12 97.3	6 55.7 99 12 97.2	7 25.4 99 12 97.2	7 55.2 99 12 97.1	8 25.0 99 12 97.0	2
3		5 19.1 99 12 96.4	5 48.8 99 12 96.3	6 18.6 99 12 96.3	6 48.4 99 12 96.2	7 18.2 99 12 96.2	7 48.0 99 12 96.1	8 17.7 99 12 96.0	3
4		5 11.8 99 12 95.4	5 41.6 99 12 95.3	6 11.4 99 12 95.3	6 41.1 99 12 95.2	7 10.9 99 12 95.2	7 40.7 99 12 95.1	8 10.5 99 12 95.0	4
85		5 04.5 99 12 94.4	5 34.3 99 12 94.4	6 04.1 99 12 94.3	6 33.8 99 12 94.2	7 03.6 99 12 94.2	7 33.4 99 12 94.1	8 03.2 99 12 94.0	85
6			5 27.0 99 12 93.4	5 56.8 99 12 93.3	6 26.5 99 12 93.2	6 56.3 99 12 93.2	7 26.1 99 12 93.1	7 55.9 99 12 93.0	6
7			5 19.7 99 12 92.4	5 49.5 99 12 92.3	6 19.2 99 12 92.2	6 49.0 99 12 92.2	7 18.8 99 12 92.1	7 48.6 99 12 92.1	7
8			5 12.4 99 12 91.4	5 42.2 99 12 91.3	6 11.9 99 12 91.3	6 41.7 99 12 91.2	7 11.5 99 12 91.1	7 41.3 99 12 91.1	8
9			5 05.1 99 12 90.4	5 34.8 99 12 90.3	6 04.6 99 12 90.3	6 34.4 99 12 90.2	7 04.2 99 12 90.1	7 33.9 99 12 90.1	9
90				5 27.5 99 12 89.3	5 57.3 99 12 89.3	6 27.1 99 12 89.2	6 56.9 99 12 89.1	7 26.6 99 12 89.1	90

Lat
83°

H.A.	4° 00' Alt / Δd Δt / Az.	4° 30' Alt / Δd Δt / Az.	5° 00' Alt / Δd Δt / Az.	5° 30' Alt / Δd Δt / Az.	6° 00' Alt / Δd Δt / Az.	6° 30' Alt / Δd Δt / Az.	7° 00' Alt / Δd Δt / Az.	7° 30' Alt / Δd Δt / Az.	H.A.
91				5 20.2 99 12 88.3	5 50.0 99 12 88.3	6 19.8 99 12 88.2	6 49.5 99 12 88.1	7 19.3 99 12 88.1	91
2				5 12.9 99 12 87.3	5 42.7 99 12 87.3	6 12.5 99 12 87.2	6 42.2 99 12 87.2	7 12.0 99 12 87.1	2
3				5 05.6 99 12 86.4	5 35.4 99 12 86.3	6 05.2 99 12 86.2	6 34.9 99 12 86.2	7 04.7 99 12 86.1	3
4					5 28.1 99 12 85.3	5 57.9 99 12 85.2	6 27.6 99 12 85.2	6 57.4 99 12 85.1	4
95					5 20.8 99 12 84.3	5 50.6 99 12 84.2	6 20.4 99 12 84.2	6 50.1 99 12 84.1	95
6					5 13.5 99 12 83.3	5 43.3 99 12 83.3	6 13.1 99 12 83.2	6 42.9 99 12 83.1	6
7					5 06.3 99 12 82.8	5 36.1 99 12 82.3	6 05.8 99 12 82.2	6 35.6 99 12 82.1	7
8						5 28.8 99 12 81.3	5 58.6 99 12 81.2	6 28.4 99 12 81.2	8
9						5 21.6 99 12 80.3	5 51.4 99 12 80.2	6 21.2 99 12 80.2	9
100						5 14.4 99 12 79.3	5 44.2 99 12 79.2	6 14.0 99 12 79.2	100
1						5 07.2 99 12 78.3	5 37.0 99 12 78.2	6 06.8 99 12 78.2	1
2						5 00.1 99 12 77.3	5 29.9 99 12 77.2	5 59.7 99 12 77.2	2
3							5 22.8 99 12 76.3	5 52.6 99 12 76.2	3
4							5 15.7 99 12 75.3	5 45.5 99 12 75.2	4
105							5 08.6 99 12 74.3	5 38.4 99 12 74.2	105
6							5 01.6 99 12 73.3	5 31.4 99 12 73.2	6
7								5 24.4 99 12 72.2	7
8								5 17.5 99 12 71.3	8
9								5 10.6 99 11 70.3	9
110								5 03.7 99 11 69.3	110

Lat. 83°

H.A.	8° 00' Alt. Δd Δt Az.	8° 30' Alt. Δd Δt Az.	9° 00' Alt. Δd Δt Az.	9° 30' Alt. Δd Δt Az.	10° 00' Alt. Δd Δt Az.	10° 30' Alt. Δd Δt Az.	11° 00' Alt. Δd Δt Az.	11° 30' Alt. Δd Δt Az.	H.A.
00	15 00.0 1.00 0 180.0	15 30.0 1.00 0 180.0	16 00.0 1.00 0 180.0	16 30.0 1.00 0 180.0	17 00.0 1.00 0 180.0	17 30.0 1.00 0 180.0	18 00.0 1.00 0 180.0	18 30.0 1.00 0 180.0	00
1	14 59.9 1.00 0 179.0	15 29.9 1.00 0 179.0	15 59.9 1.00 0 179.0	16 29.9 1.00 0 179.0	16 59.9 1.00 0 179.0	17 29.9 1.00 0 179.0	17 59.9 1.00 0 179.0	18 29.9 1.00 0 179.0	1
2	14 59.7 1.00 1 177.9	15 29.7 1.00 1 177.9	15 59.7 1.00 1 177.9	16 29.7 1.00 1 177.9	16 59.7 1.00 1 177.9	17 29.7 1.00 1 177.9	17 59.7 1.00 1 177.9	18 29.7 1.00 1 177.9	2
3	14 59.4 1.00 1 176.9	15 29.4 1.00 1 176.9	15 59.4 1.00 1 176.9	16 29.4 1.00 1 176.9	16 59.4 1.00 1 176.9	17 29.4 1.00 1 176.9	17 59.4 1.00 1 176.9	18 29.4 1.00 1 176.9	3
4	14 59.0 1.00 1 175.9	15 29.0 1.00 1 175.9	15 59.0 1.00 1 175.9	16 29.0 1.00 1 175.9	16 58.9 1.00 1 175.9	17 28.9 1.00 1 175.9	17 58.9 1.00 1 175.9	18 28.9 1.00 1 175.9	4
05	14 58.4 1.00 1 174.9	15 28.4 1.00 1 174.9	15 58.4 1.00 1 174.9	16 28.4 1.00 1 174.9	16 58.4 1.00 1 174.8	17 28.4 1.00 1 174.8	17 58.4 1.00 1 174.8	18 28.4 1.00 1 174.8	05
6	14 57.6 1.00 1 173.8	15 27.6 1.00 1 173.8	15 57.6 1.00 1 173.8	16 27.6 1.00 1 173.8	16 57.6 1.00 1 173.8	17 27.6 1.00 1 173.8	17 57.6 1.00 1 173.8	18 27.6 1.00 1 173.8	6
7	14 56.8 1.00 2 172.8	15 26.8 1.00 2 172.8	15 56.8 1.00 2 172.8	16 26.8 1.00 2 172.8	16 56.8 1.00 2 172.8	17 26.8 1.00 2 172.8	17 56.8 1.00 2 172.8	18 26.8 1.00 2 172.8	7
8	14 55.8 1.00 2 171.8	15 25.8 1.00 2 171.8	15 55.8 1.00 2 171.8	16 25.8 1.00 2 171.8	16 55.8 1.00 2 171.8	17 25.8 1.00 2 171.8	17 55.8 1.00 2 171.7	18 25.8 1.00 2 171.7	8
9	14 54.7 1.00 2 170.8	15 24.7 1.00 2 170.8	15 54.7 1.00 2 170.8	16 24.7 1.00 2 170.7	16 54.7 1.00 2 170.7	17 24.7 1.00 2 170.7	17 54.7 1.00 2 170.7	18 24.7 1.00 2 170.7	9
10	14 53.5 1.00 2 169.8	15 23.5 1.00 2 169.7	15 53.5 1.00 2 169.7	16 23.5 1.00 2 169.7	16 53.5 1.00 2 169.7	17 23.4 1.00 2 169.7	17 53.4 1.00 2 169.7	18 23.4 1.00 2 169.7	10
1	14 52.1 1.00 2 168.7	15 22.1 1.00 2 168.7	15 52.1 1.00 2 168.7	16 22.1 1.00 2 168.7	16 52.1 1.00 2 168.7	17 22.1 1.00 3 168.7	17 52.1 1.00 3 168.7	18 22.0 1.00 3 168.6	1
2	14 50.6 1.00 3 167.7	15 20.6 1.00 3 167.7	15 50.6 1.00 3 167.7	16 20.6 1.00 3 167.7	16 50.6 1.00 3 167.6	17 20.6 1.00 3 167.6	17 50.6 1.00 3 167.6	18 20.5 1.00 3 167.6	2
3	14 49.0 1.00 3 166.7	15 19.0 1.00 3 166.7	15 49.0 1.00 3 166.6	16 19.0 1.00 3 166.6	16 48.9 1.00 3 166.6	17 18.9 1.00 3 166.6	17 48.9 1.00 3 166.6	18 18.9 1.00 3 166.6	3
4	14 47.2 1.00 3 165.7	15 17.2 1.00 3 165.6	15 47.2 1.00 3 165.6	16 17.2 1.00 3 165.6	16 47.2 1.00 3 165.6	17 17.2 1.00 3 165.6	17 47.2 1.00 3 165.6	18 17.1 1.00 3 165.5	4
15	14 45.4 1.00 4 164.6	15 15.4 1.00 4 164.6	15 45.3 1.00 4 164.6	16 15.3 1.00 4 164.6	16 45.3 1.00 4 164.6	17 15.3 1.00 4 164.5	17 45.3 1.00 4 164.5	18 15.3 1.00 4 164.5	15
6	14 43.4 1.00 4 163.6	15 13.4 1.00 4 163.6	15 43.3 1.00 4 163.6	16 13.3 1.00 4 163.6	16 43.3 1.00 4 163.5	17 13.3 1.00 4 163.5	17 43.3 1.00 4 163.5	18 13.2 1.00 4 163.5	6
7	14 41.2 1.00 4 162.6	15 11.2 1.00 4 162.6	15 41.2 1.00 4 162.5	16 11.2 1.00 4 162.5	16 41.2 1.00 4 162.5	17 11.1 1.00 4 162.5	17 41.1 1.00 4 162.5	18 11.1 1.00 4 162.4	7
8	14 39.0 1.00 4 161.6	15 09.0 1.00 4 161.5	15 38.9 1.00 4 161.5	16 08.9 1.00 4 161.5	16 38.9 1.00 4 161.5	17 08.9 1.00 4 161.4	17 38.9 1.00 4 161.4	18 08.8 1.00 4 161.4	8
9	14 36.6 1.00 4 160.5	15 06.6 1.00 4 160.5	15 36.6 1.00 4 160.5	16 06.5 1.00 4 160.5	16 36.5 1.00 4 160.5	17 06.5 1.00 4 160.4	17 36.5 1.00 4 160.4	18 06.4 1.00 4 160.4	9
20	14 34.1 1.00 4 159.5	15 04.1 1.00 4 159.5	15 34.1 1.00 4 159.4	16 04.1 1.00 4 159.4	16 34.0 1.00 4 159.4	17 04.0 1.00 4 159.4	17 34.0 1.00 4 159.4	18 03.9 1.00 4 159.4	20
1	14 31.5 1.00 5 158.5	15 01.5 1.00 5 158.5	15 31.4 1.00 5 158.4	16 01.4 1.00 5 158.4	16 31.4 1.00 5 158.4	17 01.3 1.00 5 158.4	17 31.3 1.00 5 158.4	18 01.3 1.00 5 158.3	1
2	14 28.8 1.00 5 157.5	14 58.7 1.00 5 157.4	15 28.7 1.00 5 157.4	15 58.7 1.00 5 157.4	16 28.6 1.00 5 157.4	16 58.6 1.00 5 157.3	17 28.6 1.00 5 157.3	17 58.5 1.00 5 157.3	2
3	14 25.9 1.00 5 156.5	14 55.9 1.00 5 156.4	15 25.8 1.00 5 156.4	15 55.8 1.00 5 156.4	16 25.8 1.00 5 156.3	16 55.7 1.00 5 156.3	17 25.7 1.00 5 156.3	17 55.6 1.00 5 156.3	3
4	14 22.9 1.00 5 155.4	14 52.9 1.00 5 155.4	15 22.8 1.00 5 155.4	15 52.8 1.00 5 155.4	16 22.8 1.00 5 155.3	16 52.7 1.00 5 155.3	17 22.7 1.00 5 155.3	17 52.6 1.00 5 155.2	4
25	14 19.8 1.00 5 154.4	14 49.8 1.00 6 154.4	15 19.7 1.00 6 154.4	15 49.7 1.00 6 154.3	16 19.6 1.00 6 154.3	16 49.6 1.00 6 154.3	17 19.6 1.00 6 154.3	17 49.5 1.00 6 154.2	25
6	14 16.6 1.00 6 153.4	14 46.6 1.00 6 153.4	15 16.5 1.00 6 153.3	15 46.5 1.00 6 153.3	16 16.4 1.00 6 153.3	16 46.4 1.00 6 153.2	17 16.3 1.00 6 153.2	17 46.3 1.00 6 153.2	6
7	14 13.3 1.00 6 152.4	14 43.2 1.00 6 152.3	15 13.2 1.00 6 152.3	15 43.1 1.00 6 152.3	16 13.1 1.00 6 152.2	16 43.0 1.00 6 152.2	17 13.0 1.00 6 152.2	17 42.9 1.00 6 152.2	7
8	14 09.8 1.00 6 151.3	14 39.8 1.00 6 151.3	15 09.7 1.00 6 151.3	15 39.7 1.00 6 151.3	16 09.6 1.00 6 151.2	16 39.6 1.00 6 151.2	17 09.5 1.00 6 151.2	17 39.4 1.00 6 151.1	8
9	14 06.3 1.00 6 150.3	14 36.2 1.00 6 150.3	15 06.1 1.00 6 150.3	15 36.1 1.00 6 150.2	16 06.0 1.00 6 150.2	16 36.0 1.00 6 150.2	17 05.9 1.00 6 150.1	17 35.9 1.00 6 150.1	9
30	14 02.6 1.00 6 149.3	14 32.5 1.00 6 149.3	15 02.5 1.00 6 149.2	15 32.4 1.00 6 149.2	16 02.3 1.00 6 149.2	16 32.3 1.00 6 149.1	17 02.2 1.00 6 149.1	17 32.2 1.00 6 149.1	30
1	13 58.8 1.00 6 148.3	14 28.7 1.00 6 148.3	14 58.7 1.00 6 148.2	15 28.6 1.00 6 148.2	15 58.5 1.00 6 148.2	16 28.5 1.00 7 148.1	16 58.4 1.00 7 148.1	17 28.3 1.00 7 148.1	1
2	13 54.9 1.00 7 147.3	14 24.8 1.00 7 147.2	14 54.8 1.00 7 147.2	15 24.7 1.00 7 147.2	15 54.6 1.00 7 147.1	16 24.6 1.00 7 147.1	16 54.5 1.00 7 147.1	17 24.4 1.00 7 147.0	2
3	13 50.9 1.00 7 146.2	14 20.8 1.00 7 146.2	14 50.7 1.00 7 146.2	15 20.7 1.00 7 146.1	15 50.6 1.00 7 146.1	16 20.5 1.00 7 146.0	16 50.5 1.00 7 146.0	17 20.4 1.00 7 146.0	3
4	13 46.8 1.00 7 145.2	14 16.7 1.00 7 145.2	14 46.6 1.00 7 145.2	15 16.5 1.00 7 145.1	15 46.5 1.00 7 145.1	16 16.4 1.00 7 145.1	16 46.3 1.00 7 145.0	17 16.2 1.00 7 145.0	4
35	13 42.6 1.00 7 144.2	14 12.5 1.00 7 144.2	14 42.4 1.00 7 144.1	15 12.3 1.00 7 144.1	15 42.2 1.00 7 144.1	16 12.2 1.00 7 144.0	16 42.1 1.00 7 144.0	17 12.0 1.00 7 144.0	35
6	13 38.2 1.00 7 143.2	14 08.1 1.00 7 143.2	14 38.1 1.00 7 143.1	15 08.0 1.00 7 143.1	15 37.9 1.00 7 143.1	16 07.8 1.00 7 143.0	16 37.7 1.00 7 143.0	17 07.6 1.00 7 142.9	6
7	13 33.8 1.00 8 142.2	14 03.7 1.00 8 142.2	14 33.6 1.00 8 142.1	15 03.5 1.00 8 142.1	15 33.4 1.00 8 142.0	16 03.4 1.00 8 142.0	16 33.3 1.00 8 142.0	17 03.2 1.00 8 141.9	7
8	13 29.3 1.00 8 141.2	13 59.2 1.00 8 141.1	14 29.1 1.00 8 141.1	14 59.0 1.00 8 141.1	15 28.9 1.00 8 141.0	15 58.8 1.00 8 141.0	16 28.7 1.00 8 140.9	16 58.6 1.00 8 140.9	8
9	13 24.6 1.00 8 140.2	13 54.5 1.00 8 140.1	14 24.4 1.00 8 140.1	14 54.3 1.00 8 140.0	15 24.2 1.00 8 140.0	15 54.2 1.00 8 140.0	16 24.1 1.00 8 139.9	16 54.0 1.00 8 139.9	9
40	13 19.9 1.00 8 139.1	13 49.8 1.00 8 139.1	14 19.7 1.00 8 139.0	14 49.6 1.00 8 139.0	15 19.5 1.00 8 139.0	15 49.4 1.00 8 138.9	16 19.3 1.00 8 138.9	16 49.2 1.00 8 138.8	40
1	13 15.1 1.00 8 138.1	13 45.0 1.00 8 138.1	14 14.9 1.00 8 138.0	14 44.8 1.00 8 138.0	15 14.6 1.00 8 138.0	15 44.5 1.00 8 137.9	16 14.4 1.00 8 137.9	16 44.3 1.00 8 137.8	1
2	13 10.1 1.00 8 137.1	13 40.0 1.00 8 137.1	14 09.9 1.00 8 137.0	14 39.8 1.00 8 137.0	15 09.7 1.00 8 136.9	15 39.6 1.00 8 136.9	16 09.5 1.00 8 136.9	16 39.4 1.00 8 136.8	2
3	13 05.1 1.00 9 136.1	13 35.0 1.00 9 136.0	14 04.9 1.00 9 136.0	14 34.8 1.00 9 136.0	15 04.7 1.00 9 135.9	15 34.6 1.00 9 135.9	16 04.4 1.00 9 135.8	16 34.3 1.00 9 135.8	3
4	13 00.0 1.00 9 135.1	13 29.9 1.00 9 135.0	13 59.8 1.00 9 135.0	14 29.6 1.00 9 135.0	14 59.5 1.00 9 134.9	15 29.4 1.00 9 134.9	15 59.3 1.00 9 134.8	16 29.2 1.00 9 134.8	4
45	12 54.8 1.00 9 134.1	13 24.7 1.00 9 134.0	13 54.5 1.00 9 134.0	14 24.4 1.00 9 133.9	14 54.3 1.00 9 133.9	15 24.2 1.00 9 133.8	15 54.1 1.00 9 133.8	16 23.9 1.00 9 133.8	45
6	12 49.5 1.00 9 133.1	13 19.4 1.00 9 133.0	13 49.2 1.00 9 133.0	14 19.1 1.00 9 132.9	14 49.0 1.00 9 132.9	15 18.9 1.00 9 132.8	15 48.7 1.00 9 132.8	16 18.6 1.00 9 132.7	6
7	12 44.1 1.00 9 132.1	13 14.0 1.00 9 132.0	13 43.8 1.00 9 132.0	14 13.7 1.00 9 131.9	14 43.6 1.00 9 131.9	15 13.5 1.00 9 131.8	15 43.3 1.00 9 131.8	16 13.2 1.00 9 131.7	7
8	12 38.6 1.00 9 131.0	13 08.5 1.00 9 131.0	13 38.4 1.00 9 130.9	14 08.2 1.00 9 130.9	14 38.1 1.00 9 130.8	15 08.0 1.00 9 130.8	15 37.8 1.00 9 130.7	16 07.7 1.00 9 130.7	8
9	12 33.1 1.00 9 130.0	13 02.9 1.00 9 130.0	13 32.8 1.00 9 129.9	14 02.7 1.00 9 129.9	14 32.5 1.00 9 129.8	15 02.4 1.00 9 129.8	15 32.3 1.00 9 129.7	16 02.1 1.00 9 129.7	9
50	12 27.4 1.0 10 129.0	12 57.3 1.0 10 129.0	13 27.2 1.0 10 128.9	13 57.0 1.0 10 128.9	14 26.9 1.0 10 128.8	14 56.7 1.0 10 128.8	15 26.6 1.0 10 128.7	15 56.5 1.0 10 128.7	50
1	12 21.7 1.0 10 128.0	12 51.6 1.0 10 128.0	13 21.4 1.0 10 127.9	13 51.3 1.0 10 127.9	14 21.1 1.0 10 127.8	14 51.0 1.0 10 127.8	15 20.8 1.0 10 127.7	15 50.7 1.0 10 127.7	1
2	12 15.9 1.0 10 127.0	12 45.8 1.0 10 127.0	13 15.6 1.0 10 126.9	13 45.5 1.0 10 126.9	14 15.3 1.0 10 126.8	14 45.2 1.0 10 126.8	15 15.0 1.0 10 126.7	15 44.9 1.0 10 126.6	2
3	12 10.0 1.0 10 126.0	12 39.9 1.0 10 125.9	13 09.7 99 10 125.9	13 39.6 99 10 125.8	14 09.4 99 10 125.8	14 39.3 99 10 125.7	15 09.1 99 10 125.7	15 39.0 99 10 125.6	3
4	12 04.1 99 10 125.0	12 33.9 99 10 124.9	13 03.8 99 10 124.9	13 33.6 99 10 124.8	14 03.5 99 10 124.8	14 33.3 99 10 124.7	15 03.1 99 10 124.7	15 33.0 99 10 124.6	4
55	11 58.0 99 10 124.0	12 27.9 99 10 123.9	12 57.7 99 10 123.9	13 27.6 99 10 123.8	13 57.4 99 10 123.8	14 27.3 99 10 123.7	14 57.1 99 10 123.7	15 26.9 99 10 123.6	55
6	11 52.0 99 10 123.0	12 21.8 99 10 122.9	12 51.6 99 10 122.9	13 21.5 99 10 122.8	13 51.3 99 10 122.8	14 21.1 99 10 122.7	14 51.0 99 10 122.7	15 20.8 99 10 122.6	6
7	11 45.8 99 10 121.9	12 15.6 99 10 121.9	12 45.5 99 10 121.8	13 15.3 99 10 121.8	13 45.1 99 10 121.7	14 15.0 99 10 121.7	14 44.8 99 10 121.6	15 14.6 99 10 121.6	7
8	11 39.5 99 11 121.0	12 09.4 99 11 120.9	12 39.2 99 11 120.9	13 09.0 99 11 120.8	13 38.9 99 11 120.7	14 08.7 99 11 120.7	14 38.5 99 11 120.6	15 08.4 99 11 120.6	8
9	11 33.2 99 11 120.0	12 03.1 99 11 119.9	12 32.9 99 11 119.9	13 02.7 99 11 119.8	13 32.6 99 11 119.7	14 02.4 99 11 119.7	14 32.2 99 11 119.6	15 02.0 99 11 119.6	9
60	11 26.9 99 11 119.0	11 56.7 99 11 118.9	12 26.5 99 11 118.8	12 56.4 99 11 118.8	13 26.2 99 11 118.7	13 56.0 99 11 118.7	14 25.8 99 11 118.6	14 55.6 99 11 118.6	60
1	11 20.4 99 11 118.0	11 50.3 99 11 117.9	12 20.1 99 11 117.8	12 49.9 99 11 117.8	13 19.7 99 11 117.7	13 49.6 99 11 117.7	14 19.4 99 11 117.6	14 49.2 99 11 117.6	1
2	11 14.0 99 11 116.9	11 43.8 99 11 116.9	12 13.6 99 11 116.8	12 43.4 99 11 116.8	13 13.2 99 11 116.7	13 43.0 99 11 116.7	14 12.9 99 11 116.6	14 42.7 99 11 116.6	2
3	11 07.4 99 11 115.9	11 37.2 99 11 115.9	12 07.0 99 11 115.8	12 36.9 99 11 115.8	13 06.7 99 11 115.7	13 36.5 99 11 115.7	14 06.3 99 11 115.6	14 36.1 99 11 115.5	3
4	11 00.8 99 11 114.9	11 30.6 99 11 114.9	12 00.4 99 11 114.8	12 30.2 99 11 114.8	13 00.1 99 11 114.7	13 29.9 99 11 114.7	13 59.7 99 11 114.6	14 29.5 99 11 114.5	4
65	10 54.2 99 11 113.9	11 24.0 99 11 113.9	11 53.8 99 11 113.8	12 23.6 99 11 113.8	12 53.4 99 11 113.7	13 23.2 99 11 113.6	13 53.0 99 11 113.6	14 22.8 99 11 113.5	65
6	10 47.4 99 11 112.9	11 17.2 99 11 112.9	11 47.1 99 11 112.8	12 16.9 99 11 112.8	12 46.7 99 11 112.7	13 16.5 99 11 112.6	13 46.3 99 11 112.6	14 16.1 99 11 112.5	6
7	10 40.7 99 11 111.9	11 10.5 99 11 111.9	11 40.3 99 11 111.8	12 10.1 99 11 111.8	12 39.9 99 11 111.7	13 09.7 99 11 111.6	13 39.5 99 11 111.6	14 09.3 99 11 111.5	7
8	10 33.9 99 11 110.9	11 03.7 99 11 110.9	11 33.5 99 11 110.8	12 03.3 99 11 110.8	12 33.1 99 11 110.7	13 02.9 99 11 110.6	13 32.7 99 11 110.6	14 02.5 99 11 110.5	8
9	10 27.0 99 12 109.9	10 56.8 99 11 109.9	11 26.6 99 11 109.8	11 56.4 99 11 109.8	12 26.2 99 11 109.7	12 56.0 99 12 109.6	13 25.8 99 12 109.6	13 55.6 99 12 109.5	9
70	10 20.1 99 12 108.9	10 49.9 99 12 108.9	11 19.7 99 12 108.8	11 49.5 99 12 108.8	12 19.3 99 12 108.7	12 49.1 99 12 108.6	13 18.9 99 12 108.6	13 48.7 99 12 108.5	70
1	10 13.2 99 12 107.9	10 43.0 99 12 107.9	11 12.8 99 12 107.8	11 42.6 99 12 107.8	12 12.4 99 12 107.7	12 42.2 99 12 107.6	13 11.9 99 12 107.6	13 41.7 99 12 107.5	1
2	10 06.2 99 12 106.9	10 36.0 99 12 106.9	11 05.8 99 12 106.8	11 35.6 99 12 106.8	12 05.4 99 12 106.7	12 35.2 99 12 106.6	13 05.0 99 12 106.6	13 34.7 99 12 106.5	2
3	9 59.2 99 12 105.9	10 29.0 99 12 105.9	10 58.8 99 12 105.8	11 28.6 99 12 105.8	11 58.4 99 12 105.7	12 28.1 99 12 105.6	12 57.9 99 12 105.6	13 27.7 99 12 105.5	3
4	9 52.2 99 12 104.9	10 21.9 99 12 104.9	10 51.7 99 12 104.8	11 21.5 99 12 104.8	11 51.3 99 12 104.7	12 21.1 99 12 104.6	12 50.9 99 12 104.6	13 20.6 99 12 104.5	4
75	9 45.1 99 12 103.9	10 14.9 99 12 103.9	10 44.6 99 12 103.8	11 14.4 99 12 103.8	11 44.2 99 12 103.7	12 14.0 99 12 103.6	12 43.8 99 12 103.6	13 13.6 99 12 103.5	75
6	9 38.0 99 12 102.9	10 07.7 99 12 102.9	10 37.5 99 12 102.8	11 07.3 99 12 102.8	11 37.1 99 12 102.7	12 06.9 99 12 102.6	12 36.6 99 12 102.6	13 06.4 99 12 102.5	6
7	9 30.8 99 12 101.9	10 00.6 99 12 101.9	10 30.4 99 12 101.8	11 00.2 99 12 101.8	11 29.9 99 12 101.7	11 59.7 99 12 101.6	12 29.5 99 12 101.6	12 59.3 99 12 101.5	7
8	9 23.7 99 12 100.9	9 53.4 99 12 100.9	10 23.2 99 12 100.8	10 53.0 99 12 100.8	11 22.8 99 12 100.7	11 52.5 99 12 100.6	12 22.3 99 12 100.6	12 52.1 99 12 100.5	8
9	9 16.5 99 12 100.0	9 46.2 99 12 99.9	10 16.0 99 12 99.8	10 45.8 99 12 99.8	11 15.6 99 12 99.7	11 45.4 99 12 99.6	12 15.1 99 12 99.6	12 44.9 99 12 99.5	9
80	9 09.3 99 12 99.0	9 39.0 99 12 98.9	10 08.8 99 12 98.8	10 38.6 99 12 98.8	11 08.4 99 12 98.7	11 38.1 99 12 98.6	12 07.9 99 12 98.6	12 37.7 99 12 98.5	80
1	9 02.0 99 12 98.0	9 31.8 99 12 97.9	10 01.6 99 12 97.8	10 31.3 99 12 97.8	11 01.1 99 12 97.7	11 30.9 99 12 97.7	12 00.7 99 12 97.6	12 30.4 99 12 97.5	1
2	8 54.8 99 12 97.0	9 24.5 99 12 96.9	9 54.3 99 12 96.8	10 24.1 99 12 96.8	10 53.9 99 12 96.7	11 23.6 99 12 96.7	11 53.4 99 12 96.6	12 23.2 99 12 96.5	2
3	8 47.5 99 12 96.0	9 17.3 99 12 95.9	9 47.1 99 12 95.8	10 16.8 99 12 95.8	10 46.6 99 12 95.7	11 16.4 99 12 95.6	11 46.1 99 12 95.6	12 15.9 99 12 95.5	3
4	8 40.2 99 12 95.0	9 10.0 99 12 94.9	9 39.8 99 12 94.8	10 09.5 99 12 94.8	10 39.3 99 12 94.7	11 09.1 99 12 94.7	11 38.9 99 12 94.6	12 08.6 99 12 94.5	4
85	8 32.9 99 12 93.9	9 02.7 99 12 93.9	9 32.5 99 12 93.8	10 02.3 99 12 93.8	10 32.0 99 12 93.7	11 01.8 99 12 93.7	11 31.6 99 12 93.6	12 01.3 99 12 93.5	85
6	8 25.6 99 12 93.0	8 55.4 99 12 92.9	9 25.2 99 12 92.8	9 55.0 99 12 92.8	10 24.7 99 12 92.7	10 54.5 99 12 92.7	11 24.3 99 12 92.6	11 54.0 99 12 92.6	6
7	8 18.3 99 12 92.0	8 48.1 99 12 91.9	9 17.9 99 12 91.9	9 47.6 99 12 91.8	10 17.4 99 12 91.7	10 47.2 99 12 91.7	11 17.0 99 12 91.6	11 46.7 99 12 91.6	7
8	8 11.0 99 12 91.0	8 40.8 99 12 90.9	9 10.6 99 12 90.9	9 40.3 99 12 90.8	10 10.1 99 12 90.8	10 39.9 99 12 90.7	11 09.6 99 12 90.6	11 39.4 99 12 90.6	8
9	8 03.7 99 12 90.0	8 33.5 99 12 89.9	9 03.3 99 12 89.9	9 33.0 99 12 89.8	10 02.8 99 12 89.8	10 32.6 99 12 89.7	11 02.3 99 12 89.6	11 32.1 99 12 89.6	9
90	7 56.4 99 12 89.0	8 26.2 99 12 89.0	8 55.9 99 12 88.9	9 25.7 99 12 88.8	9 55.5 99 12 88.8	10 25.3 99 12 88.7	10 55.0 99 12 88.6	11 24.8 99 12 88.6	90

H.A.	8° 00'	8° 30'	9° 00'	9° 30'	10° 00'	10° 30'	11° 00'	11° 30'	H.A.
	Alt. Δd Δt Az.	Alt. Δd Δt Az.	Alt. Δd Δt Az.	Alt. Δd Δt Az.	Alt. Δd Δt Az.	Alt. Δd Δt Az.	Alt. Δd Δt Az.	Alt. Δd Δt Az.	
91	7 49.1 99 12 88.0	8 18.9 99 12 88.0	8 48.6 99 12 87.9	9 18.4 99 12 87.8	9 48.2 99 12 87.8	10 17.9 99 12 87.7	10 47.7 99 12 87.7	11 17.5 99 12 87.6	91
2	7 41.8 99 12 87.0	8 11.6 99 12 87.0	8 41.3 99 12 86.9	9 11.1 99 12 86.8	9 40.9 99 12 86.8	10 10.6 99 12 86.7	10 40.4 99 12 86.7	11 10.2 99 12 86.6	2
3	7 34.5 99 12 86.0	8 04.3 99 12 86.0	8 34.0 99 12 85.9	9 03.8 99 12 85.9	9 33.6 99 12 85.8	10 03.3 99 12 85.7	10 33.1 99 12 85.7	11 02.9 99 12 85.6	3
4	7 27.2 99 12 85.1	7 57.0 99 12 85.0	8 26.7 99 12 84.9	8 56.5 99 12 84.9	9 26.3 99 12 84.8	9 56.1 99 12 84.7	10 25.8 99 12 84.7	10 55.6 99 12 84.6	4
95	7 19.9 99 12 84.1	7 49.7 99 12 84.0	8 19.5 99 12 83.9	8 49.2 99 12 83.9	9 19.0 99 12 83.8	9 48.8 99 12 83.7	10 18.6 99 12 83.7	10 48.3 99 12 83.6	95
6	7 12.6 99 12 83.1	7 42.4 99 12 83.0	8 12.2 99 12 82.9	8 42.0 99 12 82.9	9 11.7 99 12 82.8	9 41.5 99 12 82.8	10 11.3 99 12 82.7	10 41.1 99 12 82.6	6
7	7 05.4 99 12 82.1	7 35.2 99 12 82.0	8 05.0 99 12 82.0	8 34.7 99 12 81.9	9 04.5 99 12 81.8	9 34.3 99 12 81.8	10 04.0 99 12 81.7	10 33.8 99 12 81.6	7
8	6 58.2 99 12 81.1	7 27.9 99 12 81.0	7 57.7 99 12 81.0	8 27.5 99 12 80.9	8 57.3 99 12 80.8	9 27.0 99 12 80.8	9 56.8 99 12 80.7	10 26.6 99 12 80.7	8
9	6 51.0 99 12 80.1	7 20.7 99 12 80.0	7 50.5 99 12 80.0	8 20.3 99 12 79.9	8 50.1 99 12 79.9	9 19.8 99 12 79.8	9 49.6 99 12 79.7	10 19.4 99 12 79.7	9
100	6 43.8 99 12 79.1	7 13.5 99 12 79.0	7 43.3 99 12 79.0	8 13.1 99 12 78.9	8 42.9 99 12 78.9	9 12.7 99 12 78.8	9 42.4 99 12 78.7	10 12.2 99 12 78.7	100
1	6 36.6 99 12 78.1	7 06.4 99 12 78.1	7 36.2 99 12 78.0	8 05.9 99 12 77.9	8 35.7 99 12 77.9	9 05.5 99 12 77.8	9 35.3 99 12 77.8	10 05.1 99 12 77.7	1
2	6 29.4 99 12 77.1	6 59.2 99 12 77.1	7 29.0 99 12 77.0	7 58.8 99 12 76.9	8 28.6 99 12 76.9	8 58.4 99 12 76.8	9 28.1 99 12 76.8	9 57.9 99 12 76.7	2
3	6 22.3 99 12 76.1	6 52.1 99 12 76.1	7 21.9 99 12 76.0	7 51.7 99 12 76.0	8 21.5 99 12 75.9	8 51.3 99 12 75.8	9 21.0 99 12 75.8	9 50.8 99 12 75.7	3
4	6 15.3 99 12 75.2	6 45.0 99 12 75.1	7 14.8 99 12 75.0	7 44.6 99 12 75.0	8 14.4 99 12 74.9	8 44.2 99 12 74.8	9 14.0 99 12 74.8	9 43.7 99 12 74.7	4
105	6 08.2 99 12 74.2	6 38.0 99 12 74.1	7 07.8 99 12 74.0	7 37.6 99 12 74.0	8 07.4 99 12 73.9	8 37.1 99 12 73.9	9 06.9 99 12 73.8	9 36.7 99 12 73.7	105
6	6 01.2 99 12 73.2	6 31.0 99 12 73.1	7 00.8 99 12 73.1	7 30.6 99 12 73.0	8 00.3 99 12 72.9	8 30.1 99 12 72.9	8 59.9 99 12 72.8	9 29.7 99 12 72.8	6
7	5 54.2 99 12 72.2	6 24.0 99 12 72.1	6 53.8 99 12 72.1	7 23.6 99 12 72.0	7 53.4 99 12 71.9	8 23.2 99 12 71.9	8 53.0 99 12 71.8	9 22.7 99 12 71.8	7
8	5 47.3 99 12 71.2	6 17.1 99 12 71.1	6 46.9 99 12 71.1	7 16.6 99 12 71.0	7 46.4 99 11 71.0	8 16.2 99 11 70.9	8 46.0 99 12 70.8	9 15.8 99 11 70.8	8
9	5 40.4 99 11 70.2	6 10.2 99 11 70.1	6 40.0 99 11 70.1	7 09.8 99 11 70.0	7 39.5 99 11 70.0	8 09.3 99 11 69.9	8 39.1 99 11 69.9	9 08.9 99 11 69.8	9
110	5 33.5 99 11 69.2	6 03.3 99 11 69.2	6 33.1 99 11 69.1	7 02.9 99 11 69.0	7 32.7 99 11 69.0	8 02.5 99 11 68.9	8 32.3 99 11 68.9	9 02.1 99 11 68.8	110
1	5 26.7 99 11 68.2	5 56.5 99 11 68.2	6 26.3 99 11 68.1	6 56.1 99 11 68.1	7 25.9 99 11 68.0	7 55.7 99 11 67.9	8 25.5 99 11 67.9	8 55.3 99 11 67.8	1
2	5 19.9 99 11 67.2	5 49.7 99 11 67.2	6 19.5 99 11 67.1	6 49.3 99 11 67.1	7 19.1 99 11 67.0	7 48.9 99 11 67.0	8 18.8 99 11 66.9	8 48.6 99 11 66.8	2
3	5 13.2 99 11 66.3	5 43.0 99 11 66.2	6 12.8 99 11 66.1	6 42.6 99 11 66.1	7 12.4 99 11 66.0	7 42.2 99 11 66.0	8 12.1 99 11 65.9	8 41.9 99 11 65.9	3
4	5 06.5 99 11 65.3	5 36.3 99 11 65.2	6 06.2 99 11 65.2	6 36.0 99 11 65.1	7 05.8 99 11 65.0	7 35.6 99 11 65.0	8 05.4 99 11 64.9	8 35.2 99 11 64.9	4
115		5 29.7 99 11 64.2	5 59.6 99 11 64.2	6 29.4 99 11 64.1	6 59.2 99 11 64.1	7 29.0 99 11 64.0	7 58.8 99 11 63.9	8 28.6 99 11 63.9	115
6		5 23.2 99 11 63.2	5 53.0 99 11 63.2	6 22.8 99 11 63.1	6 52.6 99 11 63.1	7 22.4 99 11 63.0	7 52.3 99 11 63.0	8 22.1 99 11 62.9	6
7		5 16.7 99 11 62.2	5 46.5 99 11 62.2	6 16.3 99 11 62.1	6 46.1 99 11 62.1	7 16.0 99 11 62.0	7 45.8 99 11 62.0	8 15.6 99 11 61.9	7
8		5 10.2 99 11 61.3	5 40.1 99 11 61.2	6 09.9 99 11 61.2	6 39.7 99 11 61.1	7 09.5 99 11 61.0	7 39.4 99 11 61.0	8 09.2 99 11 60.9	8
9		5 03.9 99 11 60.3	5 33.7 99 11 60.2	6 03.5 99 11 60.2	6 33.3 99 10 60.1	7 03.2 99 10 60.1	7 33.0 99 10 60.0	8 02.8 99 10 59.9	9
120			5 27.4 99 10 59.2	5 57.2 99 10 59.2	6 27.0 99 10 59.1	6 56.9 99 10 59.1	7 26.7 99 10 59.0	7 56.5 99 10 59.0	120
1			5 21.1 99 10 58.2	5 51.0 99 10 58.2	6 20.8 99 10 58.1	6 50.6 99 10 58.1	7 20.5 99 10 58.0	7 50.3 99 10 58.0	1
2			5 14.9 99 10 57.3	5 44.8 99 10 57.2	6 14.6 99 10 57.2	6 44.4 99 10 57.1	7 14.3 99 10 57.1	7 44.1 99 10 57.0	2
3			5 08.8 99 10 56.3	5 38.7 99 10 56.2	6 08.5 99 10 56.2	6 38.3 99 10 56.1	7 08.2 99 10 56.1	7 38.0 99 10 56.0	3
4			5 02.8 99 10 55.3	5 32.6 99 10 55.2	6 02.5 99 10 55.2	6 32.3 99 10 55.1	7 02.2 99 10 55.1	7 32.0 99 10 55.0	4
125				5 26.6 99 10 54.3	5 56.5 99 10 54.2	6 26.3 99 10 54.1	6 56.2 99 10 54.1	7 26.0 99 10 54.0	125
6				5 20.7 1.0 10 53.3	5 50.6 1.0 10 53.2	6 20.5 1.0 10 53.1	6 50.3 1.0 10 53.1	7 20.2 1.0 10 53.1	6
7				5 14.9 1.0 10 52.3	5 44.8 1.0 10 52.2	6 14.6 1.0 10 52.2	6 44.5 1.0 10 52.1	7 14.4 1.0 10 52.1	7
8				5 09.2 1.0 09 51.3	5 39.0 1.0 09 51.2	6 08.9 1.0 09 51.2	6 38.8 1.0 09 51.1	7 08.6 1.0 09 51.1	8
9				5 03.5 1.0 09 50.3	5 33.4 1.0 09 50.3	6 03.2 1.0 09 50.2	6 33.1 1.0 09 50.2	7 03.0 1.0 09 50.1	9
130				5 27.8 1.0 09 49.3	5 57.7 1.0 09 49.2	6 27.5 1.0 09 49.2	6 57.4 1.0 09 49.1		130
1				5 22.3 1.0 09 48.3	5 52.2 1.0 09 48.2	6 22.0 1.0 09 48.2	6 51.9 1.0 09 48.2		1
2				5 16.9 1.0 09 47.3	5 46.8 1.0 09 47.3	6 16.6 1.0 09 47.2	6 46.5 1.0 09 47.2		2
3				5 11.5 1.0 09 46.3	5 41.4 1.0 09 46.3	6 11.3 1.0 09 46.2	6 41.2 1.0 09 46.2		3
4				5 06.3 1.0 09 45.3	5 36.2 1.0 09 45.3	6 06.1 1.0 09 45.2	6 36.0 1.0 09 45.2		4
135				5 01.1 1.0 08 44.4	5 31.0 1.0 08 44.3	6 00.9 1.0 08 44.3	6 30.8 1.0 08 44.2		135
6					5 26.0 1.0 08 43.3	5 55.9 1.0 08 43.3	6 25.8 1.0 08 43.2		6
7					5 21.0 1.0 08 42.3	5 50.9 1.0 08 42.3	6 20.8 1.0 08 42.3		7
8					5 16.1 1.0 08 41.4	5 46.0 1.0 08 41.3	6 15.9 1.0 08 41.3		8
9					5 11.3 1.0 08 40.4	5 41.2 1.0 08 40.3	6 11.1 1.0 08 40.3		9
140					5 06.7 1.0 08 39.4	5 36.6 1.0 08 39.3	6 06.5 1.0 08 39.3		140
1					5 02.1 1.0 07 38.4	5 32.0 1.0 07 38.4	6 01.9 1.0 07 38.3		1
2						5 27.5 1.0 07 37.4	5 57.4 1.0 07 37.3		2
3						5 23.1 1.0 07 36.4	5 53.0 1.0 07 36.4		3
4						5 18.8 1.0 07 35.4	5 48.7 1.0 07 35.4		4
145						5 14.6 1.0 07 34.4	5 44.5 1.0 07 34.4		145
6						5 10.5 1.0 07 33.4	5 40.5 1.0 07 33.4		6
7						5 06.6 1.0 06 32.5	5 36.5 1.0 06 32.4		7
8						5 02.7 1.0 06 31.5	5 32.6 1.0 06 31.4		8
9							5 28.9 1.0 06 30.5		9
150							5 25.2 1.0 06 29.5		150
1							5 21.7 1.0 06 28.5		1
2							5 18.2 1.0 06 27.5		2
3							5 14.9 1.0 05 26.5		3
4							5 11.7 1.0 05 25.6		4
155							5 08.6 1.0 05 24.6		155
6							5 05.6 1.0 05 23.6		6
7							5 02.8 1.0 05 22.6		7
8							5 00.0 1.0 04 21.6		8

Each cell lists: Alt. (° ′), Δd Δt, Az. (°)

H.A.	12° 00′	12° 30′	13° 00′	13° 30′	14° 00′	14° 30′	15° 00′	15° 30′	H.A.
00	19 00.0 1.00 00 180.0	19 30.0 1.00 00 180.0	20 00.0 1.00 00 180.0	20 30.0 1.00 00 180.0	21 00.0 1.00 00 180.0	21 30.0 1.00 00 180.0	22 00.0 1.00 00 180.0	22 30.0 1.00 00 180.0	00
1	18 59.9 1.00 00 179.0	19 29.9 1.00 00 179.0	19 59.9 1.00 00 179.0	20 29.9 1.00 00 179.0	20 59.9 1.00 00 179.0	21 29.9 1.00 00 179.0	21 59.9 1.00 00 179.0	22 29.9 1.00 00 179.0	1
2	18 59.7 1.00 01 177.9	19 29.7 1.00 01 177.9	19 59.7 1.00 01 177.9	20 29.7 1.00 01 177.9	20 59.7 1.00 01 177.9	21 29.7 1.00 01 177.9	21 59.7 1.00 01 177.9	22 29.7 1.00 01 177.9	2
3	18 59.4 1.00 01 176.9	19 29.4 1.00 01 176.9	19 59.4 1.00 01 176.9	20 29.4 1.00 01 176.9	20 59.4 1.00 01 176.9	21 29.4 1.00 01 176.9	21 59.4 1.00 01 176.9	22 29.4 1.00 01 176.9	3
4	18 58.9 1.00 01 175.9	19 28.9 1.00 01 175.9	19 58.9 1.00 01 175.9	20 28.9 1.00 01 175.8	20 58.9 1.00 01 175.8	21 28.9 1.00 01 175.8	21 58.9 1.00 01 175.8	22 28.9 1.00 01 175.8	4
05	18 58.4 1.00 01 174.8	19 28.3 1.00 01 174.8	19 58.3 1.00 01 174.8	20 28.3 1.00 01 174.8	20 58.3 1.00 01 174.8	21 28.3 1.00 01 174.8	21 58.3 1.00 01 174.8	22 28.3 1.00 01 174.8	05
6	18 57.6 1.00 01 173.8	19 27.6 1.00 01 173.8	19 57.6 1.00 01 173.8	20 27.6 1.00 01 173.8	20 57.6 1.00 01 173.8	21 27.6 1.00 01 173.8	21 57.6 1.00 01 173.8	22 27.6 1.00 01 173.7	6
7	18 56.8 1.00 02 172.8	19 26.8 1.00 02 172.8	19 56.8 1.00 02 172.7	20 26.8 1.00 02 172.7	20 56.8 1.00 02 172.7	21 26.8 1.00 02 172.7	21 56.7 1.00 02 172.7	22 26.7 1.00 02 172.7	7
8	18 55.8 1.00 02 171.7	19 25.8 1.00 02 171.7	19 55.8 1.00 02 171.7	20 25.8 1.00 02 171.7	20 55.8 1.00 02 171.7	21 25.8 1.00 02 171.7	21 55.8 1.00 02 171.7	22 25.7 1.00 02 171.7	8
9	18 54.7 1.00 02 170.7	19 24.7 1.00 02 170.7	19 54.7 1.00 02 170.7	20 24.6 1.00 02 170.7	20 54.6 1.00 02 170.6	21 24.6 1.00 02 170.6	21 54.6 1.00 02 170.6	22 24.6 1.00 02 170.6	9
10	18 53.4 1.00 02 169.7	19 23.4 1.00 02 169.6	19 53.4 1.00 02 169.6	20 23.4 1.00 02 169.6	20 53.4 1.00 02 169.6	21 23.4 1.00 02 169.6	21 53.4 1.00 02 169.6	22 23.4 1.00 02 169.6	10
1	18 52.0 1.00 02 168.6	19 22.0 1.00 03 168.6	19 52.0 1.00 02 168.6	20 22.0 1.00 03 168.6	20 52.0 1.00 03 168.6	21 22.0 1.00 03 168.6	21 52.0 1.00 03 168.5	22 22.0 1.00 03 168.5	1
2	18 50.5 1.00 03 167.6	19 20.5 1.00 03 167.6	19 50.5 1.00 03 167.6	20 20.5 1.00 03 167.5	20 50.5 1.00 03 167.5	21 20.5 1.00 03 167.5	21 50.5 1.00 03 167.5	22 20.5 1.00 03 167.5	2
3	18 48.9 1.00 03 166.6	19 18.9 1.00 03 166.5	19 48.9 1.00 03 166.5	20 18.9 1.00 03 166.5	20 48.8 1.00 03 166.5	21 18.8 1.00 03 166.5	21 48.8 1.00 03 166.4	22 18.8 1.00 03 166.4	3
4	18 47.1 1.00 03 165.5	19 17.1 1.00 03 165.5	19 47.1 1.00 03 165.5	20 17.1 1.00 03 165.5	20 47.1 1.00 03 165.4	21 17.1 1.00 03 165.4	21 47.0 1.00 03 165.4	22 17.0 1.00 03 165.4	4
15	18 45.2 1.00 03 164.5	19 15.2 1.00 03 164.5	19 45.2 1.00 03 164.5	20 15.2 1.00 03 164.4	20 45.2 1.00 03 164.4	21 15.2 1.00 03 164.4	21 45.1 1.00 03 164.4	22 15.1 1.00 03 164.4	15
6	18 43.2 1.00 04 163.5	19 13.2 1.00 04 163.4	19 43.2 1.00 04 163.4	20 13.2 1.00 04 163.4	20 43.1 1.00 04 163.4	21 13.1 1.00 04 163.4	21 43.1 1.00 04 163.3	22 13.1 1.00 04 163.3	6
7	18 41.1 1.00 04 162.4	19 11.1 1.00 04 162.4	19 41.0 1.00 04 162.4	20 11.0 1.00 04 162.4	20 41.0 1.00 04 162.3	21 11.0 1.00 04 162.3	21 40.9 1.00 04 162.3	22 10.9 1.00 04 162.3	7
8	18 38.8 1.00 04 161.4	19 08.8 1.00 04 161.4	19 38.8 1.00 04 161.4	20 08.7 1.00 04 161.3	20 38.7 1.00 04 161.3	21 08.7 1.00 04 161.3	21 38.7 1.00 04 161.3	22 08.6 1.00 04 161.2	8
9	18 36.4 1.00 04 160.4	19 06.4 1.00 04 160.3	19 36.4 1.00 04 160.3	20 06.3 1.00 04 160.3	20 36.3 1.00 04 160.3	21 06.3 1.00 04 160.3	21 36.3 1.00 04 160.2	22 06.2 1.00 04 160.2	9
20	18 33.9 1.00 04 159.3	19 03.9 1.00 04 159.3	19 33.8 1.00 04 159.3	20 03.8 1.00 04 159.3	20 33.8 1.00 04 159.2	21 03.7 1.00 04 159.2	21 33.7 1.00 04 159.2	22 03.7 1.00 04 159.2	20
1	18 31.3 1.00 05 158.3	19 01.2 1.00 05 158.3	19 31.2 1.00 05 158.3	20 01.2 1.00 05 158.2	20 31.1 1.00 05 158.2	21 01.1 1.00 05 158.2	21 31.1 1.00 05 158.2	22 01.0 1.00 05 158.1	1
2	18 28.5 1.00 05 157.3	18 58.5 1.00 05 157.2	19 28.4 1.00 05 157.2	19 58.4 1.00 05 157.2	20 28.3 1.00 05 157.2	20 58.3 1.00 05 157.1	21 28.3 1.00 05 157.1	21 58.2 1.00 05 157.1	2
3	18 25.6 1.00 05 156.2	18 55.6 1.00 05 156.2	19 25.5 1.00 05 156.2	19 55.5 1.00 05 156.2	20 25.5 1.00 05 156.1	20 55.4 1.00 05 156.1	21 25.4 1.00 05 156.1	21 55.3 1.00 05 156.1	3
4	18 22.6 1.00 05 155.2	18 52.6 1.00 05 155.2	19 22.5 1.00 05 155.2	19 52.5 1.00 05 155.1	20 22.4 1.00 05 155.1	20 52.4 1.00 05 155.1	21 22.3 1.00 05 155.0	21 52.3 1.00 05 155.0	4
25	18 19.5 1.00 05 154.2	18 49.4 1.00 05 154.2	19 19.4 1.00 05 154.1	19 49.3 1.00 05 154.1	20 19.3 1.00 05 154.1	20 49.2 1.00 05 154.0	21 19.2 1.00 05 154.0	21 49.2 1.00 05 154.0	25
6	18 16.2 1.00 06 153.2	18 46.2 1.00 06 153.1	19 16.1 1.00 06 153.1	19 46.1 1.00 06 153.1	20 16.0 1.00 06 153.0	20 46.0 1.00 06 153.0	21 15.9 1.00 06 153.0	21 45.9 1.00 06 152.9	6
7	18 12.9 1.00 06 152.1	18 42.8 1.00 06 152.1	19 12.8 1.00 06 152.1	19 42.7 1.00 06 152.0	20 12.7 1.00 06 152.0	20 42.6 1.00 06 152.0	21 12.6 1.00 06 151.9	21 42.5 1.00 06 151.9	7
8	18 09.4 1.00 06 151.1	18 39.3 1.00 06 151.1	19 09.3 1.00 06 151.0	19 39.2 1.00 06 151.0	20 09.2 1.00 06 151.0	20 39.1 1.00 06 150.9	21 09.1 1.00 06 150.9	21 39.0 1.00 06 150.9	8
9	18 05.8 1.00 06 150.1	18 35.7 1.00 06 150.0	19 05.7 1.00 06 150.0	19 35.6 1.00 06 150.0	20 05.6 1.00 06 149.9	20 35.5 1.00 06 149.9	21 05.4 1.00 06 149.9	21 35.4 1.00 06 149.8	9
30	18 02.1 1.00 06 149.0	18 32.0 1.00 06 149.0	19 02.0 1.00 06 149.0	19 31.9 1.00 06 148.9	20 01.8 1.00 06 148.9	20 31.8 1.00 06 148.9	21 01.7 1.00 06 148.8	21 31.7 1.00 06 148.8	30
1	17 58.3 1.00 07 148.0	18 28.2 1.00 07 148.0	18 58.2 1.00 07 148.0	19 28.1 1.00 07 147.9	19 58.0 1.00 07 147.9	20 28.0 1.00 07 147.8	20 57.9 1.00 07 147.8	21 27.8 1.00 07 147.8	1
2	17 54.4 1.00 07 147.0	18 24.3 1.00 07 147.0	18 54.2 1.00 07 146.9	19 24.1 1.00 07 146.9	19 54.1 1.00 07 146.8	20 24.0 1.00 07 146.8	20 53.9 1.00 07 146.8	21 23.9 1.00 07 146.7	2
3	17 50.3 1.00 07 146.0	18 20.2 1.00 07 145.9	18 50.1 1.00 07 145.9	19 20.1 1.00 07 145.9	19 50.0 1.00 07 145.8	20 19.9 1.00 07 145.8	20 49.9 1.00 07 145.7	21 19.8 1.00 07 145.7	3
4	17 46.2 1.00 07 144.9	18 16.1 1.00 07 144.9	18 46.0 1.00 07 144.9	19 15.9 1.00 07 144.8	19 45.9 1.00 07 144.8	20 15.8 1.00 07 144.8	20 45.7 1.00 07 144.7	21 15.6 1.00 07 144.7	4
35	17 41.9 1.00 07 143.9	18 11.8 1.00 07 143.9	18 41.8 1.00 07 143.8	19 11.7 1.00 07 143.8	19 41.6 1.00 07 143.8	20 11.5 1.00 07 143.7	20 41.4 1.00 07 143.7	21 11.3 1.00 07 143.6	35
6	17 37.6 1.00 07 142.9	18 07.5 1.00 07 142.9	18 37.4 1.00 07 142.8	19 07.3 1.00 07 142.8	19 37.2 1.00 07 142.7	20 07.1 1.00 07 142.7	20 37.0 1.00 07 142.7	21 07.0 1.00 07 142.6	6
7	17 33.1 1.00 08 141.9	18 03.0 1.00 08 141.8	18 32.9 1.00 08 141.8	19 02.8 1.00 08 141.7	19 32.7 1.00 08 141.7	20 02.6 1.00 08 141.7	20 32.6 1.00 08 141.6	21 02.5 1.00 08 141.6	7
8	17 28.5 1.00 08 140.9	17 58.4 1.00 08 140.8	18 28.3 1.00 08 140.8	18 58.2 1.00 08 140.7	19 28.2 1.00 08 140.7	19 58.1 1.00 08 140.6	20 28.0 1.00 08 140.6	20 57.9 1.00 08 140.6	8
9	17 23.9 1.00 08 139.8	17 53.8 1.00 08 139.8	18 23.7 1.00 08 139.7	18 53.6 1.00 08 139.7	19 23.5 1.00 08 139.7	19 53.4 1.00 08 139.6	20 23.3 1.00 08 139.6	20 53.2 1.00 08 139.5	9
40	17 19.1 1.00 08 138.8	17 49.0 1.00 08 138.8	18 18.9 1.00 08 138.7	18 48.8 1.00 08 138.7	19 18.7 1.00 08 138.6	19 48.6 1.00 08 138.6	20 18.5 1.00 08 138.5	20 48.4 1.00 08 138.5	40
1	17 14.2 1.00 08 137.8	17 44.1 1.00 08 137.7	18 14.0 1.00 08 137.7	18 43.9 1.00 08 137.7	19 13.8 1.00 08 137.6	19 43.7 1.00 08 137.6	20 13.6 1.00 08 137.5	20 43.5 1.00 08 137.5	1
2	17 09.3 1.00 08 136.8	17 39.2 1.00 08 136.7	18 09.0 1.00 08 136.7	18 38.9 1.00 08 136.6	19 08.8 1.00 08 136.6	19 38.7 1.00 08 136.5	20 08.6 1.00 08 136.5	20 38.5 1.00 08 136.4	2
3	17 04.2 1.00 09 135.7	17 34.1 1.00 09 135.7	18 04.0 1.00 09 135.7	18 33.9 1.00 09 135.6	19 03.8 1.00 09 135.6	19 33.6 1.00 09 135.5	20 03.5 1.00 09 135.5	20 33.4 1.00 09 135.4	3
4	16 59.1 1.00 09 134.7	17 28.9 1.00 09 134.7	17 58.8 1.00 09 134.6	18 28.7 1.00 09 134.6	18 58.6 1.00 09 134.5	19 28.5 1.00 09 134.5	19 58.3 1.00 09 134.4	20 28.2 1.00 09 134.4	4
45	16 53.8 1.00 09 133.7	17 23.7 1.00 09 133.7	17 53.6 1.00 09 133.6	18 23.5 1.00 09 133.6	18 53.3 1.00 09 133.5	19 23.2 1.00 09 133.5	19 53.1 1.00 09 133.4	20 23.0 1.00 09 133.4	45
6	16 48.5 1.00 09 132.7	17 18.4 1.00 09 132.6	17 48.2 1.00 09 132.6	18 18.1 1.00 09 132.5	18 48.0 1.00 09 132.5	19 17.9 1.00 09 132.4	19 47.7 1.00 09 132.4	20 17.6 1.00 09 132.4	6
7	16 43.1 1.00 09 131.7	17 12.9 1.00 09 131.6	17 42.8 1.00 09 131.6	18 12.7 1.00 09 131.5	18 42.6 1.00 09 131.5	19 12.4 1.00 09 131.4	19 42.3 1.00 09 131.4	20 12.1 1.00 09 131.3	7
8	16 37.6 1.00 09 130.7	17 07.4 1.00 09 130.6	17 37.3 1.00 09 130.6	18 07.2 1.00 09 130.5	18 37.0 1.00 09 130.5	19 06.9 1.00 09 130.4	19 36.8 1.00 09 130.4	20 06.6 1.00 09 130.3	8
9	16 32.0 1.00 09 129.6	17 01.8 1.00 09 129.6	17 31.7 1.00 09 129.5	18 01.6 1.00 09 129.5	18 31.4 1.00 09 129.4	19 01.3 1.0 10 129.4	19 31.1 1.0 10 129.3	20 01.0 1.0 10 129.3	9
50	16 26.3 1.0 10 128.6	16 56.2 1.0 10 128.6	17 26.0 1.0 10 128.5	17 55.9 1.0 10 128.5	18 25.7 1.0 10 128.4	18 55.6 1.0 10 128.4	19 25.4 1.0 10 128.3	19 55.3 1.0 10 128.3	50
1	16 20.6 1.0 10 127.6	16 50.4 1.0 10 127.6	17 20.3 1.0 10 127.5	17 50.1 1.0 10 127.5	18 20.0 1.0 10 127.4	18 49.8 99 10 127.4	19 19.7 99 10 127.3	19 49.5 99 10 127.2	1
2	16 14.7 99 10 126.6	16 44.6 99 10 126.5	17 14.4 99 10 126.5	17 44.3 99 10 126.5	18 14.1 99 10 126.4	18 44.0 99 10 126.3	19 13.8 99 10 126.3	19 43.7 99 10 126.2	2
3	16 08.8 99 10 125.6	16 38.7 99 10 125.5	17 08.5 99 10 125.5	17 38.4 99 10 125.4	18 08.2 99 10 125.4	18 38.0 99 10 125.3	19 07.9 99 10 125.3	19 37.7 99 10 125.2	3
4	16 02.8 99 10 124.6	16 32.7 99 10 124.5	17 02.5 99 10 124.5	17 32.4 99 10 124.4	18 02.2 99 10 124.4	18 32.0 99 10 124.3	19 01.9 99 10 124.2	19 31.7 99 10 124.2	4
55	15 56.8 99 10 123.6	16 26.6 99 10 123.5	16 56.4 99 10 123.4	17 26.3 99 10 123.4	17 56.1 99 10 123.3	18 26.0 99 10 123.3	18 55.8 99 10 123.2	19 25.6 99 10 123.2	55
6	15 50.6 99 10 122.6	16 20.5 99 10 122.5	16 50.3 99 10 122.4	17 20.1 99 10 122.4	17 50.0 99 10 122.3	18 19.8 99 10 122.3	18 49.6 99 10 122.2	19 19.5 99 10 122.2	6
7	15 44.4 99 10 121.5	16 14.3 99 10 121.5	16 44.1 99 10 121.4	17 13.9 99 10 121.4	17 43.8 99 10 121.3	18 13.6 99 10 121.3	18 43.4 99 10 121.2	19 13.2 99 11 121.1	7
8	15 38.2 99 11 120.5	16 08.0 99 11 120.5	16 37.8 99 11 120.4	17 07.7 99 11 120.4	17 37.5 99 11 120.3	18 07.3 99 11 120.2	18 37.1 99 11 120.2	19 06.9 99 11 120.1	8
9	15 31.9 99 11 119.5	16 01.7 99 11 119.5	16 31.5 99 11 119.4	17 01.3 99 11 119.3	17 31.1 99 11 119.3	18 01.0 99 11 119.2	18 30.8 99 11 119.2	19 00.6 99 11 119.1	9
60	15 25.5 99 11 118.5	15 55.3 99 11 118.5	16 25.1 99 11 118.4	16 54.9 99 11 118.3	17 24.7 99 11 118.3	17 54.5 99 11 118.2	18 24.4 99 11 118.2	18 54.2 99 11 118.1	60
1	15 19.0 99 11 117.5	15 48.8 99 11 117.4	16 18.6 99 11 117.4	16 48.4 99 11 117.3	17 18.3 99 11 117.3	17 48.1 99 11 117.2	18 17.9 99 11 117.2	18 47.7 99 11 117.1	1
2	15 12.5 99 11 116.5	15 42.3 99 11 116.4	16 12.1 99 11 116.4	16 41.9 99 11 116.3	17 11.7 99 11 116.3	17 41.5 99 11 116.2	18 11.3 99 11 116.1	18 41.1 99 11 116.1	2
3	15 05.9 99 11 115.5	15 35.7 99 11 115.4	16 05.5 99 11 115.4	16 35.3 99 11 115.3	17 05.1 99 11 115.2	17 34.9 99 11 115.2	18 04.8 99 11 115.1	18 34.6 99 11 115.1	3
4	14 59.3 99 11 114.5	15 29.1 99 11 114.4	15 58.9 99 11 114.4	16 28.7 99 11 114.3	16 58.5 99 11 114.2	17 28.3 99 11 114.2	17 58.1 99 11 114.1	18 27.9 99 11 114.1	4
65	14 52.6 99 11 113.5	15 22.4 99 11 113.4	15 52.2 99 11 113.4	16 22.0 99 11 113.3	16 51.8 99 11 113.2	17 21.6 99 11 113.2	17 51.4 99 11 113.1	18 21.2 99 11 113.1	65
6	14 45.9 99 11 112.5	15 15.7 99 11 112.5	15 45.5 99 11 112.4	16 15.3 99 11 112.3	16 45.1 99 11 112.2	17 14.9 99 11 112.2	17 44.7 99 11 112.1	18 14.5 99 11 112.0	6
7	14 39.1 99 11 111.5	15 08.9 99 11 111.4	15 38.7 99 11 111.3	16 08.5 99 11 111.3	16 38.3 99 11 111.2	17 08.1 99 11 111.2	17 37.9 99 11 111.1	18 07.6 99 11 111.0	7
8	14 32.3 99 11 110.5	15 02.1 99 11 110.4	15 31.9 99 11 110.3	16 01.6 99 11 110.2	16 31.4 99 11 110.2	17 01.2 99 12 110.2	17 31.0 99 11 110.1	18 00.8 99 11 110.0	8
9	14 25.4 99 12 109.5	14 55.2 99 12 109.4	15 25.0 99 12 109.3	15 54.8 99 12 109.3	16 24.6 99 12 109.2	16 54.3 99 12 109.1	17 24.1 99 12 109.1	17 53.9 99 12 109.0	9
70	14 18.5 99 12 108.5	14 48.3 99 12 108.4	15 18.1 99 12 108.3	15 47.8 99 12 108.3	16 17.6 99 12 108.2	16 47.4 99 12 108.1	17 17.2 99 12 108.1	17 47.0 99 12 108.0	70
1	14 11.5 99 12 107.5	14 41.3 99 12 107.4	15 11.1 99 12 107.3	15 40.9 99 12 107.3	16 10.7 99 12 107.2	16 40.4 99 12 107.1	17 10.2 99 12 107.1	17 40.0 99 12 107.0	1
2	14 04.5 99 12 106.5	14 34.3 99 12 106.4	15 04.1 99 12 106.3	15 33.9 99 12 106.3	16 03.7 99 12 106.2	16 33.4 99 12 106.1	17 03.2 99 12 106.1	17 33.0 99 12 106.0	2
3	13 57.5 99 12 105.4	14 27.3 99 12 105.4	14 57.1 99 12 105.3	15 26.8 99 12 105.3	15 56.6 99 12 105.2	16 26.4 99 12 105.1	16 56.2 99 12 105.1	17 25.9 99 12 105.0	3
4	13 50.4 99 12 104.4	14 20.2 99 12 104.4	14 50.0 99 12 104.3	15 19.8 99 12 104.3	15 49.5 99 12 104.2	16 19.3 99 12 104.1	16 49.1 99 12 104.1	17 18.9 99 12 104.0	4
75	13 43.3 99 12 103.4	14 13.1 99 12 103.4	14 42.9 99 12 103.3	15 12.7 99 12 103.3	15 42.4 99 12 103.2	16 12.2 99 12 103.1	16 42.0 99 12 103.1	17 11.8 99 12 103.0	75
6	13 36.2 99 12 102.4	14 06.0 99 12 102.4	14 35.8 99 12 102.3	15 05.5 99 12 102.3	15 35.3 99 12 102.2	16 05.1 99 12 102.1	16 34.9 99 12 102.1	17 04.6 99 12 102.0	6
7	13 29.1 99 12 101.5	13 58.8 99 12 101.4	14 28.6 99 12 101.3	14 58.4 99 12 101.3	15 28.1 99 12 101.2	15 57.9 99 12 101.1	16 27.7 99 12 101.1	16 57.5 99 12 101.0	7
8	13 21.9 99 12 100.5	13 51.6 99 12 100.4	14 21.4 99 12 100.3	14 51.2 99 12 100.3	15 21.0 99 12 100.2	15 50.7 99 12 100.1	16 20.5 99 12 100.1	16 50.3 99 12 100.0	8
9	13 14.7 99 12 99.5	13 44.4 99 12 99.4	14 14.2 99 12 99.3	14 44.0 99 12 99.3	15 13.8 99 12 99.2	15 43.5 99 12 99.1	16 13.3 99 12 99.1	16 43.1 99 12 99.0	9
80	13 07.4 99 12 98.5	13 37.2 99 12 98.4	14 07.0 99 12 98.3	14 36.8 99 12 98.3	15 06.5 99 12 98.2	15 36.3 99 12 98.1	16 06.1 99 12 98.1	16 35.8 99 12 98.0	80
1	13 00.2 99 12 97.5	13 30.0 99 12 97.4	13 59.7 99 12 97.3	14 29.5 99 12 97.3	14 59.3 99 12 97.2	15 29.0 99 12 97.1	15 58.8 99 12 97.1	16 28.6 99 12 97.0	1
2	12 53.0 99 12 96.5	13 22.7 99 12 96.4	13 52.5 99 12 96.3	14 22.3 99 12 96.3	14 52.0 99 12 96.2	15 21.8 99 12 96.1	15 51.5 99 12 96.1	16 21.3 99 12 96.0	2
3	12 45.7 99 12 95.5	13 15.4 99 12 95.4	13 45.2 99 12 95.3	14 15.0 99 12 95.3	14 44.7 99 12 95.2	15 14.5 99 12 95.1	15 44.3 99 12 95.1	16 14.0 99 12 95.0	3
4	12 38.4 99 12 94.5	13 08.2 99 12 94.4	13 37.9 99 12 94.3	14 07.7 99 12 94.3	14 37.5 99 12 94.2	15 07.2 99 12 94.2	15 37.0 99 12 94.1	16 06.7 99 12 94.0	4
85	12 31.1 99 12 93.5	13 00.9 99 12 93.4	13 30.6 99 12 93.4	14 00.4 99 12 93.3	14 30.2 99 12 93.2	14 59.9 99 12 93.2	15 29.7 99 12 93.1	15 59.4 99 12 93.0	85
6	12 23.8 99 12 92.5	12 53.6 99 12 92.4	13 23.3 99 12 92.4	13 53.1 99 12 92.3	14 22.9 99 12 92.2	14 52.6 99 12 92.2	15 22.4 99 12 92.1	15 52.1 99 12 92.0	6
7	12 16.5 99 12 91.5	12 46.3 99 12 91.4	13 16.0 99 12 91.4	13 45.8 99 12 91.3	14 15.5 99 12 91.2	14 45.3 99 12 91.2	15 15.1 99 12 91.1	15 44.8 99 12 91.0	7
8	12 09.2 99 12 90.5	12 38.9 99 12 90.4	13 08.7 99 12 90.4	13 38.5 99 12 90.3	14 08.2 99 12 90.2	14 38.0 99 12 90.2	15 07.8 99 12 90.1	15 37.5 99 12 90.0	8
9	12 01.9 99 12 89.5	12 31.6 99 12 89.4	13 01.4 99 12 89.4	13 31.2 99 12 89.3	14 00.9 99 12 89.3	14 30.7 99 12 89.2	15 00.4 99 12 89.1	15 30.2 99 12 89.1	9
90	11 54.6 99 12 88.5	12 24.3 99 12 88.5	12 54.1 99 12 88.4	13 23.8 99 12 88.3	13 53.6 99 12 88.3	14 23.4 99 12 88.2	14 53.1 99 12 88.1	15 22.9 99 12 88.1	90

H.A.	12° 00' Alt.	Δd Δt	Az.	12° 30' Alt.	Δd Δt	Az.	13° 00' Alt.	Δd Δt	Az.	13° 30' Alt.	Δd Δt	Az.	14° 00' Alt.	Δd Δt	Az.	14° 30' Alt.	Δd Δt	Az.	15° 00' Alt.	Δd Δt	Az.	15° 30' Alt.	Δd Δt	Az.	H.A.
91	11 47.2	99 12	87.5	12 17.0	99 12	87.5	12 46.8	99 12	87.4	13 16.5	99 12	87.3	13 46.3	99 12	87.3	14 16.1	99 12	87.2	14 45.8	99 12	87.1	15 15.6	99 12	87.1	91
2	11 39.9	99 12	86.5	12 09.7	99 12	86.5	12 39.5	99 12	86.4	13 09.2	99 12	86.3	13 39.0	99 12	86.3	14 08.8	99 12	86.2	14 38.5	99 12	86.1	15 08.3	99 12	86.1	2
3	11 32.7	99 12	85.5	12 02.4	99 12	85.5	12 32.2	99 12	85.4	13 01.9	99 12	85.3	13 31.7	99 12	85.3	14 01.5	99 12	85.2	14 31.2	99 12	85.2	15 01.0	99 12	85.1	3
4	11 25.4	99 12	84.6	11 55.1	99 12	84.5	12 24.9	99 12	84.4	12 54.7	99 12	84.4	13 24.4	99 12	84.3	13 54.2	99 12	84.2	14 24.0	99 12	84.2	14 53.7	99 12	84.1	4
95	11 18.1	99 12	83.6	11 47.9	99 12	83.5	12 17.6	99 12	83.4	12 47.4	99 12	83.4	13 17.2	99 12	83.3	13 46.9	99 12	83.2	14 16.7	99 12	83.2	14 46.5	99 12	83.1	95
6	11 10.8	99 12	82.6	11 40.6	99 12	82.5	12 10.4	99 12	82.4	12 40.1	99 12	82.4	13 09.9	99 12	82.3	13 39.7	99 12	82.3	14 09.4	99 12	82.2	14 39.2	99 12	82.1	6
7	11 03.6	99 12	81.6	11 33.4	99 12	81.5	12 03.1	99 12	81.5	12 32.9	99 12	81.4	13 02.7	99 12	81.3	13 32.4	99 12	81.3	14 02.2	99 12	81.2	14 32.0	99 12	81.1	7
8	10 56.4	99 12	80.6	11 26.1	99 12	80.5	11 55.9	99 12	80.5	12 25.7	99 12	80.4	12 55.5	99 12	80.3	13 25.2	99 12	80.3	13 55.0	99 12	80.2	14 24.8	99 12	80.2	8
9	10 49.2	99 12	79.6	11 18.9	99 12	79.5	11 48.7	99 12	79.5	12 18.5	99 12	79.4	12 48.3	99 12	79.4	13 18.0	99 12	79.3	13 47.8	99 12	79.2	14 17.6	99 12	79.2	9
100	10 42.0	99 12	78.6	11 11.8	99 12	78.6	11 41.5	99 12	78.5	12 11.3	99 12	78.4	12 41.1	99 12	78.4	13 10.9	99 12	78.3	13 40.6	99 12	78.2	14 10.4	99 12	78.2	100
1	10 34.8	99 12	77.6	11 04.6	99 12	77.6	11 34.4	99 12	77.5	12 04.2	99 12	77.4	12 33.9	99 12	77.4	13 03.7	99 12	77.3	13 33.5	99 12	77.3	14 03.2	99 12	77.2	1
2	10 27.7	99 12	76.6	10 57.5	99 12	76.6	11 27.3	99 12	76.5	11 57.0	99 12	76.5	12 26.8	99 12	76.4	12 56.6	99 12	76.3	13 26.4	99 12	76.3	13 56.1	99 12	76.2	2
3	10 20.6	99 12	75.7	10 50.4	99 12	75.6	11 20.2	99 12	75.5	11 49.9	99 12	75.5	12 19.7	99 12	75.4	12 49.5	99 12	75.3	13 19.3	99 12	75.3	13 49.0	99 12	75.2	3
4	10 13.5	99 12	74.7	10 43.3	99 12	74.6	11 13.1	99 12	74.5	11 42.9	99 12	74.5	12 12.7	99 12	74.4	12 42.4	99 12	74.4	13 12.2	99 12	74.3	13 42.0	99 12	74.2	4
105	10 06.5	99 12	73.7	10 36.3	99 12	73.6	11 06.1	99 12	73.6	11 35.8	99 12	73.5	12 05.6	99 12	73.4	12 35.4	99 12	73.4	13 05.2	99 12	73.3	13 35.0	99 12	73.3	105
6	9 59.5	99 12	72.7	10 29.3	99 12	72.6	10 59.1	99 12	72.6	11 28.9	99 12	72.5	11 58.6	99 12	72.5	12 28.4	99 12	72.4	12 58.2	99 12	72.3	13 28.0	99 12	72.3	6
7	9 52.5	99 12	71.7	10 22.3	99 12	71.6	10 52.1	99 12	71.6	11 21.9	99 12	71.5	11 51.7	99 12	71.5	12 21.5	99 12	71.4	12 51.3	99 12	71.3	13 21.0	99 12	71.3	7
8	9 45.6	99 11	70.7	10 15.4	99 11	70.7	10 45.2	99 11	70.6	11 15.0	99 11	70.5	11 44.8	99 11	70.5	12 14.6	99 11	70.4	12 44.4	99 11	70.4	13 14.1	99 11	70.3	8
9	9 38.7	99 11	69.7	10 08.5	99 11	69.7	10 38.3	99 11	69.6	11 08.1	99 11	69.6	11 37.9	99 11	69.5	12 07.7	99 11	69.4	12 37.5	99 11	69.4	13 07.3	99 11	69.3	9
110	9 31.9	99 11	68.8	10 01.7	99 11	68.7	10 31.5	99 11	68.6	11 01.3	99 11	68.6	11 31.1	99 11	68.5	12 00.9	99 11	68.5	12 30.7	99 11	68.4	13 00.5	99 11	68.3	110
1	9 25.1	99 11	67.8	9 54.9	99 11	67.7	10 24.7	99 11	67.6	10 54.5	99 11	67.6	11 24.3	99 11	67.5	11 54.1	99 11	67.5	12 23.9	99 11	67.4	12 53.7	99 11	67.4	1
2	9 18.4	99 11	66.8	9 48.2	99 11	66.7	10 18.0	99 11	66.7	10 47.8	99 11	66.6	11 17.6	99 11	66.5	11 47.4	99 11	66.5	12 17.2	99 11	66.4	12 47.0	99 11	66.4	2
3	9 11.7	99 11	65.8	9 41.5	99 11	65.7	10 11.3	99 11	65.7	10 41.1	99 11	65.6	11 10.9	99 11	65.6	11 40.7	99 11	65.5	12 10.5	99 11	65.4	12 40.3	99 11	65.4	3
4	9 05.0	99 11	64.8	9 34.8	99 11	64.8	10 04.6	99 11	64.7	10 34.4	99 11	64.6	11 04.2	99 11	64.6	11 34.1	99 11	64.5	12 03.9	99 11	64.5	12 33.7	99 11	64.4	4
115	8 58.4	99 11	63.8	9 28.2	99 11	63.8	9 58.1	99 11	63.7	10 27.9	99 11	63.7	10 57.7	99 11	63.6	11 27.5	99 11	63.5	11 57.3	99 11	63.5	12 27.1	99 11	63.4	115
6	8 51.9	99 11	62.8	9 21.7	99 11	62.8	9 51.5	99 11	62.7	10 21.3	99 11	62.7	10 51.2	99 11	62.6	11 21.0	99 11	62.6	11 50.8	99 11	62.5	12 20.6	99 11	62.4	6
7	8 45.4	99 11	61.9	9 15.2	99 11	61.8	9 45.1	99 11	61.8	10 14.9	99 11	61.7	10 44.7	99 11	61.6	11 14.5	99 11	61.6	11 44.3	99 11	61.5	12 14.1	99 11	61.5	7
8	8 39.0	99 11	60.9	9 08.8	99 11	60.8	9 38.6	99 11	60.8	10 08.5	99 11	60.7	10 38.3	99 11	60.7	11 08.1	99 11	60.6	11 37.9	99 11	60.5	12 07.7	99 11	60.5	8
9	8 32.6	99 10	59.9	9 02.5	99 10	59.8	9 32.3	99 10	59.8	10 02.1	99 10	59.7	10 31.9	99 10	59.7	11 01.8	99 10	59.6	11 31.6	99 10	59.6	12 01.4	99 10	59.5	9
120	8 26.3	99 10	58.9	8 56.2	99 10	58.9	9 26.0	99 10	58.8	9 55.8	99 10	58.8	10 25.7	99 10	58.7	10 55.5	99 10	58.6	11 25.3	99 10	58.6	11 55.1	99 10	58.5	120
1	8 20.1	99 10	57.9	8 50.0	99 10	57.9	9 19.8	99 10	57.8	9 49.6	99 10	57.8	10 19.4	99 10	57.7	10 49.3	99 10	57.7	11 19.1	99 10	57.6	11 48.9	99 10	57.6	1
2	8 14.0	99 10	56.9	8 43.8	99 10	56.9	9 13.6	99 10	56.8	9 43.5	99 10	56.8	10 13.3	99 10	56.7	10 43.1	99 10	56.7	11 13.0	99 10	56.6	11 42.8	99 10	56.6	2
3	8 07.9	99 10	56.0	8 37.7	99 10	55.9	9 07.5	99 10	55.9	9 37.4	99 10	55.8	10 07.2	99 10	55.8	10 37.1	99 10	55.7	11 06.9	99 10	55.6	11 36.7	99 10	55.6	3
4	8 01.8	99 10	55.0	8 31.7	99 10	54.9	9 01.5	99 10	54.9	9 31.4	99 10	54.8	10 01.2	99 10	54.8	10 31.1	99 10	54.7	11 00.9	99 10	54.7	11 30.7	99 10	54.6	4
125	7 55.9	99 10	54.0	8 25.7	99 10	53.9	8 55.6	99 10	53.9	9 25.4	99 10	53.8	9 55.3	99 10	53.8	10 25.1	99 10	53.7	10 55.0	99 10	53.7	11 24.8	99 10	53.6	125
6	7 50.0	1.0 10	53.0	8 19.9	1.0 10	53.0	8 49.7	1.0 10	52.9	9 19.6	99 10	52.9	9 49.4	99 10	52.8	10 19.3	99 10	52.8	10 49.1	99 10	52.7	11 19.0	99 10	52.7	6
7	7 44.2	1.0 10	52.0	8 14.1	1.0 10	52.0	8 43.9	1.0 10	51.9	9 13.8	1.0 10	51.9	9 43.6	1.0 10	51.8	10 13.5	1.0 10	51.8	10 43.3	1.0 10	51.7	11 13.2	1.0 10	51.7	7
8	7 38.5	1.0 09	51.1	8 08.3	1.0 09	51.0	8 38.2	1.0 09	51.0	9 08.1	1.0 09	50.9	9 37.9	1.0 09	50.9	10 07.8	1.0 09	50.8	10 37.6	1.0 09	50.8	11 07.5	1.0 09	50.7	8
9	7 32.8	1.0 09	50.1	8 02.7	1.0 09	50.0	8 32.6	1.0 09	50.0	9 02.4	1.0 09	49.9	9 32.3	1.0 09	49.9	10 02.1	1.0 09	49.8	10 32.0	1.0 09	49.8	11 01.9	1.0 09	49.8	9
130	7 27.3	1.0 09	49.1	7 57.1	1.0 09	49.0	8 27.0	1.0 09	49.0	8 56.9	1.0 09	48.9	9 26.7	1.0 09	48.9	9 56.6	1.0 09	48.8	10 26.5	1.0 09	48.8	10 56.3	1.0 09	48.8	130
1	7 21.8	1.0 09	48.1	7 51.7	1.0 09	48.1	8 21.5	1.0 09	48.0	8 51.4	1.0 09	48.0	9 21.3	1.0 09	47.9	9 51.1	1.0 09	47.9	10 21.0	1.0 09	47.8	10 50.9	1.0 09	47.8	1
2	7 16.4	1.0 09	47.1	7 46.3	1.0 09	47.1	8 16.1	1.0 09	47.0	8 46.0	1.0 09	47.0	9 15.9	1.0 09	46.9	9 45.8	1.0 09	46.9	10 15.6	1.0 09	46.8	10 45.5	1.0 09	46.8	2
3	7 11.1	1.0 09	46.1	7 40.9	1.0 09	46.1	8 10.8	1.0 09	46.0	8 40.7	1.0 09	46.0	9 10.6	1.0 09	46.0	9 40.5	1.0 09	45.9	10 10.3	1.0 09	45.9	10 40.2	1.0 09	45.8	3
4	7 05.8	1.0 09	45.2	7 35.7	1.0 09	45.1	8 05.6	1.0 09	45.1	8 35.5	1.0 09	45.0	9 05.4	1.0 09	45.0	9 35.2	1.0 09	44.9	10 05.1	1.0 09	44.9	10 35.0	1.0 09	44.8	4
135	7 00.7	1.0 08	44.2	7 30.6	1.0 08	44.1	8 00.5	1.0 08	44.1	8 30.4	1.0 08	44.0	9 00.2	1.0 08	44.0	9 30.1	1.0 08	44.0	10 00.0	1.0 08	43.9	10 29.9	1.0 08	43.9	135
6	6 55.6	1.0 08	43.2	7 25.5	1.0 08	43.2	7 55.4	1.0 08	43.1	8 25.3	1.0 08	43.1	8 55.2	1.0 08	43.0	9 25.1	1.0 08	43.0	9 55.0	1.0 08	42.9	10 24.9	1.0 08	42.9	6
7	6 50.7	1.0 08	42.2	7 20.6	1.0 08	42.2	7 50.5	1.0 08	42.1	8 20.4	1.0 08	42.0	8 50.3	1.0 08	42.0	9 20.2	1.0 08	42.0	9 50.1	1.0 08	42.0	10 19.9	1.0 08	41.9	7
8	6 45.8	1.0 08	41.2	7 15.7	1.0 08	41.2	7 45.6	1.0 08	41.1	8 15.5	1.0 08	41.1	8 45.4	1.0 08	41.1	9 15.3	1.0 08	41.0	9 45.2	1.0 08	41.0	10 15.1	1.0 08	40.9	8
9	6 41.0	1.0 08	40.2	7 11.0	1.0 08	40.2	7 40.9	1.0 08	40.2	8 10.8	1.0 08	40.1	8 40.7	1.0 08	40.1	9 10.6	1.0 08	40.0	9 40.5	1.0 08	40.0	10 10.4	1.0 08	40.0	9
140	6 36.4	1.0 08	39.3	7 06.3	1.0 08	39.2	7 36.2	1.0 08	39.2	8 06.1	1.0 08	39.1	8 36.0	1.0 08	39.1	9 05.9	1.0 08	39.1	9 35.8	1.0 08	39.0	10 05.7	1.0 08	39.0	140
1	6 31.8	1.0 07	38.3	7 01.7	1.0 07	38.2	7 31.6	1.0 07	38.2	8 01.5	1.0 07	38.2	8 31.4	1.0 07	38.1	9 01.3	1.0 07	38.1	9 31.3	1.0 07	38.1	10 01.2	1.0 07	38.0	1
2	6 27.3	1.0 07	37.3	6 57.2	1.0 07	37.3	7 27.1	1.0 07	37.2	7 57.1	1.0 07	37.2	8 27.0	1.0 07	37.2	8 56.9	1.0 07	37.1	9 26.8	1.0 07	37.1	9 56.7	1.0 07	37.0	2
3	6 22.9	1.0 07	36.3	6 52.8	1.0 07	36.3	7 22.8	1.0 07	36.2	7 52.7	1.0 07	36.2	8 22.6	1.0 07	36.2	8 52.5	1.0 07	36.1	9 22.4	1.0 07	36.1	9 52.4	1.0 07	36.1	3
4	6 18.6	1.0 07	35.3	6 48.6	1.0 07	35.3	7 18.5	1.0 07	35.3	7 48.4	1.0 07	35.2	8 18.3	1.0 07	35.2	8 48.3	1.0 07	35.2	9 18.2	1.0 07	35.1	9 48.1	1.0 07	35.1	4
145	6 14.5	1.0 07	34.4	6 44.4	1.0 07	34.3	7 14.3	1.0 07	34.3	7 44.2	1.0 07	34.3	8 14.2	1.0 07	34.2	8 44.1	1.0 07	34.2	9 14.0	1.0 07	34.1	9 43.9	1.0 07	34.1	145
6	6 10.4	1.0 07	33.4	6 40.3	1.0 07	33.3	7 10.3	1.0 07	33.3	7 40.2	1.0 07	33.3	8 10.1	1.0 07	33.2	8 40.0	1.0 07	33.2	9 10.0	1.0 07	33.2	9 39.9	1.0 07	33.1	6
7	6 06.4	1.0 06	32.4	6 36.4	1.0 06	32.4	7 06.3	1.0 06	32.3	7 36.2	1.0 06	32.3	8 06.2	1.0 06	32.3	8 36.1	1.0 06	32.2	9 06.0	1.0 06	32.2	9 36.0	1.0 06	32.2	7
8	6 02.6	1.0 06	31.4	6 32.5	1.0 06	31.4	7 02.4	1.0 06	31.4	7 32.4	1.0 06	31.3	8 02.3	1.0 06	31.3	8 32.2	1.0 06	31.3	9 02.2	1.0 06	31.2	9 32.1	1.0 06	31.2	8
9	5 58.8	1.0 06	30.4	6 28.7	1.0 06	30.4	6 58.7	1.0 06	30.4	7 28.6	1.0 06	30.3	7 58.6	1.0 06	30.3	8 28.5	1.0 06	30.3	8 58.4	1.0 06	30.2	9 28.4	1.0 06	30.2	9
150	5 55.2	1.0 06	29.5	6 25.1	1.0 06	29.4	6 55.0	1.0 06	29.4	7 25.0	1.0 06	29.4	7 54.9	1.0 06	29.3	8 24.9	1.0 06	29.3	8 54.8	1.0 06	29.3	9 24.8	1.0 06	29.2	150
1	5 51.6	1.0 06	28.5	6 21.6	1.0 06	28.4	6 51.5	1.0 06	28.4	7 21.5	1.0 06	28.4	7 51.4	1.0 06	28.4	8 21.3	1.0 06	28.3	8 51.3	1.0 06	28.3	9 21.2	1.0 06	28.3	1
2	5 48.2	1.0 06	27.5	6 18.1	1.0 06	27.4	6 48.1	1.0 06	27.4	7 18.0	1.0 06	27.4	7 48.0	1.0 06	27.4	8 17.9	1.0 06	27.3	8 47.9	1.0 06	27.3	9 17.8	1.0 06	27.3	2
3	5 44.9	1.0 05	26.5	6 14.8	1.0 05	26.5	6 44.8	1.0 05	26.5	7 14.7	1.0 05	26.4	7 44.7	1.0 05	26.4	8 14.6	1.0 05	26.4	8 44.6	1.0 05	26.3	9 14.5	1.0 05	26.3	3
4	5 41.7	1.0 05	25.5	6 11.6	1.0 05	25.5	6 41.6	1.0 05	25.5	7 11.5	1.0 05	25.4	7 41.5	1.0 05	25.4	8 11.4	1.0 05	25.4	8 41.4	1.0 05	25.4	9 11.4	1.0 05	25.3	4
155	5 38.6	1.0 05	24.5	6 08.5	1.0 05	24.5	6 38.5	1.0 05	24.5	7 08.4	1.0 05	24.5	7 38.4	1.0 05	24.4	8 08.4	1.0 05	24.4	8 38.3	1.0 05	24.4	9 08.3	1.0 05	24.4	155
6	5 35.6	1.0 05	23.5	6 05.5	1.0 05	23.5	6 35.5	1.0 05	23.5	7 05.5	1.0 05	23.5	7 35.4	1.0 05	23.5	8 05.4	1.0 05	23.4	8 35.4	1.0 05	23.4	9 05.3	1.0 05	23.4	6
7	5 32.7	1.0 05	22.6	6 02.7	1.0 05	22.6	6 32.6	1.0 05	22.5	7 02.6	1.0 05	22.5	7 32.6	1.0 05	22.5	8 02.5	1.0 05	22.5	8 32.5	1.0 05	22.4	9 02.5	1.0 05	22.4	7
8	5 30.0	1.0 04	21.6	5 59.9	1.0 04	21.6	6 29.9	1.0 04	21.6	6 59.9	1.0 04	21.5	7 29.8	1.0 04	21.5	7 59.8	1.0 04	21.5	8 29.8	1.0 04	21.5	8 59.7	1.0 04	21.4	8
9	5 27.3	1.0 04	20.6	5 57.3	1.0 04	20.6	6 27.3	1.0 04	20.6	6 57.2	1.0 04	20.6	7 27.2	1.0 04	20.5	7 57.2	1.0 04	20.5	8 27.2	1.0 04	20.5	8 57.1	1.0 04	20.5	9
160	5 24.8	1.0 04	19.6	5 54.8	1.0 04	19.6	6 24.8	1.0 04	19.6	6 54.7	1.0 04	19.6	7 24.7	1.0 04	19.6	7 54.7	1.0 04	19.5	8 24.7	1.0 04	19.5	8 54.6	1.0 04	19.5	160
1	5 22.4	1.0 04	18.7	5 52.4	1.0 04	18.6	6 22.4	1.0 04	18.6	6 52.3	1.0 04	18.6	7 22.3	1.0 04	18.6	7 52.3	1.0 04	18.6	8 22.3	1.0 04	18.5	8 52.3	1.0 04	18.5	1
2	5 20.1	1.0 04	17.7	5 50.1	1.0 04	17.7	6 20.1	1.0 04	17.6	6 50.1	1.0 04	17.6	7 20.1	1.0 04	17.6	7 50.0	1.0 04	17.6	8 20.0	1.0 04	17.6	8 50.0	1.0 04	17.5	2
3	5 18.0	1.0 03	16.7	5 48.0	1.0 03	16.7	6 17.9	1.0 03	16.7	6 47.9	1.0 03	16.6	7 17.9	1.0 03	16.6	7 47.9	1.0 03	16.6	8 17.9	1.0 03	16.6	8 47.8	1.0 03	16.6	3
4	5 15.9	1.0 03	15.7	5 45.9	1.0 03	15.7	6 15.9	1.0 03	15.7	6 45.9	1.0 03	15.7	7 15.9	1.0 03	15.6	7 45.9	1.0 03	15.6	8 15.8	1.0 03	15.6	8 45.8	1.0 03	15.6	4
165	5 14.0	1.0 03	14.7	5 44.0	1.0 03	14.7	6 14.0	1.0 03	14.7	6 44.0	1.0 03	14.7	7 14.0	1.0 03	14.7	7 43.9	1.0 03	14.6	8 13.9	1.0 03	14.6	8 43.9	1.0 03	14.6	165
6	5 12.2	1.0 03	13.7	5 42.2	1.0 03	13.7	6 12.2	1.0 03	13.7	6 42.2	1.0 03	13.7	7 12.2	1.0 03	13.7	7 42.2	1.0 03	13.7	8 12.1	1.0 03	13.7	8 42.1	1.0 03	13.6	6
7	5 10.5	1.0 03	12.8	5 40.5	1.0 03	12.8	6 10.5	1.0 03	12.7	6 40.5	1.0 03	12.7	7 10.5	1.0 03	12.7	7 40.5	1.0 03	12.7	8 10.5	1.0 03	12.7	8 40.5	1.0 03	12.7	7
8	5 09.0	1.0 02	11.8	5 39.0	1.0 02	11.8	6 09.0	1.0 02	11.7	6 39.0	1.0 02	11.7	7 09.0	1.0 02	11.7	7 38.9	1.0 02	11.7	8 08.9	1.0 02	11.7	8 38.9	1.0 02	11.7	8
9	5 07.6	1.0 02	10.8	5 37.6	1.0 02	10.8	6 07.5	1.0 02	10.8	6 37.5	1.0 02	10.8	7 07.5	1.0 02	10.8	7 37.5	1.0 02	10.7	8 07.5	1.0 02	10.7	8 37.5	1.0 02	10.7	9
170	5 06.2	1.0 02	09.8	5 36.2	1.0 02	09.8	6 06.2	1.0 02	09.8	6 36.2	1.0 02	09.8	7 06.2	1.0 02	09.8	7 36.2	1.0 02	09.8	8 06.2	1.0 02	09.8	8 36.2	1.0 02	09.7	170
1	5 05.1	1.0 02	08.8	5 35.1	1.0 02	08.8	6 05.1	1.0 02	08.8	6 35.0	1.0 02	08.8	7 05.0	1.0 02	08.8	7 35.0	1.0 02	08.8	8 05.0	1.0 02	08.8	8 35.0	1.0 02	08.8	1
2	5 04.0	1.0 01	07.9	5 34.0	1.0 01	07.9	6 04.0	1.0 01	07.8	6 34.0	1.0 01	07.8	7 04.0	1.0 01	07.8	7 34.0	1.0 01	07.8	8 04.0	1.0 01	07.8	8 34.0	1.0 01	07.8	2
3	5 03.1	1.0 01	06.9	5 33.1	1.0 01	06.9	6 03.1	1.0 01	06.9	6 33.1	1.0 01	06.9	7 03.1	1.0 01	06.8	7 33.0	1.0 01	06.8	8 03.0	1.0 01	06.8	8 33.0	1.0 01	06.8	3
4	5 02.3	1.0 01	05.9	5 32.3	1.0 01	05.9	6 02.2	1.0 01	05.9	6 32.2	1.0 01	05.9	7 02.2	1.0 01	05.9	7 32.2	1.0 01	05.9	8 02.2	1.0 01	05.9	8 32.2	1.0 01	05.8	4
175	5 01.6	1.0 01	04.9	5 31.6	1.0 01	04.9	6 01.6	1.0 01	04.9	6 31.6	1.0 01	04.9	7 01.6	1.0 01	04.9	7 31.6	1.0 01	04.9	8 01.6	1.0 01	04.9	8 31.6	1.0 01	04.9	175
6	5 01.0	1.0 01	03.9	5 31.0	1.0 01	03.9	6 01.0	1.0 01	03.9	6 31.0	1.0 01	03.9	7 01.0	1.0 01	03.9	7 31.0	1.0 01	03.9	8 01.0	1.0 01	03.9	8 31.0	1.0 01	03.9	6
7	5 00.6	1.0 01	02.9	5 30.6	1.0 01	02.9	6 00.6	1.0 01	02.9	6 30.6	1.0 01	02.9	7 00.6	1.0 01	02.9	7 30.6	1.0 01	02.9	8 00.6	1.0 01	02.9	8 30.6	1.0 01	02.9	7
8	5 00.3	1.0 00	02.0	5 30.3	1.0 00	02.0	6 00.3	1.0 00	02.0	6 30.2	1.0 00	02.0	7 00.2	1.0 00	02.0	7 30.2	1.0 00	02.0	8 00.2	1.0 00	02.0	8 30.2	1.0 00	01.9	8
9	5 00.1	1.0 00	01.0	5 30.1	1.0 00	01.0	6 00.1	1.0 00	01.0	6 30.1	1.0 00	01.0	7 00.1	1.0 00	01.0	7 30.1	1.0 00	01.0	8 00.1	1.0 00	01.0	8 30.1	1.0 00	01.0	9
180	5 00.0	1.0 00	00.0	5 30.0	1.0 00	00.0	6 00.0	1.0 00	00.0	6 30.0	1.0 00	00.0	7 00.0	1.0 00	00.0	7 30.0	1.0 00	00.0	8 00.0	1.0 00	00.0	8 30.0	1.0 00	00.0	180

Each cell below lists: Alt. (° ′) · Δd Δt · Az.

H.A.	16° 00′	16° 30′	17° 00′	17° 30′	18° 00′	18° 30′	19° 00′	19° 30′	H.A.
00	-23 00.0 1.000 180.0	23 30.0 1.000 180.0	24 00.0 1.000 180.0	24 30.0 1.000 180.0	25 00.0 1.000 180.0	25 30.0 1.000 180.0	26 00.0 1.000 180.0	26 30.0 1.000 180.0	00
1	22 59.9 1.000 179.0	23 29.9 1.000 179.0	23 59.9 1.000 179.0	24 29.9 1.000 179.0	24 59.9 1.000 179.0	25 29.9 1.000 178.9	25 59.9 1.000 178.9	26 29.9 1.000 178.9	1
2	22 59.7 1.001 177.9	23 29.7 1.001 177.9	23 59.7 1.001 177.9	24 29.7 1.001 177.9	24 59.7 1.001 177.9	25 29.7 1.001 177.9	25 59.7 1.001 177.9	26 29.7 1.001 177.9	2
3	22 59.4 1.001 176.9	23 29.4 1.001 176.9	23 59.4 1.001 176.9	24 29.4 1.001 176.9	24 59.4 1.001 176.9	25 29.4 1.001 176.8	25 59.4 1.001 176.8	26 29.4 1.001 176.8	3
4	22 58.9 1.001 175.8	23 28.9 1.001 175.8	23 58.9 1.001 175.8	24 28.9 1.001 175.8	24 58.9 1.001 175.8	25 28.9 1.001 175.8	25 58.9 1.001 175.8	26 28.9 1.001 175.8	4
05	22 58.3 1.001 174.8	23 28.3 1.001 174.8	23 58.3 1.001 174.8	24 28.3 1.001 174.8	24 58.3 1.001 174.8	25 28.3 1.001 174.7	25 58.3 1.001 174.7	26 28.3 1.001 174.7	05
6	22 57.6 1.001 173.7	23 27.6 1.001 173.7	23 57.6 1.001 173.7	24 27.6 1.001 173.7	24 57.6 1.001 173.7	25 27.6 1.001 173.7	25 57.6 1.001 173.7	26 27.6 1.001 173.7	6
7	22 56.7 1.002 172.7	23 26.7 1.002 172.7	23 56.7 1.002 172.7	24 26.7 1.002 172.7	24 56.7 1.002 172.7	25 26.7 1.002 172.6	25 56.7 1.002 172.6	26 26.7 1.002 172.6	7
8	22 55.7 1.002 171.6	23 25.7 1.002 171.6	23 55.7 1.002 171.6	24 25.7 1.002 171.6	24 55.7 1.002 171.6	25 25.7 1.002 171.6	25 55.7 1.002 171.6	26 25.7 1.002 171.6	8
9	22 54.6 1.002 170.6	23 24.6 1.002 170.6	23 54.6 1.002 170.6	24 24.6 1.002 170.6	24 54.6 1.002 170.6	25 24.6 1.002 170.5	25 54.6 1.002 170.5	26 24.6 1.002 170.5	9
10	22 53.4 1.002 169.6	23 23.3 1.002 169.5	23 53.3 1.002 169.5	24 23.3 1.002 169.5	24 53.3 1.002 169.5	25 23.3 1.002 169.5	25 53.3 1.002 169.5	26 23.3 1.002 169.5	10
1	22 52.0 1.003 168.5	23 22.0 1.003 168.5	23 51.9 1.003 168.5	24 21.9 1.003 168.5	24 51.9 1.003 168.5	25 21.9 1.003 168.4	25 51.9 1.003 168.4	26 21.9 1.003 168.4	1
2	22 50.4 1.003 167.5	23 20.4 1.003 167.5	23 50.4 1.003 167.4	24 20.4 1.003 167.4	24 50.4 1.003 167.4	25 20.4 1.003 167.4	25 50.4 1.003 167.4	26 20.4 1.003 167.4	2
3	22 48.8 1.003 166.4	23 18.8 1.003 166.4	23 48.8 1.003 166.4	24 18.8 1.003 166.4	24 48.7 1.003 166.4	25 18.7 1.003 166.4	25 48.7 1.003 166.3	26 18.7 1.003 166.3	3
4	22 47.0 1.003 165.4	23 17.0 1.003 165.4	23 47.0 1.003 165.4	24 17.0 1.003 165.3	24 47.0 1.003 165.3	25 16.9 1.003 165.3	25 46.9 1.003 165.3	26 16.9 1.003 165.3	4
15	22 45.1 1.003 164.3	23 15.1 1.003 164.3	23 45.1 1.003 164.3	24 15.1 1.003 164.3	24 45.0 1.003 164.3	25 15.0 1.003 164.3	25 45.0 1.003 164.2	26 15.0 1.003 164.2	15
6	22 43.1 1.004 163.3	23 13.0 1.004 163.3	23 43.0 1.004 163.3	24 13.0 1.004 163.2	24 43.0 1.004 163.2	25 13.0 1.004 163.2	25 42.9 1.004 163.2	26 12.9 1.004 163.2	6
7	22 40.9 1.004 162.2	23 10.9 1.004 162.2	23 40.9 1.004 162.2	24 10.8 1.004 162.2	24 40.8 1.004 162.2	25 10.8 1.004 162.2	25 40.8 1.004 162.1	26 10.7 1.004 162.1	7
8	22 38.6 1.004 161.2	23 08.6 1.004 161.2	23 38.6 1.004 161.2	24 08.5 1.004 161.2	24 38.5 1.004 161.1	25 08.5 1.004 161.1	25 38.5 1.004 161.1	26 08.4 1.004 161.1	8
9	22 36.2 1.004 160.2	23 06.2 1.004 160.2	23 36.1 1.004 160.1	24 06.1 1.004 160.1	24 36.1 1.004 160.1	25 06.1 1.004 160.1	25 36.0 1.004 160.0	26 06.0 1.004 160.0	9
20	22 33.7 1.004 159.1	23 03.6 1.004 159.1	23 33.6 1.004 159.1	24 03.6 1.004 159.1	24 33.5 1.004 159.0	25 03.5 1.004 159.0	25 33.5 1.004 159.0	26 03.4 1.004 159.0	20
1	22 31.0 1.005 158.1	23 01.0 1.005 158.1	23 30.9 1.005 158.1	24 00.9 1.005 158.0	24 30.9 1.005 158.0	25 00.8 1.005 158.0	25 30.8 1.005 157.9	26 00.8 1.005 157.9	1
2	22 28.2 1.005 157.1	22 58.2 1.005 157.0	23 28.1 1.005 157.0	23 58.1 1.005 157.0	24 28.1 1.005 157.0	24 58.0 1.005 156.9	25 28.0 1.005 156.9	25 57.9 1.005 156.9	2
3	22 25.3 1.005 156.0	22 55.3 1.005 156.0	23 25.2 1.005 156.0	23 55.2 1.005 155.9	24 25.1 1.005 155.9	24 55.1 1.005 155.9	25 25.0 1.005 155.9	25 55.0 1.005 155.8	3
4	22 22.3 1.005 155.0	22 52.2 1.005 155.0	23 22.2 1.005 154.9	23 52.1 1.005 154.9	24 22.1 1.005 154.9	24 52.0 1.005 154.8	25 22.0 1.005 154.8	25 52.0 1.005 154.8	4
25	22 19.1 1.005 154.0	22 49.1 1.005 153.9	23 19.0 1.005 153.9	23 49.0 1.005 153.9	24 18.9 1.005 153.8	24 48.9 1.005 153.8	25 18.8 1.006 153.8	25 48.8 1.006 153.7	25
6	22 15.8 1.006 152.9	22 45.8 1.006 152.9	23 15.7 1.006 152.9	23 45.7 1.006 152.8	24 15.6 1.006 152.8	24 45.6 1.006 152.8	25 15.5 1.006 152.7	25 45.5 1.006 152.7	6
7	22 12.5 1.006 151.9	22 42.4 1.006 151.8	23 12.3 1.006 151.8	23 42.3 1.006 151.8	24 12.2 1.006 151.7	24 42.2 1.006 151.7	25 12.1 1.006 151.7	25 42.1 1.006 151.6	7
8	22 08.9 1.006 150.8	22 38.9 1.006 150.8	23 08.8 1.006 150.8	23 38.8 1.006 150.7	24 08.7 1.006 150.7	24 38.7 1.006 150.7	25 08.6 1.006 150.6	25 38.5 1.006 150.6	8
9	22 05.3 1.006 149.8	22 35.3 1.006 149.8	23 05.2 1.006 149.7	23 35.1 1.006 149.7	24 05.1 1.006 149.7	24 35.0 1.006 149.6	25 05.0 1.006 149.6	25 34.9 1.006 149.6	9
30	22 01.6 1.006 148.8	22 31.5 1.006 148.7	23 01.5 1.006 148.7	23 31.4 1.006 148.7	24 01.3 1.006 148.6	24 31.3 1.006 148.6	25 01.2 1.006 148.6	25 31.1 1.006 148.5	30
1	21 57.7 1.007 147.7	22 27.7 1.007 147.7	22 57.6 1.007 147.7	23 27.5 1.007 147.6	23 57.5 1.007 147.6	24 27.4 1.007 147.6	24 57.3 1.007 147.5	25 27.3 1.007 147.5	1
2	21 53.8 1.007 146.7	22 23.7 1.007 146.7	22 53.6 1.007 146.6	23 23.6 1.007 146.6	23 53.5 1.007 146.6	24 23.4 1.007 146.5	24 53.3 1.007 146.5	25 23.2 1.007 146.5	2
3	21 49.7 1.007 145.7	22 19.6 1.007 145.6	22 49.6 1.007 145.6	23 19.5 1.007 145.6	23 49.4 1.007 145.5	24 19.3 1.007 145.5	24 49.2 1.007 145.4	25 19.2 1.007 145.4	3
4	21 45.5 1.007 144.6	22 15.5 1.007 144.6	22 45.4 1.007 144.6	23 15.3 1.007 144.5	23 45.2 1.007 144.5	24 15.1 1.007 144.4	24 45.0 1.007 144.4	25 15.0 1.007 144.4	4
35	21 41.3 1.007 143.6	22 11.2 1.007 143.6	22 41.1 1.007 143.5	23 11.0 1.007 143.5	23 40.9 1.007 143.4	24 10.8 1.007 143.4	24 40.7 1.007 143.4	25 10.6 1.007 143.3	35
6	21 36.9 1.008 142.6	22 06.8 1.008 142.5	22 36.7 1.008 142.5	23 06.6 1.008 142.4	23 36.5 1.008 142.4	24 06.4 1.008 142.4	24 36.3 1.008 142.3	25 06.2 1.008 142.3	6
7	21 32.4 1.008 141.5	22 02.3 1.008 141.5	22 32.2 1.008 141.5	23 02.1 1.008 141.4	23 32.0 1.008 141.4	24 01.9 1.008 141.3	24 31.8 1.008 141.3	25 01.7 1.008 141.3	7
8	21 27.8 1.008 140.5	21 57.7 1.008 140.5	22 27.6 1.008 140.4	22 57.5 1.008 140.4	23 27.4 1.008 140.3	23 57.3 1.008 140.3	24 27.2 1.008 140.2	24 57.1 1.008 140.2	8
9	21 23.1 1.008 139.5	21 53.0 1.008 139.4	22 22.9 1.008 139.4	22 52.8 1.008 139.3	23 22.7 1.008 139.3	23 52.5 1.008 139.3	24 22.4 1.008 139.2	24 52.3 1.008 139.2	9
40	21 18.3 1.008 138.5	21 48.2 1.008 138.4	22 18.1 1.008 138.4	22 47.9 1.008 138.3	23 17.8 1.008 138.3	23 47.7 1.008 138.2	24 17.6 1.008 138.2	24 47.5 1.008 138.1	40
1	21 13.4 1.008 137.4	21 43.3 1.008 137.4	22 13.1 1.008 137.3	22 43.0 1.008 137.3	23 12.9 1.008 137.2	23 42.8 1.008 137.2	24 12.7 1.008 137.1	24 42.6 1.008 137.1	1
2	21 08.4 1.009 136.4	21 38.3 1.009 136.4	22 08.1 1.009 136.3	22 38.0 1.009 136.3	23 07.9 1.009 136.2	23 37.8 1.009 136.2	24 07.7 1.009 136.1	24 37.5 1.009 136.1	2
3	21 03.3 1.009 135.4	21 33.2 1.009 135.3	22 03.0 1.009 135.3	22 32.9 1.009 135.2	23 02.8 1.009 135.2	23 32.7 1.009 135.1	24 02.6 1.009 135.1	24 32.4 1.009 135.0	3
4	20 58.1 1.009 134.3	21 28.0 1.009 134.3	21 57.9 1.009 134.3	22 27.7 1.009 134.2	22 57.6 1.009 134.2	23 27.5 1.009 134.1	23 57.3 1.009 134.1	24 27.2 1.009 134.0	4
45	20 52.8 1.009 133.3	21 22.7 1.009 133.3	21 52.6 1.009 133.2	22 22.4 1.009 133.2	22 52.3 1.009 133.1	23 22.2 1.009 133.1	23 52.0 1.009 133.0	24 21.9 1.009 133.0	45
6	20 47.5 1.009 132.3	21 17.3 1.009 132.2	21 47.2 1.009 132.2	22 17.1 1.009 132.1	22 46.9 1.009 132.1	23 16.8 1.009 132.0	23 46.7 1.009 131.9	24 16.5 1.009 131.9	6
7	20 42.0 1.009 131.2	21 11.9 1.009 131.2	21 41.7 1.009 131.1	22 11.6 1.009 131.1	22 41.5 1.009 131.1	23 11.3 1.009 131.0	23 41.2 1.009 131.0	24 11.0 1.009 130.9	7
8	20 36.5 1.009 130.3	21 06.3 1.009 130.2	21 36.2 1.009 130.1	22 06.0 1.009 130.1	22 35.9 1.009 130.0	23 05.8 1.009 130.0	23 35.6 1.009 129.9	24 05.5 1.009 129.9	8
9	20 30.8 1.010 129.2	21 00.7 1.010 129.2	21 30.6 1.010 129.1	22 00.4 1.010 129.1	22 30.3 1.010 129.0	23 00.1 .99 10 129.0	23 30.0 .99 10 128.9	23 59.8 .99 10 128.9	9
50	20 25.1 1.010 128.2	20 55.0 .99 10 128.2	21 24.8 .99 10 128.1	21 54.7 .99 10 128.1	22 24.5 .99 10 128.0	22 54.4 .99 10 127.9	23 24.2 .99 10 127.9	23 54.1 .99 10 127.8	50
1	20 19.4 .99 10 127.2	20 49.2 .99 10 127.1	21 19.1 .99 10 127.1	21 48.9 .99 10 127.0	22 18.7 .99 10 127.0	22 48.6 .99 10 126.9	23 18.4 .99 10 126.9	23 48.3 .99 10 126.8	1
2	20 13.5 .99 10 126.2	20 43.3 .99 10 126.1	21 13.2 .99 10 126.1	21 43.0 .99 10 126.0	22 12.9 .99 10 126.0	22 42.7 .99 10 125.9	23 12.5 .99 10 125.8	23 42.4 .99 10 125.8	2
3	20 07.6 .99 10 125.2	20 37.4 .99 10 125.1	21 07.2 .99 10 125.1	21 37.1 .99 10 125.0	22 06.9 .99 10 124.9	22 36.7 .99 10 124.9	23 06.6 .99 10 124.8	23 36.4 .99 10 124.8	3
4	20 01.5 .99 10 124.1	20 31.4 .99 10 124.1	21 01.2 .99 10 124.0	21 31.0 .99 10 124.0	22 00.9 .99 10 123.9	22 30.7 .99 10 123.9	23 00.5 .99 10 123.8	23 30.4 .99 10 123.7	4
55	19 55.5 .99 10 123.1	20 25.3 .99 10 123.1	20 55.1 .99 10 123.0	21 24.9 .99 10 122.9	21 54.8 .99 10 122.9	22 24.6 .99 10 122.8	22 54.4 .99 10 122.8	23 24.2 .99 10 122.7	55
6	19 49.3 .99 10 122.1	20 19.1 .99 10 122.0	20 48.9 .99 10 122.0	21 18.8 .99 10 121.9	21 48.6 .99 10 121.9	22 18.4 .99 10 121.8	22 48.2 .99 10 121.7	23 18.0 .99 10 121.7	6
7	19 43.1 .99 10 121.1	20 12.9 .99 10 121.0	20 42.7 .99 10 121.0	21 12.5 .99 10 120.9	21 42.3 .99 11 120.9	22 12.2 .99 11 120.8	22 42.0 .99 11 120.7	23 11.8 .99 11 120.7	7
8	19 36.8 .99 11 120.1	20 06.6 .99 11 120.0	20 36.4 .99 11 120.0	21 06.2 .99 11 119.9	21 36.0 .99 11 119.8	22 05.8 .99 11 119.8	22 35.7 .99 11 119.7	23 05.5 .99 11 119.7	8
9	19 30.4 .99 11 119.1	20 00.2 .99 11 119.0	20 30.0 .99 11 118.9	20 59.8 .99 11 118.9	21 29.7 .99 11 118.8	21 59.5 .99 11 118.8	22 29.3 .99 11 118.7	22 59.1 .99 11 118.6	9
60	19 24.0 .99 11 118.0	19 53.8 .99 11 118.0	20 23.6 .99 11 117.9	20 53.4 .99 11 117.9	21 23.2 .99 11 117.8	21 53.0 .99 11 117.7	22 22.8 .99 11 117.7	22 52.6 .99 11 117.6	60
1	19 17.5 .99 11 117.0	19 47.3 .99 11 117.0	20 17.1 .99 11 116.9	20 46.9 .99 11 116.9	21 16.7 .99 11 116.8	21 46.5 .99 11 116.7	22 16.3 .99 11 116.7	22 46.1 .99 11 116.6	1
2	19 11.0 .99 11 116.0	19 40.8 .99 11 116.0	20 10.6 .99 11 115.9	20 40.4 .99 11 115.8	21 10.2 .99 11 115.8	21 40.0 .99 11 115.7	22 09.8 .99 11 115.7	22 39.6 .99 11 115.6	2
3	19 04.4 .99 11 115.0	19 34.2 .99 11 114.9	20 04.0 .99 11 114.9	20 33.8 .99 11 114.8	21 03.6 .99 11 114.8	21 33.4 .99 11 114.7	22 03.1 .99 11 114.6	22 32.9 .99 11 114.6	3
4	18 57.7 .99 11 114.0	19 27.5 .99 11 113.9	19 57.3 .99 11 113.9	20 27.1 .99 11 113.8	20 56.9 .99 11 113.8	21 26.7 .99 11 113.7	21 56.5 .99 11 113.6	22 26.3 .99 11 113.6	4
65	18 51.0 .99 11 113.0	19 20.8 .99 11 112.9	19 50.6 .99 11 112.9	20 20.4 .99 11 112.8	20 50.2 .99 11 112.7	21 20.0 .99 11 112.7	21 49.7 .99 11 112.6	22 19.5 .99 11 112.5	65
6	18 44.2 .99 11 112.0	19 14.0 .99 11 111.9	19 43.8 .99 11 111.9	20 13.6 .99 11 111.8	20 43.4 .99 11 111.7	21 13.2 .99 11 111.6	21 43.0 .99 11 111.6	22 12.7 .99 11 111.5	6
7	18 37.4 .99 11 111.0	19 07.2 .99 11 110.9	19 37.0 .99 11 110.8	20 06.8 .99 11 110.8	20 36.6 .99 11 110.7	21 06.4 .99 11 110.7	21 36.2 .99 11 110.6	22 05.9 .99 11 110.5	7
8	18 30.6 .99 12 110.0	19 00.4 .99 12 109.9	19 30.2 .99 12 109.8	19 59.9 .99 12 109.8	20 29.7 .99 12 109.7	20 59.5 .99 12 109.6	21 29.3 .99 12 109.6	21 59.1 .99 12 109.5	8
9	18 23.7 .99 12 109.0	18 53.5 .99 12 108.9	19 23.3 .99 12 108.8	19 53.0 .99 12 108.8	20 22.8 .99 12 108.7	20 52.6 .99 12 108.6	21 22.4 .99 12 108.6	21 52.1 .99 12 108.5	9
70	18 16.8 .99 12 108.0	18 46.5 .99 12 107.9	19 16.3 .99 12 107.8	19 46.1 .99 12 107.8	20 15.9 .99 12 107.7	20 45.6 .99 12 107.6	21 15.4 .99 12 107.6	21 45.2 .99 12 107.5	70
1	18 09.8 .99 12 107.0	18 39.6 .99 12 106.9	19 09.3 .99 12 106.8	19 39.1 .99 12 106.8	20 08.9 .99 12 106.7	20 38.7 .99 12 106.6	21 08.4 .99 12 106.6	21 38.2 .99 12 106.5	1
2	18 02.8 .99 12 105.9	18 32.5 .99 12 105.9	19 02.3 .99 12 105.8	19 32.1 .99 12 105.8	20 01.9 .99 12 105.7	20 31.6 .99 12 105.6	21 01.4 .99 12 105.6	21 31.2 .99 12 105.5	2
3	17 55.7 .99 12 104.9	18 25.5 .99 12 104.9	18 55.3 .99 12 104.8	19 25.0 .99 12 104.7	19 54.8 .99 12 104.7	20 24.6 .99 12 104.6	20 54.3 .99 12 104.6	21 24.1 .99 12 104.5	3
4	17 48.6 .99 12 103.9	18 18.4 .99 12 103.9	18 48.2 .99 12 103.8	19 18.0 .99 12 103.7	19 47.7 .99 12 103.7	20 17.5 .99 12 103.6	20 47.3 .99 12 103.5	21 17.0 .99 12 103.5	4
75	17 41.5 .99 12 102.9	18 11.3 .99 12 102.9	18 41.1 .99 12 102.8	19 10.8 .99 12 102.7	19 40.6 .99 12 102.7	20 10.4 .99 12 102.6	20 40.1 .99 12 102.5	21 09.9 .99 12 102.5	75
6	17 34.4 .99 12 101.9	18 04.2 .99 12 101.9	18 33.9 .99 12 101.8	19 03.7 .99 12 101.7	19 33.5 .99 12 101.7	20 03.2 .99 12 101.6	20 33.0 .99 12 101.5	21 02.7 .99 12 101.5	6
7	17 27.2 .99 12 100.9	17 57.0 .99 12 100.9	18 26.8 .99 12 100.8	18 56.5 .99 12 100.7	19 26.3 .99 12 100.7	19 56.0 .99 12 100.6	20 25.8 .99 12 100.5	20 55.6 .99 12 100.5	7
8	17 20.0 .99 12 99.9	17 49.8 .99 12 99.9	18 19.6 .99 12 99.8	18 49.3 .99 12 99.7	19 19.1 .99 12 99.7	19 48.8 .99 12 99.6	20 18.6 .99 12 99.5	20 48.4 .99 12 99.5	8
9	17 12.8 .99 12 98.9	17 42.6 .99 12 98.9	18 12.3 .99 12 98.8	18 42.1 .99 12 98.7	19 11.9 .99 12 98.7	19 41.6 .99 12 98.6	20 11.4 .99 12 98.5	20 41.1 .99 12 98.5	9
80	17 05.6 .99 12 97.9	17 35.3 .99 12 97.9	18 05.1 .99 12 97.8	18 34.9 .99 12 97.7	19 04.6 .99 12 97.6	19 34.4 .99 12 97.6	20 04.1 .99 12 97.5	20 33.9 .99 12 97.5	80
1	16 58.3 .99 12 96.9	17 28.1 .99 12 96.9	17 57.9 .99 12 96.8	18 27.6 .99 12 96.7	18 57.4 .99 12 96.7	19 27.1 .99 12 96.6	19 56.9 .99 12 96.5	20 26.6 .99 12 96.5	1
2	16 51.1 .99 12 95.9	17 20.8 .99 12 95.9	17 50.6 .99 12 95.8	18 20.3 .99 12 95.8	18 50.1 .99 12 95.7	19 19.9 .99 12 95.6	19 49.6 .99 12 95.5	20 19.4 .99 12 95.5	2
3	16 43.8 .99 12 95.0	17 13.5 .99 12 94.9	17 43.3 .99 12 94.8	18 13.1 .99 12 94.8	18 42.8 .99 12 94.7	19 12.6 .99 12 94.6	19 42.3 .99 12 94.6	20 12.1 .99 12 94.5	3
4	16 36.5 .99 12 94.0	17 06.3 .99 12 93.9	17 36.0 .99 12 93.8	18 05.8 .99 12 93.8	18 35.5 .99 12 93.7	19 05.3 .99 12 93.6	19 35.0 .99 12 93.6	20 04.8 .99 12 93.5	4
85	16 29.2 .99 12 93.0	16 59.0 .99 12 92.9	17 28.7 .99 12 92.8	17 58.5 .99 12 92.8	18 28.2 .99 12 92.7	18 58.0 .99 12 92.6	19 27.7 .99 12 92.6	19 57.5 .99 12 92.5	85
6	16 21.9 .99 12 92.0	16 51.7 .99 12 91.9	17 21.4 .99 12 91.8	17 51.2 .99 12 91.8	18 20.9 .99 12 91.7	18 50.7 .99 12 91.6	19 20.4 .99 12 91.6	19 50.2 .99 12 91.5	6
7	16 14.6 .99 12 91.0	16 44.3 .99 12 90.9	17 14.1 .99 12 90.8	17 43.9 .99 12 90.8	18 13.6 .99 12 90.7	18 43.4 .99 12 90.6	19 13.1 .99 12 90.6	19 42.9 .99 12 90.5	7
8	16 07.3 .99 12 90.0	16 37.0 .99 12 89.9	17 06.8 .99 12 89.8	17 36.5 .99 12 89.7	18 06.3 .99 12 89.7	18 36.0 .99 12 89.6	19 05.8 .99 12 89.6	19 35.5 .99 12 89.5	8
9	16 00.0 .99 12 89.0	16 29.7 .99 12 88.9	16 59.5 .99 12 88.8	17 29.2 .99 12 88.8	17 59.0 .99 12 88.7	18 28.7 .99 12 88.7	18 58.5 .99 12 88.6	19 28.2 .99 12 88.5	9
90	15 52.7 .99 12 88.0	16 22.4 .99 12 87.9	16 52.2 .99 12 87.8	17 21.9 .99 12 87.8	17 51.7 .99 12 87.7	18 21.4 .99 12 87.7	18 51.2 .99 12 87.6	19 20.9 .99 12 87.5	90

H.A.	16° 00' Alt. (Δd Δt)	Az.	16° 30' Alt. (Δd Δt)	Az.	17° 00' Alt. (Δd Δt)	Az.	17° 30' Alt. (Δd Δt)	Az.	18° 00' Alt. (Δd Δt)	Az.	18° 30' Alt. (Δd Δt)	Az.	19° 00' Alt. (Δd Δt)	Az.	19° 30' Alt. (Δd Δt)	Az.	H.A.
91	15 45.3 99 12	87.0	16 15.1 99 12	86.9	16 44.9 99 12	86.9	17 14.6 99 12	86.8	17 44.4 99 12	86.7	18 14.1 99 12	86.7	18 43.9 99 12	86.6	19 13.6 99 12	86.5	91
2	15 38.1 99 12	86.0	16 07.8 99 12	86.0	16 37.6 99 12	85.9	17 07.3 99 12	85.8	17 37.1 99 12	85.8	18 06.8 99 12	85.7	18 36.6 99 12	85.6	19 06.3 99 12	85.5	2
3	15 30.8 99 12	85.0	16 00.5 99 12	85.0	16 30.3 99 12	84.9	17 00.0 99 12	84.8	17 29.8 99 12	84.8	17 59.5 99 12	84.7	18 29.3 99 12	84.6	18 59.0 99 12	84.6	3
4	15 23.5 99 12	84.0	15 53.2 99 12	84.0	16 23.0 99 12	83.9	16 52.8 99 12	83.8	17 22.5 99 12	83.8	17 52.3 99 12	83.7	18 22.0 99 12	83.6	18 51.8 99 12	83.6	4
95	15 16.2 99 12	83.0	15 46.0 99 12	83.0	16 15.7 99 12	82.9	16 45.5 99 12	82.9	17 15.3 99 12	82.8	17 45.0 99 12	82.7	18 14.8 99 12	82.7	18 44.5 99 12	82.6	95
6	15 09.0 99 12	82.1	15 38.7 99 12	82.0	16 08.5 99 12	81.9	16 38.2 99 12	81.9	17 08.0 99 12	81.8	17 37.8 99 12	81.7	18 07.5 99 12	81.7	18 37.3 99 12	81.6	6
7	15 01.7 99 12	81.1	15 31.5 99 12	81.0	16 01.3 99 12	80.9	16 31.0 99 12	80.9	17 00.8 99 12	80.8	17 30.5 99 12	80.7	18 00.3 99 12	80.7	18 30.1 99 12	80.6	7
8	14 54.5 99 12	80.1	15 24.3 99 12	80.0	15 54.0 99 12	80.0	16 23.8 99 12	79.9	16 53.6 99 12	79.8	17 23.3 99 12	79.8	17 53.1 99 12	79.7	18 22.8 99 12	79.6	8
9	14 47.3 99 12	79.1	15 17.1 99 12	79.0	15 46.9 99 12	79.0	16 16.6 99 12	78.9	16 46.4 99 12	78.8	17 16.1 99 12	78.8	17 45.9 99 12	78.7	18 15.7 99 12	78.6	9
100	14 40.2 99 12	78.1	15 09.9 99 12	78.0	15 39.7 99 12	78.0	16 09.5 99 12	77.9	16 39.2 99 12	77.9	17 09.0 99 12	77.8	17 38.7 99 12	77.7	18 08.5 99 12	77.7	100
1	14 33.0 99 12	77.1	15 02.8 99 12	77.1	15 32.6 99 12	77.0	16 02.3 99 12	76.9	16 32.1 99 12	76.9	17 01.9 99 12	76.8	17 31.6 99 12	76.7	18 01.4 99 12	76.7	1
2	14 25.9 99 12	76.1	14 55.7 99 12	76.1	15 25.4 99 12	76.0	15 55.2 99 12	76.0	16 25.0 99 12	75.9	16 54.7 99 12	75.8	17 24.5 99 12	75.8	17 54.3 99 12	75.7	2
3	14 18.8 99 12	75.2	14 48.6 99 12	75.1	15 18.4 99 12	75.0	15 48.1 99 12	75.0	16 17.9 99 12	74.9	16 47.7 99 12	74.8	17 17.4 99 12	74.8	17 47.2 99 12	74.7	3
4	14 11.8 99 12	74.2	14 41.5 99 12	74.1	15 11.3 99 12	74.0	15 41.1 99 12	74.0	16 10.9 99 12	73.9	16 40.6 99 12	73.9	17 10.4 99 12	73.8	17 40.2 99 12	73.7	4
105	14 04.8 99 12	73.2	14 34.5 99 12	73.1	15 04.3 99 12	73.1	15 34.1 99 12	73.0	16 03.9 99 12	72.9	16 33.6 99 12	72.9	17 03.4 99 12	72.8	17 33.2 99 12	72.7	105
6	13 57.8 99 12	72.2	14 27.5 99 12	72.1	14 57.3 99 12	72.1	15 27.1 99 12	72.0	15 56.9 99 12	72.0	16 26.7 99 12	71.9	16 56.4 99 12	71.8	17 26.2 99 12	71.8	6
7	13 50.8 99 12	71.2	14 20.6 99 12	71.2	14 50.4 99 11	71.1	15 20.2 99 11	71.0	15 50.0 99 11	71.0	16 19.7 99 12	70.9	16 49.5 99 11	70.8	17 19.3 99 11	70.8	7
8	13 43.9 99 11	70.2	14 13.7 99 11	70.2	14 43.5 99 11	70.1	15 13.3 99 11	70.1	15 43.1 99 11	70.0	16 12.8 99 11	69.9	16 42.6 99 11	69.9	17 12.4 99 11	69.8	8
9	13 37.1 99 11	69.3	14 06.9 99 11	69.2	14 36.6 99 11	69.2	15 06.4 99 11	69.1	15 36.2 99 11	69.0	16 06.0 99 11	68.9	16 35.8 99 11	68.9	17 05.6 99 11	68.8	9
110	13 30.2 99 11	68.3	14 00.0 99 11	68.2	14 29.8 99 11	68.2	14 59.6 99 11	68.1	15 29.4 99 11	68.0	15 59.2 99 11	68.0	16 29.0 99 11	67.9	16 58.8 99 11	67.8	110
1	13 23.5 99 11	67.3	13 53.3 99 11	67.2	14 23.1 99 11	67.2	14 52.9 99 11	67.1	15 22.6 99 11	67.1	15 52.4 99 11	67.0	16 22.2 99 11	66.9	16 52.0 99 11	66.9	1
2	13 16.8 99 11	66.3	13 46.6 99 11	66.3	14 16.4 99 11	66.2	14 46.1 99 11	66.1	15 15.9 99 11	66.1	15 45.7 99 11	66.0	16 15.5 99 11	66.0	16 45.3 99 11	65.9	2
3	13 10.1 99 11	65.3	13 39.9 99 11	65.3	14 09.7 99 11	65.2	14 39.5 99 11	65.2	15 09.3 99 11	65.1	15 39.1 99 11	65.0	16 08.9 99 11	65.0	16 38.7 99 11	64.9	3
4	13 03.5 99 11	64.3	13 33.3 99 11	64.3	14 03.1 99 11	64.2	14 32.9 99 11	64.2	15 02.7 99 11	64.1	15 32.5 99 11	64.1	16 02.3 99 11	64.0	16 32.1 99 11	63.9	4
115	12 56.9 99 11	63.4	13 26.7 99 11	63.3	13 56.5 99 11	63.3	14 26.3 99 11	63.2	14 56.1 99 11	63.1	15 25.9 99 11	63.1	15 55.7 99 11	63.0	16 25.5 99 11	63.0	115
6	12 50.4 99 11	62.4	13 20.2 99 11	62.3	13 50.0 99 11	62.3	14 19.8 99 11	62.2	14 49.6 99 11	62.2	15 19.4 99 11	62.1	15 49.2 99 11	62.0	16 19.0 99 11	62.0	6
7	12 43.9 99 11	61.4	13 13.8 99 11	61.4	13 43.6 99 11	61.3	14 13.4 99 11	61.2	14 43.2 99 11	61.2	15 13.0 99 11	61.1	15 42.8 99 11	61.1	16 12.6 99 11	61.0	7
8	12 37.6 99 11	60.4	13 07.4 99 11	60.4	13 37.2 99 11	60.3	14 07.0 99 11	60.3	14 36.8 99 11	60.2	15 06.6 99 11	60.1	15 36.4 99 11	60.1	16 06.3 99 10	60.0	8
9	12 31.2 99 11	59.5	13 01.0 99 11	59.4	13 30.9 99 11	59.4	14 00.7 99 10	59.3	14 30.5 99 10	59.2	15 00.3 99 10	59.1	15 30.1 99 10	59.1	16 00.0 99 10	59.1	9
120	12 25.0 99 10	58.5	12 54.8 99 10	58.4	13 24.6 99 10	58.4	13 54.4 99 10	58.3	14 24.3 99 10	58.3	14 54.1 99 10	58.2	15 23.9 99 10	58.1	15 53.7 99 10	58.1	120
1	12 18.8 99 10	57.5	12 48.6 99 10	57.4	13 18.4 99 10	57.4	13 48.2 99 10	57.3	14 18.1 99 10	57.3	14 47.9 99 10	57.2	15 17.7 99 10	57.2	15 47.5 99 10	57.1	1
2	12 12.6 99 10	56.5	12 42.5 99 10	56.5	13 12.3 99 10	56.4	13 42.1 99 10	56.4	14 12.0 99 10	56.3	14 41.8 99 10	56.2	15 11.6 99 10	56.2	15 41.4 99 10	56.1	2
3	12 06.6 99 10	55.5	12 36.4 99 10	55.5	13 06.2 99 10	55.4	13 36.1 99 10	55.4	14 05.9 99 10	55.3	14 35.7 99 10	55.3	15 05.6 99 10	55.2	15 35.4 99 10	55.2	3
4	12 00.6 99 10	54.5	12 30.4 99 10	54.5	13 00.2 99 10	54.5	13 30.0 99 10	54.4	13 59.9 99 10	54.3	14 29.8 99 10	54.3	14 59.6 99 10	54.2	15 29.4 99 10	54.2	4
125	11 54.7 99 10	53.6	12 24.5 99 10	53.5	12 54.3 99 10	53.5	13 24.2 99 10	53.4	13 54.1 99 10	53.4	14 23.9 99 10	53.3	14 53.7 99 10	53.3	15 23.5 99 10	53.2	125
6	11 48.8 99 10	52.6	12 18.6 99 10	52.6	12 48.5 99 10	52.5	13 18.3 99 10	52.5	13 48.2 99 10	52.4	14 18.0 99 10	52.3	14 47.9 99 10	52.3	15 17.7 99 10	52.2	6
7	11 43.0 1.0 10	51.6	12 12.9 1.0 09	51.6	12 42.7 1.0 09	51.5	13 12.6 99 09	51.5	13 42.4 99 09	51.4	14 12.3 99 09	51.4	14 42.1 99 09	51.3	15 12.0 99 09	51.3	7
8	11 37.3 1.0 09	50.7	12 07.2 1.0 09	50.6	12 37.0 1.0 09	50.6	13 06.9 1.0 09	50.5	13 36.8 1.0 09	50.5	14 06.6 1.0 09	50.4	14 36.5 1.0 09	50.4	15 06.3 1.0 09	50.3	8
9	11 31.7 1.0 09	49.6	12 01.6 1.0 09	49.6	12 31.4 1.0 09	49.6	13 01.3 1.0 09	49.5	13 31.2 1.0 09	49.5	14 01.0 1.0 09	49.4	14 30.9 1.0 09	49.4	15 00.7 1.0 09	49.3	9
130	11 26.2 1.0 09	48.7	11 56.1 1.0 09	48.7	12 25.9 1.0 09	48.6	12 55.8 1.0 09	48.6	13 25.6 1.0 09	48.5	13 55.5 1.0 09	48.5	14 25.4 1.0 09	48.4	14 55.2 1.0 09	48.4	130
1	11 20.7 1.0 09	47.7	11 50.6 1.0 09	47.7	12 20.5 1.0 09	47.6	12 50.3 1.0 09	47.6	13 20.2 1.0 09	47.5	13 50.1 1.0 09	47.5	14 19.9 1.0 09	47.4	14 49.8 1.0 09	47.4	1
2	11 15.4 1.0 09	46.7	11 45.2 1.0 09	46.7	12 15.1 1.0 09	46.7	12 45.0 1.0 09	46.6	13 14.9 1.0 09	46.6	13 44.7 1.0 09	46.5	14 14.6 1.0 09	46.5	14 44.5 1.0 09	46.4	2
3	11 10.1 1.0 09	45.8	11 40.0 1.0 09	45.7	12 09.8 1.0 09	45.7	12 39.7 1.0 09	45.6	13 09.6 1.0 09	45.6	13 39.5 1.0 09	45.5	14 09.3 1.0 09	45.5	14 39.2 1.0 09	45.4	3
4	11 04.9 1.0 08	44.8	11 34.8 1.0 08	44.8	12 04.6 1.0 08	44.7	12 34.5 1.0 08	44.7	13 04.4 1.0 08	44.6	13 34.3 1.0 08	44.6	14 04.2 1.0 08	44.5	14 34.0 1.0 08	44.5	4
135	10 59.8 1.0 08	43.8	11 29.7 1.0 08	43.8	11 59.5 1.0 08	43.7	12 29.4 1.0 08	43.7	12 59.3 1.0 08	43.6	13 29.2 1.0 08	43.6	13 59.1 1.0 08	43.6	14 29.0 1.0 08	43.5	135
6	10 54.8 1.0 08	42.8	11 24.7 1.0 08	42.8	11 54.5 1.0 08	42.8	12 24.4 1.0 08	42.7	12 54.3 1.0 08	42.7	13 24.2 1.0 08	42.6	13 54.1 1.0 08	42.6	14 24.0 1.0 08	42.5	6
7	10 49.8 1.0 08	41.9	11 19.7 1.0 08	41.8	11 49.6 1.0 08	41.8	12 19.5 1.0 08	41.7	12 49.4 1.0 08	41.7	13 19.3 1.0 08	41.7	13 49.2 1.0 08	41.6	14 19.1 1.0 08	41.6	7
8	10 45.0 1.0 08	40.9	11 14.9 1.0 08	40.9	11 44.8 1.0 08	40.8	12 14.7 1.0 08	40.8	12 44.6 1.0 08	40.7	13 14.5 1.0 08	40.7	13 44.4 1.0 08	40.6	14 14.3 1.0 08	40.6	8
9	10 40.3 1.0 08	39.9	11 10.2 1.0 08	39.9	11 40.1 1.0 08	39.9	12 10.0 1.0 08	39.8	12 39.9 1.0 08	39.8	13 09.8 1.0 08	39.7	13 39.7 1.0 08	39.7	14 09.6 1.0 08	39.6	9
140	10 35.6 1.0 08	38.9	11 05.5 1.0 08	38.9	11 35.4 1.0 08	38.9	12 05.3 1.0 08	38.8	12 35.2 1.0 08	38.8	13 05.1 1.0 08	38.7	13 35.0 1.0 08	38.7	14 04.9 1.0 08	38.7	140
1	10 31.1 1.0 07	38.0	11 01.0 1.0 07	37.9	11 30.9 1.0 07	37.9	12 00.8 1.0 07	37.9	12 30.7 1.0 07	37.8	13 00.6 1.0 07	37.8	13 30.5 1.0 07	37.7	14 00.4 1.0 07	37.7	1
2	10 26.6 1.0 07	37.0	10 56.5 1.0 07	37.0	11 26.4 1.0 07	36.9	11 56.4 1.0 07	36.9	12 26.3 1.0 07	36.8	12 56.2 1.0 07	36.8	13 26.1 1.0 07	36.8	13 56.0 1.0 07	36.7	2
3	10 22.3 1.0 07	36.0	10 52.2 1.0 07	36.0	11 22.1 1.0 07	35.9	11 52.0 1.0 07	35.9	12 21.9 1.0 07	35.9	12 51.8 1.0 07	35.8	13 21.8 1.0 07	35.8	13 51.7 1.0 07	35.8	3
4	10 18.0 1.0 07	35.0	10 47.9 1.0 07	35.0	11 17.9 1.0 07	35.0	11 47.8 1.0 07	34.9	12 17.7 1.0 07	34.9	12 47.6 1.0 07	34.9	13 17.5 1.0 07	34.8	13 47.5 1.0 07	34.8	4
145	10 13.9 1.0 07	34.1	10 43.8 1.0 07	34.0	11 13.7 1.0 07	34.0	11 43.6 1.0 07	34.0	12 13.6 1.0 07	33.9	12 43.5 1.0 07	33.9	13 13.4 1.0 07	33.9	13 43.3 1.0 07	33.8	145
6	10 09.8 1.0 07	33.1	10 39.8 1.0 07	33.1	11 09.7 1.0 07	33.0	11 39.6 1.0 07	33.0	12 09.5 1.0 07	33.0	12 39.5 1.0 07	32.9	13 09.4 1.0 07	32.9	13 39.3 1.0 07	32.9	6
7	10 05.9 1.0 06	32.1	10 35.8 1.0 06	32.1	11 05.7 1.0 06	32.1	11 35.7 1.0 06	32.0	12 05.6 1.0 06	32.0	12 35.5 1.0 06	32.0	13 05.5 1.0 06	31.9	13 35.4 1.0 06	31.9	7
8	10 02.0 1.0 06	31.2	10 32.0 1.0 06	31.1	11 01.9 1.0 06	31.1	11 31.8 1.0 06	31.1	12 01.8 1.0 06	31.0	12 31.7 1.0 06	31.0	13 01.7 1.0 06	31.0	13 31.6 1.0 06	30.9	8
9	9 58.3 1.0 06	30.2	10 28.3 1.0 06	30.1	10 58.2 1.0 06	30.1	11 28.1 1.0 06	30.1	11 58.1 1.0 06	30.0	12 28.0 1.0 06	30.0	12 58.0 1.0 06	30.0	13 27.9 1.0 06	29.9	9
150	9 54.7 1.0 06	29.2	10 24.6 1.0 06	29.2	10 54.6 1.0 06	29.1	11 24.5 1.0 06	29.1	11 54.5 1.0 06	29.1	12 24.4 1.0 06	29.0	12 54.4 1.0 06	29.0	13 24.3 1.0 06	29.0	150
1	9 51.2 1.0 06	28.2	10 21.1 1.0 06	28.2	10 51.1 1.0 06	28.2	11 21.0 1.0 06	28.1	11 51.0 1.0 06	28.1	12 20.9 1.0 06	28.1	12 50.9 1.0 06	28.0	13 20.8 1.0 06	28.0	1
2	9 47.8 1.0 06	27.3	10 17.7 1.0 06	27.2	10 47.7 1.0 05	27.2	11 17.6 1.0 05	27.2	11 47.6 1.0 05	27.1	12 17.5 1.0 05	27.1	12 47.5 1.0 05	27.1	13 17.4 1.0 05	27.0	2
3	9 44.5 1.0 05	26.3	10 14.4 1.0 05	26.3	10 44.4 1.0 05	26.2	11 14.3 1.0 05	26.2	11 44.3 1.0 05	26.2	12 14.2 1.0 05	26.1	12 44.2 1.0 05	26.1	13 14.1 1.0 05	26.1	3
4	9 41.3 1.0 05	25.3	10 11.3 1.0 05	25.3	10 41.2 1.0 05	25.3	11 11.2 1.0 05	25.2	11 41.1 1.0 05	25.2	12 11.1 1.0 05	25.2	12 41.0 1.0 05	25.1	13 11.0 1.0 05	25.1	4
155	9 38.2 1.0 05	24.3	10 08.2 1.0 05	24.3	10 38.2 1.0 05	24.3	11 08.1 1.0 05	24.3	11 38.1 1.0 05	24.2	12 08.0 1.0 05	24.2	12 38.0 1.0 05	24.2	13 07.9 1.0 05	24.1	155
6	9 35.3 1.0 05	23.4	10 05.2 1.0 05	23.3	10 35.2 1.0 05	23.3	11 05.2 1.0 05	23.3	11 35.1 1.0 05	23.3	12 05.1 1.0 05	23.2	12 35.1 1.0 05	23.2	13 05.0 1.0 05	23.2	6
7	9 32.4 1.0 05	22.4	10 02.4 1.0 05	22.4	10 32.4 1.0 05	22.3	11 02.3 1.0 05	22.3	11 32.3 1.0 05	22.3	12 02.3 1.0 05	22.3	12 32.2 1.0 05	22.2	13 02.2 1.0 04	22.2	7
8	9 29.7 1.0 04	21.4	9 59.7 1.0 04	21.4	10 29.6 1.0 04	21.4	10 59.6 1.0 04	21.4	11 29.6 1.0 04	21.3	11 59.5 1.0 04	21.3	12 29.5 1.0 04	21.3	12 59.5 1.0 04	21.2	8
9	9 27.1 1.0 04	20.4	9 57.1 1.0 04	20.4	10 27.0 1.0 04	20.4	10 57.0 1.0 04	20.4	11 27.0 1.0 04	20.4	11 57.0 1.0 04	20.3	12 26.9 1.0 04	20.3	12 56.9 1.0 04	20.3	9
160	9 24.6 1.0 04	19.5	9 54.6 1.0 04	19.4	10 24.6 1.0 04	19.4	10 54.5 1.0 04	19.4	11 24.5 1.0 04	19.4	11 54.5 1.0 04	19.4	12 24.4 1.0 04	19.3	12 54.4 1.0 04	19.3	160
1	9 22.2 1.0 04	18.5	9 52.2 1.0 04	18.5	10 22.2 1.0 04	18.5	10 52.2 1.0 04	18.4	11 22.1 1.0 04	18.4	11 52.1 1.0 04	18.4	12 22.1 1.0 04	18.4	12 52.1 1.0 04	18.3	1
2	9 20.0 1.0 04	17.5	9 49.9 1.0 04	17.5	10 19.9 1.0 04	17.5	10 49.9 1.0 04	17.5	11 19.9 1.0 04	17.4	11 49.9 1.0 04	17.4	12 19.8 1.0 04	17.4	12 49.8 1.0 04	17.4	2
3	9 17.8 1.0 03	16.5	9 47.8 1.0 03	16.5	10 17.8 1.0 03	16.5	10 47.7 1.0 03	16.5	11 17.7 1.0 03	16.5	11 47.7 1.0 03	16.4	12 17.7 1.0 03	16.4	12 47.7 1.0 03	16.4	3
4	9 15.8 1.0 03	15.6	9 45.8 1.0 03	15.6	10 15.8 1.0 03	15.5	10 45.7 1.0 03	15.5	11 15.7 1.0 03	15.5	11 45.7 1.0 03	15.5	12 15.7 1.0 03	15.5	12 45.7 1.0 03	15.5	4
165	9 13.9 1.0 03	14.6	9 43.9 1.0 03	14.6	10 13.9 1.0 03	14.6	10 43.9 1.0 03	14.6	11 13.8 1.0 03	14.5	11 43.8 1.0 03	14.5	12 13.8 1.0 03	14.5	12 43.8 1.0 03	14.5	165
6	9 12.1 1.0 03	13.6	9 42.1 1.0 03	13.6	10 12.1 1.0 03	13.6	10 42.1 1.0 03	13.6	11 12.1 1.0 03	13.6	11 42.0 1.0 03	13.5	12 12.0 1.0 03	13.5	12 42.0 1.0 03	13.5	6
7	9 10.5 1.0 03	12.7	9 40.4 1.0 03	12.6	10 10.4 1.0 03	12.6	10 40.4 1.0 03	12.6	11 10.4 1.0 03	12.6	11 40.4 1.0 03	12.6	12 10.4 1.0 03	12.6	12 40.4 1.0 03	12.6	7
8	9 08.9 1.0 02	11.7	9 38.9 1.0 02	11.7	10 08.9 1.0 02	11.7	10 38.9 1.0 02	11.6	11 08.9 1.0 02	11.6	11 38.9 1.0 02	11.6	12 08.9 1.0 02	11.6	12 38.8 1.0 02	11.6	8
9	9 07.5 1.0 02	10.7	9 37.5 1.0 02	10.7	10 07.5 1.0 02	10.7	10 37.5 1.0 02	10.7	11 07.5 1.0 02	10.7	11 37.5 1.0 02	10.6	12 07.4 1.0 02	10.6	12 37.4 1.0 02	10.6	9
170	9 06.2 1.0 02	09.7	9 36.2 1.0 02	09.7	10 06.2 1.0 02	09.7	10 36.2 1.0 02	09.7	11 06.2 1.0 02	09.7	11 36.2 1.0 02	09.7	12 06.2 1.0 02	09.7	12 36.1 1.0 02	09.7	170
1	9 05.0 1.0 02	08.8	9 35.0 1.0 02	08.7	10 05.0 1.0 02	08.7	10 35.0 1.0 02	08.7	11 05.0 1.0 02	08.7	11 35.0 1.0 02	08.7	12 05.0 1.0 02	08.7	12 35.0 1.0 02	08.7	1
2	9 04.0 1.0 02	07.8	9 34.0 1.0 02	07.8	10 04.0 1.0 02	07.8	10 34.0 1.0 02	07.8	11 03.9 1.0 02	07.8	11 33.9 1.0 02	07.7	12 03.9 1.0 02	07.7	12 33.9 1.0 02	07.7	2
3	9 03.0 1.0 01	06.8	9 33.0 1.0 01	06.8	10 03.0 1.0 01	06.8	10 33.0 1.0 01	06.8	11 03.0 1.0 01	06.8	11 33.0 1.0 01	06.8	12 03.0 1.0 01	06.8	12 33.0 1.0 01	06.8	3
4	9 02.2 1.0 01	05.8	9 32.2 1.0 01	05.8	10 02.2 1.0 01	05.8	10 32.2 1.0 01	05.8	11 02.2 1.0 01	05.8	11 32.2 1.0 01	05.8	12 02.2 1.0 01	05.8	12 32.2 1.0 01	05.8	4
175	9 01.6 1.0 01	04.9	9 31.5 1.0 01	04.9	10 01.5 1.0 01	04.9	10 31.5 1.0 01	04.8	11 01.5 1.0 01	04.8	11 31.5 1.0 01	04.8	12 01.5 1.0 01	04.8	12 31.5 1.0 01	04.8	175
6	9 01.0 1.0 01	03.9	9 31.0 1.0 01	03.9	10 01.0 1.0 01	03.9	10 31.0 1.0 01	03.9	11 01.0 1.0 01	03.9	11 31.0 1.0 01	03.9	12 01.0 1.0 01	03.9	12 31.0 1.0 01	03.9	6
7	9 00.6 1.0 01	02.9	9 30.6 1.0 01	02.9	10 00.6 1.0 00	02.9	10 30.6 1.0 00	02.9	11 00.6 1.0 00	02.9	11 30.6 1.0 00	02.9	12 00.6 1.0 00	02.9	12 30.6 1.0 00	02.9	7
8	9 00.2 1.0 00	01.9	9 30.2 1.0 00	01.9	10 00.2 1.0 00	01.9	10 30.2 1.0 00	01.9	11 00.2 1.0 00	01.9	11 30.2 1.0 00	01.9	12 00.2 1.0 00	01.9	12 30.2 1.0 00	01.9	8
9	9 00.1 1.0 00	01.0	9 30.1 1.0 00	01.0	10 00.1 1.0 00	01.0	10 30.1 1.0 00	01.0	11 00.1 1.0 00	01.0	11 30.1 1.0 00	01.0	12 00.1 1.0 00	01.0	12 30.1 1.0 00	01.0	9
180	9 00.0 1.0 00	00.0	9 30.0 1.0 00	00.0	10 00.0 1.0 00	00.0	10 30.0 1.0 00	00.0	11 00.0 1.0 00	00.0	11 30.0 1.0 00	00.0	12 00.0 1.0 00	00.0	12 30.0 1.0 00	00.0	180

Lat. 83°

H.A.	20° 00' Alt.	Δd Δt	Az.	20° 30' Alt.	Δd Δt	Az.	21° 00' Alt.	Δd Δt	Az.	21° 30' Alt.	Δd Δt	Az.	22° 00' Alt.	Δd Δt	Az.	22° 30' Alt.	Δd Δt	Az.	23° 00' Alt.	Δd Δt	Az.	23° 30' Alt.	Δd Δt	Az.	H.A.
00	27 00.0	1.00 00	180.0	27 30.0	1.00 00	180.0	28 00.0	1.00 00	180.0	28 30.0	1.00 00	180.0	29 00.0	1.00 00	180.0	29 30.0	1.00 00	180.0	30 00.0	1.00 00	180.0	30 30.0	1.00 00	180.0	00
1	26 59.9	1.00 00	178.9	27 29.9	1.00 00	178.9	27 59.9	1.00 00	178.9	28 29.9	1.00 00	178.9	28 59.9	1.00 00	178.9	29 29.9	1.00 00	178.9	29 59.9	1.00 00	178.9	30 29.9	1.00 00	178.9	1
2	26 59.7	1.00 01	177.9	27 29.7	1.00 01	177.9	27 59.7	1.00 01	177.9	28 29.7	1.00 01	177.9	28 59.7	1.00 01	177.9	29 29.7	1.00 01	177.9	29 59.7	1.00 01	177.9	30 29.7	1.00 01	177.9	2
3	26 59.4	1.00 01	176.8	27 29.4	1.00 01	176.8	27 59.4	1.00 01	176.8	28 29.4	1.00 01	176.8	28 59.4	1.00 01	176.8	29 29.4	1.00 01	176.8	29 59.4	1.00 01	176.8	30 29.4	1.00 01	176.8	3
4	26 58.9	1.00 01	175.8	27 28.9	1.00 01	175.8	27 58.9	1.00 01	175.8	28 28.9	1.00 01	175.8	28 58.9	1.00 01	175.8	29 28.9	1.00 01	175.8	29 58.9	1.00 01	175.7	30 28.9	1.00 01	175.7	4
05	26 58.3	1.00 01	174.7	27 28.3	1.00 01	174.7	27 58.3	1.00 01	174.7	28 28.3	1.00 01	174.7	28 58.3	1.00 01	174.7	29 28.3	1.00 01	174.7	29 58.3	1.00 01	174.7	30 28.3	1.00 01	174.7	05
6	26 57.6	1.00 01	173.7	27 27.6	1.00 01	173.7	27 57.6	1.00 01	173.7	28 27.6	1.00 01	173.6	28 57.6	1.00 01	173.6	29 27.6	1.00 01	173.6	29 57.6	1.00 01	173.6	30 27.6	1.00 01	173.6	6
7	26 56.7	1.00 02	172.6	27 26.7	1.00 02	172.6	27 56.7	1.00 02	172.6	28 26.7	1.00 02	172.6	28 56.7	1.00 02	172.6	29 26.7	1.00 02	172.6	29 56.7	1.00 02	172.6	30 26.7	1.00 02	172.6	7
8	26 55.7	1.00 02	171.6	27 25.7	1.00 02	171.6	27 55.7	1.00 02	171.5	28 25.7	1.00 02	171.5	28 55.7	1.00 02	171.5	29 25.7	1.00 02	171.5	29 55.7	1.00 02	171.5	30 25.7	1.00 03	171.5	8
9	26 54.6	1.00 02	170.5	27 24.6	1.00 02	170.5	27 54.5	1.00 02	170.5	28 24.5	1.00 02	170.5	28 54.5	1.00 02	170.5	29 24.5	1.00 02	170.5	29 54.5	1.00 02	170.4	30 24.5	1.00 02	170.4	9
10	26 53.3	1.00 02	169.5	27 23.3	1.00 02	169.4	27 53.3	1.00 02	169.4	28 23.3	1.00 02	169.4	28 53.3	1.00 02	169.4	29 23.2	1.00 02	169.4	29 53.2	1.00 02	169.4	30 23.2	1.00 02	169.4	10
1	26 51.9	1.00 03	168.4	27 21.9	1.00 03	168.4	27 51.9	1.00 03	168.4	28 21.9	1.00 03	168.4	28 51.8	1.00 03	168.3	29 21.8	1.00 03	168.3	29 51.8	1.00 03	168.3	30 21.8	1.00 03	168.3	1
2	26 50.4	1.00 03	167.4	27 20.3	1.00 03	167.3	27 50.3	1.00 03	167.3	28 20.3	1.00 03	167.3	28 50.3	1.00 03	167.3	29 20.3	1.00 03	167.3	29 50.3	1.00 03	167.3	30 20.3	1.00 03	167.2	2
3	26 48.7	1.00 03	166.3	27 18.6	1.00 03	166.3	27 48.7	1.00 03	166.2	28 18.6	1.00 03	166.2	28 48.6	1.00 03	166.2	29 18.6	1.00 03	166.2	29 48.6	1.00 03	166.2	30 18.6	1.00 03	166.2	3
4	26 46.9	1.00 03	165.2	27 16.9	1.00 03	165.2	27 46.9	1.00 03	165.2	28 16.8	1.00 03	165.2	28 46.8	1.00 03	165.2	29 16.8	1.00 03	165.2	29 46.8	1.00 03	165.1	30 16.8	1.00 03	165.1	4
15	26 45.0	1.00 03	164.2	27 14.9	1.00 03	164.2	27 44.9	1.00 03	164.2	28 14.9	1.00 03	164.1	28 44.9	1.00 03	164.1	29 14.9	1.00 03	164.1	29 44.8	1.00 03	164.1	30 14.8	1.00 03	164.1	15
6	26 42.9	1.00 04	163.1	27 12.9	1.00 04	163.1	27 42.9	1.00 04	163.1	28 12.8	1.00 04	163.1	28 42.8	1.00 04	163.1	29 12.8	1.00 04	163.0	29 42.8	1.00 04	163.0	30 12.8	1.00 04	163.0	6
7	26 40.7	1.00 04	162.1	27 10.7	1.00 04	162.1	27 40.7	1.00 04	162.0	28 10.6	1.00 04	162.0	28 40.6	1.00 04	162.0	29 10.6	1.00 04	162.0	29 40.6	1.00 04	162.0	30 10.5	1.00 04	161.9	7
8	26 38.4	1.00 04	161.0	27 08.4	1.00 04	161.0	27 38.4	1.00 04	161.0	28 08.3	1.00 04	161.0	28 38.3	1.00 04	160.9	29 08.3	1.00 04	160.9	29 38.2	1.00 04	160.9	30 08.2	1.00 04	160.9	8
9	26 36.0	1.00 04	160.0	27 05.9	1.00 04	160.0	27 35.9	1.00 04	159.9	28 05.9	1.00 04	159.9	28 35.8	1.00 04	159.9	29 05.8	1.00 04	159.9	29 35.8	1.00 04	159.8	30 05.8	1.00 04	159.8	9
20	26 33.4	1.00 04	158.9	27 03.4	1.00 04	158.9	27 33.3	1.00 04	158.9	28 03.3	1.00 04	158.8	28 33.3	1.00 04	158.8	29 03.2	1.00 04	158.8	29 33.2	1.00 04	158.8	30 03.2	1.00 05	158.8	20
1	26 30.7	1.00 05	157.9	27 00.7	1.00 05	157.9	27 30.6	1.00 05	157.8	28 00.6	1.00 05	157.8	28 30.6	1.00 05	157.8	29 00.5	1.00 05	157.8	29 30.5	1.00 05	157.7	30 00.5	1.00 05	157.7	1
2	26 27.9	1.00 05	156.8	26 57.9	1.00 05	156.8	27 27.8	1.00 05	156.8	27 57.8	1.00 05	156.7	28 27.7	1.00 05	156.7	28 57.7	1.00 05	156.7	29 27.7	1.00 05	156.7	29 57.6	1.00 05	156.6	2
3	26 25.0	1.00 05	155.8	26 54.9	1.00 05	155.7	27 24.9	1.00 05	155.7	27 54.8	1.00 05	155.7	28 24.8	1.00 05	155.7	28 54.7	1.00 05	155.6	29 24.7	1.00 05	155.6	29 54.7	1.00 05	155.6	3
4	26 21.9	1.00 05	154.8	26 51.9	1.00 05	154.7	27 21.8	1.00 05	154.7	27 51.8	1.00 05	154.7	28 21.7	1.00 05	154.6	28 51.7	1.00 05	154.6	29 21.6	1.00 05	154.6	29 51.6	1.00 05	154.5	4
25	26 18.7	1.00 06	153.7	26 48.7	1.00 06	153.7	27 18.6	1.00 06	153.6	27 48.6	1.00 06	153.6	28 18.5	1.00 06	153.6	28 48.5	1.00 06	153.5	29 18.4	1.00 06	153.5	29 48.4	1.00 06	153.5	25
6	26 15.4	1.00 06	152.7	26 45.4	1.00 06	152.6	27 15.3	1.00 06	152.6	27 45.3	1.00 06	152.6	28 15.2	1.00 06	152.5	28 45.2	1.00 06	152.5	29 15.1	1.00 06	152.5	29 45.0	1.00 06	152.4	6
7	26 12.0	1.00 06	151.6	26 42.0	1.00 06	151.6	27 11.9	1.00 06	151.5	27 41.8	1.00 06	151.5	28 11.8	1.00 06	151.5	28 41.7	1.00 06	151.4	29 11.7	1.00 06	151.4	29 41.6	1.00 06	151.4	7
8	26 08.5	1.00 06	150.6	26 38.4	1.00 06	150.5	27 08.4	1.00 06	150.5	27 38.3	1.00 06	150.5	28 08.2	1.00 06	150.4	28 38.2	1.00 06	150.4	29 08.1	1.00 06	150.3	29 38.0	1.00 06	150.3	8
9	26 04.8	1.00 06	149.5	26 34.8	1.00 06	149.5	27 04.7	1.00 06	149.4	27 34.6	1.00 06	149.4	28 04.6	1.00 06	149.4	28 34.5	1.00 06	149.3	29 04.4	1.00 06	149.3	29 34.4	1.00 06	149.3	9
30	26 01.1	1.00 06	148.5	26 31.0	1.00 06	148.4	27 00.9	1.00 06	148.4	27 30.8	1.00 06	148.4	28 00.8	1.00 06	148.3	28 30.7	1.00 06	148.3	29 00.6	1.00 06	148.2	29 30.6	1.00 07	148.2	30
1	25 57.2	1.00 07	147.4	26 27.1	1.00 07	147.4	26 57.0	1.00 07	147.3	27 27.0	1.00 07	147.3	27 56.9	1.00 07	147.3	28 26.8	1.00 07	147.2	28 56.7	1.00 07	147.2	29 26.6	1.00 07	147.2	1
2	25 53.2	1.00 07	146.4	26 23.1	1.00 07	146.3	26 53.0	1.00 07	146.3	27 23.0	1.00 07	146.3	27 52.9	1.00 07	146.2	28 22.8	1.00 07	146.2	28 52.7	1.00 07	146.1	29 22.6	1.00 07	146.1	2
3	25 49.1	1.00 07	145.4	26 19.0	1.00 07	145.3	26 48.9	1.00 07	145.3	27 18.8	1.00 07	145.2	27 48.8	1.00 07	145.2	28 18.7	1.00 07	145.1	28 48.6	1.00 07	145.1	29 18.5	1.00 07	145.1	3
4	25 44.9	1.00 07	144.3	26 14.8	1.00 07	144.3	26 44.7	1.00 07	144.2	27 14.6	1.00 07	144.2	27 44.5	1.00 07	144.1	28 14.4	1.00 07	144.1	28 44.3	1.00 07	144.1	29 14.3	1.00 07	144.0	4
35	25 40.6	1.00 07	143.3	26 10.5	1.00 07	143.2	26 40.4	1.00 07	143.2	27 10.3	1.00 07	143.1	27 40.2	1.00 07	143.1	28 10.1	1.00 07	143.1	28 40.0	1.00 07	143.0	29 09.9	1.00 07	143.0	35
6	25 36.1	1.00 08	142.2	26 06.0	1.00 08	142.2	26 35.9	1.00 08	142.1	27 05.8	1.00 08	142.1	27 35.7	1.00 08	142.1	28 05.6	1.00 08	142.0	28 35.5	1.00 08	142.0	29 05.4	1.00 08	141.9	6
7	25 31.6	1.00 08	141.2	26 01.5	1.00 08	141.1	26 31.4	1.00 08	141.1	27 01.3	1.00 08	141.0	27 31.2	1.00 08	141.0	28 01.1	1.00 08	141.0	28 31.0	1.00 08	140.9	29 00.9	1.00 08	140.9	7
8	25 27.0	1.00 08	140.2	25 56.9	1.00 08	140.1	26 26.8	1.00 08	140.1	26 56.6	1.00 08	140.0	27 26.5	1.00 08	140.0	27 56.4	1.00 08	139.9	28 26.3	1.00 08	139.9	28 56.2	1.00 08	139.8	8
9	25 22.2	1.00 08	139.1	25 52.1	1.00 08	139.1	26 22.0	1.00 08	139.0	26 51.9	1.00 08	139.0	27 21.8	1.00 08	138.9	27 51.7	1.00 08	138.9	28 21.6	1.00 08	138.8	28 51.4	1.00 08	138.8	9
40	25 17.4	1.00 08	138.1	25 47.3	1.00 08	138.0	26 17.2	1.00 08	138.0	26 47.0	1.00 08	137.9	27 16.9	1.00 08	137.9	27 46.8	1.00 08	137.8	28 16.7	1.00 08	137.8	28 46.6	1.00 08	137.7	40
1	25 12.5	1.00 08	137.0	25 42.3	1.00 08	137.0	26 12.2	1.00 08	137.0	26 42.1	1.00 08	136.9	27 12.0	1.00 08	136.8	27 41.9	1.00 08	136.8	28 11.7	1.00 08	136.7	28 41.6	1.00 08	136.7	1
2	25 07.4	1.00 09	136.0	25 37.3	1.00 09	135.9	26 07.2	1.00 09	135.9	26 37.1	1.00 09	135.9	27 06.9	1.00 09	135.8	27 36.8	1.00 09	135.7	28 06.7	1.00 09	135.7	28 36.5	1.00 09	135.7	2
3	25 02.3	1.00 09	135.0	25 32.2	1.00 09	134.9	26 02.0	1.00 09	134.9	26 31.9	1.00 09	134.8	27 01.8	1.00 09	134.8	27 31.7	1.00 09	134.7	28 01.5	1.00 09	134.7	28 31.4	1.00 09	134.6	3
4	24 57.1	1.00 09	133.9	25 27.0	1.00 09	133.9	25 56.8	1.00 09	133.8	26 26.7	1.00 09	133.8	26 56.6	1.00 09	133.7	27 26.4	1.00 09	133.7	27 56.3	1.00 09	133.6	28 26.1	1.00 09	133.6	4
45	24 51.8	1.00 09	132.9	25 21.6	1.00 09	132.9	25 51.5	1.00 09	132.8	26 21.4	1.00 09	132.8	26 51.2	1.00 09	132.7	27 21.1	1.00 09	132.7	27 50.9	1.00 09	132.6	28 20.8	1.00 09	132.5	45
6	24 46.4	1.00 09	131.9	25 16.2	1.00 09	131.8	25 46.1	1.00 09	131.8	26 15.9	1.00 09	131.7	26 45.8	1.00 09	131.6	27 15.7	1.00 09	131.6	27 45.5	1.00 09	131.5	28 15.4	1.00 09	131.5	6
7	24 40.9	1.00 09	130.9	25 10.7	1.00 09	130.8	25 40.6	1.00 09	130.7	26 10.4	1.00 09	130.7	26 40.3	1.00 09	130.6	27 10.1	99 09	130.6	27 40.0	99 09	130.5	28 09.8	99 09	130.5	7
8	24 35.3	1.00 09	129.8	25 05.2	99 09	129.8	25 35.0	99 09	129.7	26 04.9	99 09	129.7	26 34.7	99 09	129.6	27 04.6	99 09	129.5	27 34.4	99 09	129.5	28 04.2	99 09	129.4	8
9	24 29.7	99 10	128.8	24 59.5	99 10	128.7	25 29.3	99 10	128.7	25 59.2	99 10	128.6	26 29.0	99 10	128.6	26 58.9	99 10	128.5	27 28.7	99 10	128.5	27 58.5	99 10	128.4	9
50	24 23.9	99 10	127.8	24 53.8	99 10	127.7	25 23.6	99 10	127.7	25 53.4	99 10	127.6	26 23.3	99 10	127.5	26 53.1	99 10	127.5	27 22.9	99 10	127.4	27 52.8	99 10	127.4	50
1	24 18.1	99 10	126.7	24 47.9	99 10	126.7	25 17.8	99 10	126.6	25 47.6	99 10	126.6	26 17.4	99 10	126.5	26 47.3	99 10	126.5	27 17.1	99 10	126.4	27 46.9	99 10	126.3	1
2	24 12.2	99 10	125.7	24 42.0	99 10	125.7	25 11.9	99 10	125.6	25 41.7	99 10	125.5	26 11.5	99 10	125.5	26 41.3	99 10	125.4	27 11.2	99 10	125.4	27 41.0	99 10	125.3	2
3	24 06.2	99 10	124.7	24 36.1	99 10	124.6	25 05.9	99 10	124.6	25 35.7	99 10	124.5	26 05.5	99 10	124.5	26 35.4	99 10	124.4	27 05.2	99 10	124.3	27 35.0	99 10	124.3	3
4	24 00.2	99 10	123.7	24 30.0	99 10	123.6	24 59.8	99 10	123.6	25 29.6	99 10	123.5	25 59.5	99 10	123.4	26 29.3	99 10	123.4	26 59.1	99 10	123.3	27 28.9	99 10	123.2	4
55	23 54.1	99 10	122.7	24 23.9	99 10	122.6	24 53.7	99 10	122.5	25 23.5	99 10	122.5	25 53.3	99 10	122.4	26 23.1	99 10	122.3	26 53.0	99 10	122.3	27 22.8	99 10	122.2	55
6	23 47.9	99 10	121.6	24 17.7	99 10	121.6	24 47.5	99 10	121.5	25 17.3	99 10	121.4	25 47.1	99 10	121.4	26 16.9	99 10	121.3	26 46.7	99 10	121.3	27 16.5	99 10	121.2	6
7	23 41.6	99 11	120.6	24 11.4	99 11	120.6	24 41.2	99 11	120.5	25 11.0	99 11	120.4	25 40.8	99 11	120.4	26 10.6	99 11	120.3	26 40.5	99 11	120.2	27 10.3	99 11	120.2	7
8	23 35.3	99 11	119.6	24 05.1	99 11	119.5	24 34.9	99 11	119.5	25 04.7	99 11	119.4	25 34.5	99 11	119.3	26 04.3	99 11	119.3	26 34.1	99 11	119.2	27 03.9	99 11	119.1	8
9	23 28.9	99 11	118.6	23 58.7	99 11	118.5	24 28.5	99 11	118.4	24 58.3	99 11	118.4	25 28.1	99 11	118.3	25 57.9	99 11	118.3	26 27.7	99 11	118.2	26 57.5	99 11	118.1	9
60	23 22.4	99 11	117.6	23 52.2	99 11	117.5	24 22.0	99 11	117.4	24 51.8	99 11	117.4	25 21.6	99 11	117.3	25 51.4	99 11	117.2	26 21.2	99 11	117.2	26 51.0	99 11	117.1	60
1	23 15.9	99 11	116.5	23 45.7	99 11	116.5	24 15.5	99 11	116.4	24 45.3	99 11	116.3	25 15.1	99 11	116.3	25 44.9	99 11	116.2	26 14.7	99 11	116.2	26 44.5	99 11	116.1	1
2	23 09.4	99 11	115.5	23 39.1	99 11	115.5	24 08.9	99 11	115.4	24 38.7	99 11	115.3	25 08.5	99 11	115.3	25 38.3	99 11	115.2	26 08.1	99 11	115.1	26 37.9	99 11	115.1	2
3	23 02.7	99 11	114.5	23 32.5	99 11	114.4	24 02.3	99 11	114.4	24 32.1	99 11	114.3	25 01.9	99 11	114.2	25 31.7	99 11	114.2	26 01.4	99 11	114.1	26 31.2	99 11	114.0	3
4	22 56.0	99 11	113.4	23 25.8	99 11	113.4	23 55.6	99 11	113.3	24 25.4	99 11	113.3	24 55.2	99 11	113.2	25 25.0	99 11	113.2	25 54.7	99 11	113.1	26 24.5	99 11	113.0	4
65	22 49.3	99 11	112.4	23 19.1	99 11	112.4	23 48.9	99 11	112.3	24 18.7	99 11	112.3	24 48.4	99 11	112.2	25 18.2	99 11	112.2	25 48.0	99 11	112.1	26 17.8	99 11	112.0	65
6	22 42.5	99 11	111.5	23 12.3	99 11	111.4	23 42.1	99 11	111.3	24 11.9	99 11	111.3	24 41.6	99 11	111.2	25 11.4	99 11	111.1	25 41.2	99 11	111.1	26 11.0	99 11	111.0	6
7	22 35.7	99 11	110.5	23 05.5	99 11	110.4	23 35.3	99 11	110.3	24 05.0	99 11	110.3	24 34.8	99 11	110.2	25 04.6	99 12	110.1	25 34.3	99 12	110.1	26 04.1	99 12	110.0	7
8	22 28.8	99 12	109.5	22 58.6	99 12	109.4	23 28.4	99 12	109.3	23 58.2	99 12	109.3	24 27.9	99 12	109.2	24 57.7	99 12	109.1	25 27.5	99 12	109.1	25 57.2	99 12	109.0	8
9	22 21.9	99 12	108.4	22 51.7	99 12	108.4	23 21.5	99 12	108.3	23 51.2	99 12	108.2	24 21.0	99 12	108.2	24 50.8	99 12	108.1	25 20.5	99 12	108.0	25 50.3	99 12	108.0	9
70	22 15.0	99 12	107.4	22 44.7	99 12	107.4	23 14.5	99 12	107.3	23 44.3	99 12	107.2	24 14.0	99 12	107.2	24 43.8	99 12	107.1	25 13.5	99 12	107.0	25 43.3	99 12	107.0	70
1	22 08.0	99 12	106.4	22 37.7	99 12	106.4	23 07.5	99 12	106.3	23 37.3	99 12	106.2	24 07.0	99 12	106.2	24 36.8	99 12	106.1	25 06.5	99 12	106.0	25 36.3	99 12	105.9	1
2	22 00.9	99 12	105.4	22 30.7	99 12	105.4	23 00.5	99 12	105.3	23 30.2	99 12	105.2	24 00.0	99 12	105.1	24 29.7	99 12	105.1	24 59.5	99 12	105.0	25 29.2	99 12	104.9	2
3	21 53.9	99 12	104.4	22 23.6	99 12	104.3	22 53.4	99 12	104.3	23 23.2	99 12	104.2	23 52.9	99 12	104.1	24 22.7	99 12	104.0	24 52.4	99 12	104.0	25 22.2	99 12	103.9	3
4	21 46.8	99 12	103.4	22 16.5	99 12	103.3	22 46.3	99 12	103.2	23 16.0	99 12	103.2	23 45.8	99 12	103.1	24 15.6	99 12	103.1	24 45.3	99 12	103.0	25 15.1	99 12	102.9	4
75	21 39.6	99 12	102.4	22 09.4	99 12	102.3	22 39.2	99 12	102.3	23 08.9	99 12	102.2	23 38.7	99 12	102.1	24 08.4	99 12	102.1	24 38.2	99 12	102.0	25 07.9	99 12	101.9	75
6	21 32.5	99 12	101.4	22 02.2	99 12	101.3	22 32.0	99 12	101.2	23 01.8	99 12	101.2	23 31.5	99 12	101.1	24 01.3	99 12	101.1	24 31.0	99 12	101.0	25 00.7	99 12	100.9	6
7	21 25.3	99 12	100.4	21 55.1	99 12	100.3	22 24.8	99 12	100.3	22 54.6	99 12	100.2	23 24.3	99 12	100.1	23 54.1	99 12	100.1	24 23.8	99 12	100.0	24 53.6	99 12	99.9	7
8	21 18.1	99 12	99.4	21 47.9	99 12	99.3	22 17.6	99 12	99.3	22 47.3	99 12	99.2	23 17.1	99 12	99.1	23 46.8	99 12	99.1	24 16.6	99 12	99.0	24 46.3	99 12	98.9	8
9	21 10.9	99 12	98.4	21 40.6	99 12	98.3	22 10.4	99 12	98.3	22 40.1	99 12	98.2	23 09.9	99 12	98.1	23 39.6	99 12	98.1	24 09.4	99 12	98.0	24 39.1	99 12	97.9	9
80	21 03.6	99 12	97.4	21 33.4	99 12	97.3	22 03.1	99 12	97.3	22 32.9	99 12	97.2	23 02.6	99 12	97.1	23 32.4	99 12	97.1	24 02.1	99 12	97.0	24 31.9	99 12	96.9	80
1	20 56.4	99 12	96.4	21 26.1	99 12	96.3	21 55.9	99 12	96.3	22 25.6	99 12	96.2	22 55.4	99 12	96.1	23 25.1	99 12	96.1	23 54.9	99 12	96.0	24 24.6	99 12	95.9	1
2	20 49.1	99 12	95.4	21 18.9	99 12	95.3	21 48.6	99 12	95.3	22 18.3	99 12	95.2	22 48.1	99 12	95.1	23 17.8	99 12	95.1	23 47.6	99 12	95.0	24 17.3	99 12	94.9	2
3	20 41.8	99 12	94.3	21 11.6	99 12	94.3	21 41.3	99 12	94.3	22 11.1	99 12	94.2	22 40.8	99 12	94.1	23 10.5	99 12	94.1	23 40.3	99 12	94.0	24 10.0	99 12	93.9	3
4	20 34.5	99 12	93.4	21 04.3	99 12	93.3	21 34.0	99 12	93.3	22 03.8	99 12	93.2	22 33.5	99 12	93.1	23 03.2	99 12	93.1	23 33.0	99 12	93.0	24 02.7	99 12	92.9	4
85	20 27.2	99 12	92.4	20 57.0	99 12	92.4	21 26.7	99 12	92.3	21 56.5	99 12	92.2	22 26.2	99 12	92.1	22 55.9	99 12	92.1	23 25.7	99 12	92.0	23 55.4	99 12	91.9	85
6	20 19.9	99 12	91.4	20 49.7	99 12	91.4	21 19.4	99 12	91.3	21 49.2	99 12	91.2	22 18.9	99 12	91.1	22 48.6	99 12	91.1	23 18.4	99 12	91.0	23 48.1	99 12	90.9	6
7	20 12.6	99 12	90.4	20 42.4	99 12	90.4	21 12.1	99 12	90.3	21 41.8	99 12	90.2	22 11.6	99 12	90.2	22 41.3	99 12	90.1	23 11.1	99 12	90.0	23 40.8	99 12	89.9	7
8	20 05.3	99 12	89.4	20 35.0	99 12	89.3	21 04.8	99 12	89.3	21 34.5	99 12	89.2	22 04.3	99 12	89.2	22 34.0	99 12	89.1	23 03.7	99 12	89.0	23 33.5	99 12	88.9	8
9	19 58.0	99 12	88.5	20 27.7	99 12	88.4	20 57.5	99 12	88.3	21 27.2	99 12	88.2	21 57.0	99 12	88.2	22 26.7	99 12	88.1	22 56.4	99 12	88.0	23 26.2	99 12	88.0	9
90	19 50.7	99 12	87.5	20 20.4	99 12	87.4	20 50.2	99 12	87.3	21 19.9	99 12	87.3	21 49.7	99 12	87.2	22 19.4	99 12	87.1	22 49.1	99 12	87.0	23 18.9	99 12	87.0	90

Lat. 83°

H.A.	20° 00′ Alt.	ΔdΔt	Az.	20° 30′ Alt.	ΔdΔt	Az.	21° 00′ Alt.	ΔdΔt	Az.	21° 30′ Alt.	ΔdΔt	Az.	22° 00′ Alt.	ΔdΔt	Az.	22° 30′ Alt.	ΔdΔt	Az.	23° 00′ Alt.	ΔdΔt	Az.	23° 30′ Alt.	ΔdΔt	Az.	H.A.
91	19 43.4	99 12	86.5	20 13.1	99 12	86.4	20 42.9	99 12	86.3	21 12.6	99 12	86.3	21 42.4	99 12	86.2	22 12.1	99 12	86.1	22 41.8	99 12	86.0	23 11.6	99 12	86.0	91
2	19 36.1	99 12	85.5	20 05.8	99 12	85.4	20 35.6	99 12	85.3	21 05.3	99 12	85.3	21 35.1	99 12	85.2	22 04.8	99 12	85.1	22 34.5	99 12	85.1	23 04.3	99 12	85.0	2
3	19 28.8	99 12	84.5	19 58.5	99 12	84.4	20 28.3	99 12	84.4	20 58.0	99 12	84.3	21 27.8	99 12	84.2	21 57.5	99 12	84.1	22 27.3	99 12	84.1	22 57.0	99 12	84.0	3
4	19 21.5	99 12	83.5	19 51.3	99 12	83.4	20 21.0	99 12	83.4	20 50.8	99 12	83.3	21 20.5	99 12	83.2	21 50.3	99 12	83.2	22 20.0	99 12	83.1	22 49.7	99 12	83.0	4
95	19 14.3	99 12	82.5	19 44.0	99 12	82.4	20 13.8	99 12	82.4	20 43.5	99 12	82.3	21 13.3	99 12	82.2	21 43.0	99 12	82.2	22 12.7	99 12	82.1	22 42.5	99 12	82.0	95
6	19 07.0	99 12	81.5	19 36.8	99 12	81.5	20 06.5	99 12	81.4	20 36.3	99 12	81.3	21 06.0	99 12	81.3	21 35.8	99 12	81.2	22 05.5	99 12	81.1	22 35.3	99 12	81.0	6
7	18 59.8	99 12	80.5	19 29.6	99 12	80.5	19 59.3	99 12	80.4	20 29.1	99 12	80.3	20 58.8	99 12	80.3	21 28.6	99 12	80.2	21 58.3	99 12	80.1	22 28.0	99 12	80.1	7
8	18 52.6	99 12	79.6	19 22.4	99 12	79.5	19 52.1	99 12	79.4	20 21.9	99 12	79.4	20 51.6	99 12	79.3	21 21.4	99 12	79.2	21 51.1	99 12	79.1	22 20.8	99 12	79.1	8
9	18 45.4	99 12	78.6	19 15.2	99 12	78.5	19 44.9	99 12	78.4	20 14.7	99 12	78.4	20 44.4	99 12	78.3	21 14.2	99 12	78.2	21 43.9	99 12	78.2	22 13.7	99 12	78.1	9
100	18 38.3	99 12	77.6	19 08.0	99 12	77.5	19 37.8	99 12	77.5	20 07.5	99 12	77.4	20 37.3	99 12	77.3	21 07.0	99 12	77.2	21 36.8	99 12	77.2	22 06.5	99 12	77.1	100
1	18 31.1	99 12	76.6	19 00.9	99 12	76.5	19 30.7	99 12	76.5	20 00.4	99 12	76.4	20 30.2	99 12	76.3	20 59.9	99 12	76.3	21 29.7	99 12	76.2	21 59.4	99 12	76.1	1
2	18 24.0	99 12	75.6	18 53.8	99 12	75.6	19 23.6	99 12	75.5	19 53.3	99 12	75.4	20 23.1	99 12	75.4	20 52.8	99 12	75.3	21 22.6	99 12	75.2	21 52.3	99 12	75.2	2
3	18 17.0	99 12	74.6	18 46.7	99 12	74.6	19 16.5	99 12	74.5	19 46.3	99 12	74.4	20 16.0	99 12	74.4	20 45.8	99 12	74.3	21 15.5	99 12	74.2	21 45.3	99 12	74.2	3
4	18 09.9	99 12	73.7	18 39.7	99 12	73.6	19 09.5	99 12	73.5	19 39.2	99 12	73.5	20 09.0	99 12	73.4	20 38.8	99 12	73.3	21 08.5	99 12	73.3	21 38.3	99 12	73.2	4
105	18 02.9	99 12	72.7	18 32.7	99 12	72.6	19 02.5	99 12	72.5	19 32.2	99 12	72.5	20 02.0	99 12	72.4	20 31.8	99 12	72.3	21 01.5	99 12	72.3	21 31.3	99 12	72.2	105
6	17 56.0	99 12	71.7	18 25.8	99 12	71.6	18 55.5	99 12	71.6	19 25.3	99 12	71.5	19 55.1	99 12	71.4	20 24.8	99 12	71.4	20 54.6	99 12	71.3	21 24.3	99 12	71.2	6
7	17 49.1	99 11	70.7	18 18.8	99 11	70.7	18 48.6	99 11	70.6	19 18.4	99 11	70.5	19 48.1	99 11	70.5	20 17.9	99 11	70.4	20 47.7	99 11	70.3	21 17.4	99 11	70.3	7
8	17 42.2	99 11	69.7	18 12.0	99 11	69.7	18 41.7	99 11	69.6	19 11.5	99 11	69.5	19 41.3	99 11	69.5	20 11.0	99 11	69.4	20 40.8	99 11	69.3	21 10.6	99 11	69.3	8
9	17 35.3	99 11	68.8	18 05.1	99 11	68.7	18 34.9	99 11	68.6	19 04.7	99 11	68.6	19 34.4	99 11	68.5	20 04.2	99 11	68.4	20 34.0	99 11	68.4	21 03.8	99 11	68.3	9
110	17 28.5	99 11	67.8	17 58.3	99 11	67.7	18 28.1	99 11	67.7	18 57.9	99 11	67.6	19 27.7	99 11	67.5	19 57.4	99 11	67.5	20 27.2	99 11	67.4	20 57.0	99 11	67.3	110
1	17 21.8	99 11	66.8	17 51.6	99 11	66.7	18 21.4	99 11	66.7	18 51.2	99 11	66.6	19 20.9	99 11	66.6	19 50.7	99 11	66.5	20 20.5	99 11	66.4	20 50.3	99 11	66.4	1
2	17 15.1	99 11	65.8	17 44.9	99 11	65.8	18 14.7	99 11	65.7	18 44.5	99 11	65.6	19 14.3	99 11	65.6	19 44.0	99 11	65.5	20 13.8	99 11	65.4	20 43.6	99 11	65.4	2
3	17 08.5	99 11	64.9	17 38.3	99 11	64.8	18 08.0	99 11	64.7	18 37.8	99 11	64.7	19 07.6	99 11	64.6	19 37.4	99 11	64.5	20 07.2	99 11	64.5	20 37.0	99 11	64.4	3
4	17 01.9	99 11	63.9	17 31.7	99 11	63.8	18 01.5	99 11	63.8	18 31.3	99 11	63.7	19 01.0	99 11	63.6	19 30.8	99 11	63.6	20 00.6	99 11	63.5	20 30.4	99 11	63.4	4
115	16 55.3	99 11	62.9	17 25.1	99 11	62.8	17 54.9	99 11	62.8	18 24.7	99 11	62.7	18 54.5	99 11	62.7	19 24.3	99 11	62.6	19 54.1	99 11	62.5	20 23.9	99 11	62.5	115
6	16 48.9	99 11	61.9	17 18.7	99 11	61.9	17 48.5	99 11	61.8	18 18.3	99 11	61.7	18 48.1	99 11	61.7	19 17.9	99 11	61.6	19 47.6	99 11	61.6	20 17.4	99 11	61.5	6
7	16 42.4	99 11	60.9	17 12.2	99 11	60.9	17 42.0	99 11	60.8	18 11.8	99 11	60.8	18 41.6	99 11	60.7	19 11.4	99 11	60.6	19 41.2	99 11	60.6	20 11.0	99 11	60.5	7
8	16 36.1	99 10	60.0	17 05.9	99 10	59.9	17 35.7	99 10	59.9	18 05.5	99 10	59.8	18 35.3	99 10	59.7	19 05.1	99 10	59.7	19 34.9	99 10	59.6	20 04.7	99 10	59.6	8
9	16 29.8	99 10	59.0	16 59.6	99 10	58.9	17 29.4	99 10	58.9	17 59.2	99 10	58.8	18 29.0	99 10	58.8	18 58.8	99 10	58.7	19 28.6	99 10	58.6	19 58.4	99 10	58.6	9
120	16 23.5	99 10	58.0	16 53.3	99 10	58.0	17 23.2	99 10	57.9	17 53.0	99 10	57.9	18 22.8	99 10	57.8	18 52.6	99 10	57.7	19 22.4	99 10	57.7	19 52.2	99 10	57.6	120
1	16 17.4	99 10	57.1	16 47.2	99 10	57.0	17 17.0	99 10	56.9	17 46.8	99 10	56.9	18 16.6	99 10	56.8	18 46.5	99 10	56.8	19 16.3	99 10	56.7	19 46.1	99 10	56.6	1
2	16 11.3	99 10	56.1	16 41.1	99 10	56.0	17 10.9	99 10	56.0	17 40.7	99 10	55.9	18 10.6	99 10	55.9	18 40.4	99 10	55.8	19 10.2	99 10	55.7	19 40.0	99 10	55.7	2
3	16 05.2	99 10	55.1	16 35.1	99 10	55.1	17 04.9	99 10	55.0	17 34.7	99 10	54.9	18 04.5	99 10	54.9	18 34.4	99 10	54.8	19 04.2	99 10	54.8	19 34.0	99 10	54.7	3
4	15 59.3	99 10	54.1	16 29.1	99 10	54.1	16 58.9	99 10	54.0	17 28.8	99 10	54.0	17 58.6	99 10	53.9	18 28.4	99 10	53.9	18 58.3	99 10	53.8	19 28.1	99 10	53.7	4
125	15 53.4	99 10	53.2	16 23.2	99 10	53.1	16 53.1	99 10	53.1	17 22.9	99 10	53.0	17 52.7	99 10	52.9	18 22.6	99 10	52.9	18 52.4	99 10	52.8	19 22.2	99 10	52.8	125
6	15 47.6	99 10	52.2	16 17.4	99 10	52.1	16 47.2	99 10	52.1	17 17.1	99 10	52.0	17 46.9	99 10	52.0	18 16.8	99 10	51.9	18 46.6	99 10	51.9	19 16.4	99 10	51.8	6
7	15 41.8	99 10	51.2	16 11.7	99 09	51.2	16 41.5	99 09	51.1	17 11.4	99 09	51.1	17 41.2	99 09	51.0	18 11.0	99 09	51.0	18 40.9	99 09	50.9	19 10.7	99 09	50.8	7
8	15 36.2	1.009	50.2	16 06.0	99 09	50.2	16 35.9	99 09	50.1	17 05.7	99 09	50.1	17 35.6	99 09	50.0	18 05.4	99 09	50.0	18 35.3	99 09	49.9	19 05.1	99 09	49.9	8
9	15 30.6	1.009	49.3	16 00.4	1.009	49.2	16 30.3	1.009	49.2	17 00.1	1.009	49.1	17 30.0	1.009	49.1	17 59.8	1.009	49.0	18 29.7	1.009	49.0	18 59.5	1.009	48.9	9
130	15 25.1	1.009	48.3	15 54.9	1.009	48.3	16 24.8	1.009	48.2	16 54.7	1.009	48.2	17 24.5	1.009	48.1	17 54.4	1.009	48.1	18 24.2	1.009	48.0	18 54.1	1.009	47.9	130
1	15 19.7	1.009	47.3	15 49.5	1.009	47.3	16 19.4	1.009	47.2	16 49.2	1.009	47.2	17 19.1	1.009	47.1	17 49.0	1.009	47.1	18 18.8	1.009	47.0	18 48.7	1.009	47.0	1
2	15 14.3	1.009	46.4	15 44.2	1.009	46.3	16 14.1	1.009	46.3	16 43.9	1.009	46.2	17 13.8	1.009	46.2	17 43.7	1.009	46.1	18 13.5	1.009	46.1	18 43.4	1.009	46.0	2
3	15 09.1	1.009	45.4	15 38.9	1.009	45.3	16 08.8	1.009	45.3	16 38.7	1.009	45.3	17 08.6	1.009	45.2	17 38.4	1.009	45.2	18 08.3	1.009	45.1	18 38.2	1.009	45.1	3
4	15 03.9	1.008	44.4	15 33.8	1.008	44.4	16 03.7	1.008	44.3	16 33.5	1.008	44.3	17 03.4	1.008	44.2	17 33.3	1.008	44.2	18 03.2	1.008	44.1	18 33.0	1.008	44.1	4
135	14 58.8	1.008	43.5	15 28.7	1.008	43.4	15 58.6	1.008	43.4	16 28.5	1.008	43.3	16 58.4	1.008	43.3	17 28.2	1.008	43.2	17 58.1	1.008	43.2	18 28.0	1.008	43.1	135
6	14 53.9	1.008	42.5	15 23.7	1.008	42.4	15 53.6	1.008	42.4	16 23.5	1.008	42.3	16 53.4	1.008	42.3	17 23.3	1.008	42.3	17 53.2	1.008	42.2	18 23.0	1.008	42.2	6
7	14 49.0	1.008	41.5	15 18.9	1.008	41.5	15 48.7	1.008	41.4	16 18.6	1.008	41.4	16 48.5	1.008	41.3	17 18.4	1.008	41.3	17 48.3	1.008	41.3	18 18.2	1.008	41.2	7
8	14 44.2	1.008	40.6	15 14.1	1.008	40.5	15 43.9	1.008	40.5	16 13.8	1.008	40.4	16 43.7	1.808	40.4	17 13.6	1.008	40.3	17 43.5	1.008	40.3	18 13.4	1.008	40.2	8
9	14 39.5	1.008	39.6	15 09.4	1.008	39.5	15 39.2	1.008	39.5	16 09.1	1.008	39.5	16 39.0	1.008	39.4	17 08.9	1.008	39.4	17 38.8	1.008	39.3	18 08.7	1.008	39.3	9
140	14 34.8	1.008	38.6	15 04.7	1.008	38.6	15 34.6	1.008	38.5	16 04.5	1.008	38.5	16 34.4	1.008	38.4	17 04.3	1.008	38.4	17 34.2	1.008	38.4	18 04.1	1.008	38.3	140
1	14 30.3	1.007	37.7	15 00.2	1.007	37.6	15 30.1	1.007	37.6	16 00.0	1.007	37.5	16 29.9	1.007	37.5	16 59.8	1.007	37.4	17 29.8	1.007	37.4	17 59.7	1.007	37.4	1
2	14 25.9	1.007	36.7	14 55.8	1.007	36.6	15 25.7	1.007	36.6	15 55.6	1.007	36.6	16 25.5	1.007	36.5	16 55.5	1.007	36.5	17 25.4	1.007	36.4	17 55.3	1.007	36.4	2
3	14 21.6	1.007	35.7	14 51.5	1.007	35.7	15 21.4	1.007	35.6	15 51.3	1.007	35.6	16 21.2	1.007	35.6	16 51.2	1.007	35.5	17 21.1	1.007	35.5	17 51.0	1.007	35.4	3
4	14 17.4	1.007	34.7	14 47.3	1.007	34.7	15 17.2	1.007	34.7	15 47.1	1.007	34.6	16 17.0	1.007	34.6	16 46.9	1.007	34.6	17 16.9	1.007	34.5	17 46.8	1.007	34.5	4
145	14 13.1	1.007	33.8	14 43.2	1.007	33.7	15 13.0	1.007	33.7	15 43.0	1.006	33.7	16 12.9	1.007	33.6	16 42.9	1.007	33.6	17 12.8	1.007	33.6	17 42.7	1.007	33.5	145
6	14 09.2	1.007	32.8	14 39.2	1.006	32.8	15 09.1	1.007	32.7	15 39.0	1.006	32.7	16 08.9	1.006	32.7	16 38.9	1.006	32.6	17 08.8	1.006	32.6	17 38.7	1.006	32.6	6
7	14 05.3	1.006	31.8	14 35.3	1.006	31.8	15 05.2	1.006	31.8	15 35.1	1.006	31.7	16 05.0	1.006	31.7	16 35.0	1.006	31.7	17 04.9	1.006	31.6	17 34.8	1.006	31.6	7
8	14 01.5	1.006	30.9	14 31.5	1.006	30.8	15 01.4	1.006	30.8	15 31.3	1.006	30.8	16 01.3	1.006	30.7	16 31.2	1.006	30.7	17 01.1	1.006	30.7	17 31.1	1.006	30.6	8
9	13 57.8	1.006	29.9	14 27.8	1.006	29.9	14 57.7	1.006	29.9	15 27.6	1.006	29.8	15 57.6	1.006	29.8	16 27.5	1.006	29.7	16 57.4	1.006	29.7	17 27.4	1.006	29.7	9
150	13 54.2	1.006	28.9	14 24.2	1.006	28.9	14 54.1	1.006	28.9	15 24.1	1.006	28.9	15 54.0	1.006	28.8	16 23.9	1.006	28.8	16 53.9	1.006	28.8	17 23.8	1.006	28.7	150
1	13 50.7	1.006	28.0	14 20.7	1.006	28.0	14 50.6	1.006	27.9	15 20.6	1.006	27.9	15 50.5	1.006	27.9	16 20.5	1.006	27.8	16 50.4	1.006	27.8	17 20.4	1.006	27.8	1
2	13 47.4	1.005	27.0	14 17.3	1.005	27.0	14 47.3	1.005	27.0	15 17.2	1.005	26.9	15 47.2	1.005	26.9	16 17.1	1.005	26.9	16 47.1	1.005	26.8	17 17.0	1.005	26.8	2
3	13 44.1	1.005	26.1	14 14.1	1.005	26.0	14 44.0	1.005	26.0	15 14.0	1.005	26.0	15 44.0	1.005	25.9	16 13.9	1.005	25.9	16 43.8	1.005	25.9	17 13.8	1.005	25.8	3
4	13 40.9	1.005	25.1	14 10.9	1.005	25.1	14 40.9	1.005	25.0	15 10.8	1.005	25.0	15 40.8	1.005	25.0	16 10.7	1.005	24.9	16 40.7	1.005	24.9	17 10.6	1.005	24.9	4
155	13 37.9	1.005	24.1	14 07.9	1.005	24.1	14 37.8	1.005	24.1	15 07.8	1.005	24.0	15 37.7	1.005	24.0	16 07.7	1.005	24.0	16 37.6	1.005	24.0	17 07.6	1.005	23.9	155
6	13 35.0	1.005	23.2	14 04.9	1.005	23.1	14 34.9	1.005	23.1	15 04.9	1.005	23.1	15 34.8	1.005	23.0	16 04.8	1.005	23.0	16 34.7	1.005	23.0	17 04.7	1.005	23.0	6
7	13 32.2	1.004	22.2	14 02.1	1.004	22.2	14 32.1	1.004	22.1	15 02.0	1.004	22.1	15 32.0	1.004	22.1	16 02.0	1.004	22.1	16 31.9	1.004	22.0	17 01.9	1.004	22.0	7
8	13 29.5	1.004	21.2	13 59.4	1.004	21.2	14 29.4	1.004	21.2	14 59.4	1.004	21.2	15 29.4	1.004	21.1	15 59.3	1.004	21.1	16 29.2	1.004	21.1	16 59.2	1.004	21.1	8
9	13 26.9	1.004	20.3	13 56.8	1.004	20.2	14 26.8	1.004	20.2	14 56.8	1.004	20.2	15 26.7	1.004	20.2	15 56.7	1.004	20.2	16 26.7	1.004	20.1	16 56.6	1.004	20.1	9
160	13 24.4	1.004	19.3	13 54.4	1.004	19.3	14 24.3	1.004	19.2	14 54.3	1.004	19.2	15 24.3	1.004	19.2	15 54.2	1.004	19.2	16 24.2	1.004	19.2	16 54.2	1.004	19.1	160
1	13 22.0	1.004	18.3	13 52.0	1.004	18.3	14 22.0	1.004	18.3	14 52.0	1.004	18.3	15 21.9	1.004	18.2	15 51.9	1.004	18.2	16 21.9	1.004	18.2	16 51.9	1.004	18.2	1
2	13 19.8	1.004	17.4	13 49.8	1.004	17.3	14 19.7	1.004	17.3	14 49.7	1.004	17.3	15 19.7	1.004	17.3	15 49.6	1.004	17.3	16 19.6	1.004	17.2	16 49.6	1.004	17.2	2
3	13 17.7	1.003	16.4	13 47.6	1.003	16.4	14 17.6	1.003	16.4	14 47.6	1.003	16.3	15 17.6	1.003	16.3	15 47.6	1.003	16.3	16 17.5	1.003	16.3	16 47.5	1.003	16.3	3
4	13 15.7	1.003	15.4	13 45.6	1.003	15.4	14 15.6	1.003	15.4	14 45.6	1.003	15.4	15 15.6	1.003	15.4	15 45.6	1.003	15.3	16 15.6	1.003	15.3	16 45.5	1.003	15.3	4
165	13 13.8	1.003	14.5	13 43.8	1.003	14.5	14 13.7	1.003	14.4	14 43.7	1.003	14.4	15 13.7	1.003	14.4	15 43.7	1.003	14.4	16 13.7	1.003	14.4	16 43.7	1.003	14.3	165
6	13 12.0	1.003	13.5	13 42.0	1.003	13.5	14 12.0	1.003	13.5	14 42.0	1.003	13.5	15 12.0	1.003	13.4	15 41.9	1.003	13.4	16 11.9	1.003	13.4	16 41.9	1.003	13.4	6
7	13 10.4	1.003	12.5	13 40.3	1.003	12.5	14 10.3	1.003	12.5	14 40.3	1.003	12.5	15 10.3	1.003	12.5	15 40.3	1.003	12.5	16 10.3	1.003	12.5	16 40.3	1.003	12.4	7
8	13 08.8	1.002	11.6	13 38.8	1.002	11.6	14 08.8	1.002	11.5	14 38.8	1.002	11.5	15 08.8	1.002	11.5	15 38.8	1.002	11.5	16 08.8	1.002	11.5	16 38.8	1.002	11.5	8
9	13 07.4	1.002	10.6	13 37.4	1.002	10.6	14 07.4	1.002	10.6	14 37.4	1.002	10.6	15 07.4	1.002	10.6	15 37.4	1.002	10.5	16 07.4	1.002	10.5	16 37.4	1.002	10.5	9
170	13 06.1	1.002	09.6	13 36.1	1.002	09.6	14 06.1	1.002	09.6	14 36.1	1.002	09.6	15 06.1	1.002	09.6	15 36.1	1.002	09.6	16 06.1	1.002	09.6	16 36.1	1.002	09.6	170
1	13 05.0	1.002	08.7	13 35.0	1.002	08.7	14 05.0	1.002	08.7	14 35.0	1.002	08.6	15 05.0	1.002	08.6	15 34.9	1.002	08.6	16 04.9	1.002	08.6	16 34.9	1.002	08.6	1
2	13 03.9	1.001	07.7	13 33.9	1.001	07.7	14 03.9	1.001	07.7	14 33.9	1.001	07.7	15 03.9	1.002	07.7	15 33.9	1.002	07.7	16 03.9	1.002	07.7	16 33.9	1.002	07.7	2
3	13 03.0	1.001	06.8	13 33.0	1.001	06.8	14 03.0	1.001	06.7	14 33.0	1.001	06.7	15 03.0	1.001	06.7	15 33.0	1.001	06.7	16 03.0	1.001	06.7	16 33.0	1.001	06.7	3
4	13 02.2	1.001	05.8	13 32.2	1.001	05.8	14 02.2	1.001	05.8	14 32.2	1.001	05.8	15 02.2	1.001	05.8	15 32.2	1.001	05.8	16 02.2	1.001	05.7	16 32.2	1.001	05.7	4
175	13 01.5	1.001	04.8	13 31.5	1.001	04.8	14 01.5	1.001	04.8	14 31.5	1.001	04.8	15 01.5	1.001	04.8	15 31.5	1.001	04.8	16 01.5	1.001	04.8	16 31.5	1.001	04.8	175
6	13 01.0	1.001	03.9	13 31.0	1.001	03.9	14 01.0	1.001	03.8	14 31.0	1.001	03.8	15 01.0	1.001	03.8	15 31.0	1.001	03.8	16 01.0	1.001	03.8	16 31.0	1.001	03.8	6
7	13 00.6	1.000	02.9	13 30.6	1.000	02.9	14 00.6	1.000	02.9	14 30.6	1.000	02.9	15 00.6	1.000	02.9	15 30.6	1.000	02.9	16 00.6	1.000	02.9	16 30.6	1.000	02.9	7
8	13 00.2	1.000	01.9	13 30.2	1.000	01.9	14 00.2	1.000	01.9	14 30.2	1.000	01.9	15 00.2	1.000	01.9	15 30.2	1.000	01.9	16 00.2	1.000	01.9	16 30.2	1.000	01.9	8
9	13 00.1	1.000	01.0	13 30.1	1.000	01.0	14 00.1	1.000	01.0	14 30.1	1.000	01.0	15 00.1	1.000	01.0	15 30.1	1.000	01.0	16 00.1	1.000	01.0	16 30.1	1.000	01.0	9
180	13 00.0	1.000	00.0	13 30.0	1.000	00.0	14 00.0	1.000	00.0	14 30.0	1.000	00.0	15 00.0	1.000	00.0	15 30.0	1.000	00.0	16 00.0	1.000	00.0	16 30.0	1.000	00.0	180

Right margin latitude labels: Lat. 84°, Lat. 85°, Lat. 86°, Lat. 87°

DECLINATION SAME NAME AS LATITUDE

H.A.	24° 00' Alt.	Δd Δt	Az.	24° 30' Alt.	Δd Δt	Az.	25° 00' Alt.	Δd Δt	Az.	25° 30' Alt.	Δd Δt	Az.	26° 00' Alt.	Δd Δt	Az.	26° 30' Alt.	Δd Δt	Az.	27° 00' Alt.	Δd Δt	Az.	27° 30' Alt.	Δd Δt	Az.	H.A.
00	31 00.0	1.00 0	180.0	31 30.0	1.00 0	180.0	32 00.0	1.00 0	180.0	32 30.0	1.00 0	180.0	33 00.0	1.00 0	180.0	33 30.0	1.00 0	180.0	34 00.0	1.00 0	180.0	34 30.0	1.00 0	180.0	00
1	30 59.9	1.00 0	178.9	31 29.9	1.00 0	178.9	31 59.9	1.00 0	178.9	32 29.9	1.00 0	178.9	32 59.9	1.00 0	178.9	33 29.9	1.00 0	178.9	33 59.9	1.00 0	178.9	34 29.9	1.00 0	178.9	1
2	30 59.7	1.00 1	177.9	31 29.7	1.00 1	177.9	31 59.7	1.00 1	177.9	32 29.7	1.00 1	177.9	32 59.7	1.00 1	177.9	33 29.7	1.00 1	177.9	33 59.7	1.00 1	177.9	34 29.7	1.00 1	177.8	2
3	30 59.4	1.00 1	176.8	31 29.4	1.00 1	176.8	31 59.4	1.00 1	176.8	32 29.4	1.00 1	176.8	32 59.4	1.00 1	176.8	33 29.4	1.00 1	176.8	33 59.4	1.00 1	176.8	34 29.4	1.00 1	176.8	3
4	30 58.9	1.00 1	175.7	31 28.9	1.00 1	175.7	31 58.9	1.00 1	175.7	32 28.9	1.00 1	175.7	32 58.9	1.00 1	175.7	33 28.9	1.00 1	175.7	33 58.9	1.00 1	175.7	34 28.9	1.00 1	175.7	4
05	30 58.3	1.00 1	174.7	31 28.3	1.00 1	174.7	31 58.3	1.00 1	174.7	32 28.3	1.00 1	174.6	32 58.3	1.00 1	174.6	33 28.3	1.00 1	174.6	33 58.3	1.00 1	174.6	34 28.3	1.00 1	174.6	05
6	30 57.6	1.00 1	173.6	31 27.6	1.00 1	173.6	31 57.5	1.00 1	173.6	32 27.5	1.00 1	173.6	32 57.5	1.00 1	173.6	33 27.5	1.00 1	173.6	33 57.5	1.00 1	173.6	34 27.5	1.00 2	173.5	6
7	30 56.7	1.00 2	172.5	31 26.7	1.00 2	172.5	31 56.7	1.00 2	172.5	32 26.7	1.00 2	172.5	32 56.7	1.00 2	172.5	33 26.6	1.00 2	172.5	33 56.6	1.00 2	172.5	34 26.6	1.00 2	172.5	7
8	30 55.7	1.00 2	171.5	31 25.7	1.00 2	171.5	31 55.6	1.00 2	171.4	32 25.6	1.00 2	171.4	32 55.6	1.00 2	171.4	33 25.6	1.00 2	171.4	33 55.6	1.00 2	171.4	34 25.6	1.00 2	171.4	8
9	30 54.5	1.00 2	170.4	31 24.5	1.00 2	170.4	31 54.5	1.00 2	170.4	32 24.5	1.00 2	170.4	32 54.5	1.00 2	170.4	33 24.5	1.00 2	170.3	33 54.5	1.00 2	170.3	34 24.5	1.00 2	170.3	9
10	30 53.2	1.00 2	169.3	31 23.2	1.00 2	169.3	31 53.2	1.00 2	169.3	32 23.2	1.00 2	169.3	32 53.2	1.00 2	169.3	33 23.2	1.00 2	169.3	33 53.2	1.00 2	169.3	34 23.2	1.00 2	169.2	10
1	30 51.8	1.00 3	168.3	31 21.8	1.00 3	168.3	31 51.8	1.00 3	168.3	32 21.8	1.00 3	168.2	32 51.8	1.00 3	168.2	33 21.7	1.00 3	168.2	33 51.7	1.00 3	168.2	34 21.7	1.00 3	168.2	1
2	30 50.3	1.00 3	167.2	31 20.2	1.00 3	167.2	31 50.2	1.00 3	167.2	32 20.2	1.00 3	167.2	32 50.2	1.00 3	167.1	33 20.2	1.00 3	167.1	33 50.2	1.00 3	167.1	34 20.2	1.00 3	167.1	2
3	30 48.6	1.00 3	166.1	31 18.6	1.00 3	166.1	31 48.5	1.00 3	166.1	32 18.5	1.00 3	166.1	32 48.5	1.00 3	166.1	33 18.5	1.00 3	166.1	33 48.5	1.00 3	166.0	34 18.5	1.00 3	166.0	3
4	30 46.8	1.00 3	165.1	31 16.7	1.00 3	165.1	31 46.7	1.00 3	165.1	32 16.7	1.00 3	165.0	32 46.7	1.00 3	165.0	33 16.7	1.00 3	165.0	33 46.6	1.00 3	165.0	34 16.6	1.00 3	164.9	4
15	30 44.8	1.00 3	164.0	31 14.8	1.00 3	164.0	31 44.8	1.00 3	164.0	32 14.7	1.00 3	164.0	32 44.7	1.00 3	163.9	33 14.7	1.00 3	163.9	33 44.7	1.00 4	163.9	34 14.7	1.00 4	163.9	15
6	30 42.7	1.00 4	163.0	31 12.7	1.00 4	162.9	31 42.7	1.00 4	162.9	32 12.7	1.00 4	162.9	32 42.6	1.00 4	162.9	33 12.6	1.00 4	162.9	33 42.6	1.00 4	162.8	34 12.6	1.00 4	162.8	6
7	30 40.5	1.00 4	161.9	31 10.5	1.00 4	161.9	31 40.5	1.00 4	161.9	32 10.4	1.00 4	161.8	32 40.4	1.00 4	161.8	33 10.4	1.00 4	161.8	33 40.4	1.00 4	161.8	34 10.3	1.00 4	161.7	7
8	30 38.2	1.00 4	160.8	31 08.2	1.00 4	160.8	31 38.1	1.00 4	160.8	32 08.1	1.00 4	160.7	32 38.1	1.00 4	160.7	33 08.0	1.00 4	160.7	33 38.0	1.00 4	160.7	34 08.0	1.00 4	160.7	8
9	30 35.7	1.00 4	159.8	31 05.7	1.00 4	159.8	31 35.7	1.00 4	159.7	32 05.6	1.00 4	159.7	32 35.6	1.00 4	159.7	33 05.6	1.00 4	159.6	33 35.5	1.00 4	159.6	34 05.5	1.00 4	159.6	9
20	30 33.1	1.00 5	158.7	31 03.1	1.00 5	158.7	31 33.1	1.00 5	158.7	32 03.0	1.00 5	158.6	32 33.0	1.00 5	158.6	33 03.0	1.00 5	158.6	33 32.9	1.00 5	158.6	34 02.9	1.00 5	158.5	20
1	30 30.4	1.00 5	157.7	31 00.4	1.00 5	157.6	31 30.3	1.00 5	157.6	32 00.3	1.00 5	157.6	32 30.3	1.00 5	157.5	33 00.2	1.00 5	157.5	33 30.2	1.00 6	157.5	34 00.1	1.00 5	157.5	1
2	30 27.6	1.00 5	156.6	30 57.5	1.00 5	156.6	31 27.5	1.00 5	156.5	31 57.4	1.00 5	156.5	32 27.4	1.00 5	156.5	32 57.4	1.00 5	156.5	33 27.3	1.00 5	156.4	33 57.3	1.00 5	156.4	2
3	30 24.6	1.00 5	155.6	30 54.6	1.00 5	155.5	31 24.5	1.00 5	155.5	31 54.5	1.00 5	155.5	32 24.4	1.00 5	155.4	32 54.4	1.00 5	155.4	33 24.3	1.00 5	155.4	33 54.3	1.00 5	155.3	3
4	30 21.5	1.00 5	154.5	30 51.5	1.00 5	154.5	31 21.4	1.00 5	154.4	31 51.4	1.00 5	154.4	32 21.3	1.00 5	154.4	32 51.3	1.00 5	154.3	33 21.2	1.00 5	154.3	33 51.2	1.00 5	154.3	4
25	30 18.3	1.00 6	153.4	30 48.3	1.00 6	153.4	31 18.2	1.00 6	153.4	31 48.2	1.00 6	153.3	32 18.1	1.00 6	153.3	32 48.0	1.00 6	153.3	33 18.0	1.00 6	153.2	33 47.9	1.00 6	153.2	25
6	30 15.0	1.00 6	152.4	30 44.9	1.00 6	152.3	31 14.9	1.00 6	152.3	31 44.8	1.00 6	152.3	32 14.8	1.00 6	152.2	32 44.7	1.00 6	152.2	33 14.6	1.00 6	152.2	33 44.6	1.00 6	152.1	6
7	30 11.5	1.00 6	151.3	30 41.5	1.00 6	151.3	31 11.4	1.00 6	151.3	31 41.4	1.00 6	151.2	32 11.3	1.00 6	151.2	32 41.2	1.00 6	151.1	33 11.2	1.00 6	151.1	33 41.1	1.00 6	151.1	7
8	30 08.0	1.00 6	150.3	30 37.9	1.00 6	150.2	31 07.8	1.00 6	150.2	31 37.8	1.00 6	150.2	32 07.7	1.00 6	150.1	32 37.6	1.00 6	150.1	33 07.6	1.00 6	150.1	33 37.5	1.00 6	150.0	8
9	30 04.3	1.00 6	149.2	30 34.2	1.00 6	149.2	31 04.1	1.00 6	149.1	31 34.1	1.00 6	149.1	32 04.0	1.00 6	149.1	32 33.9	1.00 6	149.0	33 03.9	1.00 6	149.0	33 33.8	1.00 6	148.9	9
30	30 00.5	1.00 7	148.2	30 30.4	1.00 7	148.1	31 00.3	1.00 7	148.1	31 30.3	1.00 7	148.0	32 00.2	1.00 7	148.0	32 30.1	1.00 7	148.0	33 00.0	1.00 7	147.9	33 29.9	1.00 7	147.9	30
1	29 56.6	1.00 7	147.1	30 26.5	1.00 7	147.1	30 56.4	1.00 7	147.0	31 26.3	1.00 7	147.0	31 56.2	1.00 7	146.9	32 26.2	1.00 7	146.9	32 56.1	1.00 7	146.9	33 26.0	1.00 7	146.8	1
2	29 52.5	1.00 7	146.1	30 22.5	1.00 7	146.0	30 52.4	1.00 7	146.0	31 22.3	1.00 7	145.9	31 52.2	1.00 7	145.9	32 22.1	1.00 7	145.8	32 52.0	1.00 7	145.8	33 21.9	1.00 7	145.7	2
3	29 48.4	1.00 7	145.0	30 18.3	1.00 7	145.0	30 48.2	1.00 7	144.9	31 18.1	1.00 7	144.9	31 48.0	1.00 7	144.8	32 18.0	1.00 7	144.8	32 47.9	1.00 7	144.7	33 17.8	1.00 7	144.7	3
4	29 44.2	1.00 7	144.0	30 14.1	1.00 7	143.9	30 44.0	1.00 7	143.9	31 13.9	1.00 7	143.8	31 43.8	1.00 7	143.8	32 13.7	1.00 7	143.7	32 43.6	1.00 7	143.7	33 13.5	1.00 7	143.6	4
35	29 39.8	1.00 7	142.9	30 09.7	1.00 7	142.9	30 39.6	1.00 7	142.8	31 09.5	1.00 7	142.8	31 39.4	1.00 7	142.7	32 09.3	1.00 7	142.7	32 39.2	1.00 7	142.6	33 09.1	1.00 8	142.6	35
6	29 35.3	1.00 8	141.9	30 05.2	1.00 8	141.8	30 35.1	1.00 8	141.8	31 05.0	1.00 8	141.7	31 34.9	1.00 8	141.7	32 04.8	1.00 8	141.6	32 34.7	1.00 8	141.6	33 04.6	1.00 8	141.5	6
7	29 30.8	1.00 8	140.8	30 00.7	1.00 8	140.8	30 30.6	1.00 8	140.7	31 00.4	1.00 8	140.7	31 30.3	1.00 8	140.6	32 00.2	1.00 8	140.6	32 30.1	1.00 8	140.5	33 00.0	1.00 8	140.5	7
8	29 26.1	1.00 8	139.8	29 56.0	1.00 8	139.7	30 25.9	1.00 8	139.7	30 55.8	1.00 8	139.6	31 25.6	1.00 8	139.6	31 55.5	1.00 8	139.5	32 25.4	1.00 8	139.4	32 55.3	1.00 8	139.4	8
9	29 21.3	1.00 8	138.7	29 51.2	1.00 8	138.7	30 21.1	1.00 8	138.6	30 51.0	1.00 8	138.6	31 20.9	1.00 8	138.5	31 50.7	1.00 8	138.5	32 20.6	1.00 8	138.4	32 50.5	1.00 8	138.4	9
40	29 16.5	1.00 8	137.7	29 46.3	1.00 8	137.6	30 16.2	1.00 8	137.6	30 46.1	1.00 8	137.5	31 16.0	1.00 8	137.5	31 45.8	1.00 8	137.4	32 15.7	1.00 8	137.4	32 45.6	1.00 8	137.3	40
1	29 11.5	1.00 8	136.6	29 41.4	1.00 8	136.6	30 11.2	1.00 8	136.5	30 41.1	1.00 8	136.5	31 11.0	1.00 8	136.4	31 40.8	1.00 8	136.4	32 10.7	1.00 8	136.3	32 40.6	1.00 8	136.3	1
2	29 06.4	1.00 9	135.6	29 36.3	1.00 9	135.5	30 06.2	1.00 9	135.5	30 36.0	1.00 9	135.4	31 05.9	1.00 9	135.4	31 35.7	1.00 9	135.3	32 05.6	1.00 9	135.3	32 35.5	1.00 9	135.2	2
3	29 01.3	1.00 9	134.5	29 31.1	1.00 9	134.5	30 01.0	1.00 9	134.5	30 30.8	1.00 9	134.4	31 00.7	1.00 9	134.3	31 30.6	1.00 9	134.3	32 00.4	1.00 9	134.2	32 30.3	1.00 9	134.2	3
4	28 56.0	1.00 9	133.5	29 25.9	1.00 9	133.5	29 55.7	1.00 9	133.4	30 25.6	1.00 9	133.4	30 55.4	1.00 9	133.3	31 25.3	1.00 9	133.2	31 55.1	1.00 9	133.2	32 25.0	99 09	133.1	4
45	28 50.7	1.00 9	132.5	29 20.5	1.00 9	132.4	29 50.4	1.00 9	132.4	30 20.2	1.00 9	132.3	30 50.1	99 09	132.3	31 19.9	99 09	132.2	31 49.8	99 09	132.1	32 19.6	99 09	132.1	45
6	28 45.2	99 09	131.4	29 15.1	99 09	131.4	29 44.9	99 09	131.3	30 14.8	99 09	131.3	30 44.6	99 09	131.2	31 14.4	99 09	131.2	31 44.3	99 09	131.1	32 14.1	99 09	131.0	6
7	28 39.7	99 09	130.4	29 09.5	99 09	130.4	29 39.4	99 09	130.3	30 09.2	99 09	130.2	30 39.1	99 09	130.2	31 08.9	99 09	130.1	31 38.7	99 09	130.0	32 08.6	99 09	130.0	7
8	28 34.1	99 10	129.4	29 03.9	99 10	129.3	29 33.8	99 10	129.3	30 03.6	99 10	129.2	30 33.4	99 10	129.1	31 03.3	99 10	129.1	31 33.1	99 10	129.0	32 02.9	99 10	129.0	8
9	28 28.4	99 10	128.3	28 58.2	99 10	128.3	29 28.1	99 10	128.2	29 57.9	99 10	128.2	30 27.7	99 10	128.1	30 57.5	99 10	128.0	31 27.4	99 10	128.0	31 57.2	99 10	127.9	9
50	28 22.6	99 10	127.3	28 52.4	99 10	127.2	29 22.3	99 10	127.2	29 52.1	99 10	127.1	30 21.9	99 10	127.1	30 51.7	99 10	127.0	31 21.6	99 10	126.9	31 51.4	99 10	126.9	50
1	28 16.8	99 10	126.3	28 46.6	99 10	126.2	29 16.4	99 10	126.2	29 46.2	99 10	126.1	30 16.0	99 10	126.0	30 45.9	99 10	126.0	31 15.7	99 10	125.9	31 45.5	99 10	125.8	1
2	28 10.8	99 10	125.2	28 40.6	99 10	125.2	29 10.5	99 10	125.1	29 40.3	99 10	125.1	30 10.1	99 10	125.0	30 39.9	99 10	124.9	31 09.7	99 10	124.9	31 39.5	99 10	124.8	2
3	28 04.8	99 10	124.2	28 34.6	99 10	124.2	29 04.4	99 10	124.1	29 34.3	99 10	124.0	30 04.1	99 10	124.0	30 33.9	99 10	123.9	31 03.7	99 10	123.8	31 33.5	99 10	123.8	3
4	27 58.7	99 10	123.2	28 28.5	99 10	123.1	28 58.4	99 10	123.1	29 28.2	99 10	123.0	29 58.0	99 10	122.9	30 27.8	99 10	122.9	30 57.6	99 10	122.8	31 27.4	99 10	122.7	4
55	27 52.6	99 10	122.2	28 22.4	99 10	122.1	28 52.2	99 10	122.0	29 22.0	99 10	122.0	29 51.8	99 10	121.9	30 21.6	99 10	121.8	30 51.4	99 10	121.8	31 21.2	99 10	121.7	55
6	27 46.3	99 10	121.1	28 16.2	99 10	121.1	28 46.0	99 10	121.0	29 15.8	99 10	120.9	29 45.5	99 11	120.9	30 15.3	99 11	120.8	30 45.1	99 11	120.7	31 14.9	99 11	120.7	6
7	27 40.1	99 11	120.1	28 09.9	99 11	120.0	28 39.7	99 11	120.0	29 09.4	99 11	119.9	29 39.2	99 11	119.8	30 09.0	99 11	119.8	30 38.8	99 11	119.7	31 08.6	99 11	119.6	7
8	27 33.7	99 11	119.1	28 03.5	99 11	119.0	28 33.3	99 11	119.0	29 03.1	99 11	118.9	29 32.9	99 11	118.8	30 02.7	99 11	118.7	30 32.4	99 11	118.7	31 02.2	99 11	118.6	8
9	27 27.3	99 11	118.1	27 57.1	99 11	118.0	28 26.9	99 11	117.9	28 56.6	99 11	117.9	29 26.4	99 11	117.8	29 56.2	99 11	117.7	30 26.0	99 11	117.7	30 55.8	99 11	117.6	9
60	27 20.8	99 11	117.0	27 50.6	99 11	117.0	28 20.4	99 11	116.9	28 50.1	99 11	116.8	29 19.9	99 11	116.8	29 49.7	99 11	116.7	30 19.5	99 11	116.6	30 49.3	99 11	116.6	60
1	27 14.3	99 11	116.0	27 44.0	99 11	116.0	28 13.8	99 11	115.9	28 43.6	99 11	115.8	29 13.4	99 11	115.7	29 43.1	99 11	115.7	30 12.9	99 11	115.6	30 42.7	99 11	115.5	1
2	27 07.7	99 11	115.0	27 37.4	99 11	114.9	28 07.2	99 11	114.9	28 37.0	99 11	114.8	29 06.8	99 11	114.7	29 36.5	99 11	114.7	30 06.3	99 11	114.6	30 36.1	99 11	114.5	2
3	27 01.0	99 11	114.0	27 30.8	99 11	113.9	28 00.5	99 11	113.8	28 30.3	99 11	113.8	29 00.1	99 11	113.7	29 29.9	99 11	113.6	29 59.6	99 11	113.6	30 29.4	99 11	113.5	3
4	26 54.3	99 11	113.0	27 24.1	99 11	112.9	27 53.8	99 11	112.8	28 23.6	99 11	112.8	28 53.4	99 11	112.7	29 23.1	99 11	112.6	29 52.9	99 11	112.5	30 22.6	99 11	112.5	4
65	26 47.5	99 11	111.9	27 17.3	99 11	111.9	27 47.1	99 11	111.8	28 16.8	99 11	111.7	28 46.6	99 11	111.7	29 16.4	99 11	111.6	29 46.1	99 11	111.5	30 15.9	99 11	111.4	65
6	26 40.7	99 11	110.9	27 10.5	99 11	110.9	27 40.3	99 11	110.8	28 10.0	99 11	110.8	28 39.8	99 11	110.6	29 09.5	99 11	110.6	29 39.3	99 11	110.5	30 09.0	99 11	110.4	6
7	26 33.9	99 11	109.9	27 03.6	99 12	109.8	27 33.4	99 12	109.8	28 03.2	99 12	109.7	28 32.9	99 12	109.6	29 02.7	99 12	109.6	29 32.4	99 12	109.5	30 02.2	99 12	109.4	7
8	26 27.0	99 12	108.9	26 56.7	99 12	108.8	27 26.5	99 12	108.8	27 56.2	99 12	108.7	28 26.0	99 12	108.6	28 55.8	99 12	108.5	29 25.5	99 12	108.5	29 55.2	99 12	108.4	8
9	26 20.0	99 12	107.9	26 49.8	99 12	107.8	27 19.6	99 12	107.8	27 49.3	99 12	107.7	28 19.1	99 12	107.6	28 48.8	99 12	107.5	29 18.5	99 12	107.5	29 48.3	99 12	107.4	9
70	26 13.1	99 12	106.9	26 42.8	99 12	106.8	27 12.6	99 12	106.7	27 42.3	99 12	106.7	28 12.1	99 12	106.6	28 41.8	99 12	106.5	29 11.6	99 12	106.4	29 41.3	99 12	106.4	70
1	26 06.0	99 12	105.9	26 35.8	99 12	105.8	27 05.5	99 12	105.7	27 35.3	99 12	105.7	28 05.0	99 12	105.6	28 34.8	99 12	105.5	29 04.5	99 12	105.4	29 34.3	99 12	105.4	1
2	25 59.0	99 12	104.9	26 28.7	99 12	104.8	26 58.5	99 12	104.7	27 28.2	99 12	104.6	27 58.0	99 12	104.6	28 27.7	99 12	104.5	28 57.5	99 12	104.4	29 27.2	99 12	104.3	2
3	25 51.9	99 12	103.9	26 21.7	99 12	103.8	26 51.4	99 12	103.7	27 21.1	99 12	103.6	27 50.9	99 12	103.6	28 20.6	99 12	103.5	28 50.4	99 12	103.4	29 20.1	99 12	103.3	3
4	25 44.8	99 12	102.9	26 14.5	99 12	102.8	26 44.3	99 12	102.7	27 14.0	99 12	102.6	27 43.8	99 12	102.6	28 13.5	99 12	102.5	28 43.2	99 12	102.4	29 13.0	99 12	102.3	4
75	25 37.7	99 12	101.8	26 07.4	99 12	101.8	26 37.1	99 12	101.7	27 06.9	99 12	101.6	27 36.6	99 12	101.6	28 06.3	99 12	101.5	28 36.1	99 12	101.4	29 05.8	99 12	101.3	75
6	25 30.5	99 12	100.8	26 00.2	99 12	100.8	26 30.0	99 12	100.7	26 59.7	99 12	100.6	27 29.4	99 12	100.5	27 59.2	99 12	100.5	28 28.9	99 12	100.4	28 58.6	99 12	100.3	6
7	25 23.3	99 12	99.8	25 53.0	99 12	99.8	26 22.8	99 12	99.7	26 52.5	99 12	99.6	27 22.2	99 12	99.5	27 52.0	99 12	99.5	28 21.7	99 12	99.4	28 51.4	99 12	99.3	7
8	25 16.1	99 12	98.8	25 45.8	99 12	98.8	26 15.6	99 12	98.7	26 45.3	99 12	98.6	27 15.0	99 12	98.5	27 44.7	99 12	98.5	28 14.5	99 12	98.4	28 44.2	99 12	98.3	8
9	25 08.8	99 12	97.8	25 38.6	99 12	97.8	26 08.3	99 12	97.7	26 38.0	99 12	97.6	27 07.8	99 12	97.5	27 37.5	99 12	97.5	28 07.2	99 12	97.4	28 36.9	99 12	97.3	9
80	25 01.6	99 12	96.8	25 31.3	99 12	96.8	26 01.1	99 12	96.7	26 30.8	99 12	96.6	27 00.5	99 12	96.5	27 30.2	99 12	96.5	28 00.0	99 12	96.4	28 29.7	99 12	96.3	80
1	24 54.3	99 12	95.8	25 24.1	99 12	95.8	25 53.8	99 12	95.7	26 23.5	99 12	95.6	26 53.2	99 12	95.5	27 23.0	99 12	95.5	27 52.7	99 12	95.4	28 22.4	99 12	95.3	1
2	24 47.0	99 12	94.8	25 16.8	99 12	94.8	25 46.5	99 12	94.7	26 16.2	99 12	94.6	26 46.0	99 12	94.5	27 15.7	99 12	94.5	27 45.4	99 12	94.4	28 15.1	99 12	94.3	2
3	24 39.8	99 12	93.8	25 09.5	99 12	93.8	25 39.2	99 12	93.7	26 08.9	99 12	93.6	26 38.7	99 12	93.5	27 08.4	99 12	93.5	27 38.1	99 12	93.4	28 07.8	99 12	93.3	3
4	24 32.5	99 12	92.8	25 02.2	99 12	92.8	25 31.9	99 12	92.7	26 01.6	99 12	92.6	26 31.4	99 12	92.6	27 01.1	99 12	92.5	27 30.8	99 12	92.4	28 00.5	99 12	92.3	4
85	24 25.1	99 12	91.9	24 54.9	99 12	91.8	25 24.6	99 12	91.7	25 54.3	99 12	91.6	26 24.1	99 12	91.6	26 53.8	99 12	91.5	27 23.5	99 12	91.4	27 53.2	99 12	91.3	85
6	24 17.8	99 12	90.9	24 47.6	99 12	90.8	25 17.3	99 12	90.7	25 47.0	99 12	90.6	26 16.7	99 12	90.6	26 46.5	99 12	90.5	27 16.2	99 12	90.4	27 45.9	99 12	90.3	6
7	24 10.5	99 12	89.9	24 40.3	99 12	89.8	25 10.0	99 12	89.7	25 39.7	99 12	89.6	26 09.4	99 12	89.6	26 39.2	99 12	89.5	27 08.9	99 12	89.4	27 38.6	99 12	89.3	7
8	24 03.2	99 12	88.9	24 32.9	99 12	88.8	25 02.7	99 12	88.7	25 32.4	99 12	88.7	26 02.1	99 12	88.6	26 31.8	99 12	88.5	27 01.6	99 12	88.4	27 31.3	99 12	88.3	8
9	23 55.9	99 12	87.9	24 25.6	99 12	87.8	24 55.4	99 12	87.7	25 25.1	99 12	87.7	25 54.8	99 12	87.6	26 24.5	99 12	87.5	26 54.3	99 12	87.4	27 24.0	99 12	87.4	9
90	23 48.6	99 12	86.9	24 18.3	99 12	86.8	24 48.1	99 12	86.7	25 17.8	99 12	86.7	25 47.5	99 12	86.6	26 17.2	99 12	86.5	26 47.0	99 12	86.4	27 16.7	99 12	86.4	90

H.A.	24° 00' Alt. (Δd Δt)	Az.	24° 30' Alt. (Δd Δt)	Az.	25° 00' Alt. (Δd Δt)	Az.	25° 30' Alt. (Δd Δt)	Az.	26° 00' Alt. (Δd Δt)	Az.	26° 30' Alt. (Δd Δt)	Az.	27° 00' Alt. (Δd Δt)	Az.	27° 30' Alt. (Δd Δt)	Az.	H.A.
91	23 41.3 99 12	85.9	24 11.0 99 12	85.8	24 40.8 99 12	85.8	25 10.5 99 12	85.7	25 40.2 99 12	85.6	26 09.9 99 12	85.5	26 39.7 99 12	85.5	27 09.4 99 12	85.4	91
2	23 34.8 99 12	84.9	24 03.7 99 12	84.8	24 33.5 99 12	84.8	25 03.2 99 12	84.7	25 32.9 99 12	84.6	26 02.7 99 12	84.5	26 32.4 99 12	84.5	27 02.1 99 12	84.4	2
3	23 26.7 99 12	83.9	23 56.5 99 12	83.9	24 26.2 99 12	83.8	24 55.9 99 12	83.7	25 25.7 99 12	83.6	25 55.4 99 12	83.6	26 25.1 99 12	83.5	26 54.8 99 12	83.4	3
4	23 19.5 99 12	82.9	23 49.2 99 12	82.9	24 18.9 99 12	82.8	24 48.7 99 12	82.7	25 18.4 99 12	82.7	25 48.1 99 12	82.6	26 17.8 99 12	82.5	26 47.6 99 12	82.4	4
95	23 12.2 99 12	82.0	23 42.0 99 12	81.9	24 11.7 99 12	81.8	24 41.4 99 12	81.7	25 11.2 99 12	81.7	25 40.9 99 12	81.6	26 10.6 99 12	81.5	26 40.3 99 12	81.4	95
6	23 05.0 99 12	81.0	23 34.7 99 12	80.9	24 04.5 99 12	80.8	24 34.2 99 12	80.8	25 03.9 99 12	80.7	25 33.7 99 12	80.6	26 03.4 99 12	80.5	26 33.1 99 12	80.5	6
7	22 57.8 99 12	80.0	23 27.5 99 12	79.9	23 57.3 99 12	79.8	24 27.0 99 12	79.8	24 56.7 99 12	79.7	25 26.5 99 12	79.6	25 56.2 99 12	79.6	26 25.9 99 12	79.5	7
8	22 50.6 99 12	79.0	23 20.3 99 12	78.9	23 50.1 99 12	78.9	24 19.8 99 12	78.8	24 49.5 99 12	78.7	25 19.3 99 12	78.6	25 49.0 99 12	78.6	26 18.7 99 12	78.5	8
9	22 43.4 99 12	78.0	23 13.2 99 12	78.0	23 42.9 99 12	77.9	24 12.6 99 12	77.8	24 42.4 99 12	77.7	25 12.1 99 12	77.7	25 41.8 99 12	77.6	26 11.6 99 12	77.5	9
100	22 36.3 99 12	77.0	23 06.0 99 12	77.0	23 35.8 99 12	76.9	24 05.5 99 12	76.8	24 35.3 99 12	76.8	25 05.0 99 12	76.7	25 34.7 99 12	76.6	26 04.5 99 12	76.5	100
1	22 29.2 99 12	76.1	22 58.9 99 12	76.0	23 28.7 99 12	75.9	23 58.4 99 12	75.8	24 28.1 99 12	75.8	24 57.9 99 12	75.7	25 27.6 99 12	75.6	25 57.4 99 12	75.6	1
2	22 22.1 99 12	75.1	22 51.8 99 12	75.0	23 21.6 99 12	74.9	23 51.3 99 12	74.9	24 21.1 99 12	74.8	24 50.8 99 12	74.7	25 20.6 99 12	74.7	25 50.3 99 12	74.6	2
3	22 15.0 99 12	74.1	22 44.8 99 12	74.0	23 14.5 99 12	74.0	23 44.3 99 12	73.9	24 14.0 99 12	73.8	24 43.8 99 12	73.7	25 13.5 99 12	73.7	25 43.3 99 12	73.6	3
4	22 08.0 99 12	73.1	22 37.8 99 12	73.1	23 07.5 99 12	73.0	23 37.3 99 12	72.9	24 07.0 99 12	72.8	24 36.8 99 12	72.8	25 06.5 99 12	72.7	25 36.3 99 12	72.6	4
105	22 01.0 99 12	72.1	22 30.8 99 12	72.1	23 00.6 99 12	72.0	23 30.3 99 12	71.9	24 00.1 99 12	71.9	24 29.8 99 12	71.8	24 59.6 99 12	71.7	25 29.3 99 12	71.7	105
6	21 54.1 99 12	71.2	22 23.9 99 12	71.1	22 53.6 99 12	71.0	23 23.4 99 12	71.0	23 53.1 99 12	70.9	24 22.9 99 12	70.8	24 52.6 99 12	70.8	25 22.4 99 12	70.7	6
7	21 47.2 99 11	70.2	22 17.0 99 11	70.1	22 46.7 99 11	70.1	23 16.5 99 11	70.0	23 46.2 99 11	69.9	24 16.0 99 11	69.8	24 45.8 99 11	69.8	25 15.5 99 11	69.7	7
8	21 40.4 99 11	69.2	22 10.1 99 11	69.1	22 39.9 99 11	69.1	23 09.6 99 11	69.0	23 39.4 99 11	68.9	24 09.2 99 11	68.9	24 38.9 99 11	68.8	25 08.7 99 11	68.7	8
9	21 33.5 99 11	68.2	22 03.3 99 11	68.2	22 33.1 99 11	68.1	23 02.8 99 11	68.0	23 32.6 99 11	68.0	24 02.4 99 11	67.9	24 32.1 99 11	67.9	25 01.9 99 11	67.8	9
110	21 26.8 99 11	67.3	21 56.5 99 11	67.2	22 26.3 99 11	67.1	22 56.1 99 11	67.1	23 25.8 99 11	67.0	23 55.6 99 11	66.9	24 25.4 99 11	66.9	24 55.1 99 11	66.8	110
1	21 20.0 99 11	66.3	21 49.8 99 11	66.2	22 19.6 99 11	66.2	22 49.4 99 11	66.1	23 19.1 99 11	66.0	23 48.9 99 11	66.0	24 18.7 99 11	65.9	24 48.4 99 11	65.8	1
2	21 13.4 99 11	65.3	21 43.2 99 11	65.3	22 12.9 99 11	65.2	22 42.7 99 11	65.1	23 12.5 99 11	65.1	23 42.3 99 11	65.0	24 12.0 99 11	64.9	24 41.8 99 11	64.9	2
3	21 06.8 99 11	64.3	21 36.5 99 11	64.3	22 06.3 99 11	64.2	22 36.1 99 11	64.2	23 05.9 99 11	64.1	23 35.7 99 11	64.0	24 05.4 99 11	64.0	24 35.2 99 11	63.9	3
4	21 00.2 99 11	63.4	21 30.0 99 11	63.3	21 59.8 99 11	63.2	22 29.5 99 11	63.2	22 59.3 99 11	63.1	23 29.1 99 11	63.0	23 58.9 99 11	63.0	24 28.7 99 11	62.9	4
115	20 53.7 99 11	62.4	21 23.5 99 11	62.3	21 53.3 99 11	62.3	22 23.1 99 11	62.2	22 52.8 99 11	62.1	23 22.6 99 11	62.1	23 52.4 99 11	62.0	24 22.2 99 11	62.0	115
6	20 47.2 99 11	61.4	21 17.0 99 11	61.4	21 46.8 99 11	61.3	22 16.6 99 11	61.2	22 46.4 99 11	61.2	23 16.2 99 11	61.1	23 46.0 99 11	61.0	24 15.8 99 11	61.0	6
7	20 40.8 99 11	60.5	21 10.6 99 11	60.4	21 40.4 99 11	60.3	22 10.2 99 11	60.3	22 40.0 99 11	60.2	23 09.8 99 11	60.1	23 39.6 99 10	60.1	24 09.4 99 10	60.0	7
8	20 34.5 99 10	59.5	21 04.3 99 10	59.4	21 34.1 99 10	59.4	22 03.9 99 10	59.3	22 33.7 99 10	59.2	23 03.5 99 10	59.2	23 33.3 99 10	59.1	24 03.1 99 10	59.1	8
9	20 28.2 99 10	58.5	20 58.1 99 10	58.5	21 27.9 99 10	58.4	21 57.7 99 10	58.3	22 27.5 99 10	58.3	22 57.3 99 10	58.2	23 27.1 99 10	58.2	23 56.8 99 10	58.1	9
120	20 22.0 99 10	57.6	20 51.9 99 10	57.5	21 21.7 99 10	57.4	21 51.5 99 10	57.4	22 21.3 99 10	57.3	22 51.1 99 10	57.3	23 20.9 99 10	57.2	23 50.7 99 10	57.1	120
1	20 15.9 99 10	56.6	20 45.7 99 10	56.5	21 15.5 99 10	56.5	21 45.3 99 10	56.4	22 15.1 99 10	56.3	22 45.0 99 10	56.3	23 14.8 99 10	56.2	23 44.6 99 10	56.2	1
2	20 09.8 99 10	55.6	20 39.7 99 10	55.6	21 09.5 99 10	55.5	21 39.3 99 10	55.4	22 09.1 99 10	55.4	22 38.9 99 10	55.3	23 08.7 99 10	55.3	23 38.5 99 10	55.2	2
3	20 03.8 99 10	54.7	20 33.7 99 10	54.6	21 03.5 99 10	54.5	21 33.3 99 10	54.5	22 03.1 99 10	54.4	22 32.9 99 10	54.4	23 02.7 99 10	54.3	23 32.6 99 10	54.2	3
4	19 57.9 99 10	53.7	20 27.7 99 10	53.6	20 57.6 99 10	53.6	21 27.4 99 10	53.5	21 57.2 99 10	53.5	22 27.0 99 10	53.4	22 56.8 99 10	53.3	23 26.7 99 10	53.3	4
125	19 52.1 99 10	52.7	20 21.9 99 10	52.7	20 51.7 99 09	52.6	21 21.5 99 09	52.5	21 51.4 99 09	52.5	22 21.2 99 09	52.4	22 51.0 99 09	52.4	23 20.8 99 09	52.3	125
6	19 46.3 99 10	51.8	20 16.1 99 10	51.7	20 45.9 99 09	51.6	21 15.8 99 09	51.6	21 45.6 99 09	51.5	22 15.4 99 09	51.5	22 45.3 99 09	51.4	23 15.1 99 09	51.4	6
7	19 40.6 99 09	50.8	20 10.4 99 09	50.7	20 40.2 99 09	50.7	21 10.1 99 09	50.6	21 39.9 99 09	50.6	22 09.8 99 09	50.5	22 39.6 99 09	50.5	23 09.4 99 09	50.4	7
8	19 34.9 99 09	49.8	20 04.8 99 09	49.8	20 34.6 99 09	49.7	21 04.5 99 09	49.7	21 34.3 99 09	49.6	22 04.1 99 09	49.5	22 34.0 99 09	49.5	23 03.8 99 09	49.4	8
9	19 29.4 99 09	48.9	19 59.2 99 09	48.8	20 29.1 99 09	48.8	20 58.9 99 09	48.7	21 28.8 99 09	48.6	21 58.6 99 09	48.6	22 28.5 99 09	48.5	22 58.3 99 09	48.5	9
130	19 23.9 1.0 00	47.9	19 53.8 1.0 00	47.8	20 23.6 1.0 00	47.8	20 53.5 99 09	47.7	21 23.3 99 09	47.7	21 53.2 99 09	47.6	22 23.0 99 09	47.6	22 52.9 99 09	47.5	130
1	19 18.5 1.0 00	46.9	19 48.4 1.0 00	46.9	20 18.3 1.0 00	46.8	20 48.1 1.0 00	46.8	21 18.0 1.0 00	46.7	21 47.8 1.0 00	46.7	22 17.7 1.0 00	46.6	22 47.5 1.0 00	46.6	1
2	19 13.2 1.0 00	46.0	19 43.1 1.0 00	45.9	20 13.0 1.0 00	45.9	20 42.8 1.0 00	45.8	21 12.7 1.0 00	45.8	21 42.5 1.0 00	45.7	22 12.4 1.0 00	45.7	22 42.3 1.0 00	45.6	2
3	19 08.0 1.0 00	45.0	19 37.9 1.0 00	45.0	20 07.8 1.0 00	44.9	20 37.6 1.0 08	44.9	21 07.5 1.0 08	44.8	21 37.4 1.0 08	44.8	22 07.2 1.0 08	44.7	22 37.1 1.0 08	44.6	3
4	19 02.8 1.0 08	44.0	19 32.8 1.0 08	44.0	20 02.6 1.0 08	43.9	20 32.5 1.0 08	43.9	21 02.4 1.0 08	43.8	21 32.2 1.0 08	43.8	22 02.1 1.0 08	43.7	22 32.0 1.0 08	43.7	4
135	18 57.9 1.0 08	43.1	19 27.7 1.0 08	43.0	19 57.6 1.0 08	43.0	20 27.5 1.0 08	42.9	20 57.4 1.0 08	42.9	21 27.2 1.0 08	42.8	21 57.1 1.0 08	42.8	22 27.0 1.0 08	42.7	135
6	18 52.9 1.0 08	42.1	19 22.8 1.0 08	42.1	19 52.7 1.0 08	42.0	20 22.6 1.0 08	42.0	20 52.4 1.0 08	41.9	21 22.3 1.0 08	41.9	21 52.2 1.0 08	41.8	22 22.1 1.0 08	41.8	6
7	18 48.1 1.0 08	41.2	19 17.9 1.0 08	41.1	19 47.8 1.0 08	41.1	20 17.7 1.0 08	41.0	20 47.6 1.0 08	41.0	21 17.5 1.0 08	40.9	21 47.3 1.0 08	40.9	22 17.2 1.0 08	40.8	7
8	18 43.3 1.0 08	40.2	19 13.2 1.0 08	40.2	19 43.1 1.0 08	40.1	20 13.0 1.0 08	40.1	20 42.8 1.0 08	40.0	21 12.7 1.0 08	40.0	21 42.6 1.0 08	39.9	22 12.5 1.0 08	39.9	8
9	18 38.6 1.0 08	39.2	19 08.5 1.0 08	39.2	19 38.4 1.0 08	39.1	20 08.3 1.0 08	39.1	20 38.2 1.0 08	39.1	21 08.1 1.0 08	39.0	21 38.0 1.0 08	39.0	22 07.9 1.0 08	38.9	9
140	18 34.0 1.0 07	38.3	19 03.9 1.0 07	38.2	19 33.8 1.0 07	38.2	20 03.7 1.0 07	38.1	20 33.6 1.0 07	38.1	21 03.5 1.0 07	38.1	21 33.4 1.0 07	38.0	22 03.3 1.0 07	38.0	140
1	18 29.6 1.0 07	37.3	18 59.5 1.0 07	37.3	19 29.4 1.0 07	37.2	19 59.3 1.0 07	37.2	20 29.2 1.0 07	37.1	20 59.1 1.0 07	37.1	21 29.0 1.0 07	37.1	21 58.9 1.0 07	37.0	1
2	18 25.2 1.0 07	36.4	18 55.1 1.0 07	36.3	19 25.0 1.0 07	36.3	19 54.9 1.0 07	36.2	20 24.8 1.0 07	36.2	20 54.7 1.0 07	36.1	21 24.6 1.0 07	36.1	21 54.5 1.0 07	36.1	2
3	18 20.9 1.0 07	35.4	18 50.8 1.0 07	35.3	19 20.7 1.0 07	35.3	19 50.6 1.0 07	35.3	20 20.5 1.0 07	35.2	20 50.4 1.0 07	35.2	21 20.3 1.0 07	35.1	21 50.2 1.0 07	35.1	3
4	18 16.7 1.0 07	34.4	18 46.6 1.0 07	34.4	19 16.5 1.0 07	34.4	19 46.4 1.0 07	34.3	20 16.4 1.0 07	34.3	20 46.3 1.0 07	34.2	21 16.2 1.0 07	34.2	21 46.1 1.0 07	34.2	4
145	18 12.6 1.0 07	33.5	18 42.5 1.0 07	33.4	19 12.5 1.0 07	33.4	19 42.4 1.0 07	33.4	20 12.3 1.0 07	33.3	20 42.2 1.0 07	33.3	21 12.1 1.0 07	33.2	21 42.0 1.0 07	33.2	145
6	18 08.6 1.0 06	32.5	18 38.6 1.0 06	32.5	19 08.5 1.0 06	32.4	19 38.4 1.0 06	32.4	20 08.3 1.0 06	32.4	20 38.2 1.0 06	32.3	21 08.2 1.0 06	32.3	21 38.1 1.0 06	32.2	6
7	18 04.8 1.0 06	31.6	18 34.7 1.0 06	31.5	19 04.6 1.0 06	31.5	19 34.5 1.0 06	31.4	20 04.5 1.0 06	31.4	20 34.4 1.0 06	31.4	21 04.3 1.0 06	31.3	21 34.2 1.0 06	31.3	7
8	18 01.0 1.0 06	30.6	18 30.9 1.0 06	30.5	19 00.8 1.0 06	30.5	19 30.8 1.0 06	30.5	20 00.7 1.0 06	30.4	20 30.6 1.0 06	30.4	21 00.6 1.0 06	30.4	21 30.5 1.0 06	30.3	8
9	17 57.3 1.0 06	29.6	18 27.2 1.0 06	29.6	18 57.2 1.0 06	29.6	19 27.1 1.0 06	29.5	19 57.0 1.0 06	29.5	20 27.0 1.0 06	29.5	20 56.9 1.0 06	29.4	21 26.8 1.0 06	29.4	9
150	17 53.7 1.0 06	28.7	18 23.7 1.0 06	28.7	18 53.6 1.0 06	28.6	19 23.6 1.0 06	28.6	19 53.5 1.0 06	28.5	20 23.4 1.0 06	28.5	20 53.4 1.0 06	28.5	21 23.3 1.0 06	28.4	150
1	17 50.3 1.0 06	27.7	18 20.2 1.0 06	27.7	18 50.2 1.0 06	27.7	19 20.1 1.0 06	27.6	19 50.1 1.0 06	27.6	20 20.0 1.0 06	27.6	20 49.9 1.0 06	27.5	21 19.9 1.0 06	27.5	1
2	17 46.9 1.0 05	26.8	18 16.9 1.0 05	26.7	18 46.8 1.0 05	26.7	19 16.8 1.0 05	26.7	19 46.7 1.0 05	26.6	20 16.7 1.0 05	26.6	20 46.6 1.0 05	26.6	21 16.6 1.0 05	26.5	2
3	17 43.7 1.0 05	25.8	18 13.7 1.0 05	25.8	18 43.6 1.0 05	25.8	19 13.6 1.0 05	25.7	19 43.5 1.0 05	25.7	20 13.5 1.0 05	25.7	20 43.4 1.0 05	25.6	21 13.3 1.0 05	25.6	3
4	17 40.6 1.0 05	24.9	18 10.5 1.0 05	24.8	18 40.5 1.0 05	24.8	19 10.4 1.0 05	24.8	19 40.4 1.0 05	24.7	20 10.3 1.0 05	24.7	20 40.3 1.0 05	24.7	21 10.2 1.0 05	24.6	4
155	17 37.6 1.0 05	23.9	18 07.5 1.0 05	23.9	18 37.5 1.0 05	23.8	19 07.4 1.0 05	23.8	19 37.4 1.0 05	23.8	20 07.3 1.0 05	23.8	20 37.3 1.0 05	23.7	21 07.2 1.0 05	23.7	155
6	17 34.7 1.0 05	22.9	18 04.6 1.0 05	22.9	18 34.6 1.0 05	22.9	19 04.5 1.0 05	22.9	19 34.5 1.0 05	22.8	20 04.4 1.0 05	22.8	20 34.4 1.0 05	22.8	21 04.4 1.0 05	22.7	6
7	17 31.9 1.0 04	22.0	18 01.8 1.0 04	22.0	18 31.8 1.0 04	21.9	19 01.7 1.0 04	21.9	19 31.7 1.0 04	21.9	20 01.7 1.0 04	21.9	20 31.6 1.0 04	21.8	21 01.6 1.0 04	21.8	7
8	17 29.2 1.0 04	21.0	17 59.1 1.0 04	21.0	18 29.1 1.0 04	21.0	18 59.1 1.0 04	21.0	19 29.0 1.0 04	20.9	19 59.0 1.0 04	20.9	20 29.0 1.0 04	20.9	20 58.9 1.0 04	20.8	8
9	17 26.6 1.0 04	20.1	17 56.6 1.0 04	20.0	18 26.6 1.0 04	20.0	18 56.5 1.0 04	20.0	19 26.5 1.0 04	20.0	19 56.5 1.0 04	19.9	20 26.4 1.0 04	19.9	20 56.4 1.0 04	19.9	9
160	17 24.2 1.0 04	19.1	17 54.1 1.0 04	19.1	18 24.1 1.0 04	19.1	18 54.1 1.0 04	19.0	19 24.0 1.0 04	19.0	19 54.0 1.0 04	19.0	20 24.0 1.0 04	19.0	20 54.0 1.0 04	19.0	160
1	17 21.8 1.0 04	18.2	17 51.8 1.0 04	18.1	18 21.8 1.0 04	18.1	18 51.7 1.0 04	18.1	19 21.7 1.0 04	18.1	19 51.7 1.0 04	18.0	20 21.7 1.0 04	18.0	20 51.6 1.0 04	18.0	1
2	17 19.6 1.0 04	17.2	17 49.6 1.0 04	17.2	18 19.6 1.0 03	17.2	18 49.5 1.0 04	17.1	19 19.5 1.0 04	17.1	19 49.5 1.0 03	17.1	20 19.5 1.0 04	17.1	20 49.4 1.0 03	17.1	2
3	17 17.5 1.0 03	16.2	17 47.5 1.0 03	16.2	18 17.5 1.0 03	16.2	18 47.4 1.0 03	16.2	19 17.4 1.0 03	16.1	19 47.4 1.0 03	16.1	20 17.4 1.0 03	16.1	20 47.4 1.0 03	16.1	3
4	17 15.5 1.0 03	15.3	17 45.5 1.0 03	15.3	18 15.5 1.0 03	15.3	18 45.5 1.0 03	15.2	19 15.4 1.0 03	15.2	19 45.4 1.0 03	15.2	20 15.4 1.0 03	15.2	20 45.4 1.0 03	15.2	4
165	17 13.6 1.0 03	14.3	17 43.6 1.0 03	14.3	18 13.6 1.0 03	14.3	18 43.6 1.0 03	14.3	19 13.6 1.0 03	14.3	19 43.6 1.0 03	14.2	20 13.5 1.0 03	14.2	20 43.5 1.0 03	14.2	165
6	17 11.9 1.0 03	13.4	17 41.9 1.0 03	13.4	18 11.9 1.0 03	13.3	18 41.9 1.0 03	13.3	19 11.8 1.0 03	13.3	19 41.8 1.0 03	13.3	20 11.8 1.0 03	13.3	20 41.8 1.0 03	13.3	6
7	17 10.3 1.0 03	12.4	17 40.3 1.0 03	12.4	18 10.2 1.0 02	12.4	18 40.2 1.0 02	12.4	19 10.2 1.0 02	12.4	19 40.2 1.0 02	12.3	20 10.2 1.0 02	12.3	20 40.2 1.0 02	12.3	7
8	17 08.7 1.0 02	11.5	17 38.7 1.0 02	11.5	18 08.7 1.0 02	11.4	18 38.7 1.0 02	11.4	19 08.7 1.0 02	11.4	19 38.7 1.0 02	11.4	20 08.7 1.0 02	11.4	20 38.7 1.0 02	11.4	8
9	17 07.4 1.0 02	10.5	17 37.3 1.0 02	10.5	18 07.3 1.0 02	10.5	18 37.3 1.0 02	10.5	19 07.3 1.0 02	10.5	19 37.3 1.0 02	10.4	20 07.3 1.0 02	10.4	20 37.3 1.0 02	10.4	9
170	17 06.1 1.0 02	09.6	17 36.1 1.0 02	09.5	18 06.1 1.0 02	09.5	18 36.1 1.0 02	09.5	19 06.1 1.0 02	09.5	19 36.0 1.0 02	09.5	20 06.0 1.0 02	09.5	20 36.0 1.0 02	09.5	170
1	17 04.9 1.0 02	08.6	17 34.9 1.0 02	08.6	18 04.9 1.0 02	08.6	18 34.9 1.0 02	08.6	19 04.9 1.0 02	08.6	19 34.9 1.0 02	08.5	20 04.9 1.0 02	08.5	20 34.9 1.0 02	08.5	1
2	17 03.9 1.0 02	07.6	17 33.9 1.0 02	07.6	18 03.9 1.0 02	07.6	18 33.9 1.0 02	07.6	19 03.9 1.0 02	07.6	19 33.9 1.0 02	07.6	20 03.9 1.0 02	07.6	20 33.9 1.0 02	07.6	2
3	17 03.0 1.0 01	06.7	17 33.0 1.0 01	06.7	18 03.0 1.0 01	06.7	18 33.0 1.0 01	06.7	19 03.0 1.0 01	06.7	19 33.0 1.0 01	06.6	20 03.0 1.0 01	06.6	20 33.0 1.0 01	06.6	3
4	17 02.1 1.0 01	05.7	17 32.1 1.0 01	05.7	18 02.1 1.0 01	05.7	18 32.1 1.0 01	05.7	19 02.1 1.0 01	05.7	19 32.1 1.0 01	05.7	20 02.1 1.0 01	05.7	20 32.1 1.0 01	05.7	4
175	17 01.5 1.0 01	04.8	17 31.5 1.0 01	04.8	18 01.5 1.0 01	04.8	18 31.5 1.0 01	04.8	19 01.5 1.0 01	04.8	19 31.5 1.0 01	04.7	20 01.5 1.0 01	04.7	20 31.5 1.0 01	04.7	175
6	17 01.0 1.0 01	03.8	17 31.0 1.0 01	03.8	18 01.0 1.0 01	03.8	18 31.0 1.0 01	03.8	19 01.0 1.0 01	03.8	19 31.0 1.0 01	03.8	20 01.0 1.0 01	03.8	20 31.0 1.0 01	03.8	6
7	17 00.5 1.0 00	02.9	17 30.5 1.0 00	02.9	18 00.5 1.0 00	02.9	18 30.5 1.0 00	02.9	19 00.5 1.0 00	02.9	19 30.5 1.0 00	02.8	20 00.5 1.0 00	02.8	20 30.5 1.0 00	02.8	7
8	17 00.2 1.0 00	01.9	17 30.2 1.0 00	01.9	18 00.2 1.0 00	01.9	18 30.2 1.0 00	01.9	19 00.2 1.0 00	01.9	19 30.2 1.0 00	01.9	20 00.2 1.0 00	01.9	20 30.2 1.0 00	01.9	8
9	17 00.1 1.0 00	01.0	17 30.1 1.0 00	01.0	18 00.1 1.0 00	01.0	18 30.1 1.0 00	01.0	19 00.1 1.0 00	01.0	19 30.1 1.0 00	00.9	20 00.1 1.0 00	00.9	20 30.1 1.0 00	00.9	9
180	17 00.0 1.0 00	00.0	17 30.0 1.0 00	00.0	18 00.0 1.0 00	00.0	18 30.0 1.0 00	00.0	19 00.0 1.0 00	00.0	19 30.0 1.0 00	00.0	20 00.0 1.0 00	00.0	20 30.0 1.0 00	00.0	180

L.A.	28°00' Alt	Δd Δt	Az	28°30' Alt	Δd Δt	Az	29°00' Alt	Δd Δt	Az	30°00' Alt	Δd Δt	Az	32°00' Alt	Δd Δt	Az	34°00' Alt	Δd Δt	Az	34°30' Alt	Δd Δt	Az	35°30' Alt	Δd Δt	Az	H.A.
00	35 00.0	1.0 00	180.0	35 30.0	1.0 00	180.0	36 00.0	1.0 00	180.0	37 00.0	1.0 00	180.0	39 00.0	1.0 00	180.0	41 00.0	1.0 00	180.0	41 30.0	1.0 00	180.0	42 30.0	1.0 00	180.0	00
1	34 59.9	1.0 00	178.9	35 29.9	1.0 00	178.9	35 59.9	1.0 00	178.9	36 59.9	1.0 00	178.9	38 59.9	1.0 00	178.9	40 59.9	1.0 00	178.9	41 29.9	1.0 00	178.9	42 29.9	1.0 00	178.9	1
2	34 59.7	1.0 01	177.8	35 29.7	1.0 01	177.8	35 59.7	1.0 01	177.8	36 59.7	1.0 01	177.7	38 59.7	1.0 01	177.8	40 59.7	1.0 01	177.7	41 29.7	1.0 01	177.7	42 29.7	1.0 01	177.6	2
3	34 59.4	1.0 01	176.8	35 29.4	1.0 01	176.8	35 59.4	1.0 01	176.8	36 59.4	1.0 01	176.7	38 59.4	1.0 01	176.7	40 59.4	1.0 01	176.7	41 29.4	1.0 01	176.7	42 29.4	1.0 01	176.6	3
4	34 58.9	1.0 01	175.7	35 28.9	1.0 01	175.7	35 58.9	1.0 01	175.7	36 58.9	1.0 01	175.7	38 58.9	1.0 01	175.6	40 58.9	1.0 01	175.6	41 28.9	1.0 01	175.6	42 28.9	1.0 01	175.6	4
05	34 58.3	1.0 01	174.6	35 28.3	1.0 01	174.6	35 58.3	1.0 01	174.6	36 58.3	1.0 01	174.6	38 58.3	1.0 01	174.5	40 58.2	1.0 01	174.5	41 28.2	1.0 01	174.5	42 28.2	1.0 01	174.5	05
6	34 57.5	1.0 02	173.5	35 27.5	1.0 01	173.5	35 57.5	1.0 02	173.5	36 57.5	1.0 02	173.5	38 57.5	1.0 02	173.5	40 57.5	1.0 02	173.4	41 27.5	1.0 02	173.4	42 27.5	1.0 02	173.4	6
7	34 56.6	1.0 02	172.5	35 26.6	1.0 02	172.4	35 56.6	1.0 02	172.4	36 56.6	1.0 02	172.4	38 56.6	1.0 02	172.4	40 56.6	1.0 02	172.3	41 26.6	1.0 02	172.3	42 26.6	1.0 02	172.3	7
8	34 55.6	1.0 02	171.4	35 25.6	1.0 02	171.4	35 55.6	1.0 02	171.4	36 55.6	1.0 02	171.3	38 55.5	1.0 02	171.3	40 55.5	1.0 02	171.2	41 25.5	1.0 02	171.2	42 25.5	1.0 02	171.2	8
9	34 54.4	1.0 02	170.3	35 24.4	1.0 02	170.3	35 54.4	1.0 02	170.3	36 54.4	1.0 02	170.2	38 54.4	1.0 02	170.2	40 54.3	1.0 02	170.1	41 24.3	1.0 02	170.1	42 24.3	1.0 02	170.1	9
10	34 53.1	1.0 02	169.2	35 23.1	1.0 02	169.2	35 53.1	1.0 02	169.2	36 53.1	1.0 02	169.2	38 53.1	1.0 02	169.1	40 53.0	1.0 02	169.0	41 23.0	1.0 02	169.0	42 23.0	1.0 02	169.0	10
1	34 51.7	1.0 03	168.2	35 21.7	1.0 03	168.1	35 51.7	1.0 03	168.1	36 51.7	1.0 03	168.1	38 51.6	1.0 03	168.0	40 51.6	1.0 03	167.9	41 21.5	1.0 03	167.9	42 21.5	1.0 03	167.9	1
2	34 50.1	1.0 03	167.1	35 20.1	1.0 03	167.1	35 50.1	1.0 03	167.0	36 50.1	1.0 03	167.0	38 50.0	1.0 03	166.9	40 50.0	1.0 03	166.8	41 19.9	1.0 03	166.8	42 19.9	1.0 03	166.8	2
3	34 48.4	1.0 03	166.0	35 18.4	1.0 03	166.0	35 48.4	1.0 03	166.0	36 48.4	1.0 03	166.0	38 48.3	1.0 03	165.8	40 48.2	1.0 03	165.7	41 18.2	1.0 03	165.7	42 18.2	1.0 03	165.7	3
4	34 46.6	1.0 03	164.9	35 16.6	1.0 03	164.9	35 46.6	1.0 03	164.9	36 46.5	1.0 03	164.9	38 46.3	1.0 03	164.7	40 46.4	1.0 03	164.6	41 16.3	1.0 03	164.6	42 16.3	1.0 03	164.6	4
15	34 44.6	1.0 04	163.9	35 14.6	1.0 04	163.8	35 44.6	1.0 04	163.8	36 44.5	1.0 04	163.8	38 44.4	1.0 04	163.7	40 44.3	1.0 04	163.5	41 14.3	1.0 04	163.5	42 14.3	1.0 04	163.5	15
6	34 42.5	1.0 04	162.8	35 12.5	1.0 04	162.8	35 42.5	1.0 04	162.7	36 42.4	1.0 04	162.7	38 42.3	1.0 04	162.6	40 42.2	1.0 04	162.5	41 12.2	1.0 04	162.4	42 12.1	1.0 04	162.4	6
7	34 40.3	1.0 04	161.7	35 10.3	1.0 04	161.7	35 40.2	1.0 04	161.7	36 40.2	1.0 04	161.6	38 40.1	1.0 04	161.5	40 39.9	1.0 04	161.4	41 09.9	1.0 04	161.3	42 09.8	1.0 04	161.3	7
8	34 37.9	1.0 04	160.6	35 07.9	1.0 04	160.6	35 37.9	1.0 04	160.6	36 37.8	1.0 04	160.6	38 37.7	1.0 04	160.4	40 37.5	1.0 04	160.3	41 07.5	1.0 04	160.2	42 07.4	1.0 04	160.2	8
9	34 35.5	1.0 04	159.6	35 05.4	1.0 04	159.5	35 35.3	1.0 04	159.5	36 35.3	1.0 04	159.5	38 35.2	1.0 04	159.3	40 35.0	1.0 04	159.2	41 05.0	1.0 04	159.1	42 04.9	1.0 04	159.1	9
20	34 32.8	1.0 05	158.5	35 02.8	1.0 05	158.5	35 32.8	1.0 05	158.4	36 32.7	1.0 05	158.4	38 32.5	1.0 05	158.2	40 32.3	1.0 05	158.1	41 02.3	1.0 05	158.1	42 02.1	1.0 05	158.0	20
1	34 30.1	1.0 05	157.4	35 00.1	1.0 05	157.4	35 30.0	1.0 05	157.4	36 29.9	1.0 05	157.3	38 29.7	1.0 05	157.2	40 29.5	1.0 05	157.0	40 59.5	1.0 05	157.0	41 59.4	1.0 05	156.9	1
2	34 27.2	1.0 05	156.4	34 57.2	1.0 05	156.3	35 27.1	1.0 05	156.3	36 27.0	1.0 05	156.3	38 26.8	1.0 05	156.1	40 26.6	1.0 05	155.9	40 56.6	1.0 05	155.9	41 56.5	1.0 05	155.8	2
3	34 24.2	1.0 05	155.3	34 54.2	1.0 05	155.2	35 24.1	1.0 05	155.2	36 24.0	1.0 05	155.2	38 23.8	1.0 05	155.0	40 23.6	1.0 05	154.8	40 53.5	1.0 05	154.8	41 53.4	1.0 05	154.8	3
4	34 21.1	1.0 05	154.2	34 51.1	1.0 05	154.2	35 21.0	1.0 05	154.1	36 20.9	1.0 05	154.1	38 20.7	1.0 05	153.9	40 20.4	1.0 05	153.7	40 50.3	1.0 05	153.7	41 50.2	1.0 05	153.6	4
25	34 17.9	1.0 06	153.1	34 47.8	1.0 06	153.1	35 17.8	1.0 06	153.1	36 17.6	1.0 06	153.0	38 17.4	1.0 06	152.8	40 17.1	1.0 06	152.7	40 47.0	1.0 06	152.6	41 46.9	1.0 06	152.5	25
6	34 14.5	1.0 06	152.1	34 44.4	1.0 06	152.0	35 14.4	1.0 06	152.0	36 14.2	1.0 06	151.9	38 14.0	1.0 06	151.8	40 13.7	1.0 06	151.6	40 43.6	1.0 06	151.5	41 43.5	1.0 06	151.4	6
7	34 11.0	1.0 06	151.0	34 41.0	1.0 06	151.0	35 10.9	1.0 06	150.9	36 10.7	1.0 06	150.9	38 10.5	1.0 06	150.7	40 10.2	1.0 06	150.5	40 40.1	1.0 06	150.4	41 39.9	1.0 06	150.3	7
8	34 07.4	1.0 06	149.9	34 37.3	1.0 06	149.9	35 07.3	1.0 06	149.8	36 07.1	1.0 06	149.8	38 06.8	1.0 06	149.6	40 06.5	1.0 06	149.4	40 36.5	1.0 06	149.4	41 36.2	1.0 06	149.3	8
9	34 03.7	1.0 06	148.9	34 33.6	1.0 06	148.8	35 03.5	1.0 06	148.8	36 03.4	1.0 06	148.7	38 03.1	1.0 06	148.5	40 02.7	1.0 06	148.3	40 32.6	1.0 06	148.3	41 32.4	1.0 07	148.2	9
30	33 59.9	1.0 07	147.8	34 29.8	1.0 07	147.8	34 59.7	1.0 07	147.7	35 59.5	1.0 07	147.6	37 59.2	1.0 07	147.5	39 58.8	1.0 07	147.3	40 28.7	1.0 07	147.2	41 28.5	1.0 07	147.1	30
1	33 55.9	1.0 07	146.8	34 25.8	1.0 07	146.7	34 55.7	1.0 07	146.7	35 55.6	1.0 07	146.6	37 55.2	1.0 07	146.4	39 54.8	1.0 07	146.2	40 24.7	1.0 07	146.1	41 24.5	1.0 07	146.0	1
2	33 51.9	1.0 07	145.7	34 21.8	1.0 07	145.7	34 51.7	1.0 07	145.6	35 51.5	1.0 07	145.5	37 51.1	1.0 07	145.3	39 50.7	1.0 07	145.1	40 20.6	1.0 07	145.0	41 20.3	1.0 07	144.9	2
3	33 47.7	1.0 07	144.6	34 17.6	1.0 07	144.6	34 47.5	1.0 07	144.5	35 47.3	1.0 07	144.4	37 46.9	1.0 07	144.2	39 46.4	1.0 07	144.0	40 16.3	1.0 07	144.0	41 16.1	1.0 07	143.8	3
4	33 43.4	1.0 07	143.6	34 13.3	1.0 07	143.5	34 43.2	1.0 07	143.5	35 43.0	1.0 07	143.4	37 42.5	1.0 07	143.2	39 42.1	1.0 07	142.9	40 12.0	1.0 07	142.9	41 11.7	1.0 07	142.8	4
35	33 39.0	1.0 08	142.5	34 08.9	1.0 08	142.5	34 38.8	1.0 08	142.4	35 38.6	1.0 08	142.3	37 38.1	1.0 08	142.1	39 37.6	1.0 08	141.9	40 07.5	1.0 08	141.8	41 07.2	1.0 08	141.7	35
6	33 34.5	1.0 08	141.5	34 04.4	1.0 08	141.4	34 34.3	1.0 08	141.4	35 34.0	1.0 08	141.3	37 33.6	1.0 08	141.0	39 33.1	1.0 08	140.8	40 02.9	1.0 08	140.7	41 02.7	1.0 08	140.6	6
7	33 29.9	1.0 08	140.4	33 59.8	1.0 08	140.4	34 29.6	1.0 08	140.3	35 29.4	1.0 08	140.2	37 28.9	1.0 08	140.0	39 28.4	1.0 08	139.7	39 58.2	1.0 08	139.7	40 58.0	1.0 08	139.5	7
8	33 25.2	1.0 08	139.4	33 55.0	1.0 08	139.3	34 24.9	1.0 08	139.3	35 24.7	1.0 08	139.1	37 24.2	1.0 08	138.9	39 23.6	1.0 08	138.7	39 53.5	1.0 08	138.6	40 53.2	1.0 08	138.5	8
9	33 20.4	1.0 08	138.3	33 50.2	1.0 08	138.3	34 20.1	1.0 08	138.2	35 19.8	1.0 08	138.1	37 19.3	1.0 08	137.8	39 18.7	1.0 08	137.6	39 48.6	1.0 08	137.5	40 48.3	1.0 08	137.4	9
40	33 15.4	1.0 08	137.3	33 45.3	1.0 08	137.2	34 15.2	1.0 08	137.1	35 14.9	1.0 08	137.0	37 14.3	1.0 08	136.8	39 13.7	99 08	136.5	39 43.6	99 08	136.5	40 43.3	99 08	136.3	40
1	33 10.4	1.0 08	136.2	33 40.3	1.0 09	136.1	34 10.2	1.0 09	136.1	35 09.9	1.0 09	136.0	37 09.3	99 09	135.7	39 08.7	99 09	135.5	39 38.5	99 09	135.4	40 38.2	99 09	135.3	1
2	33 05.3	1.0 09	135.1	33 35.0	1.0 09	135.1	34 05.0	1.0 09	135.0	35 04.7	99 09	134.9	37 04.1	99 09	134.7	39 03.5	99 09	134.4	39 33.3	99 09	134.3	40 33.0	99 09	134.2	2
3	33 00.1	1.0 09	134.1	33 30.0	1.0 09	134.0	33 59.8	99 09	134.0	34 59.5	99 09	133.8	36 58.9	99 09	133.6	38 58.2	99 09	133.3	39 28.0	99 09	133.3	40 27.7	99 09	133.1	3
4	32 54.8	99 09	133.1	33 24.7	99 09	133.0	33 54.5	99 09	132.9	34 54.2	99 09	132.8	36 53.5	99 09	132.6	38 52.8	99 09	132.3	39 22.7	99 09	132.2	40 22.7	99 09	132.1	4
45	32 49.4	99 09	132.0	33 19.3	99 09	132.0	33 49.1	99 09	131.9	34 48.8	99 09	131.8	36 48.1	99 09	131.5	38 47.4	99 09	131.2	39 17.2	99 09	131.2	40 16.8	99 09	131.0	45
6	32 44.0	99 09	131.0	33 13.8	99 09	130.9	33 43.6	99 09	130.8	34 43.3	99 09	130.7	36 42.6	99 09	130.5	38 41.9	99 09	130.2	39 11.7	99 09	130.1	40 11.3	99 09	130.0	6
7	32 38.4	99 09	129.9	33 08.2	99 09	129.9	33 38.1	99 09	129.8	34 37.7	99 09	129.6	36 37.0	99 10	129.4	38 36.2	99 10	129.1	39 06.0	99 10	129.0	40 05.6	99 10	128.9	7
8	32 32.7	99 10	128.9	33 02.6	99 10	128.8	33 32.4	99 10	128.8	34 32.0	99 10	128.6	36 31.3	99 10	128.4	38 30.5	99 10	128.1	39 00.3	99 10	128.0	39 59.9	99 10	127.8	8
9	32 27.0	99 10	127.8	32 56.8	99 10	127.8	33 26.7	99 10	127.7	34 26.3	99 10	127.6	36 25.5	99 10	127.3	38 24.7	99 10	127.0	38 54.5	99 10	126.9	39 54.1	99 10	126.8	9
50	32 21.2	99 10	126.8	32 51.0	99 10	126.7	33 20.8	99 10	126.7	34 20.4	99 10	126.5	36 19.7	99 10	126.3	38 18.8	99 10	126.0	38 48.6	99 10	125.9	39 48.2	99 10	125.7	50
1	32 15.3	99 10	125.8	32 45.1	99 10	125.7	33 14.9	99 10	125.6	34 14.5	99 10	125.5	36 13.7	99 10	125.2	38 12.9	99 10	124.9	38 42.7	99 10	124.8	39 42.2	99 10	124.7	1
2	32 09.3	99 10	124.7	32 39.1	99 10	124.7	33 08.9	99 10	124.6	34 08.5	99 10	124.5	36 07.7	99 10	124.2	38 06.8	99 10	123.9	38 36.6	99 10	123.8	39 36.2	99 10	123.6	2
3	32 03.3	99 10	123.7	32 33.1	99 10	123.6	33 02.9	99 10	123.6	34 02.5	99 10	123.4	36 01.6	99 10	123.1	38 00.7	99 10	122.8	38 30.5	99 10	122.7	39 30.0	99 10	122.6	3
4	31 57.2	99 10	122.7	32 27.0	99 10	122.6	32 56.8	99 10	122.5	33 56.3	99 10	122.4	35 55.5	99 10	122.1	37 54.5	99 10	121.8	38 24.3	99 10	121.7	39 23.8	99 10	121.5	4
55	31 51.0	99 10	121.6	32 20.8	99 10	121.6	32 50.6	99 10	121.5	33 50.1	99 10	121.3	35 49.2	99 10	121.0	37 48.3	99 11	120.7	38 18.1	99 11	120.7	39 17.6	99 11	120.5	55
6	31 44.7	99 11	120.6	32 14.5	99 11	120.5	32 44.3	99 11	120.5	33 43.8	99 11	120.3	35 42.9	99 11	120.0	37 42.0	99 11	119.7	38 11.7	99 11	119.6	39 11.2	99 11	119.5	6
7	31 38.4	99 11	119.6	32 08.2	99 11	119.5	32 38.0	99 11	119.4	33 37.5	99 11	119.3	35 36.6	99 11	119.0	37 35.6	99 11	118.7	38 05.3	99 11	118.6	39 04.8	99 11	118.4	7
8	31 32.0	99 11	118.5	32 01.8	99 11	118.5	32 31.5	99 11	118.4	33 31.1	99 11	118.2	35 30.1	99 11	117.9	37 29.1	99 11	117.6	37 58.9	99 11	117.5	38 58.4	99 11	117.4	8
9	31 25.5	99 11	117.5	31 55.3	99 11	117.4	32 25.1	99 11	117.4	33 24.6	99 11	117.2	35 23.7	99 11	116.9	37 22.6	99 11	116.6	37 52.4	99 11	116.5	38 51.8	99 11	116.3	9
60	31 19.0	99 11	116.5	31 48.8	99 11	116.4	32 18.6	99 11	116.3	33 18.1	99 11	116.2	35 17.1	99 11	115.9	37 16.1	99 11	115.6	37 45.8	99 11	115.5	38 45.3	99 11	115.3	60
1	31 12.5	99 11	115.5	31 42.2	99 11	115.4	32 12.0	99 11	115.3	33 11.5	99 11	115.2	35 10.5	99 11	114.8	37 09.4	99 11	114.5	37 39.2	99 11	114.4	38 38.6	99 11	114.3	1
2	31 05.8	99 11	114.4	31 35.6	99 11	114.4	32 05.3	99 11	114.3	33 04.9	99 11	114.1	35 03.8	99 11	113.8	37 02.8	99 11	113.5	37 32.5	99 11	113.4	38 31.9	99 11	113.2	2
3	30 59.1	99 11	113.4	31 28.9	99 11	113.3	31 58.7	99 11	113.3	32 58.2	99 11	113.1	34 57.1	99 11	112.8	36 56.0	99 11	112.5	37 25.8	99 11	112.4	38 25.2	99 11	112.2	3
4	30 52.4	99 11	112.4	31 22.2	99 11	112.3	31 51.9	99 11	112.2	32 51.4	99 11	112.1	34 50.4	99 11	111.8	36 49.3	99 11	111.4	37 19.0	99 11	111.4	38 18.4	99 11	111.2	4
65	30 45.6	99 11	111.4	31 15.4	99 11	111.3	31 45.1	99 11	111.2	32 44.6	99 11	111.1	34 43.5	99 11	110.7	36 42.4	99 11	110.4	37 12.1	99 11	110.3	38 11.5	99 11	110.1	65
6	30 38.8	99 11	110.3	31 08.5	99 11	110.3	31 38.3	99 12	110.2	32 37.8	99 11	110.0	34 36.7	99 11	109.7	36 35.5	99 12	109.4	37 05.3	99 12	109.3	38 04.7	99 12	109.1	6
7	30 31.9	99 12	109.3	31 01.7	99 12	109.3	31 31.4	99 12	109.2	32 30.9	99 12	109.0	34 29.8	99 12	108.7	36 28.6	99 12	108.4	36 58.3	99 12	108.3	37 57.7	99 12	108.1	7
8	30 25.0	99 12	108.3	30 54.7	99 12	108.2	31 24.5	99 12	108.2	32 23.9	99 12	108.0	34 22.8	99 12	107.7	36 21.7	99 12	107.3	36 51.4	99 12	107.3	37 50.8	99 12	107.1	8
9	30 18.0	99 12	107.3	30 47.8	99 12	107.2	31 17.5	99 12	107.2	32 17.0	99 12	107.0	34 15.8	99 12	106.7	36 14.7	99 12	106.3	36 44.4	99 12	106.2	37 43.8	99 12	106.1	9
70	30 11.0	99 12	106.3	30 40.8	99 12	106.2	31 10.5	99 12	106.1	32 09.9	99 12	106.0	34 08.8	99 12	105.7	36 07.6	99 12	105.3	36 37.3	99 12	105.2	37 36.7	99 12	105.0	70
1	30 04.0	99 12	105.3	30 33.7	99 12	105.1	31 03.4	99 12	105.1	32 02.9	99 12	105.0	34 01.8	99 12	104.6	36 00.6	99 12	104.3	36 30.3	99 12	104.2	37 29.6	99 12	104.0	1
2	29 56.9	99 12	104.3	30 26.6	99 12	104.2	30 56.4	99 12	104.1	31 55.8	99 12	104.0	33 54.7	99 12	103.6	35 53.5	99 12	103.3	36 23.2	99 12	103.2	37 22.5	99 12	103.0	2
3	29 49.8	99 12	103.3	30 19.5	99 12	103.2	30 49.3	99 12	103.1	31 48.7	99 12	102.9	33 47.5	99 12	102.6	35 46.3	99 12	102.3	36 16.0	99 12	102.2	37 15.4	99 12	102.0	3
4	29 42.7	99 12	102.3	30 12.4	99 12	102.2	30 42.1	99 12	102.1	31 41.6	99 12	101.9	33 40.4	99 12	101.6	35 39.2	99 12	101.3	36 08.9	99 12	101.2	37 08.2	99 12	101.0	4
75	29 35.5	99 12	101.2	30 05.2	99 12	101.2	30 35.0	99 12	101.1	31 34.4	99 12	100.9	33 33.2	99 12	100.6	35 32.0	99 12	100.3	36 01.7	99 12	100.2	37 01.0	99 12	100.0	75
6	29 28.3	99 12	100.2	29 58.0	99 12	100.2	30 27.8	99 12	100.1	31 27.2	99 12	99.9	33 26.0	99 12	99.6	35 24.8	99 12	99.3	35 54.5	99 12	99.2	36 53.8	99 12	99.0	6
7	29 21.1	99 12	99.2	29 50.9	99 12	99.2	30 20.6	99 12	99.1	31 20.0	99 12	98.9	33 18.8	99 12	98.6	35 17.6	99 12	98.2	35 47.2	99 12	98.1	36 46.6	99 12	98.0	7
8	29 13.9	99 12	98.2	29 43.6	99 12	98.2	30 13.3	99 12	98.1	31 12.8	99 12	97.9	33 11.6	99 12	97.6	35 10.3	99 12	97.2	35 40.0	99 12	97.1	36 39.3	99 12	97.0	8
9	29 06.7	99 12	97.2	29 36.4	99 12	97.2	30 06.1	99 12	97.1	31 05.5	99 12	96.9	33 04.3	99 12	96.6	35 03.1	99 12	96.2	35 32.7	99 12	96.1	36 32.1	99 12	96.0	9
80	28 59.4	99 12	96.2	29 29.1	99 12	96.2	29 58.8	99 12	96.1	30 58.2	99 12	95.9	32 57.0	99 12	95.6	34 55.8	99 12	95.2	35 25.4	99 12	95.1	36 24.8	99 12	95.0	80
1	28 52.1	99 12	95.2	29 21.8	99 12	95.2	29 51.6	99 12	95.1	30 51.0	99 12	94.9	32 49.8	99 12	94.6	34 48.5	99 12	94.2	35 18.2	99 12	94.1	36 17.5	99 12	94.0	1
2	28 44.8	99 12	94.2	29 14.6	99 12	94.2	29 44.3	99 12	94.1	30 43.7	99 12	93.9	32 42.5	99 12	93.6	34 41.2	99 12	93.2	35 10.9	99 12	93.1	36 10.2	99 12	93.0	2
3	28 37.5	99 12	93.2	29 07.3	99 12	93.2	29 37.0	99 12	93.1	30 36.4	99 12	92.9	32 35.2	99 12	92.6	34 33.9	99 12	92.2	35 03.6	99 12	92.1	36 02.9	99 12	92.0	3
4	28 30.2	99 12	92.2	29 00.0	99 12	92.2	29 29.7	99 12	92.1	30 29.1	99 12	91.9	32 27.9	99 12	91.6	34 26.6	99 12	91.2	34 56.3	99 12	91.1	35 55.6	99 12	91.0	4
85	28 22.9	99 12	91.2	28 52.6	99 12	91.2	29 22.4	99 12	91.1	30 21.8	99 12	90.9	32 20.5	99 12	90.6	34 19.3	99 12	90.2	34 48.9	99 12	90.2	35 48.3	99 12	90.0	85
6	28 15.6	99 12	90.3	28 45.3	99 12	90.2	29 15.0	99 12	90.1	30 14.4	99 12	89.9	32 13.2	99 12	89.6	34 12.0	99 12	89.2	34 41.6	99 12	89.2	35 41.0	99 12	89.0	6
7	28 08.3	99 12	89.3	28 38.0	99 12	89.2	29 07.7	99 12	89.1	30 07.1	99 12	88.9	32 05.9	99 12	88.6	34 04.6	99 12	88.3	34 34.3	99 12	88.2	35 33.6	99 12	88.0	7
8	28 01.0	99 12	88.3	28 30.7	99 12	88.2	29 00.4	99 12	88.1	29 59.8	99 12	88.0	31 58.6	99 12	87.6	33 57.3	99 12	87.3	34 27.0	99 12	87.2	35 26.3	99 12	87.0	8
9	27 53.7	99 12	87.3	28 23.4	99 12	87.2	28 53.1	99 12	87.1	29 52.5	99 12	87.0	31 51.3	99 12	86.6	33 50.0	99 12	86.3	34 19.7	99 12	86.2	35 19.0	99 12	86.0	9
90	27 46.4	99 12	86.3	28 16.1	99 12	86.2	28 45.8	99 12	86.1	29 45.2	99 12	86.0	31 44.0	99 12	85.6	33 42.7	99 12	85.3	34 12.4	99 12	85.2	35 11.8	99 12	85.0	90

Lat. 83°

H.A.	28° 00' Alt. Δd Δt Az.	28° 30' Alt. Δd Δt Az.	29° 00' Alt. Δd Δt Az.	30° 00' Alt. Δd Δt Az.	32° 00' Alt. Δd Δt Az.	34° 00' Alt. Δd Δt Az.	34° 30' Alt. Δd Δt Az.	35° 30' Alt. Δd Δt Az.	H.A.
91	27 39.1 99 12 85.3	28 08.8 99 12 85.2	28 38.5 99 12 85.1	29 37.9 99 12 85.0	31 36.7 99 12 84.7	33 35.5 99 12 84.3	34 05.1 99 12 84.2	35 04.5 99 12 84.0	91
2	27 31.8 99 12 84.3	28 01.5 99 12 84.2	28 31.2 99 12 84.2	29 30.7 99 12 84.0	31 29.5 99 12 83.7	33 28.2 99 12 83.3	33 57.9 99 12 83.2	34 57.2 99 12 83.1	2
3	27 24.5 99 12 83.3	27 54.3 99 12 83.3	28 24.0 99 12 83.2	29 23.4 99 12 83.0	31 22.2 99 12 82.7	33 20.9 99 12 82.3	33 50.6 99 12 82.3	34 50.0 99 12 82.1	3
4	27 17.3 99 12 82.3	27 47.0 99 12 82.3	28 16.7 99 12 82.2	29 16.1 99 12 82.0	31 14.9 99 12 81.7	33 13.7 99 12 81.4	33 43.4 99 12 81.3	34 42.7 99 12 81.1	4
95	27 10.1 99 12 81.4	27 39.8 99 12 81.3	28 09.5 99 12 81.2	29 08.9 99 12 81.1	31 07.7 99 12 80.7	33 06.5 99 12 80.4	33 36.2 99 12 80.3	34 35.5 99 12 80.1	95
6	27 02.8 99 12 80.4	27 32.6 99 12 80.3	28 02.3 99 12 80.2	29 01.7 99 12 80.1	31 00.5 99 12 79.7	32 59.3 99 12 79.4	33 29.0 99 12 79.3	34 28.3 99 12 79.1	6
7	26 55.6 99 12 79.4	27 25.4 99 12 79.3	27 55.1 99 12 79.2	28 54.5 99 12 79.1	30 53.3 99 12 78.8	32 52.1 99 12 78.4	33 21.8 99 12 78.3	34 21.2 99 12 78.2	7
8	26 48.5 99 12 78.4	27 18.2 99 12 78.3	27 47.9 99 12 78.3	28 47.3 99 12 78.1	30 46.2 99 12 77.8	32 45.0 99 12 77.5	33 14.6 99 12 77.4	34 14.0 99 12 77.2	8
9	26 41.3 99 12 77.4	27 11.0 99 12 77.4	27 40.8 99 12 77.3	28 40.2 99 12 77.1	30 39.0 99 12 76.8	32 37.8 99 12 76.5	33 07.5 99 12 76.4	34 06.9 99 12 76.2	9
100	26 34.2 99 12 76.5	27 03.9 99 12 76.4	27 33.6 99 12 76.3	28 33.1 99 12 76.2	30 31.9 99 12 75.8	32 30.7 99 12 75.5	33 00.4 99 12 75.4	33 59.8 99 12 75.2	100
1	26 27.1 99 12 75.5	26 56.8 99 12 75.4	27 26.5 99 12 75.3	28 26.0 99 12 75.2	30 24.9 99 12 74.9	32 23.7 99 12 74.5	32 53.4 99 12 74.4	33 52.7 99 12 74.3	1
2	26 20.0 99 12 74.5	26 49.8 99 12 74.4	27 19.5 99 12 74.4	28 18.9 99 12 74.2	30 17.8 99 12 73.9	32 16.6 99 12 73.6	32 46.3 99 12 73.5	33 45.7 99 12 73.3	2
3	26 13.0 99 12 73.5	26 42.7 99 12 73.5	27 12.5 99 12 73.4	28 11.9 99 12 73.2	30 09.6 99 12 72.9	32 09.6 99 12 72.6	32 39.3 99 12 72.5	33 38.7 99 12 72.3	3
4	26 06.0 99 12 72.6	26 35.7 99 12 72.5	27 05.5 99 12 72.4	28 04.9 99 12 72.3	30 03.8 99 12 71.9	32 02.7 99 12 71.6	32 32.4 99 12 71.5	33 31.8 99 12 71.4	4
105	25 59.0 99 12 71.6	26 28.8 99 12 71.5	26 58.5 99 12 71.4	27 58.0 99 12 71.3	29 56.9 99 11 71.0	31 55.8 99 11 70.7	32 25.5 99 11 70.6	33 24.9 99 11 70.4	105
6	25 52.1 99 11 70.6	26 21.9 99 11 70.5	26 51.6 99 11 70.5	27 51.1 99 11 70.3	29 50.0 99 11 70.0	31 48.9 99 11 69.7	32 18.6 99 11 69.6	33 18.0 99 11 69.4	6
7	25 45.3 99 11 69.6	26 15.0 99 11 69.6	26 44.7 99 11 69.5	27 44.2 99 11 69.3	29 43.2 99 11 69.0	31 42.1 99 11 68.7	32 11.8 99 11 68.6	33 11.2 99 11 68.5	7
8	25 38.4 99 11 68.7	26 08.2 99 11 68.6	26 37.9 99 11 68.5	27 37.4 99 11 68.4	29 36.4 99 11 68.1	31 35.3 99 11 67.8	32 05.0 99 11 67.7	33 04.4 99 11 67.5	8
9	25 31.6 99 11 67.7	26 01.4 99 11 67.6	26 31.1 99 11 67.6	27 30.6 99 11 67.4	29 29.6 99 11 67.1	31 28.5 99 11 66.8	31 58.2 99 11 66.7	32 57.7 99 11 66.6	9
110	25 24.9 99 11 66.7	25 54.6 99 11 66.7	26 24.4 99 11 66.6	27 23.9 99 11 66.4	29 22.9 99 11 66.1	31 21.8 99 11 65.8	31 51.5 99 11 65.8	32 51.0 99 11 65.6	110
1	25 18.2 99 11 65.8	25 48.0 99 11 65.7	26 17.7 99 11 65.6	27 17.2 99 11 65.5	29 16.2 99 11 65.2	31 15.2 99 11 64.9	31 44.9 99 11 64.8	32 44.4 99 11 64.6	1
2	25 11.6 99 11 64.8	25 41.3 99 11 64.7	26 11.1 99 11 64.6	27 10.6 99 11 64.5	29 09.6 99 11 64.2	31 08.6 99 11 63.9	31 38.3 99 11 63.8	32 37.8 99 11 63.7	2
3	25 05.0 99 11 63.8	25 34.7 99 11 63.7	26 04.5 99 11 63.7	27 04.0 99 11 63.5	29 03.1 99 11 63.2	31 02.0 99 11 62.9	31 31.8 99 11 62.9	32 31.3 99 11 62.7	3
4	24 58.4 99 11 62.8	25 28.2 99 11 62.8	25 58.0 99 11 62.7	26 57.5 99 11 62.6	28 56.6 99 11 62.3	30 55.6 99 11 62.0	31 25.3 99 11 61.9	32 24.8 99 11 61.8	4
115	24 52.0 99 11 61.9	25 21.7 99 11 61.8	25 51.5 99 11 61.7	26 51.0 99 11 61.6	28 50.1 99 11 61.3	30 49.1 99 11 61.0	31 18.9 99 11 61.0	32 18.4 99 11 60.8	115
6	24 45.5 99 11 60.9	25 15.3 99 11 60.9	25 45.1 99 11 60.8	26 44.6 99 11 60.6	28 43.7 99 11 60.4	30 42.8 99 10 60.1	31 12.5 99 10 60.0	32 12.0 99 10 59.9	6
7	24 39.2 99 10 60.0	25 09.0 99 10 59.9	25 38.7 99 10 59.8	26 38.3 99 10 59.7	28 37.4 99 10 59.4	30 36.5 99 10 59.1	31 06.2 99 10 59.0	32 05.7 99 10 58.9	7
8	24 32.9 99 10 59.0	25 02.7 99 10 58.9	25 32.5 99 10 58.9	26 32.0 99 10 58.7	28 31.1 99 10 58.4	30 30.2 99 10 58.2	31 00.0 99 10 58.1	31 59.5 99 10 57.9	8
9	24 26.6 99 10 58.0	24 56.4 99 10 58.0	25 26.2 99 10 57.9	26 25.8 99 10 57.8	28 24.9 99 10 57.5	30 24.0 99 10 57.2	30 53.8 99 10 57.1	31 53.3 99 10 57.0	9
120	24 20.5 99 10 57.1	24 50.3 99 10 57.0	25 20.1 99 10 56.9	26 19.7 99 10 56.8	28 18.8 99 10 56.5	30 17.9 99 10 56.3	30 47.7 99 10 56.2	31 47.2 99 10 56.0	120
1	24 14.4 99 10 56.1	24 44.2 99 10 56.0	25 14.0 99 10 56.0	26 13.6 99 10 55.8	28 12.7 99 10 55.6	30 11.9 99 10 55.3	30 41.7 99 10 55.2	31 41.2 99 10 55.1	1
2	24 08.3 99 10 55.1	24 38.1 99 10 55.1	25 07.9 99 10 55.0	26 07.6 99 10 54.9	28 06.7 99 10 54.6	30 05.9 99 10 54.4	30 35.7 99 10 54.3	31 35.2 99 10 54.1	2
3	24 02.4 99 10 54.2	24 32.2 99 10 54.1	25 02.0 99 10 54.1	26 01.6 99 10 53.9	28 00.8 99 10 53.7	30 00.0 99 10 53.4	30 29.8 99 10 53.3	31 29.4 99 10 53.2	3
4	23 56.5 99 10 53.2	24 26.3 99 10 53.2	24 56.1 99 10 53.1	25 55.7 99 10 53.0	27 55.0 99 10 52.7	29 54.2 99 10 52.5	30 24.0 99 10 52.4	31 23.5 99 10 52.2	4
125	23 50.7 99 10 52.3	24 20.5 99 10 52.2	24 50.3 99 10 52.1	25 49.9 99 10 52.0	27 49.2 99 10 51.8	29 48.4 99 09 51.5	30 18.2 99 09 51.4	31 17.8 99 09 51.3	125
6	23 44.9 99 09 51.3	24 14.7 99 09 51.2	24 44.6 99 09 51.2	25 44.2 99 09 51.1	27 43.5 99 09 50.8	29 42.7 99 09 50.6	30 12.6 99 09 50.5	31 12.2 99 09 50.4	6
7	23 39.2 99 09 50.3	24 09.1 99 09 50.3	24 38.9 99 09 50.2	25 38.6 99 09 50.1	27 37.8 99 09 49.9	29 37.1 99 09 49.6	30 06.9 99 09 49.5	31 06.5 99 09 49.4	7
8	23 33.7 99 09 49.4	24 03.5 99 09 49.3	24 33.3 99 09 49.3	25 33.0 99 09 49.1	27 32.3 99 09 48.9	29 31.6 99 09 48.7	30 01.4 99 09 48.6	31 01.0 99 09 48.5	8
9	23 28.1 99 09 48.4	23 58.0 99 09 48.4	24 27.8 99 09 48.3	25 27.5 99 09 48.2	27 26.8 99 09 48.0	29 26.1 99 09 47.7	29 55.9 99 09 47.6	30 55.6 99 09 47.5	9
130	23 22.7 99 09 47.5	23 52.6 99 09 47.4	24 22.4 99 09 47.4	25 22.1 99 09 47.2	27 21.4 99 09 47.0	29 20.8 99 09 46.8	29 50.6 99 09 46.7	30 50.2 99 09 46.6	130
1	23 17.4 99 09 46.5	23 47.2 99 09 46.5	24 17.1 99 09 46.4	25 16.8 99 09 46.3	27 16.1 99 09 46.1	29 15.5 99 09 45.8	29 45.3 99 09 45.8	30 45.0 99 09 45.6	1
2	23 12.1 1.00 09 45.6	23 42.0 1.00 09 45.5	24 11.8 1.00 09 45.4	25 11.5 99 09 45.3	27 10.9 99 09 45.1	29 10.3 99 09 44.9	29 40.1 99 08 44.8	30 39.8 99 08 44.7	2
3	23 06.9 1.00 08 44.6	23 36.8 1.00 08 44.5	24 06.6 1.00 08 44.5	25 06.4 1.00 08 44.4	27 05.8 99 08 44.2	29 05.2 99 08 43.9	29 35.0 99 08 43.9	30 34.7 99 08 43.8	3
4	23 01.8 1.00 08 43.6	23 31.7 1.00 08 43.6	24 01.6 1.00 08 43.5	25 01.3 1.00 08 43.4	27 00.7 1.00 08 43.2	29 00.1 99 08 43.0	29 30.0 99 08 42.9	30 29.7 99 08 42.8	4
135	22 56.8 1.00 08 42.7	23 26.7 1.00 08 42.6	23 56.6 1.00 08 42.6	24 56.3 1.00 08 42.5	26 55.8 1.00 08 42.3	28 55.2 1.00 08 42.0	29 25.0 1.00 08 42.0	30 24.7 99 08 41.9	135
6	22 51.9 1.00 08 41.7	23 21.8 1.00 08 41.7	23 51.7 1.00 08 41.6	24 51.4 1.00 08 41.3	26 50.9 1.00 08 41.3	28 50.3 1.00 08 41.1	29 20.1 1.00 08 41.0	30 19.9 1.00 08 40.9	6
7	22 47.1 1.00 08 40.8	23 17.0 1.00 08 40.7	23 46.9 1.00 08 40.7	24 46.6 1.00 08 40.6	26 46.1 1.00 08 40.4	28 45.6 1.00 08 40.2	29 15.4 1.00 08 40.1	30 15.2 1.00 08 40.0	7
8	22 42.4 1.00 08 39.8	23 12.3 1.00 08 39.8	23 42.1 1.00 08 39.7	24 41.9 1.00 08 39.6	26 41.4 1.00 08 39.4	28 40.9 1.00 08 39.2	29 10.8 1.00 08 39.2	30 10.5 1.00 08 39.1	8
9	22 37.7 1.00 08 38.9	23 07.6 1.00 08 38.8	23 37.5 1.00 08 38.8	24 37.3 1.00 08 38.7	26 36.8 1.00 08 38.5	28 36.3 1.00 07 38.3	29 06.2 1.00 07 38.2	30 05.9 1.00 07 38.1	9
140	22 33.2 1.00 07 37.9	23 03.1 1.00 07 37.9	23 33.0 1.00 07 37.8	24 32.8 1.00 07 37.7	26 32.3 1.00 07 37.5	28 31.8 1.00 07 37.3	29 01.7 1.00 07 37.3	30 01.5 1.00 07 37.2	140
1	22 28.8 1.00 07 37.0	22 58.6 1.00 07 36.9	23 28.5 1.00 07 36.9	24 28.3 1.00 07 36.8	26 27.9 1.00 07 36.6	28 27.4 1.00 07 36.4	28 57.3 1.00 07 36.4	29 57.1 1.00 07 36.2	1
2	22 24.4 1.00 07 36.0	22 54.3 1.00 07 36.0	23 24.2 1.00 07 35.9	24 24.0 1.00 07 35.8	26 23.6 1.00 07 35.7	28 23.2 1.00 07 35.5	28 53.0 1.00 07 35.4	29 52.8 1.00 07 35.3	2
3	22 20.2 1.00 07 35.1	22 50.1 1.00 07 35.0	23 20.0 1.00 07 35.0	24 19.8 1.00 07 34.9	26 19.4 1.00 07 34.7	28 19.0 1.00 07 34.5	28 48.9 1.00 07 34.5	29 48.6 1.00 07 34.4	3
4	22 16.0 1.00 07 34.1	22 45.9 1.00 07 34.1	23 15.8 1.00 07 34.0	24 15.6 1.00 07 33.9	26 15.3 1.00 07 33.8	28 14.9 1.00 07 33.6	28 44.8 1.00 07 33.5	29 44.6 1.00 07 33.4	4
145	22 12.0 1.00 07 33.2	22 41.9 1.00 07 33.1	23 11.8 1.00 07 33.1	24 11.6 1.00 07 33.0	26 11.2 1.00 07 32.8	28 10.9 1.00 06 32.6	28 40.8 1.00 06 32.6	29 40.6 1.00 06 32.5	145
6	22 08.0 1.00 06 32.2	22 37.9 1.00 06 32.2	23 07.8 1.00 06 32.1	24 07.7 1.00 06 32.0	26 07.3 1.00 06 31.9	28 07.0 1.00 06 31.7	28 36.9 1.00 06 31.7	29 36.7 1.00 06 31.6	6
7	22 04.2 1.00 06 31.3	22 34.1 1.00 06 31.2	23 04.0 1.00 06 31.2	24 03.8 1.00 06 31.1	26 03.5 1.00 06 30.9	28 03.2 1.00 06 30.8	28 33.1 1.00 06 30.7	29 32.9 1.00 06 30.6	7
8	22 00.4 1.00 06 30.3	22 30.3 1.00 06 30.3	23 00.3 1.00 06 30.2	24 00.1 1.00 06 30.2	25 59.8 1.00 06 30.0	27 59.5 1.00 06 29.8	28 29.4 1.00 06 29.8	29 29.3 1.00 06 29.7	8
9	21 56.8 1.00 06 29.4	22 26.7 1.00 06 29.3	22 56.6 1.00 06 29.3	23 56.5 1.00 06 29.2	25 56.2 1.00 06 29.1	27 55.9 1.00 06 28.9	28 25.8 1.00 06 28.9	29 25.7 1.00 06 28.8	9
150	21 53.2 1.00 06 28.4	22 23.2 1.00 06 28.4	22 53.1 1.00 06 28.3	23 53.0 1.00 06 28.3	25 52.7 1.00 06 28.1	27 52.4 1.00 06 28.0	28 22.4 1.00 06 27.9	29 22.2 1.00 06 27.8	150
1	21 49.8 1.00 06 27.5	22 19.8 1.00 06 27.4	22 49.7 1.00 06 27.4	23 49.6 1.00 06 27.3	25 49.3 1.00 05 27.2	27 49.1 1.00 05 27.0	28 19.0 1.00 05 27.0	29 18.9 1.00 05 26.9	1
2	21 46.5 1.00 05 26.5	22 16.4 1.00 05 26.5	22 46.4 1.00 05 26.4	23 46.3 1.00 05 26.4	25 46.0 1.00 05 26.2	27 45.8 1.00 05 26.1	28 15.7 1.00 05 26.1	29 15.6 1.00 05 26.0	2
3	21 43.3 1.00 05 25.6	22 13.2 1.00 05 25.5	22 43.2 1.00 05 25.5	23 43.1 1.00 05 25.4	25 42.9 1.00 05 25.3	27 42.6 1.00 05 25.2	28 12.6 1.00 05 25.1	29 12.4 1.00 05 25.1	3
4	21 40.2 1.00 05 24.6	22 10.1 1.00 05 24.6	22 40.0 1.00 05 24.5	23 40.0 1.00 05 24.5	25 39.8 1.00 05 24.4	27 39.6 1.00 05 24.2	28 09.5 1.00 05 24.2	29 09.4 1.00 05 24.1	4
155	21 37.2 1.00 05 23.7	22 07.2 1.00 05 23.6	22 37.1 1.00 05 23.6	23 37.0 1.00 05 23.5	25 36.8 1.00 05 23.4	27 36.6 1.00 05 23.3	28 06.6 1.00 05 23.3	29 06.5 1.00 05 23.2	155
6	21 34.3 1.00 05 22.7	22 04.3 1.00 05 22.7	22 34.2 1.00 05 22.7	23 34.1 1.00 05 22.6	25 34.0 1.00 05 22.5	27 33.8 1.00 04 22.4	28 03.7 1.00 04 22.3	29 03.6 1.00 05 22.3	6
7	21 31.6 1.00 04 21.8	22 01.5 1.00 04 21.7	22 31.5 1.00 04 21.7	23 31.4 1.00 04 21.7	25 31.2 1.00 04 21.5	27 31.1 1.00 04 21.4	28 01.0 1.00 04 21.4	29 00.9 1.00 04 21.3	7
8	21 28.9 1.00 04 20.8	21 58.9 1.00 04 20.8	22 28.8 1.00 04 20.7	23 28.8 1.00 04 20.7	25 28.6 1.00 04 20.6	27 28.4 1.00 04 20.5	27 58.4 1.00 04 20.5	28 58.3 1.00 04 20.4	8
9	21 26.4 1.00 04 19.9	21 56.3 1.00 04 19.8	22 26.3 1.00 04 19.8	23 26.2 1.00 04 19.7	25 26.1 1.00 04 19.7	27 25.9 1.00 04 19.6	27 55.9 1.00 04 19.5	28 55.8 1.00 04 19.5	9
160	21 23.9 1.00 04 18.9	21 53.9 1.00 04 18.9	22 23.9 1.00 04 18.9	23 23.8 1.00 04 18.8	25 23.7 1.00 04 18.7	27 23.6 1.00 04 18.6	27 53.5 1.00 04 18.6	28 53.4 1.00 04 18.6	160
1	21 21.6 1.00 04 18.0	21 51.6 1.00 04 18.0	22 21.6 1.00 04 17.9	23 21.5 1.00 04 17.9	25 21.4 1.00 04 17.8	27 21.3 1.00 04 17.7	27 51.2 1.00 04 17.7	28 51.2 1.00 04 17.6	1
2	21 19.4 1.00 03 17.0	21 49.4 1.00 03 17.0	22 19.4 1.00 03 17.0	23 19.3 1.00 03 16.9	25 19.2 1.00 03 16.9	27 19.1 1.00 03 16.8	27 49.1 1.00 03 16.7	28 49.0 1.00 03 16.7	2
3	21 17.3 1.00 03 16.1	21 47.3 1.00 03 16.1	22 17.3 1.00 03 16.0	23 17.2 1.00 03 16.0	25 17.1 1.00 03 15.9	27 17.1 1.00 03 15.8	27 47.0 1.00 03 15.8	28 47.0 1.00 03 15.8	3
4	21 15.4 1.00 03 15.1	21 45.3 1.00 03 15.1	22 15.3 1.00 03 15.1	23 15.3 1.00 03 15.1	25 15.2 1.00 03 15.0	27 15.1 1.00 03 14.9	27 45.1 1.00 03 14.9	28 45.1 1.00 03 14.8	4
165	21 13.5 1.00 03 14.2	21 43.5 1.00 03 14.2	22 13.5 1.00 03 14.2	23 13.4 1.00 03 14.1	25 13.4 1.00 03 14.0	27 13.3 1.00 03 14.0	27 43.3 1.00 03 13.9	28 43.2 1.00 03 13.9	165
6	21 11.8 1.00 03 13.2	21 41.8 1.00 03 13.2	22 11.7 1.00 03 13.2	23 11.7 1.00 03 13.2	25 11.7 1.00 03 13.1	27 11.6 1.00 03 13.0	27 41.6 1.00 03 13.0	28 41.5 1.00 03 13.0	6
7	21 10.2 1.00 02 12.3	21 40.1 1.00 02 12.3	22 10.1 1.00 02 12.3	23 10.1 1.00 02 12.2	25 10.1 1.00 02 12.2	27 10.0 1.00 02 12.1	27 40.0 1.00 02 12.1	28 40.0 1.00 02 12.0	7
8	21 08.7 1.00 02 11.4	21 38.7 1.00 02 11.3	22 08.6 1.00 02 11.3	23 08.6 1.00 02 11.3	25 08.6 1.00 02 11.2	27 08.5 1.00 02 11.2	27 38.5 1.00 02 11.2	28 38.5 1.00 02 11.1	8
9	21 07.2 1.00 02 10.4	21 37.2 1.00 02 10.4	22 07.3 1.00 02 10.4	23 07.2 1.00 02 10.4	25 07.2 1.00 02 10.3	27 07.2 1.00 02 10.2	27 37.2 1.00 02 10.2	28 37.1 1.00 02 10.2	9
170	21 05.9 1.00 02 09.5	21 36.0 1.00 02 09.4	22 06.0 1.00 02 09.4	23 06.0 1.00 02 09.4	25 06.0 1.00 02 09.4	27 05.9 1.00 02 09.3	27 35.9 1.00 02 09.3	28 35.9 1.00 02 09.3	170
1	21 04.9 1.00 02 08.5	21 34.9 1.00 02 08.5	22 04.9 1.00 02 08.5	23 04.9 1.00 02 08.5	25 04.8 1.00 02 08.4	27 04.8 1.00 02 08.4	27 34.8 1.00 02 08.4	28 34.8 1.00 02 08.3	1
2	21 03.9 1.00 02 07.6	21 33.9 1.00 02 07.6	22 03.8 1.00 02 07.5	23 03.8 1.00 02 07.5	25 03.8 1.00 02 07.5	27 03.8 1.00 02 07.4	27 33.8 1.00 01 07.4	28 33.8 1.00 01 07.4	2
3	21 03.0 1.00 01 06.6	21 33.0 1.00 01 06.6	22 02.9 1.00 01 06.6	23 02.9 1.00 01 06.6	25 02.9 1.00 01 06.6	27 02.9 1.00 01 06.5	27 32.9 1.00 01 06.5	28 32.9 1.00 01 06.5	3
4	21 02.2 1.00 01 05.7	21 32.2 1.00 01 05.7	22 02.2 1.00 01 05.7	23 02.2 1.00 01 05.6	25 02.1 1.00 01 05.6	27 02.1 1.00 01 05.6	27 32.1 1.00 01 05.6	28 32.1 1.00 01 05.6	4
175	21 01.5 1.00 01 04.7	21 31.5 1.00 01 04.7	22 01.5 1.00 01 04.7	23 01.5 1.00 01 04.7	25 01.5 1.00 01 04.7	27 01.5 1.00 01 04.6	27 31.5 1.00 01 04.6	28 31.5 1.00 01 04.6	175
6	21 01.0 1.00 01 03.8	21 31.0 1.00 01 03.8	22 01.0 1.00 01 03.8	23 01.0 1.00 01 03.8	25 01.0 1.00 01 03.7	27 01.0 1.00 01 03.7	27 30.9 1.00 01 03.7	28 30.9 1.00 01 03.7	6
7	21 00.5 1.00 01 02.8	21 30.5 1.00 01 02.8	22 00.5 1.00 01 02.8	23 00.5 1.00 01 02.8	25 00.5 1.00 00 02.8	27 00.5 1.00 00 02.8	27 30.5 1.00 00 02.8	28 30.5 1.00 00 02.8	7
8	21 00.2 1.00 00 01.9	21 30.2 1.00 00 01.9	22 00.2 1.00 00 01.9	23 00.2 1.00 00 01.9	25 00.2 1.00 00 01.9	27 00.2 1.00 00 01.9	27 30.2 1.00 00 01.9	28 30.2 1.00 00 01.9	8
9	21 00.1 1.00 00 00.9	21 30.1 1.00 00 00.9	22 00.1 1.00 00 00.9	23 00.1 1.00 00 00.9	25 00.1 1.00 00 00.9	27 00.1 1.00 00 00.9	27 30.1 1.00 00 00.9	28 30.1 1.00 00 00.9	9

Right-margin latitude labels: Lat. 84° (near H.A. 132–133); Lat. 85° (near H.A. 140); Lat. 86° (near H.A. 150); Lat. 87° (near H.A. 160).

Lat. 83°

Each cell: Alt. (° ′)   Δd Δt   Az. (°)

H.A.	36° 00′	37° 00′	38° 30′	40° 00′	42° 00′	42° 30′	43° 00′	45° 00′	H.A.
00	43 00.0 1.00 0 180.0	44 00.0 1.00 0 180.0	45 30.0 1.00 0 180.0	47 00.0 1.00 0 180.0	49 00.0 1.00 0 180.0	49 30.0 1.00 0 180.0	50 00.0 1.00 0 180.0	52 00.0 1.00 0 180.0	00
1	42 59.9 1.00 0 178.9	43 59.9 1.00 0 178.9	45 29.9 1.00 0 178.9	46 59.9 1.00 0 178.9	48 59.9 1.00 0 178.9	49 29.9 1.00 0 178.9	49 59.9 1.00 0 178.9	51 59.9 1.00 0 178.9	1
2	42 59.7 1.00 1 177.8	43 59.7 1.00 1 177.8	45 29.7 1.00 1 177.8	46 59.7 1.00 1 177.7	48 59.7 1.00 1 177.7	49 29.7 1.00 1 177.7	49 59.7 1.00 1 177.7	51 59.7 1.00 1 177.7	2
3	42 59.4 1.00 1 176.7	43 59.4 1.00 1 176.7	45 29.4 1.00 1 176.7	46 59.4 1.00 1 176.6	48 59.3 1.00 1 176.6	49 29.3 1.00 1 176.6	49 59.3 1.00 1 176.6	51 59.3 1.00 1 176.6	3
4	42 58.9 1.00 1 175.6	43 58.9 1.00 1 175.6	45 28.9 1.00 1 175.5	46 58.9 1.00 1 175.5	48 58.8 1.00 1 175.5	49 28.8 1.00 1 175.5	49 58.8 1.00 1 175.4	51 58.8 1.00 1 175.4	4
05	42 58.2 1.00 1 174.5	43 58.2 1.00 1 174.4	45 28.2 1.00 1 174.4	46 58.2 1.00 1 174.4	48 58.2 1.00 1 174.3	49 28.2 1.00 1 174.3	49 58.2 1.00 1 174.3	51 58.2 1.00 1 174.3	05
6	42 57.5 1.00 2 173.4	43 57.5 1.00 2 173.3	45 27.4 1.00 2 173.3	46 57.4 1.00 2 173.3	48 57.4 1.00 2 173.2	49 27.4 1.00 2 173.2	49 57.4 1.00 2 173.2	51 57.4 1.00 2 173.1	6
7	42 56.5 1.00 2 172.3	43 56.5 1.00 2 172.2	45 26.5 1.00 2 172.2	46 56.5 1.00 2 172.1	48 56.5 1.00 2 172.1	49 26.5 1.00 2 172.1	49 56.4 1.00 2 172.0	51 56.4 1.00 2 172.0	7
8	42 55.5 1.00 2 171.2	43 55.5 1.00 2 171.1	45 25.5 1.00 2 171.1	46 55.4 1.00 2 171.0	48 55.4 1.00 2 170.9	49 25.4 1.00 2 170.9	49 55.4 1.00 2 170.9	51 55.3 1.00 2 170.8	8
9	42 54.3 1.00 2 170.1	43 54.3 1.00 2 170.0	45 24.2 1.00 2 170.0	46 54.2 1.00 2 169.9	48 54.2 1.00 2 169.8	49 24.2 1.00 2 169.8	49 54.1 1.00 2 169.8	51 54.1 1.00 2 169.7	9
10	42 53.0 1.00 3 168.9	43 52.9 1.00 2 168.8	45 22.9 1.00 2 168.8	46 52.9 1.00 3 168.7	48 52.8 1.00 3 168.7	49 22.8 1.00 3 168.7	49 52.8 1.00 3 168.5	51 52.7 1.00 3 168.5	10
1	42 51.5 1.00 3 167.8	43 51.5 1.00 3 167.8	45 21.4 1.00 3 167.7	46 51.4 1.00 3 167.7	48 51.3 1.00 3 167.6	49 21.3 1.00 3 167.5	49 51.3 1.00 3 167.5	51 51.2 1.00 3 167.4	1
2	42 49.9 1.00 3 166.7	43 49.8 1.00 3 166.7	45 19.8 1.00 3 166.6	46 49.7 1.00 3 166.5	48 49.6 1.00 3 166.4	49 19.6 1.00 3 166.4	49 49.6 1.00 3 166.4	51 49.5 1.00 3 166.2	2
3	42 48.1 1.00 3 165.6	43 48.1 1.00 3 165.6	45 18.0 1.00 3 165.5	46 48.0 1.00 3 165.4	48 47.9 1.00 3 165.3	49 17.8 1.00 3 165.3	49 47.8 1.00 3 165.2	51 47.7 1.00 3 165.1	3
4	42 46.3 1.00 3 164.5	43 46.2 1.00 3 164.5	45 16.1 1.00 3 164.4	46 46.1 1.00 3 164.3	48 45.9 1.00 3 164.2	49 15.9 1.00 3 164.1	49 45.9 1.00 3 164.1	51 45.7 1.00 4 164.0	4
15	42 44.2 1.00 4 163.4	43 44.2 1.00 4 163.4	45 14.1 1.00 4 163.3	46 44.0 1.00 4 163.0	48 43.9 1.00 4 163.0	49 13.8 1.00 4 163.0	49 43.8 1.00 4 162.8	51 43.7 1.00 4 162.8	15
6	42 42.1 1.00 4 162.3	43 42.0 1.00 4 162.3	45 11.9 1.00 4 162.2	46 41.8 1.00 4 162.1	48 41.7 1.00 4 161.9	49 11.6 1.00 4 161.9	49 41.6 1.00 4 161.8	51 41.4 1.00 4 161.7	6
7	42 39.8 1.00 4 161.2	43 39.7 1.00 4 161.2	45 09.6 1.00 4 161.1	46 39.5 1.00 4 161.0	48 39.3 1.00 4 160.8	49 09.3 1.00 4 160.8	49 39.2 1.00 4 160.7	51 39.1 1.00 4 160.5	7
8	42 37.4 1.00 4 160.1	43 37.3 1.00 4 160.1	45 07.2 1.00 4 160.0	46 37.0 1.00 4 159.8	48 36.9 1.00 4 159.7	49 06.8 1.00 4 159.6	49 36.8 1.00 4 159.6	51 36.6 1.00 4 159.4	8
9	42 34.8 1.00 5 159.0	43 34.7 1.00 5 159.0	45 04.6 1.00 5 158.8	46 34.3 1.00 5 158.7	48 34.3 1.00 5 158.6	49 04.2 1.00 5 158.5	49 34.1 1.00 5 158.5	51 33.9 1.00 5 158.3	9
20	42 32.2 1.00 5 157.9	43 32.1 1.00 5 157.9	45 01.9 1.00 5 157.7	46 31.7 1.00 5 157.6	48 31.5 1.00 5 157.4	49 01.5 1.00 5 157.4	49 31.4 1.00 5 157.3	51 31.1 1.00 5 157.1	20
1	42 29.3 1.00 5 156.8	43 29.2 1.00 5 156.8	44 59.1 1.00 5 156.6	46 28.9 1.00 5 156.5	48 28.6 1.00 5 156.3	48 58.6 1.00 5 156.3	49 28.5 1.00 5 156.2	51 28.2 1.00 5 156.0	1
2	42 26.4 1.00 5 155.8	43 26.3 1.00 5 155.7	44 56.1 1.00 5 155.5	46 25.9 1.00 5 155.4	48 25.6 1.00 5 155.2	48 55.6 1.00 5 155.1	49 25.5 1.00 5 155.1	51 25.2 1.00 5 154.9	2
3	42 23.3 1.00 5 154.7	43 23.2 1.00 5 154.6	44 53.0 1.00 5 154.4	46 22.8 1.00 5 154.3	48 22.5 1.00 5 154.1	48 52.4 1.00 5 154.0	49 22.4 1.00 5 154.0	51 22.0 1.00 6 153.7	3
4	42 20.1 1.00 6 153.6	43 20.0 1.00 6 153.6	44 49.8 1.00 6 153.3	46 19.6 1.00 6 153.2	48 19.2 1.00 6 153.0	48 49.2 1.00 6 152.9	49 19.1 1.00 6 152.8	51 18.7 1.00 6 152.6	4
25	42 16.8 1.00 6 152.5	43 16.7 1.00 6 152.4	44 46.4 1.00 6 152.2	46 16.2 1.00 6 152.1	48 15.9 1.00 6 151.8	48 45.8 1.00 6 151.8	49 15.7 1.00 6 151.7	51 15.3 1.00 6 151.5	25
6	42 13.4 1.00 6 151.4	43 13.2 1.00 6 151.3	44 43.0 1.00 6 151.1	46 12.7 1.00 6 151.0	48 12.3 1.00 6 150.7	48 42.3 1.00 6 150.7	49 12.2 1.00 6 150.6	51 11.7 1.00 6 150.4	6
7	42 09.8 1.00 6 150.3	43 09.7 1.00 6 150.2	44 39.4 1.00 6 150.0	46 09.1 1.00 6 149.9	48 08.7 1.00 6 149.6	48 38.6 1.00 6 149.6	49 08.5 1.00 6 149.5	51 08.1 1.00 6 149.2	7
8	42 06.1 1.00 6 149.2	43 06.0 1.00 6 149.1	44 35.7 1.00 6 149.0	46 05.4 1.00 6 148.8	48 05.0 1.00 6 148.5	48 34.8 1.00 6 148.4	49 04.7 1.00 6 148.4	51 04.3 1.00 7 148.1	8
9	42 02.3 1.00 7 148.1	43 02.1 1.00 7 148.0	44 31.8 1.00 7 147.8	46 01.5 1.00 7 147.7	48 01.1 1.00 7 147.4	48 31.0 1.00 7 147.3	49 00.8 1.00 7 147.3	51 00.0 1.00 7 147.0	9
30	41 58.4 1.00 7 147.0	42 58.2 1.00 7 146.9	44 27.9 1.00 7 146.8	45 57.6 1.00 7 146.6	47 57.1 1.00 7 146.3	48 27.0 1.00 7 146.2	48 56.8 1.00 7 146.2	50 56.3 1.00 7 145.9	30
1	41 54.4 1.00 7 146.0	42 54.2 1.00 7 145.8	44 23.8 1.00 7 145.7	45 53.5 1.00 7 145.5	47 53.0 1.00 7 145.2	48 22.8 1.00 7 145.1	48 52.7 1.00 7 145.1	50 52.1 1.00 7 144.8	1
2	41 50.2 1.00 7 144.9	42 50.0 1.00 7 144.8	44 19.6 1.00 7 144.6	45 49.3 1.00 7 144.4	47 48.7 1.00 7 144.1	48 18.6 1.00 7 144.0	48 48.4 1.00 7 144.0	50 47.8 99 07 143.6	2
3	41 46.0 1.00 7 143.7	42 45.7 1.00 7 143.7	44 15.4 1.00 7 143.5	45 45.0 1.00 7 143.3	47 44.4 1.00 7 143.0	48 14.2 1.00 7 143.0	48 44.1 1.00 7 142.9	50 43.5 99 08 142.5	3
4	41 41.6 1.00 7 142.7	42 41.3 1.00 7 142.6	44 10.9 1.00 8 142.4	45 40.5 1.00 8 142.2	47 39.9 99 08 141.9	48 09.8 99 08 141.8	48 39.6 99 08 141.7	50 39.0 99 08 141.4	4
35	41 37.1 1.00 8 141.6	42 36.8 1.00 8 141.5	44 06.4 1.00 8 141.3	45 36.0 99 08 141.1	47 35.4 99 08 140.8	48 05.2 99 08 140.7	48 35.0 99 08 140.6	50 34.3 99 08 140.3	35
6	41 32.5 1.00 8 140.6	42 32.2 1.00 8 140.4	44 01.8 1.00 8 140.2	45 31.3 99 08 140.0	47 30.7 99 08 139.7	48 00.5 99 08 139.6	48 30.3 99 08 139.5	50 29.6 99 08 139.2	6
7	41 27.8 1.00 8 139.5	42 27.5 1.00 8 139.3	43 57.1 99 08 139.1	45 26.6 99 08 138.9	47 25.9 99 08 138.6	47 55.7 99 08 138.5	48 25.5 99 08 138.5	50 24.8 99 08 138.1	7
8	41 23.0 99 08 138.4	42 22.7 99 08 138.3	43 52.2 99 08 138.1	45 21.7 99 08 137.8	47 21.0 99 08 137.5	47 50.8 99 08 137.4	48 20.6 99 08 137.4	50 19.8 99 08 137.0	8
9	41 18.1 99 08 137.3	42 17.8 99 08 137.2	43 47.3 99 08 137.0	45 16.8 99 08 136.8	47 16.0 99 08 136.4	47 45.8 99 08 136.3	48 15.6 99 08 136.3	50 14.8 99 09 135.9	9
40	41 13.1 99 08 136.3	42 12.8 99 09 136.1	43 42.3 99 09 135.9	45 11.7 99 09 135.7	47 10.9 99 09 135.3	47 40.7 99 09 135.3	48 10.5 99 09 135.2	50 09.7 99 09 134.8	40
1	41 08.0 99 09 135.2	42 07.7 99 09 135.1	43 37.1 99 09 134.8	45 06.6 99 09 134.6	47 05.8 99 09 134.3	47 35.5 99 09 134.2	48 05.3 99 09 134.1	50 04.4 99 09 133.7	1
2	41 02.8 99 09 134.1	42 02.4 99 09 134.0	43 31.9 99 09 133.8	45 01.3 99 09 133.5	47 00.5 99 09 133.2	47 30.3 99 09 133.1	48 00.0 99 09 133.0	49 59.1 99 09 132.6	2
3	40 57.5 99 09 133.1	41 57.1 99 09 132.9	43 26.6 99 09 132.7	44 56.0 99 09 132.4	46 55.1 99 09 132.1	47 24.9 99 09 132.0	47 54.6 99 09 131.9	49 53.7 99 09 131.5	3
4	40 52.1 99 09 132.0	41 51.7 99 09 131.8	43 21.1 99 09 131.6	44 50.5 99 09 131.4	46 49.6 99 09 131.0	47 19.4 99 09 130.9	47 49.1 99 09 130.8	49 48.2 99 09 130.4	4
45	40 46.6 99 09 130.9	41 46.2 99 09 130.8	43 15.6 99 09 130.5	44 45.0 99 09 130.3	46 44.1 99 09 129.9	47 13.8 99 09 129.8	47 43.6 99 09 129.8	49 42.5 99 10 129.4	45
6	40 41.1 99 09 129.9	41 40.7 99 09 129.7	43 10.0 99 09 129.5	44 39.4 99 10 129.2	46 38.4 99 10 128.9	47 08.2 99 10 128.8	47 37.9 99 10 128.7	49 36.8 99 10 128.3	6
7	40 35.4 99 10 128.8	41 35.0 99 10 128.7	43 04.3 99 10 128.4	44 33.6 99 10 128.2	46 32.7 99 10 127.8	47 02.4 99 10 127.6	47 32.2 99 10 127.6	49 31.1 99 10 127.2	7
8	40 29.7 99 10 127.8	41 29.2 99 10 127.6	42 58.6 99 10 127.4	44 27.9 99 10 127.1	46 26.9 99 10 126.7	46 56.6 99 10 126.6	47 26.3 99 10 126.5	49 25.2 99 10 126.1	8
9	40 23.9 99 10 126.7	41 23.4 99 10 126.5	42 52.7 99 10 126.3	44 22.0 99 10 126.0	46 21.0 99 10 125.7	46 50.7 99 10 125.6	47 20.4 99 10 125.5	49 19.3 99 10 125.0	9
50	40 18.0 99 10 125.7	41 17.5 99 10 125.5	42 46.8 99 10 125.2	44 16.0 99 10 125.0	46 15.0 99 10 124.6	46 44.7 99 10 124.5	47 14.4 99 10 124.4	49 13.2 99 10 124.0	50
1	40 12.0 99 10 124.6	41 11.5 99 10 124.4	42 40.8 99 10 124.2	44 10.0 99 10 123.9	46 08.9 99 10 123.5	46 38.6 99 10 123.4	47 08.3 99 10 123.3	49 07.1 99 10 122.9	1
2	40 05.9 99 10 123.5	41 05.4 99 10 123.4	42 34.7 99 10 123.1	44 03.9 99 10 122.8	46 02.8 99 10 122.5	46 32.5 99 10 122.3	47 02.2 99 10 122.3	49 00.9 99 10 121.8	2
3	39 59.8 99 10 122.5	40 59.3 99 10 122.3	42 28.5 99 10 122.1	43 57.7 99 10 121.8	45 56.6 99 10 121.4	46 26.3 99 10 121.3	46 56.0 99 10 121.2	48 54.7 99 11 120.8	3
4	39 53.6 99 10 121.5	40 53.1 99 10 121.3	42 22.3 99 10 121.0	43 51.5 99 11 120.7	45 50.3 99 11 120.3	46 20.0 99 11 120.2	46 49.7 99 11 120.1	48 48.4 99 11 119.7	4
55	39 47.3 99 11 120.4	40 46.8 99 11 120.2	42 16.0 99 11 120.0	43 45.1 99 11 119.7	45 44.0 99 11 119.3	46 13.6 99 11 119.2	46 43.3 99 11 119.1	48 42.0 99 11 118.6	55
6	39 41.0 99 11 119.4	40 40.4 99 11 119.2	42 09.6 99 11 118.9	43 38.8 99 11 118.6	45 37.5 99 11 118.2	46 07.2 99 11 118.1	46 36.9 99 11 118.0	48 35.6 99 11 117.6	6
7	39 34.6 99 11 118.3	40 34.0 99 11 118.2	42 03.2 99 11 117.9	43 32.3 99 11 117.6	45 31.1 99 11 117.2	46 00.7 99 11 117.1	46 30.4 99 11 117.0	48 29.0 99 11 116.5	7
8	39 28.1 99 11 117.3	40 27.5 99 11 117.1	41 56.7 99 11 116.8	43 25.8 99 11 116.5	45 24.5 99 11 116.1	45 54.2 99 11 116.0	46 23.9 99 11 115.9	48 22.5 99 11 115.5	8
9	39 21.6 99 11 116.2	40 21.0 99 11 116.1	41 50.1 99 11 115.8	43 19.2 99 11 115.5	45 17.9 99 11 115.1	45 47.6 99 11 115.0	46 17.3 99 11 114.9	48 15.8 99 11 114.4	9
60	39 15.0 99 11 115.2	40 14.4 99 11 115.0	41 43.5 99 11 114.8	43 12.6 99 11 114.5	45 11.3 99 11 114.1	45 41.0 99 11 113.9	46 10.6 99 11 113.8	48 09.2 99 11 113.4	60
1	39 08.3 99 11 114.2	40 07.8 99 11 114.0	41 36.9 99 11 113.7	43 05.9 99 11 113.4	45 04.6 99 11 113.0	45 34.2 99 11 112.9	46 03.9 99 11 112.8	48 02.4 99 11 112.3	1
2	39 01.6 99 11 113.1	40 01.1 99 11 113.0	41 30.1 99 11 112.7	42 59.2 99 11 112.4	44 57.8 99 11 112.0	45 27.5 99 11 111.9	45 57.1 99 11 111.8	47 55.6 99 11 111.3	2
3	38 54.9 99 11 112.1	39 54.3 99 11 111.9	41 23.4 99 11 111.7	42 52.4 99 11 111.4	44 51.0 99 11 110.9	45 20.7 99 11 110.8	45 50.3 99 11 110.7	47 48.8 99 11 110.3	3
4	38 48.1 99 11 111.1	39 47.5 99 11 110.9	41 16.5 99 11 110.6	42 45.6 99 11 110.3	44 44.2 99 12 109.9	45 13.8 99 12 109.8	45 43.4 99 12 109.7	47 41.9 99 12 109.2	4
65	38 41.2 99 12 110.1	39 40.6 99 12 109.9	41 09.7 99 12 109.6	42 38.7 99 12 109.3	44 37.3 99 12 108.9	45 06.9 99 12 108.8	45 36.5 99 12 108.6	47 35.0 99 12 108.2	65
6	38 34.4 99 12 109.0	39 33.7 99 12 108.8	41 02.8 99 12 108.6	42 31.8 99 12 108.3	44 30.3 99 12 107.8	45 00.0 99 12 107.7	45 29.6 99 12 107.6	47 28.0 99 12 107.1	6
7	38 27.4 99 12 108.0	39 26.8 99 12 107.8	40 55.8 99 12 107.5	42 24.8 99 12 107.2	44 23.4 99 12 106.8	44 53.0 99 12 106.7	45 22.6 99 12 106.6	47 21.0 99 12 106.1	7
8	38 20.4 99 12 107.0	39 19.8 99 12 106.8	40 48.8 99 12 106.5	42 17.8 99 12 106.2	44 16.3 99 12 105.8	44 46.0 99 12 105.7	45 15.6 99 12 105.6	47 14.0 99 12 105.1	8
9	38 13.4 99 12 106.0	39 12.8 99 12 105.8	40 41.8 99 12 105.5	42 10.8 99 12 105.2	44 09.3 99 12 104.8	44 38.9 99 12 104.6	45 08.5 99 12 104.5	47 06.9 99 12 104.1	9
70	38 06.4 99 12 105.0	39 05.7 99 12 104.8	40 34.7 99 12 104.5	42 03.7 99 12 104.2	44 02.2 99 12 103.7	44 31.8 99 12 103.6	45 01.4 99 12 103.5	46 59.8 99 12 103.0	70
1	37 59.3 99 12 103.9	38 58.7 99 12 103.8	40 27.6 99 12 103.5	41 56.6 99 12 103.1	43 55.1 99 12 102.7	44 24.7 99 12 102.6	44 54.3 99 12 102.5	46 52.6 99 12 102.0	1
2	37 52.2 99 12 102.9	38 51.5 99 12 102.7	40 20.5 99 12 102.4	41 49.4 99 12 102.1	43 47.9 99 12 101.7	44 17.5 99 12 101.6	44 47.1 99 12 101.5	46 45.5 99 12 101.0	2
3	37 45.1 99 12 101.9	38 44.4 99 12 101.7	40 13.4 99 12 101.4	41 42.3 99 12 101.1	43 40.8 99 12 100.7	44 10.4 99 12 100.6	44 40.0 99 12 100.5	46 38.3 99 12 100.0	3
4	37 37.9 99 12 100.9	38 37.2 99 12 100.7	40 06.2 99 12 100.4	41 35.1 99 12 100.1	43 33.6 99 12 99.7	44 03.2 99 12 99.6	44 32.8 99 12 99.4	46 31.1 99 12 99.0	4
75	37 30.7 99 12 99.9	38 30.0 99 12 99.7	39 59.0 99 12 99.4	41 27.9 99 12 99.1	43 26.3 99 12 98.7	43 55.9 99 12 98.5	44 25.5 99 12 98.4	46 23.8 99 12 98.0	75
6	37 23.5 99 12 98.9	38 22.8 99 12 98.7	39 51.8 99 12 98.4	41 20.7 99 12 98.1	43 19.1 99 12 97.7	43 48.7 99 12 97.5	44 18.3 99 12 97.4	46 16.6 99 12 96.9	6
7	37 16.2 99 12 97.9	38 15.6 99 12 97.7	39 44.5 99 12 97.4	41 13.4 99 12 97.1	43 11.9 99 12 96.6	43 41.4 99 12 96.5	44 11.0 99 12 96.4	46 09.3 99 12 95.9	7
8	37 09.0 99 12 96.9	38 08.3 99 12 96.7	39 37.3 99 12 96.4	41 06.1 99 12 96.1	43 04.6 99 12 95.6	43 34.2 99 12 95.5	44 03.8 99 12 95.4	46 02.0 99 12 94.9	8
9	37 01.7 99 12 95.9	38 01.0 99 12 95.7	39 30.0 99 12 95.4	40 58.9 99 12 95.1	42 57.3 99 12 94.6	43 26.9 99 12 94.5	43 56.5 99 12 94.4	45 54.8 99 12 93.9	9
80	36 54.4 99 12 94.9	37 53.8 99 12 94.7	39 22.7 99 12 94.4	40 51.6 99 12 94.1	42 50.0 99 12 93.6	43 19.6 99 12 93.5	43 49.2 99 12 93.4	45 47.5 99 12 92.9	80
1	36 47.2 99 12 93.9	37 46.5 99 12 93.7	39 15.4 99 12 93.4	40 44.3 99 12 93.1	42 42.7 99 12 92.6	43 12.3 99 12 92.5	43 41.9 99 12 92.4	45 40.2 99 12 91.9	1
2	36 39.9 99 12 92.9	37 39.2 99 12 92.7	39 08.1 99 12 92.4	40 37.0 99 12 92.1	42 35.4 99 12 91.6	43 05.0 99 12 91.5	43 34.6 99 12 91.4	45 32.8 99 12 90.9	2
3	36 32.6 99 12 91.9	37 31.9 99 12 91.7	39 00.8 99 12 91.4	40 29.7 99 12 91.1	42 28.1 99 12 90.6	42 57.7 99 12 90.5	43 27.3 99 12 90.4	45 25.5 99 12 89.9	3
4	36 25.2 99 12 90.9	37 24.6 99 12 90.7	38 53.5 99 12 90.4	40 22.4 99 12 90.1	42 20.8 99 12 89.7	42 50.4 99 12 89.5	43 20.0 99 12 89.4	45 18.2 99 12 89.0	4
85	36 17.9 99 12 89.9	37 17.2 99 12 89.7	38 46.2 99 12 89.4	40 15.0 99 12 89.1	42 13.4 99 12 88.7	42 43.1 99 12 88.6	43 12.6 99 12 88.4	45 10.9 99 12 88.0	85
6	36 10.6 99 12 88.9	37 09.9 99 12 88.7	38 38.9 99 12 88.4	40 07.7 99 12 88.1	42 06.2 99 12 87.7	42 35.7 99 12 87.6	43 05.3 99 12 87.5	45 03.6 99 12 87.0	6
7	36 03.3 99 12 87.9	37 02.6 99 12 87.7	38 31.5 99 12 87.4	40 00.4 99 12 87.1	41 58.9 99 12 86.7	42 28.4 99 12 86.6	42 58.0 99 12 86.5	44 56.3 99 12 86.0	7
8	35 56.0 99 12 86.9	36 55.3 99 12 86.7	38 24.2 99 12 86.4	39 53.1 99 12 86.1	41 51.6 99 12 85.7	42 21.2 99 12 85.6	42 50.7 99 12 85.5	44 49.0 99 12 85.0	8
9	35 48.7 99 12 85.9	36 48.0 99 12 85.7	38 16.9 99 12 85.4	39 45.8 99 12 85.1	41 44.3 99 12 84.7	42 13.9 99 12 84.6	42 43.5 99 12 84.5	44 41.7 99 12 84.0	9
90	35 41.4 99 12 84.9	36 40.7 99 12 84.8	38 09.7 99 12 84.2	39 38.6 99 12 83.7	41 37.0 99 12 83.7	42 06.6 99 12 83.6	42 36.2 99 12 83.5	44 34.5 99 12 83.1	90

H.A.	36° 00' Alt.	Δd Δt	Az.	37° 00' Alt.	Δd Δt	Az.	38° 30' Alt.	Δd Δt	Az.	40° 00' Alt.	Δd Δt	Az.	42° 00' Alt.	Δd Δt	Az.	42° 30' Alt.	Δd Δt	Az.	43° 00' Alt.	Δd Δt	Az.	45° 00' Alt.	Δd Δt	Az.	H.A.
91	35 34.1	99 12	84.0	36 33.5	99 12	83.8	38 02.4	99 12	83.5	39 31.3	99 12	83.2	41 29.7	99 12	82.8	41 59.3	99 12	82.6	42 28.9	99 12	82.5	44 27.2	99 12	82.1	91
2	35 26.9	99 12	83.0	36 26.2	99 12	82.8	37 55.1	99 12	82.5	39 24.0	99 12	82.2	41 22.5	99 12	81.8	41 52.1	99 12	81.7	42 21.7	99 12	81.6	44 20.0	99 12	81.1	2
3	35 19.6	99 12	82.0	36 18.9	99 12	81.8	37 47.9	99 12	81.5	39 16.8	99 12	81.2	41 15.3	99 12	80.8	41 44.9	99 12	80.7	42 14.5	99 12	80.6	44 12.8	99 12	80.1	3
4	35 12.4	99 12	81.0	36 11.7	99 12	80.8	37 40.7	99 12	80.5	39 09.6	99 12	80.2	41 08.1	99 12	79.8	41 37.7	99 12	79.7	42 07.3	99 12	79.6	44 05.6	99 12	79.2	4
95	35 05.2	99 12	80.0	36 04.5	99 12	79.9	37 33.5	99 12	79.6	39 02.4	99 12	79.3	41 00.9	99 12	78.9	41 30.5	99 12	78.7	42 00.1	99 12	78.6	43 58.4	99 12	78.2	95
6	34 58.0	99 12	79.1	35 57.3	99 12	78.9	37 26.3	99 12	78.6	38 55.2	99 12	78.3	40 53.7	99 12	77.9	41 23.3	99 12	77.8	41 52.9	99 12	77.7	43 51.3	99 12	77.2	6
7	34 50.8	99 12	78.1	35 50.2	99 12	77.9	37 19.1	99 12	77.6	38 48.1	99 12	77.3	40 46.6	99 12	76.9	41 16.2	99 12	76.8	41 45.8	99 12	76.7	43 44.1	99 12	76.3	7
8	34 43.7	99 12	77.1	35 43.0	99 12	76.9	37 12.0	99 12	76.6	38 40.9	99 12	76.4	40 39.7	99 12	75.9	41 09.1	99 12	75.8	41 38.7	99 12	75.7	43 37.1	99 12	75.3	8
9	34 36.6	99 12	76.1	35 35.9	99 12	76.0	37 04.9	99 12	75.7	38 33.9	99 12	75.4	40 32.4	99 12	75.0	41 02.0	99 12	74.9	41 31.6	99 12	74.8	43 30.0	99 12	74.3	9
100	34 29.5	99 12	75.2	35 28.8	99 12	75.0	36 57.8	99 12	74.7	38 26.8	99 12	74.4	40 25.3	99 12	74.0	40 55.0	99 12	73.9	41 24.6	99 12	73.8	43 23.0	99 12	73.4	100
1	34 22.4	99 12	74.2	35 21.8	99 12	74.0	36 50.8	99 12	73.7	38 19.8	99 12	73.5	40 18.3	99 12	73.1	40 48.0	99 12	72.9	41 17.6	99 12	72.8	43 16.0	99 12	72.4	1
2	34 15.4	99 12	73.2	35 14.8	99 12	73.0	36 43.8	99 12	72.8	38 12.8	99 12	72.5	40 11.3	99 12	72.1	40 41.0	99 12	72.0	41 10.6	99 12	71.9	43 09.0	99 12	71.5	2
3	34 08.4	99 12	72.3	35 07.8	99 12	72.1	36 36.8	99 12	71.8	38 05.8	99 12	71.5	40 04.4	99 12	71.1	40 34.0	99 12	71.0	41 03.7	99 12	70.9	43 02.1	99 12	70.5	3
4	34 01.5	99 12	71.3	35 00.9	99 12	71.1	36 29.9	99 11	70.8	37 58.9	99 11	70.6	39 57.5	99 11	70.2	40 27.2	99 11	70.1	40 56.8	99 11	70.0	42 55.3	99 11	69.5	4
105	33 54.6	99 11	70.3	34 54.0	99 11	70.1	36 23.0	99 11	69.9	37 52.0	99 11	69.6	39 50.7	99 11	69.2	40 20.3	99 11	69.1	40 49.9	99 11	69.0	42 48.4	99 11	68.6	105
6	33 47.7	99 11	69.4	34 47.1	99 11	69.2	36 16.2	99 11	68.9	37 45.2	99 11	68.6	39 43.8	99 11	68.3	40 13.5	99 11	68.2	40 43.1	99 11	68.1	42 41.6	99 11	67.6	6
7	33 40.9	99 11	68.4	34 40.3	99 11	68.2	36 09.4	99 11	68.0	37 38.4	99 11	67.7	39 37.1	99 11	67.3	40 06.7	99 11	67.2	40 36.4	99 11	67.1	42 34.9	99 11	66.7	7
8	33 34.1	99 11	67.4	34 33.5	99 11	67.3	36 02.6	99 11	67.0	37 31.7	99 11	66.7	39 30.3	99 11	66.4	40 00.0	99 11	66.3	40 29.7	99 11	66.2	42 28.2	99 11	65.7	8
9	33 27.4	99 11	66.5	34 26.8	99 11	66.3	35 55.9	99 11	66.0	37 25.0	99 11	65.8	39 23.7	99 11	65.4	39 53.3	99 11	65.3	40 23.0	99 11	65.2	42 21.6	99 11	64.8	9
110	33 20.7	99 11	65.5	34 20.1	99 11	65.3	35 49.3	99 11	65.1	37 18.3	99 11	64.8	39 17.1	99 11	64.5	39 46.7	99 11	64.4	40 16.4	99 11	64.3	42 15.0	99 11	63.9	110
1	33 14.1	99 11	64.6	34 13.5	99 11	64.4	35 42.7	99 11	64.1	37 11.7	99 11	63.9	39 10.5	99 11	63.5	39 40.2	99 11	63.4	40 09.8	99 11	63.3	42 08.4	99 11	62.9	1
2	33 07.5	99 11	63.6	34 07.0	99 11	63.4	35 36.1	99 11	63.2	37 05.2	99 11	62.9	39 04.0	99 11	62.6	39 33.6	99 11	62.5	40 03.3	99 11	62.4	42 02.0	99 11	62.0	2
3	33 01.0	99 11	62.6	34 00.4	99 11	62.4	35 29.6	99 11	62.2	36 58.7	99 11	62.0	38 57.5	99 11	61.6	39 27.2	99 11	61.5	39 56.9	99 11	61.4	41 55.5	99 11	61.0	3
4	32 54.5	99 11	61.7	33 54.0	99 11	61.5	35 23.2	99 11	61.3	36 52.3	99 11	61.0	38 51.1	99 11	60.7	39 20.8	99 11	60.6	39 50.5	99 11	60.5	41 49.2	99 10	60.1	4
115	32 48.1	99 11	60.7	33 47.6	99 11	60.6	35 16.8	99 11	60.3	36 45.9	99 10	60.1	38 44.8	99 10	59.7	39 14.5	99 10	59.6	39 44.1	99 10	59.5	41 42.9	99 10	59.2	115
6	32 41.8	99 10	59.8	33 41.3	99 10	59.6	35 10.5	99 10	59.4	36 39.6	99 10	59.1	38 38.5	99 10	58.8	39 08.2	99 10	58.7	39 37.9	99 10	58.6	41 36.6	99 10	58.2	6
7	32 35.5	99 10	58.8	33 35.0	99 10	58.7	35 04.2	99 10	58.4	36 33.4	99 10	58.2	38 32.3	99 10	57.8	39 02.0	99 10	57.7	39 31.7	99 10	57.7	41 30.4	99 10	57.3	7
8	32 29.3	99 10	57.9	33 28.8	99 10	57.7	34 58.0	99 10	57.5	36 27.2	99 10	57.2	38 26.1	99 10	56.9	38 55.8	99 10	56.8	39 25.5	99 10	56.7	41 24.3	99 10	56.3	8
9	32 23.1	99 10	56.9	33 22.6	99 10	56.8	34 51.9	99 10	56.5	36 21.1	99 10	56.3	38 20.0	99 10	56.0	38 49.7	99 10	55.9	39 19.4	99 10	55.8	41 18.3	99 10	55.4	9
120	32 17.0	99 10	56.0	33 16.5	99 10	55.8	34 45.8	99 10	55.6	36 15.0	99 10	55.4	38 14.0	99 10	55.0	38 43.7	99 10	54.9	39 13.4	99 10	54.8	41 12.3	99 10	54.5	120
1	32 11.0	99 10	55.0	33 10.5	99 10	54.9	34 39.8	99 10	54.6	36 09.1	99 10	54.4	38 08.0	99 10	54.1	38 37.8	99 10	54.0	39 07.5	99 10	53.9	41 06.4	99 10	53.6	1
2	32 05.0	99 10	54.1	33 04.6	99 10	53.9	34 33.9	99 10	53.7	36 03.1	99 10	53.5	38 02.1	99 10	53.1	38 31.9	99 10	53.1	39 01.6	99 10	53.0	41 00.5	99 10	52.6	2
3	31 59.1	99 10	53.1	32 58.7	99 10	53.0	34 28.0	99 10	52.8	35 57.3	99 10	52.5	37 56.3	99 10	52.2	38 26.1	99 10	52.1	38 55.8	99 10	52.0	40 54.7	99 10	51.7	3
4	31 53.3	99 10	52.2	32 52.9	99 10	52.0	34 22.2	99 10	51.8	35 51.5	99 09	51.6	37 50.6	99 09	51.3	38 20.3	99 09	51.2	38 50.1	99 09	51.1	40 49.0	99 09	50.8	4
125	31 47.6	99 09	51.2	32 47.2	99 09	51.1	34 16.5	99 09	50.9	35 45.8	99 09	50.7	37 44.9	99 09	50.3	38 14.7	99 09	50.3	38 44.4	99 09	50.2	40 43.4	99 09	49.8	125
6	31 41.9	99 09	50.3	32 41.5	99 09	50.2	34 10.9	99 09	49.9	35 40.2	99 09	49.7	37 39.3	99 09	49.4	38 09.1	99 09	49.3	38 38.8	99 09	49.3	40 37.9	99 09	48.9	6
7	31 36.3	99 09	49.3	32 35.9	99 09	49.2	34 05.3	99 09	49.0	35 34.7	99 09	48.8	37 33.8	99 09	48.5	38 03.6	99 09	48.4	38 33.3	99 09	48.4	40 32.4	99 09	48.0	7
8	31 30.8	99 09	48.4	32 30.4	99 09	48.3	33 59.8	99 09	48.1	35 29.2	99 09	47.8	37 28.4	99 09	47.6	37 58.1	99 09	47.5	38 27.9	99 09	47.4	40 27.0	99 09	47.1	8
9	31 25.4	99 09	47.5	32 25.0	99 09	47.3	33 54.4	99 09	47.1	35 23.8	99 09	46.9	37 23.0	99 09	46.6	37 52.8	99 09	46.5	38 22.6	99 09	46.5	40 21.7	99 09	46.2	9
130	31 20.1	99 09	46.5	32 19.7	99 09	46.4	33 49.1	99 09	46.2	35 18.5	99 09	46.0	37 17.7	99 09	45.7	37 47.5	99 09	45.6	38 17.3	99 09	45.5	40 16.4	99 09	45.2	130
1	31 14.8	99 09	45.6	32 14.4	99 09	45.4	33 43.9	99 09	45.3	35 13.3	99 09	45.0	37 12.5	99 09	44.8	37 42.3	99 08	44.7	38 12.1	99 08	44.6	40 11.3	99 08	44.3	1
2	31 09.6	99 08	44.6	32 09.3	99 08	44.5	33 38.7	99 08	44.3	35 08.2	99 08	44.1	37 07.4	99 08	43.8	37 37.2	99 08	43.8	38 07.0	99 08	43.7	40 06.2	99 08	43.4	2
3	31 04.5	99 08	43.7	32 04.2	99 08	43.6	33 33.7	99 08	43.4	35 03.2	99 08	43.2	37 02.4	99 08	42.9	37 32.2	99 08	42.8	38 02.0	99 08	42.8	40 01.2	99 08	42.5	3
4	30 59.5	99 08	42.8	31 59.2	99 08	42.6	33 28.7	99 08	42.4	34 58.2	99 08	42.3	36 57.5	99 08	42.0	37 27.3	99 08	41.9	37 57.1	99 08	41.8	39 56.4	99 08	41.6	4
135	30 54.6	99 08	41.8	31 54.3	99 08	41.7	33 23.8	99 08	41.5	34 53.3	99 08	41.3	36 52.6	99 08	41.1	37 22.5	99 08	41.0	37 52.3	99 08	40.9	39 51.5	99 08	40.6	135
6	30 49.8	1 08	40.9	31 49.5	1 08	40.8	33 19.0	99 08	40.6	34 48.5	99 08	40.4	36 47.9	99 08	40.1	37 17.7	99 08	40.1	37 47.5	99 08	40.1	39 46.8	99 08	39.7	6
7	30 45.0	1 08	39.9	31 44.7	1 08	39.8	33 14.3	1 08	39.7	34 43.8	99 08	39.5	36 43.2	99 08	39.2	37 13.0	99 08	39.2	37 42.9	99 08	39.1	39 42.2	99 08	38.8	7
8	30 40.4	1 08	39.0	31 40.1	1 08	38.9	33 09.7	1 08	38.7	34 39.2	1 08	38.5	36 38.6	99 07	38.3	37 08.5	99 07	38.2	37 38.3	99 07	38.2	39 37.7	99 07	37.9	8
9	30 35.8	1 07	38.1	31 35.5	1 07	38.0	33 05.1	1 07	37.8	34 34.7	1 07	37.6	36 34.1	1 07	37.4	37 04.0	99 07	37.3	37 33.8	99 07	37.3	39 33.2	99 07	37.0	9
140	30 31.3	1 07	37.1	31 31.1	1 07	37.0	33 00.7	1 07	36.9	34 30.3	1 07	36.7	36 29.8	1 07	36.5	36 59.6	1 07	36.4	37 29.5	1 07	36.3	39 28.9	99 07	36.1	140
1	30 27.0	1 07	36.2	31 26.7	1 07	36.1	32 56.4	1 07	35.9	34 26.0	1 07	35.8	36 25.5	1 07	35.5	36 55.3	1 07	35.5	37 25.2	1 07	35.4	39 24.6	1 07	35.2	1
2	30 22.7	1 07	35.3	31 22.5	1 07	35.2	32 52.1	1 07	35.0	34 21.8	1 07	34.8	36 21.3	1 07	34.6	36 51.1	1 07	34.6	37 21.0	1 07	34.5	39 20.4	1 07	34.3	2
3	30 18.5	1 07	34.3	31 18.3	1 07	34.2	32 48.0	1 07	34.1	34 17.6	1 07	33.9	36 17.1	1 07	33.7	36 47.0	1 06	33.6	37 16.9	1 07	33.6	39 16.4	1 07	33.3	3
4	30 14.5	1 07	33.4	31 14.3	1 07	33.3	32 43.9	1 07	33.2	34 13.6	1 07	33.0	36 13.1	1 06	32.8	36 43.0	1 06	32.7	37 12.9	1 06	32.7	39 12.4	1 06	32.4	4
145	30 10.5	1 06	32.5	31 10.3	1 06	32.4	32 40.0	1 06	32.2	34 09.7	1 06	32.1	36 09.2	1 06	31.9	36 39.1	1 06	31.8	37 09.0	1 06	31.8	39 08.5	1 06	31.5	145
6	30 06.6	1 06	31.5	31 06.4	1 06	31.4	32 36.1	1 06	31.3	34 05.8	1 06	31.2	36 05.4	1 06	30.9	36 35.3	1 06	30.9	37 05.2	1 06	30.8	39 04.6	1 06	30.6	6
7	30 02.8	1 06	30.6	31 02.7	1 06	30.5	32 32.4	1 06	30.4	34 02.1	1 06	30.2	36 01.7	1 06	30.0	36 31.6	1 06	30.0	37 01.5	1 06	29.9	39 01.1	1 06	29.7	7
8	29 59.2	1 06	29.7	30 59.0	1 06	29.6	32 28.7	1 06	29.4	33 58.5	1 06	29.3	35 58.1	1 06	29.1	36 28.0	1 06	29.1	36 57.9	1 06	29.0	38 57.5	1 06	28.8	8
9	29 55.6	1 06	28.7	30 55.4	1 06	28.7	32 25.2	1 06	28.5	33 54.9	1 06	28.4	35 54.6	1 06	28.2	36 24.5	1 06	28.2	36 54.4	1 06	28.1	38 54.0	1 06	27.9	9
150	29 52.1	1 06	27.8	30 52.0	1 06	27.7	32 21.8	1 06	27.6	33 51.5	1 06	27.5	35 51.2	1 06	27.3	36 21.1	1 05	27.2	36 51.0	1 05	27.2	38 50.7	1 05	27.0	150
1	29 48.8	1 06	26.9	30 48.6	1 05	26.8	32 18.4	1 05	26.7	33 48.2	1 05	26.5	35 47.9	1 05	26.4	36 17.8	1 05	26.3	36 47.7	1 05	26.3	38 47.4	1 05	26.1	1
2	29 45.5	1 05	25.9	30 45.4	1 05	25.9	32 15.2	1 05	25.8	33 45.0	1 05	25.6	35 44.7	1 05	25.5	36 14.6	1 05	25.4	36 44.5	1 05	25.4	38 44.2	1 05	25.2	2
3	29 42.4	1 05	25.0	30 42.3	1 05	24.9	32 12.1	1 05	24.8	33 41.9	1 05	24.7	35 41.6	1 05	24.5	36 11.5	1 05	24.5	36 41.5	1 05	24.5	38 41.2	1 05	24.3	3
4	29 39.3	1 05	24.1	30 39.2	1 05	24.0	32 09.1	1 05	23.9	33 38.9	1 05	23.8	35 38.6	1 05	23.6	36 08.6	1 05	23.6	36 38.5	1 05	23.6	38 38.2	1 05	23.4	4
155	29 36.4	1 05	23.2	30 36.3	1 05	23.1	32 06.1	1 05	23.0	33 36.0	1 05	22.9	35 35.7	1 05	22.7	36 05.7	1 05	22.7	36 35.6	1 05	22.6	38 35.4	1 05	22.5	155
6	29 33.6	1 05	22.2	30 33.5	1 04	22.2	32 03.3	1 04	22.1	33 33.2	1 04	22.0	35 33.0	1 04	21.8	36 02.9	1 04	21.8	36 32.9	1 04	21.8	38 32.6	1 04	21.6	6
7	29 30.9	1 04	21.3	30 30.8	1 04	21.2	32 00.7	1 04	21.1	33 30.5	1 04	21.0	35 30.3	1 04	20.9	36 00.3	1 04	20.9	36 30.2	1 04	20.8	38 30.0	1 04	20.7	7
8	29 28.3	1 04	20.4	30 28.2	1 04	20.3	31 58.1	1 04	20.2	33 27.9	1 04	20.1	35 27.8	1 04	20.0	35 57.7	1 04	20.0	36 27.7	1 04	19.9	38 27.5	1 04	19.8	8
9	29 25.8	1 04	19.4	30 25.7	1 04	19.4	31 55.6	1 04	19.3	33 25.5	1 04	19.2	35 25.3	1 04	19.1	35 55.3	1 04	19.0	36 25.2	1 04	19.0	38 25.0	1 04	18.9	9
160	29 23.4	1 04	18.5	30 23.3	1 04	18.5	31 53.2	1 04	18.4	33 23.1	1 04	18.3	35 23.0	1 04	18.2	35 52.9	1 04	18.1	36 22.9	1 04	18.1	38 22.7	1 04	18.0	160
1	29 21.1	1 04	17.5	30 21.1	1 04	17.5	31 51.0	1 04	17.5	33 20.9	1 04	17.4	35 20.8	1 04	17.3	35 50.7	1 04	17.2	36 20.7	1 04	17.2	38 20.5	1 04	17.1	1
2	29 19.0	1 03	16.7	30 18.9	1 03	16.6	31 48.9	1 03	16.5	33 18.8	1 03	16.5	35 18.6	1 03	16.3	35 48.6	1 03	16.3	36 18.6	1 03	16.3	38 18.4	1 03	16.2	2
3	29 17.0	1 03	15.7	30 16.9	1 03	15.7	31 46.8	1 03	15.6	33 16.7	1 03	15.5	35 16.6	1 03	15.4	35 46.6	1 03	15.4	36 16.6	1 03	15.4	38 16.5	1 03	15.3	3
4	29 15.0	1 03	14.8	30 15.0	1 03	14.8	31 44.9	1 03	14.7	33 14.8	1 03	14.6	35 14.7	1 03	14.5	35 44.7	1 03	14.5	36 14.7	1 03	14.5	38 14.6	1 03	14.4	4
165	29 13.2	1 03	13.9	30 13.2	1 03	13.8	31 43.1	1 03	13.8	33 13.1	1 03	13.8	35 13.0	1 03	13.6	35 42.9	1 03	13.6	36 12.9	1 03	13.6	38 12.8	1 03	13.5	165
6	29 11.5	1 03	13.0	30 11.5	1 03	12.9	31 41.4	1 03	12.9	33 11.4	1 03	12.8	35 11.3	1 03	12.7	35 41.3	1 03	12.7	36 11.3	1 03	12.7	38 11.2	1 03	12.6	6
7	29 09.9	1 02	12.0	30 09.9	1 02	12.0	31 39.9	1 02	11.9	33 09.8	1 02	11.9	35 09.8	1 02	11.8	35 39.7	1 02	11.8	36 09.7	1 02	11.8	38 09.6	1 02	11.7	7
8	29 08.5	1 02	11.1	30 08.4	1 02	11.1	31 38.4	1 02	11.0	33 08.4	1 02	11.0	35 08.3	1 02	10.9	35 38.3	1 02	10.9	36 08.3	1 02	10.9	38 08.2	1 02	10.8	8
9	29 07.1	1 02	10.2	30 07.1	1 02	10.1	31 37.1	1 02	10.1	33 07.0	1 02	10.1	35 07.0	1 02	10.0	35 37.0	1 02	10.0	36 07.0	1 02	09.9	38 06.9	1 02	09.9	9
170	29 05.9	1 02	09.3	30 05.9	1 02	09.2	31 35.8	1 02	09.2	33 05.8	1 02	09.1	35 05.8	1 02	09.1	35 35.8	1 02	09.1	36 05.8	1 02	09.0	38 05.7	1 02	09.0	170
1	29 04.8	1 02	08.3	30 04.8	1 02	08.3	31 34.7	1 02	08.3	33 04.7	1 02	08.2	35 04.7	1 02	08.2	35 34.7	1 02	08.2	36 04.7	1 02	08.1	38 04.7	1 02	08.1	1
2	29 03.8	1 01	07.4	30 03.8	1 01	07.4	31 33.7	1 01	07.3	33 03.7	1 01	07.3	35 03.7	1 01	07.3	35 33.7	1 01	07.2	36 03.7	1 01	07.2	38 03.7	1 01	07.2	2
3	29 02.9	1 01	06.5	30 02.9	1 01	06.5	31 32.9	1 01	06.4	33 02.9	1 01	06.4	35 02.8	1 01	06.4	35 32.8	1 01	06.3	36 02.8	1 01	06.3	38 02.8	1 01	06.3	3
4	29 02.1	1 01	05.6	30 02.1	1 01	05.5	31 32.1	1 01	05.5	33 02.1	1 01	05.5	35 02.1	1 01	05.4	35 32.1	1 01	05.4	36 02.1	1 01	05.4	38 02.1	1 01	05.4	4
175	29 01.5	1 01	04.6	30 01.5	1 01	04.6	31 31.5	1 01	04.6	33 01.5	1 01	04.6	35 01.4	1 01	04.5	35 31.4	1 01	04.5	36 01.4	1 01	04.5	38 01.4	1 01	04.5	175
6	29 00.9	1 01	03.7	30 00.9	1 01	03.7	31 30.9	1 01	03.7	33 00.9	1 01	03.7	35 00.9	1 01	03.6	35 30.9	1 01	03.6	36 00.9	1 01	03.6	38 00.9	1 01	03.6	6
7	29 00.5	1 00	02.8	30 00.5	1 00	02.8	31 30.5	1 00	02.8	33 00.5	1 00	02.7	35 00.5	1 00	02.7	35 30.5	1 00	02.7	36 00.5	1 00	02.7	38 00.5	1 00	02.7	7
8	29 00.2	1 00	01.8	30 00.2	1 00	01.8	31 30.2	1 00	01.8	33 00.2	1 00	01.8	35 00.2	1 00	01.8	35 30.2	1 00	01.8	36 00.2	1 00	01.8	38 00.2	1 00	01.8	8
9	29 00.1	1 00	00.9	30 00.1	1 00	00.9	31 30.1	1 00	00.9	33 00.1	1 00	00.9	35 00.1	1 00	00.9	35 30.1	1 00	00.9	36 00.1	1 00	00.9	38 00.1	1 00	00.9	9
180	29 00.0	1 00	00.0	30 00.0	1 00	00.0	31 30.0	1 00	00.0	33 00.0	1 00	00.0	35 00.0	1 00	00.0	35 30.0	1 00	00.0	36 00.0	1 00	00.0	38 00.0	1 00	00.0	180

Lat. 84°

Lat. 85°

La 86

DECLINATION SAME NAME AS LATITUDE

Lat. °

Each latitude cell is: **Alt. ° ′ | Δd Δt | Az. °**

H.A.	46° 00′	47° 00′	48° 30′	49° 30′	50° 30′	51° 30′	52° 30′	54° 00′	H.A.
00	53 00.0 1.00 0 180.0	54 00.0 1.00 0 180.0	55 30.0 1.00 0 180.0	56 30.0 1.00 0 180.0	57 30.0 1.00 0 180.0	58 30.0 1.00 0 180.0	59 30.0 1.00 0 180.0	61 00.0 1.00 0 180.0	00
1	52 59.9 1.00 0 178.8	53 59.9 1.00 0 178.8	55 29.9 1.00 0 178.8	56 29.9 1.00 0 178.8	57 29.9 1.00 0 178.8	58 29.9 1.00 0 178.8	59 29.9 1.00 0 178.8	60 59.7 1.00 0 178.8	1
2	52 59.7 1.00 1 177.7	53 59.7 1.00 1 177.7	55 29.7 1.00 1 177.7	56 29.7 1.00 1 177.6	57 29.7 1.00 1 177.6	58 29.7 1.00 1 177.6	59 29.7 1.00 1 177.6	60 59.3 1.00 1 177.6	2
3	52 59.3 1.00 1 176.5	53 59.3 1.00 1 176.5	55 29.3 1.00 1 176.5	56 29.3 1.00 1 176.5	57 29.3 1.00 1 176.5	58 29.3 1.00 1 176.4	59 29.3 1.00 1 176.4	60 59.3 1.00 1 176.4	3
4	52 58.8 1.00 1 175.4	53 58.8 1.00 1 175.4	55 28.8 1.00 1 175.3	56 28.8 1.00 1 175.3	57 28.8 1.00 1 175.3	58 28.8 1.00 1 175.2	59 28.8 1.00 1 175.2	60 58.8 1.00 1 175.2	4
05	52 58.2 1.00 1 174.2	53 58.2 1.00 2 174.2	55 28.1 1.00 1 174.1	56 28.1 1.00 1 174.1	57 28.1 1.00 1 174.1	58 28.1 1.00 1 174.0	59 28.1 1.00 2 174.0	60 58.1 1.00 2 173.9	05
6	52 57.4 1.00 2 173.1	53 57.3 1.00 2 173.0	55 27.3 1.00 2 173.0	56 27.3 1.00 2 172.9	57 27.3 1.00 2 172.9	58 27.3 1.00 2 172.9	59 27.2 1.00 2 172.8	60 57.2 1.00 2 172.7	6
7	52 56.4 1.00 2 171.9	53 56.4 1.00 2 171.9	55 26.4 1.00 2 171.8	56 26.3 1.00 2 171.8	57 26.3 1.00 2 171.7	58 26.3 1.00 2 171.7	59 26.3 1.00 2 171.6	60 56.2 1.00 2 171.5	7
8	52 55.3 1.00 2 170.8	53 55.3 1.00 2 170.7	55 25.2 1.00 2 170.6	56 25.2 1.00 2 170.6	57 25.2 1.00 2 170.5	58 25.1 1.00 2 170.5	59 25.1 1.00 2 170.4	60 55.1 1.00 2 170.3	8
9	52 54.1 1.00 2 169.6	53 54.0 1.00 2 169.6	55 24.0 1.00 2 169.5	56 24.0 1.00 2 169.4	57 23.9 1.00 2 169.4	58 23.9 1.00 2 169.3	59 23.8 1.00 2 169.2	60 53.8 1.00 2 169.1	9
10	52 52.7 1.00 3 168.5	53 52.6 1.00 3 168.4	55 22.6 1.00 3 168.3	56 22.5 1.00 3 168.2	57 22.4 1.00 3 168.2	58 22.4 1.00 3 168.1	59 22.4 1.00 3 168.0	60 52.3 1.00 3 167.9	10
1	52 51.1 1.00 3 167.3	53 51.1 1.00 3 167.3	55 21.0 1.00 3 167.2	56 21.0 1.00 3 167.1	57 20.9 1.00 3 167.0	58 20.8 1.00 3 166.9	59 20.8 1.00 3 166.8	60 50.7 1.00 3 166.7	1
2	52 49.5 1.00 3 166.2	53 49.4 1.00 3 166.1	55 19.3 1.00 3 166.0	56 19.3 1.00 3 165.9	57 19.2 1.00 3 165.8	58 19.1 1.00 3 165.7	59 19.0 1.00 3 165.6	60 48.9 1.00 3 165.5	2
3	52 47.6 1.00 3 165.0	53 47.6 1.00 3 164.9	55 17.5 1.00 3 164.8	56 17.4 1.00 3 164.7	57 17.3 1.00 3 164.6	58 17.2 1.00 4 164.5	59 17.2 1.00 3 164.4	60 47.0 1.00 3 164.3	3
4	52 45.7 1.00 4 163.9	53 45.6 1.00 4 163.8	55 15.5 1.00 4 163.7	56 15.4 1.00 4 163.6	57 15.1 1.00 4 163.5	58 15.2 1.00 4 163.3	59 15.1 1.00 4 163.2	60 45.0 1.00 4 163.1	4
15	52 43.6 1.00 4 162.7	53 43.5 1.00 4 162.6	55 13.4 1.00 4 162.5	56 13.1 1.00 4 162.4	57 13.2 1.00 4 162.3	58 13.1 1.00 4 162.2	59 13.0 1.00 4 162.1	60 42.8 1.00 4 161.9	15
6	52 41.3 1.00 4 161.6	53 41.2 1.00 4 161.5	55 11.1 1.00 4 161.3	56 11.0 1.00 4 161.2	57 10.9 1.00 4 161.1	58 10.8 1.00 4 161.0	59 10.6 1.00 4 160.9	60 40.4 1.00 4 160.7	6
7	52 39.0 1.00 4 160.4	53 38.8 1.00 4 160.3	55 08.7 1.00 4 160.2	56 08.6 1.00 4 160.1	57 08.4 1.00 4 160.0	58 08.3 1.00 4 159.8	59 08.2 1.00 4 159.7	60 37.9 1.00 4 159.5	7
8	52 36.4 1.00 4 159.3	53 36.3 1.00 4 159.2	55 06.1 1.00 4 159.0	56 06.0 1.00 4 158.9	57 05.9 1.00 5 158.8	58 05.7 1.00 5 158.7	59 05.6 1.00 5 158.5	60 35.3 1.00 5 158.3	8
9	52 33.8 1.00 5 158.1	53 33.7 1.00 5 158.0	55 03.4 1.00 5 157.9	56 03.3 1.00 5 157.7	57 03.1 1.00 5 157.6	58 03.0 1.00 5 157.5	59 02.8 1.00 5 157.3	60 32.5 1.00 5 157.1	9
20	52 31.0 1.00 5 157.0	53 30.9 1.00 5 156.9	55 00.6 1.00 5 156.7	56 00.6 1.00 5 156.6	57 00.3 1.00 5 156.5	58 00.1 1.00 5 156.3	58 59.9 1.00 5 156.2	60 29.6 1.00 5 155.9	20
1	52 28.1 1.00 5 155.9	53 27.9 1.00 5 155.8	54 57.7 1.00 5 155.6	55 57.5 1.00 5 155.4	56 57.3 1.00 5 155.3	57 57.1 1.00 5 155.1	58 56.9 1.00 5 155.0	60 26.6 1.00 5 154.7	1
2	52 25.0 1.00 5 154.7	53 24.9 1.00 5 154.6	54 54.6 1.00 5 154.4	55 54.4 1.00 5 154.3	56 54.2 1.00 5 154.1	57 54.0 1.00 5 154.0	58 53.7 1.00 6 153.8	60 23.4 1.00 6 153.5	2
3	52 21.8 1.00 6 153.6	53 21.6 1.00 6 153.5	54 51.4 1.00 6 153.3	55 51.1 1.00 6 153.1	56 50.9 1.00 6 153.0	57 50.7 1.00 6 152.8	58 50.4 1.00 6 152.6	60 20.0 1.00 6 152.4	3
4	52 18.5 1.00 6 152.5	53 18.3 1.00 6 152.3	54 48.0 1.00 6 152.1	55 47.8 1.00 6 151.9	56 47.5 1.00 6 151.8	57 47.3 1.00 6 151.6	58 47.0 1.00 6 151.5	60 16.6 1.00 6 151.2	4
25	52 15.1 1.00 6 151.3	53 14.9 1.00 6 151.2	54 44.5 1.00 6 151.0	55 44.3 1.00 6 150.8	56 44.0 1.00 6 150.7	57 43.7 1.00 6 150.5	58 43.5 1.00 6 150.3	60 13.0 99 06 150.0	25
6	52 11.5 1.00 6 150.2	53 11.3 1.00 6 150.1	54 40.9 1.00 6 149.8	55 40.6 1.00 6 149.7	56 40.4 1.00 6 149.5	57 40.1 99 06 149.3	58 39.8 99 06 149.1	60 09.3 99 06 148.8	6
7	52 07.8 1.00 6 149.1	53 07.6 1.00 6 148.9	54 37.2 1.00 6 148.7	55 36.9 1.00 6 148.5	56 36.6 99 06 148.4	57 36.3 99 07 148.2	58 36.0 99 07 148.0	60 05.4 99 07 147.6	7
8	52 04.0 1.00 7 147.9	53 03.7 1.00 7 147.8	54 33.3 1.00 7 147.6	55 33.0 99 07 147.4	56 32.7 99 07 147.2	57 32.4 99 07 147.0	58 32.0 99 07 146.8	60 01.4 99 07 146.5	8
9	52 00.1 1.00 7 146.8	52 59.8 1.00 7 146.7	54 29.3 99 07 146.4	55 29.0 99 07 146.2	56 28.7 99 07 146.1	57 28.3 99 07 145.9	58 27.9 99 07 145.6	59 57.3 99 07 145.3	9
30	51 56.0 1.00 7 145.7	52 55.7 99 07 145.6	54 25.2 99 07 145.3	55 24.9 99 07 145.1	56 24.5 99 07 144.9	57 24.2 99 07 144.7	58 23.8 99 07 144.5	59 53.1 99 07 144.1	30
1	51 51.8 99 07 144.6	52 51.5 99 07 144.4	54 21.0 99 07 144.2	55 20.6 99 07 144.0	56 20.3 99 07 143.8	57 19.9 99 07 143.6	58 19.4 99 07 143.3	59 48.8 99 07 143.0	1
2	51 47.5 99 07 143.5	52 47.2 99 07 143.3	54 16.7 99 07 143.0	55 16.3 99 07 142.8	56 15.9 99 08 142.6	57 15.5 99 08 142.4	58 15.0 99 08 142.2	59 44.3 99 08 141.8	2
3	51 43.1 99 08 142.4	52 42.8 99 08 142.2	54 12.2 99 08 141.9	55 11.8 99 07 141.7	56 11.4 99 08 141.5	57 10.9 99 08 141.3	58 10.7 99 08 141.0	59 39.7 99 08 140.7	3
4	51 38.6 99 08 141.2	52 38.2 99 08 141.1	54 07.6 99 08 140.8	55 07.2 99 08 140.6	56 06.8 99 08 140.4	57 06.3 99 08 140.1	58 05.8 99 08 139.9	59 35.0 99 08 139.5	4
35	51 34.0 99 08 140.1	52 33.6 99 08 140.0	54 03.0 99 08 139.7	55 02.5 99 08 139.4	56 02.1 99 08 139.2	57 01.6 99 08 139.0	58 01.1 99 08 138.8	59 30.2 99 08 138.4	35
6	51 29.2 99 08 139.0	52 28.8 99 08 138.8	53 58.2 99 08 138.5	54 57.7 99 08 138.3	55 57.2 99 08 138.1	56 56.7 99 08 137.9	57 56.2 99 08 137.6	59 25.3 99 08 137.2	6
7	51 24.4 99 08 137.9	52 23.9 99 08 137.7	53 53.3 99 08 137.4	54 52.8 99 08 137.2	55 52.3 99 08 137.0	56 51.8 99 08 136.7	57 51.2 99 08 136.5	59 20.3 99 09 136.1	7
8	51 19.4 99 08 136.8	52 19.0 99 08 136.6	53 48.3 99 08 136.3	54 47.9 99 08 136.1	55 47.3 99 09 135.9	56 46.7 99 09 135.6	57 46.1 99 09 135.4	59 15.2 99 09 134.9	8
9	51 14.4 99 09 135.7	52 13.9 99 09 135.5	53 43.2 99 09 135.2	54 42.7 99 09 135.0	55 42.1 99 09 134.7	56 41.5 99 09 134.5	57 40.9 99 09 134.2	59 10.0 99 09 133.8	9
40	51 09.2 99 09 134.6	52 08.7 99 09 134.4	53 38.0 99 09 134.1	54 37.4 99 09 133.9	55 36.9 99 09 133.6	56 36.3 99 09 133.4	57 35.6 99 09 133.1	59 04.6 99 09 132.7	40
1	51 04.0 99 09 133.5	52 03.5 99 09 133.3	53 32.7 99 09 133.0	54 32.1 99 09 132.7	55 31.5 99 09 132.5	56 30.9 99 09 132.2	57 30.3 99 09 132.0	58 59.2 99 09 131.5	1
2	50 58.6 99 09 132.4	51 58.1 99 09 132.2	53 27.3 99 09 131.9	54 26.7 99 09 131.6	55 26.1 99 09 131.4	56 25.4 99 09 131.1	57 24.8 99 09 130.9	58 53.7 99 09 130.4	2
3	50 53.2 99 09 131.3	51 52.6 99 09 131.1	53 21.8 99 09 130.8	54 21.2 99 09 130.5	55 20.6 99 09 130.3	56 19.9 99 09 130.0	57 19.2 99 09 129.7	58 48.1 99 10 129.3	3
4	50 47.6 99 09 130.2	51 47.1 99 09 130.0	53 16.2 99 09 129.7	54 15.6 99 10 129.4	55 14.9 99 10 129.2	56 14.2 99 10 128.9	57 13.5 99 10 128.6	58 42.4 99 10 128.1	4
45	50 42.0 99 10 129.1	51 41.4 99 10 128.9	53 10.5 99 10 128.6	54 09.9 99 10 128.3	55 09.2 99 10 128.1	56 08.5 99 10 127.8	57 07.8 99 10 127.5	58 36.6 99 10 127.1	45
6	50 36.3 99 10 128.1	51 35.7 99 10 127.8	53 04.8 99 10 127.5	54 04.1 99 10 127.2	55 03.4 99 10 127.0	56 02.7 99 10 126.7	57 01.9 99 10 126.4	58 30.7 99 10 126.0	6
7	50 30.5 99 10 127.0	51 29.9 99 10 126.8	52 58.9 99 10 126.4	53 58.2 99 10 126.1	54 57.5 99 10 125.9	55 56.8 99 10 125.6	56 56.0 99 10 125.3	58 24.7 99 10 124.8	7
8	50 24.6 99 10 125.9	51 24.0 99 10 125.7	52 53.0 99 10 125.3	53 52.3 99 10 125.1	54 51.6 99 10 124.8	55 50.8 99 10 124.5	56 50.0 99 10 124.2	58 18.7 99 10 123.7	8
9	50 18.6 99 10 124.8	51 18.0 99 10 124.6	52 47.0 99 10 124.2	53 46.3 99 10 124.0	54 45.5 99 10 123.7	55 44.7 99 10 123.4	56 43.9 99 10 123.1	58 12.6 98 10 122.6	9
50	50 12.6 99 10 123.7	51 11.9 99 10 123.5	52 40.9 99 10 123.1	53 40.2 99 10 122.9	54 39.4 99 10 122.6	55 38.6 99 10 122.3	56 37.7 99 10 122.0	58 06.4 98 10 121.5	50
1	50 06.5 99 10 122.7	51 05.8 99 10 122.4	52 34.7 99 10 122.1	53 34.0 99 10 121.8	54 33.2 99 10 121.5	55 32.4 99 11 121.2	56 31.5 99 11 120.9	58 00.1 98 11 120.5	1
2	50 00.3 99 10 121.6	50 59.6 99 10 121.4	52 28.5 99 11 121.0	53 27.7 99 11 120.7	54 26.9 99 11 120.4	55 26.1 99 11 120.2	56 25.2 98 11 119.9	57 53.8 98 11 119.4	2
3	49 54.0 99 11 120.5	50 53.3 99 11 120.3	52 22.2 99 11 119.9	53 21.4 99 11 119.7	54 20.6 99 11 119.4	55 19.7 99 11 119.1	56 18.8 98 11 118.8	57 47.4 98 11 118.3	3
4	49 47.7 99 11 119.5	50 47.0 99 11 119.2	52 15.8 99 11 118.8	53 15.0 99 11 118.6	54 14.2 99 11 118.3	55 13.3 98 11 118.0	56 12.4 98 11 117.7	57 40.9 98 11 117.2	4
55	49 41.3 99 11 118.4	50 40.6 99 11 118.2	52 09.4 99 11 117.8	53 08.6 99 11 117.5	54 07.7 99 11 117.2	55 06.8 98 11 116.9	56 05.9 98 11 116.6	57 34.4 98 11 116.1	55
6	49 34.8 99 11 117.4	50 34.1 99 11 117.1	52 02.9 99 11 116.7	53 02.1 99 11 116.4	54 01.2 98 11 116.2	55 00.3 98 11 115.9	55 59.3 98 11 115.5	57 27.8 98 11 115.0	6
7	49 28.3 99 11 116.3	50 27.5 99 11 116.0	51 56.3 99 11 115.7	52 55.5 99 11 115.4	53 54.6 98 11 115.1	54 53.7 98 11 114.8	55 52.7 98 11 114.5	57 21.1 98 11 114.0	7
8	49 21.7 99 11 115.2	50 20.9 99 11 114.9	51 49.7 99 11 114.6	52 48.9 99 11 114.3	53 47.9 98 11 114.0	54 47.0 98 11 113.7	55 46.0 98 11 113.4	57 14.4 98 11 112.9	8
9	49 15.1 99 11 114.2	50 14.3 99 11 113.9	51 43.0 99 11 113.5	52 42.2 99 11 113.3	53 41.2 98 11 113.0	54 40.3 98 11 112.7	55 39.3 98 11 112.3	57 07.6 98 11 111.8	9
60	49 08.4 99 11 113.1	50 07.6 99 11 112.9	51 36.3 99 11 112.5	52 35.4 99 11 112.2	53 34.5 98 11 111.9	54 33.5 98 11 111.6	55 32.5 98 11 111.3	57 00.8 98 11 110.8	60
1	49 01.6 99 11 112.1	50 00.8 99 11 111.8	51 29.5 98 11 111.4	52 28.6 98 11 111.2	53 27.7 98 11 110.9	54 26.7 98 11 110.6	55 25.6 98 11 110.2	56 54.0 98 12 109.7	1
2	48 54.8 99 12 111.0	49 54.0 99 12 110.8	51 22.7 98 11 110.4	52 21.8 98 11 110.1	53 20.8 98 12 109.8	54 19.8 98 12 109.5	55 18.8 98 12 109.2	56 47.1 98 12 108.7	2
3	48 48.0 99 12 109.9	49 47.1 99 12 109.8	51 15.8 98 12 109.3	52 14.9 98 12 109.1	53 13.9 98 12 108.8	54 12.9 98 12 108.5	55 11.8 98 12 108.1	56 40.1 98 12 107.6	3
4	48 41.1 99 12 109.0	49 40.2 99 12 108.7	51 08.9 98 12 108.3	52 08.0 98 12 108.0	53 07.0 98 12 107.7	54 05.9 98 12 107.4	55 04.9 98 12 107.1	56 33.1 98 12 106.6	4
65	48 34.2 99 12 107.9	49 33.3 99 12 107.7	51 01.9 98 12 107.3	52 01.0 98 12 107.0	53 00.0 98 12 106.7	53 58.9 98 12 106.4	54 57.9 98 12 106.0	56 26.1 98 12 105.5	65
6	48 27.2 99 12 106.9	49 26.3 99 12 106.6	50 54.9 98 12 106.2	51 54.0 98 12 105.9	52 53.0 98 12 105.6	53 51.9 98 12 105.3	54 50.8 98 12 105.0	56 19.0 98 12 104.5	6
7	48 20.2 99 12 105.9	49 19.3 99 12 105.6	50 47.9 98 12 105.2	51 46.9 98 12 104.9	52 45.9 98 12 104.6	53 44.8 98 12 104.3	54 43.7 98 12 104.0	56 11.9 98 12 103.4	7
8	48 13.1 99 12 104.8	49 12.2 98 12 104.6	50 40.8 98 12 104.2	51 39.8 98 12 103.9	52 38.8 98 12 103.6	53 37.7 98 12 103.3	54 36.6 98 12 102.9	56 04.8 98 12 102.4	8
9	48 06.0 99 12 103.8	49 05.1 98 12 103.6	50 33.7 98 12 103.1	51 32.7 98 12 102.9	52 31.7 98 12 102.6	53 30.6 98 12 102.2	54 29.5 98 12 101.9	55 57.7 98 12 101.4	9
70	47 58.9 99 12 102.8	48 58.0 98 12 102.5	50 26.6 98 12 102.1	51 25.6 98 12 101.8	52 24.5 98 12 101.5	53 23.5 98 12 101.2	54 22.3 98 12 100.9	55 50.5 98 12 100.4	70
1	47 51.8 99 12 101.8	48 50.9 98 12 101.5	50 19.4 98 12 101.1	51 18.4 98 12 100.8	52 17.4 98 12 100.5	53 16.3 98 12 100.2	54 15.1 98 12 99.9	55 43.3 98 12 99.3	1
2	47 44.6 99 12 100.7	48 43.7 98 12 100.5	50 12.2 98 12 100.1	51 11.2 98 12 99.8	52 10.2 98 12 99.5	53 09.1 98 12 99.2	54 07.9 98 12 98.8	55 36.1 98 12 98.3	2
3	47 37.4 98 12 99.7	48 36.5 98 12 99.5	50 05.0 98 12 99.1	51 04.0 98 12 98.8	52 02.9 98 12 98.5	53 01.8 98 12 98.2	54 00.7 98 12 97.8	55 28.8 98 12 97.3	3
4	47 30.2 98 12 98.7	48 29.3 98 12 98.5	49 57.8 98 12 98.0	50 56.8 98 12 97.8	51 55.7 98 12 97.5	52 54.6 98 12 97.1	53 53.4 98 12 96.8	55 21.6 98 12 96.3	4
75	47 22.9 98 12 97.7	48 22.0 98 12 97.4	49 50.5 98 12 97.0	50 49.5 98 12 96.7	51 48.4 98 12 96.4	52 47.3 98 12 96.1	53 46.1 98 12 95.8	55 14.3 98 12 95.3	75
6	47 15.7 98 12 96.7	48 14.8 98 12 96.4	49 43.3 98 12 96.0	50 42.2 98 12 95.7	51 41.2 98 12 95.4	52 40.0 98 12 95.1	53 38.9 98 12 94.8	55 07.0 98 12 94.3	6
7	47 08.4 98 12 95.7	48 07.5 98 12 95.4	49 36.0 98 12 95.0	50 35.0 98 12 94.7	51 33.9 98 12 94.4	52 32.8 98 12 94.1	53 31.6 98 12 93.8	54 59.7 98 12 93.3	7
8	47 01.1 98 12 94.7	48 00.2 98 12 94.4	49 28.7 98 12 94.0	50 27.7 98 12 93.7	51 26.6 98 12 93.4	52 25.5 98 12 93.1	53 24.3 98 12 92.8	54 52.4 98 12 92.3	8
9	46 53.8 98 12 93.7	47 52.9 98 12 93.4	49 21.4 98 12 93.0	50 20.4 98 12 92.7	51 19.3 98 12 92.4	52 18.2 98 12 92.1	53 17.0 98 12 91.8	54 45.1 98 12 91.3	9
80	46 46.5 98 12 92.7	47 45.6 98 12 92.4	49 14.1 98 12 92.0	50 13.1 98 12 91.7	51 12.0 98 12 91.4	52 10.8 98 12 91.1	53 09.7 98 12 90.8	54 37.8 98 12 90.3	80
1	46 39.2 98 12 91.7	47 38.3 98 12 91.4	49 06.8 98 12 91.0	50 05.8 98 12 90.7	51 04.7 98 12 90.4	52 03.5 98 12 90.1	53 02.3 98 12 89.8	54 30.5 98 12 89.3	1
2	46 31.9 98 12 90.7	47 31.0 98 12 90.4	48 59.5 98 12 90.0	49 58.4 98 12 89.7	50 57.4 98 12 89.4	51 56.2 98 12 89.1	52 55.0 98 12 88.8	54 23.1 98 12 88.3	2
3	46 24.6 98 12 89.7	47 23.7 98 12 89.4	48 52.2 98 12 89.0	49 51.1 98 12 88.7	50 50.0 98 12 88.4	51 48.9 98 12 88.1	52 47.7 98 12 87.8	54 15.8 98 12 87.3	3
4	46 17.3 98 12 88.7	47 16.4 98 12 88.4	48 44.9 98 12 88.0	49 43.8 98 12 87.8	50 42.7 98 12 87.5	51 41.6 98 12 87.2	52 40.4 98 12 86.8	54 08.5 98 12 86.3	4
85	46 10.0 98 12 87.7	47 09.0 98 12 87.5	48 37.6 98 12 87.1	49 36.5 98 12 86.8	50 35.4 98 12 86.5	51 34.3 98 12 86.2	52 33.1 98 12 85.8	54 01.2 98 12 85.3	85
6	46 02.7 98 12 86.7	47 01.7 98 12 86.5	48 30.3 98 12 86.1	49 29.2 98 12 85.8	50 28.1 98 12 85.5	51 27.0 98 12 85.2	52 25.8 98 12 84.9	53 54.0 98 12 84.4	6
7	45 55.4 98 12 85.7	46 54.5 98 12 85.5	48 23.0 98 12 85.1	49 21.9 98 12 84.8	50 20.9 98 12 84.5	51 19.7 98 12 84.2	52 18.4 98 12 83.9	53 46.7 98 12 83.4	7
8	45 48.1 98 12 84.8	46 47.2 98 12 84.5	48 15.7 98 12 84.1	49 14.7 98 12 83.8	50 13.6 98 12 83.5	51 12.5 98 12 83.2	52 11.3 98 12 82.9	53 39.4 98 12 82.4	8
9	45 40.8 98 12 83.8	46 39.9 98 12 83.5	48 08.4 98 12 83.1	49 07.4 98 12 82.9	50 06.0 98 12 82.6	51 05.2 98 12 82.3	52 04.0 98 12 81.9	53 32.2 98 12 81.4	9
90	45 33.6 98 12 82.8	46 32.6 98 12 82.6	48 01.2 98 12 82.2	49 00.1 98 12 81.9	49 59.1 98 12 81.6	50 58.0 98 12 81.3	51 56.8 98 12 81.0	53 25.0 98 12 80.5	90

Each cell below is formatted as: **Alt (° ′)**   **Δd Δt**   **Az (°)**

H.A.	46° 00′	47° 00′	48° 30′	49° 30′	50° 30′	51° 30′	52° 30′	54° 00′	H.A.
91	45 26.3 98 12 81.8	46 25.4 98 12 81.6	47 53.9 98 12 81.2	48 52.9 98 12 80.9	49 51.9 98 12 80.6	50 50.8 98 12 80.3	51 49.6 98 12 80.0	53 17.8 98 12 79.5	91
2	45 19.1 98 12 80.9	46 18.2 98 12 80.6	47 46.7 98 12 80.2	48 45.7 98 12 79.9	49 44.7 98 12 79.7	50 43.6 98 12 79.4	51 42.4 98 12 79.0	53 10.6 98 12 78.6	2
3	45 11.9 98 12 79.9	46 11.0 98 12 79.6	47 39.5 98 12 79.2	48 38.5 98 12 79.0	49 37.5 98 12 78.7	50 36.4 98 12 78.4	51 35.2 98 12 78.1	53 03.4 98 12 77.6	3
4	45 04.7 99 12 78.9	46 03.8 98 12 78.7	47 32.4 98 12 78.3	48 31.4 98 12 78.0	49 30.3 98 12 77.7	50 29.2 98 12 77.4	51 28.1 98 12 77.1	52 56.3 98 12 76.6	4
95	44 57.5 99 12 77.9	45 56.6 98 12 77.7	47 25.2 98 12 77.3	48 24.2 98 12 77.0	49 23.2 98 12 76.8	50 22.1 98 12 76.5	51 21.0 98 12 76.2	52 49.2 98 12 75.7	95
6	44 50.4 99 12 77.0	45 49.5 98 12 76.7	47 18.1 98 12 76.4	48 17.1 98 12 76.1	49 16.1 98 12 75.8	50 15.0 98 12 75.5	51 13.9 98 12 75.2	52 42.1 98 12 74.7	6
7	44 43.3 99 12 76.0	45 42.4 98 12 75.8	47 11.0 98 12 75.4	48 10.0 98 12 75.1	49 09.0 98 12 74.8	50 08.0 98 12 74.6	51 06.9 98 12 74.3	52 35.1 98 12 73.8	7
8	44 36.2 99 12 75.1	45 35.3 99 12 74.8	47 03.9 98 12 74.4	48 03.0 98 12 74.2	49 02.0 98 12 73.9	50 00.9 98 12 73.6	50 59.8 98 12 73.3	52 28.1 98 12 72.8	8
9	44 29.2 99 12 74.1	45 28.3 99 12 73.9	46 56.9 98 12 73.5	47 56.0 98 12 73.2	48 55.0 98 12 72.9	49 53.9 98 12 72.7	50 52.8 98 12 72.4	52 21.1 98 12 71.9	9
100	44 22.1 99 12 73.1	45 21.3 99 12 72.9	46 49.9 98 12 72.5	47 49.0 98 12 72.3	48 48.0 98 12 72.0	49 47.0 98 12 71.7	50 45.9 98 12 71.4	52 14.2 98 11 70.9	100
1	44 15.2 99 12 72.2	45 14.3 99 12 71.9	46 43.0 98 12 71.6	47 42.0 98 12 71.3	48 41.0 98 12 71.0	49 40.0 98 12 70.8	50 39.0 98 12 70.5	52 07.3 98 11 70.0	1
2	44 08.2 99 12 71.2	45 07.4 99 11 71.0	46 36.0 98 11 70.6	47 35.1 98 11 70.4	48 34.2 98 11 70.1	49 33.2 98 11 69.8	50 32.1 98 11 69.5	52 00.5 98 11 69.1	2
3	44 01.3 99 12 70.3	45 00.5 99 11 70.0	46 29.2 98 11 69.7	47 28.3 98 11 69.4	48 27.3 98 11 69.1	49 26.3 98 11 68.9	50 25.3 98 11 68.6	51 53.7 98 11 68.1	3
4	43 54.5 99 11 69.3	44 53.6 99 11 69.1	46 22.3 98 11 68.7	47 21.4 98 11 68.5	48 20.5 98 11 68.2	49 19.5 98 11 67.9	50 18.5 98 11 67.6	51 46.9 98 11 67.2	4
105	43 47.6 99 11 68.4	44 46.8 99 11 68.1	46 15.5 99 11 67.8	47 14.6 99 11 67.5	48 13.7 98 11 67.3	49 12.8 98 11 67.0	50 11.8 98 11 66.7	51 40.2 98 11 66.3	105
6	43 40.9 99 11 67.4	44 40.1 99 11 67.2	46 08.8 99 11 66.8	47 07.9 99 11 66.6	48 07.0 98 11 66.3	49 06.1 98 11 66.1	50 05.1 98 11 65.8	51 33.5 98 11 65.3	6
7	43 34.1 99 11 66.5	44 33.3 99 11 66.2	46 02.1 99 11 65.9	47 01.2 99 11 65.6	48 00.3 98 11 65.4	48 59.4 98 11 65.1	49 58.4 98 11 64.8	51 26.9 98 11 64.4	7
8	43 27.5 99 11 65.5	44 26.7 99 11 65.3	45 55.4 99 11 65.0	46 54.6 99 11 64.7	47 53.7 98 11 64.5	48 52.8 98 11 64.2	49 51.8 98 11 63.9	51 20.3 98 11 63.5	8
9	43 20.8 99 11 64.6	44 20.1 99 11 64.4	45 48.8 99 11 64.0	46 48.0 99 11 63.8	47 47.1 99 11 63.5	48 46.2 98 11 63.3	49 45.3 98 11 63.0	51 13.8 98 11 62.6	9
110	43 14.2 99 11 63.6	44 13.5 99 11 63.4	45 42.3 99 11 63.1	46 41.5 99 11 62.8	47 40.6 99 11 62.6	48 39.7 98 11 62.3	49 38.8 98 11 62.1	51 07.3 98 11 61.6	110
1	43 07.7 99 11 62.7	44 07.0 99 11 62.5	45 35.8 99 11 62.1	46 35.0 99 11 61.9	47 34.2 99 11 61.7	48 33.3 99 11 61.4	49 32.4 98 11 61.1	51 00.9 98 11 60.7	1
2	43 01.3 99 11 61.8	44 00.5 99 11 61.5	45 29.4 99 11 61.2	46 28.6 99 11 61.0	47 27.7 99 11 60.7	48 26.9 99 11 60.5	49 26.0 98 11 60.2	50 54.6 98 10 59.8	2
3	42 54.8 99 11 60.8	43 54.1 99 11 60.6	45 23.0 99 11 60.3	46 22.2 99 11 60.0	47 21.4 99 11 59.8	48 20.6 99 10 59.6	49 19.7 99 10 59.3	50 48.3 98 10 58.9	3
4	42 48.5 99 10 59.9	43 47.8 99 10 59.7	45 16.7 99 10 59.3	46 15.9 99 10 59.1	47 15.1 99 10 58.9	48 14.3 99 10 58.6	49 13.4 99 10 58.4	50 42.1 98 10 58.0	4
115	42 42.2 99 10 58.9	43 41.5 99 10 58.7	45 10.4 99 10 58.4	46 09.7 99 10 58.2	47 08.9 99 10 58.0	48 08.1 99 10 57.7	49 07.2 99 10 57.5	50 35.9 98 10 57.1	115
6	42 36.0 99 10 58.0	43 35.3 99 10 57.8	45 04.2 99 10 57.5	46 03.5 99 10 57.3	47 02.7 99 10 57.0	48 01.9 99 10 56.8	49 01.1 99 10 56.5	50 29.8 99 10 56.1	6
7	42 29.8 99 10 57.1	43 29.1 99 10 56.9	44 58.1 99 10 56.6	45 57.4 99 10 56.3	46 56.6 99 10 56.1	47 55.8 99 10 55.9	48 55.0 99 10 55.6	50 23.7 99 10 55.2	7
8	42 23.7 99 10 56.2	43 23.0 99 10 56.0	44 52.0 99 10 55.6	45 51.3 99 10 55.4	46 50.6 99 10 55.2	47 49.8 99 10 55.0	48 49.0 99 10 54.7	50 17.8 99 10 54.3	8
9	42 17.6 99 10 55.2	43 17.0 99 10 55.0	44 46.0 99 10 54.7	45 45.3 99 10 54.5	46 44.6 99 10 54.3	47 43.9 99 10 54.0	48 43.1 99 10 53.8	50 11.9 99 10 53.4	9
120	42 11.7 99 10 54.3	43 11.0 99 10 54.1	44 40.1 99 10 53.8	45 39.4 99 10 53.6	46 38.7 99 10 53.4	47 38.0 99 10 53.1	48 37.2 99 10 52.9	50 06.0 99 10 52.5	120
1	42 05.8 99 10 53.4	43 05.2 99 10 53.2	44 34.2 99 10 52.9	45 33.6 99 10 52.7	46 32.9 99 10 52.4	47 32.2 99 10 52.2	48 31.4 99 10 52.0	50 00.3 99 10 51.6	1
2	41 59.9 99 10 52.4	42 59.3 99 10 52.2	44 28.4 99 10 52.0	45 27.8 99 10 51.7	46 27.1 99 09 51.5	47 26.4 99 09 51.3	48 25.7 99 09 51.1	49 54.6 99 09 50.7	2
3	41 54.2 99 09 51.5	42 53.6 99 09 51.3	44 22.7 99 09 51.0	45 22.1 99 09 50.8	46 21.4 99 09 50.6	47 20.7 99 09 50.4	48 20.0 99 09 50.2	49 48.9 99 09 49.8	3
4	41 48.5 99 09 50.6	42 47.9 99 09 50.4	44 17.0 99 09 50.1	45 16.4 99 09 49.9	46 15.8 99 09 49.7	47 15.1 99 09 49.5	48 14.5 99 09 49.3	49 43.4 99 09 48.9	4
125	41 42.9 99 09 49.7	42 42.3 99 09 49.5	44 11.5 99 09 49.2	45 10.9 99 09 49.0	46 10.3 99 09 48.8	47 09.6 99 09 48.6	48 09.0 99 09 48.4	49 37.9 99 09 48.0	125
6	41 37.3 99 09 48.7	42 36.8 99 09 48.6	44 06.0 99 09 48.3	45 05.4 99 09 48.1	46 04.8 99 09 47.9	47 04.2 99 09 47.7	48 03.5 99 09 47.5	49 32.5 99 09 47.1	6
7	41 31.9 99 09 47.8	42 31.4 99 09 47.6	44 00.6 99 09 47.4	45 00.0 99 09 47.2	45 59.4 99 09 47.0	46 58.8 99 09 46.8	47 58.2 99 09 46.6	49 27.2 99 09 46.2	7
8	41 26.5 99 09 46.9	42 26.0 99 09 46.7	43 55.2 99 09 46.5	44 54.7 99 09 46.3	45 54.1 99 09 46.1	46 53.5 99 09 45.9	47 52.9 99 09 45.7	49 22.0 99 09 45.3	8
9	41 21.2 99 09 46.0	42 20.7 99 09 45.8	43 50.0 99 09 45.6	44 49.4 99 09 45.4	45 48.9 99 09 45.2	46 48.3 99 09 45.0	47 47.7 99 09 44.8	49 16.8 99 08 44.4	9
130	41 16.0 99 08 45.1	42 15.5 99 09 44.9	43 44.8 99 08 44.6	44 44.3 99 08 44.5	45 43.7 99 08 44.3	46 43.2 99 08 44.1	47 42.6 99 08 43.9	49 11.7 99 08 43.6	130
1	41 10.8 99 08 44.2	42 10.4 99 08 44.0	43 39.7 99 08 43.7	44 39.2 99 08 43.6	45 38.7 99 08 43.4	46 38.1 99 08 43.2	47 37.6 99 08 43.0	49 06.7 99 08 42.7	1
2	41 05.8 99 08 43.2	42 05.4 99 08 43.1	43 34.7 99 08 42.8	44 34.2 99 08 42.6	45 33.7 99 08 42.5	46 33.2 99 08 42.3	47 32.6 99 08 42.1	49 01.8 99 08 41.8	2
3	41 00.8 99 08 42.3	42 00.4 99 08 42.2	43 29.7 99 08 41.9	44 29.3 99 08 41.7	45 28.8 99 08 41.6	46 28.3 99 08 41.4	47 27.8 99 08 41.2	48 57.0 99 08 40.9	3
4	40 55.9 99 08 41.4	41 55.5 99 08 41.3	43 24.9 99 08 41.0	44 24.5 99 08 40.8	45 24.0 99 08 40.7	46 23.5 99 08 40.5	47 23.0 99 08 40.3	48 52.4 99 08 40.0	4
135	40 51.2 99 08 40.5	41 50.8 99 08 40.3	43 20.1 99 08 40.1	44 19.7 99 08 39.9	45 19.3 99 08 39.8	46 18.8 99 08 39.6	47 18.3 99 08 39.4	48 47.6 99 08 39.1	135
6	40 46.5 99 08 39.6	41 46.1 99 08 39.4	43 15.5 99 08 39.2	44 15.1 99 08 39.0	45 14.6 99 08 38.9	46 14.2 99 08 38.7	47 13.7 99 08 38.5	48 43.0 99 07 38.2	6
7	40 41.8 99 08 38.7	41 41.5 99 08 38.5	43 10.9 99 07 38.3	44 10.5 99 07 38.1	45 10.1 99 07 38.0	46 09.7 99 07 37.8	47 09.2 99 07 37.6	48 38.5 99 07 37.3	7
8	40 37.3 99 07 37.8	41 37.0 99 07 37.6	43 06.4 99 07 37.4	44 06.0 99 07 37.2	45 05.6 99 07 37.1	46 05.2 99 07 36.9	47 04.8 99 07 36.7	48 34.1 99 07 36.5	8
9	40 32.9 99 07 36.9	41 32.5 99 07 36.7	43 01.9 99 07 36.5	44 01.7 99 07 36.3	45 01.3 99 07 36.2	46 00.9 99 07 36.0	47 00.5 99 07 35.9	48 29.8 99 07 35.6	9
140	40 28.5 99 07 35.9	41 28.2 99 07 35.8	42 57.7 99 07 35.6	43 57.4 99 07 35.4	44 57.0 99 07 35.3	45 56.6 99 07 35.1	46 56.2 99 07 35.0	48 25.6 99 07 34.7	140
1	40 24.3 99 07 35.0	41 24.0 99 07 34.9	42 53.5 99 07 34.7	43 53.2 99 07 34.5	44 52.8 99 07 34.4	45 52.5 99 07 34.2	46 52.1 99 07 34.1	48 21.5 99 07 33.8	1
2	40 20.2 1.0 07 34.1	41 19.9 99 07 34.0	42 49.4 99 07 33.8	43 49.1 99 07 33.7	44 48.7 99 06 33.5	45 48.4 99 07 33.4	46 48.0 99 07 33.2	48 17.5 99 07 32.9	2
3	40 16.1 1.0 07 33.2	41 15.8 1.0 07 33.1	42 45.4 99 07 32.9	43 45.1 99 06 32.8	44 44.8 99 06 32.6	45 44.4 99 06 32.5	46 44.1 99 06 32.3	48 13.6 99 06 32.1	3
4	40 12.1 1.0 06 32.3	41 11.8 1.0 06 32.2	42 41.5 1.0 06 31.9	43 41.2 99 06 31.9	44 40.9 99 06 31.7	45 40.6 99 06 31.6	46 40.2 99 06 31.4	48 09.7 99 06 31.2	4
145	40 08.3 1.0 06 31.4	41 08.0 1.0 06 31.3	42 37.6 1.0 06 31.1	43 37.4 1.0 06 31.0	44 37.1 1.0 06 30.8	45 36.8 99 06 30.7	46 36.5 99 06 30.5	48 06.0 99 06 30.3	145
6	40 04.5 1.0 06 30.5	41 04.3 1.0 06 30.4	42 33.9 1.0 06 30.2	43 33.6 1.0 06 30.1	44 33.4 1.0 06 29.9	45 33.1 1.0 06 29.8	46 32.8 1.0 06 29.7	48 02.3 99 06 29.4	6
7	40 00.9 1.0 06 29.6	41 00.6 1.0 06 29.5	42 30.3 1.0 06 29.3	43 30.0 1.0 06 29.2	44 29.8 1.0 06 29.1	45 29.5 1.0 06 28.9	46 29.2 1.0 06 28.8	47 58.8 1.0 06 28.6	7
8	39 57.1 1.0 06 28.7	40 57.1 1.0 06 28.6	42 26.7 1.0 06 28.4	43 26.5 1.0 06 28.3	44 26.2 1.0 06 28.2	45 26.0 1.0 06 28.0	46 25.8 1.0 06 27.9	47 55.3 1.0 06 27.7	8
9	39 53.8 1.0 06 27.8	40 53.6 1.0 06 27.7	42 23.3 1.0 06 27.5	43 23.1 1.0 06 27.4	44 22.9 1.0 06 27.3	45 22.6 1.0 06 27.2	46 22.4 1.0 05 27.0	47 52.0 1.0 05 26.8	9
150	39 50.5 1.0 05 26.9	40 50.3 1.0 05 26.8	42 20.0 1.0 05 26.6	43 19.8 1.0 05 26.5	44 19.6 1.0 05 26.4	45 19.3 1.0 05 26.3	46 19.1 1.0 05 26.1	47 48.7 1.0 05 26.0	150
1	39 47.2 1.0 05 26.0	40 47.0 1.0 05 25.9	42 16.8 1.0 05 25.7	43 16.6 1.0 05 25.6	44 16.4 1.0 05 25.5	45 16.2 1.0 05 25.4	46 15.9 1.0 05 25.3	47 45.6 1.0 05 25.1	1
2	39 44.1 1.0 05 25.1	40 43.9 1.0 05 25.0	42 13.6 1.0 05 24.8	43 13.4 1.0 05 24.7	44 13.3 1.0 05 24.6	45 13.1 1.0 05 24.5	46 12.9 1.0 05 24.4	47 42.5 1.0 05 24.2	2
3	39 41.0 1.0 05 24.2	40 40.9 1.0 05 24.1	42 10.6 1.0 05 23.9	43 10.4 1.0 05 23.8	44 10.3 1.0 05 23.7	45 10.1 1.0 05 23.6	46 09.9 1.0 05 23.5	47 39.6 1.0 05 23.3	3
4	39 38.1 1.0 05 23.3	40 37.9 1.0 05 23.2	42 07.7 1.0 05 23.1	43 07.5 1.0 05 23.0	44 07.4 1.0 05 22.9	45 07.2 1.0 05 22.8	46 07.0 1.0 05 22.6	47 36.8 1.0 05 22.5	4
155	39 35.2 1.0 05 22.4	40 35.1 1.0 05 22.3	42 04.9 1.0 04 22.2	43 04.7 1.0 04 22.1	44 04.6 1.0 04 22.0	45 04.4 1.0 04 21.9	46 04.3 1.0 04 21.8	47 34.0 1.0 04 21.6	155
6	39 32.5 1.0 04 21.5	40 32.4 1.0 04 21.4	42 02.2 1.0 04 21.3	43 02.0 1.0 04 21.2	44 01.9 1.0 04 21.1	45 01.8 1.0 04 21.0	46 01.6 1.0 04 20.9	47 31.4 1.0 04 20.7	6
7	39 29.9 1.0 04 20.6	40 29.8 1.0 04 20.5	41 59.6 1.0 04 20.4	42 59.5 1.0 04 20.3	43 59.3 1.0 04 20.2	44 59.2 1.0 04 20.1	45 59.1 1.0 04 20.0	47 28.8 1.0 04 19.9	7
8	39 27.4 1.0 04 19.7	40 27.3 1.0 04 19.6	41 57.1 1.0 04 19.5	42 57.0 1.0 04 19.4	43 56.9 1.0 04 19.3	44 56.6 1.0 04 19.2	45 56.6 1.0 04 19.1	47 26.4 1.0 04 19.0	8
9	39 24.9 1.0 04 18.8	40 24.8 1.0 04 18.7	41 54.7 1.0 04 18.6	42 54.6 1.0 04 18.5	43 54.5 1.0 04 18.4	44 54.4 1.0 04 18.4	45 54.3 1.0 04 18.3	47 24.1 1.0 04 18.1	9
160	39 22.6 1.0 04 17.9	40 22.6 1.0 04 17.8	41 52.4 1.0 04 17.7	42 52.3 1.0 04 17.6	43 52.2 1.0 04 17.6	44 52.1 1.0 04 17.5	45 52.0 1.0 04 17.4	47 21.8 1.0 04 17.3	160
1	39 20.5 1.0 03 17.0	40 20.4 1.0 03 16.9	41 50.2 1.0 03 16.8	42 50.2 1.0 03 16.8	43 50.1 1.0 03 16.7	44 50.0 1.0 03 16.6	45 49.9 1.0 03 16.5	47 19.7 1.0 03 16.4	1
2	39 18.4 1.0 03 16.1	40 18.3 1.0 03 16.0	41 48.2 1.0 03 15.9	42 48.1 1.0 03 15.9	43 48.0 1.0 03 15.8	44 47.9 1.0 03 15.7	45 47.9 1.0 03 15.7	47 17.7 1.0 03 15.5	2
3	39 16.4 1.0 03 15.2	40 16.3 1.0 03 15.1	41 46.2 1.0 03 15.1	42 46.2 1.0 03 15.0	43 46.1 1.0 03 14.9	44 46.0 1.0 03 14.9	45 45.9 1.0 03 14.8	47 15.8 1.0 03 14.7	3
4	39 14.5 1.0 03 14.3	40 14.5 1.0 03 14.3	41 44.4 1.0 03 14.2	42 44.3 1.0 03 14.1	43 44.3 1.0 03 14.0	44 44.2 1.0 03 14.0	45 44.1 1.0 03 13.9	47 14.0 1.0 03 13.8	4
165	39 12.8 1.0 03 13.4	40 12.7 1.0 03 13.4	41 42.7 1.0 03 13.3	42 42.6 1.0 03 13.2	43 42.5 1.0 03 13.2	44 42.5 1.0 03 13.1	45 42.4 1.0 03 13.0	47 12.3 1.0 03 12.9	165
6	39 11.1 1.0 03 12.5	40 11.1 1.0 03 12.5	41 41.0 1.0 03 12.4	42 41.0 1.0 03 12.3	43 40.9 1.0 02 12.3	44 40.9 1.0 02 12.2	45 40.8 1.0 02 12.2	47 10.7 1.0 02 12.1	6
7	39 09.6 1.0 02 11.6	40 09.6 1.0 02 11.6	41 39.5 1.0 02 11.5	42 39.5 1.0 02 11.5	43 39.4 1.0 02 11.4	44 39.4 1.0 02 11.4	45 39.3 1.0 02 11.3	47 09.3 1.0 02 11.2	7
8	39 08.1 1.0 02 10.7	40 08.1 1.0 02 10.7	41 38.0 1.0 02 10.6	42 38.0 1.0 02 10.6	43 38.0 1.0 02 10.5	44 38.0 1.0 02 10.5	45 38.0 1.0 02 10.4	47 07.9 1.0 02 10.3	8
9	39 06.9 1.0 02 09.8	40 06.9 1.0 02 09.8	41 36.8 1.0 02 09.7	42 36.8 1.0 02 09.7	43 36.8 1.0 02 09.6	44 36.7 1.0 02 09.6	45 36.7 1.0 02 09.6	47 06.6 1.0 02 09.5	9
170	39 05.7 1.0 02 08.9	40 05.7 1.0 02 08.9	41 35.6 1.0 02 08.9	42 35.6 1.0 02 08.8	43 35.6 1.0 02 08.8	44 35.6 1.0 02 08.7	45 35.5 1.0 02 08.7	47 05.5 1.0 02 08.6	170
1	39 04.6 1.0 02 08.0	40 04.6 1.0 02 08.0	41 34.6 1.0 02 08.0	42 34.5 1.0 02 07.9	43 34.5 1.0 02 07.9	44 34.5 1.0 02 07.9	45 34.5 1.0 02 07.8	47 04.4 1.0 02 07.8	1
2	39 03.6 1.0 01 07.2	40 03.6 1.0 01 07.1	41 33.6 1.0 01 07.1	42 33.6 1.0 01 07.0	43 33.6 1.0 01 07.0	44 33.6 1.0 01 07.0	45 33.5 1.0 01 06.9	47 03.5 1.0 01 06.9	2
3	39 02.6 1.0 01 06.3	40 02.6 1.0 01 06.2	41 32.6 1.0 01 06.2	42 32.6 1.0 01 06.2	43 32.6 1.0 01 06.1	44 32.7 1.0 01 06.1	45 32.7 1.0 01 06.1	47 02.7 1.0 01 06.0	3
4	39 02.1 1.0 01 05.4	40 02.0 1.0 01 05.3	41 32.0 1.0 01 05.3	42 32.0 1.0 01 05.3	43 32.0 1.0 01 05.3	44 32.0 1.0 01 05.2	45 32.0 1.0 01 05.2	47 02.0 1.0 01 05.2	4
175	39 01.4 1.0 01 04.5	40 01.4 1.0 01 04.5	41 31.4 1.0 01 04.4	42 31.4 1.0 01 04.4	43 31.4 1.0 01 04.4	44 31.4 1.0 01 04.4	45 31.4 1.0 01 04.3	47 01.4 1.0 01 04.3	175
6	39 00.9 1.0 01 03.6	40 00.9 1.0 01 03.6	41 30.9 1.0 01 03.5	42 30.9 1.0 01 03.5	43 30.9 1.0 01 03.5	44 30.9 1.0 01 03.5	45 30.9 1.0 01 03.5	47 00.9 1.0 01 03.4	6
7	39 00.5 1.0 00 02.7	40 00.5 1.0 00 02.7	41 30.5 1.0 00 02.7	42 30.5 1.0 00 02.6	43 30.5 1.0 00 02.6	44 30.5 1.0 00 02.6	45 30.5 1.0 00 02.6	47 00.5 1.0 00 02.6	7
8	39 00.2 1.0 00 01.8	40 00.2 1.0 00 01.8	41 30.2 1.0 00 01.8	42 30.2 1.0 00 01.8	43 30.2 1.0 00 01.7	44 30.2 1.0 00 01.7	45 30.2 1.0 00 01.7	47 00.2 1.0 00 01.7	8
9	39 00.1 1.0 00 00.9	40 00.1 1.0 00 00.9	41 30.1 1.0 00 00.9	42 30.1 1.0 00 00.9	43 30.1 1.0 00 00.9	44 30.1 1.0 00 00.9	45 30.1 1.0 00 00.9	47 00.1 1.0 00 00.9	9
180	39 00.0 1.0 00 00.0	40 00.0 1.0 00 00.0	41 30.0 1.0 00 00.0	42 30.0 1.0 00 00.0	43 30.0 1.0 00 00.0	44 30.0 1.0 00 00.0	45 30.0 1.0 00 00.0	47 00.0 1.0 00 00.0	180

Right-margin latitude annotations: **Lat. 83°**, **Lat. 84°**, **Lat. 85°**, **Lat. 86°**, **Lat. 87°**, **Lat. 88°**

H.A.	54° 30′ (Alt. Δd Δt Az.)	55° 00′	56° 00′	56° 30′	57° 00′	57° 30′	59° 00′	59° 30′	H.A.
00	61 30.0 1.00 0 180.0	62 00.0 1.00 0 180.0	63 00.0 1.00 0 180.0	63 30.0 1.00 0 180.0	64 00.0 1.00 0 180.0	64 30.0 1.00 0 180.0	66 00.0 1.00 0 180.0	66 30.0 1.00 0 180.0	00
1	61 29.9 1.00 0 178.8	61 59.9 1.00 0 178.8	62 59.9 1.00 0 178.8	63 29.9 1.00 0 178.8	63 59.9 1.00 0 178.8	64 29.9 1.00 0 178.8	65 59.9 1.00 0 178.7	66 29.9 1.00 0 178.7	1
2	61 29.7 1.00 1 177.6	61 59.7 1.00 1 177.6	62 59.7 1.00 1 177.5	63 29.7 1.00 1 177.5	63 59.7 1.00 1 177.5	64 29.7 1.00 1 177.5	65 59.7 1.00 1 177.6	66 29.7 1.00 1 177.5	2
3	61 29.3 1.00 1 176.3	61 59.3 1.00 1 176.3	62 59.3 1.00 1 176.3	63 29.3 1.00 1 176.3	63 59.3 1.00 1 176.3	64 29.3 1.00 1 176.3	65 59.3 1.00 1 176.2	66 29.3 1.00 1 176.2	3
4	61 28.8 1.00 1 175.1	61 58.8 1.00 1 175.1	62 58.7 1.00 1 175.1	63 28.7 1.00 1 175.1	63 58.7 1.00 1 175.0	64 28.7 1.00 1 175.0	65 58.7 1.00 1 174.9	66 28.7 1.00 1 174.9	4
05	61 28.1 1.00 1 173.9	61 58.1 1.00 1 173.9	62 58.0 1.00 1 173.8	63 28.0 1.00 1 173.8	63 58.0 1.00 1 173.8	64 28.0 1.00 1 173.8	65 58.0 1.00 1 173.7	66 28.0 1.00 1 173.6	05
6	61 27.2 1.00 2 172.7	61 57.2 1.00 2 172.7	62 57.2 1.00 2 172.6	63 27.2 1.00 2 172.6	63 57.2 1.00 2 172.6	64 27.1 1.00 2 172.5	65 57.1 1.00 2 172.4	66 27.1 1.00 2 172.4	6
7	61 26.2 1.00 2 171.5	61 56.2 1.00 2 171.5	62 56.2 1.00 2 171.4	63 26.1 1.00 2 171.3	63 56.1 1.00 2 171.3	64 26.1 1.00 2 171.3	65 56.1 1.00 2 171.1	66 26.0 1.00 2 171.1	7
8	61 25.0 1.00 2 170.3	61 55.0 1.00 2 170.3	62 55.0 1.00 2 170.2	63 25.0 1.00 2 170.1	63 54.9 1.00 2 170.1	64 24.9 1.00 2 170.0	65 54.8 1.00 2 169.8	66 24.8 1.00 2 169.8	8
9	61 23.7 1.00 2 169.1	61 53.7 1.00 2 169.0	62 53.7 1.00 2 168.9	63 23.6 1.00 2 168.9	63 53.6 1.00 2 168.8	64 23.6 1.00 2 168.8	65 53.5 1.00 3 168.6	66 23.4 1.00 3 168.6	9
10	61 22.3 1.00 3 167.9	61 52.2 1.00 3 167.8	62 52.2 1.00 3 167.7	63 22.1 1.00 3 167.7	63 52.1 1.00 3 167.6	64 22.1 1.00 3 167.5	65 52.0 1.00 3 167.4	66 21.9 1.00 3 167.3	10
1	61 20.7 1.00 3 166.6	61 50.6 1.00 3 166.6	62 50.5 1.00 3 166.5	63 20.5 1.00 3 166.4	63 50.5 1.00 3 166.4	64 20.4 1.00 3 166.3	65 50.3 1.00 3 166.1	66 20.2 1.00 3 166.0	1
2	61 18.9 1.00 3 165.4	61 48.8 1.00 3 165.4	62 48.8 1.00 3 165.3	63 18.7 1.00 3 165.2	63 48.7 1.00 3 165.1	64 18.6 1.00 3 165.1	65 48.4 1.00 3 164.9	66 18.4 1.00 3 164.8	2
3	61 17.0 1.00 3 164.2	61 46.9 1.00 3 164.2	62 46.8 1.00 4 164.1	63 16.8 1.00 4 164.0	63 46.7 1.00 4 163.9	64 16.7 1.00 4 163.9	65 46.5 1.00 4 163.6	66 16.4 1.00 4 163.5	3
4	61 14.9 1.00 4 163.0	61 44.9 1.00 4 163.0	62 44.7 1.00 4 162.8	63 14.7 1.00 4 162.7	63 44.6 1.00 4 162.7	64 14.5 1.00 4 162.6	65 44.3 1.00 4 162.3	66 14.2 1.00 4 162.3	4
15	61 12.7 1.00 4 161.8	61 42.6 1.00 4 161.7	62 42.5 1.00 4 161.6	63 12.4 1.00 4 161.5	63 42.4 1.00 4 161.4	64 12.3 1.00 4 161.4	65 42.0 1.00 4 161.1	66 11.9 1.00 4 161.0	15
6	61 10.4 1.00 4 160.6	61 40.3 1.00 4 160.5	62 40.1 1.00 4 160.4	63 10.0 1.00 4 160.3	63 40.0 1.00 4 160.2	64 09.9 1.00 4 160.1	65 39.6 1.00 4 159.9	66 09.5 1.00 5 159.8	6
7	61 07.9 1.00 4 159.4	61 37.8 1.00 4 159.3	62 37.6 1.00 5 159.2	63 07.5 1.00 5 159.1	63 37.4 1.00 5 159.0	64 07.3 1.00 5 158.9	65 37.0 1.00 5 158.6	66 06.9 1.00 5 158.5	7
8	61 05.2 1.00 5 158.2	61 35.1 1.00 5 158.1	62 34.9 1.00 5 157.9	63 04.7 1.00 5 157.9	63 34.7 1.00 5 157.8	64 04.6 1.00 5 157.7	65 34.3 1.00 5 157.4	66 04.1 1.00 5 157.3	8
9	61 02.4 1.00 5 157.0	61 32.3 1.00 5 156.9	62 32.1 1.00 5 156.8	63 02.0 1.00 5 156.7	63 31.9 1.00 5 156.6	64 01.8 1.00 5 156.5	65 31.4 1.00 5 156.1	66 01.2 1.00 5 156.0	9
20	60 59.5 1.00 5 155.8	61 29.4 1.00 5 155.7	62 29.2 1.00 5 155.5	62 59.0 1.00 5 155.4	63 28.9 1.00 5 155.3	63 58.8 1.00 5 155.2	65 28.3 99 05 154.9	65 58.2 99 05 154.8	20
1	60 56.4 1.00 5 154.6	61 26.3 1.00 5 154.5	62 26.1 1.00 5 154.3	62 55.9 1.00 5 154.2	63 25.8 1.00 5 154.1	63 55.6 1.00 5 154.0	65 25.2 99 06 153.7	65 55.0 99 06 153.5	1
2	60 53.2 1.00 6 153.3	61 23.1 1.00 6 153.3	62 22.8 1.00 6 153.1	62 52.7 99 06 153.0	63 22.5 99 06 152.9	63 52.4 99 06 152.8	65 21.8 99 06 152.4	65 51.7 99 06 152.3	2
3	60 49.9 1.00 6 152.3	61 19.8 1.00 6 152.2	62 19.4 99 06 151.9	62 49.3 99 06 151.8	63 19.1 99 06 151.7	63 48.9 99 06 151.6	65 18.4 99 06 151.2	65 48.2 99 06 151.1	3
4	60 46.4 99 06 151.1	61 16.3 99 06 151.0	62 15.9 99 06 150.7	62 45.8 99 06 150.6	63 15.6 99 06 150.5	63 45.4 99 06 150.4	65 14.8 99 06 150.0	65 44.6 99 06 149.8	4
25	60 42.8 99 06 149.9	61 12.7 99 06 149.8	62 12.3 99 06 149.5	62 42.1 99 06 149.4	63 11.9 99 06 149.3	63 41.7 99 06 149.2	65 11.1 99 06 148.6	65 40.8 99 06 148.6	25
6	60 39.1 99 06 148.7	61 08.9 99 06 148.6	62 08.5 99 06 148.4	62 38.3 99 06 148.2	63 08.1 99 07 148.1	63 37.9 99 07 148.0	65 07.2 99 07 147.5	65 37.0 99 07 147.4	6
7	60 35.2 99 07 147.4	61 05.0 99 07 147.4	62 04.6 99 07 147.2	62 34.4 99 07 147.0	63 04.2 99 07 146.9	63 34.0 99 07 146.8	65 03.2 99 07 146.3	65 33.0 99 07 146.2	7
8	60 31.2 99 07 146.4	61 01.0 99 07 146.2	62 00.6 99 07 146.0	62 30.4 99 07 145.9	63 00.1 99 07 145.7	63 29.9 99 07 145.6	64 59.1 99 07 145.1	65 28.8 99 07 145.0	8
9	60 27.1 99 07 145.2	60 56.9 99 07 145.1	61 56.4 99 07 144.8	62 26.2 99 07 144.7	62 56.0 99 07 144.5	63 25.7 99 07 144.4	64 54.9 99 07 143.9	65 24.6 99 07 143.8	9
30	60 22.9 99 07 144.0	60 52.7 99 07 143.9	61 52.2 99 07 143.6	62 21.9 99 07 143.5	62 51.7 99 07 143.3	63 21.4 99 07 143.2	64 50.5 99 08 142.7	65 20.2 99 08 142.5	30
1	60 18.5 99 07 142.9	60 48.3 99 07 142.7	61 47.8 99 08 142.5	62 17.5 99 08 142.3	62 47.2 99 08 142.2	63 16.9 99 08 142.0	64 46.0 99 08 141.5	65 15.7 99 08 141.3	1
2	60 14.1 99 08 141.7	60 43.8 99 08 141.6	61 43.3 99 08 141.3	62 13.0 99 08 141.1	62 42.7 99 08 141.0	63 12.4 99 08 140.8	64 41.4 99 08 140.3	65 11.0 99 08 140.1	2
3	60 09.5 99 08 140.5	60 39.2 99 08 140.4	61 38.6 99 08 140.1	62 08.3 99 08 140.0	62 38.0 99 08 139.8	63 07.7 99 08 139.7	64 36.7 99 08 139.1	65 06.3 99 08 139.0	3
4	60 04.8 99 08 139.4	60 34.5 99 08 139.2	61 33.9 99 08 139.0	62 03.6 99 08 138.8	62 33.2 99 08 138.6	63 02.9 99 08 138.5	64 31.8 99 08 138.0	65 01.4 99 08 137.8	4
35	60 00.0 99 08 138.2	60 29.7 99 08 138.1	61 29.0 99 08 137.8	61 58.7 99 08 137.6	62 28.4 99 08 137.5	62 58.0 99 08 137.3	64 26.9 99 08 136.8	64 56.5 99 08 136.6	35
6	59 55.0 99 08 137.1	60 24.7 99 08 136.9	61 24.1 99 08 136.6	61 53.7 99 08 136.5	62 23.4 99 09 136.3	62 53.0 99 09 136.1	64 21.8 99 09 135.6	64 51.4 99 09 135.4	6
7	59 50.0 99 08 135.9	60 19.7 99 09 135.8	61 19.0 99 09 135.5	61 48.6 99 09 135.3	62 18.3 99 09 135.2	62 47.9 99 09 135.0	64 16.6 99 09 134.4	64 46.2 99 09 134.2	7
8	59 44.9 99 09 134.8	60 14.5 99 09 134.6	61 13.8 99 09 134.3	61 43.4 99 09 134.2	62 13.0 99 09 134.0	62 42.6 99 09 133.8	64 11.4 99 09 133.3	64 40.9 99 09 133.1	8
9	59 39.6 99 09 133.7	60 09.3 99 09 133.5	61 08.5 99 09 133.2	61 38.1 99 09 133.0	62 07.7 99 09 132.8	62 37.3 99 09 132.7	64 06.0 98 09 132.1	64 35.5 98 09 131.9	9
40	59 34.3 99 09 132.5	60 03.9 99 09 132.4	61 03.1 99 09 132.0	61 32.7 99 09 131.9	62 02.3 99 09 131.7	62 31.9 99 09 131.5	64 00.5 98 09 130.9	64 30.0 98 09 130.7	40
1	59 28.8 99 09 131.4	59 58.5 99 09 131.2	60 57.7 99 09 130.9	61 27.2 99 09 130.7	61 56.8 99 09 130.6	62 26.4 98 09 130.4	63 55.0 98 09 129.8	64 24.4 98 09 129.6	1
2	59 23.3 99 09 130.1	59 52.9 99 09 130.1	60 52.1 99 09 129.8	61 21.7 99 09 129.6	61 51.2 98 10 129.4	62 20.8 98 10 129.2	63 49.3 98 10 128.6	64 18.8 98 10 128.4	2
3	59 17.7 99 10 129.1	59 47.3 99 10 129.0	60 46.4 98 10 128.5	61 16.0 98 10 128.5	61 45.5 98 10 128.3	62 15.0 98 10 128.1	63 43.5 98 10 127.5	64 13.0 98 10 127.3	3
4	59 12.0 99 10 128.0	59 41.5 99 10 127.9	60 40.7 98 10 127.5	61 10.2 98 10 127.3	61 39.7 98 10 127.1	62 09.2 98 10 127.0	63 37.7 98 10 126.3	64 07.1 98 10 126.1	4
45	59 06.2 99 10 126.9	59 35.7 99 10 126.7	60 34.8 98 10 126.4	61 04.4 98 10 126.2	61 33.9 98 10 126.0	62 03.4 98 10 125.8	63 31.8 98 10 125.2	64 01.2 98 10 125.0	45
6	59 00.3 99 10 125.8	59 29.8 99 10 125.6	60 28.9 98 10 125.3	60 58.4 98 10 125.1	61 27.9 98 10 124.9	61 57.4 98 10 124.7	63 25.7 98 10 124.1	63 55.1 98 10 123.9	6
7	58 54.3 98 10 124.7	59 23.8 98 10 124.5	60 22.9 98 10 124.2	60 52.4 98 10 124.0	61 21.9 98 10 123.8	61 51.3 98 10 123.6	63 19.6 98 10 123.0	63 49.0 98 10 122.7	7
8	58 48.2 98 10 123.6	59 17.8 98 10 123.4	60 16.8 98 10 123.0	60 46.3 98 10 122.9	61 15.8 98 10 122.7	61 45.2 98 10 122.5	63 13.5 98 10 121.8	63 42.8 98 10 121.6	8
9	58 42.1 98 10 122.5	59 11.6 98 10 122.3	60 10.6 98 10 121.9	60 40.1 98 10 121.8	61 09.6 98 11 121.6	61 39.0 98 11 121.4	63 07.2 98 11 120.7	63 36.6 98 11 120.5	9
50	58 35.9 98 10 121.4	59 05.4 98 10 121.2	60 04.4 98 11 120.8	60 33.8 98 11 120.6	61 03.3 98 11 120.5	61 32.7 98 11 120.2	63 00.9 98 11 119.6	63 30.2 98 11 119.4	50
1	58 29.6 98 11 120.3	58 59.1 98 11 120.1	59 58.1 98 11 119.7	60 27.5 98 11 119.5	60 57.0 98 11 119.1	61 26.4 98 11 119.1	62 54.5 98 11 118.5	63 23.8 98 11 118.3	1
2	58 23.3 98 11 119.2	58 52.8 98 11 119.0	59 51.7 98 11 118.6	60 21.1 98 11 118.4	60 50.5 98 11 118.2	61 20.0 98 11 118.0	62 48.0 98 11 117.4	63 17.4 98 11 117.2	2
3	58 16.9 98 11 118.1	58 46.3 98 11 117.9	59 45.2 98 11 117.6	60 14.7 98 11 117.4	60 44.1 98 11 117.2	61 13.5 98 11 116.9	62 41.5 98 11 116.3	63 10.8 98 11 116.1	3
4	58 10.4 98 11 117.0	58 39.8 98 11 116.8	59 38.7 98 11 116.5	60 08.1 98 11 116.3	60 37.5 98 11 116.1	61 06.9 98 11 115.9	62 34.9 98 11 115.2	63 04.2 98 11 115.0	4
55	58 03.8 98 11 115.9	58 33.3 98 11 115.8	59 32.2 98 11 115.4	60 01.6 98 11 115.2	60 30.9 98 11 115.0	61 00.3 98 11 114.8	62 28.3 98 11 114.1	62 57.6 98 11 113.9	55
6	57 57.2 98 11 114.7	58 26.7 98 11 114.7	59 25.5 98 11 114.3	59 54.9 98 11 114.1	60 24.3 98 11 113.9	60 53.6 98 11 113.7	62 21.6 98 11 113.0	62 50.8 98 11 112.8	6
7	57 50.6 98 11 113.8	58 20.0 98 11 113.6	59 18.8 98 11 113.2	59 48.2 98 11 113.0	60 17.6 98 11 112.8	60 46.9 98 11 112.6	62 14.8 98 11 111.9	62 44.1 97 11 111.7	7
8	57 43.9 98 11 112.7	58 13.3 98 11 112.5	59 12.1 98 11 112.2	59 41.4 98 11 112.0	60 10.8 98 11 111.7	60 40.1 98 11 111.5	62 08.0 98 11 110.9	62 37.3 97 11 110.6	8
9	57 37.1 98 11 111.7	58 06.5 98 11 111.5	59 05.3 98 11 111.1	59 34.6 98 11 110.9	60 04.0 98 11 110.7	60 33.3 98 11 110.5	62 01.2 97 12 109.8	62 30.4 97 12 109.5	9
60	57 30.3 98 11 110.6	57 59.7 98 11 110.4	58 58.4 98 12 110.0	59 27.8 98 12 109.8	59 57.1 98 12 109.6	60 26.4 98 12 109.4	61 54.3 97 12 108.7	62 23.5 97 12 108.5	60
1	57 23.4 98 12 109.5	57 52.8 98 12 109.4	58 51.5 98 12 109.0	59 20.9 98 12 108.8	59 50.2 98 12 108.6	60 19.5 98 12 108.3	61 47.3 97 12 107.7	62 16.5 97 12 107.4	1
2	57 16.5 98 12 108.5	57 45.9 98 12 108.3	58 44.6 98 12 107.9	59 13.9 98 12 107.7	59 43.3 98 12 107.5	60 12.6 98 12 107.3	61 40.3 97 12 106.6	62 09.5 97 12 106.4	2
3	57 09.5 98 12 107.4	57 38.9 98 12 107.2	58 37.6 98 12 106.9	59 07.0 98 12 106.7	59 36.3 98 12 106.4	60 05.6 98 12 106.2	61 33.3 97 12 105.5	62 02.5 97 12 105.3	3
4	57 02.5 98 12 106.4	57 31.9 98 12 106.2	58 30.6 98 12 105.8	58 59.9 98 12 105.6	59 29.2 98 12 105.4	59 58.5 98 12 105.2	61 26.2 97 12 104.5	61 55.4 97 12 104.2	4
65	56 55.5 98 12 105.3	57 24.9 98 12 105.2	58 23.6 98 12 104.8	58 52.9 98 12 104.6	59 22.2 98 12 104.3	59 51.4 98 12 104.1	61 19.1 97 12 103.4	61 48.3 97 12 103.2	65
6	56 48.4 98 12 104.3	57 17.8 98 12 104.1	58 16.5 98 12 103.7	58 45.8 98 12 103.5	59 15.1 98 12 103.3	59 44.3 98 12 103.1	61 12.0 97 12 102.3	61 41.2 97 12 102.2	6
7	56 41.3 98 12 103.3	57 10.7 98 12 103.1	58 09.3 98 12 102.7	58 38.7 98 12 102.5	59 07.9 98 12 102.3	59 37.2 98 12 102.1	61 04.9 97 12 101.4	61 34.0 97 12 101.1	7
8	56 34.2 98 12 102.2	57 03.5 98 12 102.0	58 02.2 98 12 101.6	58 31.5 98 12 101.4	59 00.8 98 12 101.2	59 30.0 97 12 101.0	60 57.7 97 12 100.3	61 26.8 97 12 100.1	8
9	56 27.0 98 12 101.2	56 56.4 98 12 101.0	57 55.0 98 12 100.6	58 24.3 98 12 100.4	58 53.6 98 12 100.2	59 22.8 97 12 100.0	60 50.5 97 12 99.3	61 19.6 97 12 99.1	9
70	56 19.8 98 12 100.2	56 49.2 98 12 100.0	57 47.8 98 12 99.6	58 17.1 98 12 99.4	58 46.4 98 12 99.2	59 15.6 97 12 99.0	60 43.2 97 12 98.3	61 12.4 97 12 98.0	70
1	56 12.6 98 12 99.2	56 42.0 98 12 99.0	57 40.6 98 12 98.6	58 09.9 98 12 98.4	58 39.2 98 12 98.2	59 08.4 97 12 97.9	60 36.0 97 12 97.3	61 05.1 97 12 97.0	1
2	56 05.4 98 12 98.1	56 34.7 98 12 97.9	57 33.4 98 12 97.5	58 02.6 98 12 97.3	58 31.9 98 12 97.1	59 01.2 97 12 96.9	60 28.7 97 12 96.2	60 57.9 97 12 96.0	2
3	55 58.2 98 12 97.1	56 27.5 98 12 96.9	57 26.1 98 12 96.5	57 55.4 98 12 96.3	58 24.6 97 12 96.1	58 53.9 97 12 95.9	60 21.5 97 12 95.2	60 50.6 97 12 95.0	3
4	55 50.9 98 12 96.1	56 20.2 98 12 95.9	57 18.8 98 12 95.5	57 48.1 98 12 95.3	58 17.4 97 12 95.1	58 46.6 97 12 94.9	60 14.2 97 12 94.2	60 43.3 97 12 94.0	4
75	55 43.6 98 12 95.1	56 13.0 98 12 94.9	57 11.6 98 12 94.5	57 40.8 98 12 94.3	58 10.1 97 12 94.1	58 39.3 97 12 93.9	60 06.9 97 12 93.2	60 36.0 97 12 93.0	75
6	55 36.3 98 12 94.1	56 05.7 98 12 93.9	57 04.3 98 12 93.5	57 33.5 98 12 93.3	58 02.8 97 12 93.1	58 32.0 97 12 92.9	59 59.6 97 12 92.2	60 28.7 97 12 92.0	6
7	55 29.0 98 12 93.1	55 58.4 98 12 92.9	56 57.0 98 12 92.5	57 26.2 98 12 92.3	57 55.5 97 12 92.1	58 24.7 97 12 91.9	59 52.3 97 12 91.2	60 21.4 97 12 91.0	7
8	55 21.7 98 12 92.1	55 51.1 98 12 91.9	56 49.6 98 12 91.5	57 18.9 98 12 91.3	57 48.2 97 12 91.1	58 17.4 97 12 90.9	59 45.0 97 12 90.2	60 14.1 97 12 90.0	8
9	55 14.5 98 12 91.1	55 43.7 98 12 90.9	56 42.3 98 12 90.5	57 11.6 98 12 90.3	57 40.9 97 12 90.1	58 10.1 97 12 89.9	59 37.6 97 12 89.2	60 06.8 97 12 89.0	9
80	55 07.1 98 12 90.1	55 36.4 98 12 89.9	56 35.0 98 12 89.5	57 04.3 98 12 89.3	57 33.5 97 12 89.1	58 02.8 97 12 88.9	59 30.3 97 12 88.2	59 59.5 97 12 88.0	80
1	54 59.8 98 12 89.1	55 29.1 98 12 88.9	56 27.7 98 12 88.5	56 57.0 98 12 88.3	57 26.2 97 12 88.1	57 55.5 97 12 87.9	59 23.0 97 12 87.2	59 52.2 97 12 87.0	1
2	54 52.5 98 12 88.1	55 21.8 98 12 87.9	56 20.4 98 12 87.5	56 49.7 98 12 87.3	57 18.9 97 12 87.1	57 48.2 97 12 86.9	59 15.7 97 12 86.3	59 44.9 97 12 86.0	2
3	54 45.2 98 12 87.1	55 14.5 98 12 86.9	56 13.1 98 12 86.6	56 42.4 98 12 86.4	57 11.6 97 12 86.2	57 40.9 97 12 85.9	59 08.4 97 12 85.3	59 37.6 97 12 85.1	3
4	54 37.9 98 12 86.1	55 07.2 98 12 86.0	56 05.8 98 12 85.6	56 35.1 98 12 85.4	57 04.3 97 12 85.2	57 33.6 97 12 85.0	59 01.1 97 12 84.3	59 30.3 97 12 84.1	4
85	54 30.6 98 12 85.2	54 59.9 98 12 85.0	55 58.5 98 12 84.6	56 27.8 98 12 84.4	56 57.1 97 12 84.2	57 26.3 97 12 84.0	58 53.9 97 12 83.3	59 23.0 97 12 83.1	85
6	54 23.3 98 12 84.2	54 52.6 98 12 84.0	55 51.2 98 12 83.6	56 20.5 98 12 83.4	56 49.8 97 12 83.2	57 19.0 97 12 83.0	58 46.6 97 12 82.4	59 15.8 97 12 82.1	6
7	54 16.0 98 12 83.2	54 45.4 98 12 83.0	55 44.0 98 12 82.7	56 13.3 98 12 82.5	56 42.5 97 12 82.3	57 11.8 97 12 82.1	58 39.4 97 12 81.4	59 08.5 97 12 81.2	7
8	54 08.8 98 12 82.2	54 38.1 98 12 82.1	55 36.7 98 12 81.7	56 06.0 98 12 81.5	56 35.3 97 12 81.3	57 04.5 97 12 81.1	58 32.2 97 12 80.4	59 01.2 97 12 80.2	8
9	54 01.6 98 12 81.3	54 30.9 98 12 81.1	55 29.5 98 12 80.7	55 58.8 98 12 80.5	56 28.1 97 12 80.3	56 57.3 97 12 80.1	58 25.0 97 12 79.5	58 54.1 97 12 79.3	9
90	53 54.3 98 12 80.3	54 23.7 98 12 80.1	55 22.3 98 12 79.8	55 51.6 98 12 79.6	56 20.9 97 12 79.4	56 50.1 97 12 79.2	58 17.8 97 12 78.5	58 47.0 97 12 78.3	90

H.A.	54° 30' Alt.	Δd Δt	Az.	55° 00' Alt.	Δd Δt	Az.	56° 00' Alt.	Δd Δt	Az.	56° 30' Alt.	Δd Δt	Az.	57° 00' Alt.	Δd Δt	Az.	57° 30' Alt.	Δd Δt	Az.	59° 00' Alt.	Δd Δt	Az.	59° 30' Alt.	Δd Δt	Az.	H.A.
91	53 47.1	98 12	79.3	54 16.5	98 12	79.2	55 15.1	98 12	78.8	55 44.4	98 12	78.6	56 13.7	98 12	78.4	56 43.0	98 12	78.2	58 10.6	97 12	77.6	58 39.8	97 12	77.4	91
2	53 40.9	98 12	78.4	54 09.3	98 12	78.2	55 08.0	98 12	77.8	55 37.3	98 12	77.7	56 06.6	98 12	77.5	56 35.8	98 12	77.3	58 03.5	97 12	76.6	58 32.7	97 12	76.4	2
3	53 32.8	98 12	77.4	54 02.2	98 12	77.2	55 00.8	98 12	76.9	55 30.1	98 12	76.7	55 59.4	98 12	76.5	56 28.7	98 12	76.3	57 56.4	97 12	75.7	58 25.6	97 12	75.5	3
4	53 25.7	98 12	76.5	53 55.1	98 12	76.3	54 53.7	98 12	75.9	55 23.0	98 12	75.8	55 52.3	98 12	75.6	56 21.6	98 12	75.4	57 49.3	97 12	74.7	58 18.5	97 12	74.5	4
95	53 18.6	98 12	75.5	53 48.0	98 12	75.3	54 46.7	98 12	75.0	55 16.0	98 12	74.8	55 45.3	98 12	74.6	56 14.6	98 12	74.4	57 42.3	97 12	73.8	58 11.5	97 12	73.6	95
6	53 11.5	98 12	74.6	53 40.9	98 12	74.4	54 39.6	98 12	74.0	55 08.9	98 12	73.9	55 38.2	98 12	73.7	56 07.5	98 12	73.5	57 35.3	97 12	72.9	58 04.5	97 11	72.7	6
7	53 04.5	98 12	73.6	53 33.9	98 12	73.4	54 32.6	98 12	73.1	55 01.9	98 12	72.9	55 31.2	98 12	72.7	56 00.5	98 12	72.5	57 28.3	97 11	71.9	57 57.5	97 11	71.7	7
8	52 57.5	98 12	72.7	53 26.9	98 12	72.5	54 25.6	98 12	72.2	54 55.0	98 12	72.0	55 24.3	98 11	71.8	55 53.6	98 11	71.6	57 21.4	97 11	71.0	57 50.6	97 11	70.8	8
9	52 50.5	98 12	71.7	53 19.9	98 12	71.6	54 18.7	98 12	71.2	54 48.0	98 12	71.0	55 17.3	98 11	70.9	55 46.7	98 11	70.7	57 14.5	97 11	70.1	57 43.7	97 11	69.9	9
100	52 43.6	98 11	70.8	53 13.0	98 11	70.6	54 11.8	98 11	70.3	54 41.1	98 11	70.1	55 10.5	98 11	69.9	55 39.8	98 11	69.7	57 07.6	98 11	69.1	57 36.9	97 11	68.9	100
1	52 36.7	98 11	69.8	53 06.1	98 11	69.7	54 04.9	98 11	69.3	54 34.3	98 11	69.2	55 03.6	98 11	68.8	55 32.9	98 11	68.8	57 00.8	98 11	68.2	57 30.1	97 11	68.0	1
2	52 29.9	98 11	68.9	52 59.3	98 11	68.7	53 58.1	98 11	68.4	54 27.5	98 11	68.2	54 56.8	98 11	68.1	55 26.1	98 11	67.9	56 54.1	98 11	67.3	57 23.3	98 11	67.1	2
3	52 23.1	98 11	68.0	52 52.5	98 11	67.8	53 51.3	98 11	67.5	54 20.7	98 11	67.3	54 50.0	98 11	67.1	55 19.4	98 11	67.0	56 47.3	98 11	66.4	57 16.6	98 11	66.2	3
4	52 16.3	98 11	67.0	52 45.8	98 11	66.9	53 44.6	98 11	66.6	54 14.0	98 11	66.4	54 43.3	98 11	66.2	55 12.7	98 11	66.0	56 40.7	98 11	65.5	57 09.9	98 11	65.3	4
105	52 09.6	98 11	66.1	52 39.1	98 11	66.0	53 37.9	98 11	65.6	54 07.3	98 11	65.5	54 36.7	98 11	65.1	55 06.0	98 11	65.1	56 34.0	98 11	64.5	57 03.3	98 11	64.4	105
6	52 03.0	98 11	65.2	52 32.4	98 11	65.0	53 31.1	98 11	64.7	54 00.7	98 11	64.5	54 30.0	98 11	64.4	54 59.4	98 11	64.2	56 27.5	98 11	63.6	56 56.8	98 11	63.4	6
7	51 56.3	98 11	64.3	52 25.8	98 11	64.1	53 24.7	98 11	63.8	53 54.1	98 11	63.6	54 23.5	98 11	63.4	54 52.9	98 11	63.3	56 20.9	98 11	62.7	56 50.2	98 11	62.5	7
8	51 49.8	98 11	63.3	52 19.2	98 11	63.2	53 18.1	98 11	62.9	53 47.6	98 11	62.7	54 17.0	98 11	62.5	54 46.4	98 11	62.4	56 14.5	98 11	61.8	56 43.8	98 11	61.6	8
9	51 43.3	98 11	62.4	52 12.7	98 11	62.3	53 11.7	98 11	61.9	53 41.1	98 11	61.8	54 10.6	98 11	61.6	54 39.9	98 11	61.5	56 08.0	98 11	60.9	56 37.4	98 11	60.7	9
110	51 36.8	98 11	61.5	52 06.3	98 11	61.3	53 05.2	98 11	61.0	53 34.7	98 11	60.9	54 04.1	98 11	60.7	54 33.5	98 11	60.5	56 01.7	98 11	60.0	56 31.0	98 10	59.8	110
1	51 30.4	98 11	60.6	51 59.9	98 11	60.4	52 58.9	98 11	60.1	53 28.3	98 10	60.0	53 57.8	98 10	59.8	54 27.2	98 10	59.6	55 55.4	98 10	59.1	56 24.7	98 10	58.9	1
2	51 24.1	98 10	59.7	51 53.6	98 10	59.5	52 52.5	98 10	59.2	53 22.0	98 10	59.1	53 51.5	98 10	58.9	54 20.9	98 10	58.7	55 49.1	98 10	58.2	56 18.5	98 10	58.0	2
3	51 17.8	98 10	58.7	51 47.3	98 10	58.6	52 46.3	98 10	58.3	53 15.8	98 10	58.1	53 45.2	98 10	58.0	54 14.7	98 10	57.8	55 42.9	98 10	57.3	56 12.3	98 10	57.1	3
4	51 11.6	98 10	57.8	51 41.1	98 10	57.7	52 40.1	98 10	57.4	53 09.6	98 10	57.2	53 39.1	98 10	57.1	54 08.5	98 10	56.9	55 36.8	98 10	56.4	56 06.2	98 10	56.2	4
115	51 05.4	98 10	56.9	51 35.0	98 10	56.8	52 34.0	98 10	56.5	53 03.5	98 10	56.3	53 33.0	98 10	56.2	54 02.4	98 10	56.0	55 30.8	98 10	55.5	56 00.2	98 10	55.4	115
6	50 59.3	98 10	56.0	51 28.9	98 10	55.9	52 27.9	98 10	55.6	52 57.4	98 10	55.4	53 26.9	98 10	55.3	53 56.4	98 10	55.1	55 24.8	98 10	54.6	55 54.2	98 10	54.5	6
7	50 53.3	99 10	55.1	51 22.9	99 10	55.0	52 21.9	98 10	54.7	52 51.4	98 10	54.5	53 20.9	98 10	54.4	53 50.4	98 10	54.2	55 18.8	98 10	53.7	55 48.3	98 10	53.6	7
8	50 47.3	99 10	54.2	51 16.9	99 10	54.1	52 16.0	98 10	53.8	52 45.5	98 10	53.6	53 15.0	98 10	53.5	53 44.5	98 10	53.3	55 13.0	98 10	52.9	55 42.4	98 10	52.7	8
9	50 41.4	99 10	53.3	51 11.0	99 10	53.2	52 10.1	98 10	52.9	52 39.7	98 10	52.7	53 09.2	98 10	52.6	53 38.7	98 10	52.4	55 07.2	98 10	51.8	55 36.6	98 10	51.8	9
120	50 35.6	99 10	52.4	51 05.2	99 10	52.3	52 04.3	99 10	52.0	52 33.9	98 10	51.8	53 03.4	98 10	51.7	53 32.9	98 09	51.6	55 01.5	98 09	51.1	55 30.9	98 09	50.9	120
1	50 29.9	99 09	51.5	50 59.4	99 09	51.4	51 58.6	99 09	51.1	52 28.2	99 09	51.0	52 57.7	98 09	50.8	53 27.2	98 09	50.7	54 55.8	98 09	50.2	55 25.3	98 09	50.0	1
2	50 24.2	99 09	50.6	50 53.8	99 09	50.5	51 52.9	99 09	50.2	52 22.5	99 09	50.1	52 52.1	99 09	49.9	53 21.6	98 09	49.8	54 50.2	98 09	49.3	55 19.7	98 09	49.2	2
3	50 18.6	99 09	49.7	50 48.2	99 09	49.6	51 47.4	99 09	49.3	52 16.9	99 09	49.2	52 46.5	99 09	49.0	53 16.1	99 09	48.9	54 44.7	98 09	48.4	55 14.2	98 09	48.3	3
4	50 13.0	99 09	48.8	50 42.6	99 09	48.7	51 41.9	99 09	48.4	52 11.4	99 09	48.3	52 41.0	99 09	48.1	53 10.6	99 09	48.0	54 39.3	98 09	47.6	55 08.8	98 09	47.3	4
125	50 07.6	99 09	47.9	50 37.2	99 09	47.8	51 36.4	99 09	47.5	52 06.0	99 09	47.4	52 35.6	99 09	47.3	53 05.2	99 09	47.1	54 33.9	99 09	46.7	55 03.5	98 09	46.5	125
6	50 02.2	99 09	47.0	50 31.8	99 09	46.9	51 31.1	99 09	46.6	52 00.7	99 09	46.5	52 30.3	99 09	46.4	52 59.9	99 09	46.2	54 28.6	99 09	45.8	54 58.2	99 09	45.7	6
7	49 56.9	99 09	46.1	50 26.5	99 09	46.0	51 25.8	99 09	45.7	51 55.4	99 09	45.6	52 25.0	99 09	45.5	52 54.6	99 09	45.4	54 23.4	99 09	44.9	54 53.0	99 09	44.8	7
8	49 51.6	99 09	45.2	50 21.3	99 08	45.1	51 20.6	99 08	44.9	51 50.2	99 08	44.7	52 19.9	99 08	44.6	52 49.5	99 08	44.5	54 18.3	99 08	44.1	54 47.9	99 08	43.9	8
9	49 46.5	99 08	44.3	50 16.2	99 08	44.2	51 15.5	99 08	44.0	51 45.1	99 08	43.9	52 14.8	99 08	43.7	52 44.4	99 08	43.6	54 13.3	99 08	43.2	54 42.9	99 08	43.1	9
130	49 41.4	99 08	43.4	50 11.1	99 08	43.3	51 10.4	99 08	43.1	51 40.1	99 08	43.0	52 09.8	99 08	42.9	52 39.4	99 08	42.7	54 08.3	99 08	42.3	54 37.9	99 08	42.2	130
1	49 36.4	99 08	42.6	50 06.1	99 08	42.4	51 05.5	99 08	42.2	51 35.2	99 08	42.1	52 04.8	99 08	42.0	52 34.5	99 08	41.9	54 03.4	99 08	41.5	54 33.0	99 08	41.3	1
2	49 31.5	99 08	41.7	50 01.2	99 08	41.6	51 00.6	99 08	41.3	51 30.3	99 08	41.2	52 00.0	99 08	41.1	52 29.6	99 08	41.0	53 58.6	99 08	40.6	54 28.2	99 08	40.5	2
3	49 26.7	99 08	40.8	49 56.4	99 08	40.8	50 55.8	99 08	40.5	51 25.5	99 08	40.3	51 55.2	99 08	40.2	52 24.9	99 08	40.1	53 53.9	99 08	39.7	54 23.5	99 08	39.6	3
4	49 22.0	99 08	39.9	49 51.7	99 08	39.8	50 51.1	99 08	39.6	51 20.8	99 08	39.5	51 50.5	99 08	39.4	52 20.2	99 08	39.2	53 49.3	99 08	38.9	54 18.9	99 08	38.7	4
135	49 17.3	99 08	39.0	49 47.1	99 08	38.9	50 46.5	99 08	38.7	51 16.2	99 08	38.6	51 45.9	99 08	38.5	52 15.6	99 07	38.4	53 44.7	99 07	38.0	54 14.4	99 07	37.9	135
6	49 12.8	99 07	38.1	49 42.5	99 07	38.0	50 42.0	99 07	37.8	51 11.7	99 07	37.7	51 41.4	99 07	37.6	52 11.1	99 07	37.5	53 40.3	99 07	37.2	54 09.9	99 07	37.0	6
7	49 08.3	99 07	37.3	49 38.0	99 07	37.2	50 37.5	99 07	37.0	51 07.3	99 07	36.8	51 37.0	99 07	36.7	52 06.7	99 07	36.6	53 35.9	99 07	36.3	54 05.6	99 07	36.2	7
8	49 03.9	99 07	36.4	49 33.7	99 07	36.3	50 33.1	99 07	36.1	51 02.9	99 07	36.0	51 32.7	99 07	35.9	52 02.4	99 07	35.8	53 31.6	99 07	35.4	54 01.3	99 07	35.3	8
9	48 59.6	99 07	35.5	49 29.4	99 07	35.4	50 28.9	99 07	35.2	50 58.7	99 07	35.1	51 28.4	99 07	35.0	51 58.2	99 07	34.9	53 27.4	99 07	34.6	53 57.1	99 07	34.5	9
140	48 55.4	99 07	34.6	49 25.2	99 07	34.5	50 24.8	99 07	34.3	50 54.5	99 07	34.2	51 24.3	99 07	34.1	51 54.1	99 07	34.0	53 23.3	99 07	33.7	53 53.0	99 07	33.6	140
1	48 51.3	99 07	33.7	49 21.1	99 07	33.7	50 20.7	99 07	33.5	50 50.5	99 07	33.4	51 20.2	99 07	33.3	51 50.0	99 07	33.2	53 19.3	99 07	32.9	53 49.0	99 07	32.8	1
2	48 47.3	99 07	32.9	49 17.1	99 07	32.8	50 16.7	99 06	32.6	50 46.5	99 06	32.5	51 16.3	99 06	32.4	51 46.0	99 06	32.3	53 15.4	99 06	32.0	53 45.1	99 06	31.9	2
3	48 43.4	99 06	32.0	49 13.2	99 06	31.9	50 12.8	99 06	31.7	50 42.6	99 06	31.6	51 12.4	99 06	31.5	51 42.2	99 06	31.5	53 11.5	99 06	31.2	53 41.3	99 06	31.1	3
4	48 39.5	99 06	31.1	49 09.4	99 06	31.0	50 09.0	99 06	30.9	50 38.8	99 06	30.8	51 08.6	99 06	30.7	51 38.4	99 06	30.6	53 07.8	99 06	30.3	53 37.6	99 06	30.2	4
145	48 35.8	99 06	30.2	49 05.6	99 06	30.2	50 05.3	99 06	30.0	50 35.1	99 06	29.9	51 04.9	99 06	29.8	51 34.7	99 06	29.7	53 04.2	99 06	29.4	53 33.9	99 06	29.4	145
6	48 32.2	99 06	29.4	49 02.0	99 06	29.3	50 01.7	99 06	29.1	50 31.5	99 06	29.0	51 01.3	99 06	29.0	51 31.2	99 06	28.9	53 00.6	99 06	28.6	53 30.4	99 06	28.5	6
7	48 28.6	99 06	28.5	48 58.5	99 06	28.4	49 58.2	99 06	28.3	50 28.0	99 06	28.2	50 57.9	99 06	28.1	51 27.7	99 06	28.0	52 57.0	99 06	27.7	53 27.0	99 06	27.7	7
8	48 25.2	1.0 05	27.6	48 55.1	1.0 05	27.6	49 54.8	99 06	27.4	50 24.6	99 06	27.3	50 54.5	99 06	27.2	51 24.3	99 05	27.2	52 53.8	99 05	26.9	53 23.6	99 05	26.8	8
9	48 21.9	1.0 05	26.8	48 51.7	1.0 05	26.7	49 51.4	1.0 05	26.5	50 21.3	1.0 05	26.5	50 51.2	1.0 05	26.4	51 21.0	99 05	26.3	52 50.5	99 05	26.1	53 20.4	99 05	26.0	9
150	48 18.6	1.0 05	25.9	48 48.5	1.0 05	25.8	49 48.2	1.0 05	25.7	50 18.1	1.0 05	25.6	50 48.0	1.0 05	25.5	51 17.8	1.0 05	25.4	52 47.4	99 05	25.2	53 17.2	99 05	25.1	150
1	48 15.4	1.0 05	25.0	48 45.4	1.0 05	24.9	49 45.1	1.0 05	24.8	50 14.9	1.0 05	24.7	50 44.9	1.0 05	24.7	51 14.7	1.0 05	24.6	52 44.3	1.0 05	24.4	53 14.2	1.0 05	24.3	1
2	48 12.4	1.0 05	24.1	48 42.3	1.0 05	24.1	49 42.1	1.0 05	23.9	50 12.0	1.0 05	23.9	50 41.9	1.0 05	23.8	51 11.7	1.0 05	23.7	52 41.3	1.0 05	23.5	53 11.3	1.0 05	23.4	2
3	48 09.5	1.0 05	23.3	48 39.4	1.0 05	23.2	49 39.2	1.0 05	23.1	50 09.1	1.0 05	23.0	50 39.0	1.0 05	23.0	51 08.9	1.0 05	22.9	52 38.5	1.0 05	22.7	53 08.4	1.0 05	22.6	3
4	48 06.7	1.0 05	22.4	48 36.6	1.0 05	22.4	49 36.4	1.0 05	22.2	50 06.3	1.0 05	22.2	50 36.2	1.0 04	22.1	51 06.0	1.0 04	22.0	52 35.7	1.0 04	21.8	53 05.6	1.0 04	21.7	4
155	48 03.9	1.0 04	21.5	48 33.8	1.0 04	21.5	49 33.6	1.0 04	21.4	50 03.6	1.0 04	21.3	50 33.5	1.0 04	21.2	51 03.4	1.0 04	21.2	52 33.0	1.0 04	21.0	53 02.9	1.0 04	20.9	155
6	48 01.3	1.0 04	20.7	48 31.2	1.0 04	20.6	49 31.0	1.0 04	20.5	50 00.9	1.0 04	20.4	50 30.9	1.0 04	20.3	51 00.8	1.0 04	20.3	52 30.5	1.0 04	20.1	53 00.4	1.0 04	20.1	6
7	47 58.9	1.0 04	19.8	48 28.7	1.0 04	19.8	49 28.7	1.0 04	19.6	49 58.4	1.0 04	19.6	50 28.4	1.0 04	19.5	50 58.3	1.0 04	19.5	52 28.0	1.0 04	19.2	52 57.9	1.0 04	19.2	7
8	47 56.3	1.0 04	18.9	48 26.3	1.0 04	18.9	49 26.1	1.0 04	18.8	49 56.0	1.0 04	18.7	50 26.0	1.0 04	18.7	50 55.9	1.0 04	18.6	52 25.6	1.0 04	18.4	52 55.6	1.0 04	18.4	8
9	47 54.0	1.0 04	18.1	48 23.9	1.0 04	18.0	49 23.8	1.0 04	17.9	49 53.7	1.0 04	17.9	50 23.7	1.0 04	17.8	50 53.6	1.0 04	17.8	52 23.4	1.0 04	17.6	52 53.3	1.0 04	17.5	9
160	47 51.8	1.0 04	17.2	48 21.7	1.0 04	17.2	49 21.6	1.0 04	17.1	49 51.6	1.0 04	17.0	50 21.5	1.0 03	17.0	50 51.4	1.0 03	16.9	52 21.2	1.0 03	16.8	52 51.2	1.0 03	16.7	160
1	47 49.7	1.0 03	16.4	48 19.6	1.0 03	16.3	49 19.5	1.0 03	16.2	49 49.5	1.0 03	16.2	50 19.4	1.0 03	16.1	50 49.3	1.0 03	16.1	52 19.2	1.0 03	15.9	52 49.1	1.0 03	15.9	1
2	47 47.7	1.0 03	15.5	48 17.6	1.0 03	15.5	49 17.5	1.0 03	15.4	49 47.5	1.0 03	15.3	50 17.4	1.0 03	15.3	50 47.4	1.0 03	15.2	52 17.2	1.0 03	15.1	52 47.2	1.0 03	15.0	2
3	47 45.8	1.0 03	14.6	48 15.7	1.0 03	14.6	49 15.6	1.0 03	14.5	49 45.6	1.0 03	14.5	50 15.6	1.0 03	14.4	50 45.5	1.0 03	14.4	52 15.4	1.0 03	14.2	52 45.3	1.0 03	14.2	3
4	47 44.0	1.0 03	13.8	48 13.9	1.0 03	13.7	49 13.9	1.0 03	13.7	49 43.8	1.0 03	13.6	50 13.8	1.0 03	13.6	50 43.7	1.0 03	13.5	52 13.6	1.0 03	13.4	52 43.6	1.0 03	13.4	4
165	47 42.3	1.0 03	12.9	48 12.3	1.0 03	12.9	49 12.2	1.0 03	12.8	49 42.2	1.0 03	12.8	50 12.1	1.0 03	12.7	50 42.1	1.0 03	12.7	52 12.0	1.0 03	12.6	52 41.9	1.0 03	12.5	165
6	47 40.7	1.0 02	12.0	48 10.6	1.0 02	12.0	49 10.6	1.0 02	11.9	49 40.6	1.0 02	11.9	50 10.6	1.0 02	11.9	50 40.5	1.0 02	11.8	52 10.4	1.0 02	11.7	52 40.4	1.0 02	11.7	6
7	47 39.2	1.0 02	11.2	48 09.2	1.0 02	11.2	49 09.2	1.0 02	11.1	49 39.1	1.0 02	11.1	50 09.1	1.0 02	11.0	50 39.1	1.0 02	11.0	52 09.0	1.0 02	10.9	52 39.0	1.0 02	10.8	7
8	47 37.9	1.0 02	10.3	48 07.9	1.0 02	10.3	49 07.8	1.0 02	10.2	49 37.8	1.0 02	10.2	50 07.8	1.0 02	10.2	50 37.7	1.0 02	10.1	52 07.7	1.0 02	10.0	52 37.6	1.0 02	10.0	8
9	47 36.6	1.0 02	09.5	48 06.6	1.0 02	09.4	49 06.6	1.0 02	09.4	49 36.5	1.0 02	09.4	50 06.5	1.0 02	09.3	50 36.5	1.0 02	09.3	52 06.4	1.0 02	09.2	52 36.4	1.0 02	09.2	9
170	47 35.5	1.0 02	08.6	48 05.5	1.0 02	08.6	49 05.4	1.0 02	08.5	49 35.4	1.0 02	08.5	50 05.4	1.0 02	08.5	50 35.4	1.0 02	08.5	52 05.3	1.0 02	08.4	52 35.3	1.0 02	08.3	170
1	47 34.4	1.0 02	07.7	48 04.4	1.0 02	07.7	49 04.4	1.0 02	07.7	49 34.4	1.0 02	07.6	50 04.4	1.0 02	07.6	50 34.4	1.0 02	07.6	52 04.3	1.0 02	07.5	52 34.3	1.0 02	07.5	1
2	47 33.5	1.0 01	06.9	48 03.5	1.0 01	06.9	49 03.5	1.0 01	06.8	49 33.5	1.0 01	06.8	50 03.5	1.0 01	06.8	50 33.4	1.0 01	06.8	52 03.4	1.0 01	06.7	52 33.4	1.0 01	06.7	2
3	47 32.7	1.0 01	06.0	48 02.7	1.0 01	06.0	49 02.7	1.0 01	06.0	49 32.7	1.0 01	06.0	50 02.6	1.0 01	05.9	50 32.6	1.0 01	05.9	52 02.6	1.0 01	05.8	52 32.6	1.0 01	05.8	3
4	47 32.0	1.0 01	05.2	48 02.0	1.0 01	05.1	49 02.0	1.0 01	05.1	49 32.0	1.0 01	05.1	50 01.9	1.0 01	05.1	50 31.9	1.0 01	05.1	52 01.9	1.0 01	05.0	52 31.9	1.0 01	05.0	4
175	47 31.4	1.0 01	04.3	48 01.4	1.0 01	04.3	49 01.4	1.0 01	04.3	49 31.4	1.0 01	04.2	50 01.4	1.0 01	04.2	50 31.3	1.0 01	04.2	52 01.3	1.0 01	04.2	52 31.3	1.0 01	04.2	175
6	47 30.9	1.0 01	03.4	48 00.9	1.0 01	03.4	49 00.9	1.0 01	03.4	49 30.9	1.0 01	03.4	50 00.9	1.0 01	03.4	50 30.9	1.0 01	03.4	52 00.9	1.0 01	03.3	52 30.9	1.0 01	03.3	6
7	47 30.5	1.0 00	02.6	48 00.5	1.0 00	02.6	49 00.5	1.0 00	02.6	49 30.5	1.0 00	02.5	50 00.5	1.0 00	02.5	50 30.5	1.0 00	02.5	52 00.5	1.0 00	02.5	52 30.5	1.0 00	02.5	7
8	47 30.2	1.0 00	01.7	48 00.2	1.0 00	01.7	49 00.2	1.0 00	01.7	49 30.2	1.0 00	01.7	50 00.2	1.0 00	01.7	50 30.2	1.0 00	01.7	52 00.2	1.0 00	01.7	52 30.2	1.0 00	01.7	8
9	47 30.1	1.0 00	00.9	48 00.1	1.0 00	00.9	49 00.1	1.0 00	00.9	49 30.1	1.0 00	00.9	50 00.1	1.0 00	00.8	50 30.1	1.0 00	00.8	52 00.1	1.0 00	00.8	52 30.1	1.0 00	00.8	9
180	47 30.0	1.0 00	00.0	48 00.0	1.0 00	00.0	49 00.0	1.0 00	00.0	49 30.0	1.0 00	00.0	50 00.0	1.0 00	00.0	50 30.0	1.0 00	00.0	52 00.0	1.0 00	00.0	52 30.0	1.0 00	00.0	180

H.A.	60° 00' Alt. (Ad Δt) / Az.	60° 30' Alt. (Ad Δt) / Az.	62° 00' Alt. (Ad Δt) / Az.	62° 30' Alt. (Ad Δt) / Az.	63° 00' Alt. (Ad Δt) / Az.	69° 00' Alt. (Ad Δt) / Az.	69° 30' Alt. (Ad Δt) / Az.	74° 30' Alt. (Ad Δt) / Az.	H.A.
00	67 00.0 1.00 0 180.0	67 30.0 1.00 0 180.0	69 00.0 1.00 0 180.0	69 30.0 1.00 0 180.0	70 00.0 1.00 0 180.0	76 00.0 1.00 0 180.0	76 30.0 1.00 0 180.0	81 30.0 1.00 0 180.0	00
1	66 59.9 1.00 0 178.7	67 29.9 1.00 0 178.7	68 59.7 1.00 1 178.7	69 29.9 1.00 0 178.7	69 59.9 1.00 0 178.7	75 59.9 1.00 0 178.5	76 29.9 1.00 0 178.5	81 29.9 1.00 1 178.2	1
2	66 59.7 1.00 1 177.4	67 29.3 1.00 1 177.4	68 59.7 1.00 1 177.4	69 29.7 1.00 1 177.4	69 59.7 1.00 1 177.3	75 59.6 1.00 1 177.0	76 29.6 1.00 1 177.0	81 29.5 1.00 1 176.4	2
3	66 59.0 1.00 1 176.2	67 29.3 1.00 1 176.1	68 59.2 1.00 1 176.1	69 29.3 1.00 1 176.0	69 59.2 1.00 1 176.0	75 59.2 1.00 1 175.6	76 29.1 1.00 1 175.5	81 29.0 1.00 1 174.6	3
4	66 58.7 1.00 1 174.9	67 28.7 1.00 1 174.9	68 58.7 1.00 1 174.8	69 28.7 1.00 1 174.7	69 58.6 1.00 1 174.7	75 58.5 1.00 1 174.1	76 28.5 1.00 1 174.0	81 28.2 1.00 2 172.8	4
05	66 58.0 1.00 2 173.6	67 28.0 1.00 2 173.6	68 57.9 1.00 2 173.5	69 27.9 1.00 2 173.4	69 57.9 1.00 2 173.4	75 57.6 1.00 2 172.6	76 27.6 1.00 2 172.5	81 27.1 1.00 2 171.0	05
6	66 57.1 1.00 2 172.3	67 27.0 1.00 2 172.3	68 57.0 1.00 2 172.1	69 27.0 1.00 2 172.1	69 57.0 1.00 2 172.0	75 56.6 1.00 2 171.1	76 26.6 1.00 2 171.1	81 25.9 1.00 2 169.2	6
7	66 56.0 1.00 2 171.1	67 26.0 1.00 2 171.0	68 55.9 1.00 2 170.8	69 25.9 1.00 2 170.8	69 55.9 1.00 2 170.7	75 55.4 1.00 2 169.7	76 25.3 1.00 2 169.5	81 24.4 1.00 3 167.4	7
8	66 54.8 1.00 2 169.8	67 24.8 1.00 2 169.7	68 54.7 1.00 2 169.6	69 24.6 1.00 2 169.5	69 54.6 1.00 2 169.4	75 54.0 1.00 2 168.2	76 23.9 1.00 3 168.0	81 22.7 1.00 3 165.6	8
9	66 53.4 1.00 3 168.5	67 23.4 1.00 3 168.4	68 53.3 1.00 3 168.2	69 23.2 1.00 3 168.2	69 53.2 1.00 3 168.1	75 52.4 1.00 3 166.7	76 22.3 1.00 3 166.6	81 20.8 99 04 163.9	9
10	66 51.9 1.00 3 167.2	67 21.8 1.00 3 167.2	68 51.7 1.00 3 166.9	69 21.6 1.00 3 166.9	69 51.6 1.00 3 166.8	75 50.6 1.00 3 165.3	76 20.5 1.00 3 165.1	81 18.6 99 04 162.1	10
1	66 50.2 1.00 3 166.0	67 20.1 1.00 3 165.9	68 50.0 1.00 3 165.6	69 19.9 1.00 3 165.5	69 49.8 1.00 3 165.5	75 48.7 1.00 4 163.8	76 18.5 1.00 4 163.6	81 16.3 99 04 160.4	1
2	66 48.3 1.00 3 164.7	67 18.3 1.00 3 164.6	68 48.1 1.00 3 164.3	69 18.0 1.00 3 164.2	69 47.9 1.00 3 164.1	75 46.5 99 04 162.3	76 16.4 99 04 162.1	81 13.7 99 05 158.6	2
3	66 46.3 1.00 4 163.4	67 16.2 1.00 4 163.3	68 46.0 1.00 4 163.0	69 15.9 1.00 4 162.9	69 45.8 1.00 4 162.8	75 44.2 99 04 160.9	76 14.0 99 04 160.7	81 10.9 99 05 156.9	3
4	66 44.2 1.00 4 162.2	67 14.1 1.00 4 162.1	68 43.8 1.00 4 161.8	69 13.7 1.00 4 161.6	69 43.6 1.00 4 161.5	75 41.8 99 04 159.5	76 11.5 99 04 159.2	81 08.0 98 05 155.2	4
15	66 41.8 1.00 4 160.9	67 11.7 1.00 4 160.8	68 41.4 1.00 4 160.5	69 11.3 1.00 4 160.3	69 41.2 1.00 4 160.2	75 39.1 99 05 158.0	76 08.9 99 05 157.8	81 04.8 98 06 153.5	15
6	66 39.4 1.00 4 159.6	67 09.3 1.00 4 159.5	68 38.9 1.00 4 159.2	69 08.8 1.00 4 159.1	69 38.6 1.00 4 158.9	75 36.3 99 05 156.6	76 06.0 99 05 156.3	81 01.4 98 06 151.8	6
7	66 36.8 1.00 5 158.4	67 06.6 1.00 5 158.3	68 36.2 1.00 5 157.9	69 06.1 99 05 157.8	69 35.9 99 05 157.6	75 33.3 99 05 155.2	76 03.0 99 05 154.9	80 57.9 97 06 150.2	7
8	66 34.0 1.00 5 157.1	67 03.9 1.00 5 157.0	68 33.4 99 05 156.6	69 03.2 99 05 156.5	69 33.1 99 05 156.3	75 30.1 99 06 153.7	75 59.8 99 06 153.4	80 54.2 97 06 148.5	8
9	66 31.1 1.00 5 155.9	67 00.9 99 05 155.8	68 30.4 99 05 155.3	69 00.2 99 05 155.2	69 30.1 99 05 155.0	75 26.8 99 06 152.3	75 56.4 99 06 152.0	80 50.3 97 07 146.9	9
20	66 28.0 99 06 154.6	66 57.8 99 06 154.5	68 27.3 99 05 154.1	68 57.1 99 05 153.9	69 26.9 99 06 153.7	75 23.4 99 06 150.9	75 52.9 99 06 150.6	80 46.2 97 07 145.3	20
1	66 24.8 99 06 153.4	66 54.6 99 06 153.3	68 24.0 99 05 152.8	68 53.8 99 06 152.6	69 23.6 99 06 152.5	75 19.7 99 06 149.5	75 49.3 98 06 149.2	80 41.9 96 07 143.7	1
2	66 21.5 99 06 152.2	66 51.3 99 06 152.0	68 20.6 99 06 151.5	68 50.4 99 06 151.4	69 20.1 99 06 151.2	75 15.9 98 07 148.1	75 45.4 98 07 147.8	80 37.5 96 08 142.1	2
3	66 18.0 99 06 150.9	66 47.8 99 06 150.8	68 17.1 99 06 150.3	68 46.8 99 06 150.1	69 16.5 99 06 149.9	75 12.0 98 07 146.8	75 41.5 98 07 146.4	80 33.0 96 08 140.5	3
4	66 14.4 99 06 149.7	66 44.1 99 06 149.5	68 13.4 99 06 149.0	68 43.1 99 06 148.8	69 12.8 99 06 148.6	75 07.9 98 07 145.4	75 37.3 98 07 145.0	80 28.2 95 08 139.0	4
25	66 10.6 99 06 148.5	66 40.4 99 06 148.3	68 09.5 99 07 147.8	68 39.2 99 07 147.6	69 08.9 99 07 147.4	75 03.7 98 07 144.0	75 33.1 98 07 143.6	80 23.4 95 08 137.4	25
6	66 06.7 99 07 147.2	66 36.4 99 07 147.1	68 05.6 99 07 146.5	68 35.3 99 07 146.3	69 04.9 99 07 146.1	74 59.3 98 08 142.7	75 28.7 98 08 142.2	80 18.3 95 09 135.9	6
7	66 02.7 99 07 146.0	66 32.4 99 07 145.8	68 01.5 99 07 145.3	68 31.1 99 07 145.1	69 00.8 99 07 144.9	74 54.8 98 08 141.3	75 24.1 98 08 140.9	80 13.2 95 09 134.4	7
8	65 58.5 99 07 144.8	66 28.2 99 07 144.6	67 57.2 99 07 144.0	68 26.9 99 07 143.8	68 56.5 99 07 143.6	74 50.2 98 08 140.0	75 19.4 97 08 139.5	80 07.9 94 09 132.9	8
9	65 54.3 99 07 143.6	66 23.9 99 07 143.4	67 52.9 99 07 142.9	68 22.5 99 08 142.6	68 52.1 99 08 142.4	74 45.4 97 08 138.6	75 14.6 97 08 138.2	80 02.5 94 09 131.5	9
30	65 49.9 99 08 142.4	66 19.5 99 08 142.2	67 48.4 99 08 141.6	68 18.0 99 08 141.4	68 47.6 99 08 141.1	74 40.5 97 09 137.3	75 09.7 97 09 136.9	79 56.9 94 09 130.0	30
1	65 45.3 99 08 141.2	66 15.0 99 08 141.0	67 43.8 99 08 140.4	68 13.4 99 08 140.1	68 42.9 98 08 139.9	74 35.5 97 09 136.0	75 04.6 97 09 135.5	79 51.3 93 10 128.6	1
2	65 40.7 99 08 140.0	66 10.3 99 08 139.8	67 39.1 99 08 139.1	68 08.6 98 08 138.9	68 38.2 98 08 138.7	74 30.4 97 09 134.7	74 59.5 97 09 134.2	79 45.5 93 10 127.2	2
3	65 35.9 99 08 138.8	66 05.5 99 08 138.6	67 34.2 98 08 137.9	68 03.8 98 08 137.7	68 33.3 98 08 137.4	74 25.1 97 09 133.4	74 54.2 97 09 132.9	79 39.6 93 10 125.8	3
4	65 31.0 99 08 137.6	66 00.6 99 08 137.4	67 29.3 98 08 136.7	67 58.8 98 08 136.5	68 28.3 98 09 136.2	74 19.7 97 09 132.1	74 48.7 97 09 131.6	79 33.7 93 10 124.4	4
35	65 26.1 99 08 136.4	65 55.6 99 09 136.2	67 24.3 98 09 135.5	67 53.7 98 09 135.3	68 23.2 98 09 135.0	74 14.3 97 09 130.8	74 43.2 96 09 130.3	79 27.6 92 10 123.1	35
6	65 21.0 99 09 135.2	65 50.5 98 09 135.0	67 19.0 98 09 134.3	67 48.5 98 09 134.1	68 17.9 98 09 133.8	74 08.7 97 09 129.6	74 37.6 96 10 129.1	79 21.4 92 10 121.7	6
7	65 15.8 98 09 134.0	65 45.3 98 09 133.8	67 13.7 98 09 133.1	67 43.2 98 09 132.9	68 12.6 98 09 132.6	74 03.0 96 10 128.3	74 31.9 96 10 127.8	79 15.1 92 11 120.4	7
8	65 10.4 98 09 132.8	65 40.0 98 09 132.6	67 08.4 98 09 131.9	67 37.8 98 09 131.7	68 07.2 98 09 131.4	73 57.2 96 10 127.0	74 26.0 96 10 126.5	79 08.6 92 11 119.1	8
9	65 05.0 98 09 131.7	65 34.5 98 09 131.5	67 02.9 98 09 130.7	67 32.3 98 09 130.5	68 01.6 98 09 130.2	73 51.3 96 10 125.8	74 20.1 96 10 125.3	79 02.4 92 11 117.8	9
40	64 59.5 98 09 130.5	65 29.0 98 09 130.3	66 57.3 98 10 129.6	67 26.7 98 10 129.3	67 56.0 98 10 129.0	73 45.3 96 10 124.6	74 14.1 96 10 124.0	78 55.9 91 11 116.5	40
1	64 53.9 98 10 129.4	65 23.4 98 10 129.1	66 51.6 98 10 128.4	67 21.0 98 10 128.1	67 50.3 98 10 127.9	73 39.3 96 10 123.3	74 08.0 96 10 122.8	78 49.3 91 11 115.3	1
2	64 48.2 98 10 128.2	65 17.6 98 10 128.0	66 45.8 98 10 127.2	67 15.2 98 10 127.0	67 44.5 98 10 126.7	73 33.1 96 10 122.1	74 01.8 96 10 121.6	78 42.6 91 11 114.0	2
3	64 42.4 98 10 127.0	65 11.8 98 10 126.8	66 39.9 98 10 126.1	67 09.3 98 10 125.8	67 38.6 96 10 125.5	73 26.9 96 11 120.9	73 55.6 95 11 120.3	78 35.9 91 11 112.8	3
4	64 36.5 98 10 125.9	65 05.9 98 10 125.7	66 34.0 98 10 124.9	67 03.3 98 10 124.6	67 32.6 96 10 124.4	73 20.6 96 11 119.7	73 49.2 95 11 119.2	78 29.2 91 11 111.6	4
45	64 30.6 98 10 124.8	65 00.0 98 10 124.5	66 28.0 98 10 123.8	66 57.2 98 10 123.5	67 26.5 97 10 123.2	73 14.2 95 11 118.5	73 42.8 95 11 118.0	78 22.3 90 11 110.4	45
6	64 24.5 98 10 123.6	64 53.9 98 10 123.4	66 21.8 98 10 122.6	66 51.1 97 10 122.3	67 20.3 97 10 122.0	73 07.7 95 11 117.3	73 36.3 95 11 116.8	78 15.4 90 12 109.2	6
7	64 18.4 98 10 122.5	64 47.7 98 10 122.3	66 15.6 98 10 121.5	66 44.9 97 10 121.2	67 14.1 97 11 120.9	73 01.2 95 11 116.2	73 29.7 95 11 115.6	78 08.5 90 12 108.0	7
8	64 12.2 98 10 121.4	64 41.5 98 10 121.1	66 09.4 97 11 120.3	66 38.6 97 11 120.1	67 07.8 97 11 119.8	72 54.6 95 11 115.0	73 23.1 95 11 114.5	78 01.5 90 12 106.8	8
9	64 05.9 98 11 120.2	64 35.2 98 11 120.0	66 03.0 97 11 119.2	66 32.2 97 11 118.9	67 01.4 97 11 118.6	72 48.0 95 11 113.9	73 16.4 95 11 113.3	77 54.5 90 12 105.7	9
50	63 59.6 98 11 119.1	64 28.9 98 11 118.9	65 56.6 97 11 118.1	66 25.8 97 11 117.8	66 54.9 97 11 117.5	72 41.2 95 11 112.7	73 09.7 95 11 112.2	77 47.4 90 12 104.5	50
1	63 53.1 98 11 118.0	64 22.4 98 11 117.8	65 50.1 97 11 117.0	66 19.3 97 11 116.7	66 48.4 97 11 116.4	72 34.5 95 11 111.6	73 02.9 95 11 111.0	77 40.4 90 12 103.4	1
2	63 46.7 98 11 116.9	64 15.9 98 11 116.7	65 43.6 97 11 115.9	66 12.7 97 11 115.6	66 41.8 97 11 115.3	72 27.6 95 11 110.4	72 56.0 94 12 109.9	77 33.2 90 12 102.3	2
3	63 40.1 98 11 115.8	64 09.4 97 11 115.6	65 37.0 97 11 114.7	66 06.1 97 11 114.5	66 35.2 97 11 114.2	72 20.8 95 12 109.3	72 49.1 94 12 108.8	77 26.1 89 12 101.2	3
4	63 33.5 98 11 114.7	64 02.7 97 11 114.5	65 30.3 97 11 113.6	65 59.4 97 11 113.4	66 28.5 97 11 113.0	72 13.8 95 12 108.2	72 42.2 94 12 107.7	77 18.9 89 12 100.1	4
55	63 26.8 97 11 113.6	63 56.0 97 11 113.4	65 23.6 97 11 112.5	65 52.7 97 11 112.3	66 21.7 97 11 111.9	72 06.9 95 12 107.1	72 35.2 94 12 106.5	77 11.7 89 12 99.0	55
6	63 20.1 97 11 112.5	63 49.3 97 11 112.3	65 16.8 97 11 111.5	65 45.9 97 11 111.2	66 14.9 97 11 110.9	71 59.9 94 12 106.0	72 28.2 94 12 105.4	77 04.4 89 12 97.9	6
7	63 13.3 97 11 111.4	63 42.5 97 11 111.2	65 10.0 97 11 110.4	65 39.0 97 12 110.1	66 08.1 97 12 109.8	71 52.8 94 12 104.9	72 21.1 94 12 104.4	76 57.2 89 12 96.9	7
8	63 06.5 97 11 110.4	63 35.7 97 11 110.1	65 03.1 97 12 109.3	65 32.1 97 12 109.0	66 01.2 97 12 108.7	71 45.7 94 12 103.9	72 14.0 94 12 103.3	76 49.9 89 12 95.8	8
9	62 59.6 97 12 109.3	63 28.8 97 12 109.0	64 56.1 97 12 108.2	65 25.2 97 12 107.9	65 54.2 97 12 107.6	71 38.6 94 12 102.7	72 06.9 94 12 102.2	76 42.6 89 12 94.8	9
60	62 52.7 97 12 108.2	63 21.8 97 12 108.0	64 49.2 97 12 107.1	65 18.2 97 12 106.8	65 47.2 97 12 106.5	71 31.5 94 12 101.7	71 59.7 94 12 101.1	76 35.3 89 12 93.8	60
1	62 45.7 97 12 107.2	63 14.9 97 12 106.9	64 42.2 97 12 106.1	65 11.2 97 12 105.8	65 40.2 97 12 105.5	71 24.3 94 12 100.6	71 52.5 94 12 100.1	76 28.0 89 12 92.7	1
2	62 38.7 97 12 106.1	63 07.9 97 12 105.8	64 35.1 97 12 105.0	65 04.2 97 12 104.7	65 33.1 97 12 104.4	71 17.1 94 12 99.5	71 45.3 94 12 99.0	76 20.7 89 12 91.7	2
3	62 31.7 97 12 105.0	63 00.8 97 12 104.8	64 28.0 97 12 104.0	64 57.1 97 12 103.7	65 26.0 97 12 103.3	71 09.9 94 12 98.5	71 38.1 94 12 98.0	76 13.4 89 12 90.7	3
4	62 24.6 97 12 104.0	62 53.7 97 12 103.7	64 20.9 97 12 102.9	64 49.9 97 12 102.6	65 18.9 96 12 102.3	71 02.6 94 12 97.5	71 30.8 94 12 96.9	76 06.1 89 12 89.7	4
65	62 17.5 97 12 102.9	62 46.6 97 12 102.7	64 13.8 97 12 101.9	64 42.8 97 12 101.6	65 11.8 96 12 101.2	70 55.4 94 12 96.4	71 23.6 94 12 95.9	75 58.8 89 12 88.7	65
6	62 10.3 97 12 101.9	62 39.5 97 12 101.6	64 06.6 97 12 100.8	64 35.6 97 12 100.5	65 04.6 96 12 100.2	70 48.1 94 12 95.4	71 16.3 94 12 94.9	75 51.5 89 12 87.8	6
7	62 03.2 97 12 100.9	62 32.3 97 12 100.6	63 59.4 97 12 99.8	64 28.4 97 12 99.5	64 57.4 96 12 99.2	70 40.8 94 12 94.4	71 09.0 94 12 93.8	75 44.2 89 12 86.8	7
8	61 56.0 97 12 99.8	62 25.1 97 12 99.6	63 52.2 97 12 98.7	64 21.2 97 12 98.4	64 50.1 96 12 98.1	70 33.5 94 12 93.4	71 01.7 94 12 92.8	75 36.9 89 12 85.8	8
9	61 48.8 97 12 98.8	62 17.9 97 12 98.5	63 45.0 97 12 97.7	64 14.0 97 12 97.4	64 42.9 96 12 97.1	70 26.2 94 12 92.3	70 54.4 94 12 91.8	75 29.6 89 12 84.9	9
70	61 41.5 97 12 97.8	62 10.6 97 12 97.5	63 37.7 97 12 96.7	64 06.7 96 12 96.4	64 35.6 96 12 96.1	70 18.9 94 12 91.3	70 47.1 94 12 90.8	75 22.3 89 12 83.9	70
1	61 34.3 97 12 96.8	62 03.4 97 12 96.5	63 30.5 97 12 95.7	63 59.4 96 12 95.4	64 28.3 96 12 95.1	70 11.6 94 12 90.3	70 39.8 94 12 89.8	75 15.1 89 12 83.0	1
2	61 27.0 97 12 95.7	61 56.1 97 12 95.5	63 23.2 97 12 94.7	63 52.1 96 12 94.4	64 21.1 96 12 94.1	70 04.3 94 12 89.4	70 32.5 94 12 88.8	75 07.8 89 12 82.1	2
3	61 19.7 97 12 94.7	61 48.8 97 12 94.5	63 15.9 97 12 93.6	63 44.8 96 12 93.4	64 13.8 96 12 93.1	69 57.0 94 12 88.4	70 25.1 94 12 87.9	75 00.6 89 12 81.1	3
4	61 12.4 97 12 93.7	61 41.5 97 12 93.5	63 08.6 97 12 92.6	63 37.5 96 12 92.4	64 06.5 96 12 92.0	69 49.7 94 12 87.4	70 17.8 94 12 86.9	74 53.4 89 12 80.2	4
75	61 05.1 97 12 92.7	61 34.2 97 12 92.5	63 01.3 96 12 91.6	63 30.2 96 12 91.4	63 59.1 96 12 91.0	69 42.4 96 12 86.4	70 10.5 94 12 85.9	74 46.2 89 12 79.3	75
6	60 57.7 97 12 91.7	61 26.9 97 12 91.5	62 54.6 96 12 90.6	63 22.9 96 12 90.4	63 51.8 96 12 90.1	69 35.1 96 12 85.4	70 03.3 94 12 84.9	74 39.0 89 12 78.4	6
7	60 50.5 97 12 90.7	61 19.6 97 12 90.5	62 46.6 96 12 89.7	63 15.6 96 12 89.4	63 44.5 96 12 89.1	69 27.8 96 12 84.5	69 56.0 94 12 84.0	74 31.8 89 12 77.5	7
8	60 43.2 97 12 89.7	61 12.3 97 12 89.5	62 39.3 97 12 88.7	63 08.3 96 12 88.4	63 37.2 96 12 88.1	69 20.5 94 12 83.5	69 48.7 94 12 83.0	74 24.7 90 12 76.6	8
9	60 35.9 97 12 88.7	61 05.0 97 12 88.5	62 32.0 97 12 87.7	63 01.0 96 12 87.4	63 29.9 96 12 87.1	69 13.3 94 12 82.6	69 41.5 94 12 82.1	74 17.6 90 12 75.7	9
80	60 28.6 97 12 87.7	60 57.7 97 12 87.5	62 24.7 97 12 86.7	62 53.7 96 12 86.4	63 22.6 96 12 86.1	69 06.0 94 12 81.6	69 34.2 94 12 81.1	74 10.6 90 12 74.8	80
1	60 21.3 97 12 86.8	60 50.4 97 12 86.5	62 17.4 97 12 85.7	62 46.4 96 12 85.4	63 15.3 96 12 85.1	68 58.8 94 12 80.7	69 27.0 94 12 80.2	74 03.5 90 12 73.9	1
2	60 14.0 97 12 85.8	60 43.1 97 12 85.5	62 10.1 97 12 84.7	62 39.1 96 12 84.5	63 08.0 96 12 84.2	68 51.6 94 12 79.7	69 19.8 94 12 79.3	73 56.5 90 12 73.1	2
3	60 06.7 97 12 84.8	60 35.8 97 12 84.6	62 02.9 97 12 83.8	62 31.8 96 12 83.5	63 00.8 96 12 83.2	68 44.4 94 12 78.8	69 12.6 94 12 78.3	73 49.5 90 12 72.2	3
4	59 59.4 97 12 83.8	60 28.5 97 12 83.6	61 55.6 97 12 82.8	62 24.6 96 12 82.5	62 53.5 96 12 82.2	68 37.2 94 12 77.9	69 05.5 94 12 77.4	73 42.6 90 12 71.3	4
85	59 52.1 97 12 82.9	60 21.2 97 12 82.6	61 48.4 97 12 81.8	62 17.3 97 12 81.6	62 46.3 96 12 81.3	68 30.1 94 12 76.9	68 58.4 94 12 76.5	73 35.7 90 11 70.5	85
6	59 44.4 97 12 81.9	60 14.0 97 12 81.7	61 41.1 97 12 80.9	62 10.1 96 12 80.6	62 39.1 96 12 80.3	68 23.0 94 12 76.0	68 51.3 94 12 75.6	73 28.8 90 11 69.6	6
7	59 37.7 97 12 80.9	60 06.8 97 12 80.7	61 33.9 97 12 79.9	62 02.9 97 12 79.7	62 31.9 96 12 79.4	68 15.9 94 12 75.1	68 44.2 94 12 74.7	73 22.0 91 11 68.8	7
8	59 30.5 97 12 80.0	59 59.6 97 12 79.7	61 26.7 97 12 79.0	61 55.7 96 12 78.7	62 24.7 96 12 78.4	68 08.9 94 12 74.2	68 37.2 94 12 73.7	73 15.2 91 11 67.9	8
9	59 23.3 97 12 79.0	59 52.4 97 12 78.8	61 19.6 97 12 78.0	61 48.6 96 12 77.8	62 17.5 96 12 77.5	68 01.8 95 12 73.3	68 30.2 94 12 72.8	73 08.4 91 11 67.1	9
90	59 16.1 97 12 78.1	59 45.2 97 12 77.8	61 12.4 97 12 77.1	61 41.4 97 12 76.8	62 10.4 97 12 76.5	67 54.8 95 12 72.4	68 23.2 94 12 71.9	73 01.7 91 11 66.3	90

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H.A.	60° 00' Alt	Δd Δt	Az.	60° 30' Alt	Δd Δt	Az.	62° 00' Alt	Δd Δt	Az.	62° 30' Alt	Δd Δt	Az.	63° 00' Alt	Δd Δt	Az.	69° 00' Alt	Δd Δt	Az.	69° 30' Alt	Δd Δt	Az.	74° 30' Alt	Δd Δt	Az.	H.A.	Lat.
91	59 09.0	97 12	77.1	59 38.1	97 12	76.9	61 05.3	97 12	76.1	61 34.3	97 12	75.9	62 03.3	97 12	75.6	67 47.9	95 12	71.5	68 16.3	94 12	71.1	72 55.0	91 11	65.4	91	83°
2	59 01.8	97 12	76.2	59 31.0	97 12	76.0	60 58.2	97 12	75.2	61 27.2	97 12	74.7	61 56.2	97 12	74.7	67 41.0	95 11	70.6	68 09.4	94 11	70.2	72 48.4	91 11	64.6	2	
3	58 54.8	97 12	75.2	59 23.9	97 12	75.0	60 51.2	97 12	74.3	61 20.2	97 12	74.0	61 49.2	97 12	73.7	67 34.1	95 11	69.7	68 02.5	94 11	69.3	72 41.8	91 11	63.8	3	
4	58 47.7	97 12	74.3	59 16.9	97 12	74.1	60 44.2	97 12	73.3	61 13.2	97 12	73.1	61 42.2	97 12	72.8	67 27.3	95 11	68.8	67 55.7	95 11	68.4	72 35.3	91 11	63.0	4	
95	58 40.7	97 12	73.4	59 09.8	97 12	73.1	60 37.2	97 12	72.4	61 06.2	97 12	72.2	61 35.2	97 12	71.9	67 20.5	95 11	67.9	67 48.9	95 11	67.5	72 28.8	92 11	62.2	95	
6	58 33.7	97 12	72.4	59 02.9	97 12	72.2	60 30.2	97 12	71.5	60 59.3	97 12	71.2	61 28.3	97 11	71.0	67 13.7	95 11	67.0	67 42.2	95 11	66.6	72 22.3	92 11	61.4	6	
7	58 26.7	97 12	71.5	58 55.9	97 12	71.3	60 23.3	97 12	70.6	60 52.4	97 11	70.3	61 21.4	97 11	70.1	67 07.0	95 11	66.2	67 35.5	95 11	65.8	72 15.9	92 11	60.6	7	
8	58 19.8	97 11	70.6	58 49.0	97 11	70.4	60 16.4	97 11	69.6	60 45.5	97 11	69.4	61 14.6	97 11	69.1	67 00.3	95 11	65.3	67 28.8	95 11	64.9	72 09.6	92 11	59.7	8	
9	58 12.9	97 11	69.6	58 42.1	97 11	69.4	60 09.6	97 11	68.7	60 38.7	97 11	68.5	61 07.7	97 11	68.2	66 53.7	95 11	64.4	67 22.2	95 11	64.0	72 03.3	92 10	58.9	9	
100	58 06.1	97 11	68.7	58 35.3	97 11	68.5	60 02.8	97 11	67.8	60 31.9	97 11	67.6	61 01.0	97 11	67.3	66 47.1	95 11	63.6	67 15.7	95 11	63.2	71 57.1	92 11	58.1	100	
1	57 59.3	97 11	67.8	58 28.5	97 11	67.6	59 56.0	97 11	66.9	60 25.2	97 11	66.7	60 54.3	97 11	66.4	66 40.6	95 11	62.7	67 09.2	95 11	62.3	71 50.9	92 10	57.4	1	
2	57 52.6	97 11	66.9	58 21.8	97 11	66.7	59 49.2	97 11	66.0	60 18.5	97 11	65.8	60 47.6	97 11	65.5	66 34.2	95 11	61.8	67 02.7	95 11	61.4	71 44.8	92 10	56.6	2	
3	57 45.9	97 11	66.0	58 15.1	97 11	65.8	59 42.7	97 11	65.1	60 11.8	97 11	64.9	60 40.9	97 11	64.6	66 27.8	95 11	61.0	66 56.4	96 11	60.6	71 38.7	93 10	55.8	3	
4	57 39.2	98 11	65.1	58 08.5	97 11	64.9	59 36.1	97 11	64.2	60 05.2	97 11	64.0	60 34.4	97 11	63.7	66 21.4	96 11	60.1	66 50.0	96 10	59.7	71 32.7	93 10	55.0	4	
105	57 32.6	98 11	64.2	58 01.9	98 11	63.9	59 29.5	97 11	63.3	59 58.7	97 11	63.1	60 27.8	97 11	62.8	66 15.1	96 11	61.8	66 43.7	96 10	60.6	71 26.7	93 10	54.2	105	
6	57 26.1	98 11	63.2	57 55.3	98 11	63.0	59 23.0	97 11	62.4	59 52.2	97 11	62.2	60 21.4	97 11	61.9	66 08.8	96 10	58.4	66 37.5	96 10	58.0	71 20.8	93 10	53.4	6	
7	57 19.6	98 11	62.3	57 48.8	98 11	62.1	59 16.6	97 11	61.5	59 45.8	97 11	61.3	60 14.9	97 11	61.0	66 02.6	96 10	57.6	66 31.3	96 10	57.2	71 15.0	93 10	52.7	7	
8	57 13.1	98 11	61.4	57 42.4	98 11	61.2	59 10.2	97 11	60.4	59 39.4	97 11	60.4	60 08.6	97 11	60.1	65 56.5	96 10	56.7	66 25.0	96 10	56.4	71 09.2	93 10	51.9	8	
9	57 06.7	98 11	60.5	57 36.0	98 11	60.3	59 03.8	97 10	59.7	59 33.0	97 10	59.5	60 02.2	97 10	59.3	65 50.4	96 10	55.9	66 19.1	96 10	55.5	71 03.4	93 09	51.1	9	
110	57 00.4	98 10	59.6	57 29.7	98 10	59.4	58 57.5	98 10	58.8	59 26.8	97 10	58.6	59 56.0	97 10	58.4	65 44.3	96 10	55.0	66 13.1	96 10	54.7	70 57.8	94 09	50.3	110	
1	56 54.1	98 10	58.7	57 23.4	98 10	58.5	58 51.3	98 10	57.9	59 20.6	97 10	57.7	59 49.8	97 10	57.5	65 38.4	96 10	54.2	66 07.2	96 10	53.9	70 52.2	94 09	49.6	1	
2	56 47.8	98 10	57.8	57 17.2	98 10	57.7	58 45.1	98 10	57.0	59 14.4	98 10	56.8	59 43.7	97 10	56.6	65 32.5	96 10	53.4	66 01.3	96 10	53.0	70 46.7	94 09	48.8	2	
3	56 41.7	98 10	57.0	57 11.1	98 10	56.8	58 39.0	98 10	56.2	59 08.3	98 10	56.0	59 37.6	97 10	55.7	65 26.6	96 10	52.5	65 55.5	96 10	52.2	70 41.2	94 09	48.1	3	
4	56 35.6	98 10	56.1	57 05.9	98 10	55.9	58 33.0	98 10	55.3	59 02.3	98 10	55.1	59 31.6	98 10	54.9	65 20.9	96 10	51.7	65 49.8	96 00	51.4	70 35.8	94 09	47.3	4	
115	56 29.6	98 10	55.2	56 59.0	98 10	55.0	58 27.0	98 10	54.4	58 56.3	98 10	54.2	59 25.6	98 10	54.0	65 15.2	96 09	50.9	65 44.1	96 10	50.6	70 30.4	94 09	46.5	115	
6	56 23.6	98 10	54.3	56 53.0	98 10	54.1	58 21.1	98 10	53.5	58 50.4	98 10	53.3	59 19.7	98 10	53.1	65 09.5	97 00	50.1	65 38.5	96 00	49.7	70 25.2	96 00	45.8	6	
7	56 17.7	98 10	53.4	56 47.1	98 10	53.2	58 15.3	98 10	52.7	58 44.6	98 10	52.5	59 13.9	98 10	52.3	65 04.0	97 00	49.2	65 32.9	96 00	48.9	70 20.0	96 00	45.0	7	
8	56 11.9	98 10	52.5	56 41.3	98 10	52.3	58 09.5	98 10	51.8	58 38.8	98 10	52.5	59 08.2	98 09	51.4	64 58.5	97 00	48.4	65 27.4	97 00	48.1	70 14.8	95 08	44.3	8	
9	56 06.1	98 10	51.6	56 35.5	98 09	51.5	58 03.8	98 09	50.9	58 33.1	98 09	50.7	59 02.5	98 09	50.5	64 53.0	97 09	47.6	65 22.0	97 00	47.3	70 09.7	95 08	43.5	9	
120	56 00.4	98 09	50.8	56 29.9	98 09	50.6	57 58.1	98 09	50.0	58 27.5	98 09	49.9	58 56.9	98 09	49.7	64 47.7	97 09	46.8	65 16.7	97 09	46.5	70 04.7	95 08	42.8	120	
1	55 54.8	98 09	49.9	56 24.2	98 09	49.7	57 52.6	98 09	49.2	58 22.0	98 09	49.0	58 51.4	98 09	48.8	64 42.4	97 09	46.0	65 11.4	97 09	45.7	69 59.8	95 08	42.0	1	
2	55 49.2	98 09	49.0	56 18.7	98 09	48.8	57 47.1	98 09	48.3	58 16.5	98 09	48.1	58 45.9	98 09	47.9	64 37.1	97 08	45.2	65 06.1	97 08	44.9	69 55.0	95 08	41.3	2	
3	55 43.7	98 09	48.1	56 13.2	98 09	48.0	57 41.6	98 09	47.5	58 11.1	98 09	47.3	58 40.5	98 09	47.1	64 32.0	97 08	44.3	65 01.1	97 08	44.1	69 50.2	96 08	40.6	3	
4	55 38.3	98 09	47.3	56 07.8	98 09	47.1	57 36.3	98 09	46.6	58 05.7	98 09	46.4	58 35.2	98 09	46.2	64 26.9	97 08	43.5	64 56.1	97 08	43.3	69 45.4	96 08	39.8	4	
125	55 33.0	98 09	46.4	56 02.5	98 09	46.2	57 31.0	98 09	45.7	58 00.5	98 09	45.6	58 29.9	98 09	45.4	64 21.9	97 08	42.7	64 51.1	97 08	42.5	69 40.8	96 08	39.1	125	
6	55 27.7	98 09	45.5	55 57.3	98 09	45.4	57 25.8	98 08	44.9	57 55.3	98 08	44.7	58 24.8	98 08	44.5	64 17.0	97 08	41.9	64 46.2	97 08	41.7	69 36.2	96 08	38.3	6	
7	55 22.6	99 08	44.7	55 52.1	98 08	44.5	57 20.7	98 08	44.0	57 50.2	98 08	43.8	58 19.7	98 08	43.7	64 12.2	97 08	41.1	64 41.4	97 08	40.9	69 31.7	96 07	37.6	7	
8	55 17.5	99 08	43.8	55 47.0	99 08	43.2	57 15.7	98 08	43.2	57 45.2	98 08	43.0	58 14.7	98 08	42.8	64 07.4	97 08	40.3	64 36.6	97 08	40.1	69 27.3	96 07	36.9	8	
9	55 12.4	99 08	42.9	55 42.0	99 08	42.8	57 10.7	98 08	42.3	57 40.2	98 08	42.1	58 09.7	98 08	42.0	64 02.7	98 07	39.5	64 32.0	97 08	39.3	69 23.0	96 07	36.1	9	
130	55 07.5	99 08	42.1	55 37.1	99 08	41.9	57 05.8	99 08	41.5	57 35.4	98 08	41.3	58 04.9	98 08	41.1	63 58.1	98 07	38.7	64 27.4	98 06	38.5	69 18.7	96 07	35.4	130	
1	55 02.6	99 08	41.2	55 32.3	99 08	41.1	57 01.0	99 08	40.6	57 30.6	99 08	40.4	58 00.1	98 08	40.3	63 53.5	98 07	37.9	64 22.9	98 06	37.7	69 14.5	97 07	34.7	1	
2	54 57.9	99 08	40.3	55 27.5	99 08	40.2	56 56.3	99 08	39.8	57 25.9	99 08	39.6	57 55.4	98 08	39.4	63 49.1	98 07	37.1	64 18.4	98 07	36.3	69 10.4	97 07	34.0	2	
3	54 53.2	99 08	39.5	55 22.8	99 08	39.3	56 51.6	99 08	38.9	57 21.2	99 08	38.8	57 50.8	99 08	38.6	63 44.7	98 07	36.3	64 14.1	98 07	36.1	69 06.3	97 06	33.2	3	
4	54 48.6	99 08	38.6	55 18.2	99 08	38.5	56 47.1	99 07	38.1	57 16.7	99 07	38.1	57 46.3	99 07	37.8	63 40.4	98 07	35.5	64 09.8	97 08	35.3	69 02.3	97 06	32.5	4	84°
135	54 44.1	99 07	37.8	55 13.7	99 07	37.6	56 42.6	99 07	37.2	57 12.3	99 07	37.1	57 41.9	99 07	36.9	63 36.2	98 07	34.7	64 05.6	98 07	34.5	68 58.4	97 06	31.8	135	
6	54 39.6	99 07	36.9	55 09.3	99 07	36.8	56 38.3	99 07	36.4	57 07.9	99 07	36.2	57 37.5	99 07	36.1	63 32.1	98 07	34.0	64 01.5	98 07	33.7	68 54.6	97 06	31.1	6	
7	54 35.3	99 07	36.0	55 05.0	99 07	35.9	56 34.0	99 07	35.5	57 03.6	99 07	35.4	57 33.3	99 07	35.2	63 28.0	98 07	33.2	63 57.5	98 06	33.0	68 50.9	97 06	30.3	7	
8	54 31.0	99 07	35.2	55 00.7	99 07	35.1	56 29.8	99 07	34.7	56 59.4	99 07	34.6	57 29.1	99 07	34.4	63 24.1	98 06	32.4	63 53.6	98 06	32.2	68 47.2	97 06	29.6	8	
9	54 26.8	99 07	34.3	54 56.6	99 07	34.2	56 25.6	99 07	33.8	56 55.3	99 07	33.7	57 25.0	99 07	33.6	63 20.1	98 06	31.6	63 49.7	98 06	31.4	68 43.7	98 06	28.9	9	
140	54 22.8	99 07	33.5	54 52.5	99 07	33.4	56 21.6	99 07	33.0	56 51.3	99 07	32.9	57 21.0	99 07	32.7	63 16.4	98 06	30.8	63 46.0	98 06	30.6	68 40.2	98 06	28.2	140	
1	54 18.8	99 06	32.6	54 48.5	99 06	32.5	56 17.7	99 06	32.2	56 47.4	99 07	32.0	57 17.1	99 06	31.9	63 12.7	98 06	30.0	63 42.5	98 06	29.8	68 36.8	98 06	27.5	1	
2	54 14.9	99 06	31.8	54 44.6	99 06	31.7	56 13.8	99 06	31.3	56 43.6	99 06	31.2	57 13.3	99 06	31.1	63 09.1	98 06	29.2	63 38.7	98 06	29.1	68 33.4	98 05	26.7	2	
3	54 11.1	99 06	30.9	54 40.8	99 06	30.8	56 10.1	99 06	30.5	56 39.8	99 06	30.4	57 09.5	99 06	30.3	63 05.5	99 06	28.5	63 35.2	99 06	28.3	68 30.2	98 05	26.0	3	
4	54 07.4	99 06	30.1	54 37.1	99 06	30.0	56 06.4	99 06	29.7	56 36.2	99 06	29.5	57 05.9	99 06	29.4	63 02.1	99 06	27.7	63 31.8	99 06	27.5	68 27.0	98 05	25.3	4	85°
145	54 03.7	99 06	29.3	54 33.5	99 06	29.1	56 02.8	99 06	28.8	56 32.6	99 06	28.7	57 02.4	99 06	28.6	62 58.8	99 06	26.9	63 28.4	99 06	26.7	68 23.9	98 05	24.6	145	
6	54 00.2	99 06	28.4	54 30.0	99 06	28.3	55 59.4	99 06	28.0	56 29.1	99 06	27.9	56 58.9	99 06	27.8	62 55.5	99 05	26.1	63 25.2	99 05	26.0	68 20.9	98 05	23.9	6	
7	53 56.8	99 06	27.6	54 26.6	99 06	27.5	55 56.0	99 06	27.2	56 25.8	99 05	27.1	56 55.5	99 05	26.9	62 52.3	99 05	25.3	63 22.0	99 05	25.2	68 18.0	98 05	23.2	7	
8	53 53.4	99 06	26.7	54 23.3	99 06	26.6	55 52.7	99 05	26.3	56 22.5	99 05	26.2	56 52.3	99 05	26.1	62 49.3	99 05	24.5	63 19.0	99 05	24.4	68 15.2	98 05	22.5	8	
9	53 50.2	99 05	25.9	54 20.0	99 05	25.8	55 49.5	99 05	25.5	56 19.3	99 05	25.4	56 49.1	99 05	25.3	62 46.3	99 05	23.8	63 16.0	99 05	23.6	68 12.4	98 04	21.8	9	
150	53 47.1	99 05	25.0	54 16.9	99 05	24.9	55 46.4	99 05	24.7	56 16.2	99 05	24.6	56 46.0	99 05	24.5	62 43.4	99 05	23.0	63 13.1	99 05	22.9	68 09.8	98 04	21.1	150	
1	53 44.0	1.05	24.2	54 13.9	99 05	24.1	55 43.4	99 05	23.8	56 13.2	99 05	23.7	56 43.0	99 05	23.6	62 40.5	99 05	22.2	63 10.3	99 05	22.1	68 07.3	98 04	20.3	1	
2	53 41.1	1.05	23.4	54 10.9	1.05	23.3	55 40.5	99 05	23.0	56 10.3	99 05	22.9	56 40.2	99 05	22.8	62 37.7	99 04	21.5	63 07.6	99 04	21.3	68 04.7	99 04	20.3	2	
3	53 38.2	1.05	22.5	54 08.1	1.05	22.4	55 37.7	1.04	22.2	56 07.5	1.04	22.1	56 37.4	1.04	22.0	62 35.2	99 04	20.7	63 05.0	99 04	20.6	68 02.3	99 04	18.9	3	
4	53 35.5	1.04	21.7	54 05.3	1.04	21.6	55 35.0	1.04	21.4	56 04.8	1.04	21.3	56 34.7	1.04	21.2	62 32.7	99 04	19.9	63 02.5	99 04	19.8	67 59.9	99 04	18.2	4	86°
155	53 32.8	1.04	20.8	54 02.7	1.04	20.8	55 32.3	1.04	20.5	56 02.2	1.04	20.4	56 32.1	1.04	20.4	62 30.2	99 04	19.2	63 00.0	99 04	19.1	67 57.7	99 04	17.5	155	
6	53 30.3	1.04	20.0	54 00.0	1.04	19.9	55 29.8	1.04	19.7	55 59.7	1.04	19.6	56 29.6	1.04	19.5	62 27.9	99 04	18.4	62 57.7	99 04	18.3	67 55.5	99 03	16.8	6	
7	53 27.8	1.04	19.2	53 57.7	1.04	19.1	55 27.4	1.04	18.9	55 57.3	1.04	18.8	56 27.2	1.04	18.7	62 25.6	99 04	17.6	62 55.4	99 04	17.5	67 53.5	99 03	16.1	7	
8	53 25.5	1.04	18.3	53 55.4	1.04	18.3	55 25.1	1.04	18.1	55 55.0	1.04	18.0	56 24.9	1.04	17.9	62 23.4	1.03	16.8	62 53.3	99 03	16.7	67 51.5	99 03	15.4	8	
9	53 23.2	1.04	17.5	53 53.1	1.04	17.4	55 22.9	1.04	17.2	55 52.8	1.04	17.2	56 22.7	1.04	17.1	62 21.4	1.03	16.1	62 51.2	1.03	16.0	67 49.6	99 03	14.7	9	
160	53 21.1	1.03	16.6	53 51.0	1.03	16.6	55 20.8	1.03	16.4	55 50.7	1.03	16.3	56 20.6	1.03	16.3	62 19.4	1.03	15.3	62 49.3	1.03	15.2	67 47.8	99 03	14.0	160	
1	53 19.0	1.03	15.8	53 49.0	1.03	15.8	55 18.8	1.03	15.6	55 48.7	1.03	15.5	56 18.6	1.03	15.5	62 17.5	1.03	14.5	62 47.4	1.03	14.4	67 46.0	99 03	13.3	1	
2	53 17.1	1.03	15.0	53 47.0	1.03	14.9	55 16.8	1.03	14.8	55 46.8	1.03	14.7	56 16.7	1.03	14.6	62 15.7	1.03	13.8	62 45.6	1.03	13.7	67 44.4	99 03	12.6	2	
3	53 15.3	1.03	14.1	53 45.2	1.03	14.1	55 15.0	1.03	13.9	55 45.0	1.03	13.9	56 14.9	1.03	13.8	62 14.0	1.02	13.0	62 43.9	1.03	12.9	67 42.8	1.02	11.9	3	
4	53 13.5	1.03	13.3	53 43.5	1.03	13.3	55 13.3	1.03	13.1	55 43.2	1.03	13.1	56 13.2	1.03	13.0	62 12.4	1.02	12.2	62 42.4	1.02	12.2	67 41.4	1.02	11.2	4	87°
165	53 11.9	1.03	12.5	53 41.8	1.03	12.5	55 11.7	1.03	12.3	55 41.7	1.03	12.2	56 11.6	1.03	13.0	62 10.9	1.02	11.5	62 40.9	1.02	11.4	67 40.0	1.02	10.5	165	
6	53 10.4	1.02	11.6	53 40.3	1.02	11.6	55 10.1	1.02	11.5	55 40.2	1.02	11.5	56 10.1	1.02	11.4	62 09.5	1.02	10.7	62 39.5	1.02	10.6	67 38.7	1.02	09.8	6	
7	53 08.9	1.02	10.8	53 38.9	1.02	10.8	55 08.8	1.02	10.6	55 38.8	1.02	10.6	56 08.7	1.02	10.6	62 08.2	1.02	09.9	62 38.2	1.02	09.9	67 37.5	1.02	09.1	7	
8	53 07.6	1.02	09.9	53 37.6	1.02	09.9	55 07.5	1.02	09.8	55 37.5	1.02	09.8	56 07.4	1.02	09.7	62 07.0	1.02	09.2	62 37.0	1.02	09.1	67 36.4	1.02	08.4	8	
9	53 06.4	1.02	09.1	53 36.4	1.02	09.1	55 06.3	1.02	09.0	55 37.5	1.02	08.9	56 07.5	1.02	08.9	62 05.9	1.02	08.4	62 35.8	1.02	09.1	67 35.4	1.02	07.7	9	
170	53 05.3	1.02	08.3	53 35.3	1.02	08.3	55 05.2	1.02	08.2	55 35.2	1.02	08.2	56 05.2	1.02	08.1	62 05.9	1.00	09.2	62 37.0	1.02	09.9	67 37.5	1.02	09.1	170	
1	53 04.3	1.02	07.5	53 34.3	1.01	07.5	55 04.2	1.01	07.4	55 35.2	1.02	07.3	56 05.2	1.02	07.3	62 04.9	1.02	07.6	62 34.8	1.02	07.6	67 34.4	1.02	07.0	1	
2	53 02.6	1.01	06.6	53 33.4	1.01	06.6	55 03.3	1.01	06.6	55 03.3	1.01	06.5	56 03.3	1.01	06.5	62 03.9	1.01	06.9	62 33.9	1.01	06.8	67 33.6	1.01	06.3	2	
3	53 01.9	1.01	05.8	53 31.9	1.01	05.8	55 01.9	1.01	05.7	55 32.5	1.01	05.7	56 02.5	1.01	05.7	62 03.1	1.01	06.9	62 33.1	1.01	06.1	67 33.0	1.01	05.6	3	88°
175	53 01.3	1.01	04.2	53 31.3	1.01	04.1	55 01.3	1.01	04.1	55 31.3	1.01	04.1	56 01.3	1.01	04.1	62 02.4	1.01	05.3	62 32.4	1.01	05.3	67 32.8	1.01	04.9	175	
6	53 00.8	1.01	03.3	53 30.8	1.01	03.3	55 00.8	1.01	03.3	55 30.8	1.01	03.3	56 00.8	1.01	03.3	62 01.8	1.01	04.6	62 31.7	1.01	04.6	67 32.2	1.01	04.2	6	
7	53 00.5	1.00	02.5	53 30.5	1.00	02.5	55 00.5	1.00	02.5	55 30.5	1.00	02.4	56 00.5	1.00	02.4	62 01.2	1.00	03.8	62 31.2	1.00	03.8	67 31.6	1.01	03.5	7	
8	53 00.2	1.00	01.7	53 30.2	1.00	01.7	55 00.2	1.00	01.6	55 30.2	1.00	01.6	56 00.2	1.00	01.6	62 00.8	1.00	03.1	62 30.8	1.00	03.0	67 31.0	1.00	02.1	8	
9	53 00.1	1.00	00.8	53 30.1	1.00	00.8	55 00.1	1.00	00.8	55 30.1	1.00	00.8	56 00.1	1.00	00.8	62 00.4	1.00	02.3	62 30.4	1.00	02.3	67 30.7	1.00	01.4	9	
180	53 00.0	1.00	00.0	53 30.0	1.00	00.0	55 00.0	1.00	00.0	55 30.0	1.00	00.0	56 00.0	1.00	00.0	62 00.0	1.00	00.0	62 30.0	1.00	00.0	67 30.0	1.00	00.0	180	

STAR IDENTIFICATION TABLE

ALTITUDE

AZ.	4° Dec.	4° H.A.	8° Dec.	8° H.A.	12° Dec.	12° H.A.	16° Dec.	16° H.A.	20° Dec.	20° H.A.	24° Dec.	24° H.A.	28° Dec.	28° H.A.	32° Dec.	32° H.A.	36° Dec.	36° H.A.	40° Dec.	40° H.A.	44° Dec.	44° H.A.	AZ.
00	11	180	15	180	19	180	23	180	27	180	31	180	35	180	39	180	43	180	47	180	51	180	00
4	11	176	15	176	19	176	23	176	27	176	31	176	35	176	39	176	43	176	47	176	51	175	4
8	11	172	15	172	19	172	23	172	27	172	31	171	35	171	39	171	43	171	47	171	51	171	8
12	11	168	15	168	19	168	23	167	27	167	31	167	35	167	39	167	43	167	47	167	51	166	12
16	11	164	15	164	19	163	23	163	27	163	31	163	35	163	39	163	43	162	47	162	51	162	16
20	11	160	15	160	19	159	23	159	27	159	31	159	35	158	39	158	43	158	47	158	51	157	20
24	10	156	14	155	18	155	22	155	26	155	30	154	34	154	38	154	42	154	46	153	50	153	24
28	10	152	14	151	18	151	22	151	26	151	30	150	34	150	38	150	42	149	46	149	50	148	28
32	10	148	14	147	18	147	22	147	26	146	30	146	34	146	38	145	42	145	46	144	50	144	32
36	10	144	14	143	18	143	22	143	26	142	30	142	34	141	38	141	42	141	46	140	50	139	36
40	09	139	13	139	17	139	21	138	25	138	29	138	33	137	37	137	41	136	45	136	49	135	40
44	09	135	13	135	17	135	21	134	25	134	29	134	33	133	37	133	41	132	45	131	49	131	44
48	09	131	13	131	17	131	21	130	25	130	29	129	33	129	37	128	40	128	44	127	48	126	48
52	08	127	12	127	16	127	20	126	24	126	28	125	32	125	36	124	40	124	44	123	48	122	52
56	08	123	12	123	16	123	20	122	24	122	28	121	32	121	36	120	40	119	44	119	48	118	56
60	07	119	11	119	15	119	19	118	23	118	27	117	31	116	35	116	39	115	43	114	47	114	60
64	07	115	11	115	15	114	19	114	23	113	27	113	31	112	35	112	39	111	43	110	47	109	64
68	07	111	11	111	15	110	19	110	22	109	26	109	30	108	34	108	38	107	42	106	46	105	68
72	06	107	10	107	14	106	18	106	22	105	26	105	30	104	34	104	38	103	42	102	46	101	72
76	06	103	10	103	14	102	18	102	22	101	26	101	29	100	33	100	37	99	41	98	45	97	76
80	05	99	09	99	13	98	17	98	21	97	25	97	29	96	33	96	37	95	41	94	45	93	80
84	05	95	09	95	13	94	17	94	21	93	25	93	29	92	32	92	36	91	40	90	44	89	84
88	04	91	08	91	12	91	16	90	20	89	24	89	28	88	32	88	36	87	40	86	44	85	88
92	04	88	08	87	12	87	16	86	20	85	24	85	28	84	31	84	35	83	39	82	43	81	92
96	03	84	07	83	11	83	15	82	19	82	23	81	27	80	31	80	35	79	39	78	43	77	96
100	03	80	07	79	11	79	15	78	19	78	23	77	27	76	31	76	34	75	38	74	42	74	100
104	02	76	06	75	10	75	14	74	18	74	22	73	26	73	30	72	34	71	38	71	42	70	104
108	02	72	06	71	10	71	14	70	18	70	22	69	26	69	30	68	34	67	38	67	41	66	108
112	01	68	05	67	09	67	13	66	17	66	21	65	25	65	29	64	33	64	37	63	41	62	112
116	01	64	05	63	09	63	13	62	17	62	21	61	25	61	29	60	33	60	37	59	41	58	116
120	00	60	04	59	08	59	12	58	16	58	20	58	24	57	28	57	32	56	36	55	40	55	120
124	00	56	04	55	08	55	12	55	16	54	20	54	24	53	28	53	32	52	36	52	40	51	124
128	*00*	52	04	51	08	51	12	51	16	50	20	50	24	49	28	49	32	48	35	48	39	47	128
132	*01*	48	03	47	07	47	11	47	15	46	19	46	23	46	27	45	31	45	35	44	39	44	132
136	*01*	44	03	44	07	43	11	43	15	42	19	42	23	42	27	41	31	41	35	40	39	40	136
140	*01*	40	03	40	07	39	11	39	15	39	19	38	23	38	27	38	31	37	35	37	38	36	140
144	*02*	36	02	36	06	35	10	35	14	35	18	34	22	34	26	34	30	33	34	33	38	33	144
148	*02*	32	02	32	06	31	10	31	14	31	18	31	22	30	26	30	30	30	34	29	38	29	148
152	*02*	28	02	28	06	27	10	27	14	27	18	27	22	27	26	26	30	26	34	26	38	25	152
156	*02*	24	02	24	06	24	10	23	14	23	18	23	22	23	26	22	30	22	34	22	38	22	156
160	*03*	20	01	20	05	20	09	19	13	19	17	19	21	19	25	19	29	19	33	18	37	18	160
164	*03*	16	01	16	05	16	09	16	13	15	17	15	21	15	25	15	29	15	33	15	37	14	164
168	*03*	12	01	12	05	12	09	12	13	12	17	11	21	11	25	11	29	11	33	11	37	11	168
172	*03*	08	01	08	05	08	09	08	13	08	17	08	21	08	25	07	29	07	33	07	37	07	172
176	*03*	04	01	04	05	04	09	04	13	04	17	04	21	04	25	04	29	04	33	04	37	04	176
180	*03*	00	01	00	05	00	09	00	13	00	17	00	21	00	25	00	29	00	33	00	37	00	180
	4°		8°		12°		16°		20°		24°		28°		32°		36°		40°		44°		

FIGURES IN ITALICS INDICATE THAT DECLINATION IS OF CONTRARY NAME TO LATITUDE

STAR IDENTIFICATION TABLE

ALTITUDE

AZ.	48° Dec.	48° H.A.	52° Dec.	52° H.A.	56° Dec.	56° H.A.	60° Dec.	60° H.A.	64° Dec.	64° H.A.	68° Dec.	68° H.A.	72° Dec.	72° H.A.	76° Dec.	76° H.A.	80° Dec.	80° H.A.	84° Dec.	84° H.A.	88° Dec.	88° H.A.	AZ.
°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
00	55	180	59	180	63	180	67	180	71	180	75	180	79	180	83	180	87	180	89	00	85	00	00
4	55	175	59	175	63	175	67	175	71	175	75	174	79	174	83	172	87	167	89	22	85	02	4
8	55	171	59	170	63	170	67	170	71	169	75	168	79	167	83	164	87	154	89	38	85	03	8
12	55	166	59	166	63	165	67	165	71	164	75	163	79	161	83	157	87	143	88	48	85	05	12
16	55	161	59	161	63	160	67	160	71	159	75	157	79	155	82	149	86	134	88	53	85	06	16
20	55	157	58	156	62	156	66	155	70	153	74	152	78	148	82	142	86	125	88	56	85	08	20
24	54	152	58	152	62	151	66	150	70	148	74	146	78	143	82	136	85	118	87	58	85	09	24
28	54	148	58	147	62	146	66	145	70	143	74	141	78	137	82	130	85	112	87	59	85	10	28
32	54	143	58	142	62	141	66	140	70	138	74	136	77	131	81	124	84	106	86	59	85	11	32
36	53	139	57	138	61	137	65	135	69	133	73	130	77	126	81	118	84	101	86	59	84	12	36
40	53	134	57	133	61	132	65	131	69	128	73	126	77	121	80	113	84	96	85	58	84	13	40
44	53	130	57	129	61	128	65	126	69	124	72	121	76	116	80	108	83	92	85	57	84	14	44
48	52	125	56	124	60	123	64	121	68	119	72	116	76	111	79	103	83	88	85	56	84	15	48
52	52	121	56	120	60	119	64	117	68	115	72	111	75	107	79	99	82	84	84	55	84	15	52
56	52	117	55	116	59	114	63	113	67	110	71	107	75	102	78	95	82	81	84	54	84	16	56
60	51	113	55	111	59	110	63	108	67	106	71	103	74	98	78	90	81	77	83	53	84	16	60
64	51	108	55	107	59	106	62	104	66	102	70	98	74	94	77	87	81	74	83	51	84	16	64
68	50	104	54	103	58	102	62	100	66	97	70	94	73	90	77	83	80	71	83	50	83	17	68
72	50	100	54	99	58	98	61	96	65	93	69	90	73	86	76	79	80	68	82	48	83	17	72
76	49	96	53	95	57	94	61	92	65	89	69	86	72	82	76	76	79	65	82	47	83	17	76
80	49	92	53	91	57	90	60	88	64	85	68	83	72	78	76	72	79	62	82	45	83	17	80
84	48	88	52	87	56	86	60	84	64	82	68	79	71	75	75	69	78	59	81	43	83	16	84
88	48	84	52	83	56	82	60	80	63	78	67	75	71	71	75	66	78	57	81	42	83	16	88
92	47	80	51	79	55	78	59	76	63	74	67	71	70	68	74	62	78	54	81	40	83	16	92
96	47	76	51	75	55	74	59	72	62	70	66	68	70	64	74	59	77	51	80	38	83	15	96
100	46	73	50	72	54	70	58	69	62	67	66	64	70	61	73	56	77	49	80	36	82	15	100
104	46	69	50	68	54	67	58	65	62	63	65	61	69	58	73	53	76	46	80	35	82	15	104
108	45	65	49	64	53	63	57	61	61	60	65	57	69	54	73	50	76	44	79	33	82	14	108
112	45	61	49	60	53	59	57	58	61	56	65	54	68	51	72	47	76	41	79	31	82	14	112
116	45	58	49	57	52	56	56	54	60	53	64	51	68	48	72	44	76	39	79	29	82	13	116
120	44	54	48	53	52	52	56	51	60	49	64	47	68	45	72	41	75	36	79	28	82	12	120
124	44	50	48	49	52	48	56	47	60	46	63	44	67	42	71	38	75	34	79	26	82	12	124
128	43	47	47	46	51	45	55	44	59	42	63	41	67	39	71	36	75	31	78	24	82	11	128
132	43	43	47	42	51	41	55	40	59	39	63	38	67	36	71	33	74	29	78	22	82	10	132
136	43	39	47	39	51	38	55	37	59	36	63	34	66	33	70	30	74	26	78	20	81	09	136
140	42	36	46	35	50	34	54	33	58	32	62	31	66	30	70	27	74	24	78	19	81	09	140
144	42	32	46	32	50	31	54	30	58	29	62	28	66	27	70	24	74	21	78	17	81	08	144
148	42	28	46	28	50	27	54	27	58	26	62	25	66	24	70	22	74	19	78	15	81	07	148
152	42	25	46	24	50	24	54	23	58	23	62	22	66	21	70	19	73	17	77	13	81	06	152
156	42	21	46	21	50	21	54	20	57	19	61	19	65	18	69	16	73	14	77	11	81	05	156
160	41	18	45	17	49	17	53	17	57	16	61	15	65	15	69	14	73	12	77	09	81	04	160
164	41	14	45	14	49	14	53	13	57	13	61	12	65	12	69	11	73	10	77	07	81	04	164
168	41	11	45	10	49	10	53	10	57	10	61	09	65	09	69	08	73	07	77	06	81	03	168
172	41	07	45	07	49	07	53	07	57	06	61	06	65	06	69	05	73	05	77	04	81	02	172
176	41	04	45	03	49	03	53	03	57	03	61	03	65	03	69	03	73	02	77	02	81	01	176
180	41	00	45	00	49	00	53	00	57	00	61	00	65	00	69	00	73	00	77	00	81	00	180
	48°		52°		56°		60°		64°		68°		72°		76°		80°		84°		88°	

FIGURES IN ITALICS INDICATE THAT DECLINATION IS OF CONTRARY NAME TO LATITUDE

16—43722-1

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Lat. 84°

H.A.	0° 00′ (Alt. · Δd Δt · Az.)	0° 30′	1° 00′	1° 30′	2° 00′	2° 30′	3° 00′	3° 30′	H.A.
00	6 00.0 1.00 0 180.0	6 30.0 1.00 0 180.0	7 00.0 1.00 0 180.0	7 30.0 1.00 0 180.0	8 00.0 1.00 0 180.0	8 30.0 1.00 0 180.0	9 00.0 1.00 0 180.0	9 30.0 1.00 0 180.0	00
1	5 59.9 1.00 0 179.0	6 29.9 1.00 0 179.0	6 59.9 1.00 0 179.0	7 29.9 1.00 0 179.0	7 59.9 1.00 0 179.0	8 29.9 1.00 0 179.0	8 59.9 1.00 0 179.0	9 29.9 1.00 0 179.0	1
2	5 59.8 1.00 0 178.0	6 29.8 1.00 0 178.0	6 59.8 1.00 0 178.0	7 29.8 1.00 0 178.0	7 59.8 1.00 0 178.0	8 29.8 1.00 0 178.0	8 59.8 1.00 0 178.0	9 29.8 1.00 0 178.0	2
3	5 59.5 1.00 1 177.0	6 29.5 1.00 1 177.0	6 59.5 1.00 1 177.0	7 29.5 1.00 1 177.0	7 59.5 1.00 1 177.0	8 29.5 1.00 1 177.0	8 59.5 1.00 1 177.0	9 29.5 1.00 1 177.0	3
4	5 59.1 1.00 1 176.0	6 29.1 1.00 1 176.0	6 59.1 1.00 1 176.0	7 29.1 1.00 1 176.0	7 59.1 1.00 1 176.0	8 29.1 1.00 1 176.0	8 59.1 1.00 1 176.0	9 29.1 1.00 1 176.0	4
05	5 58.6 1.00 1 175.0	6 28.6 1.00 1 175.0	6 58.6 1.00 1 175.0	7 28.6 1.00 1 175.0	7 58.6 1.00 1 175.0	8 28.6 1.00 1 174.9	8 58.6 1.00 1 174.9	9 28.6 1.00 1 174.9	05
6	5 58.0 1.00 1 174.0	6 28.0 1.00 1 174.0	6 58.0 1.00 1 174.0	7 28.0 1.00 1 174.0	7 58.0 1.00 1 173.9	8 28.0 1.00 1 173.9	8 58.0 1.00 1 173.9	9 28.0 1.00 1 173.9	6
7	5 57.3 1.00 1 173.0	6 27.3 1.00 1 173.0	6 57.3 1.00 1 173.0	7 27.3 1.00 1 172.9	7 57.3 1.00 1 172.9	8 27.3 1.00 1 172.9	8 57.3 1.00 1 172.9	9 27.3 1.00 1 172.9	7
8	5 56.5 1.00 2 172.0	6 26.5 1.00 2 171.9	6 56.5 1.00 2 171.9	7 26.5 1.00 2 171.9	7 56.5 1.00 2 171.9	8 26.5 1.00 2 171.9	8 56.5 1.00 2 171.9	9 26.5 1.00 2 171.9	8
9	5 55.6 1.00 2 171.0	6 25.5 1.00 2 170.9	6 55.5 1.00 2 170.9	7 25.5 1.00 2 170.9	7 55.5 1.00 2 170.9	8 25.5 1.00 2 170.9	8 55.5 1.00 2 170.9	9 25.5 1.00 2 170.9	9
10	5 54.5 1.00 2 169.9	6 24.5 1.00 2 169.9	6 54.5 1.00 2 169.9	7 24.5 1.00 2 169.9	7 54.5 1.00 2 169.9	8 24.5 1.00 2 169.9	8 54.5 1.00 2 169.9	9 24.5 1.00 2 169.9	10
1	5 53.4 1.00 2 168.9	6 23.4 1.00 2 168.9	6 53.4 1.00 2 168.9	7 23.3 1.00 2 168.9	7 53.3 1.00 2 168.9	8 23.3 1.00 2 168.9	8 53.3 1.00 2 168.9	9 23.3 1.00 2 168.9	1
2	5 52.1 1.00 2 167.9	6 22.1 1.00 2 167.9	6 52.1 1.00 2 167.9	7 22.1 1.00 2 167.9	7 52.1 1.00 2 167.9	8 22.1 1.00 2 167.9	8 52.1 1.00 2 167.9	9 22.1 1.00 2 167.9	2
3	5 50.7 1.00 2 166.9	6 20.7 1.00 2 166.9	6 50.7 1.00 2 166.9	7 20.7 1.00 2 166.9	7 50.7 1.00 2 166.9	8 20.7 1.00 2 166.9	8 50.7 1.00 2 166.9	9 20.7 1.00 2 166.8	3
4	5 49.3 1.00 3 165.9	6 19.3 1.00 3 165.9	6 49.3 1.00 3 165.9	7 19.2 1.00 3 165.9	7 49.2 1.00 3 165.9	8 19.2 1.00 3 165.9	8 49.2 1.00 3 165.8	9 19.2 1.00 3 165.8	4
15	5 47.7 1.00 3 164.9	6 17.7 1.00 3 164.9	6 47.7 1.00 3 164.9	7 17.7 1.00 3 164.9	7 47.6 1.00 3 164.9	8 17.6 1.00 3 164.9	8 47.6 1.00 3 164.8	9 17.6 1.00 3 164.8	15
6	5 46.0 1.00 3 163.9	6 16.0 1.00 3 163.9	6 46.0 1.00 3 163.9	7 16.0 1.00 3 163.9	7 46.0 1.00 3 163.9	8 15.9 1.00 3 163.8	8 45.9 1.00 3 163.8	9 15.9 1.00 3 163.8	6
7	5 44.2 1.00 3 162.9	6 14.2 1.00 3 162.9	6 44.2 1.00 3 162.9	7 14.2 1.00 3 162.9	7 44.2 1.00 3 162.8	8 14.1 1.00 3 162.8	8 44.1 1.00 3 162.8	9 14.1 1.00 3 162.8	7
8	5 42.3 1.00 3 161.9	6 12.3 1.00 3 161.9	6 42.3 1.00 3 161.9	7 12.3 1.00 3 161.9	7 42.3 1.00 3 161.8	8 12.2 1.00 3 161.8	8 42.2 1.00 3 161.8	9 12.2 1.00 3 161.8	8
9	5 40.3 1.00 4 160.9	6 10.3 1.00 4 160.9	6 40.3 1.00 4 160.9	7 10.3 1.00 4 160.9	7 40.3 1.00 4 160.8	8 10.2 1.00 4 160.8	8 40.2 1.00 4 160.8	9 10.2 1.00 4 160.8	9
20	5 38.2 1.00 4 159.9	6 08.2 1.00 4 159.9	6 38.2 1.00 4 159.9	7 08.2 1.00 4 159.8	7 38.1 1.00 4 159.8	8 08.1 1.00 4 159.8	8 38.1 1.00 4 159.8	9 08.1 1.00 4 159.8	20
1	5 36.0 1.00 4 158.9	6 06.0 1.00 4 158.9	6 36.0 1.00 4 158.9	7 05.9 1.00 4 158.8	7 35.9 1.00 4 158.8	8 05.9 1.00 4 158.8	8 35.9 1.00 4 158.8	9 05.9 1.00 4 158.8	1
2	5 33.7 1.00 4 157.9	6 03.7 1.00 4 157.9	6 33.7 1.00 4 157.9	7 03.6 1.00 4 157.8	7 33.6 1.00 4 157.8	8 03.6 1.00 4 157.8	8 33.6 1.00 4 157.8	9 03.5 1.00 4 157.8	2
3	5 31.3 1.00 4 156.9	6 01.3 1.00 4 156.9	6 31.2 1.00 4 156.8	7 01.2 1.00 4 156.8	7 31.2 1.00 4 156.8	8 01.2 1.00 4 156.8	8 31.1 1.00 4 156.8	9 01.1 1.00 4 156.7	3
4	5 28.8 1.00 4 155.9	5 58.7 1.00 4 155.9	6 28.7 1.00 4 155.8	6 58.7 1.00 4 155.8	7 28.7 1.00 4 155.8	7 58.6 1.00 4 155.8	8 28.6 1.00 4 155.8	8 58.6 1.00 4 155.7	4
25	5 26.2 1.00 5 154.9	5 56.1 1.00 5 154.9	6 26.1 1.00 5 154.8	6 56.1 1.00 5 154.8	7 26.0 1.00 5 154.8	7 56.0 1.00 5 154.8	8 26.0 1.00 5 154.7	8 56.0 1.00 5 154.7	25
6	5 23.5 1.00 5 153.9	5 53.4 1.00 5 153.9	6 23.4 1.00 5 153.8	6 53.4 1.00 5 153.8	7 23.3 1.00 5 153.8	7 53.3 1.00 5 153.8	8 23.3 1.00 5 153.7	8 53.2 1.00 5 153.7	6
7	5 20.6 1.00 5 152.9	5 50.6 1.00 5 152.8	6 20.5 1.00 5 152.8	6 50.5 1.00 5 152.8	7 20.5 1.00 5 152.8	7 50.5 1.00 5 152.8	8 20.4 1.00 5 152.7	8 50.4 1.00 5 152.7	7
8	5 17.7 1.00 5 151.9	5 47.7 1.00 5 151.8	6 17.7 1.00 5 151.8	6 47.6 1.00 5 151.8	7 17.6 1.00 5 151.8	7 47.5 1.00 5 151.7	8 17.5 1.00 5 151.7	8 47.5 1.00 5 151.7	8
9	5 14.7 1.00 5 150.9	5 44.7 1.00 5 150.8	6 14.5 1.00 5 150.8	6 44.6 1.00 5 150.8	7 14.6 1.00 5 150.8	7 44.5 1.00 5 150.7	8 14.5 1.00 5 150.7	8 44.5 1.00 5 150.7	9
30	5 11.6 1.00 5 149.9	5 41.6 1.00 5 149.8	6 11.5 1.00 5 149.8	6 41.5 1.00 5 149.8	7 11.5 1.00 5 149.8	7 41.4 1.00 5 149.7	8 11.4 1.00 5 149.7	8 41.3 1.00 5 149.7	30
1	5 08.4 1.00 6 148.9	5 38.4 1.00 6 148.8	6 08.3 1.00 6 148.8	6 38.3 1.00 6 148.8	7 08.3 1.00 6 148.8	7 38.2 1.00 6 148.7	8 08.2 1.00 6 148.7	8 38.1 1.00 6 148.7	1
2	5 05.1 1.00 6 147.9	5 35.1 1.00 6 147.8	6 05.0 1.00 6 147.8	6 35.0 1.00 6 147.7	7 05.0 1.00 6 147.7	7 34.9 1.00 6 147.7	8 04.9 1.00 6 147.7	8 34.8 1.00 6 147.7	2
3	5 01.8 1.00 6 146.9	5 31.7 1.00 6 146.8	6 01.7 1.00 6 146.8	6 31.6 1.00 6 146.8	7 01.6 1.00 6 146.7	7 31.5 1.00 6 146.7	8 01.5 1.00 6 146.7	8 31.4 1.00 6 146.7	3
4		5 28.2 1.00 6 145.8	5 58.1 1.00 6 145.8	6 28.1 1.00 6 145.8	6 58.1 1.00 6 145.7	7 28.0 1.00 6 145.7	7 58.0 1.00 6 145.7	8 27.9 1.00 6 145.6	4
35		5 24.7 1.00 6 144.8	5 54.6 1.00 6 144.8	6 24.6 1.00 6 144.8	6 54.5 1.00 6 144.7	7 24.4 1.00 6 144.7	7 54.4 1.00 6 144.7	8 24.3 1.00 6 144.6	35
6		5 21.0 1.00 6 143.8	5 50.9 1.00 6 143.8	6 20.9 1.00 6 143.8	6 50.8 1.00 6 143.7	7 20.8 1.00 6 143.7	7 50.7 1.00 6 143.7	8 20.7 1.00 6 143.6	6
7		5 17.3 1.00 6 142.8	5 47.2 1.00 6 142.8	6 17.1 1.00 6 142.8	6 47.1 1.00 6 142.7	7 17.0 1.00 6 142.7	7 47.0 1.00 6 142.7	8 16.9 1.00 6 142.6	7
8		5 13.4 1.00 7 141.8	5 43.4 1.00 7 141.8	6 13.3 1.00 7 141.8	6 43.2 1.00 7 141.7	7 13.2 1.00 7 141.7	7 43.1 1.00 7 141.7	8 13.0 1.00 7 141.6	8
9		5 09.5 1.00 7 140.8	5 39.4 1.00 7 140.8	6 09.4 1.00 7 140.7	6 39.3 1.00 7 140.7	7 09.2 1.00 7 140.7	7 39.2 1.00 7 140.6	8 09.1 1.00 7 140.6	9
40		5 05.5 1.00 7 139.8	5 35.4 1.00 7 139.8	6 05.4 1.00 7 139.7	6 35.3 1.00 7 139.7	7 05.2 1.00 7 139.7	7 35.2 1.00 7 139.6	8 05.1 1.00 7 139.6	40
1		5 01.4 1.00 7 138.8	5 31.3 1.00 7 138.8	6 01.3 1.00 7 138.7	6 31.2 1.00 7 138.7	7 01.1 1.00 7 138.7	7 31.1 1.00 7 138.6	8 01.0 1.00 7 138.6	1
2			5 27.2 1.00 7 137.8	5 57.1 1.00 7 137.7	6 27.0 1.00 7 137.7	6 56.9 1.00 7 137.7	7 26.9 1.00 7 137.6	7 56.8 1.00 7 137.6	2
3			5 22.9 1.00 7 136.8	5 52.8 1.00 7 136.7	6 22.8 1.00 7 136.7	6 52.7 1.00 7 136.7	7 22.6 1.00 7 136.6	7 52.5 1.00 7 136.6	3
4			5 18.6 1.00 7 135.8	5 48.5 1.00 7 135.7	6 18.4 1.00 7 135.7	6 48.3 1.00 7 135.7	7 18.3 1.00 7 135.6	7 48.2 1.00 7 135.6	4
45			5 14.2 1.00 8 134.8	5 44.1 1.00 8 134.7	6 14.0 1.00 8 134.7	6 43.9 1.00 8 134.7	7 13.8 1.00 8 134.6	7 43.7 1.00 8 134.6	45
6			5 09.7 1.00 8 133.8	5 39.6 1.00 8 133.7	6 09.5 1.00 8 133.7	6 39.4 1.00 8 133.7	7 09.3 1.00 8 133.6	7 39.2 1.00 8 133.6	6
7			5 05.1 1.00 8 132.8	5 35.0 1.00 8 132.7	6 04.9 1.00 8 132.7	6 34.8 1.00 8 132.7	7 04.7 1.00 8 132.6	7 34.7 1.00 8 132.6	7
8			5 00.5 1.00 8 131.8	5 30.4 1.00 8 131.7	6 00.3 1.00 8 131.7	6 30.2 1.00 8 131.6	7 00.1 1.00 8 131.6	7 30.0 1.00 8 131.6	8
9				5 25.7 1.00 8 130.7	5 55.6 1.00 8 130.7	6 25.5 1.00 8 130.6	6 55.4 1.00 8 130.6	7 25.3 1.00 8 130.6	9
50				5 20.9 1.00 8 129.7	5 50.8 1.00 8 129.7	6 20.7 1.00 8 129.6	6 50.6 1.00 8 129.6	7 20.5 1.00 8 129.6	50
1				5 16.0 1.00 8 128.7	5 45.9 1.00 8 128.7	6 15.8 1.00 8 128.6	6 45.7 1.00 8 128.6	7 15.6 1.00 8 128.6	1
2				5 11.1 1.00 8 127.7	5 41.0 1.00 8 127.7	6 10.9 1.00 8 127.6	6 40.8 1.00 8 127.6	7 10.7 1.00 8 127.6	2
3				5 06.1 1.00 8 126.7	5 36.0 1.00 8 126.7	6 05.9 1.00 8 126.6	6 35.8 1.00 8 126.6	7 05.7 1.00 8 126.6	3
4				5 01.0 1.00 9 125.7	5 30.9 1.00 9 125.7	6 00.8 1.00 9 125.6	6 30.7 1.00 9 125.6	7 00.6 1.00 9 125.6	4
55					5 25.8 1.00 9 124.7	5 55.7 1.00 9 124.6	6 25.6 1.00 9 124.6	6 55.5 1.00 9 124.6	55
6					5 20.6 1.00 9 123.7	5 50.5 1.00 9 123.6	6 20.4 1.00 9 123.6	6 50.3 1.00 9 123.5	6
7					5 15.4 1.00 9 122.7	5 45.2 1.00 9 122.6	6 15.1 1.00 9 122.6	6 45.0 1.00 9 122.5	7
8					5 10.0 1.00 9 121.7	5 39.9 1.00 9 121.6	6 09.8 1.00 9 121.6	6 39.7 1.00 9 121.5	8
9					5 04.7 1.00 9 120.7	5 34.6 1.00 9 120.6	6 04.4 1.00 9 120.6	6 34.3 1.00 9 120.5	9
60						5 29.1 1.00 9 119.6	5 59.0 1.00 9 119.6	6 28.9 1.00 9 119.5	60
1						5 23.7 1.00 9 118.6	5 53.5 1.00 9 118.6	6 23.4 1.00 9 118.5	1
2						5 18.1 1.00 9 117.6	5 48.0 1.00 9 117.6	6 17.9 1.00 9 117.5	2
3						5 12.5 1.00 9 116.6	5 42.4 1.00 9 116.6	6 12.3 1.00 9 116.5	3
4						5 06.9 1.00 9 115.6	5 36.8 1.00 9 115.6	6 06.6 1.00 9 115.5	4
65						5 01.2 1.0 10 114.6	5 31.1 1.0 10 114.6	6 01.0 1.0 10 114.5	65
6							5 25.4 1.0 10 113.6	5 55.2 1.0 10 113.5	6
7							5 19.6 1.0 10 112.6	5 49.5 1.0 00 112.5	7
8							5 13.8 1.0 10 111.6	5 43.7 1.0 10 111.6	8
9							5 07.9 1.0 10 110.6	5 37.8 1.0 10 110.6	9
70							5 02.1 1.0 10 109.6	5 31.9 1.0 10 109.6	70
1								5 26.0 1.0 10 108.6	1
2								5 20.0 1.0 10 107.6	2
3								5 14.0 99 10 106.6	3
4								5 08.0 99 10 105.6	4
75								5 01.9 99 10 104.6	75

Lat. 84°

H.A.	0° 00' Alt.	Δd Δt	Az.	0° 30' Alt.	Δd Δt	Az.	1° 00' Alt.	Δd Δt	Az.	1° 30' Alt.	Δd Δt	Az.	2° 00' Alt.	Δd Δt	Az.	2° 30' Alt.	Δd Δt	Az.	3° 00' Alt.	Δd Δt	Az.	3° 30' Alt.	Δd Δt	Az.	H.A.
00	6 00.0	1.0 00	180.0	5 30.0	1.0 00	180.0	5 00.0	1.0 00	180.0																00
1	5 59.9	1.0 00	179.0	5 29.9	1.0 00	179.0																			1
2	5 59.8	1.0 00	178.0	5 29.8	1.0 00	178.0																			2
3	5 59.5	1.0 01	177.0	5 29.5	1.0 01	177.0																			3
4	5 59.1	1.0 01	176.0	5 29.1	1.0 01	176.0																			4
05	5 58.6	1.0 01	175.0	5 28.6	1.0 01	175.0																			05
6	5 58.0	1.0 01	174.0	5 28.0	1.0 01	174.0																			6
7	5 57.3	1.0 01	173.0	5 27.3	1.0 01	173.0																			7
8	5 56.5	1.0 02	172.0	5 26.5	1.0 02	172.0																			8
9	5 55.6	1.0 02	171.0	5 25.6	1.0 02	171.0																			9
10	5 54.5	1.0 02	169.9	5 24.5	1.0 02	170.0																			10
1	5 53.4	1.0 02	168.9	5 23.4	1.0 02	169.0																			1
2	5 52.1	1.0 02	167.9	5 22.1	1.0 02	167.9																			2
3	5 50.7	1.0 02	166.9	5 20.7	1.0 02	166.9																			3
4	5 49.3	1.0 03	165.9	5 19.3	1.0 03	165.9																			4
15	5 47.7	1.0 03	164.9	5 17.7	1.0 03	164.9																			15
6	5 46.0	1.0 03	163.9	5 16.0	1.0 03	163.9																			6
7	5 44.2	1.0 03	162.9	5 14.2	1.0 03	162.9																			7
8	5 42.3	1.0 03	161.9	5 12.3	1.0 03	161.9																			8
9	5 40.3	1.0 04	160.9	5 10.3	1.0 04	160.9																			9
20	5 38.2	1.0 04	159.9	5 08.2	1.0 04	159.9																			20
1	5 36.0	1.0 04	158.9	5 06.0	1.0 04	158.9																			1
2	5 33.7	1.0 04	157.9	5 03.7	1.0 04	157.9																			2
3	5 31.3	1.0 04	156.9	5 01.3	1.0 04	156.9																			3
4	5 28.8	1.0 04	155.9																					4
25	5 26.2	1.0 05	154.9																					25
6	5 23.5	1.0 05	153.9																					6
7	5 20.6	1.0 05	152.9																					7
8	5 17.7	1.0 05	151.9																					8
9	5 14.7	1.0 05	150.9																					9
30	5 11.6	1.0 05	149.9																					30
1	5 08.4	1.0 06	148.9																					1
2	5 05.1	1.0 06	147.9																					2
3	5 01.8	1.0 06	146.9																					3

Lat. 84°

Lat. 85°

Lat. 86°

Lat. 87°

Lat. 84°

H.A.	4° 00' Alt.	Δd Δt	Az.	4° 30' Alt.	Δd Δt	Az.	5° 00' Alt.	Δd Δt	Az.	5° 30' Alt.	Δd Δt	Az.	6° 00' Alt.	Δd Δt	Az.	6° 30' Alt.	Δd Δt	Az.	7° 00' Alt.	Δd Δt	Az.	7° 30' Alt.	Δd Δt	Az.	H.A.
00	10 00.0	1.00 0	180.0	10 30.0	1.00 0	180.0	11 00.0	1.00 0	180.0	11 30.0	1.00 0	180.0	12 00.0	1.00 0	180.0	12 30.0	1.00 0	180.0	13 00.0	1.00 0	180.0	13 30.0	1.00 0	180.0	00
1	9 59.9	1.00 0	179.0	10 29.9	1.00 0	179.0	10 59.9	1.00 0	179.0	11 29.9	1.00 0	179.0	11 59.9	1.00 0	179.0	12 29.9	1.00 0	179.0	12 59.9	1.00 0	179.0	13 29.9	1.00 0	179.0	1
2	9 59.8	1.00 0	178.0	10 29.8	1.00 0	178.0	10 59.8	1.00 0	178.0	11 29.8	1.00 0	178.0	11 59.8	1.00 0	178.0	12 29.8	1.00 0	178.0	12 59.8	1.00 0	178.0	13 29.8	1.00 0	178.0	2
3	9 59.5	1.00 1	177.0	10 29.5	1.00 1	177.0	10 59.5	1.00 1	177.0	11 29.5	1.00 1	177.0	11 59.5	1.00 1	176.9	12 29.5	1.00 1	176.9	12 59.5	1.00 1	176.9	13 29.5	1.00 1	176.9	3
4	9 59.1	1.00 1	175.9	10 29.1	1.00 1	175.9	10 59.1	1.00 1	175.9	11 29.1	1.00 1	175.9	11 59.1	1.00 1	175.9	12 29.1	1.00 1	175.9	12 59.1	1.00 1	175.9	13 29.1	1.00 1	175.9	4
05	9 58.6	1.00 1	174.9	10 28.6	1.00 1	174.9	10 58.6	1.00 1	174.9	11 28.6	1.00 1	174.9	11 58.6	1.00 1	174.9	12 28.6	1.00 1	174.9	12 58.6	1.00 1	174.9	13 28.6	1.00 1	174.9	05
6	9 58.0	1.00 1	173.9	10 28.0	1.00 1	173.9	10 58.0	1.00 1	173.9	11 28.0	1.00 1	173.9	11 58.0	1.00 1	173.9	12 28.0	1.00 1	173.9	12 58.0	1.00 1	173.9	13 28.0	1.00 1	173.9	6
7	9 57.3	1.00 1	172.9	10 27.3	1.00 1	172.9	10 57.3	1.00 1	172.9	11 27.3	1.00 1	172.9	11 57.3	1.00 1	172.9	12 27.3	1.00 1	172.9	12 57.3	1.00 1	172.9	13 27.3	1.00 1	172.9	7
8	9 56.5	1.00 2	171.9	10 26.5	1.00 2	171.9	10 56.5	1.00 2	171.9	11 26.4	1.00 2	171.9	11 56.4	1.00 2	171.9	12 26.4	1.00 2	171.9	12 56.4	1.00 2	171.9	13 26.4	1.00 2	171.8	8
9	9 55.5	1.00 2	170.9	10 25.5	1.00 2	170.9	10 55.5	1.00 2	170.9	11 25.5	1.00 2	170.9	11 55.5	1.00 2	170.9	12 25.5	1.00 2	170.8	12 55.5	1.00 2	170.8	13 25.5	1.00 2	170.8	9
10	9 54.5	1.00 2	169.9	10 24.5	1.00 2	169.9	10 54.5	1.00 2	169.9	11 24.5	1.00 2	169.8	11 54.5	1.00 2	169.8	12 24.4	1.00 2	169.8	12 54.4	1.00 2	169.8	13 24.4	1.00 2	169.8	10
1	9 53.3	1.00 2	168.9	10 23.3	1.00 2	168.8	10 53.3	1.00 2	168.8	11 23.3	1.00 2	168.8	11 53.3	1.00 2	168.8	12 23.3	1.00 2	168.8	12 53.3	1.00 2	168.8	13 23.3	1.00 2	168.8	1
2	9 52.0	1.00 2	167.8	10 22.0	1.00 2	167.8	10 52.0	1.00 2	167.8	11 22.0	1.00 2	167.8	11 52.0	1.00 2	167.8	12 22.0	1.00 2	167.8	12 52.0	1.00 2	167.8	13 22.0	1.00 2	167.8	2
3	9 50.7	1.00 2	166.8	10 20.7	1.00 2	166.8	10 50.7	1.00 2	166.8	11 20.6	1.00 2	166.8	11 50.6	1.00 2	166.8	12 20.6	1.00 2	166.8	12 50.6	1.00 2	166.8	13 20.6	1.00 2	166.7	3
4	9 49.2	1.00 3	165.8	10 19.2	1.00 3	165.8	10 49.2	1.00 3	165.8	11 19.2	1.00 3	165.8	11 49.2	1.00 3	165.8	12 19.1	1.00 3	165.8	12 49.1	1.00 3	165.7	13 19.1	1.00 3	165.7	4
15	9 47.6	1.00 3	164.8	10 17.6	1.00 3	164.8	10 47.6	1.00 3	164.8	11 17.6	1.00 3	164.8	11 47.6	1.00 3	164.8	12 17.5	1.00 3	164.7	12 47.5	1.00 3	164.7	13 17.5	1.00 3	164.7	15
6	9 45.9	1.00 3	163.8	10 15.9	1.00 3	163.8	10 45.9	1.00 3	163.8	11 15.9	1.00 3	163.8	11 45.9	1.00 3	163.7	12 15.8	1.00 3	163.7	12 45.8	1.00 3	163.7	13 15.8	1.00 3	163.7	6
7	9 44.1	1.00 3	162.8	10 14.1	1.00 3	162.8	10 44.1	1.00 3	162.8	11 14.1	1.00 3	162.7	11 44.0	1.00 3	162.7	12 14.0	1.00 3	162.7	12 44.0	1.00 3	162.7	13 14.0	1.00 3	162.7	7
8	9 42.2	1.00 3	161.8	10 12.2	1.00 3	161.8	10 42.2	1.00 3	161.7	11 12.1	1.00 3	161.7	11 42.1	1.00 3	161.7	12 12.1	1.00 3	161.7	12 42.1	1.00 3	161.7	13 12.1	1.00 3	161.7	8
9	9 40.2	1.00 4	160.8	10 10.2	1.00 4	160.7	10 40.1	1.00 4	160.7	11 10.1	1.00 4	160.7	11 40.1	1.00 4	160.7	12 10.1	1.00 4	160.7	12 40.1	1.00 4	160.7	13 10.1	1.00 4	160.6	9
20	9 38.1	1.00 4	159.8	10 08.0	1.00 4	159.7	10 38.0	1.00 4	159.7	11 08.0	1.00 4	159.7	11 38.0	1.00 4	159.7	12 08.0	1.00 4	159.7	12 37.9	1.00 4	159.6	13 07.9	1.00 4	159.6	20
1	9 35.8	1.00 4	158.7	10 05.8	1.00 4	158.7	10 35.8	1.00 4	158.7	11 05.8	1.00 4	158.7	11 35.8	1.00 4	158.7	12 05.7	1.00 4	158.7	12 35.7	1.00 4	158.6	13 05.7	1.00 4	158.6	1
2	9 33.5	1.00 4	157.7	10 03.5	1.00 4	157.7	10 33.5	1.00 4	157.7	11 03.4	1.00 4	157.7	11 33.4	1.00 4	157.6	12 03.4	1.00 4	157.6	12 33.4	1.00 4	157.6	13 03.3	1.00 4	157.6	2
3	9 31.1	1.00 4	156.7	10 01.1	1.00 4	156.7	10 31.0	1.00 4	156.7	11 01.0	1.00 4	156.7	11 31.0	1.00 4	156.6	12 01.0	1.00 4	156.6	12 30.9	1.00 4	156.6	13 00.9	1.00 4	156.6	3
4	9 28.6	1.00 4	155.7	9 58.5	1.00 4	155.7	10 28.5	1.00 4	155.7	10 58.5	1.00 4	155.6	11 28.4	1.00 4	155.6	11 58.4	1.00 4	155.6	12 28.4	1.00 4	155.6	12 58.4	1.00 4	155.6	4
25	9 25.9	1.00 5	154.7	9 55.9	1.00 5	154.7	10 25.9	1.00 5	154.7	10 55.8	1.00 5	154.6	11 25.8	1.00 5	154.6	11 55.8	1.00 5	154.6	12 25.7	1.00 5	154.6	12 55.7	1.00 5	154.5	25
6	9 23.2	1.00 5	153.7	9 53.2	1.00 5	153.7	10 23.1	1.00 5	153.7	10 53.1	1.00 5	153.6	11 23.1	1.00 5	153.6	11 53.0	1.00 5	153.6	12 23.0	1.00 5	153.5	12 53.0	1.00 5	153.5	6
7	9 20.4	1.00 5	152.7	9 50.3	1.00 5	152.7	10 20.3	1.00 5	152.6	10 50.3	1.00 5	152.6	11 20.2	1.00 5	152.6	11 50.2	1.00 5	152.6	12 20.2	1.00 5	152.5	12 50.1	1.00 5	152.5	7
8	9 17.4	1.00 5	151.7	9 47.4	1.00 5	151.6	10 17.4	1.00 5	151.6	10 47.3	1.00 5	151.6	11 17.3	1.00 5	151.6	11 47.3	1.00 5	151.5	12 17.2	1.00 5	151.5	12 47.2	1.00 5	151.5	8
9	9 14.4	1.00 5	150.7	9 44.4	1.00 5	150.6	10 14.3	1.00 5	150.6	10 44.3	1.00 5	150.6	11 14.3	1.00 5	150.6	11 44.2	1.00 5	150.5	12 14.2	1.00 5	150.5	12 44.1	1.00 5	150.5	9
30	9 11.3	1.00 5	149.7	9 41.3	1.00 6	149.6	10 11.2	1.00 6	149.6	10 41.2	1.00 6	149.6	11 11.1	1.00 6	149.5	11 41.1	1.00 6	149.5	12 11.0	1.00 6	149.5	12 41.0	1.00 6	149.5	30
1	9 08.1	1.00 6	148.6	9 38.0	1.00 6	148.6	10 08.0	1.00 6	148.6	10 37.9	1.00 6	148.6	11 07.9	1.00 6	148.5	11 37.9	1.00 6	148.5	12 07.8	1.00 6	148.5	12 37.8	1.00 6	148.4	1
2	9 04.8	1.00 6	147.6	9 34.7	1.00 6	147.6	10 04.7	1.00 6	147.6	10 34.6	1.00 6	147.5	11 04.6	1.00 6	147.5	11 34.5	1.00 6	147.5	12 04.5	1.00 6	147.5	12 34.4	1.00 6	147.4	2
3	9 01.4	1.00 6	146.6	9 31.3	1.00 6	146.6	10 01.3	1.00 6	146.6	10 31.2	1.00 6	146.5	11 01.2	1.00 6	146.5	11 31.1	1.00 6	146.5	12 01.1	1.00 6	146.4	12 31.0	1.00 6	146.4	3
4	8 57.9	1.00 6	145.6	9 27.8	1.00 6	145.6	9 57.8	1.00 6	145.6	10 27.7	1.00 6	145.5	10 57.7	1.00 6	145.5	11 27.6	1.00 6	145.5	11 57.5	1.00 6	145.4	12 27.5	1.00 6	145.4	4
35	8 54.3	1.00 6	144.6	9 24.2	1.00 6	144.6	9 54.2	1.00 6	144.5	10 24.1	1.00 6	144.5	10 54.1	1.00 6	144.5	11 24.0	1.00 6	144.5	11 53.9	1.00 6	144.4	12 23.9	1.00 6	144.4	35
6	8 50.6	1.00 6	143.6	9 20.5	1.00 6	143.6	9 50.5	1.00 6	143.5	10 20.4	1.00 6	143.5	10 50.4	1.00 6	143.5	11 20.3	1.00 6	143.4	11 50.2	1.00 6	143.4	12 20.2	1.00 6	143.4	6
7	8 46.8	1.00 6	142.6	9 16.8	1.00 6	142.6	9 46.7	1.00 6	142.5	10 16.7	1.00 6	142.5	10 46.6	1.00 6	142.5	11 16.5	1.00 6	142.4	11 46.5	1.00 6	142.4	12 16.4	1.00 6	142.4	7
8	8 43.0	1.00 7	141.6	9 12.9	1.00 7	141.6	9 42.9	1.00 7	141.5	10 12.8	1.00 7	141.5	10 42.7	1.00 7	141.5	11 12.7	1.00 7	141.4	11 42.6	1.00 7	141.4	12 12.5	1.00 7	141.4	8
9	8 39.0	1.00 7	140.6	9 09.0	1.00 7	140.6	9 38.9	1.00 7	140.5	10 08.8	1.00 7	140.5	10 38.8	1.00 7	140.4	11 08.7	1.00 7	140.4	11 38.6	1.00 7	140.4	12 08.6	1.00 7	140.3	9
40	8 35.0	1.00 7	139.6	9 04.9	1.00 7	139.5	9 34.9	1.00 7	139.5	10 04.8	1.00 7	139.5	10 34.7	1.00 7	139.4	11 04.7	1.00 7	139.4	11 34.6	1.00 7	139.4	12 04.5	1.00 7	139.3	40
1	8 30.9	1.00 7	138.6	9 00.8	1.00 7	138.5	9 30.8	1.00 7	138.5	10 00.7	1.00 7	138.5	10 30.6	1.00 7	138.4	11 00.5	1.00 7	138.4	11 30.5	1.00 7	138.4	12 00.4	1.00 7	138.3	1
2	8 26.7	1.00 7	137.6	8 56.6	1.00 7	137.5	9 26.6	1.00 7	137.5	9 56.5	1.00 7	137.5	10 26.4	1.00 7	137.4	10 56.3	1.00 7	137.4	11 26.3	1.00 7	137.3	11 56.2	1.00 7	137.3	2
3	8 22.4	1.00 7	136.6	8 52.4	1.00 7	136.5	9 22.3	1.00 7	136.5	9 52.2	1.00 7	136.4	10 22.1	1.00 7	136.4	10 52.1	1.00 7	136.4	11 22.0	1.00 7	136.3	11 51.9	1.00 7	136.3	3
4	8 18.1	1.00 7	135.5	8 48.0	1.00 7	135.5	9 17.9	1.00 7	135.5	9 47.8	1.00 7	135.4	10 17.8	1.00 7	135.4	10 47.7	1.00 7	135.4	11 17.6	1.00 7	135.3	11 47.5	1.00 7	135.3	4
45	8 13.7	1.00 8	134.5	8 43.6	1.00 8	134.5	9 13.5	1.00 8	134.5	9 43.4	1.00 8	134.4	10 13.3	1.00 8	134.4	10 43.2	1.00 8	134.4	11 13.2	1.00 8	134.3	11 43.1	1.00 8	134.3	45
6	8 09.2	1.00 8	133.5	8 39.1	1.00 8	133.5	9 09.0	1.00 8	133.5	9 38.9	1.00 8	133.4	10 08.8	1.00 8	133.4	10 38.7	1.00 8	133.3	11 08.6	1.00 8	133.3	11 38.5	1.00 8	133.3	6
7	8 04.6	1.00 8	132.5	8 34.5	1.00 8	132.5	9 04.4	1.00 8	132.5	9 34.3	1.00 8	132.4	10 04.2	1.00 8	132.4	10 34.1	1.00 8	132.3	11 04.0	1.00 8	132.3	11 33.9	1.00 8	132.3	7
8	7 59.9	1.00 8	131.5	8 29.8	1.00 8	131.5	8 59.7	1.00 8	131.5	9 29.6	1.00 8	131.4	9 59.5	1.00 8	131.4	10 29.4	1.00 8	131.3	10 59.3	1.00 8	131.3	11 29.3	1.00 8	131.2	8
9	7 55.2	1.00 8	130.5	8 25.1	1.00 8	130.5	8 55.0	1.00 8	130.4	9 24.9	1.00 8	130.4	9 54.8	1.00 8	130.4	10 24.7	1.00 8	130.3	10 54.6	1.00 8	130.3	11 24.5	1.00 8	130.2	9
50	7 50.4	1.00 8	129.5	8 20.3	1.00 8	129.5	8 50.2	1.00 8	129.4	9 20.1	1.00 8	129.4	9 50.0	1.00 8	129.4	10 19.9	1.00 8	129.3	10 49.8	1.00 8	129.3	11 19.7	1.00 8	129.2	50
1	7 45.5	1.00 8	128.5	8 15.4	1.00 8	128.5	8 45.3	1.00 8	128.4	9 15.2	1.00 8	128.4	9 45.1	1.00 8	128.4	10 15.0	1.00 8	128.3	10 44.9	1.00 8	128.3	11 14.8	1.00 8	128.2	1
2	7 40.6	1.00 8	127.5	8 10.5	1.00 8	127.5	8 40.4	1.00 8	127.4	9 10.2	1.00 8	127.4	9 40.1	1.00 8	127.3	10 10.0	1.00 8	127.3	10 39.9	1.00 8	127.3	11 09.8	1.00 8	127.2	2
3	7 35.6	1.00 8	126.5	8 05.4	1.00 8	126.5	8 35.3	1.00 8	126.4	9 05.2	1.00 8	126.4	9 35.1	1.00 8	126.3	10 05.0	1.00 8	126.3	10 34.9	1.00 8	126.3	11 04.8	1.00 8	126.2	3
4	7 30.5	1.00 9	125.5	8 00.4	1.00 9	125.5	8 30.3	1.00 9	125.4	9 00.2	1.00 9	125.4	9 30.0	1.00 9	125.3	9 59.9	1.00 9	125.3	10 29.8	1.00 9	125.2	10 59.7	1.00 9	125.2	4
55	7 25.3	1.00 9	124.5	7 55.2	1.00 9	124.5	8 25.1	1.00 9	124.4	8 55.0	1.00 9	124.4	9 24.9	1.00 9	124.3	9 54.8	1.00 9	124.3	10 24.7	1.00 9	124.2	10 54.6	1.00 9	124.2	55
6	7 20.1	1.00 9	123.5	7 50.0	1.00 9	123.5	8 19.9	1.00 9	123.4	8 49.8	1.00 9	123.4	9 19.7	1.00 9	123.3	9 49.6	1.00 9	123.3	10 19.5	1.00 9	123.2	10 49.3	1.00 9	123.2	6
7	7 14.9	1.00 9	122.5	7 44.8	1.00 9	122.5	8 14.6	1.00 9	122.4	8 44.5	1.00 9	122.4	9 14.4	1.00 9	122.3	9 44.3	1.00 9	122.3	10 14.2	1.00 9	122.2	10 44.1	1.00 9	122.2	7
8	7 09.6	1.00 9	121.5	7 39.4	1.00 9	121.5	8 09.3	1.00 9	121.4	8 39.2	1.00 9	121.4	9 09.1	1.00 9	121.3	9 39.0	1.00 9	121.3	10 08.8	1.00 9	121.2	10 38.7	1.00 9	121.2	8
9	7 04.2	1.00 9	120.5	7 34.1	1.00 9	120.5	8 03.9	1.00 9	120.4	8 33.8	1.00 9	120.4	9 03.7	1.00 9	120.3	9 33.6	1.00 9	120.3	10 03.5	1.00 9	120.2	10 33.3	1.00 9	120.2	9
60	6 58.8	1.00 9	119.5	7 28.6	1.00 9	119.5	7 58.5	1.00 9	119.4	8 28.4	1.00 9	119.4	8 58.3	1.00 9	119.3	9 28.1	1.00 9	119.3	9 58.0	1.00 9	119.2	10 27.9	1.00 9	119.2	60
1	6 53.3	1.00 9	118.5	7 23.1	1.00 9	118.5	7 53.0	1.00 9	118.4	8 22.9	1.00 9	118.4	8 52.8	1.00 9	118.3	9 22.6	1.00 9	118.3	9 52.5	1.00 9	118.2	10 22.4	1.00 9	118.2	1
2	6 47.7	1.00 9	117.5	7 17.6	1.00 9	117.5	7 47.5	1.00 9	117.4	8 17.3	1.00 9	117.4	8 47.2	1.00 9	117.3	9 17.1	1.00 9	117.3	9 47.0	1.00 9	117.2	10 16.8	1.00 9	117.2	2
3	6 42.1	1.00 9	116.5	7 12.0	1.00 9	116.5	7 41.9	1.00 9	116.4	8 11.8	1.00 9	116.4	8 41.6	1.00 9	116.3	9 11.5	1.00 9	116.3	9 41.3	1.00 9	116.2	10 11.2	1.00 9	116.2	3
4	6 36.5	1.00 9	115.5	7 06.4	1.0 10	115.4	7 36.2	1.0 10	115.4	8 06.1	1.00 9	115.4	8 36.0	1.00 9	115.3	9 05.8	1.0 10	115.3	9 35.7	1.0 10	115.2	10 05.6	1.0 10	115.2	4
65	6 30.8	1.0 10	114.5	7 00.7	1.0 10	114.4	7 30.6	1.0 10	114.4	8 00.4	1.0 10	114.4	8 30.3	1.0 10	114.3	9 00.1	1.0 10	114.3	9 30.0	1.0 10	114.2	9 59.9	1.0 10	114.2	65
6	6 25.1	1.0 10	113.5	6 55.0	1.0 10	113.4	7 24.8	1.0 10	113.4	7 54.7	1.0 10	113.4	8 24.5	1.0 10	113.3	8 54.4	1.0 10	113.3	9 24.3	1.0 10	113.2	9 54.1	1.0 10	113.2	6
7	6 19.3	1.0 10	112.5	6 49.2	1.0 10	112.5	7 19.0	1.0 10	112.4	7 48.9	1.0 10	112.4	8 18.8	1.0 10	112.3	8 48.6	1.0 10	112.3	9 18.5	1.0 10	112.2	9 48.3	1.0 10	112.2	7
8	6 13.5	1.0 10	111.5	6 43.4	1.0 10	111.5	7 13.2	1.0 10	111.4	7 43.1	1.0 10	111.4	8 12.9	1.0 10	111.3	8 42.8	1.0 10	111.3	9 12.6	1.0 10	111.2	9 42.5	1.0 10	111.2	8
9	6 07.7	1.0 10	110.5	6 37.5	1.0 10	110.5	7 07.4	1.0 10	110.4	7 37.2	1.0 10	110.4	8 07.1	1.0 10	110.3	8 36.9	1.0 10	110.3	9 06.8	1.0 10	110.2	9 36.6	1.0 10	110.2	9
70	6 01.8	1.0 10	109.5	6 31.6	1.0 10	109.5	7 01.5	1.0 10	109.4	7 31.3	1.0 10	109.4	8 01.2	1.0 10	109.3	8 31.0	1.0 10	109.3	9 00.9	1.0 10	109.2	9 30.7	1.0 10	109.2	70
1	5 55.8	1.0 10	108.5	6 25.7	1.0 10	108.5	6 55.5	1.0 10	108.4	7 25.4	1.0 10	108.4	7 55.2	1.0 10	108.3	8 25.1	.99 10	108.3	8 54.9	.99 10	108.2	9 24.8	.99 10	108.2	1
2	5 49.9	.99 10	107.5	6 19.7	.99 10	107.5	6 49.6	.99 10	107.4	7 19.4	.99 10	107.4	7 49.3	.99 10	107.3	8 19.1	.99 10	107.3	8 49.0	.99 10	107.2	9 18.8	.99 10	107.2	2
3	5 43.9	.99 10	106.5	6 13.7	.99 10	106.5	6 43.6	.99 10	106.4	7 13.4	.99 10	106.4	7 43.3	.99 10	106.3	8 13.1	.99 10	106.3	8 43.0	.99 10	106.2	9 12.8	.99 10	106.2	3
4	5 37.8	.99 10	105.5	6 07.7	.99 10	105.5	6 37.5	.99 10	105.4	7 07.4	.99 10	105.4	7 37.2	.99 10	105.3	8 07.1	.99 10	105.3	8 36.9	.99 10	105.2	9 06.8	.99 10	105.2	4
75	5 31.8	.99 10	104.5	6 01.6	.99 10	104.5	6 31.5	.99 10	104.4	7 01.3	.99 10	104.4	7 31.2	.99 10	104.3	8 01.0	.99 10	104.3	8 30.8	.99 10	104.2	9 00.7	.99 10	104.2	75
6	5 25.7	.99 10	103.5	5 55.5	.99 10	103.5	6 25.4	.99 10	103.4	6 55.2	.99 10	103.4	7 25.1	.99 10	103.3	7 54.9	.99 10	103.3	8 24.8	.99 10	103.2	8 54.6	.99 10	103.2	6
7	5 19.6	.99 10	102.5	5 49.4	.99 10	102.5	6 19.3	.99 10	102.4	6 49.1	.99 10	102.4	7 19.0	.99 10	102.3	7 48.8	.99 10	102.3	8 18.6	.99 10	102.2	8 48.5	.99 10	102.2	7
8	5 13.5	.99 10	101.5	5 43.3	.99 10	101.5	6 13.1	.99 10	101.4	6 43.0	.99 10	101.4	7 12.8	.99 10	101.3	7 42.7	.99 10	101.3	8 12.5	.99 10	101.2	8 42.3	.99 10	101.2	8
9	5 07.3	.99 10	100.5	5 37.1	.99 10	100.5	6 07.0	.99 10	100.4	6 36.8	.99 10	100.4	7 06.7	.99 10	100.3	7 36.5	.99 10	100.3	8 06.3	.99 10	100.2	8 36.2	.99 10	100.2	9
80	5 01.1	.99 10	99.5	5 31.0	.99 10	99.5	6 00.8	.99 10	99.4	6 30.6	.99 10	99.4	7 00.5	.99 10	99.3	7 30.3	.99 10	99.3	8 00.2	.99 10	99.2	8 30.0	.99 10	99.2	80
1				5 24.8	.99 10	98.5	5 54.6	.99 10	98.4	6 24.4	.99 10	98.4	6 54.3	.99 10	98.3	7 24.1	.99 10	98.3	7 54.0	.99 10	98.2	8 23.8	.99 10	98.2	1
2				5 18.6	.99 10	97.5	5 48.4	.99 10	97.4	6 18.2	.99 10	97.4	6 48.1	.99 10	97.3	7 17.9	.99 10	97.3	7 47.7	.99 10	97.2	8 17.6	.99 10	97.2	2
3				5 12.3	.99 10	96.5	5 42.2	.99 10	96.4	6 12.0	.99 10	96.4	6 41.8	.99 10	96.3	7 11.7	.99 10	96.3	7 41.5	.99 10	96.2	8 11.3	.99 10	96.2	3
4				5 06.1	.99 10	95.5	5 35.9	.99 10	95.4	6 05.8	.99 10	95.4	6 35.6	.99 10	95.3	7 05.4	.99 10	95.3	7 35.3	.99 10	95.2	8 05.1	.99 10	95.2	4
85							5 29.7	.99 10	94.4	5 59.5	.99 10	94.4	6 29.4	.99 10	94.3	6 59.2	.99 10	94.3	7 29.0	.99 10	94.2	7 58.9	.99 10	94.2	85
6							5 23.4	.99 10	93.5	5 53.3	.99 10	93.4	6 23.1	.99 10	93.3	6 52.9	.99 10	93.3	7 22.8	.99 10	93.2	7 52.6	.99 10	93.2	6
7							5 17.2	.99 10	92.5	5 47.0	.99 10	92.4	6 16.8	.99 10	92.4	6 46.7	.99 10	92.3	7 16.5	.99 10	92.2	7 46.3	.99 10	92.2	7
8							5 10.9	.99 10	91.5	5 40.7	.99 10	91.4	6 10.6	.99 10	91.4	6 40.4	.99 10	91.3	7 10.3	.99 10	91.2	7 40.1	.99 10	91.2	8
9							5 04.6	.99 10	90.5	5 34.5	.99 10	90.4	6 04.3	.99 10	90.4	6 34.1	.99 10	90.3	7 04.0	.99 10	90.3	7 33.8	.99 10	90.2	9
90										5 28.2	.99 10	89.4	5 58.0	.99 10	89.4	6 27.9	.99 10	89.3	6 57.7	.99 10	89.3	7 27.5	.99 10	89.2	90

Lat. 84°

H.A.	4° 00' Alt. Az.	4° 30' Alt. Az.	5° 00' Alt. Az.	5° 30' Alt. Az.	6° 00' Alt. Az.	6° 30' Alt. Az.	7° 00' Alt. Az.	7° 30' Alt. Az.	H.A.
°	° ' Δd Δt °	° ' Δd Δt °	° ' Δd Δt °	° ' Δd Δt °	° ' Δd Δt °	° ' Δd Δt °	° ' Δd Δt °	° ' Δd Δt °	°
91				5 21.9 99 10 88.4	5 51.7 99 10 88.4	6 21.6 99 10 88.3	6 51.4 99 10 88.3	7 21.2 99 10 88.2	91
2				5 15.6 99 10 87.4	5 45.5 99 10 87.4	6 15.3 99 10 87.3	6 45.2 99 10 87.3	7 15.0 99 10 87.2	2
3				5 09.4 99 10 86.4	5 39.2 99 10 86.4	6 09.1 99 10 86.3	6 38.9 99 10 86.3	7 08.7 99 10 86.2	3
4				5 03.1 99 10 85.4	5 33.0 99 10 85.4	6 02.8 99 10 85.3	6 32.6 99 10 85.3	7 02.5 99 10 85.2	4
95					5 26.7 99 10 84.4	5 56.6 99 10 84.3	6 26.4 99 10 84.3	6 56.2 99 10 84.2	95
6					5 20.5 99 10 83.4	5 50.3 99 10 83.4	6 20.2 99 10 83.3	6 50.0 99 10 83.2	6
7					5 14.3 99 10 82.4	5 44.1 99 10 82.4	6 13.9 99 10 82.3	6 43.8 99 10 82.3	7
8					5 08.0 99 10 81.4	5 37.9 99 10 81.4	6 07.7 99 10 81.3	6 37.6 99 10 81.3	8
9					5 01.9 99 10 80.4	5 31.7 99 10 80.4	6 01.5 99 10 80.3	6 31.4 99 10 80.3	9
100						5 25.5 99 10 79.4	5 55.4 99 10 79.3	6 25.2 99 10 79.3	100
1						5 19.4 99 10 78.4	5 49.2 99 10 78.3	6 19.0 99 10 78.3	1
2						5 13.2 99 10 77.4	5 43.1 99 10 77.3	6 12.9 99 10 77.3	2
3						5 07.1 99 10 76.4	5 37.0 99 10 76.4	6 06.8 99 10 76.3	3
4						5 01.0 99 10 75.4	5 30.9 99 10 75.4	6 00.7 99 10 75.3	4
105							5 24.8 99 10 74.4	5 54.7 99 10 74.3	105
6							5 18.8 99 10 73.4	5 48.7 99 10 73.3	6
7							5 12.8 99 10 72.4	5 42.7 99 10 72.3	7
8							5 06.9 1.0 10 71.4	5 36.7 99 10 71.3	8
9							5 00.9 1.0 10 70.4	5 30.8 1.0 10 70.4	9
110								5 24.9 1.0 10 69.4	110
1								5 19.0 1.0 10 68.4	1
2								5 13.2 1.0 10 67.4	2
3								5 07.5 1.0 10 66.4	3
4								5 01.7 1.0 10 65.4	4

Lat. 85°

Lat. 86°

H.A.	8° 00′ Alt.	Δd Δt	Az.	8° 30′ Alt.	Δd Δt	Az.	9° 00′ Alt.	Δd Δt	Az.	9° 30′ Alt.	Δd Δt	Az.	10° 00′ Alt.	Δd Δt	Az.	10° 30′ Alt.	Δd Δt	Az.	11° 00′ Alt.	Δd Δt	Az.	11° 30′ Alt.	Δd Δt	Az.	H.A.
00	14 00.0	1.0 00	180.0	14 30.0	1.0 00	180.0	15 00.0	1.0 00	180.0	15 30.0	1.0 00	180.0	16 00.0	1.0 00	180.0	16 30.0	1.0 00	180.0	17 00.0	1.0 00	180.0	17 30.0	1.0 00	180.0	00
1	13 59.9	1.0 00	179.0	14 29.9	1.0 00	179.0	14 59.9	1.0 00	179.0	15 29.9	1.0 00	179.0	15 59.9	1.0 00	179.0	16 29.9	1.0 00	177.9	16 59.9	1.0 00	179.0	17 29.9	1.0 00	179.0	1
2	13 59.8	1.0 00	178.0	14 29.8	1.0 00	178.0	14 59.8	1.0 00	178.0	15 29.8	1.0 00	178.0	15 59.8	1.0 00	178.0	16 29.8	1.0 00	177.9	16 59.8	1.0 00	177.9	17 29.8	1.0 00	177.9	2
3	13 59.5	1.0 01	176.9	14 29.5	1.0 01	176.9	14 59.5	1.0 01	176.9	15 29.5	1.0 01	176.9	15 59.5	1.0 01	176.9	16 29.5	1.0 01	176.9	16 59.5	1.0 01	176.9	17 29.5	1.0 01	176.9	3
4	13 59.1	1.0 01	175.9	14 29.1	1.0 01	175.9	14 59.1	1.0 01	175.9	15 29.1	1.0 01	175.9	15 59.1	1.0 01	175.9	16 29.1	1.0 01	175.9	16 59.1	1.0 01	175.9	17 29.1	1.0 01	175.9	4
05	13 58.6	1.0 01	174.9	14 28.6	1.0 01	174.9	14 58.6	1.0 01	174.9	15 28.6	1.0 01	174.9	15 58.6	1.0 01	174.9	16 28.6	1.0 01	174.9	16 58.6	1.0 01	174.9	17 28.6	1.0 01	174.9	05
6	13 58.0	1.0 01	173.9	14 28.0	1.0 01	173.9	14 58.0	1.0 01	173.9	15 28.0	1.0 01	173.9	15 58.0	1.0 01	173.9	16 28.0	1.0 01	173.8	16 58.0	1.0 01	173.8	17 28.0	1.0 01	173.8	6
7	13 57.3	1.0 01	172.9	14 27.3	1.0 01	172.8	14 57.3	1.0 01	172.8	15 27.3	1.0 01	172.8	15 57.3	1.0 01	172.8	16 27.3	1.0 01	172.8	16 57.3	1.0 01	172.8	17 27.3	1.0 01	172.8	7
8	13 56.4	1.0 02	171.8	14 26.4	1.0 02	171.8	14 56.4	1.0 02	171.8	15 26.4	1.0 02	171.8	15 56.4	1.0 02	171.8	16 26.4	1.0 02	171.8	16 56.4	1.0 02	171.8	17 26.4	1.0 02	171.8	8
9	13 55.5	1.0 02	170.8	14 25.5	1.0 02	170.8	14 55.5	1.0 02	170.8	15 25.5	1.0 02	170.8	15 55.5	1.0 02	170.8	16 25.5	1.0 02	170.8	16 55.5	1.0 02	170.8	17 25.5	1.0 02	170.8	9
10	13 54.4	1.0 02	169.8	14 24.4	1.0 02	169.8	14 54.4	1.0 02	169.8	15 24.4	1.0 02	169.8	15 54.4	1.0 02	169.8	16 24.4	1.0 02	169.7	16 54.4	1.0 02	169.7	17 24.4	1.0 02	169.7	10
1	13 53.3	1.0 02	168.8	14 23.3	1.0 02	168.8	14 53.3	1.0 02	168.8	15 23.2	1.0 02	168.7	15 53.2	1.0 02	168.7	16 23.2	1.0 02	168.7	16 53.2	1.0 02	168.7	17 23.2	1.0 02	168.7	1
2	13 52.0	1.0 02	167.8	14 22.0	1.0 02	167.7	14 52.0	1.0 02	167.7	15 22.0	1.0 02	167.7	15 52.0	1.0 02	167.7	16 22.0	1.0 02	167.7	16 51.9	1.0 02	167.7	17 21.9	1.0 02	167.7	2
3	13 50.6	1.0 02	166.7	14 20.6	1.0 02	166.7	14 50.6	1.0 02	166.7	15 20.6	1.0 02	166.7	15 50.6	1.0 02	166.7	16 20.6	1.0 02	166.7	16 50.6	1.0 02	166.7	17 20.5	1.0 02	166.6	3
4	13 49.1	1.0 03	165.7	14 19.1	1.0 03	165.7	14 49.1	1.0 03	165.7	15 19.1	1.0 03	165.7	15 49.1	1.0 03	165.7	16 19.1	1.0 03	165.6	16 49.0	1.0 03	165.6	17 19.0	1.0 03	165.6	4
15	13 47.5	1.0 03	164.7	14 17.5	1.0 03	164.7	14 47.5	1.0 03	164.7	15 17.5	1.0 03	164.7	15 47.5	1.0 03	164.6	16 17.5	1.0 03	164.6	16 47.4	1.0 03	164.6	17 17.4	1.0 03	164.6	15
6	13 45.8	1.0 03	163.7	14 15.8	1.0 03	163.7	14 45.8	1.0 03	163.6	15 15.8	1.0 03	163.6	15 45.7	1.0 03	163.6	16 15.7	1.0 03	163.6	16 45.7	1.0 03	163.6	17 15.7	1.0 03	163.6	6
7	13 44.0	1.0 03	162.7	14 14.0	1.0 03	162.6	14 44.0	1.0 03	162.6	15 13.9	1.0 03	162.6	15 43.9	1.0 03	162.6	16 13.9	1.0 03	162.6	16 43.9	1.0 03	162.6	17 13.9	1.0 03	162.5	7
8	13 42.1	1.0 03	161.6	14 12.0	1.0 03	161.6	14 42.0	1.0 03	161.6	15 12.0	1.0 03	161.6	15 42.0	1.0 03	161.6	16 12.0	1.0 03	161.6	16 42.0	1.0 03	161.5	17 11.9	1.0 03	161.5	8
9	13 40.0	1.0 04	160.6	14 10.0	1.0 04	160.6	14 40.0	1.0 04	160.6	15 10.0	1.0 04	160.6	15 40.0	1.0 04	160.5	16 09.9	1.0 04	160.5	16 39.9	1.0 04	160.5	17 09.9	1.0 04	160.5	9
20	13 37.9	1.0 04	159.6	14 07.9	1.0 04	159.6	14 37.9	1.0 04	159.6	15 07.8	1.0 04	159.5	15 37.8	1.0 04	159.5	16 07.8	1.0 04	159.5	16 37.8	1.0 04	159.5	17 07.8	1.0 04	159.5	20
1	13 35.7	1.0 04	158.6	14 05.6	1.0 04	158.6	14 35.6	1.0 04	158.5	15 05.6	1.0 04	158.5	15 35.6	1.0 04	158.5	16 05.6	1.0 04	158.5	16 35.5	1.0 04	158.5	17 05.5	1.0 04	158.4	1
2	13 33.3	1.0 04	157.6	14 03.3	1.0 04	157.5	14 33.3	1.0 04	157.5	15 03.2	1.0 04	157.5	15 33.2	1.0 04	157.5	16 03.2	1.0 04	157.5	16 33.2	1.0 04	157.4	17 03.1	1.0 04	157.4	2
3	13 30.9	1.0 04	156.6	14 00.9	1.0 04	156.5	14 30.8	1.0 04	156.5	15 00.8	1.0 04	156.5	15 30.8	1.0 04	156.5	16 00.7	1.0 04	156.4	16 30.7	1.0 04	156.4	17 00.7	1.0 04	156.4	3
4	13 28.3	1.0 04	155.5	13 58.3	1.0 04	155.5	14 28.3	1.0 04	155.5	14 58.2	1.0 04	155.5	15 28.2	1.0 04	155.4	15 58.2	1.0 04	155.4	16 28.2	1.0 04	155.4	16 58.1	1.0 04	155.4	4
25	13 25.7	1.0 05	154.5	13 55.7	1.0 05	154.5	14 25.6	1.0 05	154.5	14 55.6	1.0 05	154.4	15 25.6	1.0 05	154.4	15 55.5	1.0 05	154.4	16 25.5	1.0 05	154.4	16 55.5	1.0 05	154.3	25
6	13 22.9	1.0 05	153.5	13 52.9	1.0 05	153.5	14 22.9	1.0 05	153.5	14 52.8	1.0 05	153.4	15 22.8	1.0 05	153.4	15 52.8	1.0 05	153.4	16 22.7	1.0 05	153.4	16 52.7	1.0 05	153.3	6
7	13 20.1	1.0 05	152.5	13 50.0	1.0 05	152.5	14 20.0	1.0 05	152.4	14 50.0	1.0 05	152.4	15 19.9	1.0 05	152.4	15 49.9	1.0 05	152.4	16 19.9	1.0 05	152.3	16 49.8	1.0 05	152.3	7
8	13 17.1	1.0 05	151.5	13 47.1	1.0 05	151.4	14 17.1	1.0 05	151.4	14 47.0	1.0 05	151.4	15 17.0	1.0 05	151.4	15 46.9	1.0 05	151.3	16 16.9	1.0 05	151.3	16 46.9	1.0 05	151.3	8
9	13 14.1	1.0 05	150.4	13 44.1	1.0 05	150.4	14 14.0	1.0 05	150.4	14 44.0	1.0 05	150.4	15 13.9	1.0 05	150.3	15 43.9	1.0 05	150.3	16 13.8	1.0 05	150.3	16 43.8	1.0 05	150.3	9
30	13 11.0	1.0 05	149.4	13 40.9	1.0 05	149.4	14 10.9	1.0 05	149.4	14 40.8	1.0 05	149.4	15 10.8	1.0 05	149.3	15 40.7	1.0 05	149.3	16 10.7	1.0 05	149.3	16 40.6	1.0 05	149.2	30
1	13 07.7	1.0 06	148.4	13 37.7	1.0 06	148.4	14 07.6	1.0 06	148.4	14 37.6	1.0 06	148.3	15 07.5	1.0 06	148.3	15 37.5	1.0 06	148.3	16 07.4	1.0 06	148.2	16 37.4	1.0 06	148.2	1
2	13 04.4	1.0 06	147.4	13 34.3	1.0 06	147.4	14 04.3	1.0 06	147.3	14 34.2	1.0 06	147.3	15 04.2	1.0 06	147.3	15 34.1	1.0 06	147.3	16 04.1	1.0 06	147.2	16 34.0	1.0 06	147.2	2
3	13 01.0	1.0 06	146.4	13 30.9	1.0 06	146.4	14 00.9	1.0 06	146.3	14 30.8	1.0 06	146.3	15 00.8	1.0 06	146.3	15 30.7	1.0 06	146.2	16 00.6	1.0 06	146.2	16 30.6	1.0 06	146.2	3
4	12 57.4	1.0 06	145.4	13 27.4	1.0 06	145.3	13 57.3	1.0 06	145.3	14 27.3	1.0 06	145.3	14 57.2	1.0 06	145.2	15 27.2	1.0 06	145.2	15 57.1	1.0 06	145.2	16 27.1	1.0 06	145.2	4
35	12 53.8	1.0 06	144.4	13 23.8	1.0 06	144.3	13 53.7	1.0 06	144.3	14 23.7	1.0 06	144.3	14 53.6	1.0 06	144.2	15 23.5	1.0 06	144.2	15 53.5	1.0 06	144.2	16 23.4	1.0 06	144.1	35
6	12 50.1	1.0 06	143.3	13 20.1	1.0 06	143.3	13 50.0	1.0 06	143.3	14 20.0	1.0 06	143.2	14 49.9	1.0 06	143.2	15 19.8	1.0 06	143.2	15 49.8	1.0 06	143.1	16 19.7	1.0 06	143.1	6
7	12 46.3	1.0 06	142.3	13 16.3	1.0 06	142.3	13 46.2	1.0 06	142.3	14 16.2	1.0 06	142.2	14 46.1	1.0 06	142.2	15 16.0	1.0 06	142.2	15 46.0	1.0 06	142.1	16 15.9	1.0 06	142.1	7
8	12 42.5	1.0 07	141.3	13 12.4	1.0 07	141.3	13 42.3	1.0 07	141.3	14 12.3	1.0 07	141.2	14 42.2	1.0 07	141.2	15 12.1	1.0 07	141.1	15 42.1	1.0 07	141.1	16 12.0	1.0 07	141.1	8
9	12 38.5	1.0 07	140.3	13 08.4	1.0 07	140.3	13 38.4	1.0 07	140.2	14 08.3	1.0 07	140.2	14 38.2	1.0 07	140.2	15 08.2	1.0 07	140.1	15 38.1	1.0 07	140.1	16 08.0	1.0 07	140.1	9
40	12 34.5	1.0 07	139.3	13 04.4	1.0 07	139.3	13 34.3	1.0 07	139.2	14 04.2	1.0 07	139.2	14 34.2	1.0 07	139.2	15 04.1	1.0 07	139.1	15 34.0	1.0 07	139.1	16 04.0	1.0 07	139.0	40
1	12 30.3	1.0 07	138.3	13 00.2	1.0 07	138.2	13 30.2	1.0 07	138.2	14 00.1	1.0 07	138.2	14 30.0	1.0 07	138.1	14 59.9	1.0 07	138.1	15 29.9	1.0 07	138.1	15 59.8	1.0 07	138.0	1
2	12 26.1	1.0 07	137.3	12 56.0	1.0 07	137.2	13 26.0	1.0 07	137.2	13 55.9	1.0 07	137.2	14 25.8	1.0 07	137.1	14 55.7	1.0 07	137.1	15 25.6	1.0 07	137.0	15 55.6	1.0 07	137.0	2
3	12 21.8	1.0 07	136.3	12 51.7	1.0 07	136.2	13 21.7	1.0 07	136.2	13 51.6	1.0 07	136.1	14 21.5	1.0 07	136.1	14 51.4	1.0 07	136.1	15 21.3	1.0 07	136.0	15 51.2	1.0 07	136.0	3
4	12 17.4	1.0 07	135.2	12 47.4	1.0 07	135.2	13 17.3	1.0 07	135.2	13 47.2	1.0 07	135.1	14 17.1	1.0 07	135.1	14 47.0	1.0 07	135.1	15 16.9	1.0 07	135.0	15 46.8	1.0 07	135.0	4
45	12 13.0	1.0 08	134.2	12 42.9	1.0 08	134.2	13 12.8	1.0 08	134.2	13 42.7	1.0 08	134.1	14 12.6	1.0 08	134.1	14 42.5	1.0 08	134.0	15 12.5	1.0 08	134.0	15 42.4	1.0 08	134.0	45
6	12 08.5	1.0 08	133.2	12 38.4	1.0 08	133.2	13 08.3	1.0 08	133.1	13 38.2	1.0 08	133.1	14 08.1	1.0 08	133.1	14 38.0	1.0 08	133.0	15 07.9	1.0 08	133.0	15 37.8	1.0 08	132.9	6
7	12 03.8	1.0 08	132.2	12 33.8	1.0 08	132.2	13 03.7	1.0 08	132.1	13 33.6	1.0 08	132.1	14 03.5	1.0 08	132.1	14 33.4	1.0 08	132.0	15 03.3	1.0 08	132.0	15 33.2	1.0 08	131.9	7
8	11 59.2	1.0 08	131.2	12 29.1	1.0 08	131.2	12 59.0	1.0 08	131.1	13 28.9	1.0 08	131.1	13 58.8	1.0 08	131.0	14 28.7	1.0 08	131.0	14 58.6	1.0 08	131.0	15 28.5	1.0 08	130.9	8
9	11 54.4	1.0 08	130.2	12 24.3	1.0 08	130.2	12 54.2	1.0 08	130.1	13 24.1	1.0 08	130.1	13 54.0	1.0 08	130.0	14 23.9	1.0 08	130.0	14 53.8	1.0 08	130.0	15 23.7	1.0 08	129.9	9
50	11 49.6	1.0 08	129.1	12 19.5	1.0 08	129.1	12 49.4	1.0 08	129.1	13 19.3	1.0 08	129.1	13 49.2	1.0 08	129.0	14 19.1	1.0 08	129.0	14 49.0	1.0 08	128.9	15 18.9	1.0 08	128.9	50
1	11 44.7	1.0 08	128.2	12 14.6	1.0 08	128.1	12 44.5	1.0 08	128.1	13 14.4	1.0 08	128.1	13 44.3	1.0 08	128.0	14 14.2	1.0 08	128.0	14 44.1	1.0 08	127.9	15 14.0	1.0 08	127.9	1
2	11 39.7	1.0 08	127.2	12 09.6	1.0 08	127.1	12 39.5	1.0 08	127.1	13 09.4	1.0 08	127.0	13 39.3	1.0 08	127.0	14 09.2	1.0 08	127.0	14 39.1	1.0 08	126.9	15 09.0	1.0 08	126.9	2
3	11 34.7	1.0 08	126.2	12 04.6	1.0 08	126.1	12 34.5	1.0 08	126.1	13 04.4	1.0 08	126.0	13 34.3	1.0 08	126.0	14 04.1	1.0 08	125.9	14 34.0	1.0 08	125.9	15 03.9	1.0 08	125.9	3
4	11 29.6	1.0 09	125.2	11 59.5	1.0 09	125.1	12 29.4	1.0 09	125.1	12 59.3	1.0 09	125.0	13 29.1	1.0 09	125.0	13 59.0	1.0 09	124.9	14 28.9	1.0 09	124.9	14 58.8	1.0 09	124.8	4
55	11 24.4	1.0 09	124.1	11 54.3	1.0 09	124.1	12 24.2	1.0 09	124.1	12 54.1	1.0 09	124.0	13 24.0	1.0 09	124.0	13 53.9	1.0 09	123.9	14 23.7	1.0 09	123.9	14 53.6	1.0 09	123.8	55
6	11 19.2	1.0 09	123.1	11 49.1	1.0 09	123.1	12 19.0	1.0 09	123.1	12 48.9	1.0 09	123.0	13 18.7	1.0 09	123.0	13 48.6	1.0 09	122.9	14 18.5	1.0 09	122.9	14 48.4	1.0 09	122.8	6
7	11 13.9	1.0 09	122.1	11 43.8	1.0 09	122.1	12 13.7	1.0 09	122.1	12 43.6	1.0 09	122.0	13 13.5	1.0 09	122.0	13 43.3	1.0 09	121.9	14 13.2	1.0 09	121.9	14 43.1	1.0 09	121.8	7
8	11 08.6	1.0 09	121.1	11 38.5	1.0 09	121.1	12 08.4	1.0 09	121.0	12 38.2	1.0 09	121.0	13 08.1	1.0 09	121.0	13 38.0	1.0 09	120.9	14 07.9	1.0 09	120.9	14 37.7	1.0 09	120.8	8
9	11 03.2	1.0 09	120.1	11 33.1	1.0 09	120.1	12 02.9	1.0 09	120.0	12 32.8	1.0 09	120.0	13 02.7	1.0 09	120.0	13 32.6	1.0 09	119.9	14 02.4	1.0 09	119.9	14 32.3	1.0 09	119.8	9
60	10 57.7	1.0 09	119.1	11 27.6	1.0 09	119.1	11 57.5	1.0 09	119.0	12 27.4	1.0 09	119.0	12 57.2	1.0 09	118.9	13 27.1	1.0 09	118.9	13 57.0	1.0 09	118.8	14 26.8	1.0 09	118.8	60
1	10 52.2	1.0 09	118.1	11 22.1	1.0 09	118.1	11 52.0	1.0 09	118.0	12 21.9	1.0 09	118.0	12 51.7	1.0 09	117.9	13 21.6	1.0 09	117.9	13 51.5	1.0 09	117.8	14 21.3	1.0 09	117.8	1
2	10 46.7	1.0 09	117.1	11 16.6	1.0 09	117.1	11 46.4	1.0 09	117.0	12 16.3	1.0 09	117.0	12 46.2	1.0 09	116.9	13 16.0	1.0 09	116.9	13 45.9	1.0 09	116.8	14 15.7	1.0 09	116.8	2
3	10 41.1	1.0 09	116.1	11 10.9	1.0 09	116.1	11 40.8	1.0 09	116.0	12 10.7	1.0 09	116.0	12 40.5	1.0 09	115.9	13 10.4	1.0 09	115.9	13 40.3	1.0 09	115.8	14 10.1	1.0 09	115.8	3
4	10 35.4	1.0 10	115.1	11 05.3	1.0 10	115.1	11 35.2	1.0 10	115.0	12 05.0	1.0 10	115.0	12 34.9	1.0 10	114.9	13 04.7	1.0 10	114.9	13 34.6	1.0 10	114.8	14 04.5	1.0 10	114.8	4
65	10 29.7	1.0 10	114.1	10 59.6	1.0 10	114.1	11 29.4	1.0 10	114.0	11 59.3	1.0 10	114.0	12 29.2	1.0 10	113.9	12 59.0	1.0 10	113.9	13 28.9	1.0 10	113.8	13 58.7	1.0 10	113.8	65
6	10 24.0	1.0 10	113.1	10 53.8	1.0 10	113.1	11 23.7	1.0 10	113.0	11 53.5	1.0 10	113.0	12 23.4	1.0 10	112.9	12 53.3	1.0 10	112.9	13 23.1	1.0 10	112.8	13 53.0	1.0 10	112.8	6
7	10 18.2	1.0 10	112.1	10 48.0	1.0 10	112.1	11 17.9	1.0 10	112.0	11 47.8	1.0 10	112.0	12 17.6	1.0 10	111.9	12 47.5	1.0 10	111.9	13 17.3	1.0 10	111.8	13 47.2	1.0 10	111.8	7
8	10 12.4	1.0 10	111.1	10 42.2	1.0 10	111.1	11 12.1	1.0 10	111.0	11 41.9	1.0 10	111.0	12 11.8	1.0 10	110.9	12 41.6	1.0 10	110.9	13 11.5	1.0 10	110.8	13 41.3	1.0 10	110.7	8
9	10 06.5	1.0 10	110.1	10 36.3	1.0 10	110.1	11 06.2	1.0 10	110.0	11 36.0	1.0 10	110.0	12 05.9	1.0 10	109.9	12 35.7	.99 10	109.8	13 05.6	.99 10	109.8	13 35.4	.99 10	109.7	9
70	10 00.6	1.0 10	109.1	10 30.4	.99 10	109.1	11 00.3	.99 10	109.0	11 30.1	.99 10	109.0	12 00.0	.99 10	108.9	12 29.8	.99 10	108.8	12 59.7	.99 10	108.8	13 29.5	.99 10	108.7	70
1	9 54.6	.99 10	108.1	10 24.5	.99 10	108.1	10 54.3	.99 10	108.0	11 24.2	.99 10	107.9	11 54.0	.99 10	107.9	12 23.9	.99 10	107.8	12 53.7	.99 10	107.8	13 23.6	.99 10	107.7	1
2	9 48.7	.99 10	107.1	10 18.5	.99 10	107.1	10 48.3	.99 10	107.0	11 18.2	.99 10	106.9	11 48.0	.99 10	106.9	12 17.9	.99 10	106.8	12 47.7	.99 10	106.8	13 17.6	.99 10	106.7	2
3	9 42.6	.99 10	106.1	10 12.5	.99 10	106.1	10 42.3	.99 10	106.0	11 12.2	.99 10	105.9	11 42.0	.99 10	105.9	12 11.9	.99 10	105.8	12 41.7	.99 10	105.8	13 11.5	.99 10	105.7	3
4	9 36.6	.99 10	105.1	10 06.4	.99 10	105.1	10 36.3	.99 10	105.0	11 06.1	.99 10	104.9	11 36.0	.99 10	104.9	12 05.8	.99 10	104.8	12 35.7	.99 10	104.8	13 05.5	.99 10	104.7	4
75	9 30.5	.99 10	104.1	10 00.4	.99 10	104.1	10 30.2	.99 10	104.0	11 00.1	.99 10	103.9	11 29.9	.99 10	103.9	11 59.7	.99 10	103.8	12 29.6	.99 10	103.8	12 59.4	.99 10	103.7	75
6	9 24.4	.99 10	103.1	9 54.3	.99 10	103.1	10 24.1	.99 10	103.0	10 54.0	.99 10	102.9	11 23.8	.99 10	102.9	11 53.6	.99 10	102.8	12 23.5	.99 10	102.8	12 53.3	.99 10	102.7	6
7	9 18.3	.99 10	102.1	9 48.2	.99 10	102.1	10 18.0	.99 10	102.0	10 47.8	.99 10	101.9	11 17.7	.99 10	101.9	11 47.5	.99 10	101.8	12 17.3	.99 10	101.8	12 47.2	.99 10	101.7	7
8	9 12.2	.99 10	101.1	9 42.0	.99 10	101.1	10 11.9	.99 10	101.0	10 41.7	.99 10	100.9	11 11.5	.99 10	100.9	11 41.3	.99 10	100.8	12 11.2	.99 10	100.8	12 41.0	.99 10	100.7	8
9	9 06.0	.99 10	100.1	9 35.9	.99 10	100.1	10 05.7	.99 10	100.0	10 35.5	.99 10	100.0	11 05.4	.99 10	99.9	11 35.2	.99 10	99.8	12 05.0	.99 10	99.8	12 34.9	.99 10	99.7	9
80	8 59.8	.99 10	99.1	9 29.7	.99 10	99.1	9 59.5	.99 10	99.0	10 29.3	.99 10	99.0	10 59.2	.99 10	98.9	11 29.0	.99 10	98.8	11 58.8	.99 10	98.8	12 28.7	.99 10	98.7	80
1	8 53.6	.99 10	98.1	9 23.5	.99 10	98.1	9 53.3	.99 10	98.0	10 23.1	.99 10	98.0	10 53.0	.99 10	97.9	11 22.8	.99 10	97.9	11 52.6	.99 10	97.8	12 22.5	.99 10	97.7	1
2	8 47.4	.99 10	97.1	9 17.2	.99 10	97.1	9 47.1	.99 10	97.0	10 16.9	.99 10	97.0	10 46.7	.99 10	96.9	11 16.6	.99 10	96.9	11 46.4	.99 10	96.8	12 16.2	.99 10	96.7	2
3	8 41.2	.99 10	96.1	9 11.0	.99 10	96.1	9 40.8	.99 10	96.0	10 10.7	.99 10	95.9	10 40.5	.99 10	95.9	11 10.3	.99 10	95.8	11 40.2	.99 10	95.8	12 10.0	.99 10	95.7	3
4	8 34.9	.99 10	95.1	9 04.8	.99 10	95.1	9 34.6	.99 10	95.0	10 04.4	.99 10	94.9	10 34.3	.99 10	94.9	11 04.1	.99 10	94.9	11 33.9	.99 10	94.8	12 03.8	.99 10	94.8	4
85	8 28.7	.99 10	94.1	8 58.5	.99 10	94.1	9 28.4	.99 10	94.0	9 58.2	.99 10	93.9	10 28.0	.99 10	93.9	10 57.8	.99 10	93.9	11 27.7	.99 10	93.8	11 57.5	.99 10	93.8	85
6	8 22.4	.99 10	93.1	8 52.3	.99 10	93.1	9 22.1	.99 10	93.0	9 51.9	.99 10	93.0	10 21.8	.99 10	92.9	10 51.6	.99 10	92.9	11 21.4	.99 10	92.8	11 51.2	.99 10	92.8	6
7	8 16.2	.99 10	92.1	8 46.0	.99 10	92.1	9 15.8	.99 10	92.0	9 45.7	.99 10	92.0	10 15.5	.99 10	91.9	10 45.3	.99 10	91.9	11 15.2	.99 10	91.8	11 45.0	.99 10	91.8	7
8	8 09.9	.99 10	91.1	8 39.7	.99 10	91.1	9 09.6	.99 10	91.0	9 39.4	.99 10	90.9	10 09.1	.99 10	90.9	10 39.1	.99 10	90.8	11 08.9	.99 10	90.8	11 38.7	.99 10	90.8	8
9	8 03.6	.99 10	90.2	8 33.5	.99 10	90.1	9 03.3	.99 10	90.0	9 33.1	.99 10	90.0	10 03.0	.99 10	89.9	10 32.8	.99 10	89.9	11 02.6	.99 10	89.8	11 32.4	.99 10	89.8	9
90	7 57.4	.99 10	89.2	8 27.2	.99 10	89.1	8 57.0	.99 10	89.1	9 26.8	.99 10	89.0	9 56.7	.99 10	88.9	10 26.5	.99 10	88.9	10 56.3	.99 10	88.8	11 26.2	.99 10	88.8	90

Left margin column (Lat. 84° continued — Dec. 11° 30'):

11° 30' Alt.	Δd Δt	Az.	H.A.
17 30.1	1.0 00	180.0	
17 29.9	1.0 00	179.0	1
17 29.8	1.0 00	177.9	2
17 29.5	1.0 00	176.9	3
17 29.1	1.0 01	175.9	4
17 28.6	1.0 01	174.9	95
17 28.0	1.0 01	173.8	6
17 27.2	1.0 01	172.8	7
17 26.4	1.0 01	171.8	8
17 25.5	1.0 02	170.8	9
17 24.4	1.0 02	169.7	10
17 23.2	1.0 02	168.7	1
17 21.9	1.0 02	167.7	2
17 20.5	1.0 02	166.6	3
17 19.0	1.0 02	165.6	4
17 17.4	1.0 03	164.6	15
17 15.7	1.0 03	163.6	6
17 13.9	1.0 03	162.5	7
17 11.9	1.0 03	161.5	8
17 09.9	1.0 03	160.5	9
17 07.8	1.0 03	159.5	20
17 05.5	1.0 04	158.4	1
17 03.1	1.0 04	157.4	2
17 00.7	1.0 04	156.4	3
16 58.1	1.0 04	155.4	4
16 55.5	1.0 05	154.3	25
16 52.7	1.0 05	153.3	6
16 49.8	1.0 05	152.3	7
16 46.9	1.0 05	151.3	8
16 43.8	1.0 05	150.3	9
16 40.6	1.0 06	149.2	30
16 37.4	1.0 06	148.2	1
16 34.0	1.0 06	147.2	2
16 30.6	1.0 06	146.2	3
16 27.1	1.0 06	145.2	4
16 23.4	1.0 06	144.1	35
16 19.7	1.0 06	143.1	6
16 15.9	1.0 06	142.1	7
16 12.0	1.0 07	141.1	8
16 08.0	1.0 07	140.1	9
16 04.0	1.0 07	139.0	40
15 59.8	1.0 07	138.0	1
15 55.6	1.0 07	137.0	2
15 51.2	1.0 07	136.0	3
15 46.8	1.0 07	135.0	4
15 42.4	1.0 08	134.0	45
15 37.8	1.0 08	132.9	6
15 33.2	1.0 08	131.9	7
15 28.5	1.0 08	130.9	8
15 23.7	1.0 08	129.9	9
15 18.9	1.0 08	128.9	50
15 14.0	1.0 08	127.9	1
15 09.0	1.0 08	126.9	2
15 03.9	1.0 08	125.9	3
14 58.8	1.0 08	124.8	4
14 53.6	1.0 09	123.8	55
14 48.4	1.0 09	122.8	6
14 43.1	1.0 09	121.8	7
14 37.7	1.0 09	120.8	8
14 32.3	1.0 09	119.8	9
14 26.8	1.0 09	118.8	60
14 21.3	1.0 09	117.8	1
14 15.7	1.0 09	116.8	2
14 10.1	1.0 10	115.8	3
14 04.5	1.0 10	114.8	4
13 58.7	1.0 10	113.8	65
13 53.0	1.0 10	112.8	6
13 47.2	1.0 10	111.8	7
13 41.3	1.0 10	110.7	8
13 35.4	99 10	109.7	9
13 29.5	99 10	108.7	70
13 23.6	99 10	107.7	1
13 17.6	99 10	106.7	2
13 11.5	99 10	105.7	3
13 05.5	99 10	104.7	4
12 59.4	99 10	103.7	75
12 53.3	99 10	102.7	6
12 47.2	99 10	101.7	7
12 41.0	99 10	100.7	8
12 34.9	99 10	99.7	9
12 28.7	99 10	98.7	80
12 22.5	99 10	97.7	1
12 16.2	99 10	96.7	2
12 10.0	99 10	95.7	3
12 03.8	99 10	94.8	4
11 57.5	99 10	93.8	85
11 51.2	99 10	92.8	6
11 45.0	99 10	91.8	7
11 38.7	99 10	90.8	8
11 32.4	99 10	89.8	9
11 26.2	99 10	88.8	90

Main table:

H.A.	8° 00' (Alt. Δd Δt Az.)	8° 30'	9° 00'	9° 30'	10° 00'	10° 30'	11° 00'	11° 30'	H.A.
91	7 51.1 99 10 88.2	8 20.9 99 10 88.1	8 50.7 99 10 88.1	9 20.6 99 10 88.0	9 50.4 99 10 88.0	10 20.2 99 10 87.9	10 50.1 99 10 87.8	11 19.9 99 10 87.8	91
2	7 44.8 99 10 87.2	8 14.6 99 10 87.1	8 44.5 99 10 87.1	9 14.3 99 10 87.0	9 44.1 99 10 87.0	10 14.0 99 10 86.9	10 43.8 99 10 86.8	11 13.6 99 10 86.8	2
3	7 38.6 99 10 86.2	8 08.4 99 10 86.1	8 38.2 99 10 86.1	9 08.1 99 10 86.0	9 37.9 99 10 86.0	10 07.7 99 10 85.9	10 37.5 99 10 85.9	11 07.4 99 10 85.8	3
4	7 32.3 99 10 85.2	8 02.1 99 10 85.1	8 32.0 99 10 85.1	9 01.8 99 10 85.0	9 31.6 99 10 85.0	10 01.5 99 10 84.9	10 31.3 99 10 84.9	11 01.1 99 10 84.8	4
95	7 26.1 99 10 84.2	7 55.9 99 10 84.1	8 25.7 99 10 84.1	8 55.6 99 10 84.0	9 25.4 99 10 84.0	9 55.2 99 10 83.9	10 25.1 99 10 83.9	10 54.9 99 10 83.8	95
6	7 19.8 99 10 83.2	7 49.7 99 10 83.1	8 19.5 99 10 83.1	8 49.3 99 10 83.0	9 19.2 99 10 83.0	9 49.0 99 10 82.9	10 18.8 99 10 82.9	10 48.7 99 10 82.8	6
7	7 13.6 99 10 82.2	7 43.4 99 10 82.2	8 13.3 99 10 82.1	8 43.1 99 10 82.0	9 12.9 99 10 82.0	9 42.8 99 10 81.9	10 12.6 99 10 81.9	10 42.4 99 10 81.8	7
8	7 07.4 99 10 81.2	7 37.2 99 10 81.2	8 07.1 99 10 81.1	8 36.9 99 10 81.1	9 06.7 99 10 81.0	9 36.6 99 10 80.9	10 06.4 99 10 80.9	10 36.2 99 10 80.8	8
9	7 01.2 99 10 80.2	7 31.0 99 10 80.2	8 00.9 99 10 80.1	8 30.7 99 10 80.1	9 00.6 99 10 80.0	9 30.4 99 10 79.9	10 00.2 99 10 79.9	10 30.1 99 10 79.8	9
100	6 55.0 99 10 79.2	7 24.9 99 10 79.2	7 54.7 99 10 79.1	8 24.5 99 10 79.1	8 54.4 99 10 79.0	9 24.2 99 10 79.0	9 54.1 99 10 78.9	10 23.9 99 10 78.9	100
1	6 48.9 99 10 78.2	7 18.7 99 10 78.2	7 48.6 99 10 78.1	8 18.4 99 10 78.1	8 48.2 99 10 78.0	9 18.1 99 10 78.0	9 47.9 99 10 77.9	10 17.8 99 10 77.9	1
2	6 42.8 99 10 77.2	7 12.6 99 10 77.2	7 42.4 99 10 77.1	8 12.3 99 10 77.1	8 42.1 99 10 77.0	9 12.0 99 10 77.0	9 41.8 99 10 76.9	10 11.6 99 10 76.9	2
3	6 36.7 99 10 76.3	7 06.5 99 10 76.2	7 36.3 99 10 76.1	8 06.2 99 10 76.1	8 36.0 99 10 76.0	9 05.9 99 10 76.0	9 35.7 99 10 75.9	10 05.5 99 10 75.9	3
4	6 30.6 99 10 75.3	7 00.4 99 10 75.2	7 30.3 99 10 75.2	8 00.1 99 10 75.1	8 29.9 99 10 75.1	8 59.8 99 10 75.0	9 29.6 99 10 74.9	9 59.5 99 10 74.9	4
105	6 24.5 99 10 74.3	6 54.4 99 10 74.2	7 24.2 99 10 74.2	7 54.1 99 10 74.1	8 23.9 99 10 74.1	8 53.7 99 10 74.0	9 23.6 99 10 74.0	9 53.4 99 10 73.9	105
6	6 18.5 99 10 73.3	6 48.3 99 10 73.2	7 18.2 99 10 73.2	7 48.0 99 10 73.1	8 17.9 99 10 73.1	8 47.7 99 10 73.0	9 17.6 99 10 73.0	9 47.4 99 10 72.9	6
7	6 12.5 99 10 72.3	6 42.4 99 10 72.2	7 12.2 99 10 72.2	7 42.1 99 10 72.1	8 11.9 99 10 72.1	8 41.7 99 10 72.0	9 11.6 99 10 72.0	9 41.4 99 10 71.9	7
8	6 06.6 99 10 71.3	6 36.4 99 10 71.2	7 06.3 99 10 71.2	7 36.1 99 10 71.1	8 05.9 99 10 71.1	8 35.8 99 10 71.0	9 05.6 99 10 70.9	9 35.5 99 10 70.9	8
9	6 00.6 1.0 10 70.3	6 30.5 1.0 10 70.3	7 00.3 1.0 10 70.2	7 30.2 1.0 10 70.2	8 00.0 1.0 10 70.1	8 29.9 99 10 70.1	8 59.7 99 10 70.0	9 29.6 99 10 70.0	9
110	5 54.7 1.0 10 69.3	6 24.6 1.0 10 69.3	6 54.4 1.0 10 69.2	7 24.3 1.0 10 69.2	7 54.2 1.0 10 69.1	8 24.0 1.0 10 69.1	8 53.9 1.0 10 69.0	9 23.7 1.0 10 69.0	110
1	5 48.9 1.0 10 68.3	6 18.8 1.0 10 68.3	6 48.6 1.0 10 68.2	7 18.5 1.0 10 68.2	7 48.3 1.0 10 68.1	8 18.2 1.0 10 68.1	8 48.0 1.0 10 68.0	9 17.9 1.0 10 68.0	1
2	5 43.1 1.0 10 67.3	6 12.9 1.0 10 67.3	6 42.8 1.0 10 67.2	7 12.7 1.0 10 67.2	7 42.5 1.0 10 67.1	8 12.4 1.0 10 67.1	8 42.2 1.0 10 67.0	9 12.1 1.0 10 67.0	2
3	5 37.3 1.0 10 66.3	6 07.2 1.0 10 66.3	6 37.0 1.0 10 66.2	7 06.9 1.0 10 66.2	7 36.8 1.0 10 66.1	8 06.6 1.0 10 66.1	8 36.5 1.0 10 66.0	9 06.3 1.0 10 66.0	3
4	5 31.6 1.0 09 65.4	6 01.5 1.0 09 65.3	6 31.3 1.0 09 65.3	7 01.2 1.0 09 65.2	7 31.0 1.0 09 65.2	8 00.9 1.0 09 65.1	8 30.8 1.0 09 65.1	9 00.6 1.0 09 65.0	4
115	5 25.9 1.0 09 64.4	5 55.8 1.0 09 64.3	6 25.6 1.0 09 64.3	6 55.5 1.0 09 64.2	7 25.4 1.0 09 64.2	7 55.2 1.0 09 64.1	8 25.1 1.0 09 64.1	8 55.0 1.0 09 64.0	115
6	5 20.3 1.0 09 63.4	5 50.2 1.0 09 63.3	6 20.0 1.0 09 63.3	6 49.9 1.0 09 63.2	7 19.8 1.0 09 63.2	7 49.6 1.0 09 63.1	8 19.5 1.0 09 63.1	8 49.3 1.0 09 63.0	6
7	5 14.7 1.0 09 62.4	5 44.6 1.0 09 62.3	6 14.4 1.0 09 62.3	6 44.3 1.0 09 62.2	7 14.2 1.0 09 62.2	7 44.0 1.0 09 62.1	8 13.9 1.0 09 62.0	8 43.8 1.0 09 62.0	7
8	5 09.2 1.0 09 61.4	5 39.0 1.0 09 61.3	6 08.9 1.0 09 61.3	6 38.8 1.0 09 61.2	7 08.7 1.0 09 61.2	7 38.5 1.0 09 61.2	8 08.4 1.0 09 61.1	8 38.3 1.0 09 61.1	8
9	5 03.7 1.0 09 60.4	5 33.6 1.0 09 60.4	6 03.4 1.0 09 60.3	6 33.3 1.0 09 60.3	7 03.2 1.0 09 60.2	7 33.1 1.0 09 60.2	8 02.9 1.0 09 60.1	8 32.8 1.0 09 60.1	9
120		5 28.1 1.0 09 59.4	5 58.0 1.0 09 59.3	6 27.9 1.0 09 59.3	6 57.8 1.0 09 59.2	7 27.6 1.0 09 59.2	7 57.5 1.0 09 59.1	8 27.4 1.0 09 59.1	120
1		5 22.8 1.0 09 58.4	5 52.7 1.0 09 58.3	6 22.5 1.0 09 58.3	6 52.4 1.0 09 58.2	7 22.3 1.0 09 58.2	7 52.2 1.0 09 58.1	8 22.0 1.0 09 58.1	1
2		5 17.5 1.0 09 57.4	5 47.3 1.0 09 57.3	6 17.2 1.0 09 57.3	6 47.1 1.0 09 57.3	7 17.0 1.0 09 57.2	7 46.9 1.0 09 57.2	8 16.7 1.0 09 57.1	2
3		5 12.2 1.0 09 56.4	5 42.1 1.0 09 56.4	6 12.0 1.0 09 56.3	6 41.9 1.0 09 56.3	7 11.7 1.0 09 56.2	7 41.6 1.0 09 56.2	8 11.5 1.0 09 56.1	3
4		5 07.0 1.0 09 55.4	5 36.9 1.0 09 55.4	6 06.8 1.0 09 55.3	6 36.7 1.0 09 55.3	7 06.6 1.0 09 55.2	7 36.4 1.0 09 55.2	8 06.3 1.0 09 55.1	4
125		5 01.9 1.0 08 54.4	5 31.8 1.0 08 54.4	6 01.7 1.0 08 54.3	6 31.6 1.0 08 54.3	7 01.4 1.0 08 54.2	7 31.3 1.0 08 54.2	8 01.2 1.0 08 54.2	125
6			5 26.7 1.0 08 53.4	5 56.6 1.0 08 53.3	6 26.5 1.0 08 53.3	6 56.4 1.0 08 53.3	7 26.3 1.0 08 53.2	7 56.2 1.0 08 53.2	6
7			5 21.7 1.0 08 52.4	5 51.6 1.0 08 52.4	6 21.5 1.0 08 52.3	6 51.4 1.0 08 52.3	7 21.3 1.0 08 52.2	7 51.2 1.0 08 52.2	7
8			5 16.8 1.0 08 51.4	5 46.7 1.0 08 51.4	6 16.6 1.0 08 51.3	6 46.5 1.0 08 51.3	7 16.4 1.0 08 51.2	7 46.3 1.0 08 51.2	8
9			5 11.9 1.0 08 50.4	5 41.8 1.0 08 50.4	6 11.7 1.0 08 50.3	6 41.6 1.0 08 50.3	7 11.5 1.0 08 50.3	7 41.4 1.0 08 50.2	9
130			5 07.1 1.0 08 49.4	5 37.0 1.0 08 49.4	6 06.9 1.0 08 49.4	6 36.8 1.0 08 49.3	7 06.7 1.0 08 49.3	7 36.6 1.0 08 49.2	130
1			5 02.4 1.0 08 48.4	5 32.3 1.0 08 48.4	6 02.2 1.0 08 48.4	6 32.1 1.0 08 48.3	7 02.0 1.0 08 48.3	7 31.9 1.0 08 48.2	1
2				5 27.6 1.0 08 47.4	5 57.5 1.0 08 47.4	6 27.4 1.0 08 47.3	6 57.4 1.0 08 47.3	7 27.3 1.0 08 47.3	2
3				5 23.0 1.0 08 46.4	5 53.0 1.0 08 46.4	6 22.9 1.0 08 46.4	6 52.8 1.0 08 46.3	7 22.7 1.0 08 46.3	3
4				5 18.5 1.0 07 45.4	5 48.5 1.0 07 45.4	6 18.4 1.0 07 45.4	6 48.3 1.0 07 45.4	7 18.2 1.0 07 45.3	4
135				5 14.1 1.0 07 44.5	5 44.0 1.0 07 44.4	6 13.9 1.0 07 44.4	6 43.9 1.0 07 44.3	7 13.8 1.0 07 44.3	135
6				5 09.8 1.0 07 43.5	5 39.7 1.0 07 43.4	6 09.6 1.0 07 43.4	6 39.5 1.0 07 43.4	7 09.4 1.0 07 43.3	6
7				5 05.5 1.0 07 42.5	5 35.4 1.0 07 42.4	6 05.3 1.0 07 42.4	6 35.3 1.0 07 42.4	7 05.2 1.0 07 42.3	7
8				5 01.3 1.0 07 41.5	5 31.2 1.0 07 41.4	6 01.1 1.0 07 41.4	6 31.1 1.0 07 41.3	7 01.0 1.0 07 41.3	8
9					5 27.1 1.0 07 40.5	5 57.0 1.0 07 40.4	6 27.0 1.0 07 40.4	6 56.9 1.0 07 40.4	9
140					5 23.1 1.0 07 39.5	5 53.0 1.0 07 39.4	6 22.9 1.0 07 39.4	6 52.9 1.0 07 39.4	140
1					5 19.1 1.0 06 38.5	5 49.1 1.0 06 38.5	6 19.0 1.0 06 38.4	6 48.9 1.0 06 38.4	1
2					5 15.3 1.0 06 37.5	5 45.2 1.0 06 37.5	6 15.1 1.0 06 37.4	6 45.1 1.0 06 37.4	2
3					5 11.5 1.0 06 36.5	5 41.4 1.0 06 36.5	6 11.4 1.0 06 36.5	6 41.3 1.0 06 36.4	3
4					5 07.7 1.0 06 35.5	5 37.7 1.0 06 35.5	6 07.7 1.0 06 35.5	6 37.6 1.0 06 35.4	4
145					5 04.2 1.0 06 34.5	5 34.1 1.0 06 34.5	6 04.1 1.0 06 34.5	6 34.0 1.0 06 34.5	145
6					5 00.7 1.0 06 33.6	5 30.6 1.0 06 33.5	6 00.6 1.0 06 33.5	6 30.5 1.0 06 33.5	6
7						5 27.2 1.0 06 32.5	5 57.2 1.0 06 32.5	6 27.1 1.0 06 32.5	7
8						5 23.9 1.0 05 31.6	5 53.8 1.0 05 31.5	6 23.8 1.0 05 31.5	8
9						5 20.7 1.0 05 30.6	5 50.6 1.0 05 30.5	6 20.6 1.0 05 30.5	9
150						5 17.5 1.0 05 29.6	5 47.5 1.0 05 29.6	6 17.4 1.0 05 29.5	150
1						5 14.5 1.0 05 28.6	5 44.4 1.0 05 28.6	6 14.4 1.0 05 28.5	1
2						5 11.5 1.0 05 27.6	5 41.5 1.0 05 27.6	6 11.4 1.0 05 27.6	2
3						5 08.6 1.0 05 26.6	5 38.6 1.0 05 26.6	6 08.6 1.0 05 26.6	3
4						5 05.9 1.0 04 25.6	5 35.9 1.0 04 25.6	6 05.8 1.0 04 25.6	4
155						5 03.2 1.0 04 24.7	5 33.2 1.0 04 24.6	6 03.2 1.0 04 24.6	155
6						5 00.7 1.0 04 23.7	5 30.6 1.0 04 23.6	6 00.6 1.0 04 23.6	6
7							5 28.2 1.0 04 22.7	5 58.1 1.0 04 22.6	7
8							5 25.8 1.0 04 21.7	5 55.8 1.0 04 21.7	8
9							5 23.5 1.0 04 20.7	5 53.5 1.0 04 20.7	9
160							5 21.4 1.0 03 19.7	5 51.3 1.0 03 19.7	160
1							5 19.3 1.0 03 18.7	5 49.3 1.0 03 18.7	1
2							5 17.3 1.0 03 17.7	5 47.3 1.0 03 17.7	2
3							5 15.5 1.0 03 16.8	5 45.5 1.0 03 16.7	3
4							5 13.7 1.0 03 15.8	5 43.7 1.0 03 15.8	4
165							5 12.1 1.0 03 14.8	5 42.1 1.0 03 14.8	165
6							5 10.5 1.0 02 13.8	5 40.5 1.0 02 13.8	6
7							5 09.1 1.0 02 12.8	5 39.1 1.0 02 12.8	7
8							5 07.7 1.0 02 11.8	5 37.7 1.0 02 11.8	8
9							5 06.5 1.0 02 10.8	5 36.5 1.0 02 10.8	9
170							5 05.4 1.0 02 09.9	5 35.4 1.0 02 09.8	170
1							5 04.4 1.0 02 08.9	5 34.4 1.0 02 08.9	1
2							5 03.4 1.0 01 07.9	5 33.4 1.0 01 07.9	2
3							5 02.6 1.0 01 06.9	5 32.6 1.0 01 06.9	3
4							5 01.9 1.0 01 05.9	5 31.9 1.0 01 05.9	4
175							5 01.3 1.0 01 04.9	5 31.3 1.0 01 04.9	175
6							5 00.9 1.0 01 03.9	5 30.9 1.0 01 03.9	6
7							5 00.5 1.0 00 03.0	5 30.5 1.0 00 03.0	7
8							5 00.2 1.0 00 02.0	5 30.2 1.0 00 02.0	8
9							5 00.1 1.0 00 01.0	5 30.1 1.0 00 01.0	9
180							5 00.0 1.0 00 00.0	5 30.0 1.0 00 00.0	180

H.A.	12° 00′ Alt. Δd Δt Az.	12° 30′ Alt. Δd Δt Az.	13° 00′ Alt. Δd Δt Az.	13° 30′ Alt. Δd Δt Az.	14° 00′ Alt. Δd Δt Az.	14° 30′ Alt. Δd Δt Az.	15° 00′ Alt. Δd Δt Az.	15° 30′ Alt. Δd Δt Az.	H.A.
00	18 00.0 1.0 00 180.0	18 30.0 1.0 00 180.0	19 00.0 1.0 00 180.0	19 30.0 1.0 00 180.0	20 00.0 1.0 00 180.0	20 30.0 1.0 00 180.0	21 00.0 1.0 00 180.0	21 30.0 1.0 00 180.0	09
1	17 59.9 1.0 00 179.0	18 29.9 1.0 00 179.0	18 59.9 1.0 00 179.0	19 29.9 1.0 00 179.0	19 59.9 1.0 00 179.0	20 29.9 1.0 00 179.0	20 59.9 1.0 00 179.0	21 29.9 1.0 00 179.0	1
2	17 59.8 1.0 00 177.9	18 29.8 1.0 00 177.9	18 59.8 1.0 00 177.9	19 29.8 1.0 00 177.9	19 59.8 1.0 00 177.9	20 29.8 1.0 00 177.9	20 59.8 1.0 00 177.9	21 29.8 1.0 00 177.9	2
3	17 59.5 1.0 01 176.9	18 29.5 1.0 01 176.9	18 59.5 1.0 01 176.9	19 29.5 1.0 01 176.9	19 59.5 1.0 01 176.9	20 29.5 1.0 01 176.9	20 59.5 1.0 01 176.9	21 29.5 1.0 01 176.9	3
4	17 59.1 1.0 01 175.9	18 29.1 1.0 01 175.9	18 59.1 1.0 01 175.9	19 29.1 1.0 01 175.9	19 59.1 1.0 01 175.9	20 29.1 1.0 01 175.9	20 59.1 1.0 01 175.9	21 29.1 1.0 01 175.9	4
05	17 58.6 1.0 01 174.9	18 28.6 1.0 01 174.9	18 58.6 1.0 01 174.9	19 28.6 1.0 01 174.8	19 58.6 1.0 01 174.8	20 28.6 1.0 01 174.8	20 58.6 1.0 01 174.8	21 28.6 1.0 01 174.8	05
6	17 58.0 1.0 01 173.8	18 28.0 1.0 01 173.8	18 58.0 1.0 01 173.8	19 28.0 1.0 01 173.8	19 58.0 1.0 01 173.8	20 28.0 1.0 01 173.8	20 58.0 1.0 01 173.8	21 28.0 1.0 01 173.8	6
7	17 57.2 1.0 01 172.8	18 27.2 1.0 01 172.8	18 57.2 1.0 01 172.8	19 27.2 1.0 01 172.8	19 57.2 1.0 01 172.8	20 27.2 1.0 01 172.8	20 57.2 1.0 01 172.8	21 27.2 1.0 01 172.8	7
8	17 56.4 1.0 02 171.8	18 26.4 1.0 02 171.8	18 56.4 1.0 02 171.7	19 26.4 1.0 02 171.7	19 56.4 1.0 02 171.7	20 26.4 1.0 02 171.7	20 56.4 1.0 02 171.7	21 26.4 1.0 02 171.7	8
9	17 55.5 1.0 02 170.7	18 25.4 1.0 02 170.7	18 55.4 1.0 02 170.7	19 25.4 1.0 02 170.7	19 55.4 1.0 02 170.7	20 25.4 1.0 02 170.7	20 55.4 1.0 02 170.7	21 25.4 1.0 02 170.7	9
10	17 54.4 1.0 02 169.7	18 24.4 1.0 02 169.7	18 54.4 1.0 02 169.7	19 24.4 1.0 02 169.7	19 54.4 1.0 02 169.7	20 24.4 1.0 02 169.7	20 54.4 1.0 02 169.7	21 24.3 1.0 02 169.6	10
1	17 53.2 1.0 02 168.7	18 23.2 1.0 02 168.7	18 53.2 1.0 02 168.7	19 23.2 1.0 02 168.7	19 53.2 1.0 02 168.6	20 23.2 1.0 02 168.6	20 53.2 1.0 02 168.6	21 23.2 1.0 02 168.6	1
2	17 51.9 1.0 02 167.7	18 21.9 1.0 02 167.7	18 51.9 1.0 02 167.6	19 21.9 1.0 02 167.6	19 51.9 1.0 02 167.6	20 21.9 1.0 02 167.6	20 51.9 1.0 02 167.6	21 21.9 1.0 02 167.6	2
3	17 50.5 1.0 02 166.6	18 20.5 1.0 02 166.6	18 50.5 1.0 02 166.6	19 20.5 1.0 02 166.6	19 50.5 1.0 03 166.6	20 20.5 1.0 03 166.6	20 50.5 1.0 03 166.6	21 20.5 1.0 03 166.5	3
4	17 49.0 1.0 03 165.6	18 19.0 1.0 03 165.6	18 49.0 1.0 03 165.6	19 19.0 1.0 03 165.6	19 49.0 1.0 03 165.6	20 19.0 1.0 03 165.5	20 49.0 1.0 03 165.5	21 19.0 1.0 03 165.5	4
15	17 47.4 1.0 03 164.6	18 17.4 1.0 03 164.6	18 47.4 1.0 03 164.6	19 17.4 1.0 03 164.5	19 47.4 1.0 03 164.5	20 17.4 1.0 03 164.5	20 47.3 1.0 03 164.5	21 17.3 1.0 03 164.5	15
6	17 45.7 1.0 03 163.6	18 15.7 1.0 03 163.5	18 45.7 1.0 03 163.5	19 15.7 1.0 03 163.5	19 45.6 1.0 03 163.5	20 15.6 1.0 03 163.5	20 45.6 1.0 03 163.5	21 15.6 1.0 03 163.4	6
7	17 43.9 1.0 03 162.5	18 13.8 1.0 03 162.5	18 43.8 1.0 03 162.5	19 13.8 1.0 03 162.5	19 43.8 1.0 03 162.5	20 13.8 1.0 03 162.4	20 43.8 1.0 03 162.4	21 13.8 1.0 03 162.4	7
8	17 41.9 1.0 03 161.5	18 11.9 1.0 03 161.5	18 41.9 1.0 03 161.5	19 11.9 1.0 03 161.4	19 41.9 1.0 03 161.4	20 11.8 1.0 03 161.4	20 41.8 1.0 03 161.4	21 11.8 1.0 03 161.4	8
9	17 39.9 1.0 04 160.5	18 09.9 1.0 04 160.5	18 39.9 1.0 04 160.4	19 09.8 1.0 04 160.4	19 39.8 1.0 04 160.4	20 09.8 1.0 04 160.4	20 39.8 1.0 04 160.4	21 09.7 1.0 04 160.3	9
20	17 37.7 1.0 04 159.4	18 07.7 1.0 04 159.4	18 37.7 1.0 04 159.4	19 07.7 1.0 04 159.4	19 37.6 1.0 04 159.4	20 07.6 1.0 04 159.4	20 37.6 1.0 04 159.3	21 07.6 1.0 04 159.3	20
1	17 35.5 1.0 04 158.4	18 05.5 1.0 04 158.4	18 35.4 1.0 04 158.4	19 05.4 1.0 04 158.4	19 35.4 1.0 04 158.3	20 05.4 1.0 04 158.3	20 35.3 1.0 04 158.3	21 05.3 1.0 04 158.3	1
2	17 33.1 1.0 04 157.4	18 03.1 1.0 04 157.4	18 33.1 1.0 04 157.4	19 03.0 1.0 04 157.3	19 33.0 1.0 04 157.3	20 03.0 1.0 04 157.3	20 33.0 1.0 04 157.3	21 02.9 1.0 04 157.2	2
3	17 30.7 1.0 04 156.4	18 00.6 1.0 04 156.3	18 30.6 1.0 04 156.3	19 00.6 1.0 04 156.3	19 30.5 1.0 04 156.3	20 00.5 1.0 04 156.2	20 30.5 1.0 04 156.2	21 00.5 1.0 04 156.2	3
4	17 28.1 1.0 04 155.3	17 58.0 1.0 04 155.3	18 28.0 1.0 04 155.3	18 58.0 1.0 04 155.3	19 28.0 1.0 04 155.3	19 57.9 1.0 04 155.2	20 27.9 1.0 04 155.2	20 57.9 1.0 04 155.2	4
25	17 25.4 1.0 05 154.3	17 55.4 1.0 05 154.3	18 25.4 1.0 05 154.3	18 55.3 1.0 05 154.3	19 25.3 1.0 05 154.2	19 55.3 1.0 05 154.2	20 25.2 1.0 05 154.2	20 55.2 1.0 05 154.2	25
6	17 22.7 1.0 05 153.3	17 52.6 1.0 05 153.3	18 22.6 1.0 05 153.3	18 52.6 1.0 05 153.2	19 22.5 1.0 05 153.2	19 52.5 1.0 05 153.2	20 22.5 1.0 05 153.1	20 52.4 1.0 05 153.1	6
7	17 19.8 1.0 05 152.3	17 49.8 1.0 05 152.2	18 19.7 1.0 05 152.2	18 49.7 1.0 05 152.2	19 19.6 1.0 05 152.2	19 49.6 1.0 05 152.1	20 19.6 1.0 05 152.1	20 49.5 1.0 05 152.1	7
8	17 16.8 1.0 05 151.3	17 46.8 1.0 05 151.2	18 16.7 1.0 05 151.2	18 46.7 1.0 05 151.2	19 16.7 1.0 05 151.1	19 46.6 1.0 05 151.1	20 16.6 1.0 05 151.1	20 46.5 1.0 05 151.1	8
9	17 13.8 1.0 05 150.2	17 43.7 1.0 05 150.2	18 13.7 1.0 05 150.2	18 43.6 1.0 05 150.1	19 13.6 1.0 05 150.1	19 43.5 1.0 05 150.1	20 13.5 1.0 05 150.0	20 43.5 1.0 05 150.0	9
30	17 10.6 1.0 06 149.2	17 40.6 1.0 06 149.2	18 10.5 1.0 06 149.2	18 40.5 1.0 06 149.1	19 10.4 1.0 06 149.1	19 40.4 1.0 06 149.1	20 10.3 1.0 06 149.0	20 40.3 1.0 06 149.0	30
1	17 07.3 1.0 06 148.2	17 37.3 1.0 06 148.2	18 07.2 1.0 06 148.1	18 37.2 1.0 06 148.1	19 07.1 1.0 06 148.1	19 37.1 1.0 06 148.0	20 07.1 1.0 06 148.0	20 37.0 1.0 06 148.0	1
2	17 04.0 1.0 06 147.1	17 33.9 1.0 06 147.1	18 03.9 1.0 06 147.1	18 33.8 1.0 06 147.1	19 03.8 1.0 06 147.0	19 33.7 1.0 06 147.0	20 03.7 1.0 06 147.0	20 33.6 1.0 06 146.9	2
3	17 00.5 1.0 06 146.1	17 30.5 1.0 06 146.1	18 00.4 1.0 06 146.1	18 30.4 1.0 06 146.1	19 00.3 1.0 06 146.0	19 30.3 1.0 06 146.0	20 00.2 1.0 06 146.0	20 30.2 1.0 06 145.9	3
4	16 57.0 1.0 06 145.1	17 26.9 1.0 06 145.1	17 56.9 1.0 06 145.1	18 26.8 1.0 06 145.0	18 56.8 1.0 06 145.0	19 26.7 1.0 06 145.0	19 56.7 1.0 06 144.9	20 26.6 1.0 06 144.9	4
35	16 53.4 1.0 06 144.1	17 23.3 1.0 06 144.1	17 53.3 1.0 06 144.0	18 23.2 1.0 06 144.0	18 53.1 1.0 06 144.0	19 23.1 1.0 06 143.9	19 53.0 1.0 06 143.9	20 22.9 1.0 06 143.9	35
6	16 49.6 1.0 06 143.1	17 19.6 1.0 06 143.0	17 49.5 1.0 06 143.0	18 19.5 1.0 06 143.0	18 49.4 1.0 06 142.9	19 19.3 1.0 06 142.9	19 49.3 1.0 06 142.8	20 19.2 1.0 06 142.8	6
7	16 45.8 1.0 06 142.1	17 15.8 1.0 06 142.0	17 45.7 1.0 06 142.0	18 15.6 1.0 06 142.0	18 45.6 1.0 06 141.9	19 15.5 1.0 07 141.9	19 45.4 1.0 07 141.9	20 15.4 1.0 07 141.8	7
8	16 41.9 1.0 07 141.0	17 11.9 1.0 07 141.0	17 41.8 1.0 07 141.0	18 11.7 1.0 07 140.9	18 41.7 1.0 07 140.9	19 11.6 1.0 07 140.9	19 41.5 1.0 07 140.8	20 11.5 1.0 07 140.8	8
9	16 37.9 1.0 07 140.0	17 07.9 1.0 07 140.0	17 37.8 1.0 07 140.0	18 07.7 1.0 07 139.9	18 37.7 1.0 07 139.9	19 07.6 1.0 07 139.8	19 37.5 1.0 07 139.8	20 07.4 1.0 07 139.8	9
40	16 33.9 1.0 07 139.0	17 03.8 1.0 07 139.0	17 33.7 1.0 07 138.9	18 03.7 1.0 07 138.9	18 33.6 1.0 07 138.8	19 03.5 1.0 07 138.8	19 33.4 1.0 07 138.8	20 03.4 1.0 0 7 138.7	40
1	16 29.7 1.0 07 138.0	16 59.6 1.0 07 138.0	17 29.6 1.0 07 137.9	17 59.5 1.0 07 137.9	18 29.4 1.0 07 137.8	18 59.3 1.0 07 137.8	19 29.3 1.0 07 137.8	19 59.2 1.0 07 137.7	1
2	16 25.5 1.0 07 137.0	16 55.4 1.0 07 136.9	17 25.3 1.0 07 136.9	17 55.2 1.0 07 136.9	18 25.2 1.0 07 136.8	18 55.1 1.0 07 136.8	19 25.0 1.0 07 136.7	19 54.9 1.0 07 136.7	2
3	16 21.2 1.0 07 136.0	16 51.1 1.0 07 135.9	17 21.0 1.0 07 135.9	17 50.9 1.0 07 135.8	18 20.8 1.0 07 135.8	18 50.7 1.0 07 135.8	19 20.7 1.0 07 135.7	19 50.6 1.0 07 135.7	3
4	16 16.8 1.0 07 134.9	16 46.7 1.0 07 134.9	17 16.6 1.0 07 134.9	17 46.5 1.0 07 134.8	18 16.4 1.0 08 134.8	18 46.3 1.0 08 134.7	19 16.2 1.0 07 134.7	19 46.1 1.0 08 134.7	4
45	16 12.3 1.0 08 133.9	16 42.2 1.0 08 133.9	17 12.1 1.0 08 133.8	17 42.0 1.0 08 133.8	18 11.9 1.0 08 133.8	18 41.8 1.0 08 133.7	19 11.7 1.0 08 133.7	19 41.6 1.0 08 133.6	45
6	16 07.7 1.0 08 132.9	16 37.6 1.0 08 132.9	17 07.5 1.0 08 132.8	17 37.4 1.0 08 132.8	18 07.4 1.0 08 132.7	18 37.3 1.0 08 132.7	19 07.2 1.0 08 132.7	19 37.1 1.0 08 132.6	6
7	16 03.1 1.0 08 131.9	16 33.0 1.0 08 131.9	17 02.9 1.0 08 131.8	17 32.8 1.0 08 131.8	18 02.7 1.0 08 131.7	18 32.6 1.0 08 131.7	19 02.5 1.0 08 131.6	19 32.4 1.0 08 131.6	7
8	15 58.4 1.0 08 130.9	16 28.3 1.0 08 130.8	16 58.2 1.0 08 130.8	17 28.1 1.0 08 130.8	17 58.0 1.0 08 130.7	18 27.9 1.0 08 130.7	18 57.8 1.0 08 130.6	19 27.7 1.0 08 130.6	8
9	15 53.6 1.0 08 129.9	16 23.5 1.0 08 129.8	16 53.4 1.0 08 129.8	17 23.3 1.0 08 129.7	17 53.2 1.0 08 129.7	18 23.1 1.0 08 129.6	18 53.0 1.0 08 129.6	19 22.9 1.0 08 129.6	9
50	15 48.8 1.0 08 128.9	16 18.7 1.0 08 128.8	16 48.6 1.0 08 128.8	17 18.4 1.0 08 128.7	17 48.3 1.0 08 128.7	18 18.2 1.0 08 128.6	18 48.1 1.0 08 128.6	19 18.0 1.0 08 128.5	50
1	15 43.8 1.0 08 127.8	16 13.7 1.0 08 127.8	16 43.6 1.0 08 127.7	17 13.5 1.0 08 127.7	17 43.4 1.0 08 127.6	18 13.3 1.0 08 127.6	18 43.2 1.0 08 127.6	19 13.1 1.0 08 127.5	1
2	15 38.9 1.0 09 126.8	16 08.7 1.0 09 126.8	16 38.6 1.0 09 126.7	17 08.5 1.0 09 126.7	17 38.4 1.0 09 126.6	18 08.3 1.0 09 126.6	18 38.2 1.0 09 126.6	19 08.1 1.0 09 126.5	2
3	15 33.8 1.0 09 125.8	16 03.7 1.0 09 125.8	16 33.6 1.0 09 125.7	17 03.5 1.0 09 125.7	17 33.3 1.0 09 125.6	18 03.2 1.0 09 125.6	18 33.1 1.0 09 125.5	19 03.0 1.0 09 125.5	3
4	15 28.7 1.0 09 124.8	15 58.6 1.0 09 124.8	16 28.5 1.0 09 124.7	16 58.3 1.0 09 124.7	17 28.2 1.0 09 124.6	17 58.1 1.0 09 124.6	18 28.0 1.0 09 124.5	18 57.9 1.0 09 124.5	4
55	15 23.5 1.0 09 123.8	15 53.4 1.0 09 123.7	16 23.3 1.0 09 123.7	16 53.1 1.0 09 123.7	17 23.0 1.0 09 123.6	17 52.9 1.0 09 123.6	18 22.8 1.0 09 123.5	18 52.7 1.0 09 123.5	55
6	15 18.3 1.0 09 122.8	15 48.1 1.0 09 122.7	16 18.0 1.0 09 122.7	16 47.9 1.0 09 122.6	17 17.8 1.0 09 122.6	17 47.6 1.0 09 122.5	18 17.5 1.0 09 122.5	18 47.4 1.0 09 122.5	6
7	15 13.0 1.0 09 121.8	15 42.8 1.0 09 121.7	16 12.7 1.0 09 121.7	16 42.6 1.0 09 121.6	17 12.5 1.0 09 121.6	17 42.3 1.0 09 121.5	18 12.2 1.0 09 121.5	18 42.1 1.0 09 121.4	7
8	15 07.6 1.0 09 120.8	15 37.5 1.0 09 120.7	16 07.3 1.0 09 120.7	16 37.2 1.0 09 120.6	17 07.1 1.0 09 120.6	17 37.0 1.0 09 120.5	18 06.8 1.0 09 120.5	18 36.7 1.0 09 120.4	8
9	15 02.2 1.0 09 119.8	15 32.1 1.0 09 119.7	16 01.9 1.0 09 119.7	16 31.8 1.0 09 119.6	17 01.7 1.0 09 119.6	17 31.5 1.0 09 119.5	18 01.4 1.0 09 119.5	18 31.3 1.0 09 119.4	9
60	14 56.7 1.0 09 118.7	15 26.6 1.0 09 118.7	15 56.4 1.0 09 118.6	16 26.3 1.0 09 118.6	16 56.2 1.0 09 118.6	17 26.0 1.0 09 118.5	17 55.9 1.0 09 118.5	18 25.8 1.0 09 118.4	60
1	14 51.2 1.0 09 117.7	15 21.0 1.0 09 117.7	15 50.9 1.0 09 117.6	16 20.8 1.0 09 117.6	16 50.6 1.0 09 117.5	17 20.5 1.0 09 117.5	17 50.3 1.0 09 117.4	18 20.2 1.0 09 117.4	1
2	14 45.6 1.0 09 116.7	15 15.5 1.0 09 116.7	15 45.3 1.0 09 116.6	16 15.2 1.0 09 116.6	16 45.1 1.0 09 116.5	17 14.9 1.0 09 116.5	17 44.8 1.0 09 116.4	18 14.6 1.0 09 116.4	2
3	14 40.0 1.0 09 115.7	15 09.8 1.0 09 115.7	15 39.7 1.0 09 115.6	16 09.6 1.0 09 115.6	16 39.4 1.0 09 115.5	17 09.3 1.0 09 115.5	17 39.1 1.0 09 115.4	18 09.0 1.0 09 115.4	3
4	14 34.3 1.0 10 114.7	15 04.2 1.0 10 114.7	15 34.0 1.0 10 114.6	16 03.9 1.0 10 114.6	16 33.7 1.0 10 114.5	17 03.6 1.0 10 114.5	17 33.4 1.0 10 114.4	18 03.3 1.0 10 114.4	4
65	14 28.6 1.0 10 113.7	14 58.4 1.0 10 113.7	15 28.3 1.0 10 113.6	15 58.2 1.0 10 113.6	16 28.0 1.0 10 113.5	16 57.9 1.0 10 113.5	17 27.7 1.0 10 113.4	17 57.6 1.0 10 113.4	65
6	14 22.8 1.0 10 112.7	14 52.7 1.0 10 112.7	15 22.5 1.0 10 112.6	15 52.4 1.0 10 112.6	16 22.2 1.0 10 112.5	16 52.1 1.0 10 112.5	17 21.9 99 10 112.4	17 51.8 99 10 112.3	6
7	14 17.0 1.0 10 111.7	14 46.9 1.0 10 111.7	15 16.7 1.0 10 111.6	15 46.6 99 10 111.5	16 16.4 99 10 111.5	16 46.3 99 10 111.4	17 16.1 99 10 111.4	17 46.0 99 10 111.3	7
8	14 11.2 99 10 110.7	14 41.0 99 10 110.6	15 10.9 99 10 110.6	15 40.7 99 10 110.5	16 10.6 99 10 110.5	16 40.4 99 10 110.4	17 10.3 99 10 110.4	17 40.1 99 10 110.3	8
9	14 05.3 99 10 109.7	14 35.1 99 10 109.6	15 05.0 99 10 109.6	15 34.8 99 10 109.5	16 04.7 99 10 109.5	16 34.5 99 10 109.4	17 04.4 99 10 109.4	17 34.2 99 10 109.3	9
70	13 59.4 99 10 108.7	14 29.2 99 10 108.6	14 59.1 99 10 108.6	15 28.9 99 10 108.5	15 58.7 99 10 108.5	16 28.6 99 10 108.4	16 58.4 99 10 108.4	17 28.3 99 10 108.3	70
1	13 53.4 99 10 107.7	14 23.2 99 10 107.6	14 53.1 99 10 107.6	15 22.9 99 10 107.5	15 52.8 99 10 107.5	16 22.6 99 10 107.4	16 52.5 99 10 107.4	17 22.3 99 10 107.3	1
2	13 47.4 99 10 106.7	14 17.3 99 10 106.6	14 47.1 99 10 106.6	15 16.9 99 10 106.5	15 46.8 99 10 106.5	16 16.6 99 10 106.4	16 46.5 99 10 106.4	17 16.3 99 10 106.3	2
3	13 41.4 99 10 105.7	14 11.2 99 10 105.6	14 41.1 99 10 105.6	15 10.9 99 10 105.5	15 40.7 99 10 105.5	16 10.6 99 10 105.4	16 40.4 99 10 105.3	17 10.3 99 10 105.3	3
4	13 35.3 99 10 104.7	14 05.2 99 10 104.6	14 35.0 99 10 104.6	15 04.9 99 10 104.5	15 34.7 99 10 104.5	16 04.5 99 10 104.4	16 34.4 99 10 104.4	17 04.2 99 10 104.3	4
75	13 29.3 99 10 103.7	13 59.1 99 10 103.6	14 28.9 99 10 103.6	14 58.8 99 10 103.5	15 28.6 99 10 103.5	15 58.4 99 10 103.4	16 28.3 99 10 103.4	16 58.1 99 10 103.3	75
6	13 23.2 99 10 102.7	13 53.0 99 10 102.6	14 22.8 99 10 102.6	14 52.7 99 10 102.5	15 22.5 99 10 102.5	15 52.3 99 10 102.4	16 22.2 99 10 102.4	16 52.0 99 10 102.3	6
7	13 17.0 99 10 101.7	13 46.9 99 10 101.6	14 16.7 99 10 101.6	14 46.5 99 10 101.5	15 16.4 99 10 101.5	15 46.2 99 10 101.4	16 16.0 99 10 101.4	16 45.9 99 10 101.3	7
8	13 10.9 99 10 100.7	13 40.7 99 10 100.6	14 10.5 99 10 100.6	14 40.4 99 10 100.5	15 10.2 99 10 100.5	15 40.0 99 10 100.4	16 09.9 99 10 100.4	16 39.7 99 10 100.3	8
9	13 04.7 99 10 99.7	13 34.5 99 10 99.6	14 04.3 99 10 99.6	14 34.2 99 10 99.5	15 04.0 99 10 99.5	15 33.9 99 10 99.4	16 03.7 99 10 99.4	16 33.5 99 10 99.3	9
80	12 58.5 99 10 98.7	13 28.3 99 10 98.6	13 58.2 99 10 98.6	14 28.0 99 10 98.5	14 57.8 99 10 98.5	15 27.7 99 10 98.4	15 57.5 99 10 98.4	16 27.3 99 10 98.3	80
1	12 52.3 99 10 97.7	13 22.1 99 10 97.6	13 52.0 99 10 97.6	14 21.8 99 10 97.5	14 51.6 99 10 97.5	15 21.4 99 10 97.4	15 51.3 99 10 97.4	16 21.1 99 10 97.3	1
2	12 46.1 99 10 96.7	13 15.9 99 10 96.6	13 45.7 99 10 96.6	14 15.6 99 10 96.5	14 45.4 99 10 96.5	15 15.2 99 10 96.4	15 45.0 99 10 96.4	16 14.9 99 10 96.3	2
3	12 39.8 99 10 95.7	13 09.7 99 10 95.6	13 39.5 99 10 95.6	14 09.3 99 10 95.5	14 39.2 99 10 95.5	15 09.0 99 10 95.4	15 38.8 99 10 95.4	16 08.6 99 10 95.3	3
4	12 33.6 99 10 94.7	13 03.4 99 10 94.6	13 33.3 99 10 94.6	14 03.1 99 10 94.5	14 32.9 99 10 94.5	15 02.7 99 10 94.4	15 32.6 99 10 94.4	16 02.4 99 10 94.3	4
85	12 27.3 99 10 93.7	12 57.2 99 10 93.6	13 27.0 99 10 93.6	13 56.8 99 10 93.5	14 26.6 99 10 93.5	14 56.5 99 10 93.4	15 26.3 99 10 93.4	15 56.1 99 10 93.3	85
6	12 21.1 99 10 92.7	12 50.9 99 10 92.6	13 20.7 99 10 92.6	13 50.6 99 10 92.5	14 20.4 99 10 92.5	14 50.2 99 10 92.4	15 20.0 99 10 92.4	15 49.9 99 10 92.3	6
7	12 14.8 99 10 91.7	12 44.6 99 10 91.7	13 14.5 99 10 91.6	13 44.3 99 10 91.5	14 14.1 99 10 91.5	14 43.9 99 10 91.4	15 13.8 99 10 91.4	15 43.6 99 10 91.3	7
8	12 08.5 99 10 90.7	12 38.4 99 10 90.7	13 08.2 99 10 90.6	13 38.0 99 10 90.6	14 07.8 99 10 90.5	14 37.7 99 10 90.4	15 07.5 99 10 90.4	15 37.3 99 10 90.3	8
9	12 02.3 99 10 89.7	12 32.1 99 10 89.7	13 01.9 99 10 89.6	13 31.8 99 10 89.6	14 01.6 99 10 89.5	14 31.4 99 10 89.5	15 01.2 99 10 89.4	15 31.0 99 10 89.4	9
90	11 56.0 99 10 88.7	12 25.8 99 10 88.7	12 55.7 99 10 88.6	13 25.5 99 10 88.6	13 55.3 99 10 88.5	14 25.1 99 10 88.5	14 55.0 99 10 88.4	15 24.8 99 10 88.3	90

Lat. 8°

H.A.	12° 00' Alt.	Δd Δt	Az.	12° 30' Alt.	Δd Δt	Az.	13° 00' Alt.	Δd Δt	Az.	13° 30' Alt.	Δd Δt	Az.	14° 00' Alt.	Δd Δt	Az.	14° 30' Alt.	Δd Δt	Az.	15° 00' Alt.	Δd Δt	Az.	15° 30' Alt.	Δd Δt	Az.	H.A.
91	11 49.7	99 10	87.7	12 19.6	99 10	87.7	12 49.4	99 10	87.6	13 19.2	99 10	87.6	13 49.0	99 10	87.5	14 18.9	99 10	87.5	14 48.7	99 10	87.4	15 18.5	99 10	87.3	91
2	11 43.5	99 10	86.7	12 13.3	99 10	86.7	12 43.1	99 10	86.6	13 12.9	99 10	86.6	13 42.8	99 10	86.5	14 12.6	99 10	86.5	14 42.4	99 10	86.4	15 12.2	99 10	86.4	2
3	11 37.2	99 10	85.7	12 07.0	99 10	85.7	12 36.9	99 10	85.6	13 06.7	99 10	85.6	13 36.5	99 10	85.5	14 06.3	99 10	85.5	14 36.2	99 10	85.4	15 06.0	99 10	85.4	3
4	11 31.0	99 10	84.8	12 00.8	99 10	84.7	12 30.6	99 10	84.6	13 00.4	99 10	84.6	13 30.3	99 10	84.5	14 00.1	99 10	84.5	14 29.9	99 10	84.4	14 59.7	99 10	84.4	4
95	11 24.7	99 10	83.8	11 54.5	99 10	83.7	12 24.4	99 10	83.7	12 54.2	99 10	83.6	13 24.0	99 10	83.5	13 53.9	99 10	83.5	14 23.7	99 10	83.4	14 53.5	99 10	83.4	95
6	11 18.5	99 10	82.8	11 48.3	99 10	82.7	12 18.1	99 10	82.7	12 48.0	99 10	82.6	13 17.8	99 10	82.6	13 47.6	99 10	82.5	14 17.5	99 10	82.4	14 47.3	99 10	82.4	6
7	11 12.3	99 10	81.8	11 42.1	99 10	81.7	12 11.9	99 10	81.7	12 41.8	99 10	81.6	13 11.6	99 10	81.6	13 41.4	99 10	81.5	14 11.3	99 10	81.5	14 41.1	99 10	81.4	7
8	11 06.1	99 10	80.8	11 35.9	99 10	80.7	12 05.7	99 10	80.7	12 35.6	99 10	80.6	13 05.4	99 10	80.6	13 35.2	99 10	80.5	14 05.1	99 10	80.5	14 34.9	99 10	80.4	8
9	10 59.9	99 10	79.8	11 29.7	99 10	79.7	11 59.6	99 10	79.7	12 29.4	99 10	79.6	12 59.2	99 10	79.6	13 29.1	99 10	79.5	13 58.9	99 10	79.5	14 28.7	99 10	79.4	9
100	10 53.7	99 10	78.8	11 23.6	99 10	78.8	11 53.4	99 10	78.7	12 23.2	99 10	78.6	12 53.1	99 10	78.6	13 22.9	99 10	78.5	13 52.7	99 10	78.5	14 22.6	99 10	78.4	100
1	10 47.6	99 10	77.8	11 17.4	99 10	77.8	11 47.3	99 10	77.7	12 17.1	99 10	77.7	12 46.9	99 10	77.6	13 16.8	99 10	77.5	13 46.6	99 10	77.5	14 16.4	99 10	77.4	1
2	10 41.5	99 10	76.8	11 11.3	99 10	76.8	11 41.1	99 10	76.7	12 11.0	99 10	76.7	12 40.8	99 10	76.6	13 10.6	99 10	76.6	13 40.5	99 10	76.5	14 10.3	99 10	76.4	2
3	10 35.4	99 10	75.8	11 05.2	99 10	75.8	11 35.1	99 10	75.7	12 04.9	99 10	75.7	12 34.7	99 10	75.6	13 04.6	99 10	75.6	13 34.4	99 10	75.5	14 04.2	99 10	75.5	3
4	10 29.3	99 10	74.8	10 59.1	99 10	74.8	11 29.0	99 10	74.7	11 58.8	99 10	74.7	12 28.7	99 10	74.6	12 58.5	99 10	74.6	13 28.3	99 10	74.5	13 58.2	99 10	74.5	4
105	10 23.3	99 10	73.9	10 53.1	99 10	73.8	11 23.0	99 10	73.8	11 52.8	99 10	73.7	12 22.6	99 10	73.6	12 52.5	99 10	73.6	13 22.3	99 10	73.5	13 52.1	99 10	73.5	105
6	10 17.3	99 10	72.9	10 47.1	99 10	72.8	11 16.9	99 10	72.8	11 46.8	99 10	72.7	12 16.6	99 10	72.7	12 46.5	99 10	72.6	13 16.3	99 10	72.6	13 46.1	99 10	72.5	6
7	10 11.3	99 10	71.9	10 41.1	99 10	71.8	11 11.0	99 10	71.8	11 40.8	99 10	71.7	12 10.7	99 10	71.7	12 40.5	99 10	71.6	13 10.3	99 10	71.6	13 40.2	99 10	71.5	7
8	10 05.3	99 10	70.9	10 35.2	99 10	70.8	11 05.0	99 10	70.8	11 34.9	99 10	70.7	12 04.7	99 10	70.7	12 34.6	99 10	70.6	13 04.4	99 10	70.6	13 34.3	99 10	70.5	8
9	9 59.4	99 10	69.9	10 29.3	99 10	69.8	10 59.1	99 10	69.8	11 29.0	99 10	69.7	11 58.8	99 10	69.6	12 28.7	99 10	69.6	12 58.5	99 10	69.6	13 28.4	99 10	69.5	9
110	9 53.6	1.0 10	68.9	10 23.4	1.0 10	68.9	10 53.3	1.0 10	68.8	11 23.1	1.0 10	68.8	11 53.0	99 10	68.7	12 22.8	99 10	68.7	12 52.7	99 10	68.6	13 22.5	99 10	68.6	110
1	9 47.6	1.0 10	67.9	10 17.6	1.0 10	67.9	10 47.3	1.0 10	67.8	11 17.3	1.0 10	67.8	11 47.1	1.0 10	67.7	12 17.0	1.0 10	67.7	12 46.8	99 10	67.6	13 16.7	1.0 10	67.6	1
2	9 41.9	1.0 10	66.9	10 11.8	1.0 10	66.9	10 41.6	1.0 10	66.8	11 11.5	1.0 10	66.8	11 41.4	1.0 10	66.7	12 11.2	1.0 10	66.7	12 41.1	1.0 10	66.6	13 10.9	1.0 10	66.6	2
3	9 36.2	1.0 10	65.9	10 06.0	1.0 10	65.9	10 35.9	1.0 10	65.9	11 05.8	1.0 09	65.8	11 35.6	1.0 10	65.8	12 05.5	1.0 10	65.7	12 35.3	1.0 09	65.6	13 05.2	1.0 09	65.6	3
4	9 30.5	1.0 09	65.0	10 00.3	1.0 09	64.9	10 30.2	1.0 09	64.9	11 00.1	1.0 09	64.8	11 29.9	1.0 09	64.8	11 59.8	1.0 09	64.7	12 29.6	1.0 09	64.7	12 59.5	1.0 09	64.6	4
115	9 24.8	1.0 09	64.0	9 54.7	1.0 09	63.9	10 24.5	1.0 09	63.9	10 54.4	1.0 09	63.8	11 24.3	1.0 09	63.8	11 54.1	1.0 09	63.7	12 24.0	1.0 09	63.7	12 53.8	1.0 09	63.6	115
6	9 19.1	1.0 09	63.0	9 49.1	1.0 09	62.9	10 18.9	1.0 09	62.9	10 48.8	1.0 09	62.8	11 18.7	1.0 09	62.8	11 48.5	1.0 09	62.7	12 18.4	1.0 09	62.6	12 48.2	1.0 09	62.6	6
7	9 13.7	1.0 09	62.0	9 43.5	1.0 09	62.0	10 13.4	1.0 09	61.9	10 43.2	1.0 09	61.9	11 13.1	1.0 09	61.8	11 43.0	1.0 09	61.8	12 12.8	1.0 09	61.7	12 42.7	1.0 09	61.7	7
8	9 08.1	1.0 09	61.0	9 38.0	1.0 09	61.0	10 07.9	1.0 09	60.9	10 37.7	1.0 09	60.9	11 07.6	1.0 09	60.8	11 37.5	1.0 09	60.8	12 07.3	1.0 09	60.7	12 37.2	1.0 09	60.7	8
9	9 02.7	1.0 09	60.0	9 32.5	1.0 09	60.0	10 02.4	1.0 09	59.9	10 32.3	1.0 09	59.9	11 02.2	1.0 09	59.8	11 32.0	1.0 09	59.8	12 01.9	1.0 09	59.7	12 31.8	1.0 09	59.7	9
120	8 57.3	1.0 09	59.0	9 27.1	1.0 09	59.0	9 57.0	1.0 09	59.0	10 26.9	1.0 09	58.9	10 56.8	1.0 09	58.9	11 26.6	1.0 09	58.8	11 56.5	1.0 09	58.8	12 26.4	1.0 09	58.7	120
1	8 51.9	1.0 09	58.1	9 21.8	1.0 09	58.0	9 51.7	1.0 09	58.0	10 21.5	1.0 09	57.9	10 51.4	1.0 09	57.9	11 21.3	1.0 09	57.8	11 51.2	1.0 09	57.8	12 21.0	1.0 09	57.7	1
2	8 46.6	1.0 09	57.1	9 16.5	1.0 09	57.0	9 46.4	1.0 09	57.0	10 16.3	1.0 09	56.9	10 46.1	1.0 09	56.9	11 16.0	1.0 09	56.8	11 45.9	1.0 09	56.8	12 15.8	1.0 09	56.8	2
3	8 41.4	1.0 09	56.1	9 11.3	1.0 09	56.0	9 41.2	1.0 09	56.0	10 11.0	1.0 09	56.0	10 40.9	1.0 09	55.9	11 10.8	1.0 09	55.9	11 40.7	1.0 08	55.8	12 10.6	1.0 09	55.8	3
4	8 36.2	1.0 09	55.1	9 06.1	1.0 09	55.1	9 36.0	1.0 08	55.0	10 05.9	1.0 08	55.0	10 35.8	1.0 08	54.9	11 05.6	1.0 08	54.9	11 35.5	1.0 08	54.8	12 05.4	1.0 08	54.8	4
125	8 31.1	1.0 08	54.1	9 01.0	1.0 08	54.1	9 30.9	1.0 08	54.0	10 00.8	1.0 08	54.0	10 30.7	1.0 08	53.9	11 00.5	1.0 08	53.9	11 30.4	1.0 08	53.8	12 00.3	1.0 08	53.8	125
6	8 26.1	1.0 08	53.1	8 55.9	1.0 08	53.1	9 25.8	1.0 08	53.0	9 55.7	1.0 08	53.0	10 25.6	1.0 08	53.0	10 55.5	1.0 08	52.9	11 25.4	1.0 08	52.9	11 55.3	1.0 08	52.8	6
7	8 21.1	1.0 08	52.1	8 51.0	1.0 08	52.1	9 20.9	1.0 08	52.1	9 50.8	1.0 08	52.0	10 20.6	1.0 08	52.0	10 50.5	1.0 08	51.9	11 20.4	1.0 08	51.9	11 50.3	1.0 08	51.8	7
8	8 16.2	1.0 08	51.2	8 46.1	1.0 08	51.1	9 15.9	1.0 08	51.1	9 45.8	1.0 08	51.0	10 15.7	1.0 08	51.0	10 45.6	1.0 08	50.9	11 15.5	1.0 08	50.9	11 45.4	1.0 08	50.9	8
9	8 11.3	1.0 08	50.2	8 41.2	1.0 08	50.1	9 11.1	1.0 08	50.1	9 41.0	1.0 08	50.0	10 10.8	1.0 08	50.0	10 40.8	1.0 08	50.0	11 10.7	1.0 08	49.9	11 40.6	1.0 08	49.9	9
130	8 06.5	1.0 08	49.2	8 36.4	1.0 08	49.1	9 06.3	1.0 08	49.1	9 36.2	1.0 08	49.1	10 06.1	1.0 08	49.0	10 36.0	1.0 08	49.0	11 05.9	1.0 08	48.9	11 35.8	1.0 08	48.9	130
1	8 01.8	1.0 08	48.2	8 31.7	1.0 08	48.2	9 01.6	1.0 08	48.1	9 31.5	1.0 08	48.1	10 01.4	1.0 08	48.0	10 31.3	1.0 08	48.0	11 01.2	1.0 08	48.0	11 31.1	1.0 08	47.9	1
2	7 57.2	1.0 08	47.2	8 27.1	1.0 08	47.2	8 57.0	1.0 08	47.1	9 26.9	1.0 08	47.1	9 56.8	1.0 08	47.1	10 26.7	1.0 08	47.0	10 56.6	1.0 08	47.0	11 26.5	1.0 08	46.9	2
3	7 52.6	1.0 07	46.2	8 22.5	1.0 07	46.2	8 52.4	1.0 07	46.2	9 22.3	1.0 07	46.1	9 52.2	1.0 07	46.1	10 22.2	1.0 07	46.0	10 52.1	1.0 07	46.0	11 22.0	1.0 07	46.0	3
4	7 48.1	1.0 07	45.3	8 18.0	1.0 07	45.2	8 47.9	1.0 07	45.2	9 17.9	1.0 07	45.1	9 47.8	1.0 07	45.1	10 17.7	1.0 07	45.1	10 47.6	1.0 07	45.0	11 17.5	1.0 07	45.0	4
135	7 43.7	1.0 07	44.3	8 13.6	1.0 07	44.2	8 43.5	1.0 07	44.2	9 13.4	1.0 07	44.2	9 43.4	1.0 07	44.1	10 13.3	1.0 07	44.1	10 43.2	1.0 07	44.0	11 13.1	1.0 07	44.0	135
6	7 39.4	1.0 07	43.3	8 09.3	1.0 07	43.2	8 39.2	1.0 07	43.2	9 09.1	1.0 07	43.2	9 39.0	1.0 07	43.1	10 09.0	1.0 07	43.1	10 38.9	1.0 07	43.1	11 08.8	1.0 07	43.0	6
7	7 35.1	1.0 07	42.3	8 05.0	1.0 07	42.3	8 34.9	1.0 07	42.2	9 04.9	1.0 07	42.2	9 34.8	1.0 07	42.2	10 04.7	1.0 07	42.1	10 34.6	1.0 07	42.1	11 04.5	1.0 07	42.0	7
8	7 30.9	1.0 07	41.3	8 00.8	1.0 07	41.2	8 30.8	1.0 07	41.2	9 00.7	1.0 07	41.2	9 30.6	1.0 07	41.2	10 00.5	1.0 07	41.1	10 30.5	1.0 07	41.1	11 00.4	1.0 07	41.1	8
9	7 26.8	1.0 07	40.3	7 56.7	1.0 07	40.3	8 26.7	1.0 07	40.3	8 56.6	1.0 07	40.2	9 26.5	1.0 07	40.2	9 56.5	1.0 07	40.2	10 26.4	1.0 07	40.1	10 56.3	1.0 07	40.1	9
140	7 22.8	1.0 07	39.3	7 52.7	1.0 07	39.3	8 22.7	1.0 07	39.3	8 52.6	1.0 07	39.2	9 22.5	1.0 07	39.2	9 52.5	1.0 07	39.2	10 22.4	1.0 07	39.1	10 52.3	1.0 07	39.1	140
1	7 18.9	1.0 06	38.4	7 48.8	1.0 06	38.3	8 18.7	1.0 06	38.3	8 48.7	1.0 06	38.3	9 18.6	1.0 06	38.2	9 48.5	1.0 06	38.2	10 18.5	1.0 06	38.2	10 48.4	1.0 06	38.1	1
2	7 15.0	1.0 06	37.4	7 45.0	1.0 06	37.3	8 14.9	1.0 06	37.3	8 44.8	1.0 06	37.3	9 14.8	1.0 06	37.2	9 44.7	1.0 06	37.2	10 14.6	1.0 06	37.2	10 44.6	1.0 06	37.1	2
3	7 11.2	1.0 06	36.4	7 41.2	1.0 06	36.4	8 11.1	1.0 06	36.3	8 41.1	1.0 06	36.3	9 11.0	1.0 06	36.3	9 40.9	1.0 06	36.2	10 10.9	1.0 06	36.2	10 40.8	1.0 06	36.2	3
4	7 07.6	1.0 06	35.4	7 37.5	1.0 06	35.4	8 07.5	1.0 06	35.3	8 37.4	1.0 06	35.3	9 07.3	1.0 06	35.3	9 37.3	1.0 06	35.3	10 07.2	1.0 06	35.2	10 37.2	1.0 06	35.2	4
145	7 04.0	1.0 06	34.4	7 33.9	1.0 06	34.4	8 03.9	1.0 06	34.4	8 33.8	1.0 06	34.3	9 03.8	1.0 06	34.3	9 33.7	1.0 06	34.3	10 03.7	1.0 06	34.2	10 33.6	1.0 06	34.2	145
6	7 00.5	1.0 06	33.4	7 30.4	1.0 06	33.4	8 00.4	1.0 06	33.4	8 30.3	1.0 06	33.4	9 00.3	1.0 06	33.3	9 30.2	1.0 06	33.3	10 00.2	1.0 06	33.3	10 30.1	1.0 06	33.2	6
7	6 57.1	1.0 06	32.5	7 27.0	1.0 06	32.4	7 57.0	1.0 06	32.4	8 26.9	1.0 06	32.4	8 56.9	1.0 06	32.3	9 26.8	1.0 06	32.3	9 56.8	1.0 06	32.3	10 26.7	1.0 06	32.3	7
8	6 53.8	1.0 05	31.5	7 23.7	1.0 05	31.4	7 53.7	1.0 05	31.4	8 23.6	1.0 05	31.4	8 53.6	1.0 05	31.4	9 23.5	1.0 05	31.3	9 53.5	1.0 05	31.3	10 23.4	1.0 05	31.3	8
9	6 50.5	1.0 05	30.5	7 20.5	1.0 05	30.5	7 50.4	1.0 05	30.4	8 20.4	1.0 05	30.4	8 50.3	1.0 05	30.4	9 20.3	1.0 05	30.4	9 50.3	1.0 05	30.3	10 20.2	1.0 05	30.3	9
150	6 47.4	1.0 05	29.5	7 17.3	1.0 05	29.5	7 47.3	1.0 05	29.5	8 17.3	1.0 05	29.4	8 47.2	1.0 05	29.4	9 17.2	1.0 05	29.4	9 47.1	1.0 05	29.3	10 17.1	1.0 05	29.3	150
1	6 44.3	1.0 05	28.5	7 14.3	1.0 05	28.5	7 44.3	1.0 05	28.5	8 14.2	1.0 05	28.4	8 44.2	1.0 05	28.4	9 14.1	1.0 05	28.4	9 44.1	1.0 05	28.4	10 14.1	1.0 05	28.3	1
2	6 41.4	1.0 05	27.5	7 11.4	1.0 05	27.5	7 41.3	1.0 05	27.5	8 11.3	1.0 05	27.5	8 41.2	1.0 05	27.4	9 11.2	1.0 05	27.4	9 41.2	1.0 05	27.4	10 11.1	1.0 05	27.4	2
3	6 38.5	1.0 05	26.6	7 08.5	1.0 05	26.5	7 38.5	1.0 05	26.5	8 08.4	1.0 05	26.5	8 38.4	1.0 05	26.5	9 08.4	1.0 05	26.4	9 38.3	1.0 05	26.4	10 08.3	1.0 05	26.4	3
4	6 35.8	1.0 04	25.6	7 05.8	1.0 04	25.5	7 35.7	1.0 04	25.5	8 05.7	1.0 04	25.5	8 35.7	1.0 04	25.5	9 05.6	1.0 04	25.4	9 35.6	1.0 04	25.4	10 05.6	1.0 04	25.4	4
155	6 33.1	1.0 04	24.6	7 03.1	1.0 04	24.6	7 33.1	1.0 04	24.5	8 03.0	1.0 04	24.5	8 33.0	1.0 04	24.5	9 03.0	1.0 04	24.5	9 33.0	1.0 04	24.5	10 02.9	1.0 04	24.4	155
6	6 30.6	1.0 04	23.6	7 00.5	1.0 04	23.6	7 30.5	1.0 04	23.6	8 00.5	1.0 04	23.5	8 30.5	1.0 04	23.5	9 00.4	1.0 04	23.5	9 30.4	1.0 04	23.5	10 00.4	1.0 04	23.5	6
7	6 28.1	1.0 04	22.6	6 58.1	1.0 04	22.6	7 28.1	1.0 04	22.6	7 58.0	1.0 04	22.5	8 28.0	1.0 04	22.5	8 58.0	1.0 04	22.5	9 28.0	1.0 04	22.5	9 57.9	1.0 04	22.5	7
8	6 25.7	1.0 04	21.6	6 55.7	1.0 04	21.6	7 25.7	1.0 04	21.6	7 55.7	1.0 04	21.6	8 25.7	1.0 04	21.6	8 55.6	1.0 04	21.5	9 25.6	1.0 04	21.5	9 55.6	1.0 04	21.5	8
9	6 23.5	1.0 04	20.7	6 53.5	1.0 04	20.6	7 23.4	1.0 04	20.6	7 53.4	1.0 04	20.6	8 23.4	1.0 04	20.6	8 53.4	1.0 04	20.6	9 23.4	1.0 04	20.5	9 53.3	1.0 04	20.5	9
160	6 21.3	1.0 03	19.7	6 51.3	1.0 03	19.7	7 21.3	1.0 03	19.6	7 51.3	1.0 03	19.6	8 21.2	1.0 03	19.6	8 51.2	1.0 03	19.6	9 21.2	1.0 03	19.6	9 51.2	1.0 03	19.5	160
1	6 19.3	1.0 03	18.7	6 49.2	1.0 03	18.7	7 19.2	1.0 03	18.7	7 49.2	1.0 03	18.6	8 19.2	1.0 03	18.6	8 49.2	1.0 03	18.6	9 19.2	1.0 03	18.6	9 49.1	1.0 03	18.6	1
2	6 17.3	1.0 03	17.7	6 47.3	1.0 03	17.7	7 17.3	1.0 03	17.7	7 47.3	1.0 03	17.7	8 17.2	1.0 03	17.6	8 47.2	1.0 03	17.6	9 17.2	1.0 03	17.6	9 47.2	1.0 03	17.6	2
3	6 15.4	1.0 03	16.7	6 45.4	1.0 03	16.7	7 15.4	1.0 03	16.7	7 45.4	1.0 03	16.7	8 15.4	1.0 03	16.7	8 45.4	1.0 03	16.6	9 15.4	1.0 03	16.6	9 45.3	1.0 03	16.6	3
4	6 13.7	1.0 03	15.7	6 43.7	1.0 03	15.7	7 13.7	1.0 03	15.7	7 43.7	1.0 03	15.7	8 13.6	1.0 03	15.7	8 43.6	1.0 03	15.7	9 13.6	1.0 03	15.6	9 43.6	1.0 03	15.6	4
165	6 12.0	1.0 03	14.8	6 42.0	1.0 03	14.7	7 12.0	1.0 03	14.7	7 42.0	1.0 03	14.7	8 12.0	1.0 03	14.7	8 42.0	1.0 03	14.7	9 12.0	1.0 03	14.7	9 42.0	1.0 03	14.7	165
6	6 10.5	1.0 02	13.8	6 40.5	1.0 02	13.8	7 10.5	1.0 02	13.7	7 40.5	1.0 02	13.7	8 10.5	1.0 02	13.7	8 40.5	1.0 02	13.7	9 10.4	1.0 02	13.7	9 40.4	1.0 02	13.7	6
7	6 09.1	1.0 02	12.8	6 39.1	1.0 02	12.8	7 09.0	1.0 02	12.8	7 39.0	1.0 02	12.8	8 09.0	1.0 02	12.7	8 39.0	1.0 02	12.7	9 09.0	1.0 02	12.7	9 39.0	1.0 02	12.7	7
8	6 07.7	1.0 02	11.8	6 37.7	1.0 02	11.8	7 07.7	1.0 02	11.8	7 37.7	1.0 02	11.8	8 07.7	1.0 02	11.8	8 37.7	1.0 02	11.7	9 07.7	1.0 02	11.7	9 37.7	1.0 02	11.7	8
9	6 06.5	1.0 02	10.8	6 36.5	1.0 02	10.8	7 06.5	1.0 02	10.8	7 36.5	1.0 02	10.8	8 06.5	1.0 02	10.8	8 36.5	1.0 02	10.8	9 06.5	1.0 02	10.7	9 36.5	1.0 02	10.7	9
170	6 05.4	1.0 02	09.8	6 35.4	1.0 02	09.8	7 05.4	1.0 02	09.8	7 35.4	1.0 02	09.8	8 05.3	1.0 02	09.8	8 35.3	1.0 02	09.8	9 05.3	1.0 02	09.8	9 35.3	1.0 02	09.8	170
1	6 04.4	1.0 02	08.9	6 34.3	1.0 02	08.8	7 04.3	1.0 02	08.8	7 34.3	1.0 02	08.8	8 04.3	1.0 02	08.8	8 34.3	1.0 02	08.8	9 04.3	1.0 02	08.8	9 34.3	1.0 02	08.8	1
2	6 03.6	1.0 01	07.9	6 33.6	1.0 01	07.9	7 03.6	1.0 01	07.9	7 33.4	1.0 01	07.8	8 03.6	1.0 01	07.8	8 33.4	1.0 01	07.8	9 03.4	1.0 01	07.8	9 33.4	1.0 01	07.8	2
3	6 02.6	1.0 01	06.9	6 32.6	1.0 01	06.9	7 02.6	1.0 01	06.9	7 32.6	1.0 01	06.9	8 02.6	1.0 01	06.9	8 32.6	1.0 01	06.9	9 02.6	1.0 01	06.8	9 32.6	1.0 01	06.8	3
4	6 01.9	1.0 01	05.9	6 31.9	1.0 01	05.9	7 01.9	1.0 01	05.9	7 31.9	1.0 01	05.9	8 01.9	1.0 01	05.9	8 31.9	1.0 01	05.9	9 01.9	1.0 01	05.9	9 31.9	1.0 01	05.9	4
175	6 01.3	1.0 01	04.9	6 31.3	1.0 01	04.9	7 01.3	1.0 01	04.9	7 31.3	1.0 01	04.9	8 01.3	1.0 01	04.9	8 31.3	1.0 01	04.9	9 01.3	1.0 01	04.9	9 31.3	1.0 01	04.9	175
6	6 00.9	1.0 01	03.9	6 30.9	1.0 01	03.9	7 00.9	1.0 01	03.9	7 30.9	1.0 01	03.9	8 00.9	1.0 01	03.9	8 30.9	1.0 01	03.9	9 00.9	1.0 01	03.9	9 30.9	1.0 01	03.9	6
7	6 00.5	1.0 00	02.9	6 30.5	1.0 00	02.9	7 00.5	1.0 00	02.9	7 30.5	1.0 00	02.9	8 00.5	1.0 00	02.9	8 30.5	1.0 00	02.9	9 00.5	1.0 00	02.9	9 30.5	1.0 00	02.9	7
8	6 00.2	1.0 00	02.0	6 30.2	1.0 00	02.0	7 00.2	1.0 00	02.0	7 30.2	1.0 00	02.0	8 00.2	1.0 00	02.0	8 30.2	1.0 00	02.0	9 00.2	1.0 00	02.0	9 30.2	1.0 00	02.0	8
9	6 00.1	1.0 00	01.0	6 30.1	1.0 00	01.0	7 00.1	1.0 00	01.0	7 30.1	1.0 00	01.0	8 00.1	1.0 00	01.0	8 30.1	1.0 00	01.0	9 00.1	1.0 00	01.0	9 30.1	1.0 00	01.0	9
180	6 00.0	1.0 00	00.0	6 30.0	1.0 00	00.0	7 00.0	1.0 00	00.0	7 30.0	1.0 00	00.0	8 00.0	1.0 00	00.0	8 30.0	1.0 00	00.0	9 00.0	1.0 00	00.0	9 30.0	1.0 00	00.0	180

H.A.	16° 00' Alt.	Δd	Δt	Az.	16° 30' Alt.	Δd	Δt	Az.	17° 00' Alt.	Δd	Δt	Az.	17° 30' Alt.	Δd	Δt	Az.	18° 00' Alt.	Δd	Δt	Az.	18° 30' Alt.	Δd	Δt	Az.	19° 00' Alt.	Δd	Δt	Az.	19° 30' Alt.	Δd	Δt	Az.	H.A.
00	22 00.0	1.0	00	180.0	22 30.0	1.0	00	180.0	23 00.0	1.0	00	180.0	23 30.0	1.0	00	180.0	24 00.0	1.0	00	180.0	24 30.0	1.0	00	180.0	25 00.0	1.0	00	180.0	25 30.0	1.0	00	180.0	00
1	21 59.9	1.0	00	179.0	22 29.9	1.0	00	179.0	22 59.9	1.0	00	179.0	23 29.9	1.0	00	179.0	23 59.9	1.0	00	179.0	24 29.9	1.0	00	179.0	24 59.9	1.0	00	179.0	25 29.9	1.0	00	179.0	1
2	21 59.8	1.0	00	177.9	22 29.8	1.0	00	177.9	22 59.8	1.0	00	177.9	23 29.8	1.0	00	177.9	23 59.8	1.0	00	177.9	24 29.8	1.0	00	177.9	24 59.8	1.0	00	177.9	25 29.8	1.0	00	177.9	2
3	21 59.5	1.0	01	176.9	22 29.5	1.0	01	176.9	22 59.5	1.0	01	176.9	23 29.5	1.0	01	176.9	23 59.5	1.0	01	176.9	24 29.5	1.0	01	176.9	24 59.5	1.0	01	176.9	25 29.5	1.0	01	176.9	3
4	21 59.1	1.0	01	175.9	22 29.1	1.0	01	175.8	22 59.1	1.0	01	175.8	23 29.1	1.0	01	175.8	23 59.1	1.0	01	175.8	24 29.1	1.0	01	175.8	24 59.1	1.0	01	175.8	25 29.1	1.0	01	175.8	4
05	21 58.6	1.0	01	174.8	22 28.6	1.0	01	174.8	22 58.6	1.0	01	174.8	23 28.6	1.0	01	174.8	23 58.6	1.0	01	174.8	24 28.6	1.0	01	174.8	24 58.6	1.0	01	174.8	25 28.6	1.0	01	174.8	05
6	21 58.0	1.0	01	173.8	22 28.0	1.0	01	173.8	22 58.0	1.0	01	173.8	23 28.0	1.0	01	173.8	23 58.0	1.0	01	173.8	24 27.9	1.0	01	173.7	24 57.9	1.0	01	173.7	25 27.9	1.0	01	173.7	6
7	21 57.2	1.0	01	172.7	22 27.2	1.0	01	172.7	22 57.2	1.0	01	172.7	23 27.2	1.0	01	172.7	23 57.2	1.0	01	172.7	24 27.2	1.0	01	172.7	24 57.1	1.0	01	172.7	25 27.1	1.0	01	172.7	7
8	21 56.4	1.0	02	171.7	22 26.4	1.0	02	171.7	22 56.4	1.0	02	171.7	23 26.4	1.0	02	171.7	23 56.4	1.0	02	171.7	24 26.4	1.0	02	171.7	24 56.4	1.0	02	171.6	25 26.3	1.0	02	171.6	8
9	21 55.4	1.0	02	170.7	22 25.4	1.0	02	170.7	22 55.4	1.0	02	170.7	23 25.4	1.0	02	170.6	23 55.4	1.0	02	170.6	24 25.4	1.0	02	170.6	24 55.4	1.0	02	170.6	25 25.4	1.0	02	170.6	9
10	21 54.3	1.0	02	169.6	22 24.3	1.0	02	169.6	22 54.3	1.0	02	169.6	23 24.3	1.0	02	169.6	23 54.3	1.0	02	169.6	24 24.3	1.0	02	169.6	24 54.3	1.0	02	169.6	25 24.3	1.0	02	169.6	10
1	21 53.2	1.0	02	168.6	22 23.2	1.0	02	168.6	22 53.1	1.0	02	168.6	23 23.1	1.0	02	168.6	23 53.1	1.0	02	168.6	24 23.1	1.0	02	168.5	24 53.1	1.0	02	168.5	25 23.1	1.0	02	168.5	1
2	21 51.9	1.0	02	167.6	22 21.9	1.0	02	167.6	22 51.8	1.0	02	167.5	23 21.8	1.0	02	167.5	23 51.8	1.0	02	167.5	24 21.8	1.0	02	167.5	24 51.8	1.0	02	167.5	25 21.8	1.0	02	167.5	2
3	21 50.5	1.0	03	166.5	22 20.4	1.0	03	166.5	22 50.4	1.0	03	166.5	23 20.4	1.0	03	166.5	23 50.4	1.0	03	166.5	24 20.4	1.0	03	166.5	24 50.4	1.0	03	166.4	25 20.4	1.0	03	166.4	3
4	21 48.9	1.0	03	165.5	22 18.9	1.0	03	165.5	22 48.9	1.0	03	165.5	23 18.9	1.0	03	165.4	23 48.9	1.0	03	165.4	24 18.9	1.0	03	165.4	24 48.9	1.0	03	165.4	25 18.9	1.0	03	165.4	4
15	21 47.3	1.0	03	164.5	22 17.3	1.0	03	164.4	22 47.3	1.0	03	164.4	23 17.3	1.0	03	164.4	23 47.3	1.0	03	164.4	24 17.3	1.0	03	164.4	24 47.2	1.0	03	164.4	25 17.2	1.0	03	164.3	15
6	21 45.6	1.0	03	163.4	22 15.6	1.0	03	163.4	22 45.5	1.0	03	163.4	23 15.5	1.0	03	163.4	23 45.5	1.0	03	163.4	24 15.5	1.0	03	163.3	24 45.5	1.0	03	163.3	25 15.5	1.0	03	163.3	6
7	21 43.7	1.0	03	162.4	22 13.7	1.0	03	162.4	22 43.7	1.0	03	162.4	23 13.7	1.0	03	162.3	23 43.7	1.0	03	162.3	24 13.7	1.0	03	162.3	24 43.6	1.0	03	162.3	25 13.6	1.0	03	162.3	7
8	21 41.8	1.0	03	161.4	22 11.8	1.0	03	161.3	22 41.7	1.0	03	161.3	23 11.7	1.0	03	161.3	23 41.7	1.0	03	161.3	24 11.7	1.0	03	161.3	24 41.7	1.0	03	161.2	25 11.7	1.0	03	161.2	8
9	21 39.7	1.0	04	160.3	22 09.7	1.0	04	160.3	22 39.7	1.0	04	160.3	23 09.7	1.0	04	160.3	23 39.6	1.0	04	160.2	24 09.6	1.0	04	160.2	24 39.6	1.0	04	160.2	25 09.6	1.0	04	160.2	9
20	21 37.6	1.0	04	159.3	22 07.5	1.0	04	159.3	22 37.5	1.0	04	159.2	23 07.5	1.0	04	159.2	23 37.5	1.0	04	159.2	24 07.4	1.0	04	159.2	24 37.4	1.0	04	159.2	25 07.4	1.0	04	159.1	20
1	21 35.3	1.0	04	158.3	22 05.3	1.0	04	158.2	22 35.2	1.0	04	158.2	23 05.2	1.0	04	158.2	23 35.2	1.0	04	158.2	24 05.2	1.0	04	158.1	24 35.1	1.0	04	158.1	25 05.1	1.0	04	158.1	1
2	21 32.9	1.0	04	157.2	22 02.9	1.0	04	157.2	22 32.9	1.0	04	157.2	23 02.8	1.0	04	157.1	23 32.8	1.0	04	157.1	24 02.8	1.0	04	157.1	24 32.8	1.0	04	157.1	25 02.7	1.0	04	157.1	2
3	21 30.4	1.0	04	156.2	22 00.4	1.0	04	156.2	22 30.4	1.0	04	156.1	23 00.3	1.0	04	156.1	23 30.3	1.0	04	156.1	24 00.3	1.0	04	156.1	24 30.3	1.0	04	156.0	25 00.2	1.0	04	156.0	3
4	21 27.9	1.0	04	155.2	21 57.8	1.0	04	155.1	22 27.8	1.0	04	155.1	22 57.8	1.0	04	155.1	23 27.7	1.0	04	155.1	23 57.7	1.0	04	155.0	24 27.7	1.0	05	155.0	24 57.6	1.0	05	155.0	4
25	21 25.2	1.0	05	154.1	21 55.1	1.0	05	154.1	22 25.1	1.0	05	154.1	22 55.1	1.0	05	154.0	23 25.0	1.0	05	154.0	23 55.0	1.0	05	154.0	24 25.0	1.0	05	154.0	24 54.9	1.0	05	153.9	25
6	21 22.4	1.0	05	153.1	21 52.3	1.0	05	153.1	22 22.3	1.0	05	153.0	22 52.3	1.0	05	153.0	23 22.2	1.0	05	153.0	23 52.2	1.0	05	153.0	24 22.2	1.0	05	152.9	24 52.1	1.0	05	152.9	6
7	21 19.5	1.0	05	152.1	21 49.5	1.0	05	152.0	22 19.4	1.0	05	152.0	22 49.4	1.0	05	152.0	23 19.3	1.0	05	152.0	23 49.3	1.0	05	151.9	24 19.3	1.0	05	151.9	24 49.2	1.0	05	151.9	7
8	21 16.5	1.0	05	151.0	21 46.5	1.0	05	151.0	22 16.4	1.0	05	151.0	22 46.4	1.0	05	150.9	23 16.3	1.0	05	150.9	23 46.3	1.0	05	150.9	24 16.2	1.0	05	150.9	24 46.2	1.0	05	150.8	8
9	21 13.4	1.0	05	150.0	21 43.4	1.0	05	150.0	22 13.3	1.0	05	149.9	22 43.3	1.0	05	149.9	23 13.2	1.0	05	149.9	23 43.2	1.0	05	149.9	24 13.1	1.0	05	149.8	24 43.1	1.0	05	149.8	9
30	21 10.2	1.0	05	149.0	21 40.2	1.0	05	148.9	22 10.1	1.0	05	148.9	22 40.1	1.0	05	148.9	23 10.0	1.0	05	148.8	23 40.0	1.0	05	148.8	24 09.9	1.0	06	148.8	24 39.9	1.0	06	148.8	30
1	21 07.0	1.0	06	147.9	21 36.9	1.0	06	147.9	22 06.9	1.0	06	147.9	22 36.8	1.0	06	147.8	23 06.7	1.0	06	147.8	23 36.7	1.0	06	147.8	24 06.6	1.0	06	147.8	24 36.6	1.0	06	147.7	1
2	21 03.6	1.0	06	146.9	21 33.5	1.0	06	146.9	22 03.5	1.0	06	146.9	22 33.4	1.0	06	146.8	23 03.4	1.0	06	146.8	23 33.3	1.0	06	146.8	24 03.2	1.0	06	146.7	24 33.2	1.0	06	146.7	2
3	21 00.1	1.0	06	145.9	21 30.0	1.0	06	145.9	22 00.0	1.0	06	145.8	22 29.9	1.0	06	145.8	22 59.9	1.0	06	145.8	23 29.8	1.0	06	145.7	23 59.8	1.0	06	145.7	24 29.7	1.0	06	145.7	3
4	20 56.5	1.0	06	144.9	21 26.5	1.0	06	144.8	21 56.4	1.0	06	144.8	22 26.4	1.0	06	144.8	22 56.3	1.0	06	144.7	23 26.2	1.0	06	144.7	23 56.2	1.0	06	144.7	24 26.1	1.0	06	144.6	4
35	20 52.9	1.0	06	143.8	21 22.8	1.0	06	143.8	21 52.8	1.0	06	143.8	22 22.7	1.0	06	143.7	22 52.6	1.0	06	143.7	23 22.6	1.0	06	143.7	23 52.5	1.0	06	143.6	24 22.4	1.0	06	143.6	35
6	20 49.1	1.0	06	142.8	21 19.1	1.0	06	142.8	21 49.0	1.0	06	142.7	22 18.9	1.0	06	142.7	22 48.9	1.0	06	142.7	23 18.8	1.0	06	142.6	23 48.7	1.0	06	142.6	24 18.7	1.0	06	142.6	6
7	20 45.3	1.0	07	141.8	21 15.2	1.0	07	141.7	21 45.2	1.0	07	141.7	22 15.1	1.0	07	141.7	22 45.0	1.0	07	141.6	23 15.0	1.0	07	141.6	23 44.9	1.0	07	141.6	24 14.8	1.0	07	141.5	7
8	20 41.4	1.0	07	140.8	21 11.3	1.0	07	140.7	21 41.2	1.0	07	140.7	22 11.2	1.0	07	140.6	22 41.1	1.0	07	140.6	23 11.0	1.0	07	140.6	23 40.9	1.0	07	140.5	24 10.9	1.0	07	140.5	8
9	20 37.4	1.0	07	139.7	21 07.3	1.0	07	139.7	21 37.2	1.0	07	139.7	22 07.1	1.0	07	139.6	22 37.1	1.0	07	139.6	23 07.0	1.0	07	139.5	23 36.9	1.0	07	139.5	24 06.8	1.0	07	139.5	9
40	20 33.3	1.0	07	138.7	21 03.2	1.0	07	138.7	21 33.1	1.0	07	138.6	22 03.0	1.0	07	138.6	22 33.0	1.0	07	138.6	23 02.9	1.0	07	138.5	23 32.8	1.0	07	138.5	24 02.7	1.0	07	138.4	40
1	20 29.1	1.0	07	137.7	20 59.0	1.0	07	137.6	21 28.9	1.0	07	137.6	21 58.8	1.0	07	137.6	22 28.8	1.0	07	137.5	22 58.7	1.0	07	137.5	23 28.6	1.0	07	137.4	23 58.5	1.0	07	137.4	1
2	20 24.8	1.0	07	136.7	20 54.7	1.0	07	136.6	21 24.7	1.0	07	136.6	21 54.6	1.0	07	136.5	22 24.5	1.0	07	136.5	22 54.4	1.0	07	136.5	23 24.3	1.0	07	136.4	23 54.2	1.0	07	136.4	2
3	20 20.5	1.0	07	135.6	20 50.4	1.0	07	135.6	21 20.3	1.0	07	135.6	21 50.2	1.0	07	135.5	22 20.1	1.0	07	135.5	22 50.0	1.0	07	135.4	23 20.0	1.0	07	135.4	23 49.9	1.0	07	135.3	3
4	20 16.1	1.0	08	134.6	20 46.0	1.0	08	134.6	21 15.9	1.0	08	134.5	21 45.8	1.0	08	134.5	22 15.7	1.0	08	134.4	22 45.6	1.0	08	134.4	23 15.5	1.0	08	134.4	23 45.4	1.0	08	134.3	4
45	20 11.6	1.0	08	133.6	20 41.5	1.0	08	133.6	21 11.4	1.0	08	133.5	21 41.3	1.0	08	133.5	22 11.2	1.0	08	133.4	22 41.1	1.0	08	133.4	23 11.0	1.0	08	133.3	23 40.9	1.0	08	133.3	45
6	20 07.0	1.0	08	132.6	20 36.9	1.0	08	132.5	21 06.8	1.0	08	132.5	21 36.7	1.0	08	132.4	22 06.6	1.0	08	132.4	22 36.5	1.0	08	132.4	23 06.4	1.0	08	132.3	23 36.3	1.0	08	132.3	6
7	20 02.3	1.0	08	131.6	20 32.2	1.0	08	131.5	21 02.1	1.0	08	131.5	21 32.0	1.0	08	131.4	22 01.9	1.0	08	131.4	22 31.8	1.0	08	131.3	23 01.7	1.0	08	131.3	23 31.6	1.0	08	131.2	7
8	19 57.6	1.0	08	130.5	20 27.5	1.0	08	130.5	20 57.4	1.0	08	130.4	21 27.3	1.0	08	130.4	21 57.2	1.0	08	130.4	22 27.1	1.0	08	130.3	22 57.0	1.0	08	130.3	23 26.9	1.0	08	130.2	8
9	19 52.8	1.0	08	129.5	20 22.7	1.0	08	129.5	20 52.6	1.0	08	129.4	21 22.5	1.0	08	129.4	21 52.4	1.0	08	129.3	22 22.2	1.0	08	129.3	22 52.1	1.0	08	129.2	23 22.0	1.0	08	129.2	9
50	19 47.9	1.0	08	128.5	20 17.8	1.0	08	128.4	20 47.7	1.0	08	128.4	21 17.6	1.0	08	128.4	21 47.5	1.0	08	128.3	22 17.4	1.0	08	128.3	22 47.2	1.0	08	128.2	23 17.1	1.0	08	128.2	50
1	19 43.0	1.0	08	127.5	20 12.9	1.0	08	127.4	20 42.7	1.0	08	127.4	21 12.6	1.0	08	127.3	21 42.5	1.0	08	127.3	22 12.4	1.0	08	127.2	22 42.3	1.0	08	127.2	23 12.2	1.0	08	127.1	1
2	19 38.0	1.0	08	126.5	20 07.8	1.0	08	126.4	20 37.7	1.0	08	126.4	21 07.6	1.0	08	126.3	21 37.5	1.0	08	126.3	22 07.4	1.0	08	126.2	22 37.3	1.0	08	126.2	23 07.1	1.0	08	126.1	2
3	19 32.9	1.0	09	125.4	20 02.8	1.0	09	125.4	20 32.6	1.0	09	125.4	21 02.5	1.0	09	125.3	21 32.4	1.0	09	125.3	22 02.3	1.0	09	125.2	22 32.2	1.0	09	125.2	23 02.0	1.0	09	125.1	3
4	19 27.7	1.0	09	124.4	19 57.6	1.0	09	124.4	20 27.5	1.0	09	124.3	20 57.4	1.0	09	124.3	21 27.3	1.0	09	124.2	21 57.1	1.0	09	124.2	22 27.0	1.0	09	124.1	22 56.9	1.0	09	124.1	4
55	19 22.5	1.0	09	123.4	19 52.4	1.0	09	123.3	20 22.2	1.0	09	123.3	20 52.1	1.0	09	123.2	21 22.0	1.0	09	123.2	21 51.9	1.0	09	123.2	22 21.8	1.0	09	123.1	22 51.7	1.0	09	123.1	55
6	19 17.3	1.0	09	122.4	19 47.1	1.0	09	122.4	20 17.0	1.0	09	122.3	20 46.9	1.0	09	122.3	21 16.8	1.0	09	122.2	21 46.6	1.0	09	122.2	22 16.5	1.0	09	122.1	22 46.4	1.0	09	122.1	6
7	19 11.9	1.0	09	121.4	19 41.8	1.0	09	121.3	20 11.7	1.0	09	121.3	20 41.6	1.0	09	121.2	21 11.4	1.0	09	121.2	21 41.3	1.0	09	121.1	22 11.2	1.0	09	121.1	22 41.0	1.0	09	121.0	7
8	19 06.6	1.0	09	120.4	19 36.4	1.0	09	120.3	20 06.3	1.0	09	120.3	20 36.2	1.0	09	120.2	21 06.0	1.0	09	120.2	21 35.9	1.0	09	120.1	22 05.8	1.0	09	120.1	22 35.6	1.0	09	120.0	8
9	19 01.1	1.0	09	119.4	19 31.0	1.0	09	119.3	20 00.9	1.0	09	119.3	20 30.7	1.0	09	119.2	21 00.6	1.0	09	119.1	21 30.4	1.0	09	119.1	22 00.3	1.0	09	119.1	22 30.2	1.0	09	119.0	9
60	18 55.6	1.0	09	118.4	19 25.5	1.0	09	118.3	19 55.4	1.0	09	118.3	20 25.2	1.0	09	118.2	20 55.1	1.0	09	118.1	21 24.9	1.0	09	118.1	21 54.8	1.0	09	118.1	22 24.6	1.0	09	118.0	60
1	18 50.1	1.0	09	117.3	19 19.9	1.0	09	117.3	19 49.8	1.0	09	117.2	20 19.7	1.0	09	117.2	20 49.5	1.0	09	117.1	21 19.4	1.0	09	117.1	21 49.2	1.0	09	117.0	22 19.1	1.0	09	117.0	1
2	18 44.5	1.0	09	116.3	19 14.3	1.0	09	116.3	19 44.2	1.0	09	116.2	20 14.1	1.0	09	116.2	20 43.9	1.0	09	116.1	21 13.8	1.0	09	116.1	21 43.6	1.0	09	116.0	22 13.5	1.0	09	116.0	2
3	18 38.8	1.0	10	115.3	19 08.7	1.0	10	115.3	19 38.6	1.0	10	115.2	20 08.4	1.0	10	115.2	20 38.3	1.0	10	115.1	21 08.1	1.0	10	115.1	21 38.0	99	10	115.0	22 07.8	99	10	114.9	3
4	18 33.2	1.0	10	114.3	19 03.0	1.0	10	114.2	19 32.9	1.0	10	114.2	20 02.7	1.0	10	114.2	20 32.6	99	10	114.1	21 02.4	99	10	114.0	21 32.3	99	10	114.0	22 02.1	99	10	113.9	4
65	18 27.4	1.0	10	113.3	18 57.3	99	10	113.2	19 27.1	99	10	113.2	19 57.0	99	10	113.1	20 26.8	99	10	113.1	20 56.7	99	10	113.0	21 26.5	99	10	113.0	21 56.3	99	10	112.9	65
6	18 21.6	99	10	112.3	18 51.5	99	10	112.2	19 21.3	99	10	112.2	19 51.2	99	10	112.1	20 21.0	99	10	112.1	20 50.9	99	10	112.0	21 20.7	99	10	112.0	21 50.5	99	10	111.9	6
7	18 15.8	99	10	111.3	18 45.7	99	10	111.2	19 15.5	99	10	111.2	19 45.3	99	10	111.1	20 15.2	99	10	111.1	20 45.0	99	10	111.0	21 14.9	99	10	111.0	21 44.7	99	10	110.9	7
8	18 09.9	99	10	110.3	18 39.8	99	10	110.2	19 09.6	99	10	110.2	19 39.5	99	10	110.1	20 09.3	99	10	110.1	20 39.2	99	10	110.0	21 09.0	99	10	110.0	21 38.8	99	10	109.9	8
9	18 04.0	99	10	109.3	18 33.9	99	10	109.2	19 03.7	99	10	109.2	19 33.6	99	10	109.1	20 03.4	99	10	109.1	20 33.2	99	10	109.0	21 03.1	99	10	109.0	21 32.9	99	10	108.9	9
70	17 58.1	99	10	108.3	18 27.9	99	10	108.2	18 57.8	99	10	108.2	19 27.6	99	10	108.1	19 57.5	99	10	108.0	20 27.3	99	10	108.0	20 57.1	99	10	107.9	21 27.0	99	10	107.9	70
1	17 52.1	99	10	107.3	18 22.0	99	10	107.2	18 51.8	99	10	107.2	19 21.6	99	10	107.1	19 51.5	99	10	107.0	20 21.3	99	10	107.0	20 51.1	99	10	106.9	21 21.0	99	10	106.9	1
2	17 46.1	99	10	106.3	18 16.0	99	10	106.2	18 45.8	99	10	106.1	19 15.6	99	10	106.1	19 45.5	99	10	106.0	20 15.3	99	10	106.0	20 45.1	99	10	105.9	21 15.0	99	10	105.9	2
3	17 40.1	99	10	105.3	18 09.9	99	10	105.2	18 39.7	99	10	105.1	19 09.6	99	10	105.1	19 39.4	99	10	105.0	20 09.3	99	10	105.0	20 39.1	99	10	104.9	21 08.9	99	10	104.9	3
4	17 34.0	99	10	104.3	18 03.9	99	10	104.2	18 33.7	99	10	104.1	19 03.5	99	10	104.1	19 33.4	99	10	104.0	20 03.2	99	10	104.0	20 33.0	99	10	103.9	21 02.8	99	10	103.9	4
75	17 27.9	99	10	103.2	17 57.8	99	10	103.2	18 27.6	99	10	103.1	18 57.4	99	10	103.1	19 27.3	99	10	103.0	19 57.1	99	10	103.0	20 26.9	99	10	102.9	20 56.7	99	10	102.9	75
6	17 21.8	99	10	102.2	17 51.6	99	10	102.2	18 21.5	99	10	102.1	18 51.3	99	10	102.1	19 21.1	99	10	102.0	19 51.0	99	10	102.0	20 20.8	99	10	101.9	20 50.6	99	10	101.8	6
7	17 15.7	99	10	101.2	17 45.5	99	10	101.2	18 15.3	99	10	101.1	18 45.2	99	10	101.1	19 15.0	99	10	101.0	19 44.8	99	10	101.0	20 14.6	99	10	100.9	20 44.5	99	10	100.8	7
8	17 09.5	99	10	100.2	17 39.3	99	10	100.2	18 09.1	99	10	100.1	18 39.0	99	10	100.1	19 08.8	99	10	100.0	19 38.6	99	10	100.0	20 08.5	99	10	99.9	20 38.3	99	10	99.8	8
9	17 03.3	99	10	99.2	17 33.2	99	10	99.2	18 03.0	99	10	99.1	18 32.8	99	10	99.1	19 02.6	99	10	99.0	19 32.5	99	10	99.0	20 02.3	99	10	98.9	20 32.1	99	10	98.8	9
80	16 57.1	99	10	98.2	17 27.0	99	10	98.2	17 56.8	99	10	98.1	18 26.6	99	10	98.1	18 56.4	99	10	98.0	19 26.3	99	10	98.0	19 56.1	99	10	97.9	20 25.9	99	10	97.8	80
1	16 50.9	99	10	97.2	17 20.7	99	10	97.2	17 50.6	99	10	97.1	18 20.4	99	10	97.1	18 50.2	99	10	97.0	19 20.0	99	10	97.0	19 49.9	99	10	96.9	20 19.7	99	10	96.8	1
2	16 44.7	99	10	96.2	17 14.5	99	10	96.2	17 44.3	99	10	96.1	18 14.2	99	10	96.1	18 44.0	99	10	96.0	19 13.8	99	10	96.0	19 43.6	99	10	95.9	20 13.4	99	10	95.8	2
3	16 38.5	99	10	95.3	17 08.3	99	10	95.2	17 38.1	99	10	95.1	18 07.9	99	10	95.1	18 37.7	99	10	95.0	19 07.6	99	10	95.0	19 37.4	99	10	94.9	20 07.2	99	10	94.8	3
4	16 32.2	99	10	94.3	17 02.0	99	10	94.2	17 31.8	99	10	94.1	18 01.7	99	10	94.1	18 31.5	99	10	94.0	19 01.3	99	10	94.0	19 31.1	99	10	93.9	20 00.9	99	10	93.8	4
85	16 25.9	99	10	93.3	16 55.8	99	10	93.2	17 25.6	99	10	93.1	17 55.4	99	10	93.1	18 25.2	99	10	93.0	18 55.0	99	10	93.0	19 24.9	99	10	92.9	19 54.7	99	10	92.9	85
6	16 19.7	99	10	92.3	16 49.5	99	10	92.2	17 19.3	99	10	92.1	17 49.1	99	10	92.1	18 19.0	99	10	92.0	18 48.8	99	10	92.0	19 18.6	99	10	91.9	19 48.4	99	10	91.9	6
7	16 13.4	99	10	91.3	16 43.2	99	10	91.2	17 13.1	99	10	91.2	17 42.9	99	10	91.1	18 12.7	99	10	91.0	18 42.5	99	10	91.0	19 12.3	99	10	90.9	19 42.1	99	10	90.9	7
8	16 07.1	99	10	90.3	16 37.0	99	10	90.2	17 06.8	99	10	90.2	17 36.6	99	10	90.1	18 06.4	99	10	90.1	18 36.2	99	10	90.0	19 06.1	99	10	89.9	19 35.9	99	10	89.9	8
9	16 00.9	99	10	89.3	16 30.7	99	10	89.2	17 00.5	99	10	89.2	17 30.3	99	10	89.1	18 00.2	99	10	89.0	18 30.0	99	10	89.0	18 59.8	99	10	88.9	19 29.6	99	10	88.9	9
90	15 54.6	99	10	88.3	16 24.4	99	10	88.2	16 54.2	99	10	88.2	17 24.1	99	10	88.1	17 53.9	99	10	88.1	18 23.7	99	10	88.0	18 53.5	99	10	87.9	19 23.3	99	10	87.9	90

H.A.	16°00' Alt	Δd Δt	Az	16°30' Alt	Δd Δt	Az	17°00' Alt	Δd Δt	Az	17°30' Alt	Δd Δt	Az	18°00' Alt	Δd Δt	Az	18°30' Alt	Δd Δt	Az	19°00' Alt	Δd Δt	Az	19°30' Alt	Δd Δt	Az	H.A.
91	15 48.3	99 10	87.3	16 18.2	99 10	87.2	16 48.0	99 10	87.2	17 17.8	99 10	87.1	17 47.6	99 10	87.1	18 17.4	99 10	87.0	18 47.3	99 10	86.9	19 17.1	99 10	86.9	91
2	15 42.1	99 10	86.3	16 11.9	99 10	86.2	16 41.7	99 10	86.2	17 11.5	99 10	86.1	17 41.4	99 10	86.1	18 11.2	99 10	86.0	18 41.0	99 10	86.0	19 10.8	99 10	85.9	2
3	15 35.8	99 10	85.3	16 05.6	99 10	85.2	16 35.5	99 10	85.2	17 05.3	99 10	85.1	17 35.1	99 10	85.1	18 04.9	99 10	85.0	18 34.7	99 10	85.0	19 04.6	99 10	84.9	3
4	15 29.6	99 10	84.3	15 59.4	99 10	84.3	16 29.2	99 10	84.2	16 59.0	99 10	84.1	17 28.9	99 10	84.1	17 58.7	99 10	84.0	18 28.5	99 10	84.0	18 58.3	99 10	83.9	4
95	15 23.3	99 10	83.3	15 53.2	99 10	83.3	16 23.0	99 10	83.2	16 52.8	99 10	83.2	17 22.6	99 10	83.1	17 52.4	99 10	83.0	18 22.3	99 10	83.0	18 52.1	99 10	82.9	95
6	15 17.1	99 10	82.3	15 46.9	99 10	82.3	16 16.8	99 10	82.2	16 46.6	99 10	82.2	17 16.4	99 10	82.1	17 46.2	99 10	82.0	18 16.0	99 10	82.0	18 45.9	99 10	81.9	6
7	15 10.9	99 10	81.3	15 40.7	99 10	81.3	16 10.6	99 10	81.2	16 40.4	99 10	81.2	17 10.2	99 10	81.1	17 40.0	99 10	81.1	18 09.8	99 10	81.0	18 39.7	99 10	80.9	7
8	15 04.7	99 10	80.3	15 34.5	99 10	80.3	16 04.4	99 10	80.2	16 34.2	99 10	80.2	17 04.0	99 10	80.1	17 33.8	99 10	80.1	18 03.7	99 10	80.0	18 33.5	99 10	80.0	8
9	14 58.5	99 10	79.4	15 28.4	99 10	79.3	15 58.2	99 10	79.2	16 28.0	99 10	79.2	16 57.8	99 10	79.1	17 27.7	99 10	79.1	17 57.5	99 10	79.0	18 27.3	99 10	79.0	9
100	14 52.4	99 10	78.4	15 22.2	99 10	78.3	15 52.0	99 10	78.3	16 21.9	99 10	78.2	16 51.7	99 10	78.1	17 21.5	99 10	78.1	17 51.3	99 10	78.0	18 21.2	99 10	78.0	100
1	14 46.3	99 10	77.4	15 16.1	99 10	77.3	15 45.9	99 10	77.3	16 15.7	99 10	77.2	16 45.6	99 10	77.2	17 15.4	99 10	77.1	17 45.2	99 10	77.0	18 15.0	99 10	77.0	1
2	14 40.1	99 10	76.4	15 10.0	99 10	76.3	15 39.8	99 10	76.3	16 09.6	99 10	76.2	16 39.5	99 10	76.2	17 09.3	99 10	76.1	17 39.1	99 10	76.1	18 08.9	99 10	76.0	2
3	14 34.1	99 10	75.4	15 03.9	99 10	75.4	15 33.7	99 10	75.3	16 03.6	99 10	75.2	16 33.4	99 10	75.2	17 03.2	99 10	75.1	17 33.0	99 10	75.1	18 02.9	99 10	75.0	3
4	14 28.0	99 10	74.4	14 57.8	99 10	74.4	15 27.7	99 10	74.3	15 57.5	99 10	74.3	16 27.3	99 10	74.2	16 57.2	99 10	74.1	17 27.0	99 10	74.1	17 56.8	99 10	74.0	4
105	14 22.0	99 10	73.4	14 51.8	99 10	73.3	15 21.7	99 10	73.3	15 51.5	99 10	73.3	16 21.3	99 10	73.2	16 51.2	99 10	73.2	17 21.0	99 10	73.1	17 50.8	99 10	73.0	105
6	14 16.0	99 10	72.4	14 45.8	99 10	72.4	15 15.7	99 10	72.3	15 45.5	99 10	72.3	16 15.3	99 10	72.2	16 45.2	99 10	72.2	17 15.0	99 10	72.1	17 44.8	99 10	72.1	6
7	14 10.0	99 10	71.5	14 39.9	99 10	71.4	15 09.7	99 10	71.4	15 39.5	99 10	71.3	16 09.4	99 10	71.2	16 39.2	99 10	71.2	17 09.1	99 10	71.1	17 38.9	99 10	71.1	7
8	14 04.1	99 10	70.5	14 33.9	99 10	70.4	15 03.8	99 10	70.4	15 33.6	99 10	70.3	16 03.5	99 10	70.3	16 33.3	99 10	70.2	17 03.1	99 10	70.2	17 33.0	99 10	70.1	8
9	13 58.2	99 10	69.5	14 28.0	99 10	69.4	14 57.9	99 10	69.4	15 27.7	99 10	69.3	15 57.6	99 10	69.3	16 27.4	99 10	69.2	16 57.3	99 10	69.2	17 27.1	99 10	69.1	9
110	13 52.3	99 10	68.5	14 22.2	99 10	68.4	14 52.0	99 10	68.4	15 21.9	99 10	68.3	15 51.7	99 10	68.3	16 21.6	99 10	68.2	16 51.4	99 10	68.2	17 21.3	99 10	68.1	110
1	13 46.5	99 10	67.5	14 16.4	99 10	67.5	14 46.2	99 10	67.4	15 16.1	99 10	67.4	15 45.9	99 10	67.3	16 15.8	99 10	67.3	16 45.6	99 10	67.2	17 15.5	99 10	67.1	1
2	13 40.8	1.0 10	66.5	14 10.6	99 10	66.5	14 40.5	99 10	66.4	15 10.3	99 10	66.4	15 40.2	99 10	66.3	16 10.0	99 10	66.3	16 39.8	99 10	66.2	17 09.7	99 10	66.2	2
3	13 35.0	1.0 10	65.5	14 04.9	1.0 09	65.5	14 34.7	1.0 09	65.4	15 04.6	1.0 09	65.4	15 34.4	99 09	65.3	16 04.3	99 09	65.3	16 34.1	99 09	65.2	17 04.0	99 09	65.2	3
4	13 29.3	1.0 09	64.6	13 59.2	1.0 09	64.5	14 29.0	1.0 09	64.5	14 58.9	1.0 09	64.4	15 28.8	1.0 09	64.4	15 58.6	1.0 09	64.3	16 28.5	1.0 09	64.3	16 58.3	1.0 09	64.2	4
115	13 23.7	1.0 09	63.6	13 53.6	1.0 09	63.5	14 23.4	1.0 09	63.5	14 53.3	1.0 09	63.4	15 23.1	1.0 09	63.4	15 53.0	1.0 09	63.3	16 22.8	1.0 09	63.3	16 52.7	1.0 09	63.2	115
6	13 18.1	1.0 09	62.6	13 48.0	1.0 09	62.5	14 17.8	1.0 09	62.5	14 47.7	1.0 09	62.4	15 17.5	1.0 09	62.4	15 47.4	1.0 09	62.3	16 17.3	1.0 09	62.3	16 47.1	1.0 09	62.2	6
7	13 12.6	1.0 09	61.6	13 42.4	1.0 09	61.6	14 12.3	1.0 09	61.5	14 42.1	1.0 09	61.5	15 12.0	1.0 09	61.4	15 41.9	1.0 09	61.4	16 11.7	1.0 09	61.3	16 41.6	1.0 09	61.3	7
8	13 07.1	1.0 09	60.6	13 36.9	1.0 09	60.6	14 06.8	1.0 09	60.5	14 36.7	1.0 09	60.5	15 06.5	1.0 09	60.4	15 36.4	1.0 09	60.4	16 06.3	1.0 09	60.3	16 36.1	1.0 09	60.3	8
9	13 01.6	1.0 09	59.6	13 31.5	1.0 09	59.6	14 01.4	1.0 09	59.6	14 31.2	1.0 09	59.5	15 01.1	1.0 09	59.5	15 31.0	1.0 09	59.4	16 00.8	1.0 09	59.4	16 30.7	1.0 09	59.3	9
120	12 56.2	1.0 09	58.7	13 26.1	1.0 09	58.6	13 56.0	1.0 09	58.6	14 25.9	1.0 09	58.5	14 55.7	1.0 09	58.5	15 25.6	1.0 09	58.4	15 55.5	1.0 09	58.4	16 25.3	1.0 09	58.3	120
1	12 50.9	1.0 09	57.7	13 20.8	1.0 09	57.6	13 50.7	1.0 09	57.6	14 20.5	1.0 09	57.5	14 50.4	1.0 09	57.5	15 20.3	1.0 09	57.4	15 50.1	1.0 09	57.4	16 20.0	1.0 09	57.4	1
2	12 45.6	1.0 09	56.7	13 15.5	1.0 09	56.7	13 45.4	1.0 09	56.6	14 15.3	1.0 09	56.6	14 45.1	1.0 09	56.5	15 15.0	1.0 09	56.5	15 44.9	1.0 09	56.4	16 14.8	1.0 09	56.4	2
3	12 40.4	1.0 09	55.7	13 10.3	1.0 09	55.7	13 40.2	1.0 09	55.6	14 10.1	1.0 09	55.6	14 39.9	1.0 09	55.5	15 09.8	1.0 09	55.5	15 39.7	1.0 09	55.4	16 09.6	1.0 09	55.4	3
4	12 35.3	1.0 08	54.7	13 05.2	1.0 08	54.7	13 35.0	1.0 08	54.6	14 04.9	1.0 08	54.6	14 34.8	1.0 08	54.6	15 04.7	1.0 08	54.5	15 34.6	1.0 08	54.5	16 04.5	1.0 08	54.4	4
125	12 30.2	1.0 08	53.8	13 00.1	1.0 08	53.7	13 30.0	1.0 08	53.7	13 59.8	1.0 08	53.6	14 29.7	1.0 08	53.6	14 59.6	1.0 08	53.5	15 29.5	1.0 08	53.5	15 59.4	1.0 08	53.4	125
6	12 25.2	1.0 08	52.8	12 55.1	1.0 08	52.7	13 24.9	1.0 08	52.7	13 54.8	1.0 08	52.6	14 24.7	1.0 08	52.6	14 54.6	1.0 08	52.6	15 24.5	1.0 08	52.5	15 54.4	1.0 08	52.5	6
7	12 20.2	1.0 08	51.8	12 50.1	1.0 08	51.8	13 20.0	1.0 08	51.7	13 49.9	1.0 08	51.7	14 19.8	1.0 08	51.6	14 49.7	1.0 08	51.6	15 19.5	1.0 08	51.5	15 49.4	1.0 08	51.5	7
8	12 15.3	1.0 08	50.8	12 45.2	1.0 08	50.8	13 15.1	1.0 08	50.7	13 45.0	1.0 08	50.7	14 14.9	1.0 08	50.6	14 44.8	1.0 08	50.6	15 14.7	1.0 08	50.6	15 44.6	1.0 08	50.5	8
9	12 10.5	1.0 08	49.8	12 40.4	1.0 08	49.8	13 10.3	1.0 08	49.8	13 40.2	1.0 08	49.7	14 10.1	1.0 08	49.7	14 40.0	1.0 08	49.6	15 09.9	1.0 08	49.6	15 39.7	1.0 08	49.6	9
130	12 05.7	1.0 08	48.9	12 35.6	1.0 08	48.8	13 05.5	1.0 08	48.8	13 35.4	1.0 08	48.7	14 05.3	1.0 08	48.7	14 35.2	1.0 08	48.6	15 05.1	1.0 08	48.6	15 35.0	1.0 08	48.6	130
1	12 01.0	1.0 08	47.9	12 30.9	1.0 08	47.8	13 00.8	1.0 08	47.8	13 30.7	1.0 08	47.8	14 00.6	1.0 08	47.7	14 30.5	1.0 08	47.7	15 00.4	1.0 08	47.6	15 30.3	1.0 08	47.6	1
2	11 56.4	1.0 08	46.9	12 26.3	1.0 08	46.9	12 56.2	1.0 08	46.8	13 26.1	1.0 08	46.8	13 56.0	1.0 08	46.7	14 25.9	1.0 08	46.7	14 55.8	1.0 08	46.7	15 25.8	1.0 08	46.6	2
3	11 51.9	1.0 07	45.9	12 21.8	1.0 07	45.9	12 51.7	1.0 07	45.8	13 21.6	1.0 07	45.8	13 51.5	1.0 07	45.8	14 21.4	1.0 07	45.7	14 51.3	1.0 07	45.7	15 21.2	1.0 07	45.6	3
4	11 47.4	1.0 07	44.9	12 17.3	1.0 07	44.9	12 47.2	1.0 07	44.9	13 17.1	1.0 07	44.8	13 47.1	1.0 07	44.8	14 17.0	1.0 07	44.7	14 46.9	1.0 07	44.7	15 16.8	1.0 07	44.7	4
135	11 43.0	1.0 07	44.0	12 12.9	1.0 07	43.9	12 42.8	1.0 07	43.9	13 12.8	1.0 07	43.8	13 42.7	1.0 07	43.8	14 12.6	1.0 07	43.8	14 42.5	1.0 07	43.7	15 12.4	1.0 07	43.7	135
6	11 38.7	1.0 07	43.0	12 08.6	1.0 07	42.9	12 38.5	1.0 07	42.9	13 08.5	1.0 07	42.9	13 38.4	1.0 07	42.8	14 08.3	1.0 07	42.8	14 38.2	1.0 07	42.8	15 08.1	1.0 07	42.7	6
7	11 34.5	1.0 07	42.0	12 04.4	1.0 07	42.0	12 34.3	1.0 07	41.9	13 04.2	1.0 07	41.9	13 34.1	1.0 07	41.9	14 04.1	1.0 07	41.8	14 34.0	1.0 07	41.8	15 03.9	1.0 07	41.7	7
8	11 30.3	1.0 07	41.0	12 00.2	1.0 07	41.0	12 30.2	1.0 07	41.0	13 00.1	1.0 07	40.9	13 30.0	1.0 07	40.9	13 59.9	1.0 07	40.8	14 29.8	1.0 07	40.8	14 59.8	1.0 07	40.8	8
9	11 26.2	1.0 07	40.0	11 56.2	1.0 07	40.0	12 26.1	1.0 07	40.0	12 56.0	1.0 07	39.9	13 25.9	1.0 07	39.9	13 55.9	1.0 07	39.9	14 25.8	1.0 07	39.8	14 55.7	1.0 07	39.8	9
140	11 22.2	1.0 06	39.1	11 52.2	1.0 06	39.0	12 22.1	1.0 06	39.0	12 52.0	1.0 06	39.0	13 22.0	1.0 06	38.9	13 51.9	1.0 06	38.9	14 21.8	1.0 06	38.9	14 51.7	1.0 06	38.8	140
1	11 18.3	1.0 06	38.1	11 48.3	1.0 06	38.1	12 18.2	1.0 06	38.0	12 48.1	1.0 06	38.0	13 18.1	1.0 06	38.0	13 48.0	1.0 06	37.9	14 17.9	1.0 06	37.9	14 47.9	1.0 06	37.8	1
2	11 14.5	1.0 06	37.1	11 44.4	1.0 06	37.2	12 14.4	1.0 06	37.0	12 44.3	1.0 06	37.0	13 14.2	1.0 06	37.0	13 44.2	1.0 06	36.9	14 14.1	1.0 06	36.9	14 44.0	1.0 06	36.9	2
3	11 10.8	1.0 06	36.1	11 40.7	1.0 06	36.1	12 10.6	1.0 06	36.1	12 40.6	1.0 06	36.0	13 10.5	1.0 06	36.0	13 40.5	1.0 06	36.0	14 10.4	1.0 06	35.9	14 40.3	1.0 06	35.9	3
4	11 07.1	1.0 06	35.2	11 37.1	1.0 06	35.1	12 07.0	1.0 06	35.1	12 36.9	1.0 06	35.1	13 06.9	1.0 06	35.0	13 36.8	1.0 06	35.0	14 06.8	1.0 06	35.0	14 36.7	1.0 06	34.9	4
145	11 03.5	1.0 06	34.2	11 33.5	1.0 06	34.1	12 03.4	1.0 06	34.1	12 33.4	1.0 06	34.1	13 03.3	1.0 06	34.1	13 33.3	1.0 06	34.0	14 03.2	1.0 06	34.0	14 33.1	1.0 06	34.0	145
6	11 00.1	1.0 06	33.2	11 30.0	1.0 06	33.2	12 00.0	1.0 06	33.1	12 29.9	1.0 06	33.1	12 59.8	1.0 06	33.1	13 29.8	1.0 06	33.0	13 59.7	1.0 06	33.0	14 29.7	1.0 06	33.0	6
7	10 56.7	1.0 06	32.2	11 26.6	1.0 06	32.2	11 56.6	1.0 05	32.2	12 26.5	1.0 05	32.1	12 56.5	1.0 05	32.1	13 26.4	1.0 05	32.1	13 56.4	1.0 05	32.0	14 26.3	1.0 05	32.0	7
8	10 53.4	1.0 05	31.2	11 23.3	1.0 05	31.2	11 53.3	1.0 05	31.2	12 23.2	1.0 05	31.2	12 53.2	1.0 05	31.1	13 23.1	1.0 05	31.1	13 53.1	1.0 05	31.0	14 23.0	1.0 05	31.0	8
9	10 50.2	1.0 05	30.3	11 20.1	1.0 05	30.2	11 50.1	1.0 05	30.2	12 20.0	1.0 05	30.2	12 50.0	1.0 05	30.2	13 19.9	1.0 05	30.1	13 49.9	1.0 05	30.1	14 19.8	1.0 05	30.1	9
150	10 47.1	1.0 05	29.3	11 17.0	1.0 05	29.3	11 47.0	1.0 05	29.2	12 16.9	1.0 05	29.2	12 46.9	1.0 05	29.2	13 16.8	1.0 05	29.2	13 46.8	1.0 05	29.1	14 16.7	1.0 05	29.1	150
1	10 44.0	1.0 05	28.3	11 14.0	1.0 05	28.3	11 43.9	1.0 05	28.3	12 13.9	1.0 05	28.2	12 43.9	1.0 05	28.2	13 13.8	1.0 05	28.2	13 43.8	1.0 05	28.2	14 13.7	1.0 05	28.1	1
2	10 41.1	1.0 05	27.3	11 11.1	1.0 05	27.3	11 41.0	1.0 05	27.3	12 11.0	1.0 05	27.3	12 41.0	1.0 05	27.2	13 10.9	1.0 05	27.2	13 40.9	1.0 05	27.2	14 10.8	1.0 05	27.2	2
3	10 38.3	1.0 05	26.3	11 08.2	1.0 05	26.3	11 38.2	1.0 05	26.3	12 08.2	1.0 05	26.3	12 38.1	1.0 05	26.3	13 08.1	1.0 05	26.2	13 38.1	1.0 05	26.2	14 08.0	1.0 06	26.2	3
4	10 35.5	1.0 04	25.4	11 05.5	1.0 04	25.4	11 35.5	1.0 04	25.3	12 05.4	1.0 04	25.3	12 35.4	1.0 04	25.3	13 05.4	1.0 04	25.3	13 35.3	1.0 04	25.2	14 05.3	1.0 04	25.2	4
155	10 32.9	1.0 04	24.4	11 02.9	1.0 04	24.4	11 32.8	1.0 04	24.4	12 02.8	1.0 04	24.3	12 32.8	1.0 04	24.3	13 02.7	1.0 04	24.3	13 32.7	1.0 04	24.3	14 02.7	1.0 04	24.2	155
6	10 30.3	1.0 04	23.4	11 00.3	1.0 04	23.4	11 30.3	1.0 04	23.4	12 00.3	1.0 04	23.4	12 30.2	1.0 04	23.3	13 00.2	1.0 04	23.3	13 30.2	1.0 04	23.3	14 00.1	1.0 04	23.3	6
7	10 27.9	1.0 04	22.5	10 57.9	1.0 04	22.4	11 27.9	1.0 04	22.4	11 57.8	1.0 04	22.4	12 27.8	1.0 04	22.4	12 57.8	1.0 04	22.3	13 27.7	1.0 04	22.3	13 57.7	1.0 04	22.3	7
8	10 25.6	1.0 04	21.5	10 55.5	1.0 04	21.5	11 25.5	1.0 04	21.4	11 55.5	1.0 04	21.4	12 25.5	1.0 04	21.4	12 55.4	1.0 04	21.4	13 25.4	1.0 04	21.4	13 55.4	1.0 04	21.3	8
9	10 23.2	1.0 04	20.5	10 53.3	1.0 04	20.5	11 23.2	1.0 04	20.5	11 53.2	1.0 04	20.4	12 23.2	1.0 04	20.4	12 53.1	1.0 04	20.4	13 23.1	1.0 04	20.4	13 53.1	1.0 04	20.3	9
160	10 21.2	1.0 03	19.5	10 51.1	1.0 03	19.5	11 21.1	1.0 03	19.5	11 51.1	1.0 03	19.5	12 21.1	1.0 03	19.5	12 51.1	1.0 03	19.4	13 21.0	1.0 03	19.4	13 51.0	1.0 03	19.4	160
1	10 19.1	1.0 03	18.5	10 49.1	1.0 03	18.5	11 19.1	1.0 03	18.5	11 49.1	1.0 03	18.5	12 19.0	1.0 03	18.5	12 49.0	1.0 03	18.5	13 19.0	1.0 03	18.4	13 49.0	1.0 03	18.4	1
2	10 17.2	1.0 03	17.6	10 47.2	1.0 03	17.6	11 17.1	1.0 03	17.5	11 47.1	1.0 03	17.5	12 17.1	1.0 03	17.5	12 47.1	1.0 03	17.5	13 17.1	1.0 03	17.5	13 47.1	1.0 03	17.5	2
3	10 15.3	1.0 03	16.6	10 45.3	1.0 03	16.6	11 15.3	1.0 03	16.6	11 45.3	1.0 03	16.5	12 15.3	1.0 03	16.5	12 45.3	1.0 03	16.5	13 15.2	1.0 03	16.5	13 45.2	1.0 03	16.5	3
4	10 13.6	1.0 03	15.6	10 43.6	1.0 03	15.6	11 13.6	1.0 03	15.6	11 43.6	1.0 03	15.6	12 13.5	1.0 03	15.6	12 43.5	1.0 03	15.5	13 13.5	1.0 03	15.5	13 43.5	1.0 03	15.5	4
165	10 12.0	1.0 03	14.6	10 41.9	1.0 03	14.6	11 11.9	1.0 03	14.6	11 41.9	1.0 03	14.6	12 11.9	1.0 03	14.6	12 41.9	1.0 03	14.6	13 11.9	1.0 03	14.6	13 41.9	1.0 03	14.5	165
6	10 10.4	1.0 02	13.7	10 40.4	1.0 02	13.7	11 10.4	1.0 02	13.6	11 40.4	1.0 02	13.6	12 10.4	1.0 02	13.6	12 40.4	1.0 02	13.6	13 10.4	1.0 02	13.6	13 40.4	1.0 02	13.6	6
7	10 09.0	1.0 02	12.7	10 39.0	1.0 02	12.7	11 09.0	1.0 02	12.7	11 39.0	1.0 02	12.7	12 09.0	1.0 02	12.6	12 39.0	1.0 02	12.6	13 09.0	1.0 02	12.6	13 39.0	1.0 02	12.6	7
8	10 07.7	1.0 02	11.7	10 37.7	1.0 02	11.7	11 07.7	1.0 02	11.7	11 37.6	1.0 02	11.7	12 07.6	1.0 02	11.7	12 37.6	1.0 02	11.7	13 07.6	1.0 02	11.6	13 37.6	1.0 02	11.6	8
9	10 06.4	1.0 02	10.7	10 36.4	1.0 02	10.7	11 06.4	1.0 02	10.7	11 36.4	1.0 02	10.7	12 06.4	1.0 02	10.7	12 36.4	1.0 02	10.7	13 06.4	1.0 02	10.7	13 36.4	1.0 02	10.7	9
170	10 05.3	1.0 02	09.8	10 35.3	1.0 02	09.8	11 05.3	1.0 02	09.7	11 35.3	1.0 02	09.7	12 05.3	1.0 02	09.7	12 35.3	1.0 02	09.7	13 05.3	1.0 02	09.7	13 35.3	1.0 02	09.7	170
1	10 04.3	1.0 02	08.8	10 34.3	1.0 02	08.8	11 04.3	1.0 02	08.8	11 34.3	1.0 02	08.8	12 04.3	1.0 02	08.7	12 34.3	1.0 02	08.7	13 04.3	1.0 02	08.7	13 34.3	1.0 02	08.7	1
2	10 03.4	1.0 01	07.8	10 33.4	1.0 01	07.8	11 03.4	1.0 01	07.8	11 33.4	1.0 01	07.8	12 03.4	1.0 01	07.8	12 33.4	1.0 01	07.8	13 03.4	1.0 01	07.8	13 33.4	1.0 01	07.8	2
3	10 02.6	1.0 01	06.8	10 32.6	1.0 01	06.8	11 02.6	1.0 01	06.8	11 32.6	1.0 01	06.8	12 02.6	1.0 01	06.8	12 32.6	1.0 01	06.8	13 02.6	1.0 01	06.8	13 32.6	1.0 01	06.8	3
4	10 01.9	1.0 01	05.9	10 31.9	1.0 01	05.9	11 01.9	1.0 01	05.8	11 31.9	1.0 01	05.8	12 01.9	1.0 01	05.8	12 31.9	1.0 01	05.8	13 01.9	1.0 01	05.8	13 31.9	1.0 01	05.8	4
175	10 01.3	1.0 01	04.9	10 31.3	1.0 01	04.9	11 01.3	1.0 01	04.9	11 31.3	1.0 01	04.9	12 01.3	1.0 01	04.9	12 31.3	1.0 01	04.9	13 01.3	1.0 01	04.9	13 31.3	1.0 01	04.8	175
6	10 00.9	1.0 01	03.9	10 30.9	1.0 01	03.9	11 00.9	1.0 01	03.9	11 30.9	1.0 01	03.9	12 00.9	1.0 01	03.9	12 30.9	1.0 01	03.9	13 00.9	1.0 01	03.9	13 30.9	1.0 01	03.9	6
7	10 00.5	1.0 00	02.9	10 30.5	1.0 00	02.9	11 00.5	1.0 00	02.9	11 30.5	1.0 00	02.9	12 00.5	1.0 00	02.9	12 30.5	1.0 00	02.9	13 00.5	1.0 00	02.9	13 30.5	1.0 00	02.9	7
8	10 00.2	1.0 00	02.0	10 30.2	1.0 00	02.0	11 00.2	1.0 00	01.9	11 30.2	1.0 00	01.9	12 00.2	1.0 00	01.9	12 30.2	1.0 00	01.9	13 00.2	1.0 00	01.9	13 30.2	1.0 00	01.9	8
9	10 00.1	1.0 00	01.0	10 30.1	1.0 00	01.0	11 00.1	1.0 00	01.0	11 30.1	1.0 00	01.0	12 00.1	1.0 00	01.0	12 30.1	1.0 00	01.0	13 00.1	1.0 00	01.0	13 30.1	1.0 00	01.0	9
180	10 00.0	1.0 00	00.0	10 30.0	1.0 00	00.0	11 00.0	1.0 00	00.0	11 30.0	1.0 00	00.0	12 00.0	1.0 00	00.0	12 30.0	1.0 00	00.0	13 00.0	1.0 00	00.0	13 30.0	1.0 00	00.0	180

Each cell below lists: Alt (° ′) · Δd Δt · Az (°).

H.A.	20° 00′	20° 30′	21° 00′	21° 30′	22° 00′	22° 30′	23° 00′	23° 30′	H.A.
00	26 00.0 1.00 0 180.0	26 30.0 1.00 0 180.0	27 00.0 1.00 0 180.0	27 30.0 1.00 0 180.0	28 00.0 1.00 0 180.0	28 30.0 1.00 0 180.0	29 00.0 1.00 0 180.0	29 30.0 1.00 0 180.0	00
1	25 59.9 1.00 0 179.0	26 29.9 1.00 0 179.0	26 59.9 1.00 0 179.0	27 29.9 1.00 0 179.0	27 59.9 1.00 0 179.0	28 29.9 1.00 0 178.9	28 59.9 1.00 0 178.9	29 29.9 1.00 0 178.9	1
2	25 59.8 1.00 1 177.9	26 29.8 1.00 1 177.9	26 59.8 1.00 1 177.9	27 29.8 1.00 1 177.9	27 59.8 1.00 1 177.9	28 29.8 1.00 1 177.9	28 59.8 1.00 1 177.9	29 29.8 1.00 1 177.9	2
3	25 59.5 1.00 1 176.9	26 29.5 1.00 1 176.9	26 59.5 1.00 1 176.9	27 29.5 1.00 1 176.9	27 59.5 1.00 1 176.8	28 29.5 1.00 1 176.8	28 59.5 1.00 1 176.8	29 29.5 1.00 1 176.8	3
4	25 59.1 1.00 1 175.8	26 29.1 1.00 1 175.8	26 59.1 1.00 1 175.8	27 29.1 1.00 1 175.8	27 59.1 1.00 1 175.8	28 29.1 1.00 1 175.8	28 59.1 1.00 1 175.8	29 29.1 1.00 1 175.8	4
05	25 58.6 1.00 1 174.8	26 28.6 1.00 1 174.8	26 58.6 1.00 1 174.8	27 28.6 1.00 1 174.8	27 58.6 1.00 1 174.7	28 28.6 1.00 1 174.7	28 58.6 1.00 1 174.7	29 28.6 1.00 1 174.7	05
6	25 57.9 1.00 1 173.7	26 27.9 1.00 1 173.7	26 57.9 1.00 1 173.7	27 27.9 1.00 1 173.7	27 57.9 1.00 1 173.7	28 27.9 1.00 1 173.7	28 57.9 1.00 1 173.7	29 27.9 1.00 1 173.7	6
7	25 57.2 1.00 1 172.7	26 27.2 1.00 1 172.7	26 57.2 1.00 1 172.7	27 27.2 1.00 1 172.7	27 57.2 1.00 1 172.6	28 27.2 1.00 1 172.6	28 57.2 1.00 1 172.6	29 27.2 1.00 1 172.6	7
8	25 56.3 1.00 2 171.6	26 26.3 1.00 2 171.6	26 56.3 1.00 2 171.6	27 26.3 1.00 2 171.6	27 56.3 1.00 2 171.6	28 26.3 1.00 2 171.6	28 56.3 1.00 2 171.6	29 26.3 1.00 2 171.6	8
9	25 55.4 1.00 2 170.6	26 25.4 1.00 2 170.6	26 55.4 1.00 2 170.6	27 25.4 1.00 2 170.6	27 55.4 1.00 2 170.6	28 25.4 1.00 2 170.5	28 55.3 1.00 2 170.5	29 25.3 1.00 2 170.5	9
10	25 54.3 1.00 2 169.5	26 24.3 1.00 2 169.5	26 54.3 1.00 2 169.5	27 24.3 1.00 2 169.5	27 54.3 1.00 2 169.5	28 24.3 1.00 2 169.5	28 54.3 1.00 2 169.5	29 24.3 1.00 2 169.5	10
1	25 53.1 1.00 2 168.5	26 23.1 1.00 2 168.5	26 53.1 1.00 2 168.5	27 23.1 1.00 2 168.5	27 53.1 1.00 2 168.5	28 23.1 1.00 2 168.4	28 53.1 1.00 2 168.4	29 23.0 1.00 2 168.4	1
2	25 51.8 1.00 2 167.5	26 21.8 1.00 2 167.4	26 51.8 1.00 2 167.4	27 21.8 1.00 2 167.4	27 51.8 1.00 2 167.4	28 21.8 1.00 2 167.4	28 51.7 1.00 2 167.4	29 21.7 1.00 2 167.4	2
3	25 50.4 1.00 3 166.4	26 20.4 1.00 3 166.4	26 50.4 1.00 3 166.4	27 20.3 1.00 3 166.4	27 50.3 1.00 3 166.4	28 20.3 1.00 3 166.3	28 50.3 1.00 3 166.3	29 20.3 1.00 3 166.3	3
4	25 48.8 1.00 3 165.4	26 18.8 1.00 3 165.4	26 48.8 1.00 3 165.3	27 18.8 1.00 3 165.3	27 48.8 1.00 3 165.3	28 18.8 1.00 3 165.3	28 48.8 1.00 3 165.3	29 18.8 1.00 3 165.3	4
15	25 47.2 1.00 3 164.3	26 17.2 1.00 3 164.3	26 47.2 1.00 3 164.3	27 17.2 1.00 3 164.3	27 47.2 1.00 3 164.3	28 17.1 1.00 3 164.2	28 47.1 1.00 3 164.2	29 17.1 1.00 3 164.2	15
6	25 45.5 1.00 3 163.3	26 15.4 1.00 3 163.3	26 45.4 1.00 3 163.3	27 15.4 1.00 3 163.2	27 45.4 1.00 3 163.2	28 15.4 1.00 3 163.2	28 45.4 1.00 3 163.2	29 15.4 1.00 3 163.2	6
7	25 43.6 1.00 3 162.2	26 13.6 1.00 3 162.2	26 43.6 1.00 3 162.2	27 13.6 1.00 3 162.2	27 43.5 1.00 3 162.2	28 13.5 1.00 3 162.1	28 43.5 1.00 3 162.1	29 13.5 1.00 3 162.1	7
8	25 41.6 1.00 3 161.2	26 11.6 1.00 3 161.2	26 41.6 1.00 3 161.2	27 11.6 1.00 3 161.1	27 41.6 1.00 3 161.1	28 11.5 1.00 3 161.1	28 41.5 1.00 3 161.1	29 11.5 1.00 4 161.1	8
9	25 39.6 1.00 4 160.2	26 09.5 1.00 4 160.1	26 39.5 1.00 4 160.1	27 09.5 1.00 4 160.1	27 39.5 1.00 4 160.1	28 09.5 1.00 4 160.1	28 39.4 1.00 4 160.0	29 09.4 1.00 4 160.0	9
20	25 37.4 1.00 4 159.1	26 07.4 1.00 4 159.1	26 37.3 1.00 4 159.1	27 07.3 1.00 4 159.1	27 37.3 1.00 4 159.0	28 07.3 1.00 4 159.0	28 37.2 1.00 4 159.0	29 07.2 1.00 4 159.0	20
1	25 35.1 1.00 4 158.1	26 05.1 1.00 4 158.1	26 35.0 1.00 4 158.0	27 05.0 1.00 4 158.0	27 35.0 1.00 4 158.0	28 05.0 1.00 4 158.0	28 34.9 1.00 4 157.9	29 04.9 1.00 4 157.9	1
2	25 32.7 1.00 4 157.0	26 02.7 1.00 4 157.0	26 32.6 1.00 4 157.0	27 02.6 1.00 4 156.9	27 32.6 1.00 4 156.9	28 02.6 1.00 4 156.9	28 32.5 1.00 4 156.9	29 02.5 1.00 4 156.9	2
3	25 30.2 1.00 4 156.0	26 00.2 1.00 4 156.0	26 30.1 1.00 4 155.9	27 00.1 1.00 4 155.9	27 30.1 1.00 4 155.9	28 00.0 1.00 4 155.9	28 30.0 1.00 4 155.8	29 00.0 1.00 4 155.8	3
4	25 27.6 1.00 5 155.0	25 57.6 1.00 5 154.9	26 27.5 1.00 5 154.9	26 57.5 1.00 5 154.9	27 27.5 1.00 5 154.8	27 57.4 1.00 5 154.8	28 27.4 1.00 5 154.8	28 57.4 1.00 5 154.8	4
25	25 24.9 1.00 5 153.9	25 54.9 1.00 5 153.9	26 24.8 1.00 5 153.9	26 54.8 1.00 5 153.8	27 24.7 1.00 5 153.8	27 54.7 1.00 5 153.8	28 24.7 1.00 5 153.7	28 54.6 1.00 5 153.7	25
6	25 22.1 1.00 5 152.9	25 52.0 1.00 5 152.8	26 22.0 1.00 5 152.8	26 52.0 1.00 5 152.8	27 21.9 1.00 5 152.7	27 51.9 1.00 5 152.7	28 21.8 1.00 5 152.7	28 51.8 1.00 5 152.7	6
7	25 19.2 1.00 5 151.8	25 49.1 1.00 5 151.8	26 19.1 1.00 5 151.8	26 49.0 1.00 5 151.7	27 19.0 1.00 5 151.7	27 49.0 1.00 5 151.7	28 18.9 1.00 5 151.7	28 48.9 1.00 5 151.6	7
8	25 16.2 1.00 5 150.8	25 46.1 1.00 5 150.8	26 16.1 1.00 5 150.7	26 46.0 1.00 5 150.7	27 16.0 1.00 5 150.7	27 45.9 1.00 5 150.6	28 15.9 1.00 5 150.6	28 45.8 1.00 5 150.6	8
9	25 13.0 1.00 5 149.8	25 43.0 1.00 5 149.7	26 13.0 1.00 5 149.7	26 42.9 1.00 5 149.7	27 12.9 1.00 5 149.6	27 42.8 1.00 5 149.6	28 12.8 1.00 5 149.6	28 42.7 1.00 5 149.5	9
30	25 09.8 1.00 6 148.7	25 39.8 1.00 6 148.7	26 09.7 1.00 6 148.7	26 39.7 1.00 6 148.6	27 09.6 1.00 6 148.6	27 39.6 1.00 6 148.6	28 09.5 1.00 6 148.5	28 39.5 1.00 6 148.5	30
1	25 06.5 1.00 6 147.7	25 36.5 1.00 6 147.7	26 06.4 1.00 6 147.6	26 36.4 1.00 6 147.6	27 06.3 1.00 6 147.6	27 36.3 1.00 6 147.5	28 06.2 1.00 6 147.5	28 36.2 1.00 6 147.5	1
2	25 03.1 1.00 6 146.7	25 33.1 1.00 6 146.6	26 03.0 1.00 6 146.6	26 33.0 1.00 6 146.6	27 02.9 1.00 6 146.5	27 32.9 1.00 6 146.5	28 02.8 1.00 6 146.4	28 32.7 1.00 6 146.4	2
3	24 59.6 1.00 6 145.6	25 29.6 1.00 6 145.6	25 59.5 1.00 6 145.6	26 29.5 1.00 6 145.5	26 59.4 1.00 6 145.5	27 29.3 1.00 6 145.4	27 59.3 1.00 6 145.4	28 29.2 1.00 6 145.4	3
4	24 56.1 1.00 6 144.6	25 26.0 1.00 6 144.5	25 55.9 1.00 6 144.5	26 25.9 1.00 6 144.5	26 55.8 1.00 6 144.4	27 25.7 1.00 6 144.4	27 55.7 1.00 6 144.4	28 25.6 1.00 6 144.3	4
35	24 52.4 1.00 6 143.6	25 22.3 1.00 6 143.5	25 52.2 1.00 6 143.5	26 22.1 1.00 6 143.4	26 52.1 1.00 6 143.4	27 22.0 1.00 6 143.3	27 52.0 1.00 6 143.3	28 21.9 1.00 6 143.3	35
6	24 48.6 1.00 6 142.6	25 18.5 1.00 6 142.5	25 48.5 1.00 6 142.4	26 18.4 1.00 6 142.4	26 48.3 1.00 6 142.4	27 18.3 1.00 6 142.3	27 48.2 1.00 6 142.3	28 18.1 1.00 6 142.3	6
7	24 44.7 1.00 7 141.5	25 14.7 1.00 7 141.4	25 44.6 1.00 7 141.4	26 14.5 1.00 7 141.4	26 44.5 1.00 7 141.3	27 14.4 1.00 7 141.3	27 44.3 1.00 7 141.3	28 14.2 1.00 7 141.2	7
8	24 40.8 1.00 7 140.5	25 10.7 1.00 7 140.4	25 40.6 1.00 7 140.4	26 10.6 1.00 7 140.3	26 40.5 1.00 7 140.3	27 10.4 1.00 7 140.3	27 40.3 1.00 7 140.2	28 10.3 1.00 7 140.2	8
9	24 36.8 1.00 7 139.4	25 06.7 1.00 7 139.4	25 36.6 1.00 7 139.3	26 06.5 1.00 7 139.3	26 36.4 1.00 7 139.3	27 06.4 1.00 7 139.2	27 36.3 1.00 7 139.2	28 06.2 1.00 7 139.1	9
40	24 32.6 1.00 7 138.4	25 02.6 1.00 7 138.4	25 32.5 1.00 7 138.3	26 02.4 1.00 7 138.3	26 32.3 1.00 7 138.2	27 02.2 1.00 7 138.2	27 32.1 1.00 7 138.1	28 02.0 1.00 7 138.1	40
1	24 28.4 1.00 7 137.4	24 58.3 1.00 7 137.3	25 28.3 1.00 7 137.3	25 58.2 1.00 7 137.2	26 28.1 1.00 7 137.2	26 58.0 1.00 7 137.2	27 27.9 1.00 7 137.1	27 57.8 1.00 7 137.1	1
2	24 24.1 1.00 7 136.3	24 54.1 1.00 7 136.3	25 24.0 1.00 7 136.2	25 53.9 1.00 7 136.2	26 23.8 1.00 7 136.2	26 53.7 1.00 7 136.1	27 23.6 1.00 7 136.1	27 53.5 1.00 7 136.0	2
3	24 19.8 1.00 7 135.3	24 49.7 1.00 7 135.3	25 19.6 1.00 7 135.2	25 49.5 1.00 7 135.2	26 19.4 1.00 7 135.1	26 49.3 1.00 7 135.1	27 19.2 1.00 7 135.0	27 49.1 1.00 7 135.0	3
4	24 15.3 1.00 8 134.3	24 45.2 1.00 8 134.2	25 15.1 1.00 8 134.2	25 45.0 1.00 8 134.1	26 14.9 1.00 8 134.1	26 44.8 1.00 8 134.1	27 14.7 1.00 8 134.0	27 44.6 1.00 8 134.0	4
45	24 10.8 1.00 8 133.3	24 40.7 1.00 8 133.2	25 10.6 1.00 8 133.2	25 40.5 1.00 8 133.1	26 10.4 1.00 8 133.1	26 40.3 1.00 8 133.0	27 10.2 1.00 8 133.0	27 40.1 1.00 8 132.9	45
6	24 06.2 1.00 8 132.2	24 36.1 1.00 8 132.2	25 06.0 1.00 8 132.1	25 35.9 1.00 8 132.1	26 05.8 1.00 8 132.0	26 35.7 1.00 8 132.0	27 05.6 1.00 8 131.9	27 35.4 1.00 8 131.9	6
7	24 01.5 1.00 8 131.2	24 31.4 1.00 8 131.2	25 01.3 1.00 8 131.1	25 31.2 1.00 8 131.1	26 01.1 1.00 8 131.0	26 31.0 1.00 8 131.0	27 00.9 1.00 8 130.9	27 30.7 1.00 8 130.9	7
8	23 56.7 1.00 8 130.2	24 26.6 1.00 8 130.1	24 56.5 1.00 8 130.1	25 26.4 1.00 8 130.0	25 56.3 1.00 8 130.0	26 26.2 1.00 8 129.9	26 56.1 1.00 8 129.9	27 26.0 1.00 8 129.8	8
9	23 51.9 1.00 8 129.2	24 21.8 1.00 8 129.1	24 51.7 1.00 8 129.1	25 21.6 1.00 8 129.0	25 51.5 1.00 8 129.0	26 21.3 1.00 8 128.9	26 51.2 1.00 8 128.9	27 21.1 1.00 8 128.8	9
50	23 47.0 1.00 8 128.1	24 16.9 1.00 8 128.1	24 46.8 1.00 8 128.0	25 16.7 1.00 8 127.9	25 46.6 1.00 8 127.9	26 16.4 1.00 8 127.9	26 46.3 1.00 8 127.8	27 16.2 1.00 8 127.8	50
1	23 42.1 1.00 8 127.1	24 11.9 1.00 8 127.1	24 41.8 1.00 8 127.0	25 11.7 1.00 8 127.0	25 41.6 1.00 8 126.9	26 11.4 1.00 8 126.9	26 41.3 1.00 8 126.8	27 11.2 1.00 8 126.8	1
2	23 37.0 1.00 9 126.1	24 06.9 1.00 9 126.0	24 36.8 1.00 9 126.0	25 06.6 1.00 9 125.9	25 36.5 1.00 9 125.9	26 06.4 1.00 9 125.8	26 36.3 1.00 9 125.8	27 06.1 1.00 9 125.7	2
3	23 31.9 1.00 9 125.1	24 01.8 1.00 9 125.0	24 31.7 1.00 9 125.0	25 01.5 1.00 9 124.9	25 31.4 1.00 9 124.9	26 01.3 1.00 9 124.8	26 31.1 1.00 9 124.8	27 01.0 1.00 9 124.7	3
4	23 26.7 1.00 9 124.1	23 56.6 1.00 9 124.0	24 26.5 1.00 9 123.9	24 56.4 1.00 9 123.9	25 26.2 1.00 9 123.8	25 56.1 1.00 9 123.8	26 26.0 1.00 9 123.7	26 55.8 1.00 9 123.7	4
55	23 21.5 1.00 9 123.0	23 51.4 1.00 9 123.0	24 21.3 1.00 9 122.9	24 51.1 1.00 9 122.9	25 21.0 1.00 9 122.8	25 50.9 1.00 9 122.8	26 20.7 1.00 9 122.7	26 50.6 1.00 9 122.7	55
6	23 16.2 1.00 9 122.0	23 46.1 1.00 9 122.0	24 16.0 1.00 9 121.9	24 45.8 1.00 9 121.8	25 15.7 1.00 9 121.8	25 45.5 1.00 9 121.7	26 15.4 1.00 9 121.7	26 45.3 1.00 9 121.6	6
7	23 10.9 1.00 9 121.0	23 40.7 1.00 9 120.9	24 10.6 1.00 9 120.9	24 40.5 1.00 9 120.8	25 10.3 1.00 9 120.8	25 40.2 1.00 9 120.7	26 10.0 1.00 9 120.7	26 39.9 1.00 9 120.6	7
8	23 05.5 1.00 9 120.0	23 35.3 1.00 9 119.9	24 05.2 1.00 9 119.9	24 35.1 1.00 9 119.8	25 04.9 1.00 9 119.8	25 34.8 1.00 9 119.7	26 04.6 1.00 9 119.6	26 34.5 1.00 9 119.6	8
9	23 00.1 1.00 9 119.0	23 29.9 1.00 9 118.9	23 59.7 1.00 9 118.9	24 29.6 1.00 9 118.8	24 59.4 1.00 9 118.7	25 29.3 1.00 9 118.7	25 59.1 1.00 9 118.6	26 29.0 99 09 118.6	9
60	22 54.5 1.00 9 117.9	23 24.4 1.00 9 117.9	23 54.2 1.00 9 117.8	24 24.1 1.00 9 117.8	24 53.9 1.00 9 117.7	25 23.8 99 09 117.7	25 53.6 99 09 117.6	26 23.5 99 09 117.5	60
1	22 48.9 1.00 9 116.9	23 18.8 1.00 9 116.9	23 48.6 99 09 116.8	24 18.5 99 09 116.8	24 48.3 99 09 116.7	25 18.2 99 09 116.6	25 48.0 99 09 116.6	26 17.9 99 09 116.5	1
2	22 43.3 99 09 115.9	23 13.2 99 09 115.9	23 43.0 99 09 115.8	24 12.9 99 09 115.7	24 42.7 99 09 115.7	25 12.6 99 09 115.6	25 42.4 99 09 115.6	26 12.2 99 09 115.5	2
3	22 37.7 99 10 114.9	23 07.5 99 10 114.8	23 37.3 99 10 114.8	24 07.2 99 10 114.7	24 37.0 99 10 114.7	25 06.9 99 10 114.6	25 36.7 99 10 114.6	26 06.6 99 10 114.5	3
4	22 31.9 99 10 113.8	23 01.8 99 10 113.8	23 31.6 99 10 113.8	24 01.5 99 10 113.7	24 31.3 99 10 113.7	25 01.1 99 10 113.6	25 31.0 99 10 113.5	26 00.8 99 10 113.5	4
65	22 26.2 99 10 112.9	22 56.0 99 10 112.8	23 25.9 99 10 112.8	23 55.7 99 10 112.7	24 25.5 99 10 112.6	24 55.4 99 10 112.6	25 25.2 99 10 112.5	25 55.1 99 10 112.5	65
6	22 20.4 99 10 111.9	22 50.2 99 10 111.8	23 20.1 99 10 111.7	23 49.9 99 10 111.7	24 19.7 99 10 111.6	24 49.6 99 10 111.6	25 19.4 99 10 111.5	25 49.2 99 10 111.5	6
7	22 14.5 99 10 110.8	22 44.4 99 10 110.8	23 14.2 99 10 110.7	23 44.1 99 10 110.7	24 13.9 99 10 110.6	24 43.7 99 10 110.6	25 13.5 99 10 110.5	25 43.4 99 10 110.4	7
8	22 08.7 99 10 109.8	22 38.5 99 10 109.8	23 08.3 99 10 109.7	23 38.2 99 10 109.7	24 08.0 99 10 109.6	24 37.8 99 10 109.6	25 07.7 99 10 109.5	25 37.5 99 10 109.4	8
9	22 02.7 99 10 108.8	22 32.6 99 10 108.8	23 02.4 99 10 108.7	23 32.2 99 10 108.7	24 02.1 99 10 108.6	24 31.9 99 10 108.5	25 01.7 99 10 108.5	25 31.5 99 10 108.4	9
70	21 56.8 99 10 107.8	22 26.6 99 10 107.8	22 56.5 99 10 107.7	23 26.3 99 10 107.6	23 56.1 99 10 107.6	24 25.9 99 10 107.5	24 55.8 99 10 107.5	25 25.6 99 10 107.4	70
1	21 50.8 99 10 106.8	22 20.6 99 10 106.8	22 50.5 99 10 106.7	23 20.3 99 10 106.6	23 50.1 99 10 106.6	24 19.9 99 10 106.5	24 49.8 99 10 106.5	25 19.6 99 10 106.4	1
2	21 44.8 99 10 105.8	22 14.6 99 10 105.8	22 44.4 99 10 105.7	23 14.3 99 10 105.6	23 44.1 99 10 105.6	24 13.9 99 10 105.5	24 43.7 99 10 105.5	25 13.5 99 10 105.4	2
3	21 38.7 99 10 104.8	22 08.6 99 10 104.7	22 38.4 99 10 104.7	23 08.2 99 10 104.6	23 38.0 99 10 104.6	24 07.9 99 10 104.5	24 37.7 99 10 104.4	25 07.5 99 10 104.4	3
4	21 32.7 99 10 103.8	22 02.5 99 10 103.7	22 32.3 99 10 103.7	23 02.1 99 10 103.6	23 31.9 99 10 103.6	24 01.8 99 10 103.5	24 31.6 99 10 103.4	25 01.4 99 10 103.4	4
75	21 26.6 99 10 102.8	21 56.4 99 10 102.7	22 26.2 99 10 102.7	22 56.0 99 10 102.6	23 25.8 99 10 102.6	23 55.7 99 10 102.5	24 25.5 99 10 102.4	24 55.3 99 10 102.4	75
6	21 20.4 99 10 101.8	21 50.2 99 10 101.7	22 20.1 99 10 101.7	22 49.9 99 10 101.6	23 19.7 99 10 101.6	23 49.5 99 10 101.5	24 19.3 99 10 101.4	24 49.1 99 10 101.4	6
7	21 14.3 99 10 100.8	21 44.1 99 10 100.7	22 13.9 99 10 100.7	22 43.7 99 10 100.6	23 13.5 99 10 100.6	23 43.4 99 10 100.5	24 13.2 99 10 100.4	24 43.0 99 10 100.4	7
8	21 08.1 99 10 99.8	21 37.9 99 10 99.7	22 07.7 99 10 99.7	22 37.4 99 10 99.6	23 07.4 99 10 99.5	23 37.0 99 10 99.5	24 07.0 99 10 99.4	24 36.8 99 10 99.4	8
9	21 01.9 99 10 98.8	21 31.7 99 10 98.7	22 01.6 99 10 98.7	22 31.4 99 10 98.6	23 01.2 99 10 98.5	23 31.0 99 10 98.5	24 00.8 99 10 98.4	24 30.6 99 10 98.4	9
80	20 55.7 99 10 97.8	21 25.5 99 10 97.7	21 55.3 99 10 97.7	22 25.2 99 10 97.6	22 55.0 99 10 97.5	23 24.8 99 10 97.5	23 54.6 99 10 97.4	24 24.4 99 10 97.4	80
1	20 49.5 99 10 96.8	21 19.3 99 10 96.7	21 49.1 99 10 96.7	22 18.9 99 10 96.6	22 48.7 99 10 96.5	23 18.6 99 10 96.5	23 48.4 99 10 96.4	24 18.2 99 10 96.4	1
2	20 43.3 99 10 95.8	21 13.1 99 10 95.7	21 42.9 99 10 95.7	22 12.7 99 10 95.6	22 42.5 99 10 95.5	23 12.3 99 10 95.5	23 42.1 99 10 95.4	24 11.9 99 10 95.4	2
3	20 37.0 99 10 94.8	21 06.8 99 10 94.7	21 36.6 99 10 94.7	22 06.5 99 10 94.6	22 36.3 99 10 94.5	23 06.1 99 10 94.5	23 35.9 99 10 94.4	24 05.7 99 10 94.4	3
4	20 30.8 99 10 93.8	21 00.6 99 10 93.7	21 30.4 99 10 93.7	22 00.2 99 10 93.6	22 30.0 99 10 93.5	22 59.8 99 10 93.5	23 29.6 99 10 93.4	23 59.4 99 10 93.4	4
85	20 24.5 99 10 92.8	20 54.3 99 10 92.7	21 24.1 99 10 92.7	21 53.9 99 10 92.6	22 23.7 99 10 92.6	22 53.6 99 10 92.5	23 23.4 99 10 92.4	23 53.2 99 10 92.4	85
6	20 18.2 99 10 91.8	20 48.0 99 10 91.7	21 17.9 99 10 91.7	21 47.7 99 10 91.6	22 17.5 99 10 91.6	22 47.3 99 10 91.5	23 17.1 99 10 91.4	23 46.9 99 10 91.4	6
7	20 12.0 99 10 90.8	20 41.8 99 10 90.7	21 11.6 99 10 90.7	21 41.4 99 10 90.6	22 11.2 99 10 90.6	22 41.0 99 10 90.5	23 10.8 99 10 90.4	23 40.6 99 10 90.4	7
8	20 05.7 99 10 89.8	20 35.5 99 10 89.7	21 05.3 99 10 89.7	21 35.1 99 10 89.6	22 04.9 99 10 89.6	22 34.7 99 10 89.5	23 04.5 99 10 89.4	23 34.4 99 10 89.4	8
9	19 59.4 99 10 88.8	20 29.2 99 10 88.8	20 59.0 99 10 88.7	21 28.9 99 10 88.6	21 58.7 99 10 88.6	22 28.5 99 10 88.5	22 58.3 99 10 88.5	23 28.1 99 10 88.4	9
90	19 53.1 99 10 87.8	20 23.0 99 10 87.8	20 52.8 99 10 87.7	21 22.6 99 10 87.6	21 52.4 99 10 87.6	22 22.2 99 10 87.5	22 52.0 99 10 87.5	23 21.8 99 10 87.4	90

H.A.	20° 00' Alt.	Δd Δt	Az.	20° 30' Alt.	Δd Δt	Az.	21° 00' Alt.	Δd Δt	Az.	21° 30' Alt.	Δd Δt	Az.	22° 00' Alt.	Δd Δt	Az.	22° 30' Alt.	Δd Δt	Az.	23° 00' Alt.	Δd Δt	Az.	23° 30' Alt.	Δd Δt	Az.	H.A.
91	19 46.9	99 10	86.8	20 16.7	99 10	86.8	20 46.5	99 10	86.7	21 16.3	99 10	86.6	21 46.1	99 10	86.6	22 15.9	99 10	86.5	22 45.7	99 10	86.5	23 15.6	99 10	86.4	91
2	19 40.6	99 10	85.8	20 10.4	99 10	85.8	20 40.3	99 10	85.7	21 10.1	99 10	85.7	21 39.9	99 10	85.6	22 09.7	99 10	85.5	22 39.5	99 10	85.5	23 09.3	99 10	85.4	2
3	19 34.4	99 10	84.8	20 04.2	99 10	84.8	20 34.0	99 10	84.7	21 03.8	99 10	84.7	21 33.6	99 10	84.6	22 03.4	99 10	84.5	22 33.2	99 10	84.5	23 03.1	99 10	84.4	3
4	19 28.1	99 10	83.9	19 57.9	99 10	83.8	20 27.8	99 10	83.7	20 57.6	99 10	83.7	21 27.4	99 10	83.6	21 57.2	99 10	83.6	22 27.0	99 10	83.5	22 56.8	99 10	83.4	4
95	19 21.9	99 10	82.9	19 51.7	99 10	82.8	20 21.5	99 10	82.7	20 51.3	99 10	82.7	21 21.2	99 10	82.6	21 51.0	99 10	82.6	22 20.8	99 10	82.5	22 50.6	99 10	82.4	95
6	19 15.7	99 10	81.9	19 45.5	99 10	81.8	20 15.3	99 10	81.8	20 45.1	99 10	81.7	21 14.9	99 10	81.6	21 44.8	99 10	81.6	22 14.6	99 10	81.5	22 44.4	99 10	81.5	6
7	19 09.5	99 10	80.9	19 39.3	99 10	80.8	20 09.1	99 10	80.8	20 38.9	99 10	80.7	21 08.8	99 10	80.6	21 38.6	99 10	80.6	22 08.4	99 10	80.5	22 38.2	99 10	80.5	7
8	19 03.3	99 10	79.9	19 33.1	99 10	79.8	20 02.9	99 10	79.8	20 32.8	99 10	79.7	21 02.6	99 10	79.7	21 32.4	99 10	79.6	22 02.2	99 10	79.5	22 32.0	99 10	79.5	8
9	18 57.1	99 10	78.9	19 27.0	99 10	78.8	19 56.8	99 10	78.8	20 26.6	99 10	78.7	20 56.4	99 10	78.7	21 26.2	99 10	78.6	21 56.0	99 10	78.6	22 25.9	99 10	78.5	9
100	18 51.0	99 10	77.9	19 20.8	99 10	77.9	19 50.6	99 10	77.8	20 20.5	99 10	77.7	20 50.3	99 10	77.7	21 20.1	99 10	77.6	21 49.9	99 10	77.6	22 19.7	99 10	77.5	100
1	18 44.9	99 10	76.9	19 14.7	99 10	76.9	19 44.5	99 10	76.8	20 14.3	99 10	76.8	20 44.2	99 10	76.7	21 14.0	99 10	76.6	21 43.8	99 10	76.6	22 13.6	99 10	76.5	1
2	18 38.8	99 10	75.9	19 08.6	99 10	75.9	19 38.4	99 10	75.8	20 08.2	99 10	75.8	20 38.1	99 10	75.7	21 07.9	99 10	75.7	21 37.7	99 10	75.6	22 07.5	99 10	75.5	2
3	18 32.7	99 10	75.0	19 02.5	99 10	74.9	19 32.4	99 10	74.8	20 02.2	99 10	74.8	20 32.0	99 10	74.7	21 01.8	99 10	74.7	21 31.6	99 10	74.6	22 01.5	99 10	74.6	3
4	18 26.7	99 10	74.0	18 56.5	99 10	73.9	19 26.3	99 10	73.9	19 56.1	99 10	73.8	20 26.0	99 10	73.7	20 55.8	99 10	73.7	21 25.6	99 10	73.6	21 55.4	99 10	73.6	4
105	18 20.6	99 10	73.0	18 50.5	99 10	72.9	19 20.3	99 10	72.9	19 50.1	99 10	72.8	20 19.9	99 10	72.8	20 49.8	99 10	72.7	21 19.6	99 10	72.7	21 49.4	99 10	72.6	105
6	18 14.7	99 10	72.0	18 44.5	99 10	72.0	19 14.3	99 10	71.9	19 44.2	99 10	71.8	20 14.0	99 10	71.8	20 43.8	99 10	71.7	21 13.6	99 10	71.7	21 43.5	99 10	71.6	6
7	18 08.7	99 10	71.0	18 38.6	99 10	71.0	19 08.4	99 10	70.9	19 38.2	99 10	70.9	20 08.0	99 10	70.8	20 37.9	99 10	70.7	21 07.7	99 10	70.7	21 37.5	99 10	70.6	7
8	18 02.8	99 10	70.0	18 32.6	99 10	70.0	19 02.5	99 10	69.9	19 32.3	99 10	69.9	20 02.1	99 10	69.8	20 32.0	99 10	69.8	21 01.8	99 10	69.7	21 31.6	99 10	69.6	8
9	17 56.9	99 10	69.1	18 26.8	99 10	69.0	18 56.6	99 10	68.9	19 26.4	99 10	68.9	19 56.3	99 10	68.8	20 26.1	99 10	68.8	20 55.9	99 10	68.7	21 25.8	99 10	68.7	9
110	17 51.1	99 10	68.1	18 20.9	99 10	68.0	18 50.8	99 10	68.0	19 20.6	99 10	67.9	19 50.4	99 10	67.9	20 20.3	99 10	67.8	20 50.1	99 10	67.7	21 19.9	99 10	67.7	110
1	17 45.3	99 10	67.1	18 15.1	99 10	67.0	18 45.0	99 10	67.0	19 14.8	99 10	66.9	19 44.7	99 10	66.8	20 14.5	99 10	66.8	20 44.3	99 10	66.7	21 14.2	99 10	66.7	1
2	17 39.5	99 10	66.1	18 09.4	99 10	66.1	18 39.2	99 10	66.0	19 09.1	99 10	66.0	19 38.9	99 10	65.9	20 08.7	99 10	65.8	20 38.6	99 10	65.8	21 08.4	99 10	65.7	2
3	17 33.8	99 09	65.1	18 03.7	99 09	65.1	18 33.5	99 09	65.0	19 03.4	99 09	65.0	19 33.2	99 09	64.9	20 03.0	99 09	64.9	20 32.9	99 09	64.8	21 02.7	99 09	64.8	3
4	17 28.2	99 09	64.2	17 58.0	99 09	64.1	18 27.9	99 09	64.0	18 57.7	99 09	64.0	19 27.5	99 09	63.9	19 57.4	99 09	63.9	20 27.2	99 09	63.8	20 57.1	99 09	63.8	4
115	17 22.5	1.0 09	63.2	17 52.4	1.0 09	63.1	18 22.2	1.0 09	63.1	18 52.1	1.0 09	63.0	19 21.9	1.0 09	63.0	19 51.8	1.0 09	62.9	20 21.6	1.0 09	62.9	20 51.5	1.0 09	62.8	115
6	17 17.0	1.0 09	62.2	17 46.8	1.0 09	62.1	18 16.7	1.0 09	62.1	18 46.5	1.0 09	62.0	19 16.4	1.0 09	62.0	19 46.2	1.0 09	61.9	20 16.1	1.0 09	61.9	20 45.9	99 09	61.8	6
7	17 11.4	1.0 09	61.2	17 41.3	1.0 09	61.2	18 11.2	1.0 09	61.1	18 41.0	1.0 09	61.1	19 10.9	1.0 09	61.1	19 40.7	1.0 09	61.0	20 10.6	1.0 09	60.9	20 40.4	1.0 09	60.9	7
8	17 06.0	1.0 09	60.2	17 35.8	1.0 09	60.2	18 05.7	1.0 09	60.1	18 35.5	1.0 09	60.1	19 05.4	1.0 09	60.0	19 35.3	1.0 09	60.0	20 05.1	1.0 09	59.9	20 35.0	1.0 09	59.9	8
9	17 00.6	1.0 09	59.3	17 30.4	1.0 09	59.2	18 00.3	1.0 09	59.2	18 30.1	1.0 09	59.1	19 00.0	1.0 09	59.1	19 29.9	1.0 09	59.0	19 59.7	1.0 09	59.0	20 29.6	1.0 09	58.9	9
120	16 55.2	1.0 09	58.3	17 25.1	1.0 09	58.2	17 54.9	1.0 09	58.2	18 24.8	1.0 09	58.1	18 54.6	1.0 09	58.1	19 24.5	1.0 09	58.0	19 54.4	1.0 09	58.0	20 24.2	1.0 09	57.9	120
1	16 49.9	1.0 09	57.3	17 19.8	1.0 09	57.3	17 49.6	1.0 09	57.2	18 19.5	1.0 09	57.2	18 49.4	1.0 09	57.1	19 19.2	1.0 09	57.1	19 49.1	1.0 09	57.0	20 18.9	1.0 09	57.0	1
2	16 44.6	1.0 09	56.3	17 14.5	1.0 09	56.3	17 44.4	1.0 09	56.2	18 14.2	1.0 09	56.2	18 44.1	1.0 09	56.1	19 14.0	1.0 09	56.1	19 43.9	1.0 09	56.0	20 13.7	1.0 09	56.0	2
3	16 39.4	1.0 09	55.3	17 09.3	1.0 09	55.3	17 39.2	1.0 09	55.3	18 09.1	1.0 09	55.2	18 38.9	1.0 09	55.2	19 08.8	1.0 09	55.1	19 38.7	1.0 09	55.1	20 08.6	1.0 08	55.0	3
4	16 34.3	1.0 08	54.4	17 04.2	1.0 08	54.3	17 34.1	1.0 08	54.3	18 03.9	1.0 08	54.2	18 33.8	1.0 08	54.2	19 03.7	1.0 08	54.1	19 33.6	1.0 08	54.1	20 03.4	1.0 08	54.0	4
125	16 29.3	1.0 08	53.4	16 59.1	1.0 08	53.3	17 29.0	1.0 08	53.3	17 58.9	1.0 08	53.3	18 28.8	1.0 08	53.2	18 58.7	1.0 08	53.2	19 28.5	1.0 08	53.1	19 58.4	1.0 08	53.1	125
6	16 24.3	1.0 08	52.4	16 54.1	1.0 08	52.4	17 24.0	1.0 08	52.3	17 53.9	1.0 08	52.3	18 23.8	1.0 08	52.2	18 53.7	1.0 08	52.2	19 23.5	1.0 08	52.1	19 53.4	1.0 08	52.1	6
7	16 19.3	1.0 08	51.4	16 49.2	1.0 08	51.4	17 19.1	1.0 08	51.4	17 49.0	1.0 08	51.3	18 18.9	1.0 08	51.3	18 48.7	1.0 08	51.2	19 18.6	1.0 08	51.2	19 48.5	1.0 08	51.1	7
8	16 14.4	1.0 08	50.5	16 44.3	1.0 08	50.4	17 14.2	1.0 08	50.4	17 44.1	1.0 08	50.3	18 14.0	1.0 08	50.3	18 43.9	1.0 08	50.2	19 13.8	1.0 08	50.2	19 43.7	1.0 08	50.1	8
9	16 09.6	1.0 08	49.5	16 39.5	1.0 08	49.4	17 09.4	1.0 08	49.4	17 39.3	1.0 08	49.4	18 09.1	1.0 08	49.3	18 39.1	1.0 08	49.3	19 09.0	1.0 08	49.2	19 38.9	1.0 08	49.2	9
130	16 04.9	1.0 08	48.5	16 34.8	1.0 08	48.5	17 04.7	1.0 08	48.4	17 34.6	1.0 08	48.4	18 04.5	1.0 08	48.4	18 34.4	1.0 08	48.3	19 04.3	1.0 08	48.3	19 34.2	1.0 08	48.2	130
1	16 00.2	1.0 08	47.5	16 30.1	1.0 08	47.5	17 00.0	1.0 08	47.5	17 29.9	1.0 08	47.4	17 59.8	1.0 08	47.4	18 29.7	1.0 08	47.3	18 59.6	1.0 08	47.3	19 29.5	1.0 08	47.2	1
2	15 55.7	1.0 08	46.6	16 25.6	1.0 08	46.5	16 55.5	1.0 08	46.5	17 25.4	1.0 08	46.4	17 55.3	1.0 08	46.4	18 25.2	1.0 08	46.4	18 55.1	1.0 08	46.3	19 25.0	1.0 08	46.3	2
3	15 51.1	1.0 07	45.6	16 21.0	1.0 07	45.6	16 50.9	1.0 07	45.5	17 20.8	1.0 07	45.5	17 50.8	1.0 07	45.4	18 20.7	1.0 07	45.4	18 50.6	1.0 07	45.3	19 20.5	1.0 07	45.3	3
4	15 46.7	1.0 07	44.6	16 16.6	1.0 07	44.6	16 46.5	1.0 07	44.5	17 16.4	1.0 07	44.5	17 46.3	1.0 07	44.5	18 16.2	1.0 07	44.4	18 46.1	1.0 07	44.4	19 16.0	1.0 07	44.3	4
135	15 42.3	1.0 07	43.6	16 12.2	1.0 07	43.6	16 42.1	1.0 07	43.6	17 12.1	1.0 07	43.5	17 42.0	1.0 07	43.5	18 11.9	1.0 07	43.4	18 41.8	1.0 07	43.4	19 11.7	1.0 07	43.4	135
6	15 38.0	1.0 07	42.7	16 07.9	1.0 07	42.6	16 37.9	1.0 07	42.6	17 07.8	1.0 07	42.6	17 37.7	1.0 07	42.5	18 07.6	1.0 07	42.5	18 37.5	1.0 07	42.4	19 07.4	1.0 07	42.4	6
7	15 33.8	1.0 07	41.7	16 03.7	1.0 07	41.7	16 33.7	1.0 07	41.6	17 03.6	1.0 07	41.6	17 33.5	1.0 07	41.5	18 03.4	1.0 07	41.5	18 33.3	1.0 07	41.5	19 03.2	1.0 07	41.4	7
8	15 29.7	1.0 07	40.7	15 59.6	1.0 07	40.7	16 29.5	1.0 07	40.7	16 59.5	1.0 07	40.6	17 29.4	1.0 07	40.6	17 59.3	1.0 07	40.5	18 29.2	1.0 07	40.5	18 59.1	1.0 07	40.5	8
9	15 25.6	1.0 07	39.8	15 55.6	1.0 07	39.7	16 25.5	1.0 07	39.7	16 55.4	1.0 07	39.7	17 25.3	1.0 07	39.6	17 55.3	1.0 07	39.6	18 25.2	1.0 07	39.5	18 55.1	1.0 07	39.5	9
140	15 21.7	1.0 06	38.8	15 51.6	1.0 06	38.8	16 21.5	1.0 06	38.7	16 51.4	1.0 06	38.7	17 21.4	1.0 06	38.6	17 51.3	1.0 06	38.6	18 21.2	1.0 06	38.6	18 51.1	1.0 06	38.5	140
1	15 17.8	1.0 06	37.8	15 47.7	1.0 06	37.8	16 17.6	1.0 06	37.7	16 47.6	1.0 06	37.7	17 17.5	1.0 06	37.7	17 47.4	1.0 06	37.6	18 17.4	1.0 06	37.6	18 47.3	1.0 06	37.6	1
2	15 14.0	1.0 06	36.8	15 43.9	1.0 06	36.8	16 13.8	1.0 06	36.8	16 43.8	1.0 06	36.7	17 13.7	1.0 06	36.7	17 43.6	1.0 06	36.7	18 13.6	1.0 06	36.6	18 43.5	1.0 06	36.6	2
3	15 10.3	1.0 06	35.9	15 40.2	1.0 06	35.8	16 10.1	1.0 06	35.8	16 40.1	1.0 06	35.8	17 10.0	1.0 06	35.7	17 39.9	1.0 06	35.7	18 09.9	1.0 06	35.7	18 39.8	1.0 06	35.6	3
4	15 06.6	1.0 06	34.9	15 36.6	1.0 06	34.9	16 06.5	1.0 06	34.8	16 36.4	1.0 06	34.8	17 06.4	1.0 06	34.8	17 36.3	1.0 06	34.7	18 06.3	1.0 06	34.7	18 36.2	1.0 06	34.7	4
145	15 03.1	1.0 06	33.9	15 33.0	1.0 06	33.9	16 03.0	1.0 06	33.9	16 32.9	1.0 06	33.8	17 02.9	1.0 06	33.8	17 32.8	1.0 06	33.8	18 02.7	1.0 06	33.7	18 32.7	1.0 06	33.7	145
6	14 59.6	1.0 05	33.0	15 29.6	1.0 05	32.9	15 59.5	1.0 05	32.9	16 29.5	1.0 05	32.9	16 59.4	1.0 05	32.8	17 29.3	1.0 05	32.8	17 59.3	1.0 05	32.8	18 29.2	1.0 05	32.7	6
7	14 56.3	1.0 05	32.0	15 26.2	1.0 05	32.0	15 56.2	1.0 05	31.9	16 26.1	1.0 05	31.9	16 56.1	1.0 05	31.9	17 26.0	1.0 05	31.8	17 55.9	1.0 05	31.8	18 25.9	1.0 05	31.8	7
8	14 53.0	1.0 05	31.0	15 22.9	1.0 05	31.0	15 52.9	1.0 05	31.0	16 22.8	1.0 05	30.9	16 52.8	1.0 05	30.9	17 22.7	1.0 05	30.9	17 52.7	1.0 05	30.8	18 22.6	1.0 05	30.8	8
9	14 49.8	1.0 05	30.0	15 19.8	1.0 05	30.0	15 49.7	1.0 05	30.0	16 19.7	1.0 05	30.0	16 49.6	1.0 05	29.9	17 19.6	1.0 05	29.9	17 49.5	1.0 05	29.9	18 19.5	1.0 05	29.8	9
150	14 46.7	1.0 05	29.1	15 16.7	1.0 05	29.0	15 46.6	1.0 05	29.0	16 16.6	1.0 05	29.0	16 46.5	1.0 05	29.0	17 16.5	1.0 05	28.9	17 46.4	1.0 05	28.9	18 16.4	1.0 05	28.9	150
1	14 43.7	1.0 05	28.1	15 13.7	1.0 05	28.1	15 43.6	1.0 05	28.0	16 13.6	1.0 05	28.0	16 43.5	1.0 05	28.0	17 13.5	1.0 05	28.0	17 43.5	1.0 05	27.9	18 13.4	1.0 05	27.9	1
2	14 40.8	1.0 05	27.1	15 10.8	1.0 05	27.1	15 40.7	1.0 05	27.1	16 10.7	1.0 05	27.1	16 40.6	1.0 05	27.0	17 10.6	1.0 05	27.0	17 40.6	1.0 05	27.0	18 10.5	1.0 05	26.9	2
3	14 38.0	1.0 05	26.2	15 07.9	1.0 05	26.1	15 37.9	1.0 05	26.1	16 07.9	1.0 05	26.1	16 37.8	1.0 04	26.1	17 07.8	1.0 04	26.0	17 37.8	1.0 04	26.0	18 07.7	1.0 04	26.0	3
4	14 35.3	1.0 04	25.2	15 05.2	1.0 04	25.2	15 35.2	1.0 04	25.1	16 05.2	1.0 04	25.1	16 35.1	1.0 04	25.1	17 05.1	1.0 04	25.0	17 35.1	1.0 04	25.0	18 05.0	1.0 04	25.0	4
155	14 32.6	1.0 04	24.2	15 02.6	1.0 04	24.2	15 32.6	1.0 04	24.2	16 02.6	1.0 04	24.1	16 32.5	1.0 04	24.1	17 02.5	1.0 04	24.1	17 32.5	1.0 04	24.1	18 02.4	1.0 04	24.1	155
6	14 30.1	1.0 04	23.3	15 00.1	1.0 04	23.2	15 30.1	1.0 04	23.2	16 00.0	1.0 04	23.2	16 30.0	1.0 04	23.2	17 00.0	1.0 04	23.1	17 29.9	1.0 04	23.1	17 59.9	1.0 04	23.1	6
7	14 27.7	1.0 04	22.3	14 57.7	1.0 04	22.3	15 27.6	1.0 04	22.2	15 57.6	1.0 04	22.2	16 27.6	1.0 04	22.2	16 57.6	1.0 04	22.2	17 27.5	1.0 04	22.2	17 57.5	1.0 04	22.1	7
8	14 25.4	1.0 04	21.3	14 55.3	1.0 04	21.3	15 25.3	1.0 04	21.3	15 55.3	1.0 04	21.3	16 25.3	1.0 04	21.2	16 55.2	1.0 04	21.2	17 25.2	1.0 04	21.2	17 55.2	1.0 04	21.2	8
9	14 23.1	1.0 04	20.3	14 53.1	1.0 04	20.3	15 23.1	1.0 04	20.3	15 53.1	1.0 04	20.3	16 23.0	1.0 04	20.3	16 53.0	1.0 04	20.2	17 23.0	1.0 04	20.2	17 53.0	1.0 04	20.2	9
160	14 21.0	1.0 03	19.4	14 51.0	1.0 03	19.4	15 21.0	1.0 03	19.3	15 50.9	1.0 03	19.3	16 20.9	1.0 03	19.3	16 50.9	1.0 03	19.3	17 20.9	1.0 03	19.3	17 50.9	1.0 03	19.2	160
1	14 19.0	1.0 03	18.4	14 49.0	1.0 03	18.4	15 18.9	1.0 03	18.4	15 48.9	1.0 03	18.4	16 18.9	1.0 03	18.3	16 48.9	1.0 03	18.3	17 18.9	1.0 03	18.3	17 48.8	1.0 03	18.3	1
2	14 17.0	1.0 03	17.4	14 47.0	1.0 03	17.4	15 17.0	1.0 03	17.4	15 47.0	1.0 03	17.4	16 17.0	1.0 03	17.4	16 47.0	1.0 03	17.3	17 16.9	1.0 03	17.3	17 46.9	1.0 03	17.3	2
3	14 15.2	1.0 03	16.5	14 45.2	1.0 03	16.5	15 15.2	1.0 03	16.4	15 45.2	1.0 03	16.4	16 15.2	1.0 03	16.4	16 45.1	1.0 03	16.4	17 15.1	1.0 03	16.4	17 45.1	1.0 03	16.4	3
4	14 13.5	1.0 03	15.5	14 43.5	1.0 03	15.5	15 13.5	1.0 03	15.5	15 43.4	1.0 03	15.5	16 13.4	1.0 03	15.4	16 43.4	1.0 03	15.4	17 13.4	1.0 03	15.4	17 43.4	1.0 03	15.4	4
165	14 11.9	1.0 03	14.5	14 41.9	1.0 03	14.5	15 11.8	1.0 03	14.5	15 41.8	1.0 03	14.5	16 11.8	1.0 03	14.5	16 41.8	1.0 03	14.5	17 11.8	1.0 03	14.4	17 41.8	1.0 03	14.4	165
6	14 10.3	1.0 02	13.6	14 40.3	1.0 02	13.5	15 10.3	1.0 02	13.5	15 40.3	1.0 02	13.5	16 10.3	1.0 02	13.5	16 40.3	1.0 02	13.5	17 10.3	1.0 02	13.5	17 40.3	1.0 02	13.5	6
7	14 08.9	1.0 02	12.6	14 38.9	1.0 02	12.6	15 08.9	1.0 02	12.6	15 38.9	1.0 02	12.6	16 08.9	1.0 02	12.5	16 38.9	1.0 02	12.5	17 08.9	1.0 02	12.5	17 38.9	1.0 02	12.5	7
8	14 07.6	1.0 02	11.6	14 37.6	1.0 02	11.6	15 07.6	1.0 02	11.6	15 37.6	1.0 02	11.6	16 07.6	1.0 02	11.6	16 37.6	1.0 02	11.6	17 07.6	1.0 02	11.5	17 37.6	1.0 02	11.5	8
9	14 06.4	1.0 02	10.7	14 36.4	1.0 02	10.6	15 06.4	1.0 02	10.6	15 36.4	1.0 02	10.6	16 06.4	1.0 02	10.6	16 36.4	1.0 02	10.6	17 06.4	1.0 02	10.6	17 36.3	1.0 02	10.6	9
170	14 05.3	1.0 02	09.7	14 35.3	1.0 02	09.7	15 05.3	1.0 02	09.7	15 35.3	1.0 02	09.7	16 05.3	1.0 02	09.6	16 35.3	1.0 02	09.6	17 05.3	1.0 02	09.6	17 35.3	1.0 02	09.6	170
1	14 04.3	1.0 02	08.7	14 34.3	1.0 02	08.7	15 04.3	1.0 02	08.7	15 34.3	1.0 01	08.7	16 04.3	1.0 02	08.7	16 34.3	1.0 02	08.7	17 04.3	1.0 02	08.7	17 34.3	1.0 01	08.7	1
2	14 03.4	1.0 01	07.7	14 33.4	1.0 01	07.7	15 03.4	1.0 01	07.7	15 33.4	1.0 01	07.7	16 03.4	1.0 01	07.7	16 33.4	1.0 01	07.7	17 03.4	1.0 01	07.7	17 33.4	1.0 01	07.7	2
3	14 02.6	1.0 01	06.8	14 32.6	1.0 01	06.8	15 02.6	1.0 01	06.8	15 32.6	1.0 01	06.8	16 02.6	1.0 01	06.7	16 32.6	1.0 01	06.7	17 02.6	1.0 01	06.7	17 32.6	1.0 01	06.7	3
4	14 01.9	1.0 01	05.8	14 31.9	1.0 01	05.8	15 01.9	1.0 01	05.8	15 31.9	1.0 01	05.8	16 01.9	1.0 01	05.8	16 31.9	1.0 01	05.8	17 01.9	1.0 01	05.8	17 31.9	1.0 01	05.8	4
175	14 01.3	1.0 01	04.8	14 31.3	1.0 01	04.8	15 01.3	1.0 01	04.8	15 31.3	1.0 01	04.8	16 01.3	1.0 01	04.8	16 31.3	1.0 01	04.8	17 01.3	1.0 01	04.8	17 31.3	1.0 01	04.8	175
6	14 00.8	1.0 01	03.9	14 30.8	1.0 01	03.9	15 00.8	1.0 01	03.9	15 30.8	1.0 01	03.9	16 00.8	1.0 01	03.9	16 30.8	1.0 01	03.9	17 00.8	1.0 01	03.9	17 30.8	1.0 01	03.8	6
7	14 00.5	1.0 00	02.9	14 30.5	1.0 00	02.9	15 00.5	1.0 00	02.9	15 30.5	1.0 00	02.9	16 00.5	1.0 00	02.9	16 30.5	1.0 00	02.9	17 00.5	1.0 00	02.9	17 30.5	1.0 00	02.9	7
8	14 00.2	1.0 00	01.9	14 30.2	1.0 00	01.9	15 00.2	1.0 00	01.9	15 30.2	1.0 00	01.9	16 00.2	1.0 00	01.9	16 30.2	1.0 00	01.9	17 00.2	1.0 00	01.9	17 30.2	1.0 00	01.9	8
9	14 00.1	1.0 00	01.0	14 30.1	1.0 00	01.0	15 00.1	1.0 00	01.0	15 30.1	1.0 00	01.0	16 00.1	1.0 00	01.0	16 30.1	1.0 00	01.0	17 00.1	1.0 00	01.0	17 30.1	1.0 00	01.0	9
180	14 00.0	1.0 00	00.0	14 30.0	1.0 00	00.0	15 00.0	1.0 00	00.0	15 30.0	1.0 00	00.0	16 00.0	1.0 00	00.0	16 30.0	1.0 00	00.0	17 00.0	1.0 00	00.0	17 30.0	1.0 00	00.0	180

Lat. 85°
Lat. 86°
Lat. 87°
Lat. 88°

H.A.	24° 00'	24° 30'	25° 00'	25° 30'	26° 00'	26° 30'	27° 00'	27° 30'	H.A.
	Alt. / Az.	Alt. / Az.	Alt. / Az.	Alt. / Az.	Alt. / Az.	Alt. / Az.	Alt. / Az.	Alt. / Az.	
°	° ' Δd Δt °	° ' Δd Δt °	° ' Δd Δt °	° ' Δd Δt °	° ' Δd Δt °	° ' Δd Δt °	° ' Δd Δt °	° ' Δd Δt °	°
00	30 00.0 1.0 00 180.0	30 30.0 1.0 00 180.0	31 00.0 1.0 00 180.0	31 30.0 1.0 00 180.0	32 00.0 1.0 00 180.0	32 30.0 1.0 00 180.0	33 00.0 1.0 00 180.0	33 30.0 1.0 00 180.0	00
1	29 59.9 1.0 00 178.9	30 29.9 1.0 00 178.9	30 59.9 1.0 00 178.9	31 29.9 1.0 00 178.9	31 59.9 1.0 00 178.9	32 29.9 1.0 00 178.9	32 59.9 1.0 00 178.9	33 29.9 1.0 00 178.9	1
2	29 59.8 1.0 00 177.9	30 29.8 1.0 00 177.9	30 59.8 1.0 00 177.9	31 29.8 1.0 00 177.9	31 59.8 1.0 00 177.9	32 29.8 1.0 00 177.9	32 59.8 1.0 00 177.9	33 29.8 1.0 00 177.9	2
3	29 59.5 1.0 01 176.8	30 29.5 1.0 01 176.8	30 59.5 1.0 01 176.8	31 29.5 1.0 01 176.8	31 59.5 1.0 01 176.8	32 29.5 1.0 01 176.8	32 59.5 1.0 01 176.8	33 29.5 1.0 01 176.8	3
4	29 59.1 1.0 01 175.8	30 29.1 1.0 01 175.8	30 59.1 1.0 01 175.8	31 29.1 1.0 01 175.8	31 59.1 1.0 01 175.8	32 29.1 1.0 01 175.8	32 59.1 1.0 01 175.8	33 29.1 1.0 01 175.7	4
05	29 58.6 1.0 01 174.7	30 28.6 1.0 01 174.7	30 58.6 1.0 01 174.7	31 28.6 1.0 01 174.7	31 58.6 1.0 01 174.7	32 28.5 1.0 01 174.7	32 58.5 1.0 01 174.7	33 28.5 1.0 01 174.7	05
6	29 57.9 1.0 01 173.7	30 27.9 1.0 01 173.7	30 57.9 1.0 01 173.6	31 27.9 1.0 01 173.6	31 57.9 1.0 01 173.6	32 27.9 1.0 01 173.6	32 57.9 1.0 01 173.6	33 27.9 1.0 01 173.6	6
7	29 57.2 1.0 01 172.6	30 27.2 1.0 01 172.6	30 57.2 1.0 01 172.6	31 27.2 1.0 01 172.6	31 57.2 1.0 01 172.6	32 27.2 1.0 01 172.6	32 57.2 1.0 01 172.6	33 27.2 1.0 01 172.6	7
8	29 56.3 1.0 02 171.6	30 26.3 1.0 02 171.6	30 56.3 1.0 02 171.5	31 26.3 1.0 02 171.5	31 56.3 1.0 02 171.5	32 26.3 1.0 02 171.5	32 56.3 1.0 02 171.5	33 26.3 1.0 02 171.5	8
9	29 55.3 1.0 02 170.5	30 25.3 1.0 02 170.5	30 55.3 1.0 02 170.5	31 25.3 1.0 02 170.5	31 55.3 1.0 02 170.5	32 25.3 1.0 02 170.5	32 55.3 1.0 02 170.4	33 25.3 1.0 02 170.4	9
10	29 54.2 1.0 02 169.5	30 24.2 1.0 02 169.4	30 54.2 1.0 02 169.4	31 24.2 1.0 02 169.4	31 54.2 1.0 02 169.4	32 24.2 1.0 02 169.4	32 54.2 1.0 02 169.4	33 24.2 1.0 02 169.4	10
1	29 53.0 1.0 02 168.4	30 23.0 1.0 02 168.4	30 53.0 1.0 02 168.4	31 23.0 1.0 02 168.3	31 53.0 1.0 02 168.3	32 23.0 1.0 02 168.3	32 53.0 1.0 02 168.3	33 23.0 1.0 02 168.3	1
2	29 51.7 1.0 02 167.3	30 21.7 1.0 02 167.3	30 51.7 1.0 02 167.3	31 21.7 1.0 02 167.3	31 51.7 1.0 02 167.3	32 21.7 1.0 02 167.3	32 51.7 1.0 02 167.3	33 21.7 1.0 02 167.2	2
3	29 50.3 1.0 03 166.3	30 20.3 1.0 03 166.3	30 50.3 1.0 03 166.3	31 20.3 1.0 03 166.2	31 50.2 1.0 03 166.2	32 20.2 1.0 03 166.2	32 50.2 1.0 03 166.2	33 20.2 1.0 03 166.2	3
4	29 48.8 1.0 03 165.2	30 18.7 1.0 03 165.2	30 48.7 1.0 03 165.2	31 18.7 1.0 03 165.2	31 48.7 1.0 03 165.2	32 18.7 1.0 03 165.2	32 48.7 1.0 03 165.1	33 18.7 1.0 03 165.1	4
15	29 47.1 1.0 03 164.2	30 17.1 1.0 03 164.2	30 47.1 1.0 03 164.1	31 17.1 1.0 03 164.1	31 47.0 1.0 03 164.1	32 17.0 1.0 03 164.1	32 47.0 1.0 03 164.1	33 17.0 1.0 03 164.1	15
6	29 45.5 1.0 03 163.1	30 15.3 1.0 03 163.1	30 45.3 1.0 03 163.1	31 15.3 1.0 03 163.1	31 45.3 1.0 03 163.1	32 15.2 1.0 03 163.0	32 45.2 1.0 03 163.0	33 15.2 1.0 03 163.0	6
7	29 43.5 1.0 03 162.1	30 13.4 1.0 03 162.1	30 43.4 1.0 03 162.0	31 13.4 1.0 03 162.0	31 43.4 1.0 03 162.0	32 13.4 1.0 03 162.0	32 43.3 1.0 03 162.0	33 13.3 1.0 03 161.9	7
8	29 41.5 1.0 04 161.0	30 11.5 1.0 03 161.0	30 41.4 1.0 04 161.0	31 11.4 1.0 04 161.0	31 41.4 1.0 04 160.9	32 11.4 1.0 04 160.9	32 41.3 1.0 04 160.9	33 11.3 1.0 04 160.9	8
9	29 39.4 1.0 04 160.0	30 09.4 1.0 04 160.0	30 39.3 1.0 04 159.9	31 09.3 1.0 04 159.9	31 39.3 1.0 04 159.9	32 09.3 1.0 04 159.9	32 39.2 1.0 04 159.8	33 09.2 1.0 04 159.8	9
20	29 37.2 1.0 04 158.9	30 07.2 1.0 04 158.9	30 37.1 1.0 04 158.9	31 07.1 1.0 04 158.9	31 37.1 1.0 04 158.8	32 07.1 1.0 04 158.8	32 37.0 1.0 04 158.8	33 07.0 1.0 04 158.8	20
1	29 34.9 1.0 04 157.9	30 04.9 1.0 04 157.9	30 34.8 1.0 04 157.8	31 04.8 1.0 04 157.8	31 34.8 1.0 04 157.8	32 04.7 1.0 04 157.8	32 34.7 1.0 04 157.7	33 04.7 1.0 04 157.7	1
2	29 32.5 1.0 04 156.8	30 02.4 1.0 04 156.8	30 32.4 1.0 04 156.8	31 02.4 1.0 04 156.7	31 32.3 1.0 04 156.7	32 02.3 1.0 04 156.7	32 32.3 1.0 04 156.7	33 02.2 1.0 04 156.6	2
3	29 29.9 1.0 04 155.8	29 59.9 1.0 04 155.8	30 29.9 1.0 04 155.7	30 59.8 1.0 04 155.7	31 29.8 1.0 04 155.7	31 59.8 1.0 04 155.6	32 29.7 1.0 04 155.6	32 59.7 1.0 04 155.6	3
4	29 27.3 1.0 05 154.7	29 57.3 1.0 05 154.7	30 27.2 1.0 05 154.7	30 57.2 1.0 05 154.6	31 27.2 1.0 05 154.6	31 57.1 1.0 05 154.6	32 27.1 1.0 05 154.6	32 57.1 1.0 05 154.5	4
25	29 24.6 1.0 05 153.7	29 54.5 1.0 05 153.7	30 24.5 1.0 05 153.6	30 54.5 1.0 05 153.6	31 24.4 1.0 05 153.6	31 54.4 1.0 05 153.5	32 24.4 1.0 05 153.5	32 54.3 1.0 05 153.5	25
6	29 21.8 1.0 05 152.6	29 51.7 1.0 05 152.6	30 21.7 1.0 05 152.6	30 51.6 1.0 05 152.6	31 21.6 1.0 05 152.5	31 51.5 1.0 05 152.5	32 21.5 1.0 05 152.5	32 51.5 1.0 05 152.4	6
7	29 18.8 1.0 05 151.6	29 48.8 1.0 05 151.6	30 18.7 1.0 05 151.5	30 48.7 1.0 05 151.5	31 18.6 1.0 05 151.5	31 48.6 1.0 05 151.4	32 18.6 1.0 05 151.4	32 48.5 1.0 05 151.4	7
8	29 15.8 1.0 05 150.6	29 45.7 1.0 05 150.5	30 15.7 1.0 05 150.5	30 45.6 1.0 05 150.5	31 15.6 1.0 05 150.4	31 45.5 1.0 05 150.4	32 15.5 1.0 05 150.4	32 45.4 1.0 05 150.3	8
9	29 12.7 1.0 05 149.5	29 42.6 1.0 05 149.5	30 12.6 1.0 05 149.4	30 42.5 1.0 05 149.4	31 12.5 1.0 05 149.4	31 42.4 1.0 05 149.3	32 12.3 1.0 05 149.3	32 42.3 1.0 05 149.3	9
30	29 09.4 1.0 06 148.5	29 39.4 1.0 06 148.4	30 09.3 1.0 06 148.4	30 39.3 1.0 06 148.4	31 09.2 1.0 06 148.3	31 39.2 1.0 06 148.3	32 09.1 1.0 06 148.3	32 39.0 1.0 06 148.2	30
1	29 06.1 1.0 06 147.4	29 36.0 1.0 06 147.4	30 06.0 1.0 06 147.3	30 35.9 1.0 06 147.3	31 05.9 1.0 06 147.3	31 35.8 1.0 06 147.2	32 05.7 1.0 06 147.2	32 35.7 1.0 06 147.2	1
2	29 02.7 1.0 06 146.4	29 32.6 1.0 06 146.3	30 02.6 1.0 06 146.3	30 32.5 1.0 06 146.3	31 02.4 1.0 06 146.2	31 32.4 1.0 06 146.2	32 02.3 1.0 06 146.2	32 32.2 1.0 06 146.1	2
3	28 59.2 1.0 06 145.3	29 29.1 1.0 06 145.3	29 59.0 1.0 06 145.3	30 29.0 1.0 06 145.2	30 58.9 1.0 06 145.2	31 28.8 1.0 06 145.1	31 58.8 1.0 06 145.1	32 28.7 1.0 06 145.1	3
4	28 55.5 1.0 06 144.3	29 25.5 1.0 06 144.2	29 55.4 1.0 06 144.2	30 25.3 1.0 06 144.2	30 55.3 1.0 06 144.1	31 25.2 1.0 06 144.1	31 55.1 1.0 06 144.1	32 25.1 1.0 06 144.0	4
35	28 51.8 1.0 06 143.3	29 21.8 1.0 06 143.2	29 51.7 1.0 06 143.2	30 21.6 1.0 06 143.1	30 51.5 1.0 06 143.1	31 21.5 1.0 06 143.0	31 51.4 1.0 06 143.0	32 21.3 1.0 06 143.0	35
6	28 48.0 1.0 06 142.2	29 18.0 1.0 06 142.2	29 47.9 1.0 06 142.1	30 17.8 1.0 06 142.1	30 47.7 1.0 06 142.0	31 17.7 1.0 06 142.0	31 47.6 1.0 07 142.0	32 17.5 1.0 07 141.9	6
7	28 44.1 1.0 07 141.2	29 14.1 1.0 07 141.1	29 44.0 1.0 07 141.1	30 13.9 1.0 07 141.0	30 43.8 1.0 07 141.0	31 13.8 1.0 07 141.0	31 43.7 1.0 07 140.9	32 13.6 1.0 07 140.9	7
8	28 40.2 1.0 07 140.1	29 10.1 1.0 07 140.1	29 40.0 1.0 07 140.0	30 09.9 1.0 07 140.0	30 39.8 1.0 07 140.0	31 09.8 1.0 07 139.9	31 39.7 1.0 07 139.9	32 09.6 1.0 07 139.8	8
9	28 36.1 1.0 07 139.1	29 06.0 1.0 07 139.1	29 35.9 1.0 07 139.0	30 05.9 1.0 07 139.0	30 35.8 1.0 07 138.9	31 05.7 1.0 07 138.9	31 35.6 1.0 07 138.8	32 05.5 1.0 07 138.8	9
40	28 32.0 1.0 07 138.1	29 01.9 1.0 07 138.0	29 31.8 1.0 07 138.0	30 01.7 1.0 07 137.9	30 31.6 1.0 07 137.9	31 01.5 1.0 07 137.8	31 31.4 1.0 07 137.8	32 01.3 1.0 07 137.7	40
1	28 27.7 1.0 07 137.0	28 57.6 1.0 07 137.0	29 27.5 1.0 07 136.9	29 57.4 1.0 07 136.9	30 27.4 1.0 07 136.8	30 57.3 1.0 07 136.8	31 27.2 1.0 07 136.7	31 57.1 1.0 07 136.7	1
2	28 23.4 1.0 07 136.0	28 53.3 1.0 07 135.9	29 23.2 1.0 07 135.9	29 53.1 1.0 07 135.8	30 23.0 1.0 07 135.8	30 52.9 1.0 07 135.8	31 22.8 1.0 07 135.7	31 52.7 1.0 07 135.7	2
3	28 19.0 1.0 07 134.9	28 48.9 1.0 07 134.9	29 18.8 1.0 08 134.9	29 48.7 1.0 08 134.8	30 18.6 1.0 08 134.8	30 48.5 1.0 08 134.7	31 18.4 1.0 08 134.7	31 48.3 1.0 08 134.6	3
4	28 14.5 1.0 08 133.9	28 44.4 1.0 08 133.9	29 14.3 1.0 08 133.8	29 44.2 1.0 08 133.8	30 14.1 1.0 08 133.7	30 44.0 1.0 08 133.7	31 13.9 1.0 08 133.6	31 43.8 1.0 08 133.6	4
45	28 10.0 1.0 08 132.9	28 39.9 1.0 08 132.8	29 09.8 1.0 08 132.8	29 39.7 1.0 08 132.7	30 09.5 1.0 08 132.7	30 39.4 1.0 08 132.6	31 09.3 1.0 08 132.6	31 39.2 1.0 08 132.5	45
6	28 05.3 1.0 08 131.9	28 35.2 1.0 08 131.8	29 05.1 1.0 08 131.8	29 35.0 1.0 08 131.7	30 04.9 1.0 08 131.7	30 34.8 1.0 08 131.6	31 04.7 1.0 08 131.6	31 34.5 1.0 08 131.5	6
7	28 00.6 1.0 08 130.8	28 30.5 1.0 08 130.8	29 00.4 1.0 08 130.7	29 30.3 1.0 08 130.7	30 00.2 1.0 08 130.6	30 30.1 1.0 08 130.6	30 59.9 1.0 08 130.5	31 29.8 1.0 08 130.5	7
8	27 55.8 1.0 08 129.8	28 25.7 1.0 08 129.7	28 55.6 1.0 08 129.7	29 25.5 1.0 08 129.6	29 55.4 1.0 08 129.6	30 25.3 1.0 08 129.5	30 55.1 1.0 08 129.5	31 25.0 1.0 08 129.4	8
9	27 51.0 1.0 08 128.8	28 20.9 1.0 08 128.7	28 50.8 1.0 08 128.7	29 20.6 1.0 08 128.6	29 50.5 1.0 08 128.6	30 20.4 1.0 08 128.5	30 50.3 1.0 08 128.4	31 20.1 1.0 08 128.4	9
50	27 46.1 1.0 08 127.7	28 15.9 1.0 08 127.7	28 45.8 1.0 08 127.6	29 15.7 1.0 08 127.6	29 45.6 1.0 08 127.5	30 15.4 1.0 08 127.5	30 45.3 1.0 08 127.4	31 15.2 1.0 08 127.4	50
1	27 41.1 1.0 08 126.7	28 10.9 1.0 08 126.7	28 40.8 1.0 08 126.6	29 10.7 1.0 08 126.5	29 40.6 1.0 08 126.5	30 10.4 1.0 08 126.4	30 40.3 1.0 08 126.4	31 10.2 1.0 08 126.3	1
2	27 36.0 1.0 09 125.7	28 05.9 1.0 09 125.6	28 35.7 1.0 09 125.6	29 05.6 1.0 09 125.5	29 35.5 1.0 09 125.5	30 05.3 1.0 09 125.4	30 35.2 1.0 09 125.4	31 05.1 1.0 09 125.3	2
3	27 30.8 1.0 09 124.6	28 00.8 1.0 09 124.6	28 30.6 1.0 09 124.5	29 00.5 1.0 09 124.5	29 30.3 1.0 09 124.4	30 00.2 1.0 09 124.4	30 30.1 1.0 09 124.3	30 59.9 1.0 09 124.3	3
4	27 25.7 1.0 09 123.6	27 55.6 1.0 09 123.6	28 25.4 1.0 09 123.5	28 55.3 1.0 09 123.5	29 25.1 1.0 09 123.4	29 55.0 1.0 09 123.3	30 24.9 1.0 09 123.3	30 54.7 1.0 09 123.2	4
55	27 20.4 1.0 09 122.6	27 50.3 1.0 09 122.5	28 20.2 1.0 09 122.5	28 50.0 1.0 09 122.4	29 19.9 1.0 09 122.4	29 49.7 1.0 09 122.3	30 19.6 1.0 09 122.3	30 49.4 1.0 09 122.2	55
6	27 15.1 1.0 09 121.6	27 45.0 1.0 09 121.5	28 14.8 1.0 09 121.5	28 44.7 1.0 09 121.4	29 14.5 1.0 09 121.4	29 44.4 1.0 09 121.3	30 14.2 99 09 121.2	30 44.1 99 09 121.2	6
7	27 09.8 1.0 09 120.6	27 39.6 1.0 09 120.5	28 09.5 1.0 09 120.4	28 39.3 99 09 120.4	29 09.2 99 09 120.3	29 39.0 99 09 120.3	30 08.9 99 09 120.2	30 38.7 99 09 120.2	7
8	27 04.5 1.0 09 119.5	27 34.2 99 09 119.5	28 04.0 99 09 119.4	28 33.9 99 09 119.4	29 03.7 99 09 119.3	29 33.6 99 09 119.2	30 03.2 99 09 119.2	30 33.2 99 09 119.1	8
9	26 58.8 99 09 118.5	27 28.7 99 09 118.5	27 58.5 99 09 118.4	28 28.4 99 09 118.3	28 58.2 99 09 118.3	29 28.1 99 09 118.2	29 57.9 99 09 118.2	30 27.7 99 09 118.1	9
60	26 53.3 99 09 117.5	27 23.1 99 09 117.4	27 53.0 99 09 117.4	28 22.8 99 09 117.3	28 52.7 99 09 117.3	29 22.5 99 09 117.2	29 52.3 99 09 117.1	30 22.2 99 09 117.1	60
1	26 47.7 99 09 116.5	27 17.6 99 09 116.4	27 47.4 99 09 116.4	28 17.2 99 09 116.3	28 47.1 99 09 116.2	29 16.9 99 09 116.2	29 46.7 99 09 116.1	30 16.6 99 09 116.1	1
2	26 42.1 99 10 115.5	27 11.9 99 10 115.4	27 41.8 99 09 115.3	28 11.6 99 09 115.3	28 41.4 99 09 115.2	29 11.3 99 09 115.2	29 41.1 99 10 115.1	30 10.9 99 10 115.0	2
3	26 36.4 99 10 114.4	27 06.2 99 10 114.4	27 36.1 99 10 114.3	28 05.9 99 10 114.3	28 35.7 99 10 114.2	29 05.6 99 10 114.1	29 35.4 99 10 114.1	30 05.2 99 10 114.0	3
4	26 30.7 99 10 113.4	27 00.5 99 10 113.4	27 30.3 99 10 113.3	28 00.2 99 10 113.2	28 30.0 99 10 113.2	28 59.8 99 10 113.1	29 29.6 99 10 113.1	29 59.5 99 10 113.0	4
65	26 24.9 99 10 112.4	26 54.7 99 10 112.4	27 24.5 99 10 112.3	27 54.4 99 10 112.2	28 24.2 99 10 112.2	28 54.0 99 10 112.1	29 23.8 99 10 112.0	29 53.7 99 10 112.0	65
6	26 19.1 99 10 111.4	26 48.9 99 10 111.3	27 18.7 99 10 111.3	27 48.5 99 10 111.2	28 18.4 99 10 111.1	28 48.2 99 10 111.1	29 18.0 99 10 111.0	29 47.8 99 10 111.0	6
7	26 13.2 99 10 110.4	26 43.0 99 10 110.3	27 12.9 99 10 110.2	27 42.7 99 10 110.2	28 12.5 99 10 110.1	28 42.3 99 10 110.1	29 12.1 99 10 110.0	29 42.0 99 10 109.9	7
8	26 07.3 99 10 109.4	26 37.1 99 10 109.3	27 07.0 99 10 109.2	27 36.8 99 10 109.2	28 06.6 99 10 109.1	28 36.4 99 10 109.1	29 06.2 99 10 109.0	29 36.0 99 10 108.9	8
9	26 01.4 99 10 108.4	26 31.2 99 10 108.3	27 01.0 99 10 108.2	27 30.8 99 10 108.2	28 00.6 99 10 108.1	28 30.5 99 10 108.1	29 00.3 99 10 108.0	29 30.1 99 10 107.9	9
70	25 55.4 99 10 107.4	26 25.2 99 10 107.3	26 55.0 99 10 107.2	27 24.9 99 10 107.2	27 54.7 99 10 107.1	28 24.5 99 10 107.0	28 54.3 99 10 107.0	29 24.1 99 10 106.9	70
1	25 49.4 99 10 106.3	26 19.2 99 10 106.3	26 49.0 99 10 106.2	27 18.8 99 10 106.2	27 48.7 99 10 106.1	28 18.5 99 10 106.0	28 48.3 99 10 106.0	29 18.1 99 10 105.9	1
2	25 43.4 99 10 105.3	26 13.2 99 10 105.3	26 43.0 99 10 105.2	27 12.8 99 10 105.1	27 42.6 99 10 105.1	28 12.4 99 10 105.0	28 42.2 99 10 105.0	29 12.0 99 10 104.9	2
3	25 37.3 99 10 104.3	26 07.1 99 10 104.3	26 36.9 99 10 104.2	27 06.7 99 10 104.1	27 36.5 99 10 104.1	28 06.4 99 10 104.0	28 36.2 99 10 103.9	29 06.0 99 10 103.9	3
4	25 31.2 99 10 103.3	26 01.0 99 10 103.3	26 30.8 99 10 103.2	27 00.6 99 10 103.1	27 30.5 99 10 103.1	28 00.3 99 10 103.0	28 30.1 99 10 102.9	28 59.9 99 10 102.9	4
75	25 25.1 99 10 102.3	25 54.9 99 10 102.3	26 24.7 99 10 102.2	26 54.5 99 10 102.1	27 24.3 99 10 102.1	27 54.1 99 10 102.0	28 23.9 99 10 101.9	28 53.7 99 10 101.9	75
6	25 19.0 99 10 101.3	25 48.8 99 10 101.2	26 18.6 99 10 101.2	26 48.4 99 10 101.1	27 18.2 99 10 101.1	27 48.0 99 10 101.0	28 17.8 99 10 100.9	28 47.6 99 10 100.9	6
7	25 12.8 99 10 100.3	25 42.6 99 10 100.2	26 12.4 99 10 100.1	26 42.2 99 10 100.1	27 12.0 99 10 100.0	27 41.8 99 10 100.0	28 11.6 99 10 99.9	28 41.4 99 10 99.9	7
8	25 06.6 99 10 99.3	25 36.4 99 10 99.2	26 06.2 99 10 99.2	26 36.0 99 10 99.1	27 05.8 99 10 99.0	27 35.6 99 10 99.0	28 05.4 99 10 98.9	28 35.2 99 10 98.9	8
9	25 00.4 99 10 98.3	25 30.2 99 10 98.2	26 00.0 99 10 98.1	26 29.8 99 10 98.1	26 59.6 99 10 98.0	27 29.4 99 10 98.0	27 59.2 99 10 97.9	28 29.0 99 10 97.9	9
80	24 54.2 99 10 97.3	25 24.0 99 10 97.2	25 53.8 99 10 97.2	26 23.6 99 10 97.1	26 53.4 99 10 97.0	27 23.2 99 10 97.0	27 53.0 99 10 96.9	28 22.8 99 10 96.8	80
1	24 48.0 99 10 96.3	25 17.8 99 10 96.2	25 47.6 99 10 96.2	26 17.4 99 10 96.1	26 47.2 99 10 96.0	27 17.0 99 10 96.0	27 46.8 99 10 95.9	28 16.6 99 10 95.8	1
2	24 41.7 99 10 95.3	25 11.5 99 10 95.2	25 41.3 99 10 95.2	26 11.1 99 10 95.1	26 40.9 99 10 95.0	27 10.7 99 10 95.0	27 40.5 99 10 94.9	28 10.3 99 10 94.9	2
3	24 35.5 99 10 94.3	25 05.3 99 10 94.2	25 35.1 99 10 94.2	26 04.9 99 10 94.1	26 34.7 99 10 94.0	27 04.5 99 10 94.0	27 34.3 99 10 93.9	28 04.1 99 10 93.8	3
4	24 29.2 99 10 93.3	24 59.0 99 10 93.2	25 28.8 99 10 93.2	25 58.6 99 10 93.1	26 28.4 99 10 93.0	26 58.2 99 10 93.0	27 28.0 99 10 92.9	27 57.8 99 10 92.9	4
85	24 23.0 99 10 92.3	24 52.8 99 10 92.2	25 22.6 99 10 92.2	25 52.4 99 10 92.1	26 22.2 99 10 92.1	26 52.0 99 10 92.0	27 21.8 99 10 91.9	27 51.6 99 10 91.9	85
6	24 16.7 99 10 91.3	24 46.5 99 10 91.2	25 16.3 99 10 91.2	25 46.1 99 10 91.1	26 15.9 99 10 91.1	26 45.7 99 10 91.0	27 15.5 99 10 90.9	27 45.3 99 10 90.9	6
7	24 10.4 99 10 90.3	24 40.2 99 10 90.2	25 10.0 99 10 90.2	25 39.8 99 10 90.1	26 09.6 99 10 90.1	26 39.4 99 10 90.0	27 09.2 99 10 90.0	27 39.0 99 10 89.9	7
8	24 04.2 99 10 89.3	24 34.0 99 10 89.3	25 03.8 99 10 89.2	25 33.6 99 10 89.1	26 03.4 99 10 89.1	26 33.2 99 10 89.0	27 02.9 99 10 88.9	27 32.7 99 10 88.9	8
9	23 57.9 99 10 88.3	24 27.7 99 10 88.3	24 57.5 99 10 88.2	25 27.3 99 10 88.1	25 57.1 99 10 88.1	26 26.9 99 10 88.0	26 56.7 99 10 87.9	27 26.5 99 10 87.9	9
90	23 51.6 99 10 87.3	24 21.4 99 10 87.3	24 51.2 99 10 87.2	25 21.0 99 10 87.1	25 50.8 99 10 87.1	26 20.6 99 10 87.0	26 50.4 99 10 87.0	27 20.2 99 10 86.9	90

Lat. 84°

H.A.	24° 00' Alt.	Δd Δt	Az.	24° 30' Alt.	Δd Δt	Az.	25° 00' Alt.	Δd Δt	Az.	25° 30' Alt.	Δd Δt	Az.	26° 00' Alt.	Δd Δt	Az.	26° 30' Alt.	Δd Δt	Az.	27° 00' Alt.	Δd Δt	Az.	27° 30' Alt.	Δd Δt	Az.	H.A.
91	23 45.4	99 10	86.3	24 15.2	99 10	86.3	24 45.0	99 10	86.2	25 14.8	99 10	86.2	25 44.6	99 10	86.1	26 14.4	99 10	86.0	26 44.2	99 10	86.0	27 13.9	99 10	85.9	91
2	23 39.1	99 10	85.4	24 08.9	99 10	85.3	24 38.7	99 10	85.2	25 08.5	99 10	85.2	25 38.3	99 10	85.1	26 08.1	99 10	85.0	26 37.9	99 10	85.0	27 07.7	99 10	84.9	2
3	23 32.9	99 10	84.4	24 02.7	99 10	84.3	24 32.5	99 10	84.2	25 02.3	99 10	84.2	25 32.1	99 10	84.1	26 01.9	99 10	84.0	26 31.7	99 10	84.0	27 01.5	99 10	83.9	3
4	23 26.6	99 10	83.4	23 56.4	99 10	83.3	24 26.2	99 10	83.2	24 56.0	99 10	83.2	25 25.8	99 10	83.1	25 55.6	99 10	83.1	26 25.4	99 10	83.0	26 55.2	99 10	82.9	4
95	23 20.4	99 10	82.4	23 50.2	99 10	82.3	24 20.0	99 10	82.3	24 49.8	99 10	82.2	25 19.6	99 10	82.2	25 49.4	99 10	82.0	26 19.2	99 10	82.0	26 49.0	99 10	81.9	95
6	23 14.2	99 10	81.4	23 44.0	99 10	81.3	24 13.8	99 10	81.3	24 43.6	99 10	81.2	25 13.4	99 10	81.1	25 43.2	99 10	81.0	26 13.0	99 10	81.0	26 42.8	99 10	81.0	6
7	23 08.0	99 10	80.4	23 37.8	99 10	80.3	24 07.6	99 10	80.3	24 37.4	99 10	80.2	25 07.2	99 10	80.2	25 37.0	99 10	80.1	26 06.8	99 10	80.0	26 36.6	99 10	80.0	7
8	23 01.8	99 10	79.4	23 31.6	99 10	79.4	24 01.4	99 10	79.3	24 31.2	99 10	79.2	25 01.0	99 10	79.2	25 30.8	99 10	79.1	26 00.7	99 10	79.0	26 30.5	99 10	79.0	8
9	22 55.7	99 10	78.4	23 25.5	99 10	78.4	23 55.3	99 10	78.3	24 25.1	99 10	78.3	24 54.9	99 10	78.2	25 24.7	99 10	78.1	25 54.5	99 10	78.1	26 24.3	99 10	78.0	9
100	22 49.5	99 10	77.4	23 19.3	99 10	77.4	23 49.2	99 10	77.3	24 19.0	99 10	77.3	24 48.8	99 10	77.2	25 18.6	99 10	77.1	25 48.4	99 10	77.1	26 18.2	99 10	77.0	100
1	22 43.4	99 10	76.5	23 13.2	99 10	76.4	23 43.0	99 10	76.3	24 12.9	99 10	76.3	24 42.7	99 10	76.2	25 12.5	99 10	76.2	25 42.3	99 10	76.1	26 12.1	99 10	76.0	1
2	22 37.3	99 10	75.5	23 07.2	99 10	75.4	23 37.0	99 10	75.4	24 06.8	99 10	75.3	24 36.6	99 10	75.2	25 06.4	99 10	75.2	25 36.2	99 10	75.1	26 06.0	99 10	75.0	2
3	22 31.3	99 10	74.5	23 01.1	99 10	74.4	23 30.9	99 10	74.4	24 00.7	99 10	74.3	24 30.5	99 10	74.3	25 00.3	99 10	74.2	25 30.2	99 10	74.1	26 00.0	99 10	74.1	3
4	22 25.3	99 10	73.5	22 55.1	99 10	73.5	23 24.9	99 10	73.4	23 54.7	99 10	73.3	24 24.5	99 10	73.3	24 54.3	99 10	73.2	25 24.1	99 10	73.2	25 53.9	99 10	73.1	4
105	22 19.3	99 10	72.5	22 49.1	99 10	72.5	23 18.9	99 10	72.4	23 48.7	99 10	72.4	24 18.5	99 10	72.3	24 48.3	99 10	72.2	25 18.2	99 10	72.2	25 48.0	99 10	72.1	105
6	22 13.3	99 10	71.6	22 43.1	99 10	71.5	23 12.9	99 10	71.4	23 42.7	99 10	71.4	24 12.6	99 10	71.3	24 42.4	99 10	71.3	25 12.2	99 10	71.2	25 42.0	99 10	71.1	6
7	22 07.4	99 10	70.6	22 37.2	99 10	70.5	23 07.0	99 10	70.5	23 36.8	99 10	70.4	24 06.6	99 10	70.3	24 36.5	99 10	70.3	25 06.3	99 10	70.2	25 36.1	99 10	70.2	7
8	22 01.5	99 10	69.6	22 31.3	99 10	69.5	23 01.1	99 10	69.5	23 30.9	99 10	69.4	24 00.8	99 10	69.4	24 30.6	99 10	69.3	25 00.4	99 10	69.2	25 30.2	99 10	69.2	8
9	21 55.6	99 10	68.6	22 25.4	99 10	68.6	22 55.3	99 10	68.5	23 25.1	99 10	68.4	23 54.9	99 10	68.4	24 24.7	99 10	68.3	24 54.6	99 10	68.3	25 24.4	99 10	68.2	9
110	21 49.8	99 10	67.6	22 19.6	99 10	67.6	22 49.4	99 10	67.5	23 19.3	99 10	67.5	23 49.1	99 10	67.4	24 18.9	99 10	67.3	24 48.7	99 10	67.3	25 18.6	99 10	67.2	110
1	21 44.0	99 10	66.7	22 13.8	99 10	66.6	22 43.7	99 10	66.5	23 13.5	99 10	66.5	23 43.3	99 10	66.4	24 13.2	99 10	66.4	24 43.0	99 10	66.3	25 12.8	99 10	66.2	1
2	21 38.3	99 10	65.7	22 08.1	99 09	65.6	22 37.9	99 09	65.6	23 07.8	99 09	65.5	23 37.6	99 09	65.4	24 07.4	99 09	65.4	24 37.3	99 09	65.3	25 07.1	99 09	65.3	2
3	21 32.6	99 10	64.7	22 02.4	99 09	64.6	22 32.2	99 09	64.6	23 02.1	99 09	64.5	23 31.9	99 09	64.5	24 01.8	99 09	64.4	24 31.6	99 09	64.4	25 01.4	99 09	64.3	3
4	21 26.9	99 09	63.7	21 56.8	99 09	63.7	22 26.6	99 09	63.6	22 56.4	99 09	63.6	23 26.3	99 09	63.5	23 56.1	99 09	63.4	24 26.0	99 09	63.4	24 55.8	99 09	63.3	4
115	21 21.3	99 09	62.7	21 51.2	99 09	62.7	22 21.0	99 09	62.6	22 50.9	99 09	62.6	23 20.7	99 09	62.5	23 50.5	99 09	62.5	24 20.4	99 09	62.4	24 50.2	99 09	62.4	115
6	21 15.8	99 09	61.8	21 45.6	99 09	61.7	22 15.5	99 09	61.7	22 45.3	99 09	61.6	23 15.2	99 09	61.6	23 45.0	99 09	61.5	24 14.8	99 09	61.4	24 44.7	99 09	61.4	6
7	21 10.3	1.0 09	60.8	21 40.1	99 09	60.7	22 10.0	99 09	60.7	22 39.8	99 09	60.6	23 09.7	99 09	60.6	23 39.5	99 09	60.5	24 09.4	99 09	60.5	24 39.2	99 09	60.4	7
8	21 04.8	1.0 09	59.8	21 34.7	1.0 09	59.8	22 04.5	1.0 09	59.7	22 34.4	99 09	59.7	23 04.2	99 09	59.6	23 34.1	99 09	59.6	24 03.9	99 09	59.5	24 33.8	99 09	59.4	8
9	20 59.4	1.0 09	58.8	21 29.3	1.0 09	58.8	21 59.1	1.0 09	58.7	22 29.0	1.0 09	58.7	22 58.8	1.0 09	58.6	23 28.7	1.0 09	58.6	23 58.5	99 09	58.5	24 28.4	99 09	58.5	9
120	20 54.1	1.0 09	57.9	21 23.9	1.0 09	57.8	21 53.8	1.0 09	57.8	22 23.7	1.0 09	57.7	22 53.5	1.0 09	57.7	23 23.4	1.0 09	57.6	23 53.2	1.0 09	57.6	24 23.1	1.0 09	57.5	120
1	20 48.8	1.0 09	56.9	21 18.7	1.0 09	56.8	21 48.5	1.0 09	56.8	22 18.4	1.0 09	56.7	22 48.2	1.0 09	56.7	23 18.1	1.0 09	56.6	23 48.0	1.0 09	56.6	24 17.8	1.0 09	56.5	1
2	20 43.6	1.0 09	55.9	21 13.4	1.0 09	55.9	21 43.3	1.0 09	55.8	22 13.2	1.0 09	55.8	22 43.0	1.0 09	55.7	23 12.9	1.0 09	55.7	23 42.8	1.0 09	55.6	24 12.6	1.0 09	55.6	2
3	20 38.4	1.0 08	55.0	21 08.3	1.0 08	54.9	21 38.2	1.0 08	54.9	22 08.0	1.0 08	54.8	22 37.9	1.0 08	54.8	23 07.7	1.0 08	54.7	23 37.6	1.0 08	54.6	24 07.5	1.0 08	54.6	3
4	20 33.3	1.0 08	54.0	21 03.2	1.0 08	53.9	21 33.1	1.0 08	53.9	22 02.9	1.0 08	53.8	22 32.8	1.0 08	53.8	23 02.7	1.0 08	53.7	23 32.5	1.0 08	53.7	24 02.4	1.0 08	53.6	4
125	20 28.3	1.0 08	53.0	20 58.1	1.0 08	53.0	21 28.0	1.0 08	52.9	21 57.9	1.0 08	52.9	22 27.8	1.0 08	52.8	22 57.6	1.0 08	52.8	23 27.5	1.0 08	52.7	23 57.4	1.0 08	52.7	125
6	20 23.3	1.0 08	52.0	20 53.2	1.0 08	52.0	21 23.0	1.0 08	51.9	21 52.9	1.0 08	51.9	22 22.8	1.0 08	51.8	22 52.7	1.0 08	51.8	23 22.5	1.0 08	51.7	23 52.4	1.0 08	51.7	6
7	20 18.4	1.0 08	51.1	20 48.3	1.0 08	51.0	21 18.1	1.0 08	51.0	21 48.0	1.0 08	50.9	22 17.9	1.0 08	50.9	22 47.8	1.0 08	50.8	23 17.7	1.0 08	50.8	23 47.5	1.0 08	50.7	7
8	20 13.5	1.0 08	50.1	20 43.4	1.0 08	50.1	21 13.3	1.0 08	50.0	21 43.2	1.0 08	50.0	22 13.1	1.0 08	49.9	22 42.9	1.0 08	49.9	23 12.8	1.0 08	49.8	23 42.7	1.0 08	49.8	8
9	20 08.8	1.0 08	49.1	20 38.6	1.0 08	49.1	21 08.5	1.0 08	49.0	21 38.4	1.0 08	49.0	22 08.3	1.0 08	48.9	22 38.2	1.0 08	48.9	23 08.1	1.0 08	48.9	23 38.0	1.0 08	48.8	9
130	20 04.1	1.0 08	48.2	20 33.9	1.0 08	48.1	21 03.8	1.0 08	48.1	21 33.7	1.0 08	48.0	22 03.6	1.0 08	48.0	22 33.5	1.0 08	47.9	23 03.4	1.0 08	47.9	23 33.3	1.0 08	47.8	130
1	19 59.4	1.0 08	47.2	20 29.3	1.0 08	47.1	20 59.2	1.0 08	47.1	21 29.1	1.0 08	47.1	21 59.0	1.0 08	47.0	22 28.9	1.0 08	47.0	22 58.8	1.0 08	46.9	23 28.7	1.0 08	46.9	1
2	19 54.9	1.0 07	46.2	20 24.7	1.0 07	46.2	20 54.6	1.0 07	46.1	21 24.5	1.0 07	46.1	21 54.4	1.0 07	46.0	22 24.3	1.0 07	46.0	22 54.2	1.0 07	46.0	23 24.1	1.0 07	45.9	2
3	19 50.4	1.0 07	45.3	20 20.3	1.0 07	45.2	20 50.2	1.0 07	45.2	21 20.1	1.0 07	45.1	21 50.0	1.0 07	45.1	22 19.9	1.0 07	45.0	22 49.8	1.0 07	45.0	23 19.6	1.0 07	44.9	3
4	19 45.9	1.0 07	44.3	20 15.8	1.0 07	44.2	20 45.7	1.0 07	44.2	21 15.7	1.0 07	44.2	21 45.6	1.0 07	44.1	22 15.5	1.0 07	44.1	22 45.4	1.0 07	44.0	23 15.3	1.0 07	44.0	4
135	19 41.6	1.0 07	43.3	20 11.5	1.0 07	43.3	20 41.4	1.0 07	43.2	21 11.3	1.0 07	43.2	21 41.2	1.0 07	43.2	22 11.1	1.0 07	43.1	22 41.0	1.0 07	43.1	23 10.9	1.0 07	43.0	135
6	19 37.3	1.0 07	42.4	20 07.2	1.0 07	42.3	20 37.2	1.0 07	42.3	21 07.1	1.0 07	42.2	21 37.0	1.0 07	42.2	22 06.9	1.0 07	42.1	22 36.8	1.0 07	42.1	23 06.7	1.0 07	42.1	6
7	19 33.2	1.0 07	41.4	20 03.1	1.0 07	41.3	20 33.0	1.0 07	41.3	21 02.9	1.0 07	41.3	21 32.8	1.0 07	41.2	22 02.7	1.0 07	41.2	22 32.6	1.0 07	41.1	23 02.5	1.0 07	41.1	7
8	19 29.0	1.0 07	40.4	19 59.0	1.0 07	40.4	20 28.9	1.0 07	40.3	20 58.8	1.0 07	40.3	21 28.7	1.0 07	40.3	21 58.6	1.0 07	40.2	22 28.5	1.0 07	40.2	22 58.5	1.0 07	40.1	8
9	19 25.0	1.0 07	39.5	19 54.9	1.0 07	39.4	20 24.9	1.0 07	39.4	20 54.8	1.0 07	39.3	21 24.7	1.0 07	39.3	21 54.6	1.0 07	39.3	22 24.5	1.0 07	39.2	22 54.4	1.0 07	39.2	9
140	19 21.1	1.0 06	38.5	19 51.0	1.0 06	38.5	20 20.9	1.0 06	38.4	20 50.8	1.0 06	38.4	21 20.8	1.0 06	38.3	21 50.7	1.0 06	38.3	22 20.6	1.0 06	38.3	22 50.5	1.0 06	38.2	140
1	19 17.2	1.0 06	37.5	19 47.1	1.0 06	37.5	20 17.1	1.0 06	37.4	20 47.0	1.0 06	37.4	21 16.9	1.0 06	37.4	21 46.8	1.0 06	37.3	22 16.8	1.0 06	37.3	22 46.7	1.0 06	37.3	1
2	19 13.4	1.0 06	36.6	19 43.4	1.0 06	36.5	20 13.3	1.0 06	36.5	20 43.2	1.0 06	36.4	21 13.2	1.0 06	36.4	21 43.1	1.0 06	36.4	22 13.0	1.0 06	36.3	22 42.9	1.0 06	36.3	2
3	19 09.7	1.0 06	35.6	19 39.7	1.0 06	35.6	20 09.6	1.0 06	35.5	20 39.5	1.0 06	35.5	21 09.5	1.0 06	35.5	21 39.4	1.0 06	35.4	22 09.3	1.0 06	35.4	22 39.3	1.0 06	35.3	3
4	19 06.1	1.0 06	34.6	19 36.1	1.0 06	34.6	20 06.0	1.0 06	34.6	20 35.9	1.0 06	34.5	21 05.9	1.0 06	34.5	21 35.8	1.0 06	34.5	22 05.7	1.0 06	34.4	22 35.7	1.0 06	34.4	4
145	19 02.6	1.0 06	33.7	19 32.6	1.0 06	33.6	20 02.5	1.0 06	33.6	20 32.4	1.0 06	33.6	21 02.4	1.0 06	33.5	21 32.3	1.0 06	33.5	22 02.2	1.0 06	33.5	22 32.2	1.0 06	33.4	145
6	18 59.1	1.0 06	32.7	19 29.1	1.0 06	32.7	19 59.1	1.0 06	32.6	20 29.0	1.0 06	32.6	20 58.9	1.0 06	32.6	21 28.9	1.0 06	32.5	21 58.8	1.0 06	32.5	22 28.8	1.0 06	32.5	6
7	18 55.8	1.0 05	31.7	19 25.8	1.0 05	31.7	19 55.7	1.0 05	31.7	20 25.7	1.0 05	31.6	20 55.6	1.0 05	31.6	21 25.6	1.0 05	31.6	21 55.5	1.0 05	31.5	22 25.4	1.0 05	31.5	7
8	18 52.6	1.0 05	30.8	19 22.5	1.0 05	30.7	19 52.5	1.0 05	30.7	20 22.4	1.0 05	30.7	20 52.4	1.0 05	30.6	21 22.3	1.0 05	30.6	21 52.3	1.0 05	30.6	22 22.2	1.0 05	30.6	8
9	18 49.4	1.0 05	29.8	19 19.4	1.0 05	29.8	19 49.3	1.0 05	29.7	20 19.3	1.0 05	29.7	20 49.2	1.0 05	29.7	21 19.2	1.0 05	29.7	21 49.1	1.0 05	29.6	22 19.1	1.0 05	29.6	9
150	18 46.3	1.0 05	28.8	19 16.3	1.0 05	28.8	19 46.3	1.0 05	28.8	20 16.2	1.0 05	28.8	20 46.2	1.0 05	28.7	21 16.1	1.0 05	28.7	21 46.1	1.0 05	28.7	22 16.0	1.0 05	28.6	150
1	18 43.2	1.0 05	27.9	19 13.3	1.0 05	27.9	19 43.3	1.0 05	27.8	20 13.2	1.0 05	27.8	20 43.2	1.0 05	27.8	21 13.1	1.0 05	27.7	21 43.1	1.0 05	27.7	22 13.1	1.0 05	27.7	1
2	18 40.5	1.0 05	26.9	19 10.4	1.0 05	26.9	19 40.4	1.0 05	26.9	20 10.4	1.0 05	26.8	20 40.3	1.0 05	26.8	21 10.3	1.0 05	26.8	21 40.2	1.0 05	26.8	22 10.2	1.0 05	26.7	2
3	18 37.7	1.0 04	26.0	19 07.7	1.0 04	25.9	19 37.6	1.0 04	25.9	20 07.6	1.0 04	25.9	20 37.5	1.0 04	25.8	21 07.5	1.0 04	25.8	21 37.5	1.0 04	25.8	22 07.4	1.0 04	25.8	3
4	18 35.0	1.0 04	25.0	19 05.0	1.0 04	25.0	19 34.9	1.0 04	24.9	20 04.9	1.0 04	24.9	20 34.8	1.0 04	24.9	21 04.8	1.0 04	24.9	21 34.8	1.0 04	24.8	22 04.7	1.0 04	24.8	4
155	18 32.4	1.0 04	24.0	19 02.4	1.0 04	24.0	19 32.3	1.0 04	24.0	20 02.3	1.0 04	24.0	20 32.3	1.0 04	23.9	21 02.2	1.0 04	23.9	21 32.2	1.0 04	23.9	22 02.2	1.0 04	23.9	155
6	18 29.9	1.0 04	23.1	18 59.9	1.0 04	23.0	19 29.8	1.0 04	23.0	19 59.8	1.0 04	23.0	20 29.8	1.0 04	22.9	20 59.7	1.0 04	22.9	21 29.7	1.0 04	22.9	21 59.7	1.0 04	22.9	6
7	18 27.5	1.0 04	22.1	18 57.4	1.0 04	22.1	19 27.4	1.0 04	22.1	19 57.4	1.0 04	22.0	20 27.4	1.0 04	22.0	20 57.3	1.0 04	22.0	21 27.3	1.0 04	22.0	21 57.3	1.0 04	21.9	7
8	18 25.2	1.0 04	21.1	18 55.1	1.0 04	21.1	19 25.1	1.0 04	21.1	19 55.1	1.0 04	21.1	20 25.1	1.0 04	21.1	20 55.0	1.0 04	21.0	21 25.0	1.0 04	21.0	21 55.0	1.0 04	21.0	8
9	18 23.0	1.0 04	20.2	18 52.9	1.0 04	20.2	19 22.9	1.0 04	20.1	19 52.9	1.0 04	20.1	20 22.9	1.0 04	20.1	20 52.8	1.0 04	20.1	21 22.8	1.0 04	20.1	21 52.8	1.0 04	20.0	9
160	18 20.8	1.0 03	19.2	18 50.8	1.0 03	19.2	19 20.8	1.0 03	19.2	19 50.8	1.0 03	19.2	20 20.8	1.0 03	19.2	20 50.7	1.0 03	19.1	21 20.7	1.0 03	19.1	21 50.7	1.0 03	19.1	160
1	18 18.8	1.0 03	18.3	18 48.8	1.0 03	18.2	19 18.8	1.0 03	18.2	19 48.8	1.0 03	18.2	20 18.7	1.0 03	18.2	20 48.7	1.0 03	18.2	21 18.7	1.0 03	18.1	21 48.7	1.0 03	18.1	1
2	18 16.9	1.0 03	17.3	18 46.9	1.0 03	17.3	19 16.9	1.0 03	17.3	19 46.9	1.0 03	17.2	20 16.8	1.0 03	17.2	20 46.8	1.0 03	17.2	21 16.8	1.0 03	17.2	21 46.8	1.0 03	17.2	2
3	18 15.1	1.0 03	16.3	18 45.1	1.0 03	16.3	19 15.1	1.0 03	16.3	19 45.0	1.0 03	16.3	20 15.0	1.0 03	16.3	20 45.0	1.0 03	16.2	21 15.0	1.0 03	16.2	21 45.0	1.0 03	16.2	3
4	18 13.3	1.0 03	15.4	18 43.4	1.0 03	15.4	19 13.4	1.0 03	15.3	19 43.3	1.0 03	15.3	20 13.3	1.0 03	15.3	20 43.3	1.0 03	15.3	21 13.3	1.0 03	15.3	21 43.3	1.0 03	15.3	4
165	18 11.8	1.0 02	14.4	18 41.8	1.0 02	14.4	19 11.7	1.0 03	14.4	19 41.7	1.0 02	14.4	20 11.7	1.0 02	14.3	20 41.7	1.0 02	14.3	21 11.7	1.0 02	14.3	21 41.7	1.0 02	14.3	165
6	18 10.1	1.0 02	13.5	18 40.2	1.0 02	13.4	19 10.2	1.0 02	13.4	19 40.2	1.0 02	13.4	20 10.2	1.0 02	13.4	20 40.2	1.0 02	13.4	21 10.2	1.0 02	13.4	21 40.2	1.0 02	13.4	6
7	18 08.8	1.0 02	12.5	18 38.8	1.0 02	12.5	19 08.8	1.0 02	12.5	19 38.8	1.0 02	12.4	20 08.8	1.0 02	12.4	20 38.8	1.0 02	12.4	21 08.8	1.0 02	12.4	21 38.8	1.0 02	12.4	7
8	18 07.5	1.0 02	11.5	18 37.5	1.0 02	11.5	19 07.5	1.0 02	11.5	19 37.5	1.0 02	11.5	20 07.5	1.0 02	11.5	20 37.5	1.0 02	11.4	21 07.5	1.0 02	11.4	21 37.5	1.0 02	11.4	8
9	18 06.3	1.0 02	10.6	18 36.3	1.0 02	10.5	19 06.3	1.0 02	10.5	19 36.3	1.0 02	10.5	20 06.2	1.0 02	10.5	20 36.2	1.0 02	10.5	21 06.3	1.0 02	10.5	21 36.3	1.0 02	10.5	9
170	18 05.2	1.0 02	09.6	18 35.2	1.0 02	09.6	19 05.2	1.0 02	09.6	19 35.2	1.0 02	09.6	20 05.2	1.0 02	09.6	20 35.2	1.0 02	09.6	21 05.2	1.0 02	09.5	21 35.2	1.0 02	09.5	170
1	18 04.2	1.0 01	08.6	18 34.2	1.0 02	08.6	19 04.2	1.0 01	08.6	19 34.2	1.0 01	08.6	20 04.2	1.0 01	08.6	20 34.2	1.0 01	08.6	21 04.2	1.0 01	08.6	21 34.2	1.0 01	08.6	1
2	18 03.4	1.0 01	07.7	18 33.4	1.0 01	07.7	19 03.4	1.0 01	07.7	19 33.3	1.0 01	07.7	20 03.3	1.0 01	07.7	20 33.3	1.0 01	07.6	21 03.3	1.0 01	07.6	21 33.3	1.0 01	07.6	2
3	18 02.6	1.0 01	06.7	18 32.6	1.0 01	06.7	19 02.6	1.0 01	06.7	19 32.6	1.0 01	06.7	20 02.6	1.0 01	06.7	20 32.6	1.0 01	06.7	21 02.6	1.0 01	06.7	21 32.6	1.0 01	06.7	3
4	18 01.9	1.0 01	05.8	18 31.9	1.0 01	05.8	19 01.9	1.0 01	05.8	19 31.7	1.0 01	05.7	20 01.9	1.0 01	05.7	20 31.9	1.0 01	05.7	21 01.9	1.0 01	05.7	21 31.9	1.0 01	05.7	4
175	18 01.3	1.0 01	04.8	18 31.3	1.0 01	04.8	19 01.3	1.0 01	04.8	19 31.3	1.0 01	04.8	20 01.3	1.0 01	04.8	20 31.3	1.0 01	04.8	21 01.3	1.0 01	04.8	21 31.3	1.0 01	04.8	175
6	18 00.8	1.0 01	03.8	18 30.8	1.0 01	03.8	19 00.8	1.0 01	03.8	19 30.8	1.0 01	03.8	20 00.8	1.0 01	03.8	20 30.8	1.0 01	03.8	21 00.8	1.0 01	03.8	21 30.8	1.0 01	03.8	6
7	18 00.5	1.0 00	02.9	18 30.5	1.0 00	02.9	19 00.5	1.0 00	02.9	19 30.5	1.0 00	02.9	20 00.5	1.0 00	02.9	20 30.5	1.0 00	02.9	21 00.5	1.0 00	02.9	21 30.5	1.0 00	02.9	7
8	18 00.2	1.0 00	01.9	18 30.2	1.0 00	01.9	19 00.2	1.0 00	01.9	19 30.2	1.0 00	01.9	20 00.2	1.0 00	01.9	20 30.2	1.0 00	01.9	21 00.2	1.0 00	01.9	21 30.2	1.0 00	01.9	8
9	18 00.1	1.0 00	01.0	18 30.1	1.0 00	01.0	19 00.1	1.0 00	01.0	19 30.1	1.0 00	01.0	20 00.1	1.0 00	01.0	20 30.1	1.0 00	01.0	21 00.1	1.0 00	01.0	21 30.1	1.0 00	01.0	9
180	18 00.0	1.0 00	00.0	18 30.0	1.0 00	00.0	19 00.0	1.0 00	00.0	19 30.0	1.0 00	00.0	20 00.0	1.0 00	00.0	20 30.0	1.0 00	00.0	21 00.0	1.0 00	00.0	21 30.0	1.0 00	00.0	180

Lat. 85°

Lat. 86°

Lat. 87°

L. 88

H.A.	28° 00' Alt.	Δd Δt	Az.	28° 30' Alt.	Δd Δt	Az.	29° 00' Alt.	Δd Δt	Az.	30° 00' Alt.	Δd Δt	Az.	32° 00' Alt.	Δd Δt	Az.	34° 00' Alt.	Δd Δt	Az.	34° 30' Alt.	Δd Δt	Az.	35° 30' Alt.	Δd Δt	Az.	H.A.
00	34 00.0	1.00 0	180.0	34 30.0	1.00 0	180.0	35 00.0	1.00 0	180.0	36 00.0	1.00 0	180.0	38 00.0	1.00 0	180.0	40 00.0	1.00 0	180.0	40 30.0	1.00 0	180.0	41 30.0	1.00 0	180.0	00
1	33 59.9	1.00 0	178.9	34 29.9	1.00 0	178.9	34 59.9	1.00 0	178.9	35 59.9	1.00 0	178.9	37 59.9	1.00 0	178.9	39 59.9	1.00 0	178.9	40 29.9	1.00 0	178.9	41 29.9	1.00 0	178.9	1
2	33 59.8	1.00 0	177.9	34 29.8	1.00 0	177.9	34 59.8	1.00 0	177.9	35 59.8	1.00 0	177.9	37 59.8	1.00 0	177.8	39 59.8	1.00 0	177.8	40 29.8	1.00 0	177.8	41 29.8	1.00 0	177.8	2
3	33 59.5	1.00 1	176.8	34 29.5	1.00 1	176.8	34 59.5	1.00 1	176.8	35 59.5	1.00 1	176.8	37 59.5	1.00 1	176.8	39 59.5	1.00 1	176.8	40 29.5	1.00 1	176.7	41 29.5	1.00 1	176.7	3
4	33 59.1	1.00 1	175.7	34 29.1	1.00 1	175.7	34 59.1	1.00 1	175.7	35 59.1	1.00 1	175.7	37 59.1	1.00 1	175.7	39 59.1	1.00 1	175.7	40 29.1	1.00 1	175.7	41 29.1	1.00 1	175.7	4
05	33 58.5	1.00 1	174.7	34 28.5	1.00 1	174.7	34 58.5	1.00 1	174.7	35 58.5	1.00 1	174.6	37 58.5	1.00 1	174.6	39 58.5	1.00 1	174.6	40 28.5	1.00 1	174.6	41 28.5	1.00 1	174.6	05
6	33 57.9	1.00 1	173.6	34 27.9	1.00 1	173.6	34 57.9	1.00 1	173.6	35 57.9	1.00 1	173.6	37 57.9	1.00 1	173.5	39 57.9	1.00 1	173.5	40 27.9	1.00 1	173.5	41 27.9	1.00 1	173.5	6
7	33 57.1	1.00 1	172.5	34 27.1	1.00 1	172.5	34 57.1	1.00 1	172.5	35 57.1	1.00 1	172.5	37 57.1	1.00 1	172.5	39 57.1	1.00 1	172.5	40 27.1	1.00 1	172.4	41 27.1	1.00 1	172.4	7
8	33 56.3	1.00 2	171.5	34 26.3	1.00 2	171.5	34 56.3	1.00 2	171.5	35 56.3	1.00 2	171.4	37 56.2	1.00 2	171.4	39 56.2	1.00 2	171.3	40 26.2	1.00 2	171.3	41 26.2	1.00 2	171.3	8
9	33 55.3	1.00 2	170.4	34 25.3	1.00 2	170.4	34 55.3	1.00 2	170.4	35 55.3	1.00 2	170.4	37 55.2	1.00 2	170.3	39 55.2	1.00 2	170.3	40 25.2	1.00 2	170.3	41 25.2	1.00 2	170.2	9
10	33 54.2	1.00 2	169.4	34 24.2	1.00 2	169.3	34 54.2	1.00 2	169.3	35 54.2	1.00 2	169.3	37 54.1	1.00 2	169.2	39 54.1	1.00 2	169.2	40 24.1	1.00 2	169.2	41 24.1	1.00 2	169.1	10
1	33 53.0	1.00 2	168.3	34 23.0	1.00 2	168.3	34 53.0	1.00 2	168.3	35 52.9	1.00 2	168.2	37 52.9	1.00 2	168.2	39 52.9	1.00 2	168.1	40 22.9	1.00 2	168.1	41 22.8	1.00 2	168.1	1
2	33 51.6	1.00 2	167.2	34 21.6	1.00 2	167.2	34 51.6	1.00 2	167.2	35 51.6	1.00 2	167.2	37 51.6	1.00 2	167.1	39 51.5	1.00 2	167.0	40 21.5	1.00 3	167.0	41 21.5	1.00 3	167.0	2
3	33 50.2	1.00 3	166.2	34 20.2	1.00 3	166.1	34 50.2	1.00 3	166.1	35 50.2	1.00 3	166.1	37 50.1	1.00 3	166.0	39 50.0	1.00 3	165.9	40 20.0	1.00 3	165.9	41 20.0	1.00 3	165.9	3
4	33 48.6	1.00 3	165.1	34 18.6	1.00 3	165.1	34 48.6	1.00 3	165.1	35 48.6	1.00 3	165.0	37 48.5	1.00 3	164.9	39 48.5	1.00 3	164.9	40 18.4	1.00 3	164.8	41 18.4	1.00 3	164.8	4
15	33 47.0	1.00 3	164.0	34 17.0	1.00 3	164.0	34 46.9	1.00 3	164.0	35 46.9	1.00 3	164.0	37 46.8	1.00 3	163.9	39 46.8	1.00 3	163.8	40 16.8	1.00 3	163.8	41 16.7	1.00 3	163.7	15
6	33 45.2	1.00 3	163.0	34 15.2	1.00 3	163.0	34 45.2	1.00 3	162.9	35 45.1	1.00 3	162.9	37 45.0	1.00 3	162.8	39 45.0	1.00 3	162.7	40 14.9	1.00 3	162.7	41 14.9	1.00 3	162.6	6
7	33 43.3	1.00 3	161.9	34 13.3	1.00 3	161.9	34 43.3	1.00 3	161.9	35 43.2	1.00 3	161.8	37 43.1	1.00 3	161.7	39 43.0	1.00 3	161.6	40 13.0	1.00 3	161.6	41 13.0	1.00 3	161.6	7
8	33 41.3	1.00 4	160.9	34 11.3	1.00 4	160.8	34 41.3	1.00 4	160.8	35 41.2	1.00 4	160.8	37 41.1	1.00 4	160.7	39 41.0	1.00 4	160.6	40 11.0	1.00 4	160.5	41 10.9	1.00 4	160.5	8
9	33 39.2	1.00 4	159.8	34 09.2	1.00 4	159.8	34 39.1	1.00 4	159.7	35 39.1	1.00 4	159.7	37 39.0	1.00 4	159.6	39 38.9	1.00 4	159.5	40 08.8	1.00 4	159.5	41 08.8	1.00 4	159.4	9
20	33 37.0	1.00 4	158.7	34 06.9	1.00 4	158.7	34 36.9	1.00 4	158.7	35 36.9	1.00 4	158.6	37 36.7	1.00 4	158.5	39 36.6	1.00 4	158.4	40 06.6	1.00 4	158.4	41 06.5	1.00 4	158.3	20
1	33 34.6	1.00 4	157.7	34 04.6	1.00 4	157.6	34 34.6	1.00 4	157.6	35 34.4	1.00 4	157.5	37 34.4	1.00 4	157.5	39 34.3	1.00 4	157.3	40 04.2	1.00 4	157.3	41 04.1	1.00 4	157.2	1
2	33 32.2	1.00 4	156.6	34 02.2	1.00 4	156.6	34 32.1	1.00 4	156.6	35 32.1	1.00 4	156.4	37 31.9	1.00 4	156.4	39 31.8	1.00 4	156.3	40 01.7	1.00 4	156.2	41 01.7	1.00 4	156.2	2
3	33 29.7	1.00 4	155.6	33 59.6	1.00 4	155.5	34 29.6	1.00 4	155.5	35 29.5	1.00 4	155.4	37 29.4	1.00 4	155.3	39 29.2	1.00 4	155.2	39 59.2	1.00 4	155.1	40 59.1	1.00 4	155.1	3
4	33 27.0	1.00 5	154.5	33 57.0	1.00 5	154.5	34 26.9	1.00 5	154.4	35 26.9	1.00 5	154.4	37 26.7	1.00 5	154.2	39 26.5	1.00 5	154.1	39 56.5	1.00 5	154.1	40 56.4	1.00 5	154.0	4
25	33 24.3	1.00 5	153.4	33 54.2	1.00 5	153.4	34 24.2	1.00 5	153.4	35 24.1	1.00 5	153.3	37 23.9	1.00 5	153.2	39 23.7	1.00 5	153.0	39 53.7	1.00 5	153.0	40 53.6	1.00 5	152.9	25
6	33 21.4	1.00 5	152.4	33 51.4	1.00 5	152.4	34 21.3	1.00 5	152.3	35 21.2	1.00 5	152.2	37 21.0	1.00 5	152.1	39 20.8	1.00 5	152.0	39 50.8	1.00 5	151.9	40 50.7	1.00 5	151.9	6
7	33 18.5	1.00 5	151.3	33 48.4	1.00 5	151.3	34 18.4	1.00 5	151.3	35 18.3	1.00 5	151.2	37 18.0	1.00 5	151.1	39 17.8	1.00 5	150.9	39 47.8	1.00 5	150.8	40 47.7	1.00 5	150.8	7
8	33 15.4	1.00 5	150.3	33 45.3	1.00 5	150.2	34 15.3	1.00 5	150.2	35 15.2	1.00 5	150.1	37 15.0	1.00 5	150.0	39 14.7	1.00 5	149.8	39 44.7	1.00 5	149.8	40 44.5	1.00 5	149.7	8
9	33 12.2	1.00 5	149.2	33 42.2	1.00 5	149.2	34 12.1	1.00 5	149.2	35 12.0	1.00 5	149.1	37 11.8	1.00 6	148.9	39 11.5	1.00 6	148.8	39 41.5	1.00 6	148.7	40 41.3	1.00 6	148.6	9
30	33 09.0	1.00 6	148.2	33 38.9	1.00 6	148.1	34 08.9	1.00 6	148.1	35 08.7	1.00 6	148.0	37 08.5	1.00 6	147.9	39 08.2	1.00 6	147.7	39 38.2	1.00 6	147.7	40 38.0	1.00 6	147.6	30
1	33 05.6	1.00 6	147.1	33 35.6	1.00 6	147.1	34 05.5	1.00 6	147.0	35 05.4	1.00 6	146.8	37 05.1	1.00 6	146.8	39 04.8	1.00 6	146.6	39 34.8	1.00 6	146.6	40 34.6	1.00 6	146.5	1
2	33 02.1	1.00 6	146.1	33 32.1	1.00 6	146.0	34 02.0	1.00 6	146.0	35 01.9	1.00 6	145.7	37 01.6	1.00 6	145.7	39 01.3	1.00 6	145.6	39 31.2	1.00 6	145.4	40 31.1	1.00 6	145.4	2
3	32 58.6	1.00 6	145.0	33 28.6	1.00 6	145.0	33 58.5	1.00 6	144.9	34 58.3	1.00 6	144.9	36 58.0	1.00 6	144.7	38 57.7	1.00 6	144.5	39 27.6	1.00 6	144.5	40 27.5	1.00 6	144.4	3
4	32 55.0	1.00 6	144.0	33 24.9	1.00 6	143.9	33 54.8	1.00 6	143.9	34 54.7	1.00 6	143.8	36 54.4	1.00 6	143.6	38 54.0	1.00 6	143.4	39 24.0	1.00 6	143.4	40 23.8	1.00 6	143.3	4
35	32 51.2	1.00 6	142.9	33 21.2	1.00 6	142.9	33 51.1	1.00 6	142.8	34 50.9	1.00 6	142.8	36 50.6	1.00 6	142.6	38 50.3	1.00 6	142.4	39 20.2	1.00 6	142.3	40 20.0	1.00 6	142.2	35
6	32 47.4	1.00 7	141.9	33 17.2	1.00 7	141.8	33 47.3	1.00 7	141.7	34 47.1	1.00 7	141.7	36 46.7	1.00 7	141.5	38 46.4	1.00 7	141.3	39 16.3	1.00 7	141.3	40 16.1	1.00 7	141.2	6
7	32 43.5	1.00 7	140.8	33 13.4	1.00 7	140.8	33 43.3	1.00 7	140.7	34 43.2	1.00 7	140.6	36 42.8	1.00 7	140.5	38 42.4	1.00 7	140.3	39 12.3	1.00 7	140.2	40 12.1	1.00 7	140.1	7
8	32 39.5	1.00 7	139.8	33 09.4	1.00 7	139.7	33 39.3	1.00 7	139.7	34 39.1	1.00 7	139.6	36 38.8	1.00 7	139.4	38 38.4	1.00 7	139.2	39 08.3	1.00 7	139.1	40 08.1	1.00 7	139.0	8
9	32 35.4	1.00 7	138.7	33 05.3	1.00 7	138.7	33 35.2	1.00 7	138.6	34 35.0	1.00 7	138.5	36 34.6	1.00 7	138.3	38 34.2	1.00 7	138.1	39 04.1	1.00 7	138.1	40 03.9	1.00 7	138.0	9
40	32 31.2	1.00 7	137.7	33 01.1	1.00 7	137.6	33 31.0	1.00 7	137.6	34 30.8	1.00 7	137.5	36 30.4	1.00 7	137.3	38 30.0	1.00 7	137.1	38 59.9	1.00 7	137.0	39 59.7	1.00 7	136.9	40
1	32 27.0	1.00 7	136.6	32 56.9	1.00 7	136.6	33 26.8	1.00 7	136.5	34 26.6	1.00 7	136.2	36 26.1	1.00 7	136.2	38 25.7	1.00 7	136.0	38 55.6	1.00 7	136.0	39 55.3	1.00 7	135.9	1
2	32 22.6	1.00 7	135.6	32 52.5	1.00 7	135.6	33 22.4	1.00 7	135.5	34 22.2	1.00 7	135.4	36 21.8	1.00 7	135.2	38 21.3	1.00 7	135.0	38 51.2	1.00 7	134.9	39 50.9	1.00 7	134.8	2
3	32 18.2	1.00 8	134.6	32 48.1	1.00 8	134.5	33 18.0	1.00 8	134.5	34 17.8	1.00 8	134.4	36 17.3	1.00 8	134.1	38 16.8	1.00 8	133.9	38 46.7	1.00 8	133.9	39 46.4	1.00 8	133.7	3
4	32 13.7	1.00 8	133.5	32 43.6	1.00 8	133.5	33 13.5	1.00 8	133.4	34 13.2	1.00 8	133.3	36 12.8	1.00 8	133.1	38 12.3	1.00 8	132.9	38 42.1	1.00 8	132.8	39 41.9	1.00 8	132.7	4
45	32 09.1	1.00 8	132.5	32 39.0	1.00 8	132.4	33 08.9	1.00 8	132.4	34 08.6	1.00 8	132.3	36 08.1	1.00 8	132.1	38 07.6	1.00 8	131.8	38 37.5	1.00 8	131.8	39 37.2	1.00 8	131.6	45
6	32 04.4	1.00 8	131.4	32 34.3	1.00 8	131.4	33 04.2	1.00 8	131.3	34 03.9	1.00 8	131.2	36 03.4	1.00 8	131.0	38 02.9	1.00 8	130.8	38 32.8	1.00 8	130.7	39 32.5	1.00 8	130.6	6
7	31 59.7	1.00 8	130.4	32 29.6	1.00 8	130.4	32 59.4	1.00 8	130.3	33 59.2	1.00 8	130.2	35 58.7	1.00 8	130.0	37 58.1	1.00 8	129.7	38 28.0	1.00 8	129.7	39 27.7	1.00 8	129.5	7
8	31 54.9	1.00 8	129.4	32 24.8	1.00 8	129.3	32 54.6	1.00 8	129.3	33 54.4	1.00 8	129.2	35 53.8	1.00 8	128.9	37 53.3	1.00 8	128.7	38 23.1	1.00 8	128.6	39 22.8	99 08	128.5	8
9	31 50.0	1.00 8	128.3	32 19.9	1.00 8	128.3	32 49.7	1.00 8	128.2	33 49.5	1.00 8	128.1	35 48.9	1.00 8	127.9	37 48.3	1.00 8	127.6	38 18.2	99 08	127.6	39 17.9	99 08	127.4	9
50	31 45.0	1.00 8	127.3	32 14.9	1.00 8	127.3	32 44.8	1.00 8	127.2	33 44.5	1.00 8	127.1	35 43.9	99 08	126.8	37 43.3	99 08	126.6	38 13.2	99 08	126.5	39 12.9	99 08	126.4	50
1	31 40.0	1.00 8	126.3	32 09.9	1.00 8	126.2	32 39.7	1.00 8	126.2	33 39.5	1.00 9	126.0	35 38.9	99 09	125.8	37 38.3	99 09	125.6	38 08.1	99 09	125.5	39 07.8	99 09	125.4	1
2	31 34.9	1.00 9	125.2	32 04.8	1.00 9	125.2	32 34.6	1.00 9	125.1	33 34.4	1.00 9	125.0	35 33.8	99 09	124.8	37 33.1	99 09	124.5	38 03.0	99 09	124.4	39 02.6	99 09	124.3	2
3	31 29.8	1.00 9	124.2	31 59.6	1.00 9	124.2	32 29.5	1.00 9	124.1	33 29.2	99 09	124.0	35 28.6	99 09	123.7	37 27.9	99 09	123.5	37 57.8	99 09	123.4	38 57.4	99 09	123.3	3
4	31 24.6	1.00 9	123.2	31 54.4	1.00 9	123.1	32 24.3	99 09	123.1	33 24.0	99 09	122.9	35 23.3	99 09	122.7	37 22.7	99 09	122.4	37 52.5	99 09	122.4	38 52.1	99 09	122.2	4
55	31 19.3	99 09	122.1	31 49.1	99 09	122.1	32 19.0	99 09	122.0	33 18.7	99 09	121.9	35 18.0	99 09	121.7	37 17.3	99 09	121.4	37 47.2	99 09	121.3	38 46.6	99 09	121.2	55
6	31 13.9	99 09	121.1	31 43.8	99 09	121.1	32 13.6	99 09	121.0	33 13.3	99 09	120.9	35 12.6	99 09	120.6	37 12.0	99 09	120.4	37 41.8	99 09	120.3	38 41.4	99 09	120.2	6
7	31 08.5	99 09	120.1	31 38.4	99 09	120.0	32 08.2	99 09	120.0	33 07.9	99 09	119.9	35 07.2	99 09	119.6	37 06.5	99 09	119.3	37 36.3	99 09	119.3	38 36.0	99 09	119.1	7
8	31 03.1	99 09	119.1	31 32.9	99 09	119.0	32 02.8	99 09	118.9	33 02.4	99 09	118.8	35 01.7	99 09	118.6	37 01.0	99 09	118.3	37 30.8	99 09	118.2	38 30.4	99 09	118.1	8
9	30 57.6	99 09	118.0	31 27.4	99 09	118.0	31 57.2	99 09	117.9	32 56.9	99 09	117.8	34 56.2	99 09	117.5	36 55.5	99 09	117.3	37 25.3	99 09	117.2	38 24.9	99 09	117.0	9
60	30 52.0	99 09	117.0	31 21.8	99 09	117.0	31 51.7	99 09	116.9	32 51.3	99 09	116.8	34 50.6	99 09	116.5	36 49.9	99 09	116.2	37 19.7	99 09	116.2	38 19.3	99 09	116.0	60
1	30 46.4	99 10	116.0	31 16.2	99 10	115.9	31 46.1	99 10	115.9	32 45.7	99 09	115.7	34 45.0	99 09	115.5	36 44.2	99 10	115.2	37 14.0	99 10	115.1	38 13.6	99 10	115.0	1
2	30 40.7	99 10	115.0	31 10.6	99 10	114.9	31 40.4	99 10	114.9	32 40.0	99 10	114.7	34 39.3	99 10	114.5	36 38.5	99 10	114.2	37 08.3	99 10	114.1	38 07.9	99 10	114.0	2
3	30 35.0	99 10	114.0	31 04.9	99 10	113.9	31 34.7	99 10	113.8	32 34.3	99 10	113.7	34 33.6	99 10	113.4	36 32.8	99 10	113.2	37 02.6	99 10	113.1	38 02.2	99 10	112.9	3
4	30 29.3	99 10	112.9	30 59.1	99 10	112.9	31 28.9	99 10	112.8	32 28.6	99 10	112.7	34 27.8	99 10	112.4	36 27.0	99 10	112.1	36 56.8	99 10	112.1	37 56.4	99 10	111.9	4
65	30 23.5	99 10	111.9	30 53.3	99 10	111.9	31 23.1	99 10	111.8	32 22.7	99 10	111.6	34 22.0	99 10	111.4	36 21.2	99 10	111.1	36 50.9	99 10	111.0	37 50.5	99 10	110.9	65
6	30 17.6	99 10	110.9	30 47.5	99 10	110.8	31 17.3	99 10	110.8	32 16.9	99 10	110.6	34 16.1	99 10	110.4	36 15.3	99 10	110.1	36 45.1	99 10	110.0	37 44.6	99 10	109.9	6
7	30 11.8	99 10	109.9	30 41.6	99 10	109.8	31 11.4	99 10	109.8	32 11.0	99 10	109.6	34 10.2	99 10	109.4	36 09.4	99 10	109.1	36 39.2	99 10	109.0	37 38.7	99 10	108.8	7
8	30 05.9	99 10	108.9	30 35.7	99 10	108.8	31 05.5	99 10	108.7	32 05.1	99 10	108.6	34 04.3	99 10	108.3	36 03.4	99 10	108.0	36 33.2	99 10	108.0	37 32.8	99 10	107.8	8
9	29 59.9	99 10	107.9	30 29.7	99 10	107.8	30 59.5	99 10	107.7	31 59.1	99 10	107.6	33 58.3	99 10	107.3	35 57.5	99 10	107.0	36 27.2	99 10	107.0	37 26.8	99 10	106.8	9
70	29 53.9	99 10	106.8	30 23.7	99 10	106.8	30 53.5	99 10	106.7	31 53.1	99 10	106.6	33 52.3	99 10	106.3	35 51.4	99 10	106.0	36 21.2	99 10	105.9	37 20.8	99 10	105.8	70
1	29 47.9	99 10	105.8	30 17.7	99 10	105.8	30 47.5	99 10	105.7	31 47.1	99 10	105.6	33 46.3	99 10	105.3	35 45.4	99 10	105.0	36 15.2	99 10	104.9	37 14.7	99 10	104.8	1
2	29 41.8	99 10	104.8	30 11.6	99 10	104.8	30 41.4	99 10	104.7	31 41.0	99 10	104.6	33 40.2	99 10	104.3	35 39.3	99 10	104.0	36 09.1	99 10	103.9	37 08.6	99 10	103.8	2
3	29 35.8	99 10	103.8	30 05.6	99 10	103.8	30 35.4	99 10	103.7	31 35.0	99 10	103.5	33 34.1	99 10	103.3	35 33.2	99 10	102.9	36 03.0	99 10	102.9	37 02.5	99 10	102.7	3
4	29 29.7	99 10	102.8	29 59.5	99 10	102.7	30 29.3	99 10	102.7	31 28.8	99 10	102.5	33 27.9	99 10	102.3	35 27.1	99 10	102.0	35 56.9	99 10	101.9	36 56.4	99 10	101.7	4
75	29 23.5	99 10	101.8	29 53.3	99 10	101.7	30 23.1	99 10	101.7	31 22.7	99 10	101.5	33 21.9	99 10	101.2	35 21.0	99 10	101.0	35 50.7	99 10	100.9	36 50.2	99 10	100.7	75
6	29 17.4	99 10	100.8	29 47.2	99 10	100.7	30 17.0	99 10	100.7	31 16.6	99 10	100.5	33 15.7	99 10	100.2	35 14.8	99 10	99.9	35 44.6	99 10	99.9	36 44.1	99 10	99.7	6
7	29 11.2	99 10	99.8	29 41.0	99 10	99.7	30 10.8	99 10	99.7	31 10.4	99 10	99.5	33 09.5	99 10	99.2	35 08.6	99 10	98.9	35 38.4	99 10	98.9	36 37.9	99 10	98.7	7
8	29 05.0	99 10	98.8	29 34.8	99 10	98.7	30 04.6	99 10	98.7	31 04.2	99 10	98.5	33 03.3	99 10	98.2	35 02.4	99 10	97.9	35 32.2	99 10	97.9	36 31.7	99 10	97.7	8
9	28 58.8	99 10	97.8	29 28.6	99 10	97.7	29 58.4	99 10	97.6	30 58.0	99 10	97.5	32 57.1	99 10	97.2	34 56.2	99 10	96.9	35 25.9	99 10	96.9	36 25.5	99 10	96.7	9
80	28 52.6	99 10	96.8	29 22.4	99 10	96.7	29 52.2	99 10	96.6	30 51.8	99 10	96.5	32 50.9	99 10	96.2	34 49.9	99 10	95.9	35 19.7	99 10	95.8	36 19.2	99 10	95.7	80
1	28 46.4	99 10	95.8	29 16.2	99 10	95.7	29 45.9	99 10	95.6	30 45.5	99 10	95.5	32 44.6	99 10	95.2	34 43.7	99 10	94.9	35 13.5	99 10	94.8	36 13.0	99 10	94.7	1
2	28 40.1	99 10	94.8	29 09.9	99 10	94.7	29 39.7	99 10	94.6	30 39.3	99 10	94.5	32 38.4	99 10	94.2	34 37.4	99 10	93.9	35 07.2	99 10	93.8	36 06.7	99 10	93.7	2
3	28 33.9	99 10	93.8	29 03.7	99 10	93.7	29 33.5	99 10	93.6	30 33.0	99 10	93.5	32 32.1	99 10	93.2	34 31.2	99 10	92.9	35 00.9	99 10	92.8	36 00.5	99 10	92.7	3
4	28 27.6	99 10	92.8	28 57.4	99 10	92.7	29 27.2	99 10	92.6	30 26.7	99 10	92.5	32 25.9	99 10	92.2	34 24.9	99 10	91.9	34 54.7	99 10	91.8	35 54.2	99 10	91.7	4
85	28 21.3	99 10	91.8	28 51.1	99 10	91.7	29 20.9	99 10	91.7	30 20.5	99 10	91.5	32 19.6	99 10	91.2	34 18.7	99 10	90.9	34 48.4	99 10	90.9	35 47.9	99 10	90.7	85
6	28 15.1	99 10	90.8	28 44.9	99 10	90.7	29 14.6	99 10	90.7	30 14.2	99 10	90.5	32 13.3	99 10	90.2	34 12.4	99 10	89.9	34 42.1	99 10	89.9	35 41.6	99 10	89.7	6
7	28 08.8	99 10	89.8	28 38.6	99 10	89.7	29 08.4	99 10	89.7	30 07.9	99 10	89.5	32 07.0	99 10	89.2	34 06.1	99 10	88.9	34 35.9	99 10	88.9	35 35.4	99 10	88.7	7
8	28 02.5	99 10	88.8	28 32.3	99 10	88.7	29 02.1	99 10	88.7	30 01.7	99 10	88.5	32 00.8	99 10	88.2	33 59.8	99 10	87.9	34 29.6	99 10	87.9	35 29.1	99 10	87.7	8
9	27 56.3	99 10	87.8	28 26.0	99 10	87.7	28 55.8	99 10	87.7	29 55.4	99 10	87.5	31 54.5	99 10	87.3	33 53.6	99 10	87.0	34 23.3	99 10	86.9	35 22.8	99 10	86.7	9
90	27 50.0	99 10	86.8	28 19.8	99 10	86.8	28 49.6	99 10	86.7	29 49.1	99 10	86.5	31 48.2	99 10	86.3	33 47.3	99 10	86.0	34 17.1	99 10	85.9	35 16.6	99 10	85.7	90

H.A.	28° 00' Alt. Δd Δt	Az.	28° 30' Alt. Δd Δt	Az.	29° 00' Alt. Δd Δt	Az.	30° 00' Alt. Δd Δt	Az.	32° 00' Alt. Δd Δt	Az.	34° 00' Alt. Δd Δt	Az.	34° 30' Alt. Δd Δt	Az.	35° 30' Alt. Δd Δt	Az.	H.A.
91	27 43.7 99 10	85.8	28 13.5 99 10	85.8	28 43.3 99 10	85.7	29 42.9 99 10	85.6	31 42.0 99 10	85.3	33 41.1 99 10	85.0	34 10.8 99 10	84.9	35 10.3 99 10	84.7	91
2	27 37.5 99 10	84.8	28 07.3 99 10	84.8	28 37.1 99 10	84.7	29 36.6 99 10	84.6	31 35.7 99 10	84.3	33 34.8 99 10	84.0	34 04.6 99 10	83.8	35 04.1 99 10	83.8	2
3	27 31.2 99 10	83.8	28 01.0 99 10	83.8	28 30.8 99 10	83.7	29 30.4 99 10	83.6	31 29.5 99 10	83.3	33 28.6 99 10	83.0	33 58.3 99 10	82.9	34 57.9 99 10	82.8	3
4	27 25.0 99 10	82.9	27 54.8 99 10	82.8	28 24.6 99 10	82.7	29 24.2 99 10	82.6	31 23.3 99 10	82.3	33 22.4 99 10	82.0	33 52.1 99 10	81.9	34 51.7 99 10	81.8	4
95	27 18.8 99 10	81.9	27 48.6 99 10	81.8	28 18.4 99 10	81.7	29 18.0 99 10	81.6	31 17.1 99 10	81.3	33 16.2 99 10	81.0	33 45.9 99 10	81.0	34 45.5 99 10	80.8	95
6	27 12.6 99 10	80.9	27 42.4 99 10	80.8	28 12.2 99 10	80.8	29 11.8 99 10	80.6	31 10.9 99 10	80.3	33 10.0 99 10	80.1	33 39.7 99 10	80.0	34 39.3 99 10	79.8	6
7	27 06.4 99 10	79.9	27 36.2 99 10	79.8	28 06.0 99 10	79.8	29 05.6 99 10	79.6	31 04.7 99 10	79.4	33 03.8 99 10	79.1	33 33.5 99 10	79.0	34 33.1 99 10	78.8	7
8	27 00.2 99 10	78.9	27 30.0 99 10	78.9	27 59.8 99 10	78.8	28 59.4 99 10	78.7	30 58.6 99 10	78.4	32 57.7 99 10	78.1	33 27.4 99 10	78.0	34 27.0 99 10	77.9	8
9	26 54.1 99 10	77.9	27 23.9 99 10	77.9	27 53.7 99 10	77.8	28 53.3 99 10	77.7	30 52.4 99 10	77.4	32 51.5 99 10	77.1	33 21.3 99 10	77.0	34 20.8 99 10	76.9	9
100	26 48.0 99 10	76.9	27 17.8 99 10	76.9	27 47.6 99 10	76.8	28 47.2 99 10	76.7	30 46.3 99 10	76.4	32 45.4 99 10	76.1	33 15.2 99 10	76.1	34 14.7 99 10	75.9	100
1	26 41.9 99 10	76.0	27 11.7 99 10	75.9	27 41.5 99 10	75.8	28 41.1 99 10	75.7	30 40.2 99 10	75.4	32 39.4 99 10	75.2	33 09.1 99 10	75.1	34 08.7 99 10	74.9	1
2	26 35.8 99 10	75.0	27 05.6 99 10	74.9	27 35.4 99 10	74.9	28 35.0 99 10	74.7	30 34.2 99 10	74.5	32 33.3 99 10	74.2	33 03.1 99 10	74.1	34 02.6 99 10	74.0	2
3	26 29.8 99 10	74.0	26 59.6 99 10	73.9	27 29.4 99 10	73.9	28 29.0 99 10	73.7	30 28.2 99 10	73.5	32 27.3 99 10	73.2	32 57.1 99 10	73.1	33 56.6 99 10	73.0	3
4	26 23.8 99 10	73.0	26 53.6 99 10	73.0	27 23.4 99 10	72.9	28 23.0 99 10	72.8	30 22.2 99 10	72.5	32 21.3 99 10	72.2	32 51.1 99 10	72.2	33 50.6 99 10	72.0	4
105	26 17.8 99 10	72.0	26 47.6 99 10	72.0	27 17.4 99 10	71.9	28 17.0 99 10	71.8	30 16.2 99 10	71.5	32 15.4 99 10	71.2	32 45.1 99 10	71.2	33 44.7 99 10	71.0	105
6	26 11.8 99 10	71.1	26 41.6 99 10	71.0	27 11.4 99 10	70.9	28 11.1 99 10	70.8	30 10.3 99 10	70.6	32 09.4 99 10	70.3	32 39.2 99 10	70.2	33 38.8 99 10	70.1	6
7	26 05.9 99 10	70.1	26 35.7 99 10	70.0	27 05.5 99 10	70.0	28 05.2 99 10	69.8	30 04.4 99 10	69.6	32 03.5 99 10	69.3	32 33.3 99 10	69.2	33 32.9 99 10	69.1	7
8	26 00.0 99 10	69.1	26 29.8 99 10	69.1	26 59.7 99 10	69.0	27 59.3 99 10	68.9	29 58.5 99 10	68.6	31 57.7 99 10	68.3	32 27.5 99 10	68.3	33 27.1 99 10	68.1	8
9	25 54.2 99 10	68.1	26 24.0 99 10	68.1	26 53.8 99 10	68.0	27 53.5 99 10	67.9	29 52.7 99 10	67.6	31 51.9 99 10	67.4	32 21.7 99 10	67.3	33 21.3 99 10	67.2	9
110	25 48.4 99 10	67.2	26 18.2 99 10	67.1	26 48.0 99 10	67.0	27 47.7 99 10	66.9	29 46.9 99 10	66.7	31 46.1 99 10	66.4	32 15.9 99 10	66.3	33 15.5 99 10	66.2	110
1	25 42.6 99 10	66.2	26 12.5 99 10	66.1	26 42.3 99 10	65.9	27 41.9 99 10	65.9	29 41.2 99 09	65.7	31 40.4 99 09	65.4	32 10.2 99 09	65.4	33 09.8 99 09	65.2	1
2	25 36.9 99 09	65.2	26 06.7 99 09	65.2	26 36.6 99 10	65.1	27 36.2 99 09	65.0	29 35.5 99 09	64.7	31 34.7 99 09	64.5	32 04.5 99 09	64.4	33 04.1 99 09	64.3	2
3	25 31.2 99 09	64.2	26 01.1 99 09	64.2	26 30.9 99 09	64.1	27 30.5 99 09	64.0	29 29.8 99 09	63.8	31 29.1 99 09	63.5	31 58.9 99 09	63.4	32 58.5 99 09	63.3	3
4	25 25.6 99 09	63.3	25 55.5 99 09	63.2	26 25.3 99 09	63.2	27 24.9 99 09	63.0	29 24.2 99 09	62.8	31 23.5 99 09	62.5	31 53.3 99 09	62.5	32 52.9 99 09	62.3	4
115	25 20.0 99 09	62.3	25 49.9 99 09	62.2	26 19.7 99 09	62.2	27 19.4 99 09	62.1	29 18.7 99 09	61.8	31 17.9 99 09	61.6	31 47.8 99 09	61.5	32 47.4 99 09	61.4	115
6	25 14.5 99 09	61.3	25 44.4 99 09	61.3	26 14.2 99 09	61.1	27 13.9 99 09	60.9	29 13.2 99 09	60.9	31 12.5 99 09	60.5	31 42.3 99 09	60.5	32 41.9 99 09	60.4	6
7	25 09.0 99 09	60.4	25 38.9 99 09	60.3	26 08.7 99 09	60.2	27 08.4 99 09	60.1	29 07.7 99 09	59.9	31 07.0 99 09	59.6	31 36.8 99 09	59.6	32 36.5 99 09	59.4	7
8	25 03.6 99 09	59.4	25 33.5 99 09	59.3	26 03.3 99 09	59.3	27 03.0 99 09	59.2	29 02.3 99 09	58.9	31 01.6 99 09	58.7	31 31.5 99 09	58.6	32 31.1 99 09	58.5	8
9	24 58.2 99 09	58.4	25 28.1 99 09	58.4	25 57.9 99 09	58.3	26 57.6 99 09	58.2	28 57.0 99 09	58.0	30 56.3 99 09	57.7	31 26.1 99 09	57.6	32 25.8 99 09	57.5	9
120	24 52.9 1.00 09	57.4	25 22.8 99 09	57.3	25 52.6 99 09	57.2	26 52.3 99 09	57.2	28 51.7 99 09	57.0	30 51.0 99 09	56.8	31 20.9 99 09	56.7	32 20.5 99 09	56.6	120
1	24 47.7 1.00 09	56.5	25 17.5 1.00 09	56.4	25 47.4 1.00 09	56.4	26 47.1 99 09	56.3	28 46.5 99 09	56.0	30 45.8 99 09	55.7	31 15.7 99 09	55.7	32 15.3 99 09	55.6	1
2	24 42.5 1.00 09	55.5	25 12.3 1.00 09	55.5	25 42.2 1.00 09	55.4	26 41.9 1.00 09	55.3	28 41.3 99 08	55.1	30 40.7 99 08	54.8	31 10.5 99 08	54.8	32 10.2 99 08	54.6	2
3	24 37.3 1.00 08	54.5	25 07.2 1.00 08	54.5	25 37.1 1.00 08	54.4	26 36.8 1.00 08	54.3	28 36.2 1.00 08	54.1	30 35.6 99 08	53.9	31 05.4 99 08	53.8	32 05.1 99 08	53.7	3
4	24 32.1 1.00 08	53.6	25 02.1 1.00 08	53.5	25 32.0 1.00 08	53.5	26 31.7 1.00 08	53.4	28 31.1 1.00 08	53.1	30 30.5 99 08	52.9	31 00.4 99 08	52.9	32 00.1 99 08	52.7	4
125	24 27.2 1.00 08	52.6	24 57.1 1.00 08	52.6	25 27.0 1.00 08	52.5	26 26.7 1.00 08	52.4	28 26.1 1.00 08	52.2	30 25.6 1.00 08	52.0	30 55.4 1.00 08	51.9	31 55.1 99 08	51.8	125
6	24 22.3 1.00 08	51.6	24 52.2 1.00 08	51.6	25 22.0 1.00 08	51.5	26 21.8 1.00 08	51.4	28 21.2 1.00 08	51.2	30 20.7 1.00 08	51.0	30 50.5 1.00 08	50.9	31 50.2 1.00 08	50.8	6
7	24 17.4 1.00 08	50.7	24 47.3 1.00 08	50.6	25 17.1 1.00 08	50.6	26 16.9 1.00 08	50.5	28 16.4 1.00 08	50.3	30 15.8 1.00 08	50.0	30 45.7 1.00 08	50.0	31 45.4 1.00 08	49.9	7
8	24 12.6 1.00 08	49.7	24 42.5 1.00 08	49.7	25 12.3 1.00 08	49.6	26 12.1 1.00 08	49.5	28 11.6 1.00 08	49.3	30 11.0 1.00 08	49.1	30 40.9 1.00 08	49.0	31 40.6 1.00 08	48.9	8
9	24 07.8 1.00 08	48.8	24 37.7 1.00 08	48.7	25 07.6 1.00 08	48.7	26 07.4 1.00 08	48.6	28 06.8 1.00 08	48.4	30 06.3 1.00 08	48.1	30 36.2 1.00 08	48.1	31 35.9 1.00 08	48.0	9
130	24 03.2 1.00 08	47.8	24 33.0 1.00 08	47.7	25 03.3 1.00 08	47.7	26 02.7 1.00 08	47.6	28 02.2 1.00 08	47.4	30 01.7 1.00 08	47.2	30 31.6 1.00 08	47.1	31 31.3 1.00 08	47.0	130
1	23 58.5 1.00 08	46.8	24 28.4 1.00 08	46.8	24 58.3 1.00 08	46.7	25 58.1 1.00 08	46.6	27 57.6 1.00 08	46.4	29 57.1 1.00 08	46.2	30 27.0 1.00 07	46.2	31 26.8 1.00 07	46.1	1
2	23 54.0 1.00 07	45.9	24 23.9 1.00 07	45.8	24 53.8 1.00 07	45.8	25 53.6 1.00 07	45.7	27 53.1 1.00 07	45.5	29 52.6 1.00 07	45.3	30 22.5 1.00 07	45.2	31 22.3 1.00 07	45.1	2
3	23 49.5 1.00 07	44.9	24 19.4 1.00 07	44.9	24 49.3 1.00 07	44.8	25 49.1 1.00 07	44.7	27 48.7 1.00 07	44.5	29 48.2 1.00 07	44.3	30 18.1 1.00 07	44.3	31 17.9 1.00 07	44.2	3
4	23 45.2 1.00 07	43.9	24 15.1 1.00 07	43.9	24 44.9 1.00 07	43.9	25 44.7 1.00 07	43.8	27 44.3 1.00 07	43.6	29 43.9 1.00 07	43.4	30 13.8 1.00 07	43.3	31 13.5 1.00 07	43.2	4
135	23 40.8 1.00 07	43.0	24 10.7 1.00 07	42.9	24 40.6 1.00 07	42.9	25 40.4 1.00 07	42.8	27 40.0 1.00 07	42.6	29 39.6 1.00 07	42.4	30 09.5 1.00 07	42.4	31 09.3 1.00 07	42.3	135
6	23 36.6 1.00 07	42.0	24 06.5 1.00 07	42.0	24 36.4 1.00 07	41.9	25 36.2 1.00 07	41.8	27 35.8 1.00 07	41.7	29 35.4 1.00 07	41.5	30 05.5 1.00 07	41.4	31 05.1 1.00 07	41.3	6
7	23 32.4 1.00 07	41.1	24 02.4 1.00 07	41.0	24 32.3 1.00 07	41.0	25 32.1 1.00 07	40.9	27 31.7 1.00 07	40.7	29 31.3 1.00 07	40.5	30 01.2 1.00 07	40.5	31 01.0 1.00 07	40.4	7
8	23 28.4 1.00 07	40.1	23 58.3 1.00 07	40.1	24 28.2 1.00 07	40.0	25 28.0 1.00 07	39.9	27 27.6 1.00 07	39.8	29 27.3 1.00 07	39.6	29 57.2 1.00 07	39.5	30 57.0 1.00 07	39.4	8
9	23 24.3 1.00 07	39.1	23 54.3 1.00 07	39.1	24 24.2 1.00 07	39.0	25 24.0 1.00 07	39.0	27 23.7 1.00 06	38.8	29 23.3 1.00 06	38.6	29 53.2 1.00 06	38.6	30 53.0 1.00 06	38.5	9
140	23 20.4 1.00 06	38.2	23 50.4 1.00 06	38.1	24 20.3 1.00 06	38.1	25 20.1 1.00 06	38.0	27 19.8 1.00 06	37.9	29 19.4 1.00 06	37.7	29 49.3 1.00 06	37.6	30 49.2 1.00 06	37.5	140
1	23 16.6 1.00 06	37.2	23 46.5 1.00 06	37.2	24 16.5 1.00 06	37.1	25 16.3 1.00 06	37.1	27 16.0 1.00 06	36.9	29 15.6 1.00 06	36.7	29 45.6 1.00 06	36.7	30 45.4 1.00 06	36.6	1
2	23 12.9 1.00 06	36.3	23 42.8 1.00 06	36.2	24 12.7 1.00 06	36.2	25 12.6 1.00 06	36.1	27 12.3 1.00 06	35.9	29 11.9 1.00 06	35.8	29 41.8 1.00 06	35.7	30 41.7 1.00 06	35.7	2
3	23 09.2 1.00 06	35.3	23 39.1 1.00 06	35.3	24 09.1 1.00 06	35.2	25 08.9 1.00 06	35.2	27 08.6 1.00 06	35.0	29 08.3 1.00 06	34.8	29 38.2 1.00 06	34.8	30 38.1 1.00 06	34.7	3
4	23 05.6 1.00 06	34.3	23 35.5 1.00 06	34.3	24 05.5 1.00 06	34.3	25 05.3 1.00 06	34.2	27 05.1 1.00 06	34.0	29 04.8 1.00 06	33.9	29 34.7 1.00 06	33.8	30 34.5 1.00 06	33.8	4
145	23 02.1 1.00 06	33.4	23 32.1 1.00 06	33.4	24 02.0 1.00 06	33.3	25 01.9 1.00 06	33.2	27 01.6 1.00 05	33.1	29 01.3 1.00 05	32.9	29 31.2 1.00 05	32.9	30 31.1 1.00 05	32.8	145
6	22 58.7 1.00 06	32.4	23 28.6 1.00 06	32.4	23 58.6 1.00 06	32.4	24 58.5 1.00 06	32.3	26 58.2 1.00 05	32.1	28 57.9 1.00 05	32.0	29 27.9 1.00 05	32.0	30 27.7 1.00 05	31.9	6
7	22 55.4 1.00 05	31.5	23 25.3 1.00 05	31.4	23 55.3 1.00 05	31.4	24 55.2 1.00 05	31.3	26 54.9 1.00 05	31.2	28 54.7 1.00 05	31.1	29 24.6 1.00 05	31.0	30 24.5 1.00 05	30.9	7
8	22 52.2 1.00 05	30.5	23 22.1 1.00 05	30.5	23 52.1 1.00 05	30.5	24 51.9 1.00 05	30.4	26 51.7 1.00 05	30.2	28 51.5 1.00 05	30.1	29 21.4 1.00 05	30.1	30 21.3 1.00 05	30.0	8
9	22 49.0 1.00 05	29.6	23 19.0 1.00 05	29.5	23 48.9 1.00 05	29.5	24 48.9 1.00 05	29.4	26 48.6 1.00 05	29.3	28 48.4 1.00 05	29.2	29 18.3 1.00 05	29.1	30 18.2 1.00 05	29.1	9
150	22 46.0 1.00 05	28.6	23 15.9 1.00 05	28.6	23 45.9 1.00 05	28.5	24 45.8 1.00 05	28.5	26 45.6 1.00 05	28.4	28 45.4 1.00 05	28.2	29 15.3 1.00 05	28.2	30 15.2 1.00 05	28.1	150
1	22 43.0 1.00 05	27.6	23 13.0 1.00 05	27.6	23 42.9 1.00 05	27.6	24 42.8 1.00 05	27.5	26 42.6 1.00 05	27.4	28 42.4 1.00 05	27.3	29 12.4 1.00 05	27.2	30 12.3 1.00 05	27.2	1
2	22 40.2 1.00 05	26.7	23 10.1 1.00 05	26.7	23 40.1 1.00 05	26.6	24 40.0 1.00 05	26.6	26 39.8 1.00 05	26.5	28 39.6 1.00 05	26.3	29 09.6 1.00 05	26.3	30 09.5 1.00 05	26.2	2
3	22 37.4 1.00 04	25.7	23 07.3 1.00 04	25.7	23 37.3 1.00 04	25.7	24 37.2 1.00 04	25.6	26 37.1 1.00 04	25.5	28 36.9 1.00 04	25.4	29 06.8 1.00 04	25.4	30 06.7 1.00 04	25.3	3
4	22 34.7 1.00 04	24.8	23 04.7 1.00 04	24.8	23 34.6 1.00 04	24.7	24 34.6 1.00 04	24.7	26 34.4 1.00 04	24.6	28 34.2 1.00 04	24.4	29 04.2 1.00 04	24.4	30 04.1 1.00 04	24.4	4
155	22 32.1 1.00 04	23.8	23 02.1 1.00 04	23.8	23 32.1 1.00 04	23.8	24 32.0 1.00 04	23.7	26 31.8 1.00 04	23.6	28 31.7 1.00 04	23.5	29 01.7 1.00 04	23.5	30 01.6 1.00 04	23.4	155
6	22 29.6 1.00 04	22.9	22 59.6 1.00 04	22.8	23 29.6 1.00 04	22.8	24 29.5 1.00 04	22.8	26 29.4 1.00 04	22.7	28 29.2 1.00 04	22.6	28 59.2 1.00 04	22.5	29 59.1 1.00 04	22.5	6
7	22 27.2 1.00 04	21.9	22 57.2 1.00 04	21.9	23 27.2 1.00 04	21.9	24 27.1 1.00 04	21.8	26 27.0 1.00 04	21.7	28 26.9 1.00 04	21.6	28 56.8 1.00 04	21.6	29 56.8 1.00 04	21.5	7
8	22 25.0 1.00 04	21.0	22 54.9 1.00 04	20.9	23 24.8 1.00 04	20.9	24 24.8 1.00 04	20.9	26 24.7 1.00 04	20.8	28 24.6 1.00 04	20.7	28 54.6 1.00 04	20.7	29 54.5 1.00 04	20.6	8
9	22 22.8 1.00 04	20.0	22 52.8 1.00 04	20.0	23 22.7 1.00 04	20.0	24 22.7 1.00 04	19.9	26 22.6 1.00 04	19.8	28 22.4 1.00 03	19.7	28 52.4 1.00 03	19.7	29 52.4 1.00 03	19.7	9
160	22 20.7 1.00 03	19.1	22 50.6 1.00 03	19.0	23 20.6 1.00 03	19.0	24 20.6 1.00 03	19.0	26 20.5 1.00 03	18.9	28 20.4 1.00 03	18.8	28 50.4 1.00 03	18.8	29 50.3 1.00 03	18.7	160
1	22 18.7 1.00 03	18.1	22 48.6 1.00 03	18.1	23 18.6 1.00 03	18.1	24 18.6 1.00 03	18.0	26 18.5 1.00 03	17.9	28 18.4 1.00 03	17.9	28 48.4 1.00 03	17.8	29 48.3 1.00 03	17.8	1
2	22 16.8 1.00 03	17.1	22 46.7 1.00 03	17.1	23 16.7 1.00 03	17.1	24 16.7 1.00 03	17.1	26 16.6 1.00 03	17.0	28 16.5 1.00 03	16.9	28 46.5 1.00 03	16.9	29 46.5 1.00 03	16.8	2
3	22 15.0 1.00 03	16.2	22 44.9 1.00 03	16.2	23 14.9 1.00 03	16.2	24 14.9 1.00 03	16.1	26 14.8 1.00 03	16.0	28 14.8 1.00 03	16.0	28 44.7 1.00 03	16.0	29 44.7 1.00 03	15.9	3
4	22 13.3 1.00 03	15.2	22 43.3 1.00 03	15.2	23 13.2 1.00 03	15.2	24 13.2 1.00 03	15.2	26 13.1 1.00 03	15.1	28 13.1 1.00 03	15.0	28 43.1 1.00 03	15.0	29 43.0 1.00 03	15.0	4
165	22 11.7 1.00 02	14.3	22 41.7 1.00 02	14.3	23 11.6 1.00 02	14.3	24 11.6 1.00 02	14.2	26 11.6 1.00 02	14.2	28 11.5 1.00 02	14.1	28 41.5 1.00 02	14.1	29 41.5 1.00 02	14.0	165
6	22 10.2 1.00 02	13.3	22 40.2 1.00 02	13.3	23 10.1 1.00 02	13.3	24 10.1 1.00 02	13.3	26 10.1 1.00 02	13.2	28 10.0 1.00 02	13.2	28 40.0 1.00 02	13.1	29 40.0 1.00 02	13.1	6
7	22 08.8 1.00 02	12.4	22 38.8 1.00 02	12.4	23 08.8 1.00 02	12.4	24 08.7 1.00 02	12.3	26 08.7 1.00 02	12.3	28 08.7 1.00 02	12.2	28 38.6 1.00 02	12.2	29 38.6 1.00 02	12.2	7
8	22 07.5 1.00 02	11.4	22 37.5 1.00 02	11.4	23 07.5 1.00 02	11.4	24 07.4 1.00 02	11.3	26 07.4 1.00 02	11.3	28 07.4 1.00 02	11.3	28 37.4 1.00 02	11.3	29 37.4 1.00 02	11.2	8
9	22 06.3 1.00 02	10.5	22 36.3 1.00 02	10.5	23 06.3 1.00 02	10.5	24 06.3 1.00 02	10.4	26 06.2 1.00 02	10.4	28 06.2 1.00 02	10.3	28 36.2 1.00 02	10.3	29 36.2 1.00 02	10.3	9
170	22 05.2 1.00 02	09.5	22 35.2 1.00 02	09.5	23 05.2 1.00 02	09.5	24 05.2 1.00 02	09.5	26 05.2 1.00 02	09.4	28 05.1 1.00 02	09.4	28 35.1 1.00 02	09.4	29 35.1 1.00 02	09.4	170
1	22 04.2 1.00 01	08.6	22 34.2 1.00 01	08.6	23 04.2 1.00 01	08.6	24 04.2 1.00 01	08.5	26 04.2 1.00 01	08.5	28 04.2 1.00 01	08.5	28 34.1 1.00 01	08.4	29 34.1 1.00 01	08.4	1
2	22 03.3 1.00 01	07.6	22 33.3 1.00 01	07.6	23 03.3 1.00 01	07.6	24 03.3 1.00 01	07.6	26 03.3 1.00 01	07.5	28 03.3 1.00 01	07.5	28 33.3 1.00 01	07.5	29 33.3 1.00 01	07.5	2
3	22 02.6 1.00 01	06.7	22 32.5 1.00 01	06.7	23 02.5 1.00 01	06.7	24 02.5 1.00 01	06.6	26 02.5 1.00 01	06.6	28 02.5 1.00 01	06.6	28 32.5 1.00 01	06.6	29 32.5 1.00 01	06.5	3
4	22 01.9 1.00 01	05.7	22 31.9 1.00 01	05.7	23 01.9 1.00 01	05.7	24 01.9 1.00 01	05.7	26 01.9 1.00 01	05.7	28 01.8 1.00 01	05.6	28 31.8 1.00 01	05.6	29 31.8 1.00 01	05.6	4
175	22 01.3 1.00 01	04.8	22 31.3 1.00 01	04.8	23 01.3 1.00 01	04.8	24 01.3 1.00 01	04.7	26 01.3 1.00 01	04.7	28 01.3 1.00 01	04.7	28 31.3 1.00 01	04.7	29 31.3 1.00 01	04.7	175
6	22 00.8 1.00 01	03.8	22 30.8 1.00 01	03.8	23 00.8 1.00 01	03.8	24 00.8 1.00 01	03.8	26 00.8 1.00 01	03.8	28 00.8 1.00 01	03.8	28 30.8 1.00 01	03.8	29 30.8 1.00 01	03.7	6
7	22 00.5 1.00 00	02.9	22 30.5 1.00 00	02.9	23 00.5 1.00 00	02.9	24 00.5 1.00 00	02.8	26 00.5 1.00 00	02.8	28 00.5 1.00 00	02.8	28 30.5 1.00 00	02.8	29 30.5 1.00 00	02.8	7
8	22 00.2 1.00 00	01.9	22 30.2 1.00 00	01.9	23 00.2 1.00 00	01.9	24 00.2 1.00 00	01.9	26 00.2 1.00 00	01.9	28 00.2 1.00 00	01.9	28 30.2 1.00 00	01.9	29 30.2 1.00 00	01.9	8
9	22 00.1 1.00 00	01.0	22 30.1 1.00 00	01.0	23 00.1 1.00 00	01.0	24 00.1 1.00 00	01.0	26 00.1 1.00 00	00.9	28 00.1 1.00 00	00.9	28 30.1 1.00 00	00.9	29 30.1 1.00 00	00.9	9
180	22 00.0 1.00 00	00.0	22 30.0 1.00 00	00.0	23 00.0 1.00 00	00.0	24 00.0 1.00 00	00.0	26 00.0 1.00 00	00.0	28 00.0 1.00 00	00.0	28 30.0 1.00 00	00.0	29 30.0 1.00 00	00.0	180

Lat 85°

Lat. 84°

Each declination cell below lists: Alt.   Δd   Δt   Az.

H.A.	36° 00′	37° 00′	38° 30′	40° 00′	42° 00′	42° 30′	43° 00′	45° 00′	H.A.
00	42 00.0 1.0 00 180.0	43 00.0 1.0 00 180.0	44 30.0 1.0 00 180.0	46 00.0 1.0 00 180.0	48 00.0 1.0 00 180.0	48 30.0 1.0 00 180.0	49 00.0 1.0 00 180.0	51 00.0 1.0 00 180.0	00
1	41 59.9 1.0 00 178.9	42 59.9 1.0 00 178.9	44 29.9 1.0 00 178.9	45 59.9 1.0 00 178.9	47 59.9 1.0 00 178.9	48 29.9 1.0 00 178.9	48 59.9 1.0 00 178.9	50 59.9 1.0 00 178.9	1
2	41 59.8 1.0 00 177.8	42 59.8 1.0 00 177.8	44 29.8 1.0 00 177.8	45 59.8 1.0 01 177.8	47 59.8 1.0 00 177.8	48 29.8 1.0 00 177.8	48 59.8 1.0 00 177.8	50 59.8 1.0 00 177.8	2
3	41 59.5 1.0 01 176.7	42 59.5 1.0 01 176.7	44 29.5 1.0 01 176.7	45 59.5 1.0 01 176.7	47 59.5 1.0 01 176.7	48 29.5 1.0 01 176.7	48 59.4 1.0 01 176.7	50 59.4 1.0 01 176.6	3
4	41 59.0 1.0 01 175.6	42 59.0 1.0 01 175.6	44 29.0 1.0 01 175.6	45 59.0 1.0 01 175.6	47 59.0 1.0 01 175.6	48 29.0 1.0 01 175.5	48 59.0 1.0 01 175.5	50 59.0 1.0 01 175.5	4
05	41 58.5 1.0 01 174.6	42 58.5 1.0 01 174.5	44 28.5 1.0 01 174.5	45 58.5 1.0 01 174.5	47 58.5 1.0 01 174.4	48 28.5 1.0 01 174.4	48 58.5 1.0 01 174.4	50 58.5 1.0 01 174.4	05
6	41 57.9 1.0 01 173.5	42 57.9 1.0 01 173.4	44 27.8 1.0 01 173.4	45 57.8 1.0 01 173.4	47 57.8 1.0 01 173.3	48 27.8 1.0 01 173.3	48 57.8 1.0 01 173.3	50 57.8 1.0 01 173.3	6
7	41 57.1 1.0 01 172.4	42 57.1 1.0 02 172.4	44 27.1 1.0 02 172.3	45 57.0 1.0 02 172.3	47 57.0 1.0 02 172.2	48 27.0 1.0 02 172.2	48 57.0 1.0 02 172.2	50 57.0 1.0 02 172.1	7
8	41 56.2 1.0 02 171.3	42 56.2 1.0 02 171.3	44 26.2 1.0 02 171.2	45 56.1 1.0 02 171.2	47 56.1 1.0 02 171.1	48 26.1 1.0 02 171.1	48 56.1 1.0 02 171.1	50 56.1 1.0 02 171.0	8
9	41 55.2 1.0 02 170.2	42 55.2 1.0 02 170.2	44 25.1 1.0 02 170.1	45 55.1 1.0 02 170.1	47 55.1 1.0 02 170.0	48 25.1 1.0 02 170.0	48 55.1 1.0 02 170.0	50 55.0 1.0 02 169.9	9
10	41 54.1 1.0 02 169.1	42 54.0 1.0 02 169.1	44 24.0 1.0 02 169.0	45 54.0 1.0 02 169.0	47 53.9 1.0 02 168.9	48 23.9 1.0 02 168.9	48 53.9 1.0 02 168.9	50 53.9 1.0 02 168.8	10
1	41 52.8 1.0 02 168.0	42 52.8 1.0 02 168.0	44 22.8 1.0 02 167.9	45 52.7 1.0 02 167.9	47 52.7 1.0 02 167.8	48 22.7 1.0 02 167.8	48 52.6 1.0 02 167.7	50 52.6 1.0 02 167.7	1
2	41 51.5 1.0 02 166.9	42 51.4 1.0 02 166.9	44 21.4 1.0 02 166.8	45 51.4 1.0 02 166.8	47 51.3 1.0 02 166.7	48 21.3 1.0 03 166.7	48 51.3 1.0 03 166.6	50 51.2 1.0 03 166.5	2
3	41 50.0 1.0 03 165.9	42 50.0 1.0 03 165.8	44 19.9 1.0 03 165.8	45 49.9 1.0 03 165.7	47 49.8 1.0 03 165.6	48 19.8 1.0 03 165.6	48 49.8 1.0 03 165.5	50 49.7 1.0 03 165.4	3
4	41 48.4 1.0 03 164.8	42 48.4 1.0 03 164.7	44 18.3 1.0 03 164.7	45 48.3 1.0 03 164.6	47 48.2 1.0 03 164.5	48 18.1 1.0 03 164.4	48 48.1 1.0 03 164.4	50 48.0 1.0 03 164.3	4
15	41 46.7 1.0 03 163.6	42 46.7 1.0 03 163.6	44 16.6 1.0 03 163.6	45 46.4 1.0 03 163.4	47 46.4 1.0 03 163.4	48 16.4 1.0 03 163.3	48 46.4 1.0 03 163.3	50 46.3 1.0 03 163.2	15
6	41 44.9 1.0 03 162.6	42 44.8 1.0 03 162.6	44 14.8 1.0 03 162.5	45 44.7 1.0 03 162.4	47 44.6 1.0 03 162.3	48 14.6 1.0 03 162.2	48 44.5 1.0 03 162.2	50 44.4 1.0 03 162.1	6
7	41 42.9 1.0 03 161.5	42 42.9 1.0 03 161.5	44 12.8 1.0 03 161.4	45 42.7 1.0 03 161.3	47 42.6 1.0 03 161.2	48 12.6 1.0 03 161.1	48 42.5 1.0 04 161.1	50 42.4 1.0 04 160.9	7
8	41 40.9 1.0 04 160.4	42 40.8 1.0 04 160.4	44 10.8 1.0 04 160.3	45 40.7 1.0 04 160.2	47 40.5 1.0 04 160.1	48 10.5 1.0 04 160.0	48 40.5 1.0 04 160.0	50 40.3 1.0 04 159.8	8
9	41 38.7 1.0 04 159.4	42 38.7 1.0 04 159.3	44 08.6 1.0 04 159.2	45 38.5 1.0 04 159.1	47 38.3 1.0 04 159.0	48 08.3 1.0 04 158.9	48 38.3 1.0 04 158.9	50 38.1 1.0 04 158.7	9
20	41 36.5 1.0 04 158.3	42 36.4 1.0 04 158.1	44 06.3 1.0 04 158.1	45 36.2 1.0 04 158.0	47 36.0 1.0 04 157.9	48 06.0 1.0 04 157.8	48 35.9 1.0 04 157.8	50 35.8 1.0 04 157.6	20
1	41 34.1 1.0 04 157.2	42 34.0 1.0 04 157.1	44 03.9 1.0 04 157.0	45 33.8 1.0 04 156.9	47 33.6 1.0 04 156.8	48 03.6 1.0 04 156.7	48 33.5 1.0 04 156.7	50 33.3 1.0 04 156.5	1
2	41 31.6 1.0 04 156.1	42 31.5 1.0 04 156.0	44 01.4 1.0 04 155.9	45 31.3 1.0 04 155.8	47 31.1 1.0 04 155.7	48 01.0 1.0 04 155.6	48 31.0 1.0 04 155.6	50 30.8 1.0 04 155.4	2
3	41 29.0 1.0 04 155.0	42 28.9 1.0 04 155.0	43 58.8 1.0 05 154.9	45 28.6 1.0 05 154.7	47 28.4 1.0 05 154.6	47 58.4 1.0 05 154.5	48 28.3 1.0 05 154.5	50 28.1 1.0 05 154.3	3
4	41 26.3 1.0 05 153.9	42 26.2 1.0 05 153.9	43 56.1 1.0 05 153.8	45 25.9 1.0 05 153.6	47 25.7 1.0 05 153.5	47 55.6 1.0 05 153.4	48 25.5 1.0 05 153.4	50 25.3 1.0 05 153.2	4
25	41 23.5 1.0 05 152.9	42 23.4 1.0 05 152.8	43 53.3 1.0 05 152.7	45 23.1 1.0 05 152.6	47 22.8 1.0 05 152.4	47 52.8 1.0 05 152.3	48 22.7 1.0 05 152.3	50 22.4 1.0 05 152.1	25
6	41 20.6 1.0 05 151.8	42 20.5 1.0 05 151.7	43 50.3 1.0 05 151.6	45 20.1 1.0 05 151.5	47 19.9 1.0 05 151.3	47 49.8 1.0 05 151.2	48 19.7 1.0 05 151.2	50 19.4 1.0 05 151.0	6
7	41 17.6 1.0 05 150.7	42 17.5 1.0 05 150.7	43 47.3 1.0 05 150.5	45 17.1 1.0 05 150.4	47 16.8 1.0 05 150.2	47 46.7 1.0 05 150.1	48 16.7 1.0 05 150.1	50 16.3 1.0 05 149.9	7
8	41 14.5 1.0 05 149.7	42 14.4 1.0 05 149.6	43 44.1 1.0 05 149.4	45 13.9 1.0 05 149.3	47 13.6 1.0 05 149.1	47 43.6 1.0 05 149.0	48 13.5 1.0 05 149.0	50 13.1 1.0 06 148.7	8
9	41 11.3 1.0 06 148.5	42 11.1 1.0 06 148.5	43 40.9 1.0 06 148.4	45 10.7 1.0 06 148.2	47 10.4 1.0 06 148.0	47 40.3 1.0 06 147.9	48 10.3 1.0 06 147.9	50 09.9 1.0 06 147.6	9
30	41 07.9 1.0 06 147.5	42 07.8 1.0 06 147.4	43 37.6 1.0 06 147.3	45 07.3 1.0 06 147.1	47 07.0 1.0 06 146.9	47 36.9 1.0 06 146.8	48 06.8 1.0 06 146.8	50 06.4 1.0 06 146.5	30
1	41 04.5 1.0 06 146.4	42 04.4 1.0 06 146.3	43 34.1 1.0 06 146.2	45 03.9 1.0 06 146.0	47 03.5 1.0 06 145.8	47 33.4 1.0 06 145.8	48 03.3 1.0 06 145.7	50 02.9 1.0 06 145.4	1
2	41 01.0 1.0 06 145.4	42 00.8 1.0 06 145.3	43 30.6 1.0 06 145.1	45 00.3 1.0 06 145.0	46 59.9 1.0 06 144.7	47 29.8 1.0 06 144.7	47 59.7 1.0 06 144.6	49 59.3 1.0 06 144.4	2
3	40 57.4 1.0 06 144.3	41 57.2 1.0 06 144.2	43 27.0 1.0 06 144.0	44 56.7 1.0 06 143.9	46 56.3 1.0 06 143.6	47 26.2 1.0 06 143.6	47 56.1 1.0 06 143.5	49 55.6 1.0 06 143.3	3
4	40 53.7 1.0 06 143.2	41 53.5 1.0 06 143.1	43 23.2 1.0 06 143.0	44 52.9 1.0 06 142.8	46 52.5 1.0 06 142.6	47 22.4 1.0 06 142.5	47 52.3 1.0 06 142.4	49 51.8 1.0 06 142.2	4
35	40 49.9 1.0 06 142.2	41 49.7 1.0 06 142.1	43 19.4 1.0 07 141.9	44 49.1 1.0 07 141.7	46 48.6 1.0 07 141.5	47 18.5 1.0 07 141.4	47 48.4 1.0 07 141.3	49 47.9 1.0 07 141.1	35
6	40 46.0 1.0 07 141.1	41 45.8 1.0 07 141.0	43 15.5 1.0 07 140.8	44 45.2 1.0 07 140.7	46 44.7 1.0 07 140.4	47 14.6 1.0 07 140.3	47 44.4 1.0 07 140.3	49 43.9 1.0 07 140.0	6
7	40 42.0 1.0 07 140.0	41 41.8 1.0 07 139.9	43 11.5 1.0 07 139.8	44 41.1 1.0 07 139.6	46 40.6 1.0 07 139.3	47 10.5 1.0 07 139.3	47 40.4 1.0 07 139.2	49 39.8 1.0 07 138.9	7
8	40 37.9 1.0 07 139.0	41 37.7 1.0 07 138.9	43 07.4 1.0 07 138.7	44 37.0 1.0 07 138.5	46 36.5 1.0 07 138.2	47 06.4 1.0 07 138.2	47 36.2 1.0 07 138.1	49 35.7 1.0 07 137.8	8
9	40 33.8 1.0 07 137.9	41 33.6 1.0 07 137.8	43 03.2 1.0 07 137.6	44 32.8 1.0 07 137.4	46 32.3 1.0 07 137.2	47 02.2 1.0 07 137.1	47 32.0 1.0 07 137.0	49 31.4 99 07 136.7	9
40	40 29.5 1.0 07 136.9	41 29.3 1.0 07 136.7	42 58.9 1.0 07 136.6	44 28.5 1.0 07 136.4	46 28.0 1.0 07 136.1	46 57.8 1.0 07 136.0	47 27.7 1.0 07 135.9	49 27.1 99 07 135.6	40
1	40 25.2 1.0 07 135.8	41 25.0 1.0 07 135.7	42 54.6 1.0 07 135.5	44 24.2 1.0 07 135.3	46 23.6 1.0 07 135.0	46 53.4 99 07 134.9	47 23.3 99 08 134.9	49 22.7 99 08 134.6	1
2	40 20.8 1.0 08 134.7	41 20.5 1.0 08 134.6	42 50.1 1.0 08 134.4	44 19.7 1.0 08 134.2	46 19.1 99 08 133.9	46 49.0 99 08 133.9	47 18.8 99 08 133.8	49 18.1 99 08 133.5	2
3	40 16.3 1.0 08 133.6	41 16.0 1.0 08 133.6	42 45.6 1.0 08 133.4	44 15.2 1.0 08 133.2	46 14.6 99 08 132.9	46 44.4 99 08 132.7	47 14.2 99 08 132.7	49 13.5 99 08 132.4	3
4	40 11.7 1.0 08 132.6	41 11.4 1.0 08 132.5	42 41.0 1.0 08 132.3	44 10.6 99 08 132.1	46 09.9 99 08 131.8	46 39.8 99 08 131.7	47 09.6 99 08 131.7	49 08.9 99 08 131.3	4
45	40 07.1 1.0 08 131.6	41 06.8 1.0 08 131.4	42 36.3 99 08 131.2	44 05.9 99 08 131.0	46 05.2 99 08 130.7	46 35.0 99 08 130.7	47 04.9 99 08 130.6	49 04.1 99 08 130.3	45
6	40 02.3 1.0 08 130.5	41 02.0 1.0 08 130.4	42 31.6 99 08 130.2	44 01.1 99 08 130.0	46 00.4 99 08 129.7	46 30.2 99 08 129.6	47 00.1 99 08 129.5	48 59.3 99 08 129.2	6
7	39 57.5 1.0 08 129.5	40 57.2 99 08 129.3	42 26.8 99 08 129.1	43 56.3 99 08 128.9	45 55.5 99 08 128.6	46 25.4 99 08 128.5	46 55.2 99 08 128.5	48 54.4 99 08 128.1	7
8	39 52.7 99 08 128.4	40 52.3 99 08 128.3	42 21.9 99 08 128.1	43 51.3 99 08 127.9	45 50.6 99 08 127.6	46 20.4 99 08 127.5	46 50.2 99 08 127.4	48 49.4 99 09 127.0	8
9	39 47.7 99 08 127.4	40 47.4 99 08 127.2	42 16.9 99 08 127.0	43 46.4 99 08 126.8	45 45.6 99 08 126.5	46 15.4 99 08 126.4	46 45.2 99 08 126.3	48 44.4 99 09 126.0	9
50	39 42.7 99 08 126.3	40 42.4 99 08 126.2	42 11.8 99 09 126.0	43 41.3 99 09 125.8	45 40.5 99 09 125.4	46 10.3 99 09 125.4	46 40.1 99 09 125.3	48 39.3 99 09 124.9	50
1	39 37.6 99 09 125.3	40 37.3 99 09 125.1	42 06.7 99 09 124.9	43 36.2 99 09 124.7	45 35.4 99 09 124.4	46 05.2 99 09 124.3	46 35.0 99 09 124.2	48 34.1 99 09 123.9	1
2	39 32.5 99 09 124.2	40 32.1 99 09 124.1	42 01.6 99 09 123.9	43 31.0 99 09 123.7	45 30.2 99 09 123.3	46 00.0 99 09 123.2	46 29.8 99 09 123.2	48 28.9 99 09 122.8	2
3	39 27.2 99 09 123.2	40 26.9 99 09 123.1	41 56.3 99 09 122.8	43 25.7 99 09 122.6	45 24.9 99 09 122.3	45 54.7 99 09 122.2	46 24.5 99 09 122.1	48 23.6 99 09 121.7	3
4	39 22.0 99 09 122.2	40 21.6 99 09 122.0	41 51.0 99 09 121.8	43 20.4 99 09 121.6	45 19.6 99 09 121.2	45 49.4 99 09 121.1	46 19.1 99 09 121.1	48 18.2 99 09 120.7	4
55	39 16.6 99 09 121.1	40 16.2 99 09 121.0	41 45.7 99 09 120.7	43 15.1 99 09 120.5	45 14.2 99 09 120.2	45 44.0 99 09 120.1	46 13.7 99 09 120.0	48 12.8 99 09 119.6	55
6	39 11.2 99 09 120.1	40 10.8 99 09 119.9	41 40.2 99 09 119.7	43 09.6 99 09 119.5	45 08.7 99 09 119.1	45 38.5 99 09 119.0	46 08.3 99 09 119.0	48 07.3 99 09 118.6	6
7	39 05.8 99 09 119.0	40 05.4 99 09 118.9	41 34.8 99 09 118.7	43 04.1 99 09 118.4	45 03.2 99 09 118.1	45 33.0 99 09 118.0	46 02.8 99 09 117.9	48 01.8 99 09 117.5	7
8	39 00.3 99 09 118.0	39 59.9 99 09 117.9	41 29.2 99 09 117.6	42 58.6 99 09 117.4	44 57.7 99 09 117.0	45 27.4 99 09 117.0	45 57.2 99 09 116.9	47 56.2 99 09 116.5	8
9	38 54.7 99 09 117.0	39 54.3 99 09 116.8	41 23.7 99 09 116.6	42 53.0 99 09 116.3	44 52.1 99 09 116.0	45 21.8 99 09 115.9	45 51.6 99 09 115.8	47 50.5 99 09 115.4	9
60	38 49.1 99 09 115.9	39 48.7 99 09 115.8	41 18.0 99 09 115.6	42 47.4 99 09 115.3	44 46.4 99 10 115.0	45 16.2 99 10 114.9	45 45.9 99 10 114.8	47 44.9 99 10 114.4	60
1	38 43.4 99 10 114.9	39 43.0 99 10 114.8	41 12.3 99 10 114.5	42 41.7 99 10 114.3	44 40.7 99 10 113.9	45 10.4 99 10 113.8	45 40.2 99 10 113.7	47 39.1 99 10 113.4	1
2	38 37.7 99 10 113.9	39 37.3 99 10 113.7	41 06.6 99 10 113.5	42 35.9 99 10 113.2	44 34.9 99 10 112.9	45 04.7 99 10 112.8	45 34.4 99 10 112.7	47 33.3 99 10 112.3	2
3	38 31.9 99 10 112.9	39 31.5 99 10 112.7	41 00.8 99 10 112.5	42 30.1 99 10 112.2	44 29.1 99 10 111.9	44 58.9 99 10 111.8	45 28.6 99 10 111.7	47 27.5 99 10 111.3	3
4	38 26.1 99 10 111.8	39 25.7 99 10 111.7	40 55.0 99 10 111.4	42 24.3 99 10 111.2	44 23.3 99 10 110.8	44 53.0 99 10 110.7	45 22.8 99 10 110.6	47 21.7 99 10 110.2	4
65	38 20.3 99 10 110.8	39 19.9 99 10 110.6	40 49.2 99 10 110.4	42 18.4 99 10 110.2	44 17.4 99 10 109.8	44 47.2 99 10 109.7	45 16.9 99 10 109.6	47 15.7 99 10 109.2	65
6	38 14.4 99 10 109.8	39 14.0 99 10 109.6	40 43.3 99 10 109.4	42 12.5 99 10 109.1	44 11.5 99 10 108.8	44 41.2 99 10 108.7	45 11.0 99 10 108.6	47 09.8 99 10 108.2	6
7	38 08.5 99 10 108.8	39 08.0 99 10 108.6	40 37.3 99 10 108.4	42 06.6 99 10 108.1	44 05.5 99 10 107.7	44 35.3 99 10 107.6	45 05.0 99 10 107.6	47 03.8 99 10 107.2	7
8	38 02.5 99 10 107.7	39 02.1 99 10 107.6	40 31.4 99 10 107.3	42 00.6 99 10 107.1	43 59.6 99 10 106.7	44 29.3 99 10 106.6	44 59.0 99 10 106.5	46 57.8 99 10 106.1	8
9	37 56.6 99 10 106.7	38 56.1 99 10 106.6	40 25.4 99 10 106.3	41 54.6 99 10 106.1	43 53.5 99 10 105.7	44 23.2 99 10 105.6	44 53.0 99 10 105.5	46 51.8 99 10 105.1	9
70	37 50.5 99 10 105.7	38 50.1 99 10 105.5	40 19.3 99 10 105.3	41 48.6 99 10 105.0	43 47.5 99 10 104.7	44 17.2 99 10 104.6	44 46.9 99 10 104.5	46 45.7 99 10 104.1	70
1	37 44.5 99 10 104.7	38 44.0 99 10 104.5	40 13.3 99 10 104.3	41 42.5 99 10 104.0	43 41.4 99 10 103.7	44 11.1 99 10 103.6	44 40.8 99 10 103.5	46 39.6 99 10 103.1	1
2	37 38.4 99 10 103.7	38 37.9 99 10 103.5	40 07.2 99 10 103.3	41 36.4 99 10 103.0	43 35.3 99 10 102.6	44 05.0 99 10 102.5	44 34.7 99 10 102.4	46 33.5 99 10 102.0	2
3	37 32.3 99 10 102.7	38 31.8 99 10 102.5	40 01.1 99 10 102.3	41 30.3 99 10 102.0	43 29.2 99 10 101.6	43 58.9 99 10 101.5	44 28.6 99 10 101.4	46 27.3 99 10 101.0	3
4	37 26.2 99 10 101.6	38 25.7 99 10 101.5	39 54.9 99 10 101.2	41 24.1 99 10 101.0	43 23.0 99 10 100.6	43 52.7 99 10 100.5	44 22.4 99 10 100.4	46 21.2 99 10 100.0	4
75	37 20.0 99 10 100.6	38 19.5 99 10 100.5	39 48.7 99 10 100.2	41 18.0 99 10 100.0	43 16.8 99 10 99.6	43 46.5 99 10 99.5	44 16.2 99 10 99.4	46 15.0 99 10 99.0	75
6	37 13.8 99 10 99.6	38 13.3 99 10 99.5	39 42.6 99 10 99.2	41 11.8 99 10 99.0	43 10.6 99 10 98.6	43 40.3 99 10 98.5	44 10.0 99 10 98.4	46 08.8 99 10 98.0	6
7	37 07.6 99 10 98.6	38 07.1 99 10 98.5	39 36.4 99 10 98.2	41 05.6 99 10 97.9	43 04.4 99 10 97.6	43 34.1 99 10 97.5	44 03.8 99 10 97.4	46 02.6 99 10 97.0	7
8	37 01.4 99 10 97.6	38 00.9 99 10 97.5	39 30.2 99 10 97.2	40 59.3 99 10 96.9	42 58.2 99 10 96.6	43 27.9 99 10 96.5	43 57.6 99 10 96.4	45 56.3 99 10 96.0	8
9	36 55.2 99 10 96.6	37 54.7 99 10 96.5	39 23.9 99 10 96.2	40 53.1 99 10 95.9	42 52.0 99 10 95.6	43 21.7 99 10 95.5	43 51.4 99 10 95.4	45 50.1 99 10 95.0	9
80	36 49.0 99 10 95.6	37 48.5 99 10 95.4	39 17.7 99 10 95.2	40 46.9 99 10 94.9	42 45.7 99 10 94.6	43 15.4 99 10 94.5	43 45.1 99 10 94.4	45 43.8 99 10 94.0	80
1	36 42.7 99 10 94.6	37 42.2 99 10 94.4	39 11.4 99 10 94.2	40 40.6 99 10 93.9	42 39.5 99 10 93.6	43 09.2 99 10 93.5	43 38.9 99 10 93.4	45 37.6 99 10 93.0	1
2	36 36.5 99 10 93.6	37 36.0 99 10 93.4	39 05.2 99 10 93.2	40 34.4 99 10 92.9	42 33.2 99 10 92.6	43 02.9 99 10 92.5	43 32.6 99 10 92.4	45 31.3 99 10 92.0	2
3	36 30.2 99 10 92.6	37 29.7 99 10 92.4	38 58.9 99 10 92.2	40 28.1 99 10 91.9	42 26.9 99 10 91.6	42 56.6 99 10 91.5	43 26.3 99 10 91.4	45 25.1 99 10 91.0	3
4	36 23.9 99 10 91.6	37 23.4 99 10 91.5	38 52.6 99 10 91.2	40 21.8 99 10 90.9	42 20.7 99 10 90.6	42 50.4 99 10 90.5	43 20.1 99 10 90.4	45 18.8 99 10 90.0	4
85	36 17.7 99 10 90.6	37 17.2 99 10 90.5	38 46.4 99 10 90.2	40 15.5 99 10 89.9	42 14.4 99 10 89.6	42 44.1 99 10 89.5	43 13.8 99 10 89.4	45 12.5 99 10 89.0	85
6	36 11.4 99 10 89.6	37 10.9 99 10 89.5	38 40.1 99 10 89.2	40 09.3 99 10 88.9	42 08.1 99 10 88.6	42 37.8 99 10 88.5	43 07.5 99 10 88.4	45 06.2 99 10 88.0	6
7	36 05.1 99 10 88.6	37 04.6 99 10 88.5	38 33.8 99 10 88.2	40 03.0 99 10 88.0	42 01.9 99 10 87.6	42 31.6 99 10 87.5	43 01.2 99 10 87.4	45 00.0 99 10 87.0	7
8	35 58.9 99 10 87.6	36 58.4 99 10 87.5	38 27.6 99 10 87.2	39 56.7 99 10 87.0	41 55.6 99 10 86.6	42 25.3 99 10 86.5	42 55.0 99 10 86.4	44 53.7 99 10 86.0	8
9	35 52.6 99 10 86.6	36 52.1 99 10 86.5	38 21.3 99 10 86.2	39 50.5 99 10 86.0	41 49.3 99 10 85.6	42 19.0 99 10 85.5	42 48.7 99 10 85.4	44 47.5 99 10 85.0	9
90	35 46.3 99 10 85.7	36 45.8 99 10 85.5	38 15.0 99 10 85.2	39 44.2 99 10 85.0	41 43.1 99 10 84.6	42 12.8 99 10 84.5	42 42.5 99 10 84.4	44 41.2 99 10 84.0	90

Lat. 84°

H.A.	36°00' Alt	Δd Δt	Az	37°00' Alt	Δd Δt	Az	38°30' Alt	Δd Δt	Az	40°00' Alt	Δd Δt	Az	42°00' Alt	Δd Δt	Az	42°30' Alt	Δd Δt	Az	43°00' Alt	Δd Δt	Az	45°00' Alt	Δd Δt	Az	H.A.
91	35 40.1	99 10	84.7	36 39.6	99 10	84.5	38 08.8	99 10	84.3	39 38.0	99 10	84.0	41 36.8	99 10	83.6	42 06.5	99 10	83.5	42 36.2	99 10	83.4	44 35.0	99 10	83.1	91
2	35 33.8	99 10	83.7	36 33.3	99 10	83.5	38 02.6	99 10	83.3	39 31.8	99 10	83.0	41 30.6	99 10	82.7	42 00.3	99 10	82.6	42 30.0	99 10	82.5	44 28.8	99 10	82.1	2
3	35 27.6	99 10	82.7	36 27.1	99 10	82.5	37 56.3	99 10	82.3	39 25.5	99 10	82.0	41 24.4	99 10	81.7	41 54.1	99 10	81.6	42 23.8	99 10	81.5	44 22.6	99 10	81.1	3
4	35 21.4	99 10	81.7	36 20.9	99 10	81.6	37 50.1	99 10	81.3	39 19.3	99 10	81.1	41 18.2	99 10	80.7	41 47.9	99 10	80.6	42 17.6	99 10	80.5	44 16.4	99 10	80.1	4
95	35 15.2	99 10	80.7	36 14.7	99 10	80.6	37 43.9	99 10	80.3	39 13.1	99 10	80.1	41 12.0	99 10	79.7	41 41.7	99 10	79.6	42 11.4	99 10	79.5	44 10.2	99 10	79.1	95
6	35 09.0	99 10	79.7	36 08.5	99 10	79.6	37 37.8	99 10	79.3	39 07.0	99 10	79.1	41 05.9	99 10	78.7	41 35.6	99 10	78.6	42 05.3	99 10	78.6	44 04.1	99 10	78.2	6
7	35 02.9	99 10	78.8	36 02.4	99 10	78.6	37 31.6	99 10	78.4	39 00.8	99 10	78.1	40 59.7	99 10	77.8	41 29.4	99 10	77.7	41 59.1	99 10	77.6	43 57.9	99 10	77.2	7
8	34 56.7	99 10	77.8	35 56.2	99 10	77.6	37 25.5	99 10	77.4	38 54.7	99 10	77.1	40 53.6	99 10	76.8	41 23.3	99 10	76.7	41 53.0	99 10	76.6	43 51.8	99 10	76.2	8
9	34 50.6	99 10	76.8	35 50.1	99 10	76.7	37 19.4	99 10	76.4	38 48.6	99 10	76.2	40 47.5	99 10	75.8	41 17.2	99 10	75.7	41 46.9	99 10	75.6	43 45.8	99 10	75.2	9
100	34 44.5	99 10	75.8	35 44.0	99 10	75.7	37 13.3	99 10	75.4	38 42.5	99 10	75.2	40 41.4	99 10	74.8	41 11.2	99 10	74.7	41 40.9	99 10	74.7	43 39.7	99 10	74.3	100
1	34 38.4	99 10	74.9	35 38.0	99 10	74.7	37 07.2	99 10	74.5	38 36.5	99 10	74.2	40 35.4	99 10	73.9	41 05.1	99 10	73.8	41 34.8	99 10	73.7	43 33.7	99 10	73.3	1
2	34 32.4	99 10	73.9	35 31.9	99 10	73.7	37 01.2	99 10	73.5	38 30.5	99 10	73.2	40 29.4	99 10	72.9	40 59.1	99 10	72.8	41 28.8	99 10	72.7	43 27.7	99 10	72.3	2
3	34 26.4	99 10	72.9	35 25.9	99 10	72.8	36 55.2	99 10	72.5	38 24.5	99 10	72.3	40 23.4	99 10	71.9	40 53.1	99 10	71.8	41 22.9	99 10	71.8	43 21.7	99 10	71.4	3
4	34 20.4	99 10	71.9	35 20.0	99 10	71.8	36 49.2	99 10	71.5	38 18.5	99 10	71.3	40 17.5	99 10	71.0	40 47.2	99 10	70.9	41 16.9	99 10	70.8	43 15.8	99 10	70.4	4
105	34 14.5	99 10	71.0	35 14.0	99 10	70.8	36 43.3	99 10	70.6	38 12.6	99 10	70.3	40 11.6	99 10	70.0	40 41.3	99 10	69.9	41 11.0	99 10	69.8	43 09.9	99 10	69.5	105
6	34 08.6	99 10	70.0	35 08.1	99 10	69.8	36 37.4	99 10	69.6	38 06.7	99 10	69.4	40 05.7	99 10	69.0	40 35.4	99 10	69.0	41 05.2	99 10	68.9	43 04.1	99 10	68.5	6
7	34 02.7	99 10	69.0	35 02.2	99 10	68.9	36 31.6	99 10	68.6	38 00.8	99 10	68.4	39 59.8	99 10	68.1	40 29.6	99 10	68.0	40 59.3	99 10	67.9	42 58.2	99 10	67.5	7
8	33 56.9	99 10	68.1	34 56.4	99 10	67.9	36 25.7	99 10	67.7	37 55.0	99 10	67.4	39 54.0	99 10	67.1	40 23.8	99 10	67.0	40 53.5	99 10	66.9	42 52.5	99 10	66.6	8
9	33 51.1	99 10	67.1	34 50.6	99 10	67.0	36 20.0	99 10	66.7	37 49.3	99 10	66.5	39 48.3	99 10	66.1	40 18.0	99 10	66.0	40 47.8	99 10	66.0	42 46.7	99 10	65.6	9
110	33 45.3	99 10	66.1	34 44.9	99 10	66.0	36 14.2	99 10	65.8	37 43.5	99 09	65.5	39 42.6	99 09	65.2	40 12.3	99 09	65.1	40 42.1	99 09	65.0	42 41.0	99 09	64.7	110
1	33 39.6	99 09	65.2	34 39.2	99 09	65.0	36 08.5	99 09	64.8	37 37.8	99 09	64.6	39 36.9	99 09	64.2	40 06.7	99 09	64.2	40 36.4	99 09	64.1	42 35.4	99 09	63.7	1
2	33 33.9	99 09	64.2	34 33.5	99 09	64.0	36 02.9	99 09	63.8	37 32.2	99 09	63.6	39 31.3	99 09	63.3	40 01.0	99 09	63.2	40 30.8	99 09	63.1	42 29.8	99 09	62.8	2
3	33 28.3	99 09	63.2	34 27.9	99 09	63.1	35 57.3	99 09	62.9	37 26.6	99 09	62.6	39 25.7	99 09	62.3	39 55.5	99 09	62.2	40 25.2	99 09	62.2	42 24.2	99 09	61.8	3
4	33 22.7	99 09	62.3	34 22.3	99 09	62.1	35 51.7	99 09	61.9	37 21.1	99 09	61.7	39 20.2	99 09	61.4	39 49.9	99 09	61.4	40 19.7	99 09	61.2	42 18.7	99 09	60.9	4
115	33 17.2	99 09	61.3	34 16.8	99 09	61.2	35 46.2	99 09	60.9	37 15.6	99 09	60.7	39 14.7	99 09	60.4	39 44.5	99 09	60.3	40 14.2	99 09	60.3	42 13.3	99 09	59.9	115
6	33 11.7	99 09	60.3	34 11.3	99 09	60.2	35 40.7	99 09	60.0	37 10.1	99 09	59.8	39 09.3	99 09	59.5	39 39.0	99 09	59.4	40 08.8	99 09	59.3	42 07.9	99 09	59.0	6
7	33 06.3	99 09	59.4	34 05.9	99 09	59.2	35 35.3	99 09	59.0	37 04.7	99 09	58.8	39 03.9	99 09	58.5	39 33.7	99 09	58.4	40 03.4	99 09	58.4	42 02.5	99 09	58.0	7
8	33 00.9	99 09	58.4	34 00.6	99 09	58.3	35 30.0	99 09	57.9	36 59.4	99 09	57.9	38 58.6	99 09	57.6	39 28.4	99 09	57.5	39 58.1	99 09	57.4	41 57.2	99 09	57.1	8
9	32 55.6	99 09	57.5	33 55.2	99 09	57.3	35 24.7	99 09	57.1	36 54.1	99 09	56.9	38 53.3	99 09	56.6	39 23.1	99 09	56.5	39 52.9	99 09	56.5	41 52.0	99 09	56.1	9
120	32 50.4	99 09	56.5	33 50.0	99 09	56.4	35 19.5	99 09	56.2	36 48.9	99 09	56.0	38 48.1	99 09	55.7	39 17.9	99 09	55.6	39 47.7	99 09	55.5	41 46.8	99 09	55.2	120
1	32 45.1	99 00	55.5	33 44.8	99 09	55.4	35 14.3	99 09	55.2	36 43.7	99 08	55.0	38 42.9	99 08	54.7	39 12.7	99 08	54.7	39 42.5	99 08	54.6	41 41.7	99 08	54.3	1
2	32 40.0	99 08	54.6	33 39.7	99 08	54.5	35 09.1	99 08	54.3	36 38.6	99 08	54.1	38 37.9	99 08	53.8	39 07.7	99 08	53.7	39 37.5	99 08	53.6	41 36.6	99 08	53.3	2
3	32 34.9	99 08	53.6	33 34.6	99 08	53.5	35 04.1	99 08	53.3	36 33.6	99 08	53.1	38 32.8	99 08	52.8	39 02.6	99 08	52.8	39 32.4	99 08	52.7	41 31.6	99 08	52.4	3
4	32 29.9	99 08	52.7	33 29.6	99 08	52.6	34 59.1	99 08	52.4	36 28.6	99 08	52.2	38 27.9	99 08	51.9	38 57.7	99 08	51.8	39 27.5	99 08	51.7	41 26.7	99 08	51.4	4
125	32 25.0	99 08	51.7	33 24.6	99 08	51.6	34 54.2	99 08	51.4	36 23.7	99 08	51.2	38 23.0	99 08	50.9	38 52.8	99 08	50.9	39 22.6	99 08	50.8	41 21.8	99 08	50.5	125
6	32 20.1	99 08	50.8	33 19.8	99 08	50.7	34 49.3	99 08	50.5	36 18.8	99 08	50.3	38 18.1	99 08	50.0	38 47.9	99 08	49.9	39 17.8	99 08	49.9	41 17.0	99 08	49.6	6
7	32 15.2	1.00 08	49.8	33 14.9	1.00 08	49.7	34 44.5	99 08	49.5	36 14.0	99 08	49.3	38 13.3	99 08	49.1	38 43.2	99 08	49.0	39 13.0	99 08	48.9	41 12.3	99 08	48.6	7
8	32 10.5	1.00 08	48.9	33 10.2	1.00 08	48.8	34 39.7	1.00 08	48.6	36 09.3	99 08	48.4	38 08.6	99 08	48.1	38 38.5	99 08	48.1	39 08.3	99 08	48.0	41 07.6	99 08	47.7	8
9	32 05.8	1.00 08	47.9	33 05.5	1.00 08	47.8	34 35.1	1.00 08	47.6	36 04.6	99 08	47.4	38 04.0	99 08	47.2	38 33.8	99 08	47.1	39 03.7	99 08	47.1	41 03.0	99 08	46.8	9
130	32 01.2	1.00 08	47.0	33 00.9	1.00 08	46.9	34 30.5	1.00 08	46.7	36 00.0	1.00 08	46.5	37 59.4	99 08	46.2	38 29.3	99 07	46.2	38 59.1	99 07	46.1	40 58.5	99 07	45.8	130
1	31 56.6	1.00 07	46.0	32 56.4	1.00 07	45.9	34 26.0	1.00 07	45.7	35 55.5	1.00 07	45.6	37 54.9	1.00 07	45.3	38 24.8	99 07	45.2	38 54.6	99 07	45.2	40 54.0	99 07	44.9	1
2	31 52.1	1.00 07	45.1	32 51.9	1.00 07	45.0	34 21.5	1.00 07	44.8	35 51.1	1.00 07	44.6	37 50.5	1.00 07	44.4	38 20.4	1.00 07	44.3	38 50.2	1.00 07	44.2	40 49.6	99 07	44.0	2
3	31 47.7	1.00 07	44.1	32 47.5	1.00 07	44.0	34 17.1	1.00 07	43.7	35 46.7	1.00 07	43.7	37 46.2	1.00 07	43.4	38 16.0	1.00 07	43.3	38 45.9	1.00 07	43.3	40 45.3	99 07	43.1	3
4	31 43.4	1.00 07	43.2	32 43.2	1.00 07	43.1	34 12.8	1.00 07	42.9	35 42.4	1.00 07	42.7	37 41.9	1.00 07	42.5	38 11.8	1.00 07	42.4	38 41.6	1.00 07	42.4	40 41.1	1.00 07	42.1	4
135	31 39.2	1.00 07	42.2	32 38.9	1.00 07	42.1	34 08.6	1.00 07	42.0	35 38.2	1.00 07	41.8	37 37.7	1.00 07	41.6	38 07.6	1.00 07	41.5	38 37.4	1.00 07	41.4	40 36.9	1.00 07	41.2	135
6	31 35.0	1.00 07	41.3	32 34.8	1.00 07	41.2	24 04.4	1.00 07	41.0	35 34.1	1.00 07	40.9	37 33.6	1.00 07	40.6	38 03.5	1.00 07	40.6	38 33.3	1.00 07	40.5	40 32.8	1.00 07	40.3	6
7	31 30.9	1.00 07	40.3	32 30.7	1.00 07	40.2	34 00.3	1.00 07	40.1	35 30.0	1.00 07	39.9	37 29.5	1.00 07	39.7	37 59.4	1.00 07	39.6	38 29.3	1.00 07	39.6	40 28.8	1.00 07	39.3	7
8	31 26.8	1.00 07	39.4	32 26.7	1.00 07	39.3	33 56.3	1.00 07	39.1	35 26.0	1.00 07	39.0	37 25.6	1.00 06	38.8	37 55.4	1.00 06	38.7	38 25.3	1.00 06	38.7	40 24.8	1.00 06	38.4	8
9	31 22.9	1.00 06	38.4	32 22.7	1.00 06	38.3	33 52.4	1.00 06	38.2	35 22.1	1.00 06	38.0	37 21.7	1.00 06	37.8	37 51.6	1.00 06	37.8	38 21.5	1.00 06	37.7	40 21.0	1.00 06	37.5	9
140	31 19.1	1.00 06	37.5	32 18.9	1.00 06	37.4	33 48.6	1.00 06	37.3	35 18.3	1.00 06	37.1	37 17.9	1.00 06	36.9	37 47.8	1.00 06	36.9	38 17.7	1.00 06	36.8	40 17.2	1.00 06	36.6	140
1	31 15.3	1.00 06	36.6	32 15.1	1.00 06	36.5	33 44.8	1.00 06	36.3	35 14.5	1.00 06	36.2	37 14.1	1.00 06	36.0	37 44.0	1.00 06	35.9	38 13.9	1.00 06	35.9	40 13.5	1.00 06	35.6	1
2	31 11.6	1.00 06	35.6	32 11.4	1.00 06	35.5	33 41.2	1.00 06	35.4	35 10.9	1.00 06	35.2	37 10.5	1.00 06	35.0	37 40.4	1.00 06	35.0	38 10.3	1.00 06	34.9	40 09.9	1.00 06	34.7	2
3	31 08.0	1.00 06	34.7	32 07.8	1.00 06	34.6	33 37.6	1.00 06	34.4	35 07.3	1.00 06	34.3	37 06.9	1.00 06	34.1	37 36.8	1.00 06	34.1	38 06.8	1.00 06	34.0	40 06.4	1.00 06	33.8	3
4	31 04.5	1.00 06	33.7	32 04.3	1.00 06	33.6	33 34.1	1.00 06	33.5	35 03.8	1.00 06	33.4	37 03.5	1.00 06	33.2	37 33.4	1.00 06	33.1	38 03.3	1.00 06	33.1	40 02.9	1.00 06	32.9	4
145	31 01.0	1.00 06	32.8	32 00.9	1.00 06	32.7	33 30.6	1.00 06	32.6	35 00.4	1.00 06	32.4	37 00.1	1.00 06	32.3	37 30.0	1.00 06	32.2	37 59.9	1.00 06	32.2	39 59.5	1.00 05	32.0	145
6	30 57.7	1.00 05	31.8	31 57.5	1.00 05	31.8	33 27.3	1.00 05	31.6	34 57.1	1.00 05	31.5	36 56.8	1.00 05	31.3	37 26.7	1.00 05	31.3	37 56.6	1.00 05	31.2	39 56.3	1.00 05	31.0	6
7	30 54.4	1.00 05	30.9	31 54.3	1.00 05	30.8	33 24.1	1.00 05	30.7	34 53.9	1.00 05	30.6	36 53.6	1.00 05	30.4	37 23.5	1.00 05	30.3	37 53.4	1.00 05	30.3	39 53.1	1.00 05	30.1	7
8	30 51.2	1.00 05	30.0	31 51.1	1.00 05	29.9	33 20.9	1.00 05	29.8	34 50.7	1.00 05	29.6	36 50.4	1.00 05	29.5	37 20.4	1.00 05	29.4	37 50.3	1.00 05	29.4	39 50.0	1.00 05	29.2	8
9	30 48.1	1.00 05	29.0	31 48.0	1.00 05	28.9	33 17.8	1.00 05	28.8	34 47.6	1.00 05	28.7	36 47.4	1.00 05	28.6	37 17.3	1.00 05	28.5	37 47.2	1.00 05	28.5	39 47.0	1.00 05	28.3	9
150	30 45.1	1.00 05	28.1	31 45.0	1.00 05	28.0	33 14.9	1.00 05	27.9	34 44.7	1.00 05	27.8	36 44.4	1.00 05	27.6	37 14.4	1.00 05	27.6	37 44.3	1.00 05	27.5	39 44.0	1.00 05	27.4	150
1	30 42.2	1.00 05	27.1	31 42.1	1.00 05	27.1	33 12.0	1.00 05	27.0	34 41.8	1.00 05	26.9	36 41.6	1.00 05	26.7	37 11.5	1.00 05	26.7	37 41.4	1.00 05	26.6	39 41.2	1.00 05	26.5	1
2	30 39.4	1.00 05	26.2	31 39.3	1.00 05	26.1	33 09.2	1.00 04	26.0	34 39.0	1.00 04	25.9	36 38.8	1.00 04	25.8	37 08.7	1.00 04	25.7	37 38.7	1.00 04	25.7	39 38.4	1.00 04	25.5	2
3	30 36.7	1.00 04	25.3	31 36.6	1.00 04	25.2	33 06.5	1.00 04	25.1	34 36.3	1.00 04	25.0	36 36.1	1.00 04	24.9	37 06.1	1.00 04	24.8	37 36.0	1.00 04	24.8	39 35.8	1.00 04	24.6	3
4	30 34.1	1.00 04	24.3	31 34.0	1.00 04	24.3	33 03.9	1.00 04	24.2	34 33.7	1.00 04	24.1	36 33.5	1.00 04	23.9	37 03.5	1.00 04	23.9	37 33.4	1.00 04	23.9	39 33.2	1.00 04	23.7	4
155	30 31.5	1.00 04	23.4	31 31.5	1.00 04	23.3	33 01.3	1.00 04	23.2	34 31.2	1.00 04	23.1	36 31.0	1.00 04	23.0	37 01.0	1.00 04	23.0	37 30.9	1.00 04	22.9	39 30.7	1.00 04	22.8	155
6	30 29.1	1.00 04	22.4	31 29.0	1.00 04	22.4	32 58.9	1.00 04	22.3	34 28.8	1.00 04	22.2	36 28.6	1.00 04	22.1	36 58.6	1.00 04	22.0	37 28.5	1.00 04	22.0	39 28.4	1.00 04	21.9	6
7	30 26.7	1.00 04	21.5	31 26.7	1.00 04	21.5	32 56.6	1.00 04	21.4	34 26.5	1.00 04	21.3	36 26.3	1.00 04	21.2	36 56.3	1.00 04	21.2	37 26.2	1.00 04	21.1	39 26.1	1.00 04	21.0	7
8	30 24.5	1.00 04	20.6	31 24.4	1.00 04	20.5	32 54.3	1.00 04	20.4	34 24.2	1.00 04	20.4	36 24.1	1.00 04	20.2	36 54.1	1.00 04	20.2	37 24.0	1.00 04	20.2	39 23.9	1.00 04	20.0	8
9	30 22.3	1.00 03	19.6	31 22.3	1.00 03	19.6	32 52.2	1.00 03	19.5	34 22.1	1.00 03	19.4	36 22.0	1.00 03	19.3	36 51.9	1.00 03	19.3	37 21.9	1.00 03	19.3	39 21.8	1.00 03	19.1	9
160	30 20.3	1.00 03	18.7	31 20.2	1.00 03	18.7	32 50.1	1.00 03	18.6	34 20.1	1.00 03	18.5	36 19.9	1.00 03	18.4	36 49.9	1.00 03	18.4	37 19.9	1.00 03	18.3	39 19.8	1.00 03	18.2	160
1	30 18.3	1.00 03	17.8	31 18.3	1.00 03	17.7	32 48.2	1.00 03	17.6	34 18.1	1.00 03	17.6	36 18.0	1.00 03	17.5	36 48.0	1.00 03	17.4	37 18.0	1.00 03	17.4	39 17.9	1.00 03	17.3	1
2	30 16.5	1.00 03	16.8	31 16.4	1.00 03	16.8	32 46.3	1.00 03	16.7	34 16.3	1.00 03	16.6	36 16.2	1.00 03	16.5	36 46.2	1.00 03	16.5	37 16.1	1.00 03	16.5	39 16.0	1.00 03	16.4	2
3	30 14.7	1.00 03	15.9	31 14.6	1.00 03	15.8	32 44.6	1.00 03	15.8	34 14.5	1.00 03	15.7	36 14.4	1.00 03	15.6	36 44.4	1.00 03	15.6	37 14.4	1.00 03	15.6	39 14.3	1.00 03	15.5	3
4	30 13.0	1.00 03	15.0	31 13.0	1.00 03	14.9	32 42.9	1.00 03	14.9	34 12.9	1.00 03	14.8	36 12.8	1.00 03	14.7	36 42.8	1.00 03	14.7	37 12.8	1.00 03	14.7	39 12.7	1.00 03	14.6	4
165	30 11.4	1.00 02	14.0	31 11.4	1.00 02	14.0	32 41.4	1.00 02	13.9	34 11.3	1.00 02	13.9	36 11.3	1.00 02	13.8	36 41.2	1.00 02	13.8	37 11.2	1.00 02	13.7	39 11.2	1.00 02	13.7	165
6	30 10.0	1.00 02	13.1	31 10.0	1.00 02	13.0	32 39.9	1.00 02	13.0	34 09.9	1.00 02	12.9	36 09.8	1.00 02	12.9	36 39.8	1.00 02	12.8	37 09.8	1.00 02	12.8	39 09.7	1.00 02	12.7	6
7	30 08.6	1.00 02	12.1	31 08.6	1.00 02	12.1	32 38.6	1.00 02	12.1	34 08.5	1.00 02	12.0	36 08.5	1.00 02	11.9	36 38.5	1.00 02	11.9	37 08.4	1.00 02	11.9	39 08.4	1.00 02	11.8	7
8	30 07.3	1.00 02	11.2	31 07.3	1.00 02	11.2	32 37.3	1.00 02	11.1	34 07.3	1.00 02	11.1	36 07.2	1.00 02	11.0	36 37.2	1.00 02	11.0	37 07.2	1.00 02	11.0	39 07.2	1.00 02	10.9	8
9	30 06.2	1.00 02	10.3	31 06.2	1.00 02	10.3	32 36.1	1.00 02	10.2	34 06.1	1.00 02	10.2	36 06.1	1.00 02	10.1	36 36.1	1.00 02	10.1	37 06.0	1.00 02	10.1	39 06.0	1.00 02	10.0	9
170	30 05.1	1.00 02	09.3	31 05.1	1.00 02	09.3	32 35.1	1.00 02	09.3	34 05.0	1.00 02	09.2	36 05.0	1.00 02	09.2	36 35.0	1.00 02	09.2	37 05.0	1.00 02	09.2	39 05.0	1.00 02	09.1	170
1	30 04.1	1.00 01	08.4	31 04.1	1.00 01	08.4	32 34.1	1.00 01	08.4	34 04.1	1.00 01	08.3	36 04.1	1.00 01	08.3	36 34.1	1.00 01	08.3	37 04.1	1.00 01	08.2	39 04.0	1.00 01	08.2	1
2	30 03.3	1.00 01	07.5	31 03.3	1.00 01	07.5	32 33.2	1.00 01	07.4	34 03.2	1.00 01	07.4	36 03.2	1.00 01	07.4	36 33.2	1.00 01	07.3	37 03.2	1.00 01	07.3	39 03.2	1.00 01	07.3	2
3	30 02.5	1.00 01	06.5	31 02.5	1.00 01	06.5	32 32.5	1.00 01	06.5	34 02.5	1.00 01	06.5	36 02.5	1.00 01	06.4	36 32.5	1.00 01	06.4	37 02.5	1.00 01	06.4	39 02.4	1.00 01	06.4	3
4	30 01.8	1.00 01	05.6	31 01.8	1.00 01	05.6	32 31.8	1.00 01	05.6	34 01.8	1.00 01	05.5	36 01.8	1.00 01	05.5	36 31.8	1.00 01	05.5	37 01.8	1.00 01	05.5	39 01.8	1.00 01	05.5	4
175	30 01.3	1.00 01	04.7	31 01.3	1.00 01	04.7	32 31.3	1.00 01	04.6	34 01.3	1.00 01	04.6	36 01.3	1.00 01	04.6	36 31.3	1.00 01	04.6	37 01.3	1.00 01	04.6	39 01.2	1.00 01	04.5	175
6	30 00.8	1.00 01	03.7	31 00.8	1.00 01	03.7	32 30.8	1.00 01	03.7	34 00.8	1.00 01	03.7	36 00.8	1.00 01	03.7	36 30.8	1.00 01	03.7	37 00.8	1.00 01	03.7	39 00.8	1.00 01	03.6	6
7	30 00.5	1.00 00	02.8	31 00.5	1.00 00	02.8	32 30.5	1.00 00	02.8	34 00.5	1.00 00	02.8	36 00.5	1.00 00	02.8	36 30.5	1.00 00	02.8	37 00.5	1.00 00	02.7	39 00.4	1.00 00	02.7	7
8	30 00.2	1.00 00	01.9	31 00.2	1.00 00	01.9	32 30.2	1.00 00	01.9	34 00.2	1.00 00	01.8	36 00.2	1.00 00	01.8	36 30.2	1.00 00	01.8	37 00.2	1.00 00	01.8	39 00.2	1.00 00	01.8	8
9	30 00.1	1.00 00	00.9	31 00.1	1.00 00	00.9	32 30.1	1.00 00	00.9	34 00.1	1.00 00	00.9	36 00.1	1.00 00	00.9	36 30.1	1.00 00	00.9	37 00.1	1.00 00	00.9	39 00.1	1.00 00	00.9	9
180	30 00.0	1.00 00	00.0	31 00.0	1.00 00	00.0	32 30.0	1.00 00	00.0	34 00.0	1.00 00	00.0	36 00.0	1.00 00	00.0	36 30.0	1.00 00	00.0	37 00.0	1.00 00	00.0	39 00.0	1.00 00	00.0	180

Lat. 85°

Lat. 86°

Lat. 84°

Each cell lists: Alt. (° ′) — Δd — Δt — Az. (°)

H.A.	46° 00′	47° 00′	48° 30′	49° 30′	50° 30′	51° 30′	52° 30′	54° 00′	H.A.
00	52 00.0 1.00 0 180.0	53 00.0 1.00 0 180.0	54 30.0 1.00 0 180.0	55 30.0 1.00 0 180.0	56 30.0 1.00 0 180.0	57 30.0 1.00 0 180.0	58 30.0 1.00 0 180.0	60 00.0 1.00 0 180.0	00
1	51 59.9 1.00 0 178.9	52 59.9 1.00 0 178.9	54 29.9 1.00 0 178.9	55 29.9 1.00 0 178.9	56 29.9 1.00 0 178.8	57 29.9 1.00 0 178.8	58 29.9 1.00 0 178.8	59 59.9 1.00 0 178.8	1
2	51 59.8 1.00 0 177.7	52 59.8 1.00 0 177.7	54 29.8 1.00 0 177.7	55 29.7 1.00 0 177.7	56 29.7 1.00 0 177.7	57 29.7 1.00 0 177.7	58 29.7 1.00 0 177.7	59 59.7 1.00 0 177.6	2
3	51 59.4 1.00 1 176.6	52 59.4 1.00 1 176.6	54 29.4 1.00 1 176.6	55 29.4 1.00 1 176.6	56 29.4 1.00 1 176.5	57 29.4 1.00 1 176.5	58 29.4 1.00 1 176.5	59 59.4 1.00 1 176.5	3
4	51 59.0 1.00 1 175.5	52 59.0 1.00 1 175.5	54 29.0 1.00 1 175.4	55 29.0 1.00 1 175.4	56 29.0 1.00 1 175.4	57 29.0 1.00 1 175.4	58 29.0 1.00 1 175.3	59 59.0 1.00 1 175.3	4
05	51 58.5 1.00 1 174.4	52 58.5 1.00 1 174.3	54 28.4 1.00 1 174.3	55 28.4 1.00 1 174.3	56 28.4 1.00 1 174.2	57 28.4 1.00 1 174.2	58 28.4 1.00 1 174.2	59 58.4 1.00 1 174.1	05
6	51 57.8 1.00 1 173.2	52 57.8 1.00 1 173.2	54 27.8 1.00 1 173.2	55 27.7 1.00 1 173.1	56 27.7 1.00 1 173.1	57 27.7 1.00 1 173.1	58 27.7 1.00 1 173.0	59 57.7 1.00 1 173.0	6
7	51 57.0 1.00 2 172.1	52 57.0 1.00 2 172.1	54 26.9 1.00 2 172.0	55 26.9 1.00 2 172.0	56 26.9 1.00 2 171.9	57 26.9 1.00 2 171.9	58 26.9 1.00 2 171.8	59 56.9 1.00 2 171.8	7
8	51 56.1 1.00 2 171.0	52 56.0 1.00 2 170.9	54 26.0 1.00 2 170.9	55 26.0 1.00 2 170.8	56 26.0 1.00 2 170.8	57 26.0 1.00 2 170.7	58 25.9 1.00 2 170.7	59 55.9 1.00 2 170.6	8
9	51 55.0 1.00 2 169.9	52 55.0 1.00 2 169.8	54 25.0 1.00 2 169.7	55 24.9 1.00 2 169.7	56 24.9 1.00 2 169.6	57 24.9 1.00 2 169.6	58 24.9 1.00 2 169.5	59 54.8 1.00 2 169.4	9
10	51 53.8 1.00 2 168.7	52 53.8 1.00 2 168.7	54 23.8 1.00 2 168.6	55 23.7 1.00 2 168.5	56 23.7 1.00 2 168.5	57 23.7 1.00 2 168.4	58 23.6 1.00 2 168.4	59 53.6 1.00 2 168.3	10
1	51 52.6 1.00 2 167.6	52 52.5 1.00 2 167.5	54 22.5 1.00 2 167.5	55 22.4 1.00 2 167.4	56 22.4 1.00 2 167.3	57 22.4 1.00 2 167.3	58 22.3 1.00 2 167.2	59 52.3 1.00 2 167.1	1
2	51 51.2 1.00 3 166.5	52 51.1 1.00 3 166.4	54 21.1 1.00 3 166.3	55 21.0 1.00 3 166.3	56 21.0 1.00 3 166.2	57 20.9 1.00 3 166.1	58 20.9 1.00 3 166.0	59 50.8 1.00 3 165.9	2
3	51 49.6 1.00 3 165.4	52 49.6 1.00 3 165.3	54 19.5 1.00 3 165.2	55 19.5 1.00 3 165.1	56 19.4 1.00 3 165.0	57 19.4 1.00 3 165.0	58 19.3 1.00 3 164.9	59 49.2 1.00 3 164.8	3
4	51 48.0 1.00 3 164.2	52 47.9 1.00 3 164.2	54 17.9 1.00 3 164.1	55 17.8 1.00 3 164.0	56 17.7 1.00 3 163.9	57 17.7 1.00 3 163.8	58 17.6 1.00 3 163.7	59 47.5 1.00 3 163.6	4
15	51 46.2 1.00 3 163.1	52 46.2 1.00 3 162.9	54 16.1 1.00 3 162.9	55 16.1 1.00 3 162.8	56 15.9 1.00 3 162.8	57 15.9 1.00 3 162.7	58 15.8 1.00 3 162.6	59 45.7 1.00 3 162.5	15
6	51 44.3 1.00 3 162.0	52 44.3 1.00 3 161.9	54 14.2 1.00 3 161.8	55 14.1 1.00 3 161.7	56 14.0 1.00 3 161.6	57 13.9 1.00 3 161.5	58 13.8 1.00 3 161.4	59 43.7 1.00 3 161.3	6
7	51 42.3 1.00 4 160.9	52 42.3 1.00 4 160.8	54 12.1 1.00 4 160.7	55 12.1 1.00 4 160.6	56 12.0 1.00 4 160.5	57 11.9 1.00 4 160.4	58 11.8 1.00 4 160.3	59 41.6 1.00 4 160.1	7
8	51 40.2 1.00 4 159.7	52 40.1 1.00 4 159.7	54 10.0 1.00 4 159.5	55 09.9 1.00 4 159.4	56 09.8 1.00 4 159.3	57 09.7 1.00 4 159.2	58 09.6 1.00 4 159.1	59 39.4 1.00 4 158.9	8
9	51 38.0 1.00 4 158.6	52 37.9 1.00 4 158.5	54 07.8 1.00 4 158.4	55 07.7 1.00 4 158.3	56 07.5 1.00 4 158.2	57 07.4 1.00 4 158.1	58 07.3 1.00 4 158.0	59 37.1 1.00 4 157.8	9
20	51 35.7 1.00 4 157.5	52 35.6 1.00 4 157.4	54 05.4 1.00 4 157.3	55 05.3 1.00 4 157.2	56 05.1 1.00 4 157.1	57 05.0 1.00 4 156.9	58 04.9 1.00 4 156.8	59 34.7 1.00 4 156.6	20
1	51 33.2 1.00 4 156.4	52 33.1 1.00 4 156.3	54 02.9 1.00 4 156.1	55 02.8 1.00 4 156.0	56 02.7 1.00 4 155.9	57 02.5 1.00 4 155.8	58 02.4 1.00 4 155.7	59 32.1 1.00 4 155.5	1
2	51 30.6 1.00 4 155.3	52 30.5 1.00 4 155.2	54 00.3 1.00 5 155.0	55 00.2 1.00 5 154.9	56 00.0 1.00 5 154.8	56 59.9 1.00 5 154.6	57 59.7 1.00 5 154.5	59 29.5 1.00 5 154.3	2
3	51 28.0 1.00 5 154.2	52 27.8 1.00 5 154.1	53 57.6 1.00 5 153.9	54 57.5 1.00 5 153.8	55 57.3 1.00 5 153.6	56 57.2 1.00 5 153.5	57 57.0 1.00 5 153.4	59 26.7 1.00 5 153.1	3
4	51 25.2 1.00 5 153.1	52 25.0 1.00 5 152.9	53 54.8 1.00 5 152.8	54 54.6 1.00 5 152.6	55 54.5 1.00 5 152.5	56 54.3 1.00 5 152.4	57 54.1 1.00 5 152.2	59 23.8 1.00 5 152.0	4
25	51 22.3 1.00 5 151.9	52 22.1 1.00 5 151.8	53 51.9 1.00 5 151.6	54 51.7 1.00 5 151.5	55 51.5 1.00 5 151.4	56 51.3 1.00 5 151.2	57 51.1 1.00 5 151.1	59 20.8 1.00 5 150.8	25
6	51 19.3 1.00 5 150.8	52 19.1 1.00 5 150.7	53 48.8 1.00 5 150.5	54 48.7 1.00 5 150.4	55 48.5 1.00 5 150.3	56 48.3 1.00 5 150.1	57 48.0 1.00 6 149.9	59 17.7 1.00 6 149.7	6
7	51 16.2 1.00 5 149.7	52 16.0 1.00 5 149.6	53 45.7 1.00 5 149.4	54 45.5 1.00 5 149.3	55 45.3 1.00 5 149.1	56 45.1 1.00 5 149.0	57 44.8 1.00 6 148.8	59 14.5 1.00 6 148.5	7
8	51 13.0 1.00 6 148.6	52 12.8 1.00 6 148.5	53 42.5 1.00 6 148.2	54 42.3 1.00 6 148.2	55 42.0 1.00 6 148.0	56 41.8 1.00 6 147.8	57 41.5 1.00 6 147.7	59 11.2 1.00 6 147.4	8
9	51 09.6 1.00 6 147.5	52 09.4 1.00 6 147.4	53 39.1 1.00 6 147.2	54 38.9 1.00 6 147.0	55 38.7 1.00 6 146.9	56 38.4 1.00 6 146.7	57 38.1 1.00 6 146.5	59 07.7 1.00 6 146.3	9
30	51 06.2 1.00 6 146.4	52 06.0 1.00 6 146.3	53 35.7 1.00 6 146.1	54 35.4 1.00 6 145.9	55 35.2 1.00 6 145.8	56 34.9 1.00 6 145.6	57 34.6 1.00 6 145.4	59 04.2 99 06 145.1	30
1	51 02.7 1.00 6 145.3	52 02.5 1.00 6 145.2	53 32.1 1.00 6 145.0	54 31.9 1.00 6 144.8	55 31.6 1.00 6 144.6	56 31.3 1.00 6 144.5	57 31.0 99 06 144.3	59 00.6 99 06 144.0	1
2	50 59.1 1.00 6 144.2	51 58.8 1.00 6 144.1	53 28.5 1.00 6 143.8	54 28.2 1.00 6 143.7	55 27.9 1.00 6 143.5	56 27.6 99 06 143.3	57 27.3 99 06 143.2	58 56.9 99 06 142.9	2
3	50 55.5 1.00 6 143.1	51 55.1 1.00 6 143.0	53 24.7 1.00 6 142.7	54 24.4 1.00 6 142.6	55 24.1 1.00 6 142.4	56 23.8 99 06 142.2	57 23.5 99 06 142.0	58 53.0 99 07 141.7	3
4	50 51.6 1.00 6 142.0	51 51.3 1.00 7 141.9	53 20.9 1.00 7 141.6	54 20.6 99 07 141.5	55 20.3 99 07 141.3	56 19.9 99 07 141.1	57 19.6 99 07 140.9	58 49.0 99 07 140.6	4
35	50 47.6 1.00 7 140.9	51 47.4 1.00 7 140.8	53 16.9 99 07 140.5	54 16.6 99 07 140.4	55 16.3 99 07 140.2	56 16.0 99 07 140.0	57 15.6 99 07 139.8	58 45.0 99 07 139.5	35
6	50 43.6 1.00 7 139.8	51 43.4 1.00 7 139.7	53 12.9 99 07 139.4	54 12.6 99 07 139.3	55 12.2 99 07 139.1	56 11.9 99 07 138.9	57 11.5 99 07 138.7	58 40.9 99 07 138.3	6
7	50 39.6 99 07 138.7	51 39.3 99 07 138.6	53 08.8 99 07 138.3	54 08.4 99 07 138.1	55 08.1 99 07 138.0	56 07.7 99 07 137.8	57 07.3 99 07 137.6	58 36.7 99 07 137.2	7
8	50 35.4 99 07 137.7	51 35.1 99 07 137.5	53 04.6 99 07 137.2	54 04.2 99 07 137.0	55 03.8 99 07 136.9	56 03.4 99 07 136.7	57 03.0 99 07 136.4	58 32.4 99 07 136.1	8
9	50 31.1 99 07 136.6	51 30.8 99 07 136.4	53 00.3 99 07 136.1	53 59.9 99 07 135.9	54 59.5 99 07 135.8	55 59.1 99 07 135.5	56 58.7 99 07 135.3	58 28.0 99 07 135.0	9
40	50 26.8 99 07 135.5	51 26.4 99 07 135.3	52 55.9 99 07 135.0	53 55.5 99 07 134.9	54 55.1 99 08 134.7	55 54.7 99 08 134.4	56 54.2 99 08 134.2	58 23.5 99 08 133.9	40
1	50 22.3 99 08 134.4	51 22.0 99 08 134.2	52 51.4 99 08 133.9	53 51.0 99 08 133.8	54 50.6 99 08 133.6	55 50.1 99 08 133.3	56 49.7 99 08 133.1	58 18.9 99 08 132.8	1
2	50 17.8 99 08 133.3	51 17.4 99 08 133.1	52 46.8 99 08 132.9	53 46.4 99 08 132.5	54 46.0 99 08 132.5	55 45.5 99 08 132.2	56 45.1 99 08 132.0	58 14.3 99 08 131.7	2
3	50 13.2 99 08 132.2	51 12.8 99 08 132.1	52 42.2 99 08 131.8	53 41.8 99 08 131.6	54 41.3 99 08 131.4	55 40.9 99 08 131.1	56 40.4 99 08 130.9	58 09.6 99 08 130.5	3
4	50 08.5 99 08 131.2	51 08.1 99 08 131.0	52 37.5 99 08 130.7	53 37.0 99 08 130.5	54 36.6 99 08 130.3	55 36.1 99 08 130.1	56 35.6 99 08 129.8	58 04.8 99 08 129.4	4
45	50 03.7 99 08 130.1	51 03.3 99 08 129.9	52 32.7 99 08 129.6	53 32.2 99 08 129.4	54 31.8 99 08 129.2	55 31.3 99 08 129.0	56 30.7 99 08 128.7	57 59.9 99 08 128.3	45
6	49 58.9 99 08 129.0	50 58.5 99 08 128.8	52 27.8 99 08 128.5	53 27.3 99 08 128.3	54 26.9 99 08 128.1	55 26.3 99 08 127.9	56 25.8 99 08 127.6	57 54.9 99 08 127.2	6
7	49 54.0 99 08 127.9	50 53.6 99 08 127.7	52 22.9 99 08 127.4	53 22.4 99 08 127.2	54 21.9 99 08 127.0	55 21.4 99 08 126.8	56 20.8 99 08 126.5	57 49.9 99 08 126.2	7
8	49 49.0 99 08 126.9	50 48.6 99 08 126.7	52 17.9 99 08 126.4	53 17.4 99 08 126.2	54 16.8 99 08 125.9	55 16.3 99 09 125.7	56 15.7 99 09 125.5	57 44.8 99 09 125.1	8
9	49 44.0 99 09 125.8	50 43.5 99 09 125.6	52 12.8 99 09 125.3	53 12.3 99 09 125.1	54 11.7 99 09 124.9	55 11.2 99 09 124.6	56 10.6 99 09 124.4	57 39.6 99 09 124.0	9
50	49 38.8 99 09 124.7	50 38.4 99 09 124.5	52 07.6 99 09 124.2	53 07.1 99 09 124.0	54 06.5 99 09 123.8	55 06.0 99 09 123.5	56 05.4 99 09 123.3	57 34.4 99 09 122.9	50
1	49 33.6 99 09 123.7	50 33.2 99 09 123.5	52 02.4 99 09 122.9	53 01.9 99 09 122.7	54 01.3 99 09 122.7	55 00.7 99 09 122.5	56 00.1 99 09 122.3	57 29.1 99 09 121.9	1
2	49 28.4 99 09 122.6	50 27.9 99 09 122.4	51 57.1 99 09 122.1	52 56.6 99 09 121.9	53 56.0 99 09 121.6	54 55.4 99 09 121.4	55 54.8 99 09 121.1	57 23.7 99 09 120.7	2
3	49 23.1 99 09 121.5	50 22.6 99 09 121.3	51 51.8 99 09 121.0	52 51.2 99 09 120.8	53 50.6 99 09 120.6	54 50.0 99 09 120.3	55 49.4 99 09 120.1	57 18.3 99 09 119.7	3
4	49 17.7 99 09 120.5	50 17.2 99 09 120.3	51 46.4 99 09 120.0	52 45.8 99 09 119.7	53 45.2 99 09 119.5	54 44.6 99 09 119.3	55 43.9 99 09 119.0	57 12.8 99 09 118.6	4
55	49 12.3 99 09 119.4	50 11.7 99 09 119.2	51 40.9 99 09 118.9	52 40.3 99 09 118.7	53 39.7 99 09 118.4	54 39.1 99 09 118.2	55 38.4 99 09 117.9	57 07.9 99 09 117.5	55
6	49 06.8 99 09 118.4	50 06.2 99 09 118.2	51 35.4 99 09 117.8	52 34.8 99 09 117.6	53 34.2 99 09 117.4	54 33.5 99 09 117.1	55 32.8 99 09 116.9	57 01.7 99 09 116.5	6
7	49 01.2 99 09 117.3	50 00.7 99 09 117.1	51 29.8 99 09 116.8	52 29.2 99 09 116.6	53 28.6 99 09 116.3	54 27.9 99 09 116.1	55 27.2 99 09 115.8	56 56.1 99 09 115.4	7
8	48 55.6 99 09 116.3	49 55.1 99 09 116.1	51 24.2 99 09 115.7	52 23.6 99 09 115.5	53 22.9 99 09 115.3	54 22.2 99 10 115.0	55 21.5 99 10 114.7	56 50.4 99 10 114.3	8
9	48 50.0 99 10 115.2	49 49.4 99 10 115.0	51 18.5 99 10 114.5	52 17.9 99 10 114.5	53 17.2 99 10 114.2	54 16.5 99 10 114.0	55 15.8 99 10 113.7	56 44.6 99 10 113.3	9
60	48 44.3 99 10 114.2	49 43.7 99 10 114.0	51 12.8 99 10 113.6	52 12.1 99 10 113.4	53 11.5 99 10 113.2	54 10.8 99 10 112.9	55 10.0 99 10 112.6	56 38.9 99 10 112.2	60
1	48 38.6 99 10 113.1	49 38.0 99 10 112.9	51 07.0 99 10 112.6	52 06.4 99 10 112.4	53 05.7 99 10 112.1	54 05.0 99 10 111.9	55 04.2 99 10 111.6	56 33.0 99 10 111.1	1
2	48 32.8 99 10 112.1	49 32.2 99 10 111.9	51 01.2 99 10 111.6	52 00.6 99 10 111.3	52 59.9 99 10 111.1	53 59.1 99 10 110.8	54 58.4 99 10 110.5	56 27.2 99 10 110.1	2
3	48 26.9 99 10 111.1	49 26.3 99 10 110.9	50 55.4 99 10 110.5	51 54.7 99 10 110.3	52 54.0 99 10 110.0	53 53.3 99 10 109.8	54 52.5 99 10 109.5	56 21.2 99 10 109.0	3
4	48 21.1 99 10 110.0	49 20.4 99 10 109.8	50 49.5 99 10 109.5	51 48.8 99 10 109.2	52 48.1 99 10 109.0	53 47.3 99 10 108.7	54 46.6 99 10 108.4	56 15.3 99 10 108.0	4
65	48 15.2 99 10 109.0	49 14.5 99 10 108.8	50 43.5 99 10 108.4	51 42.9 99 10 108.2	52 42.1 99 10 107.9	53 41.4 99 10 107.7	54 40.6 99 10 107.4	56 09.3 99 10 107.0	65
6	48 09.2 99 10 108.0	49 08.6 99 10 107.7	50 37.6 99 10 107.4	51 36.9 99 10 107.2	52 36.1 99 10 106.9	53 35.4 99 10 106.6	54 34.6 99 10 106.4	56 03.3 99 10 105.9	6
7	48 03.2 99 10 106.9	49 02.6 99 10 106.7	50 31.6 99 10 106.4	51 30.9 99 10 106.1	52 30.1 99 10 105.9	53 29.4 99 10 105.6	54 28.6 99 10 105.3	55 57.3 99 10 104.9	7
8	47 57.2 99 10 105.9	48 56.6 99 10 105.7	50 25.5 99 10 105.3	51 24.8 99 10 105.1	52 24.1 99 10 104.8	53 23.3 99 10 104.6	54 22.5 99 10 104.3	55 51.2 98 10 103.9	8
9	47 51.2 99 10 104.9	48 50.5 99 10 104.7	50 19.5 99 10 104.3	51 18.8 99 10 104.1	52 18.0 99 10 103.8	53 17.2 99 10 103.8	54 16.4 99 10 103.3	55 45.1 98 10 103.0	9
70	47 45.1 99 10 103.9	48 44.4 99 10 103.6	50 13.4 99 10 103.3	51 12.7 99 10 103.0	52 11.9 99 10 102.8	53 11.1 99 10 102.5	54 10.3 99 10 102.2	55 39.0 98 10 101.8	70
1	47 39.0 99 10 102.9	48 38.3 99 10 102.6	50 07.3 99 10 102.3	51 06.5 99 10 102.0	52 05.8 99 10 101.8	53 05.0 99 10 101.5	54 04.1 99 10 101.2	55 32.8 98 10 100.8	1
2	47 32.9 99 10 101.8	48 32.2 99 10 101.6	50 01.1 99 10 101.3	51 00.4 99 10 101.0	51 59.6 99 10 100.7	52 58.8 99 10 100.5	53 58.0 99 10 100.2	55 26.6 98 10 99.8	2
3	47 26.7 99 10 100.8	48 26.0 99 10 100.6	49 55.0 99 10 100.2	50 54.2 99 10 100.0	51 53.5 99 10 99.7	52 52.6 99 10 99.5	53 51.8 99 10 99.2	55 20.4 98 10 98.7	3
4	47 20.5 99 10 99.8	48 19.9 99 10 99.6	49 48.8 99 10 99.2	50 48.0 99 10 99.0	51 47.3 99 10 98.7	52 46.4 99 10 98.4	53 45.6 99 10 98.2	55 14.2 98 10 97.7	4
75	47 14.3 99 10 98.8	48 13.7 99 10 98.6	49 42.6 99 10 98.2	50 41.8 99 10 98.0	51 41.1 99 10 97.7	52 40.2 99 10 97.4	53 39.4 99 10 97.2	55 08.0 98 10 96.7	75
6	47 08.1 99 10 97.8	48 07.5 99 10 97.5	49 36.4 99 10 97.2	50 35.6 99 10 96.9	51 34.8 99 10 96.7	52 34.0 99 10 96.4	53 33.2 99 10 96.1	55 01.8 98 10 95.7	6
7	47 01.9 99 10 96.8	48 01.2 99 10 96.5	49 30.1 99 10 96.2	50 29.4 99 10 95.9	51 28.6 99 10 95.7	52 27.8 99 10 95.4	53 26.9 99 10 95.1	54 55.5 98 10 94.7	7
8	46 55.7 99 10 95.8	47 55.0 99 10 95.5	49 23.9 99 10 95.2	50 23.1 99 10 94.9	51 22.4 99 10 94.7	52 21.5 99 10 94.4	53 20.7 99 10 94.1	54 49.3 98 10 93.7	8
9	46 49.4 99 10 94.7	47 48.7 99 10 94.5	49 17.7 99 10 94.2	50 16.9 99 10 93.9	51 16.1 99 10 93.7	52 15.3 99 10 93.4	53 14.4 99 10 93.1	54 43.0 98 10 92.7	9
80	46 43.2 99 10 93.7	47 42.5 99 10 93.5	49 11.4 99 10 93.2	50 10.6 99 10 92.9	51 09.8 99 10 92.7	52 09.0 99 10 92.4	53 08.1 99 10 92.1	54 36.8 98 10 91.7	80
1	46 36.9 99 10 92.7	47 36.2 99 10 92.5	49 05.1 99 10 92.2	50 04.4 99 10 91.9	51 03.6 99 10 91.7	52 02.7 99 10 91.4	53 01.9 99 10 91.1	54 30.5 98 10 90.7	1
2	46 30.7 99 10 91.7	47 30.0 99 10 91.5	48 58.9 99 10 91.2	49 58.1 99 10 90.9	50 57.3 99 10 90.7	51 56.5 99 10 90.4	52 55.6 99 10 90.1	54 24.2 98 10 89.7	2
3	46 24.4 99 10 90.7	47 23.7 99 10 90.5	48 52.6 99 10 90.2	49 51.8 99 10 89.9	50 51.0 99 10 89.7	51 50.2 99 10 89.4	52 49.3 99 10 89.1	54 17.9 98 10 88.7	3
4	46 18.1 99 10 89.8	47 17.4 99 10 89.5	48 46.3 99 10 89.2	49 45.6 99 10 88.9	50 44.8 99 10 88.7	51 43.9 99 10 88.4	52 43.1 99 10 88.1	54 11.7 98 10 87.7	4
85	46 11.8 99 10 88.8	47 11.1 99 10 88.5	48 40.0 99 10 88.2	49 39.3 99 10 87.9	50 38.5 99 10 87.7	51 37.7 99 10 87.4	52 36.8 99 10 87.2	54 05.4 98 10 86.7	85
6	46 05.6 99 10 87.8	47 04.9 99 10 87.5	48 33.8 99 10 87.2	49 33.0 99 10 87.0	50 32.2 99 10 86.7	51 31.4 99 10 86.4	52 30.5 99 10 86.2	53 59.1 98 10 85.7	6
7	45 59.4 99 10 86.8	46 58.6 99 10 86.5	48 27.5 99 10 86.2	49 26.8 99 10 86.0	50 26.0 99 10 85.7	51 25.1 99 10 85.5	52 24.3 99 10 85.2	53 52.8 98 10 84.7	7
8	45 53.0 99 10 85.8	46 52.4 99 10 85.6	48 21.3 99 10 85.2	49 20.5 99 10 85.0	50 19.7 99 10 84.7	51 18.9 99 10 84.5	52 18.0 99 10 84.2	53 46.7 98 10 83.8	8
9	45 46.8 99 10 84.8	46 46.1 99 10 84.6	48 15.0 99 10 84.2	49 14.3 99 10 84.0	50 13.5 99 10 83.8	51 12.7 99 10 83.5	52 11.8 99 10 83.2	53 40.4 98 10 82.8	9
90	45 40.6 99 10 83.8	46 39.9 99 10 83.6	48 08.8 99 10 83.3	49 08.0 99 10 83.0	50 07.2 99 10 82.8	51 06.4 99 10 82.5	52 05.6 99 10 82.2	53 34.2 98 10 81.8	90

H.A.	46° 00' Alt / Δd Δt / Az	47° 00' Alt / Δd Δt / Az	48° 30' Alt / Δd Δt / Az	49° 30' Alt / Δd Δt / Az	50° 30' Alt / Δd Δt / Az	51° 30' Alt / Δd Δt / Az	52° 30' Alt / Δd Δt / Az	54° 00' Alt / Δd Δt / Az	H.A.
91	45 34.3 99 10 82.8	46 33.6 99 10 82.6	48 02.6 99 10 82.3	49 01.8 99 10 82.0	50 01.0 99 10 81.8	51 00.2 99 10 81.5	51 59.4 99 10 81.3	53 28.0 98 10 80.8	91
2	45 28.1 99 10 81.9	46 27.4 99 10 81.6	47 56.4 99 10 81.3	48 55.6 99 10 81.1	49 54.8 99 10 80.8	50 54.0 99 10 80.6	51 53.2 99 10 80.3	53 21.8 98 10 79.9	2
3	45 21.9 99 10 80.9	46 21.2 99 10 80.7	47 50.2 99 10 80.3	48 49.4 99 10 80.1	49 48.6 99 10 79.8	50 47.8 99 10 79.6	51 47.0 99 10 79.3	53 15.7 98 10 78.9	3
4	45 15.7 99 10 79.9	46 15.1 99 10 79.7	47 44.0 99 10 79.4	48 43.3 99 10 79.1	49 42.5 99 10 78.9	50 41.7 99 10 78.6	51 40.8 99 10 78.4	53 09.5 98 10 77.9	4
95	45 09.6 99 10 78.9	46 08.9 99 10 78.7	47 37.8 99 10 78.4	48 37.1 99 10 78.1	49 36.3 99 10 77.9	50 35.5 99 10 77.7	51 34.7 99 10 77.4	53 03.4 98 10 77.0	95
6	45 03.4 99 10 78.0	46 02.8 99 10 77.7	47 31.7 99 10 77.4	48 31.0 99 10 77.2	49 30.2 99 10 76.9	50 29.4 99 10 76.7	51 28.6 99 10 76.4	52 57.3 98 10 76.0	6
7	44 57.3 99 10 77.0	45 56.6 99 10 76.8	47 25.6 99 10 76.4	48 24.9 99 10 76.2	49 24.1 99 10 76.0	50 23.3 99 10 75.7	51 22.5 99 10 75.5	52 51.2 98 10 75.1	7
8	44 51.2 99 10 76.0	45 50.5 99 10 75.8	47 19.5 99 10 75.5	48 18.8 99 10 75.2	49 18.1 99 10 75.0	50 17.3 99 10 74.8	51 16.5 99 10 74.5	52 45.2 98 10 74.1	8
9	44 45.1 99 10 75.0	45 44.5 99 10 74.8	47 13.5 99 10 74.5	48 12.7 99 10 74.3	49 12.0 99 10 74.0	50 11.2 99 10 73.8	51 10.4 99 10 73.5	52 39.2 99 10 73.1	9
100	44 39.1 99 10 74.1	45 38.4 99 10 73.9	47 07.4 99 10 73.5	48 06.7 99 10 73.3	49 06.0 99 10 73.1	50 05.2 99 10 72.8	51 04.4 99 10 72.6	52 33.2 99 10 72.2	100
1	44 33.1 99 10 73.1	45 32.4 99 10 72.9	47 01.4 99 10 72.6	48 00.7 99 10 72.4	49 00.0 99 10 72.1	49 59.3 99 10 71.9	50 58.5 99 10 71.6	52 27.2 99 10 71.2	1
2	44 27.1 99 10 72.1	45 26.4 99 10 71.9	46 55.5 99 10 71.6	47 54.8 99 10 71.4	48 54.1 99 10 71.2	49 53.3 99 10 70.9	50 52.5 99 10 70.7	52 21.3 99 10 70.3	2
3	44 21.1 99 10 71.2	45 20.5 99 10 71.0	46 49.5 99 10 70.7	47 48.8 99 10 70.4	48 48.1 99 10 70.2	49 47.4 99 10 70.0	50 46.6 99 10 69.7	52 15.4 99 10 69.3	3
4	44 15.2 99 10 70.2	45 14.6 99 10 70.0	46 43.6 99 10 69.7	47 43.0 99 10 69.5	48 42.3 99 10 69.3	49 41.5 99 10 69.0	50 40.8 99 10 68.8	52 09.6 99 10 68.4	4
105	44 09.3 99 10 69.3	45 00.7 99 10 69.1	46 37.8 99 10 68.8	47 37.1 99 10 68.5	48 36.4 99 10 68.3	49 35.7 99 10 68.1	50 34.9 99 10 67.8	52 03.8 99 10 67.4	105
6	44 03.5 99 10 68.3	44 54.9 99 10 68.1	46 31.3 99 10 67.8	47 31.3 99 10 67.6	48 30.6 99 10 67.4	49 29.9 99 10 67.1	50 29.2 99 10 66.9	51 58.0 99 10 66.5	6
7	43 57.7 99 10 67.4	44 49.1 99 10 67.2	46 25.1 99 10 66.8	47 25.5 99 10 66.6	48 24.8 99 10 66.4	49 24.1 99 10 66.2	50 23.4 99 10 65.9	51 52.3 99 09 65.6	7
8	43 51.9 99 10 66.4	44 43.3 99 10 66.2	46 20.4 99 10 65.9	47 19.8 99 10 65.7	48 19.1 99 09 65.5	49 18.4 99 09 65.2	50 17.7 99 09 65.0	51 46.6 99 09 64.6	8
9	43 46.2 99 09 65.4	44 37.6 99 09 65.3	46 14.7 99 09 64.9	47 14.1 99 09 64.7	48 13.4 99 09 64.5	49 12.7 99 09 64.3	50 12.0 99 09 64.1	51 40.9 99 09 63.7	9
110	43 40.5 99 09 64.5	44 39.9 99 09 64.3	46 09.0 99 09 64.0	47 08.4 99 09 63.8	48 07.8 99 09 63.6	49 07.1 99 09 63.4	50 06.4 99 09 63.1	51 35.3 99 09 62.7	110
1	43 34.9 99 00 63.5	44 34.3 99 00 63.4	46 03.4 99 00 63.1	47 02.8 99 00 62.8	48 02.2 99 00 62.6	49 01.5 99 00 62.4	50 00.8 99 00 62.2	51 29.8 99 00 61.8	1
2	43 29.3 99 00 62.6	44 28.7 99 00 62.4	45 57.9 99 00 62.1	46 57.3 99 00 61.9	47 56.6 99 00 61.7	48 56.0 99 00 61.5	49 55.3 99 00 61.2	51 24.3 99 00 60.9	2
3	43 23.7 99 00 61.6	44 23.2 99 00 61.5	45 52.3 99 00 61.2	46 51.8 99 00 61.0	47 51.1 99 00 60.8	48 50.5 99 00 60.5	49 49.9 99 00 60.3	51 18.8 99 00 60.0	3
4	43 18.2 99 00 60.7	44 17.7 99 00 60.5	45 46.9 99 00 60.2	46 46.3 99 00 60.0	47 45.7 99 00 59.8	48 45.1 99 00 59.6	49 44.4 99 00 59.4	51 13.4 99 00 59.0	4
115	43 12.8 99 00 59.7	44 12.3 99 00 59.6	45 41.5 99 00 59.3	46 40.9 99 00 59.1	47 40.3 99 00 58.9	48 39.7 99 00 58.7	49 39.1 99 00 58.4	51 08.1 99 00 58.1	115
6	43 07.4 99 00 58.8	44 06.9 99 00 58.6	45 36.1 99 00 58.3	46 35.5 99 00 57.9	47 35.0 99 00 57.9	48 34.4 99 00 57.7	49 33.7 99 00 57.5	51 02.8 99 00 57.2	6
7	43 02.0 99 00 57.9	44 01.6 99 00 57.7	45 30.8 99 00 57.4	46 30.2 99 00 57.2	47 29.7 99 00 57.0	48 29.1 99 00 56.8	49 28.5 99 00 56.6	50 57.5 99 00 56.2	7
8	42 56.8 99 00 56.9	43 56.3 99 09 56.7	45 25.5 99 00 56.5	46 25.0 99 00 56.3	47 24.4 99 09 56.1	48 23.9 99 00 55.9	49 23.3 99 00 55.7	50 52.3 99 00 55.3	8
9	42 51.5 99 09 56.0	43 51.1 99 09 55.8	45 20.3 99 09 55.5	46 19.8 99 09 55.3	47 19.3 99 09 55.2	48 18.7 99 08 54.9	49 18.1 99 08 54.7	50 47.2 99 08 54.4	9
120	42 46.4 99 08 55.0	43 45.9 99 08 54.9	45 15.2 99 08 54.6	46 14.7 99 08 54.4	47 14.1 99 08 54.2	48 13.6 99 08 54.0	49 13.0 99 08 53.8	50 42.1 99 08 53.5	120
1	42 41.3 99 08 54.1	43 40.8 99 08 53.9	45 10.2 99 08 53.7	46 09.6 99 08 53.5	47 09.1 99 08 53.3	48 08.6 99 08 53.1	49 08.0 99 08 52.9	50 37.1 99 08 52.6	1
2	42 36.2 99 08 53.2	43 35.8 99 08 53.0	45 05.1 99 08 52.7	46 04.6 99 08 52.6	47 04.1 99 08 52.4	48 03.6 99 08 52.2	49 03.0 99 08 52.0	50 32.2 99 08 51.7	2
3	42 31.2 99 08 52.2	43 30.8 99 08 52.1	45 00.1 99 08 51.8	45 59.6 99 08 51.6	46 59.2 99 08 51.4	47 58.6 99 08 51.3	48 58.1 99 08 51.1	50 27.3 99 08 50.7	3
4	42 26.3 99 08 51.3	43 25.9 99 08 51.1	44 55.2 99 08 50.9	45 54.8 99 08 50.7	46 54.3 99 08 50.5	47 53.8 99 08 50.3	48 53.3 99 08 50.1	50 22.5 99 08 49.8	4
125	42 21.4 99 08 50.4	43 21.0 99 08 50.2	44 50.4 99 08 50.0	45 49.9 99 08 49.6	46 49.5 99 08 49.4	47 49.0 99 08 49.4	48 48.5 99 08 49.2	50 17.7 99 08 48.9	125
6	42 16.6 99 08 49.4	43 16.2 99 08 49.3	44 45.6 99 08 49.0	45 45.2 99 08 48.9	46 44.7 99 08 48.7	47 44.3 99 08 48.5	48 43.8 99 08 48.3	50 13.0 99 08 48.0	6
7	42 11.9 99 08 48.5	43 11.5 99 08 48.3	44 40.9 99 08 48.1	45 40.5 99 08 47.9	46 40.1 99 08 47.8	47 39.6 99 08 47.6	48 39.1 99 08 47.4	50 08.4 99 08 47.1	7
8	42 07.2 99 08 47.6	43 06.9 99 08 47.4	44 36.3 99 08 47.2	45 35.9 99 08 47.0	46 35.4 99 08 46.8	47 35.0 99 08 46.7	48 34.5 99 08 46.5	50 03.8 99 07 46.2	8
9	42 02.6 99 08 46.6	43 02.2 99 08 46.5	44 31.7 99 08 46.2	45 31.3 99 07 46.1	46 30.9 99 07 45.9	47 30.5 99 07 45.7	48 30.0 99 07 45.6	49 59.3 99 07 45.3	9
130	41 58.1 99 07 45.7	42 57.8 99 07 45.6	44 27.2 99 07 45.3	45 26.8 99 07 45.2	46 26.4 99 07 45.0	47 26.0 99 07 44.8	48 25.6 99 07 44.6	49 54.9 99 07 44.4	130
1	41 53.7 99 07 44.8	42 53.3 99 07 44.6	44 22.8 99 07 44.4	45 22.4 99 07 44.2	46 22.0 99 07 44.1	47 21.6 99 07 43.9	48 21.2 99 07 43.7	49 50.6 99 07 43.5	1
2	41 49.3 99 07 43.8	42 49.0 99 07 43.7	44 18.4 99 07 43.5	45 18.1 99 07 43.3	46 17.7 99 07 43.2	47 17.3 99 07 43.0	48 16.9 99 07 42.8	49 46.3 99 07 42.6	2
3	41 45.0 99 07 42.9	42 44.7 99 07 42.8	44 14.2 99 07 42.6	45 13.8 99 07 42.4	46 13.5 99 07 42.3	47 13.1 99 07 42.1	48 12.7 99 07 41.9	49 42.1 99 07 41.7	3
4	41 40.8 99 07 42.0	42 40.4 99 07 41.9	44 10.0 99 07 41.6	45 09.6 99 07 41.5	46 09.3 99 07 41.3	47 08.9 99 07 41.2	48 08.5 99 07 41.0	49 37.9 99 07 40.8	4
135	41 36.6 1.00 07 41.1	42 36.3 99 07 40.9	44 05.8 99 07 40.7	45 05.5 99 07 40.6	46 05.2 99 07 40.4	47 04.8 99 07 40.3	48 04.5 99 07 40.1	49 33.9 99 07 39.9	135
6	41 32.5 1.00 07 40.1	42 32.2 1.00 07 40.0	44 01.8 99 07 39.8	45 01.5 99 07 39.7	46 01.1 99 07 39.5	47 00.8 99 07 39.4	48 00.5 99 07 39.2	49 29.9 99 06 39.0	6
7	41 28.5 1.00 07 39.2	42 28.2 1.00 07 39.1	43 57.8 1.00 06 38.9	44 57.5 99 06 38.8	45 57.2 99 06 38.6	46 56.9 99 06 38.5	47 56.5 99 06 38.3	49 26.0 99 06 38.1	7
8	41 24.5 1.00 07 38.3	42 24.3 1.00 06 38.2	43 53.9 1.00 06 38.0	44 53.6 99 06 37.7	45 53.3 99 06 37.7	46 53.0 99 06 37.5	47 52.7 99 06 37.4	49 22.2 99 06 37.2	8
9	41 20.7 1.00 06 37.4	42 20.5 1.00 06 37.3	43 50.1 1.00 06 37.1	44 49.8 1.00 06 36.9	45 49.5 99 06 36.8	46 49.2 99 06 36.6	47 48.9 99 06 36.5	49 18.4 99 06 36.3	9
140	41 17.0 1.00 06 36.5	42 16.7 1.00 06 36.3	43 46.3 1.00 06 36.1	44 46.1 1.00 06 36.0	45 45.8 1.00 06 35.9	46 45.5 1.00 06 35.7	47 45.2 99 06 35.6	49 14.8 99 06 35.4	140
1	41 13.3 1.00 06 35.5	42 13.0 1.00 06 35.4	43 42.7 1.00 06 35.2	44 42.4 1.00 06 35.1	45 42.2 1.00 06 35.0	46 41.9 1.00 06 34.8	47 41.6 1.00 06 34.7	49 11.2 99 06 34.5	1
2	41 09.7 1.00 06 34.6	42 09.5 1.00 06 34.5	43 39.1 1.00 06 34.3	44 38.9 1.00 06 34.2	45 38.6 1.00 06 34.1	46 38.4 1.00 06 33.9	47 38.1 1.00 06 33.8	49 07.7 1.00 06 33.6	2
3	41 06.2 1.00 06 33.7	42 05.9 1.00 06 33.6	43 35.6 1.00 06 33.4	44 35.4 1.00 06 33.3	45 35.1 1.00 06 33.2	46 34.9 1.00 06 33.0	47 34.6 1.00 06 32.9	49 04.2 1.00 06 32.7	3
4	41 02.7 1.00 06 32.8	42 02.5 1.00 06 32.7	43 32.2 1.00 06 32.5	44 32.0 1.00 06 32.4	45 31.8 1.00 06 32.3	46 31.5 1.00 06 32.1	47 31.3 1.00 05 32.0	49 00.9 1.00 05 31.8	4
145	40 59.4 1.00 05 31.9	41 59.2 1.00 05 31.8	43 28.9 1.00 05 31.6	44 28.7 1.00 05 31.5	45 28.4 1.00 05 31.4	46 28.2 1.00 05 31.2	47 28.0 1.00 05 31.1	48 57.6 1.00 05 30.9	145
6	40 56.1 1.00 05 30.9	41 55.9 1.00 05 30.8	43 25.6 1.00 05 30.7	44 25.4 1.00 05 30.6	45 25.2 1.00 05 30.4	46 25.0 1.00 05 30.3	47 24.8 1.00 05 30.2	48 54.4 1.00 05 30.0	6
7	40 52.9 1.00 05 30.0	41 52.7 1.00 05 29.9	43 22.5 1.00 05 29.8	44 22.3 1.00 05 29.7	45 22.1 1.00 05 29.5	46 21.9 1.00 05 29.4	47 21.7 1.00 05 29.3	48 51.3 1.00 05 29.1	7
8	40 49.8 1.00 05 29.1	41 49.7 1.00 05 29.0	43 19.4 1.00 05 28.9	44 19.2 1.00 05 28.8	45 19.0 1.00 05 28.6	46 18.9 1.00 05 28.5	47 18.7 1.00 05 28.4	48 48.3 1.00 05 28.2	8
9	40 46.8 1.00 05 28.2	41 46.7 1.00 05 28.1	43 16.4 1.00 05 28.0	44 16.2 1.00 05 27.8	45 16.1 1.00 05 27.7	46 15.9 1.00 05 27.6	47 15.7 1.00 05 27.5	48 45.4 1.00 05 27.3	9
150	40 43.9 1.00 05 27.3	41 43.7 1.00 05 27.2	43 13.5 1.00 05 27.0	44 13.4 1.00 05 26.9	45 13.2 1.00 05 26.8	46 13.0 1.00 04 26.7	47 12.9 1.00 04 26.6	48 42.6 1.00 04 26.4	150
1	40 41.1 1.00 05 26.4	41 40.9 1.00 05 26.3	43 10.7 1.00 05 26.1	44 10.6 1.00 05 26.0	45 10.4 1.00 04 25.9	46 10.3 1.00 04 25.8	47 10.1 1.00 04 25.7	48 39.8 1.00 04 25.6	1
2	40 38.3 1.00 04 25.5	41 38.2 1.00 04 25.4	43 08.0 1.00 04 25.2	44 07.9 1.00 04 25.1	45 07.7 1.00 04 25.1	46 07.6 1.00 04 24.9	47 07.4 1.00 04 24.8	48 37.2 1.00 04 24.7	2
3	40 35.7 1.00 04 24.5	41 35.6 1.00 04 24.5	43 05.4 1.00 04 24.3	44 05.2 1.00 04 24.2	45 05.1 1.00 04 24.1	46 05.0 1.00 04 24.0	47 04.8 1.00 04 23.9	48 34.6 1.00 04 23.8	3
4	40 33.1 1.00 04 23.6	41 33.0 1.00 04 23.5	43 02.8 1.00 04 23.4	44 02.7 1.00 04 23.3	45 02.6 1.00 04 23.2	46 02.5 1.00 04 23.1	47 02.3 1.00 04 23.1	48 32.1 1.00 04 22.9	4
155	40 30.6 1.00 04 22.7	41 30.5 1.00 04 22.6	43 00.4 1.00 04 22.5	44 00.3 1.00 04 22.4	45 00.2 1.00 04 22.3	46 00.0 1.00 04 22.3	46 59.9 1.00 04 22.2	48 29.7 1.00 04 22.0	155
6	40 28.3 1.00 04 21.8	41 28.2 1.00 04 21.7	42 58.0 1.00 04 21.6	43 57.6 1.00 04 21.5	44 57.8 1.00 04 21.4	45 57.7 1.00 04 21.4	46 57.7 1.00 04 21.3	48 27.4 1.00 04 21.1	6
7	40 26.0 1.00 04 20.9	41 25.9 1.00 04 20.8	42 55.8 1.00 04 20.7	43 55.7 1.00 04 20.6	44 55.6 1.00 04 20.6	45 55.5 1.00 04 20.5	46 55.4 1.00 04 20.4	48 25.2 1.00 04 20.2	7
8	40 23.8 1.00 04 20.0	41 23.7 1.00 03 19.9	42 53.6 1.00 03 19.8	43 53.5 1.00 03 19.7	44 53.4 1.00 03 19.7	45 53.3 1.00 03 19.6	46 53.2 1.00 03 19.5	48 23.1 1.00 03 19.4	8
9	40 21.7 1.00 03 19.1	41 21.6 1.00 03 19.0	42 51.5 1.00 03 18.9	43 51.4 1.00 03 18.8	44 51.4 1.00 03 18.8	45 51.3 1.00 03 18.7	46 51.2 1.00 03 18.6	48 21.0 1.00 03 18.5	9
160	40 19.7 1.00 03 18.2	41 19.6 1.00 03 18.1	42 49.5 1.00 03 18.0	43 49.5 1.00 03 17.9	44 49.4 1.00 03 17.9	45 49.3 1.00 03 17.8	46 49.2 1.00 03 17.7	48 19.1 1.00 03 17.6	160
1	40 17.8 1.00 03 17.2	41 17.7 1.00 03 17.2	42 47.6 1.00 03 17.1	43 47.6 1.00 03 17.0	44 47.5 1.00 03 17.0	45 47.4 1.00 03 16.9	46 47.4 1.00 03 16.8	48 17.2 1.00 03 16.7	1
2	40 16.0 1.00 03 16.3	41 15.9 1.00 03 16.3	42 45.8 1.00 03 16.2	43 45.8 1.00 03 16.1	44 45.7 1.00 03 16.1	45 45.7 1.00 03 16.0	46 45.6 1.00 03 15.9	48 15.5 1.00 03 15.9	2
3	40 14.3 1.00 03 15.4	41 14.2 1.00 03 15.4	42 44.1 1.00 03 15.3	43 44.1 1.00 03 15.2	44 44.0 1.00 03 15.2	45 44.0 1.00 03 15.1	46 43.9 1.00 03 15.1	48 13.8 1.00 03 15.0	3
4	40 12.6 1.00 03 14.5	41 12.6 1.00 03 14.5	42 42.5 1.00 03 14.4	43 42.5 1.00 02 14.3	44 42.4 1.00 02 14.3	45 42.4 1.00 02 14.2	46 42.3 1.00 02 14.2	48 12.3 1.00 02 14.1	4
165	40 11.1 1.00 02 13.6	41 11.1 1.00 02 13.6	42 41.0 1.00 02 13.5	43 41.0 1.00 02 13.4	44 40.9 1.00 02 13.4	45 40.9 1.00 02 13.3	46 40.8 1.00 02 13.3	48 10.8 1.00 02 13.2	165
6	40 09.7 1.00 02 12.7	41 09.7 1.00 02 12.7	42 39.6 1.00 02 12.6	43 39.6 1.00 02 12.5	44 39.5 1.00 02 12.5	45 39.5 1.00 02 12.4	46 39.5 1.00 02 12.4	48 09.4 1.00 02 12.3	6
7	40 08.4 1.00 02 11.8	41 08.3 1.00 02 11.8	42 38.3 1.00 02 11.7	43 38.3 1.00 02 11.6	44 38.2 1.00 02 11.6	45 38.2 1.00 02 11.6	46 38.2 1.00 02 11.5	48 08.1 1.00 02 11.4	7
8	40 07.1 1.00 02 10.9	41 07.1 1.00 02 10.8	42 37.1 1.00 02 10.8	43 37.0 1.00 02 10.7	44 37.0 1.00 02 10.7	45 37.0 1.00 02 10.7	46 37.0 1.00 02 10.6	48 06.9 1.00 02 10.5	8
9	40 06.1 1.00 02 10.0	41 06.0 1.00 02 09.9	42 35.9 1.00 02 09.9	43 35.9 1.00 02 09.8	44 35.9 1.00 02 09.8	45 35.9 1.00 02 09.8	46 35.8 1.00 02 09.7	48 05.8 1.00 02 09.7	9
170	40 05.0 1.00 01 09.1	41 04.9 1.00 01 09.0	42 34.9 1.00 01 09.0	43 34.9 1.00 01 08.9	44 34.9 1.00 01 08.9	45 33.9 1.00 01 08.8	46 34.9 1.00 01 08.8	48 04.8 1.00 01 08.8	170
1	40 04.0 1.00 01 08.2	41 04.0 1.00 01 08.1	42 34.0 1.00 01 08.1	43 34.0 1.00 01 08.1	44 33.9 1.00 01 08.0	45 33.9 1.00 01 08.0	46 33.9 1.00 01 08.0	48 03.9 1.00 01 07.9	1
2	40 03.2 1.00 01 07.3	41 03.2 1.00 01 07.2	42 33.1 1.00 01 07.2	43 33.1 1.00 01 07.2	44 33.1 1.00 01 07.1	45 33.1 1.00 01 07.1	46 33.1 1.00 01 07.1	48 03.1 1.00 01 07.0	2
3	40 02.4 1.00 01 06.3	41 02.4 1.00 01 06.3	42 32.4 1.00 01 06.3	43 32.4 1.00 01 06.3	44 32.4 1.00 01 06.2	45 32.4 1.00 01 06.2	46 32.4 1.00 01 06.2	48 02.4 1.00 01 06.2	3
4	40 01.8 1.00 01 05.4	41 01.8 1.00 01 05.4	42 31.8 1.00 01 05.4	43 31.8 1.00 01 05.4	44 31.8 1.00 01 05.4	45 31.8 1.00 01 05.3	46 31.7 1.00 01 05.3	48 01.7 1.00 01 05.3	4
175	40 01.2 1.00 01 04.5	41 01.2 1.00 01 04.5	42 31.2 1.00 01 04.5	43 31.2 1.00 01 04.5	44 31.2 1.00 01 04.5	45 31.2 1.00 01 04.4	46 31.2 1.00 01 04.4	48 01.2 1.00 01 04.4	175
6	40 00.8 1.00 01 03.6	41 00.8 1.00 01 03.6	42 30.8 1.00 01 03.6	43 30.8 1.00 01 03.6	44 30.8 1.00 01 03.6	45 30.8 1.00 01 03.6	46 30.8 1.00 01 03.5	48 00.8 1.00 01 03.5	6
7	40 00.4 1.00 00 02.7	41 00.4 1.00 00 02.7	42 30.4 1.00 00 02.7	43 30.4 1.00 00 02.7	44 30.4 1.00 00 02.7	45 30.4 1.00 00 02.7	46 30.4 1.00 00 02.7	48 00.4 1.00 00 02.6	7
8	40 00.2 1.00 00 01.8	41 00.2 1.00 00 01.8	42 30.2 1.00 00 01.8	43 30.2 1.00 00 01.8	44 30.2 1.00 00 01.8	45 30.2 1.00 00 01.8	46 30.1 1.00 00 01.8	48 00.2 1.00 00 01.8	8
9	40 00.0 1.00 00 00.9	41 00.0 1.00 00 00.9	42 30.1 1.00 00 00.9	43 30.1 1.00 00 00.9	44 30.1 1.00 00 00.9	45 30.1 1.00 00 00.9	46 30.1 1.00 00 00.9	48 00.1 1.00 00 00.9	9
180	40 00.0 1.00 00 00.0	41 00.0 1.00 00 00.0	42 30.0 1.00 00 00.0	43 30.0 1.00 00 00.0	44 30.0 1.00 00 00.0	45 30.0 1.00 00 00.0	46 30.0 1.00 00 00.0	48 00.0 1.00 00 00.0	180

Lat. 85°

Lat. 84°

H.A.	54° 30' Alt. / Az.	55° 00' Alt. / Az.	56° 00' Alt. / Az.	56° 30' Alt. / Az.	57° 00' Alt. / Az.	57° 30' Alt. / Az.	59° 00' Alt. / Az.	59° 30' Alt. / Az.	H.A.
00	60 30.0 1.000 180.0	61 00.0 1.000 180.0	62 00.0 1.000 180.0	62 30.0 1.000 180.0	63 00.0 1.000 180.0	63 30.0 1.000 180.0	65 00.0 1.000 180.0	65 30.0 1.000 180.0	00
1	60 29.9 1.000 178.8	60 59.9 1.000 178.8	61 59.9 1.000 178.8	62 29.9 1.000 178.8	62 59.9 1.000 178.8	63 29.9 1.000 178.8	64 59.9 1.000 178.8	65 29.9 1.000 178.8	1
2	60 29.7 1.001 177.6	60 59.7 1.001 177.6	61 59.7 1.001 177.6	62 29.7 1.001 177.6	62 59.7 1.001 177.6	63 29.7 1.001 177.6	64 59.7 1.001 177.6	65 29.7 1.001 177.6	2
3	60 29.4 1.001 176.5	60 59.4 1.001 176.5	61 59.4 1.001 176.4	62 29.4 1.001 176.4	62 59.4 1.001 176.4	63 29.4 1.001 176.4	64 59.4 1.001 176.3	65 29.4 1.001 176.3	3
4	60 29.0 1.001 175.3	60 59.0 1.001 175.3	61 59.0 1.001 175.2	62 29.0 1.001 175.2	62 59.0 1.001 175.2	63 28.9 1.001 175.2	64 58.9 1.001 175.1	65 28.9 1.001 175.1	4
05	60 28.4 1.001 174.1	60 58.4 1.001 174.1	61 58.4 1.001 174.0	62 28.4 1.001 174.0	62 58.4 1.001 174.0	63 28.4 1.001 174.0	64 58.3 1.001 173.9	65 28.3 1.001 173.9	05
6	60 27.7 1.001 172.9	60 57.7 1.001 172.9	61 57.7 1.001 172.8	62 27.6 1.001 172.8	62 57.6 1.001 172.8	63 27.6 1.001 172.8	64 57.6 1.001 172.7	65 27.6 1.001 172.7	6
7	60 26.8 1.002 171.8	60 56.8 1.002 171.7	61 56.8 1.002 171.6	62 26.8 1.002 171.6	62 56.8 1.002 171.6	63 26.8 1.002 171.6	64 56.7 1.002 171.5	65 26.7 1.002 171.4	7
8	60 25.9 1.002 170.6	60 55.9 1.002 170.5	61 55.8 1.002 170.5	62 25.8 1.002 170.4	62 55.8 1.002 170.4	63 25.8 1.002 170.4	64 55.7 1.002 170.3	65 25.7 1.002 170.2	8
9	60 24.8 1.002 169.4	60 54.8 1.002 169.4	61 54.7 1.002 169.3	62 24.7 1.002 169.3	62 54.7 1.002 169.2	63 24.7 1.002 169.2	64 54.6 1.002 169.0	65 24.6 1.002 169.0	9
10	60 23.6 1.002 168.2	60 53.6 1.002 168.2	61 53.5 1.002 168.1	62 23.5 1.002 168.1	62 53.5 1.002 168.0	63 23.4 1.002 168.0	64 53.4 1.002 167.8	65 23.3 1.002 167.8	10
1	60 22.2 1.002 167.0	60 52.2 1.002 167.0	61 52.1 1.002 166.9	62 22.1 1.002 166.9	62 52.1 1.002 166.8	63 22.1 1.002 166.8	64 52.0 1.002 166.6	65 21.9 1.003 166.6	1
2	60 20.8 1.003 165.9	60 50.7 1.003 165.8	61 50.7 1.003 165.7	62 20.6 1.003 165.7	62 50.6 1.003 165.6	63 20.6 1.003 165.6	64 50.5 1.003 165.4	65 20.4 1.003 165.4	2
3	60 19.2 1.003 164.7	60 49.1 1.003 164.7	61 49.1 1.003 164.6	62 19.0 1.003 164.5	62 49.0 1.003 164.4	63 18.9 1.003 164.4	64 48.8 1.003 164.2	65 18.8 1.003 164.1	3
4	60 17.5 1.003 163.5	60 47.4 1.003 163.5	61 47.3 1.003 163.4	62 17.3 1.003 163.3	62 47.2 1.003 163.2	63 17.2 1.003 163.2	64 47.0 1.003 163.0	65 17.0 1.003 162.9	4
15	60 15.6 1.003 162.4	60 45.6 1.003 162.2	61 45.5 1.004 162.2	62 15.4 1.003 162.1	62 45.4 1.003 162.0	63 15.3 1.004 162.0	64 45.1 1.004 161.8	65 15.1 1.004 161.7	15
6	60 13.7 1.004 161.2	60 43.6 1.004 161.1	61 43.5 1.004 161.0	62 13.4 1.004 160.9	62 43.4 1.004 160.9	63 13.3 1.004 160.8	64 43.1 1.004 160.6	65 13.1 1.004 160.5	6
7	60 11.6 1.004 160.0	60 41.5 1.004 160.0	61 41.4 1.004 159.8	62 11.3 1.004 159.8	62 41.3 1.004 159.7	63 11.2 1.004 159.6	64 41.0 1.004 159.4	65 10.9 1.004 159.3	7
8	60 09.4 1.004 158.9	60 39.3 1.004 158.8	61 39.2 1.004 158.7	62 09.1 1.004 158.6	62 39.0 1.004 158.5	63 09.0 1.004 158.4	64 38.7 1.004 158.2	65 08.6 1.004 158.1	8
9	60 07.0 1.004 157.7	60 37.0 1.004 157.6	61 36.8 1.004 157.5	62 06.7 1.004 157.4	62 36.7 1.004 157.3	63 06.6 1.004 157.2	64 36.3 1.004 157.0	65 06.2 1.004 156.9	9
20	60 04.6 1.004 156.5	60 34.5 1.004 156.5	61 34.4 1.004 156.3	62 04.3 1.004 156.1	62 34.2 1.005 156.1	63 04.1 1.004 156.1	64 33.8 1.005 155.7	65 03.7 1.004 155.7	20
1	60 02.1 1.004 155.4	60 32.0 1.005 155.3	61 31.8 1.005 155.1	62 01.7 1.005 155.1	62 31.6 1.005 155.0	63 01.5 1.005 154.9	64 31.2 1.005 154.6	65 01.1 1.005 154.5	1
2	59 59.4 1.005 154.2	60 29.3 1.005 154.1	61 29.1 1.005 154.0	61 59.0 1.005 153.9	62 28.9 1.005 153.8	62 58.8 1.005 153.7	64 28.4 1.005 153.4	64 58.3 1.005 153.3	2
3	59 56.6 1.005 153.1	60 26.5 1.005 153.0	61 26.3 1.005 152.8	61 56.2 1.005 152.7	62 26.1 1.005 152.6	62 55.9 1.005 152.5	64 25.6 1.005 152.2	64 55.4 1.005 152.1	3
4	59 53.7 1.005 151.9	60 23.1 1.005 151.6	61 23.0 1.005 151.5	61 53.2 1.005 151.5	62 23.0 1.005 151.5	62 53.0 1.005 151.4	64 22.6 1.005 151.0	64 52.4 99 05 151.0	4
25	59 50.7 1.005 150.8	60 20.6 1.005 150.7	61 20.3 1.005 150.5	61 50.2 1.005 150.4	62 20.1 1.005 150.3	62 49.9 1.005 150.2	64 19.5 99 05 149.8	64 49.3 99 05 149.7	25
6	59 47.6 1.005 149.6	60 17.4 1.005 149.5	61 17.2 1.005 149.3	61 47.0 1.005 149.2	62 16.9 1.005 149.1	62 46.8 99 05 149.0	64 16.3 99 05 148.7	64 46.1 99 05 148.5	6
7	59 44.3 1.006 148.5	60 14.2 1.006 148.4	61 13.9 1.006 148.2	61 43.8 99 06 148.1	62 13.6 99 06 148.0	62 43.5 99 06 147.8	64 13.0 99 06 147.5	64 42.8 99 06 147.4	7
8	59 41.0 1.006 147.3	60 10.9 1.006 147.2	61 10.6 99 06 147.0	61 40.4 99 06 146.9	62 10.2 99 06 146.8	62 40.1 99 06 146.7	64 09.5 99 06 146.3	64 39.3 99 06 146.2	8
9	59 37.6 99 06 146.2	60 07.4 99 06 146.1	61 07.2 99 06 145.9	61 36.9 99 06 145.7	62 06.8 99 06 145.6	62 36.6 99 06 145.5	64 06.0 99 06 145.1	64 35.8 99 06 145.0	9
30	59 34.0 99 06 145.0	60 03.9 99 06 144.9	61 03.5 99 06 144.7	61 33.3 99 06 144.6	62 03.2 99 06 144.5	62 33.0 99 06 144.4	64 02.4 99 06 144.0	64 32.1 99 06 143.8	30
1	59 30.4 99 06 143.9	60 00.2 99 06 143.8	60 59.9 99 06 143.6	61 29.7 99 06 143.4	61 59.5 99 06 143.3	62 29.3 99 06 143.2	63 58.6 99 06 142.8	64 28.4 99 06 142.7	1
2	59 26.6 99 06 142.7	59 56.5 99 06 142.6	60 56.1 99 06 142.4	61 25.9 99 06 142.3	61 55.7 99 06 142.2	62 25.5 99 07 142.0	63 54.8 99 07 141.6	64 24.5 99 07 141.5	2
3	59 22.8 99 07 141.6	59 52.6 99 07 141.3	60 52.2 99 07 141.3	61 22.0 99 07 141.1	61 51.8 99 07 141.0	62 21.6 99 07 140.9	63 50.8 99 07 140.5	64 20.6 99 07 140.3	3
4	59 18.8 99 07 140.5	59 48.6 99 07 140.4	60 48.2 99 07 140.1	61 18.0 99 07 140.0	61 47.8 99 07 139.9	62 17.6 99 07 139.7	63 46.8 99 07 139.3	64 16.5 99 07 139.2	4
35	59 14.8 99 07 139.4	59 44.6 99 07 139.2	60 44.2 99 07 139.0	61 13.9 99 07 138.9	61 43.7 99 07 138.7	62 13.4 99 07 138.6	63 42.7 99 07 138.2	64 12.4 99 07 138.0	35
6	59 10.7 99 07 138.2	59 40.5 99 07 138.1	60 40.0 99 07 137.9	61 09.8 99 07 137.7	61 39.5 99 07 137.6	62 09.3 99 07 137.5	63 38.4 99 07 137.0	64 08.1 99 07 136.9	6
7	59 06.5 99 07 137.1	59 36.2 99 07 137.0	60 35.7 99 07 136.7	61 05.4 99 07 136.6	61 35.2 99 07 136.5	62 05.0 99 07 136.3	63 34.1 99 07 135.9	64 03.8 99 07 135.7	7
8	59 02.1 99 07 136.0	59 31.9 99 07 135.9	60 31.4 99 07 135.6	61 01.1 99 07 135.5	61 30.9 99 07 135.3	62 00.6 99 07 135.2	63 29.7 99 08 134.7	63 59.4 99 08 134.6	8
9	58 57.7 99 07 134.9	59 27.5 99 07 134.7	60 27.0 99 08 134.5	60 56.7 99 08 134.3	61 26.4 99 08 134.2	61 56.1 99 08 134.1	63 25.2 99 08 133.6	63 54.9 99 08 133.4	9
40	58 53.3 99 08 133.7	59 23.0 99 08 133.6	60 22.5 99 08 133.4	60 52.2 99 08 133.2	61 21.9 99 08 133.1	61 51.6 99 08 132.9	63 20.6 99 08 132.4	63 50.3 99 08 132.3	40
1	58 48.7 99 08 132.6	59 18.4 99 08 132.5	60 17.8 99 08 132.2	60 47.6 99 08 132.1	61 17.3 99 08 131.9	61 46.9 99 08 131.8	63 15.9 99 08 131.3	63 45.6 99 08 131.1	1
2	58 44.0 99 08 131.5	59 13.7 99 08 131.4	60 13.2 99 08 131.1	60 42.9 99 08 131.0	61 12.4 99 08 130.9	61 42.2 99 08 130.7	63 11.2 99 08 130.2	63 40.8 99 08 130.0	2
3	58 39.3 99 08 130.4	59 09.0 99 08 130.3	60 08.4 99 08 130.0	60 38.1 99 08 129.9	61 07.8 99 08 129.7	61 37.4 99 08 129.6	63 06.4 99 08 129.1	63 36.0 99 08 128.9	3
4	58 34.5 99 08 129.3	59 04.2 99 08 129.2	60 03.6 99 08 128.9	60 33.2 99 08 128.7	61 02.9 99 08 128.6	61 32.6 99 08 128.4	63 01.5 99 08 127.9	63 31.1 99 08 127.8	4
45	58 29.6 99 08 128.2	58 59.3 99 08 128.1	59 58.6 99 08 127.8	60 28.3 99 08 127.6	60 58.0 99 08 127.5	61 27.6 99 08 127.3	62 56.5 99 08 126.8	63 26.1 99 08 126.6	45
6	58 24.6 99 08 127.1	58 54.3 99 08 127.0	59 53.6 99 08 126.7	60 23.3 99 08 126.5	60 52.9 99 08 126.4	61 22.6 99 09 126.2	62 51.4 99 09 125.7	63 21.0 99 09 125.5	6
7	58 19.6 99 09 126.0	58 49.3 99 09 125.9	59 48.9 99 09 125.6	60 18.2 99 09 125.4	60 47.9 99 09 125.3	61 17.5 99 09 125.1	62 46.3 99 09 124.6	63 15.9 99 09 124.4	7
8	58 14.5 99 09 124.9	58 44.1 99 09 124.8	59 43.4 99 09 124.5	60 13.1 99 09 124.3	60 42.7 99 09 124.2	61 12.3 99 09 124.0	62 41.1 99 09 123.5	63 10.6 99 09 123.3	8
9	58 09.3 99 09 123.8	58 39.0 99 09 123.7	59 38.2 99 09 123.4	60 07.9 99 09 123.2	60 37.5 99 09 123.1	61 07.1 99 09 122.9	62 35.8 99 09 122.4	63 05.4 98 09 122.2	9
50	58 04.1 99 09 122.7	58 33.7 99 09 122.6	59 33.0 99 09 122.3	60 02.6 99 09 122.1	60 32.2 99 09 122.0	61 01.8 99 09 121.8	62 30.5 98 09 121.3	63 00.0 98 09 121.1	50
1	57 58.8 99 09 121.7	58 28.4 99 09 121.5	59 27.6 99 09 121.2	59 57.2 99 09 121.1	60 26.8 99 09 120.9	60 56.4 99 09 120.7	62 25.1 98 09 120.2	62 54.6 98 09 120.0	1
2	57 53.4 99 09 120.6	58 23.0 99 09 120.4	59 22.2 99 09 120.1	59 51.8 99 09 120.0	60 21.4 99 09 119.8	60 51.0 99 09 119.6	62 19.6 98 09 119.1	62 49.2 98 09 118.9	2
3	57 48.0 99 09 119.5	58 17.6 99 09 119.4	59 16.8 99 09 119.0	59 46.4 99 09 118.9	60 16.0 99 09 118.7	60 45.5 99 09 118.5	62 14.1 98 09 118.0	62 43.6 98 09 117.8	3
4	57 42.5 99 09 118.4	58 12.1 99 09 118.3	59 11.3 99 09 118.0	59 40.9 99 09 117.8	60 10.4 99 09 117.6	60 40.0 99 09 117.5	62 08.6 98 09 116.9	62 38.1 98 09 116.7	4
55	57 36.9 99 09 117.4	58 06.5 99 09 117.2	59 05.7 99 09 116.9	59 35.3 99 09 116.7	60 04.8 99 09 116.6	60 34.4 98 09 116.4	62 03.0 98 09 115.8	62 32.4 98 09 115.6	55
6	57 31.3 99 10 116.3	58 00.9 99 10 116.1	59 00.1 99 10 115.8	59 29.7 99 09 115.7	59 59.2 98 10 115.5	60 28.8 98 10 115.3	61 57.3 98 10 114.7	62 26.8 98 10 114.5	6
7	57 25.7 99 10 115.2	57 55.3 99 10 115.1	58 54.4 99 10 114.8	59 24.0 99 10 114.6	59 53.5 98 10 114.4	60 23.1 98 10 114.2	61 51.6 98 10 113.7	62 21.0 98 10 113.5	7
8	57 20.0 99 10 114.2	57 49.6 99 10 114.0	58 48.7 99 10 113.7	59 18.3 98 10 113.5	59 47.8 98 10 113.3	60 17.3 98 10 113.2	61 45.8 98 10 112.6	62 15.3 98 10 112.4	8
9	57 14.2 99 10 113.1	57 43.8 99 10 112.9	58 42.9 99 10 112.6	59 12.5 98 10 112.5	59 42.0 98 10 112.3	60 11.5 98 10 112.1	61 40.0 98 10 111.5	62 09.4 98 10 111.3	9
60	57 08.4 99 10 112.0	57 38.0 99 10 111.9	58 37.1 98 10 111.6	59 06.7 98 10 111.4	59 36.2 98 10 111.2	60 05.7 98 10 111.0	61 34.1 98 10 110.5	62 03.6 98 10 110.3	60
1	57 02.6 99 10 111.0	57 32.2 99 10 110.8	58 31.3 98 10 110.5	59 00.8 98 10 110.3	59 30.3 98 10 110.2	59 59.8 98 10 110.0	61 28.2 98 10 109.4	61 57.7 98 10 109.2	1
2	56 56.7 99 10 109.9	57 26.3 99 10 109.8	58 25.4 98 10 109.5	58 54.9 98 10 109.3	59 24.4 98 10 109.1	59 53.9 98 10 108.9	61 22.3 98 10 108.4	61 51.7 98 10 108.2	2
3	56 50.8 99 10 108.9	57 20.4 98 10 108.7	58 19.4 98 10 108.4	58 49.0 98 10 108.2	59 18.5 98 10 108.1	59 48.0 98 10 107.9	61 16.3 98 10 107.3	61 45.8 98 10 107.1	3
4	56 44.9 99 10 107.8	57 14.4 98 10 107.7	58 13.5 98 10 107.4	58 43.0 98 10 107.2	59 12.5 98 10 107.0	59 42.0 98 10 106.8	61 10.3 98 10 106.3	61 39.7 98 10 106.0	4
65	56 38.9 99 10 106.8	57 08.4 98 10 106.6	58 07.5 98 10 106.3	58 37.0 98 10 106.1	59 06.5 98 10 106.0	59 36.0 98 10 105.8	61 04.3 98 10 105.2	61 33.7 98 10 105.0	65
6	56 32.9 98 10 105.8	57 02.4 98 10 105.6	58 01.4 98 10 105.3	58 30.9 98 10 105.1	59 00.4 98 10 104.9	59 29.9 98 10 104.7	60 58.2 98 10 104.2	61 27.6 98 10 104.0	6
7	56 26.8 98 10 104.7	56 56.3 98 10 104.6	57 55.4 98 10 104.2	58 24.9 98 10 104.1	58 54.4 98 10 103.9	59 23.8 98 10 103.7	60 52.1 98 10 103.1	61 21.5 98 10 102.9	7
8	56 20.7 98 10 103.7	56 50.3 98 10 103.7	57 49.3 98 10 103.2	58 18.8 98 10 103.0	58 48.3 98 10 102.9	59 17.7 98 10 102.7	60 46.0 98 10 102.1	61 15.4 98 10 101.9	8
9	56 14.6 98 10 102.7	56 44.2 98 10 102.5	57 43.2 98 10 102.2	58 12.7 98 10 102.0	58 42.1 98 10 101.8	59 11.6 98 10 101.6	60 39.9 98 10 101.1	61 09.3 98 10 100.9	9
70	56 08.5 98 10 101.6	56 38.0 98 10 101.5	57 37.0 98 10 101.1	58 06.5 98 10 101.0	58 36.0 98 10 100.8	59 05.4 98 10 100.6	60 33.7 98 10 100.0	61 03.1 98 10 99.8	70
1	56 02.3 98 10 100.6	56 31.9 98 10 100.5	57 30.9 98 10 100.1	58 00.3 98 10 99.9	58 29.8 98 10 99.8	58 59.3 98 10 99.6	60 27.5 98 10 99.0	60 56.9 98 10 98.8	1
2	55 56.2 98 10 99.6	56 25.7 98 10 99.4	57 24.7 98 10 99.1	57 54.2 98 10 98.9	58 23.6 98 10 98.7	58 53.1 98 10 98.6	60 21.3 98 10 98.0	60 50.7 98 10 97.8	2
3	55 50.0 98 10 98.6	56 19.5 98 10 98.4	57 18.5 98 10 98.1	57 48.0 98 10 97.9	58 17.4 98 10 97.7	58 46.9 98 10 97.5	60 15.1 98 10 97.0	60 44.5 98 10 96.8	3
4	55 43.8 98 10 97.6	56 13.3 98 10 97.4	57 12.3 98 10 97.1	57 41.7 98 10 96.9	58 11.2 98 10 96.7	58 40.6 98 10 96.5	60 08.9 98 10 95.9	60 38.2 98 10 95.7	4
75	55 37.5 98 10 96.5	56 07.0 98 10 96.4	57 06.0 98 10 96.1	57 35.5 98 10 95.9	58 05.0 98 10 95.7	58 34.4 98 10 95.5	60 02.6 98 10 94.9	60 32.0 98 10 94.7	75
6	55 31.3 98 10 95.5	56 00.8 98 10 95.4	56 59.8 98 10 95.0	57 29.3 98 10 94.9	57 58.7 98 10 94.7	58 28.1 98 10 94.5	59 56.4 98 10 93.9	60 25.7 98 10 93.7	6
7	55 25.1 98 10 94.5	55 54.6 98 10 94.4	56 53.6 98 10 94.0	57 23.0 98 10 93.9	57 52.5 98 10 93.7	58 21.9 98 10 93.5	59 50.1 98 10 92.9	60 19.5 98 10 92.7	7
8	55 18.8 98 10 93.5	55 48.3 98 10 93.4	56 47.3 98 10 93.0	57 16.7 98 10 92.9	57 46.2 98 10 92.7	58 15.6 98 10 92.5	59 43.8 98 10 91.9	60 13.2 98 10 91.7	8
9	55 12.5 98 10 92.5	55 42.0 98 10 92.4	56 41.0 98 10 92.0	57 10.5 98 10 91.9	57 39.9 98 10 91.7	58 09.4 98 10 91.5	59 37.6 98 10 90.9	60 06.9 98 10 90.7	9
80	55 06.3 98 10 91.5	55 35.8 98 10 91.4	56 34.7 98 10 91.0	57 04.2 98 10 90.9	57 33.7 98 10 90.7	58 03.1 98 10 90.5	59 31.3 98 10 89.9	60 00.7 98 10 89.7	80
1	55 00.0 98 10 90.5	55 29.5 98 10 90.4	56 28.5 98 10 90.0	56 57.9 98 10 89.9	57 27.4 98 10 89.7	57 56.8 98 10 89.5	59 25.0 98 10 88.9	59 54.4 98 10 88.7	1
2	54 53.7 98 10 89.5	55 23.2 98 10 89.4	56 22.2 98 10 89.0	56 51.7 98 10 88.9	57 21.1 98 10 88.7	57 50.5 98 10 88.5	59 18.8 98 10 87.9	59 48.1 98 10 87.7	2
3	54 47.5 98 10 88.5	55 17.0 98 10 88.4	56 15.9 98 10 88.1	56 45.4 98 10 87.9	57 14.8 98 10 87.7	57 44.3 98 10 87.5	59 12.5 98 10 87.0	59 41.9 98 10 86.8	3
4	54 41.2 98 10 87.5	55 10.7 98 10 87.4	56 09.7 98 10 87.1	56 39.1 98 10 86.9	57 08.6 98 10 86.7	57 38.0 98 10 86.5	59 06.2 98 10 86.0	59 35.6 98 10 85.8	4
85	54 34.9 98 10 86.6	55 04.4 98 10 86.4	56 03.4 98 10 86.1	56 32.9 98 10 85.9	57 02.3 98 10 85.7	57 31.8 98 10 85.6	59 00.0 98 10 85.0	59 29.3 98 10 84.8	85
6	54 28.7 98 10 85.6	54 58.2 98 10 85.4	55 57.1 98 10 85.1	56 26.6 98 10 84.9	56 56.1 98 10 84.8	57 25.5 98 10 84.6	58 53.7 98 10 84.0	59 23.1 98 10 83.8	6
7	54 22.4 98 10 84.6	54 51.9 98 10 84.4	55 50.8 98 10 84.1	56 20.4 98 10 83.9	56 49.8 98 10 83.8	57 19.3 98 10 83.6	58 47.5 98 10 83.0	59 16.9 98 10 82.8	7
8	54 16.2 98 10 83.6	54 45.7 98 10 83.5	55 44.7 98 10 83.1	56 14.1 98 10 83.0	56 43.6 98 10 82.8	57 13.0 98 10 82.6	58 41.3 98 10 82.1	59 10.7 98 10 81.9	8
9	54 10.0 98 10 82.6	54 39.5 98 10 82.5	55 38.5 98 10 82.2	56 07.9 98 10 82.0	56 37.4 98 10 81.8	57 06.8 98 10 81.7	58 35.1 98 10 81.1	59 04.5 98 10 80.9	9
90	54 03.7 98 10 81.7	54 33.3 98 10 81.5	55 32.2 98 10 81.2	56 01.7 98 10 81.0	56 31.2 98 10 80.9	57 00.6 98 10 80.7	58 28.9 98 10 80.1	58 58.3 98 10 79.9	90

Lat. 84°

H.A.	54° 30′ Alt.	Δd Δt	Az.	55° 00′ Alt.	Δd Δt	Az.	56° 00′ Alt.	Δd Δt	Az.	56° 30′ Alt.	Δd Δt	Az.	57° 00′ Alt.	Δd Δt	Az.	57° 30′ Alt.	Δd Δt	Az.	59° 00′ Alt.	Δd Δt	Az.	59° 30′ Alt.	Δd Δt	Az.	H.A.
91	53 57.5	98 10	80.7	54 27.1	98 10	80.5	55 26.1	98 10	80.2	55 55.5	98 10	80.1	56 25.0	98 10	79.9	56 54.5	98 10	79.7	58 22.7	98 10	79.2	58 52.1	98 10	79.0	91
2	53 51.4	98 10	79.7	54 20.9	98 10	79.6	55 19.9	98 10	79.3	55 49.4	98 10	79.1	56 18.8	98 10	78.9	56 48.3	98 10	78.8	58 16.6	98 10	78.2	58 46.0	98 10	78.0	2
3	53 45.2	98 10	78.8	54 14.7	98 10	78.6	55 13.7	98 10	78.3	55 43.2	98 10	78.1	56 12.7	98 10	78.0	56 42.2	98 10	77.8	58 10.4	98 10	77.2	58 39.8	98 10	77.1	3
4	53 39.1	98 10	77.8	54 08.6	98 10	77.6	55 07.6	98 10	77.3	55 37.1	98 10	77.2	56 06.6	98 10	77.0	56 36.0	98 10	76.8	58 04.3	98 10	76.3	58 33.7	98 10	76.1	4
95	53 32.9	98 10	76.8	54 02.5	98 10	76.7	55 01.5	98 10	76.4	55 31.0	98 10	76.2	56 00.5	98 10	76.0	56 29.9	98 10	75.9	57 58.3	98 10	75.3	58 27.7	98 10	75.2	95
6	53 26.8	98 10	75.9	53 56.4	98 10	75.7	54 55.4	98 10	75.4	55 24.9	98 10	75.2	55 54.4	98 10	75.1	56 23.9	98 10	74.9	57 52.2	98 10	74.4	58 21.6	98 10	74.2	6
7	53 20.8	98 10	74.9	53 50.3	98 10	74.8	54 49.4	98 10	74.5	55 18.9	98 10	74.3	55 48.4	98 10	74.1	56 17.8	98 10	74.0	57 46.2	98 10	73.4	58 15.6	98 10	73.3	7
8	53 14.7	98 10	73.9	53 44.3	98 10	73.8	54 43.3	98 10	73.5	55 12.8	98 10	73.3	55 42.3	98 10	73.2	56 11.8	98 10	73.0	57 40.2	98 10	72.5	58 09.6	98 10	72.3	8
9	53 08.7	98 10	73.0	53 38.2	98 10	72.8	54 37.3	98 10	72.5	55 06.8	98 10	72.4	55 36.3	98 10	72.2	56 05.8	98 10	72.1	57 34.2	98 10	71.5	58 03.6	98 10	71.4	9
100	53 02.7	99 10	72.0	53 32.3	98 10	71.9	54 31.4	98 10	71.6	55 00.9	98 10	71.4	55 30.4	98 10	71.3	55 59.9	98 10	71.1	57 28.3	98 10	70.6	57 57.7	98 10	70.4	100
1	52 56.8	99 10	71.1	53 26.3	99 10	70.9	54 25.4	98 10	70.6	54 55.0	98 10	70.5	55 24.5	98 10	70.3	55 54.0	98 10	70.2	57 22.4	98 10	69.7	57 51.8	98 10	69.5	1
2	52 50.9	99 10	70.1	53 20.4	99 10	70.0	54 19.5	98 10	69.7	54 49.1	98 10	69.6	55 18.6	98 10	69.4	55 48.1	98 10	69.2	57 16.5	98 10	68.7	57 46.0	98 10	68.6	2
3	52 45.0	99 10	69.2	53 14.6	99 10	69.1	54 13.7	98 10	68.8	54 43.2	98 10	68.7	55 12.7	98 10	68.5	55 42.2	98 10	68.3	57 10.7	98 10	67.8	57 40.2	98 10	67.6	3
4	52 39.2	99 10	68.2	53 08.7	99 10	68.1	54 07.8	98 10	67.8	54 37.4	98 10	67.7	55 06.9	98 10	67.5	55 36.4	98 10	67.4	57 04.9	98 10	66.9	57 34.4	98 10	66.7	4
105	52 33.3	99 10	67.3	53 02.9	99 10	67.2	54 02.1	99 10	66.9	54 31.6	98 10	66.7	55 01.1	98 10	66.6	55 30.7	98 10	66.4	56 59.2	98 10	65.9	57 28.6	98 10	65.8	105
6	52 27.6	99 10	66.4	52 57.2	99 10	66.2	53 56.3	99 10	65.9	54 25.9	98 10	65.8	54 55.4	98 00	65.6	55 24.9	98 00	65.5	56 53.5	98 00	65.0	57 22.9	98 00	64.8	6
7	52 21.9	99 09	65.4	52 51.4	99 09	65.3	53 50.6	99 09	65.0	54 20.2	99 09	64.9	54 49.7	98 09	64.7	55 19.2	98 09	64.6	56 47.8	98 09	64.1	57 17.3	98 09	63.9	7
8	52 16.2	99 09	64.5	52 45.8	99 09	64.4	53 45.0	99 09	64.1	54 14.5	99 09	63.9	54 44.1	98 09	63.8	55 13.6	98 09	63.6	56 42.2	98 09	63.2	57 11.7	98 09	63.0	8
9	52 10.5	99 09	63.6	52 40.1	99 09	63.4	53 39.3	99 09	63.1	54 08.9	99 09	63.0	54 38.5	99 09	62.9	55 08.0	98 09	62.7	56 36.6	98 00	62.2	57 06.1	98 09	62.1	9
110	52 04.9	99 09	62.6	52 34.6	99 09	62.5	53 33.7	99 09	62.2	54 03.3	99 09	62.1	54 32.9	99 09	61.9	55 02.5	99 09	61.8	56 31.1	98 00	61.3	57 00.6	98 00	61.2	110
1	51 59.4	99 09	61.7	52 29.0	99 09	61.6	53 28.2	99 09	61.3	53 57.8	99 09	61.1	54 27.4	99 09	61.0	54 57.0	98 00	60.9	56 25.6	98 00	60.4	56 55.1	98 00	60.2	1
2	51 53.9	99 09	60.8	52 23.5	99 09	60.6	53 22.7	99 09	60.4	53 52.3	99 09	60.2	54 21.9	99 00	60.1	54 51.5	99 00	59.9	56 20.2	98 00	59.5	56 49.7	98 00	59.3	2
3	51 48.5	99 09	59.8	52 18.1	99 09	59.7	53 17.3	99 09	59.4	53 46.9	99 09	59.3	54 16.5	99 09	59.2	54 46.1	99 09	59.0	56 14.8	98 00	58.6	56 44.3	98 00	58.4	3
4	51 43.1	99 09	58.9	52 12.7	99 09	58.8	53 11.9	99 09	58.5	53 41.6	99 09	58.4	54 11.2	99 09	58.2	54 40.8	99 09	58.1	56 09.5	99 09	57.7	56 39.0	98 00	57.5	4
115	51 37.7	99 09	58.0	52 07.4	99 09	57.9	53 06.6	99 09	57.6	53 36.2	99 09	57.5	54 05.9	99 09	57.3	54 35.5	99 09	57.2	56 04.2	99 09	56.7	56 33.8	99 09	56.6	115
6	51 32.4	99 09	57.1	52 02.1	99 09	56.9	53 01.4	99 09	56.7	53 31.0	99 09	56.5	54 00.6	99 09	56.4	54 30.2	99 09	56.3	55 59.0	99 09	55.8	56 28.5	99 09	55.7	6
7	51 27.2	99 09	56.1	51 56.8	99 09	56.0	52 56.1	99 09	55.8	53 25.8	99 09	55.6	53 55.4	99 09	55.5	54 25.0	99 00	55.4	55 53.8	99 09	54.9	56 23.4	99 09	54.8	7
8	51 22.0	99 09	55.2	51 51.7	99 08	55.1	52 51.0	99 08	54.8	53 20.6	99 08	54.7	53 50.3	99 08	54.6	54 19.9	99 08	54.4	55 48.7	99 08	54.0	56 18.3	99 08	53.9	8
9	51 16.9	99 08	54.3	51 46.6	99 08	54.2	52 45.9	99 08	53.9	53 15.5	99 08	53.8	53 45.2	99 08	53.7	54 14.8	99 08	53.5	55 43.7	99 08	53.1	56 13.3	99 08	53.0	9
120	51 11.8	99 08	53.4	51 41.5	99 08	53.3	52 40.8	99 08	53.0	53 10.5	99 08	52.9	53 40.2	99 08	52.8	54 09.8	99 08	52.6	55 38.7	99 08	52.2	56 08.3	99 08	52.1	120
1	51 06.8	99 08	52.5	51 36.5	99 08	52.3	52 35.9	99 08	52.1	53 05.5	99 08	52.0	53 35.2	99 08	51.9	54 04.8	99 08	51.7	55 33.8	99 08	51.3	56 03.4	99 08	51.2	1
2	51 01.9	99 08	51.5	51 31.6	99 08	51.4	52 31.0	99 08	51.2	53 00.6	99 08	51.1	53 30.3	99 08	51.0	54 00.0	99 08	50.8	55 28.9	99 08	50.4	55 58.5	99 08	50.3	2
3	50 57.0	99 08	50.6	51 26.7	99 08	50.5	52 26.1	99 08	50.3	52 55.8	99 08	50.2	53 25.5	99 08	50.0	53 55.1	99 08	49.9	55 24.1	99 08	49.5	55 53.7	99 08	49.4	3
4	50 52.2	99 08	49.7	51 21.9	99 08	49.6	52 21.3	99 08	49.4	52 51.0	99 08	49.3	53 20.7	99 08	49.1	53 50.4	99 08	49.0	55 19.3	99 08	48.6	55 49.0	99 08	48.5	4
125	50 47.4	99 08	48.8	51 17.2	99 08	48.7	52 16.6	99 08	48.5	52 46.3	99 08	48.4	53 16.0	99 08	48.2	53 45.7	99 08	48.1	55 14.7	99 08	47.7	55 44.3	99 08	47.6	125
6	50 42.7	99 08	47.9	51 12.5	99 08	47.8	52 11.9	99 08	47.6	52 41.6	99 08	47.5	53 11.3	99 08	47.3	53 41.0	99 08	47.2	55 10.1	99 08	46.8	55 39.7	99 08	46.7	6
7	50 38.1	99 08	47.0	51 07.9	99 08	46.9	52 07.3	99 08	46.7	52 37.0	99 08	46.6	53 06.7	99 08	46.4	53 36.4	99 08	46.3	55 05.5	99 07	46.0	55 35.2	99 07	45.8	7
8	50 33.6	99 07	46.1	51 03.3	99 07	46.0	52 02.8	99 07	45.8	52 32.5	99 07	45.7	53 02.2	99 07	45.5	53 31.9	99 07	45.4	55 01.0	99 07	45.1	55 30.7	99 07	44.9	8
9	50 29.1	99 07	45.2	50 58.8	99 07	45.1	51 58.3	99 07	44.9	52 28.1	99 07	44.8	52 57.8	99 07	44.6	53 27.5	99 07	44.5	54 56.6	99 07	44.2	55 26.3	99 07	44.1	9
130	50 24.7	99 07	44.3	50 54.4	99 07	44.2	51 53.9	99 07	44.0	52 23.7	99 07	43.9	52 53.3	99 07	43.8	53 23.2	99 07	43.6	54 52.3	99 07	43.3	55 22.0	99 07	43.2	130
1	50 20.3	99 07	43.4	50 50.1	99 07	43.3	51 49.6	99 07	43.1	52 19.4	99 07	43.0	52 49.1	99 07	42.9	53 18.9	99 07	42.7	54 48.0	99 07	42.4	55 17.8	99 07	42.3	1
2	50 16.1	99 07	42.5	50 45.8	99 07	42.4	51 45.4	99 07	42.2	52 15.1	99 07	42.1	52 44.9	99 07	42.0	53 14.6	99 07	41.9	54 43.8	99 07	41.5	55 13.6	99 07	41.4	2
3	50 11.9	99 07	41.6	50 41.6	99 07	41.5	51 41.2	99 07	41.3	52 11.0	99 07	41.2	52 40.7	99 07	41.1	53 10.5	99 07	41.0	54 39.7	99 07	40.6	55 09.5	99 07	40.5	3
4	50 07.7	99 07	40.7	50 37.5	99 07	40.6	51 37.1	99 07	40.4	52 06.9	99 07	40.3	52 36.6	99 07	40.2	53 06.4	99 07	40.1	54 35.7	99 07	39.8	55 05.4	99 07	39.6	4
135	50 03.7	99 07	39.8	50 33.5	99 07	39.7	51 33.1	99 07	39.5	52 02.9	99 07	39.4	52 32.6	99 07	39.3	53 02.4	99 07	39.2	54 31.7	99 06	38.9	55 01.5	99 06	38.8	135
6	49 59.7	99 06	38.9	50 29.5	99 06	38.8	51 29.1	99 06	38.6	51 58.9	99 06	38.5	52 28.7	99 06	38.4	52 58.5	99 06	38.3	54 27.8	99 06	38.0	54 57.6	99 06	37.9	6
7	49 55.8	99 06	38.0	50 25.6	99 06	37.9	51 25.2	99 06	37.7	51 55.0	99 06	37.6	52 24.8	99 06	37.5	52 54.6	99 06	37.4	54 24.0	99 06	37.1	54 53.8	99 06	37.0	7
8	49 52.0	99 06	37.1	50 21.8	99 06	37.0	51 21.5	99 06	36.7	51 51.3	99 06	36.7	52 21.1	99 06	36.6	52 51.0	99 06	36.5	54 20.2	99 06	36.2	54 50.0	99 06	36.1	8
9	49 48.3	99 06	36.2	50 18.1	99 06	36.1	51 17.7	99 06	35.9	51 47.6	99 06	35.8	52 17.4	99 06	35.7	52 47.2	99 06	35.7	54 16.6	99 06	35.4	54 46.4	99 06	35.3	9
140	49 44.6	99 06	35.3	50 14.4	99 06	35.2	51 14.1	99 06	35.0	51 43.9	99 06	34.9	52 13.7	99 06	34.9	52 43.6	99 06	34.8	54 13.0	99 06	34.5	54 42.8	99 06	34.4	140
1	49 41.0	99 06	34.4	50 10.9	99 06	34.3	51 10.5	99 06	34.1	51 40.4	99 06	34.1	52 10.2	99 06	34.0	52 40.0	99 06	33.9	54 09.5	99 06	33.6	54 39.3	99 06	33.5	1
2	49 37.5	1.00 06	33.5	50 07.4	99 06	33.4	51 07.1	99 06	33.3	51 36.9	99 06	33.2	52 06.7	99 06	33.1	52 36.6	99 06	33.0	54 06.0	99 06	32.7	54 35.9	99 06	32.6	2
3	49 34.1	1.00 06	32.6	50 03.9	1.00 05	32.5	51 03.7	99 06	32.4	51 33.5	99 06	32.3	52 03.3	99 06	32.2	52 33.2	99 06	32.1	54 02.7	99 05	31.9	54 32.5	99 05	31.8	3
4	49 30.8	1.00 05	31.7	50 00.6	1.00 05	31.6	51 00.3	1.00 05	31.5	51 30.2	1.00 05	31.4	52 00.0	1.00 05	31.3	52 29.9	99 05	31.2	53 59.4	99 05	31.0	54 29.3	99 05	30.9	4
145	49 27.5	1.00 05	30.8	49 57.4	1.00 05	30.8	50 57.1	1.00 05	30.6	51 27.0	1.00 05	30.5	51 56.8	1.00 05	30.5	52 26.7	1.00 05	30.4	53 56.2	99 05	30.1	54 26.1	99 05	30.0	145
6	49 24.3	1.00 05	29.9	49 54.2	1.00 05	29.9	50 54.0	1.00 05	29.7	51 23.8	1.00 05	29.6	51 53.7	1.00 05	29.6	52 23.6	1.00 05	29.5	53 53.1	1.00 05	29.3	54 23.0	99 05	29.2	6
7	49 21.2	1.00 05	29.0	49 51.1	1.00 05	29.0	50 50.9	1.00 05	28.8	51 20.8	1.00 05	28.8	51 50.6	1.00 05	28.7	52 20.5	1.00 05	28.6	53 50.1	1.00 05	28.4	54 20.0	1.00 05	28.3	7
8	49 18.2	1.00 05	28.2	49 48.1	1.00 05	28.1	50 47.9	1.00 05	28.0	51 17.8	1.00 05	27.9	51 47.7	1.00 05	27.8	52 17.5	1.00 05	27.7	53 47.2	1.00 05	27.5	54 17.0	1.00 05	27.4	8
9	49 15.3	1.00 05	27.3	49 45.2	1.00 05	27.2	50 45.0	1.00 05	27.1	51 14.9	1.00 05	27.0	51 44.8	1.00 05	26.9	52 14.7	1.00 05	26.9	53 44.3	1.00 05	26.6	54 14.2	1.00 05	26.6	9
150	49 12.5	1.00 05	26.4	49 42.4	1.00 05	26.3	50 42.2	1.00 05	26.2	51 12.1	1.00 05	26.1	51 42.0	1.00 05	26.1	52 11.9	1.00 04	26.0	53 41.5	1.00 04	25.8	54 11.4	1.00 04	25.7	150
1	49 09.7	1.00 04	25.5	49 39.7	1.00 04	25.4	50 39.5	1.00 04	25.3	51 09.4	1.00 04	25.3	51 39.3	1.00 04	25.2	52 09.2	1.00 04	25.1	53 38.8	1.00 04	24.9	54 08.7	1.00 04	24.8	1
2	49 07.1	1.00 04	24.6	49 37.0	1.00 04	24.6	50 36.8	1.00 04	24.4	51 06.7	1.00 04	24.4	51 36.6	1.00 04	24.3	52 06.5	1.00 04	24.2	53 36.3	1.00 04	24.0	54 06.1	1.00 04	24.0	2
3	49 04.5	1.00 04	23.7	49 34.4	1.00 04	23.7	50 34.3	1.00 04	23.6	51 04.2	1.00 04	23.5	51 34.1	1.00 04	23.4	52 04.0	1.00 04	23.4	53 33.7	1.00 04	23.2	54 03.6	1.00 04	23.1	3
4	49 02.0	1.00 04	22.8	49 32.0	1.00 04	22.8	50 31.8	1.00 04	22.7	51 01.7	1.00 04	22.6	51 31.7	1.00 04	22.6	52 01.6	1.00 04	22.5	53 31.3	1.00 04	22.3	54 01.2	1.00 04	22.3	4
155	48 59.7	1.00 04	22.0	49 29.6	1.00 04	21.9	50 29.4	1.00 04	21.8	50 59.4	1.00 04	21.8	51 29.3	1.00 04	21.7	51 59.2	1.00 04	21.6	53 29.0	1.00 04	21.5	53 58.9	1.00 04	21.4	155
6	48 57.3	1.00 04	21.1	49 27.3	1.00 04	21.0	50 27.2	1.00 04	20.9	50 57.1	1.00 04	20.9	51 27.0	1.00 04	20.8	51 56.9	1.00 04	20.8	53 26.7	1.00 04	20.6	53 56.6	1.00 04	20.5	6
7	48 55.1	1.00 04	20.2	49 25.1	1.00 04	20.2	50 25.0	1.00 04	20.1	50 54.9	1.00 04	20.0	51 24.8	1.00 04	20.0	51 54.8	1.00 03	19.9	53 24.5	1.00 03	19.7	53 54.5	1.00 03	19.7	7
8	48 53.0	1.00 03	19.3	49 23.0	1.00 03	19.3	50 22.9	1.00 03	19.2	50 52.8	1.00 03	19.1	51 22.7	1.00 03	19.1	51 52.7	1.00 03	19.0	53 22.5	1.00 03	18.9	53 52.4	1.00 03	18.8	8
9	48 51.0	1.00 03	18.4	49 20.9	1.00 03	18.4	50 20.8	1.00 03	18.3	50 50.8	1.00 03	18.3	51 20.7	1.00 03	18.2	51 50.7	1.00 03	18.2	53 20.5	1.00 03	18.0	53 50.4	1.00 03	18.0	9
160	48 49.1	1.00 03	17.6	49 19.0	1.00 03	17.5	50 18.9	1.00 03	17.4	50 48.9	1.00 03	17.4	51 18.8	1.00 03	17.3	51 48.8	1.00 03	17.3	53 18.6	1.00 03	17.1	53 48.6	1.00 03	17.1	160
1	48 47.2	1.00 03	16.7	49 17.2	1.00 03	16.6	50 17.1	1.00 03	16.6	50 47.0	1.00 03	16.5	51 17.0	1.00 03	16.5	51 47.0	1.00 03	16.4	53 16.8	1.00 03	16.3	53 46.8	1.00 03	16.2	1
2	48 45.5	1.00 03	15.8	49 15.4	1.00 03	15.8	50 15.3	1.00 03	15.7	50 45.3	1.00 03	15.6	51 15.3	1.00 03	15.6	51 45.2	1.00 03	15.6	53 15.1	1.00 03	15.4	53 45.0	1.00 03	15.4	2
3	48 43.8	1.00 03	14.9	49 13.8	1.00 03	14.9	50 13.7	1.00 03	14.8	50 43.7	1.00 03	14.8	51 13.6	1.00 03	14.7	51 43.6	1.00 03	14.7	53 13.5	1.00 03	14.6	53 43.4	1.00 03	14.5	3
4	48 42.2	1.00 02	14.0	49 12.2	1.00 02	14.0	50 12.1	1.00 02	13.9	50 42.1	1.00 02	13.9	51 12.1	1.00 02	13.9	51 42.0	1.00 02	13.8	53 11.9	1.00 02	13.7	53 41.9	1.00 02	13.7	4
165	48 40.7	1.00 02	13.2	49 10.7	1.00 02	13.1	50 10.7	1.00 02	13.1	50 40.6	1.00 02	13.0	51 10.6	1.00 02	13.0	51 40.6	1.00 02	13.0	53 10.5	1.00 02	12.9	53 40.5	1.00 02	12.8	165
6	48 39.4	1.00 02	12.3	49 09.3	1.00 02	12.2	50 09.3	1.00 02	12.2	50 39.3	1.00 02	12.2	51 09.3	1.00 02	12.1	51 39.2	1.00 02	12.1	53 09.2	1.00 02	12.0	53 39.1	1.00 02	12.0	6
7	48 38.1	1.00 02	11.4	49 08.1	1.00 02	11.4	50 08.0	1.00 02	11.3	50 38.0	1.00 02	11.3	51 08.0	1.00 02	11.3	51 38.0	1.00 02	11.2	53 07.9	1.00 02	11.1	53 37.9	1.00 02	11.1	7
8	48 36.9	1.00 02	10.5	49 06.9	1.00 02	10.5	50 06.8	1.00 02	10.4	50 36.8	1.00 02	10.4	51 06.8	1.00 02	10.4	51 36.8	1.00 02	10.4	53 06.7	1.00 02	10.3	53 36.7	1.00 02	10.2	8
9	48 35.8	1.00 02	09.6	49 05.8	1.00 02	09.6	50 05.7	1.00 02	09.6	50 35.7	1.00 02	09.6	51 05.7	1.00 02	09.5	51 35.7	1.00 02	09.5	53 05.7	1.00 02	09.4	53 35.6	1.00 02	09.4	9
170	48 34.8	1.00 01	08.7	49 04.8	1.00 01	08.7	50 04.8	1.00 01	08.7	50 34.7	1.00 01	08.7	51 04.7	1.00 01	08.7	51 34.7	1.00 01	08.6	53 04.7	1.00 01	08.6	53 34.7	1.00 01	08.5	170
1	48 33.9	1.00 01	07.9	49 03.9	1.00 01	07.9	50 03.9	1.00 01	07.8	50 33.8	1.00 01	07.8	51 03.8	1.00 01	07.8	51 33.8	1.00 01	07.8	53 03.8	1.00 01	07.7	53 33.8	1.00 01	07.7	1
2	48 33.1	1.00 01	07.0	49 03.1	1.00 01	07.0	50 03.0	1.00 01	07.0	50 33.0	1.00 01	06.9	51 03.0	1.00 01	06.9	51 33.0	1.00 01	06.9	53 03.0	1.00 01	06.8	53 33.0	1.00 01	06.8	2
3	48 32.3	1.00 01	06.1	49 02.3	1.00 01	06.1	50 02.3	1.00 01	06.1	50 32.3	1.00 01	06.1	51 02.3	1.00 01	06.1	51 32.3	1.00 01	06.0	53 02.3	1.00 01	06.0	53 32.3	1.00 01	06.0	3
4	48 31.7	1.00 01	05.3	49 01.7	1.00 01	05.3	50 01.7	1.00 01	05.2	50 31.7	1.00 01	05.2	51 01.7	1.00 01	05.2	51 31.7	1.00 01	05.2	53 01.7	1.00 01	05.2	53 31.7	1.00 01	05.1	4
175	48 31.2	1.00 01	04.4	49 01.2	1.00 01	04.4	50 01.2	1.00 01	04.4	50 31.2	1.00 01	04.3	51 01.2	1.00 01	04.3	51 31.2	1.00 01	04.3	53 01.2	1.00 01	04.3	53 31.2	1.00 01	04.3	175
6	48 30.8	1.00 01	03.5	49 00.8	1.00 01	03.5	50 00.8	1.00 01	03.5	50 30.8	1.00 01	03.5	51 00.8	1.00 01	03.5	51 30.8	1.00 01	03.5	53 00.7	1.00 01	03.4	53 30.7	1.00 01	03.4	6
7	48 30.4	1.00 00	02.6	49 00.4	1.00 00	02.6	50 00.4	1.00 00	02.6	50 30.4	1.00 00	02.6	51 00.4	1.00 00	02.6	51 30.4	1.00 00	02.6	53 00.4	1.00 00	02.6	53 30.4	1.00 00	02.6	7
8	48 30.2	1.00 00	01.8	49 00.2	1.00 00	01.7	50 00.2	1.00 00	01.7	50 30.2	1.00 00	01.7	51 00.2	1.00 00	01.7	51 30.2	1.00 00	01.7	53 00.2	1.00 00	01.7	53 30.2	1.00 00	01.7	8
9	48 30.0	1.00 00	00.9	49 00.0	1.00 00	00.9	50 00.0	1.00 00	00.9	50 30.0	1.00 00	00.9	51 00.0	1.00 00	00.9	51 30.0	1.00 00	00.9	53 00.0	1.00 00	00.9	53 30.0	1.00 00	00.9	9
180	48 30.0	1.00 00	00.0	49 00.0	1.00 00	00.0	50 00.0	1.00 00	00.0	50 30.0	1.00 00	00.0	51 00.0	1.00 00	00.0	51 30.0	1.00 00	00.0	53 00.0	1.00 00	00.0	53 30.0	1.00 00	00.0	180

Lat. 85°

Lat. 86°

Lat. 87°

DECLINATION SAME NAME AS LATITUDE

Lat. 84°

H.A.	60°00' Alt.	Δd Δt	Az.	60°30' Alt.	Δd Δt	Az.	62°00' Alt.	Δd Δt	Az.	62°30' Alt.	Δd Δt	Az.	63°00' Alt.	Δd Δt	Az.	69°00' Alt.	Δd Δt	Az.	69°30' Alt.	Δd Δt	Az.	74°30' Alt.	Δd Δt	Az.	H.A.
00	66 00.0	1.00 0	180.0	66 30.0	1.00 0	180.0	68 00.0	1.00 0	180.0	68 30.0	1.00 0	180.0	69 00.0	1.00 0	180.0	75 00.0	1.00 0	180.0	75 30.0	1.00 0	180.0	80 30.0	1.00 0	180.0	00
1	65 59.9	1.00 0	178.8	66 29.9	1.00 0	178.8	67 59.9	1.00 0	178.7	68 29.9	1.00 0	178.7	68 59.9	1.00 0	178.7	74 59.9	1.00 0	178.6	75 29.9	1.00 0	178.6	80 29.9	1.00 0	178.4	1
2	65 59.7	1.00 1	177.5	66 29.7	1.00 1	177.5	67 59.7	1.00 1	177.5	68 29.7	1.00 1	177.5	68 59.7	1.00 1	177.5	74 59.7	1.00 1	177.2	75 29.7	1.00 1	177.2	80 29.6	1.00 1	176.8	2
3	65 59.4	1.00 1	176.3	66 29.4	1.00 1	176.3	67 59.4	1.00 1	176.2	68 29.4	1.00 1	176.2	68 59.4	1.00 1	176.2	74 59.3	1.00 1	175.8	75 29.3	1.00 1	175.8	80 29.2	1.00 1	175.1	3
4	65 58.9	1.00 1	175.1	66 28.9	1.00 1	175.1	67 58.9	1.00 1	175.0	68 28.9	1.00 1	174.9	68 58.9	1.00 1	174.9	74 58.8	1.00 1	174.5	75 28.8	1.00 1	174.4	80 28.6	1.00 1	173.5	4
05	65 58.3	1.00 1	173.9	66 28.3	1.00 1	173.9	67 58.3	1.00 1	173.7	68 28.3	1.00 1	173.7	68 58.3	1.00 1	173.7	74 58.1	1.00 1	173.1	75 28.1	1.00 1	173.0	80 27.8	1.00 2	171.9	05
6	65 57.6	1.00 1	172.6	66 27.6	1.00 1	172.6	67 57.5	1.00 1	172.5	68 27.5	1.00 1	172.4	68 57.5	1.00 1	172.4	74 57.3	1.00 2	171.7	75 27.2	1.00 2	171.6	80 26.8	1.00 2	170.3	6
7	65 56.7	1.00 2	171.4	66 26.7	1.00 2	171.4	67 56.6	1.00 2	171.2	68 26.6	1.00 2	171.2	68 56.6	1.00 2	171.1	74 56.3	1.00 2	170.3	75 26.3	1.00 2	170.2	80 25.7	1.00 2	168.7	7
8	65 55.7	1.00 2	170.2	66 25.7	1.00 2	170.1	67 55.6	1.00 2	170.0	68 25.6	1.00 2	169.9	68 55.6	1.00 2	169.9	74 55.2	1.00 2	168.9	75 25.1	1.00 2	168.8	80 24.4	1.00 2	167.1	8
9	65 54.6	1.00 2	168.9	66 24.5	1.00 2	168.9	67 54.5	1.00 2	168.7	68 24.4	1.00 2	168.7	68 54.4	1.00 2	168.6	74 53.9	1.00 2	167.6	75 23.8	1.00 2	167.4	80 23.8	1.00 2	165.5	9
10	65 53.3	1.00 2	167.7	66 23.3	1.00 2	167.7	67 53.1	1.00 2	167.5	68 23.1	1.00 2	167.4	68 53.1	1.00 2	167.4	74 52.5	1.00 3	166.2	75 22.4	1.00 3	166.1	80 21.2	99 03	163.9	10
1	65 51.9	1.00 3	166.5	66 21.9	1.00 3	166.4	67 51.8	1.00 3	166.2	68 21.7	1.00 3	166.2	68 51.7	1.00 3	166.1	74 50.9	1.00 3	164.8	75 20.8	1.00 3	164.7	80 19.4	99 03	162.3	1
2	65 50.4	1.00 3	165.3	66 20.3	1.00 3	165.2	67 50.2	1.00 3	165.0	68 20.1	1.00 3	164.9	68 50.1	1.00 3	164.8	74 49.2	1.00 3	163.5	75 19.1	1.00 3	163.3	80 17.4	99 04	160.8	2
3	65 48.7	1.00 3	164.1	66 18.7	1.00 3	164.0	67 48.5	1.00 3	163.8	68 18.4	1.00 3	163.7	68 48.4	1.00 3	163.6	74 47.3	1.00 3	162.1	75 17.2	1.00 3	161.9	80 15.3	99 04	159.2	3
4	65 46.9	1.00 3	162.8	66 16.9	1.00 3	162.8	67 46.7	1.00 3	162.5	68 16.6	1.00 3	162.4	68 46.5	1.00 3	162.3	74 45.3	1.00 4	160.7	75 15.2	1.00 4	160.6	80 13.0	99 04	157.6	4
15	65 45.0	1.00 3	161.6	66 15.0	1.00 3	161.6	67 44.7	1.00 3	161.3	68 14.7	1.00 4	161.2	68 44.6	1.00 4	161.1	74 43.2	99 04	159.4	75 13.0	99 04	159.2	80 10.5	99 04	156.1	15
6	65 43.0	1.00 4	160.4	66 12.9	1.00 4	160.3	67 42.7	1.00 4	160.1	68 12.6	1.00 4	159.9	68 42.5	1.00 4	159.8	74 40.9	99 04	158.0	75 10.7	99 04	157.8	80 07.9	99 05	154.5	6
7	65 40.8	1.00 4	159.2	66 10.7	1.00 4	159.1	67 40.5	1.00 4	158.8	68 10.4	1.00 4	158.7	68 40.3	1.00 4	158.6	74 38.5	99 04	156.7	75 08.3	99 04	156.5	80 05.1	98 05	153.0	7
8	65 38.5	1.00 4	158.0	66 08.4	1.00 4	157.9	67 38.1	1.00 4	157.6	68 08.0	1.00 4	157.5	68 37.9	1.00 4	157.4	74 36.0	99 04	155.4	75 05.7	99 04	155.1	80 02.2	98 05	151.5	8
9	65 36.1	1.00 4	156.8	66 06.0	1.00 4	156.7	67 35.7	1.00 4	156.4	68 05.6	1.00 4	156.2	68 35.4	1.00 4	156.1	74 33.3	99 05	154.0	75 03.0	99 05	153.8	79 59.1	98 05	150.0	9
20	65 33.6	1.00 4	155.6	66 03.5	1.00 4	155.5	67 33.1	1.00 4	155.1	68 03.0	1.00 5	155.0	68 32.8	1.00 5	154.9	74 30.5	99 05	152.7	75 00.2	99 05	152.4	79 55.9	98 06	148.5	20
1	65 30.9	1.00 5	154.4	66 00.8	1.00 5	154.3	67 30.4	1.00 5	153.9	68 00.3	99 05	153.8	68 30.1	99 05	153.6	74 27.5	99 05	151.4	74 57.2	99 05	151.1	79 52.6	98 06	147.0	1
2	65 28.2	1.00 5	153.2	65 58.0	1.00 5	153.1	67 27.6	99 05	152.7	67 57.4	99 05	152.6	68 27.3	99 05	152.4	74 24.5	99 05	150.0	74 54.1	99 05	149.8	79 49.1	98 06	145.5	2
3	65 25.3	1.00 5	151.9	65 55.1	99 05	151.9	67 24.6	99 05	151.5	67 54.5	99 05	151.3	68 24.3	99 05	151.2	74 21.3	99 06	148.7	74 50.9	99 06	148.4	79 45.5	97 06	144.0	3
4	65 22.3	99 05	150.8	65 52.1	99 05	150.7	67 21.6	99 05	150.3	67 51.4	99 05	150.1	68 21.2	99 05	150.0	74 17.9	99 06	147.4	74 47.6	99 06	147.1	79 41.7	97 06	142.6	4
25	65 19.2	99 05	149.6	65 49.0	99 05	149.5	67 18.4	99 05	149.0	67 48.2	99 06	148.9	68 18.0	99 06	148.7	74 14.5	99 06	146.1	74 44.1	99 06	145.8	79 37.8	97 07	141.1	25
6	65 15.9	99 06	148.4	65 45.7	99 06	148.3	67 15.1	99 06	147.8	67 44.9	99 06	147.7	68 14.7	99 06	147.5	74 11.0	99 06	144.8	74 40.5	98 06	144.5	79 33.8	97 07	139.7	6
7	65 12.6	99 06	147.2	65 42.4	99 06	147.1	67 11.8	99 06	146.6	67 41.5	99 06	146.5	68 11.3	99 06	146.3	74 07.3	99 06	143.5	74 36.8	98 06	143.2	79 29.7	97 07	138.3	7
8	65 09.1	99 06	146.0	65 38.9	99 06	145.9	67 08.2	99 06	145.4	67 38.0	99 06	145.3	68 07.7	99 06	145.1	74 03.5	98 06	142.2	74 33.0	98 07	141.9	79 25.5	96 07	136.9	8
9	65 05.6	99 06	144.9	65 35.4	99 06	144.7	67 04.6	99 06	144.2	67 34.4	99 06	144.1	68 04.1	99 06	143.9	73 59.6	98 07	140.9	74 29.1	98 07	140.6	79 21.2	96 07	135.5	9
30	65 01.9	99 06	143.7	65 31.7	99 06	143.5	67 00.9	99 06	143.0	67 30.6	99 06	142.9	68 00.4	99 06	142.7	73 55.6	98 07	139.7	74 25.0	98 07	139.3	79 16.7	96 08	134.1	30
1	64 58.2	99 06	142.5	65 27.9	99 06	142.4	66 57.1	99 07	141.9	67 26.8	99 07	141.7	67 56.5	99 07	141.5	73 51.5	98 07	138.4	74 20.9	98 07	138.0	79 12.2	96 08	132.7	1
2	64 54.3	99 07	141.3	65 24.0	99 07	141.2	66 53.2	99 07	140.7	67 22.9	99 07	140.5	67 52.5	99 07	140.3	73 47.3	98 07	137.1	74 16.6	98 07	136.8	79 07.5	96 08	131.4	2
3	64 50.3	99 07	140.2	65 20.0	99 07	140.0	66 49.1	99 07	139.5	67 18.8	99 07	139.3	67 48.5	99 07	139.1	73 42.9	98 07	135.9	74 12.3	98 07	135.5	79 02.7	95 08	130.0	3
4	64 46.2	99 07	139.0	65 16.0	99 07	138.8	66 45.0	99 07	138.3	67 14.7	99 07	138.1	67 44.3	99 07	137.9	73 38.5	98 07	134.6	74 07.9	98 08	134.3	78 57.9	95 08	128.7	4
35	64 42.1	99 07	137.8	65 11.8	99 07	137.7	66 40.8	99 07	137.1	67 10.5	99 07	136.9	67 40.1	99 07	136.7	73 34.0	98 08	133.4	74 03.3	98 08	133.0	78 53.0	95 08	127.4	35
6	64 37.8	99 07	136.7	65 07.5	99 07	136.5	66 36.5	99 07	136.0	67 06.1	99 07	135.8	67 35.7	99 07	135.5	73 29.4	98 08	132.2	73 58.7	97 08	131.8	78 47.9	95 08	126.0	6
7	64 33.5	99 07	135.5	65 03.2	99 07	135.4	66 32.1	99 07	134.8	67 01.7	99 08	134.6	67 31.3	99 08	134.4	73 24.7	98 08	130.9	73 54.0	97 08	130.5	78 42.8	95 09	124.7	7
8	64 29.0	99 08	134.4	64 58.7	99 08	134.2	66 27.6	99 08	133.6	66 57.2	99 08	133.4	67 26.8	99 08	133.2	73 19.9	97 08	129.7	73 49.2	97 08	129.3	78 37.6	94 09	123.5	8
9	64 24.5	99 08	133.2	64 54.2	99 08	133.1	66 23.0	99 08	132.5	66 52.6	99 08	132.3	67 22.2	99 08	132.1	73 15.1	97 08	128.5	73 44.3	97 08	128.1	78 32.3	94 09	122.2	9
40	64 19.9	99 08	132.1	64 49.5	99 08	131.9	66 18.3	99 08	131.3	66 47.9	99 08	131.1	67 17.5	98 08	130.9	73 10.1	97 08	127.3	73 39.3	97 08	126.9	78 27.0	94 09	120.9	40
1	64 15.2	99 08	131.0	64 44.8	99 08	130.8	66 13.6	99 08	130.2	66 43.2	98 08	130.0	67 12.7	98 08	129.7	73 05.1	97 09	126.1	73 34.2	97 09	125.7	78 21.6	94 09	119.7	1
2	64 10.4	99 08	129.8	64 40.0	99 08	129.6	66 08.8	98 08	129.0	66 38.3	98 08	128.8	67 07.8	98 08	128.6	73 00.0	97 09	124.9	73 29.1	97 09	124.5	78 16.1	94 09	118.4	2
3	64 05.6	99 08	128.7	64 35.2	99 08	128.5	66 03.8	98 08	127.9	66 33.4	98 08	127.7	67 02.9	98 08	127.4	72 54.8	97 09	123.7	73 23.9	97 09	123.3	78 10.5	94 09	117.2	3
4	64 00.7	99 08	127.6	64 30.2	99 08	127.4	65 58.9	98 08	126.8	66 28.4	98 08	126.5	66 57.9	98 08	126.3	72 49.6	97 09	122.5	73 18.6	97 09	122.1	78 05.0	94 09	116.0	4
45	63 55.6	99 08	126.4	64 25.2	99 08	126.3	65 53.8	98 09	125.6	66 23.3	98 09	125.4	66 52.9	98 09	125.2	72 44.2	97 09	121.4	73 13.3	97 09	120.9	77 59.3	93 10	114.9	45
6	63 50.6	99 09	125.3	64 20.1	98 09	125.1	65 48.7	98 09	124.5	66 18.1	98 09	124.3	66 47.6	98 09	124.0	72 38.8	97 09	120.2	73 07.8	97 09	119.8	77 53.6	93 10	113.6	6
7	63 45.4	99 09	124.2	64 14.9	98 09	124.0	65 43.5	98 09	123.4	66 12.9	98 09	123.1	66 42.4	98 09	122.9	72 33.4	97 09	119.0	73 02.4	97 09	118.6	77 47.8	93 10	112.4	7
8	63 40.2	98 09	123.1	64 09.7	98 09	122.9	65 38.2	98 09	122.2	66 07.6	98 09	122.0	66 37.1	98 09	121.8	72 27.9	97 09	117.9	72 56.8	96 09	117.4	77 42.0	93 10	111.2	8
9	63 34.9	98 09	122.0	64 04.4	98 09	121.8	65 32.9	98 09	121.1	66 02.3	98 09	120.9	66 31.7	98 09	120.7	72 22.3	97 09	116.7	72 51.2	96 09	116.3	77 36.1	93 10	110.1	9
50	63 29.6	98 09	120.9	63 59.1	98 09	120.7	65 27.5	98 09	120.0	65 56.9	98 09	119.8	66 26.3	98 09	119.5	72 16.7	96 09	115.6	72 45.6	96 10	115.2	77 30.2	93 10	108.9	50
1	63 24.1	98 09	119.8	63 53.6	98 09	119.6	65 22.0	98 09	118.9	65 51.4	98 09	118.7	66 20.8	98 09	118.4	72 11.0	96 10	114.5	72 39.9	96 10	114.0	77 24.2	93 10	107.8	1
2	63 18.7	98 09	118.7	63 48.1	98 09	118.5	65 16.5	98 09	117.8	65 45.9	98 09	117.6	66 15.3	98 09	117.3	72 05.3	96 10	113.3	72 34.1	96 10	112.9	77 18.2	93 10	106.6	2
3	63 13.1	98 09	117.6	63 42.6	98 09	117.4	65 10.9	98 09	116.7	65 40.3	98 09	116.5	66 09.7	98 09	116.2	71 59.5	96 10	112.2	72 28.3	96 10	111.8	77 12.2	93 10	105.5	3
4	63 07.5	98 09	116.3	63 37.0	98 09	116.3	65 05.3	98 09	115.6	65 34.7	98 10	115.4	66 04.0	98 10	115.1	71 53.7	96 10	111.1	72 22.5	96 10	110.7	77 06.1	93 10	104.4	4
55	63 01.9	98 10	115.4	63 31.4	98 10	115.2	64 59.6	98 10	114.5	65 29.0	98 10	114.3	65 58.3	98 10	114.0	71 47.8	96 10	110.0	72 16.6	96 10	109.5	77 00.1	92 10	103.3	55
6	62 56.2	98 10	114.3	63 25.7	98 10	114.1	64 53.9	98 10	113.4	65 23.2	98 10	113.2	65 52.6	98 10	112.9	71 41.9	96 10	108.9	72 10.7	96 10	108.4	76 53.9	92 10	102.2	6
7	62 50.5	98 10	113.3	63 19.9	98 10	113.1	64 48.1	98 10	112.4	65 17.4	98 10	112.1	65 46.8	98 10	111.9	71 35.9	96 10	107.8	72 04.7	96 10	107.4	76 47.8	92 10	101.1	7
8	62 44.7	98 10	112.2	63 14.1	98 10	112.0	64 42.3	98 10	111.3	65 11.6	98 10	111.0	65 40.9	98 10	110.8	71 29.9	96 10	106.7	71 58.7	96 10	106.3	76 41.6	92 10	100.0	8
9	62 38.9	98 10	111.1	63 08.3	98 10	110.9	64 36.4	98 10	110.2	65 05.7	98 10	110.0	65 35.0	98 10	109.7	71 23.9	96 10	105.6	71 52.7	96 10	105.2	76 35.4	92 10	99.0	9
60	62 33.0	98 10	110.1	63 02.4	98 10	109.8	64 30.5	98 10	109.1	64 59.8	98 10	108.9	65 29.1	98 10	108.6	71 17.8	96 10	104.6	71 46.6	96 10	104.1	76 29.3	92 10	97.9	60
1	62 27.1	98 10	109.0	62 56.5	98 10	108.8	64 24.6	98 10	108.1	64 53.9	98 10	107.8	65 23.1	98 10	107.6	71 11.8	96 10	103.5	71 40.5	96 10	103.0	76 23.0	92 10	96.9	1
2	62 21.1	98 10	107.9	62 50.5	98 10	107.7	64 18.6	98 10	107.0	64 47.9	98 10	106.8	65 17.1	98 10	106.5	71 05.6	96 10	102.4	71 34.4	96 10	102.0	76 16.8	92 10	95.8	2
3	62 15.2	98 10	106.9	62 44.5	98 10	106.7	64 12.6	98 10	106.0	64 41.8	98 10	105.7	65 11.1	98 10	105.5	70 59.5	96 10	101.4	71 28.2	96 10	100.9	76 10.5	92 10	94.8	3
4	62 09.1	98 10	105.8	62 38.5	98 10	105.6	64 06.5	98 10	104.9	64 35.8	98 10	104.7	65 05.1	97 10	104.4	70 53.4	96 10	100.3	71 22.1	96 10	99.9	76 04.3	92 10	93.8	4
65	62 03.1	98 10	104.8	62 32.5	98 10	104.6	64 00.4	98 10	103.9	64 29.7	98 10	103.6	64 59.0	97 10	103.4	70 47.2	96 10	99.3	71 15.9	96 10	98.8	75 58.0	92 10	92.7	65
6	61 57.0	98 10	103.7	62 26.4	98 10	103.5	63 54.3	98 10	102.8	64 23.6	98 10	102.6	64 52.9	97 10	102.3	70 41.0	96 10	98.2	71 09.7	96 10	97.8	75 51.8	92 10	91.7	6
7	61 50.9	98 10	102.5	62 20.3	98 10	102.5	63 48.2	98 10	101.8	64 17.5	98 10	101.5	64 46.7	97 10	101.3	70 34.8	96 10	97.2	71 03.4	96 10	96.8	75 45.5	92 10	90.7	7
8	61 44.8	98 10	101.7	62 14.1	98 10	101.4	63 42.1	98 10	100.7	64 11.3	97 10	100.5	64 40.6	97 10	100.2	70 28.5	96 10	96.2	70 57.2	95 10	95.7	75 39.2	92 10	89.7	8
9	61 38.6	98 10	100.6	62 08.0	98 10	100.4	63 35.9	98 10	99.7	64 05.1	97 10	99.5	64 34.4	97 10	99.2	70 22.3	96 10	95.1	70 51.0	95 10	94.7	75 33.0	92 10	88.7	9
70	61 32.4	98 10	99.6	62 01.8	98 10	99.4	63 29.7	98 10	98.7	63 58.9	97 10	98.4	64 28.2	97 10	98.2	70 16.0	96 10	94.1	70 44.7	95 10	93.7	75 26.7	92 10	87.8	70
1	61 26.3	98 10	98.6	61 55.6	98 10	98.4	63 23.5	98 10	97.7	63 52.7	97 10	97.4	64 22.0	97 10	97.2	70 09.8	96 10	93.1	70 38.4	95 10	92.7	75 20.4	92 10	86.8	1
2	61 20.0	98 10	97.6	61 49.4	98 10	97.3	63 17.3	98 10	96.6	63 46.5	97 10	96.4	64 15.7	97 10	96.1	70 03.5	96 10	92.1	70 32.2	95 10	91.7	75 14.2	92 10	85.8	2
3	61 13.8	98 10	96.5	61 43.2	98 10	96.3	63 11.0	98 10	95.6	63 40.3	97 10	95.4	64 09.5	97 10	95.1	69 57.2	96 10	91.1	70 25.9	95 10	90.7	75 07.9	92 10	84.9	3
4	61 07.6	98 10	95.5	61 36.9	98 10	95.3	63 04.8	98 10	94.6	63 34.0	97 10	94.4	64 03.2	97 10	94.1	69 51.0	96 10	90.1	70 19.6	95 10	89.7	75 01.7	92 10	83.9	4
75	61 01.3	98 10	94.5	61 30.7	98 10	94.3	62 58.5	97 10	93.6	63 27.8	97 10	93.4	63 57.0	97 10	93.1	69 44.7	96 10	89.1	70 13.4	95 10	88.7	74 55.4	92 10	82.9	75
6	60 55.1	98 10	93.5	61 24.4	98 10	93.3	62 52.3	97 10	92.6	63 21.5	97 10	92.4	63 50.7	97 10	92.1	69 38.4	96 10	88.1	70 07.1	95 10	87.7	74 49.2	92 10	81.9	6
7	60 48.8	98 10	92.5	61 18.1	98 10	92.3	62 46.0	97 10	91.6	63 15.2	97 10	91.3	63 44.4	97 10	91.1	69 32.2	96 10	87.1	70 00.8	95 10	86.7	74 43.0	92 10	81.1	7
8	60 42.6	98 10	91.5	61 11.9	98 10	91.3	62 39.7	97 10	90.6	63 09.0	97 10	90.4	63 38.2	97 10	90.1	69 25.9	96 10	86.2	69 54.6	95 10	85.7	74 36.8	92 10	80.1	8
9	60 36.3	98 10	90.5	61 05.6	98 10	90.3	62 33.5	97 10	89.6	63 02.7	97 10	89.4	63 31.9	97 10	89.1	69 19.7	96 10	85.2	69 48.3	95 10	84.8	74 30.7	92 10	79.2	9
80	60 30.0	98 10	89.5	60 59.3	98 10	89.3	62 27.2	97 10	88.6	62 56.4	97 10	88.4	63 25.6	97 10	88.1	69 13.4	96 10	84.2	69 42.1	95 10	83.8	74 24.5	92 10	78.3	80
1	60 23.7	98 10	88.5	60 53.1	98 10	88.3	62 21.0	97 10	87.6	62 50.2	97 10	87.4	63 19.4	97 10	87.1	69 07.2	96 10	83.3	69 35.9	95 10	82.8	74 18.4	92 10	77.4	1
2	60 17.5	98 10	87.5	60 46.8	98 10	87.3	62 14.7	97 10	86.6	62 43.9	97 10	86.4	63 13.1	97 10	86.1	69 01.0	96 10	82.3	69 29.6	96 10	81.9	74 12.3	92 10	76.5	2
3	60 11.2	98 10	86.5	60 40.5	98 10	86.3	62 08.4	98 10	85.7	62 37.6	97 10	85.4	63 06.8	97 10	85.2	68 54.7	96 10	81.3	69 23.4	96 10	80.9	74 06.2	93 10	75.6	3
4	60 04.9	98 10	85.6	60 34.3	98 10	85.4	62 02.1	98 10	84.7	62 31.4	97 10	84.4	63 00.6	97 10	84.2	68 48.6	96 10	80.4	69 17.3	96 10	80.0	74 00.1	93 10	74.7	4
85	59 58.7	98 10	84.6	60 28.0	98 10	84.4	61 55.9	98 10	83.7	62 25.1	97 10	83.5	62 54.4	97 10	83.2	68 42.4	96 10	79.4	69 11.1	96 10	79.0	73 54.1	93 10	73.8	85
6	59 52.5	98 10	83.6	60 21.8	98 10	83.4	61 49.7	98 10	82.7	62 18.9	97 10	82.5	62 48.1	97 10	82.2	68 36.2	96 10	78.5	69 04.9	96 10	78.1	73 48.1	93 10	72.9	6
7	59 46.2	98 10	82.6	60 15.6	98 10	82.4	61 43.5	98 10	81.8	62 12.7	97 10	81.5	62 41.9	97 10	81.3	68 30.1	96 10	77.6	68 58.8	96 10	77.2	73 42.1	93 10	72.0	7
8	59 40.0	98 10	81.7	60 09.4	98 10	81.5	61 37.3	98 10	80.8	62 06.5	97 10	80.6	62 35.7	97 10	80.3	68 24.0	96 10	76.6	68 52.7	96 10	76.2	73 36.2	93 10	71.1	8
9	59 33.8	98 10	80.7	60 03.2	98 10	80.5	61 31.1	98 10	79.8	62 00.3	97 10	79.6	62 29.6	97 10	79.4	68 17.9	96 10	75.7	68 46.6	96 10	75.3	73 30.2	93 10	70.2	9
90	59 27.6	98 10	79.7	59 57.0	98 10	79.5	61 24.9	98 10	78.9	61 54.2	97 10	78.6	62 23.4	97 10	78.4	68 11.8	96 10	74.8	68 40.6	96 10	74.4	73 24.3	93 10	69.3	90

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H.A.	60° 00' Alt.	Δd Δt	Az.	60° 30' Alt.	Δd Δt	Az.	62° 00' Alt.	Δd Δt	Az.	62° 30' Alt.	Δd Δt	Az.	63° 00' Alt.	Δd Δt	Az.	69° 00' Alt.	Δd Δt	Az.	69° 30' Alt.	Δd Δt	Az.	71° 30' Alt.	Δd Δt	Az.	H.A.
91	59 21.5	98 10	78.8	59 50.8	98 10	78.6	61 18.8	98 10	77.9	61 48.0	98 10	77.7	62 17.3	97 10	77.5	68 05.8	96 10	73.8	68 34.6	96 10	73.5	73 18.5	93 10	68.5	92
2	59 15.3	98 10	77.8	59 44.7	98 10	77.6	61 12.7	98 10	76.9	61 41.9	98 10	76.7	62 11.2	97 10	76.5	67 59.8	96 10	72.9	68 28.6	96 10	72.5	73 12.7	93 10	67.6	3
3	59 09.2	98 10	76.9	59 38.6	98 10	76.7	61 06.6	98 10	76.0	61 35.8	98 10	75.8	62 05.1	97 10	75.6	67 53.8	96 10	72.0	68 22.6	96 10	71.6	73 06.9	93 10	66.8	4
4	59 03.1	98 10	75.9	59 32.5	98 10	75.7	61 00.5	98 10	75.1	61 29.8	98 10	74.8	61 59.0	97 10	74.6	67 47.8	96 10	71.1	68 16.6	96 10	70.7	73 01.2	93 10	65.9	95
95	58 57.1	98 10	75.0	59 26.4	98 10	74.8	60 54.4	98 10	74.1	61 23.7	98 10	73.9	61 53.0	97 10	73.7	67 41.9	96 10	70.2	68 10.7	96 10	69.8	72 55.5	94 09	65.0	6
6	58 51.0	98 10	74.0	59 20.4	98 10	73.8	60 48.4	98 10	73.2	61 17.7	98 10	73.0	61 47.0	97 10	72.7	67 36.0	96 10	69.3	68 04.9	96 10	68.9	72 49.8	94 09	64.2	7
7	58 45.0	98 10	73.1	59 14.4	98 10	72.9	60 42.4	98 10	72.2	61 11.7	98 10	72.0	61 41.0	97 10	71.8	67 30.2	96 10	68.4	67 59.0	96 10	68.0	72 44.2	94 09	63.4	8
8	58 39.0	98 10	72.1	59 08.4	98 10	71.9	60 36.5	98 10	71.3	61 05.8	98 10	71.1	61 35.1	97 10	70.9	67 24.4	96 10	67.5	67 53.2	96 10	67.1	72 38.6	94 09	62.5	9
9	58 33.1	98 10	71.2	59 02.5	98 10	71.0	60 30.5	98 10	70.4	60 59.9	98 10	70.2	61 29.2	97 10	69.9	67 18.6	96 10	66.6	67 47.5	96 10	66.2	72 33.0	94 09	61.7	100
100	58 27.1	98 10	70.2	58 56.5	98 10	70.0	60 24.7	98 10	69.4	60 54.0	98 10	69.2	61 23.3	98 10	69.0	67 12.9	96 09	65.7	67 41.8	96 09	65.3	72 27.5	94 09	60.8	1
1	58 21.3	98 10	69.3	58 50.7	98 10	69.1	60 18.8	98 10	68.5	60 48.1	98 10	68.3	61 17.5	98 10	68.1	67 07.2	96 09	64.8	67 36.1	96 09	64.4	72 22.1	94 09	60.0	2
2	58 15.4	98 10	68.4	58 44.8	98 10	68.2	60 13.0	98 10	67.6	60 42.3	98 10	67.4	61 11.7	98 10	67.2	67 01.5	97 09	63.9	67 30.5	96 09	63.6	72 16.7	94 09	59.2	3
3	58 09.6	98 10	67.4	58 39.0	98 10	67.3	60 07.2	98 10	66.7	60 36.6	98 10	66.5	61 05.9	98 10	66.3	66 55.9	97 09	63.0	67 24.9	96 09	62.7	72 11.3	94 09	58.3	4
4	58 03.8	98 10	66.5	58 33.3	98 10	66.3	60 01.5	98 10	65.7	60 30.8	98 10	65.5	61 00.2	98 10	65.3	66 50.3	97 09	62.1	67 19.3	96 09	61.8	72 06.0	94 09	57.5	105
105	57 58.1	98 10	65.6	58 27.5	98 09	65.4	59 55.8	98 09	64.8	60 25.1	98 09	64.6	60 54.5	98 09	64.4	66 44.8	97 09	61.3	67 13.8	97 09	60.9	72 00.7	95 09	56.7	6
6	57 52.4	98 10	64.7	58 21.9	98 09	64.5	59 50.1	98 09	63.9	60 19.5	98 09	63.7	60 48.9	98 09	63.5	66 39.3	97 09	60.4	67 08.3	97 09	60.1	71 55.5	95 09	55.9	7
7	57 46.8	98 09	63.7	58 16.2	98 09	63.6	59 44.5	98 09	63.0	60 13.9	98 09	62.8	60 43.3	98 09	62.6	66 33.9	97 09	59.5	67 02.9	97 09	59.2	71 50.3	95 09	55.1	8
8	57 41.2	98 09	62.8	58 10.6	98 09	62.6	59 39.0	98 09	62.1	60 08.3	98 09	61.9	60 37.7	98 09	61.7	66 28.5	97 09	58.6	66 57.6	97 09	58.3	71 45.2	95 08	54.3	9
9	57 35.6	98 09	61.9	58 05.1	98 09	61.7	59 33.4	98 09	61.2	60 02.8	98 09	61.0	60 32.2	98 09	60.8	66 23.2	97 09	57.8	66 52.3	97 09	57.5	71 40.2	95 08	53.5	110
110	57 30.1	98 09	61.0	57 59.6	98 09	60.8	59 28.0	98 09	60.3	59 57.4	98 09	60.1	60 26.8	98 09	59.9	66 17.9	97 09	56.9	66 47.0	97 09	56.6	71 35.1	95 08	52.7	1
1	57 24.6	98 09	60.1	57 54.1	98 09	59.9	59 22.5	98 09	59.4	59 52.0	98 09	59.2	60 21.4	98 09	59.0	66 12.7	97 09	56.0	66 41.8	97 09	55.7	71 30.2	95 08	51.9	2
2	57 19.2	98 09	59.2	57 48.7	98 09	59.0	59 17.2	98 09	58.5	59 46.6	98 09	58.3	60 16.0	98 09	58.1	66 07.5	97 09	55.2	66 36.6	97 09	54.9	71 25.3	95 08	51.1	3
3	57 13.9	98 09	58.2	57 43.4	98 09	58.1	59 11.8	98 09	57.6	59 41.3	98 09	57.4	60 10.7	98 09	57.2	66 02.4	97 08	54.3	66 31.5	97 08	54.0	71 20.4	95 08	50.3	4
4	57 08.6	98 09	57.3	57 38.1	98 09	57.2	59 06.6	98 09	56.7	59 36.0	98 09	56.5	60 05.5	98 09	56.3	65 57.3	97 08	53.5	66 26.5	97 08	53.2	71 15.6	95 08	49.5	115
115	57 03.3	98 09	56.4	57 32.8	98 09	56.3	59 01.4	98 09	55.8	59 30.8	98 09	55.6	60 00.3	98 09	55.4	65 52.3	97 08	52.6	66 21.5	97 08	52.3	71 10.9	96 08	48.7	6
6	56 58.1	99 09	55.5	57 27.7	98 09	55.4	58 56.2	98 09	54.9	59 25.7	98 09	54.7	59 55.2	98 09	54.5	65 47.4	97 08	51.8	66 16.6	97 08	51.5	71 06.2	96 08	47.9	7
7	56 53.0	98 08	54.6	57 22.5	98 08	54.5	58 51.1	98 08	54.0	59 20.6	98 08	53.8	59 50.1	98 08	53.6	65 42.5	97 08	50.9	66 11.7	97 08	50.6	71 01.6	96 08	47.1	8
8	56 47.9	99 08	53.7	57 17.4	99 08	53.6	58 46.1	98 08	53.1	59 15.6	98 08	52.9	59 45.1	98 08	52.7	65 37.6	97 08	50.1	66 06.9	97 08	49.8	70 57.0	96 08	46.3	9
9	56 42.8	99 08	52.8	57 12.4	99 08	52.7	58 41.1	98 08	52.2	59 10.6	98 08	52.0	59 40.1	98 08	51.8	65 32.9	98 08	49.2	66 02.1	97 08	48.9	70 52.5	96 07	45.5	120
120	56 37.9	99 08	51.9	57 07.5	99 08	51.8	58 36.2	98 08	51.3	59 05.7	98 08	51.1	59 35.2	98 08	51.0	65 28.1	98 08	48.4	65 57.3	97 08	48.1	70 48.1	96 07	44.7	1
1	56 33.0	99 08	51.0	57 02.6	99 08	50.9	58 31.3	99 08	50.4	59 00.8	98 08	50.2	59 30.4	98 08	50.1	65 23.5	98 08	47.5	65 52.8	98 08	47.3	70 43.7	96 07	44.0	2
2	56 28.1	99 08	50.1	56 57.7	99 08	50.0	58 26.5	99 08	49.5	58 56.0	98 08	49.4	59 25.6	98 08	49.2	65 18.9	98 08	46.7	65 48.2	98 08	46.4	70 39.4	96 07	43.2	3
3	56 23.3	99 08	49.2	56 53.0	99 08	49.1	58 21.7	99 08	48.6	58 51.3	99 08	48.5	59 20.9	98 08	48.3	65 14.4	98 08	45.9	65 43.7	98 08	45.6	70 35.1	96 07	42.4	4
4	56 18.6	99 08	48.4	56 48.3	99 08	48.2	58 17.1	99 08	47.8	58 46.7	99 08	47.6	59 16.2	98 08	47.4	65 09.9	98 07	45.0	65 39.3	98 07	44.8	70 30.9	97 07	41.6	125
125	56 14.0	99 08	47.5	56 43.6	99 08	47.3	58 12.5	99 08	46.9	58 42.1	99 08	46.7	59 11.6	99 08	46.6	65 05.5	98 07	44.2	65 34.8	98 07	43.9	70 26.8	97 07	40.8	6
6	56 09.4	99 08	46.6	56 39.0	99 08	46.4	58 07.9	99 07	46.0	58 37.5	99 07	45.8	59 07.1	99 07	45.7	65 01.1	98 07	43.4	65 30.5	98 07	43.1	70 22.7	97 07	40.1	7
7	56 04.9	99 07	45.7	56 34.5	99 07	45.6	58 03.4	99 07	45.1	58 33.1	99 07	45.0	59 02.7	99 07	44.8	64 56.8	98 07	42.6	65 26.3	98 07	42.3	70 18.7	97 07	39.3	8
8	56 00.4	99 07	44.8	56 30.1	99 07	44.7	57 59.0	99 07	44.3	58 28.7	99 07	44.1	58 58.3	99 07	44.0	64 52.7	98 07	41.7	65 22.1	98 07	41.5	70 14.8	97 06	38.5	9
9	55 56.0	99 07	43.9	56 25.7	99 07	43.8	57 54.7	99 07	43.4	58 24.3	99 07	43.2	58 54.0	99 07	43.1	64 48.5	98 07	40.9	65 18.0	98 07	40.6	70 10.9	97 06	37.8	130
130	55 51.7	99 07	43.0	56 21.4	99 07	42.9	57 50.4	99 07	42.5	58 20.1	99 07	42.4	58 49.7	99 07	42.2	64 44.5	98 07	40.0	65 13.9	98 07	39.8	70 07.1	97 06	37.0	1
1	55 47.5	99 07	42.2	56 17.2	99 07	42.0	57 46.2	99 07	41.6	58 15.9	99 07	41.5	58 45.6	99 07	41.3	64 40.5	98 07	39.2	65 09.9	98 07	39.0	70 03.3	97 06	36.2	2
2	55 43.3	99 07	41.3	56 13.0	99 07	41.2	57 42.1	99 07	40.8	58 11.8	99 07	40.6	58 41.4	99 07	40.5	64 36.5	98 07	38.4	65 05.9	98 07	38.2	69 59.7	97 06	35.5	3
3	55 39.2	99 07	40.4	56 08.9	99 07	40.3	57 38.0	99 07	39.9	58 07.7	99 07	39.8	58 37.4	99 07	39.6	64 32.7	98 06	37.6	65 02.2	98 06	37.4	69 56.1	97 06	34.7	4
4	55 35.2	99 07	39.5	56 04.9	99 07	40.3	57 34.0	99 07	39.0	58 03.7	99 06	38.9	58 33.4	99 07	39.4	64 28.9	98 06	36.8	64 58.4	98 06	36.5	69 52.5	98 06	34.0	135
135	55 31.2	99 06	38.6	56 00.9	99 06	38.5	57 30.1	99 06	38.2	57 59.8	99 06	38.0	58 29.5	99 06	38.8	64 25.2	99 06	35.9	64 54.7	98 06	35.7	69 49.1	98 06	33.2	6
6	55 27.3	99 06	37.8	55 57.1	99 06	37.7	57 26.3	99 06	37.3	57 56.0	99 06	37.2	58 25.7	99 06	37.0	64 21.5	99 06	35.1	64 51.1	99 06	34.9	69 45.7	98 06	32.5	7
7	55 23.5	99 06	36.9	55 53.3	99 06	36.8	57 22.5	99 06	36.4	57 52.3	99 06	36.3	58 22.0	99 06	36.2	64 17.9	99 06	34.3	64 47.5	99 06	34.1	69 42.3	98 05	31.7	8
8	55 19.8	99 06	36.0	55 49.6	99 06	35.9	57 18.8	99 06	35.6	57 48.6	99 06	35.4	58 18.3	99 06	35.3	64 14.4	99 06	33.5	64 44.0	99 06	33.3	69 35.9	98 05	30.9	9
9	55 16.1	99 06	35.2	55 45.9	99 06	35.0	57 15.2	99 06	34.7	57 45.0	99 06	34.6	58 14.7	99 06	34.5	64 11.0	99 06	32.7	64 40.6	99 06	32.5	69 35.9	98 05	30.2	140
140	55 12.6	99 06	34.3	55 42.4	99 06	34.2	57 11.7	99 06	33.8	57 41.5	99 06	33.7	58 11.2	99 06	33.6	64 07.7	99 05	31.9	64 37.3	99 05	31.7	69 32.8	98 05	29.4	1
1	55 09.1	99 06	33.4	55 38.9	99 06	33.3	57 08.2	99 06	33.0	57 38.0	99 06	32.9	58 07.8	99 06	32.8	64 04.4	99 05	31.0	64 34.1	99 05	30.9	69 29.7	98 05	28.7	2
2	55 05.7	99 06	32.5	55 35.5	99 06	32.4	57 04.7	99 06	32.1	57 34.7	99 06	32.0	58 04.4	99 06	31.9	64 01.2	99 05	30.2	64 30.9	99 05	30.1	69 26.7	98 05	27.9	3
3	55 02.3	99 05	31.7	55 32.1	99 05	32.4	57 01.6	99 05	31.3	57 31.4	99 06	31.2	58 01.2	99 05	31.1	63 58.1	99 05	29.4	64 27.8	99 05	29.3	69 23.8	98 05	27.2	4
4	54 59.1	99 05	30.8	55 28.9	99 05	30.7	56 58.4	99 05	30.4	57 28.2	99 05	31.2	57 58.0	99 05	30.3	63 55.0	99 05	28.6	64 24.7	99 05	28.5	69 21.0	98 05	26.5	145
145	54 55.9	99 05	29.9	55 25.7	99 05	29.9	56 55.2	99 05	29.6	57 25.0	99 05	29.5	57 54.8	99 05	29.4	63 52.1	99 05	27.8	64 21.8	99 05	27.7	69 18.2	99 04	25.7	6
6	54 52.8	99 05	29.1	55 22.7	99 05	29.0	56 52.2	99 05	28.7	57 21.8	99 05	28.6	57 51.8	99 05	28.5	63 49.2	99 05	26.9	64 18.9	99 05	26.9	69 15.6	99 04	25.0	7
7	54 49.8	1.005	28.2	55 19.7	99 05	28.1	56 49.2	99 05	27.9	57 19.0	99 05	27.8	57 48.9	99 05	27.7	63 46.4	99 05	26.2	64 16.1	99 05	26.1	69 13.0	99 04	24.2	8
8	54 46.9	1.005	27.4	55 16.8	1.005	27.3	56 46.3	99 05	27.0	57 16.2	99 05	26.9	57 46.0	99 05	26.9	63 43.6	99 04	25.4	64 13.4	99 04	25.3	69 10.4	99 04	23.5	9
9	54 44.0	1.005	26.5	55 13.9	1.005	26.4	56 43.5	1.005	26.1	57 13.4	1.005	26.1	57 43.2	99 04	26.0	63 41.0	99 04	24.6	64 10.8	99 04	24.5	69 08.0	99 04	22.7	150
150	54 41.3	1.004	25.6	55 11.2	1.004	25.5	56 40.8	1.004	25.3	57 10.6	1.004	25.2	57 40.5	1.004	25.1	63 38.4	99 04	23.9	64 08.2	99 04	23.7	69 05.6	99 04	22.0	1
1	54 38.6	1.004	24.8	55 08.5	1.004	24.7	56 38.1	1.004	24.4	57 07.9	1.004	24.4	57 37.9	1.004	24.3	63 35.9	99 04	23.0	64 05.7	99 04	22.9	69 03.3	99 04	21.2	2
2	54 36.0	1.004	23.9	55 05.9	1.004	23.8	56 35.6	1.004	23.6	57 05.5	1.004	23.5	57 35.3	1.004	23.4	63 33.2	99 04	22.2	64 03.3	99 04	22.1	69 01.0	99 04	20.5	3
3	54 33.5	1.004	23.0	55 03.4	1.004	23.0	56 33.1	1.004	22.7	57 03.0	1.004	22.7	57 32.9	1.004	22.6	63 31.2	99 04	21.4	64 01.0	99 04	21.3	69 58.7	99 03	19.8	4
4	54 31.1	1.004	22.2	55 01.0	1.004	22.1	56 30.7	1.004	21.9	57 00.6	1.004	21.8	57 30.5	1.004	21.7	63 28.9	99 04	20.6	64 58.9	99 04	20.5	68 56.8	99 03	19.0	155
155	54 28.8	1.004	21.3	54 58.7	1.004	21.3	56 28.4	1.004	21.1	56 58.3	1.004	21.0	57 28.2	1.004	20.9	63 26.8	1.003	19.8	63 56.6	99 03	19.7	68 54.8	99 03	18.3	6
6	54 26.6	1.004	20.5	54 56.5	1.003	20.4	56 26.2	1.004	20.2	56 56.1	1.004	20.1	57 26.0	1.004	20.1	63 24.7	1.003	19.0	63 54.6	99 03	18.1	68 52.6	99 03	17.6	7
7	54 24.4	1.003	19.6	54 54.3	1.003	19.6	56 24.1	1.004	19.4	56 54.0	1.004	19.3	57 23.9	1.004	19.2	63 22.7	1.003	18.2	63 52.6	1.003	18.1	68 51.0	99 03	16.1	8
8	54 22.4	1.003	18.8	54 52.3	1.003	18.7	56 22.1	1.003	18.5	56 52.0	1.003	18.4	57 21.9	1.003	18.4	63 20.8	1.003	17.4	63 50.7	1.003	17.3	68 47.5	99 03	15.4	9
9	54 20.4	1.003	17.9	54 50.3	1.003	17.8	56 20.1	1.003	17.7	56 50.1	1.003	17.6	57 20.0	1.003	17.5	63 18.9	1.003	16.6	63 48.8	1.003	16.5	68 47.5	99 03	15.4	160
160	54 18.5	1.003	17.0	54 48.4	1.003	17.0	56 18.3	1.003	16.8	56 48.2	1.003	16.7	57 18.1	1.003	16.6	63 17.2	1.003	15.8	63 47.1	1.003	15.7	68 45.9	1.003	14.6	1
1	54 16.7	1.003	16.2	54 46.7	1.003	16.1	56 16.5	1.003	16.0	56 46.4	1.003	15.9	57 16.4	1.003	15.8	63 15.5	1.003	15.0	63 45.4	1.003	14.9	68 44.4	1.002	13.9	2
2	54 15.0	1.003	15.3	54 45.0	1.003	15.3	56 14.8	1.003	15.1	56 44.8	1.003	15.0	57 14.7	1.003	15.0	63 13.9	1.002	14.2	63 43.9	1.002	14.2	68 42.9	1.002	13.1	3
3	54 13.4	1.003	14.5	54 43.4	1.003	14.4	56 13.2	1.002	14.3	56 43.2	1.002	14.2	57 13.1	1.002	14.2	63 12.4	1.002	13.4	63 42.4	1.002	13.4	68 41.5	1.002	12.4	4
4	54 11.9	1.002	13.6	54 41.8	1.002	13.6	56 11.7	1.002	13.4	56 41.7	1.002	13.4	57 11.6	1.002	13.4	63 11.0	1.002	12.6	63 41.0	1.002	12.6	68 40.2	1.002	11.7	165
165	54 10.4	1.002	12.8	54 40.4	1.002	12.7	56 10.3	1.002	12.6	56 40.3	1.002	12.6	57 10.2	1.002	12.5	63 09.7	1.002	11.9	63 39.6	1.002	11.8	68 39.0	1.002	11.0	6
6	54 09.1	1.002	11.9	54 39.1	1.002	11.9	56 09.1	1.002	11.8	56 38.9	1.002	11.7	57 08.9	1.002	11.7	63 08.4	1.002	11.1	63 38.4	1.002	11.0	68 37.9	1.002	10.2	7
7	54 07.8	1.002	11.1	54 37.8	1.002	11.0	56 07.7	1.002	10.9	56 37.7	1.002	10.9	57 07.7	1.002	10.8	63 07.3	1.002	10.3	63 37.2	1.002	10.2	68 36.7	1.002	09.5	8
8	54 06.7	1.002	10.2	54 35.6	1.002	10.2	56 06.6	1.002	10.1	56 36.6	1.002	10.0	57 06.6	1.002	10.0	63 06.2	1.002	09.5	63 36.2	1.002	09.4	68 35.7	1.002	08.8	9
9	54 05.6	1.002	09.4	54 35.6	1.002	09.3	56 05.5	1.002	09.2	56 35.5	1.002	09.2	57 05.5	1.002	09.2	63 05.2	1.002	08.7	63 35.2	1.002	08.6	68 35.7	1.002	08.0	170
170	54 04.6	1.001	08.5	54 34.6	1.001	08.5	56 04.5	1.001	08.4	56 34.6	1.001	08.4	57 04.5	1.001	08.4	63 04.3	1.001	07.9	63 34.3	1.001	07.9	68 34.0	1.001	07.3	1
1	54 03.8	1.001	07.7	54 33.8	1.001	07.6	56 03.7	1.001	07.6	56 33.7	1.001	07.6	57 03.7	1.001	07.5	63 03.5	1.001	07.1	63 33.5	1.001	07.1	68 33.2	1.001	06.6	2
2	54 03.0	1.001	06.9	54 32.3	1.001	06.8	56 02.9	1.001	06.7	56 32.9	1.001	06.7	57 02.9	1.001	06.7	63 02.8	1.001	06.3	63 32.7	1.001	06.3	68 32.6	1.001	05.8	3
3	54 02.3	1.001	06.0	54 32.3	1.001	05.9	56 02.2	1.001	05.9	56 32.2	1.001	05.9	57 02.1	1.001	05.8	63 02.1	1.001	05.5	63 32.1	1.001	05.5	68 32.0	1.001	05.1	4
4	54 01.7	1.001	05.1	54 31.7	1.001	05.1	56 01.1	1.001	05.0	56 31.6	1.001	05.0	57 01.6	1.001	05.0	63 01.6	1.001	04.7	63 32.1	1.001	04.7	68 31.4	1.001	04.4	175
175	54 00.9	1.001	04.3	54 31.2	1.001	04.2	56 01.1	1.001	04.2	56 31.1	1.001	04.2	57 01.1	1.001	04.2	63 01.6	1.001	03.9	63 31.5	1.001	03.9	68 31.4	1.001	03.6	6
6	54 00.4	1.001	03.4	54 30.7	1.001	03.4	56 00.7	1.001	03.4	56 30.7	1.001	03.3	57 00.7	1.001	03.3	63 00.7	1.000	03.1	63 30.7	1.000	03.1	68 30.6	1.000	02.9	7
7	54 00.2	1.000	02.6	54 30.4	1.000	02.5	56 00.4	1.000	02.5	56 30.4	1.000	02.5	57 00.4	1.000	02.5	63 00.4	1.000	02.4	63 30.4	1.000	02.4	68 30.4	1.000	02.2	8
8	54 00.1	1.000	01.7	54 30.1	1.000	01.7	56 00.2	1.000	01.7	56 30.2	1.000	01.7	57 00.2	1.000	01.7	63 00.2	1.000	01.6	63 30.2	1.000	01.6	68 30.2	1.000	01.5	9
180	54 00.0	1.000	00.9	54 30.0	1.000	00.8	56 00.0	1.000	00.8	56 30.0	1.000	00.8	57 00.0	1.000	00.8	63 00.0	1.000	00.8	63 30.0	1.000	00.8	68 30.0	1.000	00.0	180
	54 00.0	1.000	00.0	54 30.0	1.000	00.0	56 00.0	1.000	00.0	56 30.0	1.000	00.0	57 00.0	1.000	00.0	63 00.0	1.000	00.0	63 30.0	1.000	00.0	68 30.0	1.000	00.0	

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ALTITUDE

AZ.	4° Dec.	4° H.A.	8° Dec.	8° H.A.	12° Dec.	12° H.A.	16° Dec.	16° H.A.	20° Dec.	20° H.A.	24° Dec.	24° H.A.	28° Dec.	28° H.A.	32° Dec.	32° H.A.	36° Dec.	36° H.A.	40° Dec.	40° H.A.	44° Dec.	44° H.A.	AZ.
00	10	180	14	180	18	180	22	180	26	180	30	180	34	180	38	180	42	180	46	180	50	180	00
4	10	176	14	176	18	176	22	176	26	176	30	176	34	176	38	176	42	176	46	176	50	176	4
8	10	172	14	172	18	172	22	172	26	172	30	172	34	171	38	171	42	171	46	171	50	171	8
12	10	168	14	168	18	168	22	168	26	167	30	167	34	167	38	167	42	167	46	167	50	167	12
16	10	164	14	164	18	164	22	163	26	163	30	163	34	163	38	163	42	163	46	162	50	162	16
20	10	160	14	160	18	159	22	159	26	159	30	159	34	159	38	159	42	158	46	158	50	158	20
24	09	156	13	156	17	155	21	155	25	155	29	155	33	155	37	154	41	154	45	154	49	153	24
28	09	152	13	151	17	151	21	151	25	151	29	151	33	150	37	150	41	150	45	149	49	149	28
32	09	148	13	147	17	147	21	147	25	147	29	146	33	146	37	146	41	145	45	145	49	144	32
36	09	144	13	143	17	143	21	143	25	143	29	142	33	142	37	142	41	141	45	141	49	140	36
40	09	140	13	139	17	139	21	139	25	138	29	138	33	138	37	137	40	137	44	136	48	136	40
44	08	136	12	135	16	135	20	135	24	134	28	134	32	134	36	133	40	133	44	132	48	131	44
48	08	132	12	131	16	131	20	131	24	130	28	130	32	129	36	129	40	128	44	128	48	127	48
52	08	128	12	127	16	127	20	126	24	126	28	126	32	125	36	125	40	124	44	124	47	123	52
56	07	124	11	123	15	123	19	122	23	122	27	122	31	121	35	121	39	120	43	119	47	119	56
60	07	119	11	119	15	119	19	118	23	118	27	117	31	117	35	117	39	116	43	115	47	115	60
64	07	115	11	115	15	115	19	114	23	114	27	113	30	113	34	112	38	112	42	111	46	110	64
68	06	112	10	111	14	111	18	110	22	110	26	109	30	109	34	108	38	108	42	107	46	106	68
72	06	108	10	107	14	107	18	106	22	106	26	105	30	105	34	104	37	104	42	103	46	102	72
76	05	104	09	103	13	103	17	102	21	102	25	101	29	101	33	100	37	100	41	99	45	98	76
80	05	100	09	99	13	99	17	98	21	98	25	97	29	97	33	96	37	96	41	95	45	94	80
84	05	96	09	95	13	95	17	94	21	94	24	93	28	93	32	92	36	92	40	91	44	90	84
88	04	92	08	91	12	91	16	90	20	90	24	89	28	89	32	88	36	88	40	87	44	86	88
92	04	88	08	87	12	87	16	86	20	86	24	85	28	85	32	84	36	84	40	83	43	82	92
96	03	84	07	83	11	83	15	82	19	82	23	81	27	81	31	80	35	80	39	79	43	78	96
100	03	80	07	79	11	79	15	78	19	78	23	77	27	77	31	76	35	76	39	75	43	74	100
104	03	76	07	75	10	75	14	74	18	74	22	74	26	73	30	73	34	72	38	71	42	71	104
108	02	72	06	71	10	71	14	70	18	70	22	70	26	69	30	69	34	68	38	67	42	67	108
112	02	68	06	67	10	67	14	67	18	66	22	66	26	65	30	65	34	64	38	64	42	63	112
116	01	64	05	63	09	63	13	63	17	62	21	62	25	61	29	61	33	60	37	60	41	59	116
120	01	60	05	59	09	59	13	59	17	58	21	58	25	57	29	57	33	57	37	56	41	55	120
124	01	56	05	55	09	55	13	55	17	54	21	54	25	54	29	53	32	53	36	52	40	52	124
128	00	52	04	51	08	51	12	51	16	50	20	50	24	50	28	49	32	49	36	48	40	48	128
132	*00*	48	04	48	08	47	12	47	16	47	20	46	24	46	28	45	32	45	36	45	40	44	132
136	*00*	44	04	44	08	43	12	43	16	43	20	42	24	42	28	42	32	41	36	41	40	40	136
140	*01*	40	*03*	40	07	39	11	39	15	39	19	38	23	38	27	38	31	37	*35*	37	*39*	37	140
144	*01*	36	*03*	36	07	35	11	35	15	35	19	35	23	34	27	34	31	34	*35*	33	*39*	33	144
148	*01*	32	*03*	32	07	31	11	31	15	31	19	31	23	31	27	30	31	30	*35*	30	*39*	29	148
152	*01*	28	*03*	28	07	28	11	27	15	27	19	27	23	27	27	26	31	26	*35*	26	*39*	26	152
156	*01*	24	*03*	24	07	24	11	23	15	23	18	23	22	23	26	23	30	22	34	22	*38*	22	156
160	*02*	20	02	20	06	20	10	20	14	19	18	19	22	19	26	19	30	19	34	18	*38*	18	160
164	*02*	16	02	16	06	16	10	16	14	15	18	15	22	15	26	15	30	15	34	15	*38*	15	164
168	*02*	12	02	12	06	12	10	12	14	12	18	12	22	11	26	11	30	11	34	11	*38*	11	168
172	*02*	08	02	08	06	08	10	08	14	08	18	08	22	08	26	08	30	07	34	07	*38*	07	172
176	*02*	04	02	04	06	04	10	04	14	04	18	04	22	04	26	04	30	04	34	04	*38*	04	176
180	*02*	00	02	00	06	00	10	00	14	00	18	00	22	00	26	00	30	00	34	00	*38*	00	180
	4°		8°		12°		16°		20°		24°		28°		32°		36°		40°		44°		

FIGURES IN ITALICS INDICATE THAT DECLINATION IS OF CONTRARY NAME TO LATITUDE

STAR IDENTIFICATION TABLE

ALTITUDE

Lat. 84°

AZ.	48° Dec.	48° H.A.	52° Dec.	52° H.A.	56° Dec.	56° H.A.	60° Dec.	60° H.A.	64° Dec.	64° H.A.	68° Dec.	68° H.A.	72° Dec.	72° H.A.	76° Dec.	76° H.A.	80° Dec.	80° H.A.	84° Dec.	84° H.A.	88° Dec.	88° H.A.	AZ.
°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
00	54	180	58	180	62	180	66	180	70	180	74	180	78	180	82	180	86	180	90	...	86	00	00
4	54	175	58	175	62	175	66	175	70	175	74	175	78	174	82	173	86	170	90	88	86	02	4
8	54	171	58	171	62	170	66	170	70	170	74	169	78	168	82	166	86	160	89	86	86	04	8
12	54	166	58	166	62	166	66	165	70	165	74	164	78	162	82	159	86	151	89	84	86	06	12
16	54	162	58	161	62	161	66	160	70	160	74	158	78	157	82	153	85	143	88	82	86	08	16
20	54	157	58	157	62	156	66	156	70	155	74	153	77	151	81	146	85	135	88	80	86	09	20
24	53	153	57	152	61	152	65	151	69	150	73	148	77	145	81	140	85	128	88	78	86	11	24
28	53	148	57	148	61	147	65	146	69	145	73	143	77	140	81	134	85	121	87	76	86	13	28
32	53	144	57	143	61	142	65	141	69	140	73	138	77	135	81	129	84	115	87	74	86	14	32
36	53	140	57	139	61	138	65	137	69	135	73	133	76	129	80	123	84	110	86	72	85	15	36
40	52	135	56	134	60	133	64	132	68	130	72	128	76	124	80	118	83	105	86	70	85	16	40
44	52	131	56	130	60	129	64	128	68	126	72	123	76	120	79	113	83	100	86	68	85	17	44
48	52	126	56	126	60	124	64	123	68	121	71	119	75	115	79	108	83	96	85	66	85	18	48
52	51	122	55	121	59	120	63	119	67	117	71	114	75	110	79	104	82	91	85	64	85	18	52
56	51	118	55	117	59	116	63	114	67	112	71	110	75	106	78	99	82	87	84	62	85	19	56
60	51	114	55	113	59	112	63	110	66	108	70	105	74	101	78	95	81	84	84	60	85	19	60
64	50	110	54	109	58	107	62	106	66	104	70	101	74	97	77	91	81	80	84	58	85	19	64
68	50	105	54	104	58	103	62	102	66	100	70	97	73	93	77	87	80	77	83	56	84	19	68
72	50	101	53	100	57	99	61	98	65	96	69	93	73	89	77	83	80	73	83	54	84	19	72
76	49	97	53	96	57	95	61	94	65	92	69	89	72	85	76	80	80	70	83	52	84	19	76
80	49	93	53	92	57	91	61	90	64	88	68	85	72	81	76	76	79	67	82	50	84	19	80
84	48	89	52	88	56	87	60	86	64	84	68	81	72	78	75	72	79	64	82	48	84	19	84
88	48	85	52	84	56	83	60	82	64	80	67	77	71	74	75	69	79	61	82	46	84	19	88
92	47	81	51	80	55	79	59	78	63	76	67	74	71	70	75	66	78	58	81	44	84	18	92
96	47	78	51	77	55	75	59	74	63	72	67	70	70	67	74	62	78	55	81	42	83	18	96
100	47	74	51	73	55	72	58	70	62	69	66	66	70	63	74	59	77	52	81	40	83	17	100
104	46	70	50	69	54	68	58	67	62	65	66	63	70	60	74	56	77	49	81	38	83	17	104
108	46	66	50	65	54	64	58	63	62	61	66	59	69	57	73	53	77	47	80	36	83	16	108
112	45	62	49	61	53	60	57	59	61	58	65	56	69	53	73	50	77	44	80	34	83	15	112
116	45	58	49	58	53	57	57	56	61	54	65	52	69	50	73	46	76	41	80	32	83	15	116
120	45	55	49	54	53	53	57	52	61	51	64	49	68	47	72	43	76	38	80	30	83	14	120
124	44	51	48	50	52	49	56	48	60	47	64	45	68	43	72	40	76	36	79	28	83	13	124
128	44	47	48	47	52	46	56	45	60	44	64	42	68	40	72	37	76	33	79	26	83	12	128
132	44	44	48	43	52	42	56	41	60	40	64	39	68	37	71	34	75	31	79	24	83	11	132
136	44	40	48	39	51	39	55	38	59	37	63	35	67	34	71	31	75	28	79	22	82	11	136
140	43	36	47	36	51	35	55	34	59	33	63	32	67	31	71	29	75	25	79	20	82	10	140
144	43	33	47	32	51	31	55	31	59	30	63	29	67	28	71	26	75	23	79	18	82	09	144
148	43	29	47	28	51	28	55	27	59	27	63	26	67	24	71	23	75	20	78	16	82	08	148
152	43	25	47	25	51	24	55	24	59	23	63	22	67	21	70	20	74	18	78	14	82	07	152
156	42	22	46	21	50	21	54	20	58	20	62	19	66	18	70	17	74	15	78	12	82	06	156
160	42	18	46	18	50	17	54	17	58	17	62	16	66	15	70	14	74	13	78	10	82	05	160
164	42	14	46	14	50	14	54	14	58	13	62	13	66	12	70	11	74	10	78	08	82	04	164
168	42	11	46	11	50	10	54	10	58	10	62	10	66	09	70	08	74	08	78	06	82	03	168
172	42	07	46	07	50	07	54	07	58	07	62	06	66	06	70	06	74	05	78	04	82	02	172
176	42	04	46	04	50	03	54	03	58	03	62	03	66	03	70	03	74	03	78	02	82	01	176
180	42	00	46	00	50	00	54	00	58	00	62	00	66	00	70	00	74	00	78	00	82	00	180
	48°		52°		56°		60°		64°		68°		72°		76°		80°		84°		88°	

Lat. 85°

Lat. 86°

La. 87°

FIGURES IN ITALICS INDICATE THAT DECLINATION IS OF CONTRARY NAME TO LATITUDE

10—49722-1

H.A.	0°00' Alt. Δd Δt	Az.	0°30' Alt. Δd Δt	Az.	1°00' Alt. Δd Δt	Az.	1°30' Alt. Δd Δt	Az.	2°00' Alt. Δd Δt	Az.	2°30' Alt. Δd Δt	Az.	3°00' Alt. Δd Δt	Az.	3°30' Alt. Δd Δt	Az.	H.A.
00	5 00.0 1.0 00	180.0	5 30.0 1.0 00	180.0	6 00.0 1.0 00	180.0	6 30.0 1.0 00	180.0	7 00.0 1.0 00	180.0	7 30.0 1.0 00	180.0	8 00.0 1.0 00	180.0	8 30.0 1.0 00	180.0	00
1			5 30.0 1.0 00	179.0	6 00.0 1.0 00	179.0	6 30.0 1.0 00	179.0	7 00.0 1.0 00	179.0	7 30.0 1.0 00	179.0	8 00.0 1.0 00	179.0	8 30.0 1.0 00	179.0	1
2			5 29.8 1.0 00	178.0	5 59.8 1.0 00	178.0	6 29.8 1.0 00	178.0	6 59.8 1.0 00	178.0	7 29.8 1.0 00	178.0	7 59.8 1.0 00	178.0	8 29.8 1.0 00	178.0	2
3			5 29.6 1.0 01	177.0	5 59.6 1.0 01	177.0	6 29.6 1.0 01	177.0	6 59.6 1.0 01	177.0	7 29.6 1.0 01	177.0	7 59.6 1.0 01	177.0	8 29.6 1.0 01	177.0	3
4			5 29.3 1.0 01	176.0	5 59.3 1.0 01	176.0	6 29.3 1.0 01	176.0	6 59.3 1.0 01	176.0	7 29.3 1.0 01	176.0	7 59.3 1.0 01	176.0	8 29.3 1.0 01	176.0	4
05			5 28.9 1.0 01	175.0	5 58.9 1.0 01	175.0	6 28.9 1.0 01	175.0	6 58.9 1.0 01	175.0	7 28.9 1.0 01	175.0	7 58.9 1.0 01	175.0	8 28.9 1.0 01	175.0	05
6			5 28.4 1.0 01	174.0	5 58.4 1.0 01	174.0	6 28.3 1.0 01	174.0	6 58.3 1.0 01	174.0	7 28.3 1.0 01	173.9	7 58.3 1.0 01	173.9	8 28.3 1.0 01	173.9	6
7			5 27.8 1.0 01	173.0	5 57.8 1.0 01	173.0	6 27.8 1.0 01	173.0	6 57.8 1.0 01	173.0	7 27.7 1.0 01	172.9	7 57.7 1.0 01	172.9	8 27.7 1.0 01	172.9	7
8			5 27.1 1.0 01	172.0	5 57.1 1.0 01	172.0	6 27.1 1.0 01	172.0	6 57.1 1.0 01	171.9	7 27.1 1.0 01	171.9	7 57.1 1.0 01	171.9	8 27.1 1.0 01	171.9	8
9			5 26.3 1.0 01	171.0	5 56.3 1.0 01	171.0	6 26.3 1.0 01	170.9	6 56.3 1.0 01	170.9	7 26.3 1.0 01	170.9	7 56.3 1.0 01	170.9	8 26.3 1.0 01	170.9	9
10			5 25.4 1.0 02	170.0	5 55.4 1.0 02	169.9	6 25.4 1.0 02	169.9	6 55.4 1.0 02	169.9	7 25.4 1.0 02	169.9	7 55.4 1.0 02	169.9	8 25.4 1.0 02	169.9	10
1			5 24.5 1.0 02	169.0	5 54.5 1.0 02	168.9	6 24.5 1.0 02	168.9	6 54.5 1.0 02	168.9	7 24.5 1.0 02	168.9	7 54.4 1.0 02	168.9	8 24.4 1.0 02	168.9	1
2			5 23.4 1.0 02	167.9	5 53.4 1.0 02	167.9	6 23.4 1.0 02	167.9	6 53.4 1.0 02	167.9	7 23.4 1.0 02	167.9	7 53.4 1.0 02	167.9	8 23.4 1.0 02	167.9	2
3			5 22.3 1.0 02	166.9	5 52.3 1.0 02	166.9	6 22.3 1.0 02	166.9	6 52.3 1.0 02	166.9	7 22.3 1.0 02	166.9	7 52.3 1.0 02	166.9	8 22.3 1.0 02	166.9	3
4			5 21.1 1.0 02	165.9	5 51.1 1.0 02	165.9	6 21.0 1.0 02	165.9	6 51.0 1.0 02	165.9	7 21.0 1.0 02	165.9	7 51.0 1.0 02	165.9	8 21.0 1.0 02	165.9	4
15			5 19.7 1.0 02	164.9	5 49.7 1.0 02	164.9	6 19.7 1.0 02	164.9	6 49.7 1.0 02	164.9	7 19.7 1.0 02	164.9	7 49.7 1.0 02	164.9	8 19.7 1.0 02	164.9	15
6			5 18.3 1.0 02	163.9	5 48.3 1.0 02	163.9	6 18.3 1.0 02	163.9	6 48.3 1.0 02	163.9	7 18.3 1.0 02	163.9	7 48.3 1.0 02	163.9	8 18.3 1.0 02	163.9	6
7			5 16.9 1.0 03	162.9	5 46.8 1.0 03	162.9	6 16.8 1.0 03	162.9	6 46.8 1.0 03	162.9	7 16.8 1.0 03	162.9	7 46.8 1.0 03	162.9	8 16.8 1.0 03	162.8	7
8			5 15.3 1.0 03	161.9	5 45.3 1.0 03	161.9	6 15.2 1.0 03	161.9	6 45.2 1.0 03	161.9	7 15.2 1.0 03	161.9	7 45.2 1.0 03	161.9	8 15.2 1.0 03	161.8	8
9			5 13.6 1.0 03	160.9	5 43.6 1.0 03	160.9	6 13.6 1.0 03	160.9	6 43.6 1.0 03	160.9	7 13.6 1.0 03	160.9	7 43.5 1.0 03	160.8	8 13.5 1.0 03	160.8	9
20			5 11.9 1.0 03	159.9	5 41.8 1.0 03	159.9	6 11.8 1.0 03	159.9	6 41.8 1.0 03	159.9	7 11.8 1.0 03	159.9	7 41.8 1.0 03	159.8	8 11.8 1.0 03	159.8	20
1			5 10.0 1.0 03	158.9	5 40.0 1.0 03	158.9	6 10.0 1.0 03	158.9	6 40.0 1.0 03	158.9	7 10.0 1.0 03	158.8	7 39.9 1.0 03	158.8	8 09.9 1.0 03	158.8	1
2			5 08.1 1.0 03	157.9	5 38.1 1.0 03	157.9	6 08.1 1.0 03	157.9	6 38.0 1.0 03	157.9	7 08.0 1.0 03	157.8	7 38.0 1.0 03	157.8	8 08.0 1.0 03	157.8	2
3			5 06.1 1.0 04	156.9	5 36.1 1.0 04	156.9	6 06.0 1.0 04	156.9	6 36.0 1.0 04	156.9	7 06.0 1.0 04	156.8	7 36.0 1.0 04	156.8	8 06.0 1.0 04	156.8	3
4			5 04.0 1.0 04	155.9	5 34.0 1.0 04	155.9	6 03.9 1.0 04	155.9	6 33.9 1.0 04	155.8	7 03.9 1.0 04	155.8	7 33.9 1.0 04	155.8	8 03.9 1.0 04	155.8	4
25			5 01.8 1.0 04	154.9	5 31.8 1.0 04	154.9	6 01.8 1.0 04	154.9	6 31.7 1.0 04	154.8	7 01.7 1.0 04	154.8	7 31.7 1.0 04	154.8	8 01.7 1.0 04	154.8	25
6					5 29.5 1.0 04	153.9	5 59.5 1.0 04	153.9	6 29.5 1.0 04	153.8	6 59.5 1.0 04	153.8	7 29.4 1.0 04	153.8	7 59.4 1.0 04	153.8	6
7					5 27.2 1.0 04	152.9	5 57.2 1.0 04	152.9	6 27.1 1.0 04	152.8	6 57.1 1.0 04	152.8	7 27.1 1.0 04	152.8	7 57.1 1.0 04	152.8	7
8					5 24.8 1.0 04	151.8	5 54.7 1.0 04	151.8	6 24.7 1.0 04	151.8	6 54.7 1.0 04	151.8	7 24.6 1.0 04	151.8	7 54.6 1.0 04	151.8	8
9					5 22.3 1.0 04	150.9	5 52.2 1.0 04	150.9	6 22.2 1.0 04	150.8	6 52.2 1.0 04	150.8	7 22.1 1.0 04	150.8	7 52.1 1.0 04	150.8	9
30					5 19.7 1.0 04	149.9	5 49.6 1.0 04	149.8	6 19.6 1.0 04	149.8	6 49.6 1.0 04	149.8	7 19.6 1.0 04	149.8	7 49.5 1.0 04	149.8	30
1					5 17.0 1.0 05	148.9	5 47.0 1.0 05	148.8	6 16.9 1.0 05	148.8	6 46.9 1.0 05	148.8	7 16.9 1.0 05	148.8	7 46.8 1.0 05	148.7	1
2					5 14.1 1.0 05	147.9	5 44.2 1.0 05	147.8	6 14.2 1.0 05	147.8	6 44.2 1.0 05	147.8	7 14.1 1.0 05	147.8	7 44.1 1.0 05	147.7	2
3					5 11.4 1.0 05	146.9	5 41.4 1.0 05	146.8	6 11.4 1.0 05	146.8	6 41.3 1.0 05	146.8	7 11.3 1.0 05	146.8	7 41.3 1.0 05	146.7	3
4					5 08.5 1.0 05	145.8	5 38.5 1.0 05	145.8	6 08.5 1.0 05	145.8	6 38.4 1.0 05	145.8	7 08.4 1.0 05	145.8	7 38.4 1.0 05	145.7	4
35					5 05.6 1.0 05	144.8	5 35.5 1.0 05	144.8	6 05.5 1.0 05	144.8	6 35.5 1.0 05	144.8	7 05.4 1.0 05	144.7	7 35.4 1.0 05	144.7	35
6					5 02.5 1.0 05	143.8	5 32.5 1.0 05	143.8	6 02.4 1.0 05	143.8	6 32.4 1.0 05	143.8	7 02.4 1.0 05	143.7	7 32.3 1.0 05	143.7	6
7							5 29.4 1.0 05	142.8	5 59.3 1.0 05	142.8	6 29.3 1.0 05	142.8	6 59.2 1.0 05	142.7	7 29.2 1.0 05	142.7	7
8							5 26.2 1.0 05	141.8	5 56.1 1.0 05	141.8	6 26.1 1.0 05	141.8	6 56.0 1.0 05	141.7	7 26.0 1.0 05	141.7	8
9							5 22.9 1.0 06	140.8	5 52.8 1.0 06	140.8	6 22.8 1.0 06	140.8	6 52.8 1.0 06	140.7	7 22.7 1.0 06	140.7	9
40							5 19.6 1.0 06	139.8	5 49.5 1.0 06	139.8	6 19.5 1.0 06	139.8	6 49.4 1.0 06	139.7	7 19.4 1.0 06	139.7	40
1							5 16.1 1.0 06	138.8	5 46.1 1.0 06	138.8	6 16.0 1.0 06	138.7	6 46.0 1.0 06	138.7	7 15.9 1.0 06	138.7	1
2							5 12.7 1.0 06	137.8	5 42.6 1.0 06	137.8	6 12.6 1.0 06	137.7	6 42.5 1.0 06	137.7	7 12.5 1.0 06	137.7	2
3							5 09.1 1.0 06	136.8	5 39.1 1.0 06	136.8	6 09.0 1.0 06	136.7	6 39.0 1.0 06	136.7	7 08.9 1.0 06	136.7	3
4							5 05.5 1.0 06	135.8	5 35.4 1.0 06	135.8	6 05.4 1.0 06	135.7	6 35.3 1.0 06	135.7	7 05.3 1.0 06	135.7	4
45							5 01.8 1.0 06	134.8	5 31.8 1.0 06	134.8	6 01.7 1.0 06	134.7	6 31.7 1.0 06	134.7	7 01.6 1.0 06	134.7	45
6									5 28.0 1.0 06	133.8	5 58.0 1.0 06	133.7	6 27.9 1.0 06	133.7	6 57.8 1.0 06	133.7	6
7									5 24.2 1.0 06	132.8	5 54.2 1.0 06	132.7	6 24.1 1.0 06	132.7	6 54.0 1.0 06	132.7	7
8									5 20.3 1.0 07	131.8	5 50.3 1.0 07	131.7	6 20.2 1.0 07	131.7	6 50.2 1.0 07	131.7	8
9									5 16.4 1.0 07	130.8	5 46.3 1.0 07	130.7	6 16.3 1.0 07	130.7	6 46.2 1.0 07	130.7	9
50									5 12.4 1.0 07	129.8	5 42.4 1.0 07	129.7	6 12.3 1.0 07	129.7	6 42.2 1.0 07	129.7	50
1									5 08.4 1.0 07	128.8	5 38.3 1.0 07	128.7	6 08.2 1.0 07	128.7	6 38.2 1.0 07	128.7	1
2									5 04.3 1.0 07	127.8	5 34.2 1.0 07	127.7	6 04.1 1.0 07	127.7	6 34.1 1.0 07	127.7	2
3									5 00.1 1.0 07	126.8	5 30.0 1.0 07	126.7	6 00.0 1.0 07	126.7	6 29.9 1.0 07	126.6	3
4											5 25.8 1.0 07	125.7	5 55.7 1.0 07	125.7	6 25.7 1.0 07	125.6	4
55											5 21.5 1.0 07	124.7	5 51.5 1.0 07	124.7	6 21.4 1.0 07	124.6	55
6											5 17.2 1.0 07	123.7	5 47.1 1.0 07	123.7	6 17.1 1.0 07	123.6	6
7											5 12.8 1.0 07	122.7	5 42.8 1.0 07	122.7	6 12.7 1.0 07	122.6	7
8											5 08.4 1.0 07	121.7	5 38.3 1.0 07	121.7	6 08.3 1.0 07	121.6	8
9											5 03.9 1.0 08	120.7	5 33.7 1.0 08	120.7	6 03.8 1.0 08	120.6	9
60													5 29.3 1.0 08	119.7	5 59.3 1.0 08	119.6	60
1													5 24.8 1.0 08	118.7	5 54.7 1.0 08	118.6	1
2													5 20.2 1.0 08	117.7	5 50.1 1.0 08	117.6	2
3													5 15.5 1.0 08	116.7	5 45.4 1.0 08	116.6	3
4													5 10.8 1.0 08	115.7	5 40.7 1.0 08	115.6	4
65													5 06.1 1.0 08	114.7	5 36.0 1.0 08	114.6	65
6													5 01.3 1.0 08	113.7	5 31.2 1.0 08	113.6	6
7															5 26.4 1.0 08	112.6	7
8															5 21.6 1.0 08	111.6	8
9															5 16.7 1.0 08	110.6	9
70															5 11.8 1.0 08	109.6	70
1															5 06.8 1.0 08	108.6	1
2															5 01.9 1.0 08	107.6	2

H.A.	0° 00′		0° 30′		1° 00′		1° 30′		2° 00′		2° 30′		3° 00′		3° 30′		H.A.	Lat. 85°
	Alt.	Az.	Alt.	Az.	Alt.	Az.	Alt.	Az.	Alt.	Az.	Alt.	Az.	Alt.	Az.	Alt.	Az.		
°	° ′ Δd Δt °		° ′ Δd Δt °		° ′ Δd Δt °		° ′ Δd Δt °		° ′ Δd Δt °		° ′ Δd Δt °		° ′ Δd Δt °		° ′ Δd Δt °		°	
																		Lat. 85°
																		Lat. 86°
H.A.	Alt.	Az.	Alt.	Az.	Alt.	Az.	Alt.	Az.	Alt.	Az.	Alt.	Az.	Alt.	Az.	Alt.	Az.	H.A.	

16—43722-1

Lat. 85°

H.A.	4° 00' Alt. Ad Δt Az.	4° 30' Alt. Ad Δt Az.	5° 00' Alt. Ad Δt Az.	5° 30' Alt. Ad Δt Az.	6° 00' Alt. Ad Δt Az.	6° 30' Alt. Ad Δt Az.	7° 00' Alt. Ad Δt Az.	7° 30' Alt. Ad Δt Az.	H.A.
00	9 00.0 1.00 180.0	9 30.0 1.00 180.0	10 00.0 1.00 180.0	10 30.0 1.00 180.0	11 00.0 1.00 180.0	11 30.0 1.00 180.0	12 00.0 1.00 180.0	12 30.0 1.00 180.0	00
1	9 00.9 1.00 179.0	9 30.0 1.00 179.0	10 00.0 1.00 179.0	10 30.0 1.00 179.0	11 00.0 1.00 179.0	11 30.0 1.00 179.0	12 00.0 1.00 179.0	12 30.0 1.00 179.0	1
2	8 59.8 1.001 178.0	9 29.8 1.001 178.0	9 59.8 1.001 178.0	10 29.8 1.001 178.0	10 59.8 1.001 178.0	11 29.8 1.001 178.0	11 59.8 1.001 178.0	12 29.8 1.001 178.0	2
3	8 59.6 1.001 177.0	9 29.6 1.001 177.0	9 59.6 1.001 177.0	10 29.6 1.001 177.0	10 59.6 1.001 177.0	11 29.6 1.001 177.0	11 59.6 1.001 177.0	12 29.6 1.001 177.0	3
4	8 59.3 1.001 176.0	9 29.3 1.001 176.0	9 59.3 1.001 176.0	10 29.3 1.001 176.0	10 59.3 1.001 175.9	11 29.3 1.001 175.9	11 59.3 1.001 175.9	12 29.3 1.001 175.9	4
05	8 58.8 1.001 175.0	9 28.8 1.001 174.9	9 58.8 1.001 174.9	10 28.8 1.001 174.9	10 58.8 1.001 174.9	11 28.8 1.001 174.9	11 58.8 1.001 174.9	12 28.8 1.001 174.9	05
6	8 58.3 1.001 173.9	9 28.3 1.001 173.9	9 58.3 1.001 173.9	10 28.3 1.001 173.9	10 58.3 1.001 173.9	11 28.3 1.001 173.9	11 58.3 1.001 173.9	12 28.3 1.001 173.9	6
7	8 57.7 1.001 172.9	9 27.7 1.001 172.9	9 57.7 1.001 172.9	10 27.7 1.001 172.9	10 57.7 1.001 172.9	11 27.7 1.001 172.9	11 57.7 1.001 172.9	12 27.7 1.001 172.9	7
8	8 57.1 1.001 171.9	9 27.1 1.001 171.9	9 57.1 1.001 171.9	10 27.0 1.001 171.9	10 57.0 1.001 171.9	11 27.0 1.001 171.9	11 57.0 1.001 171.9	12 27.0 1.001 171.9	8
9	8 56.3 1.001 170.9	9 26.3 1.001 170.9	9 56.3 1.001 170.9	10 26.3 1.001 170.9	10 56.3 1.001 170.9	11 26.3 1.001 170.9	11 56.3 1.001 170.9	12 26.3 1.001 170.9	9
10	8 55.4 1.002 169.9	9 25.4 1.002 169.9	9 55.4 1.002 169.9	10 25.4 1.002 169.9	10 55.4 1.002 169.9	11 25.4 1.002 169.9	11 55.4 1.002 169.9	12 25.4 1.002 169.8	10
1	8 54.4 1.002 168.9	9 24.4 1.002 168.9	9 54.4 1.002 168.9	10 24.4 1.002 168.9	10 54.4 1.002 168.8	11 24.4 1.002 168.8	11 54.4 1.002 168.8	12 24.4 1.002 168.8	1
2	8 53.4 1.002 167.9	9 23.4 1.002 167.9	9 53.4 1.002 167.9	10 23.4 1.002 167.9	10 53.4 1.002 167.8	11 23.4 1.002 167.8	11 53.4 1.002 167.8	12 23.4 1.002 167.8	2
3	8 52.2 1.002 166.9	9 22.2 1.002 166.9	9 52.2 1.002 166.9	10 22.2 1.002 166.8	10 52.2 1.002 166.8	11 22.2 1.002 166.8	11 52.2 1.002 166.8	12 22.2 1.002 166.8	3
4	8 51.0 1.002 165.9	9 21.0 1.002 165.9	9 51.0 1.002 165.9	10 21.0 1.002 165.9	10 51.0 1.002 165.8	11 21.0 1.002 165.8	11 51.0 1.002 165.8	12 21.0 1.002 165.8	4
15	8 49.7 1.002 164.9	9 19.7 1.002 164.8	9 49.7 1.002 164.8	10 19.7 1.002 164.8	10 49.7 1.002 164.8	11 19.7 1.002 164.8	11 49.6 1.002 164.8	12 19.6 1.002 164.8	15
6	8 48.3 1.002 163.8	9 18.3 1.002 163.8	9 48.3 1.002 163.8	10 18.3 1.002 163.8	10 48.2 1.002 163.8	11 18.2 1.002 163.8	11 48.2 1.002 163.8	12 18.2 1.002 163.8	6
7	8 46.8 1.003 162.8	9 16.8 1.003 162.8	9 46.8 1.003 162.8	10 16.8 1.003 162.8	10 46.7 1.003 162.8	11 16.7 1.003 162.8	11 46.7 1.003 162.8	12 16.7 1.003 162.7	7
8	8 45.2 1.003 161.8	9 15.2 1.003 161.8	9 45.2 1.003 161.8	10 15.2 1.003 161.8	10 45.1 1.003 161.8	11 15.1 1.003 161.8	11 45.1 1.003 161.7	12 15.1 1.003 161.7	8
9	8 43.5 1.003 160.8	9 13.5 1.003 160.8	9 43.5 1.003 160.8	10 13.5 1.003 160.8	10 43.5 1.003 160.8	11 13.5 1.003 160.7	11 43.4 1.003 160.7	12 13.4 1.003 160.7	9
20	8 41.8 1.003 159.8	9 11.7 1.003 159.8	9 41.7 1.003 159.8	10 11.7 1.003 159.8	10 41.7 1.003 159.7	11 11.7 1.003 159.7	11 41.7 1.003 159.7	12 11.7 1.003 159.7	20
1	8 39.9 1.003 158.8	9 09.9 1.003 158.8	9 39.9 1.003 158.8	10 09.9 1.003 158.8	10 39.8 1.003 158.7	11 09.8 1.003 158.7	11 39.8 1.003 158.7	12 09.8 1.003 158.7	1
2	8 38.0 1.003 157.8	9 08.0 1.003 157.8	9 37.9 1.003 157.8	10 07.9 1.003 157.7	10 37.9 1.003 157.7	11 07.9 1.003 157.7	11 37.8 1.003 157.7	12 07.9 1.003 157.7	2
3	8 36.0 1.004 156.8	9 05.9 1.004 156.7	9 35.9 1.004 156.7	10 05.9 1.004 156.7	10 35.9 1.004 156.7	11 05.9 1.004 156.7	11 35.8 1.004 156.7	12 05.8 1.004 156.7	3
4	8 33.9 1.004 155.8	9 03.8 1.004 155.8	9 33.8 1.004 155.7	10 03.8 1.004 155.7	10 33.8 1.004 155.7	11 03.8 1.004 155.7	11 33.7 1.004 155.7	12 03.7 1.004 155.6	4
25	8 31.7 1.004 154.8	9 01.6 1.004 154.7	9 31.6 1.004 154.7	10 01.6 1.004 154.7	10 31.6 1.004 154.7	11 01.6 1.004 154.7	11 31.5 1.004 154.7	12 01.5 1.004 154.6	25
6	8 29.4 1.004 153.8	8 59.4 1.004 153.7	9 29.4 1.004 153.7	9 59.3 1.004 153.7	10 29.3 1.004 153.7	10 59.3 1.004 153.7	11 29.3 1.004 153.6	11 59.2 1.004 153.6	6
7	8 27.0 1.004 152.8	8 57.0 1.004 152.7	9 27.0 1.004 152.7	9 57.0 1.004 152.7	10 26.9 1.004 152.6	10 56.9 1.004 152.6	11 26.9 1.004 152.6	11 56.9 1.004 152.6	7
8	8 24.6 1.004 151.7	8 54.6 1.004 151.7	9 24.5 1.004 151.7	9 54.5 1.004 151.7	10 24.5 1.004 151.7	10 54.5 1.004 151.6	11 24.5 1.004 151.6	11 54.4 1.004 151.6	8
9	8 22.1 1.004 150.7	8 52.1 1.004 150.7	9 22.0 1.004 150.7	9 52.0 1.004 150.7	10 22.0 1.004 150.6	10 52.0 1.004 150.6	11 21.9 1.004 150.6	11 51.9 1.004 150.6	9
30	8 19.5 1.004 149.7	8 49.5 1.004 149.7	9 19.4 1.004 149.7	9 49.4 1.004 149.7	10 19.4 1.004 149.6	10 49.3 1.004 149.6	11 19.3 1.004 149.6	11 49.3 1.004 149.6	30
1	8 16.8 1.005 148.7	8 46.8 1.005 148.7	9 16.8 1.005 148.7	9 46.7 1.005 148.6	10 16.7 1.005 148.6	10 46.7 1.005 148.6	11 16.6 1.005 148.6	11 46.6 1.005 148.6	1
2	8 14.1 1.005 147.7	8 44.0 1.005 147.7	9 14.0 1.005 147.7	9 44.0 1.005 147.6	10 13.9 1.005 147.6	10 43.9 1.005 147.6	11 13.9 1.005 147.6	11 43.8 1.005 147.5	2
3	8 11.2 1.005 146.7	8 41.2 1.005 146.7	9 11.2 1.005 146.7	9 41.1 1.005 146.6	10 11.1 1.005 146.6	10 41.1 1.005 146.6	11 11.0 1.005 146.6	11 41.0 1.005 146.5	3
4	8 08.3 1.005 145.7	8 38.3 1.005 145.7	9 08.3 1.005 145.7	9 38.2 1.005 145.6	10 08.2 1.005 145.6	10 38.1 1.005 145.6	11 08.1 1.005 145.6	11 38.1 1.005 145.5	4
35	8 05.3 1.005 144.7	8 35.3 1.005 144.7	9 05.3 1.005 144.6	9 35.2 1.005 144.6	10 05.2 1.005 144.6	10 35.1 1.005 144.6	11 05.1 1.005 144.5	11 35.1 1.005 144.5	35
6	8 02.3 1.005 143.7	8 32.2 1.005 143.6	9 02.2 1.005 143.6	9 32.1 1.005 143.6	10 02.1 1.005 143.6	10 32.1 1.005 143.5	11 02.0 1.005 143.5	11 32.0 1.005 143.5	6
7	7 59.1 1.005 142.7	8 29.1 1.005 142.7	8 59.0 1.005 142.6	9 29.0 1.005 142.6	9 59.0 1.005 142.6	10 28.9 1.005 142.5	10 58.9 1.005 142.5	11 28.8 1.005 142.5	7
8	7 55.9 1.005 141.7	8 25.9 1.005 141.6	8 55.9 1.005 141.6	9 25.8 1.005 141.6	9 55.8 1.005 141.6	10 25.7 1.005 141.5	10 55.7 1.005 141.5	11 25.6 1.006 141.5	8
9	7 52.7 1.006 140.7	8 22.6 1.006 140.6	8 52.6 1.006 140.6	9 22.5 1.006 140.6	9 52.5 1.006 140.6	10 22.4 1.006 140.5	10 52.4 1.006 140.5	11 22.3 1.006 140.5	9
40	7 49.3 1.006 139.7	8 19.3 1.006 139.6	8 49.2 1.006 139.6	9 19.2 1.006 139.6	9 49.1 1.006 139.6	10 19.1 1.006 139.5	10 49.0 1.006 139.5	11 19.0 1.006 139.5	40
1	7 45.9 1.006 138.7	8 15.8 1.006 138.6	8 45.7 1.006 138.6	9 15.7 1.006 138.6	9 45.7 1.006 138.5	10 15.6 1.006 138.5	10 45.6 1.006 138.5	11 15.5 1.006 138.5	1
2	7 42.4 1.006 137.7	8 12.4 1.006 137.6	8 42.3 1.006 137.6	9 12.2 1.006 137.6	9 42.2 1.006 137.5	10 12.1 1.006 137.5	10 42.1 1.006 137.5	11 12.0 1.006 137.4	2
3	7 38.8 1.006 136.7	8 08.8 1.006 136.6	8 38.7 1.006 136.6	9 08.7 1.006 136.6	9 38.6 1.006 136.5	10 08.6 1.006 136.5	10 38.5 1.006 136.5	11 08.5 1.006 136.4	3
4	7 35.2 1.006 135.6	8 05.2 1.006 135.6	8 35.1 1.006 135.6	9 05.0 1.006 135.6	9 35.0 1.006 135.5	10 04.9 1.006 135.5	10 34.9 1.006 135.5	11 04.8 1.006 135.4	4
45	7 31.5 1.006 134.6	8 01.5 1.006 134.6	8 31.4 1.006 134.6	9 01.4 1.006 134.5	9 31.3 1.006 134.5	10 01.2 1.006 134.5	10 31.2 1.006 134.5	11 01.1 1.006 134.4	45
6	7 27.8 1.006 133.6	7 57.7 1.006 133.6	8 27.7 1.006 133.6	8 57.6 1.006 133.5	9 27.5 1.006 133.5	9 57.5 1.006 133.5	10 27.4 1.006 133.4	10 57.4 1.006 133.4	6
7	7 24.0 1.006 132.6	7 53.9 1.006 132.6	8 23.8 1.006 132.6	8 53.8 1.006 132.5	9 23.7 1.006 132.5	9 53.7 1.006 132.5	10 23.6 1.006 132.4	10 53.5 1.006 132.4	7
8	7 20.1 1.007 131.6	7 50.0 1.007 131.6	8 20.0 1.007 131.6	8 49.9 1.007 131.5	9 19.8 1.007 131.5	9 49.8 1.007 131.5	10 19.7 1.007 131.4	10 49.6 1.007 131.4	8
9	7 16.2 1.007 130.6	7 46.1 1.007 130.6	8 16.0 1.007 130.6	8 46.0 1.007 130.5	9 15.9 1.007 130.5	9 45.8 1.007 130.5	10 15.8 1.007 130.4	10 45.7 1.007 130.4	9
50	7 12.2 1.007 129.6	7 42.1 1.007 129.6	8 12.0 1.007 129.6	8 41.9 1.007 129.5	9 11.9 1.007 129.5	9 41.8 1.007 129.5	10 11.7 1.007 129.4	10 41.7 1.007 129.4	50
1	7 08.1 1.007 128.6	7 38.0 1.007 128.6	8 08.0 1.007 128.6	8 37.9 1.007 128.5	9 07.8 1.007 128.5	9 37.7 1.007 128.4	10 07.7 1.007 128.4	10 37.6 1.007 128.4	1
2	7 04.0 1.007 127.6	7 33.9 1.007 127.6	8 03.8 1.007 127.5	8 33.8 1.007 127.5	9 03.7 1.007 127.5	9 33.6 1.007 127.4	10 03.5 1.007 127.4	10 33.5 1.007 127.4	2
3	6 59.8 1.007 126.6	7 29.7 1.007 126.6	7 59.7 1.007 126.6	8 29.6 1.007 126.5	8 59.5 1.007 126.5	9 29.4 1.007 126.4	9 59.4 1.007 126.4	10 29.3 1.007 126.4	3
4	6 55.6 1.007 125.6	7 25.5 1.007 125.6	7 55.4 1.007 125.5	8 25.4 1.007 125.5	8 55.3 1.007 125.5	9 25.2 1.007 125.4	9 55.1 1.007 125.4	10 25.1 1.007 125.4	4
55	6 51.3 1.007 124.6	7 21.2 1.007 124.6	7 51.2 1.007 124.5	8 21.1 1.007 124.5	8 51.0 1.007 124.5	9 20.9 1.007 124.4	9 50.8 1.007 124.4	10 20.8 1.007 124.4	55
6	6 47.0 1.007 123.6	7 16.9 1.007 123.6	7 46.8 1.007 123.5	8 16.7 1.007 123.5	8 46.7 1.007 123.5	9 16.6 1.007 123.4	9 46.5 1.007 123.4	10 16.4 1.007 123.3	6
7	6 42.6 1.007 122.6	7 12.5 1.007 122.6	7 42.4 1.007 122.5	8 12.4 1.007 122.5	8 42.3 1.007 122.5	9 12.2 1.007 122.4	9 42.1 1.007 122.4	10 12.0 1.007 122.3	7
8	6 38.2 1.007 121.6	7 08.1 1.007 121.6	7 38.0 1.007 121.5	8 07.9 1.007 121.5	8 37.8 1.007 121.5	9 07.8 1.007 121.4	9 37.7 1.007 121.4	10 07.6 1.007 121.3	8
9	6 33.7 1.008 120.6	7 03.6 1.008 120.6	7 33.5 1.008 120.5	8 03.4 1.008 120.5	8 33.4 1.008 120.5	9 03.3 1.008 120.4	9 33.2 1.008 120.4	10 03.1 1.008 120.3	9
60	6 29.2 1.008 119.6	6 59.1 1.008 119.6	7 29.0 1.008 119.5	7 58.9 1.008 119.5	8 28.8 1.008 119.4	8 58.7 1.008 119.4	9 28.6 1.008 119.4	9 58.6 1.008 119.3	60
1	6 24.6 1.008 118.6	6 54.5 1.008 118.6	7 24.4 1.008 118.5	7 54.3 1.008 118.5	8 24.2 1.008 118.4	8 54.2 1.008 118.4	9 24.1 1.008 118.4	9 54.0 1.008 118.3	1
2	6 20.0 1.008 117.6	6 49.9 1.008 117.6	7 19.8 1.008 117.5	7 49.7 1.008 117.5	8 19.6 1.008 117.4	8 49.5 1.008 117.4	9 19.4 1.008 117.4	9 49.3 1.008 117.3	2
3	6 15.3 1.008 116.6	6 45.2 1.008 116.6	7 15.1 1.008 116.5	7 45.1 1.008 116.5	8 15.0 1.008 116.4	8 44.9 1.008 116.4	9 14.8 1.008 116.4	9 44.7 1.008 116.3	3
4	6 10.6 1.008 115.6	6 40.5 1.008 115.6	7 10.4 1.008 115.5	7 40.4 1.008 115.5	8 10.3 1.008 115.4	8 40.2 1.008 115.4	9 10.1 1.008 115.4	9 40.0 1.008 115.3	4
65	6 05.9 1.008 114.6	6 35.8 1.008 114.6	7 05.7 1.008 114.5	7 35.6 1.008 114.5	8 05.5 1.008 114.4	8 35.4 1.008 114.4	9 05.3 1.008 114.4	9 35.2 1.008 114.3	65
6	6 01.1 1.008 113.6	6 31.0 1.008 113.6	7 00.9 1.008 113.5	7 30.8 1.008 113.5	8 00.7 1.008 113.4	8 30.6 1.008 113.4	9 00.5 1.008 113.3	9 30.4 1.008 113.3	6
7	5 56.3 1.008 112.6	6 26.2 1.008 112.6	6 56.1 1.008 112.5	7 26.0 1.008 112.5	7 55.9 1.008 112.4	8 25.8 1.008 112.4	8 55.7 1.008 112.4	9 25.6 1.008 112.3	7
8	5 51.5 1.008 111.6	6 21.4 1.008 111.6	6 51.3 1.008 111.5	7 21.2 1.008 111.5	7 51.1 1.008 111.4	8 21.0 1.008 111.4	8 50.9 1.008 111.4	9 20.8 1.008 111.3	8
9	5 46.6 1.008 110.6	6 16.5 1.008 110.6	6 46.4 1.008 110.5	7 16.3 1.008 110.5	7 46.2 1.008 110.4	8 16.1 1.008 110.4	8 46.0 1.008 110.4	9 15.9 1.008 110.3	9
70	5 41.7 1.008 109.6	6 11.6 1.008 109.6	6 41.5 1.008 109.5	7 11.4 1.008 109.5	7 41.3 1.008 109.4	8 11.2 1.008 109.4	8 41.1 1.008 109.4	9 11.0 1.008 109.3	70
1	5 36.7 1.008 108.6	6 06.6 1.008 108.6	6 36.5 1.008 108.5	7 06.4 1.008 108.5	7 36.3 1.008 108.4	8 06.2 1.008 108.4	8 36.1 1.008 108.4	9 06.0 1.008 108.3	1
2	5 31.8 1.008 107.6	6 01.7 1.008 107.6	6 31.6 1.008 107.5	7 01.5 1.008 107.5	7 31.4 1.008 107.4	8 01.2 1.008 107.4	8 31.1 1.008 107.4	9 01.0 1.008 107.3	2
3	5 26.8 1.008 106.6	5 56.7 1.008 106.6	6 26.6 1.008 106.5	6 56.5 1.008 106.5	7 26.3 1.008 106.4	7 56.2 1.008 106.4	8 26.1 1.008 106.4	8 56.0 1.008 106.3	3
4	5 21.7 1.008 105.6	5 51.6 1.008 105.6	6 21.5 1.008 105.5	6 51.4 1.008 105.5	7 21.3 1.008 105.4	7 51.2 1.008 105.4	8 21.1 1.008 105.4	8 51.0 1.008 105.3	4
75	5 16.7 1.008 104.6	5 46.6 1.008 104.6	6 16.5 1.008 104.5	6 46.4 1.008 104.5	7 16.3 1.008 104.4	7 46.2 1.008 104.4	8 16.1 1.008 104.4	8 45.9 1.008 104.3	75
6	5 11.6 1.008 103.6	5 41.5 1.008 103.6	6 11.4 1.008 103.5	6 41.3 1.008 103.5	7 11.2 1.008 103.4	7 41.1 1.008 103.4	8 11.0 1.008 103.4	8 40.9 1.009 103.3	6
7	5 06.5 1.009 102.6	5 36.4 1.009 102.6	6 06.3 1.009 102.5	6 36.2 1.009 102.5	7 06.1 1.009 102.4	7 36.0 1.009 102.4	8 05.9 1.009 102.4	8 35.8 1.009 102.3	7
8	5 01.4 1.009 101.6	5 31.3 1.009 101.6	6 01.2 1.009 101.5	6 31.1 1.009 101.5	7 01.0 1.009 101.4	7 30.9 1.009 101.4	8 00.8 1.009 101.4	8 30.6 1.009 101.3	8
9		5 26.2 1.009 100.6	5 56.1 1.009 100.5	6 26.0 1.009 100.5	6 55.9 1.009 100.4	7 25.7 1.009 100.4	7 55.6 1.009 100.4	8 25.5 1.009 100.3	9
80		5 21.0 1.009 99.6	5 50.9 1.009 99.5	6 20.8 1.009 99.5	6 50.7 1.009 99.4	7 20.6 1.009 99.4	7 50.5 1.009 99.4	8 20.4 1.009 99.3	80
1		5 15.9 1.009 98.6	5 45.8 1.009 98.5	6 15.6 1.009 98.5	6 45.5 1.009 98.4	7 15.4 1.009 98.4	7 45.3 1.009 98.4	8 15.2 1.009 98.3	1
2		5 10.7 1.009 97.6	5 40.6 1.009 97.5	6 10.5 1.009 97.5	6 40.4 1.009 97.4	7 10.2 1.009 97.4	7 40.1 1.009 97.4	8 10.0 1.009 97.3	2
3		5 05.6 1.009 96.6	5 35.4 1.009 96.5	6 05.3 1.009 96.5	6 35.2 1.009 96.5	7 05.0 1.009 96.5	7 34.9 1.009 96.4	8 04.8 1.009 96.3	3
4		5 00.3 1.009 95.6	5 30.2 1.009 95.5	6 00.1 1.009 95.5	6 30.0 1.009 95.4	6 59.8 1.009 95.4	7 29.7 1.009 95.4	7 59.6 1.009 95.3	4
85			5 25.0 1.009 94.5	5 54.9 1.009 94.5	6 24.7 1.009 94.4	6 54.6 1.009 94.4	7 24.5 1.009 94.4	7 54.4 1.009 94.3	85
6			5 19.8 1.009 93.5	5 49.6 1.009 93.5	6 19.5 1.009 93.4	6 49.3 1.009 93.4	7 19.3 1.009 93.4	7 49.2 1.009 93.3	6
7			5 14.5 1.009 92.5	5 44.4 1.009 92.5	6 14.3 1.009 92.4	6 44.2 1.009 92.4	7 14.1 1.009 92.4	7 44.0 1.009 92.3	7
8			5 09.3 1.009 91.6	5 39.2 1.009 91.5	6 09.1 1.009 91.4	6 39.0 1.009 91.4	7 08.9 1.009 91.4	7 38.7 1.009 91.3	8
9			5 04.1 1.009 90.6	5 34.0 1.009 90.5	6 03.9 1.009 90.5	6 33.7 1.009 90.4	7 03.6 1.009 90.4	7 33.5 1.009 90.3	9
90				5 28.7 1.009 89.5	5 58.6 1.009 89.5	6 28.5 1.009 89.4	6 58.4 1.009 89.4	7 28.3 1.009 89.3	90

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Lat. 85°

H.A.	4° 00'	4° 30'	5° 00'	5° 30'	6° 00'	6° 30'	7° 00'	7° 30	H.A.
°	Alt. / Δd Δt Az. °	Alt. / Δd Δt Az °	Alt. / Δd Δt Az. °	Alt. / Δd Δt Az. °	Alt. / Δd Δt Az. °	Alt. / Δd Δt Az. °	Alt. / Δd Δt Az. °	Alt. / Δd Δt Az. °	°
91				5 23.5 1.009 88.5	5 53.4 1.009 88.5	6 23.3 1.009 88.4	6 53.2 1.009 88.4	7 23.1 1.009 88.3	91
2				5 18.3 1.009 87.5	5 48.2 1.009 87.5	6 18.1 1.009 87.4	6 47.9 1.009 87.4	7 17.8 1.009 87.4	2
3				5 13.1 1.009 86.5	5 42.9 1.009 86.5	6 12.8 1.009 86.4	6 42.7 1.009 86.4	7 12.6 1.009 86.4	3
4				5 07.8 1.009 85.5	5 37.7 1.009 85.5	6 07.6 1.009 85.4	6 37.5 1.009 85.4	7 07.4 1.009 85.4	4
95				5 02.6 1.009 84.5	5 32.5 1.009 84.5	6 02.4 1.009 84.5	6 32.3 1.009 84.4	7 02.2 1.009 84.4	95
6					5 27.3 1.009 83.5	5 57.2 1.009 83.5	6 27.1 1.009 83.4	6 57.0 1.009 83.4	6
7					5 22.1 1.009 82.5	5 52.0 1.009 82.5	6 21.9 1.009 82.4	6 51.8 1.009 82.4	7
8					5 17.0 1.009 81.5	5 46.8 1.009 81.5	6 16.7 1.009 81.4	6 46.6 1.009 81.4	8
9					5 11.8 1.009 80.5	5 41.7 1.009 80.5	6 11.6 1.009 80.4	6 41.5 1.009 80.4	9
100					5 06.6 1.009 79.5	5 36.5 1.009 79.5	6 06.4 1.009 79.4	6 36.3 1.009 79.4	100
1					5 01.5 1.009 78.5	5 31.4 1.009 78.5	6 01.3 1.009 78.4	6 31.2 1.009 78.4	1
2						5 26.3 1.008 77.5	5 56.2 1.008 77.4	6 26.1 1.008 77.4	2
3						5 21.2 1.008 76.5	5 51.1 1.008 76.5	6 21.0 1.008 76.4	3
4						5 16.1 1.008 75.5	5 46.0 1.008 75.5	6 15.9 1.008 75.4	4
105						5 11.1 1.008 74.5	5 41.0 1.008 74.5	6 10.8 1.008 74.4	105
6						5 06.0 1.008 73.5	5 35.9 1.008 73.5	6 05.8 1.008 73.4	6
7						5 01.0 1.008 72.5	5 30.9 1.008 72.5	6 00.8 1.008 72.4	7
8							5 26.0 1.008 71.5	5 55.8 1.008 71.4	8
9							5 21.0 1.008 70.5	5 50.9 1.008 70.4	9
110							5 16.1 1.008 69.5	5 46.0 1.008 69.5	110
1							5 11.2 1.008 68.5	5 41.1 1.008 68.5	1
2							5 06.4 1.008 67.5	5 36.3 1.008 67.5	2
3							5 01.6 1.008 66.5	5 31.5 1.008 66.5	3
4								5 26.7 1.008 65.5	4
115								5 21.9 1.008 64.5	115
6								5 17.2 1.008 63.5	6
7								5 12.6 1.008 62.5	7
8								5 08.0 1.008 61.5	8
9								5 03.4 1.008 60.5	9

Lat. 86°

Lat. 87°

Lat. 88°

Lat. 89°

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Lat. 85°

H.A.	8° 00′ Alt.	Δd Δt	Az.	8° 30′ Alt.	Δd Δt	Az.	9° 00′ Alt.	Δd Δt	Az.	9° 30′ Alt.	Δd Δt	Az.	10° 00′ Alt.	Δd Δt	Az.	10° 30′ Alt.	Δd Δt	Az.	11° 00′ Alt.	Δd Δt	Az.	11° 30′ Alt.	Δd Δt	Az.	H.A.
00	13 00.0	1.000	180.0	13 30.0	1.000	180.0	14 00.0	1.000	180.0	14 30.0	1.000	180.0	15 00.0	1.000	180.0	15 30.0	1.000	180.0	16 00.0	1.000	180.0	16 30.0	1.000	180.0	00
1	13 00.0	1.000	179.0	13 30.0	1.000	179.0	14 00.0	1.000	179.0	14 30.0	1.000	179.0	15 00.0	1.000	179.0	15 30.0	1.000	179.0	16 00.0	1.000	179.0	16 30.0	1.000	179.0	1
2	12 59.8	1.000	178.0	13 29.8	1.000	178.0	13 59.8	1.000	178.0	14 29.8	1.000	178.0	14 59.8	1.000	178.0	15 29.8	1.000	178.0	15 59.8	1.000	178.0	16 29.8	1.000	178.0	2
3	12 59.6	1.001	177.0	13 29.6	1.001	176.9	13 59.6	1.001	176.9	14 29.6	1.001	176.9	14 59.6	1.001	176.9	15 29.6	1.001	176.9	15 59.6	1.001	176.9	16 29.6	1.001	176.9	3
4	12 59.3	1.001	175.9	13 29.3	1.001	175.9	13 59.3	1.001	175.9	14 29.3	1.001	175.9	14 59.3	1.001	175.9	15 29.3	1.001	175.9	15 59.3	1.001	175.9	16 29.3	1.001	175.9	4
05	12 58.8	1.001	174.9	13 28.8	1.001	174.9	13 58.8	1.001	174.9	14 28.8	1.001	174.9	14 58.8	1.001	174.9	15 28.8	1.001	174.9	15 58.8	1.001	174.9	16 28.8	1.001	174.9	05
6	12 58.3	1.001	173.9	13 28.3	1.001	173.9	13 58.3	1.001	173.9	14 28.3	1.001	173.9	14 58.3	1.001	173.9	15 28.3	1.001	173.9	15 58.3	1.001	173.9	16 28.3	1.001	173.9	6
7	12 57.7	1.001	172.9	13 27.7	1.001	172.9	13 57.7	1.001	172.9	14 27.7	1.001	172.9	14 57.7	1.001	172.9	15 27.7	1.001	172.9	15 57.7	1.001	172.9	16 27.7	1.001	172.8	7
8	12 57.0	1.001	171.9	13 27.0	1.001	171.9	13 57.0	1.001	171.9	14 27.0	1.001	171.9	14 57.0	1.001	171.8	15 27.0	1.001	171.8	15 57.0	1.001	171.8	16 27.0	1.001	171.8	8
9	12 56.3	1.001	170.9	13 26.2	1.001	170.8	13 56.2	1.001	170.8	14 26.2	1.001	170.8	14 56.2	1.001	170.8	15 26.2	1.001	170.8	15 56.2	1.001	170.8	16 26.2	1.001	170.8	9
10	12 55.4	1.002	169.8	13 25.4	1.002	169.8	13 55.4	1.002	169.8	14 25.4	1.002	169.8	14 55.4	1.002	169.8	15 25.4	1.002	169.8	15 55.4	1.002	169.8	16 25.3	1.002	169.8	10
1	12 54.4	1.002	168.8	13 24.4	1.002	168.8	13 54.4	1.002	168.8	14 24.4	1.002	168.8	14 54.4	1.002	168.8	15 24.4	1.002	168.8	15 54.4	1.002	168.8	16 24.4	1.002	168.8	1
2	12 53.3	1.002	167.8	13 23.3	1.002	167.8	13 53.3	1.002	167.8	14 23.3	1.002	167.8	14 53.3	1.002	167.8	15 23.3	1.002	167.8	15 53.3	1.002	167.7	16 23.3	1.002	167.7	2
3	12 52.2	1.002	166.8	13 22.2	1.002	166.8	13 52.2	1.002	166.8	14 22.2	1.002	166.8	14 52.2	1.002	166.7	15 22.2	1.002	166.7	15 52.2	1.002	166.7	16 22.2	1.002	166.7	3
4	12 51.0	1.002	165.8	13 21.0	1.002	165.8	13 51.0	1.002	165.7	14 21.0	1.002	165.7	14 50.9	1.002	165.7	15 20.9	1.002	165.7	15 50.9	1.002	165.7	16 20.9	1.002	165.7	4
15	12 49.6	1.002	164.8	13 19.6	1.002	164.7	13 49.6	1.002	164.7	14 19.6	1.002	164.7	14 49.6	1.002	164.7	15 19.6	1.002	164.7	15 49.6	1.002	164.7	16 19.6	1.002	164.7	15
6	12 48.2	1.002	163.7	13 18.2	1.003	163.7	13 48.2	1.002	163.7	14 18.2	1.003	163.7	14 48.2	1.002	163.7	15 18.2	1.003	163.7	15 48.1	1.003	163.7	16 18.1	1.003	163.7	6
7	12 46.7	1.003	162.7	13 16.7	1.003	162.7	13 46.7	1.003	162.7	14 16.7	1.003	162.7	14 46.7	1.003	162.7	15 16.6	1.003	162.7	15 46.6	1.003	162.6	16 16.6	1.003	162.6	7
8	12 45.1	1.003	161.7	13 15.1	1.003	161.7	13 45.1	1.003	161.7	14 15.1	1.003	161.7	14 45.1	1.003	161.7	15 15.0	1.003	161.6	15 45.0	1.003	161.6	16 15.0	1.003	161.6	8
9	12 43.4	1.003	160.7	13 13.4	1.003	160.7	13 43.4	1.003	160.7	14 13.4	1.003	160.7	14 43.3	1.003	160.6	15 13.3	1.003	160.6	15 43.3	1.003	160.6	16 13.3	1.003	160.6	9
20	12 41.6	1.003	159.7	13 11.6	1.003	159.7	13 41.6	1.003	159.7	14 11.6	1.003	159.6	14 41.6	1.003	159.6	15 11.6	1.003	159.6	15 41.5	1.003	159.6	16 11.5	1.003	159.6	20
1	12 39.8	1.003	158.7	13 09.8	1.003	158.7	13 39.8	1.003	158.6	14 09.7	1.003	158.6	14 39.7	1.003	158.6	15 09.7	1.003	158.6	15 39.7	1.003	158.6	16 09.7	1.003	158.6	1
2	12 37.8	1.003	157.7	13 07.8	1.003	157.6	13 37.8	1.003	157.6	14 07.8	1.003	157.6	14 37.8	1.003	157.6	15 07.8	1.003	157.6	15 37.7	1.003	157.6	16 07.7	1.003	157.5	2
3	12 35.8	1.004	156.6	13 05.8	1.004	156.6	13 35.8	1.004	156.6	14 05.8	1.004	156.6	14 35.7	1.004	156.6	15 05.7	1.004	156.6	15 35.7	1.004	156.5	16 05.7	1.004	156.5	3
4	12 33.7	1.004	155.6	13 03.7	1.004	155.6	13 33.7	1.004	155.6	14 03.6	1.004	155.6	14 33.6	1.004	155.6	15 03.6	1.004	155.5	15 33.6	1.004	155.5	16 03.6	1.004	155.5	4
25	12 31.5	1.004	154.6	13 01.5	1.004	154.6	13 31.5	1.004	154.6	14 01.4	1.004	154.6	14 31.4	1.004	154.5	15 01.4	1.004	154.5	15 31.4	1.004	154.5	16 01.3	1.004	154.5	25
6	12 29.2	1.004	153.6	12 59.2	1.004	153.6	13 29.2	1.004	153.6	13 59.1	1.004	153.5	14 29.1	1.004	153.5	14 59.1	1.004	153.5	15 29.1	1.004	153.5	15 59.1	1.004	153.5	6
7	12 26.8	1.004	152.6	12 56.8	1.004	152.6	13 26.8	1.004	152.5	13 56.8	1.004	152.5	14 26.7	1.004	152.5	14 56.7	1.004	152.5	15 26.7	1.004	152.5	15 56.7	1.004	152.4	7
8	12 24.4	1.004	151.6	12 54.4	1.004	151.6	13 24.3	1.004	151.5	13 54.3	1.004	151.5	14 24.3	1.004	151.5	14 54.3	1.004	151.5	15 24.2	1.004	151.4	15 54.2	1.004	151.4	8
9	12 21.9	1.004	150.6	12 51.8	1.004	150.5	13 21.8	1.004	150.5	13 51.8	1.004	150.5	14 21.8	1.004	150.5	14 51.7	1.004	150.4	15 21.7	1.004	150.4	15 51.7	1.004	150.4	9
30	12 19.3	1.004	149.5	12 49.2	1.004	149.5	13 19.2	1.004	149.5	13 49.2	1.004	149.5	14 19.1	1.004	149.5	14 49.1	1.004	149.4	15 19.1	1.004	149.4	15 49.0	1.004	149.4	30
1	12 16.6	1.005	148.5	12 46.5	1.005	148.5	13 16.5	1.005	148.5	13 46.5	1.005	148.5	14 16.4	1.005	148.4	14 46.4	1.005	148.4	15 16.4	1.005	148.4	15 46.3	1.005	148.4	1
2	12 13.8	1.005	147.5	12 43.8	1.005	147.5	13 13.7	1.005	147.5	13 43.7	1.005	147.4	14 13.7	1.005	147.4	14 43.6	1.005	147.4	15 13.6	1.005	147.4	15 43.6	1.005	147.4	2
3	12 11.0	1.005	146.5	12 40.9	1.005	146.5	13 10.9	1.005	146.5	13 40.8	1.005	146.4	14 10.8	1.005	146.4	14 40.8	1.005	146.4	15 10.7	1.005	146.4	15 40.7	1.005	146.3	3
4	12 08.0	1.005	145.5	12 38.0	1.005	145.5	13 08.0	1.005	145.4	13 37.9	1.005	145.4	14 07.9	1.005	145.4	14 37.8	1.005	145.4	15 07.8	1.005	145.3	15 37.8	1.005	145.3	4
35	12 05.0	1.005	144.5	12 35.0	1.005	144.4	13 05.0	1.005	144.4	13 34.9	1.005	144.4	14 04.9	1.005	144.4	14 34.8	1.005	144.4	15 04.8	1.005	144.3	15 34.8	1.005	144.3	35
6	12 02.0	1.005	143.5	12 31.9	1.005	143.5	13 01.9	1.005	143.4	13 31.8	1.005	143.4	14 01.8	1.005	143.4	14 31.7	1.005	143.3	15 01.7	1.005	143.3	15 31.7	1.005	143.3	6
7	11 58.8	1.005	142.5	12 28.8	1.005	142.4	12 58.7	1.005	142.4	13 28.7	1.005	142.4	13 58.6	1.005	142.4	14 28.6	1.005	142.3	14 58.5	1.005	142.3	15 28.5	1.005	142.3	7
8	11 55.6	1.006	141.5	12 25.5	1.006	141.4	12 55.5	1.006	141.4	13 25.4	1.006	141.4	13 55.4	1.006	141.3	14 25.3	1.006	141.3	14 55.3	1.006	141.3	15 25.3	1.006	141.3	8
9	11 52.3	1.006	140.4	12 22.2	1.006	140.4	12 52.2	1.006	140.4	13 22.1	1.006	140.4	13 52.1	1.006	140.3	14 22.1	1.006	140.3	14 52.0	1.006	140.3	15 22.0	1.006	140.2	9
40	11 48.9	1.006	139.4	12 18.9	1.006	139.4	12 48.8	1.006	139.4	13 18.8	1.006	139.3	13 48.7	1.006	139.3	14 18.7	1.006	139.3	14 48.6	1.006	139.3	15 18.6	1.006	139.2	40
1	11 45.5	1.006	138.4	12 15.4	1.006	138.4	12 45.4	1.006	138.4	13 15.3	1.006	138.3	13 45.3	1.006	138.3	14 15.2	1.006	138.3	14 45.2	1.006	138.2	15 15.1	1.006	138.2	1
2	11 42.0	1.006	137.4	12 11.9	1.006	137.4	12 41.9	1.006	137.4	13 11.8	1.006	137.3	13 41.8	1.006	137.3	14 11.7	1.006	137.3	14 41.7	1.006	137.2	15 11.6	1.006	137.2	2
3	11 38.4	1.006	136.4	12 08.4	1.006	136.4	12 38.3	1.006	136.3	13 08.2	1.006	136.3	13 38.2	1.006	136.3	14 08.1	1.006	136.2	14 38.1	1.006	136.2	15 08.0	1.006	136.2	3
4	11 34.8	1.006	135.4	12 04.7	1.006	135.4	12 34.7	1.006	135.3	13 04.6	1.006	135.3	13 34.5	1.006	135.3	14 04.5	1.006	135.2	14 34.4	1.006	135.2	15 04.4	1.006	135.2	4
45	11 31.1	1.006	134.4	12 01.0	1.006	134.4	12 30.9	1.006	134.3	13 00.9	1.006	134.3	13 30.8	1.006	134.3	14 00.8	1.006	134.2	14 30.7	1.006	134.2	15 00.6	1.006	134.2	45
6	11 27.3	1.006	133.4	11 57.2	1.006	133.3	12 27.2	1.006	133.3	12 57.1	1.006	133.3	13 27.1	1.006	133.2	13 57.0	1.006	133.2	14 26.9	1.006	133.2	14 56.9	1.006	133.1	6
7	11 23.5	1.006	132.4	11 53.4	1.006	132.3	12 23.3	1.006	132.3	12 53.3	1.006	132.2	13 23.2	1.006	132.2	13 53.1	1.006	132.2	14 23.1	1.006	132.2	14 53.0	1.007	132.1	7
8	11 19.6	1.007	131.4	11 49.5	1.007	131.3	12 19.4	1.007	131.3	12 49.4	1.007	131.3	13 19.3	1.007	131.2	13 49.2	1.007	131.2	14 19.2	1.007	131.2	14 49.1	1.007	131.1	8
9	11 15.6	1.007	130.4	11 45.6	1.007	130.3	12 15.5	1.007	130.3	12 45.4	1.007	130.3	13 15.3	1.007	130.2	13 45.3	1.007	130.2	14 15.2	1.007	130.1	14 45.1	1.007	130.1	9
50	11 11.6	1.007	129.3	11 41.5	1.007	129.3	12 11.5	1.007	129.3	12 41.4	1.007	129.2	13 11.3	1.007	129.2	13 41.2	1.007	129.2	14 11.2	1.007	129.1	14 41.1	1.007	129.1	50
1	11 07.5	1.007	128.3	11 37.5	1.007	128.3	12 07.4	1.007	128.3	12 37.3	1.007	128.2	13 07.2	1.007	128.2	13 37.2	1.007	128.2	14 07.1	1.007	128.1	14 37.0	1.007	128.1	1
2	11 03.4	1.007	127.3	11 33.3	1.007	127.3	12 03.3	1.007	127.3	12 33.2	1.007	127.2	13 03.1	1.007	127.2	13 33.0	1.007	127.2	14 03.0	1.007	127.1	14 32.9	1.007	127.1	2
3	10 59.2	1.007	126.3	11 29.1	1.007	126.3	11 59.1	1.007	126.3	12 29.0	1.007	126.2	12 58.9	1.007	126.2	13 28.8	1.007	126.1	13 58.8	1.007	126.1	14 28.7	1.007	126.1	3
4	10 55.0	1.007	125.3	11 24.9	1.007	125.3	11 54.8	1.007	125.2	12 24.7	1.007	125.2	12 54.7	1.007	125.2	13 24.6	1.007	125.1	13 54.5	1.007	125.1	14 24.4	1.007	125.1	4
55	10 50.7	1.007	124.3	11 20.6	1.007	124.3	11 50.5	1.007	124.2	12 20.4	1.007	124.2	12 50.4	1.007	124.2	13 20.3	1.007	124.1	13 50.2	1.007	124.1	14 20.1	1.007	124.1	55
6	10 46.3	1.007	123.3	11 16.3	1.007	123.3	11 46.2	1.007	123.2	12 16.1	1.007	123.2	12 46.0	1.007	123.2	13 15.9	1.007	123.1	13 45.8	1.007	123.1	14 15.8	1.007	123.0	6
7	10 41.9	1.007	122.3	11 11.9	1.007	122.3	11 41.8	1.007	122.2	12 11.7	1.007	122.2	12 41.6	1.007	122.2	13 11.5	1.007	122.1	13 41.4	1.007	122.1	14 11.4	1.007	122.0	7
8	10 37.5	1.008	121.3	11 07.4	1.008	121.3	11 37.3	1.008	121.2	12 07.2	1.008	121.2	12 37.2	1.008	121.1	13 07.1	1.008	121.1	13 37.0	1.008	121.1	14 06.9	1.008	121.0	8
9	10 33.0	1.008	120.3	11 02.9	1.008	120.3	11 32.8	1.008	120.2	12 02.7	1.008	120.2	12 32.7	1.008	120.1	13 02.6	1.008	120.1	13 32.5	1.008	120.1	14 02.4	1.008	120.0	9
60	10 28.5	1.008	119.3	10 58.4	1.008	119.3	11 28.3	1.008	119.2	11 58.2	1.008	119.2	12 28.1	1.008	119.1	12 58.0	1.008	119.1	13 27.9	1.008	119.1	13 57.8	1.008	119.0	60
1	10 23.9	1.008	118.3	10 53.8	1.008	118.2	11 23.7	1.008	118.2	11 53.6	1.008	118.2	12 23.5	1.008	118.1	12 53.4	1.008	118.1	13 23.3	1.008	118.0	13 53.2	1.008	118.0	1
2	10 19.3	1.008	117.3	10 49.2	1.008	117.2	11 19.1	1.008	117.2	11 49.0	1.008	117.2	12 18.9	1.008	117.1	12 48.8	1.008	117.1	13 18.7	1.008	117.0	13 48.6	1.008	117.0	2
3	10 14.6	1.008	116.3	10 44.5	1.008	116.2	11 14.4	1.008	116.2	11 44.3	1.008	116.2	12 14.2	1.008	116.1	12 44.1	1.008	116.1	13 14.0	1.008	116.0	13 43.9	1.008	116.0	3
4	10 09.9	1.008	115.3	10 39.8	1.008	115.2	11 09.7	1.008	115.2	11 39.6	1.008	115.2	12 09.5	1.008	115.1	12 39.4	1.008	115.1	13 09.3	1.008	115.0	13 39.2	1.008	115.0	4
65	10 05.1	1.008	114.3	10 35.0	1.008	114.2	11 04.9	1.008	114.2	11 34.8	1.008	114.2	12 04.7	1.008	114.1	12 34.6	1.008	114.1	13 04.5	1.008	114.0	13 34.4	1.008	114.0	65
6	10 00.3	1.008	113.3	10 30.2	1.008	113.2	11 00.2	1.008	113.2	11 30.1	1.008	113.2	12 00.0	1.008	113.1	12 29.9	1.008	113.1	12 59.8	1.008	113.0	13 29.7	1.008	113.0	6
7	9 55.5	1.008	112.3	10 25.4	1.008	112.2	10 55.3	1.008	112.2	11 25.2	1.008	112.1	11 55.1	1.008	112.1	12 25.0	1.008	112.1	12 54.9	1.008	112.0	13 24.8	1.008	112.0	7
8	9 50.7	1.008	111.3	10 20.6	1.008	111.2	10 50.5	1.008	111.2	11 20.4	1.008	111.1	11 50.3	1.008	111.1	12 20.2	1.008	111.1	12 50.1	1.008	111.0	13 20.0	1.008	111.0	8
9	9 45.8	1.008	110.3	10 15.7	1.008	110.2	10 45.6	1.008	110.2	11 15.5	1.008	110.1	11 45.4	1.008	110.1	12 15.3	1.008	110.1	12 45.2	1.008	110.0	13 15.1	1.008	110.0	9
70	9 40.9	1.008	109.3	10 10.8	1.008	109.2	10 40.7	1.008	109.2	11 10.5	1.008	109.1	11 40.4	1.008	109.1	12 10.3	1.008	109.1	12 40.2	1.008	109.0	13 10.1	1.008	109.0	70
1	9 35.9	1.008	108.3	10 05.8	1.008	108.2	10 35.7	1.008	108.2	11 05.6	1.008	108.1	11 35.5	1.008	108.1	12 05.4	1.008	108.1	12 35.3	1.008	108.0	13 05.2	1.008	108.0	1
2	9 30.9	1.008	107.3	10 00.8	1.008	107.2	10 30.7	1.008	107.2	11 00.6	1.008	107.1	11 30.5	1.008	107.1	12 00.4	1.008	107.1	12 30.3	1.008	107.0	13 00.2	1.008	107.0	2
3	9 25.9	1.008	106.3	9 55.8	1.008	106.2	10 25.7	1.008	106.2	10 55.6	1.008	106.1	11 25.5	1.008	106.1	11 55.4	1.008	106.0	12 25.3	1.008	106.0	12 55.2	1.008	106.0	3
4	9 20.9	1.008	105.3	9 50.8	1.008	105.2	10 20.7	1.008	105.2	10 50.6	1.008	105.1	11 20.5	1.008	105.1	11 50.3	1.008	105.0	12 20.2	1.008	105.0	12 50.1	1.008	105.0	4
75	9 15.8	1.008	104.3	9 45.7	1.008	104.2	10 15.6	1.008	104.2	10 45.5	1.008	104.1	11 15.4	1.008	104.1	11 45.3	1.008	104.0	12 15.2	1.008	104.0	12 45.1	1.008	104.0	75
6	9 10.8	1.009	103.3	9 40.6	1.009	103.2	10 10.5	1.009	103.2	10 40.4	1.009	103.1	11 10.3	1.009	103.1	11 40.2	1.009	103.0	12 10.1	1.009	103.0	12 40.0	1.009	103.0	6
7	9 05.7	1.009	102.3	9 35.5	1.009	102.2	10 05.4	1.009	102.2	10 35.3	1.009	102.1	11 05.2	1.009	102.1	11 35.1	1.009	102.0	12 05.0	1.009	102.0	12 34.9	1.009	102.0	7
8	9 00.5	1.009	101.3	9 30.4	1.009	101.2	10 00.3	1.009	101.2	10 30.2	1.009	101.1	11 00.1	1.009	101.1	11 30.0	1.009	101.0	11 59.9	1.009	101.0	12 29.7	1.009	101.0	8
9	8 55.4	1.009	100.3	9 25.3	1.009	100.2	9 55.2	1.009	100.2	10 25.1	1.009	100.1	10 54.9	1.009	100.1	11 24.8	1.009	100.0	11 54.7	1.009	100.0	12 24.6	1.009	100.0	9
80	8 50.2	1.009	99.3	9 20.1	1.009	99.2	9 50.0	1.009	99.2	10 19.9	1.009	99.1	10 49.8	1.009	99.1	11 19.7	1.009	99.0	11 49.6	1.009	99.0	12 19.4	1.009	99.0	80
1	8 45.1	1.009	98.3	9 15.0	1.009	98.2	9 44.8	1.009	98.2	10 14.7	1.009	98.1	10 44.6	1.009	98.1	11 14.5	1.009	98.0	11 44.4	1.009	98.0	12 14.3	1.009	98.0	1
2	8 39.9	1.009	97.3	9 09.8	1.009	97.2	9 39.7	1.009	97.2	10 09.5	1.009	97.1	10 39.4	1.009	97.1	11 09.3	1.009	97.1	11 39.2	1.009	97.0	12 09.1	1.009	97.0	2
3	8 34.7	1.009	96.3	9 04.6	1.009	96.2	9 34.5	1.009	96.2	10 04.4	1.009	96.1	10 34.2	1.009	96.1	11 04.1	1.009	96.1	11 34.0	1.009	96.0	12 03.9	1.009	96.0	3
4	8 29.5	1.009	95.3	8 59.4	1.009	95.2	9 29.3	1.009	95.2	9 59.2	1.009	95.1	10 29.0	1.009	95.1	10 58.9	1.009	95.1	11 28.8	1.009	95.0	11 58.7	1.009	95.0	4
85	8 24.3	1.009	94.3	8 54.2	1.009	94.2	9 24.1	1.009	94.2	9 53.9	1.009	94.1	10 23.8	1.009	94.1	10 53.7	1.009	94.1	11 23.6	1.009	94.0	11 53.5	1.009	94.0	85
6	8 19.1	1.009	93.3	8 49.0	1.009	93.2	9 18.8	1.009	93.2	9 48.7	1.009	93.2	10 18.6	1.009	93.1	10 48.5	1.009	93.1	11 18.4	1.009	93.0	11 48.2	1.009	93.0	6
7	8 13.8	1.009	92.3	8 43.7	1.009	92.2	9 13.6	1.009	92.2	9 43.5	1.009	92.2	10 13.4	1.009	92.1	10 43.3	1.009	92.1	11 13.1	1.009	92.0	11 43.0	1.009	92.0	7
8	8 08.6	1.009	91.3	8 38.5	1.009	91.2	9 08.4	1.009	91.2	9 38.3	1.009	91.2	10 08.2	1.009	91.1	10 38.0	1.009	91.1	11 07.9	1.009	91.0	11 37.8	1.009	91.0	8
9	8 03.4	1.009	90.3	8 33.3	1.009	90.2	9 03.2	1.009	90.2	9 33.0	1.009	90.2	10 02.9	1.009	90.1	10 32.8	1.009	90.1	11 02.7	1.009	90.0	11 32.6	1.009	90.0	9
90	7 58.2	1.009	89.3	8 28.0	1.009	89.3	8 57.9	1.009	89.2	9 27.8	1.009	89.2	9 57.7	1.009	89.1	10 27.6	1.009	89.1	10 57.5	1.009	89.0	11 27.3	1.009	89.0	90

H.A.	8° 00' Alt.	Δd Δt	Az.	8° 30' Alt.	Δd Δt	Az.	9° 00' Alt.	Δd Δt	Az.	9° 30' Alt.	Δd Δt	Az.	10° 00' Alt.	Δd Δt	Az.	10° 30' Alt.	Δd Δt	Az.	11° 00' Alt.	Δd Δt	Az.	11° 30' Alt.	Δd Δt	Az.	H.A.
91	7 52.9	1.009	88.3	8 22.8	1.009	88.3	8 52.7	1.009	88.2	9 22.6	1.009	88.2	9 52.5	1.009	88.1	10 22.3	1.009	88.1	10 52.2	1.009	88.0	11 22.1	1.009	88.0	91
2	7 47.7	1.009	87.3	8 17.6	1.009	87.3	8 47.5	1.009	87.2	9 17.4	1.009	87.2	9 47.2	1.009	87.1	10 17.1	1.009	87.1	10 47.0	1.009	87.0	11 16.9	1.009	87.0	2
3	7 42.5	1.009	86.3	8 12.4	1.009	86.3	8 42.3	1.009	86.2	9 12.1	1.009	86.2	9 42.0	1.009	86.1	10 11.9	1.009	86.1	10 41.8	1.009	86.0	11 11.7	1.009	86.0	3
4	7 37.3	1.009	85.3	8 07.2	1.009	85.3	8 37.0	1.009	85.2	9 06.9	1.009	85.2	9 36.8	1.009	85.1	10 06.7	1.009	85.1	10 36.6	1.009	85.0	11 06.5	1.009	85.0	4
95	7 32.1	1.009	84.3	8 01.9	1.009	84.3	8 31.8	1.009	84.2	9 01.7	1.009	84.2	9 31.6	1.009	84.1	10 01.5	1.009	84.1	10 31.4	1.009	84.1	11 01.2	1.009	84.0	95
6	7 26.9	1.009	83.3	7 56.7	1.009	83.3	8 26.6	1.009	83.2	8 56.5	1.009	83.2	9 26.4	1.009	83.1	9 56.3	1.009	83.1	10 26.1	1.009	83.1	10 56.1	1.009	83.0	6
7	7 21.7	1.009	82.3	7 51.6	1.009	82.3	8 21.4	1.009	82.2	8 51.3	1.009	82.2	9 21.2	1.009	82.2	9 51.1	1.009	82.1	10 21.0	1.009	82.1	10 50.9	1.009	82.0	7
8	7 16.5	1.009	81.3	7 46.4	1.009	81.3	8 16.3	1.009	81.2	8 46.2	1.009	81.2	9 16.0	1.009	81.2	9 45.9	1.009	81.1	10 15.8	1.009	81.1	10 45.7	1.009	81.0	8
9	7 11.3	1.009	80.3	7 41.2	1.009	80.3	8 11.1	1.009	80.3	8 41.0	1.009	80.2	9 10.9	1.009	80.2	9 40.8	1.009	80.1	10 10.7	1.009	80.1	10 40.5	1.009	80.0	9
100	7 06.2	1.009	79.3	7 36.1	1.009	79.3	8 06.0	1.009	79.3	8 35.9	1.009	79.2	9 05.7	1.009	79.2	9 35.6	1.009	79.1	10 05.5	1.009	79.1	10 35.4	1.009	79.0	100
1	7 01.1	1.009	78.4	7 30.9	1.008	78.3	8 00.8	1.008	78.3	8 30.7	1.008	78.2	9 00.6	1.008	78.2	9 30.5	1.008	78.1	10 00.4	1.008	78.1	10 30.3	1.008	78.0	1
2	6 55.9	1.008	77.4	7 25.8	1.008	77.3	7 55.7	1.008	77.3	8 25.6	1.008	77.2	8 55.5	1.008	77.2	9 25.4	1.008	77.1	9 55.3	1.008	77.1	10 25.2	1.008	77.1	2
3	6 50.9	1.008	76.4	7 20.7	1.008	76.3	7 50.6	1.008	76.3	8 20.5	1.008	76.2	8 50.4	1.008	76.2	9 20.3	1.008	76.1	9 50.2	1.008	76.1	10 20.1	1.008	76.1	3
4	6 45.8	1.008	75.4	7 15.7	1.008	75.3	7 45.6	1.008	75.3	8 15.5	1.008	75.2	8 45.3	1.008	75.2	9 15.2	1.008	75.2	9 45.1	1.008	75.1	10 15.0	1.008	75.1	4
105	6 40.7	1.008	74.4	7 10.6	1.008	74.3	7 40.5	1.008	74.3	8 10.4	1.008	74.3	8 40.3	1.008	74.2	9 10.2	1.008	74.2	9 40.1	1.008	74.1	10 10.0	1.008	74.1	105
6	6 35.7	1.008	73.4	7 05.6	1.008	73.3	7 35.5	1.008	73.3	8 05.4	1.008	73.3	8 35.3	1.008	73.2	9 05.2	1.008	73.2	9 35.1	1.008	73.1	10 05.0	1.008	73.1	6
7	6 30.7	1.008	72.4	7 00.6	1.008	72.3	7 30.5	1.008	72.3	8 00.4	1.008	72.3	8 30.3	1.008	72.2	9 00.2	1.008	72.2	9 30.1	1.008	72.1	10 00.0	1.008	72.1	7
8	6 25.7	1.008	71.4	6 55.6	1.008	71.4	7 25.5	1.008	71.3	7 55.4	1.008	71.3	8 25.3	1.008	71.2	8 55.2	1.008	71.2	9 25.1	1.008	71.1	9 55.0	1.008	71.1	8
9	6 20.8	1.008	70.4	6 50.7	1.008	70.4	7 20.6	1.008	70.3	7 50.5	1.008	70.3	8 20.4	1.008	70.2	8 50.3	1.008	70.2	9 20.2	1.008	70.2	9 50.1	1.008	70.1	9
110	6 15.9	1.008	69.4	6 45.8	1.008	69.4	7 15.7	1.008	69.3	7 45.6	1.008	69.3	8 15.5	1.008	69.2	8 45.4	1.008	69.2	9 15.3	1.008	69.2	9 45.2	1.008	69.1	110
1	6 11.0	1.008	68.4	6 40.9	1.008	68.4	7 10.8	1.008	68.3	7 40.7	1.008	68.3	8 10.6	1.008	68.3	8 40.5	1.008	68.2	9 10.4	1.008	68.2	9 40.3	1.008	68.1	1
2	6 06.2	1.008	67.4	6 36.1	1.008	67.4	7 06.0	1.008	67.3	7 35.9	1.008	67.3	8 05.8	1.008	67.3	8 35.7	1.008	67.2	9 05.6	1.008	67.2	9 35.5	1.008	67.1	2
3	6 01.4	1.008	66.4	6 31.3	1.008	66.4	7 01.2	1.008	66.4	7 31.1	1.008	66.3	8 01.0	1.008	66.3	8 30.9	1.008	66.2	9 00.8	1.008	66.2	9 30.7	1.008	66.1	3
4	5 56.6	1.008	65.4	6 26.5	1.008	65.4	6 56.4	1.008	65.4	7 26.3	1.008	65.3	7 56.2	1.008	65.3	8 26.1	1.008	65.2	8 56.0	1.008	65.2	9 25.9	1.008	65.2	4
115	5 51.8	1.008	64.5	6 21.7	1.008	64.4	6 51.7	1.008	64.4	7 21.6	1.008	64.3	7 51.5	1.008	64.3	8 21.4	1.008	64.2	8 51.3	1.008	64.2	9 21.2	1.008	64.2	115
6	5 47.1	1.008	63.5	6 17.1	1.008	63.4	6 47.0	1.008	63.4	7 16.9	1.008	63.3	7 46.8	1.008	63.3	8 16.7	1.008	63.3	8 46.6	1.008	63.2	9 16.5	1.008	63.2	6
7	5 42.5	1.008	62.5	6 12.4	1.008	62.4	6 42.3	1.008	62.4	7 12.2	1.008	62.3	7 42.1	1.008	62.3	8 12.0	1.008	62.3	8 41.9	1.008	62.2	9 11.8	1.008	62.2	7
8	5 37.9	1.008	61.5	6 07.8	1.008	61.4	6 37.7	1.008	61.4	7 07.6	1.008	61.4	7 37.5	1.008	61.3	8 07.4	1.008	61.3	8 37.3	1.008	61.2	9 07.2	1.008	61.2	8
9	5 33.3	1.008	60.5	6 03.2	1.008	60.4	6 33.1	1.008	60.4	7 03.0	1.008	60.4	7 32.9	1.008	60.3	8 02.8	1.008	60.3	8 32.8	1.008	60.2	9 02.7	1.008	60.2	9
120	5 28.8	1.007	59.5	5 58.7	1.007	59.5	6 28.6	1.007	59.4	6 58.5	1.007	59.4	7 28.4	1.007	59.3	7 58.3	1.007	59.3	8 28.2	1.007	59.3	8 58.2	1.007	59.2	120
1	5 24.3	1.007	58.5	5 54.2	1.007	58.5	6 24.1	1.007	58.4	6 54.0	1.007	58.4	7 23.9	1.007	58.3	7 53.9	1.007	58.3	8 23.8	1.007	58.3	8 53.7	1.007	58.2	1
2	5 19.9	1.007	57.5	5 49.8	1.007	57.5	6 19.7	1.007	57.4	6 49.6	1.007	57.4	7 19.5	1.007	57.4	7 49.4	1.007	57.3	8 19.4	1.007	57.3	8 49.3	1.007	57.2	2
3	5 15.5	1.007	56.5	5 45.4	1.007	56.5	6 15.3	1.007	56.4	6 45.2	1.007	56.4	7 15.1	1.007	56.4	7 45.1	1.007	56.3	8 15.0	1.007	56.3	8 44.9	1.007	56.3	3
4	5 11.1	1.007	55.5	5 41.1	1.007	55.5	6 11.0	1.007	55.4	6 40.9	1.007	55.4	7 10.8	1.007	55.4	7 40.7	1.007	55.3	8 10.7	1.007	55.3	8 40.6	1.007	55.3	4
125	5 06.8	1.007	54.5	5 36.8	1.007	54.5	6 06.7	1.007	54.5	6 36.6	1.007	54.4	7 06.5	1.007	54.4	7 36.5	1.007	54.3	8 06.4	1.007	54.3	8 36.3	1.007	54.3	125
6	5 02.6	1.007	53.5	5 32.5	1.007	53.5	6 02.5	1.007	53.5	6 32.4	1.007	53.4	7 02.3	1.007	53.4	7 32.2	1.007	53.4	8 02.2	1.007	53.3	8 32.1	1.007	53.3	6
7				5 28.4	1.007	52.5	5 58.3	1.007	52.5	6 28.2	1.007	52.4	6 58.1	1.007	52.4	7 28.1	1.007	52.4	7 58.0	1.007	52.3	8 27.9	1.007	52.3	7
8				5 24.2	1.007	51.5	5 54.2	1.007	51.5	6 24.1	1.007	51.4	6 54.0	1.007	51.4	7 24.0	1.007	51.4	7 53.9	1.007	51.3	8 23.8	1.007	51.3	8
9				5 20.2	1.007	50.5	5 50.1	1.007	50.5	6 20.0	1.007	50.5	6 50.0	1.007	50.4	7 19.9	1.007	50.4	7 49.8	1.007	50.4	8 19.8	1.007	50.3	9
130				5 16.2	1.007	49.5	5 46.1	1.007	49.5	6 16.0	1.007	49.5	6 46.0	1.007	49.4	7 15.9	1.007	49.4	7 45.8	1.007	49.4	8 15.8	1.007	49.3	130
1				5 12.2	1.006	48.5	5 42.2	1.006	48.5	6 12.1	1.006	48.5	6 42.0	1.006	48.4	7 12.0	1.006	48.4	7 41.9	1.006	48.4	8 11.8	1.006	48.3	1
2				5 08.3	1.006	47.6	5 38.3	1.006	47.5	6 08.2	1.006	47.5	6 38.1	1.006	47.5	7 08.1	1.006	47.4	7 38.0	1.006	47.4	8 07.9	1.006	47.4	2
3				5 04.5	1.006	46.6	5 34.4	1.006	46.5	6 04.4	1.006	46.5	6 34.3	1.006	46.5	7 04.3	1.006	46.4	7 34.2	1.006	46.4	8 04.1	1.006	46.4	3
4				5 00.7	1.006	45.6	5 30.7	1.006	45.5	6 00.6	1.006	45.5	6 30.6	1.006	45.5	7 00.5	1.006	45.4	7 30.4	1.006	45.4	8 00.4	1.006	45.4	4
135							5 27.0	1.006	44.6	5 56.9	1.006	44.5	6 26.9	1.006	44.5	6 56.8	1.006	44.5	7 26.7	1.006	44.4	7 56.7	1.006	44.4	135
6							5 23.3	1.006	43.6	5 53.3	1.006	43.5	6 23.2	1.006	43.5	6 53.2	1.006	43.5	7 23.1	1.006	43.4	7 53.1	1.006	43.4	6
7							5 19.8	1.006	42.6	5 49.7	1.006	42.5	6 19.7	1.006	42.5	6 49.6	1.006	42.5	7 19.6	1.006	42.4	7 49.5	1.006	42.4	7
8							5 16.3	1.006	41.6	5 46.2	1.006	41.6	6 16.2	1.006	41.5	6 46.1	1.006	41.5	7 16.1	1.006	41.5	7 46.0	1.006	41.4	8
9							5 12.8	1.006	40.6	5 42.8	1.006	40.6	6 12.7	1.006	40.5	6 42.7	1.006	40.5	7 12.6	1.006	40.5	7 42.6	1.006	40.4	9
140							5 09.5	1.005	39.6	5 39.4	1.006	39.6	6 09.4	1.006	39.5	6 39.3	1.006	39.5	7 09.3	1.005	39.5	7 39.2	1.005	39.5	140
1							5 06.2	1.005	38.6	5 36.1	1.005	38.6	6 06.1	1.005	38.6	6 36.0	1.005	38.5	7 06.0	1.005	38.5	7 35.9	1.005	38.5	1
2							5 02.9	1.005	37.6	5 32.9	1.005	37.6	6 02.8	1.005	37.6	6 32.8	1.005	37.5	7 02.8	1.005	37.5	7 32.7	1.005	37.5	2
3										5 29.7	1.005	36.6	5 59.7	1.005	36.6	6 29.6	1.005	36.6	6 59.6	1.005	36.5	7 29.6	1.005	36.5	3
4										5 26.7	1.005	35.6	5 56.6	1.005	35.6	6 26.6	1.005	35.6	6 56.5	1.005	35.5	7 26.5	1.005	35.5	4
145										5 23.6	1.005	34.6	5 53.6	1.005	34.6	6 23.6	1.005	34.6	6 53.5	1.005	34.6	7 23.5	1.005	34.5	145
6										5 20.7	1.005	33.6	5 50.7	1.005	33.6	6 20.6	1.005	33.6	6 50.6	1.005	33.6	7 20.6	1.005	33.5	6
7										5 17.9	1.005	32.6	5 47.8	1.005	32.6	6 17.8	1.005	32.6	6 47.7	1.005	32.6	7 17.7	1.005	32.6	7
8										5 15.1	1.004	31.7	5 45.0	1.004	31.6	6 15.0	1.004	31.6	6 45.0	1.004	31.6	7 14.9	1.004	31.6	8
9										5 12.4	1.004	30.7	5 42.3	1.004	30.6	6 12.3	1.004	30.6	6 42.3	1.004	30.6	7 12.2	1.004	30.6	9
150										5 09.7	1.004	29.7	5 39.7	1.004	29.7	6 09.7	1.004	29.6	6 39.6	1.004	29.6	7 09.6	1.004	29.6	150
1										5 07.2	1.004	28.7	5 37.2	1.004	28.7	6 07.1	1.004	28.6	6 37.1	1.004	28.6	7 07.1	1.004	28.6	1
2										5 04.7	1.004	27.7	5 34.7	1.004	27.7	6 04.7	1.004	27.7	6 34.6	1.004	27.6	7 04.6	1.004	27.6	2
3										5 02.3	1.004	26.7	5 32.3	1.004	26.7	6 02.3	1.004	26.7	6 32.2	1.004	26.7	7 02.2	1.004	26.6	3
4										5 00.0	1.004	25.7	5 30.0	1.004	25.7	6 00.0	1.004	25.7	6 29.9	1.004	25.7	6 59.9	1.004	25.6	4
155													5 27.8	1.004	24.7	5 57.7	1.004	24.7	6 27.7	1.004	24.7	6 57.7	1.004	24.7	155
6													5 25.6	1.003	23.7	5 55.6	1.003	23.7	6 25.6	1.003	23.7	6 55.6	1.003	23.7	6
7													5 23.6	1.003	22.7	5 53.5	1.003	22.7	6 23.5	1.003	22.7	6 53.5	1.003	22.7	7
8													5 21.6	1.003	21.7	5 51.6	1.003	21.7	6 21.5	1.003	21.7	6 51.5	1.003	21.7	8
9													5 19.7	1.003	20.8	5 49.7	1.003	20.7	6 19.6	1.003	20.7	6 49.6	1.003	20.7	9
160													5 17.9	1.003	19.8	5 47.9	1.003	19.8	6 17.8	1.003	19.7	6 47.8	1.003	19.7	160
1													5 16.1	1.003	18.8	5 46.1	1.003	18.8	6 16.1	1.003	18.7	6 46.1	1.003	18.7	1
2													5 14.5	1.003	17.8	5 44.5	1.003	17.8	6 14.5	1.003	17.8	6 44.5	1.003	17.8	2
3													5 12.9	1.002	16.8	5 42.9	1.002	16.8	6 12.9	1.002	16.8	6 42.9	1.002	16.8	3
4													5 11.5	1.002	15.8	5 41.5	1.002	15.8	6 11.5	1.002	15.8	6 41.5	1.002	15.8	4
165													5 10.1	1.002	14.8	5 40.1	1.002	14.8	6 10.1	1.002	14.8	6 40.1	1.002	14.8	165
6													5 08.8	1.002	13.8	5 38.8	1.002	13.8	6 08.8	1.002	13.8	6 38.8	1.002	13.8	6
7													5 07.6	1.002	12.9	5 37.6	1.002	12.8	6 07.6	1.002	12.8	6 37.6	1.002	12.8	7
8													5 06.5	1.002	11.9	5 36.5	1.002	11.9	6 06.5	1.002	11.8	6 36.5	1.002	11.8	8
9													5 05.4	1.002	10.9	5 35.4	1.002	10.9	6 05.4	1.002	10.9	6 35.4	1.002	10.8	9
170													5 04.5	1.001	09.9	5 34.5	1.001	09.9	6 04.5	1.001	09.9	6 34.5	1.001	09.9	170
1													5 03.6	1.001	08.9	5 33.6	1.001	08.9	6 03.6	1.001	08.9	6 33.6	1.001	08.9	1
2													5 02.9	1.001	07.9	5 32.9	1.001	07.9	6 02.9	1.001	07.9	6 32.9	1.001	07.9	2
3													5 02.2	1.001	06.9	5 32.2	1.001	06.9	6 02.2	1.001	06.9	6 32.2	1.001	06.9	3
4													5 01.6	1.001	05.9	5 31.6	1.001	05.9	6 01.6	1.001	05.9	6 31.6	1.001	05.9	4
175													5 01.1	1.001	04.9	5 31.1	1.001	04.9	6 01.1	1.001	04.9	6 31.1	1.001	04.9	175
6													5 00.7	1.000	04.0	5 30.7	1.001	04.0	6 00.7	1.001	03.9	6 30.7	1.001	03.9	6
7													5 00.4	1.000	03.0	5 30.4	1.000	03.0	6 00.4	1.000	03.0	6 30.4	1.000	03.0	7
8													5 00.2	1.000	02.0	5 30.2	1.000	02.0	6 00.2	1.000	02.0	6 30.2	1.000	02.0	8
9													5 00.0	1.000	01.0	5 30.0	1.000	01.0	6 00.0	1.000	01.0	6 30.0	1.000	01.0	9
180													5 00.0	1.000	00.0	5 30.0	1.000	00.0	6 00.0	1.000	00.0	6 30.0	1.000	00.0	180

Lat. 5°

H.A.	12° 00' Alt. ° ' Δd Δt	Az. °	12° 30' Alt. ° ' Δd Δt	Az. °	13° 00' Alt. ° ' Δd Δt	Az. °	13° 30' Alt. ° ' Δd Δt	Az. °	14° 00' Alt. ° ' Δd Δt	Az. °	14° 30' Alt. ° ' Δd Δt	Az. °	15° 00' Alt. ° ' Δd Δt	Az. °	15° 30' Alt. ° ' Δd Δt	Az. °	H.A.
00	17 00.0 1.0 00	180.0	17 30.0 1.0 00	180.0	18 00.0 1.0 00	180.0	18 30.0 1.0 00	180.0	19 00.0 1.0 00	180.0	19 30.0 1.0 00	180.0	20 00.0 1.0 00	180.0	20 30.0 1.0 00	180.0	00
1	17 00.0 1.0 00	179.0	17 30.0 1.0 00	179.0	18 00.0 1.0 00	179.0	18 30.0 1.0 00	179.0	19 00.0 1.0 00	179.0	19 30.0 1.0 00	179.0	20 00.0 1.0 00	179.0	20 30.0 1.0 00	179.0	1
2	16 59.8 1.0 00	178.0	17 29.8 1.0 00	178.0	17 59.8 1.0 00	178.0	18 29.8 1.0 00	177.9	18 59.8 1.0 00	177.9	19 29.8 1.0 00	177.9	19 59.8 1.0 00	177.9	20 29.8 1.0 00	177.9	2
3	16 59.6 1.0 01	176.9	17 29.6 1.0 01	176.9	17 59.6 1.0 01	176.9	18 29.6 1.0 01	176.9	18 59.6 1.0 01	176.9	19 29.6 1.0 01	176.9	19 59.6 1.0 01	176.9	20 29.6 1.0 01	176.9	3
4	16 59.3 1.0 01	175.9	17 29.3 1.0 01	175.9	17 59.3 1.0 01	175.9	18 29.3 1.0 01	175.9	18 59.3 1.0 01	175.9	19 29.3 1.0 01	175.9	19 59.3 1.0 01	175.9	20 29.2 1.0 01	175.9	4
05	16 58.9 1.0 01	174.9	17 28.8 1.0 01	174.9	17 58.8 1.0 01	174.9	18 28.8 1.0 01	174.9	18 58.8 1.0 01	174.9	19 28.8 1.0 01	174.9	19 58.8 1.0 01	174.9	20 28.8 1.0 01	174.9	05
6	16 58.3 1.0 01	173.9	17 28.3 1.0 01	173.9	17 58.3 1.0 01	173.9	18 28.3 1.0 01	173.8	18 58.3 1.0 01	173.8	19 28.3 1.0 01	173.8	19 58.3 1.0 01	173.8	20 28.3 1.0 01	173.8	6
7	16 57.7 1.0 01	172.8	17 27.7 1.0 01	172.8	17 57.7 1.0 01	172.8	18 27.7 1.0 01	172.8	18 57.7 1.0 01	172.8	19 27.7 1.0 01	172.8	19 57.7 1.0 01	172.8	20 27.7 1.0 01	172.8	7
8	16 57.0 1.0 01	171.8	17 27.0 1.0 01	171.8	17 57.0 1.0 01	171.8	18 27.0 1.0 01	171.8	18 57.0 1.0 01	171.8	19 27.0 1.0 01	171.8	19 57.0 1.0 01	171.8	20 27.0 1.0 01	171.8	8
9	16 56.2 1.0 01	170.8	17 26.2 1.0 01	170.8	17 56.2 1.0 01	170.8	18 26.2 1.0 01	170.8	18 56.2 1.0 01	170.8	19 26.2 1.0 01	170.8	19 56.2 1.0 02	170.8	20 26.2 1.0 02	170.7	9
10	16 55.3 1.0 02	169.8	17 25.3 1.0 02	169.8	17 55.3 1.0 02	169.8	18 25.3 1.0 02	169.7	18 55.3 1.0 02	169.7	19 25.3 1.0 02	169.7	19 55.3 1.0 02	169.7	20 25.3 1.0 02	169.7	10
1	16 54.4 1.0 02	168.8	17 24.4 1.0 02	168.7	17 54.4 1.0 02	168.7	18 24.4 1.0 02	168.7	18 54.4 1.0 02	168.7	19 24.3 1.0 02	168.7	19 54.3 1.0 02	168.7	20 24.3 1.0 02	168.7	1
2	16 53.3 1.0 02	167.7	17 23.3 1.0 02	167.7	17 53.3 1.0 02	167.7	18 23.3 1.0 02	167.7	18 53.3 1.0 02	167.7	19 23.3 1.0 02	167.7	19 53.3 1.0 02	167.7	20 23.3 1.0 02	167.7	2
3	16 52.1 1.0 02	166.7	17 22.1 1.0 02	166.7	17 52.1 1.0 02	166.7	18 22.1 1.0 02	166.7	18 52.1 1.0 02	166.7	19 22.1 1.0 02	166.7	19 52.1 1.0 02	166.7	20 22.1 1.0 02	166.6	3
4	16 50.9 1.0 02	165.7	17 20.9 1.0 02	165.7	17 50.9 1.0 02	165.7	18 20.9 1.0 02	165.6	18 50.9 1.0 02	165.6	19 20.9 1.0 02	165.6	19 50.9 1.0 02	165.6	20 20.8 1.0 02	165.6	4
15	16 49.6 1.0 02	164.7	17 19.6 1.0 02	164.7	17 49.5 1.0 02	164.6	18 19.5 1.0 02	164.6	18 49.5 1.0 02	164.6	19 19.5 1.0 02	164.6	19 49.5 1.0 02	164.6	20 19.5 1.0 02	164.6	15
6	16 48.1 1.0 03	163.6	17 18.1 1.0 03	163.6	17 48.1 1.0 03	163.6	18 18.1 1.0 03	163.6	18 48.1 1.0 03	163.6	19 18.1 1.0 03	163.6	19 48.1 1.0 03	163.6	20 18.1 1.0 03	163.5	6
7	16 46.6 1.0 03	162.6	17 16.6 1.0 03	162.6	17 46.6 1.0 03	162.6	18 16.6 1.0 03	162.6	18 46.6 1.0 03	162.6	19 16.6 1.0 03	162.6	19 46.6 1.0 03	162.5	20 16.5 1.0 03	162.5	7
8	16 45.0 1.0 03	161.6	17 15.0 1.0 03	161.6	17 45.0 1.0 03	161.6	18 15.0 1.0 03	161.6	18 45.0 1.0 03	161.5	19 15.0 1.0 03	161.5	19 44.9 1.0 03	161.5	20 14.9 1.0 03	161.5	8
9	16 43.3 1.0 03	160.6	17 13.3 1.0 03	160.6	17 43.3 1.0 03	160.5	18 13.3 1.0 03	160.5	18 43.3 1.0 03	160.5	19 13.2 1.0 03	160.5	19 43.2 1.0 03	160.5	20 13.2 1.0 03	160.5	9
20	16 41.5 1.0 03	159.6	17 11.5 1.0 03	159.5	17 41.5 1.0 03	159.5	18 11.5 1.0 03	159.5	18 41.5 1.0 03	159.5	19 11.5 1.0 03	159.5	19 41.4 1.0 03	159.5	20 11.4 1.0 03	159.4	20
1	16 39.7 1.0 03	158.5	17 09.6 1.0 03	158.5	17 39.6 1.0 03	158.5	18 09.6 1.0 03	158.5	18 39.6 1.0 03	158.5	19 09.6 1.0 03	158.5	19 39.6 1.0 03	158.4	20 09.5 1.0 03	158.4	1
2	16 37.7 1.0 03	157.5	17 07.7 1.0 03	157.5	17 37.7 1.0 03	157.5	18 07.7 1.0 03	157.5	18 37.6 1.0 03	157.4	19 07.6 1.0 03	157.4	19 37.6 1.0 03	157.4	20 07.6 1.0 03	157.4	2
3	16 35.7 1.0 04	156.5	17 05.6 1.0 04	156.5	17 35.6 1.0 04	156.5	18 05.6 1.0 04	156.4	18 35.6 1.0 04	156.4	19 05.6 1.0 04	156.4	19 35.5 1.0 04	156.4	20 05.5 1.0 04	156.4	3
4	16 33.5 1.0 04	155.5	17 03.5 1.0 04	155.5	17 33.5 1.0 04	155.4	18 03.5 1.0 04	155.4	18 33.5 1.0 04	155.4	19 03.4 1.0 04	155.4	19 33.4 1.0 04	155.4	20 03.4 1.0 04	155.3	4
25	16 31.3 1.0 04	154.5	17 01.3 1.0 04	154.4	17 31.3 1.0 04	154.4	18 01.3 1.0 04	154.4	18 31.2 1.0 04	154.4	19 01.2 1.0 04	154.4	19 31.2 1.0 04	154.3	20 01.2 1.0 04	154.3	25
6	16 29.0 1.0 04	153.4	16 59.0 1.0 04	153.4	17 29.0 1.0 04	153.4	17 59.0 1.0 04	153.4	18 28.9 1.0 04	153.4	18 58.9 1.0 04	153.3	19 28.9 1.0 04	153.3	19 58.9 1.0 04	153.3	6
7	16 26.6 1.0 04	152.4	16 56.6 1.0 04	152.4	17 26.6 1.0 04	152.4	17 56.6 1.0 04	152.4	18 26.5 1.0 04	152.3	18 56.5 1.0 04	152.3	19 26.5 1.0 04	152.3	19 56.5 1.0 04	152.3	7
8	16 24.2 1.0 04	151.4	16 54.2 1.0 04	151.4	17 24.1 1.0 04	151.4	17 54.1 1.0 04	151.4	18 24.1 1.0 04	151.3	18 54.1 1.0 04	151.3	19 24.1 1.0 04	151.3	19 54.0 1.0 04	151.2	8
9	16 21.6 1.0 04	150.4	16 51.6 1.0 04	150.4	17 21.6 1.0 04	150.3	17 51.6 1.0 04	150.3	18 21.5 1.0 04	150.3	18 51.5 1.0 04	150.3	19 21.5 1.0 04	150.2	19 51.4 1.0 04	150.2	9
30	16 19.0 1.0 04	149.4	16 49.0 1.0 04	149.3	17 19.0 1.0 04	149.3	17 48.9 1.0 04	149.3	18 18.9 1.0 04	149.3	18 48.9 1.0 04	149.2	19 18.8 1.0 05	149.2	19 48.8 1.0 05	149.2	30
1	16 16.3 1.0 05	148.3	16 46.3 1.0 05	148.3	17 16.2 1.0 05	148.3	17 46.2 1.0 05	148.3	18 16.2 1.0 05	148.2	18 46.1 1.0 05	148.2	19 16.1 1.0 05	148.2	19 46.1 1.0 05	148.2	1
2	16 13.5 1.0 05	147.3	16 43.5 1.0 05	147.3	17 13.5 1.0 05	147.3	17 43.4 1.0 05	147.3	18 13.4 1.0 05	147.2	18 43.4 1.0 05	147.2	19 13.3 1.0 05	147.2	19 43.3 1.0 05	147.1	2
3	16 10.7 1.0 05	146.3	16 40.6 1.0 05	146.3	17 10.6 1.0 05	146.3	17 40.6 1.0 05	146.2	18 10.5 1.0 05	146.2	18 40.5 1.0 05	146.2	19 10.4 1.0 05	146.2	19 40.4 1.0 05	146.1	3
4	16 07.7 1.0 05	145.3	16 37.7 1.0 05	145.3	17 07.6 1.0 05	145.2	17 37.6 1.0 05	145.2	18 07.6 1.0 05	145.2	18 37.5 1.0 05	145.2	19 07.5 1.0 05	145.1	19 37.4 1.0 05	145.1	4
35	16 04.7 1.0 05	144.3	16 34.7 1.0 05	144.2	17 04.6 1.0 05	144.2	17 34.6 1.0 05	144.2	18 04.5 1.0 05	144.2	18 34.5 1.0 05	144.1	19 04.5 1.0 05	144.1	19 34.4 1.0 05	144.1	35
6	16 01.6 1.0 05	143.3	16 31.6 1.0 05	143.2	17 01.5 1.0 05	143.2	17 31.5 1.0 05	143.2	18 01.4 1.0 05	143.1	18 31.4 1.0 05	143.1	19 01.4 1.0 05	143.1	19 31.3 1.0 05	143.1	6
7	15 58.5 1.0 05	142.3	16 28.4 1.0 05	142.2	16 58.4 1.0 05	142.2	17 28.3 1.0 05	142.2	17 58.3 1.0 05	142.1	18 28.2 1.0 05	142.1	18 58.2 1.0 05	142.1	19 28.1 1.0 05	142.0	7
8	15 55.2 1.0 06	141.2	16 25.2 1.0 06	141.2	16 55.1 1.0 06	141.2	17 25.1 1.0 06	141.1	17 55.0 1.0 06	141.1	18 25.0 1.0 06	141.1	18 54.9 1.0 06	141.1	19 24.9 1.0 06	141.0	8
9	15 51.9 1.0 06	140.2	16 21.9 1.0 06	140.2	16 51.8 1.0 06	140.2	17 21.8 1.0 06	140.1	17 51.7 1.0 06	140.1	18 21.7 1.0 06	140.1	18 51.6 1.0 06	140.0	19 21.6 1.0 06	140.0	9
40	15 48.5 1.0 06	139.2	16 18.5 1.0 06	139.2	16 48.4 1.0 06	139.1	17 18.4 1.0 06	139.1	17 48.3 1.0 06	139.1	18 18.3 1.0 06	139.0	18 48.2 1.0 06	139.0	19 18.2 1.0 06	139.0	40
1	15 45.1 1.0 06	138.2	16 15.0 1.0 06	138.1	16 45.0 1.0 06	138.1	17 14.9 1.0 06	138.1	17 44.9 1.0 06	138.1	18 14.8 1.0 06	138.0	18 44.7 1.0 06	138.0	19 14.7 1.0 06	138.0	1
2	15 41.6 1.0 06	137.2	16 11.5 1.0 06	137.1	16 41.4 1.0 06	137.1	17 11.4 1.0 06	137.1	17 41.3 1.0 06	137.0	18 11.3 1.0 06	137.0	18 41.2 1.0 06	137.0	19 11.2 1.0 06	136.9	2
3	15 38.0 1.0 06	136.2	16 07.9 1.0 06	136.1	16 37.8 1.0 06	136.1	17 07.8 1.0 06	136.1	17 37.7 1.0 06	136.0	18 07.7 1.0 06	136.0	18 37.6 1.0 06	136.0	19 07.6 1.0 06	135.9	3
4	15 34.3 1.0 06	135.1	16 04.2 1.0 06	135.1	16 34.2 1.0 06	135.1	17 04.1 1.0 06	135.0	17 34.1 1.0 06	135.0	18 04.0 1.0 06	135.0	18 33.9 1.0 06	134.9	19 03.9 1.0 06	134.9	4
45	15 30.5 1.0 06	134.1	16 00.5 1.0 06	134.1	16 30.5 1.0 06	134.1	17 00.4 1.0 06	134.0	17 30.3 1.0 06	134.0	18 00.3 1.0 06	134.0	18 30.2 1.0 06	133.9	19 00.1 1.0 06	133.9	45
6	15 26.8 1.0 06	133.1	15 56.7 1.0 06	133.1	16 26.7 1.0 06	133.0	16 56.6 1.0 06	133.0	17 26.5 1.0 06	133.0	17 56.5 1.0 06	132.9	18 26.4 1.0 06	132.9	18 56.3 1.0 06	132.9	6
7	15 23.0 1.0 07	132.1	15 52.9 1.0 07	132.1	16 22.8 1.0 07	132.0	16 52.8 1.0 07	132.0	17 22.7 1.0 07	132.0	17 52.6 1.0 07	131.9	18 22.6 1.0 07	131.9	18 52.5 1.0 07	131.9	7
8	15 19.0 1.0 07	131.1	15 49.0 1.0 07	131.1	16 18.9 1.0 07	131.0	16 48.8 1.0 07	131.0	17 18.8 1.0 07	130.9	17 48.7 1.0 07	130.9	18 18.6 1.0 07	130.9	18 48.6 1.0 07	130.8	8
9	15 15.1 1.0 07	130.1	15 45.0 1.0 07	130.0	16 14.9 1.0 07	130.0	16 44.9 1.0 07	130.0	17 14.8 1.0 07	129.9	17 44.7 1.0 07	129.9	18 14.6 1.0 07	129.9	18 44.6 1.0 07	129.8	9
50	15 11.0 1.0 07	129.1	15 41.0 1.0 07	129.0	16 10.8 1.0 07	129.0	16 40.8 1.0 07	129.0	17 10.7 1.0 07	128.9	17 40.7 1.0 07	128.9	18 10.6 1.0 07	128.8	18 40.5 1.0 07	128.8	50
1	15 06.9 1.0 07	128.1	15 36.9 1.0 07	128.0	16 06.8 1.0 07	128.0	16 36.7 1.0 07	127.9	17 06.7 1.0 07	127.9	17 36.6 1.0 07	127.9	18 06.5 1.0 07	127.8	18 36.4 1.0 07	127.8	1
2	15 02.8 1.0 07	127.0	15 32.7 1.0 07	127.0	16 02.6 1.0 07	127.0	16 32.6 1.0 07	126.9	17 02.5 1.0 07	126.9	17 32.4 1.0 07	126.9	18 02.3 1.0 07	126.8	18 32.3 1.0 07	126.8	2
3	14 58.6 1.0 07	126.0	15 28.5 1.0 07	126.0	15 58.4 1.0 07	126.0	16 28.4 1.0 07	125.9	16 58.3 1.0 07	125.9	17 28.2 1.0 07	125.8	17 58.1 1.0 07	125.8	18 28.0 1.0 07	125.8	3
4	14 54.3 1.0 07	125.0	15 24.3 1.0 07	125.0	15 54.2 1.0 07	125.0	16 24.1 1.0 07	124.9	16 54.0 1.0 07	124.9	17 23.9 1.0 07	124.8	17 53.9 1.0 07	124.8	18 23.8 1.0 07	124.8	4
55	14 50.0 1.0 07	124.0	15 20.0 1.0 07	124.0	15 49.9 1.0 07	123.9	16 19.9 1.0 07	123.9	16 49.7 1.0 07	123.9	17 19.6 1.0 07	123.8	17 49.5 1.0 07	123.8	18 19.5 1.0 07	123.7	55
6	14 45.7 1.0 07	123.0	15 15.6 1.0 07	123.0	15 45.5 1.0 07	122.9	16 15.4 1.0 07	122.9	16 45.3 1.0 07	122.9	17 15.3 1.0 07	122.8	17 45.2 1.0 07	122.8	18 15.1 1.0 07	122.7	6
7	14 41.3 1.0 07	122.0	15 11.2 1.0 07	122.0	15 41.1 1.0 07	121.9	16 11.0 1.0 07	121.9	16 40.9 1.0 07	121.8	17 10.8 1.0 07	121.8	17 40.7 1.0 07	121.8	18 10.7 1.0 07	121.7	7
8	14 36.8 1.0 08	121.0	15 06.7 1.0 08	121.0	15 36.6 1.0 08	120.9	16 06.5 1.0 08	120.9	16 36.5 1.0 08	120.8	17 06.4 1.0 08	120.8	17 36.3 1.0 08	120.8	18 06.2 1.0 08	120.7	8
9	14 32.3 1.0 08	120.0	15 02.2 1.0 08	119.9	15 32.1 1.0 08	119.9	16 02.0 1.0 08	119.9	16 31.9 1.0 08	119.8	17 01.8 1.0 08	119.8	17 31.8 1.0 08	119.7	18 01.7 1.0 08	119.7	9
60	14 27.7 1.0 08	119.0	14 57.7 1.0 08	118.9	15 27.6 1.0 08	118.9	15 57.5 1.0 08	118.9	16 27.4 1.0 08	118.8	16 57.3 1.0 08	118.8	17 27.2 1.0 08	118.7	17 57.1 1.0 08	118.7	60
1	14 23.2 1.0 08	118.0	14 53.1 1.0 08	117.9	15 23.0 1.0 08	117.9	15 52.9 1.0 08	117.8	16 22.8 1.0 08	117.8	16 52.7 1.0 08	117.8	17 22.6 1.0 08	117.7	17 52.5 1.0 08	117.7	1
2	14 18.5 1.0 08	117.0	14 48.4 1.0 08	116.9	15 18.3 1.0 08	116.9	15 48.2 1.0 08	116.8	16 18.1 1.0 08	116.8	16 48.0 1.0 08	116.8	17 17.9 1.0 08	116.7	17 47.8 1.0 08	116.7	2
3	14 13.8 1.0 08	116.0	14 43.7 1.0 08	115.9	15 13.6 1.0 08	115.9	15 43.5 1.0 08	115.8	16 13.4 1.0 08	115.8	16 43.3 1.0 08	115.7	17 13.2 1.0 08	115.7	17 43.1 1.0 08	115.7	3
4	14 09.1 1.0 08	115.0	14 39.0 1.0 08	114.9	15 08.9 1.0 08	114.9	15 38.8 1.0 08	114.8	16 08.7 1.0 08	114.8	16 38.6 1.0 08	114.7	17 08.5 1.0 08	114.7	17 38.4 1.0 08	114.7	4
65	14 04.3 1.0 08	113.9	14 34.2 1.0 08	113.9	15 04.1 1.0 08	113.9	15 34.0 1.0 08	113.8	16 03.9 1.0 08	113.8	16 33.8 1.0 08	113.7	17 03.7 1.0 08	113.7	17 33.6 1.0 08	113.6	65
6	13 59.6 1.0 08	112.9	14 29.4 1.0 08	112.9	14 59.3 1.0 08	112.9	15 29.2 1.0 08	112.8	15 59.1 1.0 08	112.8	16 29.0 1.0 08	112.7	16 58.9 1.0 08	112.7	17 28.8 1.0 08	112.6	6
7	13 54.7 1.0 08	111.9	14 24.6 1.0 08	111.9	14 54.5 1.0 08	111.9	15 24.4 1.0 08	111.8	15 54.3 1.0 08	111.8	16 24.2 1.0 08	111.7	16 54.1 1.0 08	111.7	17 24.0 1.0 08	111.6	7
8	13 49.9 1.0 08	110.9	14 19.7 1.0 08	110.9	14 49.6 1.0 08	110.9	15 19.5 1.0 08	110.8	15 49.4 1.0 08	110.8	16 19.3 1.0 08	110.7	16 49.2 1.0 08	110.7	17 19.1 1.0 08	110.6	8
9	13 44.9 1.0 08	109.9	14 14.8 1.0 08	109.9	14 44.7 1.0 08	109.8	15 14.6 1.0 08	109.8	15 44.5 1.0 08	109.8	16 14.4 1.0 08	109.7	16 44.3 1.0 08	109.7	17 14.2 1.0 08	109.6	9
70	13 40.0 1.0 08	108.9	14 09.9 1.0 08	108.9	14 39.8 1.0 08	108.8	15 09.7 1.0 08	108.8	15 39.6 1.0 08	108.8	16 09.5 1.0 08	108.7	16 39.4 1.0 08	108.7	17 09.3 1.0 08	108.6	70
1	13 35.1 1.0 08	107.9	14 04.9 1.0 08	107.9	14 34.8 1.0 08	107.8	15 04.7 1.0 08	107.8	15 34.6 1.0 08	107.7	16 04.5 1.0 08	107.7	16 34.4 1.0 08	107.7	17 04.3 1.0 08	107.6	1
2	13 30.1 1.0 08	106.9	14 00.0 1.0 08	106.9	14 29.8 1.0 08	106.8	14 59.7 1.0 08	106.8	15 29.6 1.0 08	106.7	15 59.5 1.0 08	106.7	16 29.4 1.0 08	106.7	16 59.3 1.0 08	106.6	2
3	13 25.1 1.0 08	105.9	13 54.9 1.0 08	105.9	14 24.8 1.0 08	105.8	14 54.7 1.0 08	105.8	15 24.6 1.0 08	105.7	15 54.5 1.0 08	105.7	16 24.4 1.0 08	105.6	16 54.3 1.0 08	105.6	3
4	13 20.0 1.0 08	104.9	13 49.9 1.0 08	104.9	14 19.8 1.0 08	104.8	14 49.7 1.0 08	104.8	15 19.6 1.0 08	104.7	15 49.4 1.0 09	104.7	16 19.3 1.0 09	104.6	16 49.2 1.0 09	104.6	4
75	13 14.9 1.0 08	103.9	13 44.8 1.0 08	103.9	14 14.7 1.0 08	103.8	14 44.6 1.0 08	103.8	15 14.5 1.0 08	103.7	15 44.4 1.0 08	103.7	16 14.3 1.0 08	103.6	16 44.1 1.0 08	103.6	75
6	13 09.9 1.0 09	102.9	13 39.7 1.0 09	102.9	14 09.6 1.0 09	102.8	14 39.5 1.0 09	102.8	15 09.4 1.0 09	102.7	15 39.3 1.0 09	102.7	16 09.2 1.0 09	102.6	16 39.1 1.0 09	102.6	6
7	13 04.8 1.0 09	101.9	13 34.6 1.0 09	101.9	14 04.5 1.0 09	101.8	14 34.4 1.0 09	101.8	15 04.3 1.0 09	101.7	15 34.2 1.0 09	101.7	16 04.0 1.0 09	101.6	16 33.9 1.0 09	101.6	7
8	12 59.6 1.0 09	100.9	13 29.5 1.0 09	100.9	13 59.4 1.0 09	100.8	14 29.3 1.0 09	100.8	14 59.2 1.0 09	100.7	15 29.0 1.0 09	100.7	15 58.9 1.0 09	100.6	16 28.8 1.0 09	100.6	8
9	12 54.5 1.0 09	99.9	13 24.4 1.0 09	99.9	13 54.3 1.0 09	99.8	14 24.1 1.0 09	99.8	14 54.0 1.0 09	99.7	15 23.9 1.0 09	99.7	15 53.8 1.0 09	99.6	16 23.7 1.0 09	99.6	9
80	12 49.3 1.0 09	98.9	13 19.2 1.0 09	98.9	13 49.1 1.0 09	98.8	14 19.0 1.0 09	98.8	14 48.9 1.0 09	98.7	15 18.7 1.0 09	98.7	15 48.6 1.0 09	98.6	16 18.5 1.0 09	98.6	80
1	12 44.2 1.0 09	97.9	13 14.0 1.0 09	97.9	13 43.9 1.0 09	97.8	14 13.8 1.0 09	97.8	14 43.7 1.0 09	97.7	15 13.6 1.0 09	97.7	15 43.4 1.0 09	97.6	16 13.3 1.0 09	97.6	1
2	12 39.0 1.0 09	96.9	13 08.8 1.0 09	96.9	13 38.7 1.0 09	96.8	14 08.6 1.0 09	96.8	14 38.5 1.0 09	96.7	15 08.4 1.0 09	96.7	15 38.3 1.0 09	96.6	16 08.1 1.0 09	96.6	2
3	12 33.8 1.0 09	95.9	13 03.7 1.0 09	95.9	13 33.5 1.0 09	95.8	14 03.4 1.0 09	95.8	14 33.3 1.0 09	95.7	15 03.2 1.0 09	95.7	15 33.1 1.0 09	95.6	16 02.9 1.0 09	95.6	3
4	12 28.6 1.0 09	94.9	12 58.4 1.0 09	94.9	13 28.3 1.0 09	94.8	13 58.2 1.0 09	94.8	14 28.1 1.0 09	94.7	14 58.0 1.0 09	94.7	15 27.8 1.0 09	94.6	15 57.7 1.0 09	94.6	4
85	12 23.4 1.0 09	93.9	12 53.2 1.0 09	93.9	13 23.1 1.0 09	93.8	13 53.0 1.0 09	93.8	14 22.9 1.0 09	93.7	14 52.8 1.0 09	93.7	15 22.6 1.0 09	93.6	15 52.5 1.0 09	93.6	85
6	12 18.1 1.0 09	92.9	12 48.0 1.0 09	92.9	13 17.9 1.0 09	92.8	13 47.8 1.0 09	92.8	14 17.7 1.0 09	92.7	14 47.5 1.0 09	92.7	15 17.4 1.0 09	92.6	15 47.3 1.0 09	92.6	6
7	12 12.9 1.0 00	91.9	12 42.8 1.0 00	91.9	13 12.7 1.0 00	91.8	13 42.5 1.0 00	91.8	14 12.4 1.0 00	91.7	14 42.3 1.0 00	91.7	15 12.1 1.0 00	91.7	15 42.1 1.0 00	91.6	7
8	12 07.7 1.0 00	90.9	12 37.6 1.0 00	90.9	13 07.4 1.0 00	90.8	13 37.3 1.0 00	90.8	14 07.2 1.0 00	90.7	14 37.1 1.0 00	90.7	15 07.0 1.0 00	90.7	15 36.8 1.0 00	90.6	8
9	12 02.4 1.0 00	89.9	12 32.3 1.0 00	89.9	13 02.2 1.0 00	89.8	13 32.1 1.0 00	89.8	14 02.0 1.0 00	89.7	14 31.8 1.0 00	89.7	15 01.7 1.0 00	89.7	15 31.6 1.0 00	89.6	9
90	11 57.2 1.0 00	88.9	12 27.1 1.0 00	88.9	12 57.0 1.0 00	88.8	13 26.9 1.0 00	88.8	13 56.7 1.0 00	88.8	14 26.6 1.0 00	88.7	14 56.5 1.0 00	88.7	15 26.4 1.0 00	88.6	90

Lat. 85°

H.A.	12° 00' Alt. / Δd Δt	Az.	12° 30' Alt. / Δd Δt	Az.	13° 00' Alt. / Δd Δt	Az.	13° 30' Alt. / Δd Δt	Az.	14° 00' Alt. / Δd Δt	Az.	14° 30' Alt. / Δd Δt	Az.	15° 00' Alt. / Δd Δt	Az.	15° 30' Alt. / Δd Δt	Az.	H.A.
91	11 52.0 1.009	87.9	12 21.9 1.009	87.9	12 51.8 1.009	87.9	13 21.6 1.009	87.8	13 51.5 1.009	87.8	14 21.4 1.009	87.7	14 51.3 1.009	87.7	15 21.1 1.009	87.6	91
2	11 46.8 1.009	86.9	12 16.6 1.009	86.9	12 46.5 1.009	86.9	13 16.4 1.009	86.8	13 46.2 1.009	86.8	14 16.2 1.009	86.7	14 46.0 1.009	86.7	15 15.9 1.009	86.6	2
3	11 41.5 1.009	86.0	12 11.4 1.009	85.9	12 41.3 1.009	85.9	13 11.2 1.009	85.8	13 41.1 1.009	85.8	14 11.0 1.009	85.7	14 40.8 1.009	85.7	15 10.7 1.009	85.6	3
4	11 36.3 1.009	85.0	12 06.2 1.009	84.9	12 36.1 1.009	84.9	13 06.0 1.009	84.8	13 35.9 1.009	84.8	14 05.7 1.009	84.7	14 35.6 1.009	84.7	15 05.5 1.009	84.6	4
95	11 31.1 1.009	84.0	12 01.0 1.009	83.9	12 30.9 1.009	83.9	13 00.8 1.009	83.8	13 30.7 1.009	83.8	14 00.5 1.009	83.7	14 30.4 1.009	83.7	15 00.3 1.009	83.6	95
6	11 25.9 1.009	83.0	11 55.8 1.009	82.9	12 25.7 1.009	82.9	12 55.6 1.009	82.8	13 25.5 1.009	82.8	13 55.3 1.009	82.7	14 25.2 1.009	82.7	14 55.1 1.009	82.6	6
7	11 20.8 1.009	82.0	11 50.6 1.009	81.9	12 20.5 1.009	81.9	12 50.4 1.009	81.8	13 20.3 1.009	81.8	13 50.2 1.009	81.7	14 20.0 1.009	81.7	14 49.9 1.009	81.7	7
8	11 15.6 1.009	81.0	11 45.5 1.009	80.9	12 15.3 1.009	80.9	12 45.2 1.009	80.8	13 15.1 1.009	80.8	13 45.0 1.009	80.8	14 14.9 1.009	80.7	14 44.8 1.009	80.7	8
9	11 10.4 1.009	80.0	11 40.3 1.009	79.9	12 10.2 1.009	79.9	12 40.1 1.009	79.9	13 10.0 1.009	79.8	13 39.8 1.009	79.8	14 09.7 1.009	79.7	14 39.6 1.009	79.7	9
100	11 05.3 1.009	79.0	11 35.2 1.009	78.9	12 05.1 1.009	78.9	12 34.9 1.009	78.9	13 04.8 1.009	78.8	13 34.7 1.009	78.8	14 04.6 1.009	78.7	14 34.5 1.009	78.7	100
1	11 00.2 1.008	78.0	11 30.0 1.009	78.0	11 59.9 1.009	77.9	12 29.8 1.008	77.9	12 59.7 1.008	77.8	13 29.6 1.008	77.8	13 59.5 1.008	77.7	14 29.3 1.008	77.7	1
2	10 55.1 1.008	77.0	11 24.9 1.008	77.0	11 54.8 1.008	76.9	12 24.7 1.008	76.9	12 54.6 1.008	76.8	13 24.5 1.008	76.8	13 54.4 1.008	76.7	14 24.2 1.008	76.7	2
3	10 50.0 1.008	76.0	11 19.9 1.008	76.0	11 49.7 1.008	75.9	12 19.6 1.008	75.9	12 49.5 1.008	75.8	13 19.4 1.008	75.8	13 49.3 1.008	75.8	14 19.2 1.008	75.7	3
4	10 44.9 1.008	75.0	11 14.8 1.008	75.0	11 44.7 1.008	74.9	12 14.6 1.008	74.9	12 44.5 1.008	74.8	13 14.3 1.008	74.8	13 44.2 1.008	74.8	14 14.1 1.008	74.7	4
105	10 39.9 1.008	74.0	11 09.8 1.008	74.0	11 39.6 1.008	73.9	12 09.5 1.008	73.9	12 39.4 1.008	73.9	13 09.3 1.008	73.8	13 39.2 1.008	73.8	14 09.1 1.008	73.7	105
6	10 34.8 1.008	73.0	11 04.7 1.008	73.0	11 34.6 1.008	73.0	12 04.5 1.008	72.9	12 34.4 1.008	72.9	13 04.3 1.008	72.8	13 34.2 1.008	72.8	14 04.1 1.008	72.7	6
7	10 29.9 1.008	72.1	10 59.8 1.008	72.0	11 29.6 1.008	72.0	11 59.5 1.008	71.9	12 29.4 1.008	71.9	12 59.3 1.008	71.8	13 29.2 1.008	71.8	13 59.1 1.008	71.7	7
8	10 24.9 1.008	71.1	10 54.8 1.008	71.0	11 24.7 1.008	71.0	11 54.6 1.008	70.9	12 24.5 1.008	70.9	12 54.4 1.008	70.8	13 24.3 1.008	70.8	13 54.1 1.008	70.8	8
9	10 20.0 1.008	70.1	10 49.9 1.008	70.0	11 19.8 1.008	70.0	11 49.6 1.008	69.9	12 19.5 1.008	69.9	12 49.4 1.008	69.9	13 19.3 1.008	69.8	13 49.2 1.008	69.8	9
110	10 15.1 1.008	69.1	10 45.0 1.008	69.0	11 14.9 1.008	69.0	11 44.8 1.008	69.0	12 14.6 1.008	68.9	12 44.5 1.008	68.9	13 14.4 1.008	68.8	13 44.3 1.008	68.8	110
1	10 10.2 1.008	68.1	10 40.1 1.008	68.0	11 10.0 1.008	68.0	11 39.9 1.008	67.9	12 09.8 1.008	67.9	12 39.7 1.008	67.9	13 09.6 1.008	67.8	13 39.5 1.008	67.8	1
2	10 05.4 1.008	67.1	10 35.3 1.008	67.1	11 05.2 1.008	67.0	11 35.1 1.008	67.0	12 05.0 1.008	66.9	12 34.8 1.008	66.9	13 04.8 1.008	66.8	13 34.6 1.008	66.8	2
3	10 00.6 1.008	66.1	10 30.5 1.008	66.1	11 00.4 1.008	66.0	11 30.3 1.008	66.0	12 00.2 1.008	65.9	12 30.1 1.008	65.9	13 00.0 1.008	65.9	13 29.9 1.008	65.8	3
4	9 55.8 1.008	65.1	10 25.7 1.008	65.1	10 55.6 1.008	65.0	11 25.5 1.008	65.0	11 55.4 1.008	65.0	12 25.3 1.008	64.9	12 55.2 1.008	64.9	13 25.1 1.008	64.8	4
115	9 51.1 1.008	64.1	10 21.0 1.008	64.1	10 50.9 1.008	64.0	11 20.8 1.008	64.0	11 50.7 1.008	64.0	12 20.6 1.008	63.9	12 50.5 1.008	63.9	13 20.4 1.008	63.8	115
6	9 46.4 1.008	63.1	10 16.3 1.008	63.1	10 46.2 1.008	63.1	11 16.1 1.008	63.0	11 46.0 1.008	63.0	12 15.9 1.008	62.9	12 45.8 1.008	62.9	13 15.7 1.008	62.9	6
7	9 41.7 1.008	62.1	10 11.7 1.008	62.1	10 41.6 1.008	62.1	11 11.5 1.008	62.0	11 41.4 1.008	62.0	12 11.3 1.008	61.9	12 41.2 1.008	61.9	13 11.1 1.008	61.9	7
8	9 37.1 1.008	61.2	10 07.1 1.008	61.1	10 37.0 1.008	61.1	11 06.9 1.008	61.0	11 36.8 1.008	61.0	12 06.7 1.008	61.0	12 36.6 1.008	60.9	13 06.5 1.008	60.9	8
9	9 32.6 1.008	60.2	10 02.5 1.008	60.1	10 32.4 1.008	60.1	11 02.3 1.008	60.1	11 32.2 1.008	60.0	12 02.1 1.008	60.0	12 32.0 1.008	59.9	13 02.0 1.008	59.9	9
120	9 28.1 1.007	59.2	9 58.0 1.007	59.1	10 27.9 1.007	59.1	10 57.8 1.007	59.1	11 27.7 1.007	59.0	11 57.6 1.007	59.0	12 27.5 1.007	58.9	12 57.5 1.007	58.9	120
1	9 23.6 1.007	58.2	9 53.5 1.007	58.2	10 23.4 1.007	58.1	10 53.3 1.007	58.1	11 23.3 1.007	58.0	11 53.2 1.007	58.0	12 23.1 1.007	58.0	12 53.0 1.007	57.9	1
2	9 19.2 1.007	57.2	9 49.1 1.007	57.2	10 19.0 1.007	57.1	10 48.9 1.007	57.1	11 18.8 1.007	57.1	11 48.8 1.007	57.0	12 18.7 1.007	57.0	12 48.6 1.007	56.9	2
3	9 14.8 1.007	56.2	9 44.7 1.007	56.2	10 14.7 1.007	56.1	10 44.6 1.007	56.1	11 14.5 1.007	56.1	11 44.4 1.007	56.0	12 14.3 1.007	56.0	12 44.2 1.007	56.0	3
4	9 10.5 1.007	55.2	9 40.4 1.007	55.2	10 10.3 1.007	55.2	10 40.2 1.007	55.1	11 10.2 1.007	55.1	11 40.1 1.007	55.0	12 10.0 1.007	55.0	12 39.9 1.007	55.0	4
125	9 06.2 1.007	54.2	9 36.1 1.007	54.2	10 06.1 1.007	54.2	10 36.0 1.007	54.1	11 05.9 1.007	54.1	11 35.8 1.007	54.1	12 05.7 1.007	54.0	12 35.7 1.007	54.0	125
6	9 02.0 1.007	53.3	9 31.9 1.007	53.2	10 01.9 1.007	53.2	10 31.8 1.007	53.1	11 01.7 1.007	53.1	11 31.6 1.007	53.1	12 01.5 1.007	53.0	12 31.5 1.007	53.0	6
7	8 57.8 1.007	52.3	9 27.8 1.007	52.2	9 57.7 1.007	52.2	10 27.6 1.007	52.2	10 57.5 1.007	52.1	11 27.5 1.007	52.1	11 57.4 1.007	52.0	12 27.3 1.007	52.0	7
8	8 53.7 1.007	51.3	9 23.7 1.007	51.2	9 53.6 1.007	51.2	10 23.5 1.007	51.2	10 53.4 1.007	51.1	11 23.4 1.007	51.1	11 53.3 1.007	51.1	12 23.2 1.007	51.0	8
9	8 49.7 1.007	50.3	9 19.6 1.007	50.3	9 49.5 1.007	50.2	10 19.5 1.007	50.2	10 49.4 1.007	50.1	11 19.3 1.007	50.1	11 49.3 1.007	50.1	12 19.2 1.007	50.0	9
130	8 45.7 1.007	49.3	9 15.6 1.007	49.3	9 45.6 1.007	49.2	10 15.5 1.007	49.2	10 45.4 1.007	49.2	11 15.3 1.007	49.1	11 45.3 1.007	49.1	12 15.2 1.007	49.1	130
1	8 41.8 1.006	48.3	9 11.7 1.006	48.3	9 41.6 1.006	48.2	10 11.6 1.006	48.2	10 41.5 1.006	48.2	11 11.4 1.006	48.1	11 41.4 1.006	48.1	12 11.3 1.006	48.1	1
2	8 37.9 1.006	47.3	9 07.8 1.006	47.3	9 37.8 1.006	47.3	10 07.7 1.006	47.2	10 37.6 1.006	47.2	11 07.6 1.006	47.2	11 37.5 1.006	47.1	12 07.4 1.006	47.1	2
3	8 34.1 1.006	46.3	9 04.0 1.006	46.3	9 33.9 1.006	46.3	10 03.9 1.006	46.2	10 33.8 1.006	46.2	11 03.8 1.006	46.2	11 33.7 1.006	46.1	12 03.6 1.006	46.1	3
4	8 30.3 1.006	45.4	9 00.3 1.006	45.3	9 30.2 1.006	45.3	10 00.1 1.006	45.3	10 30.1 1.006	45.2	11 00.0 1.006	45.2	11 29.9 1.006	45.2	11 59.9 1.006	45.1	4
135	8 26.6 1.006	44.4	8 56.6 1.006	44.3	9 26.5 1.006	44.3	9 56.5 1.006	44.3	10 26.4 1.006	44.2	10 56.3 1.006	44.2	11 26.3 1.006	44.2	11 56.2 1.006	44.1	135
6	8 23.0 1.006	43.4	8 52.9 1.006	43.3	9 22.9 1.006	43.3	9 52.8 1.006	43.3	10 22.8 1.006	43.3	10 52.7 1.006	43.2	11 22.7 1.006	43.2	11 52.6 1.006	43.2	6
7	8 19.4 1.006	42.4	8 49.4 1.006	42.4	9 19.3 1.006	42.3	9 49.3 1.006	42.3	10 19.2 1.006	42.3	10 49.2 1.006	42.2	11 19.1 1.006	42.2	11 49.1 1.006	42.2	7
8	8 16.0 1.006	41.4	8 45.9 1.006	41.4	9 15.8 1.006	41.3	9 45.8 1.006	41.3	10 15.7 1.006	41.3	10 45.7 1.006	41.3	11 15.6 1.006	41.2	11 45.6 1.006	41.2	8
9	8 12.5 1.006	40.4	8 42.5 1.006	40.4	9 12.4 1.006	40.4	9 42.4 1.006	40.3	10 12.3 1.006	40.3	10 42.3 1.006	40.3	11 12.2 1.006	40.2	11 42.2 1.006	40.2	9
140	8 09.2 1.005	39.4	8 39.1 1.005	39.4	9 09.1 1.005	39.4	9 39.0 1.005	39.3	10 09.0 1.005	39.3	10 38.9 1.005	39.3	11 08.9 1.005	39.3	11 38.8 1.005	39.2	140
1	8 05.9 1.005	38.4	8 35.8 1.005	38.4	9 05.8 1.005	38.4	9 35.7 1.005	38.4	10 05.7 1.005	38.3	10 35.7 1.005	38.3	11 05.6 1.005	38.3	11 35.6 1.005	38.2	1
2	8 02.7 1.005	37.5	8 32.6 1.005	37.4	9 02.6 1.005	37.4	9 32.5 1.005	37.4	10 02.5 1.005	37.3	10 32.4 1.005	37.3	11 02.4 1.005	37.3	11 32.4 1.005	37.3	2
3	7 59.5 1.005	36.5	8 29.5 1.005	36.4	8 59.4 1.005	36.4	9 29.4 1.005	36.4	9 59.4 1.005	36.4	10 29.3 1.005	36.3	10 59.3 1.005	36.3	11 29.2 1.005	36.3	3
4	7 56.5 1.005	35.5	8 26.4 1.005	35.5	8 56.4 1.005	35.4	9 26.3 1.005	35.4	9 56.3 1.005	35.4	10 26.2 1.005	35.4	10 56.2 1.005	35.3	11 26.2 1.005	35.3	4
145	7 53.5 1.005	34.5	8 23.4 1.005	34.5	8 53.4 1.005	34.4	9 23.3 1.005	34.4	9 53.3 1.005	34.4	10 23.3 1.005	34.4	10 53.2 1.005	34.3	11 23.2 1.005	34.3	145
6	7 50.5 1.005	33.5	8 20.5 1.005	33.5	8 50.5 1.005	33.5	9 20.4 1.005	33.4	9 50.4 1.005	33.4	10 20.3 1.005	33.4	10 50.3 1.005	33.4	11 20.3 1.005	33.3	6
7	7 47.7 1.005	32.5	8 17.6 1.005	32.5	8 47.6 1.005	32.5	9 17.6 1.005	32.5	9 47.5 1.005	32.4	10 17.5 1.005	32.4	10 47.5 1.005	32.4	11 17.4 1.005	32.4	7
8	7 44.9 1.004	31.5	8 14.9 1.004	31.5	8 44.8 1.004	31.5	9 14.8 1.004	31.5	9 44.8 1.004	31.4	10 14.7 1.004	31.4	10 44.7 1.004	31.4	11 14.7 1.004	31.4	8
9	7 42.2 1.004	30.6	8 12.2 1.004	30.5	8 42.1 1.004	30.5	9 12.1 1.004	30.5	9 42.1 1.004	30.5	10 12.1 1.004	30.4	10 42.0 1.004	30.4	11 12.0 1.004	30.4	9
150	7 39.6 1.004	29.6	8 09.6 1.004	29.5	8 39.5 1.004	29.5	9 09.5 1.004	29.5	9 39.5 1.004	29.5	10 09.4 1.004	29.5	10 39.4 1.004	29.4	11 09.4 1.004	29.4	150
1	7 37.0 1.004	28.6	8 07.0 1.004	28.6	8 37.0 1.004	28.5	9 06.9 1.004	28.5	9 36.9 1.004	28.5	10 06.9 1.004	28.5	10 36.9 1.004	28.5	11 06.9 1.004	28.4	1
2	7 34.6 1.004	27.6	8 04.6 1.004	27.6	8 34.5 1.004	27.6	9 04.5 1.004	27.5	9 34.5 1.004	27.5	10 04.5 1.004	27.5	10 34.5 1.004	27.5	11 04.4 1.004	27.5	2
3	7 32.2 1.004	26.6	8 02.2 1.004	26.6	8 32.2 1.004	26.6	9 02.1 1.004	26.6	9 32.1 1.004	26.5	10 02.1 1.004	26.5	10 32.1 1.004	26.5	11 02.0 1.004	26.5	3
4	7 29.9 1.004	25.6	7 59.9 1.004	25.6	8 29.9 1.004	25.6	8 59.8 1.004	25.6	9 29.8 1.004	25.5	9 59.8 1.004	25.5	10 29.8 1.004	25.5	10 59.7 1.004	25.5	4
155	7 27.7 1.004	24.6	7 57.7 1.004	24.6	8 27.6 1.004	24.6	8 57.6 1.004	24.6	9 27.6 1.004	24.6	9 57.6 1.004	24.5	10 27.6 1.004	24.5	10 57.5 1.004	24.5	155
6	7 25.5 1.003	23.7	7 55.5 1.003	23.6	8 25.5 1.003	23.6	8 55.4 1.003	23.6	9 25.4 1.003	23.6	9 55.4 1.003	23.6	10 25.4 1.003	23.5	10 55.4 1.003	23.5	6
7	7 23.5 1.003	22.7	7 53.5 1.003	22.7	8 23.4 1.003	22.6	8 53.4 1.003	22.6	9 23.4 1.003	22.6	9 53.4 1.003	22.6	10 23.4 1.003	22.6	10 53.4 1.003	22.5	7
8	7 21.5 1.003	21.7	7 51.5 1.003	21.7	8 21.5 1.003	21.6	8 51.5 1.003	21.6	9 21.4 1.003	21.6	9 51.4 1.003	21.6	10 21.4 1.003	21.6	10 51.4 1.003	21.6	8
9	7 19.6 1.003	20.7	7 49.6 1.003	20.7	8 19.6 1.003	20.7	8 49.6 1.003	20.6	9 19.6 1.003	20.6	9 49.5 1.003	20.6	10 19.5 1.003	20.6	10 49.5 1.003	20.6	9
160	7 17.8 1.003	19.7	7 47.8 1.003	19.7	8 17.8 1.003	19.7	8 47.8 1.003	19.7	9 17.8 1.003	19.7	9 47.7 1.003	19.6	10 17.7 1.003	19.6	10 47.7 1.003	19.6	160
1	7 16.1 1.003	18.7	7 46.1 1.003	18.7	8 16.1 1.003	18.7	8 46.1 1.003	18.7	9 16.0 1.003	18.7	9 46.0 1.003	18.7	10 16.0 1.003	18.6	10 46.0 1.003	18.6	1
2	7 14.5 1.003	17.7	7 44.4 1.003	17.7	8 14.4 1.003	17.7	8 44.4 1.003	17.7	9 14.4 1.003	17.7	9 44.4 1.003	17.7	10 14.4 1.003	17.7	10 44.4 1.003	17.6	2
3	7 12.9 1.002	16.8	7 42.9 1.002	16.7	8 12.9 1.002	16.7	8 42.9 1.002	16.7	9 12.9 1.002	16.7	9 42.9 1.002	16.7	10 12.8 1.002	16.7	10 42.8 1.002	16.7	3
4	7 11.4 1.002	15.8	7 41.4 1.002	15.8	8 11.4 1.002	15.7	8 41.4 1.002	15.7	9 11.4 1.002	15.7	9 41.4 1.002	15.7	10 11.4 1.002	15.7	10 41.4 1.002	15.7	4
165	7 10.1 1.002	14.8	7 40.1 1.002	14.8	8 10.0 1.002	14.8	8 40.0 1.002	14.7	9 10.0 1.002	14.7	9 40.0 1.002	14.7	10 10.0 1.002	14.7	10 40.0 1.002	14.7	165
6	7 08.6 1.002	13.8	7 38.6 1.002	13.8	8 08.6 1.002	13.8	8 38.6 1.002	13.8	9 08.6 1.002	13.8	9 38.7 1.002	13.7	10 08.7 1.002	13.7	10 38.7 1.002	13.7	6
7	7 07.6 1.002	12.8	7 37.6 1.002	12.8	8 07.6 1.002	12.8	8 37.6 1.002	12.8	9 07.5 1.002	12.8	9 37.5 1.002	12.8	10 07.5 1.002	12.8	10 37.5 1.002	12.7	7
8	7 06.5 1.002	11.8	7 36.4 1.002	11.8	8 06.4 1.002	11.8	8 36.4 1.002	11.8	9 06.4 1.002	11.8	9 36.4 1.002	11.8	10 06.4 1.002	11.8	10 36.4 1.002	11.8	8
9	7 05.4 1.002	10.8	7 35.4 1.002	10.8	8 05.4 1.002	10.8	8 35.4 1.002	10.8	9 05.4 1.002	10.8	9 35.4 1.002	10.8	10 05.4 1.002	10.8	10 35.4 1.002	10.8	9
170	7 04.5 1.001	09.9	7 34.5 1.001	09.8	8 04.5 1.001	09.8	8 34.5 1.001	09.8	9 04.5 1.001	09.8	9 34.5 1.001	09.8	10 04.5 1.001	09.8	10 34.5 1.001	09.8	170
1	7 03.6 1.001	08.9	7 33.6 1.001	08.9	8 03.6 1.001	08.9	8 33.6 1.001	08.8	9 03.6 1.001	08.8	9 33.6 1.001	08.8	10 03.6 1.001	08.8	10 33.6 1.001	08.8	1
2	7 02.9 1.001	07.9	7 32.9 1.001	07.9	8 02.9 1.001	07.9	8 32.9 1.001	07.9	9 02.9 1.001	07.9	9 32.9 1.001	07.9	10 02.9 1.001	07.8	10 32.9 1.001	07.8	2
3	7 02.2 1.001	06.9	7 32.2 1.001	06.9	8 02.2 1.001	06.9	8 32.2 1.001	06.9	9 02.2 1.001	06.9	9 32.2 1.001	06.9	10 02.2 1.001	06.9	10 32.2 1.001	06.9	3
4	7 01.6 1.001	05.9	7 31.6 1.001	05.9	8 01.6 1.001	05.9	8 31.6 1.001	05.9	9 01.6 1.001	05.9	9 31.6 1.001	05.9	10 01.6 1.001	05.9	10 31.6 1.001	05.9	4
175	7 01.1 1.001	04.9	7 31.1 1.001	04.9	8 01.1 1.001	04.9	8 31.1 1.001	04.9	9 01.1 1.001	04.9	9 31.1 1.001	04.9	10 01.1 1.001	04.9	10 31.1 1.001	04.9	175
6	7 00.7 1.001	03.9	7 30.7 1.001	03.9	8 00.7 1.001	03.9	8 30.7 1.001	03.9	9 00.7 1.000	03.9	9 30.7 1.000	03.9	10 00.7 1.000	03.9	10 30.7 1.001	03.9	6
7	7 00.4 1.000	03.0	7 30.4 1.000	03.0	8 00.4 1.000	03.0	8 30.4 1.000	02.9	9 00.4 1.000	02.9	9 30.4 1.000	02.9	10 00.4 1.000	02.9	10 30.4 1.000	02.9	7
8	7 00.2 1.000	02.0	7 30.2 1.000	02.0	8 00.2 1.000	02.0	8 30.2 1.000	02.0	9 00.2 1.000	02.0	9 30.2 1.000	02.0	10 00.2 1.000	02.0	10 30.2 1.000	02.0	8
9	7 00.0 1.000	01.0	7 30.0 1.000	01.0	8 00.0 1.000	01.0	8 30.0 1.000	01.0	9 00.0 1.000	01.0	9 30.0 1.000	01.0	10 00.0 1.000	01.0	10 30.0 1.000	01.0	9
180	7 00.0 1.000	00.0	7 30.0 1.000	00.0	8 00.0 1.000	00.0	8 30.0 1.000	00.0	9 00.0 1.000	00.0	9 30.0 1.000	00.0	10 00.0 1.000	00.0	10 30.0 1.000	00.0	180

Lat. 5°

Each cell below lists: Alt. (° ′) · Δd Δt · Az. (°)

H.A.	16° 00′	16° 30′	17° 00′	17° 30′	18° 00′	18° 30′	19° 00′	19° 30′	H.A.
00	21 00.0 1.0 00 180.0	21 30.0 1.0 00 180.0	22 00.0 1.0 00 180.0	22 30.0 1.0 00 180.0	23 00.0 1.0 00 180.0	23 30.0 1.0 00 180.0	24 00.0 1.0 00 180.0	24 30.0 1.0 00 180.0	00
1	21 00.0 1.0 00 179.0	21 30.0 1.0 00 179.0	22 00.0 1.0 00 179.0	22 30.0 1.0 00 179.0	23 00.0 1.0 00 179.0	23 30.0 1.0 00 179.0	24 00.0 1.0 00 179.0	24 30.0 1.0 00 179.0	1
2	20 59.8 1.0 00 177.9	21 29.8 1.0 00 177.9	21 59.8 1.0 00 177.9	22 29.8 1.0 00 177.9	22 59.8 1.0 00 177.9	23 29.8 1.0 00 177.9	23 59.8 1.0 00 177.9	24 29.8 1.0 00 177.9	2
3	20 59.6 1.0 01 176.9	21 29.6 1.0 01 176.9	21 59.6 1.0 01 176.9	22 29.6 1.0 01 176.9	22 59.6 1.0 01 176.9	23 29.6 1.0 01 176.9	23 59.6 1.0 01 176.9	24 29.6 1.0 01 176.9	3
4	20 59.2 1.0 01 175.9	21 29.2 1.0 01 175.9	21 59.2 1.0 01 175.9	22 29.2 1.0 01 175.9	22 59.2 1.0 01 175.9	23 29.2 1.0 01 175.9	23 59.2 1.0 01 175.9	24 29.2 1.0 01 175.9	4
05	20 58.8 1.0 01 174.9	21 28.8 1.0 01 174.8	21 58.8 1.0 01 174.8	22 28.8 1.0 01 174.8	22 58.8 1.0 01 174.8	23 28.8 1.0 01 174.8	23 58.8 1.0 01 174.8	24 28.8 1.0 01 174.8	05
6	20 58.3 1.0 01 173.8	21 28.3 1.0 01 173.8	21 58.3 1.0 01 173.8	22 28.3 1.0 01 173.8	22 58.3 1.0 01 173.8	23 28.3 1.0 01 173.8	23 58.3 1.0 01 173.8	24 28.3 1.0 01 173.8	6
7	20 57.7 1.0 01 172.8	21 27.7 1.0 01 172.8	21 57.7 1.0 01 172.8	22 27.7 1.0 01 172.8	22 57.7 1.0 01 172.8	23 27.7 1.0 01 172.8	23 57.7 1.0 01 172.8	24 27.7 1.0 01 172.7	7
8	20 57.0 1.0 01 171.8	21 27.0 1.0 01 171.8	21 57.0 1.0 01 171.8	22 27.0 1.0 01 171.7	22 57.0 1.0 01 171.7	23 27.0 1.0 01 171.7	23 57.0 1.0 01 171.7	24 27.0 1.0 01 171.7	8
9	20 56.2 1.0 01 170.7	21 26.2 1.0 01 170.7	21 56.2 1.0 02 170.7	22 26.2 1.0 02 170.7	22 56.2 1.0 01 170.7	23 26.2 1.0 01 170.7	23 56.2 1.0 02 170.7	24 26.2 1.0 02 170.7	9
10	20 55.3 1.0 02 169.7	21 25.3 1.0 02 169.7	21 55.3 1.0 02 169.7	22 25.3 1.0 02 169.7	22 55.3 1.0 02 169.7	23 25.3 1.0 02 169.7	23 55.3 1.0 02 169.6	24 25.3 1.0 02 169.6	10
1	20 54.3 1.0 02 168.7	21 24.3 1.0 02 168.7	21 54.3 1.0 02 168.7	22 24.3 1.0 02 168.6	22 54.3 1.0 02 168.6	23 24.3 1.0 02 168.6	23 54.3 1.0 02 168.6	24 24.3 1.0 02 168.6	1
2	20 53.3 1.0 02 167.6	21 23.3 1.0 02 167.6	21 53.2 1.0 02 167.6	22 23.2 1.0 02 167.6	22 53.2 1.0 02 167.6	23 23.2 1.0 02 167.6	23 53.2 1.0 02 167.6	24 23.2 1.0 02 167.6	2
3	20 52.1 1.0 02 166.6	21 22.1 1.0 02 166.6	21 52.1 1.0 02 166.6	22 22.1 1.0 02 166.6	22 52.1 1.0 02 166.6	23 22.1 1.0 02 166.6	23 52.1 1.0 02 166.6	24 22.0 1.0 02 166.5	3
4	20 50.8 1.0 02 165.6	21 20.8 1.0 02 165.6	21 50.8 1.0 02 165.6	22 20.8 1.0 02 165.5	22 50.8 1.0 02 165.5	23 20.8 1.0 02 165.5	23 50.8 1.0 02 165.5	24 20.8 1.0 02 165.5	4
15	20 49.5 1.0 02 164.5	21 19.5 1.0 02 164.5	21 49.5 1.0 02 164.5	22 19.5 1.0 03 164.5	22 49.5 1.0 02 164.5	23 19.4 1.0 02 164.5	23 49.4 1.0 02 164.5	24 19.4 1.0 02 164.5	15
6	20 48.1 1.0 03 163.5	21 18.0 1.0 03 163.5	21 48.0 1.0 03 163.5	22 18.0 1.0 03 163.5	22 48.0 1.0 03 163.5	23 18.0 1.0 03 163.5	23 48.0 1.0 03 163.5	24 18.0 1.0 03 163.4	6
7	20 46.5 1.0 03 162.5	21 16.5 1.0 03 162.5	21 46.5 1.0 03 162.5	22 16.5 1.0 03 162.5	22 46.5 1.0 03 162.4	23 16.5 1.0 03 162.4	23 46.5 1.0 03 162.4	24 16.4 1.0 03 162.4	7
8	20 44.9 1.0 03 161.5	21 14.9 1.0 03 161.5	21 44.9 1.0 03 161.4	22 14.9 1.0 03 161.4	22 44.9 1.0 03 161.4	23 14.9 1.0 03 161.4	23 44.8 1.0 03 161.4	24 14.8 1.0 03 161.4	8
9	20 43.2 1.0 03 160.5	21 13.2 1.0 03 160.4	21 43.2 1.0 03 160.4	22 13.2 1.0 03 160.4	22 43.2 1.0 03 160.4	23 13.1 1.0 03 160.4	23 43.1 1.0 03 160.4	24 13.1 1.0 03 160.3	9
20	20 41.4 1.0 03 159.4	21 11.4 1.0 03 159.4	21 41.4 1.0 03 159.4	22 11.4 1.0 03 159.4	22 41.4 1.0 03 159.4	23 11.3 1.0 03 159.3	23 41.3 1.0 03 159.3	24 11.3 1.0 03 159.3	20
1	20 39.5 1.0 03 158.4	21 09.5 1.0 03 158.4	21 39.5 1.0 03 158.4	22 09.5 1.0 03 158.3	22 39.5 1.0 03 158.3	23 09.4 1.0 03 158.3	23 39.4 1.0 03 158.3	24 09.4 1.0 03 158.3	1
2	20 37.6 1.0 03 157.4	21 07.5 1.0 03 157.4	21 37.5 1.0 03 157.3	22 07.5 1.0 03 157.3	22 37.5 1.0 03 157.3	23 07.5 1.0 03 157.3	23 37.5 1.0 03 157.3	24 07.4 1.0 03 157.2	2
3	20 35.5 1.0 04 156.3	21 05.5 1.0 04 156.3	21 35.5 1.0 04 156.3	22 05.4 1.0 04 156.3	22 35.4 1.0 04 156.3	23 05.4 1.0 04 156.2	23 35.4 1.0 04 156.2	24 05.4 1.0 04 156.2	3
4	20 33.4 1.0 04 155.3	21 03.3 1.0 04 155.3	21 33.3 1.0 04 155.3	22 03.3 1.0 04 155.3	22 33.3 1.0 04 155.2	23 03.3 1.0 04 155.2	23 33.2 1.0 04 155.2	24 03.2 1.0 04 155.2	4
25	20 31.1 1.0 04 154.3	21 01.1 1.0 04 154.3	21 31.1 1.0 04 154.3	22 01.1 1.0 04 154.2	22 31.0 1.0 04 154.2	23 01.0 1.0 04 154.2	23 31.0 1.0 04 154.2	24 01.0 1.0 04 154.1	25
6	20 28.8 1.0 04 153.3	20 58.8 1.0 04 153.2	21 28.8 1.0 04 153.2	21 58.8 1.0 04 153.2	22 28.7 1.0 04 153.2	22 58.7 1.0 04 153.2	23 28.7 1.0 04 153.1	23 58.7 1.0 04 153.1	6
7	20 26.4 1.0 04 152.2	20 56.4 1.0 04 152.2	21 26.4 1.0 04 152.2	21 56.4 1.0 04 152.2	22 26.3 1.0 04 152.2	22 56.3 1.0 04 152.1	23 26.3 1.0 04 152.1	23 56.2 1.0 04 152.1	7
8	20 24.0 1.0 04 151.2	20 53.9 1.0 04 151.2	21 23.9 1.0 04 151.2	21 53.9 1.0 04 151.1	22 23.8 1.0 04 151.1	22 53.8 1.0 04 151.1	23 23.8 1.0 04 151.1	23 53.8 1.0 04 151.1	8
9	20 21.4 1.0 04 150.2	20 51.4 1.0 04 150.2	21 21.3 1.0 04 150.1	21 51.3 1.0 04 150.1	22 21.3 1.0 04 150.1	22 51.2 1.0 04 150.1	23 21.2 1.0 04 150.0	23 51.2 1.0 04 150.0	9
30	20 18.8 1.0 05 149.2	20 48.7 1.0 05 149.1	21 18.7 1.0 05 149.1	21 48.7 1.0 05 149.1	22 18.6 1.0 05 149.1	22 48.6 1.0 05 149.0	23 18.6 1.0 05 149.0	23 48.5 1.0 05 149.0	30
1	20 16.0 1.0 05 148.1	20 46.0 1.0 05 148.1	21 16.0 1.0 05 148.1	21 45.9 1.0 05 148.1	22 15.9 1.0 05 148.0	22 45.9 1.0 05 148.0	23 15.8 1.0 05 148.0	23 45.8 1.0 05 148.0	1
2	20 13.2 1.0 05 147.1	20 43.2 1.0 05 147.1	21 13.2 1.0 05 147.1	21 43.1 1.0 05 147.0	22 13.1 1.0 05 147.0	22 43.1 1.0 05 147.0	23 13.0 1.0 05 147.0	23 43.0 1.0 05 146.9	2
3	20 10.4 1.0 05 146.1	20 40.3 1.0 05 146.1	21 10.3 1.0 05 146.0	21 40.2 1.0 05 146.0	22 10.2 1.0 05 146.0	22 40.2 1.0 05 146.0	23 10.1 1.0 05 145.9	23 40.0 1.0 05 145.9	3
4	20 07.4 1.0 05 145.1	20 37.4 1.0 05 145.0	21 07.3 1.0 05 145.0	21 37.3 1.0 05 145.0	22 07.2 1.0 05 145.0	22 37.2 1.0 05 144.9	23 07.2 1.0 05 144.9	23 37.1 1.0 05 144.9	4
35	20 04.4 1.0 05 144.1	20 34.3 1.0 05 144.0	21 04.3 1.0 05 144.0	21 34.2 1.0 05 144.0	22 04.2 1.0 05 143.9	22 34.2 1.0 05 143.9	23 04.1 1.0 05 143.9	23 34.1 1.0 05 143.9	35
6	20 01.3 1.0 05 143.0	20 31.2 1.0 05 143.0	21 01.2 1.0 05 143.0	21 31.1 1.0 05 142.9	22 01.1 1.0 05 142.9	22 31.0 1.0 05 142.9	23 01.0 1.0 05 142.9	23 31.0 1.0 05 142.8	6
7	19 58.1 1.0 06 142.0	20 28.0 1.0 05 142.0	20 58.0 1.0 06 142.0	21 27.9 1.0 06 141.9	21 57.9 1.0 06 141.9	22 27.9 1.0 06 141.9	22 57.8 1.0 06 141.8	23 27.8 1.0 06 141.8	7
8	19 54.8 1.0 06 141.0	20 24.8 1.0 06 141.0	20 54.7 1.0 06 140.9	21 24.7 1.0 06 140.9	21 54.6 1.0 06 140.9	22 24.6 1.0 06 140.8	22 54.5 1.0 06 140.8	23 24.5 1.0 06 140.8	8
9	19 51.5 1.0 06 140.0	20 21.5 1.0 06 139.9	20 51.4 1.0 06 139.9	21 21.4 1.0 06 139.9	21 51.3 1.0 06 139.8	22 21.2 1.0 06 139.8	22 51.2 1.0 06 139.8	23 21.1 1.0 06 139.7	9
40	19 48.1 1.0 06 138.9	20 18.1 1.0 06 138.9	20 48.0 1.0 06 138.9	21 17.9 1.0 06 138.8	21 47.9 1.0 06 138.8	22 17.8 1.0 06 138.8	22 47.8 1.0 06 138.8	23 17.7 1.0 06 138.7	40
1	19 44.6 1.0 06 137.9	20 14.6 1.0 06 137.9	20 44.5 1.0 06 137.9	21 14.5 1.0 06 137.8	21 44.4 1.0 06 137.8	22 14.4 1.0 06 137.8	22 44.3 1.0 06 137.7	23 14.2 1.0 06 137.7	1
2	19 41.1 1.0 06 136.9	20 11.0 1.0 06 136.8	20 41.0 1.0 06 136.8	21 10.9 1.0 06 136.8	21 40.9 1.0 06 136.8	22 10.8 1.0 06 136.7	22 40.7 1.0 06 136.7	23 10.7 1.0 06 136.7	2
3	19 37.5 1.0 06 135.9	20 07.4 1.0 06 135.9	20 37.4 1.0 06 135.8	21 07.3 1.0 06 135.8	21 37.3 1.0 06 135.8	22 07.2 1.0 06 135.7	22 37.1 1.0 06 135.7	23 07.1 1.0 06 135.7	3
4	19 33.8 1.0 06 134.9	20 03.8 1.0 06 134.8	20 33.7 1.0 06 134.8	21 03.6 1.0 06 134.8	21 33.6 1.0 06 134.7	22 03.5 1.0 06 134.7	22 33.4 1.0 06 134.7	23 03.4 1.0 06 134.6	4
45	19 30.1 1.0 06 133.9	20 00.0 1.0 06 133.8	20 30.0 1.0 06 133.8	20 59.9 1.0 06 133.8	21 29.8 1.0 06 133.7	21 59.8 1.0 06 133.7	22 29.7 1.0 06 133.6	22 59.6 1.0 06 133.6	45
6	19 26.3 1.0 06 132.8	19 56.2 1.0 06 132.8	20 26.1 1.0 06 132.8	20 56.1 1.0 06 132.7	21 26.0 1.0 06 132.7	21 55.9 1.0 06 132.7	22 25.9 1.0 06 132.6	22 55.8 1.0 06 132.6	6
7	19 22.4 1.0 07 131.8	19 52.3 1.0 07 131.8	20 22.3 1.0 07 131.8	20 52.2 1.0 07 131.7	21 22.1 1.0 07 131.7	21 52.1 1.0 07 131.6	22 22.0 1.0 07 131.6	22 51.9 1.0 07 131.6	7
8	19 18.5 1.0 07 130.8	19 48.4 1.0 07 130.8	20 18.3 1.0 07 130.7	20 48.3 1.0 07 130.7	21 18.2 1.0 07 130.7	21 48.1 1.0 07 130.6	22 18.1 1.0 07 130.6	22 48.0 1.0 07 130.5	8
9	19 14.5 1.0 07 129.8	19 44.4 1.0 07 129.8	20 14.4 1.0 07 129.7	20 44.3 1.0 07 129.7	21 14.2 1.0 07 129.6	21 44.1 1.0 07 129.6	22 14.1 1.0 07 129.6	22 44.0 1.0 07 129.5	9
50	19 10.4 1.0 07 128.8	19 40.4 1.0 07 128.7	20 10.3 1.0 07 128.7	20 40.2 1.0 07 128.7	21 10.1 1.0 07 128.6	21 40.1 1.0 07 128.6	22 10.0 1.0 07 128.5	22 39.9 1.0 07 128.5	50
1	19 06.3 1.0 07 127.8	19 36.3 1.0 07 127.7	20 06.2 1.0 07 127.7	20 36.1 1.0 07 127.6	21 06.0 1.0 07 127.6	21 36.0 1.0 07 127.6	22 05.9 1.0 07 127.5	22 35.8 1.0 07 127.5	1
2	19 02.2 1.0 07 126.7	19 32.1 1.0 07 126.7	20 02.0 1.0 07 126.7	20 31.9 1.0 07 126.6	21 01.9 1.0 07 126.6	21 31.8 1.0 07 126.5	22 01.7 1.0 07 126.5	22 31.6 1.0 07 126.5	2
3	18 58.0 1.0 07 125.7	19 27.9 1.0 07 125.7	19 57.8 1.0 07 125.7	20 27.7 1.0 07 125.6	20 57.6 1.0 07 125.6	21 27.6 1.0 07 125.5	21 57.5 1.0 07 125.5	22 27.4 1.0 07 125.5	3
4	18 53.7 1.0 07 124.7	19 23.6 1.0 07 124.7	19 53.5 1.0 07 124.6	20 23.4 1.0 07 124.6	20 53.4 1.0 07 124.6	21 23.3 1.0 07 124.5	21 53.2 1.0 07 124.5	22 23.1 1.0 07 124.4	4
55	18 49.4 1.0 07 123.7	19 19.2 1.0 07 123.6	19 49.2 1.0 07 123.6	20 19.1 1.0 07 123.6	20 49.0 1.0 07 123.5	21 18.9 1.0 07 123.5	21 48.8 1.0 07 123.5	22 18.6 1.0 07 123.4	55
6	18 45.0 1.0 07 122.7	19 14.9 1.0 07 122.7	19 44.8 1.0 07 122.6	20 14.7 1.0 07 122.6	20 44.6 1.0 07 122.5	21 14.5 1.0 07 122.5	21 44.4 1.0 07 122.4	22 14.4 1.0 07 122.4	6
7	18 40.6 1.0 07 121.7	19 10.5 1.0 07 121.6	19 40.4 1.0 07 121.6	20 10.3 1.0 07 121.6	20 40.2 1.0 07 121.5	21 10.1 1.0 07 121.5	21 40.0 1.0 07 121.4	22 09.9 1.0 08 121.4	7
8	18 36.1 1.0 08 120.7	19 06.0 1.0 08 120.6	19 35.9 1.0 08 120.6	20 05.8 1.0 08 120.5	20 35.7 1.0 08 120.5	21 05.6 1.0 08 120.5	21 35.5 1.0 08 120.4	22 05.4 1.0 08 120.4	8
9	18 31.6 1.0 08 119.7	19 01.5 1.0 08 119.6	19 31.4 1.0 08 119.6	20 01.3 1.0 08 119.5	20 31.2 1.0 08 119.5	21 01.1 1.0 08 119.4	21 31.0 1.0 08 119.4	22 00.9 1.0 08 119.4	9
60	18 27.0 1.0 08 118.6	18 56.9 1.0 08 118.6	19 26.8 1.0 08 118.6	19 56.7 1.0 08 118.5	20 26.6 1.0 08 118.5	20 56.5 1.0 08 118.4	21 26.4 1.0 08 118.4	21 56.3 1.0 08 118.3	60
1	18 22.4 1.0 08 117.6	18 52.3 1.0 08 117.6	19 22.2 1.0 08 117.6	19 52.1 1.0 08 117.5	20 22.0 1.0 08 117.5	20 51.9 1.0 08 117.4	21 21.8 1.0 08 117.4	21 51.7 1.0 08 117.3	1
2	18 17.7 1.0 08 116.6	18 47.6 1.0 08 116.6	19 17.5 1.0 08 116.5	19 47.4 1.0 08 116.5	20 17.3 1.0 08 116.5	20 47.2 1.0 08 116.4	21 17.1 1.0 08 116.4	21 47.0 1.0 08 116.3	2
3	18 13.0 1.0 08 115.6	18 42.9 1.0 08 115.6	19 12.8 1.0 08 115.5	19 42.7 1.0 08 115.5	20 12.6 1.0 08 115.4	20 42.5 1.0 08 115.4	21 12.4 1.0 08 115.4	21 42.3 1.0 08 115.3	3
4	18 08.3 1.0 08 114.6	18 38.2 1.0 08 114.6	19 08.1 1.0 08 114.5	19 38.0 1.0 08 114.5	20 07.9 1.0 08 114.4	20 37.8 1.0 08 114.4	21 07.7 1.0 08 114.3	21 37.6 1.0 08 114.3	4
65	18 03.5 1.0 08 113.6	18 33.4 1.0 08 113.6	19 03.3 1.0 08 113.5	19 33.2 1.0 08 113.5	20 03.1 1.0 08 113.4	20 33.0 1.0 08 113.4	21 02.9 1.0 08 113.3	21 32.8 1.0 08 113.3	65
6	17 58.7 1.0 08 112.6	18 28.6 1.0 08 112.6	18 58.5 1.0 08 112.5	19 28.4 1.0 08 112.5	19 58.3 1.0 08 112.4	20 28.2 1.0 08 112.4	20 58.1 1.0 08 112.3	21 28.0 1.0 08 112.3	6
7	17 53.9 1.0 08 111.6	18 23.8 1.0 08 111.5	18 53.7 1.0 08 111.5	19 23.6 1.0 08 111.5	19 53.4 1.0 08 111.4	20 23.3 1.0 08 111.4	20 53.2 1.0 08 111.3	21 23.1 1.0 08 111.3	7
8	17 49.0 1.0 08 110.6	18 18.9 1.0 08 110.5	18 48.8 1.0 08 110.5	19 18.7 1.0 08 110.4	19 48.6 1.0 08 110.4	20 18.5 1.0 08 110.4	20 48.3 1.0 08 110.3	21 18.2 1.0 08 110.3	8
9	17 44.1 1.0 08 109.6	18 14.0 1.0 08 109.5	18 43.9 1.0 08 109.5	19 13.8 1.0 08 109.4	19 43.6 1.0 08 109.4	20 13.5 1.0 08 109.3	20 43.4 1.0 08 109.3	21 13.3 1.0 08 109.3	9
70	17 39.1 1.0 08 108.6	18 09.0 1.0 08 108.5	18 38.9 1.0 08 108.5	19 08.8 1.0 08 108.4	19 38.7 1.0 08 108.4	20 08.6 1.0 08 108.3	20 38.5 1.0 08 108.3	21 08.4 1.0 08 108.2	70
1	17 34.2 1.0 08 107.6	18 04.1 1.0 08 107.5	18 34.0 1.0 08 107.5	19 03.8 1.0 08 107.4	19 33.7 1.0 08 107.4	20 03.6 1.0 08 107.3	20 33.5 1.0 08 107.3	21 03.4 1.0 08 107.2	1
2	17 29.2 1.0 08 106.6	17 59.1 1.0 08 106.5	18 28.9 1.0 08 106.5	18 58.8 1.0 08 106.4	19 28.7 1.0 08 106.4	19 58.6 1.0 08 106.3	20 28.5 1.0 08 106.3	20 58.4 1.0 08 106.2	2
3	17 24.2 1.0 08 105.6	17 54.0 1.0 08 105.5	18 23.9 1.0 08 105.5	18 53.8 1.0 08 105.4	19 23.7 1.0 08 105.4	19 53.6 1.0 08 105.3	20 23.5 1.0 08 105.3	20 53.3 1.0 08 105.2	3
4	17 19.1 1.0 08 104.6	17 49.0 1.0 08 104.5	18 18.9 1.0 08 104.5	18 48.8 1.0 08 104.4	19 18.6 1.0 08 104.4	19 48.5 1.0 08 104.3	20 18.4 1.0 08 104.3	20 48.3 1.0 08 104.2	4
75	17 14.0 1.0 08 103.6	17 43.9 1.0 08 103.5	18 13.8 1.0 08 103.5	18 43.7 1.0 08 103.4	19 13.6 1.0 08 103.4	19 43.4 1.0 08 103.3	20 13.3 1.0 08 103.3	20 43.2 1.0 08 103.2	75
6	17 08.9 1.0 09 102.6	17 38.8 1.0 09 102.5	18 08.7 1.0 09 102.5	18 38.6 1.0 09 102.4	19 08.5 1.0 09 102.4	19 38.3 1.0 09 102.3	20 08.2 1.0 09 102.3	20 38.1 1.0 09 102.2	6
7	17 03.8 1.0 09 101.5	17 33.7 1.0 09 101.5	18 03.6 1.0 09 101.5	18 33.5 1.0 09 101.4	19 03.3 1.0 09 101.4	19 33.2 1.0 09 101.3	20 03.1 1.0 09 101.3	20 33.0 1.0 09 101.2	7
8	16 58.7 1.0 09 100.6	17 28.6 1.0 09 100.5	17 58.4 1.0 09 100.5	18 28.3 1.0 09 100.4	18 58.2 1.0 09 100.4	19 28.1 1.0 09 100.3	19 58.0 1.0 09 100.3	20 27.8 1.0 09 100.2	8
9	16 53.5 1.0 09 99.5	17 23.4 1.0 09 99.5	17 53.3 1.0 09 99.5	18 23.2 1.0 09 99.4	18 53.1 1.0 09 99.4	19 22.9 1.0 09 99.3	19 52.8 1.0 09 99.3	20 22.7 1.0 09 99.2	9
80	16 48.4 1.0 09 98.5	17 18.3 1.0 09 98.5	17 48.1 1.0 09 98.5	18 18.0 1.0 09 98.4	18 47.9 1.0 09 98.4	19 17.8 1.0 09 98.3	19 47.6 1.0 09 98.3	20 17.5 1.0 09 98.2	80
1	16 43.2 1.0 09 97.5	17 13.1 1.0 09 97.5	17 43.0 1.0 09 97.5	18 12.8 1.0 09 97.4	18 42.7 1.0 09 97.4	19 12.6 1.0 09 97.3	19 42.5 1.0 09 97.3	20 12.3 1.0 09 97.2	1
2	16 38.0 1.0 09 96.5	17 07.9 1.0 09 96.5	17 37.8 1.0 09 96.5	18 07.6 1.0 09 96.4	18 37.5 1.0 09 96.4	19 07.4 1.0 09 96.3	19 37.3 1.0 09 96.3	20 07.1 1.0 09 96.2	2
3	16 32.8 1.0 09 95.5	17 02.7 1.0 09 95.5	17 32.6 1.0 09 95.5	18 02.4 1.0 09 95.4	18 32.3 1.0 09 95.4	19 02.2 1.0 09 95.3	19 32.1 1.0 09 95.3	20 01.9 1.0 09 95.2	3
4	16 27.6 1.0 09 94.5	16 57.5 1.0 09 94.5	17 27.4 1.0 09 94.5	17 57.2 1.0 09 94.4	18 27.1 1.0 09 94.4	18 57.0 1.0 09 94.3	19 26.9 1.0 09 94.3	19 56.7 1.0 09 94.2	4
85	16 22.4 1.0 09 93.6	16 52.3 1.0 09 93.5	17 22.1 1.0 09 93.5	17 52.0 1.0 09 93.4	18 21.9 1.0 09 93.4	18 51.8 1.0 09 93.3	19 21.6 1.0 09 93.3	19 51.5 1.0 09 93.2	85
6	16 17.2 1.0 09 92.6	16 47.0 1.0 09 92.5	17 16.9 1.0 09 92.5	17 46.8 1.0 09 92.4	18 16.7 1.0 09 92.4	18 46.5 1.0 09 92.3	19 16.4 1.0 09 92.3	19 46.3 1.0 09 92.2	6
7	16 11.9 1.0 09 91.6	16 41.8 1.0 09 91.5	17 11.7 1.0 09 91.5	17 41.6 1.0 09 91.4	18 11.4 1.0 09 91.4	18 41.3 1.0 09 91.3	19 11.2 1.0 09 91.3	19 41.1 1.0 09 91.2	7
8	16 06.7 1.0 09 90.6	16 36.6 1.0 09 90.5	17 06.5 1.0 09 90.5	17 36.3 1.0 09 90.4	18 06.2 1.0 09 90.4	18 36.1 1.0 09 90.3	19 06.0 1.0 09 90.3	19 35.8 1.0 09 90.2	8
9	16 01.5 1.0 09 89.6	16 31.4 1.0 09 89.5	17 01.2 1.0 09 89.5	17 31.1 1.0 09 89.4	18 01.0 1.0 09 89.4	18 30.9 1.0 09 89.3	19 00.7 1.0 09 89.3	19 30.6 1.0 09 89.2	9
90	15 56.2 1.0 09 88.6	16 26.1 1.0 09 88.5	16 56.0 1.0 09 88.5	17 25.9 1.0 09 88.4	17 55.8 1.0 09 88.4	18 25.6 1.0 09 88.3	18 55.5 1.0 09 88.3	19 25.4 1.0 09 88.2	90

Lat. 85°

H.A.	16° 00' Alt.	Δd Δt	Az.	16° 30' Alt.	Δd Δt	Az.	17° 00' Alt.	Δd Δt	Az.	17° 30' Alt.	Δd Δt	Az.	18° 00' Alt.	Δd Δt	Az.	18° 30' Alt.	Δd Δt	Az.	19° 00' Alt.	Δd Δt	Az.	19° 30' Alt.	Δd Δt	Az.	H.A.
91	15 51.0	1.009	87.6	16 20.9	1.009	87.5	16 50.8	1.009	87.5	17 20.7	1.009	87.4	17 50.5	1.009	87.4	18 20.4	1.009	87.3	18 50.3	1.009	87.3	19 20.1	1.009	87.2	91
2	15 45.8	1.009	86.6	16 15.7	1.009	86.5	16 45.6	1.009	86.5	17 15.4	1.009	86.4	17 45.3	1.009	86.4	18 15.2	1.009	86.3	18 45.0	1.009	86.3	19 14.9	1.009	86.2	2
3	15 40.6	1.009	85.6	16 10.5	1.009	85.5	16 40.3	1.009	85.5	17 10.2	1.009	85.4	17 40.1	1.009	85.4	18 10.0	1.009	85.3	18 39.8	1.009	85.3	19 09.7	1.009	85.2	3
4	15 35.4	1.009	84.6	16 05.3	1.009	84.5	16 35.1	1.009	84.5	17 05.0	1.009	84.4	17 34.9	1.009	84.4	18 04.8	1.009	84.4	18 34.6	1.009	84.3	19 04.5	1.009	84.3	4
95	15 30.2	1.009	83.6	16 00.0	1.009	83.5	16 29.9	1.009	83.5	16 59.8	1.009	83.5	17 29.7	1.009	83.4	17 59.6	1.009	83.4	18 29.4	1.009	83.3	18 59.3	1.009	83.3	95
6	15 25.0	1.009	82.6	15 54.9	1.009	82.6	16 24.7	1.009	82.5	16 54.6	1.009	82.5	17 24.5	1.009	82.4	17 54.4	1.009	82.4	18 24.2	1.009	82.3	18 54.1	1.009	82.3	6
7	15 19.8	1.009	81.6	15 49.7	1.009	81.6	16 19.6	1.009	81.5	16 49.4	1.009	81.5	17 19.3	1.009	81.4	17 49.2	1.009	81.4	18 19.1	1.009	81.3	18 48.9	1.009	81.3	7
8	15 14.6	1.009	80.6	15 44.5	1.009	80.6	16 14.4	1.009	80.5	16 44.3	1.009	80.5	17 14.1	1.009	80.4	17 44.0	1.009	80.4	18 13.9	1.009	80.3	18 43.8	1.009	80.3	8
9	15 09.5	1.009	79.6	15 39.4	1.009	79.6	16 09.2	1.009	79.5	16 39.1	1.009	79.5	17 09.0	1.009	79.4	17 38.9	1.009	79.4	18 08.8	1.009	79.3	18 38.6	1.009	79.3	9
100	15 04.3	1.009	78.6	15 34.2	1.009	78.6	16 04.1	1.008	78.5	16 34.0	1.009	78.5	17 03.9	1.009	78.4	17 33.7	1.009	78.4	18 03.6	1.009	78.4	18 33.5	1.009	78.3	100
1	14 59.2	1.008	77.6	15 29.1	1.008	77.6	15 59.0	1.008	77.5	16 28.9	1.008	77.5	16 58.8	1.008	77.5	17 28.6	1.008	77.4	17 58.5	1.008	77.4	18 28.4	1.008	77.3	1
2	14 54.1	1.008	76.7	15 24.0	1.008	76.6	15 53.9	1.008	76.6	16 23.8	1.008	76.5	16 53.7	1.008	76.5	17 23.5	1.008	76.4	17 53.4	1.008	76.4	18 23.3	1.008	76.3	2
3	14 49.1	1.008	75.7	15 18.9	1.008	75.6	15 48.8	1.008	75.6	16 18.7	1.008	75.5	16 48.6	1.008	75.5	17 18.5	1.008	75.4	17 48.3	1.008	75.4	18 18.2	1.008	75.3	3
4	14 44.0	1.008	74.7	15 13.9	1.008	74.6	15 43.8	1.008	74.6	16 13.7	1.008	74.5	16 43.5	1.008	74.5	17 13.4	1.008	74.4	17 43.3	1.008	74.4	18 13.2	1.008	74.3	4
105	14 39.0	1.008	73.7	15 08.9	1.008	73.6	15 38.7	1.008	73.6	16 08.6	1.008	73.5	16 38.5	1.008	73.5	17 08.4	1.008	73.5	17 38.3	1.008	73.4	18 08.2	1.008	73.4	105
6	14 34.0	1.008	72.7	15 03.8	1.008	72.6	15 33.7	1.008	72.6	16 03.6	1.008	72.6	16 33.5	1.008	72.5	17 03.4	1.008	72.5	17 33.3	1.008	72.4	18 03.2	1.008	72.4	6
7	14 29.0	1.008	71.7	14 58.9	1.008	71.7	15 28.8	1.008	71.6	15 58.6	1.008	71.6	16 28.5	1.008	71.5	16 58.4	1.008	71.5	17 28.3	1.008	71.4	17 58.2	1.008	71.4	7
8	14 24.0	1.008	70.7	14 53.9	1.008	70.7	15 23.8	1.008	70.6	15 53.7	1.008	70.6	16 23.6	1.008	70.5	16 53.5	1.008	70.5	17 23.4	1.008	70.4	17 53.2	1.008	70.4	8
9	14 19.1	1.008	69.7	14 49.0	1.008	69.7	15 18.9	1.008	69.6	15 48.8	1.008	69.6	16 18.7	1.008	69.5	16 48.6	1.008	69.5	17 18.4	1.008	69.5	17 48.3	1.008	69.4	9
110	14 14.2	1.008	68.7	14 44.1	1.008	68.7	15 14.0	1.008	68.6	15 43.9	1.008	68.6	16 13.8	1.008	68.6	16 43.7	1.008	68.5	17 13.6	1.008	68.5	17 43.5	1.008	68.4	110
1	14 09.4	1.008	67.7	14 39.3	1.008	67.7	15 09.2	1.008	67.7	15 39.0	1.008	67.6	16 08.9	1.008	67.6	16 38.8	1.008	67.5	17 08.7	1.008	67.5	17 38.6	1.008	67.4	1
2	14 04.5	1.008	66.8	14 34.4	1.008	66.7	15 04.3	1.008	66.7	15 34.2	1.008	66.6	16 04.1	1.008	66.6	16 34.0	1.008	66.6	17 03.9	1.008	66.5	17 33.8	1.008	66.5	2
3	13 59.8	1.008	65.8	14 29.7	1.008	65.7	14 59.6	1.008	65.7	15 29.4	1.008	65.6	15 59.3	1.008	65.6	16 29.2	1.008	65.6	16 59.1	1.008	65.5	17 29.0	1.008	65.5	3
4	13 55.0	1.008	64.8	14 24.9	1.008	64.7	14 54.8	1.008	64.7	15 24.7	1.008	64.7	15 54.6	1.008	64.6	16 24.5	1.008	64.6	16 54.4	1.008	64.5	17 24.3	1.008	64.5	4
115	13 50.3	1.008	63.8	14 20.2	1.008	63.8	14 50.1	1.008	63.7	15 20.0	1.008	63.7	15 49.9	1.008	63.6	16 19.8	1.008	63.6	16 49.7	1.008	63.5	17 19.6	1.008	63.5	115
6	13 45.6	1.008	62.8	14 15.5	1.008	62.8	14 45.4	1.008	62.7	15 15.3	1.008	62.7	15 45.2	1.008	62.6	16 15.1	1.008	62.6	16 45.0	1.008	62.6	17 14.9	1.008	62.5	6
7	13 41.0	1.008	61.8	14 10.9	1.008	61.8	14 40.8	1.008	61.7	15 10.7	1.008	61.7	15 40.6	1.008	61.7	16 10.5	1.008	61.6	16 40.4	1.008	61.6	17 10.3	1.008	61.5	7
8	13 36.4	1.008	60.8	14 06.3	1.008	60.8	14 36.2	1.008	60.8	15 06.1	1.008	60.7	15 36.0	1.008	60.7	16 05.9	1.008	60.6	16 35.8	1.008	60.6	17 05.7	1.008	60.5	8
9	13 31.9	1.008	59.9	14 01.8	1.008	59.8	14 31.7	1.007	59.8	15 01.6	1.008	59.7	15 31.5	1.007	59.7	16 01.4	1.008	59.6	16 31.3	1.007	59.6	17 01.2	1.007	59.6	9
120	13 27.4	1.007	58.9	13 57.3	1.007	58.8	14 27.2	1.007	58.8	14 57.1	1.007	58.7	15 27.0	1.007	58.7	15 56.9	1.007	58.7	16 26.8	1.007	58.6	16 56.7	1.007	58.6	120
1	13 22.9	1.007	57.9	13 52.8	1.007	57.9	14 22.7	1.007	57.8	14 52.6	1.007	57.8	15 22.6	1.007	57.7	15 52.5	1.007	57.7	16 22.4	1.007	57.6	16 52.3	1.007	57.6	1
2	13 18.5	1.007	56.9	13 48.4	1.007	56.9	14 18.3	1.007	56.8	14 48.2	1.007	56.8	15 18.2	1.007	56.7	15 48.1	1.007	56.7	16 18.0	1.007	56.7	16 47.9	1.007	56.6	2
3	13 14.1	1.007	55.9	13 44.1	1.007	55.9	14 14.0	1.007	55.8	14 43.9	1.007	55.8	15 13.8	1.007	55.8	15 43.7	1.007	55.7	16 13.6	1.007	55.7	16 43.5	1.007	55.6	3
4	13 09.8	1.007	54.9	13 39.8	1.007	54.9	14 09.7	1.007	54.9	14 39.6	1.007	54.8	15 09.5	1.007	54.8	15 39.4	1.007	54.7	16 09.3	1.007	54.7	16 39.3	1.007	54.7	4
125	13 05.6	1.007	53.9	13 35.5	1.007	53.9	14 05.4	1.007	53.9	14 35.3	1.007	53.8	15 05.3	1.007	53.8	15 35.2	1.007	53.8	16 05.1	1.007	53.7	16 35.0	1.007	53.7	125
6	13 01.4	1.007	53.0	13 31.3	1.007	52.9	14 01.2	1.007	52.9	14 31.2	1.007	52.8	15 01.1	1.007	52.8	15 31.0	1.007	52.8	16 00.9	1.007	52.7	16 30.8	1.007	52.7	6
7	12 57.2	1.007	52.0	13 27.2	1.007	51.9	13 57.1	1.007	51.9	14 27.0	1.007	51.9	14 56.9	1.007	51.8	15 26.9	1.007	51.8	15 56.8	1.007	51.8	16 26.7	1.007	51.7	7
8	12 53.1	1.007	51.0	13 23.1	1.007	51.0	13 53.0	1.007	50.9	14 22.9	1.007	50.9	14 52.8	1.007	50.8	15 22.8	1.007	50.8	15 52.7	1.007	50.8	16 22.6	1.007	50.7	8
9	12 49.1	1.007	50.0	13 19.0	1.007	50.0	13 49.0	1.007	49.9	14 18.9	1.007	49.9	14 48.8	1.007	49.9	15 18.7	1.007	49.8	15 48.7	1.007	49.8	16 18.6	1.007	49.8	9
130	12 45.1	1.007	49.0	13 15.1	1.007	49.0	13 45.0	1.007	49.0	14 14.9	1.006	48.9	14 44.9	1.007	48.9	15 14.8	1.007	48.8	15 44.7	1.007	48.8	16 14.6	1.006	48.8	130
1	12 41.2	1.006	48.0	13 11.1	1.006	48.0	13 41.1	1.006	48.0	14 11.0	1.006	47.9	14 40.9	1.006	47.9	15 10.9	1.006	47.9	15 40.8	1.006	47.8	16 10.7	1.006	47.8	1
2	12 37.4	1.006	47.1	13 07.3	1.006	47.0	13 37.2	1.006	47.0	14 07.2	1.006	47.0	14 37.1	1.006	46.9	15 07.0	1.006	46.9	15 37.0	1.006	46.9	16 06.9	1.006	46.8	2
3	12 33.6	1.006	46.1	13 03.5	1.006	46.0	13 33.4	1.006	46.0	14 03.4	1.006	46.0	14 33.3	1.006	45.9	15 03.2	1.006	45.9	15 33.2	1.006	45.9	16 03.1	1.006	45.8	3
4	12 29.8	1.006	45.1	12 59.8	1.006	45.1	13 29.7	1.006	45.0	13 59.6	1.006	45.0	14 29.6	1.006	45.0	14 59.5	1.006	44.9	15 29.5	1.006	44.9	15 59.4	1.006	44.9	4
135	12 26.2	1.006	44.1	12 56.1	1.006	44.1	13 26.0	1.006	44.0	13 56.0	1.006	44.0	14 25.9	1.006	44.0	14 55.9	1.006	43.9	15 25.8	1.006	43.9	15 55.7	1.006	43.9	135
6	12 22.5	1.006	43.1	12 52.5	1.006	43.1	13 22.4	1.006	43.1	13 52.4	1.006	43.0	14 22.3	1.006	43.0	14 52.3	1.006	43.0	15 22.2	1.006	42.9	15 52.1	1.006	42.9	6
7	12 19.0	1.006	42.1	12 48.9	1.006	42.1	13 18.9	1.006	42.1	13 48.8	1.006	42.1	14 18.8	1.006	42.0	14 48.7	1.006	42.0	15 18.7	1.006	42.0	15 48.6	1.006	41.9	7
8	12 15.5	1.006	41.2	12 45.5	1.006	41.2	13 15.4	1.006	41.1	13 45.4	1.006	41.1	14 15.3	1.006	41.1	14 45.3	1.006	41.0	15 15.2	1.006	40.9	15 45.1	1.006	40.9	8
9	12 12.1	1.006	40.2	12 42.1	1.006	40.2	13 12.0	1.006	40.1	13 42.0	1.006	40.1	14 11.9	1.006	40.1	14 41.9	1.006	40.0	15 11.8	1.006	40.0	15 41.8	1.006	40.0	9
140	12 08.8	1.005	39.2	12 38.7	1.005	39.2	13 08.7	1.005	39.1	13 38.6	1.005	39.1	14 08.6	1.005	39.1	14 38.5	1.005	39.1	15 08.5	1.005	39.0	15 38.4	1.005	39.0	140
1	12 05.5	1.005	38.2	12 35.5	1.005	38.2	13 05.4	1.005	38.2	13 35.4	1.005	38.1	14 05.3	1.005	38.1	14 35.3	1.005	38.1	15 05.2	1.005	38.0	15 35.2	1.005	38.0	1
2	12 02.3	1.005	37.2	12 32.3	1.005	37.2	13 02.2	1.005	37.2	13 32.2	1.005	37.2	14 02.1	1.005	37.1	14 32.1	1.005	37.1	15 02.0	1.005	37.1	15 32.0	1.005	37.0	2
3	11 59.2	1.005	36.3	12 29.1	1.005	36.2	12 59.1	1.005	36.2	13 29.1	1.005	36.2	13 59.0	1.005	36.1	14 29.0	1.005	36.1	14 58.9	1.005	36.1	15 28.9	1.005	36.1	3
4	11 56.1	1.005	35.3	12 26.1	1.005	35.2	12 56.0	1.005	35.2	13 26.0	1.005	35.2	13 56.0	1.005	35.2	14 25.9	1.005	35.1	14 55.9	1.005	35.1	15 25.8	1.005	35.1	4
145	11 53.1	1.005	34.3	12 23.1	1.005	34.3	12 53.1	1.005	34.2	13 23.0	1.005	34.2	13 53.0	1.005	34.2	14 22.9	1.005	34.2	14 52.9	1.005	34.1	15 22.9	1.005	34.1	145
6	11 50.2	1.005	33.3	12 20.2	1.005	33.3	12 50.2	1.005	33.3	13 20.1	1.005	33.2	13 50.1	1.005	33.2	14 20.0	1.005	33.2	14 50.0	1.005	33.2	15 20.0	1.005	33.1	6
7	11 47.4	1.005	32.3	12 17.4	1.005	32.3	12 47.3	1.004	32.3	13 17.3	1.005	32.3	13 47.3	1.005	32.2	14 17.2	1.005	32.2	14 47.2	1.005	32.2	15 17.1	1.005	32.2	7
8	11 44.6	1.004	31.4	12 14.6	1.004	31.3	12 44.6	1.004	31.3	13 14.5	1.004	31.3	13 44.5	1.004	31.3	14 14.5	1.004	31.2	14 44.4	1.004	31.2	15 14.4	1.004	31.2	8
9	11 42.0	1.004	30.4	12 11.9	1.004	30.3	12 41.9	1.004	30.3	13 11.9	1.004	30.3	13 41.8	1.004	30.3	14 11.8	1.004	30.3	14 41.8	1.004	30.2	15 11.7	1.004	30.2	9
150	11 39.4	1.004	29.4	12 09.3	1.004	29.4	12 39.3	1.004	29.3	13 09.3	1.004	29.3	13 39.2	1.004	29.3	14 09.2	1.004	29.3	14 39.2	1.004	29.3	15 09.1	1.004	29.2	150
1	11 36.8	1.004	28.4	12 06.8	1.004	28.4	12 36.8	1.004	28.4	13 06.7	1.004	28.3	13 36.7	1.004	28.3	14 06.7	1.004	28.3	14 36.7	1.004	28.3	15 06.6	1.004	28.3	1
2	11 34.4	1.004	27.4	12 04.3	1.004	27.4	12 34.3	1.004	27.4	13 04.3	1.004	27.4	13 34.2	1.004	27.3	14 04.2	1.004	27.3	14 34.2	1.004	27.3	15 04.1	1.004	27.3	2
3	11 32.0	1.004	26.4	12 02.0	1.004	26.4	12 32.0	1.004	26.4	13 01.9	1.004	26.4	13 31.9	1.004	26.4	14 01.9	1.004	26.3	14 31.9	1.004	26.3	15 01.8	1.004	26.3	3
4	11 29.7	1.004	25.5	11 59.7	1.004	25.4	12 29.7	1.004	25.4	12 59.7	1.004	25.4	13 29.6	1.004	25.4	13 59.6	1.004	25.4	14 29.6	1.004	25.3	14 59.6	1.004	25.3	4
155	11 27.5	1.004	24.5	11 57.5	1.004	24.5	12 27.5	1.004	24.4	12 57.4	1.004	24.4	13 27.4	1.004	24.4	13 57.4	1.004	24.4	14 27.4	1.004	24.4	14 57.4	1.004	24.4	155
6	11 25.4	1.003	23.5	11 55.4	1.003	23.5	12 25.3	1.003	23.5	12 55.3	1.003	23.5	13 25.3	1.004	23.4	13 55.3	1.004	23.4	14 25.3	1.004	23.4	14 55.2	1.004	23.4	6
7	11 23.3	1.003	22.5	11 53.3	1.003	22.5	12 23.3	1.003	22.5	12 53.3	1.003	22.5	13 23.3	1.003	22.5	13 53.2	1.003	22.4	14 23.2	1.003	22.4	14 53.2	1.003	22.4	7
8	11 21.4	1.003	21.5	11 51.4	1.003	21.5	12 21.3	1.003	21.5	12 51.3	1.003	21.5	13 21.3	1.003	21.5	13 51.3	1.003	21.5	14 21.3	1.003	21.4	14 51.3	1.003	21.4	8
9	11 19.5	1.003	20.6	11 49.5	1.003	20.6	12 19.5	1.003	20.5	12 49.5	1.003	20.5	13 19.4	1.003	20.5	13 49.4	1.003	20.5	14 19.4	1.003	20.5	14 49.4	1.003	20.5	9
160	11 17.7	1.003	19.6	11 47.7	1.003	19.6	12 17.7	1.003	19.6	12 47.7	1.003	19.5	13 17.6	1.003	19.5	13 47.6	1.003	19.5	14 17.6	1.003	19.5	14 47.6	1.003	19.5	160
1	11 16.0	1.003	18.6	11 46.0	1.003	18.6	12 16.0	1.003	18.6	12 46.0	1.003	18.6	13 15.9	1.003	18.5	13 45.9	1.003	18.5	14 15.9	1.003	18.5	14 45.9	1.003	18.5	1
2	11 14.4	1.003	17.6	11 44.4	1.003	17.6	12 14.3	1.003	17.6	12 44.3	1.003	17.6	13 14.3	1.003	17.6	13 44.3	1.003	17.6	14 14.3	1.003	17.5	14 44.3	1.003	17.5	2
3	11 12.8	1.002	16.6	11 42.8	1.002	16.6	12 12.8	1.002	16.6	12 42.8	1.002	16.6	13 12.8	1.002	16.6	13 42.8	1.002	16.6	14 12.8	1.002	16.6	14 42.8	1.002	16.6	3
4	11 11.4	1.002	15.7	11 41.4	1.002	15.7	12 11.4	1.002	15.6	12 41.3	1.002	15.6	13 11.3	1.002	15.6	13 41.3	1.002	15.6	14 11.3	1.002	15.6	14 41.3	1.002	15.6	4
165	11 10.0	1.002	14.7	11 40.0	1.002	14.7	12 10.0	1.002	14.7	12 40.0	1.002	14.7	13 10.0	1.002	14.6	13 40.0	1.002	14.6	14 10.0	1.002	14.6	14 39.9	1.002	14.6	165
6	11 08.7	1.002	13.7	11 38.7	1.002	13.7	12 08.7	1.002	13.7	12 38.7	1.002	13.7	13 08.7	1.002	13.7	13 38.7	1.002	13.7	14 08.7	1.002	13.6	14 38.7	1.002	13.6	6
7	11 07.5	1.002	12.7	11 37.5	1.002	12.7	12 07.5	1.002	12.7	12 37.5	1.002	12.7	13 07.5	1.002	12.7	13 37.5	1.002	12.7	14 07.5	1.002	12.7	14 37.5	1.002	12.7	7
8	11 06.4	1.002	11.8	11 36.4	1.002	11.7	12 06.4	1.002	11.7	12 36.4	1.002	11.7	13 06.4	1.002	11.7	13 36.4	1.002	11.7	14 06.4	1.002	11.7	14 36.4	1.002	11.7	8
9	11 05.4	1.002	10.8	11 35.4	1.002	10.8	12 05.4	1.002	10.8	12 35.4	1.002	10.7	13 05.4	1.002	10.7	13 35.4	1.002	10.7	14 05.4	1.002	10.7	14 35.4	1.002	10.7	9
170	11 04.5	1.001	09.8	11 34.5	1.001	09.8	12 04.5	1.001	09.8	12 34.4	1.001	09.8	13 04.4	1.001	09.8	13 34.4	1.001	09.8	14 04.4	1.001	09.7	14 34.4	1.001	09.7	170
1	11 03.6	1.001	08.8	11 33.6	1.001	08.8	12 03.6	1.001	08.8	12 33.6	1.001	08.8	13 03.6	1.001	08.8	13 33.6	1.001	08.8	14 03.6	1.001	08.8	14 33.6	1.001	08.8	1
2	11 02.9	1.001	07.8	11 32.9	1.001	07.8	12 02.9	1.001	07.8	12 32.8	1.001	07.8	13 02.8	1.001	07.8	13 32.8	1.001	07.8	14 02.8	1.001	07.8	14 32.8	1.001	07.8	2
3	11 02.2	1.001	06.9	11 32.2	1.001	06.8	12 02.2	1.001	06.8	12 32.2	1.001	06.8	13 02.2	1.001	06.8	13 32.2	1.001	06.8	14 02.2	1.001	06.8	14 32.2	1.001	06.8	3
4	11 01.6	1.001	05.9	11 31.6	1.001	05.9	12 01.6	1.001	05.9	12 31.6	1.001	05.9	13 01.6	1.001	05.9	13 31.6	1.001	05.9	14 01.6	1.001	05.8	14 31.6	1.001	05.8	4
175	11 01.1	1.001	04.9	11 31.1	1.001	04.9	12 01.1	1.001	04.9	12 31.1	1.001	04.9	13 01.1	1.001	04.9	13 31.1	1.001	04.9	14 01.1	1.001	04.9	14 31.1	1.001	04.9	175
6	11 00.7	1.001	03.9	11 30.7	1.001	03.9	12 00.7	1.001	03.9	12 30.7	1.001	03.9	13 00.7	1.001	03.9	13 30.7	1.001	03.9	14 00.7	1.001	03.9	14 30.7	1.001	03.9	6
7	11 00.4	1.000	02.9	11 30.4	1.000	02.9	12 00.4	1.000	02.9	12 30.4	1.000	02.9	13 00.4	1.000	02.9	13 30.4	1.000	02.9	14 00.4	1.000	02.9	14 30.4	1.000	02.9	7
8	11 00.2	1.000	02.0	11 30.2	1.000	02.0	12 00.2	1.000	02.0	12 30.2	1.000	02.0	13 00.2	1.000	02.0	13 30.2	1.000	02.0	14 00.2	1.000	01.9	14 30.2	1.000	01.9	8
9	11 00.0	1.000	01.0	11 30.0	1.000	01.0	12 00.0	1.000	01.0	12 30.0	1.000	01.0	13 00.0	1.000	01.0	13 30.0	1.000	01.0	14 00.0	1.000	01.0	14 30.0	1.000	01.0	9
180	11 00.0	1.000	00.0	11 30.0	1.000	00.0	12 00.0	1.000	00.0	12 30.0	1.000	00.0	13 00.0	1.000	00.0	13 30.0	1.000	00.0	14 00.0	1.000	00.0	14 30.0	1.000	00.0	180

Lat. 5°

H.A.	20° 00' Alt. · Ad Δt · Az.	20° 30' Alt. · Ad Δt · Az.	21° 00' Alt. · Ad Δt · Az.	21° 30' Alt. · Ad Δt · Az.	22° 00' Alt. · Ad Δt · Az.	22° 30' Alt. · Ad Δt · Az.	23° 00' Alt. · Ad Δt · Az.	23° 30' Alt. · Ad Δt · Az.	H.A.
00	25 00.0 1.000 180.0	25 30.0 1.000 180.0	26 00.0 1.000 180.0	26 30.0 1.000 180.0	27 00.0 1.000 180.0	27 30.0 1.000 180.0	28 00.0 1.000 180.0	28 30.0 1.000 180.0	00
1	25 00.0 1.000 179.0	25 30.0 1.000 179.0	26 00.0 1.000 179.0	26 30.0 1.000 179.0	27 00.0 1.000 179.0	27 30.0 1.000 179.0	28 00.0 1.000 179.0	28 30.0 1.000 179.0	1
2	24 59.8 1.000 177.9	25 29.8 1.000 177.9	25 59.8 1.000 177.9	26 29.8 1.000 177.9	26 59.8 1.000 177.9	27 29.8 1.000 177.9	27 59.8 1.000 177.9	28 29.8 1.000 177.9	2
3	24 59.6 1.001 176.9	25 29.6 1.000 176.9	25 59.6 1.001 176.9	26 29.6 1.001 176.9	26 59.6 1.001 176.9	27 29.6 1.001 176.9	27 59.6 1.001 176.9	28 29.6 1.001 176.9	3
4	24 59.2 1.001 175.9	25 29.2 1.001 175.8	25 59.2 1.001 175.8	26 29.2 1.001 175.8	26 59.2 1.001 175.8	27 29.2 1.001 175.8	27 59.2 1.001 175.8	28 29.2 1.001 175.8	4
05	24 58.8 1.001 174.8	25 28.8 1.001 174.8	25 58.8 1.001 174.8	26 28.8 1.001 174.8	26 58.8 1.001 174.8	27 28.8 1.001 174.8	27 58.8 1.001 174.8	28 28.8 1.001 174.8	05
6	24 58.3 1.001 173.8	25 28.3 1.001 173.8	25 58.3 1.001 173.8	26 28.3 1.001 173.8	26 58.3 1.001 173.7	27 28.3 1.001 173.7	27 58.3 1.001 173.7	28 28.3 1.001 173.7	6
7	24 57.7 1.001 172.7	25 27.7 1.001 172.7	25 57.7 1.001 172.7	26 27.7 1.001 172.7	26 57.7 1.001 172.7	27 27.7 1.001 172.7	27 57.7 1.001 172.7	28 27.7 1.001 172.7	7
8	24 57.0 1.001 171.7	25 27.0 1.001 171.7	25 57.0 1.001 171.7	26 27.0 1.001 171.7	26 57.0 1.001 171.7	27 27.0 1.001 171.7	27 57.0 1.001 171.7	28 27.0 1.001 171.7	8
9	24 56.2 1.002 170.7	25 26.2 1.001 170.7	25 56.2 1.002 170.7	26 26.2 1.002 170.6	26 56.2 1.002 170.6	27 26.2 1.002 170.6	27 56.2 1.002 170.6	28 26.2 1.002 170.6	9
10	24 55.3 1.002 169.6	25 25.3 1.002 169.6	25 55.3 1.002 169.6	26 25.3 1.002 169.6	26 55.3 1.002 169.6	27 25.3 1.002 169.6	27 55.3 1.002 169.6	28 25.3 1.002 169.6	10
1	24 54.3 1.002 168.6	25 24.3 1.002 168.6	25 54.3 1.002 168.6	26 24.3 1.002 168.6	26 54.3 1.002 168.6	27 24.3 1.002 168.5	27 54.3 1.002 168.5	28 24.3 1.002 168.5	1
2	24 53.2 1.002 167.6	25 23.2 1.002 167.6	25 53.2 1.002 167.5	26 23.2 1.002 167.5	26 53.2 1.002 167.5	27 23.2 1.002 167.5	27 53.2 1.002 167.5	28 23.2 1.002 167.5	2
3	24 52.0 1.002 166.5	25 22.0 1.002 166.5	25 52.0 1.002 166.5	26 22.0 1.002 166.5	26 52.0 1.002 166.5	27 22.0 1.002 166.5	27 52.0 1.002 166.5	28 22.0 1.002 166.4	3
4	24 50.8 1.002 165.5	25 20.8 1.002 165.5	25 50.8 1.002 165.5	26 20.8 1.002 165.5	26 50.7 1.002 165.4	27 20.7 1.002 165.4	27 50.7 1.002 165.4	28 20.7 1.002 165.4	4
15	24 49.4 1.002 164.5	25 19.4 1.002 164.4	25 49.4 1.002 164.4	26 19.4 1.002 164.4	26 49.4 1.002 164.4	27 19.4 1.002 164.4	27 49.4 1.002 164.4	28 19.4 1.002 164.4	15
6	24 48.0 1.003 163.4	25 18.0 1.003 163.4	25 48.0 1.003 163.4	26 17.9 1.003 163.4	26 47.9 1.003 163.4	27 17.9 1.003 163.3	27 47.9 1.003 163.3	28 17.9 1.003 163.3	6
7	24 46.4 1.003 162.4	25 16.4 1.003 162.4	25 46.4 1.003 162.4	26 16.4 1.003 162.3	26 46.4 1.003 162.3	27 16.4 1.003 162.3	27 46.4 1.003 162.3	28 16.4 1.003 162.3	7
8	24 44.8 1.003 161.4	25 14.8 1.003 161.3	25 44.8 1.003 161.3	26 14.8 1.003 161.3	26 44.8 1.003 161.3	27 14.7 1.003 161.3	27 44.7 1.003 161.3	28 14.7 1.003 161.2	8
9	24 43.1 1.003 160.3	25 13.1 1.003 160.3	25 43.1 1.003 160.3	26 13.0 1.003 160.3	26 43.0 1.003 160.2	27 13.0 1.003 160.2	27 43.0 1.003 160.2	28 13.0 1.003 160.2	9
20	24 41.3 1.003 159.3	25 11.3 1.003 159.3	25 41.3 1.003 159.2	26 11.2 1.003 159.2	26 41.2 1.003 159.2	27 11.2 1.003 159.2	27 41.2 1.003 159.2	28 11.2 1.003 159.2	20
1	24 39.4 1.003 158.3	25 09.4 1.003 158.2	25 39.4 1.003 158.2	26 09.3 1.003 158.2	26 39.3 1.003 158.2	27 09.3 1.003 158.2	27 39.3 1.003 158.1	28 09.3 1.003 158.1	1
2	24 37.4 1.003 157.2	25 07.4 1.003 157.2	25 37.4 1.003 157.2	26 07.4 1.003 157.2	26 37.3 1.003 157.1	27 07.3 1.003 157.1	27 37.3 1.003 157.1	28 07.3 1.003 157.1	2
3	24 35.3 1.004 156.2	25 05.3 1.004 156.2	25 35.3 1.004 156.1	26 05.3 1.004 156.1	26 35.3 1.004 156.1	27 05.2 1.004 156.1	27 35.2 1.004 156.1	28 05.2 1.004 156.0	3
4	24 33.2 1.004 155.2	25 03.2 1.004 155.1	25 33.1 1.004 155.1	26 03.1 1.004 155.1	26 33.1 1.004 155.1	27 03.1 1.004 155.0	27 33.0 1.004 155.0	28 03.0 1.004 155.0	4
25	24 31.0 1.004 154.1	25 00.9 1.004 154.1	25 30.9 1.004 154.1	26 00.9 1.004 154.1	26 30.9 1.004 154.0	27 00.8 1.004 154.0	27 30.8 1.004 154.0	28 00.8 1.004 154.0	25
6	24 28.6 1.004 153.1	24 58.6 1.004 153.1	25 28.6 1.004 153.0	25 58.5 1.004 153.0	26 28.5 1.004 153.0	26 58.5 1.004 153.0	27 28.5 1.004 152.9	27 58.4 1.004 152.9	6
7	24 26.2 1.004 152.1	24 56.2 1.004 152.0	25 26.2 1.004 152.0	25 56.1 1.004 152.0	26 26.1 1.004 152.0	26 56.1 1.004 151.9	27 26.0 1.004 151.9	27 56.0 1.004 151.9	7
8	24 23.7 1.004 151.0	24 53.7 1.004 151.0	25 23.7 1.004 151.0	25 53.6 1.004 151.0	26 23.6 1.004 150.9	26 53.6 1.004 150.9	27 23.5 1.004 150.9	27 53.5 1.004 150.8	8
9	24 21.2 1.004 150.0	24 51.1 1.004 150.0	25 21.1 1.004 149.9	25 51.1 1.004 149.9	26 21.0 1.004 149.9	26 51.0 1.004 149.9	27 21.0 1.004 149.8	27 50.9 1.004 149.8	9
30	24 18.5 1.005 149.0	24 48.5 1.005 148.9	25 18.4 1.005 148.9	25 48.4 1.005 148.9	26 18.4 1.005 148.9	26 48.3 1.005 148.8	27 18.3 1.005 148.8	27 48.2 1.005 148.8	30
1	24 15.8 1.005 147.9	24 45.7 1.005 147.9	25 15.7 1.005 147.9	25 45.6 1.005 147.9	26 15.6 1.005 147.8	26 45.6 1.005 147.8	27 15.5 1.005 147.8	27 45.5 1.005 147.7	1
2	24 12.9 1.005 146.9	24 42.9 1.005 146.9	25 12.9 1.005 146.9	25 42.8 1.005 146.8	26 12.8 1.005 146.8	26 42.7 1.005 146.8	27 12.7 1.005 146.7	27 42.7 1.005 146.7	2
3	24 10.0 1.005 145.9	24 40.0 1.005 145.8	25 10.0 1.005 145.8	25 39.9 1.005 145.8	26 09.9 1.005 145.8	26 39.8 1.005 145.7	27 09.8 1.005 145.7	27 39.8 1.005 145.7	3
4	24 07.1 1.005 144.8	24 37.0 1.005 144.8	25 07.0 1.005 144.8	25 36.9 1.005 144.8	26 06.9 1.005 144.7	26 36.9 1.005 144.7	27 06.8 1.005 144.7	27 36.8 1.005 144.6	4
35	24 04.0 1.005 143.8	24 34.0 1.005 143.8	25 03.9 1.005 143.7	25 33.9 1.006 143.7	26 03.8 1.006 143.7	26 33.8 1.006 143.7	27 03.8 1.005 143.6	27 33.7 1.005 143.6	35
6	24 00.9 1.005 142.8	24 30.9 1.005 142.8	25 00.8 1.005 142.7	25 30.8 1.005 142.7	26 00.7 1.005 142.7	26 30.7 1.005 142.6	27 00.6 1.005 142.6	27 30.6 1.005 142.6	6
7	23 57.7 1.005 141.8	24 27.7 1.005 141.7	24 57.6 1.005 141.7	25 27.6 1.005 141.7	25 57.5 1.005 141.6	26 27.5 1.005 141.6	26 57.4 1.005 141.6	27 27.3 1.005 141.5	7
8	23 54.4 1.006 140.7	24 24.4 1.006 140.7	24 54.3 1.006 140.7	25 24.3 1.006 140.6	25 54.2 1.006 140.6	26 24.1 1.006 140.6	26 54.0 1.006 140.5	27 24.1 1.006 140.5	8
9	23 51.1 1.006 139.7	24 21.0 1.006 139.7	24 51.0 1.006 139.6	25 20.9 1.006 139.6	25 50.9 1.006 139.6	26 20.8 1.006 139.5	26 50.8 1.006 139.5	27 20.7 1.006 139.5	9
40	23 47.7 1.006 138.7	24 17.6 1.006 138.7	24 47.6 1.006 138.6	25 17.5 1.006 138.6	25 47.4 1.006 138.6	26 17.4 1.006 138.5	26 47.3 1.006 138.5	27 17.3 1.006 138.4	40
1	23 44.2 1.006 137.7	24 14.1 1.006 137.6	24 44.1 1.006 137.6	25 14.0 1.006 137.6	25 43.9 1.006 137.5	26 13.9 1.006 137.5	26 43.8 1.006 137.5	27 13.8 1.006 137.4	1
2	23 40.6 1.006 136.6	24 10.6 1.006 136.6	24 40.5 1.006 136.6	25 10.4 1.006 136.5	25 40.4 1.006 136.5	26 10.3 1.006 136.5	26 40.3 1.006 136.4	27 10.2 1.006 136.4	2
3	23 37.0 1.006 135.6	24 06.9 1.006 135.6	24 36.9 1.006 135.5	25 06.8 1.006 135.5	25 36.7 1.006 135.5	26 06.7 1.006 135.4	26 36.6 1.006 135.4	27 06.5 1.006 135.4	3
4	23 33.3 1.006 134.6	24 03.2 1.006 134.6	24 33.2 1.006 134.5	25 03.1 1.006 134.5	25 33.0 1.006 134.4	26 03.0 1.006 134.4	26 32.9 1.006 134.4	27 02.8 1.006 134.3	4
45	23 29.6 1.006 133.6	23 59.5 1.006 133.5	24 29.4 1.006 133.5	24 59.3 1.006 133.5	25 29.3 1.006 133.4	25 59.2 1.006 133.4	26 29.1 1.006 133.3	26 59.1 1.006 133.3	45
6	23 25.7 1.006 132.5	23 55.7 1.006 132.5	24 25.6 1.006 132.5	24 55.5 1.006 132.4	25 25.4 1.006 132.4	25 55.4 1.006 132.4	26 25.3 1.006 132.3	26 55.2 1.006 132.3	6
7	23 21.9 1.007 131.5	23 51.8 1.007 131.5	24 21.7 1.007 131.4	24 51.6 1.007 131.4	25 21.6 1.007 131.4	25 51.5 1.007 131.3	26 21.4 1.007 131.3	26 51.3 1.007 131.3	7
8	23 17.9 1.007 130.5	23 47.8 1.007 130.5	24 17.8 1.007 130.4	24 47.7 1.007 130.4	25 17.6 1.007 130.4	25 47.5 1.007 130.3	26 17.4 1.007 130.3	26 47.4 1.007 130.2	8
9	23 13.9 1.007 129.5	23 43.8 1.007 129.4	24 13.7 1.007 129.4	24 43.7 1.007 129.4	25 13.6 1.007 129.3	25 43.5 1.007 129.3	26 13.4 1.007 129.2	26 43.3 1.007 129.2	9
50	23 09.8 1.007 128.5	23 39.8 1.007 128.4	24 09.7 1.007 128.4	24 39.6 1.007 128.3	25 09.5 1.007 128.3	25 39.4 1.007 128.3	26 09.3 1.007 128.2	26 39.3 1.007 128.2	50
1	23 05.7 1.007 127.4	23 35.6 1.007 127.4	24 05.5 1.007 127.4	24 35.5 1.007 127.3	25 05.4 1.007 127.3	25 35.3 1.007 127.2	26 05.2 1.007 127.2	26 35.1 1.007 127.2	1
2	23 01.5 1.007 126.4	23 31.4 1.007 126.4	24 01.4 1.007 126.3	24 31.3 1.007 126.3	25 01.2 1.007 126.3	25 31.1 1.007 126.2	26 01.0 1.007 126.2	26 30.9 1.007 126.1	2
3	22 57.3 1.007 125.4	23 27.2 1.007 125.4	23 57.1 1.007 125.3	24 27.0 1.007 125.3	24 56.9 1.007 125.2	25 26.9 1.007 125.2	25 56.8 1.007 125.2	26 26.7 1.007 125.1	3
4	22 53.0 1.007 124.4	23 22.9 1.007 124.4	23 52.8 1.007 124.3	24 22.7 1.007 124.3	24 52.6 1.007 124.2	25 22.6 1.007 124.2	25 52.5 1.007 124.1	26 22.4 1.007 124.1	4
55	22 48.7 1.007 123.4	23 18.6 1.007 123.3	23 48.5 1.007 123.3	24 18.4 1.007 123.2	24 48.3 1.007 123.2	25 18.2 1.007 123.2	25 48.1 1.007 123.1	26 18.0 1.007 123.1	55
6	22 44.3 1.007 122.4	23 14.2 1.007 122.3	23 44.1 1.007 122.3	24 14.0 1.007 122.2	24 43.9 1.007 122.2	25 13.8 1.007 122.1	25 43.7 1.007 122.1	26 13.6 1.007 122.1	6
7	22 39.8 1.007 121.3	23 09.7 1.007 121.3	23 39.6 1.008 121.3	24 09.5 1.008 121.2	24 39.4 1.008 121.2	25 09.4 1.008 121.1	25 39.3 1.008 121.1	26 09.2 1.008 121.0	7
8	22 35.3 1.008 120.3	23 05.2 1.008 120.3	23 35.1 1.008 120.2	24 05.1 1.008 120.2	24 35.0 1.008 120.2	25 04.9 1.008 120.1	25 34.8 1.008 120.1	26 04.7 1.008 120.0	8
9	22 30.8 1.008 119.3	23 00.7 1.008 119.3	23 30.6 1.008 119.2	24 00.5 1.008 119.2	24 30.4 1.008 119.1	25 00.3 1.008 119.1	25 30.2 1.008 119.0	26 00.1 1.008 119.0	9
60	22 26.2 1.008 118.3	22 56.1 1.008 118.3	23 26.0 1.008 118.2	23 55.9 1.008 118.2	24 25.8 1.008 118.1	24 55.7 1.008 118.1	25 25.6 1.008 118.0	25 55.5 1.008 118.0	60
1	22 21.6 1.008 117.3	22 51.5 1.008 117.2	23 21.4 1.008 117.2	23 51.3 1.008 117.1	24 21.2 1.008 117.1	24 51.1 1.008 117.1	25 21.0 1.008 117.0	25 50.9 1.008 117.0	1
2	22 16.9 1.008 116.3	22 46.8 1.008 116.2	23 16.7 1.008 116.2	23 46.6 1.008 116.1	24 16.5 1.008 116.1	24 46.4 1.008 116.1	25 16.3 1.008 116.0	25 46.2 1.008 116.0	2
3	22 12.2 1.008 115.3	22 42.1 1.008 115.2	23 12.0 1.008 115.2	23 41.9 1.008 115.1	24 11.8 1.008 115.1	24 41.7 1.008 115.0	25 11.6 1.008 115.0	25 41.5 1.008 114.9	3
4	22 07.5 1.008 114.3	22 37.4 1.008 114.2	23 07.3 1.008 114.2	23 37.1 1.008 114.1	24 07.0 1.008 114.1	24 36.9 1.008 114.0	25 06.8 1.008 114.0	25 36.7 1.008 113.9	4
65	22 02.7 1.008 113.2	22 32.6 1.008 113.2	23 02.5 1.008 113.1	23 32.4 1.008 113.1	24 02.2 1.008 113.1	24 32.1 1.008 113.0	25 02.0 1.008 113.0	25 31.9 1.008 112.9	65
6	21 57.9 1.008 112.2	22 27.8 1.008 112.2	22 57.6 1.008 112.1	23 27.5 1.008 112.1	23 57.4 1.008 112.0	24 27.3 1.008 112.0	24 57.2 1.008 112.0	25 27.1 1.008 111.9	6
7	21 53.0 1.008 111.2	22 22.9 1.008 111.2	22 52.8 1.008 111.1	23 22.7 1.008 111.1	23 52.5 1.008 111.0	24 22.4 1.008 111.0	24 52.3 1.008 110.9	25 22.2 1.008 110.9	7
8	21 48.1 1.008 110.2	22 18.0 1.008 110.2	22 47.9 1.008 110.1	23 17.8 1.008 110.1	23 47.7 1.008 110.0	24 17.5 1.008 110.0	24 47.4 1.008 109.9	25 17.3 1.008 109.9	8
9	21 43.2 1.008 109.2	22 13.1 1.008 109.2	22 43.0 1.008 109.1	23 12.8 1.008 109.1	23 42.7 1.008 109.0	24 12.6 1.008 109.0	24 42.5 1.008 108.9	25 12.4 1.008 108.9	9
70	21 38.2 1.008 108.2	22 08.1 1.008 108.2	22 38.0 1.008 108.1	23 07.9 1.008 108.0	23 37.8 1.008 108.0	24 07.6 1.008 108.0	24 37.5 1.008 107.9	25 07.4 1.008 107.9	70
1	21 33.3 1.008 107.2	22 03.1 1.008 107.1	22 33.0 1.008 107.1	23 02.9 1.008 107.1	23 32.8 1.008 107.0	24 02.7 1.008 107.0	24 32.5 1.008 106.9	25 02.4 1.008 106.9	1
2	21 28.2 1.008 106.2	21 58.1 1.008 106.1	22 28.0 1.008 106.1	22 57.9 1.008 106.0	23 27.8 1.008 106.0	23 57.6 1.008 105.9	24 27.5 1.008 105.9	24 57.4 1.008 105.8	2
3	21 23.2 1.008 105.2	21 53.1 1.008 105.1	22 23.0 1.008 105.1	22 52.8 1.008 105.0	23 22.7 1.008 105.0	23 52.6 1.008 104.9	24 22.5 1.008 104.9	24 52.3 1.008 104.8	3
4	21 18.2 1.008 104.2	21 48.0 1.008 104.1	22 17.9 1.008 104.1	22 47.8 1.008 104.0	23 17.7 1.008 104.0	23 47.5 1.008 103.9	24 17.4 1.008 103.9	24 47.3 1.008 103.8	4
75	21 13.1 1.009 103.2	21 43.0 1.009 103.1	22 12.8 1.009 103.1	22 42.7 1.009 103.0	23 12.6 1.009 103.0	23 42.5 1.009 102.9	24 12.3 1.009 102.9	24 42.2 1.009 102.8	75
6	21 08.0 1.009 102.2	21 37.8 1.009 102.1	22 07.7 1.009 102.1	22 37.6 1.009 102.0	23 07.5 1.009 102.0	23 37.3 1.009 101.9	24 07.2 1.009 101.9	24 37.1 1.009 101.8	6
7	21 02.8 1.009 101.2	21 32.7 1.009 101.1	22 02.6 1.009 101.1	22 32.5 1.009 101.0	23 02.3 1.009 101.0	23 32.2 1.009 100.9	24 02.1 1.009 100.9	24 32.0 1.009 100.8	7
8	20 57.7 1.009 100.2	21 27.6 1.009 100.1	21 57.5 1.009 100.1	22 27.4 1.009 100.0	22 57.2 1.009 100.0	23 27.1 1.009 99.9	23 56.9 1.009 99.9	24 26.8 1.009 99.8	8
9	20 52.6 1.009 99.2	21 22.4 1.009 99.1	21 52.3 1.009 99.1	22 22.2 1.009 99.0	22 52.1 1.009 99.0	23 21.9 1.009 98.9	23 51.8 1.009 98.9	24 21.7 1.009 98.8	9
80	20 47.4 1.009 98.2	21 17.3 1.009 98.1	21 47.1 1.009 98.1	22 17.0 1.009 98.0	22 46.9 1.009 98.0	23 16.7 1.009 97.9	23 46.6 1.009 97.9	24 16.5 1.009 97.8	80
1	20 42.2 1.009 97.2	21 12.1 1.009 97.1	21 41.9 1.009 97.1	22 11.8 1.009 97.0	22 41.7 1.009 97.0	23 11.6 1.009 96.9	23 41.4 1.009 96.9	24 11.3 1.009 96.8	1
2	20 37.0 1.009 96.2	21 06.9 1.009 96.1	21 36.8 1.009 96.1	22 06.6 1.009 96.0	22 36.5 1.009 96.0	23 06.4 1.009 95.9	23 36.2 1.009 95.9	24 06.1 1.009 95.8	2
3	20 31.8 1.009 95.2	21 01.7 1.009 95.1	21 31.5 1.009 95.1	22 01.4 1.009 95.0	22 31.3 1.009 95.0	23 01.2 1.009 94.9	23 31.0 1.009 94.9	24 00.9 1.009 94.8	3
4	20 26.6 1.009 94.2	20 56.5 1.009 94.1	21 26.3 1.009 94.1	21 56.2 1.009 94.0	22 26.1 1.009 94.0	22 55.9 1.009 93.9	23 25.8 1.009 93.9	23 55.7 1.009 93.8	4
85	20 21.4 1.009 93.2	20 51.2 1.009 93.1	21 21.1 1.009 93.1	21 51.0 1.009 93.0	22 20.9 1.009 93.0	22 50.7 1.009 92.9	23 20.6 1.009 92.9	23 50.5 1.009 92.8	85
6	20 16.2 1.009 92.2	20 46.0 1.009 92.1	21 15.9 1.009 92.1	21 45.8 1.009 92.0	22 15.6 1.009 92.0	22 45.5 1.009 91.9	23 15.4 1.009 91.9	23 45.2 1.009 91.8	6
7	20 10.9 1.009 91.2	20 40.8 1.009 91.1	21 10.7 1.009 91.1	21 40.5 1.009 91.0	22 10.4 1.009 91.0	22 40.3 1.009 90.9	23 10.1 1.009 90.9	23 40.0 1.009 90.8	7
8	20 05.7 1.009 90.2	20 35.6 1.009 90.1	21 05.4 1.009 90.1	21 35.3 1.009 90.0	22 05.2 1.009 90.0	22 35.0 1.009 89.9	23 04.9 1.009 89.9	23 34.8 1.009 89.8	8
9	20 00.5 1.009 89.2	20 30.3 1.009 89.1	21 00.2 1.009 89.1	21 30.1 1.009 89.0	21 59.9 1.009 89.0	22 29.8 1.009 88.9	22 59.7 1.009 88.9	23 29.5 1.009 88.8	9
90	19 55.2 1.009 88.2	20 25.1 1.009 88.1	20 55.0 1.009 88.1	21 24.8 1.009 88.0	21 54.7 1.009 88.0	22 24.6 1.009 87.9	22 54.4 1.009 87.9	23 24.3 1.009 87.8	90

H.A.	20° 00' Alt. (° ' Δd)	Δt	Az.	20° 30' Alt. (° ' Δd)	Δt	Az.	21° 00' Alt. (° ' Δd)	Δt	Az.	21° 30' Alt. (° ' Δd)	Δt	Az.	22° 00' Alt. (° ' Δd)	Δt	Az.	22° 30' Alt. (° ' Δd)	Δt	Az.	23° 00' Alt. (° ' Δd)	Δt	Az.	23° 30' Alt. (° ' Δd)	Δt	Az.	H.A.
91	19 50.0 1.009		87.2	20 19.9 1.009		87.1	20 49.8 1.009		87.1	21 19.6 1.009		87.0	21 49.5 1.009		87.0	22 19.4 1.009		86.9	22 49.5 1.009		86.9	23 19.1 1.009		86.8	91
2	19 44.8 1.009		86.2	20 14.7 1.009		86.1	20 44.5 1.009		86.1	21 14.4 1.009		86.0	21 44.3 1.009		86.0	22 14.1 1.009		85.9	22 44.0 1.009		85.9	23 13.9 1.009		85.8	2
3	19 39.5 1.009		85.2	20 09.5 1.009		85.2	20 39.3 1.009		85.1	21 09.2 1.009		85.1	21 39.1 1.009		85.0	22 08.9 1.009		85.0	22 38.8 1.009		84.9	23 08.7 1.009		84.8	3
4	19 34.4 1.009		84.2	20 04.2 1.009		84.2	20 34.1 1.009		84.1	21 04.0 1.009		84.1	21 33.9 1.009		84.0	22 03.7 1.009		84.0	22 33.6 1.009		83.9	23 03.5 1.009		83.9	4
95	19 29.2 1.009		83.2	19 59.0 1.009		83.2	20 28.9 1.009		83.1	20 58.8 1.009		83.1	21 28.7 1.009		83.0	21 58.5 1.009		83.0	22 28.4 1.009		82.9	22 58.3 1.009		82.9	95
6	19 24.0 1.009		82.2	19 53.9 1.009		82.2	20 23.7 1.009		82.1	20 53.6 1.009		82.1	21 23.5 1.009		82.0	21 53.3 1.009		82.0	22 23.2 1.009		81.9	22 53.1 1.009		81.9	6
7	19 18.8 1.009		81.2	19 48.7 1.009		81.2	20 18.6 1.009		81.1	20 48.4 1.009		81.1	21 18.3 1.009		81.0	21 48.2 1.009		81.0	22 18.0 1.009		80.9	22 47.9 1.009		80.9	7
8	19 13.7 1.009		80.2	19 43.5 1.009		80.2	20 13.4 1.009		80.1	20 43.3 1.009		80.1	21 13.1 1.009		80.0	21 43.0 1.009		80.0	22 12.9 1.009		79.9	22 42.8 1.009		79.9	8
9	19 08.5 1.000		79.2	19 38.4 1.000		79.2	20 08.3 1.009		79.2	20 38.1 1.009		79.1	21 08.0 1.009		79.1	21 37.9 1.009		79.0	22 07.7 1.009		79.0	22 37.6 1.009		78.9	9
100	19 03.4 1.009		78.3	19 33.3 1.008		78.2	20 03.1 1.009		78.2	20 33.0 1.008		78.1	21 02.9 1.009		78.1	21 32.7 1.008		78.0	22 02.6 1.008		78.0	22 32.5 1.008		77.9	100
1	18 58.3 1.008		77.3	19 28.1 1.008		77.2	19 58.0 1.008		77.2	20 27.9 1.008		77.1	20 57.8 1.008		77.1	21 27.6 1.008		77.0	21 57.5 1.008		77.0	22 27.4 1.008		76.9	1
2	18 53.2 1.008		76.3	19 23.1 1.008		76.2	19 52.9 1.008		76.2	20 22.8 1.008		76.1	20 52.7 1.008		76.1	21 22.6 1.008		76.0	21 52.4 1.008		76.0	22 22.3 1.008		75.9	2
3	18 48.1 1.008		75.3	19 18.0 1.008		75.2	19 47.9 1.008		75.2	20 17.7 1.008		75.1	20 47.6 1.008		75.1	21 17.5 1.008		75.0	21 47.4 1.008		75.0	22 17.2 1.008		75.0	3
4	18 43.1 1.008		74.3	19 12.9 1.008		74.3	19 42.8 1.008		74.2	20 12.7 1.008		74.2	20 42.6 1.008		74.1	21 12.5 1.008		74.1	21 42.3 1.008		74.0	22 12.2 1.008		74.0	4
105	18 38.0 1.008		73.3	19 07.9 1.008		73.3	19 37.8 1.008		73.2	20 07.7 1.008		73.2	20 37.6 1.008		73.1	21 07.4 1.008		73.1	21 37.3 1.008		73.0	22 07.2 1.008		73.0	105
6	18 33.0 1.008		72.3	19 02.9 1.008		72.3	19 32.8 1.008		72.2	20 02.7 1.008		72.2	20 32.6 1.008		72.1	21 02.4 1.008		72.1	21 32.3 1.008		72.0	22 02.2 1.008		72.0	6
7	18 28.1 1.008		71.3	18 58.0 1.008		71.3	19 27.8 1.008		71.2	19 57.7 1.008		71.2	20 27.6 1.008		71.2	20 57.5 1.008		71.1	21 27.4 1.008		71.1	21 57.2 1.008		71.0	7
8	18 23.1 1.008		70.4	18 53.0 1.008		70.3	19 22.9 1.008		70.3	19 52.8 1.008		70.2	20 22.7 1.008		70.2	20 52.6 1.008		70.1	21 22.4 1.008		70.1	21 52.3 1.008		70.0	8
9	18 18.2 1.008		69.4	18 48.1 1.008		69.3	19 18.0 1.008		69.3	19 47.9 1.008		69.2	20 17.8 1.008		69.2	20 47.6 1.008		69.1	21 17.5 1.008		69.1	21 47.4 1.008		69.0	9
110	18 13.3 1.008		68.4	18 43.2 1.008		68.3	19 13.1 1.008		68.3	19 43.0 1.008		68.2	20 12.9 1.008		68.2	20 42.8 1.008		68.2	21 12.7 1.008		68.1	21 42.5 1.008		68.1	110
1	18 08.5 1.008		67.4	18 38.4 1.008		67.3	19 08.3 1.008		67.3	19 38.2 1.008		67.3	20 08.1 1.008		67.2	20 37.9 1.008		67.2	21 07.8 1.008		67.1	21 37.7 1.008		67.1	1
2	18 03.7 1.008		66.4	18 33.6 1.008		66.4	19 03.5 1.008		66.3	19 33.4 1.008		66.3	20 03.3 1.008		66.2	20 33.1 1.008		66.2	21 03.0 1.008		66.1	21 32.9 1.008		66.1	2
3	17 58.9 1.008		65.4	18 28.8 1.008		65.4	18 58.7 1.008		65.3	19 28.6 1.008		65.3	19 58.5 1.008		65.2	20 28.4 1.008		65.2	20 58.3 1.008		65.2	21 28.2 1.008		65.1	3
4	17 54.2 1.008		64.4	18 24.1 1.008		64.4	18 54.0 1.008		64.4	19 23.9 1.008		64.3	19 53.8 1.008		64.3	20 23.6 1.008		64.2	20 53.5 1.008		64.2	21 23.4 1.008		64.1	4
115	17 49.5 1.008		63.5	18 19.4 1.008		63.4	18 49.3 1.008		63.4	19 19.2 1.008		63.3	19 49.1 1.008		63.3	20 19.0 1.008		63.2	20 48.9 1.008		63.2	21 18.7 1.008		63.1	115
6	17 44.8 1.008		62.5	18 14.7 1.008		62.4	18 44.6 1.008		62.4	19 14.5 1.008		62.3	19 44.4 1.008		62.3	20 14.3 1.008		62.3	20 44.2 1.008		62.2	21 14.1 1.008		62.2	6
7	17 40.2 1.008		61.5	18 10.1 1.008		61.4	18 40.0 1.008		61.4	19 09.9 1.008		61.4	19 39.8 1.008		61.3	20 09.7 1.008		61.3	20 39.6 1.008		61.2	21 09.5 1.008		61.2	7
8	17 35.6 1.008		60.5	18 05.5 1.008		60.5	18 35.4 1.008		60.4	19 05.3 1.008		60.4	19 35.2 1.008		60.3	20 05.1 1.008		60.3	20 35.0 1.008		60.2	21 04.9 1.008		60.2	8
9	17 31.1 1.007		59.5	18 01.0 1.007		59.5	18 30.9 1.007		59.4	19 00.8 1.007		59.4	19 30.7 1.007		59.4	20 00.6 1.007		59.3	20 30.5 1.007		59.3	21 00.4 1.007		59.2	9
120	17 26.6 1.007		58.5	17 56.5 1.007		58.5	18 26.4 1.007		58.5	18 56.3 1.007		58.4	19 26.2 1.007		58.4	19 56.1 1.007		58.3	20 26.0 1.007		58.3	20 56.0 1.007		58.2	120
1	17 22.2 1.007		57.6	17 52.1 1.007		57.5	18 22.0 1.007		57.5	18 51.9 1.007		57.4	19 21.8 1.007		57.4	19 51.7 1.007		57.4	20 21.6 1.007		57.3	20 51.5 1.007		57.3	1
2	17 17.8 1.007		56.6	17 47.7 1.007		56.5	18 17.6 1.007		56.5	18 47.5 1.007		56.5	19 17.4 1.007		56.4	19 47.3 1.007		56.4	20 17.2 1.007		56.3	20 47.2 1.007		56.3	2
3	17 13.5 1.007		55.6	17 43.4 1.007		55.6	18 13.3 1.007		55.5	18 43.2 1.007		55.5	19 13.1 1.007		55.4	19 43.0 1.007		55.4	20 12.9 1.007		55.4	20 42.8 1.007		55.3	3
4	17 09.2 1.007		54.6	17 39.1 1.007		54.6	18 09.0 1.007		54.5	18 38.9 1.007		54.5	19 08.8 1.007		54.5	19 38.7 1.007		54.4	20 08.6 1.007		54.4	20 38.6 1.007		54.3	4
125	17 04.9 1.007		53.6	17 34.8 1.007		53.6	18 04.8 1.007		53.6	18 34.7 1.007		53.5	19 04.6 1.007		53.5	19 34.5 1.007		53.4	20 04.4 1.007		53.4	20 34.3 1.007		53.4	125
6	17 00.7 1.007		52.7	17 30.7 1.007		52.6	18 00.6 1.007		52.6	18 30.5 1.007		52.5	19 00.4 1.007		52.5	19 30.3 1.007		52.5	20 00.2 1.007		52.4	20 30.2 1.007		52.4	6
7	16 56.6 1.007		51.7	17 26.5 1.007		51.6	17 56.5 1.007		51.6	18 26.4 1.007		51.6	18 56.3 1.007		51.5	19 26.2 1.007		51.5	19 56.1 1.007		51.4	20 26.0 1.007		51.4	7
8	16 52.5 1.007		50.7	17 22.4 1.007		50.7	17 52.4 1.007		50.6	18 22.3 1.007		50.6	18 52.2 1.007		50.5	19 22.1 1.007		50.5	19 52.1 1.007		50.5	20 22.0 1.007		50.4	8
9	16 48.5 1.007		49.7	17 18.4 1.007		49.7	17 48.4 1.007		49.6	18 18.3 1.007		49.6	18 48.2 1.007		49.6	19 18.1 1.007		49.5	19 48.1 1.007		49.5	20 18.0 1.007		49.5	9
130	16 44.6 1.006		48.7	17 14.5 1.006		48.7	17 44.4 1.006		48.7	18 14.3 1.006		48.6	18 44.3 1.006		48.6	19 14.2 1.006		48.6	19 44.1 1.006		48.5	20 14.0 1.006		48.5	130
1	16 40.7 1.006		47.8	17 10.6 1.006		47.7	17 40.5 1.006		47.7	18 10.4 1.006		47.7	18 40.4 1.006		47.6	19 10.3 1.006		47.6	19 40.2 1.006		47.5	20 10.2 1.006		47.5	1
2	16 36.8 1.006		46.8	17 06.8 1.006		46.7	17 36.7 1.006		46.7	18 06.6 1.006		46.7	18 36.5 1.006		46.6	19 06.5 1.006		46.6	19 36.4 1.006		46.6	20 06.3 1.006		46.5	2
3	16 33.0 1.006		45.8	17 03.0 1.006		45.8	17 32.9 1.006		45.7	18 02.8 1.006		45.7	18 32.8 1.006		45.7	19 02.7 1.006		45.6	19 32.6 1.006		45.6	20 02.6 1.006		45.6	3
4	16 29.3 1.006		44.8	16 59.3 1.006		44.8	17 29.2 1.006		44.8	17 59.1 1.006		44.7	18 29.1 1.006		44.7	18 59.0 1.006		44.7	19 28.9 1.006		44.6	19 58.9 1.006		44.6	4
135	16 25.7 1.006		43.8	16 55.6 1.006		43.8	17 25.5 1.006		43.8	17 55.5 1.006		43.7	18 25.4 1.006		43.7	18 55.4 1.006		43.7	19 25.3 1.006		43.6	19 55.2 1.006		43.6	135
6	16 22.1 1.006		42.9	16 52.0 1.006		42.8	17 22.0 1.006		42.8	17 51.9 1.006		42.8	18 21.8 1.006		42.7	18 51.8 1.006		42.7	19 21.7 1.006		42.7	19 51.7 1.006		42.6	6
7	16 18.6 1.006		41.9	16 48.5 1.006		41.9	17 18.4 1.006		41.8	17 48.4 1.006		41.8	18 18.3 1.006		41.8	18 48.3 1.006		41.8	19 18.2 1.006		41.7	19 48.1 1.006		41.7	7
8	16 15.1 1.006		40.9	16 45.0 1.006		40.9	17 15.0 1.006		40.9	17 44.9 1.006		40.8	18 14.9 1.006		40.8	18 44.8 1.006		40.8	19 14.8 1.006		40.7	19 44.7 1.006		40.7	8
9	16 11.7 1.006		39.9	16 41.7 1.006		39.9	17 11.6 1.006		39.9	17 41.5 1.006		39.8	18 11.5 1.006		39.8	18 41.4 1.006		39.8	19 11.4 1.006		39.8	19 41.3 1.006		39.7	9
140	16 08.4 1.005		39.0	16 38.3 1.005		38.9	17 08.3 1.005		38.9	17 38.2 1.005		38.9	18 08.2 1.005		38.8	18 38.1 1.005		38.8	19 08.1 1.005		38.8	19 38.0 1.005		38.7	140
1	16 05.1 1.005		38.0	16 35.1 1.005		38.0	17 05.0 1.005		37.9	17 35.0 1.005		37.9	18 04.9 1.005		37.9	18 34.9 1.005		37.8	19 04.8 1.005		37.8	19 34.8 1.005		37.8	1
2	16 01.9 1.005		37.0	16 31.9 1.005		37.0	17 01.9 1.005		37.0	17 31.8 1.005		36.9	18 01.8 1.005		36.9	18 31.7 1.005		36.9	19 01.7 1.005		36.8	19 31.6 1.005		36.8	2
3	15 58.8 1.005		36.0	16 28.8 1.005		36.0	16 58.7 1.005		36.0	17 28.7 1.005		35.9	17 58.7 1.005		35.9	18 28.6 1.005		35.9	18 58.6 1.005		35.9	19 28.5 1.005		35.8	3
4	15 55.8 1.005		35.1	16 25.7 1.005		35.0	16 55.7 1.005		35.0	17 25.7 1.005		35.0	17 55.6 1.005		34.9	18 25.6 1.005		34.9	18 55.5 1.005		34.9	19 25.5 1.005		34.9	4
145	15 52.8 1.005		34.1	16 22.8 1.005		34.1	16 52.7 1.005		34.0	17 22.7 1.005		34.0	17 52.7 1.005		34.0	18 22.6 1.005		33.9	18 52.6 1.005		33.9	19 22.5 1.005		33.9	145
6	15 49.9 1.005		33.1	16 19.9 1.005		33.1	16 49.9 1.005		33.1	17 19.8 1.005		33.0	17 49.8 1.005		33.0	18 19.7 1.005		33.0	18 49.7 1.005		32.9	19 19.7 1.005		32.9	6
7	15 47.1 1.005		32.1	16 17.1 1.005		32.1	16 47.0 1.005		32.1	17 17.0 1.005		32.1	17 47.0 1.005		32.0	18 16.9 1.005		32.0	18 46.9 1.005		32.0	19 16.9 1.005		31.9	7
8	15 44.4 1.004		31.2	16 14.3 1.004		31.1	16 44.3 1.004		31.1	17 14.3 1.004		31.1	17 44.2 1.004		31.1	18 14.2 1.004		31.0	18 44.2 1.004		31.0	19 14.1 1.004		31.0	8
9	15 41.7 1.004		30.2	16 11.7 1.004		30.2	16 41.6 1.004		30.1	17 11.6 1.004		30.1	17 41.6 1.004		30.1	18 11.5 1.004		30.1	18 41.5 1.004		30.0	19 11.5 1.004		30.0	9
150	15 39.1 1.004		29.2	16 09.1 1.004		29.2	16 39.1 1.004		29.2	17 09.0 1.004		29.1	17 39.0 1.004		29.1	18 09.0 1.004		29.1	18 38.9 1.004		29.1	19 08.9 1.004		29.0	150
1	15 36.6 1.004		28.2	16 06.6 1.004		28.2	16 36.5 1.004		28.2	17 06.5 1.004		28.2	17 36.5 1.004		28.1	18 06.5 1.004		28.1	18 36.4 1.004		28.1	19 06.4 1.004		28.1	1
2	15 34.2 1.004		27.3	16 04.1 1.004		27.2	16 34.1 1.004		27.2	17 04.1 1.004		27.2	17 34.1 1.004		27.2	18 04.0 1.004		27.1	18 34.0 1.004		27.1	19 04.0 1.004		27.1	2
3	15 31.8 1.004		26.3	16 01.8 1.004		26.3	16 31.8 1.004		26.2	17 01.7 1.004		26.2	17 31.7 1.004		26.2	18 01.7 1.004		26.2	18 31.7 1.004		26.2	19 01.6 1.004		26.1	3
4	15 29.5 1.004		25.3	15 59.5 1.004		25.3	16 29.5 1.004		25.3	16 59.5 1.004		25.2	17 29.4 1.004		25.2	17 59.4 1.004		25.2	18 29.4 1.004		25.2	18 59.4 1.004		25.2	4
155	15 27.3 1.004		24.3	15 57.3 1.004		24.3	16 27.3 1.004		24.3	16 57.3 1.004		24.3	17 27.3 1.004		24.3	17 57.2 1.004		24.2	18 27.2 1.004		24.2	18 57.2 1.004		24.2	155
6	15 25.2 1.003		23.4	15 55.2 1.003		23.3	16 25.2 1.003		23.3	16 55.2 1.003		23.3	17 25.1 1.003		23.3	17 55.1 1.003		23.3	18 25.1 1.003		23.2	18 55.1 1.003		23.2	6
7	15 23.2 1.003		22.4	15 53.2 1.003		22.4	16 23.2 1.003		22.3	16 53.1 1.003		22.3	17 23.1 1.003		22.3	17 53.1 1.003		22.3	18 23.1 1.003		22.3	18 53.1 1.003		22.3	7
8	15 21.2 1.003		21.4	15 51.2 1.003		21.4	16 21.2 1.003		21.4	16 51.2 1.003		21.4	17 21.2 1.003		21.4	17 51.2 1.003		21.3	18 21.1 1.003		21.3	18 51.1 1.003		21.3	8
9	15 19.4 1.003		20.4	15 49.4 1.003		20.4	16 19.3 1.003		20.4	16 49.3 1.003		20.4	17 19.3 1.003		20.4	17 49.3 1.003		20.4	18 19.3 1.003		20.3	18 49.3 1.003		20.3	9
160	15 17.6 1.003		19.5	15 47.6 1.003		19.4	16 17.6 1.003		19.4	16 47.5 1.003		19.4	17 17.5 1.003		19.4	17 47.5 1.003		19.4	18 17.5 1.003		19.4	18 47.5 1.003		19.3	160
1	15 15.9 1.003		18.5	15 45.9 1.003		18.5	16 15.9 1.003		18.5	16 45.9 1.003		18.4	17 15.8 1.003		18.4	17 45.8 1.003		18.4	18 15.8 1.003		18.4	18 45.8 1.003		18.4	1
2	15 14.3 1.003		17.5	15 44.3 1.003		17.5	16 14.2 1.003		17.5	16 44.2 1.003		17.5	17 14.2 1.003		17.5	17 44.2 1.003		17.4	18 14.2 1.003		17.4	18 44.2 1.003		17.4	2
3	15 12.7 1.002		16.5	15 42.7 1.002		16.5	16 12.7 1.002		16.5	16 42.7 1.002		16.5	17 12.7 1.002		16.5	17 42.7 1.002		16.5	18 12.7 1.002		16.5	18 42.7 1.002		16.4	3
4	15 11.1 1.002		15.6	15 41.1 1.002		15.5	16 11.3 1.002		15.5	16 41.1 1.002		15.5	17 11.1 1.002		15.5	17 41.1 1.002		15.5	18 11.2 1.002		15.5	18 41.1 1.002		15.5	4
165	15 09.9 1.002		14.6	15 39.9 1.002		14.6	16 09.9 1.002		14.6	16 39.9 1.002		14.6	17 09.9 1.002		14.5	17 39.9 1.002		14.5	18 09.9 1.002		14.5	18 39.9 1.002		14.5	165
6	15 08.7 1.002		13.6	15 38.7 1.002		13.6	16 08.6 1.002		13.6	16 38.6 1.002		13.6	17 08.6 1.002		13.6	17 38.6 1.002		13.6	18 08.6 1.002		13.6	18 38.6 1.002		13.5	6
7	15 07.5 1.002		12.6	15 37.5 1.002		12.6	16 07.5 1.002		12.6	16 37.5 1.002		12.6	17 07.4 1.002		12.6	17 37.4 1.002		12.6	18 07.4 1.002		12.6	18 37.4 1.002		12.6	7
8	15 06.4 1.002		11.7	15 36.4 1.002		11.7	16 06.4 1.002		11.7	16 36.4 1.002		11.6	17 06.3 1.002		11.6	17 36.3 1.002		11.6	18 06.3 1.002		11.6	18 36.3 1.002		11.6	8
9	15 05.4 1.002		10.7	15 35.4 1.002		10.7	16 05.3 1.002		10.7	16 35.3 1.002		10.7	17 05.3 1.002		10.7	17 35.3 1.002		10.7	18 05.3 1.002		10.7	18 35.3 1.002		10.6	9
170	15 04.4 1.001		09.7	15 34.4 1.001		09.7	16 04.4 1.001		09.7	16 34.4 1.001		09.7	17 04.4 1.001		09.7	17 34.4 1.001		09.7	18 04.4 1.001		09.7	18 34.4 1.001		09.7	170
1	15 03.6 1.001		08.8	15 33.6 1.001		08.7	16 03.6 1.001		08.7	16 33.6 1.001		08.7	17 03.6 1.001		08.7	17 33.6 1.001		08.7	18 03.6 1.001		08.7	18 33.6 1.001		08.7	1
2	15 02.8 1.001		07.8	15 32.8 1.001		07.8	16 02.8 1.001		07.8	16 32.8 1.001		07.8	17 02.8 1.001		07.8	17 32.8 1.001		07.8	18 02.8 1.001		07.7	18 32.8 1.001		07.7	2
3	15 02.2 1.001		06.8	15 32.2 1.001		06.8	16 02.2 1.001		06.8	16 32.2 1.001		06.8	17 02.2 1.001		06.8	17 32.2 1.001		06.8	18 02.2 1.001		06.8	18 32.2 1.001		06.8	3
4	15 01.6 1.001		05.8	15 31.6 1.001		05.8	16 01.6 1.001		05.8	16 31.6 1.001		05.8	17 01.6 1.001		05.8	17 31.6 1.001		05.8	18 01.6 1.001		05.8	18 31.6 1.001		05.8	4
175	15 01.1 1.001		04.9	15 31.1 1.001		04.9	16 01.1 1.001		04.9	16 31.1 1.001		04.9	17 01.1 1.001		04.8	17 31.1 1.001		04.8	18 01.1 1.001		04.8	18 31.1 1.001		04.8	175
6	15 00.7 1.001		03.9	15 30.7 1.001		03.9	16 00.7 1.001		03.9	16 30.7 1.000		03.9	17 00.7 1.000		03.9	17 30.7 1.000		03.9	18 00.7 1.000		03.9	18 30.7 1.000		03.9	6
7	15 00.4 1.000		02.9	15 30.4 1.000		02.9	16 00.4 1.000		02.9	16 30.4 1.000		02.9	17 00.4 1.000		02.9	17 30.4 1.000		02.9	18 00.4 1.000		02.9	18 30.4 1.000		02.9	7
8	15 00.2 1.000		01.9	15 30.2 1.000		01.9	16 00.2 1.000		01.9	16 30.2 1.000		01.9	17 00.2 1.000		01.9	17 30.2 1.000		01.9	18 00.2 1.000		01.9	18 30.2 1.000		01.9	8
9	15 00.1 1.000		01.0	15 30.1 1.000		01.0	16 00.1 1.000		01.0	16 30.1 1.000		01.0	17 00.1 1.000		01.0	17 30.1 1.000		01.0	18 00.1 1.000		01.0	18 30.1 1.000		01.0	9
180	15 00.0 1.000		00.0	15 30.0 1.000		00.0	16 00.0 1.000		00.0	16 30.0 1.000		00.0	17 00.0 1.000		00.0	17 30.0 1.000		00.0	18 00.0 1.000		00.0	18 30.0 1.000		00.0	180

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H.A.	24° 00′ Alt. / Δd Δt / Az.	24° 30′ Alt. / Δd Δt / Az.	25° 00′ Alt. / Δd Δt / Az.	25° 30′ Alt. / Δd Δt / Az.	26° 00′ Alt. / Δd Δt / Az.	26° 30′ Alt. / Δd Δt / Az.	27° 00′ Alt. / Δd Δt / Az.	27° 30′ Alt. / Δd Δt / Az.	H.A.
00	29 00.0 1.000 180.0	29 30.0 1.000 180.0	30 00.0 1.000 180.0	30 30.0 1.000 180.0	31 00.0 1.000 180.0	31 30.0 1.000 180.0	32 00.0 1.000 180.0	32 30.0 1.000 180.0	00
1	29 00.0 1.000 179.0	29 30.0 1.000 179.0	30 00.0 1.000 179.0	30 30.0 1.000 179.0	31 00.0 1.000 179.0	31 30.0 1.000 179.0	32 00.0 1.000 178.9	32 30.0 1.000 178.9	1
2	28 59.8 1.000 177.9	29 29.8 1.000 177.9	29 59.8 1.000 177.9	30 29.8 1.000 177.9	30 59.8 1.000 177.9	31 29.8 1.000 177.9	31 59.8 1.000 177.9	32 29.8 1.000 177.9	2
3	28 59.6 1.001 176.9	29 29.6 1.001 176.9	29 59.6 1.001 176.9	30 29.6 1.001 176.9	30 59.6 1.001 176.9	31 29.6 1.001 176.9	31 59.6 1.001 176.8	32 29.6 1.001 176.8	3
4	28 59.2 1.001 175.8	29 29.2 1.001 175.8	29 59.2 1.001 175.8	30 29.2 1.001 175.8	30 59.2 1.001 175.8	31 29.2 1.001 175.8	31 59.2 1.001 175.8	32 29.2 1.001 175.8	4
05	28 58.8 1.001 174.8	29 28.8 1.001 174.8	29 58.8 1.001 174.8	30 28.8 1.001 174.8	30 58.8 1.001 174.8	31 28.8 1.001 174.8	31 58.8 1.001 174.7	32 28.8 1.001 174.7	05
6	28 58.3 1.001 173.7	29 28.3 1.001 173.7	29 58.3 1.001 173.7	30 28.3 1.001 173.7	30 58.3 1.001 173.7	31 28.3 1.001 173.7	31 58.3 1.001 173.7	32 28.3 1.001 173.7	6
7	28 57.7 1.001 172.7	29 27.7 1.001 172.7	29 57.7 1.001 172.7	30 27.7 1.001 172.7	30 57.7 1.001 172.7	31 27.7 1.001 172.7	31 57.7 1.001 172.6	32 27.7 1.001 172.6	7
8	28 57.0 1.001 171.6	29 27.0 1.001 171.6	29 57.0 1.001 171.6	30 27.0 1.001 171.6	30 56.9 1.001 171.6	31 26.9 1.001 171.6	31 56.9 1.001 171.6	32 26.9 1.001 171.6	8
9	28 56.1 1.002 170.6	29 26.1 1.002 170.6	29 56.1 1.002 170.6	30 26.1 1.002 170.6	30 56.1 1.002 170.6	31 26.1 1.002 170.6	31 56.1 1.002 170.5	32 26.1 1.002 170.5	9
10	28 55.2 1.002 169.6	29 25.2 1.002 169.5	29 55.2 1.002 169.5	30 25.2 1.002 169.5	30 55.2 1.002 169.5	31 25.2 1.002 169.5	31 55.2 1.002 169.5	32 25.2 1.002 169.5	10
1	28 54.3 1.002 168.5	29 24.2 1.002 168.5	29 54.2 1.002 168.5	30 24.2 1.002 168.5	30 54.2 1.002 168.5	31 24.2 1.002 168.5	31 54.2 1.002 168.4	32 24.2 1.002 168.4	1
2	28 53.2 1.002 167.5	29 23.1 1.002 167.5	29 53.1 1.002 167.4	30 23.1 1.002 167.4	30 53.1 1.002 167.4	31 23.1 1.002 167.4	31 53.1 1.002 167.4	32 23.1 1.002 167.4	2
3	28 52.0 1.002 166.4	29 22.0 1.002 166.4	29 52.0 1.002 166.4	30 22.0 1.002 166.4	30 52.0 1.002 166.4	31 21.9 1.002 166.3	31 51.9 1.002 166.3	32 21.9 1.002 166.3	3
4	28 50.7 1.002 165.4	29 20.7 1.002 165.4	29 50.7 1.002 165.4	30 20.7 1.002 165.3	30 50.7 1.002 165.3	31 20.7 1.002 165.3	31 50.7 1.002 165.3	32 20.6 1.002 165.3	4
15	28 49.3 1.002 164.3	29 19.3 1.002 164.3	29 49.3 1.002 164.3	30 19.3 1.002 164.3	30 49.3 1.002 164.3	31 19.3 1.002 164.3	31 49.3 1.002 164.3	32 19.3 1.002 164.2	15
6	28 47.9 1.003 163.3	29 17.9 1.003 163.3	29 47.9 1.003 163.3	30 17.9 1.003 163.3	30 47.8 1.003 163.2	31 17.8 1.003 163.2	31 47.8 1.003 163.2	32 17.8 1.003 163.2	6
7	28 46.3 1.003 162.2	29 16.3 1.003 162.2	29 46.3 1.003 162.2	30 16.3 1.003 162.2	30 46.3 1.003 162.2	31 16.3 1.003 162.2	31 46.3 1.003 162.2	32 16.2 1.003 162.1	7
8	28 44.7 1.003 161.2	29 14.7 1.003 161.2	29 44.7 1.003 161.2	30 14.7 1.003 161.2	30 44.6 1.003 161.1	31 14.6 1.003 161.1	31 44.6 1.003 161.1	32 14.6 1.003 161.1	8
9	28 43.0 1.003 160.2	29 13.0 1.003 160.2	29 42.9 1.003 160.1	30 12.9 1.003 160.1	30 42.9 1.003 160.1	31 12.9 1.003 160.1	31 42.9 1.003 160.1	32 12.9 1.003 160.0	9
20	28 41.2 1.003 159.1	29 11.1 1.003 159.1	29 41.1 1.003 159.1	30 11.1 1.003 159.1	30 41.1 1.003 159.1	31 11.1 1.003 159.0	31 41.0 1.003 159.0	32 11.0 1.003 159.0	20
1	28 39.2 1.003 158.1	29 09.2 1.003 158.1	29 39.2 1.003 158.1	30 09.2 1.003 158.0	30 39.2 1.003 158.0	31 09.2 1.003 158.0	31 39.1 1.003 158.0	32 09.1 1.003 157.9	1
2	28 37.3 1.003 157.1	29 07.2 1.003 157.0	29 37.2 1.003 157.0	30 07.2 1.003 157.0	30 37.2 1.003 157.0	31 07.1 1.003 156.9	31 37.1 1.003 156.9	32 07.1 1.003 156.9	2
3	28 35.2 1.004 156.0	29 05.1 1.004 156.0	29 35.1 1.004 156.0	30 05.1 1.004 155.9	30 35.1 1.004 155.9	31 05.1 1.004 155.9	31 35.0 1.004 155.9	32 05.0 1.004 155.9	3
4	28 33.0 1.004 155.0	29 03.0 1.004 155.0	29 33.0 1.004 154.9	30 02.9 1.004 154.9	30 32.9 1.004 154.9	31 02.9 1.004 154.9	31 32.9 1.004 154.8	32 02.8 1.004 154.8	4
25	28 30.7 1.004 153.9	29 00.7 1.004 153.9	29 30.7 1.004 153.9	30 00.7 1.004 153.9	30 30.6 1.004 153.8	31 00.6 1.004 153.8	31 30.6 1.004 153.8	32 00.6 1.004 153.8	25
6	28 28.4 1.004 152.9	28 58.4 1.004 152.9	29 28.4 1.004 152.8	29 58.3 1.004 152.8	30 28.3 1.004 152.8	30 58.3 1.004 152.7	31 28.2 1.004 152.7	31 58.2 1.004 152.7	6
7	28 26.0 1.004 151.9	28 56.0 1.004 151.8	29 25.9 1.004 151.8	29 55.9 1.004 151.8	30 25.9 1.004 151.8	30 55.8 1.004 151.7	31 25.8 1.004 151.7	31 55.8 1.004 151.7	7
8	28 23.5 1.004 150.8	28 53.4 1.004 150.8	29 23.4 1.004 150.8	29 53.4 1.004 150.7	30 23.3 1.004 150.7	30 53.3 1.004 150.7	31 23.3 1.004 150.7	31 53.2 1.004 150.6	8
9	28 20.9 1.004 149.8	28 50.8 1.004 149.8	29 20.8 1.004 149.7	29 50.8 1.004 149.7	30 20.7 1.004 149.7	30 50.7 1.004 149.6	31 20.7 1.004 149.6	31 50.6 1.004 149.6	9
30	28 18.2 1.005 148.7	28 48.1 1.005 148.7	29 18.1 1.005 148.7	29 48.1 1.005 148.7	30 18.1 1.005 148.6	30 48.0 1.005 148.6	31 18.0 1.005 148.6	31 47.9 1.005 148.5	30
1	28 15.4 1.005 147.7	28 45.4 1.005 147.7	29 15.4 1.005 147.7	29 45.3 1.005 147.6	30 15.3 1.005 147.6	30 45.3 1.005 147.6	31 15.2 1.005 147.5	31 45.2 1.005 147.5	1
2	28 12.6 1.005 146.7	28 42.6 1.005 146.6	29 12.5 1.005 146.6	29 42.5 1.005 146.6	30 12.5 1.005 146.6	30 42.4 1.005 146.5	31 12.4 1.005 146.5	31 42.3 1.005 146.5	2
3	28 09.7 1.005 145.6	28 39.7 1.005 145.6	29 09.6 1.005 145.6	29 39.6 1.005 145.5	30 09.5 1.005 145.5	30 39.5 1.005 145.5	31 09.4 1.005 145.5	31 39.4 1.005 145.4	3
4	28 06.7 1.005 144.6	28 36.7 1.005 144.6	29 06.6 1.005 144.5	29 36.6 1.005 144.5	30 06.5 1.005 144.5	30 36.5 1.005 144.4	31 06.4 1.005 144.4	31 36.4 1.005 144.4	4
35	28 03.7 1.005 143.6	28 33.6 1.005 143.5	29 03.6 1.005 143.5	29 33.5 1.005 143.5	30 03.5 1.005 143.4	30 33.4 1.005 143.4	31 03.4 1.005 143.4	31 33.3 1.005 143.3	35
6	28 00.5 1.005 142.5	28 30.5 1.005 142.5	29 00.4 1.005 142.5	29 30.4 1.005 142.4	30 00.3 1.005 142.4	30 30.3 1.005 142.4	31 00.2 1.005 142.3	31 30.1 1.005 142.3	6
7	27 57.3 1.006 141.5	28 27.2 1.006 141.5	28 57.2 1.005 141.4	29 27.1 1.006 141.4	29 57.1 1.006 141.4	30 27.0 1.006 141.3	30 57.0 1.006 141.3	31 26.9 1.006 141.3	7
8	27 54.0 1.006 140.5	28 23.9 1.006 140.4	28 53.9 1.006 140.4	29 23.8 1.006 140.4	29 53.8 1.006 140.3	30 23.7 1.006 140.3	30 53.7 1.006 140.3	31 23.6 1.006 140.2	8
9	27 50.6 1.006 139.4	28 20.6 1.006 139.4	28 50.5 1.006 139.4	29 20.5 1.006 139.3	29 50.4 1.006 139.3	30 20.3 1.006 139.3	30 50.3 1.006 139.2	31 20.2 1.006 139.2	9
40	27 47.2 1.006 138.4	28 17.1 1.006 138.4	28 47.1 1.006 138.3	29 17.0 1.006 138.3	29 47.0 1.006 138.3	30 16.9 1.006 138.2	30 46.8 1.006 138.2	31 16.8 1.006 138.2	40
1	27 43.7 1.006 137.4	28 13.6 1.006 137.3	28 43.6 1.006 137.3	29 13.5 1.006 137.3	29 43.4 1.006 137.2	30 13.4 1.006 137.2	30 43.3 1.006 137.2	31 13.2 1.006 137.1	1
2	27 40.1 1.006 136.4	28 10.1 1.006 136.3	28 40.0 1.006 136.3	29 09.9 1.006 136.2	29 39.9 1.006 136.2	30 09.8 1.006 136.2	30 39.7 1.006 136.1	31 09.7 1.006 136.1	2
3	27 36.5 1.006 135.3	28 06.4 1.006 135.3	28 36.3 1.006 135.2	29 06.3 1.006 135.2	29 36.2 1.006 135.2	30 06.1 1.006 135.1	30 36.1 1.006 135.1	31 06.0 1.006 135.0	3
4	27 32.8 1.006 134.3	28 02.7 1.006 134.3	28 32.6 1.006 134.2	29 02.6 1.006 134.2	29 32.5 1.006 134.1	30 02.4 1.006 134.1	30 32.3 1.006 134.1	31 02.3 1.006 134.0	4
45	27 29.0 1.006 133.3	27 58.9 1.006 133.2	28 28.8 1.006 133.2	28 58.8 1.006 133.1	29 28.7 1.006 133.1	29 58.6 1.006 133.1	30 28.5 1.006 133.0	30 58.5 1.006 133.0	45
6	27 25.2 1.006 132.2	27 55.1 1.006 132.2	28 25.0 1.006 132.2	28 54.9 1.007 132.1	29 24.8 1.007 132.1	29 54.8 1.007 132.0	30 24.7 1.007 132.0	30 54.6 1.007 132.0	6
7	27 21.3 1.007 131.2	27 51.2 1.007 131.2	28 21.1 1.007 131.1	28 51.0 1.007 131.1	29 20.9 1.007 131.1	29 50.9 1.007 131.0	30 20.8 1.007 131.0	30 50.7 1.007 130.9	7
8	27 17.3 1.007 130.2	27 47.2 1.007 130.1	28 17.1 1.007 130.1	28 47.0 1.007 130.1	29 17.0 1.007 130.0	29 46.9 1.007 130.0	30 16.8 1.007 129.9	30 46.7 1.007 129.9	8
9	27 13.3 1.007 129.2	27 43.2 1.007 129.1	28 13.1 1.007 129.1	28 43.0 1.007 129.0	29 12.9 1.007 129.0	29 42.8 1.007 129.0	30 12.7 1.007 128.9	30 42.7 1.007 128.9	9
50	27 09.2 1.007 128.1	27 39.1 1.007 128.1	28 09.0 1.007 128.1	28 38.9 1.007 128.0	29 08.8 1.007 128.0	29 38.7 1.007 127.9	30 08.7 1.007 127.9	30 38.6 1.007 127.8	50
1	27 05.0 1.007 127.1	27 35.0 1.007 127.1	28 04.9 1.007 127.0	28 34.8 1.007 127.0	29 04.7 1.007 126.9	29 34.6 1.007 126.9	30 04.5 1.007 126.9	30 34.4 1.007 126.8	1
2	27 00.8 1.007 126.1	27 30.8 1.007 126.1	28 00.7 1.007 126.0	28 30.6 1.007 126.0	29 00.5 1.007 125.9	29 30.4 1.007 125.9	30 00.3 1.007 125.8	30 30.2 1.007 125.8	2
3	26 56.6 1.007 125.1	27 26.5 1.007 125.0	27 56.4 1.007 125.0	28 26.3 1.007 124.9	28 56.2 1.007 124.9	29 26.1 1.007 124.8	29 56.0 1.007 124.8	30 25.9 1.007 124.8	3
4	26 52.3 1.007 124.1	27 22.2 1.007 124.0	27 52.1 1.007 124.0	28 22.0 1.007 123.9	28 51.9 1.007 123.9	29 21.8 1.007 123.8	29 51.7 1.007 123.8	30 21.6 1.007 123.7	4
55	26 47.9 1.007 123.0	27 17.8 1.007 123.0	27 47.7 1.007 122.9	28 17.6 1.007 122.9	28 47.5 1.007 122.8	29 17.4 1.007 122.8	29 47.3 1.007 122.8	30 17.2 1.007 122.7	55
6	26 43.5 1.007 122.0	27 13.4 1.007 122.0	27 43.3 1.007 121.9	28 13.2 1.007 121.9	28 43.1 1.007 121.8	29 13.0 1.007 121.8	29 42.9 1.007 121.7	30 12.8 1.007 121.7	6
7	26 39.1 1.008 121.0	27 09.0 1.008 120.9	27 38.9 1.008 120.9	28 08.7 1.008 120.9	28 38.6 1.008 120.8	29 08.5 1.008 120.8	29 38.4 1.008 120.7	30 08.3 1.008 120.7	7
8	26 34.5 1.008 120.0	27 04.4 1.008 119.9	27 34.3 1.008 119.9	28 04.2 1.008 119.8	28 34.1 1.008 119.8	29 04.0 1.008 119.7	29 33.9 1.008 119.7	30 03.8 1.008 119.6	8
9	26 30.0 1.008 119.0	26 59.9 1.008 118.9	27 29.8 1.008 118.9	27 59.7 1.008 118.8	28 29.6 1.008 118.8	28 59.5 1.008 118.7	29 29.3 1.008 118.7	29 59.2 1.008 118.6	9
60	26 25.4 1.008 117.9	26 55.3 1.008 117.9	27 25.2 1.008 117.8	27 55.1 1.008 117.8	28 25.0 1.008 117.7	28 54.9 1.008 117.7	29 24.7 1.008 117.6	29 54.6 1.008 117.6	60
1	26 20.8 1.008 116.9	26 50.6 1.008 116.9	27 20.5 1.008 116.8	27 50.4 1.008 116.8	28 20.3 1.008 116.7	28 50.2 1.008 116.7	29 20.1 1.008 116.6	29 50.0 1.008 116.6	1
2	26 16.1 1.008 115.9	26 46.0 1.008 115.9	27 15.8 1.008 115.8	27 45.7 1.008 115.8	28 15.6 1.008 115.8	28 45.5 1.008 115.7	29 15.4 1.008 115.6	29 45.3 1.008 115.6	2
3	26 11.3 1.008 114.9	26 41.2 1.008 114.8	27 11.1 1.008 114.8	27 41.0 1.008 114.7	28 10.9 1.008 114.7	28 40.8 1.008 114.6	29 10.7 1.008 114.6	29 40.5 1.008 114.5	3
4	26 06.6 1.008 113.9	26 36.5 1.008 113.8	27 06.4 1.008 113.8	27 36.2 1.008 113.7	28 06.1 1.008 113.7	28 36.0 1.008 113.6	29 05.9 1.008 113.6	29 35.8 1.008 113.5	4
65	26 01.8 1.008 112.9	26 31.7 1.008 112.8	27 01.6 1.008 112.8	27 31.4 1.008 112.7	28 01.3 1.008 112.7	28 31.2 1.008 112.6	29 01.1 1.008 112.6	29 30.9 1.008 112.5	65
6	25 56.9 1.008 111.9	26 26.8 1.008 111.8	26 56.7 1.008 111.8	27 26.6 1.008 111.7	27 56.5 1.008 111.7	28 26.3 1.008 111.6	28 56.2 1.008 111.6	29 26.1 1.008 111.5	6
7	25 52.1 1.008 110.8	26 22.0 1.008 110.8	26 51.8 1.008 110.7	27 21.7 1.008 110.7	27 51.6 1.008 110.6	28 21.5 1.008 110.6	28 51.3 1.008 110.5	29 21.2 1.008 110.5	7
8	25 47.2 1.008 109.8	26 17.1 1.008 109.8	26 46.9 1.008 109.7	27 16.8 1.008 109.7	27 46.7 1.008 109.6	28 16.6 1.008 109.6	28 46.4 1.008 109.5	29 16.3 1.008 109.5	8
9	25 42.2 1.008 108.8	26 12.1 1.008 108.8	26 42.0 1.008 108.7	27 11.9 1.008 108.7	27 41.7 1.008 108.6	28 11.6 1.008 108.6	28 41.5 1.008 108.5	29 11.4 1.008 108.5	9
70	25 37.3 1.008 107.8	26 07.2 1.008 107.8	26 37.0 1.008 107.7	27 06.9 1.008 107.7	27 36.8 1.008 107.6	28 06.6 1.008 107.6	28 36.5 1.008 107.5	29 06.4 1.008 107.4	70
1	25 32.3 1.008 106.8	26 02.2 1.008 106.8	26 32.0 1.008 106.7	27 01.9 1.008 106.7	27 31.8 1.008 106.6	28 01.6 1.008 106.6	28 31.5 1.008 106.5	29 01.4 1.008 106.4	1
2	25 27.3 1.008 105.8	25 57.1 1.008 105.7	26 27.0 1.008 105.7	26 56.9 1.008 105.6	27 26.8 1.008 105.6	27 56.6 1.008 105.5	28 26.5 1.008 105.5	28 56.4 1.008 105.4	2
3	25 22.2 1.008 104.8	25 52.1 1.008 104.7	26 22.0 1.008 104.7	26 51.8 1.008 104.6	27 21.7 1.008 104.6	27 51.6 1.008 104.5	28 21.4 1.008 104.5	28 51.3 1.008 104.4	3
4	25 17.2 1.008 103.8	25 47.0 1.008 103.7	26 16.9 1.008 103.7	26 46.8 1.008 103.6	27 16.6 1.008 103.6	27 46.5 1.008 103.5	28 16.4 1.008 103.5	28 46.2 1.008 103.4	4
75	25 12.1 1.009 102.8	25 41.9 1.009 102.7	26 11.8 1.009 102.7	26 41.7 1.009 102.6	27 11.5 1.009 102.6	27 41.4 1.009 102.5	28 11.3 1.009 102.5	28 41.1 1.009 102.4	75
6	25 07.0 1.009 101.8	25 36.8 1.009 101.7	26 06.7 1.009 101.7	26 36.6 1.009 101.6	27 06.4 1.009 101.6	27 36.3 1.009 101.5	28 06.1 1.009 101.5	28 36.0 1.009 101.4	6
7	25 01.8 1.009 100.8	25 31.7 1.009 100.7	26 01.6 1.009 100.7	26 31.4 1.009 100.6	27 01.3 1.009 100.6	27 31.2 1.009 100.5	28 01.0 1.009 100.4	28 30.9 1.009 100.4	7
8	24 56.7 1.009 99.8	25 26.5 1.009 99.7	25 56.4 1.009 99.7	26 26.3 1.009 99.6	26 56.1 1.009 99.6	27 26.0 1.009 99.5	27 55.9 1.009 99.4	28 25.7 1.009 99.4	8
9	24 51.5 1.009 98.8	25 21.4 1.009 98.7	25 51.2 1.009 98.7	26 21.1 1.009 98.6	26 51.0 1.009 98.6	27 20.8 1.009 98.5	27 50.7 1.009 98.4	28 20.6 1.009 98.4	9
80	24 46.3 1.009 97.8	25 16.2 1.009 97.7	25 46.1 1.009 97.7	26 15.9 1.009 97.6	26 45.8 1.009 97.5	27 15.7 1.009 97.5	27 45.5 1.009 97.4	28 15.4 1.009 97.4	80
1	24 41.2 1.009 96.8	25 11.0 1.009 96.7	25 40.9 1.009 96.7	26 10.7 1.009 96.6	26 40.6 1.009 96.5	27 10.5 1.009 96.5	27 40.3 1.009 96.4	28 10.2 1.009 96.4	1
2	24 36.0 1.009 95.8	25 05.8 1.009 95.7	25 35.7 1.009 95.7	26 05.5 1.009 95.6	26 35.4 1.009 95.5	27 05.3 1.009 95.5	27 35.1 1.009 95.4	28 05.0 1.009 95.4	2
3	24 30.8 1.009 94.8	25 00.6 1.009 94.7	25 30.5 1.009 94.7	26 00.3 1.009 94.6	26 30.2 1.009 94.5	27 00.1 1.009 94.5	27 29.9 1.009 94.4	27 59.8 1.009 94.4	3
4	24 25.5 1.009 93.8	24 55.4 1.009 93.7	25 25.3 1.009 93.7	25 55.1 1.009 93.6	26 25.0 1.009 93.5	26 54.8 1.009 93.5	27 24.7 1.009 93.4	27 54.6 1.009 93.4	4
85	24 20.3 1.009 92.8	24 50.2 1.009 92.7	25 20.0 1.009 92.7	25 49.9 1.009 92.6	26 19.8 1.009 92.5	26 49.6 1.009 92.5	27 19.5 1.009 92.4	27 49.3 1.009 92.4	85
6	24 15.1 1.009 91.8	24 45.0 1.009 91.7	25 14.8 1.009 91.7	25 44.7 1.009 91.6	26 14.5 1.009 91.5	26 44.4 1.009 91.5	27 14.2 1.009 91.4	27 44.1 1.009 91.4	6
7	24 09.9 1.009 90.8	24 39.7 1.009 90.7	25 09.6 1.009 90.7	25 39.4 1.009 90.6	26 09.3 1.009 90.6	26 39.2 1.009 90.5	27 09.0 1.009 90.4	27 38.9 1.009 90.4	7
8	24 04.6 1.009 89.8	24 34.5 1.009 89.7	25 04.4 1.009 89.7	25 34.2 1.009 89.6	26 04.1 1.009 89.6	26 33.9 1.009 89.5	27 03.8 1.009 89.4	27 33.6 1.009 89.4	8
9	23 59.4 1.009 88.8	24 29.3 1.009 88.7	24 59.1 1.009 88.7	25 29.0 1.009 88.6	25 58.8 1.009 88.6	26 28.7 1.009 88.5	26 58.6 1.009 88.5	27 28.4 1.009 88.4	9
90	23 54.2 1.009 87.8	24 24.0 1.009 87.7	24 53.9 1.009 87.7	25 23.8 1.009 87.6	25 53.6 1.009 87.6	26 23.5 1.009 87.5	26 53.3 1.009 87.5	27 23.2 1.009 87.4	90

H.A.	24° 00'			24° 30'			25° 00'			25° 30'			26° 00'			26° 30'			27° 00'			27° 30'			H.A.
	Alt.	Δd Δt	Az.	Alt.	Δd Δt	Az.	Alt.	Δd Δt	Az.	Alt.	Δd Δt	Az.	Alt.	Δd Δt	Az.	Alt.	Δd Δt	Az.	Alt.	Δd Δt	Az.	Alt.	Δd Δt	Az.	
91	23 49.0	1.009	86.8	24 18.1	1.009	86.7	24 48.7	1.009	86.7	25 18.5	1.009	86.6	25 48.4	1.009	86.6	26 18.3	1.009	86.5	26 48.1	1.009	86.5	27 18.0	1.009	86.4	91
2	23 43.7	1.009	85.8	24 13.6	1.009	85.7	24 43.5	1.009	85.7	25 13.3	1.009	85.6	25 43.2	1.009	85.6	26 13.0	1.009	85.5	26 42.9	1.009	85.5	27 12.8	1.009	85.4	2
3	23 38.5	1.009	84.8	24 08.4	1.009	84.7	24 38.3	1.009	84.7	25 08.1	1.009	84.6	25 38.0	1.009	84.6	26 07.8	1.009	84.5	26 37.7	1.009	84.5	27 07.5	1.009	84.4	3
4	23 33.3	1.009	83.8	24 03.2	1.009	83.8	24 33.0	1.009	83.7	25 02.9	1.009	83.6	25 32.8	1.009	83.6	26 02.6	1.009	83.5	26 32.5	1.009	83.5	27 02.3	1.009	83.4	4
95	23 28.1	1.009	82.8	23 58.0	1.009	82.8	24 27.9	1.009	82.7	24 57.7	1.009	82.7	25 27.6	1.009	82.6	25 57.4	1.009	82.5	26 27.3	1.009	82.5	26 57.2	1.009	82.4	95
6	23 22.9	1.009	81.8	23 52.8	1.009	81.8	24 22.7	1.009	81.7	24 52.5	1.009	81.7	25 22.4	1.009	81.6	25 52.3	1.009	81.6	26 22.1	1.009	81.5	26 52.0	1.009	81.5	6
7	23 17.8	1.009	80.8	23 47.6	1.009	80.8	24 17.5	1.009	80.7	24 47.4	1.009	80.7	25 17.2	1.009	80.6	25 47.1	1.009	80.6	26 17.0	1.009	80.5	26 46.8	1.009	80.5	7
8	23 12.6	1.009	79.8	23 42.5	1.009	79.8	24 12.4	1.009	79.7	24 42.2	1.009	79.7	25 12.1	1.009	79.6	25 41.9	1.009	79.6	26 11.8	1.009	79.5	26 41.7	1.009	79.5	8
9	23 07.5	1.009	78.9	23 37.3	1.009	78.8	24 07.2	1.009	78.7	24 37.1	1.009	78.7	25 06.9	1.009	78.6	25 36.8	1.009	78.6	26 06.7	1.009	78.5	26 36.5	1.009	78.5	9
100	23 02.4	1.009	77.9	23 32.2	1.008	77.8	24 02.1	1.008	77.8	24 32.0	1.008	77.7	25 01.8	1.008	77.7	25 31.7	1.008	77.6	26 01.6	1.008	77.6	26 31.4	1.008	77.5	100
1	22 57.3	1.008	76.9	23 27.1	1.008	76.8	23 57.0	1.008	76.8	24 26.9	1.008	76.7	24 56.7	1.008	76.7	25 26.6	1.008	76.6	25 56.5	1.008	76.6	26 26.3	1.008	76.5	1
2	22 52.2	1.008	75.9	23 22.0	1.008	75.8	23 51.9	1.008	75.8	24 21.8	1.008	75.7	24 51.7	1.008	75.7	25 21.5	1.008	75.6	25 51.4	1.008	75.6	26 21.2	1.008	75.5	2
3	22 47.1	1.008	74.9	23 17.0	1.008	74.9	23 46.9	1.008	74.8	24 16.7	1.008	74.7	24 46.6	1.008	74.7	25 16.5	1.008	74.6	25 46.3	1.008	74.6	26 16.2	1.008	74.5	3
4	22 42.1	1.008	73.9	23 12.0	1.008	73.9	23 41.8	1.008	73.8	24 11.7	1.008	73.8	24 41.6	1.008	73.7	25 11.4	1.008	73.7	25 41.3	1.008	73.6	26 11.2	1.008	73.6	4
105	22 37.1	1.008	72.9	23 06.9	1.008	72.9	23 36.8	1.008	72.8	24 06.7	1.008	72.8	24 36.6	1.008	72.7	25 06.4	1.008	72.7	25 36.3	1.008	72.6	26 06.2	1.008	72.6	105
6	22 32.1	1.008	71.9	23 02.0	1.008	71.9	23 31.8	1.008	71.8	24 01.7	1.008	71.8	24 31.6	1.008	71.7	25 01.5	1.008	71.7	25 31.3	1.008	71.6	26 01.2	1.008	71.6	6
7	22 27.1	1.008	71.0	22 57.0	1.008	70.9	23 26.9	1.008	70.9	23 56.8	1.008	70.8	24 26.6	1.008	70.8	24 56.5	1.008	70.7	25 26.4	1.008	70.7	25 56.2	1.008	70.6	7
8	22 22.2	1.008	70.0	22 52.1	1.008	69.9	23 22.0	1.008	69.9	23 51.8	1.008	69.8	24 21.7	1.008	69.8	24 51.6	1.008	69.7	25 21.5	1.008	69.7	25 51.3	1.008	69.6	8
9	22 17.3	1.008	69.0	22 47.2	1.008	68.9	23 17.1	1.008	68.9	23 46.9	1.008	68.8	24 16.8	1.008	68.8	24 46.7	1.008	68.7	25 16.6	1.008	68.7	25 46.4	1.008	68.6	9
110	22 12.4	1.008	68.0	22 42.3	1.008	68.0	23 12.2	1.008	67.9	23 42.1	1.008	67.9	24 12.0	1.008	67.8	24 41.8	1.008	67.8	25 11.7	1.008	67.7	25 41.6	1.008	67.7	110
1	22 07.6	1.008	67.0	22 37.5	1.008	67.0	23 07.4	1.008	66.9	23 37.2	1.008	66.9	24 07.1	1.008	66.8	24 37.0	1.008	66.8	25 06.9	1.008	66.7	25 36.8	1.008	66.7	1
2	22 02.8	1.008	66.0	22 32.7	1.008	66.0	23 02.6	1.008	65.9	23 32.5	1.008	65.9	24 02.3	1.008	65.9	24 32.2	1.008	65.8	25 02.1	1.008	65.8	25 32.0	1.008	65.7	2
3	21 58.0	1.008	65.1	22 27.9	1.008	65.0	22 57.8	1.008	65.0	23 27.7	1.008	64.9	23 57.6	1.008	64.9	24 27.5	1.008	64.8	24 57.4	1.008	64.8	25 27.2	1.008	64.7	3
4	21 53.3	1.008	64.1	22 23.2	1.008	64.0	22 53.1	1.008	64.0	23 23.0	1.008	63.9	23 52.9	1.008	63.9	24 22.8	1.008	63.8	24 52.6	1.008	63.8	25 22.5	1.008	63.7	4
115	21 48.6	1.008	63.1	22 18.5	1.008	63.1	22 48.4	1.008	63.0	23 18.3	1.008	63.0	23 48.2	1.008	62.9	24 18.1	1.008	62.9	24 48.0	1.008	62.8	25 17.9	1.008	62.8	115
6	21 44.0	1.008	62.1	22 13.9	1.008	62.1	22 43.8	1.008	62.0	23 13.7	1.008	62.0	23 43.6	1.008	61.9	24 13.4	1.008	61.9	24 43.3	1.008	61.8	25 13.2	1.008	61.8	6
7	21 39.4	1.008	61.1	22 09.3	1.008	61.1	22 39.2	1.008	61.0	23 09.1	1.008	61.0	23 39.0	1.008	61.0	24 08.9	1.008	60.9	24 38.7	1.008	60.9	25 08.6	1.008	60.8	7
8	21 34.8	1.008	60.2	22 04.7	1.008	60.1	22 34.6	1.008	60.1	23 04.5	1.008	60.0	23 34.4	1.008	60.0	24 04.3	1.008	59.9	24 34.2	1.008	59.9	25 04.1	1.008	59.8	8
9	21 30.3	1.007	59.2	22 00.2	1.007	59.1	22 30.1	1.007	59.1	23 00.0	1.007	59.0	23 29.9	1.007	59.0	23 59.8	1.007	59.0	24 29.7	1.007	58.9	24 59.6	1.007	58.9	9
120	21 25.9	1.007	58.2	21 55.8	1.007	58.2	22 25.7	1.007	58.1	22 55.6	1.007	58.1	23 25.5	1.007	58.0	23 55.3	1.007	58.0	24 25.2	1.007	57.9	24 55.1	1.007	57.9	120
1	21 21.4	1.007	57.2	21 51.3	1.007	57.2	22 21.2	1.007	57.1	22 51.1	1.007	57.1	23 21.0	1.007	57.0	23 50.9	1.007	57.0	24 20.8	1.007	57.0	24 50.7	1.007	56.9	1
2	21 17.1	1.007	56.2	21 47.0	1.007	56.2	22 16.9	1.007	56.2	22 46.8	1.007	56.1	23 16.7	1.007	56.1	23 46.6	1.007	56.0	24 16.5	1.007	56.0	24 46.4	1.007	55.9	2
3	21 12.7	1.007	55.3	21 42.6	1.007	55.2	22 12.6	1.007	55.2	22 42.5	1.007	55.1	23 12.4	1.007	55.1	23 42.3	1.007	55.1	24 12.2	1.007	55.0	24 42.1	1.007	55.0	3
4	21 08.5	1.007	54.3	21 38.4	1.007	54.3	22 08.3	1.007	54.2	22 38.2	1.007	54.2	23 08.1	1.007	54.1	23 38.0	1.007	54.1	24 07.9	1.007	54.0	24 37.8	1.007	54.0	4
125	21 04.2	1.007	53.3	21 34.2	1.007	53.3	22 04.1	1.007	53.2	22 34.0	1.007	53.2	23 03.9	1.007	53.2	23 33.8	1.007	53.1	24 03.7	1.007	53.1	24 33.6	1.007	53.0	125
6	21 00.1	1.007	52.3	21 30.0	1.007	52.3	21 59.9	1.007	52.3	22 29.8	1.007	52.2	22 59.7	1.007	52.2	23 29.6	1.007	52.1	23 59.6	1.007	52.1	24 29.5	1.007	52.1	6
7	20 56.0	1.007	51.4	21 25.9	1.007	51.3	21 55.8	1.007	51.3	22 25.7	1.007	51.2	22 55.6	1.007	51.2	23 25.5	1.007	51.2	23 55.5	1.007	51.1	24 25.4	1.007	51.1	7
8	20 51.9	1.007	50.4	21 21.8	1.007	50.4	21 51.7	1.007	50.3	22 21.7	1.007	50.3	22 51.6	1.007	50.2	23 21.5	1.007	50.2	23 51.4	1.007	50.1	24 21.3	1.007	50.1	8
9	20 47.9	1.007	49.4	21 17.8	1.007	49.4	21 47.7	1.007	49.3	22 17.7	1.007	49.3	22 47.6	1.007	49.3	23 17.5	1.007	49.2	23 47.4	1.007	49.2	24 17.3	1.007	49.1	9
130	20 44.0	1.006	48.4	21 13.9	1.006	48.4	21 43.8	1.006	48.4	22 13.7	1.006	48.3	22 43.7	1.006	48.3	23 13.6	1.006	48.2	23 43.5	1.006	48.2	24 13.4	1.006	48.2	130
1	20 40.1	1.006	47.5	21 10.0	1.006	47.4	21 39.9	1.006	47.4	22 09.9	1.006	47.4	22 39.8	1.006	47.3	23 09.7	1.006	47.3	23 39.6	1.006	47.2	24 09.5	1.006	47.2	1
2	20 36.3	1.006	46.5	21 06.2	1.006	46.5	21 36.1	1.006	46.4	22 06.0	1.006	46.4	22 36.0	1.006	46.3	23 05.9	1.006	46.3	23 35.8	1.006	46.3	24 05.7	1.006	46.2	2
3	20 32.5	1.006	45.5	21 02.4	1.006	45.5	21 32.4	1.006	45.4	22 02.3	1.006	45.4	22 32.2	1.006	45.4	23 02.1	1.006	45.3	23 32.1	1.006	45.3	24 02.0	1.006	45.3	3
4	20 28.8	1.006	44.5	20 58.7	1.006	44.5	21 28.7	1.006	44.5	21 58.6	1.006	44.4	22 28.5	1.006	44.4	22 58.5	1.006	44.4	23 28.4	1.006	44.3	23 58.3	1.006	44.3	4
135	20 25.2	1.006	43.6	20 55.1	1.006	43.5	21 25.0	1.006	43.5	21 55.0	1.006	43.5	22 24.9	1.006	43.4	22 54.8	1.006	43.4	23 24.8	1.006	43.4	23 54.7	1.006	43.3	135
6	20 21.6	1.006	42.6	20 51.5	1.006	42.6	21 21.5	1.006	42.5	21 51.4	1.006	42.5	22 21.3	1.006	42.5	22 51.3	1.006	42.4	23 21.2	1.006	42.4	23 51.1	1.006	42.4	6
7	20 18.1	1.006	41.6	20 48.0	1.006	41.6	21 18.0	1.006	41.6	21 47.9	1.006	41.5	22 17.8	1.006	41.5	22 47.8	1.006	41.5	23 17.7	1.006	41.4	23 47.6	1.006	41.4	7
8	20 14.6	1.006	40.7	20 44.6	1.006	40.6	21 14.5	1.006	40.6	21 44.5	1.006	40.6	22 14.4	1.006	40.5	22 44.3	1.006	40.5	23 14.3	1.006	40.5	23 44.2	1.006	40.4	8
9	20 11.3	1.006	39.7	20 41.2	1.006	39.7	21 11.2	1.006	39.6	21 41.1	1.006	39.6	22 11.0	1.006	39.6	22 41.0	1.006	39.5	23 10.9	1.006	39.5	23 40.9	1.005	39.5	9
140	20 08.0	1.005	38.7	20 37.9	1.005	38.7	21 07.9	1.005	38.7	21 37.8	1.005	38.6	22 07.7	1.005	38.6	22 37.7	1.005	38.6	23 07.6	1.005	38.5	23 37.6	1.005	38.5	140
1	20 04.7	1.005	37.7	20 34.7	1.005	37.7	21 04.6	1.005	37.7	21 34.6	1.005	37.6	22 04.5	1.005	37.6	22 34.5	1.005	37.6	23 04.4	1.005	37.6	23 34.4	1.005	37.5	1
2	20 01.6	1.005	36.8	20 31.5	1.005	36.7	21 01.5	1.005	36.7	21 31.4	1.005	36.7	22 01.4	1.005	36.6	22 31.3	1.005	36.6	23 01.3	1.005	36.6	23 31.2	1.005	36.6	2
3	19 58.5	1.005	35.8	20 28.4	1.005	35.8	20 58.4	1.005	35.7	21 28.3	1.005	35.7	21 58.3	1.005	35.7	22 28.2	1.005	35.6	22 58.2	1.005	35.6	23 28.1	1.005	35.6	3
4	19 55.4	1.005	34.8	20 25.4	1.005	34.8	20 55.4	1.005	34.8	21 25.3	1.005	34.7	21 55.3	1.005	34.7	22 25.2	1.005	34.7	22 55.2	1.005	34.7	23 25.1	1.005	34.6	4
145	19 52.5	1.005	33.8	20 22.4	1.005	33.8	20 52.4	1.005	33.8	21 22.4	1.005	33.8	21 52.3	1.005	33.7	22 22.3	1.005	33.7	22 52.2	1.005	33.7	23 22.2	1.005	33.7	145
6	19 49.6	1.005	32.9	20 19.6	1.005	32.9	20 49.5	1.005	32.8	21 19.5	1.005	32.8	21 49.5	1.005	32.8	22 19.4	1.005	32.8	22 49.4	1.005	32.7	23 19.3	1.005	32.7	6
7	19 46.8	1.005	31.9	20 16.8	1.005	31.9	20 46.7	1.005	31.9	21 16.7	1.005	31.8	21 46.7	1.005	31.8	22 16.6	1.005	31.8	22 46.6	1.005	31.8	23 16.5	1.005	31.7	7
8	19 44.1	1.004	31.0	20 14.1	1.004	30.9	20 44.0	1.004	30.9	21 14.0	1.004	30.9	21 43.9	1.004	30.8	22 13.9	1.004	30.8	22 43.9	1.004	30.8	23 13.8	1.004	30.8	8
9	19 41.4	1.004	30.0	20 11.4	1.004	30.0	20 41.4	1.004	29.9	21 11.3	1.004	29.9	21 41.3	1.004	29.9	22 11.3	1.004	29.9	22 41.2	1.004	29.8	23 11.2	1.004	29.8	9
150	19 38.9	1.004	29.0	20 08.8	1.004	29.0	20 38.8	1.004	29.0	21 08.8	1.004	28.9	21 38.7	1.004	28.9	22 08.7	1.004	28.9	22 38.7	1.004	28.9	23 08.6	1.004	28.8	150
1	19 36.4	1.004	28.0	20 06.3	1.004	28.0	20 36.3	1.004	28.0	21 06.3	1.004	28.0	21 36.2	1.004	27.9	22 06.2	1.004	27.9	22 36.2	1.004	27.9	23 06.1	1.004	27.9	1
2	19 33.9	1.004	27.1	20 03.9	1.004	27.1	20 33.9	1.004	27.0	21 03.9	1.004	27.0	21 33.8	1.004	27.0	22 03.8	1.004	27.0	22 33.8	1.004	26.9	23 03.7	1.004	26.9	2
3	19 31.6	1.004	26.1	20 01.5	1.004	26.1	20 31.5	1.004	26.1	21 01.5	1.004	26.0	21 31.5	1.004	26.0	22 01.5	1.004	26.0	22 31.4	1.004	26.0	23 01.4	1.004	25.9	3
4	19 29.3	1.004	25.1	19 59.3	1.004	25.1	20 29.3	1.004	25.1	20 59.3	1.004	25.1	21 29.2	1.004	25.1	21 59.2	1.004	25.0	22 29.2	1.004	25.0	22 59.2	1.004	25.0	4
155	19 27.2	1.004	24.2	19 57.1	1.004	24.2	20 27.1	1.004	24.1	20 57.1	1.004	24.1	21 27.1	1.004	24.1	21 57.0	1.004	24.1	22 27.0	1.003	24.0	22 57.0	1.004	24.0	155
6	19 25.1	1.003	23.2	19 55.0	1.003	23.2	20 25.0	1.003	23.2	20 55.0	1.003	23.1	21 25.0	1.003	23.1	21 55.0	1.003	23.1	22 24.9	1.003	23.1	22 54.9	1.003	23.1	6
7	19 23.0	1.003	22.2	19 53.0	1.003	22.2	20 23.0	1.003	22.2	20 53.0	1.003	22.2	21 23.0	1.003	22.2	21 52.9	1.003	22.1	22 22.9	1.003	22.1	22 52.9	1.003	22.1	7
8	19 21.1	1.003	21.3	19 51.1	1.003	21.2	20 21.1	1.003	21.2	20 51.0	1.003	21.2	21 21.0	1.003	21.2	21 51.0	1.003	21.1	22 21.0	1.003	21.1	22 51.0	1.003	21.1	8
9	19 19.2	1.003	20.3	19 49.2	1.003	20.3	20 19.2	1.003	20.3	20 49.2	1.003	20.2	21 19.2	1.003	20.2	21 49.2	1.003	20.2	22 19.1	1.003	20.2	22 49.1	1.003	20.2	9
160	19 17.5	1.003	19.3	19 47.5	1.003	19.3	20 17.4	1.003	19.3	20 47.4	1.003	19.3	21 17.4	1.003	19.3	21 47.4	1.003	19.2	22 17.4	1.003	19.2	22 47.4	1.003	19.2	160
1	19 15.8	1.003	18.4	19 45.8	1.003	18.3	20 15.8	1.003	18.3	20 45.7	1.003	18.3	21 15.7	1.003	18.3	21 45.7	1.003	18.3	22 15.7	1.003	18.3	22 45.7	1.003	18.3	1
2	19 14.2	1.003	17.4	19 44.2	1.003	17.4	20 14.2	1.003	17.4	20 44.1	1.003	17.4	21 14.1	1.003	17.3	21 44.1	1.003	17.3	22 14.1	1.003	17.3	22 44.1	1.003	17.3	2
3	19 12.7	1.002	16.4	19 42.6	1.002	16.4	20 12.6	1.002	16.4	20 42.6	1.002	16.4	21 12.6	1.002	16.4	21 42.6	1.002	16.4	22 12.6	1.002	16.3	22 42.6	1.002	16.3	3
4	19 11.2	1.002	15.5	19 41.2	1.002	15.4	20 11.2	1.002	15.4	20 41.2	1.002	15.4	21 11.2	1.002	15.4	21 41.2	1.002	15.4	22 11.2	1.002	15.4	22 41.2	1.002	15.4	4
165	19 09.9	1.002	14.5	19 39.9	1.002	14.5	20 09.9	1.002	14.5	20 39.8	1.002	14.5	21 09.8	1.002	14.4	21 39.8	1.002	14.4	22 09.8	1.002	14.4	22 39.8	1.002	14.4	165
6	19 08.6	1.002	13.5	19 38.6	1.002	13.5	20 08.6	1.002	13.5	20 38.6	1.002	13.5	21 08.6	1.002	13.5	21 38.6	1.002	13.5	22 08.6	1.002	13.5	22 38.5	1.002	13.4	6
7	19 07.4	1.002	12.6	19 37.4	1.002	12.6	20 07.4	1.002	12.5	20 37.4	1.002	12.5	21 07.4	1.002	12.5	21 37.4	1.002	12.5	22 07.4	1.002	12.5	22 37.4	1.002	12.5	7
8	19 06.3	1.002	11.6	19 36.3	1.002	11.6	20 06.3	1.002	11.6	20 36.3	1.002	11.6	21 06.3	1.002	11.6	21 36.3	1.002	11.5	22 06.3	1.002	11.5	22 36.3	1.002	11.5	8
9	19 05.3	1.002	10.6	19 35.3	1.002	10.6	20 05.3	1.002	10.6	20 35.3	1.002	10.6	21 05.3	1.002	10.6	21 35.3	1.002	10.6	22 05.3	1.002	10.6	22 35.3	1.002	10.6	9
170	19 04.4	1.001	09.7	19 34.4	1.001	09.7	20 04.4	1.001	09.6	20 34.4	1.001	09.6	21 04.4	1.001	09.6	21 34.4	1.001	09.6	22 04.4	1.001	09.6	22 34.4	1.001	09.6	170
1	19 03.6	1.001	08.7	19 33.6	1.001	08.7	20 03.5	1.001	08.7	20 33.6	1.001	08.7	21 03.6	1.001	08.7	21 33.5	1.001	08.7	22 03.5	1.001	08.6	22 33.5	1.001	08.6	1
2	19 02.8	1.001	07.7	19 32.8	1.001	07.7	20 02.8	1.001	07.7	20 32.8	1.001	07.7	21 02.8	1.001	07.7	21 32.8	1.001	07.7	22 02.8	1.001	07.7	22 32.8	1.001	07.7	2
3	19 02.2	1.001	06.8	19 32.2	1.001	06.8	20 02.2	1.001	06.7	20 32.2	1.001	06.7	21 02.2	1.001	06.7	21 32.1	1.001	06.7	22 02.1	1.001	06.7	22 32.1	1.001	06.7	3
4	19 01.6	1.001	05.8	19 31.6	1.001	05.8	20 01.6	1.001	05.8	20 31.6	1.001	05.8	21 01.6	1.001	05.8	21 31.6	1.001	05.8	22 01.6	1.001	05.8	22 31.6	1.001	05.8	4
175	19 01.1	1.01	04.8	19 31.1	1.01	04.8	20 01.1	1.001	04.8	20 31.1	1.001	04.8	21 01.1	1.001	04.8	21 31.1	1.001	04.8	22 01.1	1.001	04.8	22 31.1	1.01	04.8	175
6	19 00.7	1.000	03.9	19 30.7	1.000	03.9	20 00.7	1.000	03.9	20 30.7	1.000	03.9	21 00.7	1.000	03.9	21 30.7	1.000	03.8	22 00.7	1.000	03.8	22 30.7	1.000	03.8	6
7	19 00.4	1.000	02.9	19 30.4	1.000	02.9	20 00.4	1.000	02.9	20 30.4	1.000	02.9	21 00.4	1.000	02.9	21 30.4	1.000	02.9	22 00.4	1.000	02.9	22 30.4	1.000	02.9	7
8	19 00.2	1.000	01.9	19 30.2	1.000	01.9	20 00.2	1.000	01.9	20 30.2	1.000	01.9	21 00.2	1.000	01.9	21 30.2	1.000	01.9	22 00.2	1.000	01.9	22 30.2	1.000	01.9	8
9	19 00.0	1.000	01.0	19 30.0	1.000	01.0	20 00.0	1.000	01.0	20 30.0	1.000	01.0	21 00.0	1.000	01.0	21 30.0	1.000	01.0	22 00.0	1.000	01.0	22 30.0	1.000	01.0	9
180	19 00.0	1.000	00.0	19 30.0	1.000	00.0	20 00.0	1.000	00.0	20 30.0	1.000	00.0	21 00.0	1.000	00.0	21 30.0	1.000	00.0	22 00.0	1.000	00.0	22 30.0	1.000	00.0	180

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H.A.	28° 00′ Alt.	Δd Δt	Az.	28° 30′ Alt.	Δd Δt	Az.	29° 00′ Alt.	Δd Δt	Az.	30° 00′ Alt.	Δd Δt	Az.	32° 00′ Alt.	Δd Δt	Az.	34° 00′ Alt.	Δd Δt	Az.	34° 30′ Alt.	Δd Δt	Az.	35° 30′ Alt.	Δd Δt	Az.	H.A.
00	33 00.0	1.00 0	180.0	33 30.0	1.00 0	180.0	34 00.0	1.00 0	180.0	35 00.0	1.00 0	180.0	37 00.0	1.00 0	180.0	39 00.0	1.00 0	180.0	39 30.0	1.00 0	180.0	40 30.0	1.00 0	180.0	00
1	33 00.0	1.00 0	178.9	33 30.0	1.00 0	178.9	34 00.0	1.00 0	178.9	35 00.0	1.00 0	178.9	37 00.0	1.00 0	178.9	39 00.0	1.00 0	178.9	39 30.0	1.00 0	178.9	40 30.0	1.00 0	178.9	1
2	32 59.8	1.00 0	177.9	33 29.8	1.00 0	177.9	33 59.8	1.00 0	177.9	34 59.8	1.00 0	177.9	36 59.8	1.00 0	177.9	38 59.8	1.00 0	177.9	39 29.8	1.00 0	177.9	40 29.8	1.00 0	177.9	2
3	32 59.6	1.00 1	176.8	33 29.6	1.00 1	176.8	33 59.6	1.00 1	176.8	34 59.6	1.00 1	176.8	36 59.6	1.00 1	176.8	38 59.6	1.00 1	176.8	39 29.6	1.00 1	176.8	40 29.6	1.00 1	176.8	3
4	32 59.2	1.00 1	175.8	33 29.2	1.00 1	175.8	33 59.2	1.00 1	175.8	34 59.2	1.00 1	175.8	36 59.2	1.00 1	175.8	38 59.2	1.00 1	175.7	39 29.2	1.00 1	175.7	40 29.2	1.00 1	175.7	4
05	32 58.8	1.00 1	174.7	33 28.8	1.00 1	174.7	33 58.8	1.00 1	174.7	34 58.8	1.00 1	174.7	36 58.8	1.00 1	174.7	38 58.8	1.00 1	174.7	39 28.8	1.00 1	174.7	40 28.8	1.00 1	174.6	05
6	32 58.3	1.00 1	173.7	33 28.3	1.00 1	173.7	33 58.3	1.00 1	173.7	34 58.3	1.00 1	173.7	36 58.3	1.00 1	173.6	38 58.2	1.00 1	173.6	39 28.2	1.00 1	173.6	40 28.2	1.00 1	173.6	6
7	32 57.6	1.00 1	172.6	33 27.6	1.00 1	172.6	33 57.6	1.00 1	172.6	34 57.6	1.00 1	172.6	36 57.6	1.00 1	172.6	38 57.6	1.00 1	172.5	39 27.6	1.00 1	172.5	40 27.6	1.00 1	172.5	7
8	32 56.9	1.00 1	171.6	33 26.9	1.00 1	171.6	33 56.9	1.00 1	171.6	34 56.9	1.00 1	171.5	36 56.9	1.00 1	171.5	38 56.9	1.00 1	171.5	39 26.9	1.00 1	171.5	40 26.9	1.00 1	171.4	8
9	32 56.1	1.00 2	170.5	33 26.1	1.00 2	170.5	33 56.1	1.00 2	170.5	34 56.1	1.00 2	170.4	36 56.1	1.00 2	170.4	38 56.1	1.00 2	170.4	39 26.1	1.00 2	170.4	40 26.1	1.00 2	170.4	9
10	32 55.2	1.00 2	169.5	33 25.2	1.00 2	169.5	33 55.2	1.00 2	169.5	34 55.2	1.00 2	169.4	36 55.2	1.00 2	169.4	38 55.1	1.00 2	169.3	39 25.1	1.00 2	169.3	40 25.1	1.00 2	169.3	10
1	32 54.2	1.00 2	168.4	33 24.2	1.00 2	168.4	33 54.2	1.00 2	168.4	34 54.2	1.00 2	168.4	36 54.2	1.00 2	168.3	38 54.1	1.00 2	168.3	39 24.1	1.00 2	168.3	40 24.1	1.00 2	168.2	1
2	32 53.1	1.00 2	167.4	33 23.1	1.00 2	167.4	33 53.1	1.00 2	167.3	34 53.1	1.00 2	167.3	36 53.1	1.00 2	167.3	38 53.0	1.00 2	167.2	39 23.0	1.00 2	167.2	40 23.0	1.00 2	167.2	2
3	32 51.9	1.00 2	166.3	33 21.9	1.00 2	166.3	33 51.9	1.00 2	166.3	34 51.9	1.00 2	166.3	36 51.9	1.00 2	166.2	38 51.8	1.00 2	166.1	39 21.8	1.00 2	166.1	40 21.8	1.00 2	166.1	3
4	32 50.6	1.00 2	165.3	33 20.6	1.00 2	165.3	33 50.6	1.00 2	165.2	34 50.6	1.00 2	165.2	36 50.6	1.00 2	165.1	38 50.5	1.00 2	165.1	39 20.5	1.00 2	165.1	40 20.5	1.00 2	165.0	4
15	32 49.3	1.00 2	164.2	33 19.3	1.00 2	164.2	33 49.2	1.00 2	164.2	34 49.2	1.00 2	164.2	36 49.2	1.00 2	164.1	38 49.1	1.00 2	164.0	39 19.1	1.00 2	164.0	40 19.1	1.00 2	164.0	15
6	32 47.8	1.00 3	163.2	33 17.8	1.00 3	163.2	33 47.8	1.00 3	163.1	34 47.7	1.00 3	163.1	36 47.7	1.00 3	163.0	38 47.6	1.00 3	163.0	39 17.6	1.00 3	162.9	40 17.6	1.00 3	162.9	6
7	32 46.2	1.00 3	162.1	33 16.2	1.00 3	162.1	33 46.2	1.00 3	162.1	34 46.2	1.00 3	162.0	36 46.1	1.00 3	162.0	38 46.1	1.00 3	161.9	39 16.0	1.00 3	161.9	40 16.0	1.00 3	161.8	7
8	32 44.6	1.00 3	161.1	33 14.6	1.00 3	161.1	33 44.6	1.00 3	161.0	34 44.5	1.00 3	161.0	36 44.5	1.00 3	160.9	38 44.4	1.00 3	160.8	39 14.4	1.00 3	160.8	40 14.3	1.00 3	160.8	8
9	32 42.8	1.00 3	160.0	33 12.8	1.00 3	160.0	33 42.8	1.00 3	160.0	34 42.8	1.00 3	159.9	36 42.7	1.00 3	159.9	38 42.6	1.00 3	159.8	39 12.6	1.00 3	159.7	40 12.6	1.00 3	159.7	9
20	32 41.0	1.00 3	159.0	33 11.0	1.00 3	159.0	33 41.0	1.00 3	158.9	34 40.9	1.00 3	158.9	36 40.9	1.00 3	158.8	38 40.8	1.00 3	158.7	39 10.7	1.00 3	158.7	40 10.7	1.00 3	158.6	20
1	32 39.1	1.00 3	157.9	33 09.1	1.00 3	157.9	33 39.0	1.00 3	157.9	34 39.0	1.00 3	157.8	36 38.9	1.00 3	157.7	38 38.8	1.00 3	157.6	39 08.8	1.00 3	157.6	40 08.7	1.00 3	157.6	1
2	32 37.1	1.00 4	156.9	33 07.1	1.00 3	156.9	33 37.0	1.00 4	156.8	34 37.0	1.00 4	156.8	36 36.9	1.00 4	156.7	38 36.8	1.00 4	156.6	39 06.8	1.00 4	156.6	40 06.7	1.00 4	156.5	2
3	32 35.0	1.00 4	155.8	33 05.0	1.00 4	155.8	33 34.9	1.00 4	155.8	34 34.9	1.00 4	155.7	36 34.8	1.00 4	155.6	38 34.7	1.00 4	155.5	39 04.6	1.00 4	155.5	40 04.6	1.00 4	155.4	3
4	32 32.8	1.00 4	154.8	33 02.8	1.00 4	154.8	33 32.7	1.00 4	154.7	34 32.7	1.00 4	154.7	36 32.6	1.00 4	154.6	38 32.5	1.00 4	154.5	39 02.4	1.00 4	154.4	40 02.4	1.00 4	154.4	4
25	32 30.5	1.00 4	153.7	33 00.5	1.00 4	153.7	33 30.5	1.00 4	153.7	34 30.4	1.00 4	153.6	36 30.3	1.00 4	153.5	38 30.2	1.00 4	153.4	39 00.1	1.00 4	153.4	40 00.1	1.00 4	153.3	25
6	32 28.2	1.00 4	152.7	32 58.1	1.00 4	152.7	33 28.1	1.00 4	152.6	34 28.0	1.00 4	152.6	36 27.9	1.00 4	152.5	38 27.8	1.00 4	152.3	38 57.7	1.00 4	152.3	39 57.7	1.00 4	152.3	6
7	32 25.7	1.00 4	151.6	32 55.7	1.00 4	151.6	33 25.7	1.00 4	151.6	34 25.6	1.00 4	151.5	36 25.5	1.00 4	151.4	38 25.3	1.00 4	151.3	38 55.3	1.00 4	151.3	39 55.2	1.00 4	151.2	7
8	32 23.2	1.00 4	150.6	32 53.2	1.00 4	150.6	33 23.1	1.00 4	150.5	34 23.1	1.00 4	150.5	36 22.9	1.00 4	150.4	38 22.7	1.00 4	150.2	38 52.7	1.00 4	150.2	39 52.6	1.00 4	150.1	8
9	32 20.6	1.00 4	149.6	32 50.6	1.00 4	149.5	33 20.5	1.00 4	149.5	34 20.4	1.00 5	149.4	36 20.3	1.00 5	149.3	38 20.1	1.00 5	149.2	38 50.1	1.00 5	149.1	39 50.0	1.00 5	149.1	9
30	32 17.9	1.00 5	148.5	32 47.9	1.00 5	148.5	33 17.8	1.00 5	148.5	34 17.7	1.00 5	148.4	36 17.6	1.00 5	148.3	38 17.4	1.00 5	148.1	38 47.3	1.00 5	148.1	39 47.2	1.00 5	148.0	30
1	32 15.1	1.00 5	147.5	32 45.1	1.00 5	147.4	33 15.0	1.00 5	147.4	34 15.0	1.00 5	147.3	36 14.8	1.00 5	147.2	38 14.6	1.00 5	147.1	38 44.5	1.00 5	147.0	39 44.4	1.00 5	147.0	1
2	32 12.3	1.00 5	146.4	32 42.2	1.00 5	146.4	33 12.1	1.00 5	146.4	34 12.1	1.00 5	146.3	36 11.9	1.00 5	146.2	38 11.7	1.00 5	146.0	38 41.7	1.00 5	146.0	39 41.5	1.00 5	145.9	2
3	32 09.4	1.00 5	145.4	32 39.3	1.00 5	145.4	33 09.3	1.00 5	145.3	34 09.2	1.00 5	145.3	36 09.0	1.00 5	145.1	38 08.7	1.00 5	145.0	38 38.7	1.00 5	144.9	39 38.6	1.00 5	144.8	3
4	32 06.3	1.00 5	144.3	32 36.3	1.00 5	144.3	33 06.2	1.00 5	144.3	34 06.1	1.00 5	144.2	36 05.9	1.00 5	144.1	38 05.7	1.00 5	143.9	38 35.6	1.00 5	143.9	39 35.5	1.00 5	143.8	4
35	32 03.3	1.00 5	143.3	32 33.2	1.00 5	143.3	33 03.2	1.00 5	143.2	34 03.0	1.00 5	143.2	36 02.8	1.00 5	143.0	38 02.6	1.00 5	142.9	38 32.5	1.00 5	142.8	39 32.4	1.00 5	142.7	35
6	32 00.1	1.00 5	142.3	32 30.0	1.00 5	142.2	33 00.0	1.00 5	142.2	33 59.9	1.00 5	142.1	35 59.6	1.00 5	142.0	37 59.4	1.00 5	141.8	38 29.3	1.00 5	141.8	39 29.2	1.00 5	141.7	6
7	31 56.9	1.00 6	141.2	32 26.8	1.00 6	141.2	32 56.7	1.00 6	141.2	33 56.6	1.00 6	141.1	35 56.4	1.00 6	140.9	37 56.1	1.00 6	140.8	38 26.0	1.00 6	140.7	39 25.9	1.00 6	140.6	7
8	31 53.5	1.00 6	140.2	32 23.5	1.00 6	140.2	32 53.4	1.00 6	140.1	33 53.3	1.00 6	140.0	35 53.0	1.00 6	139.9	37 52.8	1.00 6	139.7	38 22.7	1.00 6	139.7	39 22.6	1.00 6	139.6	8
9	31 50.2	1.00 6	139.2	32 20.1	1.00 6	139.1	32 50.0	1.00 6	139.1	33 49.9	1.00 6	139.0	35 49.6	1.00 6	138.8	37 49.4	1.00 6	138.7	38 19.3	1.00 6	138.6	39 19.1	1.00 6	138.5	9
40	31 46.7	1.00 6	138.1	32 16.6	1.00 6	138.1	32 46.6	1.00 6	138.0	33 46.4	1.00 6	138.0	35 46.2	1.00 6	137.8	37 45.9	1.00 6	137.6	38 15.8	1.00 6	137.6	39 15.6	1.00 6	137.5	40
1	31 43.2	1.00 6	137.1	32 13.1	1.00 6	137.0	32 43.0	1.00 6	137.0	33 42.9	1.00 6	136.9	35 42.6	1.00 6	136.7	37 42.3	1.00 6	136.6	38 12.2	1.00 6	136.5	39 12.1	1.00 6	136.4	1
2	31 39.6	1.00 6	136.0	32 09.5	1.00 6	136.0	32 39.4	1.00 6	136.0	33 39.3	1.00 6	135.9	35 39.0	1.00 6	135.7	37 38.7	1.00 6	135.5	38 08.6	1.00 6	135.5	39 08.4	1.00 6	135.4	2
3	31 35.9	1.00 6	135.0	32 05.8	1.00 6	135.0	32 35.8	1.00 6	134.9	33 35.6	1.00 6	134.8	35 35.3	1.00 6	134.7	37 35.0	1.00 6	134.5	38 04.9	1.00 6	134.4	39 04.7	1.00 6	134.3	3
4	31 32.2	1.00 6	134.0	32 02.1	1.00 6	133.9	32 32.0	1.00 6	133.9	33 31.9	1.00 6	133.8	35 31.6	1.00 6	133.6	37 31.2	1.00 6	133.4	38 01.1	1.00 6	133.4	39 00.9	1.00 6	133.3	4
45	31 28.4	1.00 6	132.9	31 58.3	1.00 6	132.9	32 28.2	1.00 6	132.8	33 28.1	1.00 6	132.8	35 27.7	1.00 6	132.6	37 27.4	1.00 6	132.3	37 57.3	1.00 6	132.3	38 57.1	1.00 6	132.2	45
6	31 24.5	1.00 7	131.9	31 54.5	1.00 7	131.9	32 24.4	1.00 7	131.8	33 24.2	1.00 7	131.7	35 23.9	1.00 7	131.6	37 23.5	1.00 7	131.4	37 53.4	1.00 7	131.3	38 53.2	1.00 7	131.2	6
7	31 20.6	1.00 7	130.9	31 50.5	1.00 7	130.8	32 20.4	1.00 7	130.8	33 20.3	1.00 7	130.7	35 19.9	1.00 7	130.5	37 19.5	1.00 7	130.3	37 49.4	1.00 7	130.3	38 49.2	1.00 7	130.2	7
8	31 16.6	1.00 7	129.8	31 46.5	1.00 7	129.8	32 16.5	1.00 7	129.8	33 16.3	1.00 7	129.7	35 15.9	1.00 7	129.5	37 15.5	1.00 7	129.3	37 45.4	1.00 7	129.2	38 45.2	1.00 7	129.1	8
9	31 12.6	1.00 7	128.8	31 42.5	1.00 7	128.7	32 12.4	1.00 7	128.7	33 12.2	1.00 7	128.6	35 11.8	1.00 7	128.4	37 11.4	1.00 7	128.2	37 41.3	1.00 7	128.2	38 41.1	1.00 7	128.1	9
50	31 08.5	1.00 7	127.7	31 38.4	1.00 7	127.7	32 08.3	1.00 7	127.6	33 08.1	1.00 7	127.6	35 07.7	1.00 7	127.4	37 07.3	1.00 7	127.2	37 37.2	1.00 7	127.2	38 37.0	1.00 7	127.0	50
1	31 04.3	1.00 7	126.8	31 34.2	1.00 7	126.7	32 04.1	1.00 7	126.7	33 03.9	1.00 7	126.6	35 03.5	1.00 7	126.4	37 03.1	1.00 7	126.2	37 33.0	1.00 7	126.1	38 32.8	1.00 7	126.0	1
2	31 00.1	1.00 7	125.7	31 30.0	1.00 7	125.7	31 59.9	1.00 7	125.6	32 59.7	1.00 7	125.5	34 59.3	1.00 7	125.3	36 58.9	1.00 7	125.1	37 28.7	1.00 7	125.1	38 28.5	1.00 7	125.0	2
3	30 55.8	1.00 7	124.7	31 25.7	1.00 7	124.7	31 55.6	1.00 7	124.6	32 55.4	1.00 7	124.5	34 55.0	1.00 7	124.3	36 54.6	1.00 7	124.1	37 24.4	1.00 7	124.0	38 24.2	1.00 7	123.9	3
4	30 51.5	1.00 7	123.6	31 21.4	1.00 7	123.6	31 51.3	1.00 7	123.5	32 51.1	1.00 7	123.5	34 50.7	1.00 7	123.3	36 50.2	1.00 7	123.1	37 20.1	1.00 7	123.0	38 19.8	1.00 7	122.9	4
55	30 47.1	1.00 7	122.7	31 17.0	1.00 7	122.6	31 46.9	1.00 7	122.6	32 46.7	1.00 7	122.5	34 46.3	1.00 7	122.3	36 45.8	1.00 7	122.0	37 15.7	1.00 7	122.0	38 15.4	1.00 7	121.9	55
6	30 42.7	1.00 7	121.6	31 12.6	1.00 7	121.6	31 42.5	1.00 7	121.5	32 42.3	1.00 7	121.4	34 41.8	1.00 8	121.2	36 41.3	1.00 8	121.0	37 11.2	1.00 8	121.0	38 11.0	1.00 8	120.8	6
7	30 38.2	1.00 8	120.6	31 08.1	1.00 8	120.6	31 38.0	1.00 8	120.5	32 37.8	1.00 8	120.4	34 37.3	1.00 8	120.2	36 36.8	1.00 8	120.0	37 06.7	1.00 8	119.9	38 06.4	1.00 8	119.8	7
8	30 33.7	1.00 8	119.6	31 03.6	1.00 8	119.5	31 33.5	1.00 8	119.5	32 33.2	1.00 8	119.4	34 32.8	1.00 8	119.2	36 32.2	1.00 8	119.0	37 02.1	1.00 8	118.9	38 01.9	1.00 8	118.8	8
9	30 29.1	1.00 8	118.6	30 59.0	1.00 8	118.5	31 28.9	1.00 8	118.5	32 28.7	1.00 8	118.4	34 28.2	1.00 8	118.1	36 27.7	1.00 8	117.9	36 57.5	1.00 8	117.9	37 57.3	1.00 8	117.7	9
60	30 24.5	1.00 8	117.5	30 54.4	1.00 8	117.5	31 24.3	1.00 8	117.4	32 24.0	1.00 8	117.3	34 23.6	1.00 8	117.1	36 23.0	1.00 8	116.9	36 52.9	1.00 8	116.8	37 52.6	1.00 8	116.7	60
1	30 19.9	1.00 8	116.5	30 49.7	1.00 8	116.5	31 19.6	1.00 8	116.4	32 19.4	1.00 8	116.3	34 18.9	1.00 8	116.1	36 18.4	1.00 8	115.9	36 48.2	1.00 8	115.8	37 47.9	1.00 8	115.7	1
2	30 15.2	1.00 8	115.5	30 45.0	1.00 8	115.5	31 14.9	1.00 8	115.4	32 14.7	1.00 8	115.3	34 14.2	1.00 8	115.1	36 13.6	1.00 8	114.8	36 43.5	1.00 8	114.8	37 43.2	1.00 8	114.7	2
3	30 10.4	1.00 8	114.5	30 40.3	1.00 8	114.4	31 10.2	1.00 8	114.4	32 09.9	1.00 8	114.3	34 09.4	1.00 8	114.1	36 08.9	1.00 8	113.8	36 38.7	1.00 9	113.8	37 38.4	1.00 8	113.6	3
4	30 05.6	1.00 8	113.5	30 35.5	1.00 8	113.4	31 05.4	1.00 8	113.4	32 05.1	1.00 8	113.3	34 04.6	1.00 8	113.0	36 04.1	1.00 8	112.8	36 33.9	1.00 9	112.7	37 33.6	1.00 8	112.6	4
65	30 00.8	1.00 8	112.5	30 30.7	1.00 8	112.4	31 00.6	1.00 8	112.4	32 00.3	1.00 8	112.2	33 59.8	1.00 8	112.0	35 59.2	1.00 8	111.8	36 29.1	1.00 8	111.7	37 28.8	1.00 8	111.6	65
6	29 56.0	1.00 8	111.4	30 25.8	1.00 8	111.4	30 55.7	1.00 8	111.3	31 55.5	1.00 8	111.2	33 54.9	1.00 8	111.0	35 54.3	1.00 8	110.8	36 24.2	1.00 8	110.7	37 23.9	1.00 8	110.6	6
7	29 51.1	1.00 8	110.4	30 21.0	1.00 8	110.4	30 50.8	1.00 8	110.3	31 50.6	1.00 8	110.2	33 50.0	1.00 8	110.0	35 49.4	1.00 8	109.7	36 19.3	1.00 8	109.7	37 19.0	99 08	109.6	7
8	29 46.2	1.00 8	109.4	30 16.0	1.00 8	109.4	30 45.9	1.00 8	109.3	31 45.6	1.00 8	109.2	33 45.1	1.00 8	109.0	35 44.5	1.00 8	108.7	36 14.4	99 08	108.7	37 14.0	99 08	108.5	8
9	29 41.2	1.00 8	108.4	30 11.1	1.00 8	108.4	30 41.0	1.00 8	108.3	31 40.7	1.00 8	108.2	33 40.1	1.00 8	108.0	35 39.5	99 08	107.7	36 09.4	99 08	107.7	37 09.1	99 08	107.5	9
70	29 36.2	1.00 8	107.4	30 06.1	1.00 8	107.3	30 36.0	1.00 8	107.3	31 35.7	1.00 8	107.2	33 35.1	1.00 8	106.9	35 34.5	99 08	106.7	36 04.4	99 08	106.6	37 04.1	99 08	106.5	70
1	29 31.2	1.00 8	106.4	30 01.1	1.00 8	106.3	30 31.0	1.00 8	106.3	31 30.7	1.00 8	106.2	33 30.1	1.00 8	105.9	35 29.5	99 08	105.7	35 59.4	99 08	105.6	36 59.0	99 08	105.5	1
2	29 26.2	1.00 8	105.4	29 56.1	1.00 8	105.3	30 25.9	1.00 8	105.3	31 25.7	1.00 8	105.2	33 25.1	1.00 8	104.9	35 24.5	99 08	104.7	35 54.3	99 08	104.6	36 54.0	99 08	104.5	2
3	29 21.2	1.00 8	104.4	29 51.0	1.00 8	104.3	30 20.9	1.00 8	104.3	31 20.6	1.00 8	104.1	33 20.0	1.00 8	103.9	35 19.4	99 08	103.7	35 49.2	99 08	103.6	36 48.9	99 08	103.5	3
4	29 16.1	1.00 8	103.4	29 45.9	1.00 8	103.3	30 15.8	1.00 8	103.2	31 15.5	1.00 8	103.1	33 14.9	1.00 8	102.9	35 14.3	99 09	102.7	35 44.2	99 09	102.6	36 43.8	99 09	102.5	4
75	29 11.0	1.00 9	102.4	29 40.8	1.00 9	102.3	30 10.7	1.00 9	102.2	31 10.4	1.00 9	102.1	33 09.8	99 09	101.9	35 09.2	99 09	101.6	35 39.0	99 09	101.6	36 38.7	99 09	101.5	75
6	29 05.9	1.00 9	101.3	29 35.7	1.00 9	101.3	30 05.6	1.00 9	101.2	31 05.3	1.00 9	101.1	33 04.7	99 09	100.9	35 04.1	99 09	100.6	35 33.9	99 09	100.6	36 33.6	99 09	100.4	6
7	29 00.8	1.00 9	100.3	29 30.6	1.00 9	100.3	30 00.4	1.00 9	100.2	31 00.2	1.00 9	100.1	32 59.5	99 09	99.9	34 58.9	99 09	99.6	35 28.8	99 09	99.6	36 28.4	99 09	99.4	7
8	28 55.6	1.00 9	99.3	29 25.4	1.00 9	99.3	29 55.3	1.00 9	99.2	30 55.0	1.00 9	99.1	32 54.4	99 09	98.9	34 53.8	99 09	98.6	35 23.6	99 09	98.6	36 23.3	99 09	98.4	8
9	28 50.4	1.00 9	98.3	29 20.3	1.00 9	98.3	29 50.1	1.00 9	98.2	30 49.8	1.00 9	98.1	32 49.2	99 09	97.9	34 48.6	99 09	97.6	35 18.4	99 09	97.6	36 18.1	99 09	97.4	9
80	28 45.2	1.00 9	97.3	29 15.1	1.00 9	97.3	29 44.9	1.00 9	97.2	30 44.6	1.00 9	97.1	32 44.0	99 09	96.9	34 43.4	99 09	96.6	35 13.2	99 09	96.6	36 12.9	99 09	96.4	80
1	28 40.0	1.00 9	96.3	29 09.9	1.00 9	96.3	29 39.7	1.00 9	96.2	30 39.4	1.00 9	96.1	32 38.8	99 09	95.9	34 38.2	99 09	95.6	35 08.0	99 09	95.5	36 07.7	99 09	95.4	1
2	28 34.8	1.00 9	95.3	29 04.7	1.00 9	95.3	29 34.5	1.00 9	95.2	30 34.2	99 09	95.1	32 33.6	99 09	94.9	34 33.0	99 09	94.6	35 02.8	99 09	94.5	36 02.5	99 09	94.4	2
3	28 29.6	1.00 9	94.3	28 59.5	1.00 9	94.3	29 29.3	1.00 9	94.2	30 29.0	99 09	94.1	32 28.4	99 09	93.9	34 27.8	99 09	93.6	34 57.6	99 09	93.5	35 57.3	99 09	93.4	3
4	28 24.4	1.00 9	93.3	28 54.3	1.00 9	93.3	29 24.1	1.00 9	93.2	30 23.8	99 09	93.1	32 23.2	99 09	92.9	34 22.5	99 09	92.6	34 52.4	99 09	92.5	35 52.0	99 09	92.4	4
85	28 19.2	1.00 9	92.3	28 49.0	1.00 9	92.3	29 18.9	1.00 9	92.2	30 18.6	99 09	92.1	32 18.0	99 09	91.9	34 17.3	99 09	91.6	34 47.2	99 09	91.5	35 46.8	99 09	91.4	85
6	28 14.0	1.00 9	91.3	28 43.8	1.00 9	91.3	29 13.7	1.00 9	91.2	30 13.4	99 09	91.1	32 12.7	99 09	90.9	34 12.1	99 09	90.6	34 41.9	99 09	90.6	35 41.6	99 09	90.4	6
7	28 08.7	1.00 9	90.3	28 38.6	1.00 9	90.3	29 08.4	1.00 9	90.2	30 08.1	99 09	90.1	32 07.5	99 09	89.9	34 06.9	99 09	89.6	34 36.7	99 09	89.6	35 36.4	99 09	89.4	7
8	28 03.5	1.00 9	89.3	28 33.4	1.00 9	89.3	29 03.2	1.00 9	89.2	30 02.9	99 09	89.1	32 02.3	99 09	88.9	34 01.6	99 09	88.6	34 31.5	99 09	88.6	35 31.1	99 09	88.4	8
9	27 58.3	1.00 9	88.3	28 28.1	1.00 9	88.3	28 58.0	1.00 9	88.2	29 57.7	99 09	88.1	31 57.1	99 09	87.9	33 56.4	99 09	87.6	34 26.2	99 09	87.6	35 25.9	99 09	87.4	9
90	27 53.0	1.00 9	87.3	28 22.9	1.00 9	87.3	28 52.8	1.00 9	87.2	29 52.5	99 09	87.1	31 51.8	99 09	86.9	33 51.2	99 09	86.6	34 21.0	99 09	86.6	35 20.7	99 09	86.4	90

H.A.	28° 00' Alt.	Δd	Az.	28° 30' Alt.	Δd	Az.	29° 00' Alt.	Δd	Az.	30° 00' Alt.	Δd Δt	Az.	32° 00' Alt.	Δd Δt	Az.	34° 00' Alt.	Δd Δt	Az.	34° 30' Alt.	Δd Δt	Az.	35° 30' Alt.	Δd Δt	Az.	H.A.
91	27 47.8	1.009	86.4	28 17.7	1.009	86.3	28 47.5	1.009	86.2	29 47.2	99 09	86.1	31 46.6	99 09	85.9	33 46.0	99 09	85.6	34 15.8	99 09	85.6	35 15.5	99 09	85.5	91
2	27 42.6	1.009	85.4	28 12.5	1.009	85.3	28 42.3	1.009	85.2	29 42.0	99 09	85.1	31 41.4	99 09	84.9	33 40.8	99 09	84.7	34 10.6	99 09	84.6	35 10.3	99 09	84.5	2
3	27 37.4	1.009	84.4	28 07.3	1.009	84.3	28 37.1	1.009	84.3	29 36.8	99 09	84.1	31 36.2	99 09	83.9	33 35.6	99 09	83.7	34 05.4	99 09	83.6	35 05.1	99 09	83.5	3
4	27 32.2	1.009	83.4	28 02.1	1.009	83.3	28 31.9	1.009	83.3	29 31.6	99 09	83.2	31 31.0	99 09	82.9	33 30.4	99 09	82.7	34 00.2	99 09	82.6	34 59.9	99 09	82.5	4
95	27 27.0	1.009	82.4	27 56.9	1.009	82.3	28 26.7	1.009	82.3	29 26.4	1.009	82.2	31 25.8	99 09	81.9	33 25.2	99 09	81.7	33 55.0	99 09	81.6	34 54.7	99 09	81.5	95
6	27 21.8	1.009	81.4	27 51.7	1.009	81.3	28 21.5	1.009	81.3	29 21.3	1.009	81.2	31 20.6	99 09	80.9	33 20.0	99 09	80.7	33 49.9	99 09	80.6	34 49.5	99 09	80.5	6
7	27 16.7	1.009	80.4	27 46.5	1.009	80.4	28 16.4	1.009	80.3	29 16.1	1.009	80.2	31 15.5	99 09	80.0	33 14.9	99 09	79.7	33 44.7	99 09	79.6	34 44.4	99 09	79.5	7
8	27 11.5	1.009	79.4	27 41.4	1.009	79.4	28 11.2	1.009	79.3	29 10.9	1.009	79.2	31 10.3	99 09	79.0	33 09.7	99 09	78.7	33 39.6	99 09	78.7	34 39.2	99 09	78.5	8
9	27 06.4	1.009	78.4	27 36.3	1.009	78.4	28 06.1	1.009	78.3	29 05.8	1.009	78.2	31 05.2	99 09	78.0	33 04.6	99 08	77.7	33 34.4	99 09	77.7	34 34.1	99 09	77.6	9
100	27 01.3	1.008	77.4	27 31.1	1.008	77.4	28 01.0	1.008	77.3	29 00.7	1.008	77.2	31 00.1	99 08	77.0	32 59.5	99 08	76.8	33 29.3	99 08	76.7	34 29.0	99 08	76.6	100
1	26 56.2	1.008	76.5	27 26.0	1.008	76.4	27 55.9	1.008	76.3	28 55.6	1.008	76.2	30 55.0	99 08	76.0	32 54.4	99 08	75.8	33 24.3	99 08	75.7	34 23.9	99 08	75.6	1
2	26 51.1	1.008	75.5	27 21.0	1.008	75.4	27 50.8	1.008	75.4	28 50.6	1.008	75.3	30 50.0	99 08	75.0	32 49.4	99 08	74.8	33 19.2	99 08	74.7	34 18.9	99 08	74.6	2
3	26 46.1	1.008	74.5	27 15.9	1.008	74.4	27 45.8	1.008	74.4	28 45.5	1.008	74.3	30 44.9	99 08	74.0	32 44.3	99 08	73.8	33 14.2	99 08	73.8	34 13.9	99 08	73.6	3
4	26 41.0	1.008	73.5	27 10.9	1.008	73.5	27 40.8	1.008	73.4	28 40.5	1.008	73.3	30 39.9	99 08	73.1	32 39.3	99 08	72.8	33 09.2	99 08	72.8	34 08.9	99 08	72.6	4
105	26 36.0	1.008	72.5	27 05.9	1.008	72.5	27 35.8	1.008	72.4	28 35.5	1.008	72.3	30 34.9	1.008	72.1	32 34.3	99 08	71.9	33 04.2	99 08	71.8	34 03.9	99 08	71.7	105
6	26 31.1	1.008	71.5	27 00.9	1.008	71.5	27 30.8	1.008	71.4	28 30.5	1.008	71.3	30 30.0	1.008	71.1	32 29.4	99 08	70.9	32 59.2	99 08	70.8	33 58.9	99 08	70.7	6
7	26 26.1	1.008	70.6	26 56.0	1.008	70.5	27 25.9	1.008	70.5	28 25.6	1.008	70.3	30 25.0	1.008	70.1	32 24.5	99 08	69.9	32 54.3	99 08	69.8	33 54.0	99 08	69.7	7
8	26 21.2	1.008	69.6	26 51.1	1.008	69.5	27 20.9	1.008	69.5	28 20.7	1.008	69.4	30 20.1	1.008	69.1	32 19.6	99 08	68.9	32 49.4	99 08	68.9	33 49.1	1.008	68.7	8
9	26 16.3	1.008	68.6	26 46.2	1.008	68.5	27 16.1	1.008	68.5	28 15.8	1.008	68.4	30 15.3	1.008	68.2	32 14.7	1.008	67.9	32 44.6	1.008	67.9	33 44.3	1.008	67.8	9
110	26 11.5	1.008	67.6	26 41.3	1.008	67.6	27 11.2	1.008	67.5	28 11.0	1.008	67.4	30 10.4	1.008	67.2	32 09.9	1.008	67.0	32 39.7	1.008	66.9	33 39.4	1.008	66.8	110
1	26 06.6	1.008	66.6	26 36.5	1.008	66.6	27 06.4	1.008	66.5	28 06.1	1.008	66.4	30 05.6	1.008	66.2	32 05.1	1.008	66.0	32 34.9	1.008	65.9	33 34.7	1.008	65.8	1
2	26 01.9	1.008	65.7	26 31.7	1.008	65.6	27 01.6	1.008	65.6	28 01.4	1.008	65.5	30 00.9	1.008	65.2	32 00.3	1.008	65.0	32 30.2	1.008	65.0	33 29.9	1.008	64.8	2
3	25 57.1	1.008	64.7	26 27.0	1.008	64.6	26 56.9	1.008	64.6	27 56.6	1.008	64.5	29 56.1	1.008	64.3	31 55.6	1.008	64.0	32 25.5	1.008	64.0	33 25.2	1.008	63.9	3
4	25 52.4	1.008	63.7	26 22.3	1.008	63.6	26 52.2	1.008	63.6	27 51.9	1.008	63.5	29 51.4	1.008	63.3	31 50.9	1.008	63.1	32 20.8	1.008	63.0	33 20.5	1.008	62.9	4
115	25 47.7	1.008	62.7	26 17.6	1.008	62.7	26 47.5	1.008	62.6	27 47.3	1.008	62.5	29 46.8	1.008	62.3	31 46.3	1.008	62.1	32 16.1	1.008	62.0	33 15.9	1.008	61.9	115
6	25 43.1	1.008	61.7	26 13.0	1.008	61.7	26 42.9	1.008	61.6	27 42.6	1.008	61.5	29 42.2	1.008	61.3	31 41.7	1.008	61.1	32 11.5	1.008	61.1	33 11.3	1.008	61.0	6
7	25 38.5	1.008	60.8	26 08.4	1.008	60.7	26 38.3	1.008	60.7	27 38.1	1.008	60.6	29 37.6	1.008	60.4	31 37.1	1.008	60.2	32 07.0	1.008	60.1	33 06.7	1.008	60.0	7
8	25 34.0	1.008	59.8	26 03.9	1.008	59.7	26 33.8	1.008	59.7	27 33.5	1.008	59.6	29 33.1	1.007	59.4	31 32.6	1.007	59.2	32 02.5	1.007	59.1	33 02.2	1.007	59.0	8
9	25 29.5	1.007	58.8	25 59.4	1.007	58.8	26 29.3	1.007	58.7	27 29.1	1.007	58.6	29 28.6	1.007	58.4	31 28.1	1.007	58.2	31 58.0	1.007	58.2	32 57.8	1.007	58.1	9
120	25 25.0	1.007	57.8	25 54.9	1.007	57.8	26 24.8	1.007	57.8	27 24.6	1.007	57.7	29 24.2	1.007	57.5	31 23.7	1.007	57.3	31 53.6	1.007	57.2	32 53.4	1.007	57.1	120
1	25 20.6	1.007	56.9	25 50.5	1.007	56.8	26 20.4	1.007	56.8	27 20.2	1.007	56.7	29 19.8	1.007	56.5	31 19.3	1.007	56.3	31 49.2	1.007	56.2	32 49.0	1.007	56.1	1
2	25 16.3	1.007	55.9	25 46.2	1.007	55.9	26 16.1	1.007	55.8	27 15.9	1.007	55.7	29 15.4	1.007	55.5	31 15.0	1.007	55.3	31 44.9	1.007	55.3	32 44.7	1.007	55.2	2
3	25 12.0	1.007	54.9	25 41.9	1.007	54.9	26 11.8	1.007	54.8	27 11.6	1.007	54.7	29 11.2	1.007	54.6	31 10.6	1.007	54.4	31 40.6	1.007	54.3	32 40.4	1.007	54.2	3
4	25 07.7	1.007	54.0	25 37.6	1.007	53.9	26 07.5	1.007	53.9	27 07.3	1.007	53.8	29 06.9	1.007	53.6	31 06.5	1.007	53.4	31 36.4	1.007	53.3	32 36.2	1.007	53.2	4
125	25 03.5	1.007	53.0	25 33.4	1.007	52.9	26 03.3	1.007	52.9	27 03.1	1.007	52.8	29 02.7	1.007	52.6	31 02.3	1.007	52.4	31 32.2	1.007	52.4	32 32.0	1.007	52.3	125
6	24 59.4	1.007	52.0	25 29.3	1.007	52.0	25 59.2	1.007	51.9	26 59.0	1.007	51.8	28 58.6	1.007	51.7	30 58.2	1.007	51.5	31 28.1	1.007	51.4	32 27.9	1.007	51.3	6
7	24 55.3	1.007	51.0	25 25.2	1.007	51.0	25 55.1	1.007	50.9	26 54.9	1.007	50.9	28 54.5	1.007	50.7	30 54.2	1.007	50.5	31 24.1	1.007	50.5	32 23.9	1.007	50.4	7
8	24 51.2	1.007	50.1	25 21.2	1.007	50.0	25 51.1	1.007	50.0	26 50.9	1.007	49.9	28 50.5	1.007	49.7	30 50.2	1.007	49.5	31 20.1	1.007	49.5	32 19.9	1.007	49.4	8
9	24 47.3	1.007	49.1	25 17.2	1.007	49.1	25 47.1	1.007	49.0	26 46.9	1.007	48.9	28 46.6	1.006	48.8	30 46.2	1.006	48.6	31 16.1	1.006	48.5	32 15.9	1.006	48.4	9
130	24 43.3	1.006	48.1	25 13.3	1.006	48.1	25 43.2	1.006	48.0	26 43.0	1.006	48.0	28 42.7	1.006	47.8	30 42.3	1.006	47.6	31 12.2	1.006	47.6	32 12.0	1.006	47.5	130
1	24 39.5	1.006	47.2	25 09.4	1.006	47.1	25 39.3	1.006	47.1	26 39.2	1.006	47.0	28 38.8	1.006	46.8	30 38.5	1.006	46.7	31 08.4	1.006	46.6	32 08.2	1.006	46.5	1
2	24 35.7	1.006	46.2	25 05.6	1.006	46.1	25 35.5	1.006	46.1	26 35.4	1.006	46.0	28 35.0	1.006	45.9	30 34.7	1.006	45.7	31 04.6	1.006	45.6	32 04.4	1.006	45.6	2
3	24 31.9	1.006	45.2	25 01.8	1.006	45.2	25 31.8	1.006	45.1	26 31.6	1.006	45.1	28 31.3	1.006	44.9	30 31.0	1.006	44.7	31 00.9	1.006	44.7	32 00.7	1.006	44.6	3
4	24 28.2	1.006	44.3	24 58.2	1.006	44.2	25 28.1	1.006	44.2	26 28.0	1.006	44.1	28 27.7	1.006	43.9	30 27.3	1.006	43.8	30 57.3	1.006	43.7	31 57.1	1.006	43.6	4
135	24 24.6	1.006	43.3	24 54.6	1.006	43.2	25 24.5	1.006	43.2	26 24.3	1.006	43.1	28 24.1	1.006	43.0	30 23.8	1.006	42.8	30 53.7	1.006	42.8	31 53.5	1.006	42.7	135
6	24 21.1	1.006	42.3	24 51.0	1.006	42.3	25 20.9	1.006	42.2	26 20.8	1.006	42.2	28 20.5	1.006	42.0	30 20.2	1.006	41.9	30 50.2	1.006	41.8	31 50.0	1.006	41.7	6
7	24 17.6	1.006	41.4	24 47.5	1.006	41.3	25 17.5	1.006	41.3	26 17.3	1.006	41.2	28 17.1	1.006	41.1	30 16.8	1.006	40.9	30 46.7	1.006	40.9	31 46.6	1.006	40.8	7
8	24 14.2	1.006	40.4	24 44.1	1.006	40.3	25 14.0	1.006	40.3	26 13.9	1.006	40.2	28 13.7	1.006	40.1	30 13.4	1.006	39.9	30 43.3	1.006	39.9	31 43.2	1.006	39.8	8
9	24 10.8	1.005	39.4	24 40.8	1.005	39.4	25 10.7	1.005	39.3	26 10.6	1.005	39.3	28 10.3	1.005	39.1	30 10.1	1.005	39.0	30 40.0	1.005	38.9	31 39.9	1.005	38.9	9
140	24 07.5	1.005	38.5	24 37.5	1.005	38.4	25 07.4	1.005	38.4	26 07.3	1.005	38.3	28 07.1	1.005	38.2	30 06.8	1.005	38.0	30 36.7	1.005	38.0	31 36.6	1.005	37.9	140
1	24 04.3	1.005	37.5	24 34.3	1.005	37.5	25 04.2	1.005	37.4	26 04.1	1.005	37.4	28 03.9	1.005	37.2	30 03.6	1.005	37.1	30 33.6	1.005	37.0	31 33.4	1.005	37.0	1
2	24 01.2	1.005	36.5	24 31.1	1.005	36.5	25 01.1	1.005	36.5	26 00.9	1.005	36.4	28 00.7	1.005	36.3	30 00.5	1.005	36.1	30 30.4	1.005	36.1	31 30.3	1.005	36.0	2
3	23 58.1	1.005	35.6	24 28.0	1.005	35.5	24 58.0	1.005	35.5	25 57.9	1.005	35.4	27 57.7	1.005	35.3	29 57.5	1.005	35.2	30 27.4	1.005	35.1	31 27.3	1.005	35.1	3
4	23 55.1	1.005	34.6	24 25.0	1.005	34.6	24 55.0	1.005	34.5	25 54.9	1.005	34.5	27 54.7	1.005	34.3	29 54.5	1.005	34.2	30 24.4	1.005	34.2	31 24.3	1.005	34.1	4
145	23 52.1	1.005	33.6	24 22.1	1.005	33.6	24 52.1	1.005	33.6	25 52.0	1.005	33.5	27 51.8	1.005	33.4	29 51.6	1.005	33.3	30 21.5	1.005	33.2	31 21.4	1.005	33.1	145
6	23 49.3	1.005	32.7	24 19.2	1.005	32.6	24 49.2	1.005	32.6	25 49.1	1.005	32.5	27 48.9	1.005	32.4	29 48.7	1.005	32.3	30 18.7	1.005	32.3	31 18.6	1.005	32.2	6
7	23 46.5	1.005	31.7	24 16.5	1.005	31.7	24 46.4	1.004	31.6	25 46.3	1.004	31.6	27 46.2	1.004	31.5	29 46.0	1.004	31.3	30 15.9	1.004	31.3	31 15.9	1.004	31.2	7
8	23 43.8	1.004	30.7	24 13.8	1.004	30.7	24 43.7	1.004	30.7	25 43.6	1.004	30.6	27 43.5	1.004	30.5	29 43.3	1.004	30.4	30 13.3	1.004	30.4	31 13.2	1.004	30.3	8
9	23 41.2	1.004	29.7	24 11.1	1.004	29.7	24 41.1	1.004	29.7	25 41.0	1.004	29.7	27 40.9	1.004	29.6	29 40.7	1.004	29.4	30 10.7	1.004	29.4	31 10.6	1.004	29.3	9
150	23 38.6	1.004	28.8	24 08.6	1.004	28.8	24 38.5	1.004	28.8	25 38.5	1.004	28.7	27 38.3	1.004	28.6	29 38.2	1.004	28.6	30 08.1	1.004	28.5	31 08.1	1.004	28.4	150
1	23 36.1	1.004	27.8	24 06.1	1.004	27.8	24 36.1	1.004	27.8	25 36.0	1.004	27.7	27 35.9	1.004	27.6	29 35.7	1.004	27.5	30 05.7	1.004	27.5	31 05.6	1.004	27.4	1
2	23 33.7	1.004	26.9	24 03.7	1.004	26.9	24 33.7	1.004	26.8	25 33.6	1.004	26.8	27 33.5	1.004	26.7	29 33.3	1.004	26.6	30 03.3	1.004	26.6	31 03.2	1.004	26.5	2
3	23 31.4	1.004	25.9	24 01.4	1.004	25.9	24 31.3	1.004	25.9	25 31.3	1.004	25.8	27 31.2	1.004	25.7	29 31.0	1.004	25.6	30 01.0	1.004	25.6	31 00.9	1.004	25.5	3
4	23 29.1	1.004	24.9	23 59.1	1.004	24.9	24 29.0	1.004	24.9	25 29.0	1.004	24.9	27 28.9	1.004	24.8	29 28.8	1.004	24.7	29 58.8	1.004	24.6	30 58.7	1.004	24.6	4
155	23 27.0	1.003	24.0	23 56.9	1.003	24.0	24 26.9	1.003	24.0	25 26.9	1.003	23.9	27 26.8	1.003	23.8	29 26.7	1.003	23.7	29 56.6	1.003	23.7	30 56.6	1.003	23.7	155
6	23 24.9	1.003	23.0	23 54.9	1.003	23.0	24 24.8	1.003	23.0	25 24.8	1.003	23.0	27 24.7	1.003	22.9	29 24.6	1.003	22.8	29 54.6	1.003	22.7	30 54.5	1.003	22.7	6
7	23 22.9	1.003	22.1	23 52.9	1.003	22.1	24 22.8	1.003	22.0	25 22.8	1.003	22.0	27 22.7	1.003	21.9	29 22.6	1.003	21.8	29 52.6	1.003	21.8	30 52.5	1.003	21.8	7
8	23 21.0	1.003	21.1	23 50.9	1.003	21.1	24 20.9	1.003	21.1	25 20.9	1.003	21.0	27 20.8	1.003	21.0	29 20.7	1.003	20.9	29 50.7	1.003	20.9	30 50.7	1.003	20.8	8
9	23 19.1	1.003	20.2	23 49.1	1.003	20.1	24 19.1	1.003	20.1	25 19.0	1.003	20.1	27 19.0	1.003	20.1	29 18.9	1.003	19.9	29 48.9	1.003	19.9	30 48.8	1.003	19.9	9
160	23 17.4	1.003	19.2	23 47.3	1.003	19.2	24 17.3	1.003	19.2	25 17.3	1.003	19.1	27 17.2	1.003	19.0	29 17.2	1.003	19.0	29 47.1	1.003	19.0	30 47.1	1.003	18.9	160
1	23 15.7	1.003	18.2	23 45.7	1.003	18.2	24 15.6	1.003	18.2	25 15.6	1.003	18.2	27 15.6	1.003	18.1	29 15.5	1.003	18.0	29 45.5	1.003	18.0	30 45.4	1.003	18.0	1
2	23 14.1	1.003	17.3	23 44.1	1.003	17.3	24 14.1	1.002	17.2	25 14.0	1.002	17.2	27 14.0	1.002	17.1	29 13.9	1.002	17.1	29 43.9	1.002	17.1	30 43.9	1.002	17.0	2
3	23 12.6	1.002	16.3	23 42.6	1.002	16.3	24 12.5	1.002	16.3	25 12.5	1.002	16.3	27 12.5	1.002	16.2	29 12.4	1.002	16.1	29 42.4	1.002	16.1	30 42.4	1.002	16.1	3
4	23 11.1	1.002	15.4	23 41.1	1.002	15.3	24 11.1	1.002	15.3	25 11.1	1.002	15.3	27 11.1	1.002	15.2	29 11.0	1.002	15.2	29 41.0	1.002	15.2	30 41.0	1.002	15.1	4
165	23 09.8	1.002	14.4	23 39.8	1.002	14.4	24 09.8	1.002	14.4	25 09.8	1.002	14.3	27 09.7	1.002	14.3	29 09.7	1.002	14.2	29 39.7	1.002	14.2	30 39.7	1.002	14.2	165
6	23 08.5	1.002	13.4	23 38.5	1.002	13.4	24 08.5	1.002	13.4	25 08.5	1.002	13.4	27 08.5	1.002	13.3	29 08.4	1.002	13.3	29 38.4	1.002	13.3	30 38.4	1.002	13.2	6
7	23 07.4	1.002	12.5	23 37.4	1.002	12.5	24 07.4	1.002	12.4	25 07.3	1.002	12.4	27 07.3	1.002	12.4	29 07.3	1.002	12.3	29 37.3	1.002	12.3	30 37.3	1.002	12.3	7
8	23 06.3	1.002	11.5	23 36.3	1.002	11.5	24 06.3	1.002	11.5	25 06.3	1.002	11.5	27 06.2	1.002	11.4	29 06.2	1.002	11.4	29 36.2	1.002	11.4	30 36.2	1.002	11.3	8
9	23 05.3	1.002	10.6	23 35.3	1.002	10.5	24 05.3	1.002	10.5	25 05.3	1.002	10.5	27 05.2	1.002	10.5	29 05.2	1.002	10.4	29 35.2	1.002	10.4	30 35.2	1.002	10.4	9
170	23 04.4	1.001	09.6	23 34.4	1.001	09.6	24 04.4	1.001	09.6	25 04.4	1.001	09.6	27 04.3	1.001	09.5	29 04.3	1.001	09.5	29 34.3	1.001	09.5	30 34.3	1.001	09.5	170
1	23 03.5	1.001	08.6	23 33.5	1.001	08.6	24 03.5	1.001	08.6	25 03.5	1.001	08.6	27 03.5	1.001	08.6	29 03.5	1.001	08.5	29 33.5	1.001	08.5	30 33.5	1.001	08.5	1
2	23 02.8	1.001	07.7	23 32.8	1.001	07.7	24 02.8	1.001	07.7	25 02.8	1.001	07.6	27 02.8	1.001	07.6	29 02.8	1.001	07.6	29 32.8	1.001	07.6	30 32.8	1.001	07.6	2
3	23 02.1	1.001	06.7	23 32.1	1.001	06.7	24 02.1	1.001	06.7	25 02.1	1.001	06.7	27 02.1	1.001	06.7	29 02.1	1.001	06.6	29 32.1	1.001	06.6	30 32.1	1.001	06.6	3
4	23 01.6	1.001	05.8	23 31.6	1.001	05.8	24 01.6	1.001	05.7	25 01.6	1.001	05.7	27 01.6	1.001	05.7	29 01.6	1.001	05.7	29 31.6	1.001	05.7	30 31.6	1.001	05.7	4
175	23 01.1	1.001	04.8	23 31.1	1.001	04.8	24 01.1	1.001	04.8	25 01.1	1.001	04.8	27 01.1	1.001	04.8	29 01.1	1.001	04.7	29 31.1	1.001	04.7	30 31.1	1.001	04.7	175
6	23 00.7	1.000	03.8	23 30.7	1.000	03.8	24 00.7	1.000	03.8	25 00.7	1.000	03.8	27 00.7	1.000	03.8	29 00.7	1.001	03.8	29 30.7	1.000	03.8	30 30.7	1.000	03.8	6
7	23 00.4	1.000	02.9	23 30.4	1.000	02.9	24 00.4	1.000	02.9	25 00.4	1.000	02.9	27 00.4	1.000	02.9	29 00.4	1.000	02.8	29 30.4	1.900	02.8	30 30.4	1.000	02.8	7
8	23 00.2	1.000	01.9	23 30.2	1.000	01.9	24 00.2	1.000	01.9	25 00.2	1.000	01.9	27 00.2	1.000	01.9	29 00.2	1.000	01.9	29 30.2	1.000	01.9	30 30.2	1.000	01.9	8
9	23 00.0	1.000	01.0	23 30.0	1.000	01.0	24 00.0	1.000	01.0	25 00.0	1.000	01.0	27 00.0	1.000	01.0	29 00.0	1.000	00.9	29 30.0	1.000	00.9	30 30.0	1.000	00.9	9
180	23 00.0	1.000	00.0	23 30.0	1.000	00.0	24 00.0	1.000	00.0	25 00.0	1.000	00.0	27 00.0	1.000	00.0	29 00.0	1.000	00.0	29 30.0	1.000	00.0	30 30.0	1.000	00.0	180

Lat. 5°

Each cell below lists: **Alt** (° ′), **Δd Δt**, **Az** (°).

H.A.	36° 00′	37° 00′	38° 30′	40° 00′	42° 00′	42° 30′	43° 00′	45° 00′	H.A.
00	41 00.0 1.00 0 180.0	42 00.0 1.00 0 180.0	43 30.0 1.00 0 180.0	45 00.0 1.00 0 180.0	47 00.0 1.00 0 180.0	47 30.0 1.00 0 180.0	48 00.0 1.00 0 180.0	50 00.0 1.00 0 180.0	00
1	41 00.0 1.00 0 178.9	42 00.0 1.00 0 178.9	43 30.0 1.00 0 178.9	45 00.0 1.00 0 178.9	47 00.0 1.00 0 178.9	47 30.0 1.00 0 178.9	48 00.0 1.00 0 178.9	50 00.0 1.00 0 178.9	1
2	40 59.8 1.00 0 177.9	41 59.8 1.00 0 177.9	43 29.8 1.00 0 177.8	44 59.8 1.00 0 177.8	46 59.8 1.00 0 177.8	47 29.8 1.00 0 177.8	47 59.8 1.00 0 177.8	49 59.8 1.00 0 177.8	2
3	40 59.6 1.00 1 176.8	41 59.6 1.00 1 176.8	43 29.6 1.00 1 176.8	44 59.6 1.00 1 176.8	46 59.6 1.00 1 176.7	47 29.6 1.00 1 176.7	47 59.6 1.00 1 176.7	49 59.5 1.00 1 176.7	3
4	40 59.2 1.00 1 175.7	41 59.2 1.00 1 175.7	43 29.2 1.00 1 175.7	44 59.2 1.00 1 175.7	46 59.2 1.00 1 175.6	47 29.2 1.00 1 175.6	47 59.2 1.00 1 175.6	49 59.2 1.00 1 175.6	4
05	40 58.8 1.00 1 174.6	41 58.8 1.00 1 174.6	43 28.8 1.00 1 174.6	44 58.8 1.00 1 174.6	46 58.8 1.00 1 174.6	47 28.8 1.00 1 174.5	47 58.8 1.00 1 174.5	49 58.7 1.00 1 174.5	05
6	40 58.2 1.00 1 173.6	41 58.2 1.00 1 173.6	43 28.2 1.00 1 173.5	44 58.2 1.00 1 173.5	46 58.2 1.00 1 173.5	47 28.2 1.00 1 173.5	47 58.2 1.00 1 173.4	49 58.2 1.00 1 173.4	6
7	40 57.6 1.00 1 172.5	41 57.6 1.00 1 172.5	43 27.6 1.00 1 172.4	44 57.6 1.00 1 172.4	46 57.6 1.00 1 172.4	47 27.6 1.00 1 172.4	47 57.6 1.00 1 172.4	49 57.5 1.00 1 172.3	7
8	40 56.9 1.00 1 171.4	41 56.9 1.00 1 171.4	43 26.9 1.00 1 171.4	44 56.8 1.00 1 171.3	46 56.8 1.00 1 171.3	47 26.8 1.00 1 171.3	47 56.8 1.00 1 171.3	49 56.8 1.00 1 171.2	8
9	40 56.0 1.00 2 170.4	41 56.0 1.00 2 170.3	43 26.0 1.00 2 170.3	44 56.0 1.00 2 170.3	46 56.0 1.00 2 170.2	47 26.0 1.00 2 170.2	47 56.0 1.00 2 170.2	49 55.9 1.00 2 170.1	9
10	40 55.1 1.00 2 169.3	41 55.1 1.00 2 169.3	43 25.1 1.00 2 169.2	44 55.1 1.00 2 169.2	46 55.0 1.00 2 169.1	47 25.0 1.00 2 169.1	47 55.0 1.00 2 169.1	49 55.0 1.00 2 169.0	10
1	40 54.1 1.00 2 168.2	41 54.1 1.00 2 168.3	43 24.1 1.00 2 168.1	44 54.0 1.00 2 168.1	46 54.0 1.00 2 168.0	47 24.0 1.00 2 168.0	47 54.0 1.00 2 168.0	49 54.0 1.00 2 167.9	1
2	40 53.0 1.00 2 167.1	41 53.0 1.00 2 167.1	43 22.9 1.00 2 167.1	44 52.9 1.00 2 167.0	46 52.9 1.00 2 166.9	47 22.9 1.00 2 166.9	47 52.9 1.00 2 166.9	49 52.8 1.00 2 166.8	2
3	40 51.8 1.00 2 166.1	41 51.8 1.00 2 166.0	43 21.7 1.00 2 166.0	44 51.7 1.00 2 165.9	46 51.6 1.00 2 165.8	47 21.6 1.00 2 165.8	47 51.6 1.00 2 165.8	49 51.6 1.00 2 165.7	3
4	40 50.5 1.00 2 165.0	41 50.4 1.00 2 165.0	43 20.4 1.00 2 164.9	44 50.4 1.00 2 164.8	46 50.3 1.00 2 164.7	47 20.3 1.00 2 164.7	47 50.3 1.00 2 164.7	49 50.2 1.00 2 164.6	4
15	40 49.1 1.00 3 163.9	41 49.0 1.00 3 163.9	43 19.0 1.00 3 163.8	44 49.0 1.00 3 163.7	46 48.9 1.00 3 163.7	47 18.9 1.00 3 163.7	47 48.9 1.00 3 163.6	49 48.8 1.00 3 163.5	15
6	40 47.6 1.00 3 162.9	41 47.5 1.00 3 162.8	43 17.5 1.00 3 162.8	44 47.4 1.00 3 162.7	46 47.4 1.00 3 162.6	47 17.4 1.00 3 162.6	47 47.3 1.00 3 162.5	49 47.3 1.00 3 162.4	6
7	40 46.0 1.00 3 161.8	41 46.0 1.00 3 161.8	43 15.9 1.00 3 161.7	44 45.8 1.00 3 161.6	46 45.8 1.00 3 161.5	47 15.7 1.00 3 161.5	47 45.7 1.00 3 161.5	49 45.6 1.00 3 161.3	7
8	40 44.3 1.00 3 160.7	41 44.3 1.00 3 160.7	43 14.2 1.00 3 160.6	44 44.2 1.00 3 160.5	46 44.1 1.00 3 160.4	47 14.0 1.00 3 160.4	47 44.0 1.00 3 160.4	49 43.9 1.00 3 160.2	8
9	40 42.5 1.00 3 159.7	41 42.5 1.00 3 159.6	43 12.4 1.00 3 159.5	44 42.4 1.00 3 159.5	46 42.3 1.00 3 159.3	47 12.2 1.00 3 159.3	47 42.2 1.00 3 159.3	49 42.1 1.00 3 159.1	9
20	40 40.7 1.00 3 158.6	41 40.6 1.00 3 158.5	43 10.6 1.00 3 158.5	44 40.5 1.00 3 158.4	46 40.4 1.00 3 158.3	47 10.3 1.00 3 158.2	47 40.3 1.00 3 158.2	49 40.2 1.00 3 158.1	20
1	40 38.7 1.00 3 157.5	41 38.7 1.00 3 157.5	43 08.6 1.00 3 157.4	44 38.5 1.00 3 157.3	46 38.4 1.00 3 157.2	47 08.4 1.00 3 157.1	47 38.3 1.00 3 157.1	49 38.2 1.00 3 157.0	1
2	40 36.7 1.00 4 156.5	41 36.6 1.00 4 156.4	43 06.5 1.00 4 156.3	44 36.4 1.00 4 156.2	46 36.3 1.00 4 156.1	47 06.3 1.00 4 156.1	47 36.2 1.00 4 156.0	49 36.1 1.00 4 155.9	2
3	40 34.5 1.00 4 155.4	41 34.5 1.00 4 155.4	43 04.4 1.00 4 155.3	44 34.3 1.00 4 155.2	46 34.2 1.00 4 155.0	47 04.1 1.00 4 155.0	47 34.1 1.00 4 154.9	49 33.9 1.00 4 154.9	3
4	40 32.3 1.00 4 154.3	41 32.3 1.00 4 154.3	43 02.2 1.00 4 154.2	44 32.0 1.00 4 154.1	46 31.9 1.00 4 153.9	47 01.9 1.00 4 153.9	47 31.8 1.00 4 153.9	49 31.6 1.00 4 153.7	4
25	40 30.0 1.00 4 153.3	41 30.0 1.00 4 153.2	42 59.8 1.00 4 153.1	44 29.7 1.00 4 153.0	46 29.6 1.00 4 152.9	46 59.5 1.00 4 152.8	47 29.5 1.00 4 152.8	49 29.3 1.00 4 152.6	25
6	40 27.6 1.00 4 152.2	41 27.6 1.00 4 152.2	42 57.4 1.00 4 152.0	44 27.3 1.00 4 151.9	46 27.1 1.00 4 151.8	46 57.1 1.00 4 151.7	47 27.0 1.00 4 151.7	49 26.8 1.00 4 151.5	6
7	40 25.1 1.00 4 151.2	41 25.1 1.00 4 151.1	42 54.9 1.00 4 151.0	44 24.8 1.00 4 150.9	46 24.6 1.00 4 150.7	46 54.6 1.00 4 150.7	47 24.5 1.00 4 150.6	49 24.3 1.00 4 150.4	7
8	40 22.6 1.00 4 150.1	41 22.5 1.00 4 150.0	42 52.4 1.00 4 149.9	44 22.2 1.00 4 149.8	46 22.0 1.00 4 149.6	46 52.0 1.00 4 149.6	47 21.9 1.00 4 149.5	49 21.7 1.00 4 149.3	8
9	40 19.9 1.00 5 149.0	41 19.8 1.00 5 149.0	42 49.7 1.00 5 148.8	44 19.5 1.00 5 148.7	46 19.3 1.00 5 148.6	46 49.3 1.00 5 148.5	47 19.2 1.00 5 148.5	49 19.0 1.00 5 148.3	9
30	40 17.2 1.00 5 148.0	41 17.1 1.00 5 147.9	42 46.9 1.00 5 147.8	44 16.8 1.00 5 147.7	46 16.6 1.00 5 147.5	46 46.5 1.00 5 147.4	47 16.4 1.00 5 147.4	49 16.2 1.00 5 147.2	30
1	40 14.4 1.00 5 146.9	41 14.3 1.00 5 146.8	42 44.1 1.00 5 146.7	44 13.9 1.00 5 146.6	46 13.7 1.00 5 146.4	46 43.6 1.00 5 146.4	47 13.6 1.00 5 146.3	49 13.3 1.00 5 146.1	1
2	40 11.5 1.00 5 145.8	41 11.4 1.00 5 145.8	42 41.2 1.00 5 145.7	44 11.0 1.00 5 145.5	46 10.7 1.00 5 145.3	46 40.7 1.00 5 145.3	47 10.6 1.00 5 145.2	49 10.3 1.00 5 145.0	2
3	40 08.5 1.00 5 144.8	41 08.4 1.00 5 144.7	42 38.2 1.00 5 144.6	44 08.0 1.00 5 144.4	46 07.8 1.00 5 144.3	46 37.7 1.00 5 144.2	47 07.6 1.00 5 144.2	49 07.3 1.00 5 144.0	3
4	40 05.5 1.00 5 143.7	41 05.3 1.00 5 143.7	42 35.1 1.00 5 143.5	44 04.9 1.00 5 143.4	46 04.7 1.00 5 143.2	46 34.6 1.00 5 143.1	47 04.5 1.00 5 143.1	49 04.2 1.00 5 142.9	4
35	40 02.3 1.00 5 142.7	41 02.2 1.00 5 142.6	42 32.0 1.00 5 142.5	44 01.8 1.00 5 142.3	46 01.5 1.00 5 142.1	46 31.4 1.00 5 142.1	47 01.3 1.00 5 142.0	49 01.0 1.00 5 141.8	35
6	39 59.1 1.00 5 141.6	40 59.0 1.00 5 141.5	42 28.8 1.00 6 141.4	43 58.6 1.00 6 141.3	45 58.2 1.00 6 141.1	46 28.2 1.00 6 141.0	46 58.1 1.00 6 141.0	48 57.7 1.00 6 140.7	6
7	39 55.8 1.00 6 140.6	40 55.7 1.00 6 140.5	42 25.5 1.00 6 140.4	43 55.2 1.00 6 140.2	45 54.8 1.00 6 139.9	46 24.8 1.00 6 139.9	46 54.7 1.00 6 139.9	48 54.4 1.00 6 139.3	7
8	39 52.5 1.00 6 139.5	40 52.3 1.00 6 139.4	42 22.1 1.00 6 139.3	43 51.9 1.00 6 139.1	45 51.5 1.00 6 138.9	46 21.4 1.00 6 138.9	46 51.3 1.00 6 138.8	48 50.9 1.00 6 138.6	8
9	39 49.1 1.00 6 138.5	40 48.9 1.00 6 138.4	42 18.7 1.00 6 138.2	43 48.4 1.00 6 138.1	45 48.0 1.00 6 137.9	46 18.0 1.00 6 137.8	46 47.9 1.00 6 137.8	48 47.5 1.00 6 137.5	9
40	39 45.6 1.00 6 137.4	40 45.4 1.00 6 137.3	42 15.1 1.00 6 137.2	43 44.9 1.00 6 137.0	45 44.5 1.00 6 136.8	46 14.4 1.00 6 136.7	46 44.3 1.00 6 136.7	48 43.9 1.00 6 136.4	40
1	39 42.0 1.00 6 136.4	40 41.8 1.00 6 136.3	42 11.5 1.00 6 136.1	43 41.3 1.00 6 136.0	45 40.9 1.00 6 135.7	46 10.8 1.00 6 135.6	46 40.7 1.00 6 135.6	48 40.2 1.00 6 135.4	1
2	39 38.3 1.00 6 135.3	40 38.2 1.00 6 135.2	42 07.9 1.00 6 135.1	43 37.6 1.00 6 134.9	45 37.2 1.00 6 134.7	46 07.1 1.00 6 134.6	46 37.0 1.00 6 134.6	48 36.5 1.00 6 134.3	2
3	39 34.6 1.00 6 134.3	40 34.4 1.00 6 134.2	42 04.2 1.00 6 134.0	43 33.9 1.00 6 133.9	45 33.5 1.00 6 133.6	46 03.3 1.00 6 133.6	46 33.2 1.00 6 133.5	48 32.8 1.00 6 133.2	3
4	39 30.9 1.00 6 133.2	40 30.7 1.00 6 133.1	42 00.4 1.00 6 133.0	43 30.1 1.00 6 132.8	45 29.6 1.00 6 132.6	45 59.5 1.00 6 132.5	46 29.4 1.00 6 132.4	48 28.9 1.00 6 132.2	4
45	39 27.0 1.00 7 132.2	40 26.8 1.00 7 132.1	41 56.5 1.00 7 131.9	43 26.2 1.00 7 131.8	45 25.7 1.00 7 131.5	45 55.6 1.00 7 131.5	46 25.5 1.00 7 131.4	48 25.0 1.00 7 131.1	45
6	39 23.1 1.00 7 131.2	40 22.9 1.00 7 131.0	41 52.6 1.00 7 130.9	43 22.3 1.00 7 130.7	45 21.8 1.00 7 130.4	45 51.7 1.00 7 130.4	46 21.6 1.00 7 130.3	48 21.0 1.00 7 130.1	6
7	39 19.1 1.00 7 130.1	40 18.9 1.00 7 130.0	41 48.6 1.00 7 129.8	43 18.3 1.00 7 129.7	45 17.7 1.00 7 129.4	45 47.7 1.00 7 129.3	46 17.5 1.00 7 129.3	48 17.0 1.00 7 129.0	7
8	39 15.1 1.00 7 129.1	40 14.9 1.00 7 129.0	41 44.6 1.00 7 128.8	43 14.2 1.00 7 128.6	45 13.7 1.00 7 128.4	45 43.6 1.00 7 128.3	46 13.5 1.00 7 128.2	48 12.9 1.00 7 127.9	8
9	39 11.0 1.00 7 128.0	40 10.8 1.00 7 127.9	41 40.5 1.00 7 127.7	43 10.1 1.00 7 127.6	45 09.6 1.00 7 127.3	45 39.5 1.00 7 127.2	46 09.3 1.00 7 127.2	48 08.8 1.00 7 126.9	9
50	39 06.9 1.00 7 127.0	40 06.6 1.00 7 126.9	41 36.3 1.00 7 126.7	43 05.9 1.00 7 126.5	45 05.4 1.00 7 126.3	45 35.3 1.00 7 126.2	46 05.1 1.00 7 126.1	48 04.6 99 07 125.8	50
1	39 02.7 1.00 7 126.0	40 02.4 1.00 7 125.8	41 32.1 1.00 7 125.7	43 01.7 1.00 7 125.5	45 01.2 1.00 7 125.2	45 31.0 1.00 7 125.1	46 00.9 1.00 7 125.1	48 00.5 99 07 124.8	1
2	38 58.4 1.00 7 124.9	39 58.2 1.00 7 124.8	41 27.8 1.00 7 124.6	42 57.4 1.00 7 124.4	44 56.9 1.00 7 124.2	45 26.7 1.00 7 124.1	45 56.6 1.00 7 124.0	47 56.0 99 07 123.7	2
3	38 54.1 1.00 7 123.9	39 53.8 1.00 7 123.8	41 23.5 1.00 7 123.6	42 53.1 1.00 7 123.4	44 52.5 1.00 7 123.1	45 22.4 1.00 7 123.1	45 52.2 1.00 7 123.0	47 51.6 99 07 122.7	3
4	38 49.7 1.00 7 122.8	39 49.5 1.00 7 122.7	41 19.1 1.00 7 122.5	42 48.7 1.00 7 122.3	44 48.1 1.00 7 122.1	45 18.0 99 07 122.0	45 47.8 99 07 121.9	47 47.2 99 07 121.6	4
55	38 45.3 1.00 7 121.8	39 45.0 1.00 7 121.7	41 14.6 1.00 7 121.5	42 44.2 1.00 8 121.3	44 43.6 99 08 121.0	45 13.5 99 08 121.0	45 43.3 99 08 121.0	47 42.7 99 08 120.6	55
6	38 40.8 1.00 8 120.8	39 40.6 1.00 8 120.7	41 10.2 1.00 8 120.5	42 39.7 1.00 8 120.3	44 39.1 99 08 120.0	45 09.0 99 08 119.9	45 38.8 99 08 119.9	47 38.2 99 08 119.5	6
7	38 36.3 1.00 8 119.7	39 36.0 1.00 8 119.6	41 05.6 1.00 8 119.4	42 35.2 1.00 8 119.2	44 34.6 99 08 119.0	45 04.4 99 08 118.9	45 34.3 99 08 118.8	47 33.6 99 08 118.5	7
8	38 31.8 1.00 8 118.7	39 31.5 1.00 8 118.6	41 01.1 1.00 8 118.4	42 30.6 1.00 8 118.2	44 30.0 99 08 117.9	44 59.8 99 08 117.8	45 29.7 99 08 117.8	47 29.0 99 08 117.5	8
9	38 27.1 1.00 8 117.7	39 26.9 1.00 8 117.6	40 56.4 1.00 8 117.4	42 26.0 1.00 8 117.1	44 25.4 99 08 116.9	44 55.2 99 08 116.8	45 25.0 99 08 116.7	47 24.3 99 08 116.4	9
60	38 22.5 1.00 8 116.7	39 22.2 1.00 8 116.5	40 51.8 1.00 8 116.3	42 21.3 99 08 116.1	44 20.7 99 08 115.8	44 50.5 99 08 115.8	45 20.3 99 08 115.7	47 19.6 99 08 115.4	60
1	38 17.8 1.00 8 115.6	39 17.5 1.00 8 115.5	40 47.1 1.00 8 115.3	42 16.6 99 08 115.1	44 15.9 99 08 114.8	44 45.8 99 08 114.7	45 15.6 99 08 114.7	47 14.9 99 08 114.3	1
2	38 13.1 1.00 8 114.6	39 12.8 1.00 8 114.5	40 42.3 1.00 8 114.3	42 11.8 99 08 114.1	44 11.2 99 08 113.8	44 41.0 99 08 113.7	45 10.8 99 08 113.6	47 10.1 99 08 113.3	2
3	38 08.3 1.00 8 113.6	39 08.0 99 08 113.5	40 37.5 99 08 113.3	42 07.0 99 08 113.1	44 06.4 99 08 112.8	44 36.2 99 08 112.7	45 06.0 99 08 112.6	47 05.3 99 08 112.3	3
4	38 03.5 1.00 8 112.6	39 03.2 99 08 112.4	40 32.7 99 08 112.2	42 02.2 99 08 112.1	44 01.5 99 08 111.7	44 31.3 99 08 111.7	45 01.2 99 08 111.6	47 00.4 99 08 111.3	4
65	37 58.6 99 08 111.5	38 58.3 99 08 111.4	40 27.8 99 08 111.2	41 57.4 99 08 111.0	43 56.6 99 08 110.7	44 26.5 99 08 110.6	44 56.3 99 08 110.5	46 55.5 99 08 110.2	65
6	37 53.7 99 08 110.5	38 53.4 99 08 110.4	40 23.0 99 08 110.2	41 52.5 99 08 110.0	43 51.7 99 08 109.7	44 21.6 99 08 109.6	44 51.4 99 08 109.5	46 50.6 99 08 109.2	6
7	37 48.8 99 08 109.5	38 48.5 99 08 109.4	40 18.0 99 08 109.2	41 47.5 99 08 109.0	43 46.8 99 08 108.7	44 16.6 99 08 108.6	44 46.4 99 08 108.5	46 45.6 99 08 108.2	7
8	37 43.9 99 08 108.5	38 43.6 99 08 108.3	40 13.1 99 08 108.1	41 42.6 99 08 107.9	43 41.8 99 08 107.6	44 11.6 99 08 107.6	44 41.5 99 08 107.5	46 40.6 99 08 107.1	8
9	37 38.9 99 08 107.5	38 38.6 99 08 107.3	40 08.1 99 08 107.1	41 37.6 99 08 106.9	43 36.8 99 08 106.6	44 06.6 99 08 106.5	44 36.4 99 08 106.5	46 35.6 99 08 106.1	9
70	37 33.9 99 08 106.4	38 33.6 99 08 106.3	40 03.1 99 08 106.1	41 32.6 99 08 105.9	43 31.8 99 08 105.6	44 01.6 99 08 105.5	44 31.4 99 08 105.4	46 30.6 99 08 105.1	70
1	37 28.9 99 08 105.4	38 28.6 99 08 105.3	39 58.0 99 08 105.1	41 27.5 99 08 104.9	43 26.8 99 08 104.6	43 56.6 99 08 104.5	44 26.4 99 08 104.4	46 25.5 99 08 104.1	1
2	37 23.8 99 08 104.4	38 23.5 99 08 104.3	39 53.0 99 08 104.1	41 22.4 99 08 103.9	43 21.7 99 08 103.6	43 51.5 99 08 103.5	44 21.3 99 08 103.4	46 20.5 99 08 103.1	2
3	37 18.8 99 08 103.4	38 18.4 99 08 103.3	39 47.9 99 08 103.1	41 17.4 99 08 102.8	43 16.6 99 09 102.5	43 46.4 99 09 102.5	44 16.2 99 09 102.4	46 15.4 99 09 102.0	3
4	37 13.7 99 09 102.4	38 13.3 99 09 102.3	39 42.8 99 09 102.1	41 12.3 99 09 101.8	43 11.5 99 09 101.5	43 41.3 99 09 101.5	44 11.1 99 09 101.4	46 10.2 99 09 101.0	4
75	37 08.5 99 09 101.4	38 08.2 99 09 101.3	39 37.7 99 09 101.0	41 07.1 99 09 100.8	43 06.3 99 09 100.5	43 36.1 99 09 100.4	44 05.9 99 09 100.4	46 05.1 99 09 100.0	75
6	37 03.4 99 09 100.4	38 03.1 99 09 100.2	39 32.5 99 09 100.0	41 02.0 99 09 99.8	43 01.2 99 09 99.5	43 31.0 99 09 99.4	44 00.8 99 09 99.3	45 59.9 99 09 99.0	6
7	36 58.3 99 09 99.4	37 57.9 99 09 99.2	39 27.4 99 09 99.0	40 56.9 99 09 98.8	42 56.0 99 09 98.5	43 25.8 99 09 98.4	43 55.6 99 09 98.3	45 54.8 99 09 98.0	7
8	36 53.1 99 09 98.4	37 52.7 99 09 98.2	39 22.2 99 09 98.0	40 51.6 99 09 97.8	42 50.9 99 09 97.5	43 20.7 99 09 97.4	43 50.5 99 09 97.3	45 49.6 99 09 97.0	8
9	36 47.9 99 09 97.4	37 47.6 99 09 97.2	39 17.0 99 09 97.0	40 46.5 99 09 96.8	42 45.7 99 09 96.5	43 15.5 99 09 96.4	43 45.2 99 09 96.3	45 44.4 99 09 96.0	9
80	36 42.7 99 09 96.4	37 42.4 99 09 96.2	39 11.8 99 09 96.0	40 41.3 99 09 95.8	42 40.5 99 09 95.5	43 10.3 99 09 95.4	43 40.0 99 09 95.3	45 39.2 99 09 95.0	80
1	36 37.5 99 09 95.4	37 37.2 99 09 95.2	39 06.6 99 09 95.0	40 36.1 99 09 94.8	42 35.3 99 09 94.5	43 05.0 99 09 94.4	43 34.8 99 09 94.3	45 34.0 99 09 94.0	1
2	36 32.3 99 09 94.4	37 32.0 99 09 94.2	39 01.4 99 09 94.0	40 30.8 99 09 93.8	42 30.0 99 09 93.5	42 59.8 99 09 93.4	43 29.6 99 09 93.3	45 28.7 99 09 93.0	2
3	36 27.1 99 09 93.3	37 26.7 99 09 93.2	38 56.2 99 09 93.0	40 25.6 99 09 92.8	42 24.8 99 09 92.5	42 54.6 99 09 92.4	43 24.4 99 09 92.3	45 23.5 99 09 92.0	3
4	36 21.9 99 09 92.3	37 21.5 99 09 92.2	38 51.0 99 09 92.0	40 20.4 99 09 91.8	42 19.6 99 09 91.5	42 49.4 99 09 91.4	43 19.2 99 09 91.3	45 18.3 99 09 91.0	4
85	36 16.6 99 09 91.4	37 16.3 99 09 91.2	38 45.7 99 09 91.0	40 15.2 99 09 90.8	42 14.4 99 09 90.5	42 44.2 99 09 90.4	43 13.9 99 09 90.3	45 13.1 99 09 90.0	85
6	36 11.4 99 09 90.4	37 11.1 99 09 90.2	38 40.5 99 09 90.0	40 09.9 99 09 89.8	42 09.1 99 09 89.5	42 38.9 99 09 89.4	43 08.7 99 09 89.3	45 07.8 99 09 89.0	6
7	36 06.2 99 09 89.4	37 05.8 99 09 89.2	38 35.3 99 09 89.0	40 04.7 99 09 88.8	42 03.9 99 09 88.5	42 33.7 99 09 88.4	43 03.5 99 09 88.3	45 02.6 99 09 88.0	7
8	36 01.0 99 09 88.4	37 00.6 99 09 88.2	38 30.1 99 09 88.0	39 59.5 99 09 87.8	41 58.7 99 09 87.5	42 28.5 99 09 87.4	42 58.3 99 09 87.3	44 57.4 99 09 87.0	8
9	35 55.7 99 09 87.4	36 55.4 99 09 87.2	38 24.8 99 09 87.0	39 54.3 99 09 86.8	41 53.5 99 09 86.5	42 23.2 99 09 86.4	42 53.0 99 09 86.3	44 52.2 99 09 86.0	9
90	35 50.5 99 09 86.4	36 50.2 99 09 86.2	38 19.6 99 09 86.0	39 49.0 99 09 85.8	41 48.2 99 09 85.5	42 18.0 99 09 85.4	42 47.8 99 09 85.4	44 46.9 99 09 85.0	90

Lat. 85°

H.A.	36° 00' Alt.	Δd Δt	Az.	37° 00' Alt.	Δd Δt	Az.	38° 30' Alt.	Δd Δt	Az.	40° 00' Alt.	Δd Δt	Az.	42° 00' Alt.	Δd Δt	Az.	42° 30' Alt.	Δd Δt	Az.	43° 00' Alt.	Δd Δt	Az.	45° 00' Alt.	Δd Δt	Az.	H.A.
91	35 45.3	99 09	85.4	36 44.9	99 09	85.3	38 14.4	99 09	85.0	39 43.8	99 09	84.8	41 43.0	99 09	84.5	42 12.8	99 09	84.4	42 42.6	99 09	84.4	44 41.7	99 09	84.0	91
2	35 40.1	99 09	84.4	36 39.7	99 09	84.3	38 09.2	99 09	84.1	39 38.6	99 09	83.8	41 37.8	99 09	83.5	42 07.6	99 09	83.5	42 37.4	99 09	83.4	44 36.5	99 09	83.0	2
3	35 34.9	99 09	83.4	36 34.5	99 09	83.3	38 04.0	99 09	83.1	39 33.4	99 09	82.8	41 32.6	99 09	82.5	42 02.4	99 09	82.5	42 32.2	99 09	82.4	44 31.4	99 09	82.1	3
4	35 29.7	99 09	82.4	36 29.3	99 09	82.3	37 58.8	99 09	82.1	39 28.2	99 09	81.9	41 27.5	99 09	81.6	41 57.3	99 09	81.5	42 27.0	99 09	81.4	44 26.2	99 09	81.1	4
95	35 24.5	99 09	81.4	36 24.2	99 09	81.3	37 53.6	99 09	81.1	39 23.1	99 09	80.9	41 22.3	99 09	80.6	41 52.1	99 09	80.5	42 21.9	99 09	80.4	44 21.0	99 09	80.1	95
6	35 19.4	99 09	80.4	36 19.0	99 09	80.3	37 48.5	99 09	80.1	39 17.9	99 09	79.9	41 17.1	99 09	79.6	41 46.9	99 09	79.5	42 16.7	99 09	79.4	44 15.9	99 09	79.1	6
7	35 14.2	99 09	79.5	36 13.9	99 09	79.3	37 43.3	99 09	79.1	39 12.8	99 09	78.9	41 12.0	99 09	78.6	41 41.8	99 09	78.5	42 11.6	99 09	78.5	44 10.8	99 09	78.1	7
8	35 09.1	99 09	78.5	36 08.7	99 09	78.3	37 38.2	99 09	78.1	39 07.7	99 08	77.9	41 06.9	99 08	77.6	41 36.7	99 08	77.6	42 06.5	99 08	77.5	44 05.6	99 08	77.2	8
9	35 04.0	99 08	77.5	36 03.6	99 08	77.4	37 33.1	99 08	77.2	39 02.6	99 08	76.9	41 01.8	99 08	76.7	41 31.6	99 08	76.6	42 01.4	99 08	76.5	44 00.6	99 08	76.2	9
100	34 58.9	99 08	76.5	35 58.5	99 08	76.4	37 28.0	99 08	76.2	38 57.5	99 08	76.0	40 56.7	99 08	75.7	41 26.5	99 08	75.6	41 56.3	99 08	75.5	43 55.5	99 08	75.2	100
1	34 53.8	99 08	75.5	35 53.5	99 08	75.4	37 22.9	99 08	75.2	38 52.4	99 08	75.0	40 51.7	99 08	74.7	41 21.5	99 08	74.6	41 51.3	99 08	74.5	43 50.4	99 08	74.2	1
2	34 48.7	99 08	74.5	35 48.4	99 08	74.4	37 17.9	99 08	74.2	38 47.4	99 08	74.0	40 46.6	99 08	73.7	41 16.4	99 08	73.6	41 46.2	99 08	73.6	43 45.4	99 08	73.3	2
3	34 43.7	99 08	73.6	35 43.4	99 08	73.4	37 12.9	99 08	73.2	38 42.4	99 08	73.0	40 41.6	99 08	72.7	41 11.4	99 08	72.7	41 41.2	99 08	72.6	43 40.4	99 08	72.3	3
4	34 38.7	99 08	72.6	35 38.4	99 08	72.5	37 07.9	99 08	72.3	38 37.4	99 08	72.1	40 36.6	99 08	71.8	41 06.5	99 08	71.7	41 36.3	99 08	71.6	43 35.5	99 08	71.3	4
105	34 33.7	99 08	71.6	35 33.4	99 08	71.5	37 02.9	99 08	71.3	38 32.4	99 08	71.1	40 31.7	99 08	70.8	41 01.5	99 08	70.7	41 31.3	99 08	70.7	43 30.5	99 08	70.3	105
6	34 28.8	99 08	70.6	35 28.5	99 08	70.5	36 58.0	99 08	70.3	38 27.5	99 08	70.1	40 26.8	99 08	69.8	40 56.6	99 08	69.8	41 26.4	99 08	69.7	43 25.6	99 08	69.4	6
7	34 23.9	99 08	69.7	35 23.6	99 08	69.5	36 53.1	99 08	69.3	38 22.6	99 08	69.1	40 21.9	99 08	68.9	40 51.7	99 08	68.8	41 21.5	99 08	68.7	43 20.7	99 08	68.4	7
8	34 19.0	99 08	68.7	35 18.7	99 08	68.6	36 48.2	99 08	68.4	38 17.7	99 08	68.2	40 17.0	99 08	67.9	40 46.8	99 08	67.8	41 16.6	99 08	67.7	43 15.9	99 08	67.4	8
9	34 14.1	1.00 08	67.7	35 13.8	99 08	67.6	36 43.3	99 08	67.4	38 12.9	99 08	67.2	40 12.2	99 08	66.9	40 42.0	99 08	66.9	41 11.8	99 08	66.8	43 11.1	99 08	66.5	9
110	34 09.3	1.00 08	66.7	35 09.0	99 08	66.6	36 38.5	99 08	66.4	38 08.1	99 08	66.2	40 07.4	99 08	66.0	40 37.2	99 08	65.9	41 07.0	99 08	65.8	43 06.3	99 08	65.5	110
1	34 04.5	1.00 08	65.8	35 04.2	1.00 08	65.6	36 33.8	99 08	65.5	38 03.3	99 08	65.3	40 02.6	99 08	65.0	40 32.5	99 08	64.9	41 02.3	99 08	64.9	43 01.6	99 08	64.6	1
2	33 59.8	1.00 08	64.8	34 59.5	1.00 08	64.7	36 29.0	99 08	64.5	37 58.6	99 08	64.3	39 57.9	99 08	64.0	40 27.7	99 08	64.0	40 57.6	99 08	63.9	42 56.9	99 08	63.6	2
3	33 55.0	1.00 08	63.8	34 54.8	1.00 08	63.7	36 24.3	1.00 08	63.5	37 53.9	99 08	63.3	39 53.2	99 08	63.1	40 23.1	99 08	63.0	40 52.9	99 08	62.9	42 52.2	99 08	62.6	3
4	33 50.4	1.00 08	62.8	34 50.1	1.00 08	62.7	36 19.7	1.00 08	62.6	37 49.2	99 08	62.4	39 48.6	99 08	62.1	40 18.4	99 08	62.0	40 48.3	99 08	62.0	42 47.6	99 08	61.7	4
115	33 45.7	1.00 08	61.9	34 45.5	1.00 08	61.8	36 15.0	1.00 08	61.6	37 44.6	99 08	61.4	39 44.0	99 08	61.1	40 13.8	99 08	61.1	40 43.7	99 08	61.0	42 43.0	99 08	60.7	115
6	33 41.2	1.00 08	60.9	34 40.9	1.00 08	60.8	36 10.5	1.00 08	60.6	37 40.0	1.00 08	60.4	39 39.4	99 08	60.2	40 09.3	99 08	60.1	40 39.1	99 08	60.0	42 38.4	99 08	59.8	6
7	33 36.6	1.00 08	59.9	34 36.3	1.00 08	59.8	36 05.9	1.00 08	59.7	37 35.5	1.00 07	59.5	39 34.9	99 07	59.2	40 04.8	99 07	59.2	40 34.6	99 07	59.1	42 34.0	99 07	58.8	7
8	33 32.1	1.00 08	59.0	34 31.8	1.00 08	58.9	36 01.4	1.00 07	58.7	37 31.0	1.00 07	58.5	39 30.4	1.00 07	58.3	40 00.3	99 07	58.2	40 30.1	99 07	58.1	42 29.5	99 07	57.9	8
9	33 27.6	1.00 07	58.0	34 27.4	1.00 07	57.9	35 57.0	1.00 07	57.7	37 26.6	1.00 07	57.6	39 26.0	1.00 07	57.3	39 55.9	1.00 07	57.2	40 25.7	99 07	57.2	42 25.1	99 07	56.9	9
120	33 23.2	1.00 07	57.0	34 23.0	1.00 07	56.9	35 52.6	1.00 07	56.8	37 22.2	1.00 07	56.6	39 21.6	1.00 07	56.3	39 51.5	1.00 07	56.3	40 21.3	1.00 07	56.2	42 20.7	99 07	55.9	120
1	33 18.9	1.00 07	56.1	34 18.6	1.00 07	56.0	35 48.2	1.00 07	55.8	37 17.9	1.00 07	55.6	39 17.3	1.00 07	55.4	39 47.2	1.00 07	55.3	40 17.0	1.00 07	55.3	42 16.4	99 07	55.0	1
2	33 14.5	1.00 07	55.1	34 14.3	1.00 07	55.0	35 43.9	1.00 07	54.8	37 13.6	1.00 07	54.7	39 13.0	1.00 07	54.4	39 42.9	1.00 07	54.4	40 12.8	1.00 07	54.3	42 12.1	1.00 07	54.0	2
3	33 10.3	1.00 07	54.2	34 10.1	1.00 07	54.0	35 39.7	1.00 07	53.9	37 09.3	1.00 07	53.7	39 08.8	1.00 07	53.5	39 38.7	1.00 07	53.4	40 08.5	1.00 07	53.4	42 08.0	1.00 07	53.1	3
4	33 06.1	1.00 07	53.2	34 05.8	1.00 07	53.1	35 35.5	1.00 07	52.9	37 05.1	1.00 07	52.8	39 04.6	1.00 07	52.5	39 34.5	1.00 07	52.5	40 04.4	1.00 07	52.4	42 03.8	1.00 07	52.1	4
125	33 01.9	1.00 07	52.2	34 01.7	1.00 07	52.1	35 31.4	1.00 07	52.0	37 01.0	1.00 07	51.8	39 00.5	1.00 07	51.6	39 30.4	1.00 07	51.5	40 00.2	1.00 07	51.5	41 59.7	1.00 07	51.2	125
6	32 57.8	1.00 07	51.3	33 57.6	1.00 07	51.2	35 27.3	1.00 07	51.0	36 56.9	1.00 07	50.8	38 56.4	1.00 07	50.6	39 26.3	1.00 07	50.6	39 56.2	1.00 07	50.5	41 55.7	1.00 07	50.3	6
7	32 53.8	1.00 07	50.2	33 53.5	1.00 07	50.2	35 23.2	1.00 07	50.1	36 52.9	1.00 07	49.9	38 52.4	1.00 07	49.7	39 22.3	1.00 07	49.7	39 52.2	1.00 07	49.6	41 51.7	1.00 07	49.3	7
8	32 49.8	1.00 07	49.3	33 49.6	1.00 07	49.2	35 19.2	1.00 07	49.1	36 48.9	1.00 07	48.9	38 48.5	1.00 06	48.7	39 18.3	1.00 06	48.7	39 48.2	1.00 06	48.6	41 47.7	1.00 06	48.4	8
9	32 45.8	1.00 06	48.4	33 45.6	1.00 06	48.3	35 15.3	1.00 06	48.1	36 45.0	1.00 06	48.0	38 44.6	1.00 06	47.8	39 14.4	1.00 06	47.7	39 44.3	1.00 06	47.7	41 43.8	1.00 06	47.4	9
130	32 41.9	1.00 06	47.4	33 41.7	1.00 06	47.3	35 11.5	1.00 06	47.2	36 41.1	1.00 06	47.0	38 40.7	1.00 06	46.8	39 10.6	1.00 06	46.8	39 40.5	1.00 06	46.7	41 40.0	1.00 06	46.5	130
1	32 38.1	1.00 06	46.5	33 37.9	1.00 06	46.4	35 07.6	1.00 06	46.2	36 37.3	1.00 06	46.1	38 36.9	1.00 06	45.9	39 06.8	1.00 06	45.8	39 36.7	1.00 06	45.8	41 36.3	1.00 06	45.5	1
2	32 34.4	1.00 06	45.5	33 34.2	1.00 06	45.4	35 03.9	1.00 06	45.3	36 33.6	1.00 06	45.1	38 33.2	1.00 06	44.9	39 03.1	1.00 06	44.9	39 33.0	1.00 06	44.8	41 32.6	1.00 06	44.6	2
3	32 30.7	1.00 06	44.6	33 30.5	1.00 06	44.5	35 00.2	1.00 06	44.3	36 29.9	1.00 06	44.2	38 29.5	1.00 06	44.0	38 59.4	1.00 06	43.9	39 29.3	1.00 06	43.9	41 28.9	1.00 06	43.7	3
4	32 27.0	1.00 06	43.6	33 26.8	1.00 06	43.5	34 56.6	1.00 06	43.4	36 26.3	1.00 06	43.2	38 25.9	1.00 06	43.0	38 55.9	1.00 06	43.0	39 25.8	1.00 06	42.9	41 25.3	1.00 06	42.7	4
135	32 23.4	1.00 06	42.6	33 23.3	1.00 06	42.6	34 53.0	1.00 06	42.4	36 22.8	1.00 06	42.3	38 22.4	1.00 06	42.1	38 52.3	1.00 06	42.0	39 22.2	1.00 06	42.0	41 21.8	1.00 06	41.8	135
6	32 19.9	1.00 06	41.7	33 19.8	1.00 06	41.6	34 49.5	1.00 06	41.5	36 19.3	1.00 06	41.3	38 18.9	1.00 06	41.1	38 48.8	1.00 06	41.1	39 18.8	1.00 06	41.0	41 18.4	1.00 06	40.9	6
7	32 16.5	1.00 06	40.7	33 16.3	1.00 06	40.7	34 46.1	1.00 06	40.5	36 15.9	1.00 06	40.4	38 15.5	1.00 06	40.2	38 45.4	1.00 06	40.2	39 15.4	1.00 06	40.1	41 15.0	1.00 06	39.9	7
8	32 13.1	1.00 06	39.8	33 13.0	1.00 06	39.7	34 42.7	1.00 06	39.6	36 12.5	1.00 06	39.4	38 12.2	1.00 05	39.3	38 42.1	1.00 05	39.2	39 12.0	1.00 05	39.2	41 11.7	1.00 05	39.0	8
9	32 09.8	1.00 05	38.8	33 09.7	1.00 05	38.7	34 39.4	1.00 05	38.6	36 09.2	1.00 05	38.5	38 08.9	1.00 05	38.3	38 38.8	1.00 05	38.3	39 08.8	1.00 05	38.2	41 08.4	1.00 05	38.0	9
140	32 06.6	1.00 05	37.9	33 06.4	1.00 05	37.8	34 36.2	1.00 05	37.7	36 06.0	1.00 05	37.5	38 05.7	1.00 05	37.4	38 35.6	1.00 05	37.3	39 05.5	1.00 05	37.3	41 05.2	1.00 05	37.1	140
1	32 03.4	1.00 05	36.9	33 03.2	1.00 05	36.8	34 33.1	1.00 05	36.7	36 02.8	1.00 05	36.6	38 02.6	1.00 05	36.4	38 32.5	1.00 05	36.4	39 02.4	1.00 05	36.3	41 02.1	1.00 05	36.2	1
2	32 00.3	1.00 05	36.0	33 00.1	1.00 05	35.9	34 30.0	1.00 05	35.8	35 59.8	1.00 05	35.7	37 59.5	1.00 05	35.5	38 29.4	1.00 05	35.4	38 59.4	1.00 05	35.4	40 59.1	1.00 05	35.2	2
3	31 57.2	1.00 05	35.0	32 57.1	1.00 05	34.9	34 26.9	1.00 05	34.8	35 56.7	1.00 05	34.7	37 56.5	1.00 05	34.5	38 26.4	1.00 05	34.5	38 56.4	1.00 05	34.5	40 56.1	1.00 05	34.3	3
4	31 54.3	1.00 05	34.1	32 54.2	1.00 05	34.0	34 24.0	1.00 05	33.9	35 53.8	1.00 05	33.8	37 53.6	1.00 05	33.6	38 23.5	1.00 05	33.6	38 53.4	1.00 05	33.5	40 53.2	1.00 05	33.4	4
145	31 51.4	1.00 05	33.1	32 51.3	1.00 05	33.0	34 21.1	1.00 05	32.9	35 50.9	1.00 05	32.8	37 50.7	1.00 05	32.7	38 20.6	1.00 05	32.6	38 50.6	1.00 05	32.6	40 50.3	1.00 05	32.4	145
6	31 48.6	1.00 05	32.2	32 48.5	1.00 05	32.1	34 18.3	1.00 05	32.0	35 48.1	1.00 05	31.9	37 47.9	1.00 05	31.7	38 17.9	1.00 05	31.7	38 47.8	1.00 04	31.7	40 47.6	1.00 04	31.5	6
7	31 45.8	1.00 04	31.2	32 45.7	1.00 04	31.1	34 15.6	1.00 04	31.0	35 45.4	1.00 04	30.9	37 45.2	1.00 04	30.8	38 15.2	1.00 04	30.8	38 45.1	1.00 04	30.7	40 44.9	1.00 04	30.6	7
8	31 43.1	1.00 04	30.3	32 43.0	1.00 04	30.2	34 12.9	1.00 04	30.1	35 42.8	1.00 04	30.0	37 42.6	1.00 04	29.9	38 12.5	1.00 04	29.8	38 42.5	1.00 04	29.8	40 42.2	1.00 04	29.6	8
9	31 40.5	1.00 04	29.3	32 40.5	1.00 04	29.3	34 10.3	1.00 04	29.2	35 40.2	1.00 04	29.1	37 40.0	1.00 04	28.9	38 09.9	1.00 04	28.9	38 39.9	1.00 04	28.8	40 39.7	1.00 04	28.7	9
150	31 38.0	1.00 04	28.4	32 37.9	1.00 04	28.3	34 07.8	1.00 04	28.2	35 37.7	1.00 04	28.1	37 37.5	1.00 04	28.0	38 07.5	1.00 04	27.9	38 37.4	1.00 04	27.9	40 37.2	1.00 04	27.8	150
1	31 35.6	1.00 04	27.4	32 35.5	1.00 04	27.4	34 05.4	1.00 04	27.3	35 35.3	1.00 04	27.2	37 35.1	1.00 04	27.0	38 05.0	1.00 04	27.0	38 35.0	1.00 04	27.0	40 34.8	1.00 04	26.8	1
2	31 33.2	1.00 04	26.5	32 33.1	1.00 04	26.4	34 03.0	1.00 04	26.3	35 32.9	1.00 04	26.2	37 32.8	1.00 04	26.1	38 02.7	1.00 04	26.1	38 32.7	1.00 04	26.0	40 32.5	1.00 04	25.9	2
3	31 30.9	1.00 04	25.5	32 30.8	1.00 04	25.5	34 00.7	1.00 04	25.4	35 30.6	1.00 04	25.3	37 30.5	1.00 04	25.2	38 00.5	1.00 04	25.1	38 30.4	1.00 04	25.1	40 30.3	1.00 04	25.0	3
4	31 28.7	1.00 04	24.6	32 28.6	1.00 04	24.5	33 58.5	1.00 04	24.4	35 28.4	1.00 04	24.4	37 28.3	1.00 04	24.2	37 58.3	1.00 04	24.2	38 28.2	1.00 04	24.2	40 28.1	1.00 03	24.0	4
155	31 26.6	1.00 03	23.6	32 26.5	1.00 03	23.6	33 56.4	1.00 03	23.5	35 26.3	1.00 03	23.4	37 26.2	1.00 03	23.3	37 56.2	1.00 03	23.3	38 26.1	1.00 03	23.2	40 26.0	1.00 03	23.1	155
6	31 24.5	1.00 03	22.7	32 24.4	1.00 03	22.6	33 54.4	1.00 03	22.6	35 24.3	1.00 03	22.5	37 24.2	1.00 03	22.4	37 54.1	1.00 03	22.3	38 24.1	1.00 03	22.3	40 24.0	1.00 03	22.2	6
7	31 22.5	1.00 03	21.7	32 22.5	1.00 03	21.7	33 52.4	1.00 03	21.6	35 22.3	1.00 03	21.5	37 22.2	1.00 03	21.4	37 52.2	1.00 03	21.4	38 22.2	1.00 03	21.4	40 22.0	1.00 03	21.3	7
8	31 20.6	1.00 03	20.8	32 20.6	1.00 03	20.7	33 50.5	1.00 03	20.7	35 20.4	1.00 03	20.6	37 20.3	1.00 03	20.5	37 50.3	1.00 03	20.5	38 20.3	1.00 03	20.4	40 20.2	1.00 03	20.3	8
9	31 18.8	1.00 03	19.8	32 18.8	1.00 03	19.8	33 48.7	1.00 03	19.7	35 18.6	1.00 03	19.7	37 18.6	1.00 03	19.6	37 48.5	1.00 03	19.5	38 18.5	1.00 03	19.5	40 18.4	1.00 03	19.4	9
160	31 17.1	1.00 03	18.9	32 17.0	1.00 03	18.9	33 47.0	1.00 03	18.8	35 16.9	1.00 03	18.7	37 16.8	1.00 03	18.6	37 46.8	1.00 03	18.6	38 16.8	1.00 03	18.6	40 16.7	1.00 03	18.5	160
1	31 15.4	1.00 03	17.9	32 15.4	1.00 03	17.9	33 45.3	1.00 03	17.8	35 15.3	1.00 03	17.8	37 15.2	1.00 03	17.7	37 45.2	1.00 03	17.7	38 15.2	1.00 03	17.7	40 15.1	1.00 03	17.6	1
2	31 13.9	1.00 02	17.0	32 13.8	1.00 02	17.0	33 43.8	1.00 02	16.9	35 13.7	1.00 02	16.8	37 13.7	1.00 02	16.8	37 43.6	1.00 02	16.7	38 13.6	1.00 02	16.7	40 13.6	1.00 02	16.6	2
3	31 12.4	1.00 02	16.1	32 12.3	1.00 02	16.0	33 42.3	1.00 02	16.0	35 12.2	1.00 02	15.9	37 12.2	1.00 02	15.8	37 42.2	1.00 02	15.8	38 12.2	1.00 02	15.8	40 12.1	1.00 02	15.7	3
4	31 11.0	1.00 02	15.1	32 10.9	1.00 02	15.1	33 40.9	1.00 02	15.0	35 10.9	1.00 02	15.0	37 10.8	1.00 02	14.9	37 40.8	1.00 02	14.9	38 10.8	1.00 02	14.9	40 10.7	1.00 02	14.8	4
165	31 09.6	1.00 02	14.2	32 09.6	1.00 02	14.1	33 39.6	1.00 02	14.1	35 09.6	1.00 02	14.0	37 09.5	1.00 02	14.0	37 39.5	1.00 02	13.9	38 09.5	1.00 02	13.9	40 09.4	1.00 02	13.9	165
6	31 08.4	1.00 02	13.2	32 08.4	1.00 02	13.2	33 38.4	1.00 02	13.1	35 08.3	1.00 02	13.1	37 08.3	1.00 02	13.0	37 38.3	1.00 02	13.0	38 08.3	1.00 02	13.0	40 08.2	1.00 02	12.9	6
7	31 07.3	1.00 02	12.3	32 07.2	1.00 02	12.2	33 37.2	1.00 02	12.2	35 07.2	1.00 02	12.2	37 07.2	1.00 02	12.1	37 37.1	1.00 02	12.1	38 07.1	1.00 02	12.1	40 07.1	1.00 02	12.0	7
8	31 06.2	1.00 02	11.3	32 06.2	1.00 02	11.3	33 36.1	1.00 02	11.3	35 06.1	1.00 02	11.2	37 06.1	1.00 02	11.2	37 36.1	1.00 02	11.2	38 06.1	1.00 02	11.1	40 06.1	1.00 02	11.1	8
9	31 05.2	1.00 02	10.4	32 05.2	1.00 02	10.4	33 35.2	1.00 02	10.3	35 05.2	1.00 01	10.3	37 05.1	1.00 02	10.2	37 35.1	1.00 01	10.2	38 05.1	1.00 01	10.2	40 05.1	1.00 01	10.2	9
170	31 04.3	1.00 01	09.4	32 04.3	1.00 01	09.4	33 34.3	1.00 01	09.4	35 04.3	1.00 01	09.4	37 04.2	1.00 01	09.3	37 34.2	1.00 01	09.3	38 04.2	1.00 01	09.3	40 04.2	1.00 01	09.2	170
1	31 03.5	1.00 01	08.5	32 03.5	1.00 01	08.5	33 33.5	1.00 01	08.4	35 03.5	1.00 01	08.4	37 03.4	1.00 01	08.4	37 33.4	1.00 01	08.4	38 03.4	1.00 01	08.4	40 03.4	1.00 01	08.3	1
2	31 02.8	1.00 01	07.6	32 02.7	1.00 01	07.5	33 32.7	1.00 01	07.5	35 02.7	1.00 01	07.5	37 02.7	1.00 01	07.4	37 32.7	1.00 01	07.4	38 02.7	1.00 01	07.4	40 02.7	1.00 01	07.4	2
3	31 02.1	1.00 01	06.6	32 02.1	1.00 01	06.6	33 32.1	1.00 01	06.6	35 02.1	1.00 01	06.5	37 02.1	1.00 01	06.5	37 32.1	1.00 01	06.5	38 02.1	1.00 01	06.5	40 02.1	1.00 01	06.5	3
4	31 01.5	1.00 01	05.7	32 01.5	1.00 01	05.7	33 31.5	1.00 01	05.6	35 01.5	1.00 01	05.6	37 01.5	1.00 01	05.6	37 31.5	1.00 01	05.6	38 01.5	1.00 01	05.6	40 01.5	1.00 01	05.5	4
175	31 01.1	1.00 01	04.7	32 01.1	1.00 01	04.7	33 31.1	1.00 01	04.7	35 01.1	1.00 01	04.7	37 01.1	1.00 01	04.7	37 31.1	1.00 01	04.6	38 01.1	1.00 01	04.6	40 01.1	1.00 01	04.6	175
6	31 00.7	1.00 00	03.8	32 00.7	1.00 00	03.8	33 30.7	1.00 00	03.8	35 00.7	1.00 00	03.7	37 00.7	1.00 00	03.7	37 30.7	1.00 00	03.7	38 00.7	1.00 00	03.7	40 00.7	1.00 00	03.7	6
7	31 00.4	1.00 00	02.8	32 00.4	1.00 00	02.8	33 30.4	1.00 00	02.8	35 00.4	1.00 00	02.8	37 00.4	1.00 00	02.8	37 30.4	1.00 00	02.8	38 00.4	1.00 00	02.8	40 00.4	1.00 00	02.8	7
8	31 00.2	1.00 00	01.9	32 00.2	1.00 00	01.9	33 30.2	1.00 00	01.9	35 00.2	1.00 00	01.9	37 00.2	1.00 00	01.9	37 30.2	1.00 00	01.9	38 00.2	1.00 00	01.8	40 00.2	1.00 00	01.8	8
9	31 00.0	1.00 00	00.9	32 00.0	1.00 00	00.9	33 30.0	1.00 00	00.9	35 00.0	1.00 00	00.9	37 00.0	1.00 00	00.9	37 30.0	1.00 00	00.9	38 00.0	1.00 00	00.9	40 00.0	1.00 00	00.9	9

Lat. 45°

H.A.	46° 00' Alt	Δd Δt	Az.	47° 00' Alt	Δd Δt	Az.	48° 30' Alt	Δd Δt	Az.	49° 30' Alt	Δd Δt	Az.	50° 30' Alt	Δd Δt	Az.	51° 30' Alt	Δd Δt	Az.	52° 30' Alt	Δd Δt	Az.	54° 00' Alt	Δd Δt	Az.	H.A.
00	51 00.0	1.00 0	180.0	52 00.0	1.00 0	180.0	53 30.0	1.00 0	180.0	54 30.0	1.00 0	180.0	55 30.0	1.00 0	180.0	56 30.0	1.00 0	180.0	57 30.0	1.00 0	180.0	59 00.0	1.00 0	180.0	00
1	51 00.0	1.00 0	178.9	52 00.0	1.00 0	178.9	53 30.0	1.00 0	178.9	54 29.9	1.00 0	178.9	55 29.9	1.00 0	178.9	56 29.9	1.00 0	178.9	57 29.9	1.00 0	178.9	58 59.9	1.00 0	178.9	1
2	50 59.8	1.00 0	177.8	51 59.8	1.00 0	177.8	53 29.8	1.00 0	177.8	54 29.8	1.00 0	177.8	55 29.8	1.00 0	177.8	56 29.8	1.00 0	177.7	57 29.8	1.00 0	177.7	58 59.8	1.00 0	177.7	2
3	50 59.5	1.00 1	176.7	51 59.5	1.00 1	176.7	53 29.5	1.00 1	176.7	54 29.5	1.00 1	176.6	55 29.5	1.00 1	176.6	56 29.5	1.00 1	176.6	57 29.5	1.00 1	176.6	58 59.5	1.00 1	176.6	3
4	50 59.2	1.00 1	175.6	51 59.2	1.00 1	175.6	53 29.2	1.00 1	175.5	54 29.2	1.00 1	175.5	55 29.2	1.00 1	175.5	56 29.2	1.00 1	175.5	57 29.2	1.00 1	175.5	58 59.2	1.00 1	175.4	4
05	50 58.7	1.00 1	174.5	51 58.7	1.00 1	174.5	53 28.7	1.00 1	174.4	54 28.7	1.00 1	174.4	55 28.7	1.00 1	174.4	56 28.7	1.00 1	174.4	57 28.7	1.00 1	174.3	58 58.7	1.00 1	174.3	05
6	50 58.2	1.00 1	173.4	51 58.2	1.00 1	173.4	53 28.2	1.00 1	173.3	54 28.2	1.00 1	173.3	55 28.2	1.00 1	173.3	56 28.2	1.00 1	173.2	57 28.1	1.00 1	173.2	58 58.1	1.00 1	173.2	6
7	50 57.5	1.00 1	172.3	51 57.5	1.00 1	172.3	53 27.5	1.00 1	172.2	54 27.5	1.00 1	172.2	55 27.5	1.00 1	172.1	56 27.5	1.00 1	172.1	57 27.5	1.00 1	172.1	58 57.5	1.00 1	172.0	7
8	50 56.8	1.00 1	171.2	51 56.8	1.00 1	171.1	53 26.8	1.00 1	171.1	54 26.7	1.00 1	171.1	55 26.7	1.00 1	171.0	56 26.7	1.00 1	171.0	57 26.7	1.00 1	170.9	58 56.7	1.00 1	170.9	8
9	50 55.9	1.00 2	170.1	51 55.9	1.00 2	170.0	53 25.9	1.00 2	170.0	54 25.9	1.00 2	169.9	55 25.9	1.00 2	169.9	56 25.8	1.00 2	169.9	57 25.8	1.00 2	169.8	58 55.8	1.00 2	169.7	9
10	50 55.0	1.00 2	169.0	51 55.0	1.00 2	168.9	53 24.9	1.00 2	168.9	54 24.9	1.00 2	168.8	55 24.9	1.00 2	168.8	56 24.9	1.00 2	168.7	57 24.8	1.00 2	168.7	58 54.8	1.00 2	168.6	10
1	50 53.9	1.00 2	167.9	51 53.9	1.00 2	167.8	53 23.9	1.00 2	167.8	54 23.9	1.00 2	167.7	55 23.8	1.00 2	167.7	56 23.8	1.00 2	167.6	57 23.8	1.00 2	167.6	58 53.7	1.00 2	167.5	1
2	50 52.8	1.00 2	166.8	51 52.8	1.00 2	166.7	53 22.7	1.00 2	166.7	54 22.7	1.00 2	166.6	55 22.7	1.00 2	166.6	56 22.6	1.00 2	166.4	57 22.6	1.00 2	166.4	58 52.5	1.00 2	166.3	2
3	50 51.5	1.00 2	165.7	51 51.5	1.00 2	165.6	53 21.5	1.00 2	165.5	54 21.4	1.00 2	165.5	55 21.4	1.00 2	165.4	56 21.4	1.00 2	165.4	57 21.3	1.00 2	165.3	58 51.3	1.00 2	165.2	3
4	50 50.2	1.00 2	164.6	51 50.2	1.00 2	164.5	53 20.1	1.00 2	164.4	54 20.1	1.00 2	164.4	55 20.0	1.00 2	164.3	56 20.0	1.00 2	164.2	57 19.9	1.00 2	164.2	58 49.9	1.00 2	164.1	4
15	50 48.8	1.00 3	163.5	51 48.7	1.00 3	163.4	53 18.7	1.00 3	163.3	54 18.6	1.00 3	163.3	55 18.6	1.00 3	163.2	56 18.5	1.00 3	163.1	57 18.5	1.00 3	163.0	58 48.4	1.00 3	162.9	15
6	50 47.2	1.00 3	162.4	51 47.2	1.00 3	162.3	53 17.1	1.00 3	162.2	54 17.1	1.00 3	162.1	55 17.0	1.00 3	162.1	56 16.9	1.00 3	161.9	57 16.9	1.00 3	161.9	58 46.8	1.00 3	161.8	6
7	50 45.6	1.00 3	161.3	51 45.5	1.00 3	161.2	53 15.5	1.00 3	161.1	54 15.4	1.00 3	161.0	55 15.3	1.00 3	161.0	56 15.3	1.00 3	160.9	57 15.2	1.00 3	160.8	58 45.1	1.00 3	160.7	7
8	50 43.9	1.00 3	160.2	51 43.8	1.00 3	160.1	53 13.7	1.00 3	160.0	54 13.7	1.00 3	159.9	55 13.6	1.00 3	159.8	56 13.5	1.00 3	159.8	57 13.4	1.00 3	159.7	58 43.3	1.00 3	159.5	8
9	50 42.0	1.00 3	159.1	51 42.0	1.00 3	159.0	53 11.9	1.00 3	158.9	54 11.8	1.00 3	158.8	55 11.7	1.00 3	158.7	56 11.7	1.00 3	158.6	57 11.6	1.00 3	158.5	58 41.5	1.00 3	158.4	9
20	50 40.1	1.00 3	158.0	51 40.1	1.00 3	157.9	53 10.0	1.00 3	157.8	54 09.9	1.00 3	157.7	55 09.8	1.00 3	157.6	56 09.7	1.00 3	157.5	57 09.6	1.00 3	157.4	58 39.5	1.00 3	157.3	20
1	50 38.1	1.00 4	156.9	51 38.0	1.00 4	156.8	53 07.9	1.00 4	156.6	54 07.8	1.00 4	156.6	55 07.8	1.00 4	156.5	56 07.7	1.00 4	156.4	57 07.6	1.00 4	156.3	58 37.4	1.00 4	156.1	1
2	50 36.0	1.00 4	155.8	51 35.9	1.00 4	155.7	53 05.8	1.00 4	155.6	54 05.7	1.00 4	155.5	55 05.6	1.00 4	155.4	56 05.5	1.00 4	155.3	57 05.4	1.00 4	155.2	58 35.2	1.00 4	155.0	2
3	50 33.8	1.00 4	154.7	51 33.7	1.00 4	154.6	53 03.6	1.00 4	154.5	54 03.5	1.00 4	154.4	55 03.4	1.00 4	154.3	56 03.3	1.00 4	154.2	57 03.2	1.00 4	154.1	58 33.0	1.00 4	153.9	3
4	50 31.6	1.00 4	153.6	51 31.5	1.00 4	153.5	53 01.3	1.00 4	153.4	54 01.2	1.00 4	153.3	55 01.1	1.00 4	153.2	56 01.0	1.00 4	153.1	57 00.8	1.00 4	152.9	58 30.6	1.00 4	152.8	4
25	50 29.2	1.00 4	152.5	51 29.1	1.00 4	152.4	52 58.9	1.00 4	152.3	53 58.8	1.00 4	152.2	54 58.7	1.00 4	152.1	55 58.6	1.00 4	152.0	56 58.4	1.00 4	151.8	58 28.2	1.00 4	151.6	25
6	50 26.7	1.00 4	151.4	51 26.6	1.00 4	151.3	52 56.4	1.00 4	151.2	53 56.3	1.00 4	151.1	54 56.2	1.00 4	151.0	55 56.1	1.00 4	150.9	56 55.9	1.00 4	150.7	58 25.7	1.00 4	150.5	6
7	50 24.2	1.00 4	150.3	51 24.1	1.00 4	150.2	52 53.9	1.00 4	150.1	53 53.7	1.00 4	150.0	54 53.6	1.00 4	149.9	55 53.5	1.00 5	149.7	56 53.3	1.00 5	149.6	58 23.1	1.00 5	149.4	7
8	50 21.6	1.00 5	149.3	51 21.4	1.00 5	149.2	52 51.2	1.00 5	149.0	53 51.1	1.00 5	148.9	54 50.9	1.00 5	148.8	55 50.8	1.00 5	148.6	56 50.6	1.00 5	148.5	58 20.4	1.00 5	148.3	8
9	50 18.8	1.00 5	148.2	51 18.7	1.00 5	148.1	52 48.5	1.00 5	147.9	53 48.3	1.00 5	147.8	54 48.2	1.00 5	147.7	55 48.0	1.00 5	147.5	56 47.8	1.00 5	147.4	58 17.6	1.00 5	147.2	9
30	50 16.0	1.00 5	147.1	51 15.9	1.00 5	147.0	52 45.7	1.00 5	146.8	53 45.5	1.00 5	146.7	54 45.3	1.00 5	146.6	55 45.2	1.00 5	146.4	56 45.0	1.00 5	146.3	58 14.7	1.00 5	146.1	30
1	50 13.2	1.00 5	145.9	51 13.0	1.00 5	145.9	52 42.8	1.00 5	145.7	53 42.4	1.00 5	145.6	54 42.4	1.00 5	145.5	55 42.2	1.00 5	145.3	56 42.0	1.00 5	145.2	58 11.7	1.00 5	144.9	1
2	50 10.2	1.00 5	144.9	51 10.0	1.00 5	144.8	52 39.8	1.00 5	144.6	53 39.6	1.00 5	144.5	54 39.4	1.00 5	144.4	55 39.2	1.00 5	144.2	56 39.0	1.00 5	144.1	58 08.8	1.00 5	143.8	2
3	50 07.1	1.00 5	143.8	51 07.0	1.00 5	143.7	52 36.7	1.00 5	143.5	53 36.5	1.00 5	143.4	54 36.3	1.00 5	143.3	55 36.1	1.00 5	143.1	56 35.9	1.00 5	143.0	58 05.6	1.00 5	142.7	3
4	50 04.0	1.00 5	142.8	51 03.8	1.00 5	142.6	52 33.6	1.00 5	142.4	53 33.4	1.00 5	142.3	54 33.2	1.00 5	142.2	55 32.9	1.00 5	142.0	56 32.7	1.00 5	141.9	58 02.3	1.00 6	141.6	4
35	50 00.7	1.00 5	141.7	51 00.6	1.00 6	141.6	52 30.3	1.00 6	141.4	53 30.1	1.00 6	141.2	54 29.9	1.00 6	141.1	55 29.7	1.00 6	140.9	56 29.4	1.00 6	140.8	57 59.1	1.00 6	140.5	35
6	49 57.5	1.00 6	140.5	50 57.3	1.00 6	140.5	52 27.0	1.00 6	140.3	53 26.8	1.00 6	140.0	54 26.6	1.00 6	140.0	55 26.3	1.00 6	139.8	56 26.1	1.00 6	139.7	57 55.7	1.00 6	139.4	6
7	49 54.2	1.00 6	139.5	50 54.0	1.00 6	139.4	52 23.7	1.00 6	139.2	53 23.4	1.00 6	139.1	54 23.2	1.00 6	138.9	55 22.9	1.00 6	138.7	56 22.7	1.00 6	138.6	57 52.3	1.00 6	138.3	7
8	49 50.7	1.00 6	138.5	50 50.5	1.00 6	138.3	52 20.2	1.00 6	138.1	53 20.0	1.00 6	138.0	54 19.7	1.00 6	137.8	55 19.4	1.00 6	137.7	56 19.2	1.00 6	137.5	57 48.7	99 06	137.2	8
9	49 47.2	1.00 6	137.4	50 47.0	1.00 6	137.2	52 16.7	1.00 6	137.0	53 16.4	1.00 6	136.9	54 16.2	1.00 6	136.7	55 15.9	1.00 6	136.6	56 15.6	1.00 6	136.4	57 45.1	99 06	136.1	9
40	49 43.7	1.00 6	136.3	50 43.4	1.00 6	136.2	52 13.1	1.00 6	136.0	53 12.8	1.00 6	135.8	54 12.5	1.00 6	135.6	55 12.0	99 06	135.5	56 12.0	99 06	135.3	57 41.5	99 06	135.0	40
1	49 40.0	1.00 6	135.2	50 39.8	1.00 6	135.1	52 09.4	1.00 6	134.9	53 09.1	1.00 6	134.7	54 08.9	1.00 6	134.6	55 08.6	99 06	134.4	56 08.2	99 06	134.2	57 37.8	99 06	133.9	1
2	49 36.3	1.00 6	134.2	50 36.1	1.00 6	134.0	52 05.7	1.00 6	133.8	53 05.4	1.00 6	133.6	54 05.1	1.00 6	133.5	55 04.8	99 06	133.3	56 04.5	99 06	133.1	57 34.0	99 06	132.8	2
3	49 32.5	1.00 6	133.1	50 32.3	1.00 6	133.0	52 01.9	1.00 6	132.7	53 01.6	1.00 6	132.6	54 01.3	1.00 6	132.4	55 00.9	99 06	132.2	56 00.6	99 07	132.0	57 30.1	99 07	131.7	3
4	49 28.7	1.00 7	132.0	50 28.4	1.00 7	131.9	51 58.0	1.00 7	131.7	52 57.7	99 07	131.5	53 57.4	99 07	131.3	54 57.0	99 07	131.1	55 56.7	99 07	131.0	57 26.2	99 07	130.7	4
45	49 24.8	1.00 7	131.0	50 24.5	1.00 7	130.8	51 54.0	99 07	130.6	52 53.7	99 07	130.4	53 53.4	99 07	130.3	54 53.1	99 07	130.1	55 52.7	99 07	129.9	57 22.2	99 07	129.6	45
6	49 20.8	1.00 7	129.9	50 20.5	1.00 7	129.8	51 50.0	99 07	129.5	52 49.7	99 07	129.4	53 49.4	99 07	129.2	54 49.0	99 07	129.0	55 48.7	99 07	128.8	57 18.1	99 07	128.5	6
7	49 16.7	1.00 7	128.9	50 16.4	1.00 7	128.7	51 46.0	99 07	128.5	52 45.6	99 07	128.3	53 45.3	99 07	128.1	54 44.9	99 07	127.9	55 44.6	99 07	127.7	57 14.0	99 07	127.4	7
8	49 12.6	1.00 7	127.8	50 12.3	99 07	127.6	51 41.8	99 07	127.4	52 41.5	99 07	127.2	53 41.2	99 07	127.0	54 40.8	99 07	126.9	55 40.4	99 07	126.7	57 09.8	99 07	126.3	8
9	49 08.5	99 07	126.7	50 08.2	99 07	126.6	51 37.7	99 07	126.3	52 37.3	99 07	126.2	53 37.0	99 07	126.0	54 36.6	99 07	125.8	55 36.2	99 07	125.6	57 05.5	99 07	125.3	9
50	49 04.2	99 07	125.7	50 03.9	99 07	125.5	51 33.4	99 07	125.3	52 33.1	99 07	125.1	53 32.7	99 07	124.9	54 32.3	99 07	124.7	55 31.9	99 07	124.5	57 01.2	99 07	124.2	50
1	49 00.0	99 07	124.6	49 59.6	99 07	124.5	51 29.1	99 07	124.2	52 28.8	99 07	124.0	53 28.4	99 07	123.8	54 28.0	99 07	123.7	55 27.6	99 07	123.4	56 56.9	99 07	123.1	1
2	48 55.6	99 07	123.6	49 55.3	99 07	123.4	51 24.8	99 07	123.2	52 24.4	99 07	123.0	53 24.0	99 07	122.8	54 23.6	99 07	122.6	55 23.2	99 07	122.4	56 52.5	99 07	122.0	2
3	48 51.3	99 07	122.5	49 50.9	99 07	122.4	51 20.4	99 07	122.1	52 20.0	99 07	121.9	53 19.6	99 07	121.7	54 19.2	99 07	121.5	55 18.7	99 08	121.3	56 48.0	99 08	121.0	3
4	48 46.8	99 07	121.5	49 46.5	99 07	121.3	51 15.9	99 08	121.0	52 15.5	99 08	120.9	53 15.1	99 08	120.7	54 14.7	99 08	120.5	55 14.2	99 08	120.3	56 43.5	99 08	119.9	4
55	48 42.3	99 08	120.4	49 42.0	99 08	120.3	51 11.4	99 08	120.0	52 11.0	99 08	119.8	53 10.6	99 08	119.6	54 10.2	99 08	119.4	55 09.7	99 08	119.2	56 39.0	99 08	118.9	55
6	48 37.8	99 08	119.4	49 37.4	99 08	119.2	51 06.9	99 08	118.9	52 06.5	99 08	118.8	53 06.0	99 08	118.6	54 05.6	99 08	118.4	55 05.1	99 08	118.1	56 34.4	99 08	117.8	6
7	48 33.2	99 08	118.3	49 32.8	99 08	118.2	51 02.3	99 08	117.9	52 01.8	99 08	117.7	53 01.4	99 08	117.5	54 01.0	99 08	117.3	55 00.5	99 08	117.1	56 29.7	99 08	116.7	7
8	48 28.6	99 08	117.3	49 28.2	99 08	117.1	50 57.6	99 08	116.9	51 57.2	99 08	116.7	52 56.7	99 08	116.5	53 56.3	99 08	116.3	54 55.8	99 08	116.0	56 25.0	99 08	115.7	8
9	48 23.9	99 08	116.3	49 23.5	99 08	116.1	50 52.9	99 08	115.8	51 52.5	99 08	115.6	52 52.0	99 08	115.4	53 51.6	99 08	115.2	54 51.1	99 08	115.0	56 20.3	99 08	114.6	9
60	48 19.2	99 08	115.2	49 18.8	99 08	115.0	50 48.2	99 08	114.8	51 47.8	99 08	114.6	52 47.3	99 08	114.4	53 46.8	99 08	114.2	54 46.3	99 08	113.9	56 15.5	99 08	113.6	60
1	48 14.5	99 08	114.2	49 14.1	99 08	114.0	50 43.4	99 08	113.7	51 43.0	99 08	113.5	52 42.5	99 08	113.3	53 42.0	99 08	113.1	54 41.5	99 08	112.9	56 10.7	99 08	112.5	1
2	48 09.7	99 08	113.1	49 09.3	99 08	113.0	50 38.6	99 08	112.7	51 38.2	99 08	112.5	52 37.7	99 08	112.3	53 37.2	99 08	112.1	54 36.7	99 08	111.9	56 05.9	99 08	111.5	2
3	48 04.9	99 08	112.1	49 04.4	99 08	111.9	50 33.8	99 08	111.7	51 33.3	99 08	111.5	52 32.8	99 08	111.3	53 32.3	99 08	111.0	54 31.8	99 08	110.8	56 01.0	99 08	110.5	3
4	48 00.0	99 08	111.0	48 59.6	99 08	110.9	50 28.9	99 08	110.6	51 28.4	99 08	110.4	52 28.0	99 08	110.2	53 27.4	99 08	110.0	54 26.9	99 08	109.8	55 56.1	99 08	109.4	4
65	47 55.1	99 08	110.0	48 54.7	99 08	109.9	50 24.0	99 08	109.6	51 23.5	99 08	109.4	52 23.0	99 08	109.2	53 22.5	99 08	109.0	54 22.0	99 08	108.7	55 51.1	99 08	108.4	65
6	47 50.2	99 08	109.0	48 49.7	99 08	108.8	50 19.1	99 08	108.6	51 18.6	99 08	108.4	52 18.1	99 08	108.1	53 17.6	99 08	107.9	54 17.0	99 08	107.7	55 46.1	99 08	107.3	6
7	47 45.2	99 08	108.0	48 44.8	99 08	107.8	50 14.1	99 08	107.5	51 13.6	99 08	107.3	52 13.1	99 08	107.1	53 12.6	99 08	106.9	54 12.0	99 08	106.7	55 41.1	99 08	106.3	7
8	47 40.2	99 08	107.0	48 39.8	99 08	106.8	50 09.1	99 08	106.5	51 08.6	99 08	106.3	52 08.1	99 08	106.1	53 07.5	99 08	105.9	54 07.0	99 08	105.6	55 36.1	99 08	105.3	8
9	47 35.2	99 08	105.9	48 34.8	99 08	105.8	50 04.1	99 08	105.5	51 03.6	99 08	105.3	52 03.0	99 08	105.1	53 02.5	99 08	104.8	54 01.9	99 08	104.6	55 31.0	99 08	104.2	9
70	47 30.2	99 08	104.9	48 29.7	99 08	104.7	49 59.0	99 08	104.5	50 58.5	99 08	104.3	51 58.0	99 08	104.0	52 57.4	99 08	103.8	53 56.9	99 08	103.6	55 26.0	99 00	103.2	70
1	47 25.1	99 08	103.9	48 24.6	99 08	103.7	49 53.9	99 08	103.4	50 53.4	99 08	103.2	51 52.9	99 09	103.0	52 52.3	99 09	102.8	53 51.8	99 08	102.6	55 20.9	99 00	102.2	1
2	47 20.0	99 09	102.9	48 19.6	99 09	102.7	49 48.8	99 09	102.4	50 48.3	99 09	102.2	51 47.8	99 09	102.0	52 47.2	99 09	101.8	53 46.7	99 09	101.5	55 15.7	99 00	101.2	2
3	47 14.9	99 09	101.9	48 14.4	99 09	101.7	49 43.7	99 09	101.4	50 43.2	99 09	101.2	51 42.7	99 09	101.0	52 42.1	99 09	100.8	53 41.5	99 09	100.5	55 10.6	99 00	100.2	3
4	47 09.8	99 09	100.9	48 09.3	99 09	100.7	49 38.6	99 09	100.4	50 38.1	99 09	100.2	51 37.5	99 09	100.0	52 37.0	99 09	99.7	53 36.4	99 09	99.5	55 05.4	99 00	99.1	4
75	47 04.6	99 09	99.8	48 04.2	99 09	99.7	49 33.4	99 09	99.4	50 32.9	99 09	99.2	51 32.4	99 09	98.9	52 31.8	99 09	98.7	53 31.2	99 09	98.5	55 00.3	99 00	98.1	75
6	46 59.5	99 09	98.8	47 59.0	99 09	98.6	49 28.3	99 09	98.4	50 27.7	99 09	98.1	51 27.2	99 09	97.9	52 26.6	99 09	97.7	53 26.0	99 09	97.5	54 55.1	99 00	97.1	6
7	46 54.3	99 09	97.8	47 53.8	99 09	97.6	49 23.1	99 09	97.3	50 22.6	99 09	97.1	51 22.0	99 09	96.9	52 21.4	99 09	96.7	53 20.8	99 09	96.5	54 49.9	99 00	96.1	7
8	46 49.1	99 09	96.8	47 48.6	99 09	96.6	49 18.0	99 09	96.3	50 17.4	99 09	96.1	51 16.8	99 09	95.9	52 16.2	99 09	95.7	53 15.6	99 09	95.5	54 44.7	99 00	95.1	8
9	46 43.9	99 09	95.8	47 43.4	99 09	95.6	49 12.7	99 09	95.3	50 12.2	99 09	95.1	51 11.6	99 09	94.9	52 11.0	99 09	94.7	53 10.4	99 09	94.5	54 39.5	99 00	94.1	9
80	46 38.7	99 00	94.8	47 38.2	99 00	94.6	49 07.5	99 00	94.3	50 06.9	99 00	94.1	51 06.4	99 00	93.9	52 05.8	99 00	93.7	53 05.2	99 00	93.5	54 34.3	99 00	93.1	80
1	46 33.5	99 00	93.8	47 33.0	99 00	93.6	49 02.3	99 00	93.3	50 01.7	99 00	93.1	51 01.2	99 00	92.9	52 00.6	99 00	92.7	53 00.0	99 00	92.4	54 29.0	99 00	92.1	1
2	46 28.3	99 00	92.8	47 27.8	99 00	92.6	48 57.1	99 00	92.3	49 56.5	99 00	92.1	50 55.9	99 00	91.9	51 55.4	99 00	91.7	52 54.8	99 00	91.4	54 23.8	99 00	91.1	2
3	46 23.0	99 00	91.8	47 22.6	99 00	91.6	48 51.8	99 00	91.3	49 51.3	99 00	91.1	50 50.7	99 00	90.9	51 50.1	99 00	90.7	52 49.5	99 00	90.4	54 18.6	99 00	90.1	3
4	46 17.8	99 00	90.8	47 17.3	99 00	90.6	48 46.6	99 00	90.3	49 46.0	99 00	90.1	50 45.5	99 00	89.9	51 44.9	99 00	89.7	52 44.3	99 00	89.5	54 13.4	99 00	89.1	4
85	46 12.6	99 00	89.8	47 12.1	99 00	89.6	48 41.3	99 00	89.3	49 40.8	99 00	89.1	50 40.3	99 00	88.9	51 39.7	99 00	88.7	52 39.1	99 00	88.5	54 08.1	99 00	88.1	85
6	46 07.4	99 00	88.8	47 06.9	99 00	88.6	48 36.1	99 00	88.3	49 35.6	99 00	88.1	50 35.0	99 00	87.9	51 34.5	99 00	87.7	52 33.9	99 00	87.5	54 02.9	99 00	87.1	6
7	46 02.1	99 00	87.8	47 01.7	99 00	87.6	48 30.9	99 00	87.3	49 30.4	99 00	87.1	50 29.8	99 00	86.9	51 29.2	99 00	86.7	52 28.6	99 00	86.5	53 57.7	99 00	86.1	7
8	45 56.9	99 00	86.8	46 56.4	99 00	86.6	48 25.7	99 00	86.3	49 25.1	99 00	86.1	50 24.6	99 00	85.9	51 24.0	99 00	85.7	52 23.4	99 00	85.5	53 52.5	99 00	85.1	8
9	45 51.7	99 00	85.8	46 51.2	99 00	85.6	48 20.5	99 00	85.4	49 19.9	99 00	85.2	50 19.4	99 00	85.0	51 18.8	99 00	84.7	52 18.2	99 00	84.5	53 47.3	99 00	84.1	9
90	45 46.5	99 00	84.8	46 46.0	99 00	84.7	48 15.2	99 00	84.4	49 14.7	99 00	84.2	50 14.2	99 00	84.0	51 13.6	99 00	83.7	52 13.0	99 00	83.5	53 42.1	99 00	83.2	90

H.A.	46°00' Alt	Δd Δt	Az	47°00' Alt	Δd Δt	Az	48°30' Alt	Δd Δt	Az	49°30' Alt	Δd Δt	Az	50°30' Alt	Δd Δt	Az	51°30' Alt	Δd Δt	Az	52°30' Alt	Δd Δt	Az	54°00' Alt	Δd Δt	Az	H.A.
91	45 41.3	99 09	83.9	46 40.8	99 09	83.7	48 10.1	99 09	83.4	49 09.5	99 09	83.2	50 09.0	99 09	83.0	51 08.4	99 09	82.8	52 07.8	99 09	82.5	53 36.9	99 09	82.2	91
2	45 36.1	99 09	82.9	46 35.6	99 09	82.7	48 04.9	99 09	82.4	49 04.3	99 09	82.2	50 03.8	99 09	82.0	51 03.2	99 09	81.8	52 02.6	99 09	81.6	53 31.7	99 09	81.2	2
3	45 30.9	99 09	81.9	46 30.4	99 09	81.7	47 59.7	99 09	81.4	48 59.2	99 09	81.2	49 58.6	99 09	81.0	50 58.1	99 09	80.8	51 57.5	99 09	80.6	53 26.5	99 09	80.2	3
4	45 25.7	99 09	80.9	46 25.3	99 09	80.7	47 54.5	99 09	80.4	48 54.0	99 09	80.2	49 53.5	99 09	80.0	50 52.9	99 09	79.8	51 52.3	99 09	79.6	53 21.4	99 09	79.2	4
95	45 20.6	99 09	79.9	46 20.1	99 09	79.7	47 49.4	99 09	79.5	48 48.9	99 09	79.3	49 48.3	99 09	79.1	50 47.8	99 09	78.8	51 47.2	99 09	78.6	53 16.3	99 09	78.3	95
6	45 15.4	99 09	78.9	46 15.0	99 09	78.8	47 44.2	99 09	78.5	48 43.7	99 09	78.3	49 43.2	99 09	78.1	50 42.6	99 09	77.9	51 42.1	99 09	77.7	53 11.2	99 09	77.3	6
7	45 10.3	99 09	78.0	46 09.8	99 09	77.8	47 39.1	99 08	77.5	48 38.6	99 08	77.3	49 38.1	99 08	77.1	50 37.5	99 08	76.9	51 37.0	99 08	76.7	53 06.1	99 08	76.3	7
8	45 05.2	99 08	77.0	46 04.7	99 08	76.8	47 34.0	99 08	76.5	48 33.5	99 08	76.3	49 33.0	99 08	76.1	50 32.5	99 08	75.9	51 31.9	99 08	75.7	53 01.0	99 08	75.4	8
9	45 00.1	99 08	76.0	45 59.7	99 08	75.8	47 29.0	99 08	75.6	48 28.5	99 08	75.4	49 27.9	99 08	75.2	50 27.4	99 08	75.0	51 26.8	99 08	74.7	52 55.9	99 08	74.4	9
100	44 55.1	99 08	75.0	45 54.6	99 08	74.9	47 23.9	99 08	74.6	48 23.4	99 08	74.4	49 22.9	99 08	74.2	50 22.4	99 08	74.0	51 21.8	99 08	73.8	52 50.9	99 08	73.4	100
1	44 50.0	99 08	74.1	45 49.6	99 08	73.9	47 18.9	99 08	73.6	48 18.4	99 08	73.4	49 17.9	99 08	73.2	50 17.3	99 08	73.0	51 16.8	99 08	72.8	52 45.9	99 08	72.5	1
2	44 45.0	99 08	73.1	45 44.6	99 08	72.9	47 13.9	99 08	72.6	48 13.4	99 08	72.5	49 12.9	99 08	72.3	50 12.4	99 08	72.1	51 11.8	99 08	71.8	52 40.9	99 08	71.5	2
3	44 40.0	99 08	72.1	45 39.6	99 08	71.9	47 08.9	99 08	71.7	48 08.4	99 08	71.5	49 07.9	99 08	71.3	50 07.4	99 08	71.1	51 06.9	99 08	70.9	52 36.0	99 08	70.6	3
4	44 35.0	99 08	71.2	45 34.6	99 08	71.0	47 03.9	99 08	70.7	48 03.5	99 08	70.5	49 03.0	99 08	70.3	50 02.5	99 08	70.1	51 01.9	99 08	69.9	52 31.1	99 08	69.6	4
105	44 30.1	99 08	70.2	45 29.7	99 08	70.0	46 59.0	99 08	69.8	47 58.5	99 08	69.6	48 58.1	99 08	69.4	49 57.6	99 08	69.2	50 57.0	99 08	69.0	52 26.2	99 08	68.6	105
6	44 25.2	99 08	69.2	45 24.8	99 08	69.0	46 54.1	99 08	68.8	47 53.7	99 08	68.6	48 53.2	99 08	68.4	49 52.7	99 08	68.2	50 52.2	99 08	68.0	52 21.3	99 08	67.7	6
7	44 20.3	99 08	68.3	45 19.9	99 08	68.1	46 49.3	99 08	67.8	47 48.8	99 08	67.6	48 48.3	99 08	67.5	49 47.8	99 08	67.3	50 47.3	99 08	67.1	52 16.5	99 08	66.7	7
8	44 15.5	99 08	67.3	45 15.1	99 08	67.1	46 44.4	99 08	66.9	47 44.0	99 08	66.7	48 43.5	99 08	66.5	49 43.0	99 08	66.3	50 42.5	99 08	66.1	52 11.7	99 08	65.8	8
9	44 10.7	99 08	66.3	45 10.3	99 08	66.2	46 39.6	99 08	65.9	47 39.2	99 08	65.7	48 38.7	99 08	65.5	49 38.3	99 08	65.3	50 37.8	99 08	65.1	52 07.0	99 08	64.8	9
110	44 05.9	99 08	65.4	45 05.5	99 08	65.2	46 34.9	99 08	64.9	47 34.5	99 08	64.8	48 34.0	99 08	64.6	49 33.5	99 08	64.4	50 33.0	99 08	64.2	52 02.3	99 08	63.9	110
1	44 01.2	99 08	64.4	45 00.8	99 08	64.2	46 30.2	99 08	64.0	47 29.7	99 08	63.8	48 29.3	99 08	63.6	49 28.8	99 08	63.4	50 28.4	99 08	63.2	51 57.6	99 08	62.9	1
2	43 56.5	99 08	63.4	44 56.1	99 08	63.3	46 25.5	99 08	63.0	47 25.1	99 08	62.9	48 24.6	99 08	62.7	49 24.2	99 08	62.5	50 23.7	99 08	62.3	51 53.0	99 08	62.0	2
3	43 51.8	99 08	62.5	44 51.4	99 08	62.3	46 20.9	99 08	62.1	47 20.4	99 08	61.9	48 20.0	99 08	61.7	49 19.6	99 08	61.5	50 19.1	99 08	61.4	51 48.4	99 08	61.0	3
4	43 47.2	99 08	61.5	44 46.8	99 08	61.4	46 16.3	99 08	61.1	47 15.8	99 08	61.0	48 15.4	99 08	60.8	49 14.9	99 08	60.5	50 14.5	99 08	60.4	51 43.8	99 08	60.1	4
115	43 42.6	99 08	60.6	44 42.3	99 08	60.4	46 11.7	99 08	60.2	47 11.3	99 08	60.0	48 10.9	99 08	59.8	49 10.5	99 07	59.7	50 10.0	99 07	59.5	51 39.3	99 07	59.2	115
6	43 38.1	99 07	59.6	44 37.7	99 07	59.5	46 07.2	99 07	59.2	47 06.8	99 07	59.1	48 06.4	99 07	58.9	49 06.0	99 07	58.7	50 05.5	99 07	58.5	51 34.8	99 07	58.2	6
7	43 33.6	99 07	58.7	44 33.3	99 07	58.5	46 02.7	99 07	58.3	47 02.3	99 07	58.1	48 01.9	99 07	57.9	49 01.5	99 07	57.8	50 01.1	99 07	57.6	51 30.4	99 07	57.3	7
8	43 29.2	99 07	57.7	44 28.8	99 07	57.6	45 58.3	99 07	57.3	46 57.9	99 07	57.2	47 57.5	99 07	57.0	48 57.1	99 07	56.8	49 56.7	99 07	56.6	51 26.0	99 07	56.4	8
9	43 24.8	99 07	56.8	44 24.4	99 07	56.6	45 53.9	99 07	56.4	46 53.5	99 07	56.2	47 53.2	99 07	56.0	48 52.8	99 07	55.9	49 52.4	99 07	55.7	51 21.7	99 07	55.4	9
120	43 20.4	99 07	55.8	44 20.1	99 07	55.7	45 49.6	99 07	55.4	46 49.2	99 07	55.3	47 48.8	99 07	55.1	48 48.5	99 07	54.9	49 48.1	99 07	54.8	51 17.4	99 07	54.5	120
1	43 16.1	99 07	54.9	44 15.8	99 07	54.7	45 45.3	99 07	54.5	46 44.9	99 07	54.3	47 44.6	99 07	54.2	48 44.2	99 07	54.0	49 43.8	99 07	53.8	51 13.2	99 07	53.6	1
2	43 11.9	99 07	53.9	44 11.6	99 07	53.8	45 41.1	99 07	53.5	46 40.7	99 07	53.4	47 40.4	99 07	53.2	48 40.0	99 07	53.1	49 39.6	99 07	52.9	51 09.0	99 07	52.6	2
3	43 07.7	99 07	53.0	44 07.4	99 07	52.8	45 36.9	99 07	52.6	46 36.5	99 07	52.5	47 36.2	99 07	52.3	48 35.8	99 07	52.1	49 35.5	99 07	52.0	51 04.9	99 07	51.7	3
4	43 03.5	1.007	52.0	44 03.2	99 07	51.9	45 32.8	99 07	51.7	46 32.4	99 07	51.5	47 32.1	99 07	51.4	48 31.7	99 07	51.2	49 31.4	99 07	51.0	51 00.8	99 07	50.8	4
125	42 59.4	1.007	51.1	43 59.1	1.007	50.9	45 28.7	99 07	50.7	46 28.4	99 07	50.6	47 28.0	99 07	50.4	48 27.7	99 07	50.3	49 27.3	99 07	50.1	50 56.8	99 07	49.8	125
6	42 55.4	1.007	50.1	43 55.1	1.007	50.0	45 24.7	99 07	49.8	46 24.4	99 07	49.6	47 24.0	99 07	49.5	48 23.7	99 07	49.3	49 23.4	99 07	49.2	50 52.8	99 07	48.9	6
7	42 51.4	1.007	49.2	43 51.1	1.007	49.1	45 20.7	1.007	48.8	46 20.4	99 06	48.7	47 20.1	99 06	48.6	48 19.8	99 06	48.4	49 19.4	99 06	48.2	50 48.9	99 06	48.0	7
8	42 47.5	1.006	48.2	43 47.2	1.006	48.1	45 16.8	1.006	47.9	46 16.5	1.006	47.8	47 16.2	99 06	47.6	48 15.9	99 06	47.5	49 15.5	99 06	47.3	50 45.0	99 06	47.1	8
9	42 43.6	1.006	47.3	43 43.3	1.006	47.2	45 12.9	1.006	47.0	46 12.6	1.006	46.8	47 12.4	1.006	46.7	48 12.0	99 06	46.5	49 11.7	99 06	46.4	50 41.2	99 06	46.1	9
130	42 39.8	1.006	46.4	43 39.5	1.006	46.2	45 09.1	1.006	46.0	46 08.9	1.006	45.9	47 08.6	1.006	45.8	48 08.3	99 06	45.6	49 08.0	99 06	45.5	50 37.5	99 06	45.2	130
1	42 36.0	1.006	45.4	43 35.8	1.006	45.3	45 05.4	1.006	45.1	46 05.1	1.006	45.0	47 04.9	1.006	44.8	48 04.6	1.006	44.7	49 04.3	99 06	44.5	50 33.8	99 06	44.3	1
2	42 32.3	1.006	44.5	43 32.1	1.006	44.4	45 01.7	1.006	44.2	46 01.5	1.006	44.0	47 01.2	1.006	43.9	48 00.9	1.006	43.8	49 00.6	1.006	43.6	50 30.2	99 06	43.4	2
3	42 28.7	1.006	43.5	43 28.4	1.006	43.4	44 58.1	1.006	43.2	45 57.9	1.006	43.1	46 57.6	1.006	43.0	47 57.3	1.006	42.9	48 57.1	1.006	42.7	50 26.6	99 06	42.5	3
4	42 25.1	1.006	42.6	43 24.9	1.006	42.5	44 54.6	1.006	42.3	45 54.3	1.006	42.2	46 54.1	1.006	42.0	47 53.8	1.006	41.9	48 53.6	1.006	41.8	50 23.1	1.006	41.5	4
135	42 21.6	1.006	41.7	43 21.4	1.006	41.5	44 51.1	1.006	41.4	45 50.8	1.006	41.2	46 50.6	1.006	41.1	47 50.4	1.006	41.0	48 50.1	1.006	40.8	50 19.7	1.006	40.6	135
6	42 18.2	1.006	40.7	43 18.0	1.006	40.6	44 47.7	1.006	40.4	45 47.4	1.006	40.3	46 47.2	1.006	40.2	47 47.0	1.006	40.1	48 46.7	1.006	39.9	50 16.3	1.006	39.7	6
7	42 14.8	1.006	39.8	43 14.6	1.006	39.7	44 44.3	1.006	39.5	45 44.1	1.005	39.4	46 43.9	1.005	39.3	47 43.6	1.005	39.1	48 43.4	1.005	39.0	50 13.0	1.005	38.8	7
8	42 11.5	1.005	38.9	43 11.3	1.005	38.7	44 41.0	1.005	38.6	45 40.8	1.005	38.5	46 40.6	1.005	38.3	47 40.4	1.005	38.1	48 40.1	1.005	38.1	50 09.8	1.005	37.9	8
9	42 08.2	1.005	37.9	43 08.1	1.005	37.8	44 37.8	1.005	37.7	45 37.6	1.005	37.5	46 37.4	1.005	37.4	47 37.2	1.005	37.3	48 36.9	1.005	37.2	50 06.6	1.005	37.0	9
140	42 05.1	1.005	37.0	43 04.9	1.005	36.9	44 34.6	1.005	36.7	45 34.4	1.005	36.6	46 34.2	1.005	36.5	47 34.0	1.005	36.4	48 33.8	1.005	36.2	50 03.5	1.005	36.1	140
1	42 01.9	1.005	36.1	43 01.8	1.005	36.0	44 31.5	1.005	35.8	45 31.3	1.005	35.7	46 31.2	1.005	35.6	47 31.0	1.005	35.5	48 30.8	1.005	35.3	50 00.4	1.005	35.1	1
2	41 58.9	1.005	35.1	42 58.7	1.005	35.0	44 28.5	1.005	34.9	45 28.3	1.005	34.8	46 28.1	1.005	34.7	47 28.0	1.005	34.5	48 27.8	1.005	34.4	49 57.5	1.005	34.2	2
3	41 55.9	1.005	34.2	42 55.8	1.005	34.1	44 25.5	1.005	33.9	45 25.4	1.005	33.8	46 25.2	1.005	33.7	47 25.0	1.005	33.6	48 24.8	1.005	33.5	49 54.6	1.005	33.3	3
4	41 53.0	1.005	33.3	42 52.9	1.005	33.2	44 22.7	1.005	33.0	45 22.5	1.005	32.9	46 22.3	1.005	32.8	47 22.2	1.005	32.7	48 22.0	1.005	32.6	49 51.7	1.005	32.4	4
145	41 50.2	1.005	32.3	42 50.1	1.005	32.2	44 19.8	1.005	32.1	45 19.7	1.005	32.0	46 19.5	1.005	31.9	47 19.4	1.005	31.8	48 19.2	1.005	31.7	49 48.9	1.004	31.5	145
6	41 47.4	1.004	31.4	42 47.3	1.004	31.3	44 17.1	1.004	31.2	45 17.0	1.004	31.1	46 16.8	1.004	31.0	47 16.7	1.004	30.9	48 16.5	1.004	30.8	49 46.3	1.004	30.6	6
7	41 44.7	1.004	30.5	42 44.6	1.004	30.4	44 14.3	1.004	30.2	45 14.2	1.004	30.2	46 14.2	1.004	30.1	47 14.0	1.004	30.0	48 13.9	1.004	29.8	49 43.6	1.004	29.7	7
8	41 42.1	1.004	29.5	42 42.0	1.004	29.5	44 11.8	1.004	29.3	45 11.7	1.004	29.2	46 11.6	1.004	29.1	47 11.4	1.004	29.0	48 11.3	1.004	28.9	49 41.1	1.004	28.8	8
9	41 39.6	1.004	28.6	42 39.5	1.004	28.5	44 09.3	1.004	28.4	45 09.2	1.004	28.3	46 09.1	1.004	28.2	47 08.9	1.004	28.1	48 08.8	1.004	28.0	49 38.6	1.004	27.9	9
150	41 37.1	1.004	27.7	42 37.0	1.004	27.6	44 06.9	1.004	27.5	45 06.7	1.004	27.4	46 06.6	1.004	27.3	47 06.5	1.004	27.2	48 06.4	1.004	27.1	49 36.2	1.004	27.0	150
1	41 34.7	1.004	26.8	42 34.6	1.004	26.7	44 04.5	1.004	26.6	45 04.4	1.004	26.5	46 04.3	1.004	26.4	47 04.2	1.004	26.3	48 04.0	1.004	26.2	49 33.9	1.004	26.1	1
2	41 32.4	1.004	25.8	42 32.3	1.004	25.8	44 02.2	1.004	25.6	45 02.1	1.004	25.6	46 02.0	1.004	25.5	47 01.9	1.004	25.4	48 01.8	1.004	25.3	49 31.6	1.004	25.2	2
3	41 30.2	1.004	24.9	42 30.1	1.004	24.8	44 00.0	1.004	24.7	44 59.9	1.004	24.6	45 59.8	1.004	24.6	46 59.7	1.004	24.5	47 59.6	1.004	24.4	49 29.4	1.004	24.3	3
4	41 28.0	1.004	24.0	42 27.9	1.003	23.9	43 57.8	1.003	23.8	44 57.7	1.003	23.7	45 57.6	1.003	23.6	46 57.5	1.003	23.6	47 57.4	1.003	23.5	49 27.3	1.003	23.4	4
155	41 25.9	1.003	23.1	42 25.9	1.003	23.0	43 55.7	1.003	22.9	44 55.7	1.003	22.8	45 55.6	1.003	22.7	46 55.5	1.003	22.7	47 55.4	1.003	22.6	49 25.3	1.003	22.4	155
6	41 23.9	1.003	22.1	42 23.8	1.003	22.1	43 53.7	1.003	22.0	44 53.7	1.003	21.9	45 53.6	1.003	21.8	46 53.5	1.003	21.7	47 53.4	1.003	21.7	49 23.3	1.003	21.5	6
7	41 22.0	1.003	21.2	42 21.9	1.003	21.1	43 51.8	1.003	21.0	44 51.8	1.003	21.0	45 51.7	1.003	20.9	46 51.6	1.003	20.8	47 51.5	1.003	20.8	49 21.4	1.003	20.6	7
8	41 20.1	1.003	20.3	42 20.1	1.003	20.2	43 50.0	1.003	20.1	44 49.9	1.003	20.1	45 49.9	1.003	20.0	46 49.8	1.003	19.9	47 49.7	1.003	19.9	49 19.6	1.003	19.7	8
9	41 18.4	1.003	19.4	42 18.3	1.003	19.3	43 48.2	1.003	19.2	44 48.2	1.003	19.1	45 48.1	1.003	19.1	46 48.0	1.003	19.0	47 48.0	1.003	19.0	49 17.9	1.003	18.8	9
160	41 16.7	1.003	18.4	42 16.6	1.003	18.4	43 46.5	1.003	18.3	44 46.5	1.003	18.2	45 46.4	1.003	18.2	46 46.4	1.003	18.1	47 46.3	1.003	18.0	49 16.2	1.003	17.9	160
1	41 15.1	1.003	17.5	42 14.9	1.003	17.4	43 44.9	1.003	17.4	44 44.9	1.003	17.3	45 44.8	1.003	17.3	46 44.8	1.003	17.2	47 44.7	1.003	17.1	49 14.7	1.003	17.0	1
2	41 13.5	1.002	16.6	42 13.5	1.002	16.5	43 43.4	1.002	16.5	44 43.4	1.002	16.4	45 43.3	1.002	16.4	46 43.3	1.002	16.4	47 43.1	1.002	16.2	49 13.2	1.002	16.1	2
3	41 12.1	1.002	15.7	42 12.0	1.002	15.6	43 42.0	1.002	15.5	44 41.9	1.002	15.5	45 41.9	1.002	15.4	46 41.9	1.002	15.4	47 41.8	1.002	15.3	49 11.8	1.002	15.2	3
4	41 10.7	1.002	14.7	42 10.7	1.002	14.7	43 40.6	1.002	14.6	44 40.6	1.002	14.6	45 40.6	1.002	14.5	46 40.5	1.002	14.5	47 40.5	1.002	14.4	49 10.4	1.002	14.3	4
165	41 09.4	1.002	13.8	42 09.4	1.002	13.8	43 39.3	1.002	13.7	44 39.3	1.002	13.7	45 39.3	1.002	13.6	46 39.2	1.002	13.6	47 39.2	1.002	13.5	49 09.2	1.002	13.4	165
6	41 08.2	1.002	12.9	42 08.2	1.002	12.9	43 38.1	1.002	12.8	44 38.1	1.002	12.8	45 38.1	1.002	12.7	46 38.1	1.002	12.7	47 38.0	1.002	12.6	49 08.0	1.002	12.6	6
7	41 07.1	1.002	12.0	42 07.1	1.002	11.9	43 37.0	1.002	11.9	44 37.0	1.002	11.8	45 37.0	1.002	11.8	46 37.0	1.002	11.8	47 36.9	1.002	11.7	49 06.9	1.002	11.7	7
8	41 06.0	1.001	11.0	42 06.0	1.001	11.0	43 36.0	1.001	11.0	44 36.0	1.001	10.9	45 35.9	1.001	10.9	46 35.9	1.001	10.9	47 35.9	1.001	10.8	49 05.9	1.001	10.8	8
9	41 05.1	1.001	10.1	42 05.1	1.001	10.1	43 35.0	1.001	10.1	44 35.0	1.001	10.0	45 35.0	1.001	10.0	46 35.0	1.001	10.0	47 35.0	1.001	09.9	49 04.9	1.001	09.9	9
170	41 04.2	1.001	09.2	42 04.2	1.001	09.2	43 34.2	1.001	09.1	44 34.1	1.001	09.1	45 34.1	1.001	09.1	46 34.1	1.001	09.0	47 34.1	1.001	09.0	49 04.1	1.001	09.0	170
1	41 03.4	1.001	08.3	42 03.4	1.001	08.3	43 33.4	1.001	08.2	44 33.4	1.001	08.2	45 33.4	1.001	08.2	46 33.3	1.001	08.1	47 33.3	1.001	08.1	49 03.3	1.001	08.1	1
2	41 02.7	1.001	07.4	42 02.7	1.001	07.3	43 32.7	1.001	07.3	44 32.7	1.001	07.3	45 32.6	1.001	07.3	46 32.6	1.001	07.2	47 32.6	1.001	07.2	49 02.6	1.001	07.2	2
3	41 02.1	1.001	06.4	42 02.0	1.001	06.4	43 32.0	1.001	06.4	44 32.0	1.001	06.4	45 32.0	1.001	06.4	46 32.0	1.001	06.3	47 32.0	1.001	06.3	49 02.0	1.001	06.3	3
4	41 01.5	1.001	05.5	42 01.5	1.001	05.5	43 31.5	1.001	05.5	44 31.5	1.001	05.5	45 31.5	1.001	05.4	46 31.5	1.001	05.4	47 31.5	1.001	05.4	49 01.5	1.001	05.4	4
175	41 01.1	1.001	04.6	42 01.0	1.001	04.6	43 31.0	1.001	04.6	44 31.0	1.001	04.6	45 31.0	1.001	04.5	46 31.0	1.001	04.5	47 31.0	1.001	04.5	49 01.0	1.001	04.5	175
6	41 00.7	1.000	03.7	42 00.7	1.000	03.7	43 30.7	1.000	03.7	44 30.7	1.000	03.6	45 30.7	1.000	03.6	46 30.7	1.000	03.6	47 30.7	1.000	03.6	49 00.7	1.000	03.6	6
7	41 00.4	1.000	02.8	42 00.4	1.000	02.8	43 30.4	1.000	02.7	44 30.4	1.000	02.7	45 30.4	1.000	02.7	46 30.4	1.000	02.7	47 30.4	1.000	02.7	49 00.4	1.000	02.7	7
8	41 00.2	1.000	01.8	42 00.2	1.000	01.8	43 30.2	1.000	01.8	44 30.2	1.000	01.8	45 30.2	1.000	01.8	46 30.2	1.000	01.8	47 30.2	1.000	01.8	49 00.2	1.000	01.8	8
9	41 00.0	1.000	00.9	42 00.0	1.000	00.9	43 30.0	1.000	00.9	44 30.0	1.000	00.9	45 30.0	1.000	00.9	46 30.0	1.000	00.9	47 30.0	1.000	00.9	49 00.0	1.000	00.9	9
180	41 00.0	1.000	00.0	42 00.0	1.000	00.0	43 30.0	1.000	00.0	44 30.0	1.000	00.0	45 30.0	1.000	00.0	46 30.0	1.000	00.0	47 30.0	1.000	00.0	49 00.0	1.000	00.0	180

Each cell lists: Alt. (° ′) · Δd · Δt · Az. (°)

H.A.	54° 30′	55° 00′	56° 00′	56° 30′	57° 00′	57° 30′	59° 00′	59° 30′	H.A.
00	59 30.0 1.0 00 180.0	60 00.0 1.0 00 180.0	61 00.0 1.0 00 180.0	61 30.0 1.0 00 180.0	62 00.0 1.0 00 180.0	62 30.0 1.0 00 180.0	64 00.0 1.0 00 180.0	64 30.0 1.0 00 180.0	00
1	59 29.9 1.0 00 178.9	59 59.9 1.0 00 178.9	60 59.9 1.0 00 178.8	61 29.9 1.0 00 178.8	61 59.9 1.0 00 178.8	62 29.9 1.0 00 178.8	63 59.9 1.0 00 178.8	64 29.9 1.0 00 178.8	1
2	59 29.8 1.0 00 177.7	59 59.8 1.0 00 177.7	60 59.8 1.0 00 177.7	61 29.8 1.0 00 177.7	61 59.8 1.0 00 177.7	62 29.8 1.0 00 177.7	63 59.8 1.0 00 177.7	64 29.8 1.0 00 177.6	2
3	59 29.5 1.0 01 176.6	59 59.5 1.0 01 176.6	60 59.5 1.0 01 176.5	61 29.5 1.0 01 176.5	61 59.5 1.0 01 176.5	62 29.5 1.0 01 176.5	63 59.5 1.0 01 176.5	64 29.5 1.0 01 176.5	3
4	59 29.2 1.0 01 175.4	59 59.2 1.0 01 175.4	60 59.2 1.0 01 175.4	61 29.2 1.0 01 175.4	61 59.2 1.0 01 175.4	62 29.2 1.0 01 175.3	63 59.1 1.0 01 175.3	64 29.1 1.0 01 175.3	4
05	59 28.7 1.0 01 174.3	59 58.7 1.0 01 174.3	60 58.7 1.0 01 174.2	61 28.7 1.0 01 174.2	61 58.7 1.0 01 174.2	62 28.7 1.0 01 174.2	63 58.7 1.0 01 174.1	64 28.7 1.0 01 174.1	05
6	59 28.1 1.0 01 173.1	59 58.1 1.0 01 173.1	60 58.1 1.0 01 173.1	61 28.1 1.0 01 173.1	61 58.1 1.0 01 173.0	62 28.1 1.0 01 173.0	63 58.1 1.0 01 173.0	64 28.1 1.0 01 172.9	6
7	59 27.4 1.0 01 172.0	59 57.4 1.0 01 172.0	60 57.4 1.0 01 171.9	61 27.4 1.0 01 171.9	61 57.4 1.0 01 171.9	62 27.4 1.0 01 171.9	63 57.4 1.0 01 171.8	64 27.4 1.0 01 171.8	7
8	59 26.7 1.0 01 170.9	59 56.7 1.0 02 170.8	60 56.6 1.0 02 170.8	61 26.6 1.0 02 170.8	61 56.6 1.0 01 170.7	62 26.6 1.0 02 170.7	63 56.6 1.0 02 170.6	64 26.6 1.0 02 170.6	8
9	59 25.8 1.0 02 169.7	59 55.8 1.0 02 169.7	60 55.8 1.0 02 169.6	61 25.7 1.0 02 169.6	61 55.7 1.0 02 169.6	62 25.7 1.0 02 169.5	63 55.7 1.0 02 169.4	64 25.7 1.0 02 169.4	9
10	59 24.8 1.0 02 168.6	59 54.8 1.0 02 168.5	60 54.8 1.0 02 168.5	61 24.7 1.0 02 168.4	61 54.7 1.0 02 168.4	62 24.7 1.0 02 168.4	63 54.7 1.0 02 168.3	64 24.6 1.0 02 168.2	10
1	59 23.7 1.0 02 167.4	59 53.7 1.0 02 167.4	60 53.7 1.0 02 167.3	61 23.6 1.0 02 167.3	61 53.6 1.0 02 167.3	62 23.6 1.0 02 167.2	63 53.5 1.0 02 167.1	64 23.5 1.0 02 167.1	1
2	59 22.5 1.0 02 166.3	59 52.5 1.0 02 166.3	60 52.5 1.0 02 166.2	61 22.4 1.0 02 166.1	61 52.4 1.0 02 166.1	62 22.4 1.0 02 166.1	63 52.3 1.0 02 165.9	64 22.3 1.0 02 165.9	2
3	59 21.2 1.0 02 165.2	59 51.2 1.0 02 165.1	60 51.2 1.0 02 165.0	61 21.1 1.0 02 165.0	61 51.1 1.0 02 164.9	62 21.1 1.0 02 164.9	63 51.0 1.0 02 164.8	64 21.0 1.0 02 164.7	3
4	59 19.8 1.0 02 164.0	59 49.8 1.0 02 164.0	60 49.8 1.0 02 163.9	61 19.7 1.0 02 163.8	61 49.7 1.0 02 163.8	62 19.7 1.0 02 163.8	63 49.6 1.0 03 163.6	64 19.5 1.0 03 163.5	4
15	59 18.4 1.0 03 162.9	59 48.3 1.0 03 162.8	60 48.3 1.0 03 162.7	61 18.2 1.0 03 162.7	61 48.2 1.0 03 162.6	62 18.2 1.0 03 162.6	63 48.0 1.0 03 162.4	64 18.0 1.0 03 162.4	15
6	59 16.8 1.0 03 161.7	59 46.7 1.0 03 161.7	60 46.7 1.0 03 161.6	61 16.6 1.0 03 161.5	61 46.6 1.0 03 161.5	62 16.5 1.0 03 161.4	63 46.4 1.0 03 161.3	64 16.4 1.0 03 161.2	6
7	59 15.1 1.0 03 160.6	59 45.0 1.0 03 160.6	60 45.0 1.0 03 160.5	61 14.9 1.0 03 160.4	61 44.9 1.0 03 160.3	62 14.8 1.0 03 160.3	63 44.7 1.0 03 160.1	64 14.6 1.0 03 160.0	7
8	59 13.3 1.0 03 159.5	59 43.2 1.0 03 159.4	60 43.2 1.0 03 159.3	61 13.1 1.0 03 159.3	61 43.1 1.0 03 159.2	62 13.0 1.0 03 159.1	63 42.9 1.0 03 158.9	64 12.8 1.0 03 158.9	8
9	59 11.4 1.0 03 158.3	59 41.4 1.0 03 158.3	60 41.3 1.0 03 158.2	61 11.2 1.0 03 158.1	61 41.2 1.0 03 158.0	62 11.1 1.0 03 158.0	63 40.9 1.0 03 157.8	64 10.9 1.0 03 157.7	9
20	59 09.4 1.0 03 157.2	59 39.4 1.0 03 157.1	60 39.3 1.0 03 157.0	61 09.2 1.0 04 157.0	61 39.2 1.0 04 156.9	62 09.1 1.0 04 156.8	63 38.9 1.0 04 156.6	64 08.8 1.0 04 156.5	20
1	59 07.4 1.0 04 156.1	59 37.3 1.0 04 156.0	60 37.2 1.0 04 155.9	61 07.1 1.0 04 155.8	61 37.1 1.0 04 155.8	62 07.0 1.0 04 155.7	63 36.8 1.0 04 155.5	64 06.7 1.0 04 155.4	1
2	59 05.2 1.0 04 154.9	59 35.1 1.0 04 154.9	60 35.0 1.0 04 154.8	61 04.9 1.0 04 154.7	61 34.9 1.0 04 154.6	62 04.8 1.0 04 154.5	63 34.6 1.0 04 154.3	64 04.5 1.0 04 154.2	2
3	59 02.9 1.0 04 153.8	59 32.9 1.0 04 153.8	60 32.7 1.0 04 153.6	61 02.6 1.0 04 153.5	61 32.6 1.0 04 153.5	62 02.5 1.0 04 153.4	63 32.2 1.0 04 153.2	64 02.2 1.0 04 153.1	3
4	59 00.6 1.0 04 152.7	59 30.5 1.0 04 152.6	60 30.4 1.0 04 152.5	61 00.3 1.0 04 152.4	61 30.2 1.0 04 152.3	62 00.1 1.0 04 152.3	63 29.8 1.0 04 152.0	63 59.7 1.0 04 151.9	4
25	58 58.1 1.0 04 151.6	59 28.1 1.0 04 151.5	60 27.9 1.0 04 151.4	60 57.8 1.0 04 151.3	61 27.7 1.0 04 151.2	61 57.6 1.0 04 151.1	63 27.3 1.0 04 150.9	63 57.2 1.0 04 150.8	25
6	58 55.6 1.0 04 150.4	59 25.5 1.0 04 150.4	60 25.3 1.0 04 150.2	60 55.2 1.0 04 150.1	61 25.2 1.0 04 150.1	61 55.1 1.0 04 150.0	63 24.7 1.0 04 149.7	63 54.6 1.0 04 149.6	6
7	58 53.0 1.0 04 149.3	59 22.9 1.0 04 149.3	60 22.7 1.0 05 149.1	60 52.6 1.0 05 149.0	61 22.5 1.0 05 148.9	61 52.4 1.0 05 148.8	63 22.1 1.0 05 148.6	63 51.9 1.0 05 148.5	7
8	58 50.3 1.0 05 148.1	59 20.2 1.0 05 148.1	60 20.0 1.0 05 148.0	60 49.9 1.0 05 147.9	61 19.8 1.0 05 147.8	61 49.6 1.0 05 147.7	63 19.3 1.0 05 147.4	63 49.2 1.0 05 147.3	8
9	58 47.5 1.0 05 147.1	59 17.4 1.0 05 147.0	60 17.2 1.0 05 146.8	60 47.0 1.0 05 146.8	61 16.9 1.0 05 146.7	61 46.8 1.0 05 146.6	63 16.4 1.0 05 146.3	63 46.3 1.0 05 146.2	9
30	58 44.6 1.0 05 146.0	59 14.5 1.0 05 145.9	60 14.2 1.0 05 145.7	60 44.1 1.0 05 145.6	61 14.0 1.0 05 145.5	61 43.9 1.0 05 145.4	63 13.5 1.0 05 145.1	63 43.3 1.0 05 145.0	30
1	58 41.6 1.0 05 144.9	59 11.5 1.0 05 144.8	60 11.3 1.0 05 144.6	60 41.1 1.0 05 144.5	61 11.0 1.0 05 144.4	61 40.9 1.0 05 144.3	63 10.4 99 05 144.0	63 40.3 99 05 143.9	1
2	58 38.6 1.0 05 143.7	59 08.4 1.0 05 143.7	60 08.2 1.0 05 143.5	60 38.1 1.0 05 143.4	61 07.9 1.0 05 143.3	61 37.8 1.0 05 143.2	63 07.3 99 05 142.9	63 37.2 99 05 142.7	2
3	58 35.4 1.0 05 142.5	59 05.3 1.0 05 142.5	60 05.0 1.0 06 142.4	60 34.9 1.0 06 142.3	61 04.8 1.0 06 142.2	61 34.6 1.0 06 142.1	63 04.1 99 06 141.7	63 34.0 99 06 141.6	3
4	58 32.2 1.0 06 141.5	59 02.1 1.0 06 141.4	60 01.8 1.0 06 141.2	60 31.7 1.0 06 141.1	61 01.5 99 06 141.0	61 31.4 99 06 140.9	63 00.9 99 06 140.6	63 30.7 99 06 140.5	4
35	58 28.9 1.0 06 140.4	58 58.8 1.0 06 140.3	59 58.5 99 06 140.1	60 28.3 99 06 140.0	60 58.2 99 06 139.9	61 28.0 99 06 139.8	62 57.5 99 06 139.5	63 27.3 99 06 139.4	35
6	58 25.6 1.0 06 139.3	58 55.4 1.0 06 139.2	59 55.1 99 06 139.0	60 24.9 99 06 138.9	60 54.8 99 06 138.8	61 24.6 99 06 138.7	62 54.1 99 06 138.4	63 23.9 99 06 138.2	6
7	58 22.1 99 06 138.2	58 52.0 99 06 138.1	59 51.6 99 06 137.9	60 21.5 99 06 137.8	60 51.3 99 06 137.7	61 21.1 99 06 137.6	62 50.6 99 06 137.2	63 20.3 99 06 137.1	7
8	58 18.6 99 06 137.1	58 48.4 99 06 137.0	59 48.1 99 06 136.8	60 17.9 99 06 136.7	60 47.7 99 06 136.6	61 17.6 99 06 136.5	62 47.0 99 06 136.1	63 16.8 99 06 136.0	8
9	58 15.0 99 06 136.0	58 44.8 99 06 135.9	59 44.5 99 06 135.7	60 14.3 99 06 135.6	60 44.1 99 06 135.5	61 13.9 99 06 135.4	62 43.3 99 06 135.0	63 13.1 99 06 134.9	9
40	58 11.3 99 06 134.9	58 41.1 99 06 134.8	59 40.8 99 06 134.6	60 10.6 99 06 134.5	60 40.4 99 06 134.4	61 10.2 99 06 134.3	62 39.6 99 06 133.9	63 09.3 99 06 133.7	40
1	58 07.6 99 06 133.8	58 37.4 99 06 133.7	59 37.0 99 06 133.5	60 06.8 99 06 133.4	60 36.6 99 06 133.3	61 06.4 99 06 133.2	62 35.8 99 06 132.8	63 05.5 99 06 132.6	1
2	58 03.8 99 06 132.7	58 33.6 99 06 132.6	59 33.2 99 06 132.4	60 03.0 99 06 132.3	60 32.8 99 06 132.2	61 02.6 99 07 132.0	62 31.9 99 07 131.7	63 01.6 99 07 131.5	2
3	57 59.9 99 07 131.6	58 29.7 99 07 131.5	59 29.3 99 07 131.3	59 59.1 99 07 131.2	60 28.9 99 07 131.1	60 58.7 99 07 130.9	62 27.9 99 07 130.6	62 57.7 99 07 130.4	3
4	57 56.0 99 07 130.6	58 25.8 99 07 130.4	59 25.3 99 07 130.2	59 55.1 99 07 130.1	60 24.9 99 07 130.0	60 54.7 99 07 129.8	62 23.9 99 07 129.4	62 53.7 99 07 129.3	4
45	57 52.0 99 07 129.5	58 21.7 99 07 129.4	59 21.3 99 07 129.1	59 51.1 99 07 129.0	60 20.9 99 07 128.9	60 50.6 99 07 128.8	62 19.9 99 07 128.3	62 49.6 99 07 128.2	45
6	57 47.9 99 07 128.4	58 17.7 99 07 128.3	59 17.2 99 07 128.0	59 47.0 99 07 127.9	60 16.8 99 07 127.8	60 46.5 99 07 127.7	62 15.7 99 07 127.2	62 45.5 99 07 127.1	6
7	57 43.8 99 07 127.2	58 13.5 99 07 127.2	59 13.1 99 07 127.0	59 42.8 99 07 126.8	60 12.6 99 07 126.7	60 42.4 99 07 126.6	62 11.5 99 07 126.2	62 41.3 99 07 126.0	7
8	57 39.6 99 07 126.2	58 09.3 99 07 126.1	59 08.9 99 07 125.9	59 38.6 99 07 125.7	60 08.4 99 07 125.6	60 38.1 99 07 125.5	62 07.3 99 07 125.1	62 37.0 99 07 124.9	8
9	57 35.3 99 07 125.1	58 05.1 99 07 125.0	59 04.6 99 07 124.8	59 34.4 99 07 124.7	60 04.1 99 07 124.5	60 33.8 99 07 124.4	62 03.0 99 07 124.0	62 32.7 99 07 123.8	9
50	57 31.0 99 07 124.1	58 00.8 99 07 124.0	59 00.3 99 07 123.7	59 30.0 99 07 123.6	59 59.8 99 07 123.5	60 29.5 99 07 123.3	61 58.6 99 07 122.9	62 28.3 99 07 122.7	50
1	57 26.7 99 07 123.0	57 56.4 99 07 122.9	58 55.9 99 07 122.6	59 25.6 99 07 122.5	59 55.4 99 07 122.4	60 25.1 99 07 122.2	61 54.2 99 07 121.8	62 23.9 99 07 121.6	1
2	57 22.2 99 07 121.9	57 52.0 99 07 121.8	58 51.5 99 07 121.6	59 21.2 99 08 121.4	59 50.9 99 08 121.3	60 20.6 99 08 121.2	61 49.7 99 08 120.7	62 19.4 99 08 120.6	2
3	57 17.8 99 08 120.9	57 47.5 99 08 120.7	58 47.0 99 08 120.5	59 16.7 99 08 120.4	59 46.4 99 08 120.2	60 16.1 99 08 120.1	61 45.2 99 08 119.6	62 14.9 99 08 119.5	3
4	57 13.3 99 08 119.8	57 43.0 99 08 119.7	58 42.5 99 08 119.4	59 12.2 99 08 119.3	59 41.9 99 08 119.2	60 11.6 99 08 119.0	61 40.6 99 08 118.6	62 10.3 99 08 118.4	4
55	57 08.7 99 08 118.7	57 38.4 99 08 118.6	58 37.9 99 08 118.4	59 07.6 99 08 118.2	59 37.3 99 08 118.1	60 07.0 99 08 117.9	61 36.0 99 08 117.5	62 05.7 99 08 117.3	55
6	57 04.1 99 08 117.7	57 33.8 99 08 117.6	58 33.3 99 08 117.3	59 03.0 99 08 117.2	59 32.7 99 08 117.0	60 02.4 99 08 116.9	61 31.4 99 08 116.4	62 01.0 99 08 116.3	6
7	56 59.4 99 08 116.6	57 29.2 99 08 116.5	58 28.6 99 08 116.2	58 58.3 99 08 116.1	59 28.0 99 08 116.0	59 57.7 99 08 115.8	61 26.7 99 08 115.4	61 56.3 99 08 115.2	7
8	56 54.7 99 08 115.6	57 24.5 99 08 115.4	58 23.9 99 08 115.2	58 53.6 99 08 115.0	59 23.3 99 08 114.9	59 52.9 99 08 114.8	61 21.9 99 08 114.3	61 51.6 99 08 114.1	8
9	56 50.0 99 08 114.5	57 19.7 99 08 114.4	58 19.1 99 08 114.1	58 48.8 99 08 114.0	59 18.5 99 08 113.8	59 48.2 99 08 113.7	61 17.1 99 08 113.2	61 46.8 99 08 113.1	9
60	56 45.2 99 08 113.5	57 14.9 99 08 113.3	58 14.3 99 08 113.1	58 44.0 99 08 112.9	59 13.7 99 08 112.8	59 43.4 99 08 112.6	61 12.3 99 08 112.2	61 41.9 99 08 112.0	60
1	56 40.4 99 08 112.4	57 10.1 99 08 112.3	58 09.5 99 08 112.0	58 39.2 99 08 111.9	59 08.9 99 08 111.7	59 38.5 99 08 111.6	61 07.4 99 08 111.1	61 37.1 99 08 111.0	1
2	56 35.6 99 08 111.4	57 05.3 99 08 111.2	58 04.6 99 08 111.0	58 34.3 99 08 110.8	59 04.0 99 08 110.7	59 33.6 99 08 110.5	61 02.6 99 08 110.1	61 32.2 99 08 109.9	2
3	56 30.7 99 08 110.3	57 00.4 99 08 110.2	57 59.7 99 08 109.9	58 29.4 99 08 109.8	58 59.1 99 08 109.6	59 28.7 99 08 109.5	60 57.6 99 08 109.0	61 27.2 99 08 108.9	3
4	56 25.8 99 08 109.3	56 55.5 99 08 109.2	57 54.8 99 08 108.9	58 24.5 99 08 108.7	58 54.1 99 08 108.6	59 23.8 99 08 108.5	60 52.7 99 08 108.0	61 22.3 99 08 107.8	4
65	56 20.8 99 08 108.2	56 50.5 99 08 108.1	57 49.8 99 08 107.8	58 19.5 99 08 107.7	58 49.2 99 08 107.6	59 18.8 99 08 107.4	60 47.7 99 08 106.9	61 17.3 99 08 106.8	65
6	56 15.8 99 08 107.2	56 45.5 99 08 107.1	57 44.9 99 08 106.8	58 14.4 99 08 106.7	58 44.2 99 08 106.5	59 13.8 99 08 106.4	60 42.7 99 08 105.9	61 12.3 99 08 105.7	6
7	56 10.8 99 08 106.0	56 40.5 99 08 106.0	57 39.8 99 08 105.8	58 09.5 99 08 105.6	58 39.1 99 08 105.5	59 08.8 99 08 105.3	60 37.6 99 08 104.9	61 07.2 99 08 104.7	7
8	56 05.8 99 08 105.1	56 35.5 99 08 105.0	57 34.8 99 08 104.7	58 04.4 99 08 104.6	58 34.1 99 08 104.5	59 03.7 99 08 104.3	60 32.6 99 08 103.8	61 02.1 99 08 103.7	8
9	56 00.7 99 08 104.1	56 30.4 99 08 104.0	57 29.7 99 08 103.7	57 59.4 99 08 103.6	58 29.0 99 08 103.4	58 58.6 99 08 103.3	60 27.5 99 09 102.8	60 57.0 99 09 102.6	9
70	55 55.6 99 08 103.1	56 25.3 99 09 103.0	57 24.6 99 09 102.7	57 54.3 99 09 102.5	58 23.9 99 09 102.4	58 53.5 99 09 102.2	60 22.4 99 09 101.8	60 51.9 99 09 101.6	70
1	55 50.5 99 09 102.1	56 20.2 99 09 101.9	57 19.5 99 09 101.7	57 49.2 99 09 101.4	58 18.8 99 09 101.4	58 48.4 99 09 101.2	60 17.2 99 09 100.7	60 46.6 99 09 100.6	1
2	55 45.4 99 09 101.0	56 15.1 99 09 100.9	57 14.4 99 09 100.6	57 44.0 99 09 100.3	58 13.7 99 09 100.3	58 43.3 99 09 100.2	60 12.1 99 09 99.7	60 41.7 99 09 99.5	2
3	55 40.3 99 09 100.0	56 09.9 99 09 99.9	57 09.2 99 09 99.6	57 38.9 99 09 99.5	58 08.5 99 09 99.3	58 38.1 99 09 99.2	60 06.9 99 09 98.7	60 36.5 99 09 98.5	3
4	55 35.1 99 09 99.0	56 04.8 99 09 98.9	57 04.1 99 09 98.6	57 33.7 99 09 98.5	58 03.3 99 09 98.3	58 33.0 99 09 98.2	60 01.7 99 09 97.7	60 31.3 99 09 97.5	4
75	55 29.9 99 09 98.0	55 59.6 99 09 97.9	56 58.9 99 09 97.6	57 28.5 99 09 97.4	57 58.2 99 09 97.3	58 27.8 99 09 97.1	59 56.6 99 09 96.7	60 26.1 99 09 96.5	75
6	55 24.8 99 09 97.0	55 54.4 99 09 96.8	56 53.7 99 09 96.6	57 23.3 99 09 96.4	57 53.0 99 09 96.3	58 22.6 99 09 96.1	59 51.4 99 09 95.6	60 20.9 99 09 95.5	6
7	55 19.6 99 09 96.0	55 49.2 99 09 95.8	56 48.5 99 09 95.6	57 18.1 99 09 95.4	57 47.8 99 09 95.3	58 17.4 99 09 95.1	59 46.1 99 09 94.6	60 15.7 99 09 94.5	7
8	55 14.4 99 09 95.0	55 44.0 99 09 94.8	56 43.3 99 09 94.6	57 12.9 99 09 94.4	57 42.6 99 09 94.3	58 12.2 99 09 94.1	59 40.9 99 09 93.6	60 10.5 99 09 93.5	8
9	55 09.1 99 09 94.0	55 38.8 99 09 93.8	56 38.1 99 09 93.5	57 07.7 99 09 93.4	57 37.3 99 09 93.3	58 06.9 99 09 93.1	59 35.7 99 09 92.6	60 05.3 99 09 92.5	9
80	55 03.9 99 09 93.0	55 33.6 99 09 92.8	56 32.9 99 09 92.5	57 02.5 99 09 92.4	57 32.1 99 09 92.3	58 01.7 99 09 92.1	59 30.5 99 09 91.6	60 00.0 99 09 91.5	80
1	54 58.7 99 09 92.0	55 28.4 99 09 91.8	56 27.6 99 09 91.5	56 57.3 99 09 91.4	57 26.9 99 09 91.3	57 56.5 99 09 91.1	59 25.3 99 09 90.6	59 54.8 99 09 90.5	1
2	54 53.5 99 09 91.0	55 23.1 99 09 90.8	56 22.4 99 09 90.5	56 52.0 99 09 90.4	57 21.7 99 09 90.3	57 51.3 99 09 90.1	59 20.0 99 09 89.6	59 49.6 99 09 89.5	2
3	54 48.2 99 09 90.0	55 17.9 99 09 89.8	56 17.2 99 09 89.5	56 46.8 99 09 89.4	57 16.4 99 09 89.3	57 46.0 99 09 89.1	59 14.8 99 09 88.6	59 44.4 99 09 88.5	3
4	54 43.0 99 09 89.0	55 12.7 99 09 88.8	56 12.0 99 09 88.6	56 41.6 99 09 88.4	57 11.2 99 09 88.3	57 40.8 99 09 88.1	59 09.6 99 09 87.6	59 39.1 99 09 87.5	4
85	54 37.8 99 09 88.0	55 07.4 99 09 87.8	56 06.7 99 09 87.6	56 36.4 99 09 87.4	57 06.0 99 09 87.3	57 35.6 99 09 87.1	59 04.3 99 09 86.7	59 33.9 99 09 86.5	85
6	54 32.6 99 09 87.0	55 02.2 99 09 86.8	56 01.5 99 09 86.6	56 31.1 99 09 86.4	57 00.8 99 09 86.3	57 30.4 99 09 86.1	58 59.1 99 09 85.7	59 28.7 99 09 85.5	6
7	54 27.3 99 09 86.0	54 57.0 99 09 85.9	55 56.3 99 09 85.4	56 25.9 99 09 85.4	56 55.5 99 09 85.3	57 25.2 99 09 85.2	58 53.9 99 09 84.7	59 23.5 99 09 84.5	7
8	54 22.1 99 09 85.0	54 51.8 99 09 84.9	55 51.1 99 09 84.6	56 20.7 99 09 84.5	56 50.3 99 09 84.3	57 19.9 99 09 84.2	58 48.7 99 09 83.7	59 18.3 99 09 83.5	8
9	54 16.9 99 09 84.0	54 46.6 99 09 83.9	55 45.9 99 09 83.6	56 15.5 99 09 83.5	56 45.1 99 09 83.3	57 14.7 99 09 83.2	58 43.5 99 09 82.7	59 13.1 99 09 82.6	9
90	54 11.7 99 09 83.0	54 41.4 99 09 82.9	55 40.7 99 09 82.6	56 10.3 99 09 82.5	56 39.9 99 09 82.4	57 09.6 99 09 82.2	58 38.3 99 09 81.7	59 07.9 99 09 81.6	90

Lat. 85°

H.A.	54° 30′ Alt.	Δd Δt	Az.	55° 00′ Alt.	Δd Δt	Az.	56° 00′ Alt.	Δd Δt	Az.	56° 30′ Alt.	Δd Δt	Az.	57° 00′ Alt.	Δd Δt	Az.	57° 30′ Alt.	Δd Δt	Az.	59° 00′ Alt.	Δd Δt	Az.	59° 30′ Alt.	Δd Δt	Az.	H.A.
91	54 06.5	99 09	82.1	54 36.2	99 09	81.9	55 35.5	99 09	81.7	56 05.1	99 09	81.5	56 34.8	99 09	81.4	57 04.4	99 09	81.2	58 33.2	99 09	80.8	59 02.7	99 09	80.6	91
2	54 01.4	99 09	81.1	54 31.0	99 09	80.9	55 30.3	99 09	80.7	56 00.0	99 09	80.5	56 29.6	99 09	80.4	56 59.2	99 09	80.3	58 28.0	99 09	79.8	58 57.6	99 09	79.6	2
3	53 56.2	99 09	80.1	54 25.9	99 09	80.0	55 25.2	99 09	79.7	55 54.8	99 09	79.6	56 24.5	99 09	79.4	56 54.1	99 09	79.3	58 22.9	99 09	78.8	58 52.5	99 09	78.7	3
4	53 51.1	99 09	79.1	54 20.7	99 09	79.0	55 20.0	99 09	78.7	55 49.7	99 09	78.6	56 19.3	99 09	78.5	56 48.9	99 09	78.3	58 17.8	99 09	77.9	58 47.3	99 08	77.7	4
95	53 45.9	99 08	78.2	54 15.6	99 09	78.0	55 14.9	99 08	77.8	55 44.6	99 08	77.6	56 14.2	99 08	77.5	56 43.8	99 08	77.3	58 12.7	99 08	76.9	58 42.2	99 08	76.7	95
6	53 40.8	99 08	77.2	54 10.5	99 08	77.1	55 09.8	99 08	76.8	55 39.5	99 08	76.7	56 09.1	99 08	76.5	56 38.7	99 08	76.4	58 07.6	99 08	75.9	58 37.2	99 08	75.8	6
7	53 35.7	99 08	76.2	54 05.4	99 08	76.1	55 04.7	99 08	75.8	55 34.4	99 08	75.7	56 04.0	99 08	75.6	56 33.7	99 08	75.4	58 02.5	99 08	75.0	58 32.1	99 08	74.8	7
8	53 30.7	99 08	75.2	54 00.4	99 08	75.1	54 59.7	99 08	74.9	55 29.3	99 08	74.7	55 59.0	99 08	74.6	56 28.6	99 08	74.5	57 57.5	99 08	74.0	58 27.1	99 08	73.9	8
9	53 25.6	99 08	74.3	53 55.3	99 08	74.2	54 54.7	99 08	73.9	55 24.3	99 08	73.8	55 54.0	99 08	73.6	56 23.6	99 08	73.5	57 52.5	99 08	73.1	58 22.1	99 08	72.9	9
100	53 20.6	99 08	73.3	53 50.3	99 08	73.2	54 49.6	99 08	72.9	55 19.3	99 08	72.8	55 49.0	99 08	72.7	56 18.6	99 08	72.5	57 47.5	99 08	72.1	58 17.1	99 08	71.9	100
1	53 15.6	99 08	72.4	53 45.3	99 08	72.2	54 44.7	99 08	72.0	55 14.3	99 08	71.9	55 44.0	99 08	71.7	56 13.6	99 08	71.6	57 42.5	99 08	71.1	58 12.1	99 08	71.0	1
2	53 10.6	99 08	71.4	53 40.3	99 08	71.3	54 39.7	99 08	71.0	55 09.4	99 08	70.9	55 39.0	99 08	70.8	56 08.7	99 08	70.6	57 37.6	99 08	70.2	58 07.2	99 08	70.0	2
3	53 05.7	99 08	70.4	53 35.4	99 08	70.3	54 34.8	99 08	70.1	55 04.4	99 08	69.9	55 34.1	99 08	69.8	56 03.8	99 08	69.7	57 32.7	99 08	69.3	58 02.3	99 08	69.1	3
4	53 00.8	99 08	69.5	53 30.5	99 08	69.4	54 29.9	99 08	69.1	54 59.5	99 08	69.0	55 29.2	99 08	68.9	55 58.9	99 08	68.7	57 27.8	99 03	68.3	57 57.4	99 08	68.2	4
105	52 55.9	99 08	68.5	53 25.6	99 08	68.4	54 25.0	99 08	68.2	54 54.7	99 08	68.0	55 24.3	99 08	67.9	55 54.0	99 08	67.8	57 22.9	99 08	67.4	57 52.6	99 08	67.2	105
6	52 51.1	99 08	67.6	53 20.8	99 08	67.5	54 20.2	99 08	67.2	54 49.8	99 08	67.1	55 19.5	99 08	67.0	55 49.2	99 08	66.8	57 18.1	99 08	66.4	57 47.8	99 08	66.3	6
7	52 46.2	99 08	66.6	53 16.0	99 08	66.5	54 15.4	99 08	66.3	54 45.0	99 08	66.1	55 14.7	99 08	66.0	55 44.4	99 08	65.9	57 13.4	99 08	65.5	57 43.0	99 08	65.3	7
8	52 41.5	99 08	65.7	53 11.2	99 08	65.6	54 10.5	99 08	65.3	54 40.3	99 08	65.2	55 10.0	99 08	65.1	55 39.6	99 08	64.9	57 08.6	99 08	64.5	57 38.3	99 08	64.4	8
9	52 36.7	99 08	64.7	53 06.4	99 08	64.6	54 05.8	99 08	64.4	54 35.5	99 08	64.3	55 05.2	99 08	64.1	55 34.9	99 08	64.0	57 03.9	99 08	63.6	57 33.6	99 08	63.5	9
110	52 32.0	99 08	63.8	53 01.7	99 08	63.7	54 01.2	99 08	63.4	54 30.9	99 08	63.3	55 00.6	99 08	63.2	55 30.2	99 08	63.1	56 59.3	99 08	62.7	57 28.9	99 08	62.5	110
1	52 27.3	99 08	62.8	52 57.1	99 08	62.7	53 56.5	99 08	62.5	54 26.2	99 08	62.4	54 55.9	99 08	62.2	55 25.6	99 08	62.1	56 54.6	99 08	61.7	57 24.3	99 08	61.6	1
2	52 22.7	99 08	61.9	52 52.4	99 08	61.8	53 51.9	99 08	61.5	54 21.6	99 08	61.4	54 51.3	99 08	61.3	55 21.0	99 08	61.2	56 50.0	99 08	60.8	57 19.7	99 08	60.7	2
3	52 18.1	99 08	60.9	52 47.8	99 08	60.8	53 47.3	99 08	60.6	54 17.0	99 08	60.5	54 46.7	99 08	60.4	55 16.4	99 08	60.3	56 45.5	99 08	59.9	57 15.2	99 07	59.7	3
4	52 13.6	99 08	60.0	52 43.3	99 08	59.9	53 42.8	99 08	59.7	54 12.5	99 07	59.6	54 42.2	99 07	59.4	55 11.9	99 07	59.4	56 41.0	99 07	58.9	57 10.7	99 07	58.8	4
115	52 09.0	99 07	59.1	52 38.8	99 07	59.0	53 38.3	99 07	58.7	54 08.0	99 07	58.6	54 37.7	99 07	58.5	55 07.4	99 07	58.4	56 36.5	99 07	58.0	57 06.2	99 07	57.9	115
6	52 04.6	99 07	58.1	52 34.3	99 07	58.0	53 33.8	99 07	57.8	54 03.6	99 07	57.7	54 33.3	99 07	57.6	55 03.0	99 07	57.5	56 32.1	99 07	57.1	57 01.8	99 07	57.0	6
7	52 00.2	99 07	57.2	52 29.9	99 07	57.1	53 29.4	99 07	56.9	53 59.2	99 07	56.8	54 28.9	99 07	56.6	54 58.6	99 07	56.5	56 27.8	99 07	56.2	56 57.5	99 07	56.0	7
8	51 55.8	99 07	56.3	52 25.6	99 07	56.2	53 25.1	99 07	55.9	53 54.8	99 07	55.8	54 24.6	99 07	55.7	54 54.3	99 07	55.6	56 23.4	99 07	55.2	56 53.1	99 07	55.1	8
9	51 51.5	99 07	55.3	52 21.2	99 07	55.2	53 20.8	99 07	54.9	53 50.5	99 07	54.9	54 20.3	99 07	54.8	54 50.0	99 07	54.7	56 19.2	99 07	54.3	56 48.9	99 07	54.2	9
120	51 47.2	99 07	54.4	52 17.0	99 07	54.3	53 16.5	99 07	54.1	53 46.3	99 07	54.0	54 16.0	99 07	53.9	54 45.8	99 07	53.8	56 14.9	99 07	53.4	56 44.7	99 07	53.3	120
1	51 43.0	99 07	53.5	52 12.7	99 07	53.4	53 12.3	99 07	53.2	53 42.1	99 07	53.0	54 11.8	99 07	52.9	54 41.6	99 07	52.8	56 10.8	99 07	52.5	56 40.5	99 07	52.4	1
2	51 38.8	99 07	52.5	52 08.6	99 07	52.4	53 08.1	99 07	52.2	53 37.9	99 07	52.1	54 07.7	99 07	52.0	54 37.4	99 07	51.9	56 06.7	99 07	51.6	56 36.4	99 07	51.4	2
3	51 34.7	99 07	51.6	52 04.5	99 07	51.5	53 04.0	99 07	51.3	53 33.8	99 07	51.2	54 03.6	99 07	51.1	54 33.3	99 07	51.0	56 02.6	99 07	50.7	56 32.3	99 07	50.5	3
4	51 30.6	99 07	50.7	52 00.4	99 07	50.6	53 00.0	99 07	50.4	53 29.7	99 07	50.3	53 59.5	99 07	50.2	54 29.3	99 07	50.1	55 58.6	99 07	49.7	56 28.3	99 07	49.6	4
125	51 26.6	99 07	49.7	51 56.4	99 07	49.7	52 56.0	99 07	49.5	53 25.8	99 07	49.4	53 55.5	99 07	49.3	54 25.3	99 07	49.2	55 54.6	99 06	48.8	56 24.4	99 06	48.7	125
6	51 22.6	99 07	48.8	51 52.4	99 06	48.7	52 52.0	99 06	48.5	53 21.8	99 06	48.4	53 51.6	99 06	48.3	54 21.4	99 06	48.2	55 50.7	99 06	47.9	56 20.5	99 06	47.8	6
7	51 18.7	99 06	47.9	51 48.5	99 06	47.8	52 48.1	99 06	47.6	53 17.9	99 06	47.5	53 47.7	99 06	47.4	54 17.5	99 06	47.3	55 46.8	99 06	47.0	56 16.6	99 06	46.9	7
8	51 14.9	99 06	47.0	51 44.7	99 06	46.9	52 44.3	99 06	46.7	53 14.1	99 06	46.6	53 43.9	99 06	46.5	54 13.7	99 06	46.4	55 43.0	99 06	46.1	56 13.0	99 06	46.0	8
9	51 11.1	99 06	46.1	51 40.9	99 06	46.0	52 40.5	99 06	45.8	53 10.3	99 06	45.7	53 40.1	99 06	45.6	54 09.9	99 06	45.5	55 39.3	99 06	45.2	56 09.1	99 06	45.1	9
130	51 07.3	99 06	45.1	51 37.2	99 06	45.0	52 36.8	99 06	44.9	53 06.6	99 06	44.8	53 36.4	99 06	44.7	54 06.2	99 06	44.6	55 35.6	99 06	44.3	56 05.4	99 06	44.2	130
1	51 03.6	99 06	44.2	51 33.5	99 06	44.1	52 33.1	99 06	44.0	53 03.0	99 06	43.9	53 32.8	99 06	43.8	54 02.6	99 06	43.7	55 32.0	99 06	43.4	56 01.8	99 06	43.3	1
2	51 00.0	99 06	43.3	51 29.9	99 06	43.2	52 29.5	99 06	43.0	52 59.4	99 06	43.0	53 29.2	99 06	42.9	53 59.0	99 06	42.8	55 28.4	99 06	42.5	55 58.2	99 06	42.4	2
3	50 56.5	99 06	42.4	51 26.3	99 06	42.3	52 26.0	99 06	42.1	52 55.8	99 06	42.0	53 25.7	99 06	42.0	53 55.5	99 06	41.9	55 24.9	99 06	41.6	55 54.7	99 06	41.5	3
4	50 53.0	1.00 06	41.5	51 22.8	99 06	41.4	52 22.5	99 06	41.2	52 52.4	99 06	41.1	53 22.2	99 06	41.0	53 52.0	99 06	41.0	55 21.5	99 06	40.7	55 51.3	99 06	40.6	4
135	50 49.6	1.00 06	40.5	51 19.4	1.00 06	40.5	52 19.1	99 06	40.3	52 49.0	99 06	40.2	53 18.8	99 06	40.1	53 48.6	99 06	40.0	55 18.1	99 06	39.8	55 47.9	99 06	39.7	135
6	50 46.2	1.00 06	39.6	51 16.0	1.00 06	39.6	52 15.8	99 05	39.4	52 45.6	99 05	39.3	53 15.5	99 05	39.2	53 45.3	99 05	39.1	55 14.8	99 05	38.9	55 44.6	99 05	38.8	6
7	50 42.9	1.00 05	38.7	51 12.7	1.00 05	38.6	52 12.5	99 05	38.5	52 42.3	99 05	38.4	53 12.2	99 05	38.3	53 42.0	99 05	38.2	55 11.6	99 05	38.0	55 41.4	99 05	37.9	7
8	50 39.6	1.00 05	37.8	51 09.5	1.00 05	37.7	52 09.2	99 05	37.6	52 39.1	99 05	37.5	53 09.0	99 05	37.4	53 38.8	1.00 05	37.3	55 08.4	99 05	37.1	55 38.2	99 05	37.0	8
9	50 36.5	1.00 05	36.9	51 06.3	1.00 05	36.8	52 06.1	99 05	36.7	52 36.0	99 05	36.6	53 05.8	1.00 05	36.5	53 35.7	1.00 05	36.4	55 05.3	99 05	36.2	55 35.1	99 05	36.1	9
140	50 33.4	1.00 05	36.0	51 03.2	1.00 05	35.9	52 03.0	1.00 05	35.8	52 32.9	1.00 05	35.7	53 02.7	1.00 05	35.6	53 32.6	1.00 05	35.5	55 02.2	1.00 05	35.3	55 32.1	1.00 05	35.2	140
1	50 30.3	1.00 05	35.1	51 00.2	1.00 05	35.0	52 00.0	1.00 05	34.9	52 29.9	1.00 05	34.8	52 59.7	1.00 05	34.7	53 29.6	1.00 05	34.6	54 59.2	1.00 05	34.4	55 29.1	1.00 05	34.3	1
2	50 27.4	1.00 05	34.2	50 57.2	1.00 05	34.1	51 57.0	1.00 05	34.0	52 26.9	1.00 05	33.9	52 56.8	1.00 05	33.8	53 26.7	1.00 05	33.7	54 56.3	1.00 05	33.5	55 26.2	1.00 05	33.4	2
3	50 24.5	1.00 05	33.3	50 54.4	1.00 05	33.2	51 54.1	1.00 05	33.1	52 24.0	1.00 05	33.0	52 53.9	1.00 05	32.9	53 23.8	1.00 05	32.8	54 53.4	1.00 05	32.6	55 23.3	1.00 05	32.5	3
4	50 21.6	1.00 05	32.3	50 51.5	1.00 05	32.3	51 51.3	1.00 05	32.2	52 21.2	1.00 05	32.1	52 51.1	1.00 05	32.0	53 21.0	1.00 05	31.9	54 50.7	1.00 05	31.7	55 20.5	1.00 04	31.6	4
145	50 18.9	1.00 04	31.4	50 48.8	1.00 04	31.4	51 48.6	1.00 04	31.2	52 18.5	1.00 04	31.2	52 48.4	1.00 04	31.1	53 18.3	1.00 04	31.0	54 47.9	1.00 04	30.8	55 17.8	1.00 04	30.8	145
6	50 16.2	1.00 04	30.5	50 46.1	1.00 04	30.5	51 45.9	1.00 04	30.3	52 15.8	1.00 04	30.3	52 45.7	1.00 04	30.2	53 15.6	1.00 04	30.2	54 45.3	1.00 04	29.9	55 15.2	1.00 04	29.9	6
7	50 13.5	1.00 04	29.6	50 43.5	1.00 04	29.6	51 43.3	1.00 04	29.4	52 13.2	1.00 04	29.4	52 43.1	1.00 04	29.3	53 13.0	1.00 04	29.3	54 42.7	1.00 04	29.0	55 12.6	1.00 04	29.0	7
8	50 11.0	1.00 04	28.7	50 40.9	1.00 04	28.7	51 40.8	1.00 04	28.5	52 10.7	1.00 04	28.5	52 40.6	1.00 04	28.4	53 10.5	1.00 04	28.4	54 40.2	1.00 04	28.2	55 10.1	1.00 04	28.1	8
9	50 08.5	1.00 04	27.8	50 38.4	1.00 04	27.8	51 38.3	1.00 04	27.6	52 08.2	1.00 04	27.6	52 38.1	1.00 04	27.5	53 08.0	1.00 04	27.5	54 37.8	1.00 04	27.3	55 07.7	1.00 04	27.2	9
150	50 06.1	1.00 04	26.9	50 36.0	1.00 04	26.9	51 35.9	1.00 04	26.8	52 05.8	1.00 04	26.7	52 35.7	1.00 04	26.6	53 05.7	1.00 04	26.6	54 35.4	1.00 04	26.4	55 05.3	1.00 04	26.3	150
1	50 03.8	1.00 04	26.0	50 33.7	1.00 04	26.0	51 33.6	1.00 04	25.9	52 03.5	1.00 04	25.8	52 33.4	1.00 04	25.7	53 03.4	1.00 04	25.7	54 33.1	1.00 04	25.5	55 03.1	1.00 04	25.4	1
2	50 01.5	1.00 04	25.1	50 31.5	1.00 04	25.1	51 31.3	1.00 04	25.0	52 01.3	1.00 04	24.9	52 31.2	1.00 04	24.8	53 01.1	1.00 04	24.8	54 30.9	1.00 04	24.6	55 00.8	1.00 04	24.6	2
3	49 59.3	1.00 04	24.2	50 29.3	1.00 04	24.2	51 29.2	1.00 04	24.1	51 59.1	1.00 04	24.0	52 29.0	1.00 03	24.0	52 59.0	1.00 03	23.9	54 28.8	1.00 03	23.7	54 58.7	1.00 03	23.7	3
4	49 57.2	1.00 03	23.3	50 27.2	1.00 03	23.3	51 27.1	1.00 03	23.2	51 57.0	1.00 03	23.1	52 27.0	1.00 03	23.1	52 56.9	1.00 03	23.0	54 26.7	1.00 03	22.8	54 56.6	1.00 03	22.8	4
155	49 55.1	1.00 03	22.4	50 25.2	1.00 03	22.4	51 25.1	1.00 03	22.3	51 55.0	1.00 03	22.2	52 25.0	1.00 03	22.2	52 54.9	1.00 03	22.1	54 24.7	1.00 03	22.0	54 54.7	1.00 03	21.9	155
6	49 53.3	1.00 03	21.5	50 23.2	1.00 03	21.5	51 23.1	1.00 03	21.4	51 53.1	1.00 03	21.3	52 23.0	1.00 03	21.3	52 53.0	1.00 03	21.2	54 22.8	1.00 03	21.1	54 52.7	1.00 03	21.0	6
7	49 51.4	1.00 03	20.6	50 21.3	1.00 03	20.6	51 21.2	1.00 03	20.5	51 51.2	1.00 03	20.4	52 21.1	1.00 03	20.4	52 51.1	1.00 03	20.3	54 21.0	1.00 03	20.2	54 50.9	1.00 03	20.1	7
8	49 49.6	1.00 03	19.7	50 19.5	1.00 03	19.7	51 19.5	1.00 03	19.6	51 49.4	1.00 03	19.5	52 19.4	1.00 03	19.5	52 49.3	1.00 03	19.5	54 19.2	1.00 03	19.3	54 49.1	1.00 03	19.3	8
9	49 47.8	1.00 03	18.8	50 17.8	1.00 03	18.8	51 17.7	1.00 03	18.7	51 47.7	1.00 03	18.7	52 17.7	1.00 03	18.6	52 47.6	1.00 03	18.6	54 17.5	1.00 03	18.4	54 47.5	1.00 03	18.4	9
160	49 46.2	1.00 03	17.9	50 16.2	1.00 03	17.9	51 16.1	1.00 03	17.8	51 46.1	1.00 03	17.8	52 16.0	1.00 03	17.7	52 46.0	1.00 03	17.7	54 15.9	1.00 03	17.6	54 45.8	1.00 03	17.5	160
1	49 44.6	1.00 02	17.0	50 14.6	1.00 02	17.0	51 14.5	1.00 02	16.9	51 44.5	1.00 02	16.9	52 14.5	1.00 02	16.8	52 44.4	1.00 02	16.8	54 14.3	1.00 02	16.7	54 44.3	1.00 02	16.6	1
2	49 43.1	1.00 02	16.1	50 13.1	1.00 02	16.1	51 13.1	1.00 02	16.0	51 43.0	1.00 02	16.0	52 13.0	1.00 02	15.9	52 43.0	1.00 02	15.9	54 12.9	1.00 02	15.8	54 42.8	1.00 02	15.8	2
3	49 41.7	1.00 02	15.2	50 11.7	1.00 02	15.2	51 11.7	1.00 02	15.1	51 41.6	1.00 02	15.1	52 11.6	1.00 02	15.1	52 41.6	1.00 02	15.0	54 11.5	1.00 02	14.9	54 41.5	1.00 02	14.9	3
4	49 40.4	1.00 02	14.3	50 10.4	1.00 02	14.3	51 10.3	1.00 02	14.2	51 40.3	1.00 02	14.2	52 10.3	1.00 02	14.2	52 40.3	1.00 02	14.1	54 10.2	1.00 02	14.0	54 40.2	1.00 02	14.0	4
165	49 39.1	1.00 02	13.4	50 09.1	1.00 02	13.4	51 09.0	1.00 02	13.3	51 39.1	1.00 02	13.3	52 09.0	1.00 02	13.3	52 39.0	1.00 02	13.3	54 09.0	1.00 02	13.2	54 38.8	1.00 02	13.1	165
6	49 38.0	1.00 02	12.5	50 08.0	1.00 02	12.5	51 07.9	1.00 02	12.4	51 37.9	1.00 02	12.4	52 07.9	1.00 02	12.4	52 37.9	1.00 02	12.4	54 07.8	1.00 02	12.4	54 37.8	1.00 02	12.2	6
7	49 36.9	1.00 02	11.6	50 06.9	1.00 02	11.6	51 06.9	1.00 02	11.6	51 36.8	1.00 02	11.5	52 06.8	1.00 02	11.5	52 36.8	1.00 02	11.5	54 06.7	1.00 02	11.4	54 36.7	1.00 02	11.4	7
8	49 35.9	1.00 02	10.7	50 05.8	1.00 02	10.7	51 05.8	1.00 02	10.7	51 35.8	1.00 02	10.6	52 05.8	1.00 02	10.6	52 35.8	1.00 02	10.6	54 05.7	1.00 02	10.5	54 35.7	1.00 02	10.5	8
9	49 34.9	1.00 01	09.8	50 04.9	1.00 01	09.8	51 04.9	1.00 01	09.8	51 34.9	1.00 01	09.8	52 04.9	1.00 01	09.7	52 34.9	1.00 01	09.7	54 04.8	1.00 01	09.6	54 34.8	1.00 01	09.6	9
170	49 34.1	1.00 01	08.9	50 04.1	1.00 01	08.9	51 04.0	1.00 01	08.9	51 34.0	1.00 01	08.9	52 04.0	1.00 01	08.8	52 34.0	1.00 01	08.8	54 04.0	1.00 01	08.8	54 34.0	1.00 01	08.7	170
1	49 33.3	1.00 01	08.0	50 03.3	1.00 01	08.0	51 03.3	1.00 01	08.0	51 33.3	1.00 01	08.0	52 03.3	1.00 01	08.0	52 33.3	1.00 01	07.9	54 03.2	1.00 01	07.9	54 33.2	1.00 01	07.9	1
2	49 32.6	1.00 01	07.2	50 02.6	1.00 01	07.1	51 02.6	1.00 01	07.1	51 32.6	1.00 01	07.1	52 02.6	1.00 01	07.1	52 32.6	1.00 01	07.1	54 02.6	1.00 01	07.0	54 32.6	1.00 01	07.0	2
3	49 32.0	1.00 01	06.3	50 02.0	1.00 01	06.2	51 02.0	1.00 01	06.2	51 32.0	1.00 01	06.2	52 02.0	1.00 01	06.2	52 32.0	1.00 01	06.2	54 02.0	1.00 01	06.1	54 32.0	1.00 01	06.1	3
4	49 31.5	1.00 01	05.4	50 01.5	1.00 01	05.4	51 01.5	1.00 01	05.3	51 31.5	1.00 01	05.3	52 01.5	1.00 01	05.3	52 31.4	1.00 01	05.3	54 01.4	1.00 01	05.3	54 31.4	1.00 01	05.2	4
175	49 31.0	1.00 01	04.5	50 01.0	1.00 01	04.5	51 01.0	1.00 01	04.5	51 31.0	1.00 01	04.4	52 01.0	1.00 01	04.4	52 31.0	1.00 01	04.4	54 01.0	1.00 01	04.4	54 31.0	1.00 01	04.4	175
6	49 30.7	1.00 00	03.6	50 00.7	1.00 00	03.6	51 00.6	1.00 00	03.6	51 30.6	1.00 00	03.6	52 00.6	1.00 00	03.5	52 30.6	1.00 00	03.5	54 00.6	1.00 00	03.5	54 30.6	1.00 00	03.5	6
7	49 30.4	1.00 00	02.7	50 00.4	1.00 00	02.7	51 00.4	1.00 00	02.7	51 30.4	1.00 00	02.7	52 00.4	1.00 00	02.7	52 30.4	1.00 00	02.6	54 00.4	1.00 00	02.6	54 30.4	1.00 00	02.6	7
8	49 30.2	1.00 00	01.8	50 00.2	1.00 00	01.8	51 00.2	1.00 00	01.8	51 30.2	1.00 00	01.8	52 00.2	1.00 00	01.8	52 30.2	1.00 00	01.8	54 00.2	1.00 00	01.7	54 30.2	1.00 00	01.7	8
9	49 30.0	1.00 00	00.9	50 00.0	1.00 00	00.9	51 00.0	1.00 00	00.9	51 30.0	1.00 00	00.9	52 00.0	1.00 00	00.9	52 30.0	1.00 00	00.9	54 00.0	1.00 00	00.9	54 30.0	1.00 00	00.9	9
180	49 30.0	1.00 00	00.0	50 00.0	1.00 00	00.0	51 00.0	1.00 00	00.0	51 30.0	1.00 00	00.0	52 00.0	1.00 00	00.0	52 30.0	1.00 00	00.0	54 00.0	1.00 00	00.0	54 30.0	1.00 00	00.0	180

Right margin latitude labels: Lat. 85°; Lat. 86°; Lat. 87°; Lat. 88°; Lat. 89°

Each cell below lists: Alt. (° ′), Δd, Δt, Az. (°)

H.A.	60° 00′	60° 30′	62° 00′	62° 30′	63° 00′	69° 00′	69° 30′	74° 30′	H.A.
00	65 00.0 1.00 0 180.0	65 30.0 1.00 0 180.0	67 00.0 1.00 0 180.0	67 30.0 1.00 0 180.0	68 00.0 1.00 0 180.0	74 00.0 1.00 0 180.0	74 30.0 1.00 0 180.0	79 30.0 1.00 0 180.0	00
1	64 59.9 1.00 0 178.8	65 29.9 1.00 0 178.8	66 59.9 1.00 0 178.8	67 29.9 1.00 0 178.8	67 59.9 1.00 0 178.8	73 59.9 1.00 0 178.7	74 29.9 1.00 0 178.7	79 29.9 1.00 0 178.5	1
2	64 59.8 1.00 0 177.6	65 29.8 1.00 0 177.6	66 59.8 1.00 0 177.6	67 29.8 1.00 0 177.6	67 59.8 1.00 0 177.6	73 59.8 1.00 0 177.4	74 29.8 1.00 0 177.4	79 29.7 1.00 1 177.1	2
3	64 59.5 1.00 1 176.5	65 29.5 1.00 1 176.4	66 59.5 1.00 1 176.4	67 29.5 1.00 1 176.4	67 59.5 1.00 1 176.4	73 59.5 1.00 1 176.1	74 29.5 1.00 1 176.1	79 29.4 1.00 1 175.6	3
4	64 59.1 1.00 1 175.3	65 29.1 1.00 1 175.3	66 59.1 1.00 1 175.2	67 29.1 1.00 1 175.2	67 59.1 1.00 1 175.2	73 59.1 1.00 1 174.8	74 29.0 1.00 1 174.8	79 28.9 1.00 1 174.1	4
05	64 58.7 1.00 1 174.1	65 28.6 1.00 1 174.1	66 58.6 1.00 1 174.0	67 28.6 1.00 1 174.0	67 58.6 1.00 1 173.9	73 58.5 1.00 1 173.5	74 28.5 1.00 1 173.5	79 28.3 1.00 1 172.7	05
6	64 58.1 1.00 1 172.9	65 28.1 1.00 1 172.9	66 58.0 1.00 1 172.8	67 28.0 1.00 1 172.8	67 58.0 1.00 1 172.7	73 57.9 1.00 1 172.2	74 27.8 1.00 1 172.1	79 27.6 1.00 1 171.2	6
7	64 57.4 1.00 1 171.7	65 27.4 1.00 1 171.7	66 57.3 1.00 1 171.6	67 27.3 1.00 1 171.6	67 57.3 1.00 1 171.5	73 57.1 1.00 1 170.9	74 27.1 1.00 2 170.8	79 26.7 1.00 2 169.8	7
8	64 56.6 1.00 2 170.5	65 26.6 1.00 2 170.5	66 56.5 1.00 2 170.4	67 26.5 1.00 2 170.4	67 56.5 1.00 2 170.3	73 56.2 1.00 2 169.6	74 26.2 1.00 2 169.5	79 25.7 1.00 2 168.3	8
9	64 55.6 1.00 2 169.4	65 25.6 1.00 2 169.3	66 55.6 1.00 2 169.2	67 25.6 1.00 2 169.2	67 55.5 1.00 2 169.1	73 55.2 1.00 2 168.3	74 25.2 1.00 2 168.2	79 24.6 1.00 2 166.9	9
10	64 54.6 1.00 2 168.2	65 24.6 1.00 2 168.1	66 54.5 1.00 2 168.0	67 24.5 1.00 2 168.0	67 54.5 1.00 2 167.9	73 54.1 1.00 2 167.0	74 24.1 1.00 2 166.9	79 23.4 1.00 2 165.4	10
1	64 53.5 1.00 2 167.0	65 23.5 1.00 2 167.0	66 53.4 1.00 2 166.8	67 23.4 1.00 2 166.8	67 53.3 1.00 2 166.7	73 52.9 1.00 2 165.7	74 22.8 1.00 2 165.6	79 22.0 1.00 3 164.0	1
2	64 52.3 1.00 2 165.8	65 22.2 1.00 2 165.8	66 52.2 1.00 2 165.6	67 22.1 1.00 2 165.6	67 52.1 1.00 2 165.5	73 51.5 1.00 2 164.5	74 21.5 1.00 2 164.3	79 20.5 1.00 3 162.5	2
3	64 50.9 1.00 2 164.7	65 20.9 1.00 2 164.6	66 50.8 1.00 2 164.4	67 20.8 1.00 2 164.4	67 50.7 1.00 2 164.3	73 50.1 1.00 3 163.2	74 20.0 1.00 3 163.0	79 18.8 99 03 161.1	3
4	64 49.5 1.00 3 163.5	65 19.5 1.00 3 163.4	66 49.3 1.00 3 163.2	67 19.3 1.00 3 163.2	67 49.3 1.00 3 163.1	73 48.5 1.00 3 161.9	74 18.4 1.00 3 161.7	79 17.1 99 03 159.7	4
15	64 48.0 1.00 3 162.3	65 17.9 1.00 3 162.2	66 47.8 1.00 3 162.0	67 17.7 1.00 3 162.0	67 47.7 1.00 3 161.9	73 46.8 1.00 3 160.6	74 16.7 1.00 3 160.5	79 15.2 99 03 158.2	15
6	64 46.3 1.00 3 161.1	65 16.3 1.00 3 161.1	66 46.1 1.00 3 160.8	67 16.1 1.00 3 160.8	67 46.0 1.00 3 160.7	73 45.0 1.00 3 159.3	74 14.9 1.00 3 159.2	79 13.2 99 04 156.8	6
7	64 44.6 1.00 3 160.0	65 14.5 1.00 3 159.9	66 44.4 1.00 3 159.7	67 14.3 1.00 3 159.6	67 44.2 1.00 3 159.5	73 43.1 1.00 3 158.1	74 13.0 1.00 3 157.9	79 11.1 99 04 155.4	7
8	64 42.7 1.00 3 158.7	65 12.7 1.00 3 158.7	66 42.5 1.00 3 158.4	67 12.4 1.00 3 158.3	67 42.3 1.00 3 158.3	73 41.1 1.00 4 156.8	74 11.0 1.00 4 156.6	79 08.8 99 04 154.0	8
9	64 40.8 1.00 3 157.6	65 10.7 1.00 3 157.5	66 40.5 1.00 3 157.3	67 10.4 1.00 3 157.2	67 40.4 1.00 3 157.1	73 39.0 99 04 155.5	74 08.8 99 04 155.3	79 06.5 99 04 152.6	9
20	64 38.8 1.00 4 156.5	65 08.7 1.00 4 156.4	66 38.4 1.00 4 156.1	67 08.4 1.00 4 156.0	67 38.3 1.00 4 155.9	73 36.8 99 04 154.2	74 06.6 99 04 154.1	79 04.0 99 04 151.2	20
1	64 36.6 1.00 4 155.3	65 06.5 1.00 4 155.2	66 36.3 1.00 4 154.9	67 06.2 1.00 4 154.8	67 36.1 1.00 4 154.7	73 34.5 99 04 153.0	74 04.3 99 04 152.8	79 01.5 99 04 149.8	1
2	64 34.4 1.00 4 154.1	65 04.3 1.00 4 154.0	66 34.0 1.00 4 153.8	67 03.9 1.00 4 153.6	67 33.8 1.00 4 153.5	73 32.0 99 04 151.8	74 01.8 99 04 151.5	78 58.8 99 05 148.4	2
3	64 32.1 1.00 4 153.0	65 02.0 1.00 4 152.9	66 31.7 1.00 4 152.6	67 01.5 1.00 4 152.5	67 31.4 1.00 4 152.3	73 29.5 99 04 150.5	73 59.3 99 04 150.3	78 56.0 99 05 147.0	3
4	64 29.6 1.00 4 151.8	64 59.5 1.00 4 151.7	66 29.2 1.00 4 151.4	66 59.1 1.00 4 151.3	67 29.0 1.00 4 151.2	73 26.9 99 05 149.2	73 56.6 99 05 149.0	78 53.1 98 05 145.7	4
25	64 27.1 1.00 4 150.7	64 57.0 1.00 4 150.6	66 26.7 1.00 4 150.2	66 56.5 1.00 4 150.1	67 26.4 1.00 4 150.0	73 24.2 99 05 148.0	73 53.9 99 05 147.7	78 50.1 98 05 144.3	25
6	64 24.5 1.00 4 149.5	64 54.4 1.00 4 149.4	66 24.0 1.00 5 149.1	66 53.9 1.00 5 148.9	67 23.7 1.00 5 148.8	73 21.3 99 05 146.7	73 51.1 99 05 146.5	78 47.0 98 05 143.0	6
7	64 21.8 1.00 5 148.4	64 51.7 1.00 5 148.2	66 21.3 1.00 5 147.9	66 51.1 99 05 147.6	67 21.0 99 05 147.6	73 18.4 99 05 145.5	73 48.1 99 05 145.3	78 43.8 98 06 141.6	7
8	64 19.0 1.00 5 147.2	64 48.9 1.00 5 147.1	66 18.4 99 05 146.7	66 48.3 99 05 146.6	67 18.1 99 05 146.5	73 15.4 99 05 144.3	73 45.1 99 05 144.0	78 40.5 98 06 140.3	8
9	64 16.2 1.00 5 146.1	64 46.0 1.00 5 145.9	66 15.5 99 05 145.6	66 45.4 99 05 145.4	67 15.2 99 05 145.3	73 12.3 99 05 143.0	73 42.0 99 05 142.8	78 37.1 98 06 139.0	9
30	64 13.2 99 05 144.9	64 43.0 99 05 144.8	66 12.5 99 05 144.4	66 42.4 99 05 144.3	67 12.2 99 05 144.1	73 09.1 99 05 141.8	73 38.8 99 06 141.5	78 33.6 98 06 137.6	30
1	64 10.1 99 05 143.8	64 40.0 99 05 143.6	66 09.5 99 05 143.3	66 39.3 99 05 143.1	67 09.1 99 05 143.0	73 05.8 99 06 140.6	73 35.5 99 06 140.3	78 30.1 97 06 136.3	1
2	64 07.0 99 05 142.6	64 36.8 99 05 142.5	66 06.3 99 05 142.1	66 36.1 99 05 141.9	67 05.9 99 06 141.8	73 02.5 99 06 139.4	73 32.1 99 06 139.1	78 26.4 97 06 135.0	2
3	64 03.8 99 06 141.5	64 33.6 99 06 141.4	66 03.0 99 06 141.0	66 32.8 99 06 140.8	67 02.6 99 06 140.7	72 59.0 99 06 138.2	73 28.6 99 06 137.9	78 22.7 97 06 133.7	3
4	64 00.5 99 06 140.4	64 30.3 99 06 140.2	65 59.7 99 06 139.8	66 29.5 99 06 139.7	66 59.2 99 06 139.5	72 55.5 99 06 137.0	73 25.1 99 06 136.7	78 18.8 97 06 132.5	4
35	63 57.1 99 06 139.2	64 26.9 99 06 139.1	65 56.3 99 06 138.7	66 26.1 99 06 138.5	66 55.8 99 06 138.4	72 51.9 99 06 135.8	73 21.5 98 06 135.5	78 15.0 97 07 131.2	35
6	63 53.7 99 06 138.1	64 23.5 99 06 138.0	65 52.8 99 06 137.5	66 22.6 99 06 137.4	66 52.3 99 06 137.2	72 48.2 98 06 134.6	73 17.7 98 06 134.3	78 11.0 97 07 129.9	6
7	63 50.1 99 06 137.0	64 19.9 99 06 136.8	65 49.2 99 06 136.4	66 19.0 99 06 136.1	66 48.7 99 06 136.1	72 44.4 98 06 133.4	73 14.0 98 06 133.1	78 06.9 97 07 128.7	7
8	63 46.5 99 06 135.8	64 16.3 99 06 135.7	65 45.6 99 06 135.3	66 15.3 99 06 135.1	66 45.0 99 06 134.9	72 40.6 98 07 132.2	73 10.1 98 07 131.9	78 02.8 97 07 127.4	8
9	63 42.9 99 06 134.7	64 12.6 99 06 134.6	65 41.9 99 06 134.1	66 11.6 99 06 134.0	66 41.3 99 06 133.8	72 36.7 98 07 131.0	73 06.2 98 07 130.7	77 58.6 96 07 126.2	9
40	63 39.1 99 06 133.6	64 08.9 99 06 133.5	65 38.1 99 06 133.0	66 07.8 99 06 132.8	66 37.5 99 06 132.6	72 32.7 98 07 129.8	73 02.2 98 07 129.5	77 54.4 96 07 124.9	40
1	63 35.3 99 06 132.5	64 05.0 99 06 132.3	65 34.2 99 07 131.9	66 03.9 99 07 131.7	66 33.6 99 07 131.5	72 28.7 98 07 128.7	72 58.1 98 07 128.3	77 50.0 96 07 123.7	1
2	63 31.4 99 07 131.4	64 01.1 99 07 131.2	65 30.3 99 07 130.7	66 00.0 99 07 130.4	66 29.7 99 07 130.4	72 24.6 98 07 127.5	72 54.0 98 07 127.2	77 45.7 96 07 122.5	2
3	63 27.4 99 07 130.3	63 57.2 99 07 130.1	65 26.3 99 07 129.6	65 56.0 99 07 129.4	66 25.6 99 07 129.3	72 20.4 98 07 126.3	72 49.8 98 07 126.0	77 41.2 96 08 121.3	3
4	63 23.4 99 07 129.2	63 53.1 99 07 129.0	65 22.2 99 07 128.5	65 51.9 99 07 128.3	66 21.6 99 07 128.1	72 16.1 98 07 125.2	72 45.5 98 07 124.8	77 36.7 96 08 120.1	4
45	63 19.3 99 07 128.1	63 49.0 99 07 127.9	65 18.1 99 07 127.4	65 47.8 99 07 127.2	66 17.4 99 07 127.0	72 11.8 98 07 124.0	72 41.2 98 07 123.7	77 32.2 96 08 118.9	45
6	63 15.2 99 07 126.9	63 44.9 99 07 126.8	65 13.9 99 07 126.3	65 43.6 99 07 126.1	66 13.2 99 07 125.9	72 07.5 98 07 122.9	72 36.8 98 07 122.5	77 27.6 96 08 117.7	6
7	63 11.0 99 07 125.9	63 40.7 99 07 125.7	65 09.7 99 07 125.2	65 39.3 99 07 125.0	66 09.0 99 07 124.8	72 03.0 98 07 121.7	72 32.4 98 07 121.4	77 22.9 96 08 116.5	7
8	63 06.7 99 07 124.8	63 36.4 99 07 124.6	65 05.4 99 07 124.1	65 35.0 99 07 123.9	66 04.6 99 07 123.7	71 58.6 98 08 120.6	72 27.9 98 08 120.3	77 18.2 96 08 115.4	8
9	63 02.4 99 07 123.7	63 32.0 99 07 123.5	65 01.0 99 07 123.0	65 30.6 99 07 122.8	66 00.2 99 07 122.6	71 54.0 98 08 119.5	72 23.3 98 08 119.1	77 13.5 95 08 114.2	9
50	62 58.0 99 07 122.6	63 27.7 99 07 122.4	64 56.6 99 07 121.9	65 26.2 99 07 121.7	65 55.8 99 07 121.5	71 49.5 98 08 118.3	72 18.7 98 08 118.0	77 08.7 95 08 113.1	50
1	62 53.6 99 08 121.5	63 23.2 99 07 121.3	64 52.1 99 08 120.8	65 21.7 99 08 120.6	65 51.3 99 08 120.4	71 44.8 98 08 117.2	72 14.1 98 08 116.9	77 03.8 95 08 111.9	1
2	62 49.1 99 08 120.4	63 18.7 99 08 120.2	64 47.6 99 08 119.7	65 17.2 99 08 119.5	65 46.8 99 08 119.3	71 40.2 98 08 116.1	72 09.4 97 08 115.8	76 59.0 95 08 110.8	2
3	62 44.5 99 08 119.3	63 14.2 99 08 119.2	64 43.0 99 08 118.6	65 12.6 99 08 118.4	65 42.2 99 08 118.2	71 35.4 98 08 115.0	72 04.7 97 08 114.6	76 54.1 95 08 109.7	3
4	62 40.0 99 08 118.2	63 09.6 99 08 118.1	64 38.4 99 08 117.5	65 08.0 99 08 117.3	65 37.6 99 08 117.1	71 30.7 98 08 113.9	71 59.9 97 08 113.5	76 49.1 95 08 108.5	4
55	62 35.3 99 08 117.2	63 05.0 99 08 117.0	64 33.8 99 08 116.4	65 03.3 99 08 116.3	65 32.9 99 08 116.0	71 25.9 98 08 112.8	71 55.1 97 08 112.4	76 44.2 95 08 107.4	55
6	62 30.7 99 08 116.1	63 00.3 99 08 115.9	64 29.1 99 08 115.4	64 58.6 99 08 115.0	65 28.2 99 08 115.0	71 21.0 97 08 111.7	71 50.2 97 08 111.3	76 39.2 95 08 106.3	6
7	62 25.9 99 08 115.0	62 55.6 99 08 114.9	64 24.3 99 08 114.3	64 53.9 99 08 114.1	65 23.4 98 08 113.9	71 16.2 97 08 110.6	71 45.4 97 08 110.3	76 34.1 95 08 105.2	7
8	62 21.2 99 08 114.0	62 50.8 99 08 113.8	64 19.5 99 08 113.2	64 49.1 98 08 113.0	65 18.6 98 08 112.8	71 11.3 97 08 109.5	71 40.4 97 08 109.2	76 29.1 95 08 104.1	8
9	62 16.4 99 08 112.9	62 46.0 99 08 112.7	64 14.7 99 08 112.2	64 44.3 98 08 112.0	65 13.8 98 08 111.8	71 06.3 97 08 108.5	71 35.5 97 08 108.1	76 24.0 95 08 103.1	9
60	62 11.5 99 08 111.8	62 41.1 99 08 111.7	64 09.8 98 08 111.1	64 39.4 98 08 110.9	65 08.9 98 08 110.7	71 01.3 97 08 107.4	71 30.5 97 08 107.0	76 18.9 95 09 102.0	60
1	62 06.7 99 08 110.8	62 36.3 99 08 110.6	64 05.0 98 08 110.0	64 34.5 98 08 109.8	65 04.0 98 08 109.6	70 56.3 97 08 106.3	71 25.5 97 08 105.9	76 13.7 95 09 100.9	1
2	62 01.8 99 08 109.7	62 31.4 99 08 109.6	64 00.0 98 08 109.0	64 29.6 98 08 108.8	64 59.1 98 08 108.6	70 51.3 97 08 105.2	71 20.4 97 08 104.9	76 08.6 95 09 99.9	2
3	61 56.8 99 08 108.7	62 26.4 99 08 108.5	63 55.1 98 08 107.9	64 24.6 98 08 107.7	64 54.1 98 08 107.5	70 46.2 97 08 104.2	71 15.4 97 08 103.8	76 03.4 95 09 98.8	3
4	61 51.9 99 08 107.6	62 21.4 99 08 107.5	63 50.1 98 08 106.9	64 19.6 98 08 106.7	64 49.1 98 08 106.5	70 41.2 97 08 103.1	71 10.3 97 09 102.8	75 58.3 95 09 97.8	4
65	61 46.9 99 08 106.6	62 16.4 99 08 106.4	63 45.1 98 08 105.8	64 14.6 98 08 105.6	64 44.1 98 08 105.4	70 36.1 97 09 102.1	71 05.2 97 09 101.7	75 53.1 95 09 96.7	65
6	61 41.8 99 08 105.6	62 11.4 99 08 105.4	63 40.0 98 08 104.8	64 09.5 98 08 104.6	64 39.0 98 08 104.4	70 30.9 97 09 101.0	71 00.0 97 09 100.7	75 47.9 95 09 95.7	6
7	61 36.8 99 08 104.5	62 06.3 99 08 104.3	63 34.9 98 08 103.8	64 04.4 98 08 103.5	64 33.9 98 08 103.3	70 25.8 97 09 100.0	70 54.9 97 09 99.6	75 42.7 95 09 94.7	7
8	61 31.7 99 08 103.5	62 01.3 99 08 103.3	63 29.9 98 08 102.7	63 59.4 98 09 102.5	64 28.8 98 09 102.3	70 20.6 97 09 99.0	70 49.7 97 09 98.6	75 37.5 95 09 93.6	8
9	61 26.6 99 09 102.4	61 56.2 98 09 102.3	63 24.7 98 08 101.7	63 54.2 98 09 101.5	64 23.7 98 09 101.3	70 15.5 97 09 97.9	70 44.6 97 09 97.6	75 32.2 95 09 92.6	9
70	61 21.5 99 09 101.4	61 51.0 98 09 101.2	63 19.6 98 09 100.7	63 49.1 98 09 100.4	64 18.6 98 09 100.2	70 10.3 97 09 96.9	70 39.4 97 09 96.5	75 27.0 95 09 91.6	70
1	61 16.4 99 09 100.4	61 45.9 98 09 100.2	63 14.5 98 09 99.6	63 44.0 98 09 99.4	64 13.4 98 09 99.2	70 05.1 97 09 95.9	70 34.2 97 09 95.5	75 21.8 95 09 90.6	1
2	61 11.2 99 09 99.4	61 40.8 98 09 99.2	63 09.3 98 09 98.6	63 38.8 98 09 98.4	64 08.2 98 09 98.2	69 59.9 97 09 94.9	70 29.0 97 09 94.5	75 16.6 95 09 89.6	2
3	61 06.0 99 09 98.3	61 35.6 98 09 98.2	63 04.1 98 09 97.6	63 33.6 98 09 97.4	64 03.1 98 09 97.2	69 54.7 97 09 93.8	70 23.7 97 09 93.5	75 11.3 95 09 88.6	3
4	61 00.9 98 09 97.3	61 30.4 98 09 97.1	62 58.9 98 09 96.6	63 28.4 98 09 96.4	63 57.9 98 09 96.1	69 49.4 97 09 92.8	70 18.5 97 09 92.5	75 06.1 95 09 87.6	4
75	60 55.7 98 09 96.3	61 25.2 98 09 96.1	62 53.7 98 09 95.6	63 23.2 98 09 95.3	63 52.7 98 09 95.1	69 44.2 97 09 91.8	70 13.3 97 09 91.5	75 00.9 95 09 86.7	75
6	60 50.5 98 09 95.3	61 20.0 98 09 95.1	62 48.5 98 09 94.5	63 18.0 98 09 94.3	63 47.5 98 09 94.1	69 39.0 97 09 90.8	70 08.1 97 09 90.5	74 55.7 95 09 85.7	6
7	60 45.3 98 09 94.3	61 14.8 98 09 94.1	62 43.3 98 09 93.5	63 12.8 98 09 93.3	63 42.2 98 09 93.1	69 33.8 97 09 89.8	70 02.8 97 09 89.5	74 50.4 95 09 84.7	7
8	60 40.0 98 09 93.3	61 09.6 98 09 93.1	62 38.1 98 09 92.5	63 07.6 98 09 92.3	63 37.0 98 09 92.1	69 28.5 97 09 88.8	69 57.6 97 09 88.5	74 45.2 95 09 83.7	8
9	60 34.8 98 09 92.3	61 04.4 98 09 92.1	62 32.9 98 09 91.5	63 02.3 98 09 91.3	63 31.8 98 09 91.1	69 23.3 97 09 87.8	69 52.4 97 09 87.5	74 40.1 95 09 82.8	9
80	60 29.6 98 09 91.3	60 59.1 98 09 91.1	62 27.6 98 09 90.5	62 57.1 98 09 90.3	63 26.6 98 09 90.1	69 18.1 97 09 86.9	69 47.2 97 09 86.5	74 34.9 95 09 81.8	80
1	60 24.4 98 09 90.3	60 53.9 98 09 90.1	62 22.4 98 09 89.5	62 51.9 98 09 89.3	63 21.3 98 09 89.1	69 12.9 97 09 85.9	69 41.9 97 09 85.5	74 29.7 95 09 80.9	1
2	60 19.1 98 09 89.3	60 48.7 98 09 89.1	62 17.2 98 09 88.5	62 46.6 98 09 88.3	63 16.1 98 09 88.1	69 07.6 97 09 84.9	69 36.7 97 09 84.6	74 24.5 95 09 79.9	2
3	60 13.9 98 09 88.3	60 43.4 98 09 88.1	62 12.0 98 09 87.5	62 41.4 98 09 87.3	63 10.9 98 09 87.1	69 02.4 97 09 83.9	69 31.5 97 09 83.6	74 19.4 95 09 79.0	3
4	60 08.7 98 09 87.3	60 38.2 98 09 87.1	62 06.7 98 09 86.6	62 36.2 98 09 86.4	63 05.7 98 09 86.2	68 57.2 97 09 83.0	69 26.3 97 09 82.6	74 14.3 95 09 78.1	4
85	60 03.5 98 09 86.3	60 33.0 98 09 86.1	62 01.5 98 09 85.6	62 31.0 98 09 85.2	63 00.4 98 09 85.2	68 52.1 97 09 82.0	69 21.1 97 09 81.6	74 09.2 95 08 77.1	85
6	59 58.2 98 09 85.3	60 27.8 98 09 85.2	61 56.3 98 09 84.6	62 25.8 98 09 84.4	62 55.2 98 09 84.2	68 46.9 97 09 81.0	69 16.0 97 09 80.7	74 04.1 95 08 76.2	6
7	59 53.0 98 09 84.3	60 22.6 98 09 84.2	61 51.1 98 09 83.6	62 20.6 98 09 83.4	62 50.0 98 09 83.2	68 41.7 97 09 80.1	69 10.8 97 09 79.7	73 59.0 95 08 75.3	7
8	59 47.8 98 09 83.4	60 17.4 98 09 83.2	61 45.9 98 09 82.6	62 15.4 98 09 82.4	62 44.8 98 09 82.2	68 36.6 97 09 79.1	69 05.7 97 09 78.8	73 54.0 95 08 74.4	8
9	59 42.6 98 09 82.4	60 12.2 98 09 82.2	61 40.7 98 09 81.7	62 10.2 98 09 81.5	62 39.7 98 09 81.3	68 31.5 97 09 78.2	69 00.6 97 08 77.8	73 48.9 95 08 73.5	9
90	59 37.5 98 09 81.4	60 07.0 98 09 81.2	61 35.6 98 09 80.7	62 05.0 98 09 80.5	62 34.5 98 09 80.3	68 26.3 97 08 77.2	68 55.5 97 08 76.9	73 43.9 95 08 72.6	90

Lat. 85°

H.A.	60°00′ Alt	Δd Δt	Az	60°30′ Alt	Δd Δt	Az	62°00′ Alt	Δd Δt	Az	62°30′ Alt	Δd Δt	Az	63°00′ Alt	Δd Δt	Az	69°00′ Alt	Δd Δt	Az	69°30′ Alt	Δd Δt	Az	74°30′ Alt	Δd Δt	Az	H.A.
91	59 32.3	99 00	80.4	60 01.9	98 09	80.3	61 30.4	98 09	79.7	61 59.9	98 09	79.5	62 29.4	98 09	79.3	68 21.3	97 08	76.3	68 50.4	97 08	75.9	73 39.0	95 08	71.6	91
2	59 27.2	99 00	79.5	59 56.7	98 09	79.3	61 25.3	98 09	78.8	61 54.8	98 09	78.6	62 24.2	98 09	78.4	68 16.2	97 08	75.3	68 45.3	97 08	75.0	73 34.0	95 08	70.7	2
3	59 22.0	99 00	78.5	59 51.6	98 09	78.3	61 20.2	98 08	77.8	61 49.6	98 08	77.6	62 19.1	98 08	77.4	68 11.1	97 08	74.4	68 40.3	97 08	74.1	73 29.1	95 08	69.9	3
4	59 16.9	99 00	77.5	59 46.5	98 09	77.4	61 15.0	98 08	76.8	61 44.5	98 08	76.6	62 14.0	98 08	76.4	68 06.1	97 08	73.4	68 35.3	97 08	73.1	73 24.2	95 08	69.0	4
95	59 11.8	99 08	76.6	59 41.4	98 08	76.4	61 10.0	98 08	75.9	61 39.5	98 08	75.7	62 09.0	98 08	75.5	68 01.1	97 08	72.5	68 30.3	97 08	72.2	73 19.3	95 08	68.1	95
6	59 06.7	99 08	75.6	59 36.3	98 08	75.4	61 04.9	98 08	74.9	61 34.4	98 08	74.7	62 03.9	98 08	74.5	67 56.1	97 08	71.6	68 25.3	97 08	71.3	73 14.5	95 08	67.2	6
7	59 01.7	99 08	74.7	59 31.2	98 08	74.5	60 59.9	98 08	74.0	61 29.4	98 08	73.8	61 58.9	98 08	73.6	67 51.2	97 08	70.7	68 20.4	97 08	70.3	73 09.7	95 08	66.3	7
8	58 56.6	99 08	73.7	59 26.2	98 08	73.5	60 54.9	98 08	73.0	61 24.4	98 08	72.8	61 53.9	98 08	72.6	67 46.3	97 08	69.7	68 15.5	97 08	69.4	73 04.9	95 08	65.4	8
9	58 51.6	99 08	72.7	59 21.2	98 08	72.6	60 49.9	98 08	72.1	61 19.4	98 08	71.9	61 48.9	98 08	71.7	67 41.4	97 08	68.8	68 10.6	97 08	68.5	73 00.2	95 08	64.5	9
100	58 46.7	99 08	71.8	59 16.2	98 08	71.6	60 44.9	98 08	71.1	61 14.4	98 08	70.9	61 43.9	98 08	70.7	67 36.5	97 08	67.9	68 05.7	97 08	67.6	72 55.5	96 08	63.7	100
1	58 41.7	99 08	70.8	59 11.3	98 08	70.7	60 40.0	98 08	70.2	61 09.5	98 08	70.0	61 39.0	98 08	69.8	67 31.7	97 08	67.0	68 00.9	97 08	66.7	72 50.8	96 08	62.8	1
2	58 36.8	99 08	69.9	59 06.4	98 08	69.7	60 35.1	98 08	69.2	61 04.6	98 08	69.0	61 34.1	98 08	68.9	67 26.9	97 08	66.1	67 56.1	97 08	65.8	72 46.2	96 08	61.9	2
3	58 31.9	99 08	68.9	59 01.5	98 08	68.8	60 30.2	98 08	68.3	60 59.7	98 08	68.1	61 29.3	98 08	67.9	67 22.1	97 08	65.2	67 51.4	97 08	64.9	72 41.6	96 08	61.1	3
4	58 27.0	99 08	68.0	58 56.6	98 08	67.8	60 25.4	98 08	67.3	60 54.9	98 08	67.2	61 24.4	98 08	67.0	67 17.4	98 08	64.2	67 46.7	97 08	64.0	72 37.0	96 08	60.2	4
105	58 22.2	99 08	67.1	58 51.8	98 08	66.9	60 20.5	99 08	66.4	60 50.1	98 08	66.2	61 19.6	98 08	66.1	67 12.7	98 08	63.3	67 42.0	98 08	63.1	72 32.5	96 07	59.4	105
6	58 17.4	99 08	66.1	58 47.0	98 08	66.0	60 15.8	98 08	65.5	60 45.3	98 08	65.3	61 14.9	98 08	65.1	67 08.1	98 08	62.4	67 37.3	98 08	62.2	72 28.0	96 07	58.5	6
7	58 12.6	99 08	65.2	58 42.2	98 08	65.0	60 11.0	98 08	64.5	60 40.6	99 08	64.4	61 10.2	98 08	64.2	67 03.4	98 08	61.5	67 32.7	98 08	61.3	72 23.6	96 07	57.7	7
8	58 07.9	99 08	64.2	58 37.5	99 08	64.1	60 06.3	99 08	63.6	60 35.9	99 08	63.4	61 05.5	99 08	63.3	66 58.9	98 08	60.6	67 28.2	98 08	60.4	72 19.2	96 07	56.8	8
9	58 03.2	99 08	63.3	58 32.8	99 08	63.2	60 01.7	99 08	62.7	60 31.2	99 08	62.5	61 00.8	99 08	62.3	66 54.3	98 08	59.8	67 23.6	98 08	59.5	72 14.8	96 07	56.0	9
110	57 58.6	99 08	62.4	58 28.2	99 08	62.2	59 57.0	99 08	61.8	60 26.6	99 08	61.6	60 56.2	99 08	61.4	66 49.8	98 08	58.9	67 19.2	98 07	58.6	72 10.5	96 07	55.1	110
1	57 53.9	99 08	61.4	58 23.6	99 08	61.3	59 52.4	99 08	60.8	60 22.0	99 08	60.7	60 51.6	99 08	60.5	66 45.4	98 07	58.0	67 14.7	98 07	57.7	72 06.2	96 07	54.3	1
2	57 49.4	99 08	60.5	58 19.0	99 08	60.4	59 47.9	99 08	59.9	60 17.5	99 08	59.8	60 47.1	99 08	59.6	66 41.0	98 07	57.1	67 10.3	98 07	56.8	72 02.0	97 07	53.4	2
3	57 44.8	99 08	59.5	58 14.5	99 07	59.5	59 43.4	99 07	59.0	60 13.0	99 07	58.8	60 42.6	99 07	58.7	66 36.6	98 07	56.2	67 06.0	98 07	55.9	71 57.8	97 07	52.6	3
4	57 40.4	99 07	58.7	58 10.0	99 07	58.5	59 38.9	99 07	58.1	60 08.6	99 07	57.9	60 38.2	99 07	57.8	66 32.3	98 07	55.3	67 01.7	98 07	55.1	71 53.7	97 07	51.8	4
115	57 35.9	99 07	57.7	58 05.6	99 07	57.6	59 34.5	99 07	57.2	60 04.1	99 07	57.0	60 33.8	99 07	56.8	66 28.0	98 07	54.4	66 57.4	98 07	54.2	71 49.6	97 07	50.9	115
6	57 31.5	99 07	56.8	58 01.2	99 07	56.7	59 30.1	99 07	56.2	59 59.8	99 07	56.1	60 29.4	99 07	55.9	66 23.8	98 07	53.6	66 53.2	98 07	53.3	71 45.6	97 07	50.1	6
7	57 27.2	99 07	55.9	57 56.8	99 07	55.8	59 25.8	99 07	55.3	59 55.5	99 07	55.2	60 25.1	99 07	55.0	66 19.6	98 07	52.7	66 49.0	98 07	52.4	71 41.6	97 07	49.3	7
8	57 22.8	99 07	55.0	57 52.5	99 07	54.8	59 21.5	99 07	54.4	59 51.2	99 07	54.3	60 20.8	99 07	54.1	66 15.5	98 07	51.8	66 44.9	98 07	51.6	71 37.7	97 06	48.5	8
9	57 18.6	99 07	54.1	57 48.3	99 07	53.9	59 17.3	99 07	53.5	59 47.0	99 07	53.4	60 16.6	99 07	53.2	66 11.4	98 07	50.9	66 40.8	98 07	50.7	71 33.8	97 06	47.6	9
120	57 14.4	99 07	53.2	57 44.1	99 07	53.0	59 13.1	99 07	52.6	59 42.8	99 07	52.5	60 12.5	99 07	52.3	66 07.3	98 07	50.1	66 36.8	98 07	49.8	71 29.9	97 06	46.8	120
1	57 10.2	99 07	52.2	57 39.9	99 07	52.1	59 09.0	99 07	51.7	59 38.7	99 07	51.6	60 08.3	99 07	51.4	66 03.4	98 07	49.2	66 32.8	98 07	49.0	71 26.2	97 06	46.0	1
2	57 06.1	99 07	51.3	57 35.8	99 07	51.2	59 04.9	99 07	50.8	59 34.6	99 07	50.7	60 04.3	99 07	50.5	65 59.4	98 06	48.3	66 28.9	98 06	48.1	71 22.4	97 06	45.2	2
3	57 02.1	99 07	50.4	57 31.8	99 07	50.3	59 00.9	99 07	49.9	59 30.6	99 07	49.7	60 00.3	99 07	49.6	65 55.5	98 06	47.5	66 25.0	98 06	47.2	71 18.7	97 06	44.4	3
4	56 58.0	99 07	49.5	57 27.8	99 07	49.4	58 56.9	99 07	49.0	59 26.6	99 07	48.8	59 56.3	99 07	48.7	65 51.7	98 06	46.6	66 21.2	98 06	46.4	71 15.1	97 06	43.6	4
125	56 54.1	99 06	48.6	57 23.8	99 06	48.5	58 53.0	99 06	48.1	59 22.7	99 06	48.0	59 52.4	99 06	47.8	65 47.9	98 06	45.7	66 17.5	98 06	45.5	71 11.5	98 06	42.8	125
6	56 50.2	99 06	47.7	57 20.0	99 06	47.6	58 49.1	99 06	47.2	59 18.9	99 06	47.1	59 48.6	99 06	46.9	65 44.2	98 06	44.9	66 13.8	98 06	44.7	71 08.0	98 06	42.0	6
7	56 46.4	99 06	46.8	57 16.1	99 06	46.7	58 45.3	99 06	46.3	59 15.1	99 06	46.2	59 44.8	99 06	46.0	65 40.6	98 06	44.0	66 10.1	99 06	43.8	71 04.5	98 06	41.2	7
8	56 42.6	99 06	45.9	57 12.3	99 06	45.8	58 41.5	99 06	45.4	59 11.3	99 06	45.3	59 41.0	99 06	45.1	65 37.0	99 06	43.2	66 06.5	99 06	43.0	71 01.1	98 06	40.3	8
9	56 38.9	99 06	45.0	57 08.6	99 06	44.9	58 37.9	99 06	44.5	59 07.6	99 06	44.4	59 37.4	99 06	44.2	65 33.4	99 06	42.3	66 03.0	99 06	42.1	70 57.8	98 06	39.5	9
130	56 35.2	99 06	44.1	57 05.0	99 06	44.0	58 34.3	99 06	43.6	59 04.0	99 06	43.5	59 33.8	99 06	43.4	65 29.9	99 06	41.4	65 59.5	99 06	41.3	70 54.5	98 05	38.7	130
1	56 31.6	99 06	43.2	57 01.4	99 06	43.1	58 30.7	99 06	42.7	59 00.4	99 06	42.6	59 30.2	99 06	42.5	65 26.5	99 06	40.6	65 56.1	99 06	40.4	70 51.2	98 05	37.9	1
2	56 28.0	99 06	42.3	56 57.8	99 06	42.2	58 27.2	99 06	41.8	58 56.9	99 06	41.7	59 26.7	99 06	41.6	65 23.1	99 06	39.7	65 52.7	99 06	39.6	70 48.0	98 05	37.1	2
3	56 24.5	99 06	41.4	56 54.3	99 06	41.3	58 23.7	99 06	40.9	58 53.5	99 06	40.8	59 23.2	99 06	40.7	65 19.8	99 06	38.9	65 49.4	99 06	38.7	70 44.9	98 05	36.4	3
4	56 21.1	99 06	40.5	56 50.9	99 06	40.4	58 20.3	99 06	40.0	58 50.1	99 06	39.9	59 19.9	99 06	39.8	65 16.5	99 06	38.0	65 46.2	99 05	37.9	70 41.8	98 05	35.6	4
135	56 17.8	99 06	39.6	56 47.6	99 05	39.5	58 17.0	99 05	39.2	58 46.8	99 05	39.0	59 16.6	99 05	38.9	65 13.4	99 05	37.2	65 43.0	99 05	37.0	70 38.8	98 05	34.8	135
6	56 14.5	99 05	38.7	56 44.3	99 05	38.6	58 13.7	99 05	38.3	58 43.5	99 05	38.2	59 13.3	99 05	38.0	65 10.2	99 05	36.4	65 39.9	99 05	36.2	70 35.9	98 05	34.0	6
7	56 11.2	99 05	37.8	56 41.1	99 05	37.7	58 10.5	99 05	37.3	58 40.3	99 05	37.3	59 10.1	99 05	37.2	65 07.2	99 05	35.5	65 36.8	99 05	35.3	70 33.0	98 05	33.2	7
8	56 08.1	99 05	36.9	56 37.9	99 05	36.8	58 07.4	99 05	36.5	58 37.2	99 05	36.4	59 07.0	99 05	36.3	65 04.1	99 05	34.7	65 33.9	99 05	34.5	70 30.1	98 05	32.4	8
9	56 04.9	99 05	36.0	56 34.8	99 05	35.9	58 04.3	99 05	35.6	58 34.1	99 05	35.5	59 03.9	99 05	35.4	65 01.2	99 05	33.8	65 30.9	99 05	33.7	70 27.4	98 05	31.6	9
140	56 01.9	99 05	35.1	56 31.8	99 05	35.0	58 01.3	99 05	34.7	58 31.1	99 05	34.6	59 00.9	99 05	34.5	64 58.3	99 05	33.0	65 28.1	99 05	32.8	70 24.7	98 04	30.8	140
1	55 58.9	99 05	34.2	56 28.8	99 05	34.1	57 58.3	99 05	33.9	58 28.2	99 05	33.8	58 58.0	99 05	33.7	64 55.5	99 05	32.2	65 25.3	99 05	32.0	70 22.2	99 04	30.0	1
2	55 56.0	1.0 05	33.3	56 25.9	1.0 05	33.2	57 55.4	99 05	33.0	58 25.3	99 05	32.9	58 55.1	99 05	32.8	64 52.8	99 04	31.3	65 22.5	99 04	31.2	70 19.4	99 04	29.3	2
3	55 53.2	1.0 05	32.4	56 23.0	1.0 05	32.4	57 52.6	1.0 05	32.1	58 22.5	99 05	32.0	58 52.3	99 05	31.9	64 50.1	99 04	30.5	65 19.8	99 04	30.3	70 16.9	99 04	28.5	3
4	55 50.4	1.0 05	31.6	56 20.3	1.0 04	31.5	57 49.9	1.0 04	31.2	58 19.7	1.0 04	31.1	58 49.6	1.0 04	31.0	64 47.5	99 04	29.6	65 17.2	99 04	29.5	70 14.4	99 04	27.7	4
145	55 47.7	1.0 04	30.7	56 17.6	1.0 04	30.6	57 47.2	1.0 04	30.3	58 17.1	1.0 04	30.3	58 46.9	1.0 04	30.2	64 44.9	99 04	28.8	65 14.7	99 04	28.7	70 12.0	99 04	26.9	145
6	55 45.1	1.0 04	29.8	56 15.0	1.0 04	29.7	57 44.6	1.0 04	29.5	58 14.5	1.0 04	29.4	58 44.3	1.0 04	29.3	64 42.4	99 04	28.0	65 12.2	99 04	27.8	70 09.7	99 04	26.1	6
7	55 42.5	1.0 04	28.9	56 12.4	1.0 04	28.8	57 42.1	1.0 04	28.6	58 11.9	1.0 04	28.5	58 41.8	1.0 04	28.4	64 40.0	99 04	27.1	65 09.8	99 04	27.0	70 07.4	99 03	25.3	7
8	55 40.0	1.0 04	28.0	56 09.9	1.0 04	27.9	57 39.6	1.0 04	27.7	58 09.5	1.0 04	27.6	58 39.4	1.0 04	27.5	64 37.6	99 04	26.3	65 07.5	99 04	26.2	70 05.2	99 04	24.6	8
9	55 37.6	1.0 04	27.1	56 07.5	1.0 04	27.1	57 37.2	1.0 04	26.8	58 07.1	1.0 04	26.8	58 37.0	1.0 04	26.7	64 35.4	99 04	25.5	65 05.2	99 04	25.4	70 03.1	99 03	23.8	9
150	55 35.3	1.0 04	26.3	56 05.2	1.0 04	26.2	57 34.9	1.0 04	26.0	58 04.8	1.0 04	25.9	58 34.7	1.0 04	25.8	64 33.1	99 04	24.6	65 03.0	99 04	24.5	70 01.0	99 03	23.0	150
1	55 33.0	1.0 04	25.4	56 02.9	1.0 04	25.3	57 32.6	1.0 04	25.1	58 02.5	1.0 04	25.0	58 32.4	1.0 04	24.9	64 31.0	1.0 03	23.8	65 00.8	99 03	23.7	69 59.0	99 03	22.1	1
2	55 30.8	1.0 04	24.5	56 00.7	1.0 04	24.4	57 30.4	1.0 04	24.2	58 00.4	1.0 04	24.2	58 30.3	1.0 04	24.1	64 28.8	1.0 03	23.0	64 58.8	1.0 03	22.9	69 57.0	99 03	21.5	2
3	55 28.6	1.0 03	23.6	55 58.6	1.0 03	23.5	57 28.3	1.0 03	23.4	57 58.2	1.0 03	23.3	58 28.2	1.0 03	23.2	64 26.9	1.0 03	22.2	64 56.8	1.0 03	22.1	69 55.2	99 03	20.7	3
4	55 26.6	1.0 03	22.7	55 56.5	1.0 03	22.7	57 26.3	1.0 03	22.5	57 56.2	1.0 03	22.4	58 26.1	1.0 03	22.3	64 25.0	1.0 03	21.3	64 54.9	1.0 03	21.2	69 53.4	99 03	19.9	4
155	55 24.6	1.0 03	21.9	55 54.5	1.0 03	21.8	57 24.3	1.0 03	21.6	57 54.3	1.0 03	21.5	58 24.2	1.0 03	21.5	64 23.1	1.0 03	20.5	64 53.0	1.0 03	20.4	69 51.6	99 03	19.1	155
6	55 22.7	1.0 03	21.0	55 52.6	1.0 03	20.9	57 22.4	1.0 03	20.7	57 52.4	1.0 03	20.7	58 22.3	1.0 03	20.6	64 21.3	1.0 03	19.7	64 51.2	1.0 03	19.6	69 49.9	99 03	18.4	6
7	55 20.9	1.0 03	20.1	55 50.8	1.0 03	20.0	57 20.6	1.0 03	19.9	57 50.6	1.0 03	19.8	58 20.5	1.0 03	19.8	64 19.6	1.0 03	18.9	64 49.5	1.0 03	18.8	69 48.3	1.0 02	17.6	7
8	55 19.1	1.0 03	19.2	55 49.0	1.0 03	19.2	57 18.9	1.0 03	19.0	57 48.8	1.0 03	18.9	58 18.8	1.0 03	18.9	64 17.9	1.0 03	18.0	64 47.8	1.0 03	17.9	69 46.8	1.0 02	16.8	8
9	55 17.4	1.0 03	18.3	55 47.4	1.0 03	18.3	57 17.2	1.0 03	18.1	57 47.2	1.0 03	18.1	58 17.1	1.0 03	18.0	64 16.4	1.0 03	17.2	64 46.3	1.0 02	17.1	69 45.3	1.0 02	16.1	9
160	55 15.8	1.0 03	17.5	55 45.8	1.0 03	17.4	57 15.6	1.0 03	17.3	57 45.6	1.0 03	17.2	58 15.5	1.0 02	17.2	64 14.8	1.0 02	16.4	64 44.8	1.0 02	16.3	69 43.9	1.0 02	15.3	160
1	55 14.3	1.0 02	16.6	55 44.2	1.0 02	16.5	57 14.1	1.0 02	16.4	57 44.1	1.0 02	16.3	58 14.0	1.0 02	16.3	64 13.4	1.0 02	15.6	64 43.3	1.0 02	15.5	69 42.5	1.0 02	14.5	1
2	55 12.8	1.0 02	15.7	55 42.8	1.0 02	15.7	57 12.7	1.0 02	15.5	57 42.6	1.0 02	15.5	58 12.6	1.0 02	15.4	64 12.0	1.0 02	14.7	64 42.0	1.0 02	14.7	69 41.2	1.0 02	13.7	2
3	55 11.4	1.0 02	14.8	55 41.4	1.0 02	14.8	57 11.3	1.0 02	14.7	57 41.3	1.0 02	14.6	58 11.2	1.0 02	14.6	64 10.7	1.0 02	13.9	64 40.7	1.0 02	13.9	69 40.0	1.0 02	13.0	3
4	55 10.1	1.0 02	14.0	55 40.1	1.0 02	13.9	57 10.0	1.0 02	13.8	57 40.0	1.0 02	13.8	58 10.0	1.0 02	13.7	64 09.5	1.0 02	13.1	64 39.5	1.0 02	13.0	69 38.9	1.0 02	12.2	4
165	55 08.9	1.0 02	13.1	55 38.9	1.0 02	13.1	57 08.8	1.0 02	12.9	57 38.8	1.0 02	12.9	58 08.8	1.0 02	12.9	64 08.4	1.0 02	12.3	64 38.3	1.0 02	12.2	69 37.8	1.0 02	11.5	165
6	55 07.8	1.0 02	12.2	55 37.7	1.0 02	12.2	57 07.7	1.0 02	12.1	57 37.7	1.0 02	12.0	58 07.6	1.0 02	12.0	64 07.3	1.0 02	11.5	64 37.3	1.0 02	11.4	69 36.8	1.0 02	10.7	6
7	55 06.7	1.0 02	11.3	55 36.7	1.0 02	11.3	57 06.6	1.0 02	11.2	57 36.6	1.0 02	11.2	58 06.6	1.0 02	11.1	64 06.3	1.0 02	10.6	64 36.3	1.0 02	10.6	69 35.9	1.0 02	09.9	7
8	55 05.7	1.0 02	10.5	55 35.7	1.0 02	10.4	57 05.7	1.0 02	10.4	57 35.6	1.0 02	10.3	58 05.6	1.0 02	10.3	64 05.4	1.0 01	09.8	64 35.3	1.0 01	09.8	69 35.0	1.0 01	09.2	8
9	55 04.8	1.0 01	09.6	55 34.8	1.0 01	09.6	57 04.8	1.0 01	09.5	57 34.7	1.0 01	09.5	58 04.7	1.0 01	09.4	64 04.5	1.0 01	09.0	64 34.5	1.0 01	09.0	69 34.2	1.0 01	08.4	9
170	55 04.0	1.0 01	08.7	55 34.0	1.0 01	08.7	57 03.9	1.0 01	08.6	57 33.9	1.0 01	08.6	58 03.9	1.0 01	08.6	64 03.7	1.0 01	08.2	64 33.7	1.0 01	08.1	69 33.5	1.0 01	07.6	170
1	55 03.2	1.0 01	07.8	55 33.2	1.0 01	07.8	57 03.1	1.0 01	07.7	57 33.1	1.0 01	07.7	58 03.1	1.0 01	07.7	64 03.0	1.0 01	07.4	64 33.0	1.0 01	07.3	69 32.8	1.0 01	06.9	1
2	55 02.5	1.0 01	07.0	55 32.5	1.0 01	07.0	57 02.5	1.0 01	06.9	57 32.5	1.0 01	06.9	58 02.5	1.0 01	06.9	64 02.4	1.0 01	06.5	64 32.4	1.0 01	06.5	69 32.2	1.0 01	06.1	2
3	55 01.9	1.0 01	06.1	55 31.9	1.0 01	06.1	57 01.9	1.0 01	06.0	57 31.9	1.0 01	06.0	58 01.9	1.0 01	06.0	64 01.8	1.0 01	05.7	64 31.8	1.0 01	05.7	69 31.7	1.0 01	05.3	3
4	55 01.4	1.0 01	05.2	55 31.4	1.0 01	05.2	57 01.4	1.0 01	05.2	57 31.4	1.0 01	05.2	58 01.4	1.0 01	05.1	64 01.3	1.0 01	04.9	64 31.3	1.0 01	04.9	69 31.3	1.0 01	04.6	4
175	55 01.0	1.0 01	04.4	55 31.0	1.0 01	04.3	57 01.0	1.0 01	04.3	57 31.0	1.0 01	04.3	58 01.0	1.0 01	04.3	64 00.9	1.0 01	04.1	64 30.9	1.0 01	04.1	69 30.9	1.0 00	03.8	175
6	55 00.6	1.0 01	03.5	55 30.6	1.0 01	03.5	57 00.6	1.0 01	03.4	57 30.6	1.0 01	03.4	58 00.6	1.0 00	03.4	64 00.6	1.0 00	03.3	64 30.6	1.0 00	03.3	69 30.6	1.0 00	03.1	6
7	55 00.4	1.0 00	02.6	55 30.4	1.0 00	02.6	57 00.4	1.0 00	02.6	57 30.4	1.0 00	02.6	58 00.4	1.0 00	02.6	64 00.3	1.0 00	02.5	64 30.3	1.0 00	02.4	69 30.3	1.0 00	02.3	7
8	55 00.2	1.0 00	01.7	55 30.2	1.0 00	01.7	57 00.2	1.0 00	01.7	57 30.2	1.0 00	01.7	58 00.2	1.0 00	01.7	64 00.2	1.0 00	01.6	64 30.1	1.0 00	01.6	69 30.1	1.0 00	01.5	8
9	55 00.0	1.0 00	00.9	55 30.0	1.0 00	00.9	57 00.0	1.0 00	00.9	57 30.0	1.0 00	00.9	58 00.0	1.0 00	00.9	64 00.0	1.0 00	00.8	64 30.0	1.0 00	00.8	69 30.0	1.0 00	00.8	9
180	55 00.0	1.0 00	00.0	55 30.0	1.0 00	00.0	57 00.0	1.0 00	00.0	57 30.0	1.0 00	00.0	58 00.0	1.0 00	00.0	64 00.0	1.0 00	00.0	64 30.0	1.0 00	00.0	69 30.0	1.0 00	00.0	180

Lat. 85°

Lat. 86°

Lat. 87°

Lat. 88°

STAR IDENTIFICATION TABLE

ALTITUDE

Lat. 85°

AZ.	4° Dec.	4° H.A.	8° Dec.	8° H.A.	12° Dec.	12° H.A.	16° Dec.	16° H.A.	20° Dec.	20° H.A.	24° Dec.	24° H.A.	28° Dec.	28° H.A.	32° Dec.	32° H.A.	36° Dec.	36° H.A.	40° Dec.	40° H.A.	44° Dec.	44° H.A.	AZ.
00	09	180	13	180	17	180	21	180	25	180	29	180	33	180	37	180	41	180	45	180	49	180	00
4	09	176	13	176	17	176	21	176	25	176	29	176	33	176	37	176	41	176	45	176	49	176	4
8	09	172	13	172	17	172	21	172	25	172	29	172	33	172	37	172	41	171	45	171	49	171	8
12	09	168	13	168	17	168	21	168	25	168	29	167	33	167	37	167	41	167	45	167	49	167	12
16	09	164	13	164	17	164	21	164	25	163	29	163	33	163	37	163	41	163	45	163	49	162	16
20	09	160	13	160	17	160	21	159	25	159	29	159	33	159	37	159	41	159	45	158	49	158	20
24	09	156	13	156	17	155	21	155	25	155	29	155	33	155	37	155	41	154	45	154	49	154	24
28	08	152	12	152	16	151	20	151	24	151	28	151	32	151	36	150	40	150	44	150	48	149	28
32	08	148	12	148	16	147	20	147	24	147	28	147	32	146	36	146	40	146	44	146	48	145	32
36	08	144	12	143	16	143	20	143	24	143	28	143	32	142	36	142	40	142	44	141	48	141	36
40	08	140	12	139	16	139	20	139	24	139	28	138	32	138	36	138	40	137	44	137	48	137	40
44	08	136	12	135	16	135	20	135	24	135	28	134	32	134	36	134	40	133	44	133	47	132	44
48	07	132	11	131	15	131	19	131	23	131	27	130	31	130	35	129	39	129	43	129	47	128	48
52	07	128	11	127	15	127	19	127	23	126	27	126	31	126	35	125	39	125	43	124	47	124	52
56	07	124	11	123	15	123	19	123	23	122	27	122	31	122	35	121	39	121	43	120	47	120	56
60	06	120	10	119	14	119	18	119	22	118	26	118	30	118	34	117	38	117	42	116	46	116	60
64	06	116	10	115	14	115	18	115	22	114	26	114	30	113	34	113	38	113	42	112	46	111	64
68	06	112	10	111	14	111	18	111	22	110	26	110	30	109	34	109	38	108	42	108	46	107	68
72	06	108	10	107	14	107	17	107	21	106	25	106	29	105	33	105	37	104	41	104	45	103	72
76	05	104	09	103	13	103	17	103	21	102	25	102	29	101	33	101	37	100	41	100	45	99	76
80	05	100	09	99	13	99	17	99	21	98	25	98	29	97	33	97	37	96	41	96	45	95	80
84	04	96	08	95	12	95	16	95	20	94	24	94	28	93	32	93	36	92	40	92	44	91	84
88	04	92	08	91	12	91	16	91	20	90	24	90	28	89	32	89	36	88	40	88	44	87	88
92	04	88	08	87	12	87	16	87	20	86	24	86	28	85	32	85	36	84	40	84	44	83	92
96	03	84	07	83	11	83	15	83	19	82	23	82	27	81	31	81	35	80	39	80	43	79	96
100	03	80	07	79	11	79	15	79	19	78	23	78	27	77	31	77	35	77	39	76	43	75	100
104	03	76	07	75	11	75	15	75	19	74	23	74	27	74	31	73	35	73	39	72	43	71	104
108	02	72	06	71	10	71	14	71	18	70	22	70	26	70	30	69	34	69	38	68	42	68	108
112	02	68	06	67	10	67	14	67	18	66	22	66	26	66	30	65	34	65	38	64	42	64	112
116	02	64	06	63	10	63	14	63	18	62	22	62	26	62	30	61	34	61	38	60	42	60	116
120	01	60	05	59	09	59	13	59	17	59	21	58	25	58	29	57	33	57	37	57	41	56	120
124	01	56	05	56	09	55	13	55	17	55	21	54	25	54	29	54	33	53	37	53	41	52	124
128	01	52	05	52	09	51	13	51	17	51	21	50	25	50	29	50	33	49	37	49	41	48	128
132	01	48	05	48	09	47	13	47	17	47	21	46	25	46	29	46	33	46	37	45	41	45	132
136	00	44	04	44	08	43	12	43	16	43	20	43	24	42	28	42	32	42	36	41	40	41	136
140	00	40	04	40	08	39	12	39	16	39	20	39	24	38	28	38	32	38	36	38	40	37	140
144	00	36	04	36	08	35	12	35	16	35	20	35	24	35	28	34	32	34	36	34	40	33	144
148	*00*	32	04	32	08	32	12	31	16	31	20	31	24	31	28	31	32	30	36	30	40	30	148
152	*00*	28	04	28	08	28	12	27	16	27	20	27	24	27	28	27	32	26	36	26	40	26	152
156	*01*	24	03	24	07	24	11	24	15	23	19	23	23	23	27	23	31	23	35	22	39	22	156
160	*01*	20	03	20	07	20	11	20	15	19	19	19	23	19	27	19	31	19	35	19	39	19	160
164	*01*	16	03	16	07	16	11	16	15	16	19	15	23	15	27	15	31	15	35	15	39	15	164
168	*01*	12	03	12	07	12	11	12	15	12	19	12	23	12	27	11	31	11	35	11	39	11	168
172	*01*	08	03	08	07	08	11	08	15	08	19	08	23	08	27	08	31	08	35	07	39	07	172
176	*01*	04	03	04	07	04	11	04	15	04	19	04	23	04	27	04	31	04	35	04	39	04	176
180	*01*	00	03	00	07	00	11	00	15	00	19	00	23	00	27	00	31	00	35	00	39	00	180
	4°		8°		12°		16°		20°		24°		28°		32°		36°		40°		44°		

FIGURES IN ITALICS INDICATE THAT DECLINATION IS OF **CONTRARY NAME TO LATITUDE**

AZ.	48°		52°		56°		60°		64°		68°		72°		76°		80°		84°		88°		AZ.
	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	
00	53	180	57	180	61	180	65	180	69	180	73	180	77	180	81	180	85	180	89	180	87	00	00
4	53	176	57	175	61	175	65	175	69	175	73	175	77	175	81	174	85	172	89	157	87	03	4
8	53	171	57	171	61	171	65	171	69	170	73	170	77	169	81	168	85	164	89	138	87	05	8
12	53	167	57	166	61	166	65	166	69	165	73	165	77	164	81	162	85	157	88	125	87	08	12
16	53	162	57	162	61	162	65	161	69	161	73	160	77	158	81	156	85	149	88	115	87	10	16
20	53	158	57	157	61	157	65	156	69	156	73	155	77	153	81	150	84	142	88	107	87	12	20
24	53	153	57	153	61	152	64	152	68	151	72	150	76	148	80	144	84	136	88	101	87	14	24
28	52	149	56	149	60	148	64	147	68	146	72	145	76	142	80	138	84	129	87	96	87	16	28
32	52	145	56	144	60	143	64	143	68	141	72	140	76	137	80	133	84	123	87	92	87	18	32
36	52	140	56	140	60	139	64	138	68	137	72	135	76	132	80	128	83	118	86	88	86	19	36
40	52	136	56	135	60	135	64	134	68	132	72	130	75	128	79	123	83	113	86	84	86	20	40
44	51	132	55	131	59	130	63	129	67	128	71	126	75	123	79	118	83	108	86	81	86	21	44
48	51	127	55	127	59	126	63	125	67	123	71	121	75	118	79	113	82	103	85	78	86	22	48
52	51	123	55	122	59	122	63	120	67	119	71	117	75	114	78	109	82	99	85	75	86	23	52
56	51	119	55	118	59	117	63	116	66	115	70	112	74	109	78	104	82	94	85	72	86	23	56
60	50	115	54	114	58	113	62	112	66	110	70	108	74	105	78	100	81	90	84	69	86	23	60
64	50	111	54	110	58	109	62	108	66	106	70	104	74	101	77	96	81	86	84	66	86	24	64
68	50	107	54	106	58	105	62	103	65	102	69	100	73	96	77	91	81	83	84	64	85	24	68
72	49	103	53	102	57	101	61	99	65	98	69	96	73	92	77	87	80	79	83	61	85	23	72
76	49	98	53	98	57	97	61	95	65	94	69	91	73	88	76	84	80	75	83	59	85	23	76
80	49	94	53	94	57	93	60	91	64	90	68	88	72	84	76	80	80	72	83	56	85	23	80
84	48	90	52	90	56	89	60	87	64	86	68	84	72	81	76	76	79	69	83	54	85	23	84
88	48	86	52	86	56	85	60	83	64	82	68	80	72	77	75	73	79	65	82	52	85	22	88
92	48	83	52	82	56	81	59	79	63	78	67	76	71	73	75	69	79	62	82	49	85	22	92
96	47	79	51	78	55	77	59	76	63	74	67	72	71	69	75	65	78	59	82	47	84	21	96
100	47	75	51	74	55	73	59	72	63	70	67	68	71	66	74	62	78	56	82	44	84	20	100
104	47	71	51	70	54	69	58	68	62	67	66	65	70	62	74	59	78	53	81	42	84	20	104
108	46	67	50	66	54	65	58	64	62	63	66	61	70	59	74	55	78	50	81	40	84	19	108
112	46	63	50	62	54	62	58	61	62	59	66	58	70	55	73	52	77	47	81	38	84	18	112
116	46	59	50	59	54	58	58	57	61	56	65	54	69	52	73	49	77	44	81	35	84	17	116
120	45	56	49	55	53	54	57	53	61	52	65	51	69	48	73	46	77	41	80	33	84	16	120
124	45	52	49	51	53	50	57	50	61	48	65	47	69	45	73	42	77	38	80	31	84	15	124
128	45	48	49	47	53	47	57	46	61	45	65	44	69	42	72	39	76	35	80	29	84	14	128
132	45	44	49	44	52	43	56	42	60	41	64	40	68	38	72	36	76	33	80	26	83	13	132
136	44	40	48	40	52	39	56	39	60	38	64	37	68	35	72	33	76	30	80	24	83	12	136
140	44	37	48	36	52	36	56	35	60	34	64	33	68	32	72	30	76	27	80	22	83	11	140
144	44	33	48	33	52	32	56	32	60	31	64	30	68	29	72	27	76	24	80	20	83	10	144
148	44	29	48	29	52	29	56	28	60	27	64	27	68	25	72	24	76	22	79	18	83	09	148
152	44	26	48	25	52	25	56	24	60	24	63	23	67	22	71	21	75	19	79	15	83	08	152
156	43	22	47	22	51	21	55	21	59	20	63	20	67	19	71	18	75	16	79	13	83	07	156
160	43	18	47	18	51	18	55	17	59	17	63	17	67	16	71	15	75	13	79	11	83	06	160
164	43	15	47	14	51	14	55	14	59	14	63	13	67	13	71	12	75	11	79	09	83	05	164
168	43	11	47	11	51	11	55	10	59	10	63	10	67	09	71	09	75	08	79	07	83	03	168
172	43	07	47	07	51	07	55	07	59	07	63	07	67	06	71	06	75	05	79	04	83	02	172
176	43	04	47	04	51	04	55	03	59	03	63	03	67	03	71	03	75	03	79	02	83	01	176
180	43	00	47	00	51	00	55	00	59	00	63	00	67	00	71	00	75	00	79	00	83	00	180
	48°		52°		56°		60°		64°		68°		72°		76°		80°		84°		88°		

Lat. 86°

Lat. 87°

Lat. 88°

FIGURES IN ITALICS INDICATE THAT DECLINATION IS OF CONTRARY NAME TO LATITUDE

10—49722-1

H.A.	0° 00′ Alt. / Az.	0° 30′ Alt. / Az.	1° 00′ Alt. / Az.	1° 30′ Alt. / Az.	2° 00′ Alt. / Az.	2° 30′ Alt. / Az.	3° 00′ Alt. / Az.	3° 30′ Alt. / Az.
00			5 00.0 1.0 00 180.0	5 30.0 1.0 00 180.0	6 00.0 1.0 00 180.0	6 30.0 1.0 00 180.0	7 00.0 1.0 00 180.0	7 30.0 1.0 00 180.0
1				5 30.0 1.0 00 179.0	6 00.0 1.0 00 179.0	6 30.0 1.0 00 179.0	7 00.0 1.0 00 179.0	7 30.0 1.0 00 179.0
2				5 29.9 1.0 00 178.0	5 59.9 1.0 00 178.0	6 29.9 1.0 00 178.0	6 59.9 1.0 00 178.0	7 29.9 1.0 00 178.0
3				5 29.7 1.0 00 177.0	5 59.7 1.0 00 177.0	6 29.7 1.0 00 177.0	6 59.7 1.0 00 177.0	7 29.7 1.0 00 177.0
4				5 29.4 1.0 01 176.0	5 59.4 1.0 01 176.0	6 29.4 1.0 01 176.0	6 59.4 1.0 01 176.0	7 29.4 1.0 01 176.0
05				5 29.1 1.0 01 175.0	5 59.1 1.0 01 175.0	6 29.1 1.0 01 175.0	6 59.1 1.0 01 175.0	7 29.1 1.0 01 175.0
6				5 28.7 1.0 01 174.0	5 58.7 1.0 01 174.0	6 28.7 1.0 01 174.0	6 58.7 1.0 01 174.0	7 28.7 1.0 01 174.0
7				5 28.2 1.0 01 173.0	5 58.2 1.0 01 173.0	6 28.2 1.0 01 173.0	6 58.2 1.0 01 173.0	7 28.2 1.0 01 173.0
8				5 27.7 1.0 01 172.0	5 57.7 1.0 01 172.0	6 27.7 1.0 01 172.0	6 57.7 1.0 01 172.0	7 27.7 1.0 01 171.9
9				5 27.0 1.0 01 171.0	5 57.0 1.0 01 171.0	6 27.0 1.0 01 171.0	6 57.0 1.0 01 170.9	7 27.0 1.0 01 170.9
10				5 26.3 1.0 01 170.0	5 56.3 1.0 01 170.0	6 26.3 1.0 01 169.9	6 56.3 1.0 01 169.9	7 26.3 1.0 01 169.9
1				5 25.6 1.0 01 169.0	5 55.6 1.0 01 168.9	6 25.6 1.0 01 168.9	6 55.6 1.0 01 168.9	7 25.6 1.0 01 168.9
2				5 24.7 1.0 02 167.9	5 54.7 1.0 02 167.9	6 24.7 1.0 02 167.9	6 54.7 1.0 02 167.9	7 24.7 1.0 02 167.9
3				5 23.8 1.0 02 166.9	5 53.8 1.0 02 166.9	6 23.8 1.0 02 166.9	6 53.8 1.0 02 166.9	7 23.8 1.0 02 166.9
4				5 22.8 1.0 02 165.9	5 52.8 1.0 02 165.9	6 22.8 1.0 02 165.9	6 52.8 1.0 02 165.9	7 22.8 1.0 02 165.9
15				5 21.8 1.0 02 164.9	5 51.8 1.0 02 164.9	6 21.8 1.0 02 164.9	6 51.8 1.0 02 164.9	7 21.8 1.0 02 164.9
6				5 20.7 1.0 02 163.9	5 50.7 1.0 02 163.9	6 20.7 1.0 02 163.9	6 50.7 1.0 02 163.9	7 20.6 1.0 02 163.9
7				5 19.5 1.0 02 162.9	5 49.5 1.0 02 162.9	6 19.5 1.0 02 162.9	6 49.5 1.0 02 162.9	7 19.5 1.0 02 162.9
8				5 18.2 1.0 02 161.9	5 48.2 1.0 02 161.9	6 18.2 1.0 02 161.9	6 48.2 1.0 02 161.9	7 18.2 1.0 02 161.9
9				5 16.9 1.0 02 160.9	5 46.9 1.0 02 160.9	6 16.9 1.0 02 160.9	6 46.9 1.0 02 160.9	7 16.8 1.0 02 160.9
20				5 15.5 1.0 02 159.9	5 45.5 1.0 02 159.9	6 15.5 1.0 02 159.9	6 45.5 1.0 02 159.9	7 15.4 1.0 02 159.9
1				5 14.0 1.0 03 158.9	5 44.0 1.0 03 158.9	6 14.0 1.0 03 158.9	6 44.0 1.0 03 158.9	7 14.0 1.0 03 158.9
2				5 12.5 1.0 03 157.9	5 42.5 1.0 03 157.9	6 12.4 1.0 03 157.9	6 42.4 1.0 03 157.9	7 12.4 1.0 03 157.9
3				5 10.9 1.0 03 156.9	5 40.8 1.0 03 156.9	6 10.8 1.0 03 156.9	6 40.8 1.0 03 156.9	7 10.8 1.0 03 156.9
4				5 09.2 1.0 03 155.9	5 39.2 1.0 03 155.9	6 09.2 1.0 03 155.9	6 39.1 1.0 03 155.9	7 09.1 1.0 03 155.8
25				5 07.4 1.0 03 154.9	5 37.4 1.0 03 154.9	6 07.4 1.0 03 154.9	6 37.4 1.0 03 154.9	7 07.4 1.0 03 154.8
6				5 05.6 1.0 03 153.9	5 35.6 1.0 03 153.9	6 05.6 1.0 03 153.9	6 35.6 1.0 03 153.9	7 05.6 1.0 03 153.8
7				5 03.8 1.0 03 152.9	5 33.7 1.0 03 152.9	6 03.7 1.0 03 152.9	6 33.7 1.0 03 152.8	7 03.7 1.0 03 152.8
8				5 01.8 1.0 03 151.9	5 31.8 1.0 03 151.9	6 01.8 1.0 03 151.9	6 31.8 1.0 03 151.8	7 01.8 1.0 03 151.8
9					5 29.8 1.0 03 150.9	5 59.8 1.0 03 150.9	6 29.8 1.0 03 150.8	6 59.7 1.0 03 150.8
30					5 27.7 1.0 04 149.9	5 57.7 1.0 04 149.9	6 27.7 1.0 04 149.8	6 57.7 1.0 04 149.8
1					5 25.6 1.0 04 148.9	5 55.6 1.0 04 148.8	6 25.6 1.0 04 148.8	6 55.5 1.0 04 148.8
2					5 23.4 1.0 04 147.9	5 53.4 1.0 04 147.8	6 23.4 1.0 04 147.8	6 53.3 1.0 04 147.8
3					5 21.1 1.0 04 146.9	5 51.1 1.0 04 146.8	6 21.1 1.0 04 146.8	6 51.1 1.0 04 146.8
4					5 18.8 1.0 04 145.9	5 48.8 1.0 04 145.8	6 18.8 1.0 04 145.8	6 48.8 1.0 04 145.8
35					5 16.4 1.0 04 144.9	5 46.4 1.0 04 144.8	6 16.4 1.0 04 144.8	6 46.4 1.0 04 144.8
6					5 14.0 1.0 04 143.9	5 44.0 1.0 04 143.8	6 14.0 1.0 04 143.8	6 43.9 1.0 04 143.8
7					5 11.5 1.0 04 142.8	5 41.5 1.0 04 142.8	6 11.5 1.0 04 142.8	6 41.4 1.0 04 142.8
8					5 09.0 1.0 04 141.8	5 38.9 1.0 04 141.8	6 08.9 1.0 04 141.8	6 38.9 1.0 04 141.8
9					5 06.3 1.0 04 140.8	5 36.3 1.0 04 140.8	6 06.3 1.0 04 140.8	6 36.3 1.0 04 140.8
40					5 03.7 1.0 05 139.8	5 33.6 1.0 05 139.8	6 03.6 1.0 05 139.8	6 33.6 1.0 05 139.8
1					5 00.9 1.0 05 138.8	5 30.9 1.0 05 138.8	6 00.9 1.0 05 138.8	6 30.8 1.0 05 138.8
2						5 28.1 1.0 05 137.8	5 58.1 1.0 05 137.8	6 28.1 1.0 05 137.8
3						5 25.3 1.0 05 136.8	5 55.3 1.0 05 136.8	6 25.2 1.0 05 136.8
4						5 22.4 1.0 05 135.8	5 52.4 1.0 05 135.8	6 22.3 1.0 05 135.8
45						5 19.5 1.0 05 134.8	5 49.4 1.0 05 134.8	6 19.4 1.0 05 134.8
6						5 16.5 1.0 05 133.8	5 46.4 1.0 05 133.8	6 16.4 1.0 05 133.8
7						5 13.4 1.0 05 132.8	5 43.4 1.0 05 132.8	6 13.3 1.0 05 132.8
8						5 10.3 1.0 05 131.8	5 40.3 1.0 05 131.8	6 10.2 1.0 05 131.7
9						5 07.2 1.0 05 130.8	5 37.1 1.0 05 130.8	6 07.1 1.0 05 130.7
50						5 04.0 1.0 05 129.8	5 33.9 1.0 05 129.8	6 03.9 1.0 05 129.7
1						5 00.7 1.0 06 128.8	5 30.7 1.0 06 128.8	6 00.7 1.0 06 128.7
2							5 27.4 1.0 06 127.8	5 57.4 1.0 06 127.7
3							5 24.1 1.0 06 126.8	5 54.0 1.0 06 126.7
4							5 20.7 1.0 06 125.8	5 50.7 1.0 06 125.7
55							5 17.3 1.0 06 124.8	5 47.2 1.0 06 124.7
6							5 13.8 1.0 06 123.8	5 43.8 1.0 06 123.7
7							5 10.3 1.0 06 122.8	5 40.3 1.0 06 122.7
8							5 06.8 1.0 06 121.8	5 36.7 1.0 06 121.7
9							5 03.2 1.0 06 120.8	5 33.2 1.0 06 120.7
60								5 29.5 1.0 06 119.7
1								5 25.9 1.0 06 118.7
2								5 22.2 1.0 06 117.7
3								5 18.5 1.0 06 116.7
4								5 14.7 1.0 06 115.7
65								5 10.9 1.0 06 114.7
6								5 07.1 1.0 06 113.7
7								5 03.3 1.0 06 112.7

H.A.	° ' Alt. Az.	° ' Alt. Az.	° ' Alt. Az.	° ' Alt. Az.	° ' Alt. Az.	° ' Alt. Az.	° ' Alt. Az.	° ' Alt. Az.	H.A.
°	° ' Δd Δt °	° ' Δd Δt °	° ' Δd Δt °	° ' Δd Δt °	° ' Δd Δt °	° ' Δd Δt °	° ' Δd Δt °	° ' Δd Δt °	°
H.A.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	H.A.

Lat. 86°

Each cell lists: Alt. (° ′), Δd, Δt, Az. (°)

H.A.	4° 00′	4° 30′	5° 00′	5° 30′	6° 00′	6° 30′	7° 00′	7° 30′	H.A.
00	8 00.0 1.00 0 180.0	8 30.0 1.00 0 180.0	9 00.0 1.00 0 180.0	9 30.0 1.00 0 180.0	10 00.0 1.00 0 180.0	10 30.0 1.00 0 180.0	11 00.0 1.00 0 180.0	11 30.0 1.00 0 180.0	00
1	8 00.0 1.00 0 179.0	8 30.0 1.00 0 179.0	9 00.0 1.00 0 179.0	9 30.0 1.00 0 179.0	10 00.0 1.00 0 179.0	10 30.0 1.00 0 179.0	11 00.0 1.00 0 179.0	11 30.0 1.00 0 179.0	1
2	7 59.9 1.00 0 178.0	8 29.9 1.00 0 178.0	8 59.9 1.00 0 178.0	9 29.9 1.00 0 178.0	9 59.9 1.00 0 178.0	10 29.9 1.00 0 178.0	10 59.9 1.00 0 178.0	11 29.9 1.00 0 178.0	2
3	7 59.7 1.00 0 177.0	8 29.7 1.00 0 177.0	8 59.7 1.00 0 177.0	9 29.7 1.00 0 177.0	9 59.7 1.00 0 177.0	10 29.7 1.00 0 177.0	10 59.7 1.00 0 177.0	11 29.7 1.00 0 177.0	3
4	7 59.4 1.00 1 176.0	8 29.4 1.00 1 176.0	8 59.4 1.00 1 176.0	9 29.4 1.00 1 176.0	9 59.4 1.00 1 176.0	10 29.4 1.00 1 176.0	10 59.4 1.00 1 176.0	11 29.4 1.00 1 176.0	4
05	7 59.1 1.00 1 175.0	8 29.1 1.00 1 175.0	8 59.1 1.00 1 175.0	9 29.1 1.00 1 175.0	9 59.1 1.00 1 175.0	10 29.1 1.00 1 174.9	10 59.1 1.00 1 174.9	11 29.1 1.00 1 174.9	05
6	7 58.7 1.00 1 174.0	8 28.7 1.00 1 174.0	8 58.7 1.00 1 173.9	9 28.7 1.00 1 173.9	9 58.7 1.00 1 173.9	10 28.7 1.00 1 173.9	10 58.7 1.00 1 173.9	11 28.7 1.00 1 173.9	6
7	7 58.2 1.00 1 172.9	8 28.2 1.00 1 172.9	8 58.2 1.00 1 172.9	9 28.2 1.00 1 172.9	9 58.2 1.00 1 172.9	10 28.2 1.00 1 172.9	10 58.2 1.00 1 172.9	11 28.2 1.00 1 172.9	7
8	7 57.6 1.00 1 171.9	8 27.6 1.00 1 171.9	8 57.6 1.00 1 171.9	9 27.6 1.00 1 171.9	9 57.6 1.00 1 171.9	10 27.6 1.00 1 171.9	10 57.6 1.00 1 171.9	11 27.6 1.00 1 171.9	8
9	7 57.0 1.00 1 170.9	8 27.0 1.00 1 170.9	8 57.0 1.00 1 170.9	9 27.0 1.00 1 170.9	9 57.0 1.00 1 170.9	10 27.0 1.00 1 170.9	10 57.0 1.00 1 170.9	11 27.0 1.00 1 170.9	9
10	7 56.3 1.00 1 169.9	8 26.3 1.00 1 169.9	8 56.3 1.00 1 169.9	9 26.3 1.00 1 169.9	9 56.3 1.00 1 169.9	10 26.3 1.00 1 169.9	10 56.3 1.00 1 169.9	11 26.3 1.00 1 169.9	10
1	7 55.6 1.00 1 168.9	8 25.6 1.00 1 168.9	8 55.6 1.00 1 168.9	9 25.6 1.00 1 168.9	9 55.6 1.00 1 168.9	10 25.5 1.00 1 168.9	10 55.5 1.00 1 168.9	11 25.5 1.00 1 168.9	1
2	7 54.7 1.00 2 167.9	8 24.7 1.00 2 167.9	8 54.7 1.00 2 167.9	9 24.7 1.00 2 167.9	9 54.7 1.00 2 167.9	10 24.7 1.00 2 167.9	10 54.7 1.00 2 167.9	11 24.7 1.00 2 167.9	2
3	7 53.8 1.00 2 166.9	8 23.8 1.00 2 166.9	8 53.8 1.00 2 166.9	9 23.8 1.00 2 166.9	9 53.8 1.00 2 166.9	10 23.8 1.00 2 166.9	10 53.8 1.00 2 166.9	11 23.8 1.00 2 166.8	3
4	7 52.8 1.00 2 165.9	8 22.8 1.00 2 165.9	8 52.8 1.00 2 165.9	9 22.8 1.00 2 165.9	9 52.8 1.00 2 165.9	10 22.8 1.00 2 165.9	10 52.8 1.00 2 165.8	11 22.8 1.00 2 165.8	4
15	7 51.8 1.00 2 164.9	8 21.8 1.00 2 164.9	8 51.8 1.00 2 164.9	9 21.8 1.00 2 164.9	9 51.7 1.00 2 164.9	10 21.7 1.00 2 164.8	10 51.7 1.00 2 164.8	11 21.7 1.00 2 164.8	15
6	7 50.6 1.00 2 163.9	8 20.6 1.00 2 163.9	8 50.6 1.00 2 163.9	9 20.6 1.00 2 163.9	9 50.6 1.00 2 163.8	10 20.6 1.00 2 163.8	10 50.6 1.00 2 163.8	11 20.6 1.00 2 163.8	6
7	7 49.4 1.00 2 162.9	8 19.4 1.00 2 162.9	8 49.4 1.00 2 162.9	9 19.4 1.00 2 162.8	9 49.4 1.00 2 162.8	10 19.4 1.00 2 162.8	10 49.4 1.00 2 162.8	11 19.4 1.00 2 162.8	7
8	7 48.2 1.00 2 161.9	8 18.2 1.00 2 161.9	8 48.2 1.00 2 161.8	9 18.2 1.00 2 161.8	9 48.2 1.00 2 161.8	10 18.1 1.00 2 161.8	10 48.1 1.00 2 161.8	11 18.1 1.00 2 161.8	8
9	7 46.8 1.00 2 160.9	8 16.8 1.00 2 160.9	8 46.8 1.00 2 160.8	9 16.8 1.00 2 160.8	9 46.8 1.00 2 160.8	10 16.8 1.00 2 160.8	10 46.8 1.00 2 160.8	11 16.8 1.00 2 160.8	9
20	7 45.4 1.00 2 159.9	8 15.4 1.00 2 159.8	8 45.4 1.00 2 159.8	9 15.4 1.00 2 159.8	9 45.4 1.00 2 159.8	10 15.4 1.00 2 159.8	10 45.4 1.00 2 159.8	11 15.4 1.00 2 159.8	20
1	7 44.0 1.00 3 158.8	8 14.0 1.00 3 158.8	8 43.9 1.00 3 158.8	9 13.9 1.00 3 158.8	9 43.9 1.00 3 158.8	10 13.9 1.00 3 158.8	10 43.9 1.00 3 158.8	11 13.9 1.00 3 158.8	1
2	7 42.4 1.00 3 157.8	8 12.4 1.00 3 157.8	8 42.4 1.00 3 157.8	9 12.4 1.00 3 157.8	9 42.4 1.00 3 157.8	10 12.4 1.00 3 157.8	10 42.4 1.00 3 157.8	11 12.3 1.00 3 157.8	2
3	7 40.8 1.00 3 156.8	8 10.8 1.00 3 156.8	8 40.8 1.00 3 156.8	9 10.8 1.00 3 156.8	9 40.8 1.00 3 156.8	10 10.7 1.00 3 156.8	10 40.7 1.00 3 156.8	11 10.7 1.00 3 156.7	3
4	7 39.1 1.00 3 155.8	8 09.1 1.00 3 155.8	8 39.1 1.00 3 155.8	9 09.1 1.00 3 155.8	9 39.1 1.00 3 155.8	10 09.1 1.00 3 155.8	10 39.0 1.00 3 155.7	11 09.0 1.00 3 155.7	4
25	7 37.4 1.00 3 154.8	8 07.4 1.00 3 154.8	8 37.4 1.00 3 154.8	9 07.4 1.00 3 154.8	9 37.3 1.00 3 154.8	10 07.3 1.00 3 154.8	10 37.3 1.00 3 154.7	11 07.3 1.00 3 154.7	25
6	7 35.6 1.00 3 153.8	8 05.5 1.00 3 153.8	8 35.5 1.00 3 153.8	9 05.5 1.00 3 153.8	9 35.5 1.00 3 153.8	10 05.5 1.00 3 153.7	10 35.5 1.00 3 153.7	11 05.5 1.00 3 153.7	6
7	7 33.7 1.00 3 152.8	8 03.7 1.00 3 152.8	8 33.7 1.00 3 152.8	9 03.6 1.00 3 152.8	9 33.6 1.00 3 152.8	10 03.6 1.00 3 152.7	10 33.6 1.00 3 152.7	11 03.6 1.00 3 152.7	7
8	7 31.7 1.00 3 151.8	8 01.7 1.00 3 151.8	8 31.7 1.00 3 151.8	9 01.7 1.00 3 151.8	9 31.7 1.00 3 151.7	10 01.7 1.00 3 151.7	10 31.6 1.00 3 151.7	11 01.6 1.00 3 151.7	8
9	7 29.7 1.00 3 150.8	7 59.7 1.00 3 150.8	8 29.7 1.00 3 150.8	8 59.7 1.00 3 150.8	9 29.7 1.00 3 150.7	9 59.6 1.00 3 150.7	10 29.6 1.00 3 150.7	10 59.6 1.00 3 150.7	9
30	7 27.7 1.00 4 149.8	7 57.6 1.00 4 149.8	8 27.6 1.00 4 149.8	8 57.6 1.00 4 149.7	9 27.6 1.00 4 149.7	9 57.6 1.00 4 149.7	10 27.5 1.00 4 149.7	10 57.5 1.00 4 149.7	30
1	7 25.5 1.00 4 148.8	7 55.5 1.00 4 148.8	8 25.5 1.00 4 148.8	8 55.5 1.00 4 148.7	9 25.4 1.00 4 148.7	9 55.4 1.00 4 148.7	10 25.4 1.00 4 148.7	10 55.4 1.00 4 148.7	1
2	7 23.3 1.00 4 147.8	7 53.3 1.00 4 147.8	8 23.3 1.00 4 147.8	8 53.3 1.00 4 147.7	9 23.2 1.00 4 147.7	9 53.2 1.00 4 147.7	10 23.2 1.00 4 147.7	10 53.2 1.00 4 147.7	2
3	7 21.1 1.00 4 146.8	7 51.0 1.00 4 146.8	8 21.0 1.00 4 146.7	8 51.0 1.00 4 146.7	9 21.0 1.00 4 146.7	9 50.9 1.00 4 146.7	10 20.9 1.00 4 146.7	10 50.9 1.00 4 146.6	3
4	7 18.7 1.00 4 145.8	7 48.7 1.00 4 145.8	8 18.7 1.00 4 145.7	8 48.7 1.00 4 145.7	9 18.6 1.00 4 145.7	9 48.6 1.00 4 145.7	10 18.6 1.00 4 145.7	10 48.6 1.00 4 145.6	4
35	7 16.4 1.00 4 144.8	7 46.3 1.00 4 144.8	8 16.3 1.00 4 144.7	8 46.3 1.00 4 144.7	9 16.3 1.00 4 144.7	9 46.2 1.00 4 144.7	10 16.2 1.00 4 144.7	10 46.2 1.00 4 144.6	35
6	7 13.9 1.00 4 143.8	7 43.9 1.00 4 143.7	8 13.9 1.00 4 143.7	8 43.8 1.00 4 143.7	9 13.8 1.00 4 143.7	9 43.8 1.00 4 143.7	10 13.8 1.00 4 143.6	10 43.7 1.00 4 143.6	6
7	7 11.4 1.00 4 142.8	7 41.4 1.00 4 142.7	8 11.3 1.00 4 142.7	8 41.3 1.00 4 142.7	9 11.3 1.00 4 142.7	9 41.3 1.00 4 142.7	10 11.2 1.00 4 142.6	10 41.2 1.00 4 142.6	7
8	7 08.8 1.00 4 141.8	7 38.8 1.00 4 141.7	8 08.8 1.00 4 141.7	8 38.8 1.00 4 141.7	9 08.7 1.00 4 141.7	9 38.7 1.00 4 141.6	10 08.7 1.00 4 141.6	10 38.6 1.00 4 141.6	8
9	7 06.2 1.00 4 140.7	7 36.2 1.00 4 140.7	8 06.2 1.00 4 140.7	8 36.1 1.00 4 140.7	9 06.1 1.00 4 140.7	9 36.1 1.00 4 140.6	10 06.0 1.00 4 140.6	10 36.0 1.00 4 140.6	9
40	7 03.5 1.00 5 139.7	7 33.5 1.00 5 139.7	8 03.5 1.00 5 139.7	8 33.5 1.00 5 139.7	9 03.4 1.00 5 139.7	9 33.4 1.00 5 139.6	10 03.4 1.00 5 139.6	10 33.3 1.00 5 139.6	40
1	7 00.8 1.00 5 138.7	7 30.8 1.00 5 138.7	8 00.7 1.00 5 138.7	8 30.7 1.00 5 138.7	9 00.7 1.00 5 138.7	9 30.7 1.00 5 138.6	10 00.6 1.00 5 138.6	10 30.6 1.00 5 138.6	1
2	6 58.0 1.00 5 137.7	7 28.0 1.00 5 137.7	7 58.0 1.00 5 137.7	8 27.9 1.00 5 137.7	8 57.9 1.00 5 137.6	9 27.9 1.00 5 137.6	9 57.8 1.00 5 137.6	10 27.8 1.00 5 137.6	2
3	6 55.2 1.00 5 136.7	7 25.2 1.00 5 136.7	7 55.1 1.00 5 136.7	8 25.1 1.00 5 136.7	8 55.0 1.00 5 136.6	9 25.0 1.00 5 136.6	9 55.0 1.00 5 136.6	10 24.9 1.00 5 136.6	3
4	6 52.3 1.00 5 135.7	7 22.3 1.00 5 135.7	7 52.2 1.00 5 135.7	8 22.2 1.00 5 135.7	8 52.1 1.00 5 135.6	9 22.1 1.00 5 135.6	9 52.1 1.00 5 135.6	10 22.0 1.00 5 135.6	4
45	6 49.3 1.00 5 134.7	7 19.3 1.00 5 134.7	7 49.3 1.00 5 134.7	8 19.2 1.00 5 134.7	8 49.2 1.00 5 134.6	9 19.2 1.00 5 134.6	9 49.1 1.00 5 134.6	10 19.1 1.00 5 134.6	45
6	6 46.3 1.00 5 133.7	7 16.3 1.00 5 133.7	7 46.3 1.00 5 133.7	8 16.2 1.00 5 133.7	8 46.2 1.00 5 133.6	9 16.2 1.00 5 133.6	9 46.1 1.00 5 133.6	10 16.1 1.00 5 133.5	6
7	6 43.3 1.00 5 132.7	7 13.3 1.00 5 132.7	7 43.2 1.00 5 132.7	8 13.2 1.00 5 132.6	8 43.1 1.00 5 132.6	9 13.1 1.00 5 132.6	9 43.1 1.00 5 132.6	10 13.0 1.00 5 132.5	7
8	6 40.2 1.00 5 131.7	7 10.2 1.00 5 131.7	7 40.1 1.00 5 131.7	8 10.1 1.00 5 131.6	8 40.0 1.00 5 131.6	9 10.0 1.00 5 131.6	9 39.9 1.00 5 131.6	10 09.9 1.00 5 131.5	8
9	6 37.0 1.00 5 130.7	7 07.0 1.00 5 130.7	7 37.0 1.00 5 130.7	8 06.9 1.00 5 130.6	8 36.9 1.00 5 130.6	9 06.8 1.00 5 130.6	9 36.8 1.00 5 130.6	10 06.7 1.00 5 130.5	9
50	6 33.9 1.00 5 129.7	7 03.8 1.00 5 129.7	7 33.8 1.00 5 129.7	8 03.7 1.00 5 129.6	8 33.7 1.00 5 129.6	9 03.6 1.00 5 129.6	9 33.6 1.00 5 129.6	10 03.5 1.00 5 129.5	50
1	6 30.6 1.00 5 128.7	7 00.6 1.00 6 128.7	7 30.5 1.00 5 128.7	8 00.5 1.00 5 128.6	8 30.4 1.00 6 128.6	9 00.4 1.00 6 128.6	9 30.3 1.00 5 128.5	10 00.3 1.00 6 128.5	1
2	6 27.3 1.00 6 127.7	6 57.3 1.00 6 127.7	7 27.2 1.00 6 127.7	7 57.2 1.00 6 127.6	8 27.1 1.00 6 127.6	8 57.1 1.00 6 127.6	9 27.0 1.00 6 127.5	9 57.0 1.00 6 127.5	2
3	6 24.0 1.00 6 126.7	6 53.9 1.00 6 126.7	7 23.9 1.00 6 126.7	7 53.8 1.00 6 126.6	8 23.8 1.00 6 126.6	8 53.7 1.00 6 126.6	9 23.7 1.00 6 126.5	9 53.7 1.00 6 126.5	3
4	6 20.6 1.00 6 125.7	6 50.6 1.00 6 125.7	7 20.5 1.00 6 125.6	7 50.5 1.00 6 125.6	8 20.4 1.00 6 125.6	8 50.4 1.00 6 125.6	9 20.3 1.00 6 125.5	9 50.3 1.00 6 125.5	4
55	6 17.2 1.00 6 124.7	6 47.1 1.00 6 124.7	7 17.1 1.00 6 124.6	7 47.0 1.00 6 124.6	8 17.0 1.00 6 124.6	8 46.9 1.00 6 124.6	9 16.9 1.00 6 124.5	9 46.8 1.00 6 124.5	55
6	6 13.7 1.00 6 123.7	6 43.7 1.00 6 123.7	7 13.6 1.00 6 123.6	7 43.6 1.00 6 123.6	8 13.5 1.00 6 123.6	8 43.5 1.00 6 123.6	9 13.4 1.00 6 123.5	9 43.4 1.00 6 123.5	6
7	6 10.2 1.00 6 122.7	6 40.2 1.00 6 122.7	7 10.1 1.00 6 122.6	7 40.1 1.00 6 122.6	8 10.0 1.00 6 122.6	8 40.0 1.00 6 122.6	9 09.9 1.00 6 122.5	9 39.9 1.00 6 122.5	7
8	6 06.7 1.00 6 121.7	6 36.6 1.00 6 121.7	7 06.6 1.00 6 121.6	7 36.5 1.00 6 121.6	8 06.5 1.00 6 121.6	8 36.4 1.00 6 121.5	9 06.4 1.00 6 121.5	9 36.3 1.00 6 121.5	8
9	6 03.1 1.00 6 120.7	6 33.0 1.00 6 120.7	7 03.0 1.00 6 120.6	7 32.9 1.00 6 120.6	8 02.9 1.00 6 120.6	8 32.8 1.00 6 120.5	9 02.8 1.00 6 120.5	9 32.7 1.00 6 120.5	9
60	5 59.5 1.00 6 119.7	6 29.4 1.00 6 119.7	6 59.4 1.00 6 119.6	7 29.3 1.00 6 119.6	7 59.3 1.00 6 119.6	8 29.2 1.00 6 119.5	8 59.2 1.00 6 119.5	9 29.1 1.00 6 119.5	60
1	5 55.8 1.00 6 118.7	6 25.8 1.00 6 118.7	6 55.7 1.00 6 118.6	7 25.7 1.00 6 118.6	7 55.6 1.00 6 118.6	8 25.5 1.00 6 118.5	8 55.5 1.00 6 118.5	9 25.4 1.00 6 118.5	1
2	5 52.1 1.00 6 117.7	6 22.1 1.00 6 117.7	6 52.0 1.00 6 117.6	7 22.0 1.00 6 117.6	7 51.9 1.00 6 117.6	8 21.9 1.00 6 117.5	8 51.8 1.00 6 117.5	9 21.7 1.00 6 117.5	2
3	5 48.4 1.00 6 116.7	6 18.4 1.00 6 116.7	6 48.3 1.00 6 116.6	7 18.2 1.00 6 116.6	7 48.2 1.00 6 116.6	8 18.1 1.00 6 116.5	8 48.1 1.00 6 116.5	9 18.0 1.00 6 116.5	3
4	5 44.7 1.00 6 115.7	6 14.6 1.00 6 115.7	6 44.5 1.00 6 115.6	7 14.5 1.00 6 115.6	7 44.4 1.00 6 115.6	8 14.4 1.00 6 115.5	8 44.3 1.00 6 115.5	9 14.2 1.00 6 115.5	4
65	5 40.9 1.00 6 114.7	6 10.8 1.00 6 114.7	6 40.8 1.00 6 114.6	7 10.7 1.00 6 114.6	7 40.6 1.00 6 114.6	8 10.6 1.00 6 114.5	8 40.5 1.00 6 114.5	9 10.5 1.00 6 114.5	65
6	5 37.1 1.00 6 113.7	6 07.1 1.00 6 113.7	6 36.9 1.00 6 113.6	7 06.9 1.00 6 113.6	7 36.8 1.00 6 113.6	8 06.8 1.00 6 113.5	8 36.7 1.00 6 113.5	9 06.6 1.00 6 113.5	6
7	5 33.2 1.00 6 112.7	6 03.2 1.00 6 112.7	6 33.1 1.00 6 112.6	7 03.0 1.00 6 112.6	7 33.0 1.00 6 112.6	8 02.9 1.00 6 112.5	8 32.8 1.00 6 112.5	9 02.8 1.00 6 112.5	7
8	5 29.3 1.00 6 111.7	5 59.3 1.00 7 111.7	6 29.2 1.00 7 111.6	6 59.1 1.00 7 111.6	7 29.1 1.00 7 111.6	7 59.0 1.00 6 111.5	8 29.0 1.00 6 111.5	8 58.9 1.00 6 111.5	8
9	5 25.4 1.00 7 110.7	5 55.4 1.00 7 110.7	6 25.3 1.00 7 110.6	6 55.2 1.00 7 110.6	7 25.2 1.00 7 110.6	7 55.1 1.00 7 110.5	8 25.0 1.00 7 110.5	8 55.0 1.00 7 110.5	9
70	5 21.5 1.00 7 109.7	5 51.4 1.00 7 109.7	6 21.4 1.00 7 109.6	6 51.3 1.00 7 109.6	7 21.2 1.00 7 109.6	7 51.2 1.00 7 109.5	8 21.1 1.00 7 109.5	8 51.0 1.00 7 109.5	70
1	5 17.6 1.00 7 108.7	5 47.5 1.00 7 108.7	6 17.4 1.00 7 108.6	6 47.4 1.00 7 108.6	7 17.3 1.00 7 108.6	7 47.2 1.00 7 108.5	8 17.2 1.00 7 108.5	8 47.1 1.00 7 108.5	1
2	5 13.6 1.00 7 107.7	5 43.5 1.00 7 107.7	6 13.4 1.00 7 107.6	6 43.4 1.00 7 107.6	7 13.3 1.00 7 107.6	7 43.2 1.00 7 107.5	8 13.2 1.00 7 107.5	8 43.1 1.00 7 107.5	2
3	5 09.6 1.00 7 106.7	5 39.5 1.00 7 106.7	6 09.4 1.00 7 106.6	6 39.4 1.00 7 106.6	7 09.3 1.00 7 106.6	7 39.2 1.00 7 106.5	8 09.2 1.00 7 106.5	8 39.1 1.00 7 106.5	3
4	5 05.6 1.00 7 105.7	5 35.5 1.00 7 105.7	6 05.4 1.00 7 105.6	6 35.4 1.00 7 105.6	7 05.3 1.00 7 105.6	7 35.2 1.00 7 105.5	8 05.1 1.00 7 105.5	8 35.1 1.00 7 105.5	4
75	5 01.5 1.00 7 104.7	5 31.5 1.00 7 104.7	6 01.4 1.00 7 104.6	6 31.3 1.00 7 104.6	7 01.2 1.00 7 104.6	7 31.2 1.00 7 104.5	8 01.1 1.00 7 104.5	8 31.0 1.00 7 104.5	75
6		5 27.4 1.00 7 103.7	5 57.3 1.00 7 103.6	6 27.3 1.00 7 103.6	6 57.2 1.00 7 103.6	7 27.1 1.00 7 103.5	7 57.0 1.00 7 103.5	8 27.0 1.00 7 103.5	6
7		5 23.3 1.00 7 102.7	5 53.2 1.00 7 102.6	6 23.2 1.00 7 102.6	6 53.1 1.00 7 102.6	7 23.0 1.00 7 102.5	7 53.0 1.00 7 102.5	8 22.9 1.00 7 102.5	7
8		5 19.2 1.00 7 101.7	5 49.2 1.00 7 101.6	6 19.1 1.00 7 101.6	6 49.0 1.00 7 101.6	7 18.9 1.00 7 101.5	7 48.9 1.00 7 101.5	8 18.8 1.00 7 101.5	8
9		5 15.1 1.00 7 100.7	5 45.1 1.00 7 100.6	6 15.0 1.00 7 100.6	6 44.9 1.00 7 100.6	7 14.8 1.00 7 100.5	7 44.8 1.00 7 100.5	8 14.7 1.00 7 100.5	9
80		5 11.0 1.00 7 99.7	5 40.9 1.00 7 99.6	6 10.9 1.00 7 99.6	6 40.8 1.00 7 99.6	7 10.7 1.00 7 99.5	7 40.6 1.00 7 99.5	8 10.6 1.00 7 99.5	80
1		5 06.9 1.00 7 98.7	5 36.8 1.00 7 98.6	6 06.7 1.00 7 98.6	6 36.7 1.00 7 98.6	7 06.6 1.00 7 98.5	7 36.5 1.00 7 98.5	8 06.4 1.00 7 98.5	1
2		5 02.7 1.00 7 97.7	5 32.7 1.00 7 97.6	6 02.6 1.00 7 97.6	6 32.5 1.00 7 97.6	7 02.4 1.00 7 97.5	7 32.4 1.00 7 97.5	8 02.3 1.00 7 97.5	2
3			5 28.5 1.00 7 96.6	5 58.5 1.00 7 96.6	6 28.4 1.00 7 96.6	6 58.3 1.00 7 96.5	7 28.2 1.00 7 96.5	7 58.1 1.00 7 96.5	3
4			5 24.3 1.00 7 95.6	5 54.3 1.00 7 95.6	6 24.2 1.00 7 95.6	6 54.1 1.00 7 95.5	7 24.0 1.00 7 95.5	7 54.0 1.00 7 95.5	4
85			5 20.2 1.00 7 94.6	5 50.1 1.00 7 94.6	6 20.0 1.00 7 94.6	6 50.0 1.00 7 94.5	7 19.9 1.00 7 94.5	7 49.8 1.00 7 94.5	85
6			5 16.0 1.00 7 93.6	5 45.9 1.00 7 93.6	6 15.9 1.00 7 93.6	6 45.8 1.00 7 93.5	7 15.7 1.00 7 93.5	7 45.6 1.00 7 93.5	6
7			5 11.8 1.00 7 92.6	5 41.7 1.00 7 92.6	6 11.7 1.00 7 92.6	6 41.6 1.00 7 92.5	7 11.5 1.00 7 92.5	7 41.5 1.00 7 92.5	7
8			5 07.6 1.00 7 91.6	5 37.6 1.00 7 91.6	6 07.5 1.00 7 91.6	6 37.4 1.00 7 91.5	7 07.3 1.00 7 91.5	7 37.3 1.00 7 91.5	8
9			5 03.5 1.00 7 90.6	5 33.4 1.00 7 90.6	6 03.3 1.00 7 90.6	6 33.2 1.00 7 90.5	7 03.2 1.00 7 90.5	7 33.1 1.00 7 90.5	9
90			5 29.2 1.00 7 89.6	5 59.1 1.00 7 89.6	6 29.0 1.00 7 89.5	6 59.0 1.00 7 89.5	7 28.9 1.00 7 89.5		90

H.A.	4° 00' Alt. Δd Δt Az.	4° 30' Alt. Δd Δt Az.	5° 00' Alt. Δd Δt Az.	5° 30' Alt. Δd Δt Az.	6° 00' Alt. Δd Δt Az.	6° 30' Alt. Δd Δt Az.	7° 00' Alt. Δd Δt Az.	7° 30' Alt. Δd Δt Az.	H.A.
91				5 25.0 1.007 88.6	5 54.9 1.007 88.6	6 24.9 1.007 88.5	6 54.8 1.007 88.5	7 24.7 1.007 88.5	91
2				5 20.8 1.007 87.6	5 50.8 1.007 87.6	6 20.7 1.007 87.6	6 50.6 1.007 87.5	7 20.5 1.007 87.5	2
3				5 16.6 1.007 86.6	5 46.6 1.007 86.6	6 16.5 1.007 86.6	6 46.4 1.007 86.5	7 16.4 1.007 86.5	3
4				5 12.5 1.007 85.6	5 42.4 1.007 85.6	6 12.3 1.007 85.6	6 42.2 1.007 85.5	7 12.2 1.007 85.5	4
95				5 08.3 1.007 84.6	5 38.2 1.007 84.6	6 08.2 1.007 84.6	6 38.1 1.007 84.5	7 08.0 1.007 84.5	95
6				5 04.1 1.007 83.6	5 34.1 1.007 83.6	6 04.0 1.007 83.6	6 33.9 1.007 83.5	7 03.8 1.007 83.5	6
7				5 00.0 1.007 82.6	5 29.9 1.007 82.6	5 59.8 1.007 82.6	6 29.8 1.007 82.5	6 59.7 1.007 82.5	7
8					5 25.8 1.007 81.6	5 55.7 1.007 81.6	6 25.6 1.007 81.5	6 55.5 1.007 81.5	8
9					5 21.6 1.007 80.6	5 51.6 1.007 80.6	6 21.5 1.007 80.5	6 51.4 1.007 80.5	9
100					5 17.5 1.007 79.6	5 47.4 1.007 79.6	6 17.4 1.007 79.5	6 47.3 1.007 79.5	100
1					5 13.4 1.007 78.6	5 43.3 1.007 78.6	6 13.3 1.007 78.5	6 43.2 1.007 78.5	1
2					5 09.3 1.007 77.6	5 39.2 1.007 77.6	6 09.2 1.007 77.5	6 39.1 1.007 77.5	2
3					5 05.2 1.007 76.6	5 35.1 1.007 76.6	6 05.1 1.007 76.6	6 35.0 1.007 76.5	3
4					5 01.2 1.007 75.6	5 31.1 1.007 75.6	6 01.0 1.007 75.6	6 30.9 1.007 75.5	4
105						5 27.0 1.007 74.6	5 57.0 1.007 74.6	6 26.9 1.007 74.5	105
6						5 23.0 1.007 73.6	5 52.9 1.007 73.6	6 22.9 1.007 73.5	6
7						5 19.0 1.007 72.6	5 48.9 1.007 72.6	6 18.9 1.007 72.5	7
8						5 15.0 1.007 71.6	5 45.0 1.007 71.6	6 14.9 1.007 71.5	8
9						5 11.1 1.007 70.6	5 41.0 1.007 70.6	6 10.9 1.007 70.5	9
110						5 07.1 1.007 69.6	5 37.1 1.006 69.6	6 07.0 1.006 69.6	110
1						5 03.2 1.006 68.6	5 33.2 1.006 68.6	6 03.1 1.006 68.6	1
2							5 29.3 1.006 67.6	5 59.2 1.006 67.6	2
3							5 25.4 1.006 66.6	5 55.4 1.006 66.6	3
4							5 21.6 1.006 65.6	5 51.5 1.006 65.6	4
115							5 17.8 1.006 64.6	5 47.7 1.006 64.6	115
6							5 14.0 1.006 63.6	5 44.0 1.006 63.6	6
7							5 10.3 1.006 62.6	5 40.2 1.006 62.6	7
8							5 06.6 1.006 61.6	5 36.5 1.006 61.6	8
9							5 02.9 1.006 60.6	5 32.9 1.006 60.6	9
120								5 29.2 1.006 59.6	120
1								5 25.7 1.006 58.6	1
2								5 22.1 1.006 57.6	2
3								5 18.6 1.006 56.6	3
4								5 15.1 1.006 55.6	4
125								5 11.7 1.006 54.6	125
6								5 08.3 1.006 53.6	6
7								5 04.9 1.006 52.6	7
8								5 01.6 1.005 51.7	8

16—48722-1

Each cell is formatted: Alt (° ') · Δd Δt · Az (°)

H.A.	8° 00'	8° 30'	9° 00'	9° 30'	10° 00'	10° 30'	11° 00'	11° 30'	H.A.
00	12 00.0 1.0 00 180.0	12 30.0 1.0 00 180.0	13 00.0 1.0 00 180.0	13 30.0 1.0 00 180.0	14 00.0 1.0 00 180.0	14 30.0 1.0 00 180.0	15 00.0 1.0 00 180.0	15 30.0 1.0 00 180.0	00
1	12 00.0 1.0 00 179.0	12 30.0 1.0 00 179.0	13 00.0 1.0 00 179.0	13 30.0 1.0 00 179.0	14 00.0 1.0 00 179.0	14 30.0 1.0 00 179.0	15 00.0 1.0 00 179.0	15 30.0 1.0 00 179.0	1
2	11 59.9 1.0 00 178.0	12 29.9 1.0 00 178.0	12 59.9 1.0 00 178.0	13 29.9 1.0 00 178.0	13 59.9 1.0 00 178.0	14 29.9 1.0 00 178.0	14 59.9 1.0 00 178.0	15 29.9 1.0 00 178.0	2
3	11 59.7 1.0 00 177.0	12 29.7 1.0 00 177.0	12 59.7 1.0 00 177.0	13 29.7 1.0 00 177.0	13 59.7 1.0 00 177.0	14 29.7 1.0 00 177.0	14 59.7 1.0 00 177.0	15 29.7 1.0 00 176.9	3
4	11 59.4 1.0 01 176.0	12 29.4 1.0 01 175.9	12 59.4 1.0 01 175.9	13 29.4 1.0 01 175.9	13 59.4 1.0 01 175.9	14 29.4 1.0 01 175.9	14 59.4 1.0 01 175.9	15 29.4 1.0 01 175.9	4
05	11 59.1 1.0 01 174.9	12 29.1 1.0 01 174.9	12 59.1 1.0 01 174.9	13 29.1 1.0 01 174.9	13 59.1 1.0 01 174.9	14 29.1 1.0 01 174.9	14 59.1 1.0 01 174.9	15 29.1 1.0 01 174.9	05
6	11 58.7 1.0 01 173.9	12 28.7 1.0 01 173.9	12 58.7 1.0 01 173.9	13 28.7 1.0 01 173.9	13 58.7 1.0 01 173.9	14 28.7 1.0 01 173.9	14 58.7 1.0 01 173.9	15 28.7 1.0 01 173.9	6
7	11 58.2 1.0 01 172.9	12 28.2 1.0 01 172.9	12 58.2 1.0 01 172.9	13 28.2 1.0 01 172.9	13 58.2 1.0 01 172.9	14 28.2 1.0 01 172.9	14 58.2 1.0 01 172.9	15 28.2 1.0 01 172.9	7
8	11 57.6 1.0 01 171.9	12 27.6 1.0 01 171.9	12 57.6 1.0 01 171.9	13 27.6 1.0 01 171.9	13 57.6 1.0 01 171.9	14 27.6 1.0 01 171.9	14 57.6 1.0 01 171.9	15 27.6 1.0 01 171.9	8
9	11 57.0 1.0 01 170.9	12 27.0 1.0 01 170.9	12 57.0 1.0 01 170.9	13 27.0 1.0 01 170.9	13 57.0 1.0 01 170.9	14 27.0 1.0 01 170.9	14 57.0 1.0 01 170.9	15 27.0 1.0 01 170.8	9
10	11 56.3 1.0 01 169.9	12 26.3 1.0 01 169.9	12 56.3 1.0 01 169.9	13 26.3 1.0 01 169.9	13 56.3 1.0 01 169.9	14 26.3 1.0 01 169.8	14 56.3 1.0 01 169.8	15 26.3 1.0 01 169.8	10
1	11 55.5 1.0 01 168.9	12 25.5 1.0 01 168.9	12 55.5 1.0 01 168.9	13 25.5 1.0 01 168.8	13 55.5 1.0 01 168.8	14 25.5 1.0 01 168.8	14 55.5 1.0 01 168.8	15 25.5 1.0 01 168.8	1
2	11 54.7 1.0 02 167.9	12 24.7 1.0 02 167.8	12 54.7 1.0 02 167.8	13 24.7 1.0 02 167.8	13 54.7 1.0 02 167.8	14 24.7 1.0 02 167.8	14 54.7 1.0 02 167.8	15 24.7 1.0 02 167.8	2
3	11 53.8 1.0 02 166.8	12 23.8 1.0 02 166.8	12 53.8 1.0 02 166.8	13 23.8 1.0 02 166.8	13 53.8 1.0 02 166.8	14 23.8 1.0 02 166.8	14 53.8 1.0 02 166.8	15 23.8 1.0 02 166.8	3
4	11 52.8 1.0 02 165.8	12 22.8 1.0 02 165.8	12 52.8 1.0 02 165.8	13 22.8 1.0 02 165.8	13 52.8 1.0 02 165.8	14 22.8 1.0 02 165.8	14 52.8 1.0 02 165.8	15 22.8 1.0 02 165.8	4
15	11 51.7 1.0 02 164.8	12 21.7 1.0 02 164.8	12 51.7 1.0 02 164.8	13 21.7 1.0 02 164.8	13 51.7 1.0 02 164.8	14 21.7 1.0 02 164.8	14 51.7 1.0 02 164.8	15 21.7 1.0 02 164.8	15
6	11 50.6 1.0 02 163.8	12 20.6 1.0 02 163.8	12 50.6 1.0 02 163.8	13 20.6 1.0 02 163.8	13 50.6 1.0 02 163.8	14 20.6 1.0 02 163.8	14 50.6 1.0 02 163.7	15 20.6 1.0 02 163.7	6
7	11 49.4 1.0 02 162.8	12 19.4 1.0 02 162.8	12 49.4 1.0 02 162.8	13 19.4 1.0 02 162.8	13 49.4 1.0 02 162.8	14 19.4 1.0 02 162.7	14 49.4 1.0 02 162.7	15 19.3 1.0 02 162.7	7
8	11 48.1 1.0 02 161.8	12 18.1 1.0 02 161.8	12 48.1 1.0 02 161.8	13 18.1 1.0 02 161.7	13 48.1 1.0 02 161.7	14 18.1 1.0 02 161.7	14 48.1 1.0 02 161.7	15 18.1 1.0 02 161.7	8
9	11 46.8 1.0 02 160.8	12 16.8 1.0 02 160.8	12 46.8 1.0 02 160.7	13 16.8 1.0 02 160.7	13 46.7 1.0 02 160.7	14 16.7 1.0 02 160.7	14 46.7 1.0 02 160.7	15 16.7 1.0 02 160.7	9
20	11 45.4 1.0 02 159.8	12 15.4 1.0 02 159.7	12 45.3 1.0 02 159.7	13 15.3 1.0 02 159.7	13 45.3 1.0 02 159.7	14 15.3 1.0 02 159.7	14 45.3 1.0 02 159.7	15 15.3 1.0 02 159.7	20
1	11 43.9 1.0 03 158.7	12 13.9 1.0 03 158.7	12 43.9 1.0 03 158.7	13 13.9 1.0 03 158.7	13 43.8 1.0 03 158.7	14 13.8 1.0 03 158.7	14 43.8 1.0 03 158.7	15 13.8 1.0 03 158.7	1
2	11 42.3 1.0 03 157.7	12 12.3 1.0 03 157.7	12 42.3 1.0 03 157.7	13 12.3 1.0 03 157.7	13 42.3 1.0 03 157.7	14 12.3 1.0 03 157.7	14 42.3 1.0 03 157.7	15 12.3 1.0 03 157.6	2
3	11 40.7 1.0 03 156.7	12 10.7 1.0 03 156.7	12 40.7 1.0 03 156.7	13 10.7 1.0 03 156.7	13 40.7 1.0 03 156.7	14 10.7 1.0 03 156.7	14 40.6 1.0 03 156.6	15 10.6 1.0 03 156.6	3
4	11 39.0 1.0 03 155.7	12 09.0 1.0 03 155.7	12 39.0 1.0 03 155.7	13 09.0 1.0 03 155.7	13 39.0 1.0 03 155.7	14 09.0 1.0 03 155.6	14 38.9 1.0 03 155.6	15 08.9 1.0 03 155.6	4
25	11 37.3 1.0 03 154.7	12 07.3 1.0 03 154.7	12 37.2 1.0 03 154.7	13 07.2 1.0 03 154.7	13 37.2 1.0 03 154.6	14 07.2 1.0 03 154.6	14 37.2 1.0 03 154.6	15 07.2 1.0 03 154.6	25
6	11 35.4 1.0 03 153.7	12 05.4 1.0 03 153.7	12 35.4 1.0 03 153.6	13 05.4 1.0 03 153.6	13 35.4 1.0 03 153.6	14 05.4 1.0 03 153.6	14 35.4 1.0 03 153.6	15 05.3 1.0 03 153.6	6
7	11 33.6 1.0 03 152.7	12 03.5 1.0 03 152.7	12 33.5 1.0 03 152.7	13 03.5 1.0 03 152.6	13 33.5 1.0 03 152.6	14 03.5 1.0 03 152.6	14 33.5 1.0 03 152.6	15 03.4 1.0 03 152.6	7
8	11 31.6 1.0 03 151.7	12 01.6 1.0 03 151.7	12 31.6 1.0 03 151.6	13 01.6 1.0 03 151.6	13 31.5 1.0 03 151.6	14 01.5 1.0 03 151.6	14 31.5 1.0 03 151.6	15 01.5 1.0 03 151.6	8
9	11 29.6 1.0 03 150.7	11 59.6 1.0 03 150.6	12 29.6 1.0 03 150.6	12 59.5 1.0 03 150.6	13 29.5 1.0 03 150.6	13 59.5 1.0 03 150.6	14 29.5 1.0 04 150.6	14 59.5 1.0 04 150.5	9
30	11 27.5 1.0 04 149.7	11 57.5 1.0 04 149.6	12 27.5 1.0 04 149.6	12 57.4 1.0 04 149.6	13 27.4 1.0 04 149.6	13 57.4 1.0 04 149.6	14 27.4 1.0 04 149.5	14 57.4 1.0 04 149.5	30
1	11 25.4 1.0 04 148.6	11 55.3 1.0 04 148.6	12 25.3 1.0 04 148.6	12 55.3 1.0 04 148.6	13 25.3 1.0 04 148.6	13 55.3 1.0 04 148.6	14 25.2 1.0 04 148.5	14 55.2 1.0 04 148.5	1
2	11 23.2 1.0 04 147.6	11 53.1 1.0 04 147.6	12 23.1 1.0 04 147.6	12 53.1 1.0 04 147.6	13 23.1 1.0 04 147.6	13 53.0 1.0 04 147.5	14 23.0 1.0 04 147.5	14 53.0 1.0 04 147.5	2
3	11 20.9 1.0 04 146.6	11 50.9 1.0 04 146.6	12 20.8 1.0 04 146.6	12 50.8 1.0 04 146.6	13 20.8 1.0 04 146.5	13 50.8 1.0 04 146.5	14 20.7 1.0 04 146.5	14 50.7 1.0 04 146.5	3
4	11 18.5 1.0 04 145.6	11 48.5 1.0 04 145.6	12 18.5 1.0 04 145.6	12 48.5 1.0 04 145.6	13 18.5 1.0 04 145.5	13 48.4 1.0 04 145.5	14 18.4 1.0 04 145.5	14 48.4 1.0 04 145.5	4
35	11 16.1 1.0 04 144.6	11 46.1 1.0 04 144.6	12 16.1 1.0 04 144.5	12 46.1 1.0 04 144.5	13 16.1 1.0 04 144.5	13 46.0 1.0 04 144.5	14 16.0 1.0 04 144.5	14 46.0 1.0 04 144.5	35
6	11 13.7 1.0 04 143.6	11 43.7 1.0 04 143.6	12 13.6 1.0 04 143.5	12 43.6 1.0 04 143.5	13 13.6 1.0 04 143.5	13 43.6 1.0 04 143.5	14 13.5 1.0 04 143.5	14 43.5 1.0 04 143.4	6
7	11 11.2 1.0 04 142.6	11 41.2 1.0 04 142.6	12 11.1 1.0 04 142.5	12 41.1 1.0 04 142.5	13 11.1 1.0 04 142.5	13 41.0 1.0 04 142.5	14 11.0 1.0 04 142.5	14 41.0 1.0 04 142.4	7
8	11 08.6 1.0 04 141.6	11 38.6 1.0 04 141.6	12 08.6 1.0 04 141.5	12 38.5 1.0 04 141.5	13 08.5 1.0 04 141.5	13 38.5 1.0 04 141.5	14 08.4 1.0 04 141.4	14 38.4 1.0 04 141.4	8
9	11 06.0 1.0 04 140.6	11 36.0 1.0 04 140.6	12 05.9 1.0 04 140.5	12 35.9 1.0 04 140.5	13 05.9 1.0 04 140.5	13 35.8 1.0 04 140.5	14 05.8 1.0 04 140.4	14 35.8 1.0 04 140.4	9
40	11 03.3 1.0 05 139.6	11 33.3 1.0 05 139.5	12 03.2 1.0 05 139.5	12 33.2 1.0 05 139.5	13 03.2 1.0 05 139.5	13 33.1 1.0 05 139.4	14 03.1 1.0 05 139.4	14 33.1 1.0 05 139.4	40
1	11 00.6 1.0 05 138.6	11 30.5 1.0 05 138.5	12 00.5 1.0 05 138.5	12 30.5 1.0 05 138.5	13 00.4 1.0 05 138.5	13 30.4 1.0 05 138.4	14 00.4 1.0 05 138.4	14 30.3 1.0 05 138.4	1
2	10 57.8 1.0 05 137.6	11 27.7 1.0 05 137.5	11 57.7 1.0 05 137.5	12 27.7 1.0 05 137.5	12 57.6 1.0 05 137.5	13 27.6 1.0 05 137.4	13 57.6 1.0 05 137.4	14 27.5 1.0 05 137.4	2
3	10 54.9 1.0 05 136.5	11 24.9 1.0 05 136.5	11 54.8 1.0 05 136.5	12 24.8 1.0 05 136.5	12 54.8 1.0 05 136.4	13 24.7 1.0 05 136.4	13 54.7 1.0 05 136.4	14 24.7 1.0 05 136.4	3
4	10 52.0 1.0 05 135.5	11 22.0 1.0 05 135.5	11 51.9 1.0 05 135.5	12 21.9 1.0 05 135.5	12 51.9 1.0 05 135.4	13 21.8 1.0 05 135.4	13 51.8 1.0 05 135.4	14 21.7 1.0 05 135.4	4
45	10 49.0 1.0 05 134.5	11 19.0 1.0 05 134.5	11 49.0 1.0 05 134.5	12 18.9 1.0 05 134.4	12 48.9 1.0 05 134.4	13 18.9 1.0 05 134.4	13 48.8 1.0 05 134.4	14 18.8 1.0 05 134.3	45
6	10 46.0 1.0 05 133.5	11 16.0 1.0 05 133.5	11 46.0 1.0 05 133.5	12 15.9 1.0 05 133.4	12 45.9 1.0 05 133.4	13 15.8 1.0 05 133.4	13 45.8 1.0 05 133.4	14 15.8 1.0 05 133.3	6
7	10 43.0 1.0 05 132.5	11 12.9 1.0 05 132.5	11 42.9 1.0 05 132.5	12 12.9 1.0 05 132.4	12 42.8 1.0 05 132.4	13 12.8 1.0 05 132.4	13 42.7 1.0 05 132.4	14 12.7 1.0 05 132.3	7
8	10 39.9 1.0 05 131.5	11 09.8 1.0 05 131.5	11 39.8 1.0 05 131.5	12 09.7 1.0 05 131.4	12 39.7 1.0 05 131.4	13 09.7 1.0 05 131.4	13 39.6 1.0 05 131.3	14 09.6 1.0 05 131.3	8
9	10 36.7 1.0 05 130.5	11 06.7 1.0 05 130.5	11 36.6 1.0 05 130.4	12 06.6 1.0 05 130.4	12 36.5 1.0 05 130.4	13 06.5 1.0 05 130.4	13 36.4 1.0 05 130.3	14 06.4 1.0 05 130.3	9
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1	10 30.2 1.0 06 128.5	11 00.2 1.0 06 128.5	11 30.2 1.0 06 128.4	12 00.1 1.0 06 128.4	12 30.1 1.0 06 128.4	13 00.0 1.0 06 128.4	13 30.0 1.0 06 128.3	13 59.9 1.0 06 128.3	1
2	10 26.9 1.0 06 127.5	10 56.9 1.0 06 127.5	11 26.9 1.0 06 127.4	11 56.8 1.0 06 127.4	12 26.8 1.0 06 127.4	12 56.7 1.0 06 127.3	13 26.7 1.0 06 127.3	13 56.6 1.0 06 127.3	2
3	10 23.6 1.0 06 126.5	10 53.6 1.0 06 126.5	11 23.5 1.0 06 126.4	11 53.5 1.0 06 126.4	12 23.4 1.0 06 126.4	12 53.4 1.0 06 126.3	13 23.3 1.0 06 126.3	13 53.3 1.0 06 126.3	3
4	10 20.2 1.0 06 125.5	10 50.2 1.0 06 125.4	11 20.1 1.0 06 125.4	11 50.1 1.0 06 125.4	12 20.0 1.0 06 125.4	12 50.0 1.0 06 125.3	13 19.9 1.0 06 125.3	13 49.9 1.0 06 125.3	4
55	10 16.8 1.0 06 124.5	10 46.7 1.0 06 124.4	11 16.7 1.0 06 124.4	11 46.6 1.0 06 124.4	12 16.6 1.0 06 124.4	12 46.5 1.0 06 124.3	13 16.5 1.0 06 124.3	13 46.4 1.0 06 124.2	55
6	10 13.3 1.0 06 123.5	10 43.3 1.0 06 123.4	11 13.2 1.0 06 123.4	11 43.2 1.0 06 123.4	12 13.1 1.0 06 123.3	12 43.1 1.0 06 123.3	13 13.0 1.0 06 123.3	13 43.0 1.0 06 123.2	6
7	10 09.8 1.0 06 122.5	10 39.8 1.0 06 122.4	11 09.7 1.0 06 122.4	11 39.6 1.0 06 122.4	12 09.6 1.0 06 122.3	12 39.5 1.0 06 122.3	13 09.5 1.0 06 122.3	13 39.4 1.0 06 122.2	7
8	10 06.3 1.0 06 121.5	10 36.2 1.0 06 121.4	11 06.1 1.0 06 121.4	11 36.1 1.0 06 121.4	12 06.0 1.0 06 121.3	12 36.0 1.0 06 121.3	13 05.9 1.0 06 121.3	13 35.9 1.0 06 121.2	8
9	10 02.7 1.0 06 120.5	10 32.6 1.0 06 120.4	11 02.6 1.0 06 120.4	11 32.5 1.0 06 120.4	12 02.4 1.0 06 120.3	12 32.4 1.0 06 120.3	13 02.3 1.0 06 120.2	13 32.3 1.0 06 120.2	9
60	9 59.0 1.0 06 119.4	10 29.0 1.0 06 119.4	10 58.9 1.0 06 119.4	11 28.9 1.0 06 119.4	11 58.8 1.0 06 119.3	12 28.8 1.0 06 119.3	12 58.7 1.0 06 119.3	13 28.6 1.0 06 119.2	60
1	9 55.4 1.0 06 118.4	10 25.3 1.0 06 118.4	10 55.3 1.0 06 118.4	11 25.2 1.0 06 118.4	11 55.1 1.0 06 118.3	12 25.1 1.0 06 118.3	12 55.0 1.0 06 118.3	13 25.0 1.0 06 118.2	1
2	9 51.7 1.0 06 117.4	10 21.6 1.0 06 117.4	10 51.6 1.0 06 117.4	11 21.5 1.0 06 117.3	11 51.4 1.0 06 117.3	12 21.4 1.0 06 117.3	12 51.3 1.0 06 117.3	13 21.3 1.0 06 117.2	2
3	9 47.9 1.0 06 116.4	10 17.9 1.0 06 116.4	10 47.8 1.0 06 116.4	11 17.8 1.0 06 116.3	11 47.7 1.0 06 116.3	12 17.6 1.0 06 116.3	12 47.6 1.0 06 116.2	13 17.5 1.0 06 116.2	3
4	9 44.2 1.0 06 115.4	10 14.1 1.0 06 115.4	10 44.1 1.0 06 115.4	11 14.0 1.0 06 115.3	11 43.9 1.0 06 115.3	12 13.9 1.0 06 115.3	12 43.8 1.0 06 115.2	13 13.8 1.0 06 115.2	4
65	9 40.4 1.0 06 114.4	10 10.3 1.0 06 114.4	10 40.3 1.0 06 114.4	11 10.2 1.0 06 114.3	11 40.1 1.0 06 114.3	12 10.1 1.0 06 114.3	12 40.0 1.0 06 114.2	13 10.0 1.0 06 114.2	65
6	9 36.6 1.0 06 113.4	10 06.5 1.0 06 113.4	10 36.4 1.0 06 113.4	11 06.4 1.0 06 113.3	11 36.3 1.0 06 113.3	12 06.2 1.0 06 113.3	12 36.2 1.0 06 113.2	13 06.1 1.0 06 113.2	6
7	9 32.7 1.0 06 112.4	10 02.6 1.0 06 112.4	10 32.6 1.0 06 112.4	11 02.5 1.0 06 112.3	11 32.5 1.0 06 112.3	12 02.4 1.0 06 112.3	12 32.3 1.0 06 112.2	13 02.3 1.0 06 112.2	7
8	9 28.8 1.0 07 111.4	9 58.8 1.0 07 111.4	10 28.7 1.0 07 111.4	10 58.6 1.0 07 111.3	11 28.6 1.0 07 111.3	11 58.5 1.0 07 111.3	12 28.4 1.0 07 111.2	12 58.4 1.0 07 111.2	8
9	9 24.9 1.0 07 110.4	9 54.9 1.0 07 110.4	10 24.7 1.0 07 110.4	10 54.7 1.0 07 110.3	11 24.7 1.0 07 110.3	11 54.6 1.0 07 110.3	12 24.5 1.0 07 110.2	12 54.5 1.0 07 110.2	9
70	9 21.0 1.0 07 109.4	9 50.9 1.0 07 109.4	10 20.9 1.0 07 109.4	10 50.8 1.0 07 109.3	11 20.7 1.0 07 109.3	11 50.6 1.0 07 109.3	12 20.6 1.0 07 109.2	12 50.5 1.0 07 109.2	70
1	9 17.0 1.0 07 108.4	9 47.0 1.0 07 108.4	10 16.9 1.0 07 108.4	10 46.8 1.0 07 108.3	11 16.8 1.0 07 108.3	11 46.7 1.0 07 108.3	12 16.6 1.0 07 108.2	12 46.5 1.0 07 108.2	1
2	9 13.0 1.0 07 107.4	9 43.0 1.0 07 107.4	10 12.9 1.0 07 107.4	10 42.8 1.0 07 107.3	11 12.8 1.0 07 107.3	11 42.7 1.0 07 107.3	12 12.6 1.0 07 107.2	12 42.6 1.0 07 107.2	2
3	9 09.0 1.0 07 106.4	9 39.0 1.0 07 106.4	10 08.9 1.0 07 106.4	10 38.8 1.0 07 106.3	11 08.8 1.0 07 106.3	11 38.7 1.0 07 106.2	12 08.6 1.0 07 106.2	12 38.6 1.0 07 106.2	3
4	9 05.0 1.0 07 105.4	9 34.9 1.0 07 105.4	10 04.9 1.0 07 105.4	10 34.8 1.0 07 105.3	11 04.7 1.0 07 105.3	11 34.7 1.0 07 105.2	12 04.6 1.0 07 105.2	12 34.5 1.0 07 105.2	4
75	9 01.0 1.0 07 104.4	9 30.9 1.0 07 104.4	10 00.8 1.0 07 104.4	10 30.8 1.0 07 104.3	11 00.7 1.0 07 104.3	11 30.6 1.0 07 104.2	12 00.5 1.0 07 104.2	12 30.5 1.0 07 104.2	75
6	8 56.9 1.0 07 103.4	9 26.8 1.0 07 103.4	9 56.8 1.0 07 103.3	10 26.7 1.0 07 103.3	10 56.6 1.0 07 103.3	11 26.6 1.0 07 103.2	11 56.5 1.0 07 103.2	12 26.4 1.0 07 103.2	6
7	8 52.8 1.0 07 102.4	9 22.8 1.0 07 102.4	9 52.7 1.0 07 102.4	10 22.6 1.0 07 102.3	10 52.5 1.0 07 102.3	11 22.5 1.0 07 102.2	11 52.4 1.0 07 102.2	12 22.3 1.0 07 102.2	7
8	8 48.7 1.0 07 101.4	9 18.7 1.0 07 101.4	9 48.6 1.0 07 101.3	10 18.5 1.0 07 101.3	10 48.4 1.0 07 101.3	11 18.4 1.0 07 101.2	11 48.3 1.0 07 101.2	12 18.2 1.0 07 101.2	8
9	8 44.6 1.0 07 100.4	9 14.6 1.0 07 100.4	9 44.5 1.0 07 100.3	10 14.4 1.0 07 100.3	10 44.3 1.0 07 100.3	11 14.3 1.0 07 100.2	11 44.2 1.0 07 100.2	12 14.1 1.0 07 100.2	9
80	8 40.5 1.0 07 99.4	9 10.4 1.0 07 99.4	9 40.4 1.0 07 99.3	10 10.3 1.0 07 99.3	10 40.2 1.0 07 99.3	11 10.1 1.0 07 99.2	11 40.1 1.0 07 99.2	12 10.0 1.0 07 99.2	80
1	8 36.4 1.0 07 98.4	9 06.3 1.0 07 98.4	9 36.2 1.0 07 98.3	10 06.1 1.0 07 98.3	10 36.1 1.0 07 98.3	11 06.0 1.0 07 98.2	11 35.9 1.0 07 98.2	12 05.8 1.0 07 98.2	1
2	8 32.2 1.0 07 97.4	9 02.1 1.0 07 97.4	9 32.1 1.0 07 97.3	10 02.0 1.0 07 97.3	10 31.9 1.0 07 97.3	11 01.9 1.0 07 97.2	11 31.8 1.0 07 97.2	12 01.7 1.0 07 97.2	2
3	8 28.1 1.0 07 96.4	8 58.0 1.0 07 96.4	9 27.9 1.0 07 96.3	9 57.8 1.0 07 96.3	10 27.8 1.0 07 96.3	10 57.7 1.0 07 96.2	11 27.6 1.0 07 96.2	11 57.5 1.0 07 96.2	3
4	8 23.9 1.0 07 95.4	8 53.8 1.0 07 95.4	9 23.8 1.0 07 95.3	9 53.7 1.0 07 95.3	10 23.6 1.0 07 95.3	10 53.5 1.0 07 95.2	11 23.5 1.0 07 95.2	11 53.4 1.0 07 95.2	4
85	8 19.7 1.0 07 94.4	8 49.7 1.0 07 94.4	9 19.6 1.0 07 94.3	9 49.5 1.0 07 94.3	10 19.4 1.0 07 94.3	10 49.4 1.0 07 94.2	11 19.3 1.0 07 94.2	11 49.2 1.0 07 94.2	85
6	8 15.6 1.0 07 93.4	8 45.5 1.0 07 93.4	9 15.4 1.0 07 93.3	9 45.3 1.0 07 93.3	10 15.3 1.0 07 93.3	10 45.2 1.0 07 93.2	11 15.1 1.0 07 93.2	11 45.0 1.0 07 93.2	6
7	8 11.4 1.0 07 92.4	8 41.3 1.0 07 92.4	9 11.2 1.0 07 92.3	9 41.2 1.0 07 92.3	10 11.1 1.0 07 92.3	10 41.0 1.0 07 92.2	11 10.9 1.0 07 92.2	11 40.9 1.0 07 92.2	7
8	8 07.2 1.0 07 91.4	8 37.1 1.0 07 91.4	9 07.0 1.0 07 91.4	9 37.0 1.0 07 91.3	10 06.9 1.0 07 91.3	10 36.8 1.0 07 91.3	11 06.7 1.0 07 91.2	11 36.7 1.0 07 91.2	8
9	8 03.0 1.0 07 90.4	8 32.9 1.0 07 90.4	9 02.8 1.0 07 90.4	9 32.8 1.0 07 90.3	10 02.7 1.0 07 90.3	10 32.6 1.0 07 90.3	11 02.5 1.0 07 90.2	11 32.5 1.0 07 90.2	9
90	7 58.8 1.0 07 89.4	8 28.7 1.0 07 89.4	8 58.7 1.0 07 89.4	9 28.6 1.0 07 89.3	9 58.5 1.0 07 89.3	10 28.4 1.0 07 89.3	10 58.4 1.0 07 89.2	11 28.3 1.0 07 89.2	90

Lat. 86°

H.A.	8° 00' Alt.	8° 00' Az.	8° 30' Alt.	8° 30' Az.	9° 00' Alt.	9° 00' Az.	9° 30' Alt.	9° 30' Az.	10° 00' Alt.	10° 00' Az.	10° 30' Alt.	10° 30' Az.	11° 00' Alt.	11° 00' Az.	11° 30' Alt.	11° 30' Az.	H.A.
°	° ' Δd Δt	°	° ' Δd Δt	°	° ' Δd Δt	°	° ' Δd Δt	°	° ' Δd Δt	°	° ' Δd Δt	°	° ' Δd Δt	°	° ' Δd Δt	°	°
91	7 54.6 1.007	88.4	8 24.6 1.007	88.4	8 54.5 1.007	88.3	9 24.4 1.007	88.3	9 54.3 1.007	88.3	10 24.3 1.007	88.3	10 54.2 1.007	88.2	11 24.1 1.007	88.2	91
2	7 50.5 1.007	87.4	8 20.4 1.007	87.4	8 50.3 1.007	87.4	9 20.2 1.007	87.3	9 50.2 1.007	87.3	10 20.1 1.007	87.3	10 50.0 1.007	87.2	11 19.9 1.007	87.2	2
3	7 46.3 1.007	86.4	8 16.2 1.007	86.4	8 46.1 1.007	86.4	9 16.1 1.007	86.3	9 46.0 1.007	86.3	10 15.9 1.007	86.3	10 45.8 1.007	86.2	11 15.8 1.007	86.2	3
4	7 42.1 1.007	85.4	8 12.0 1.007	85.4	8 42.0 1.007	85.4	9 11.9 1.007	85.3	9 41.8 1.007	85.3	10 11.7 1.007	85.3	10 41.7 1.007	85.2	11 11.6 1.007	85.2	4
95	7 37.9 1.007	84.5	8 07.9 1.007	84.4	8 37.8 1.007	84.4	9 07.7 1.007	84.3	9 37.6 1.007	84.3	10 07.6 1.007	84.3	10 37.5 1.007	84.2	11 07.4 1.007	84.2	95
6	7 33.8 1.007	83.5	8 03.7 1.007	83.4	8 33.6 1.007	83.4	9 03.5 1.007	83.4	9 33.5 1.007	83.3	10 03.4 1.007	83.3	10 33.3 1.007	83.2	11 03.3 1.007	83.2	6
7	7 29.6 1.007	82.5	7 59.5 1.007	82.4	8 29.5 1.007	82.4	8 59.4 1.007	82.4	9 29.3 1.007	82.3	9 59.2 1.007	82.3	10 29.2 1.007	82.2	10 59.1 1.007	82.2	7
8	7 25.5 1.007	81.5	7 55.4 1.007	81.4	8 25.3 1.007	81.4	8 55.3 1.007	81.4	9 25.2 1.007	81.3	9 55.1 1.007	81.3	10 25.0 1.007	81.3	10 55.0 1.007	81.2	8
9	7 21.3 1.007	80.5	7 51.3 1.007	80.4	8 21.2 1.007	80.4	8 51.1 1.007	80.4	9 21.0 1.007	80.3	9 51.0 1.007	80.3	10 20.9 1.007	80.3	10 50.8 1.007	80.2	9
100	7 17.2 1.007	79.5	7 47.1 1.007	79.4	8 17.1 1.007	79.4	8 47.0 1.007	79.4	9 16.9 1.007	79.3	9 46.9 1.007	79.3	10 16.8 1.007	79.3	10 46.7 1.007	79.2	100
1	7 13.1 1.007	78.5	7 43.0 1.007	78.4	8 13.0 1.007	78.4	8 42.9 1.007	78.4	9 12.8 1.007	78.3	9 42.7 1.007	78.3	10 12.7 1.007	78.3	10 42.6 1.007	78.2	1
2	7 09.0 1.007	77.5	7 38.9 1.007	77.4	8 08.9 1.007	77.4	8 38.8 1.007	77.4	9 08.7 1.007	77.3	9 38.7 1.007	77.3	10 08.6 1.007	77.3	10 38.5 1.007	77.2	2
3	7 04.9 1.007	76.5	7 34.9 1.007	76.5	8 04.8 1.007	76.4	8 34.7 1.007	76.4	9 04.7 1.007	76.3	9 34.6 1.007	76.3	10 04.5 1.007	76.3	10 34.4 1.007	76.2	3
4	7 00.9 1.007	75.5	7 30.8 1.007	75.5	8 00.7 1.007	75.4	8 30.7 1.007	75.4	9 00.6 1.007	75.4	9 30.5 1.007	75.3	10 00.5 1.007	75.3	10 30.4 1.007	75.2	4
105	6 56.8 1.007	74.5	7 26.8 1.007	74.5	7 56.7 1.007	74.4	8 26.6 1.007	74.4	8 56.6 1.007	74.4	9 26.5 1.007	74.3	9 56.4 1.007	74.3	10 26.3 1.007	74.3	105
6	6 52.8 1.007	73.5	7 22.7 1.007	73.5	7 52.7 1.007	73.4	8 22.6 1.007	73.4	8 52.5 1.007	73.4	9 22.5 1.007	73.3	9 52.4 1.007	73.3	10 22.3 1.007	73.3	6
7	6 48.8 1.007	72.5	7 18.7 1.007	72.5	7 48.7 1.007	72.4	8 18.6 1.007	72.4	8 48.5 1.007	72.4	9 18.5 1.007	72.3	9 48.4 1.007	72.3	10 18.3 1.007	72.3	7
8	6 44.8 1.007	71.5	7 14.8 1.007	71.5	7 44.7 1.007	71.4	8 14.6 1.007	71.4	8 44.6 1.007	71.4	9 14.5 1.007	71.3	9 44.4 1.007	71.3	10 14.4 1.007	71.3	8
9	6 40.9 1.007	70.5	7 10.8 1.007	70.5	7 40.7 1.007	70.4	8 10.7 1.007	70.4	8 40.6 1.007	70.4	9 10.5 1.007	70.3	9 40.5 1.007	70.3	10 10.4 1.007	70.3	9
110	6 36.9 1.006	69.5	7 06.9 1.006	69.5	7 36.8 1.006	69.5	8 06.7 1.006	69.4	8 36.7 1.006	69.4	9 06.6 1.007	69.4	9 36.5 1.007	69.3	10 06.5 1.007	69.3	110
1	6 33.0 1.006	68.5	7 03.0 1.006	68.5	7 32.9 1.006	68.5	8 02.8 1.006	68.4	8 32.8 1.006	68.4	9 02.7 1.006	68.4	9 32.6 1.006	68.3	10 02.6 1.006	68.3	1
2	6 29.1 1.006	67.5	6 59.1 1.006	67.5	7 29.0 1.006	67.5	7 59.0 1.006	67.4	8 28.9 1.006	67.4	8 58.8 1.006	67.4	9 28.8 1.006	67.3	9 58.7 1.006	67.3	2
3	6 25.3 1.006	66.5	6 55.2 1.006	66.5	7 25.2 1.006	66.5	7 55.1 1.006	66.4	8 25.0 1.006	66.4	8 55.0 1.006	66.4	9 24.9 1.006	66.3	9 54.9 1.006	66.3	3
4	6 21.5 1.006	65.5	6 51.4 1.006	65.5	7 21.3 1.006	65.5	7 51.3 1.006	65.4	8 21.2 1.006	65.4	8 51.2 1.006	65.4	9 21.1 1.003	65.3	9 51.0 1.006	65.3	4
115	6 17.7 1.006	64.5	6 47.6 1.006	64.5	7 17.6 1.006	64.5	7 47.5 1.006	64.4	8 17.4 1.006	64.4	8 47.4 1.006	64.4	9 17.4 1.006	64.4	9 47.2 1.006	64.3	115
6	6 13.9 1.006	63.6	6 43.9 1.006	63.5	7 13.9 1.006	63.5	7 43.8 1.006	63.5	8 13.7 1.006	63.4	8 43.6 1.006	63.4	9 13.6 1.006	63.4	9 43.5 1.006	63.3	6
7	6 10.2 1.006	62.6	6 40.1 1.006	62.5	7 10.1 1.006	62.5	7 40.0 1.006	62.5	8 09.9 1.006	62.4	8 39.9 1.006	62.4	9 09.8 1.006	62.4	9 39.8 1.006	62.3	7
8	6 06.5 1.006	61.6	6 36.4 1.006	61.5	7 06.4 1.006	61.5	7 36.3 1.006	61.5	8 06.3 1.006	61.4	8 36.2 1.006	61.4	9 06.1 1.006	61.4	9 36.1 1.006	61.3	8
9	6 02.8 1.006	60.6	6 32.8 1.006	60.5	7 02.7 1.006	60.5	7 32.7 1.006	60.5	8 02.6 1.006	60.4	8 32.5 1.006	60.4	9 02.5 1.006	60.4	9 32.4 1.006	60.4	9
120	5 59.2 1.006	59.6	6 29.1 1.006	59.5	6 59.1 1.006	59.5	7 29.0 1.006	59.5	7 59.0 1.006	59.5	8 28.9 1.006	59.4	8 58.9 1.006	59.4	9 28.8 1.006	59.4	120
1	5 55.6 1.006	58.6	6 25.5 1.006	58.6	6 55.5 1.006	58.5	7 25.4 1.006	58.5	7 55.4 1.006	58.5	8 25.3 1.006	58.4	8 55.3 1.006	58.4	9 25.2 1.006	58.4	1
2	5 52.1 1.006	57.6	6 22.0 1.006	57.6	6 51.9 1.006	57.5	7 21.9 1.006	57.5	7 51.8 1.006	57.5	8 21.8 1.006	57.4	8 51.7 1.006	57.4	9 21.7 1.006	57.4	2
3	5 48.5 1.006	56.6	6 18.5 1.006	56.6	6 48.4 1.006	56.5	7 18.4 1.006	56.5	7 48.3 1.006	56.5	8 18.3 1.006	56.4	8 48.2 1.006	56.4	9 18.2 1.006	56.4	3
4	5 45.1 1.006	55.6	6 15.0 1.006	55.6	6 45.0 1.006	55.5	7 14.9 1.006	55.5	7 44.9 1.006	55.5	8 14.8 1.006	55.5	8 44.8 1.006	55.4	9 14.7 1.006	55.4	4
125	5 41.6 1.006	54.6	6 11.6 1.006	54.6	6 41.5 1.006	54.5	7 11.5 1.006	54.5	7 41.4 1.006	54.5	8 11.4 1.006	54.5	8 41.3 1.006	54.4	9 11.3 1.006	54.4	125
6	5 38.2 1.006	53.6	6 08.2 1.006	53.6	6 38.1 1.006	53.6	7 08.1 1.006	53.5	7 38.0 1.006	53.5	8 08.0 1.006	53.5	8 37.9 1.006	53.4	9 07.9 1.006	53.4	6
7	5 34.9 1.006	52.6	6 04.8 1.006	52.6	6 34.8 1.006	52.6	7 04.8 1.006	52.5	7 34.7 1.006	52.5	8 04.7 1.006	52.5	8 34.6 1.006	52.5	9 04.6 1.006	52.4	7
8	5 31.6 1.006	51.6	6 01.5 1.006	51.6	6 31.5 1.005	51.6	7 01.5 1.005	51.5	7 31.4 1.005	51.5	8 01.4 1.005	51.5	8 31.3 1.005	51.5	9 01.3 1.005	51.4	8
9	5 28.3 1.006	50.6	5 58.3 1.006	50.6	6 28.2 1.006	50.6	6 58.2 1.006	50.6	7 28.2 1.006	50.5	7 58.1 1.006	50.5	8 28.1 1.005	50.5	8 58.0 1.005	50.4	9
130	5 25.1 1.005	49.6	5 55.1 1.005	49.6	6 25.0 1.005	49.6	6 55.0 1.005	49.6	7 24.9 1.005	49.5	7 54.9 1.005	49.5	8 24.9 1.005	49.5	8 54.8 1.005	49.4	130
1	5 22.0 1.005	48.6	5 51.9 1.005	48.6	6 21.9 1.005	48.6	6 51.8 1.005	48.6	7 21.8 1.005	48.5	7 51.7 1.005	48.5	8 21.7 1.005	48.5	8 51.7 1.005	48.5	1
2	5 18.8 1.005	47.7	5 48.8 1.005	47.6	6 18.8 1.005	47.6	6 48.7 1.005	47.6	7 18.7 1.005	47.5	7 48.6 1.005	47.5	8 18.6 1.005	47.5	8 48.5 1.005	47.5	2
3	5 15.8 1.005	46.7	5 45.7 1.005	46.6	6 15.7 1.005	46.6	6 45.6 1.005	46.6	7 15.6 1.005	46.6	7 45.6 1.005	46.5	8 15.5 1.005	46.5	8 45.5 1.005	46.5	3
4	5 12.7 1.005	45.7	5 42.7 1.005	45.6	6 12.7 1.005	45.6	6 42.6 1.005	45.6	7 12.6 1.005	45.6	7 42.6 1.005	45.5	8 12.5 1.005	45.5	8 42.5 1.005	45.5	4
135	5 09.8 1.005	44.7	5 39.7 1.005	44.6	6 09.7 1.005	44.6	6 39.7 1.005	44.6	7 09.6 1.005	44.6	7 39.6 1.005	44.5	8 09.6 1.005	44.5	8 39.5 1.005	44.5	135
6	5 06.9 1.005	43.7	5 36.8 1.005	43.7	6 06.8 1.005	43.6	6 36.8 1.005	43.6	7 06.7 1.005	43.6	7 36.7 1.005	43.6	8 06.6 1.005	43.5	8 36.6 1.005	43.5	6
7	5 04.0 1.005	42.7	5 34.0 1.005	42.7	6 03.9 1.005	42.6	6 33.9 1.005	42.6	7 03.9 1.005	42.6	7 33.8 1.005	42.6	8 03.8 1.005	42.5	8 33.8 1.005	42.5	7
8	5 01.2 1.005	41.7	5 31.2 1.005	41.7	6 01.1 1.005	41.6	6 31.1 1.005	41.6	7 01.1 1.005	41.6	7 31.0 1.005	41.6	8 01.0 1.005	41.6	8 31.0 1.005	41.5	8
9			5 28.4 1.004	40.7	5 58.4 1.004	40.7	6 28.3 1.004	40.6	6 58.3 1.004	40.6	7 28.3 1.004	40.6	7 58.2 1.004	40.6	8 28.2 1.004	40.5	9
140			5 25.7 1.004	39.7	5 55.7 1.004	39.7	6 25.6 1.004	39.6	6 55.6 1.004	39.6	7 25.6 1.004	39.6	7 55.5 1.004	39.6	8 25.5 1.004	39.6	140
1			5 23.1 1.004	38.7	5 53.0 1.004	38.7	6 23.0 1.004	38.6	6 53.0 1.004	38.6	7 22.9 1.004	38.6	7 52.9 1.004	38.6	8 22.9 1.004	38.6	1
2			5 20.5 1.004	37.7	5 50.4 1.004	37.7	6 20.4 1.004	37.7	6 50.4 1.004	37.6	7 20.4 1.004	37.6	7 50.3 1.004	37.6	8 20.3 1.004	37.6	2
3			5 17.9 1.004	36.7	5 47.9 1.004	36.7	6 17.9 1.004	36.7	6 47.9 1.004	36.6	7 17.8 1.004	36.6	7 47.8 1.004	36.6	8 17.8 1.004	36.6	3
4			5 15.5 1.004	35.7	5 45.4 1.004	35.7	6 15.4 1.004	35.7	6 45.4 1.004	35.7	7 15.4 1.004	35.7	7 45.3 1.004	35.6	8 15.3 1.004	35.6	4
145			5 13.0 1.004	34.7	5 43.0 1.004	34.7	6 13.0 1.004	34.7	6 43.0 1.004	34.7	7 12.9 1.004	34.6	7 42.9 1.004	34.6	8 12.9 1.004	34.6	145
6			5 10.7 1.004	33.7	5 40.7 1.004	33.7	6 10.6 1.004	33.7	6 40.6 1.004	33.7	7 10.6 1.004	33.7	7 40.6 1.004	33.6	8 10.6 1.004	33.6	6
7			5 08.4 1.004	32.7	5 38.4 1.004	32.7	6 08.4 1.004	32.7	6 38.3 1.004	32.7	7 08.3 1.004	32.7	7 38.3 1.004	32.6	8 08.3 1.004	32.6	7
8			5 06.2 1.004	31.7	5 36.1 1.004	31.7	6 06.1 1.004	31.7	6 36.1 1.004	31.7	7 06.1 1.004	31.7	7 36.1 1.004	31.7	8 06.0 1.004	31.6	8
9			5 04.0 1.004	30.8	5 34.0 1.004	30.7	6 04.0 1.004	30.7	6 33.9 1.004	30.7	7 03.9 1.004	30.7	7 33.9 1.004	30.7	8 03.9 1.004	30.6	9
150			5 01.9 1.003	29.8	5 31.9 1.003	29.7	6 01.8 1.003	29.7	6 31.8 1.003	29.7	7 01.8 1.003	29.7	7 31.8 1.003	29.7	8 01.8 1.003	29.7	150
1					5 29.8 1.003	28.8	5 59.8 1.003	28.7	6 29.8 1.003	28.7	6 59.8 1.003	28.7	7 29.8 1.003	28.7	7 59.7 1.003	28.7	1
2					5 27.8 1.003	27.8	5 57.8 1.003	27.7	6 27.8 1.003	27.7	6 57.8 1.003	27.7	7 27.8 1.003	27.7	7 57.8 1.003	27.7	2
3					5 25.9 1.003	26.8	5 55.9 1.003	26.8	6 25.9 1.003	26.7	6 55.9 1.003	26.7	7 25.9 1.003	26.7	7 55.8 1.003	26.7	3
4					5 24.1 1.003	25.8	5 54.1 1.003	25.8	6 24.0 1.003	25.7	6 54.0 1.003	25.7	7 24.0 1.003	25.7	7 54.0 1.003	25.7	4
155					5 22.3 1.003	24.8	5 52.3 1.003	24.8	6 22.3 1.003	24.8	6 52.2 1.003	24.7	7 22.2 1.003	24.7	7 52.2 1.003	24.7	155
6					5 20.6 1.003	23.8	5 50.5 1.003	23.8	6 20.5 1.003	23.8	6 50.5 1.003	23.8	7 20.5 1.003	23.7	7 50.5 1.003	23.7	6
7					5 18.9 1.003	22.8	5 48.9 1.003	22.8	6 18.9 1.003	22.8	6 48.9 1.003	22.8	7 18.9 1.003	22.7	7 48.8 1.003	22.7	7
8					5 17.3 1.003	21.8	5 47.3 1.003	21.8	6 17.3 1.003	21.8	6 47.3 1.003	21.8	7 17.3 1.003	21.8	7 47.3 1.003	21.7	8
9					5 15.8 1.002	20.8	5 45.8 1.002	20.8	6 15.8 1.002	20.8	6 45.8 1.002	20.8	7 15.8 1.002	20.8	7 45.7 1.002	20.8	9
160					5 14.3 1.002	19.8	5 44.3 1.002	19.8	6 14.3 1.002	19.8	6 44.3 1.002	19.8	7 14.3 1.002	19.8	7 44.3 1.002	19.8	160
1					5 13.0 1.002	18.8	5 42.9 1.002	18.8	6 12.9 1.002	18.8	6 42.9 1.002	18.8	7 12.9 1.002	18.8	7 42.9 1.002	18.8	1
2					5 11.6 1.002	17.8	5 41.6 1.002	17.8	6 11.6 1.002	17.8	6 41.6 1.002	17.8	7 11.6 1.002	17.8	7 41.6 1.002	17.8	2
3					5 10.4 1.002	16.9	5 40.4 1.002	16.8	6 10.4 1.002	16.8	6 40.4 1.002	16.8	7 10.4 1.002	16.8	7 40.4 1.002	16.8	3
4					5 09.2 1.002	15.9	5 39.2 1.002	15.9	6 09.2 1.002	15.8	6 39.2 1.002	15.8	7 09.2 1.002	15.8	7 39.2 1.002	15.8	4
165					5 08.1 1.002	14.9	5 38.1 1.002	14.9	6 08.1 1.002	14.9	6 38.1 1.002	14.8	7 08.1 1.002	14.8	7 38.1 1.002	14.8	165
6					5 07.1 1.002	13.9	5 37.1 1.002	13.9	6 07.1 1.002	13.9	6 37.0 1.002	13.9	7 07.0 1.002	13.8	7 37.0 1.002	13.8	6
7					5 06.1 1.002	12.9	5 36.1 1.001	12.9	6 06.1 1.001	12.9	6 36.1 1.001	12.9	7 06.1 1.001	12.9	7 36.1 1.001	12.8	7
8					5 05.2 1.001	11.9	5 35.2 1.001	11.9	6 05.2 1.001	11.9	6 35.2 1.001	11.9	7 05.2 1.001	11.9	7 35.2 1.001	11.9	8
9					5 04.4 1.001	10.9	5 34.4 1.001	10.9	6 04.4 1.001	10.9	6 34.4 1.001	10.9	7 04.4 1.001	10.9	7 34.4 1.001	10.9	9
170					5 03.6 1.001	09.9	5 33.6 1.001	09.9	6 03.6 1.001	09.9	6 33.6 1.001	09.9	7 03.6 1.001	09.9	7 33.6 1.001	09.9	170
1					5 02.9 1.001	08.9	5 32.9 1.001	08.9	6 02.9 1.001	08.9	6 32.9 1.001	08.9	7 02.9 1.001	08.9	7 32.9 1.001	08.9	1
2					5 02.3 1.001	07.9	5 32.3 1.001	07.9	6 02.3 1.001	07.9	6 32.3 1.001	07.9	7 02.3 1.001	07.9	7 32.3 1.001	07.9	2
3					5 01.8 1.001	06.9	5 31.8 1.001	06.9	6 01.8 1.001	06.9	6 31.8 1.001	06.9	7 01.8 1.001	06.9	7 31.8 1.001	06.9	3
4					5 01.3 1.001	05.9	5 31.3 1.001	05.9	6 01.3 1.001	05.9	6 31.3 1.001	05.9	7 01.3 1.001	05.9	7 31.3 1.001	05.9	4
175					5 00.9 1.001	05.0	5 30.9 1.001	05.0	6 00.9 1.001	05.0	6 30.9 1.001	04.9	7 00.9 1.001	04.9	7 30.9 1.001	04.9	175
6					5 00.6 1.000	04.0	5 30.6 1.000	04.0	6 00.6 1.000	04.0	6 30.6 1.000	04.0	7 00.6 1.000	04.0	7 30.6 1.000	04.0	6
7					5 00.3 1.000	03.0	5 30.3 1.000	03.0	6 00.3 1.000	03.0	6 30.3 1.000	03.0	7 00.3 1.000	03.0	7 30.3 1.000	03.0	7
8					5 00.1 1.000	02.0	5 30.1 1.000	02.0	6 00.1 1.000	02.0	6 30.1 1.000	02.0	7 00.1 1.000	02.0	7 30.1 1.000	02.0	8
9					5 00.0 1.000	01.0	5 30.0 1.000	01.0	6 00.0 1.000	01.0	6 30.0 1.000	01.0	7 00.0 1.000	01.0	7 30.0 1.000	01.0	9
180					5 00.0 1.000	00.0	5 30.0 1.000	00.0	6 00.0 1.000	00.0	6 30.0 1.000	00.0	7 00.0 1.000	00.0	7 30.0 1.000	00.0	180

Lat. 87°

Lat. 88°

Lat. 86°

The table gives, for each Hour Angle (H.A.) and Declination (12°00′ to 15°30′), the Altitude (Alt.), the corrections Δd and Δt, and the Azimuth (Az.). Here Δd = 1.0 throughout; Δt is shown per row. The Azimuth column shows the range from the 12°00′ column to the 15°30′ column (the intermediate declinations lie between these values).

H.A.	Δd	Δt	12°00′ Alt	12°30′ Alt	13°00′ Alt	13°30′ Alt	14°00′ Alt	14°30′ Alt	15°00′ Alt	15°30′ Alt	Az. (12°00′→15°30′)	H.A.
00	1.0	00	16 00.0	16 30.0	17 00.0	17 30.0	18 00.0	18 30.0	19 00.0	19 30.0	180.0	00
1	1.0	00	16 00.0	16 30.0	17 00.0	17 30.0	18 00.0	18 30.0	19 00.0	19 30.0	179.0	1
2	1.0	00	15 59.9	16 29.9	16 59.9	17 29.9	17 59.9	18 29.9	18 59.9	19 29.9	178.0	2
3	1.0	00	15 59.7	16 29.7	16 59.7	17 29.7	17 59.7	18 29.7	18 59.7	19 29.7	176.9	3
4	1.0	01	15 59.4	16 29.4	16 59.4	17 29.4	17 59.4	18 29.4	18 59.4	19 29.4	175.9	4
05	1.0	01	15 59.1	16 29.1	16 59.1	17 29.1	17 59.1	18 29.1	18 59.1	19 29.1	174.9	05
6	1.0	01	15 58.7	16 28.7	16 58.7	17 28.7	17 58.7	18 28.7	18 58.7	19 28.7	173.9	6
7	1.0	01	15 58.2	16 28.2	16 58.2	17 28.2	17 58.2	18 28.2	18 58.2	19 28.2	172.9–172.8	7
8	1.0	01	15 57.6	16 27.6	16 57.6	17 27.6	17 57.6	18 27.6	18 57.6	19 27.6	171.8	8
9	1.0	01	15 57.0	16 27.0	16 57.0	17 27.0	17 57.0	18 27.0	18 57.0	19 27.0	170.8	9
10	1.0	01	15 56.3	16 26.3	16 56.3	17 26.3	17 56.3	18 26.3	18 56.3	19 26.3	169.8	10
1	1.0	01	15 55.5	16 25.5	16 55.5	17 25.5	17 55.5	18 25.5	18 55.5	19 25.5	168.8	1
2	1.0	02	15 54.7	16 24.7	16 54.7	17 24.7	17 54.7	18 24.7	18 54.6	19 24.6	167.8–167.7	2
3	1.0	02	15 53.7	16 23.7	16 53.7	17 23.7	17 53.7	18 23.7	18 53.7	19 23.7	166.8–166.7	3
4	1.0	02	15 52.8	16 22.7	16 52.7	17 22.7	17 52.7	18 22.7	18 52.7	19 22.7	165.8–165.7	4
15	1.0	02	15 51.7	16 21.7	16 51.7	17 21.7	17 51.7	18 21.7	18 51.7	19 21.6	164.7	15
6	1.0	02	15 50.6	16 20.5	16 50.5	17 20.5	17 50.5	18 20.5	18 50.5	19 20.5	163.7	6
7	1.0	02	15 49.3	16 19.3	16 49.3	17 19.3	17 49.3	18 19.3	18 49.3	19 19.3	162.7–162.6	7
8	1.0	02	15 48.1	16 18.1	16 48.0	17 18.0	17 48.0	18 18.0	18 48.0	19 18.0	161.7–161.6	8
9	1.0	02	15 46.7	16 16.7	16 46.7	17 16.7	17 46.7	18 16.7	18 46.7	19 16.7	160.7–160.6	9
20	1.0	02	15 45.3	16 15.3	16 45.3	17 15.3	17 45.3	18 15.2	18 45.2	19 15.2	159.7–159.6	20
1	1.0	03	15 43.8	16 13.8	16 43.8	17 13.8	17 43.8	18 13.8	18 43.7	19 13.7	158.6–158.5	1
2	1.0	03	15 42.2	16 12.2	16 42.2	17 12.2	17 42.2	18 12.2	18 42.2	19 12.2	157.6–157.5	2
3	1.0	03	15 40.6	16 10.6	16 40.6	17 10.6	17 40.6	18 10.6	18 40.5	19 10.5	156.6–156.5	3
4	1.0	03	15 38.9	16 08.9	16 38.9	17 08.9	17 38.9	18 08.9	18 38.8	19 08.8	155.6–155.5	4
25	1.0	03	15 37.2	16 07.1	16 37.1	17 07.1	17 37.1	18 07.1	18 37.1	19 07.1	154.6–154.5	25
6	1.0	03	15 35.3	16 05.3	16 35.3	17 05.3	17 35.3	18 05.3	18 35.2	19 05.2	153.6–153.4	6
7	1.0	03	15 33.4	16 03.4	16 33.4	17 03.4	17 33.4	18 03.4	18 33.3	19 03.3	152.6–152.4	7
8	1.0	03	15 31.5	16 01.5	16 31.4	17 01.4	17 31.4	18 01.4	18 31.4	19 01.3	151.5–151.4	8
9	1.0	04	15 29.4	15 59.4	16 29.4	16 59.4	17 29.4	17 59.3	18 29.3	18 59.3	150.5–150.4	9
30	1.0	04	15 27.4	15 57.3	16 27.3	16 57.3	17 27.3	17 57.3	18 27.2	18 57.2	149.5–149.4	30
1	1.0	04	15 25.2	15 55.2	16 25.2	16 55.1	17 25.1	17 55.1	18 25.1	18 55.0	148.5–148.4	1
2	1.0	04	15 23.0	15 53.0	16 22.9	16 52.9	17 22.9	17 52.9	18 22.8	18 52.8	147.5–147.3	2
3	1.0	04	15 20.7	15 50.7	16 20.6	16 50.6	17 20.6	17 50.6	18 20.6	18 50.5	146.5–146.3	3
4	1.0	04	15 18.4	15 48.3	16 18.3	16 48.3	17 18.3	17 48.2	18 18.2	18 48.2	145.5–145.3	4
35	1.0	04	15 15.9	15 45.9	16 15.9	16 45.9	17 15.8	17 45.8	18 15.8	18 45.8	144.4–144.3	35
6	1.0	04	15 13.5	15 43.5	16 13.4	16 43.4	17 13.4	17 43.3	18 13.3	18 43.3	143.4–143.3	6
7	1.0	04	15 11.0	15 40.9	16 10.9	16 40.9	17 10.8	17 40.8	18 10.8	18 40.8	142.4–142.3	7
8	1.0	04	15 08.4	15 38.3	16 08.3	16 38.3	17 08.3	17 38.2	18 08.2	18 38.2	141.4–141.2	8
9	1.0	04	15 05.7	15 35.7	16 05.7	16 35.6	17 05.6	17 35.6	18 05.6	18 35.5	140.4–140.2	9
40	1.0	05	15 03.0	15 33.0	16 03.0	16 32.9	17 02.9	17 32.9	18 02.9	18 32.8	139.4–139.2	40
1	1.0	05	15 00.3	15 30.3	16 00.2	16 30.2	17 00.2	17 30.1	18 00.1	18 30.0	138.4–138.2	1
2	1.0	05	14 57.5	15 27.4	15 57.4	16 27.4	16 57.3	17 27.3	17 57.3	18 27.2	137.4–137.2	2
3	1.0	05	14 54.6	15 24.6	15 54.5	16 24.5	16 54.5	17 24.4	17 54.4	18 24.4	136.3–136.2	3
4	1.0	05	14 51.7	15 21.7	15 51.6	16 21.6	16 51.6	17 21.5	17 51.5	18 21.4	135.3–135.1	4
45	1.0	05	14 48.7	15 18.7	15 48.6	16 18.6	16 48.6	17 18.5	17 48.5	18 18.5	134.3–134.1	45
6	1.0	05	14 45.7	15 15.7	15 45.7	16 15.6	16 45.6	17 15.5	17 45.5	18 15.4	133.3–133.1	6
7	1.0	05	14 42.6	15 12.6	15 42.6	16 12.5	16 42.5	17 12.4	17 42.4	18 12.3	132.3–132.1	7
8	1.0	05	14 39.5	15 09.5	15 39.4	16 09.4	16 39.4	17 09.3	17 39.3	18 09.2	131.3–131.1	8
9	1.0	05	14 36.4	15 06.3	15 36.3	16 06.2	16 36.2	17 06.1	17 36.1	18 06.0	130.3–130.1	9
50	1.0	05	14 33.1	15 03.1	15 33.0	16 03.0	16 33.0	17 02.9	17 32.9	18 02.8	129.3–129.1	50
1	1.0	06	14 29.9	14 59.8	15 29.8	15 59.7	16 29.7	16 59.6	17 29.6	17 59.5	128.3–128.1	1
2	1.0	06	14 26.6	14 56.5	15 26.5	15 56.4	16 26.4	16 56.3	17 26.3	17 56.2	127.3–127.0	2
3	1.0	06	14 23.2	14 53.2	15 23.1	15 53.1	16 23.0	16 53.0	17 22.9	17 52.9	126.2–126.0	3
4	1.0	06	14 19.8	14 49.8	15 19.7	15 49.7	16 19.6	16 49.6	17 19.5	17 49.5	125.2–125.0	4
55	1.0	06	14 16.4	14 46.3	15 16.3	15 46.2	16 16.2	16 46.1	17 16.1	17 46.0	124.2–124.0	55
6	1.0	06	14 12.9	14 42.8	15 12.8	15 42.7	16 12.7	16 42.6	17 12.6	17 42.5	123.2–123.0	6
7	1.0	06	14 09.4	14 39.3	15 09.3	15 39.2	16 09.2	16 39.1	17 09.0	17 39.0	122.2–122.0	7
8	1.0	06	14 05.8	14 35.8	15 05.7	15 35.6	16 05.6	16 35.5	17 05.5	17 35.4	121.2–121.0	8
9	1.0	06	14 02.1	14 32.2	15 02.1	15 32.0	16 01.9	16 31.9	17 01.9	17 31.8	120.2–120.0	9
60	1.0	06	13 58.6	14 28.5	14 58.5	15 28.4	15 58.3	16 28.3	16 58.2	17 28.2	119.2–119.0	60
1	1.0	06	13 54.9	14 24.8	14 54.8	15 24.7	15 54.7	16 24.6	16 54.5	17 24.5	118.2–118.0	1
2	1.0	06	13 51.2	14 21.1	14 51.1	15 21.0	15 51.0	16 20.9	16 50.8	17 20.8	117.2–117.0	2
3	1.0	06	13 47.5	14 17.4	14 47.3	15 17.3	15 47.2	16 17.2	16 47.1	17 17.0	116.2–116.0	3
4	1.0	06	13 43.7	14 13.6	14 43.6	15 13.5	15 43.4	16 13.4	16 43.3	17 13.2	115.2–114.9	4
65	1.0	06	13 39.9	14 09.8	14 39.8	15 09.7	15 39.6	16 09.6	16 39.5	17 09.4	114.2–113.9	65
6	1.0	06	13 36.1	14 06.0	14 35.9	15 05.9	15 35.8	16 05.7	16 35.7	17 05.6	113.2–112.9	6
7	1.0	06	13 32.2	14 02.1	14 32.1	15 02.0	15 31.9	16 01.9	16 31.8	17 01.7	112.2–111.9	7
8	1.0	07	13 28.3	13 58.2	14 28.2	14 58.1	15 28.0	15 58.0	16 27.9	16 57.8	111.2–110.9	8
9	1.0	07	13 24.4	13 54.3	14 24.3	14 54.2	15 24.1	15 54.0	16 24.0	16 53.9	110.2–109.9	9
70	1.0	07	13 20.4	13 50.4	14 20.3	14 50.2	15 20.2	15 50.1	16 20.0	16 50.0	109.2–108.9	70
1	1.0	07	13 16.5	13 46.4	14 16.3	14 46.3	15 16.2	15 46.1	16 16.1	16 46.0	108.1–107.9	1
2	1.0	07	13 12.5	13 42.4	14 12.4	14 42.3	15 12.2	15 42.1	16 12.1	16 42.0	107.1–106.9	2
3	1.0	07	13 08.5	13 38.4	14 08.3	14 38.3	15 08.2	15 38.1	16 08.1	16 38.0	106.1–105.9	3
4	1.0	07	13 04.5	13 34.4	14 04.3	14 34.2	15 04.2	15 34.1	16 04.0	16 33.9	105.1–104.9	4
75	1.0	07	13 00.4	13 30.3	14 00.3	14 30.2	15 00.1	15 30.0	16 00.0	16 29.9	104.1–103.9	75
6	1.0	07	12 56.3	13 26.3	13 56.2	14 26.1	14 56.0	15 26.0	15 55.9	16 25.8	103.1–102.9	6
7	1.0	07	12 52.3	13 22.2	13 52.1	14 22.0	14 52.0	15 21.9	15 51.8	16 21.7	102.1–101.9	7
8	1.0	07	12 48.2	13 18.1	13 48.0	14 17.9	14 47.9	15 17.8	15 47.7	16 17.6	101.1–100.9	8
9	1.0	07	12 44.0	13 14.0	13 43.9	14 13.8	14 43.7	15 13.7	15 43.6	16 13.5	100.1–99.9	9
80	1.0	07	12 39.9	13 09.8	13 39.8	14 09.7	14 39.6	15 09.5	15 39.5	16 09.4	99.1–98.9	80
1	1.0	07	12 35.8	13 05.7	13 35.6	14 05.5	14 35.5	15 05.4	15 35.3	16 05.2	98.1–97.9	1
2	1.0	07	12 31.6	13 01.6	13 31.5	14 01.4	14 31.3	15 01.2	15 31.2	16 01.1	97.1–96.9	2
3	1.0	07	12 27.5	12 57.4	13 27.3	13 57.2	14 27.1	14 57.1	15 27.0	15 56.9	96.1–95.9	3
4	1.0	07	12 23.3	12 53.2	13 23.2	13 53.1	14 23.0	14 52.9	15 22.8	15 52.8	95.1–94.9	4
85	1.0	07	12 19.1	12 49.1	13 19.0	13 48.9	14 18.8	14 48.7	15 18.7	15 48.6	94.1–93.9	85
6	1.0	07	12 15.0	12 44.9	13 14.8	13 44.7	14 14.6	14 44.6	15 14.5	15 44.4	93.1–92.9	6
7	1.0	07	12 10.8	12 40.7	13 10.6	13 40.5	14 10.5	14 40.4	15 10.3	15 40.2	92.1–91.9	7
8	1.0	07	12 06.6	12 36.5	13 06.4	13 36.4	14 06.3	14 36.2	15 06.1	15 36.0	91.1–90.9	8
9	1.0	07	12 02.4	12 32.3	13 02.3	13 32.2	14 02.1	14 32.0	15 01.9	15 31.9	90.1–89.9	9
90	1.0	07	11 58.2	12 28.1	12 58.1	13 28.0	13 57.9	14 27.8	14 57.8	15 27.7	89.2–88.9	90

Lat. 86°

H.A.	12° 00' Alt. Δd Δt	Az.	12° 30' Alt. Δd Δt	Az.	13° 00' Alt. Δd Δt	Az.	13° 30' Alt. Δd Δt	Az.	14° 00' Alt. Δd Δt	Az.	14° 30' Alt. Δd Δt	Az.	15° 00' Alt. Δd Δt	Az.	15° 30' Alt. Δd Δt	Az.	H.A.
91	11 54.0 1.007	88.2	12 24.0 1.007	88.1	12 53.9 1.007	88.1	13 23.8 1.007	88.0	13 53.7 1.007	88.0	14 23.7 1.007	88.0	14 53.6 1.007	87.9	15 23.5 1.007	87.9	91
2	11 49.9 1.007	87.2	12 19.8 1.007	87.1	12 49.7 1.007	87.1	13 19.6 1.007	87.0	13 49.5 1.007	87.0	14 19.5 1.007	87.0	14 49.4 1.007	86.9	15 19.3 1.007	86.9	2
3	11 45.7 1.007	86.2	12 15.6 1.007	86.1	12 45.5 1.007	86.1	13 15.4 1.007	86.0	13 45.3 1.007	86.0	14 15.3 1.007	86.0	14 45.2 1.007	85.9	15 15.1 1.007	85.9	3
4	11 41.5 1.007	85.2	12 11.4 1.007	85.1	12 41.4 1.007	85.1	13 11.3 1.007	85.1	13 41.2 1.007	85.0	14 11.1 1.007	85.0	14 41.0 1.007	84.9	15 11.0 1.007	84.9	4
95	11 37.3 1.007	84.2	12 07.3 1.007	84.1	12 37.2 1.007	84.1	13 07.1 1.007	84.1	13 37.0 1.007	84.0	14 07.0 1.007	84.0	14 36.9 1.007	83.9	15 06.8 1.007	83.9	95
6	11 33.2 1.007	83.2	12 03.1 1.007	83.1	12 33.0 1.007	83.1	13 02.9 1.007	83.1	13 32.9 1.007	83.0	14 02.8 1.007	83.0	14 32.7 1.007	83.0	15 02.6 1.007	82.9	6
7	11 29.0 1.007	82.2	11 58.9 1.007	82.1	12 28.9 1.007	82.1	12 58.8 1.007	82.1	13 28.7 1.007	82.0	13 58.6 1.007	82.0	14 28.6 1.007	82.0	14 58.5 1.007	81.9	7
8	11 24.9 1.007	81.2	11 54.8 1.007	81.1	12 24.7 1.007	81.1	12 54.7 1.007	81.1	13 24.6 1.007	81.0	13 54.5 1.007	81.0	14 24.4 1.007	81.0	14 54.4 1.007	80.9	8
9	11 20.8 1.007	80.2	11 50.7 1.007	80.1	12 20.6 1.007	80.1	12 50.5 1.007	80.1	13 20.5 1.007	80.0	13 50.4 1.007	80.0	14 20.3 1.007	80.0	14 50.2 1.007	79.9	9
100	11 16.6 1.007	79.2	11 46.6 1.007	79.2	12 16.5 1.007	79.1	12 46.4 1.007	79.1	13 16.3 1.007	79.0	13 46.3 1.007	79.0	14 16.2 1.007	79.0	14 46.1 1.007	78.9	100
1	11 12.5 1.007	78.2	11 42.5 1.007	78.2	12 12.4 1.007	78.1	12 42.3 1.007	78.1	13 12.2 1.007	78.1	13 42.2 1.007	78.0	14 12.1 1.007	78.0	14 42.0 1.007	77.9	1
2	11 08.4 1.007	77.2	11 38.4 1.007	77.2	12 08.3 1.007	77.1	12 38.2 1.007	77.1	13 08.1 1.007	77.1	13 38.1 1.007	77.0	14 08.0 1.007	77.0	14 37.9 1.007	76.9	2
3	11 04.4 1.007	76.2	11 34.3 1.007	76.2	12 04.2 1.007	76.1	12 34.2 1.007	76.1	13 04.1 1.007	76.1	13 34.0 1.007	76.0	14 03.9 1.007	76.0	14 33.8 1.007	76.0	3
4	11 00.3 1.007	75.2	11 30.2 1.007	75.2	12 00.2 1.007	75.1	12 30.1 1.007	75.1	13 00.0 1.007	75.1	13 30.0 1.007	75.0	13 59.9 1.007	75.0	14 29.8 1.007	75.0	4
105	10 56.3 1.007	74.2	11 26.2 1.007	74.2	11 56.1 1.007	74.1	12 26.1 1.007	74.1	12 56.0 1.007	74.1	13 25.9 1.007	74.0	13 55.8 1.007	74.0	14 25.8 1.007	74.0	105
6	10 52.3 1.007	73.2	11 22.2 1.007	73.2	11 52.1 1.007	73.2	12 22.0 1.007	73.1	12 52.0 1.007	73.1	13 21.9 1.007	73.0	13 51.8 1.007	73.0	14 21.8 1.007	73.0	6
7	10 48.3 1.007	72.2	11 18.2 1.007	72.2	11 48.1 1.007	72.2	12 18.1 1.007	72.1	12 48.0 1.007	72.1	13 17.9 1.007	72.1	13 47.8 1.007	72.0	14 17.8 1.007	72.0	7
8	10 44.3 1.007	71.2	11 14.2 1.007	71.2	11 44.2 1.007	71.2	12 14.1 1.007	71.1	12 44.0 1.007	71.1	13 13.9 1.007	71.1	13 43.9 1.007	71.0	14 13.8 1.007	71.0	8
9	10 40.3 1.007	70.2	11 10.3 1.007	70.2	11 40.2 1.007	70.2	12 10.1 1.007	70.1	12 40.1 1.007	70.1	13 10.0 1.007	70.1	13 39.9 1.007	70.0	14 09.9 1.007	70.0	9
110	10 36.4 1.006	69.3	11 06.3 1.006	69.2	11 36.3 1.006	69.2	12 06.2 1.006	69.1	12 36.1 1.006	69.1	13 06.1 1.006	69.1	13 36.0 1.006	69.0	14 05.9 1.006	69.0	110
1	10 32.5 1.006	68.3	11 02.4 1.006	68.2	11 32.4 1.006	68.2	12 02.3 1.006	68.2	12 32.2 1.006	68.1	13 02.2 1.006	68.1	13 32.1 1.006	68.1	14 02.0 1.006	68.0	1
2	10 28.6 1.006	67.3	10 58.6 1.006	67.2	11 28.5 1.006	67.2	11 58.4 1.006	67.2	12 28.4 1.006	67.1	12 58.3 1.006	67.1	13 28.2 1.006	67.1	13 58.2 1.006	67.0	2
3	10 24.8 1.006	66.3	10 54.7 1.006	66.2	11 24.7 1.006	66.2	11 54.6 1.006	66.2	12 24.5 1.006	66.1	12 54.5 1.006	66.1	13 24.4 1.006	66.1	13 54.3 1.006	66.0	3
4	10 21.0 1.006	65.3	10 50.9 1.006	65.2	11 20.8 1.006	65.2	11 50.8 1.006	65.2	12 20.7 1.006	65.1	12 50.7 1.006	65.1	13 20.6 1.006	65.1	13 50.5 1.006	65.0	4
115	10 17.2 1.006	64.3	10 47.1 1.006	64.3	11 17.1 1.006	64.2	11 47.0 1.006	64.2	12 16.9 1.006	64.2	12 46.9 1.006	64.1	13 16.8 1.006	64.1	13 46.7 1.006	64.1	115
6	10 13.4 1.006	63.3	10 43.4 1.006	63.3	11 13.3 1.006	63.2	11 43.2 1.006	63.2	12 13.2 1.006	63.2	12 43.1 1.006	63.1	13 13.1 1.006	63.1	13 43.0 1.006	63.1	6
7	10 09.7 1.006	62.3	10 39.6 1.006	62.3	11 09.6 1.006	62.2	11 39.5 1.006	62.2	12 09.5 1.006	62.2	12 39.4 1.006	62.1	13 09.3 1.006	62.1	13 39.3 1.006	62.1	7
8	10 06.0 1.006	61.3	10 36.0 1.006	61.3	11 05.9 1.006	61.2	11 35.8 1.006	61.2	12 05.8 1.006	61.2	12 35.7 1.006	61.2	13 05.7 1.006	61.1	13 35.6 1.006	61.1	8
9	10 02.4 1.006	60.3	10 32.3 1.006	60.3	11 02.3 1.006	60.3	11 32.2 1.006	60.2	12 02.1 1.006	60.2	12 32.1 1.006	60.2	13 02.0 1.006	60.1	13 32.0 1.006	60.1	9
120	9 58.7 1.006	59.3	10 28.7 1.006	59.3	10 58.6 1.006	59.3	11 28.6 1.006	59.2	11 58.5 1.006	59.2	12 28.5 1.006	59.2	12 58.4 1.006	59.1	13 28.3 1.006	59.1	120
1	9 55.2 1.006	58.3	10 25.1 1.006	58.3	10 55.1 1.006	58.3	11 25.0 1.006	58.2	11 54.9 1.006	58.2	12 24.9 1.006	58.2	12 54.8 1.006	58.1	13 24.8 1.006	58.1	1
2	9 51.6 1.006	57.3	10 21.6 1.006	57.3	10 51.5 1.006	57.3	11 21.5 1.006	57.3	11 51.4 1.006	57.2	12 21.3 1.006	57.2	12 51.3 1.006	57.2	13 21.2 1.006	57.1	2
3	9 48.1 1.006	56.4	10 18.1 1.006	56.3	10 48.0 1.006	56.3	11 18.0 1.006	56.3	11 47.9 1.006	56.2	12 17.9 1.006	56.2	12 47.8 1.006	56.2	13 17.7 1.006	56.1	3
4	9 44.7 1.006	55.4	10 14.6 1.006	55.3	10 44.6 1.006	55.3	11 14.5 1.006	55.3	11 44.4 1.006	55.2	12 14.4 1.006	55.2	12 44.3 1.006	55.2	13 14.3 1.006	55.2	4
125	9 41.2 1.006	54.4	10 11.2 1.006	54.3	10 41.1 1.006	54.3	11 11.1 1.006	54.3	11 41.0 1.006	54.3	12 11.0 1.006	54.2	12 40.9 1.006	54.2	13 10.9 1.006	54.2	125
6	9 37.9 1.006	53.4	10 07.8 1.006	53.4	10 37.8 1.006	53.3	11 07.7 1.006	53.3	11 37.7 1.006	53.3	12 07.6 1.006	53.2	12 37.6 1.006	53.2	13 07.5 1.006	53.2	6
7	9 34.5 1.006	52.4	10 04.5 1.006	52.4	10 34.4 1.006	52.3	11 04.4 1.006	52.3	11 34.3 1.006	52.3	12 04.3 1.006	52.2	12 34.2 1.006	52.2	13 04.2 1.006	52.2	7
8	9 31.2 1.005	51.4	10 01.2 1.005	51.4	10 31.1 1.005	51.3	11 01.1 1.005	51.3	11 31.0 1.005	51.3	12 01.0 1.005	51.3	12 30.9 1.005	51.2	13 00.9 1.005	51.2	8
9	9 28.0 1.005	50.4	9 57.9 1.005	50.4	10 27.9 1.005	50.4	10 57.8 1.005	50.3	11 27.8 1.005	50.3	11 57.7 1.005	50.3	12 27.7 1.005	50.2	12 57.6 1.005	50.2	9
130	9 24.8 1.005	49.4	9 54.7 1.005	49.4	10 24.7 1.005	49.4	10 54.6 1.005	49.3	11 24.6 1.005	49.3	11 54.5 1.005	49.3	12 24.5 1.005	49.3	12 54.5 1.005	49.2	130
1	9 21.6 1.005	48.4	9 51.6 1.005	48.4	10 21.5 1.005	48.4	10 51.5 1.005	48.4	11 21.4 1.005	48.3	11 51.4 1.005	48.3	12 21.4 1.005	48.3	12 51.3 1.005	48.2	1
2	9 18.5 1.005	47.4	9 48.5 1.005	47.4	10 18.4 1.005	47.4	10 48.4 1.005	47.4	11 18.3 1.005	47.3	11 48.3 1.005	47.3	12 18.3 1.005	47.3	12 48.2 1.005	47.3	2
3	9 15.4 1.005	46.5	9 45.4 1.005	46.4	10 15.4 1.005	46.4	10 45.3 1.005	46.4	11 15.3 1.005	46.3	11 45.2 1.005	46.3	12 15.2 1.005	46.3	12 45.2 1.005	46.3	3
4	9 12.4 1.005	45.5	9 42.4 1.005	45.4	10 12.4 1.005	45.4	10 42.3 1.005	45.4	11 12.3 1.005	45.4	11 42.2 1.005	45.3	12 12.2 1.005	45.3	12 42.2 1.005	45.3	4
135	9 09.5 1.005	44.5	9 39.4 1.005	44.4	10 09.4 1.005	44.4	10 39.4 1.005	44.4	11 09.3 1.005	44.4	11 39.3 1.005	44.3	12 09.3 1.005	44.3	12 39.2 1.005	44.3	135
6	9 06.6 1.005	43.5	9 36.5 1.005	43.5	10 06.5 1.005	43.4	10 36.5 1.005	43.4	11 06.4 1.005	43.4	11 36.4 1.005	43.4	12 06.4 1.005	43.3	12 36.3 1.005	43.3	6
7	9 03.7 1.005	42.5	9 33.7 1.005	42.5	10 03.7 1.005	42.4	10 33.6 1.005	42.4	11 03.6 1.005	42.4	11 33.5 1.005	42.4	12 03.5 1.005	42.3	12 33.5 1.005	42.3	7
8	9 00.9 1.005	41.5	9 30.9 1.005	41.5	10 00.9 1.005	41.5	10 30.8 1.005	41.4	11 00.8 1.005	41.4	11 30.8 1.005	41.4	12 00.7 1.005	41.4	12 30.7 1.005	41.3	8
9	8 58.2 1.004	40.5	9 28.1 1.004	40.5	9 58.1 1.004	40.5	10 28.1 1.004	40.4	10 58.0 1.004	40.4	11 28.0 1.004	40.4	11 58.0 1.004	40.4	12 27.9 1.004	40.4	9
140	8 55.5 1.004	39.5	9 25.5 1.004	39.5	9 55.4 1.004	39.5	10 25.4 1.004	39.5	10 55.4 1.004	39.4	11 25.3 1.004	39.4	11 55.3 1.004	39.4	12 25.3 1.004	39.4	140
1	8 52.8 1.004	38.5	9 22.8 1.004	38.5	9 52.8 1.004	38.5	10 22.8 1.004	38.5	10 52.7 1.004	38.4	11 22.7 1.004	38.4	11 52.7 1.004	38.4	12 22.6 1.004	38.4	1
2	8 50.3 1.004	37.5	9 20.2 1.004	37.5	9 50.2 1.004	37.5	10 20.2 1.004	37.5	10 50.2 1.004	37.5	11 20.1 1.004	37.4	11 50.1 1.004	37.4	12 20.1 1.004	37.4	2
3	8 47.7 1.004	36.6	9 17.7 1.004	36.5	9 47.7 1.004	36.5	10 17.7 1.004	36.5	10 47.6 1.004	36.5	11 17.6 1.004	36.5	11 47.6 1.004	36.4	12 17.6 1.004	36.4	3
4	8 45.3 1.004	35.6	9 15.3 1.004	35.6	9 45.2 1.004	35.5	10 15.2 1.004	35.5	10 45.2 1.004	35.5	11 15.2 1.004	35.5	11 45.1 1.004	35.4	12 15.1 1.004	35.4	4
145	8 42.9 1.004	34.6	9 12.9 1.004	34.6	9 42.8 1.004	34.5	10 12.8 1.004	34.5	10 42.8 1.004	34.5	11 12.8 1.004	34.5	11 42.7 1.004	34.5	12 12.7 1.004	34.4	145
6	8 40.5 1.004	33.6	9 10.5 1.004	33.6	9 40.5 1.004	33.6	10 10.5 1.004	33.5	10 40.4 1.004	33.5	11 10.4 1.004	33.5	11 40.4 1.004	33.5	12 10.4 1.004	33.5	6
7	8 38.2 1.004	32.6	9 08.2 1.004	32.6	9 38.2 1.004	32.6	10 08.2 1.004	32.5	10 38.2 1.004	32.5	11 08.1 1.004	32.5	11 38.1 1.004	32.5	12 08.1 1.004	32.5	7
8	8 36.0 1.004	31.6	9 06.0 1.004	31.6	9 36.0 1.004	31.6	10 06.0 1.004	31.6	10 35.9 1.004	31.5	11 05.9 1.004	31.5	11 35.9 1.004	31.5	12 05.9 1.004	31.5	8
9	8 33.9 1.004	30.6	9 03.8 1.004	30.6	9 33.8 1.004	30.6	10 03.8 1.004	30.6	10 33.8 1.004	30.6	11 03.8 1.004	30.5	11 33.7 1.003	30.5	12 03.7 1.003	30.5	9
150	8 31.8 1.003	29.6	9 01.7 1.003	29.6	9 31.7 1.003	29.6	10 01.7 1.003	29.6	10 31.7 1.003	29.6	11 01.7 1.003	29.5	11 31.6 1.003	29.5	12 01.6 1.003	29.5	150
1	8 29.7 1.003	28.7	8 59.7 1.003	28.6	9 29.7 1.003	28.6	9 59.7 1.003	28.6	10 29.6 1.003	28.6	10 59.6 1.003	28.6	11 29.6 1.003	28.5	11 59.6 1.003	28.5	1
2	8 27.7 1.003	27.7	8 57.7 1.003	27.6	9 27.7 1.003	27.6	9 57.7 1.003	27.6	10 27.7 1.003	27.6	10 57.7 1.003	27.6	11 27.6 1.003	27.6	11 57.6 1.003	27.5	2
3	8 25.8 1.003	26.7	8 55.8 1.003	26.7	9 25.8 1.003	26.7	9 55.8 1.003	26.6	10 25.8 1.003	26.6	10 55.8 1.003	26.6	11 25.8 1.003	26.6	11 55.8 1.003	26.6	3
4	8 24.0 1.003	25.7	8 54.0 1.003	25.7	9 24.0 1.003	25.7	9 53.9 1.003	25.6	10 23.9 1.003	25.6	10 53.9 1.003	25.6	11 23.9 1.003	25.6	11 53.9 1.003	25.6	4
155	8 22.2 1.003	24.7	8 52.2 1.003	24.7	9 22.2 1.003	24.7	9 52.2 1.003	24.7	10 22.1 1.003	24.6	10 52.1 1.003	24.6	11 22.1 1.003	24.6	11 52.1 1.003	24.6	155
6	8 20.5 1.003	23.7	8 50.5 1.003	23.7	9 20.5 1.003	23.7	9 50.4 1.003	23.7	10 20.4 1.003	23.7	10 50.4 1.003	23.6	11 20.4 1.003	23.6	11 50.4 1.003	23.6	6
7	8 18.8 1.003	22.7	8 48.8 1.003	22.7	9 18.8 1.003	22.7	9 48.8 1.003	22.7	10 18.8 1.003	22.7	10 48.8 1.003	22.7	11 18.8 1.003	22.6	11 48.8 1.003	22.6	7
8	8 17.3 1.003	21.7	8 47.2 1.003	21.7	9 17.2 1.003	21.7	9 47.2 1.003	21.7	10 17.2 1.003	21.7	10 47.2 1.003	21.7	11 17.2 1.003	21.7	11 47.2 1.003	21.6	8
9	8 15.7 1.002	20.7	8 45.7 1.002	20.7	9 15.7 1.002	20.7	9 45.7 1.002	20.7	10 15.7 1.002	20.7	10 45.7 1.002	20.7	11 15.7 1.002	20.7	11 45.7 1.002	20.7	9
160	8 14.3 1.002	19.8	8 44.3 1.002	19.7	9 14.3 1.002	19.7	9 44.3 1.002	19.7	10 14.3 1.002	19.7	10 44.2 1.002	19.7	11 14.2 1.002	19.7	11 44.2 1.002	19.7	160
1	8 12.9 1.002	18.8	8 42.9 1.002	18.8	9 12.9 1.002	18.7	9 42.9 1.002	18.7	10 12.9 1.002	18.7	10 42.9 1.002	18.7	11 12.9 1.002	18.7	11 42.9 1.002	18.7	1
2	8 11.6 1.002	17.8	8 41.6 1.002	17.8	9 11.6 1.002	17.8	9 41.6 1.002	17.7	10 11.6 1.002	17.7	10 41.6 1.002	17.7	11 11.6 1.002	17.7	11 41.5 1.002	17.7	2
3	8 10.4 1.002	16.8	8 40.3 1.002	16.8	9 10.3 1.002	16.8	9 40.3 1.002	16.8	10 10.3 1.002	16.8	10 40.3 1.002	16.7	11 10.3 1.002	16.7	11 40.3 1.002	16.7	3
4	8 09.2 1.002	15.8	8 39.2 1.002	15.8	9 09.2 1.002	15.8	9 39.2 1.002	15.8	10 09.2 1.002	15.8	10 39.1 1.002	15.8	11 09.1 1.002	15.7	11 39.1 1.002	15.7	4
165	8 08.1 1.002	14.8	8 38.1 1.002	14.8	9 08.1 1.002	14.8	9 38.1 1.002	14.8	10 08.1 1.002	14.8	10 38.0 1.002	14.8	11 08.0 1.002	14.8	11 38.0 1.002	14.8	165
6	8 07.0 1.002	13.8	8 37.0 1.002	13.8	9 07.0 1.002	13.8	9 37.0 1.002	13.8	10 07.0 1.002	13.8	10 37.0 1.002	13.8	11 07.0 1.002	13.8	11 37.0 1.002	13.8	6
7	8 06.1 1.001	12.8	8 36.1 1.002	12.8	9 06.1 1.002	12.8	9 36.1 1.002	12.8	10 06.1 1.001	12.8	10 36.1 1.001	12.8	11 06.0 1.002	12.8	11 36.0 1.002	12.8	7
8	8 05.2 1.001	11.9	8 35.2 1.001	11.8	9 05.2 1.001	11.8	9 35.2 1.001	11.8	10 05.2 1.001	11.8	10 35.2 1.001	11.8	11 05.2 1.001	11.8	11 35.2 1.001	11.8	8
9	8 04.4 1.001	10.9	8 34.3 1.001	10.9	9 04.3 1.001	10.9	9 34.3 1.001	10.9	10 04.3 1.001	10.8	10 34.3 1.001	10.8	11 04.3 1.001	10.8	11 34.3 1.001	10.8	9
170	8 03.6 1.001	09.9	8 33.6 1.001	09.9	9 03.6 1.001	09.9	9 33.6 1.001	09.9	10 03.6 1.001	09.9	10 33.6 1.001	09.8	11 03.6 1.001	09.8	11 33.6 1.001	09.8	170
1	8 02.9 1.001	08.9	8 32.9 1.001	08.9	9 02.9 1.001	08.9	9 32.9 1.001	08.9	10 02.9 1.001	08.9	10 32.9 1.001	08.9	11 02.9 1.001	08.9	11 32.9 1.001	08.9	1
2	8 02.3 1.001	07.9	8 32.3 1.001	07.9	9 02.3 1.001	07.9	9 32.3 1.001	07.9	10 02.3 1.001	07.9	10 32.3 1.001	07.9	11 02.3 1.001	07.9	11 32.3 1.001	07.9	2
3	8 01.8 1.001	06.9	8 31.8 1.001	06.9	9 01.8 1.001	06.9	9 31.8 1.001	06.9	10 01.8 1.001	06.9	10 31.8 1.001	06.9	11 01.8 1.001	06.9	11 31.8 1.001	06.9	3
4	8 01.3 1.001	05.9	8 31.3 1.001	05.9	9 01.3 1.001	05.9	9 31.3 1.001	05.9	10 01.3 1.001	05.9	10 31.3 1.001	05.9	11 01.3 1.001	05.9	11 31.3 1.001	05.9	4
175	8 00.9 1.001	04.9	8 30.9 1.001	04.9	9 00.9 1.001	04.9	9 30.9 1.001	04.9	10 00.9 1.001	04.9	10 30.9 1.001	04.9	11 00.9 1.001	04.9	11 30.9 1.001	04.9	175
6	8 00.6 1.000	04.0	8 30.6 1.000	03.9	9 00.6 1.000	03.9	9 30.6 1.000	03.9	10 00.6 1.000	03.9	10 30.6 1.000	03.9	11 00.6 1.000	03.9	11 30.6 1.000	03.9	6
7	8 00.3 1.000	03.0	8 30.3 1.000	03.0	9 00.3 1.000	03.0	9 30.3 1.000	03.0	10 00.3 1.000	03.0	10 30.3 1.000	03.0	11 00.3 1.000	03.0	11 30.3 1.000	03.0	7
8	8 00.1 1.000	02.0	8 30.1 1.000	02.0	9 00.1 1.000	02.0	9 30.1 1.000	02.0	10 00.1 1.000	02.0	10 30.1 1.000	02.0	11 00.1 1.000	02.0	11 30.1 1.000	02.0	8
9	8 00.0 1.000	01.0	8 30.0 1.000	01.0	9 00.0 1.000	01.0	9 30.0 1.000	01.0	10 00.0 1.000	01.0	10 30.0 1.000	01.0	11 00.0 1.000	01.0	11 30.0 1.000	01.0	9
180	8 00.0 1.000	00.0	8 30.0 1.000	00.0	9 00.0 1.000	00.0	9 30.0 1.000	00.0	10 00.0 1.000	00.0	10 30.0 1.000	00.0	11 00.0 1.000	00.0	11 30.0 1.000	00.0	180

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Lat. 88°

Lat. 89°

Lat. 86°

H.A.	16° 00' Alt.	Δd Δt	Az.	16° 30' Alt.	Δd Δt	Az.	17° 00' Alt.	Δd Δt	Az.	17° 30' Alt.	Δd Δt	Az.	18° 00' Alt.	Δd Δt	Az.	18° 30' Alt.	Δd Δt	Az.	19° 00' Alt.	Δd Δt	Az.	19° 30' Alt.	Δd Δt	Az.	H.A.
00	20 00.0	1.00	180.0	20 30.0	1.00	180.0	21 00.0	1.00	180.0	21 30.0	1.00	180.0	22 00.0	1.00	180.0	22 30.0	1.00	180.0	23 00.0	1.00	180.0	23 30.0	1.00	180.0	00
1	20 00.0	1.00	179.0	20 30.0	1.00	179.0	21 00.0	1.00	179.0	21 30.0	1.00	179.0	22 00.0	1.00	179.0	22 30.0	1.00	179.0	23 00.0	1.00	179.0	23 30.0	1.00	179.0	1
2	19 59.9	1.00	178.0	20 29.9	1.00	178.0	20 59.9	1.00	178.0	21 29.9	1.00	178.0	21 59.9	1.00	177.9	22 29.9	1.00	177.9	22 59.9	1.00	177.9	23 29.9	1.00	177.9	2
3	19 59.7	1.00	176.9	20 29.7	1.00	176.9	20 59.7	1.00	176.9	21 29.7	1.00	176.9	21 59.7	1.00	176.9	22 29.7	1.00	176.9	22 59.7	1.00	176.9	23 29.7	1.00	176.9	3
4	19 59.4	1.01	175.9	20 29.4	1.01	175.9	20 59.4	1.01	175.9	21 29.4	1.01	175.9	21 59.4	1.01	175.9	22 29.4	1.01	175.9	22 59.4	1.01	175.9	23 29.4	1.01	175 9	4
05	19 59.1	1.01	174.9	20 29.1	1.01	174.9	20 59.1	1.01	174.9	21 29.1	1.01	174.9	21 59.1	1.01	174.9	22 29.1	1.01	174.9	22 59.1	1.01	174.9	23 29.1	1.01	174.9	05
6	19 58.7	1.01	173.9	20 28.7	1.01	173.9	20 58.7	1.01	173.9	21 28.7	1.01	173.8	21 58.7	1.01	173.8	22 28.7	1.01	173.8	22 58.7	1.01	173.8	23 28.7	1.01	173.8	6
7	19 58.2	1.01	172.8	20 28.2	1.01	172.8	20 58.2	1.01	172.8	21 28.2	1.01	172.8	21 58.2	1.01	172.8	22 28.2	1.01	172.8	22 58.2	1.01	172.8	23 28.2	1.01	172.8	7
8	19 57.6	1.01	171.8	20 27.6	1.01	171.8	20 57.6	1.01	171.8	21 27.6	1.01	171.8	21 57.6	1.01	171.8	22 27.6	1.01	171.8	22 57.6	1.01	171.8	23 27.6	1.01	171.8	8
9	19 57.0	1.01	170.8	20 27.0	1.01	170.8	20 57.0	1.01	170.8	21 27.0	1.01	170.8	21 57.0	1.01	170.8	22 27.0	1.01	170.8	22 57.0	1.01	170.8	23 27.0	1.01	170.8	9
10	19 56.3	1.01	169.8	20 26.3	1.01	169.8	20 56.3	1.01	169.8	21 26.3	1.01	169.8	21 56.3	1.01	169.7	22 26.3	1.01	169.7	22 56.3	1.01	169.7	23 26.3	1.01	169.7	10
1	19 55.5	1.01	168.7	20 25.5	1.01	168.7	20 55.5	1.01	168.7	21 25.5	1.01	168.7	21 55.5	1.01	168.7	22 25.5	1.01	168.7	22 55.5	1.01	168.7	23 25.5	1.01	168.7	1
2	19 54.6	1.02	167.7	20 24.6	1.02	167.7	20 54.6	1.02	167.7	21 24.6	1.02	167.7	21 54.6	1.02	167.7	22 24.6	1.02	167.7	22 54.6	1.02	167.7	23 24.6	1.02	167.7	2
3	19 53.7	1.02	166.7	20 23.7	1.02	166.7	20 53.7	1.02	166.7	21 23.7	1.02	166.7	21 53.7	1.02	166.7	22 23.7	1.02	166.7	22 53.7	1.02	166.6	23 23.7	1.02	166.6	3
4	19 52.7	1.02	165.7	20 22.7	1.02	165.7	20 52.7	1.02	165.7	21 22.7	1.02	165.7	21 52.7	1.02	165.6	22 22.7	1.02	165.6	22 52.7	1.02	165.6	23 22.7	1.02	165.6	4
15	19 51.6	1.02	164.7	20 21.6	1.02	164.7	20 51.6	1.02	164.6	21 21.6	1.02	164.6	21 51.6	1.02	164.6	22 21.6	1.02	164.6	22 51.6	1.02	164.6	23 21.6	1.02	164.6	15
6	19 50.5	1.02	163.6	20 20.5	1.02	163.6	20 50.5	1.02	163.6	21 20.5	1.02	163.6	21 50.5	1.02	163.6	22 20.5	1.02	163.6	22 50.5	1.02	163.6	23 20.5	1.02	163.6	6
7	19 49.3	1.02	162.6	20 19.3	1.02	162.6	20 49.3	1.02	162.6	21 19.3	1.02	162.6	21 49.3	1.02	162.6	22 19.3	1.02	162.6	22 49.2	1.02	162.5	23 19.2	1.02	162.5	7
8	19 48.0	1.02	161.6	20 18.0	1.02	161.6	20 48.0	1.02	161.6	21 18.0	1.02	161.6	21 48.0	1.02	161.5	22 18.0	1.02	161.5	22 48.0	1.02	161.5	23 17.9	1.02	161.5	8
9	19 46.6	1.02	160.6	20 16.6	1.02	160.6	20 46.6	1.02	160.5	21 16.6	1.02	160.5	21 46.6	1.02	160.5	22 16.6	1.02	160.5	22 46.6	1.02	160.5	23 16.6	1.02	160.5	9
20	19 45.2	1.02	159.6	20 15.2	1.02	159.5	20 45.2	1.02	159.5	21 15.2	1.02	159.5	21 45.2	1.02	159.5	22 15.2	1.02	159.5	22 45.2	1.02	159.5	23 15.1	1.02	159.5	20
1	19 43.7	1.03	158.5	20 13.7	1.03	158.5	20 43.7	1.03	158.5	21 13.7	1.03	158.5	21 43.7	1.03	158.5	22 13.7	1.03	158.5	22 43.7	1.03	158.4	23 13.6	1.03	158.4	1
2	19 42.2	1.03	157.5	20 12.1	1.03	157.5	20 42.1	1.03	157.5	21 12.1	1.03	157.5	21 42.1	1.03	157.5	22 12.1	1.03	157.4	22 42.1	1.03	157.4	23 12.1	1.03	157.4	2
3	19 40.5	1.03	156.5	20 10.5	1.03	156.5	20 40.5	1.03	156.5	21 10.5	1.03	156.4	21 40.5	1.03	156.4	22 10.5	1.03	156.4	22 40.4	1.03	156.4	23 10.4	1.03	156.4	3
4	19 38.8	1.03	155.5	20 08.8	1.03	155.5	20 38.8	1.03	155.4	21 08.8	1.03	155.4	21 38.8	1.03	155.4	22 08.7	1.03	155.4	22 38.7	1.03	155.4	23 08.7	1.03	155.4	4
25	19 37.0	1.03	154.5	20 07.0	1.03	154.4	20 37.0	1.03	154.4	21 07.0	1.03	154.4	21 37.0	1.03	154.4	22 07.0	1.03	154.4	22 37.0	1.03	154.3	23 06.9	1.03	154.3	25
6	19 35.2	1.03	153.4	20 05.2	1.03	153.4	20 35.2	1.03	153.4	21 05.2	1.03	153.4	21 35.1	1.03	153.4	22 05.1	1.03	153.3	22 35.1	1.03	153.3	23 05.1	1.03	153.3	6
7	19 33.3	1.03	152.4	20 03.3	1.03	152.4	20 33.3	1.03	152.4	21 03.2	1.03	152.4	21 33.2	1.03	152.3	22 03.2	1.03	152.3	22 33.2	1.03	152.3	23 03.2	1.03	152.3	7
8	19 31.3	1.03	151.4	20 01.3	1.03	151.4	20 31.3	1.03	151.4	21 01.3	1.03	151.3	21 31.3	1.03	151.3	22 01.2	1.03	151.3	22 31.2	1.03	151.3	23 01.2	1.03	151.3	8
9	19 29.3	1.04	150.4	19 59.3	1.04	150.4	20 29.3	1.04	150.3	20 59.2	1.04	150.3	21 29.2	1.04	150.3	21 59.2	1.04	150.3	22 29.2	1.04	150.3	22 59.2	1.04	150.2	9
30	19 27.2	1.04	149.4	19 57.2	1.04	149.3	20 27.1	1.04	149.3	20 57.1	1.04	149.3	21 27.1	1.04	149.3	21 57.1	1.04	149.3	22 27.1	1.04	149.2	22 57.0	1.04	149.2	30
1	19 25.0	1.04	148.3	19 55.0	1.04	148.3	20 25.0	1.04	148.3	20 55.0	1.04	148.3	21 24.9	1.04	148.3	21 54.9	1.04	148.2	22 24.9	1.04	148.2	22 54.9	1.04	148.2	1
2	19 22.8	1.04	147.3	19 52.8	1.04	147.3	20 22.8	1.04	147.3	20 52.7	1.04	147.3	21 22.7	1.04	147.2	21 52.7	1.04	147.2	22 22.7	1.04	147.2	22 52.6	1.04	147.2	2
3	19 20.5	1.04	146.3	19 50.5	1.04	146.3	20 20.5	1.04	146.3	20 50.4	1.04	146.2	21 20.4	1.04	146.2	21 50.4	1.04	146.2	22 20.4	1.04	146.2	22 50.3	1.04	146.1	3
4	19 18.2	1.04	145.3	19 48.1	1.04	145.3	20 18.1	1.04	145.2	20 48.1	1.04	145.2	21 18.0	1.04	145.2	21 48.0	1.04	145.2	22 18.0	1.04	145.1	22 48.0	1.04	145.1	4
35	19 15.7	1.04	144.3	19 45.7	1.04	144.2	20 15.7	1.04	144.2	20 45.7	1.04	144.2	21 15.6	1.04	144.2	21 45.6	1.04	144.1	22 15.6	1.04	144.1	22 45.5	1.04	144.1	35
6	19 13.3	1.04	143.2	19 43.2	1.04	143.2	20 13.2	1.04	143.2	20 43.2	1.04	143.2	21 13.2	1.04	143.2	21 43.1	1.04	143.1	22 13.1	1.04	143.1	22 43.1	1.04	143.1	6
7	19 10.7	1.04	142.2	19 40.7	1.04	142.2	20 10.7	1.04	142.2	20 40.6	1.04	142.2	21 10.6	1.04	142.1	21 40.6	1.04	142.1	22 10.5	1.04	142.1	22 40.5	1.04	142.1	7
8	19 08.1	1.04	141.2	19 38.1	1.04	141.2	20 08.0	1.04	141.2	20 38.0	1.04	141.2	21 08.0	1.04	141.1	21 38.0	1.04	141.1	22 07.9	1.04	141.1	22 37.9	1.04	141.0	8
9	19 05.5	1.04	140.2	19 35.5	1.04	140.2	20 05.4	1.04	140.1	20 35.4	1.04	140.1	21 05.4	1.04	140.1	21 35.3	1.04	140.1	22 05.3	1.05	140.0	22 35.3	1.05	140.0	9
40	19 02.8	1.05	139.2	19 32.7	1.05	139.2	20 02.7	1.05	139.1	20 32.7	1.05	139.1	21 02.6	1.05	139.1	21 32.6	1.05	139.1	22 02.6	1.05	139.0	22 32.5	1.05	139.0	40
1	19 00.0	1.05	138.2	19 30.0	1.05	138.1	19 59.9	1.05	138.1	20 29.9	1.05	138.1	20 59.9	1.05	138.1	21 29.8	1.05	138.0	21 59.8	1.05	138.0	22 29.8	1.05	138.0	1
2	18 57.2	1.05	137.1	19 27.2	1.05	137.1	19 57.1	1.05	137.1	20 27.1	1.05	137.1	20 57.0	1.05	137.0	21 27.0	1.05	137.0	21 57.0	1.05	137.0	22 26.9	1.05	137.0	2
3	18 54.3	1.05	136.1	19 24.3	1.05	136.1	19 54.2	1.05	136.1	20 24.2	1.05	136.1	20 54.2	1.05	136.0	21 24.1	1.05	136.0	21 54.1	1.05	136.0	22 24.1	1.05	135.9	3
4	18 51.4	1.05	135.1	19 21.4	1.05	135.1	19 51.3	1.05	135.1	20 21.3	1.05	135.0	20 51.2	1.05	135.0	21 21.2	1.05	135.0	21 51.2	1.05	135.0	22 21.1	1.05	134.9	4
45	18 48.4	1.05	134.1	19 18.4	1.05	134.1	19 48.3	1.05	134.1	20 18.3	1.05	134.0	20 48.3	1.05	134.0	21 18.2	1.05	134.0	21 48.2	1.05	133.9	22 18.1	1.05	133.9	45
6	18 45.4	1.05	133.1	19 15.3	1.05	133.1	19 45.3	1.05	133.0	20 15.3	1.05	133.0	20 45.2	1.05	133.0	21 15.2	1.05	133.0	21 45.1	1.05	132.9	22 15.1	1.05	132.9	6
7	18 42.3	1.05	132.1	19 12.3	1.05	132.1	19 42.2	1.05	132.0	20 12.2	1.05	132.0	20 42.1	1.05	132.0	21 12.1	1.05	131.9	21 42.0	1.05	131.9	22 12.0	1.05	131.9	7
8	18 39.2	1.05	131.1	19 09.1	1.05	131.0	19 39.1	1.05	131.0	20 09.0	1.05	131.0	20 39.0	1.05	130.9	21 08.9	1.05	130.9	21 38.9	1.05	130.9	22 08.9	1.05	130.9	8
9	18 36.0	1.05	130.1	19 05.9	1.05	130.0	19 35.9	1.05	130.0	20 05.9	1.05	130.0	20 35.8	1.05	129.9	21 05.8	1.05	129.9	21 35.7	1.05	129.9	22 05.7	1.05	129.8	9
50	18 32.8	1.05	129.0	19 02.7	1.05	129.0	19 32.7	1.05	129.0	20 02.6	1.05	129.0	20 32.6	1.05	128.9	21 02.5	1.05	128.9	21 32.5	1.05	128.9	22 02.4	1.06	128.8	50
1	18 29.5	1.06	128.0	18 59.4	1.06	128.0	19 29.4	1.06	128.0	19 59.3	1.06	127.9	20 29.3	1.06	127.9	20 59.2	1.06	127.9	21 29.2	1.06	127.8	21 59.1	1.06	127.8	1
2	18 26.2	1.06	127.0	18 56.1	1.06	127.0	19 26.1	1.06	127.0	19 56.0	1.06	126.9	20 26.0	1.06	126.9	20 55.9	1.06	126.9	21 25.9	1.06	126.8	21 55.8	1.06	126.8	2
3	18 22.8	1.06	126.0	18 52.8	1.06	126.0	19 22.7	1.06	125.9	19 52.7	1.06	125.9	20 22.6	1.06	125.9	20 52.5	1.06	125.8	21 22.5	1.06	125.8	21 52.4	1.06	125.8	3
4	18 19.4	1.06	125.0	18 49.3	1.06	125.0	19 19.3	1.06	124.9	19 49.2	1.06	124.9	20 19.2	1.06	124.9	20 49.1	1.06	124.8	21 19.1	1.06	124.8	21 49.0	1.06	124.8	4
55	18 16.0	1.06	124.0	18 45.9	1.06	124.0	19 15.8	1.06	123.9	19 45.8	1.06	123.9	20 15.7	1.06	123.9	20 45.7	1.06	123.8	21 15.6	1.06	123.8	21 45.6	1.06	123.8	55
6	18 12.5	1.06	123.0	18 42.4	1.06	122.9	19 12.3	1.06	122.9	19 42.3	1.06	122.9	20 12.2	1.06	122.8	20 42.2	1.06	122.8	21 12.1	1.06	122.8	21 42.1	1.06	122.7	6
7	18 08.9	1.06	122.0	18 38.9	1.06	121.9	19 08.8	1.06	121.9	19 38.8	1.06	121.9	20 08.7	1.06	121.8	20 38.6	1.06	121.8	21 08.6	1.06	121.8	21 38.5	1.06	121.7	7
8	18 05.4	1.06	121.0	18 35.3	1.06	120.9	19 05.2	1.06	120.9	19 35.2	1.06	120.9	20 05.1	1.06	120.8	20 35.1	1.06	120.8	21 05.0	1.06	120.8	21 34.9	1.06	120.7	8
9	18 01.8	1.06	119.9	18 31.7	1.06	119.9	19 01.6	1.06	119.9	19 31.6	1.06	119.8	20 01.5	1.06	119.8	20 31.4	1.06	119.8	21 01.4	1.06	119.7	21 31.3	1.06	119.7	9
60	17 58.1	1.06	118.9	18 28.0	1.06	118.9	18 58.0	1.06	118.9	19 27.9	1.06	118.8	19 57.9	1.06	118.8	20 27.8	1.06	118.8	20 57.7	1.06	118.7	21 27.7	1.06	118.7	60
1	17 54.4	1.06	117.9	18 24.4	1.06	117.9	18 54.4	1.06	117.9	19 24.2	1.06	117.8	19 54.2	1.06	117.8	20 24.1	1.06	117.8	20 54.0	1.06	117.7	21 24.0	1.06	117.7	1
2	17 50.7	1.06	116.9	18 20.6	1.06	116.9	18 50.6	1.06	116.9	19 20.5	1.06	116.8	19 50.5	1.06	116.8	20 20.4	1.06	116.7	20 50.3	1.06	116.7	21 20.3	1.06	116.7	2
3	17 47.0	1.06	115.9	18 16.9	1.06	115.9	18 46.8	1.06	115.8	19 16.8	1.06	115.8	19 46.7	1.06	115.8	20 16.6	1.06	115.7	20 46.6	1.06	115.7	21 16.5	1.06	115.7	3
4	17 43.2	1.06	114.9	18 13.1	1.06	114.9	18 43.1	1.06	114.8	19 13.0	1.06	114.8	19 42.9	1.06	114.8	20 12.9	1.06	114.7	20 42.8	1.06	114.7	21 12.7	1.06	114.7	4
65	17 39.4	1.06	113.9	18 09.3	1.06	113.9	18 39.2	1.06	113.8	19 09.2	1.06	113.8	19 39.1	1.06	113.8	20 09.0	1.06	113.7	20 39.0	1.06	113.7	21 08.9	1.06	113.6	65
6	17 35.5	1.06	112.9	18 05.5	1.06	112.9	18 35.4	1.06	112.8	19 05.3	1.06	112.8	19 35.3	1.06	112.7	20 05.2	1.06	112.7	20 35.1	1.06	112.7	21 05.1	1.06	112.6	6
7	17 31.7	1.06	111.9	18 01.6	1.06	111.9	18 31.5	1.06	111.8	19 01.5	1.06	111.8	19 31.4	1.06	111.7	20 01.3	1.06	111.7	20 31.2	1.07	111.7	21 01.2	1.06	111.6	7
8	17 27.8	1.07	110.9	17 57.7	1.07	110.8	18 27.6	1.07	110.8	18 57.5	1.07	110.8	19 27.4	1.07	110.7	19 57.4	1.07	110.7	20 27.3	1.07	110.6	20 57.3	1.07	110.6	8
9	17 23.8	1.07	109.9	17 53.8	1.07	109.8	18 23.7	1.07	109.8	18 53.6	1.07	109.8	19 23.6	1.07	109.7	19 53.5	1.07	109.7	20 23.4	1.07	109.7	20 53.3	1.07	109.6	9
70	17 19.9	1.07	108.9	17 49.8	1.07	108.8	18 19.7	1.07	108.8	18 49.7	1.07	108.8	19 19.6	1.07	108.7	19 49.5	1.07	108.7	20 19.5	1.07	108.7	20 49.4	1.07	108.6	70
1	17 15.9	1.07	107.9	17 45.8	1.07	107.8	18 15.8	1.07	107.8	18 45.7	1.07	107.8	19 15.6	1.07	107.7	19 45.6	1.07	107.7	20 15.5	1.07	107.6	20 45.4	1.07	107.6	1
2	17 11.9	1.07	106.9	17 41.9	1.07	106.8	18 11.8	1.07	106.8	18 41.7	1.07	106.8	19 11.6	1.07	106.7	19 41.6	1.07	106.7	20 11.5	1.07	106.6	20 41.4	1.07	106.6	2
3	17 07.9	1.07	105.9	17 37.8	1.07	105.8	18 07.8	1.07	105.8	18 37.7	1.07	105.7	19 07.6	1.07	105.7	19 37.5	1.07	105.7	20 07.5	1.07	105.6	20 37.4	1.07	105.6	3
4	17 03.9	1.07	104.9	17 33.8	1.07	104.8	18 03.7	1.07	104.8	18 33.6	1.07	104.7	19 03.6	1.07	104.7	19 33.5	1.07	104.7	20 03.4	1.07	104.6	20 33.3	1.07	104.6	4
75	16 59.8	1.07	103.9	17 29.7	1.07	103.8	17 59.7	1.07	103.8	18 29.6	1.07	103.7	18 59.5	1.07	103.7	19 29.4	1.07	103.7	19 59.4	1.07	103.6	20 29.3	1.07	103.6	75
6	16 55.7	1.07	102.8	17 25.7	1.07	102.8	17 55.6	1.07	102.8	18 25.5	1.07	102.7	18 55.4	1.07	102.7	19 25.4	1.07	102.7	19 55.3	1.07	102.6	20 25.2	1.07	102.6	6
7	16 51.7	1.07	101.8	17 21.6	1.07	101.8	17 51.5	1.07	101.8	18 21.4	1.07	101.7	18 51.3	1.07	101.7	19 21.3	1.07	101.7	19 51.2	1.07	101.6	20 21.1	1.07	101.6	7
8	16 47.6	1.07	100.8	17 17.5	1.07	100.8	17 47.4	1.07	100.8	18 17.3	1.07	100.7	18 47.2	1.07	100.7	19 17.2	1.07	100.7	19 47.1	1.07	100.6	20 17.0	1.07	100.6	8
9	16 43.4	1.07	99.8	17 13.4	1.07	99.8	17 43.3	1.07	99.8	18 13.2	1.07	99.7	18 43.1	1.07	99.7	19 13.0	1.07	99.7	19 43.0	1.07	99.6	20 12.9	1.07	99.6	9
80	16 39.3	1.07	98.8	17 09.2	1.07	98.8	17 39.2	1.07	98.8	18 09.1	1.07	98.7	18 39.0	1.07	98.7	19 08.9	1.07	98.7	19 38.8	1.07	98.6	20 08.8	1.07	98.6	80
1	16 35.2	1.07	97.8	17 05.1	1.07	97.8	17 35.0	1.07	97.8	18 04.9	1.07	97.7	18 34.9	1.07	97.7	19 04.8	1.07	97.7	19 34.7	1.07	97.6	20 04.6	1.07	97.6	1
2	16 31.0	1.07	96.8	17 00.9	1.07	96.8	17 30.9	1.07	96.8	18 00.8	1.07	96.7	18 30.7	1.07	96.7	19 00.6	1.07	96.7	19 30.5	1.07	96.6	20 00.5	1.07	96.6	2
3	16 26.9	1.07	95.8	16 56.8	1.07	95.8	17 26.7	1.07	95.8	17 56.6	1.07	95.7	18 26.5	1.07	95.7	18 56.5	1.07	95.7	19 26.4	1.07	95.6	19 56.3	1.07	95.6	3
4	16 22.7	1.07	94.8	16 52.6	1.07	94.8	17 22.5	1.07	94.8	17 52.4	1.07	94.7	18 22.4	1.07	94.7	18 52.3	1.07	94.7	19 22.2	1.07	94.6	19 52.1	1.07	94.6	4
85	16 18.5	1.07	93.8	16 48.4	1.07	93.8	17 18.4	1.07	93.8	17 48.3	1.07	93.7	18 18.2	1.07	93.7	18 48.1	1.07	93.7	19 18.0	1.07	93.6	19 48.0	1.07	93.6	85
6	16 14.3	1.07	92.8	16 44.3	1.07	92.8	17 14.2	1.07	92.8	17 44.1	1.07	92.7	18 14.0	1.07	92.7	18 43.9	1.07	92.7	19 13.9	1.07	92.6	19 43.8	1.07	92.6	6
7	16 10.2	1.07	91.8	16 40.1	1.07	91.8	17 10.0	1.07	91.8	17 39.9	1.07	91.7	18 09.8	1.07	91.7	18 39.8	1.07	91.7	19 09.7	1.07	91.6	19 39.6	1.07	91.6	7
8	16 06.0	1.07	90.8	16 35.9	1.07	90.8	17 05.8	1.07	90.8	17 35.7	1.07	90.7	18 05.7	1.07	90.7	18 35.6	1.07	90.7	19 05.5	1.07	90.6	19 35.4	1.07	90.6	8
9	16 01.8	1.07	89.9	16 31.7	1.07	89.8	17 01.6	1.07	89.8	17 31.5	1.07	89.7	18 01.5	1.07	89.7	18 31.4	1.07	89.7	19 01.3	1.07	89.6	19 31.2	1.07	89.6	9
90	15 57.6	1.07	88.9	16 27.5	1.07	88.8	16 57.4	1.07	88.8	17 27.4	1.07	88.7	17 57.3	1.07	88.7	18 27.2	1.07	88.7	18 57.1	1.07	88.6	19 27.0	1.07	88.6	90

Lat. 86°

H.A.	16° 00' Alt.	16° 00' Az.	16° 30' Alt.	16° 30' Az.	17° 00' Alt.	17° 00' Az.	17° 30' Alt.	17° 30' Az.	18° 00' Alt.	18° 00' Az.	18° 30' Alt.	18° 30' Az.	19° 00' Alt.	19° 00' Az.	19° 30' Alt.	19° 30' Az.	H.A.
91	15 53.4 1.007	87.9	16 23.3 1.007	87.8	16 53.3 1.007	87.8	17 23.2 1.007	87.7	17 53.1 1.007	87.7	18 23.0 1.007	87.7	18 52.9 1.007	87.6	19 22.9 1.007	87.6	91
2	15 49.2 1.007	86.9	16 19.2 1.007	86.8	16 49.1 1.007	86.8	17 19.0 1.007	86.7	17 48.9 1.007	86.7	18 18.8 1.007	86.7	18 48.8 1.007	86.6	19 18.7 1.007	86.6	2
3	15 45.1 1.007	85.9	16 15.0 1.007	85.8	16 44.9 1.007	85.8	17 14.8 1.007	85.8	17 44.7 1.007	85.7	18 14.7 1.007	85.7	18 44.6 1.007	85.6	19 14.5 1.007	85.6	3
4	15 40.9 1.007	84.9	16 10.8 1.007	84.8	16 40.7 1.007	84.8	17 10.6 1.007	84.8	17 40.6 1.007	84.7	18 10.5 1.007	84.7	18 40.4 1.007	84.6	19 10.3 1.007	84.6	4
95	15 36.7 1.007	83.9	16 06.6 1.007	83.8	16 36.6 1.007	83.8	17 06.5 1.007	83.8	17 36.4 1.007	83.7	18 06.3 1.007	83.7	18 36.2 1.007	83.6	19 06.2 1.007	83.6	95
6	15 32.6 1.007	82.9	16 02.5 1.007	82.8	16 32.4 1.007	82.8	17 02.3 1.007	82.8	17 32.2 1.007	82.7	18 02.2 1.007	82.7	18 32.1 1.007	82.6	19 02.0 1.007	82.6	6
7	15 28.4 1.007	81.9	15 58.3 1.007	81.8	16 28.3 1.007	81.8	16 58.2 1.007	81.8	17 28.1 1.007	81.7	17 58.0 1.007	81.7	18 27.9 1.007	81.7	18 57.9 1.007	81.6	7
8	15 24.3 1.007	80.9	15 54.2 1.007	80.9	16 24.1 1.007	80.8	16 54.0 1.007	80.8	17 24.0 1.007	80.7	17 53.9 1.007	80.7	18 23.8 1.007	80.7	18 53.7 1.007	80.6	8
9	15 20.2 1.007	79.9	15 50.1 1.007	79.9	16 20.0 1.007	79.8	16 49.9 1.007	79.8	17 19.8 1.007	79.7	17 49.8 1.007	79.7	18 19.7 1.007	79.7	18 49.6 1.007	79.6	9
100	15 16.9 1.007	78.9	15 46.0 1.007	78.9	16 15.9 1.007	78.8	16 45.8 1.007	78.8	17 15.7 1.007	78.7	17 45.7 1.007	78.7	18 15.6 1.007	78.7	18 45.5 1.007	78.6	100
1	15 11.9 1.007	77.9	15 41.9 1.007	77.9	16 11.8 1.007	77.8	16 41.7 1.007	77.8	17 11.6 1.007	77.8	17 41.6 1.007	77.7	18 11.5 1.007	77.7	18 41.4 1.007	77.6	1
2	15 07.9 1.007	76.9	15 37.8 1.007	76.9	16 07.7 1.007	76.8	16 37.6 1.007	76.8	17 07.5 1.007	76.8	17 37.5 1.007	76.7	18 07.4 1.007	76.7	18 37.3 1.007	76.7	2
3	15 03.8 1.007	75.9	15 33.7 1.007	75.9	16 03.6 1.007	75.8	16 33.6 1.007	75.8	17 03.5 1.007	75.8	17 33.4 1.007	75.7	18 03.3 1.007	75.7	18 33.3 1.007	75.7	3
4	14 59.7 1.007	74.9	15 29.7 1.007	74.9	15 59.6 1.007	74.9	16 29.5 1.007	74.8	16 59.4 1.007	74.8	17 29.4 1.007	74.7	17 59.3 1.007	74.7	18 29.2 1.007	74.7	4
105	14 55.7 1.007	73.9	15 25.6 1.007	73.9	15 55.6 1.007	73.9	16 25.5 1.007	73.8	16 55.4 1.007	73.8	17 25.3 1.007	73.8	17 55.3 1.007	73.7	18 25.2 1.007	73.7	105
6	14 51.7 1.007	72.9	15 21.6 1.007	72.9	15 51.5 1.007	72.9	16 21.5 1.007	72.8	16 51.4 1.007	72.8	17 21.3 1.007	72.8	17 51.3 1.007	72.7	18 21.2 1.007	72.7	6
7	14 47.7 1.007	71.9	15 17.6 1.007	71.9	15 47.6 1.007	71.9	16 17.5 1.007	71.8	16 47.4 1.007	71.8	17 17.3 1.007	71.8	17 47.3 1.007	71.7	18 17.2 1.007	71.7	7
8	14 43.7 1.007	71.0	15 13.7 1.007	70.9	15 43.6 1.007	70.9	16 13.5 1.007	70.9	16 43.4 1.007	70.8	17 13.4 1.007	70.8	17 43.3 1.007	70.8	18 13.2 1.007	70.7	8
9	14 39.8 1.007	70.0	15 09.7 1.007	69.9	15 39.6 1.007	69.9	16 09.6 1.007	69.9	16 39.5 1.007	69.8	17 09.4 1.007	69.8	17 39.4 1.007	69.8	18 09.3 1.006	69.7	9
110	14 35.9 1.006	69.0	15 05.8 1.006	68.9	15 35.7 1.006	68.9	16 05.7 1.006	68.9	16 35.6 1.006	68.8	17 05.5 1.006	68.8	17 35.4 1.006	68.8	18 05.4 1.006	68.7	110
1	14 32.0 1.006	68.0	15 01.9 1.006	67.9	15 31.8 1.006	67.9	16 01.8 1.006	67.9	16 31.7 1.006	67.8	17 01.6 1.006	67.8	17 31.6 1.006	67.8	18 01.5 1.006	67.7	1
2	14 28.1 1.006	67.0	14 58.0 1.006	67.0	15 28.0 1.006	66.9	15 57.9 1.006	66.9	16 27.8 1.006	66.9	16 57.7 1.006	66.8	17 27.7 1.006	66.8	17 57.6 1.006	66.7	2
3	14 24.3 1.006	66.0	14 54.2 1.006	66.0	15 24.1 1.006	65.9	15 54.1 1.006	65.9	16 24.0 1.006	65.9	16 53.9 1.006	65.8	17 23.9 1.006	65.8	17 53.8 1.006	65.8	3
4	14 20.5 1.006	65.0	14 50.4 1.006	65.0	15 20.3 1.006	64.9	15 50.3 1.006	64.9	16 20.2 1.006	64.9	16 50.1 1.006	64.8	17 20.1 1.006	64.8	17 50.0 1.006	64.8	4
115	14 16.7 1.006	64.0	14 46.6 1.006	64.0	15 16.6 1.006	64.0	15 46.5 1.006	63.9	16 16.4 1.006	63.9	16 46.4 1.006	63.9	17 16.3 1.006	63.8	17 46.2 1.006	63.8	115
6	14 12.9 1.006	63.0	14 42.9 1.006	63.0	15 12.8 1.006	63.0	15 42.7 1.006	62.9	16 12.7 1.006	62.9	16 42.6 1.006	62.9	17 12.6 1.006	62.8	17 42.5 1.006	62.8	6
7	14 09.2 1.006	62.0	14 39.2 1.006	62.0	15 09.1 1.006	62.0	15 39.0 1.006	61.9	16 09.0 1.006	61.9	16 38.9 1.006	61.9	17 08.8 1.006	61.8	17 38.8 1.006	61.8	7
8	14 05.5 1.006	61.1	14 35.5 1.006	61.0	15 05.4 1.006	61.0	15 35.4 1.006	61.0	16 05.3 1.006	60.9	16 35.2 1.006	60.9	17 05.2 1.006	60.9	17 35.1 1.006	60.8	8
9	14 01.9 1.006	60.1	14 31.8 1.006	60.0	15 01.8 1.006	60.0	15 31.7 1.006	60.0	16 01.7 1.006	59.9	16 31.6 1.006	59.9	17 01.5 1.006	59.9	17 31.5 1.006	59.8	9
120	13 58.3 1.006	59.1	14 28.2 1.006	59.0	14 58.2 1.006	59.0	15 28.1 1.006	59.0	15 58.1 1.006	58.9	16 28.0 1.006	58.9	16 57.9 1.006	58.9	17 27.9 1.006	58.8	120
1	13 54.7 1.006	58.1	14 24.7 1.006	58.1	14 54.6 1.006	58.0	15 24.5 1.006	58.0	15 54.5 1.006	58.0	16 24.4 1.006	57.9	16 54.4 1.006	57.9	17 24.3 1.006	57.9	1
2	13 51.2 1.006	57.1	14 21.1 1.006	57.1	14 51.1 1.006	57.0	15 21.0 1.006	57.0	15 51.0 1.006	57.0	16 20.9 1.006	56.9	16 50.8 1.006	56.9	17 20.8 1.006	56.9	2
3	13 47.7 1.006	56.1	14 17.6 1.006	56.1	14 47.6 1.006	56.0	15 17.5 1.006	56.0	15 47.5 1.006	56.0	16 17.4 1.006	56.0	16 47.4 1.006	55.9	17 17.3 1.006	55.9	3
4	13 44.2 1.006	55.1	14 14.2 1.006	55.1	14 44.1 1.006	55.1	15 14.1 1.006	55.0	15 44.0 1.006	55.0	16 14.0 1.006	55.0	16 43.9 1.006	54.9	17 13.9 1.006	54.9	4
125	13 40.8 1.006	54.1	14 10.8 1.006	54.1	14 40.7 1.006	54.1	15 10.7 1.006	54.0	15 40.6 1.006	54.0	16 10.6 1.006	54.0	16 40.5 1.006	54.0	17 10.5 1.006	53.9	125
6	13 37.5 1.006	53.1	14 07.4 1.006	53.1	14 37.3 1.006	53.1	15 07.3 1.006	53.1	15 37.2 1.006	53.0	16 07.2 1.006	53.0	16 37.1 1.006	53.0	17 07.1 1.006	52.9	6
7	13 34.1 1.005	52.2	14 04.1 1.005	52.1	14 34.0 1.005	52.1	15 04.0 1.005	52.1	15 33.9 1.005	52.0	16 03.9 1.005	52.0	16 33.8 1.005	52.0	17 03.8 1.005	52.0	7
8	13 30.8 1.005	51.2	14 00.8 1.005	51.1	14 30.7 1.005	51.1	15 00.7 1.005	51.1	15 30.6 1.005	51.1	16 00.6 1.005	51.0	16 30.5 1.005	51.0	17 00.5 1.005	51.0	8
9	13 27.6 1.005	50.2	13 57.6 1.005	50.2	14 27.5 1.005	50.1	14 57.5 1.005	50.1	15 27.4 1.005	50.1	15 57.4 1.005	50.0	16 27.3 1.005	50.0	16 57.3 1.005	50.0	9
130	13 24.4 1.005	49.2	13 54.4 1.005	49.2	14 24.3 1.005	49.1	14 54.3 1.005	49.1	15 24.3 1.005	49.1	15 54.2 1.005	49.1	16 24.1 1.005	49.0	16 54.1 1.005	49.0	130
1	13 21.3 1.005	48.2	13 51.2 1.005	48.2	14 21.2 1.005	48.2	14 51.1 1.005	48.1	15 21.1 1.005	48.1	15 51.0 1.005	48.1	16 21.0 1.005	48.0	16 51.0 1.005	48.0	1
2	13 18.2 1.005	47.2	13 48.1 1.005	47.2	14 18.1 1.005	47.2	14 48.1 1.005	47.1	15 18.0 1.005	47.1	15 48.0 1.005	47.1	16 17.9 1.005	47.1	16 47.9 1.005	47.0	2
3	13 15.1 1.005	46.2	13 45.1 1.005	46.2	14 15.0 1.005	46.2	14 45.0 1.005	46.2	15 15.0 1.005	46.1	15 44.9 1.005	46.1	16 14.9 1.005	46.1	16 44.8 1.005	46.0	3
4	13 12.1 1.005	45.3	13 42.1 1.005	45.2	14 12.0 1.005	45.2	14 42.0 1.005	45.2	15 12.0 1.005	45.1	15 41.9 1.005	45.1	16 11.9 1.005	45.1	16 41.8 1.005	45.1	4
135	13 09.2 1.005	44.3	13 39.1 1.005	44.2	14 09.1 1.005	44.2	14 39.1 1.005	44.2	15 09.0 1.005	44.2	15 39.0 1.005	44.1	16 08.9 1.005	44.1	16 38.9 1.005	44.1	135
6	13 06.3 1.005	43.3	13 36.2 1.005	43.3	14 06.2 1.005	43.2	14 36.2 1.005	43.2	15 06.1 1.005	43.2	15 36.1 1.005	43.2	16 06.1 1.005	43.1	16 36.0 1.005	43.1	6
7	13 03.4 1.005	42.3	13 33.4 1.005	42.3	14 03.4 1.005	42.2	14 33.3 1.005	42.2	15 03.3 1.005	42.2	15 33.3 1.005	42.2	16 03.2 1.005	42.1	16 33.2 1.005	42.1	7
8	13 00.6 1.005	41.3	13 30.6 1.005	41.3	14 00.6 1.005	41.3	14 30.5 1.005	41.2	15 00.5 1.005	41.2	15 30.5 1.005	41.2	16 00.4 1.005	41.2	16 30.4 1.005	41.1	8
9	12 57.9 1.004	40.3	13 27.9 1.004	40.3	13 57.8 1.004	40.3	14 27.8 1.004	40.3	14 57.8 1.004	40.2	15 27.7 1.004	40.2	15 57.7 1.004	40.2	16 27.7 1.004	40.2	9
140	12 55.2 1.004	39.3	13 25.2 1.004	39.3	13 55.2 1.004	39.3	14 25.1 1.004	39.3	14 55.1 1.004	39.2	15 25.1 1.004	39.2	15 55.0 1.004	39.2	16 25.0 1.004	39.2	140
1	12 52.6 1.004	38.4	13 22.6 1.004	38.3	13 52.5 1.004	38.3	14 22.5 1.004	38.3	14 52.5 1.004	38.3	15 22.5 1.004	38.2	15 52.4 1.004	38.2	16 22.4 1.004	38.2	1
2	12 50.0 1.004	37.4	13 20.0 1.004	37.3	13 50.0 1.004	37.3	14 20.0 1.004	37.3	14 49.9 1.004	37.3	15 19.9 1.004	37.3	15 49.9 1.004	37.2	16 19.8 1.004	37.2	2
3	12 47.5 1.004	36.4	13 17.5 1.004	36.4	13 47.5 1.004	36.3	14 17.4 1.004	36.3	14 47.4 1.004	36.3	15 17.4 1.004	36.3	15 47.4 1.004	36.3	16 17.3 1.004	36.2	3
4	12 45.1 1.004	35.4	13 15.0 1.004	35.4	13 45.0 1.004	35.4	14 15.0 1.004	35.3	14 45.0 1.004	35.3	15 14.9 1.004	35.3	15 44.9 1.004	35.3	16 14.9 1.004	35.2	4
145	12 42.7 1.004	34.4	13 12.7 1.004	34.4	13 42.6 1.004	34.4	14 12.6 1.004	34.4	14 42.6 1.004	34.3	15 12.5 1.004	34.3	15 42.5 1.004	34.3	16 12.5 1.004	34.3	145
6	12 40.3 1.004	33.4	13 10.3 1.004	33.4	13 40.3 1.004	33.4	14 10.3 1.004	33.4	14 40.2 1.004	33.3	15 10.2 1.004	33.3	15 40.2 1.004	33.3	16 10.2 1.004	33.3	6
7	12 38.1 1.004	32.4	13 08.0 1.004	32.4	13 38.0 1.004	32.4	14 08.0 1.004	32.4	14 38.0 1.004	32.4	15 07.9 1.004	32.3	15 37.9 1.004	32.3	16 07.9 1.004	32.3	7
8	12 35.8 1.004	31.5	13 05.8 1.004	31.4	13 35.8 1.004	31.4	14 05.8 1.004	31.4	14 35.8 1.004	31.4	15 05.7 1.004	31.4	15 35.7 1.004	31.3	16 05.7 1.004	31.3	8
9	12 33.7 1.004	30.5	13 03.7 1.004	30.5	13 33.7 1.003	30.4	14 03.6 1.003	30.4	14 33.6 1.003	30.4	15 03.6 1.003	30.4	15 33.6 1.003	30.4	16 03.6 1.003	30.3	9
150	12 31.6 1.003	29.5	13 01.6 1.003	29.5	13 31.6 1.003	29.5	14 01.5 1.003	29.4	14 31.5 1.003	29.4	15 01.5 1.003	29.4	15 31.5 1.003	29.4	16 01.5 1.003	29.4	150
1	12 29.6 1.003	28.5	12 59.6 1.003	28.5	13 29.5 1.003	28.5	13 59.5 1.003	28.5	14 29.5 1.003	28.4	14 59.5 1.003	28.4	15 29.5 1.003	28.4	15 59.4 1.003	28.4	1
2	12 27.6 1.003	27.5	12 57.6 1.003	27.5	13 27.6 1.003	27.5	13 57.6 1.003	27.5	14 27.5 1.003	27.5	14 57.5 1.003	27.4	15 27.5 1.003	27.4	15 57.5 1.003	27.4	2
3	12 25.7 1.003	26.5	12 55.7 1.003	26.5	13 25.7 1.003	26.5	13 55.7 1.003	26.5	14 25.6 1.003	26.5	14 55.6 1.003	26.5	15 25.6 1.003	26.4	15 55.6 1.003	26.4	3
4	12 23.9 1.003	25.6	12 53.9 1.003	25.5	13 23.8 1.003	25.5	13 53.8 1.003	25.5	14 23.8 1.003	25.5	14 53.8 1.003	25.5	15 23.8 1.003	25.5	15 53.8 1.003	25.4	4
155	12 22.1 1.003	24.6	12 52.1 1.003	24.6	13 22.1 1.003	24.5	13 52.1 1.003	24.5	14 22.0 1.003	24.5	14 52.0 1.003	24.5	15 22.0 1.003	24.5	15 52.0 1.003	24.5	155
6	12 20.4 1.003	23.6	12 50.4 1.003	23.6	13 20.4 1.003	23.6	13 50.3 1.003	23.5	14 20.3 1.003	23.5	14 50.3 1.003	23.5	15 20.3 1.003	23.5	15 50.3 1.003	23.5	6
7	12 18.7 1.003	22.6	12 48.7 1.003	22.6	13 18.7 1.003	22.6	13 48.7 1.003	22.6	14 18.7 1.003	22.6	14 48.7 1.003	22.5	15 18.7 1.003	22.5	15 48.7 1.003	22.5	7
8	12 17.2 1.002	21.6	12 47.2 1.002	21.6	13 17.1 1.003	21.6	13 47.1 1.002	21.6	14 17.1 1.002	21.6	14 47.1 1.002	21.6	15 17.1 1.002	21.5	15 47.1 1.002	21.5	8
9	12 15.6 1.002	20.6	12 45.7 1.002	20.6	13 15.6 1.002	20.6	13 45.6 1.002	20.6	14 15.6 1.002	20.6	14 45.6 1.002	20.6	15 15.6 1.002	20.6	15 45.6 1.002	20.5	9
160	12 14.2 1.002	19.7	12 44.2 1.002	19.6	13 14.2 1.002	19.6	13 44.2 1.002	19.6	14 14.2 1.002	19.6	14 44.2 1.002	19.6	15 14.2 1.002	19.6	15 44.2 1.002	19.6	160
1	12 12.8 1.002	18.7	12 42.8 1.002	18.7	13 12.8 1.002	18.7	13 42.8 1.002	18.6	14 12.8 1.002	18.6	14 42.8 1.002	18.6	15 12.8 1.002	18.6	15 42.8 1.002	18.6	1
2	12 11.5 1.002	17.7	12 41.5 1.002	17.7	13 11.5 1.002	17.7	13 41.5 1.002	17.7	14 11.5 1.002	17.6	14 41.5 1.002	17.6	15 11.5 1.002	17.6	15 41.5 1.002	17.6	2
3	12 10.3 1.002	16.7	12 40.3 1.002	16.7	13 10.3 1.002	16.7	13 40.3 1.002	16.7	14 10.3 1.002	16.7	14 40.3 1.002	16.7	15 10.3 1.002	16.6	15 40.3 1.002	16.6	3
4	12 09.1 1.002	15.7	12 39.1 1.002	15.7	13 09.1 1.002	15.7	13 39.1 1.002	15.7	14 09.1 1.002	15.7	14 39.1 1.002	15.7	15 09.1 1.002	15.7	15 39.1 1.002	15.7	4
165	12 08.0 1.002	14.7	12 38.0 1.002	14.7	13 08.0 1.002	14.7	13 38.0 1.002	14.7	14 08.0 1.002	14.7	14 38.0 1.002	14.7	15 08.0 1.002	14.7	15 38.0 1.002	14.7	165
6	12 07.0 1.002	13.8	12 37.0 1.002	13.8	13 07.0 1.002	13.7	13 37.0 1.002	13.7	14 07.0 1.002	13.7	14 37.0 1.002	13.7	15 07.0 1.002	13.7	15 37.0 1.002	13.7	6
7	12 06.0 1.001	12.8	12 36.0 1.001	12.8	13 06.0 1.002	12.8	13 36.0 1.002	12.7	14 06.0 1.002	12.7	14 36.0 1.002	12.7	15 06.0 1.001	12.7	15 36.0 1.001	12.7	7
8	12 05.2 1.001	11.8	12 35.1 1.001	11.8	13 05.1 1.001	11.8	13 35.1 1.001	11.8	14 05.1 1.001	11.8	14 35.1 1.001	11.8	15 05.1 1.001	11.7	15 35.1 1.001	11.7	8
9	12 04.3 1.001	10.8	12 34.3 1.001	10.8	13 04.3 1.001	10.8	13 34.3 1.001	10.8	14 04.3 1.001	10.8	14 34.3 1.001	10.8	15 04.3 1.001	10.8	15 34.3 1.001	10.8	9
170	12 03.6 1.001	09.8	12 33.6 1.001	09.8	13 03.6 1.001	09.8	13 33.6 1.001	09.8	14 03.6 1.001	09.8	14 33.6 1.001	09.8	15 03.6 1.001	09.8	15 33.6 1.001	09.8	170
1	12 02.9 1.001	08.8	12 32.9 1.001	08.8	13 02.9 1.001	08.8	13 32.9 1.001	08.8	14 02.9 1.001	08.8	14 32.9 1.001	08.8	15 02.9 1.001	08.8	15 32.9 1.001	08.8	1
2	12 02.3 1.001	07.9	12 32.3 1.001	07.9	13 02.3 1.001	07.8	13 32.3 1.001	07.8	14 02.3 1.001	07.8	14 32.3 1.001	07.8	15 02.3 1.001	07.8	15 32.3 1.001	07.8	2
3	12 01.8 1.001	06.9	12 31.8 1.001	06.9	13 01.8 1.001	06.9	13 31.8 1.001	06.9	14 01.8 1.001	06.9	14 31.8 1.001	06.9	15 01.8 1.001	06.9	15 31.7 1.001	06.8	3
4	12 01.3 1.001	05.9	12 31.3 1.001	05.9	13 01.3 1.001	05.9	13 31.3 1.001	05.9	14 01.3 1.001	05.9	14 31.3 1.001	05.9	15 01.3 1.001	05.9	15 31.3 1.001	05.9	4
175	12 00.9 1.001	04.9	12 30.9 1.001	04.9	13 00.9 1.001	04.9	13 30.9 1.001	04.9	14 00.9 1.001	04.9	14 30.9 1.001	04.9	15 00.9 1.001	04.9	15 30.9 1.001	04.9	175
6	12 00.6 1.000	03.9	12 30.6 1.000	03.9	13 00.6 1.000	03.9	13 30.6 1.000	03.9	14 00.6 1.000	03.9	14 30.6 1.000	03.9	15 00.6 1.000	03.9	15 30.6 1.000	03.9	6
7	12 00.3 1.000	02.9	12 30.3 1.000	02.9	13 00.3 1.000	02.9	13 30.3 1.000	02.9	14 00.3 1.000	02.9	14 30.3 1.000	02.9	15 00.3 1.000	02.9	15 30.3 1.000	02.9	7
8	12 00.1 1.000	02.0	12 30.1 1.000	02.0	13 00.1 1.000	02.0	13 30.1 1.000	02.0	14 00.1 1.000	02.0	14 30.1 1.000	02.0	15 00.1 1.000	02.0	15 30.1 1.000	02.0	8
9	12 00.0 1.000	01.0	12 30.0 1.000	01.0	13 00.0 1.000	01.0	13 30.0 1.000	01.0	14 00.0 1.000	01.0	14 30.0 1.000	01.0	15 00.0 1.000	01.0	15 30.0 1.000	01.0	9
180	12 00.0 1.000	00.0	12 30.0 1.000	00.0	13 00.0 1.000	00.0	13 30.0 1.000	00.0	14 00.0 1.000	00.0	14 30.0 1.000	00.0	15 00.0 1.000	00.0	15 30.0 1.000	00.0	180

Lat. 87°

Lat. 88°

Lat. 89°

10—69788-1

Lat. 6°

H.A.	20° 00′ Alt.	Δd Δt	Az.	20° 30′ Alt.	Δd Δt	Az.	21° 00′ Alt.	Δd Δt	Az.	21° 30′ Alt.	Δd Δt	Az.	22° 00′ Alt.	Δd Δt	Az.	22° 30′ Alt.	Δd Δt	Az.	23° 00′ Alt.	Δd Δt	Az.	23° 30′ Alt.	Δd Δt	Az.	H.A.
00	24 00.0	1.000	180.0	24 30.0	1.000	180.0	25 00.0	1.000	180.0	25 30.0	1.000	180.0	26 00.0	1.000	180.0	26 30.0	1.000	180.0	27 00.0	1.000	180.0	27 30.0	1.000	180.0	00
1	24 00.0	1.000	179.0	24 30.0	1.000	179.0	25 00.0	1.000	179.0	25 30.0	1.000	179.0	26 00.0	1.000	179.0	26 30.0	1.000	179.0	27 00.0	1.000	179.0	27 30.0	1.000	179.0	1
2	23 59.9	1.000	177.9	24 29.9	1.000	177.9	24 59.9	1.000	177.9	25 29.8	1.000	177.9	25 59.8	1.000	177.9	26 29.7	1.000	177.9	26 59.8	1.000	177.9	27 29.8	1.000	177.9	2
3	23 59.7	1.000	176.9	24 29.7	1.000	176.9	24 59.7	1.000	176.9	25 29.7	1.000	176.9	25 59.7	1.000	176.9	26 29.7	1.000	176.9	26 59.7	1.000	176.9	27 29.7	1.000	176.9	3
4	23 59.4	1.001	175.9	24 29.4	1.001	175.9	24 59.4	1.001	175.9	25 29.4	1.001	175.9	25 59.4	1.001	175.9	26 29.4	1.001	175.9	26 59.4	1.001	175.9	27 29.4	1.001	175.9	4
05	23 59.1	1.001	174.9	24 29.1	1.001	174.9	24 59.1	1.001	174.8	25 29.1	1.001	174.8	25 59.1	1.001	174.8	26 29.1	1.001	174.8	26 59.1	1.001	174.8	27 29.1	1.001	174.8	05
6	23 58.6	1.001	173.8	24 28.6	1.001	173.8	24 58.6	1.001	173.8	25 28.6	1.001	173.8	25 58.6	1.001	173.8	26 28.6	1.001	173.8	26 58.6	1.001	173.8	27 28.6	1.001	173.8	6
7	23 58.2	1.001	172.8	24 28.2	1.001	172.8	24 58.2	1.001	172.8	25 28.2	1.001	172.8	25 58.2	1.001	172.8	26 28.2	1.001	172.8	26 58.2	1.001	172.8	27 28.2	1.001	172.8	7
8	23 57.6	1.001	171.8	24 27.6	1.001	171.8	24 57.6	1.001	171.8	25 27.6	1.001	171.8	25 57.6	1.001	171.7	26 27.6	1.001	171.7	26 57.6	1.001	171.7	27 27.6	1.001	171.7	8
9	23 57.0	1.001	170.7	24 27.0	1.001	170.7	24 57.0	1.001	170.7	25 27.0	1.001	170.7	25 57.0	1.001	170.7	26 27.0	1.001	170.7	26 57.0	1.001	170.7	27 26.9	1.001	170.7	9
10	23 56.3	1.001	169.7	24 26.3	1.001	169.7	24 56.2	1.001	169.7	25 26.2	1.001	169.7	25 56.2	1.001	169.7	26 26.2	1.001	169.7	26 56.2	1.001	169.7	27 26.2	1.001	169.7	10
1	23 55.5	1.001	168.7	24 25.5	1.001	168.7	24 55.5	1.001	168.7	25 25.5	1.001	168.7	25 55.5	1.001	168.7	26 25.5	1.001	168.6	26 55.5	1.001	168.6	27 25.4	1.001	168.6	1
2	23 54.6	1.002	167.7	24 24.6	1.002	167.6	24 54.6	1.002	167.6	25 24.6	1.002	167.6	25 54.6	1.002	167.6	26 24.6	1.002	167.6	26 54.6	1.002	167.6	27 24.6	1.002	167.6	2
3	23 53.7	1.002	166.6	24 23.7	1.002	166.6	24 53.7	1.002	166.6	25 23.7	1.002	166.6	25 53.7	1.002	166.6	26 23.7	1.002	166.6	26 53.7	1.002	166.6	27 23.6	1.002	166.6	3
4	23 52.7	1.002	165.6	24 22.7	1.002	165.6	24 52.7	1.002	165.6	25 22.7	1.002	165.6	25 52.7	1.002	165.6	26 22.7	1.002	165.6	26 52.6	1.002	165.5	27 22.6	1.002	165.5	4
15	23 51.6	1.002	164.6	24 21.6	1.002	164.6	24 51.6	1.002	164.6	25 21.6	1.002	164.5	25 51.6	1.002	164.5	26 21.6	1.002	164.5	26 51.6	1.002	164.5	27 21.6	1.002	164.5	15
6	23 50.5	1.002	163.6	24 20.4	1.002	163.5	24 50.4	1.002	163.5	25 20.4	1.002	163.5	25 50.4	1.002	163.5	26 20.4	1.002	163.5	26 50.4	1.002	163.5	27 20.4	1.002	163.5	6
7	23 49.2	1.002	162.5	24 19.2	1.002	162.5	24 49.2	1.002	162.5	25 19.2	1.002	162.5	25 49.2	1.002	162.5	26 19.2	1.002	162.5	26 49.2	1.002	162.4	27 19.2	1.002	162.4	7
8	23 47.9	1.002	161.5	24 17.9	1.002	161.5	24 47.9	1.002	161.5	25 17.9	1.002	161.5	25 47.9	1.002	161.4	26 17.9	1.002	161.4	26 47.9	1.002	161.4	27 17.9	1.002	161.4	8
9	23 46.6	1.002	160.5	24 16.6	1.002	160.5	24 46.6	1.002	160.4	25 16.5	1.002	160.4	25 46.5	1.002	160.4	26 16.5	1.002	160.4	26 46.5	1.002	160.4	27 16.5	1.002	160.4	9
20	23 45.1	1.002	159.4	24 15.1	1.003	159.4	24 45.1	1.003	159.4	25 15.1	1.003	159.4	25 45.1	1.003	159.4	26 15.1	1.002	159.4	26 45.1	1.003	159.4	27 15.1	1.003	159.3	20
1	23 43.6	1.003	158.4	24 13.6	1.003	158.4	24 43.6	1.003	158.4	25 13.6	1.003	158.4	25 43.6	1.003	158.4	26 13.6	1.003	158.3	26 43.6	1.003	158.3	27 13.6	1.003	158.3	1
2	23 42.1	1.003	157.4	24 12.0	1.003	157.4	24 42.0	1.003	157.4	25 12.0	1.003	157.3	25 42.0	1.003	157.3	26 12.0	1.003	157.3	26 42.0	1.003	157.3	27 12.0	1.003	157.3	2
3	23 40.4	1.003	156.4	24 10.4	1.003	156.3	24 40.4	1.003	156.3	25 10.4	1.003	156.3	25 40.4	1.003	156.3	26 10.3	1.003	156.3	26 40.3	1.003	156.3	27 10.3	1.003	156.2	3
4	23 38.7	1.003	155.3	24 08.7	1.003	155.3	24 38.7	1.003	155.3	25 08.7	1.003	155.3	25 38.6	1.003	155.3	26 08.6	1.003	155.3	26 38.6	1.003	155.2	27 08.6	1.003	155.2	4
25	23 36.9	1.003	154.3	24 06.9	1.003	154.3	24 36.9	1.003	154.3	25 06.9	1.003	154.3	25 36.9	1.003	154.2	26 06.8	1.003	154.2	26 36.8	1.003	154.2	27 06.8	1.003	154.2	25
6	23 35.1	1.003	153.3	24 05.1	1.003	153.3	24 35.0	1.003	153.2	25 05.0	1.003	153.2	25 35.0	1.003	153.2	26 05.0	1.003	153.2	26 35.0	1.003	153.2	27 05.0	1.003	153.2	6
7	23 33.2	1.003	152.3	24 03.1	1.003	152.2	24 33.1	1.003	152.2	25 03.1	1.003	152.2	25 33.1	1.003	152.2	26 03.1	1.003	152.2	26 33.1	1.003	152.2	27 03.0	1.003	152.1	7
8	23 31.2	1.003	151.2	24 01.2	1.003	151.2	24 31.1	1.003	151.2	25 01.1	1.003	151.2	25 31.1	1.003	151.2	26 01.1	1.003	151.1	26 31.1	1.003	151.1	27 01.0	1.003	151.1	8
9	23 29.1	1.004	150.2	23 59.1	1.004	150.2	24 29.1	1.004	150.2	24 59.1	1.004	150.2	25 29.1	1.004	150.1	25 59.0	1.004	150.1	26 29.0	1.004	150.1	26 59.0	1.004	150.1	9
30	23 27.0	1.004	149.2	23 57.0	1.004	149.2	24 27.0	1.004	149.2	24 57.0	1.004	149.1	25 26.9	1.004	149.1	25 56.9	1.004	149.1	26 26.9	1.004	149.1	26 56.9	1.004	149.0	30
1	23 24.8	1.004	148.1	23 54.8	1.004	148.1	24 24.8	1.004	148.1	24 54.8	1.004	148.1	25 24.8	1.004	148.1	25 54.7	1.004	148.0	26 24.7	1.004	148.0	26 54.7	1.004	148.0	1
2	23 22.6	1.004	147.1	23 52.6	1.004	147.1	24 22.6	1.004	147.1	24 52.5	1.004	147.1	25 22.5	1.004	147.1	25 52.5	1.004	147.0	26 22.5	1.004	147.0	26 52.4	1.004	147.0	2
3	23 20.3	1.004	146.1	23 50.3	1.004	146.1	24 20.3	1.004	146.1	24 50.2	1.004	146.1	25 20.2	1.004	146.0	25 50.2	1.004	146.0	26 20.1	1.004	146.0	26 50.1	1.004	146.0	3
4	23 17.9	1.004	145.1	23 47.9	1.004	145.1	24 17.9	1.004	145.1	24 47.9	1.004	145.0	25 17.8	1.004	145.0	25 47.8	1.004	145.0	26 17.8	1.004	145.0	26 47.7	1.004	144.9	4
35	23 15.5	1.004	144.1	23 45.5	1.004	144.1	24 15.5	1.004	144.0	24 45.4	1.004	144.0	25 15.4	1.004	144.0	25 45.4	1.004	144.0	26 15.3	1.004	143.9	26 45.3	1.004	143.9	35
6	23 13.1	1.004	143.1	23 43.0	1.004	143.0	24 13.0	1.004	143.0	24 42.9	1.004	143.0	25 12.9	1.004	143.0	25 42.9	1.004	142.9	26 12.8	1.004	142.9	26 42.8	1.004	142.9	6
7	23 10.5	1.004	142.0	23 40.5	1.004	142.0	24 10.4	1.004	142.0	24 40.4	1.004	142.0	25 10.4	1.004	141.9	25 40.3	1.004	141.9	26 10.3	1.004	141.9	26 40.3	1.004	141.9	7
8	23 07.9	1.004	141.0	23 37.8	1.004	141.0	24 07.8	1.004	141.0	24 37.8	1.004	140.9	25 07.7	1.004	140.9	25 37.7	1.004	140.9	26 07.7	1.004	140.9	26 37.6	1.004	140.8	8
9	23 05.2	1.005	140.0	23 35.2	1.005	140.0	24 05.2	1.005	139.9	24 35.1	1.005	139.9	25 05.1	1.005	139.9	25 35.0	1.005	139.9	26 05.0	1.005	139.8	26 35.0	1.005	139.8	9
40	23 02.4	1.005	139.0	23 32.5	1.005	138.9	24 02.4	1.005	138.9	24 32.4	1.005	138.9	25 02.4	1.005	138.9	25 32.3	1.005	138.8	26 02.3	1.005	138.8	26 32.2	1.005	138.8	40
1	22 59.7	1.005	138.0	23 29.7	1.005	137.9	23 59.7	1.005	137.9	24 29.6	1.005	137.9	24 59.6	1.005	137.9	25 29.5	1.005	137.8	25 59.5	1.005	137.8	26 29.5	1.005	137.8	1
2	22 56.9	1.005	136.9	23 26.9	1.005	136.9	23 56.8	1.005	136.9	24 26.8	1.005	136.9	24 56.7	1.005	136.8	25 26.7	1.005	136.8	25 56.7	1.005	136.8	26 26.6	1.005	136.7	2
3	22 54.0	1.005	135.9	23 24.0	1.005	135.9	23 53.9	1.005	135.9	24 23.9	1.005	135.8	24 53.8	1.005	135.8	25 23.8	1.005	135.8	25 53.8	1.005	135.7	26 23.7	1.005	135.7	3
4	22 51.1	1.005	134.9	23 21.0	1.005	134.9	23 51.0	1.005	134.8	24 20.9	1.005	134.8	24 50.9	1.005	134.8	25 20.9	1.005	134.8	25 50.8	1.005	134.7	26 20.8	1.005	134.7	4
45	22 48.1	1.005	133.9	23 18.0	1.005	133.9	23 48.0	1.005	133.8	24 18.0	1.005	133.8	24 47.9	1.005	133.8	25 17.9	1.005	133.7	25 47.8	1.005	133.7	26 17.8	1.005	133.7	45
6	22 45.0	1.005	132.9	23 15.0	1.005	132.8	23 45.0	1.005	132.8	24 14.9	1.005	132.8	24 44.9	1.005	132.7	25 14.8	1.005	132.7	25 44.8	1.005	132.7	26 14.7	1.005	132.7	6
7	22 41.9	1.005	131.8	23 11.9	1.005	131.8	23 41.9	1.005	131.8	24 11.8	1.005	131.8	24 41.8	1.005	131.7	25 11.7	1.005	131.7	25 41.7	1.005	131.7	26 11.6	1.005	131.6	7
8	22 38.8	1.005	130.8	23 08.8	1.005	130.8	23 38.7	1.005	130.8	24 08.7	1.005	130.7	24 38.6	1.005	130.7	25 08.6	1.005	130.7	25 38.5	1.005	130.6	26 08.5	1.005	130.6	8
9	22 35.6	1.005	129.8	23 05.6	1.005	129.8	23 35.5	1.005	129.8	24 05.5	1.005	129.7	24 35.4	1.005	129.7	25 05.4	1.005	129.7	25 35.3	1.005	129.6	26 05.3	1.005	129.6	9
50	22 32.4	1.006	128.8	23 02.3	1.006	128.8	23 32.3	1.006	128.7	24 02.2	1.006	128.7	24 32.2	1.006	128.7	25 02.1	1.006	128.6	25 32.1	1.006	128.6	26 02.0	1.006	128.6	50
1	22 29.1	1.006	127.8	22 59.0	1.006	127.7	23 29.0	1.006	127.7	23 58.9	1.006	127.7	24 28.9	1.006	127.7	24 58.8	1.006	127.6	25 28.8	1.006	127.6	25 58.7	1.006	127.6	1
2	22 25.8	1.006	126.8	22 55.7	1.006	126.7	23 25.7	1.006	126.7	23 55.6	1.006	126.7	24 25.5	1.006	126.6	24 55.5	1.006	126.6	25 25.4	1.006	126.6	25 55.4	1.006	126.5	2
3	22 22.4	1.006	125.8	22 52.3	1.006	125.7	23 22.3	1.006	125.7	23 52.2	1.006	125.7	24 22.2	1.006	125.6	24 52.1	1.006	125.6	25 22.0	1.006	125.6	25 52.0	1.006	125.5	3
4	22 19.0	1.006	124.7	22 48.9	1.006	124.7	23 18.9	1.006	124.7	23 48.8	1.006	124.6	24 18.7	1.006	124.6	24 48.7	1.006	124.6	25 18.6	1.006	124.5	25 48.6	1.006	124.5	4
55	22 15.5	1.006	123.7	22 45.4	1.006	123.7	23 15.4	1.006	123.6	23 45.3	1.006	123.6	24 15.3	1.006	123.6	24 45.2	1.006	123.6	25 15.2	1.006	123.5	25 45.1	1.006	123.5	55
6	22 12.0	1.006	122.7	22 41.9	1.006	122.7	23 11.9	1.006	122.6	23 41.8	1.006	122.6	24 11.8	1.006	122.6	24 41.7	1.006	122.5	25 11.6	1.006	122.5	25 41.6	1.006	122.5	6
7	22 08.5	1.006	121.7	22 38.4	1.006	121.7	23 08.3	1.006	121.6	23 38.3	1.006	121.6	24 08.2	1.006	121.6	24 38.2	1.006	121.5	25 08.1	1.006	121.5	25 38.0	1.006	121.5	7
8	22 04.9	1.006	120.7	22 34.8	1.006	120.7	23 04.8	1.006	120.6	23 34.7	1.006	120.6	24 04.6	1.006	120.5	24 34.6	1.006	120.5	25 04.5	1.006	120.5	25 34.4	1.006	120.4	8
9	22 01.3	1.006	119.7	22 31.2	1.006	119.6	23 01.1	1.006	119.6	23 31.1	1.006	119.6	24 01.0	1.006	119.5	24 30.9	1.006	119.5	25 00.9	1.006	119.5	25 30.8	1.006	119.4	9
60	21 57.6	1.006	118.7	22 27.5	1.006	118.6	22 57.5	1.006	118.6	23 27.4	1.006	118.6	23 57.4	1.006	118.5	24 27.3	1.006	118.5	24 57.2	1.006	118.4	25 27.2	1.006	118.4	60
1	21 53.9	1.006	117.7	22 23.9	1.006	117.6	22 53.8	1.006	117.6	23 23.7	1.006	117.6	23 53.7	1.006	117.5	24 23.6	1.006	117.5	24 53.5	1.006	117.4	25 23.5	1.006	117.4	1
2	21 50.2	1.006	116.6	22 20.1	1.006	116.6	22 50.1	1.006	116.6	23 20.0	1.006	116.5	23 49.9	1.006	116.5	24 19.9	1.006	116.5	24 49.8	1.006	116.4	25 19.7	1.006	116.4	2
3	21 46.4	1.006	115.6	22 16.4	1.006	115.6	22 46.3	1.006	115.6	23 16.2	1.006	115.5	23 46.2	1.006	115.5	24 16.1	1.006	115.4	24 46.0	1.006	115.4	25 16.0	1.006	115.4	3
4	21 42.6	1.006	114.6	22 12.6	1.006	114.6	22 42.5	1.006	114.5	23 12.4	1.006	114.5	23 42.4	1.006	114.4	24 12.3	1.006	114.4	24 42.2	1.006	114.4	25 12.2	1.006	114.4	4
65	21 38.8	1.006	113.6	22 08.8	1.006	113.6	22 38.7	1.006	113.5	23 08.6	1.006	113.5	23 38.5	1.006	113.5	24 08.5	1.006	113.4	24 38.4	1.006	113.4	25 08.3	1.006	113.3	65
6	21 35.0	1.006	112.6	22 04.9	1.006	112.6	22 34.8	1.006	112.5	23 04.8	1.006	112.5	23 34.7	1.006	112.5	24 04.6	1.006	112.4	24 34.5	1.006	112.4	25 04.5	1.006	112.3	6
7	21 31.1	1.006	111.6	22 01.0	1.006	111.6	22 31.0	1.006	111.5	23 00.9	1.006	111.5	23 30.8	1.006	111.4	24 00.7	1.006	111.4	24 30.7	1.007	111.4	25 00.6	1.006	111.3	7
8	21 27.2	1.007	110.6	21 57.1	1.007	110.6	22 27.1	1.007	110.5	22 57.0	1.007	110.5	23 26.9	1.007	110.4	23 56.8	1.007	110.4	24 26.8	1.007	110.4	24 56.7	1.007	110.3	8
9	21 23.3	1.007	109.6	21 53.2	1.007	109.5	22 23.1	1.007	109.5	22 53.0	1.007	109.5	23 23.0	1.007	109.4	23 52.9	1.007	109.4	24 22.8	1.007	109.4	24 52.7	1.007	109.3	9
70	21 19.3	1.007	108.6	21 49.2	1.007	108.5	22 19.2	1.007	108.5	22 49.1	1.007	108.5	23 19.0	1.007	108.4	23 48.9	1.007	108.4	24 18.9	1.007	108.3	24 48.8	1.007	108.3	70
1	21 15.3	1.007	107.6	21 45.3	1.007	107.5	22 15.2	1.007	107.5	22 45.1	1.007	107.5	23 15.0	1.007	107.4	23 44.9	1.007	107.4	24 14.9	1.007	107.3	24 44.8	1.007	107.3	1
2	21 11.3	1.007	106.6	21 41.3	1.007	106.5	22 11.2	1.007	106.5	22 41.1	1.007	106.4	23 11.0	1.007	106.4	23 40.9	1.007	106.4	24 10.9	1.007	106.3	24 40.8	1.007	106.3	2
3	21 07.3	1.007	105.6	21 37.2	1.007	105.5	22 07.2	1.007	105.5	22 37.1	1.007	105.4	23 07.0	1.007	105.4	23 36.9	1.007	105.3	24 06.8	1.007	105.3	24 36.8	1.007	105.3	3
4	21 03.3	1.007	104.6	21 33.2	1.007	104.5	22 03.1	1.007	104.5	22 33.0	1.007	104.4	23 03.0	1.007	104.4	23 32.9	1.007	104.4	24 02.8	1.007	104.3	24 32.7	1.007	104.3	4
75	20 59.2	1.007	103.6	21 29.1	1.007	103.5	21 59.0	1.007	103.5	22 29.0	1.007	103.4	22 58.9	1.007	103.4	23 28.8	1.007	103.4	23 58.7	1.007	103.3	24 28.6	1.007	103.3	75
6	20 55.1	1.007	102.5	21 25.0	1.007	102.5	21 55.0	1.007	102.5	22 24.9	1.007	102.4	22 54.8	1.007	102.4	23 24.7	1.007	102.3	23 54.6	1.007	102.3	24 24.6	1.007	102.3	6
7	20 51.0	1.007	101.5	21 21.0	1.007	101.5	21 50.9	1.007	101.5	22 20.8	1.007	101.4	22 50.7	1.007	101.4	23 20.6	1.007	101.3	23 50.5	1.007	101.3	24 20.5	1.007	101.3	7
8	20 46.9	1.007	100.5	21 16.8	1.007	100.5	21 46.7	1.007	100.5	22 16.6	1.007	100.4	22 46.6	1.007	100.4	23 16.5	1.007	100.3	23 46.4	1.007	100.3	24 16.4	1.007	100.3	8
9	20 42.8	1.007	99.5	21 12.7	1.007	99.5	21 42.6	1.007	99.5	22 12.6	1.007	99.4	22 42.5	1.007	99.4	23 12.4	1.007	99.3	23 42.3	1.007	99.3	24 12.2	1.007	99.3	9
80	20 38.7	1.007	98.5	21 08.6	1.007	98.5	21 38.5	1.007	98.4	22 08.4	1.007	98.4	22 38.3	1.007	98.4	23 08.3	1.007	98.3	23 38.2	1.007	98.3	24 08.1	1.007	98.3	80
1	20 34.5	1.007	97.5	21 04.4	1.007	97.5	21 34.4	1.007	97.4	22 04.3	1.007	97.4	22 34.2	1.007	97.4	23 04.1	1.007	97.3	23 34.0	1.007	97.3	24 03.9	1.007	97.3	1
2	20 30.4	1.007	96.5	21 00.3	1.007	96.5	21 30.2	1.007	96.5	22 00.1	1.007	96.4	22 30.0	1.007	96.4	23 00.0	1.007	96.3	23 29.9	1.007	96.3	23 59.8	1.007	96.3	2
3	20 26.2	1.007	95.5	20 56.1	1.007	95.5	21 26.0	1.007	95.4	21 56.0	1.007	95.4	22 25.9	1.007	95.3	22 55.8	1.007	95.3	23 25.7	1.007	95.3	23 55.6	1.007	95.3	3
4	20 22.0	1.007	94.5	20 52.0	1.007	94.5	21 21.9	1.007	94.5	21 51.8	1.007	94.4	22 21.7	1.007	94.4	22 51.6	1.007	94.3	23 21.5	1.007	94.3	23 51.5	1.007	94.3	4
85	20 17.9	1.007	93.5	20 47.8	1.007	93.5	21 17.7	1.007	93.5	21 47.6	1.007	93.4	22 17.5	1.007	93.4	22 47.5	1.007	93.3	23 17.4	1.007	93.3	23 47.3	1.007	93.3	85
6	20 13.7	1.007	92.5	20 43.6	1.007	92.5	21 13.5	1.007	92.5	21 43.4	1.007	92.4	22 13.4	1.007	92.4	22 43.3	1.007	92.3	23 13.2	1.007	92.3	23 43.1	1.007	92.3	6
7	20 09.5	1.007	91.5	20 39.4	1.007	91.5	21 09.3	1.007	91.5	21 39.3	1.007	91.4	22 09.2	1.007	91.4	22 39.1	1.007	91.3	23 09.0	1.007	91.3	23 38.9	1.007	91.3	7
8	20 05.3	1.007	90.5	20 35.2	1.007	90.5	21 05.2	1.007	90.5	21 35.1	1.007	90.4	22 05.0	1.007	90.4	22 35.0	1.007	90.3	23 04.8	1.007	90.3	23 34.8	1.007	90.3	8
9	20 01.1	1.007	89.5	20 31.1	1.007	89.5	21 01.0	1.007	89.4	21 30.9	1.007	89.4	22 00.8	1.007	89.4	22 30.7	1.007	89.3	23 00.6	1.007	89.3	23 30.5	1.007	89.3	9
90	19 57.0	1.007	88.5	20 26.9	1.007	88.5	20 56.8	1.007	88.5	21 26.7	1.007	88.4	21 56.6	1.007	88.4	22 26.5	1.007	88.3	22 56.4	1.007	88.3	23 26.4	1.007	88.3	90

Lat. 86°

H.A.	20° 00' Alt. / Δd Δt / Az.	20° 30' Alt. / Δd Δt / Az.	21° 00' Alt. / Δd Δt / Az.	21° 30' Alt. / Δd Δt / Az.	22° 00' Alt. / Δd Δt / Az.	22° 30' Alt. / Δd Δt / Az.	23° 00' Alt. / Δd Δt / Az.	23° 30' Alt. / Δd Δt / Az.	H.A.
91	19 52.8 1.007 87.5	20 22.7 1.007 87.5	20 52.6 1.007 87.5	21 22.5 1.007 87.4	21 52.4 1.007 87.4	22 22.4 1.007 87.3	22 52.3 1.007 87.3	23 22.2 1.007 87.3	91
2	19 48.6 1.007 86.6	20 18.5 1.007 86.5	20 48.4 1.007 86.5	21 18.3 1.007 86.4	21 48.3 1.007 86.4	22 18.2 1.007 86.4	22 48.1 1.007 86.3	23 18.0 1.007 86.3	2
3	19 44.4 1.007 85.6	20 14.3 1.007 85.5	20 44.2 1.007 85.5	21 14.1 1.007 85.4	21 44.1 1.007 85.4	22 13.9 1.007 85.4	22 43.9 1.007 85.3	23 13.8 1.007 85.3	3
4	19 40.2 1.007 84.6	20 10.2 1.007 84.5	20 40.1 1.007 84.5	21 10.0 1.007 84.4	21 39.9 1.007 84.4	22 09.8 1.007 84.4	22 39.7 1.007 84.3	23 09.7 1.007 84.3	4
95	19 36.1 1.007 83.6	20 06.0 1.007 83.5	20 35.9 1.007 83.5	21 05.8 1.007 83.4	21 35.8 1.007 83.4	22 05.7 1.007 83.3	22 35.6 1.007 83.3	23 05.5 1.007 83.3	95
6	19 31.9 1.007 82.6	20 01.8 1.007 82.5	20 31.8 1.007 82.5	21 01.7 1.007 82.5	21 31.6 1.007 82.4	22 01.5 1.007 82.4	22 31.4 1.007 82.3	23 01.3 1.007 82.3	6
7	19 27.8 1.007 81.6	19 57.7 1.007 81.5	20 27.6 1.007 81.5	20 57.5 1.007 81.5	21 27.5 1.007 81.4	21 57.4 1.007 81.4	22 27.3 1.007 81.3	22 57.2 1.007 81.3	7
8	19 23.6 1.007 80.6	19 53.6 1.007 80.5	20 23.4 1.007 80.5	20 53.4 1.007 80.5	21 23.3 1.007 80.4	21 53.2 1.007 80.4	22 23.2 1.007 80.3	22 53.1 1.007 80.3	8
9	19 19.5 1.007 79.6	19 49.4 1.007 79.6	20 19.4 1.007 79.5	20 49.3 1.007 79.5	21 19.2 1.007 79.4	21 49.1 1.007 79.4	22 19.0 1.007 79.4	22 49.0 1.007 79.3	9
100	19 15.4 1.007 78.6	19 45.3 1.007 78.6	20 15.3 1.007 78.5	20 45.2 1.007 78.5	21 15.1 1.007 78.4	21 45.0 1.007 78.4	22 14.9 1.007 78.4	22 44.8 1.007 78.3	100
1	19 11.3 1.007 77.6	19 41.2 1.007 77.6	20 11.2 1.007 77.5	20 41.1 1.007 77.5	21 11.0 1.007 77.4	21 40.9 1.007 77.4	22 10.8 1.007 77.4	22 40.8 1.007 77.3	1
2	19 07.2 1.007 76.6	19 37.2 1.007 76.6	20 07.1 1.007 76.5	20 37.0 1.007 76.5	21 06.9 1.007 76.5	21 36.8 1.007 76.4	22 06.8 1.007 76.4	22 36.7 1.007 76.3	2
3	19 03.2 1.007 75.6	19 33.1 1.007 75.6	20 03.0 1.007 75.5	20 32.9 1.007 75.5	21 02.9 1.007 75.5	21 32.8 1.007 75.4	22 02.7 1.007 75.4	22 32.6 1.007 75.3	3
4	18 59.1 1.007 74.6	19 29.1 1.007 74.6	19 59.0 1.007 74.6	20 28.9 1.007 74.5	20 58.8 1.007 74.5	21 28.7 1.007 74.4	21 58.7 1.007 74.4	22 28.6 1.007 74.4	4
105	18 55.1 1.007 73.6	19 25.0 1.007 73.6	19 55.0 1.007 73.6	20 24.9 1.007 73.5	20 54.8 1.007 73.5	21 24.7 1.007 73.4	21 54.6 1.007 73.4	22 24.6 1.007 73.4	105
6	18 51.1 1.007 72.6	19 21.0 1.007 72.6	19 50.9 1.007 72.6	20 20.9 1.007 72.5	20 50.8 1.007 72.5	21 20.7 1.007 72.5	21 50.6 1.007 72.4	22 20.6 1.007 72.4	6
7	18 47.1 1.007 71.7	19 17.0 1.007 71.6	19 47.0 1.007 71.6	20 16.9 1.007 71.5	20 46.8 1.007 71.5	21 16.7 1.007 71.5	21 46.7 1.007 71.4	22 16.6 1.007 71.4	7
8	18 43.2 1.007 70.7	19 13.1 1.007 70.6	19 43.0 1.007 70.6	20 12.9 1.007 70.6	20 42.9 1.007 70.5	21 12.8 1.007 70.5	21 42.7 1.007 70.4	22 12.6 1.007 70.4	8
9	18 39.2 1.007 69.7	19 09.1 1.007 69.6	19 39.1 1.006 69.6	20 09.0 1.007 69.6	20 38.9 1.006 69.5	21 08.8 1.007 69.5	21 38.8 1.006 69.5	22 08.7 1.007 69.4	9
110	18 35.3 1.006 68.7	19 05.3 1.006 68.7	19 35.2 1.006 68.6	20 05.1 1.006 68.6	20 35.0 1.006 68.5	21 04.9 1.006 68.5	21 34.9 1.006 68.5	22 04.8 1.006 68.4	110
1	18 31.4 1.006 67.7	19 01.3 1.006 67.7	19 31.3 1.006 67.6	20 01.2 1.006 67.6	20 31.1 1.006 67.6	21 01.0 1.006 67.5	21 31.0 1.006 67.5	22 00.9 1.006 67.4	1
2	18 27.6 1.006 66.7	18 57.5 1.006 66.7	19 27.4 1.006 66.6	19 57.3 1.006 66.6	20 27.3 1.006 66.6	20 57.2 1.006 66.5	21 27.1 1.006 66.5	21 57.1 1.006 66.5	2
3	18 23.7 1.006 65.7	18 53.7 1.006 65.7	19 23.6 1.006 65.7	19 53.5 1.006 65.6	20 23.5 1.006 65.6	20 53.4 1.006 65.5	21 23.3 1.006 65.5	21 53.2 1.006 65.5	3
4	18 19.9 1.006 64.7	18 49.9 1.006 64.7	19 19.8 1.006 64.7	19 49.7 1.006 64.6	20 19.7 1.006 64.6	20 49.6 1.006 64.6	21 19.5 1.006 64.5	21 49.4 1.006 64.5	4
115	18 16.2 1.006 63.7	18 46.1 1.006 63.7	19 16.0 1.006 63.7	19 46.0 1.006 63.6	20 15.9 1.006 63.6	20 45.8 1.006 63.6	21 15.8 1.006 63.5	21 45.7 1.006 63.5	115
6	18 12.4 1.006 62.8	18 42.4 1.006 62.7	19 12.3 1.006 62.7	19 42.2 1.006 62.7	20 12.2 1.006 62.6	20 42.1 1.006 62.6	21 12.0 1.006 62.5	21 42.0 1.006 62.5	6
7	18 08.7 1.006 61.8	18 38.7 1.006 61.7	19 08.6 1.006 61.7	19 38.5 1.006 61.7	20 08.5 1.006 61.6	20 38.4 1.006 61.6	21 08.3 1.006 61.6	21 38.3 1.006 61.5	7
8	18 05.0 1.006 60.8	18 35.0 1.006 60.8	19 04.9 1.006 60.7	19 34.9 1.006 60.7	20 04.8 1.006 60.6	20 34.7 1.006 60.6	21 04.7 1.006 60.6	21 34.6 1.006 60.5	8
9	18 01.4 1.006 59.8	18 31.4 1.006 59.8	19 01.3 1.006 59.7	19 31.2 1.006 59.7	20 01.2 1.006 59.7	20 31.1 1.006 59.6	21 01.0 1.006 59.6	21 31.0 1.006 59.6	9
120	17 57.8 1.006 58.8	18 27.8 1.006 58.8	18 57.7 1.006 58.7	19 27.6 1.006 58.7	19 57.6 1.006 58.7	20 27.5 1.006 58.6	20 57.4 1.006 58.6	21 27.4 1.006 58.6	120
1	17 54.3 1.006 57.8	18 24.2 1.006 57.8	18 54.1 1.006 57.8	19 24.1 1.006 57.7	19 54.0 1.006 57.7	20 24.0 1.006 57.7	20 53.9 1.006 57.6	21 23.8 1.006 57.6	1
2	17 50.7 1.006 56.8	18 20.7 1.006 56.8	18 50.6 1.006 56.8	19 20.6 1.006 56.7	19 50.5 1.006 56.7	20 20.4 1.006 56.7	20 50.4 1.006 56.6	21 20.3 1.006 56.6	2
3	17 47.2 1.006 55.9	18 17.2 1.006 55.8	18 47.1 1.006 55.8	19 17.1 1.006 55.8	19 47.0 1.006 55.7	20 17.0 1.006 55.7	20 46.9 1.006 55.7	21 16.8 1.006 55.6	3
4	17 43.8 1.006 54.9	18 13.7 1.006 54.8	18 43.7 1.006 54.8	19 13.6 1.006 54.8	19 43.6 1.006 54.7	20 13.5 1.006 54.7	20 43.5 1.006 54.7	21 13.4 1.006 54.6	4
125	17 40.4 1.006 53.9	18 10.3 1.006 53.9	18 40.3 1.006 53.8	19 10.2 1.006 53.8	19 40.2 1.006 53.8	20 10.1 1.006 53.7	20 40.1 1.006 53.7	21 10.0 1.006 53.7	125
6	17 37.0 1.006 52.9	18 07.0 1.006 52.9	18 36.9 1.006 52.8	19 06.9 1.006 52.8	19 36.8 1.006 52.8	20 06.8 1.006 52.7	20 36.7 1.006 52.7	21 06.7 1.006 52.7	6
7	17 33.7 1.006 51.9	18 03.7 1.005 51.9	18 33.6 1.005 51.9	19 03.6 1.005 51.8	19 33.5 1.005 51.8	20 03.5 1.005 51.8	20 33.4 1.005 51.7	21 03.4 1.005 51.7	7
8	17 30.4 1.005 50.9	18 00.4 1.005 50.9	18 30.3 1.005 50.9	19 00.3 1.005 50.8	19 30.2 1.005 50.8	20 00.2 1.005 50.8	20 30.1 1.005 50.8	21 00.1 1.005 50.7	8
9	17 27.2 1.005 50.0	17 57.2 1.005 49.9	18 27.1 1.005 49.9	18 57.1 1.005 49.9	19 27.0 1.005 49.8	19 57.0 1.005 49.8	20 26.9 1.005 49.8	20 56.9 1.005 49.7	9
130	17 24.0 1.005 49.0	17 54.0 1.005 48.9	18 23.9 1.005 48.9	18 53.9 1.005 48.9	19 23.9 1.005 48.9	19 53.8 1.005 48.8	20 23.8 1.005 48.8	20 53.7 1.005 48.8	130
1	17 20.9 1.005 48.0	17 50.9 1.005 48.0	18 20.8 1.005 47.9	18 50.8 1.005 47.9	19 20.7 1.005 47.9	19 50.7 1.005 47.8	20 20.6 1.005 47.8	20 50.6 1.005 47.8	1
2	17 17.8 1.005 47.0	17 47.8 1.005 47.0	18 17.7 1.005 46.9	18 47.7 1.005 46.9	19 17.6 1.005 46.9	19 47.6 1.005 46.9	20 17.6 1.005 46.8	20 47.5 1.005 46.8	2
3	17 14.8 1.005 46.0	17 44.7 1.005 46.0	18 14.7 1.005 46.0	18 44.7 1.005 45.9	19 14.6 1.005 45.9	19 44.6 1.005 45.9	20 14.5 1.005 45.9	20 44.5 1.005 45.8	3
4	17 11.8 1.005 45.0	17 41.8 1.005 45.0	18 11.7 1.005 45.0	18 41.7 1.005 45.0	19 11.6 1.005 44.9	19 41.6 1.005 44.9	20 11.5 1.005 44.9	20 41.5 1.005 44.8	4
135	17 08.9 1.005 44.1	17 38.8 1.005 44.0	18 08.8 1.005 44.0	18 38.7 1.005 44.0	19 08.7 1.005 43.9	19 38.7 1.005 43.9	20 08.6 1.005 43.9	20 38.6 1.005 43.9	135
6	17 06.0 1.005 43.1	17 35.9 1.005 43.0	18 05.9 1.005 43.0	18 35.9 1.005 43.0	19 05.8 1.005 42.9	19 35.8 1.005 42.9	20 05.7 1.005 42.9	20 35.7 1.005 42.9	6
7	17 03.1 1.005 42.1	17 33.1 1.005 42.1	18 03.1 1.005 42.0	18 33.0 1.005 42.0	19 03.0 1.005 42.0	19 33.0 1.005 42.0	20 02.9 1.005 41.9	20 32.9 1.005 41.9	7
8	17 00.4 1.005 41.1	17 30.3 1.005 41.1	18 00.3 1.005 41.1	18 30.3 1.005 41.0	19 00.2 1.005 41.0	19 30.2 1.005 41.0	20 00.1 1.005 41.0	20 30.1 1.005 40.9	8
9	16 57.6 1.004 40.1	17 27.6 1.004 40.1	17 57.6 1.004 40.1	18 27.5 1.004 40.1	18 57.5 1.004 40.0	19 27.5 1.004 40.0	19 57.4 1.004 40.0	20 27.4 1.004 40.0	9
140	16 55.0 1.004 39.1	17 24.9 1.004 39.1	17 54.9 1.004 39.1	18 24.9 1.004 39.1	18 54.8 1.004 39.0	19 24.8 1.004 39.0	19 54.8 1.004 39.0	20 24.7 1.004 39.0	140
1	16 52.4 1.004 38.2	17 22.3 1.004 38.1	17 52.3 1.004 38.1	18 22.3 1.004 38.1	18 52.2 1.004 38.1	19 22.2 1.004 38.0	19 52.2 1.004 38.0	20 22.1 1.004 38.0	1
2	16 49.8 1.004 37.2	17 19.8 1.004 37.2	17 49.7 1.004 37.1	18 19.7 1.004 37.1	18 49.7 1.004 37.1	19 19.6 1.004 37.1	19 49.6 1.004 37.0	20 19.6 1.004 37.0	2
3	16 47.3 1.004 36.2	17 17.3 1.004 36.2	17 47.2 1.004 36.2	18 17.2 1.004 36.1	18 47.2 1.004 36.1	19 17.2 1.004 36.1	19 47.1 1.004 36.1	20 17.1 1.004 36.0	3
4	16 44.9 1.004 35.2	17 14.8 1.004 35.2	17 44.8 1.004 35.2	18 14.8 1.004 35.2	18 44.7 1.004 35.1	19 14.7 1.004 35.1	19 44.7 1.004 35.1	20 14.7 1.004 35.1	4
145	16 42.5 1.004 34.2	17 12.4 1.004 34.2	17 42.4 1.004 34.2	18 12.4 1.004 34.2	18 42.4 1.004 34.2	19 12.3 1.004 34.1	19 42.3 1.004 34.1	20 12.3 1.004 34.1	145
6	16 40.1 1.004 33.3	17 10.1 1.004 33.2	17 40.1 1.004 33.2	18 10.1 1.004 33.2	18 40.0 1.004 33.2	19 10.0 1.004 33.2	19 40.0 1.004 33.1	20 10.0 1.004 33.1	6
7	16 37.9 1.004 32.3	17 07.9 1.004 32.3	17 37.8 1.004 32.2	18 07.8 1.004 32.2	18 37.8 1.004 32.2	19 07.8 1.004 32.2	19 37.7 1.004 32.2	20 07.7 1.004 32.1	7
8	16 35.7 1.004 31.3	17 05.7 1.004 31.3	17 35.6 1.004 31.3	18 05.6 1.004 31.2	18 35.6 1.004 31.2	19 05.6 1.004 31.2	19 35.5 1.004 31.2	20 05.5 1.004 31.2	8
9	16 33.5 1.003 30.3	17 03.5 1.003 30.3	17 33.5 1.003 30.3	18 03.5 1.003 30.2	18 33.5 1.003 30.2	19 03.4 1.003 30.2	19 33.4 1.003 30.2	20 03.4 1.003 30.2	9
150	16 31.4 1.003 29.3	17 01.4 1.003 29.3	17 31.4 1.003 29.3	18 01.4 1.003 29.3	18 31.4 1.003 29.3	19 01.3 1.003 29.2	19 31.3 1.003 29.2	20 01.3 1.003 29.2	150
1	16 29.4 1.003 28.4	16 59.4 1.003 28.3	17 29.4 1.003 28.3	17 59.4 1.003 28.3	18 29.4 1.003 28.3	18 59.3 1.003 28.3	19 29.3 1.003 28.3	19 59.3 1.003 28.2	1
2	16 27.5 1.003 27.4	16 57.5 1.003 27.4	17 27.4 1.003 27.4	17 57.4 1.003 27.3	18 27.4 1.003 27.3	18 57.4 1.003 27.3	19 27.4 1.003 27.3	19 57.3 1.003 27.3	2
3	16 25.6 1.003 26.4	16 55.6 1.003 26.4	17 25.5 1.003 26.4	17 55.5 1.003 26.4	18 25.5 1.003 26.3	18 55.5 1.003 26.3	19 25.5 1.003 26.3	19 55.5 1.003 26.3	3
4	16 23.7 1.003 25.4	16 53.7 1.003 25.4	17 23.7 1.003 25.4	17 53.7 1.003 25.4	18 23.7 1.003 25.4	18 53.7 1.003 25.3	19 23.7 1.003 25.3	19 53.6 1.003 25.3	4
155	16 22.0 1.003 24.5	16 52.0 1.003 24.4	17 22.0 1.003 24.4	17 51.9 1.003 24.4	18 21.9 1.003 24.4	18 51.9 1.003 24.4	19 21.9 1.003 24.4	19 51.9 1.003 24.3	155
6	16 20.3 1.003 23.5	16 50.3 1.003 23.5	17 20.3 1.003 23.4	17 50.3 1.003 23.4	18 20.2 1.003 23.4	18 50.2 1.003 23.4	19 20.2 1.003 23.4	19 50.2 1.003 23.4	6
7	16 18.6 1.003 22.5	16 48.6 1.003 22.5	17 18.6 1.003 22.5	17 48.6 1.003 22.4	18 18.6 1.003 22.4	18 48.6 1.003 22.4	19 18.6 1.003 22.4	19 48.6 1.003 22.4	7
8	16 17.1 1.002 21.5	16 47.1 1.002 21.5	17 17.1 1.002 21.5	17 47.0 1.002 21.5	18 17.0 1.002 21.5	18 47.0 1.002 21.4	19 17.0 1.002 21.4	19 47.0 1.002 21.4	8
9	16 15.6 1.002 20.5	16 45.6 1.002 20.5	17 15.6 1.002 20.5	17 45.6 1.002 20.5	18 15.5 1.002 20.5	18 45.5 1.002 20.5	19 15.5 1.002 20.5	19 45.5 1.002 20.4	9
160	16 14.1 1.002 19.6	16 44.1 1.002 19.5	17 14.1 1.002 19.5	17 44.1 1.002 19.5	18 14.1 1.002 19.5	18 44.1 1.002 19.5	19 14.1 1.002 19.5	19 44.1 1.002 19.5	160
1	16 12.8 1.002 18.6	16 42.8 1.002 18.6	17 12.8 1.002 18.6	17 42.8 1.002 18.5	18 12.7 1.002 18.5	18 42.7 1.002 18.5	19 12.7 1.002 18.5	19 42.7 1.002 18.5	1
2	16 11.5 1.002 17.6	16 41.5 1.002 17.6	17 11.5 1.002 17.6	17 41.5 1.002 17.6	18 11.4 1.002 17.5	18 41.4 1.002 17.5	19 11.4 1.002 17.5	19 41.4 1.002 17.5	2
3	16 10.2 1.002 16.6	16 40.2 1.002 16.6	17 10.2 1.002 16.6	17 40.2 1.002 16.6	18 10.2 1.002 16.6	18 40.2 1.002 16.6	19 10.2 1.002 16.6	19 40.2 1.002 16.5	3
4	16 09.1 1.002 15.6	16 39.1 1.002 15.6	17 09.1 1.002 15.6	17 39.1 1.002 15.6	18 09.1 1.002 15.6	18 39.1 1.002 15.6	19 09.0 1.002 15.6	19 39.0 1.002 15.6	4
165	16 08.0 1.002 14.7	16 38.0 1.002 14.7	17 08.0 1.002 14.6	17 38.0 1.002 14.6	18 08.0 1.002 14.6	18 38.0 1.002 14.6	19 08.0 1.002 14.6	19 38.0 1.002 14.6	165
6	16 07.0 1.002 13.7	16 37.0 1.002 13.7	17 07.0 1.002 13.7	17 37.0 1.002 13.7	18 06.9 1.002 13.7	18 36.9 1.002 13.6	19 06.9 1.002 13.6	19 36.9 1.002 13.6	6
7	16 06.0 1.002 12.7	16 36.0 1.001 12.7	17 06.0 1.001 12.7	17 36.0 1.001 12.7	18 06.0 1.001 12.7	18 36.0 1.001 12.7	19 06.0 1.001 12.7	19 36.0 1.001 12.6	7
8	16 05.1 1.001 11.7	16 35.1 1.001 11.7	17 05.1 1.001 11.7	17 35.1 1.001 11.7	18 05.1 1.001 11.7	18 35.1 1.001 11.7	19 05.1 1.001 11.7	19 35.1 1.001 11.7	8
9	16 04.3 1.001 10.8	16 34.3 1.001 10.7	17 04.3 1.001 10.7	17 34.3 1.001 10.7	18 04.3 1.001 10.7	18 34.3 1.001 10.7	19 04.3 1.001 10.7	19 34.3 1.001 10.7	9
170	16 03.6 1.001 09.8	16 33.6 1.001 09.8	17 03.6 1.001 09.8	17 33.6 1.001 09.8	18 03.6 1.001 09.8	18 33.6 1.001 09.7	19 03.5 1.001 09.7	19 33.5 1.001 09.7	170
1	16 02.9 1.001 08.8	16 32.9 1.001 08.8	17 02.9 1.001 08.8	17 32.9 1.001 08.8	18 02.9 1.001 08.8	18 32.9 1.001 08.8	19 02.9 1.001 08.8	19 32.9 1.001 08.8	1
2	16 02.3 1.001 07.8	16 32.3 1.001 07.8	17 02.3 1.001 07.8	17 32.3 1.001 07.8	18 02.3 1.001 07.8	18 32.3 1.001 07.8	19 02.3 1.001 07.8	19 32.3 1.001 07.8	2
3	16 01.7 1.001 06.8	16 31.7 1.001 06.8	17 01.7 1.001 06.8	17 31.7 1.001 06.8	18 01.7 1.001 06.8	18 31.7 1.001 06.8	19 01.7 1.001 06.8	19 31.7 1.001 06.8	3
4	16 01.3 1.001 05.9	16 31.3 1.001 05.9	17 01.3 1.001 05.9	17 31.3 1.001 05.9	18 01.3 1.001 05.8	18 31.3 1.001 05.8	19 01.3 1.001 05.8	19 31.3 1.001 05.8	4
175	16 00.9 1.001 04.9	16 30.9 1.001 04.9	17 00.9 1.001 04.9	17 30.9 1.001 04.9	18 00.9 1.001 04.9	18 30.9 1.001 04.9	19 00.9 1.001 04.9	19 30.9 1.001 04.9	175
6	16 00.6 1.000 03.9	16 30.6 1.000 03.9	17 00.6 1.000 03.9	17 30.6 1.000 03.9	18 00.6 1.000 03.9	18 30.6 1.000 03.9	19 00.6 1.000 03.9	19 30.6 1.000 03.9	6
7	16 00.3 1.000 02.9	16 30.3 1.000 02.9	17 00.3 1.000 02.9	17 30.3 1.000 02.9	18 00.3 1.000 02.9	18 30.3 1.000 02.9	19 00.3 1.000 02.9	19 30.3 1.000 02.9	7
8	16 00.1 1.000 02.0	16 30.1 1.000 02.0	17 00.1 1.000 02.0	17 30.1 1.000 02.0	18 00.1 1.000 01.9	18 30.1 1.000 01.9	19 00.1 1.000 01.9	19 30.1 1.000 01.9	8
9	16 00.0 1.000 01.0	16 30.0 1.000 01.0	17 00.0 1.000 01.0	17 30.0 1.000 01.0	18 00.0 1.000 01.0	18 30.0 1.000 01.0	19 00.0 1.000 01.0	19 30.0 1.000 01.0	9
180	16 00.0 1.000 00.0	16 30.0 1.000 00.0	17 00.0 1.000 00.0	17 30.0 1.000 00.0	18 00.0 1.000 00.0	18 30.0 1.000 00.0	19 00.0 1.000 00.0	19 30.0 1.000 00.0	180

Lat. 87°

Lat. 88°

Lat. 86°

H.A.	Δd Δt	24° 00' Alt. — Az.	24° 30' Alt. — Az.	25° 00' Alt. — Az.	25° 30' Alt. — Az.	26° 00' Alt. — Az.	26° 30' Alt. — Az.	27° 00' Alt. — Az.	27° 30' Alt. — Az.
00	1.0 00	28 00.0 — 180.0	28 30.0 — 180.0	29 00.0 — 180.0	29 30.0 — 180.0	30 00.0 — 180.0	30 30.0 — 180.0	31 00.0 — 180.0	31 30.0 — 180.0
1	1.0 00	28 00.0 — 179.0	28 30.0 — 179.0	29 00.0 — 179.0	29 30.0 — 179.0	30 00.0 — 179.0	30 30.0 — 179.0	31 00.0 — 179.0	31 30.0 — 179.0
2	1.0 00	27 59.8 — 177.9	28 29.8 — 177.9	28 59.8 — 177.9	29 29.8 — 177.9	29 59.8 — 177.9	30 29.8 — 177.9	30 59.8 — 177.9	31 29.8 — 177.9
3	1.0 00	27 59.7 — 176.9	28 29.7 — 176.9	28 59.7 — 176.9	29 29.7 — 176.9	29 59.7 — 176.9	30 29.7 — 176.9	30 59.7 — 176.9	31 29.7 — 176.9
4	1.0 01	27 59.4 — 175.9	28 29.4 — 175.9	28 59.4 — 175.9	29 29.4 — 175.9	29 59.4 — 175.8	30 29.4 — 175.8	30 59.4 — 175.8	31 29.4 — 175.8
05	1.0 01	27 59.1 — 174.8	28 29.1 — 174.8	28 59.1 — 174.8	29 29.1 — 174.8	29 59.1 — 174.8	30 29.1 — 174.8	30 59.1 — 174.8	31 29.1 — 174.8
6	1.0 01	27 58.6 — 173.8	28 28.6 — 173.8	28 58.6 — 173.8	29 28.6 — 173.8	29 58.6 — 173.8	30 28.6 — 173.8	30 58.6 — 173.8	31 28.6 — 173.8
7	1.0 01	27 58.2 — 172.8	28 28.1 — 172.8	28 58.1 — 172.8	29 28.1 — 172.7	29 58.1 — 172.7	30 28.1 — 172.7	30 58.1 — 172.7	31 28.1 — 172.7
8	1.0 01	27 57.6 — 171.7	28 27.6 — 171.7	28 57.6 — 171.7	29 27.6 — 171.7	29 57.6 — 171.7	30 27.6 — 171.7	30 57.6 — 171.7	31 27.6 — 171.7
9	1.0 01	27 56.9 — 170.7	28 26.9 — 170.7	28 56.9 — 170.7	29 26.9 — 170.7	29 56.9 — 170.7	30 26.9 — 170.7	30 56.9 — 170.6	31 26.9 — 170.6
10	1.0 01	27 56.2 — 169.7	28 26.2 — 169.6	28 56.2 — 169.6	29 26.2 — 169.6	29 56.2 — 169.6	30 26.2 — 169.6	30 56.2 — 169.6	31 26.2 — 169.6
1	1.0 01	27 55.4 — 168.6	28 25.4 — 168.6	28 55.4 — 168.6	29 25.4 — 168.6	29 55.4 — 168.6	30 25.4 — 168.6	30 55.4 — 168.6	31 25.4 — 168.6
2	1.0 02	27 54.6 — 167.6	28 24.6 — 167.6	28 54.6 — 167.6	29 24.6 — 167.6	29 54.6 — 167.6	30 24.6 — 167.5	30 54.6 — 167.5	31 24.6 — 167.5
3	1.0 02	27 53.6 — 166.6	28 23.6 — 166.5	28 53.6 — 166.5	29 23.6 — 166.5	29 53.6 — 166.5	30 23.6 — 166.5	30 53.6 — 166.5	31 23.6 — 166.5
4	1.0 02	27 52.6 — 165.5	28 22.6 — 165.5	28 52.6 — 165.5	29 22.6 — 165.5	29 52.6 — 165.5	30 22.6 — 165.5	30 52.6 — 165.5	31 22.6 — 165.4
15	1.0 02	27 51.6 — 164.5	28 21.5 — 164.5	28 51.5 — 164.5	29 21.5 — 164.5	29 51.5 — 164.4	30 21.5 — 164.4	30 51.5 — 164.4	31 21.5 — 164.4
6	1.0 02	27 50.4 — 163.5	28 20.4 — 163.5	28 50.4 — 163.4	29 20.4 — 163.4	29 50.4 — 163.4	30 20.4 — 163.4	30 50.4 — 163.4	31 20.3 — 163.4
7	1.0 02	27 49.2 — 162.4	28 19.2 — 162.4	28 49.2 — 162.4	29 19.1 — 162.4	29 49.1 — 162.4	30 19.1 — 162.4	30 49.1 — 162.3	31 19.1 — 162.3
8	1.0 02	27 47.9 — 161.4	28 17.9 — 161.4	28 47.8 — 161.4	29 17.8 — 161.3	29 47.8 — 161.3	30 17.8 — 161.3	30 47.8 — 161.3	31 17.8 — 161.3
9	1.0 02	27 46.5 — 160.4	28 16.5 — 160.3	28 46.5 — 160.3	29 16.5 — 160.3	29 46.5 — 160.3	30 16.4 — 160.3	30 46.4 — 160.3	31 16.4 — 160.3
20	1.0 03	27 45.1 — 159.3	28 15.0 — 159.3	28 45.0 — 159.3	29 15.0 — 159.3	29 45.0 — 159.3	30 15.0 — 159.2	30 45.0 — 159.2	31 15.0 — 159.2
1	1.0 03	27 43.5 — 158.3	28 13.5 — 158.3	28 43.5 — 158.3	29 13.5 — 158.2	29 43.5 — 158.2	30 13.5 — 158.2	30 43.5 — 158.2	31 13.5 — 158.2
2	1.0 03	27 42.0 — 157.3	28 11.9 — 157.2	28 41.9 — 157.2	29 11.9 — 157.2	29 41.9 — 157.2	30 11.9 — 157.2	30 41.9 — 157.1	31 11.9 — 157.1
3	1.0 03	27 40.3 — 156.2	28 10.3 — 156.2	28 40.3 — 156.2	29 10.3 — 156.2	29 40.2 — 156.2	30 10.2 — 156.1	30 40.2 — 156.1	31 10.2 — 156.1
4	1.0 03	27 38.6 — 155.2	28 08.6 — 155.2	28 38.6 — 155.2	29 08.5 — 155.1	29 38.5 — 155.1	30 08.5 — 155.1	30 38.5 — 155.1	31 08.5 — 155.1
25	1.0 03	27 36.8 — 154.2	28 06.8 — 154.1	28 36.8 — 154.1	29 06.7 — 154.1	29 36.7 — 154.1	30 06.7 — 154.1	30 36.7 — 154.1	31 06.7 — 154.0
6	1.0 03	27 34.9 — 153.1	28 04.9 — 153.1	28 34.9 — 153.1	29 04.9 — 153.1	29 34.9 — 153.1	30 04.8 — 153.0	30 34.8 — 153.0	31 04.8 — 153.0
7	1.0 03	27 33.0 — 152.1	28 03.0 — 152.1	28 33.0 — 152.1	29 03.0 — 152.0	29 32.9 — 152.0	30 02.9 — 152.0	30 32.9 — 152.0	31 02.9 — 152.0
8	1.0 03	27 31.0 — 151.1	28 01.0 — 151.1	28 31.0 — 151.0	29 01.0 — 151.0	29 30.9 — 151.0	30 00.9 — 151.0	30 30.9 — 151.0	31 00.9 — 150.9
9	1.0 04	27 29.0 — 150.0	27 58.9 — 150.0	28 28.9 — 150.0	28 58.9 — 150.0	29 28.7 — 150.0	29 58.7 — 149.9	30 28.8 — 149.9	30 58.8 — 149.9
30	1.0 04	27 26.8 — 149.0	27 56.8 — 149.0	28 26.8 — 149.0	28 56.8 — 149.0	29 26.7 — 148.9	29 56.7 — 148.9	30 26.7 — 148.9	30 56.7 — 148.9
1	1.0 04	27 24.7 — 148.0	27 54.6 — 148.0	28 24.6 — 147.9	28 54.6 — 147.9	29 24.6 — 147.9	29 54.5 — 147.9	30 24.5 — 147.9	30 54.5 — 147.8
2	1.0 04	27 22.4 — 147.0	27 52.4 — 146.9	28 22.4 — 146.9	28 52.3 — 146.9	29 22.3 — 146.9	29 52.3 — 146.8	30 22.2 — 146.8	30 52.2 — 146.8
3	1.0 04	27 20.1 — 145.9	27 50.1 — 145.9	28 20.0 — 145.9	28 50.0 — 145.9	29 20.0 — 145.8	29 50.0 — 145.8	30 19.9 — 145.8	30 49.9 — 145.8
4	1.0 04	27 17.7 — 144.9	27 47.7 — 144.9	28 17.7 — 144.8	28 47.5 — 144.8	29 17.6 — 144.8	29 47.6 — 144.8	30 17.5 — 144.8	30 47.5 — 144.7
35	1.0 04	27 15.3 — 143.9	27 45.3 — 143.9	28 15.2 — 143.8	28 45.2 — 143.8	29 15.2 — 143.8	29 45.1 — 143.8	30 15.1 — 143.7	30 45.1 — 143.7
6	1.0 04	27 12.8 — 142.9	27 42.8 — 142.8	28 12.7 — 142.8	28 42.7 — 142.8	29 12.7 — 142.8	29 42.6 — 142.7	30 12.6 — 142.7	30 42.6 — 142.7
7	1.0 04	27 10.2 — 141.8	27 40.2 — 141.8	28 10.2 — 141.8	28 40.1 — 141.8	29 10.1 — 141.7	29 40.1 — 141.7	30 10.0 — 141.7	30 40.0 — 141.6
8	1.0 04	27 07.6 — 140.8	27 37.6 — 140.8	28 07.5 — 140.8	28 37.5 — 140.7	29 07.5 — 140.7	29 37.4 — 140.7	30 07.4 — 140.6	30 37.4 — 140.6
9	1.0 05	27 04.9 — 139.8	27 34.9 — 139.8	28 04.9 — 139.7	28 34.8 — 139.7	29 04.8 — 139.7	29 34.8 — 139.7	30 04.7 — 139.6	30 34.7 — 139.6
40	1.0 05	27 02.2 — 138.8	27 32.2 — 138.7	28 02.1 — 138.7	28 32.1 — 138.7	29 02.1 — 138.6	29 32.0 — 138.6	30 02.0 — 138.6	30 31.9 — 138.6
1	1.0 05	26 59.4 — 137.7	27 29.4 — 137.7	27 59.3 — 137.7	28 29.3 — 137.6	28 59.3 — 137.6	29 29.2 — 137.6	29 59.2 — 137.6	30 29.1 — 137.5
2	1.0 05	26 56.6 — 136.7	27 26.5 — 136.7	27 56.5 — 136.6	28 26.5 — 136.6	28 56.4 — 136.6	29 26.4 — 136.6	29 56.3 — 136.5	30 26.3 — 136.5
3	1.0 05	26 53.7 — 135.7	27 23.6 — 135.7	27 53.6 — 135.6	28 23.5 — 135.6	28 53.5 — 135.6	29 23.5 — 135.6	29 53.4 — 135.5	30 23.4 — 135.5
4	1.0 05	26 50.7 — 134.7	27 20.7 — 134.6	27 50.6 — 134.6	28 20.6 — 134.6	28 50.5 — 134.5	29 20.5 — 134.5	29 50.5 — 134.5	30 20.4 — 134.4
45	1.0 05	26 47.7 — 133.6	27 17.7 — 133.6	27 47.6 — 133.6	28 17.6 — 133.5	28 47.5 — 133.5	29 17.5 — 133.5	29 47.4 — 133.5	30 17.4 — 133.4
6	1.0 05	26 44.7 — 132.6	27 14.6 — 132.6	27 44.6 — 132.6	28 14.5 — 132.5	28 44.5 — 132.5	29 14.4 — 132.5	29 44.4 — 132.4	30 14.3 — 132.4
7	1.0 05	26 41.6 — 131.6	27 11.5 — 131.6	27 41.5 — 131.5	28 11.4 — 131.5	28 41.4 — 131.5	29 11.3 — 131.4	29 41.3 — 131.4	30 11.2 — 131.4
8	1.0 05	26 38.4 — 130.6	27 08.4 — 130.5	27 38.3 — 130.5	28 08.3 — 130.5	28 38.2 — 130.4	29 08.2 — 130.4	29 38.1 — 130.4	30 08.0 — 130.3
9	1.0 05	26 35.2 — 129.6	27 05.2 — 129.5	27 35.1 — 129.5	28 05.1 — 129.5	28 35.0 — 129.4	29 04.9 — 129.4	29 34.9 — 129.4	30 04.8 — 129.3
50	1.0 06	26 32.0 — 128.5	27 01.9 — 128.5	27 31.9 — 128.5	28 01.8 — 128.4	28 31.7 — 128.4	29 01.7 — 128.4	29 31.6 — 128.3	30 01.6 — 128.3
1	1.0 06	26 28.7 — 127.5	26 58.6 — 127.5	27 28.6 — 127.5	27 58.5 — 127.4	28 28.4 — 127.4	28 58.4 — 127.3	29 28.3 — 127.3	29 58.3 — 127.3
2	1.0 06	26 25.3 — 126.5	26 55.3 — 126.5	27 25.2 — 126.4	27 55.1 — 126.4	28 25.1 — 126.4	28 55.0 — 126.3	29 25.0 — 126.3	29 54.9 — 126.3
3	1.0 06	26 21.9 — 125.5	26 51.9 — 125.4	27 21.8 — 125.4	27 51.8 — 125.4	28 21.7 — 125.3	28 51.6 — 125.3	29 21.6 — 125.3	29 51.5 — 125.2
4	1.0 06	26 18.5 — 124.5	26 48.4 — 124.4	27 18.4 — 124.4	27 48.3 — 124.4	28 18.3 — 124.3	28 48.2 — 124.3	29 18.1 — 124.2	29 48.1 — 124.2
55	1.0 06	26 15.0 — 123.4	26 45.0 — 123.4	27 14.9 — 123.4	27 44.8 — 123.3	28 14.8 — 123.3	28 44.7 — 123.3	29 14.7 — 123.2	29 44.6 — 123.2
6	1.0 06	26 11.5 — 122.4	26 41.5 — 122.4	27 11.4 — 122.4	27 41.3 — 122.3	28 11.3 — 122.3	28 41.2 — 122.2	29 11.1 — 122.2	29 41.1 — 122.2
7	1.0 06	26 08.0 — 121.4	26 37.9 — 121.4	27 07.8 — 121.3	27 37.8 — 121.3	28 07.7 — 121.3	28 37.6 — 121.2	29 07.6 — 121.2	29 37.5 — 121.2
8	1.0 06	26 04.4 — 120.4	26 34.3 — 120.4	27 04.2 — 120.3	27 34.2 — 120.3	28 04.1 — 120.3	28 34.0 — 120.2	29 04.0 — 120.2	29 33.9 — 120.1
9	1.0 06	26 00.7 — 119.4	26 30.7 — 119.3	27 00.6 — 119.3	27 30.5 — 119.3	28 00.5 — 119.2	28 30.4 — 119.2	29 00.3 — 119.2	29 30.3 — 119.1
60	1.0 06	25 57.1 — 118.4	26 27.0 — 118.3	26 56.9 — 118.3	27 26.9 — 118.3	27 56.8 — 118.2	28 26.7 — 118.2	28 56.7 — 118.1	29 26.6 — 118.1
1	1.0 06	25 53.4 — 117.4	26 23.3 — 117.3	26 53.2 — 117.3	27 23.2 — 117.2	27 53.1 — 117.2	28 23.0 — 117.2	28 53.0 — 117.1	29 22.9 — 117.1
2	1.0 06	25 49.7 — 116.3	26 19.6 — 116.3	26 49.5 — 116.3	27 19.4 — 116.2	27 49.4 — 116.2	28 19.3 — 116.2	28 49.2 — 116.1	29 19.1 — 116.1
3	1.0 06	25 45.9 — 115.3	26 15.8 — 115.3	26 45.7 — 115.3	27 15.7 — 115.2	27 45.6 — 115.2	28 15.5 — 115.2	28 45.4 — 115.1	29 15.4 — 115.1
4	1.0 06	25 42.1 — 114.3	26 12.0 — 114.3	26 41.9 — 114.2	27 11.9 — 114.2	27 41.8 — 114.2	28 11.7 — 114.1	28 41.6 — 114.1	29 11.6 — 114.0
65	1.0 06	25 38.3 — 113.3	26 08.2 — 113.3	26 38.1 — 113.2	27 08.0 — 113.2	27 38.0 — 113.1	28 07.9 — 113.1	28 37.8 — 113.1	29 07.7 — 113.0
6	1.0 06	25 34.4 — 112.3	26 04.3 — 112.3	26 34.2 — 112.2	27 04.2 — 112.2	27 34.1 — 112.1	28 04.0 — 112.1	28 33.9 — 112.1	29 03.9 — 112.0
7	1.0 07	25 30.5 — 111.3	26 00.4 — 111.3	26 30.4 — 111.2	27 00.3 — 111.2	27 30.2 — 111.1	28 00.1 — 111.1	28 30.0 — 111.0	29 00.0 — 111.0
8	1.0 07	25 26.6 — 110.3	25 56.5 — 110.2	26 26.4 — 110.2	26 56.4 — 110.1	27 26.3 — 110.1	27 56.2 — 110.1	28 26.1 — 110.0	28 56.0 — 110.0
9	1.0 07	25 22.7 — 109.3	25 52.6 — 109.2	26 22.5 — 109.2	26 52.4 — 109.2	27 22.3 — 109.1	27 52.3 — 109.1	28 22.2 — 109.0	28 52.1 — 109.0
70	1.0 07	25 18.7 — 108.3	25 48.6 — 108.2	26 18.5 — 108.2	26 48.5 — 108.1	27 18.4 — 108.1	27 48.3 — 108.1	28 18.2 — 108.0	28 48.1 — 108.0
1	1.0 07	25 14.7 — 107.3	25 44.6 — 107.2	26 14.6 — 107.2	26 44.5 — 107.1	27 14.4 — 107.1	27 44.3 — 107.0	28 14.2 — 107.0	28 44.1 — 107.0
2	1.0 07	25 10.7 — 106.3	25 40.6 — 106.2	26 10.5 — 106.2	26 40.5 — 106.1	27 10.4 — 106.1	27 40.3 — 106.0	28 10.2 — 106.0	28 40.1 — 106.0
3	1.0 07	25 06.7 — 105.2	25 36.6 — 105.2	26 06.5 — 105.1	26 36.4 — 105.1	27 06.3 — 105.1	27 36.3 — 105.0	28 06.2 — 105.0	28 36.1 — 104.9
4	1.0 07	25 02.6 — 104.2	25 32.5 — 104.2	26 02.5 — 104.1	26 32.4 — 104.1	27 02.3 — 104.1	27 32.2 — 104.0	28 02.1 — 104.0	28 32.0 — 103.9
75	1.0 07	24 58.6 — 103.2	25 28.5 — 103.2	25 58.4 — 103.1	26 28.3 — 103.1	26 58.2 — 103.1	27 28.1 — 103.0	27 58.1 — 103.0	28 28.0 — 102.9
6	1.0 07	24 54.5 — 102.2	25 24.4 — 102.2	25 54.3 — 102.1	26 24.3 — 102.1	26 54.1 — 102.1	27 24.1 — 102.0	27 54.0 — 102.0	28 23.9 — 101.9
7	1.0 07	24 50.4 — 101.2	25 20.3 — 101.2	25 50.2 — 101.1	26 20.1 — 101.1	26 50.0 — 101.1	27 20.0 — 101.0	27 49.9 — 101.0	28 19.8 — 100.9
8	1.0 07	24 46.3 — 100.2	25 16.2 — 100.2	25 46.1 — 100.1	26 16.0 — 100.1	26 45.9 — 100.1	27 15.8 — 100.0	27 45.7 — 100.0	28 15.7 — 99.9
9	1.0 07	24 42.1 — 99.2	25 12.1 — 99.2	25 42.0 — 99.1	26 11.9 — 99.1	26 41.8 — 99.0	27 11.7 — 99.0	27 41.6 — 99.0	28 11.5 — 98.9
80	1.0 07	24 38.0 — 98.2	25 07.9 — 98.2	25 37.8 — 98.1	26 07.7 — 98.1	26 37.7 — 98.0	27 07.6 — 98.0	27 37.5 — 98.0	28 07.4 — 97.9
1	1.0 07	24 33.9 — 97.2	25 03.8 — 97.2	25 33.7 — 97.1	26 03.6 — 97.1	26 33.5 — 97.0	27 03.4 — 97.0	27 33.3 — 97.0	28 03.2 — 96.9
2	1.0 07	24 29.7 — 96.2	24 59.6 — 96.2	25 29.5 — 96.1	25 59.4 — 96.1	26 29.4 — 96.0	26 59.3 — 96.0	27 29.2 — 96.0	27 59.1 — 95.9
3	1.0 07	24 25.5 — 95.2	24 55.5 — 95.2	25 25.4 — 95.1	25 55.3 — 95.1	26 25.2 — 95.0	26 55.1 — 95.0	27 25.0 — 95.0	27 54.9 — 94.9
4	1.0 07	24 21.4 — 94.2	24 51.3 — 94.2	25 21.2 — 94.1	25 51.1 — 94.1	26 21.0 — 94.0	26 50.9 — 94.0	27 20.8 — 94.0	27 50.7 — 93.9
85	1.0 07	24 17.2 — 93.2	24 47.1 — 93.2	25 17.0 — 93.1	25 46.9 — 93.1	26 16.8 — 93.0	26 46.7 — 93.0	27 16.7 — 93.0	27 46.6 — 92.9
6	1.0 07	24 13.0 — 92.2	24 42.9 — 92.2	25 12.8 — 92.1	25 42.7 — 92.1	26 12.7 — 92.0	26 42.6 — 92.0	27 12.5 — 92.0	27 42.4 — 91.9
7	1.0 07	24 08.8 — 91.2	24 38.7 — 91.2	25 08.7 — 91.1	25 38.6 — 91.1	26 08.5 — 91.0	26 38.4 — 91.0	27 08.3 — 91.0	27 38.2 — 90.9
8	1.0 07	24 04.6 — 90.2	24 34.6 — 90.2	25 04.5 — 90.1	25 34.4 — 90.1	26 04.3 — 90.0	26 34.2 — 90.0	27 04.1 — 90.0	27 34.0 — 89.9
9	1.0 07	24 00.5 — 89.2	24 30.4 — 89.2	25 00.4 — 89.1	25 30.2 — 89.1	26 00.1 — 89.0	26 30.0 — 89.0	26 59.9 — 89.0	27 29.8 — 88.9
90	1.0 07	23 56.3 — 88.2	24 26.2 — 88.2	24 56.1 — 88.1	25 26.0 — 88.1	25 55.9 — 88.1	26 25.8 — 88.0	26 55.7 — 88.0	27 25.6 — 87.9

Lat. 86°

H.A.	24° 00' Alt.	Δd Δt	Az.	24° 30' Alt.	Δd Δt	Az.	25° 00' Alt.	Δd Δt	Az.	25° 30' Alt.	Δd Δt	Az.	26° 00' Alt.	Δd Δt	Az.	26° 30' Alt.	Δd Δt	Az.	27° 00' Alt.	Δd Δt	Az.	27° 30' Alt.	Δd Δt	Az.	H.A.
91	23 52.1	1.007	87.2	24 22.0	1.007	87.2	24 51.9	1.007	87.1	25 21.8	1.007	87.1	25 51.7	1.007	87.1	26 21.6	1.007	87.0	26 51.6	1.007	87.0	27 21.5	1.007	86.9	91
2	23 47.9	1.007	86.2	24 17.8	1.007	86.2	24 47.7	1.007	86.1	25 17.6	1.007	86.1	25 47.6	1.007	86.1	26 17.5	1.007	86.0	26 47.4	1.007	86.0	27 17.3	1.007	85.9	2
3	23 43.7	1.007	85.2	24 13.7	1.007	85.2	24 43.6	1.007	85.2	25 13.5	1.007	85.1	25 43.4	1.007	85.1	26 13.3	1.007	85.0	26 43.2	1.007	85.0	27 13.1	1.007	84.9	3
4	23 39.6	1.007	84.2	24 09.5	1.007	84.2	24 39.4	1.007	84.2	25 09.4	1.007	84.1	25 39.2	1.007	84.1	26 09.1	1.007	84.0	26 39.0	1.007	84.0	27 08.9	1.007	83.9	4
95	23 35.4	1.007	83.3	24 05.3	1.007	83.3	24 35.2	1.007	83.2	25 05.1	1.007	83.1	25 35.1	1.007	83.1	26 05.0	1.007	83.0	26 34.9	1.007	83.0	27 04.8	1.007	82.9	95
6	23 31.3	1.007	82.3	24 01.2	1.007	82.2	24 31.1	1.007	82.2	25 01.0	1.007	82.1	25 30.9	1.007	82.1	26 00.8	1.007	82.0	26 30.7	1.007	82.0	27 00.6	1.007	82.0	6
7	23 27.1	1.007	81.3	23 57.0	1.007	81.2	24 26.9	1.007	81.2	24 56.9	1.007	81.1	25 26.8	1.007	81.1	25 56.7	1.007	81.0	26 26.6	1.007	81.0	26 56.5	1.007	81.0	7
8	23 23.0	1.007	80.3	23 52.9	1.007	80.2	24 22.8	1.007	80.2	24 52.7	1.007	80.1	25 22.6	1.007	80.1	25 52.6	1.007	80.1	26 22.5	1.007	80.0	26 52.4	1.007	80.0	8
9	23 18.9	1.007	79.3	23 48.8	1.007	79.2	24 18.7	1.007	79.2	24 48.6	1.007	79.1	25 18.5	1.007	79.1	25 48.4	1.007	79.1	26 18.3	1.007	79.0	26 48.3	1.007	79.0	9
100	23 14.8	1.007	78.3	23 44.7	1.007	78.2	24 14.6	1.007	78.2	24 44.5	1.007	78.2	25 14.4	1.007	78.1	25 44.3	1.007	78.1	26 14.2	1.007	78.0	26 44.2	1.007	78.0	100
1	23 10.7	1.007	77.3	23 40.6	1.007	77.2	24 10.5	1.007	77.2	24 40.4	1.007	77.2	25 10.3	1.007	77.1	25 40.2	1.007	77.1	26 10.2	1.007	77.0	26 40.1	1.007	77.0	1
2	23 06.6	1.007	76.3	23 36.5	1.007	76.3	24 06.4	1.007	76.2	24 36.3	1.007	76.2	25 06.3	1.007	76.1	25 36.2	1.007	76.1	26 06.1	1.007	76.1	26 36.0	1.007	76.0	2
3	23 02.5	1.007	75.3	23 32.5	1.007	75.3	24 02.4	1.007	75.2	24 32.3	1.007	75.2	25 02.2	1.007	75.1	25 32.1	1.007	75.1	26 02.0	1.007	75.1	26 31.9	1.007	75.0	3
4	22 58.5	1.007	74.3	23 28.4	1.007	74.3	23 58.3	1.007	74.2	24 28.3	1.007	74.2	24 58.2	1.007	74.2	25 28.1	1.007	74.1	25 58.0	1.007	74.1	26 27.9	1.007	74.0	4
105	22 54.5	1.007	73.3	23 24.4	1.007	73.3	23 54.3	1.007	73.2	24 24.2	1.007	73.2	24 54.2	1.007	73.2	25 24.1	1.007	73.1	25 54.0	1.007	73.1	26 23.9	1.007	73.0	105
6	22 50.5	1.007	72.3	23 20.4	1.007	72.3	23 50.3	1.007	72.3	24 20.2	1.007	72.2	24 50.2	1.007	72.2	25 20.1	1.007	72.1	25 50.0	1.007	72.1	26 19.9	1.007	72.1	6
7	22 46.5	1.007	71.4	23 16.4	1.007	71.3	23 46.3	1.007	71.3	24 16.3	1.007	71.2	24 46.2	1.007	71.2	25 16.1	1.007	71.2	25 46.0	1.007	71.1	26 15.9	1.007	71.1	7
8	22 42.5	1.007	70.4	23 12.5	1.007	70.3	23 42.4	1.007	70.3	24 12.3	1.007	70.2	24 42.2	1.007	70.2	25 12.2	1.007	70.2	25 42.1	1.007	70.1	26 12.0	1.007	70.1	8
9	22 38.6	1.006	69.4	23 08.5	1.007	69.3	23 38.5	1.006	69.3	24 08.4	1.006	69.3	24 38.3	1.007	69.2	25 08.2	1.006	69.2	25 38.1	1.006	69.1	26 08.1	1.006	69.1	9
110	22 34.7	1.006	68.4	23 04.6	1.006	68.4	23 34.6	1.006	68.3	24 04.5	1.006	68.3	24 34.4	1.006	68.2	25 04.3	1.006	68.2	25 34.3	1.006	68.2	26 04.2	1.006	68.1	110
1	22 30.8	1.006	67.4	23 00.8	1.006	67.4	23 30.7	1.006	67.3	24 00.6	1.006	67.3	24 30.5	1.006	67.2	25 00.5	1.006	67.2	25 30.4	1.006	67.2	26 00.3	1.006	67.1	1
2	22 27.0	1.006	66.4	22 56.9	1.006	66.4	23 26.8	1.006	66.3	23 56.8	1.006	66.3	24 26.7	1.006	66.3	24 56.6	1.006	66.2	25 26.5	1.006	66.2	25 56.5	1.006	66.1	2
3	22 23.2	1.006	65.4	22 53.1	1.006	65.4	23 23.0	1.006	65.4	23 52.9	1.006	65.3	24 22.9	1.006	65.3	24 52.8	1.006	65.2	25 22.7	1.006	65.2	25 52.6	1.006	65.2	3
4	22 19.4	1.006	64.4	22 49.3	1.006	64.4	23 19.2	1.006	64.4	23 49.2	1.006	64.3	24 19.1	1.006	64.3	24 49.0	1.006	64.3	25 18.9	1.006	64.2	25 48.9	1.006	64.2	4
115	22 15.6	1.006	63.5	22 45.5	1.006	63.4	23 15.5	1.006	63.4	23 45.4	1.006	63.3	24 15.3	1.006	63.3	24 45.3	1.006	63.3	25 15.2	1.006	63.2	25 45.1	1.006	63.2	115
6	22 11.9	1.006	62.5	22 41.8	1.006	62.4	23 11.7	1.006	62.4	23 41.7	1.006	62.4	24 11.6	1.006	62.3	24 41.5	1.006	62.3	25 11.5	1.006	62.3	25 41.4	1.006	62.2	6
7	22 08.2	1.006	61.5	22 38.1	1.006	61.5	23 08.1	1.006	61.4	23 38.0	1.006	61.4	24 07.9	1.006	61.3	24 37.8	1.006	61.3	25 07.8	1.006	61.3	25 37.7	1.006	61.2	7
8	22 04.5	1.006	60.5	22 34.5	1.006	60.5	23 04.4	1.006	60.4	23 34.3	1.006	60.4	24 04.3	1.006	60.4	24 34.2	1.006	60.3	25 04.1	1.006	60.3	25 34.1	1.006	60.2	8
9	22 00.9	1.006	59.5	22 30.8	1.006	59.5	23 00.8	1.006	59.5	23 30.7	1.006	59.4	24 00.6	1.006	59.4	24 30.6	1.006	59.3	25 00.5	1.006	59.3	25 30.4	1.006	59.3	9
120	21 57.3	1.006	58.5	22 27.3	1.006	58.5	22 57.2	1.006	58.5	23 27.1	1.006	58.4	23 57.1	1.006	58.4	24 27.0	1.006	58.4	24 56.9	1.006	58.3	25 26.9	1.006	58.3	120
1	21 53.8	1.006	57.6	22 23.7	1.006	57.5	22 53.6	1.006	57.5	23 23.6	1.006	57.5	23 53.5	1.006	57.4	24 23.4	1.006	57.4	24 53.4	1.006	57.3	25 23.3	1.006	57.3	1
2	21 50.3	1.006	56.6	22 20.2	1.006	56.5	22 50.1	1.006	56.5	23 20.1	1.006	56.5	23 50.0	1.006	56.4	24 19.9	1.006	56.4	24 49.9	1.006	56.4	25 19.8	1.006	56.3	2
3	21 46.8	1.006	55.6	22 16.7	1.006	55.6	22 46.7	1.006	55.5	23 16.6	1.006	55.5	23 46.5	1.006	55.5	24 16.5	1.006	55.4	24 46.4	1.006	55.4	25 16.4	1.006	55.4	3
4	21 43.3	1.006	54.6	22 13.3	1.006	54.6	22 43.2	1.006	54.5	23 13.2	1.006	54.5	23 43.1	1.006	54.5	24 13.1	1.006	54.4	24 43.0	1.006	54.4	25 12.9	1.006	54.4	4
125	21 40.0	1.006	53.6	22 09.9	1.006	53.6	22 39.8	1.006	53.6	23 09.8	1.006	53.5	23 39.7	1.006	53.5	24 09.7	1.006	53.5	24 39.6	1.006	53.4	25 09.5	1.006	53.4	125
6	21 36.6	1.006	52.7	22 06.5	1.006	52.6	22 36.5	1.006	52.6	23 06.4	1.006	52.6	23 36.4	1.006	52.5	24 06.3	1.006	52.5	24 36.3	1.006	52.5	25 06.2	1.006	52.4	6
7	21 33.3	1.005	51.7	22 03.2	1.005	51.6	22 33.2	1.005	51.6	23 03.1	1.005	51.6	23 33.1	1.005	51.5	24 03.0	1.005	51.5	24 33.0	1.005	51.5	25 02.9	1.005	51.4	7
8	21 30.0	1.005	50.7	22 00.0	1.005	50.7	22 29.9	1.005	50.6	22 59.9	1.005	50.6	23 29.8	1.005	50.6	23 59.8	1.005	50.5	24 29.7	1.005	50.5	24 59.7	1.005	50.5	8
9	21 26.8	1.005	49.7	21 56.8	1.005	49.7	22 26.7	1.005	49.6	22 56.7	1.005	49.6	23 26.6	1.005	49.6	23 56.6	1.005	49.6	24 26.5	1.005	49.5	24 56.5	1.005	49.5	9
130	21 23.7	1.005	48.7	21 53.6	1.005	48.7	22 23.6	1.005	48.7	22 53.5	1.005	48.6	23 23.5	1.005	48.6	23 53.4	1.005	48.6	24 23.4	1.005	48.5	24 53.3	1.005	48.5	130
1	21 20.5	1.005	47.8	21 50.5	1.005	47.7	22 20.4	1.005	47.7	22 50.4	1.005	47.7	23 20.3	1.005	47.6	23 50.3	1.005	47.6	24 20.2	1.005	47.6	24 50.2	1.005	47.5	1
2	21 17.5	1.005	46.8	21 47.4	1.005	46.7	22 17.4	1.005	46.7	22 47.3	1.005	46.7	23 17.3	1.005	46.7	23 47.2	1.005	46.6	24 17.2	1.005	46.6	24 47.1	1.005	46.6	2
3	21 14.4	1.005	45.8	21 44.4	1.005	45.8	22 14.3	1.005	45.7	22 44.3	1.005	45.7	23 14.3	1.005	45.7	23 44.2	1.005	45.6	24 14.2	1.005	45.6	24 44.1	1.005	45.6	3
4	21 11.5	1.005	44.8	21 41.4	1.005	44.8	22 11.4	1.005	44.8	22 41.3	1.005	44.7	23 11.3	1.005	44.7	23 41.2	1.005	44.7	24 11.2	1.005	44.6	24 41.1	1.005	44.6	4
135	21 08.5	1.005	43.8	21 38.5	1.005	43.8	22 08.5	1.005	43.8	22 38.4	1.005	43.7	23 08.4	1.005	43.7	23 38.3	1.005	43.7	24 08.3	1.005	43.7	24 38.2	1.005	43.6	135
6	21 05.7	1.005	42.9	21 35.6	1.005	42.8	22 05.6	1.005	42.8	22 35.5	1.005	42.8	23 05.5	1.005	42.7	23 35.5	1.005	42.7	24 05.4	1.005	42.7	24 35.4	1.005	42.7	6
7	21 02.8	1.005	41.9	21 32.8	1.005	41.9	22 02.8	1.005	41.8	22 32.7	1.005	41.8	23 02.7	1.005	41.8	23 32.6	1.005	41.7	24 02.6	1.005	41.7	24 32.6	1.005	41.7	7
8	21 00.1	1.004	40.9	21 30.0	1.004	40.9	22 00.0	1.005	40.8	22 30.0	1.005	40.8	22 59.9	1.004	40.8	23 29.9	1.004	40.8	23 59.8	1.005	40.7	24 29.8	1.004	40.7	8
9	20 57.4	1.004	39.9	21 27.3	1.004	39.9	21 57.3	1.004	39.9	22 27.3	1.004	39.8	22 57.2	1.004	39.8	23 27.2	1.004	39.8	23 57.1	1.004	39.8	24 27.1	1.004	39.7	9
140	20 54.7	1.004	38.9	21 24.7	1.004	38.9	21 54.6	1.004	38.9	22 24.6	1.004	38.9	22 54.6	1.004	38.8	23 24.5	1.004	38.8	23 54.5	1.004	38.8	24 24.5	1.004	38.8	140
1	20 52.1	1.004	38.0	21 22.1	1.004	37.9	21 52.0	1.004	37.9	22 22.0	1.004	37.9	22 52.0	1.004	37.9	23 21.9	1.004	37.8	23 51.9	1.004	37.8	24 21.9	1.004	37.8	1
2	20 49.6	1.004	37.0	21 19.5	1.004	37.0	21 49.5	1.004	36.9	22 19.5	1.004	36.9	22 49.4	1.004	36.9	23 19.4	1.004	36.9	23 49.4	1.004	36.8	24 19.3	1.004	36.8	2
3	20 47.1	1.004	36.0	21 17.0	1.004	36.0	21 47.0	1.004	36.0	22 17.0	1.004	35.9	22 46.9	1.004	35.9	23 16.9	1.004	35.9	23 46.9	1.004	35.9	24 16.8	1.004	35.8	3
4	20 44.6	1.004	35.0	21 14.6	1.004	35.0	21 44.6	1.004	35.0	22 14.5	1.004	35.0	22 44.5	1.004	34.9	23 14.5	1.004	34.9	23 44.5	1.004	34.9	24 14.4	1.004	34.9	4
145	20 42.3	1.004	34.1	21 12.2	1.004	34.0	21 42.2	1.004	34.0	22 12.2	1.004	34.0	22 42.1	1.004	34.0	23 12.1	1.004	34.0	23 42.1	1.004	33.9	24 12.1	1.004	33.9	145
6	20 39.9	1.004	33.1	21 09.9	1.004	33.1	21 39.9	1.004	33.0	22 09.9	1.004	33.0	22 39.8	1.004	33.0	23 09.8	1.004	33.0	23 39.8	1.004	33.0	24 09.8	1.004	32.9	6
7	20 37.7	1.004	32.1	21 07.7	1.004	32.1	21 37.6	1.004	32.1	22 07.6	1.004	32.1	22 37.6	1.004	32.0	23 07.6	1.004	32.0	23 37.5	1.004	32.0	24 07.5	1.004	32.0	7
8	20 35.5	1.004	31.1	21 05.5	1.004	31.1	21 35.4	1.004	31.1	22 05.4	1.004	31.1	22 35.4	1.004	31.1	23 05.4	1.004	31.0	23 35.3	1.004	31.0	24 05.3	1.004	31.0	8
9	20 33.4	1.003	30.1	21 03.3	1.003	30.1	21 33.3	1.003	30.1	22 03.3	1.003	30.1	22 33.3	1.003	30.0	23 03.2	1.003	30.0	23 33.2	1.003	30.0	24 03.2	1.003	30.0	9
150	20 31.3	1.003	29.2	21 01.3	1.003	29.2	21 31.2	1.003	29.2	22 01.2	1.003	29.1	22 31.2	1.003	29.1	23 01.2	1.003	29.1	23 31.2	1.003	29.1	24 01.1	1.003	29.0	150
1	20 29.3	1.003	28.2	20 59.3	1.003	28.2	21 29.2	1.003	28.2	21 59.2	1.003	28.2	22 29.2	1.003	28.1	22 59.2	1.003	28.1	23 29.2	1.003	28.1	23 59.1	1.003	28.1	1
2	20 27.3	1.003	27.2	20 57.3	1.003	27.2	21 27.3	1.003	27.2	21 57.3	1.003	27.2	22 27.3	1.003	27.2	22 57.2	1.003	27.1	23 27.2	1.003	27.1	23 57.2	1.003	27.1	2
3	20 25.4	1.003	26.3	20 55.4	1.003	26.2	21 25.4	1.003	26.2	21 55.4	1.003	26.2	22 25.4	1.003	26.2	22 55.4	1.003	26.2	23 25.3	1.003	26.2	23 55.3	1.003	26.1	3
4	20 23.6	1.003	25.3	20 53.6	1.003	25.3	21 23.6	1.003	25.3	21 53.6	1.003	25.2	22 23.6	1.003	25.2	22 53.5	1.003	25.2	23 23.5	1.003	25.2	23 53.5	1.003	25.2	4
155	20 21.9	1.003	24.3	20 51.9	1.003	24.3	21 21.8	1.003	24.3	21 51.8	1.003	24.3	22 21.8	1.003	24.3	22 51.8	1.003	24.2	23 21.8	1.003	24.2	23 51.8	1.003	24.2	155
6	20 20.2	1.003	23.3	20 50.2	1.003	23.3	21 20.1	1.003	23.3	21 50.1	1.003	23.3	22 20.1	1.003	23.3	22 50.1	1.003	23.3	23 20.1	1.003	23.2	23 50.1	1.003	23.2	6
7	20 18.6	1.003	22.4	20 48.5	1.003	22.4	21 18.5	1.003	22.3	21 48.5	1.003	22.3	22 18.5	1.003	22.3	22 48.5	1.003	22.3	23 18.5	1.003	22.3	23 48.5	1.003	22.3	7
8	20 17.0	1.002	21.4	20 47.0	1.002	21.4	21 17.0	1.002	21.4	21 47.0	1.002	21.4	22 16.9	1.002	21.3	22 46.9	1.002	21.3	23 16.9	1.002	21.3	23 46.9	1.002	21.3	8
9	20 15.5	1.002	20.4	20 45.5	1.002	20.4	21 15.5	1.002	20.4	21 45.5	1.002	20.4	22 15.5	1.002	20.4	22 45.4	1.002	20.4	23 15.4	1.002	20.3	23 45.4	1.002	20.3	9
160	20 14.1	1.002	19.5	20 44.1	1.002	19.4	21 14.1	1.002	19.4	21 44.0	1.002	19.4	22 14.0	1.002	19.4	22 44.0	1.002	19.4	23 14.0	1.002	19.4	23 44.0	1.002	19.4	160
1	20 12.7	1.002	18.5	20 42.7	1.002	18.5	21 12.7	1.002	18.5	21 42.7	1.002	18.4	22 12.7	1.002	18.4	22 42.7	1.002	18.4	23 12.7	1.002	18.4	23 42.6	1.002	18.4	1
2	20 11.4	1.002	17.5	20 41.4	1.002	17.5	21 11.4	1.002	17.5	21 41.4	1.002	17.5	22 11.4	1.002	17.5	22 41.4	1.002	17.4	23 11.4	1.002	17.4	23 41.4	1.002	17.4	2
3	20 10.2	1.002	16.5	20 40.2	1.002	16.5	21 10.2	1.002	16.5	21 40.2	1.002	16.5	22 10.2	1.002	16.5	22 40.2	1.002	16.5	23 10.1	1.002	16.5	23 40.1	1.002	16.4	3
4	20 09.0	1.002	15.6	20 39.0	1.002	15.5	21 09.0	1.002	15.5	21 39.0	1.002	15.5	22 09.0	1.002	15.5	22 39.0	1.002	15.5	23 09.0	1.002	15.5	23 39.0	1.002	15.5	4
165	20 07.9	1.002	14.6	20 37.9	1.002	14.6	21 07.9	1.002	14.6	21 37.9	1.002	14.6	22 07.9	1.002	14.5	22 37.9	1.002	14.5	23 07.9	1.002	14.5	23 37.9	1.002	14.5	165
6	20 06.9	1.002	13.6	20 36.9	1.002	13.6	21 06.9	1.002	13.6	21 36.9	1.002	13.6	22 06.9	1.002	13.6	22 36.9	1.002	13.6	23 06.9	1.002	13.6	23 36.9	1.002	13.5	6
7	20 06.0	1.001	12.6	20 36.0	1.001	12.6	21 06.0	1.001	12.6	21 36.0	1.001	12.6	22 06.0	1.001	12.6	22 36.0	1.001	12.6	23 06.0	1.001	12.6	23 35.9	1.001	12.6	7
8	20 05.1	1.001	11.7	20 35.1	1.001	11.7	21 05.1	1.001	11.7	21 35.1	1.001	11.7	22 05.1	1.001	11.6	22 35.1	1.001	11.6	23 05.1	1.001	11.6	23 35.1	1.001	11.6	8
9	20 04.3	1.001	10.7	20 34.3	1.001	10.7	21 04.3	1.001	10.7	21 34.3	1.001	10.7	22 04.3	1.001	10.7	22 34.3	1.001	10.7	23 04.3	1.001	10.6	23 34.3	1.001	10.6	9
170	20 03.5	1.001	09.7	20 33.5	1.001	09.7	21 03.5	1.001	09.7	21 33.5	1.001	09.7	22 03.5	1.001	09.7	22 33.5	1.001	09.7	23 03.5	1.001	09.7	23 33.5	1.001	09.7	170
1	20 02.9	1.001	08.8	20 32.9	1.001	08.7	21 02.9	1.001	08.7	21 32.9	1.001	08.7	22 02.9	1.001	08.7	22 32.9	1.001	08.7	23 02.9	1.001	08.7	23 32.9	1.001	08.7	1
2	20 02.3	1.001	07.8	20 32.3	1.001	07.8	21 02.3	1.001	07.8	21 32.3	1.001	07.8	22 02.3	1.001	07.8	22 32.3	1.001	07.8	23 02.3	1.001	07.7	23 32.3	1.001	07.7	2
3	20 01.7	1.001	06.8	20 31.7	1.001	06.8	21 01.7	1.001	06.8	21 31.7	1.001	06.8	22 01.7	1.001	06.8	22 31.7	1.001	06.8	23 01.7	1.001	06.8	23 31.7	1.001	06.8	3
4	20 01.3	1.001	05.8	20 31.3	1.001	05.8	21 01.3	1.001	05.8	21 31.3	1.001	05.8	22 01.3	1.001	05.8	22 31.3	1.001	05.8	23 01.3	1.001	05.8	23 31.3	1.001	05.8	4
175	20 00.9	1.001	04.9	20 30.9	1.001	04.9	21 00.9	1.001	04.9	21 30.9	1.001	04.9	22 00.9	1.001	04.8	22 30.9	1.001	04.8	23 00.9	1.001	04.8	23 30.9	1.001	04.8	175
6	20 00.6	1.000	03.9	20 30.6	1.000	03.9	21 00.6	1.000	03.9	21 30.6	1.000	03.9	22 00.6	1.000	03.9	22 30.6	1.000	03.9	23 00.6	1.000	03.9	23 30.6	1.000	03.9	6
7	20 00.3	1.000	02.9	20 30.3	1.000	02.9	21 00.3	1.000	02.9	21 30.3	1.000	02.9	22 00.3	1.000	02.9	22 30.3	1.000	02.9	23 00.3	1.000	02.9	23 30.3	1.000	02.9	7
8	20 00.1	1.000	01.9	20 30.1	1.000	01.9	21 00.1	1.000	01.9	21 30.1	1.000	01.9	22 00.1	1.000	01.9	22 30.1	1.000	01.9	23 00.1	1.000	01.9	23 30.1	1.000	01.9	8
9	20 00.0	1.000	01.0	20 30.0	1.000	01.0	21 00.0	1.000	01.0	21 30.0	1.000	01.0	22 00.0	1.000	01.0	22 30.0	1.000	01.0	23 00.0	1.000	01.0	23 30.0	1.000	01.0	9
180	20 00.0	1.000	00.0	20 30.0	1.000	00.0	21 00.0	1.000	00.0	21 30.0	1.000	00.0	22 00.0	1.000	00.0	22 30.0	1.000	00.0	23 00.0	1.000	00.0	23 30.0	1.000	00.0	180

Lat. 87°

Lat. 88°

Lat. 89°

L. o	H.A.	28° 00' Alt. (° ' Δd)	Az. °	28° 30' Alt. (° ' Δd)	Az. °	29° 00' Alt. (° ' Δd)	Az. °	30° 00' Alt. (° ' Δd)	Az. °	32° 00' Alt. (° ' Δd)	Az. °	34° 00' Alt. (° ' Δd)	Az. °	34° 30' Alt. (° ' Δd)	Az. °	35° 30' Alt. (° ' Δd)	Az. °	H.A.
	00	32 00.0 1.00	180.0	32 30.0 1.00	180.0	33 00.0 1.00	180.0	34 00.0 1.00	180.0	36 00.0 1.00	180.0	38 00.0 1.00	180.0	38 30.0 1.00	180.0	39 30.0 1.00	180.0	00
	1	32 00.0 1.00	179.0	32 30.0 1.00	179.0	33 00.0 1.00	179.0	34 00.0 1.00	179.0	36 00.0 1.00	179.0	38 00.0 1.00	178.9	38 30.0 1.00	178.9	39 30.0 1.00	178.9	1
	2	31 59.8 1.00	177.9	32 29.8 1.00	177.9	32 59.8 1.00	177.9	33 59.8 1.00	177.9	35 59.8 1.00	177.9	37 59.8 1.00	177.9	38 29.8 1.00	177.9	39 29.8 1.00	177.9	2
	3	31 59.7 1.00	176.9	32 29.7 1.00	176.9	32 59.7 1.00	176.9	33 59.7 1.00	176.9	35 59.7 1.00	176.9	37 59.7 1.00	176.8	38 29.7 1.00	176.8	39 29.7 1.00	176.8	3
	4	31 59.4 1.01	175.8	32 29.4 1.01	175.8	32 59.4 1.01	175.8	33 59.4 1.01	175.8	35 59.4 1.01	175.8	37 59.4 1.01	175.8	38 29.4 1.01	175.8	39 29.4 1.01	175.8	4
	05	31 59.1 1.01	174.8	32 29.1 1.01	174.8	32 59.0 1.01	174.8	33 59.0 1.01	174.8	35 59.0 1.01	174.8	37 59.0 1.01	174.7	38 29.0 1.01	174.7	39 29.0 1.01	174.7	05
	6	31 58.6 1.01	173.8	32 28.6 1.01	173.7	32 58.6 1.01	173.7	33 58.6 1.01	173.7	35 58.6 1.01	173.7	37 58.6 1.01	173.7	38 28.6 1.01	173.7	39 28.6 1.01	173.7	6
	7	31 58.1 1.01	172.7	32 28.1 1.01	172.7	32 58.1 1.01	172.7	33 58.1 1.01	172.7	35 58.1 1.01	172.7	37 58.1 1.01	172.6	38 28.1 1.01	172.6	39 28.1 1.01	172.6	7
	8	31 57.6 1.01	171.7	32 27.6 1.01	171.7	32 57.6 1.01	171.7	33 57.6 1.01	171.6	35 57.6 1.01	171.6	37 57.5 1.01	171.6	38 27.5 1.01	171.6	39 27.5 1.01	171.6	8
	9	31 56.9 1.01	170.6	32 26.9 1.01	170.6	32 56.9 1.01	170.6	33 56.9 1.01	170.6	35 56.9 1.01	170.6	37 56.9 1.01	170.5	38 26.9 1.01	170.5	39 26.9 1.01	170.5	9
	10	31 56.2 1.01	169.6	32 26.2 1.01	169.6	32 56.2 1.01	169.6	33 56.2 1.01	169.6	35 56.2 1.01	169.5	37 56.2 1.01	169.5	38 26.2 1.01	169.5	39 26.2 1.01	169.5	10
	1	31 55.4 1.01	168.6	32 25.4 1.01	168.5	32 55.4 1.01	168.5	33 55.4 1.01	168.5	35 55.4 1.01	168.5	37 55.4 1.01	168.4	38 25.4 1.01	168.4	39 25.4 1.01	168.4	1
	2	31 54.5 1.02	167.5	32 24.5 1.02	167.5	32 54.5 1.02	167.5	33 54.5 1.02	167.5	35 54.5 1.02	167.4	37 54.5 1.02	167.4	38 24.5 1.02	167.4	39 24.5 1.02	167.3	2
	3	31 53.6 1.02	166.5	32 23.6 1.02	166.5	32 53.6 1.02	166.4	33 53.6 1.02	166.4	35 53.6 1.02	166.4	37 53.5 1.02	166.3	38 23.5 1.02	166.3	39 23.5 1.02	166.3	3
	4	31 52.6 1.02	165.4	32 22.6 1.02	165.4	32 52.6 1.02	165.4	33 52.6 1.02	165.4	35 52.5 1.02	165.3	37 52.5 1.02	165.3	38 22.5 1.02	165.3	39 22.5 1.02	165.2	4
	15	31 51.5 1.02	164.4	32 21.5 1.02	164.4	32 51.5 1.02	164.4	33 51.5 1.02	164.3	35 51.4 1.02	164.3	37 51.4 1.02	164.2	38 21.4 1.02	164.2	39 21.4 1.02	164.2	15
	6	31 50.3 1.02	163.4	32 20.3 1.02	163.3	32 50.3 1.02	163.3	33 50.3 1.02	163.3	35 50.3 1.02	163.2	37 50.2 1.02	163.2	38 20.2 1.02	163.2	39 20.2 1.02	163.1	6
	7	31 49.1 1.02	162.3	32 19.1 1.02	162.3	32 49.1 1.02	162.3	33 49.1 1.02	162.3	35 49.0 1.02	162.2	37 49.0 1.02	162.1	38 19.0 1.02	162.1	39 19.0 1.02	162.1	7
	8	31 47.8 1.02	161.3	32 17.8 1.02	161.3	32 47.8 1.02	161.2	33 47.8 1.02	161.2	35 47.7 1.02	161.2	37 47.7 1.02	161.1	38 17.7 1.02	161.1	39 17.6 1.02	161.0	8
	9	31 46.4 1.02	160.2	32 16.4 1.02	160.2	32 46.4 1.02	160.2	33 46.3 1.02	160.2	35 46.3 1.02	160.1	37 46.3 1.02	160.0	38 16.3 1.02	160.0	39 16.2 1.02	160.0	9
	20	31 45.0 1.03	159.2	32 15.0 1.03	159.2	32 44.9 1.03	159.2	33 44.9 1.03	159.1	35 44.9 1.03	159.1	37 44.8 1.03	159.0	38 14.8 1.03	159.0	39 14.8 1.03	158.9	20
	1	31 43.4 1.03	158.1	32 13.4 1.03	158.1	32 43.4 1.03	158.1	33 43.4 1.03	158.1	35 43.3 1.03	158.0	37 43.3 1.03	157.9	38 13.3 1.03	157.9	39 13.2 1.03	157.9	1
	2	31 41.8 1.03	157.1	32 11.8 1.03	157.1	32 41.8 1.03	157.1	33 41.8 1.03	157.0	35 41.7 1.03	157.0	37 41.7 1.03	156.9	38 11.7 1.03	156.9	39 11.6 1.03	156.8	2
	3	31 40.2 1.03	156.1	32 10.2 1.03	156.1	32 40.2 1.03	156.0	33 40.1 1.03	156.0	35 40.1 1.03	155.9	37 40.0 1.03	155.8	38 10.0 1.03	155.8	39 09.9 1.03	155.8	3
	4	31 38.5 1.03	155.0	32 08.4 1.03	155.0	32 38.4 1.03	155.0	33 38.4 1.03	155.0	35 38.3 1.03	154.9	37 38.2 1.03	154.8	38 08.2 1.03	154.8	39 08.2 1.03	154.7	4
	25	31 36.7 1.03	154.0	32 06.6 1.03	154.0	32 36.6 1.03	154.0	33 36.6 1.03	153.9	35 36.5 1.03	153.8	37 36.4 1.03	153.8	38 06.4 1.03	153.7	39 06.4 1.03	153.7	25
	6	31 34.8 1.03	153.0	32 04.8 1.03	153.0	32 34.8 1.03	152.9	33 34.7 1.03	152.9	35 34.6 1.03	152.8	37 34.5 1.03	152.7	38 04.5 1.03	152.7	39 04.5 1.03	152.6	6
	7	31 32.9 1.03	151.9	32 02.8 1.03	151.9	32 32.8 1.03	151.9	33 32.8 1.03	151.9	35 32.7 1.03	151.8	37 32.6 1.03	151.7	38 02.6 1.03	151.6	39 02.5 1.03	151.6	7
	8	31 30.9 1.03	150.9	32 00.8 1.03	150.9	32 30.8 1.03	150.9	33 30.8 1.03	150.8	35 30.7 1.03	150.7	37 30.6 1.03	150.6	38 00.5 1.03	150.6	39 00.5 1.03	150.5	8
	9	31 28.8 1.04	149.9	31 58.8 1.04	149.8	32 28.7 1.04	149.8	33 28.7 1.04	149.7	35 28.6 1.04	149.7	37 28.5 1.04	149.6	37 58.5 1.04	149.5	38 58.4 1.04	149.5	9
	30	31 26.7 1.04	148.8	31 56.6 1.04	148.8	32 26.6 1.04	148.8	33 26.5 1.04	148.7	35 26.4 1.04	148.6	37 26.3 1.04	148.5	37 56.3 1.04	148.5	38 56.2 1.04	148.4	30
	1	31 24.5 1.04	147.8	31 54.4 1.04	147.8	32 24.4 1.04	147.8	33 24.3 1.04	147.7	35 24.2 1.04	147.6	37 24.1 1.04	147.5	37 54.1 1.04	147.5	38 54.0 1.04	147.4	1
	2	31 22.2 1.04	146.8	31 52.2 1.04	146.7	32 22.1 1.04	146.7	33 22.1 1.04	146.7	35 22.0 1.04	146.6	37 21.8 1.04	146.4	37 51.8 1.04	146.4	38 51.7 1.04	146.4	2
	3	31 19.9 1.04	145.7	31 49.8 1.04	145.7	32 19.8 1.04	145.7	33 19.7 1.04	145.6	35 19.6 1.04	145.5	37 19.5 1.04	145.4	37 49.4 1.04	145.4	38 49.4 1.04	145.3	3
	4	31 17.5 1.04	144.7	31 47.4 1.04	144.7	32 17.4 1.04	144.7	33 17.4 1.04	144.6	35 17.2 1.04	144.5	37 17.1 1.04	144.4	37 47.0 1.04	144.4	38 47.0 1.04	144.3	4
	35	31 15.0 1.04	143.7	31 45.0 1.04	143.6	32 15.0 1.04	143.6	33 14.9 1.04	143.6	35 14.8 1.04	143.4	37 14.6 1.04	143.3	37 44.6 1.04	143.3	38 44.5 1.04	143.2	35
	6	31 12.5 1.04	142.6	31 42.5 1.04	142.6	32 12.5 1.04	142.6	33 12.4 1.04	142.5	35 12.2 1.04	142.4	37 12.1 1.04	142.3	37 42.0 1.04	142.2	38 42.0 1.04	142.2	6
	7	31 10.0 1.04	141.6	31 39.9 1.04	141.6	32 09.9 1.04	141.6	33 09.8 1.04	141.5	35 09.6 1.04	141.4	37 09.5 1.04	141.2	37 39.4 1.04	141.2	38 39.4 1.04	141.1	7
	8	31 07.3 1.04	140.6	31 37.2 1.04	140.5	32 07.2 1.04	140.5	33 07.2 1.05	140.5	35 07.0 1.05	140.3	37 06.8 1.04	140.2	37 36.8 1.05	140.2	38 36.7 1.05	140.1	8
	9	31 04.6 1.05	139.6	31 34.6 1.05	139.5	32 04.6 1.05	139.5	33 04.5 1.05	139.4	35 04.3 1.05	139.3	37 04.1 1.05	139.2	37 34.1 1.05	139.1	38 34.0 1.05	139.1	9
	40	31 01.9 1.05	138.5	31 31.8 1.05	138.5	32 01.8 1.05	138.5	33 01.7 1.05	138.4	35 01.5 1.05	138.3	37 01.4 1.05	138.1	37 31.3 1.05	138.1	38 31.2 1.05	138.0	40
	1	30 59.1 1.05	137.5	31 29.0 1.05	137.5	31 59.0 1.05	137.4	32 58.9 1.05	137.4	34 58.7 1.05	137.2	36 58.5 1.05	137.1	37 28.5 1.05	137.1	38 28.4 1.05	137.0	1
	2	30 56.2 1.05	136.5	31 26.2 1.05	136.4	31 56.1 1.05	136.4	32 56.1 1.05	136.3	34 55.9 1.05	136.2	36 55.7 1.05	136.1	37 25.6 1.05	136.0	38 25.5 1.05	135.9	2
	3	30 53.3 1.05	135.4	31 23.3 1.05	135.4	31 53.2 1.05	135.4	32 53.1 1.05	135.3	34 52.9 1.05	135.2	36 52.7 1.05	135.0	37 22.6 1.05	135.0	38 22.6 1.05	134.9	3
	4	30 50.4 1.05	134.4	31 20.3 1.05	134.4	31 50.3 1.05	134.3	32 50.2 1.05	134.3	34 50.0 1.05	134.1	36 49.7 1.05	134.0	37 19.7 1.05	134.0	38 19.6 1.05	133.9	4
	45	30 47.3 1.05	133.4	31 17.3 1.05	133.4	31 47.2 1.05	133.3	32 47.1 1.05	133.2	34 46.9 1.05	133.1	36 46.7 1.05	133.0	37 16.7 1.05	132.9	38 16.5 1.05	132.8	45
	6	30 44.3 1.05	132.4	31 14.2 1.05	132.3	31 44.2 1.05	132.3	32 44.1 1.05	132.2	34 43.9 1.05	132.1	36 43.6 1.05	131.9	37 13.6 1.05	131.9	38 13.4 1.05	131.8	6
	7	30 41.2 1.05	131.3	31 11.1 1.05	131.3	31 41.1 1.05	131.3	32 40.9 1.05	131.2	34 40.7 1.05	131.0	36 40.5 1.05	130.9	37 10.4 1.05	130.8	38 10.3 1.05	130.8	7
	8	30 38.0 1.05	130.3	31 07.9 1.05	130.3	31 37.9 1.05	130.2	32 37.8 1.05	130.2	34 37.5 1.05	130.0	36 37.3 1.05	129.9	37 07.2 1.05	129.8	38 07.1 1.05	129.7	8
	9	30 34.8 1.05	129.3	31 04.7 1.05	129.2	31 34.7 1.05	129.2	32 34.5 1.05	129.1	34 34.3 1.05	129.0	36 34.1 1.06	128.8	37 04.0 1.06	128.8	38 03.9 1.06	128.7	9
	50	30 31.5 1.06	128.3	31 01.5 1.06	128.2	31 31.4 1.06	128.2	32 31.3 1.06	128.1	34 31.0 1.06	128.0	36 30.8 1.06	127.8	37 00.7 1.06	127.8	38 00.6 1.06	127.7	50
	1	30 28.2 1.06	127.2	30 58.1 1.06	127.2	31 28.1 1.06	127.2	32 28.0 1.06	127.1	34 27.7 1.06	126.9	36 27.4 1.06	126.8	36 57.4 1.06	126.7	37 57.2 1.06	126.6	1
	2	30 24.9 1.06	126.2	30 54.8 1.06	126.2	31 24.7 1.06	126.1	32 24.6 1.06	126.1	34 24.3 1.06	125.9	36 24.1 1.06	125.7	36 54.0 1.06	125.7	37 53.9 1.06	125.6	2
	3	30 21.5 1.06	125.2	30 51.4 1.06	125.2	31 21.3 1.06	125.1	32 21.2 1.06	125.0	34 20.9 1.06	124.9	36 20.6 1.06	124.7	36 50.6 1.06	124.6	37 50.4 1.06	124.6	3
	4	30 18.0 1.06	124.2	30 47.9 1.06	124.1	31 17.9 1.06	124.1	32 17.7 1.06	124.0	34 17.5 1.06	123.9	36 17.2 1.06	123.7	36 47.1 1.06	123.6	37 47.0 1.06	123.6	4
	55	30 14.5 1.06	123.2	30 44.5 1.06	123.1	31 14.4 1.06	123.1	32 14.3 1.06	123.0	34 14.0 1.06	122.8	36 13.7 1.06	122.7	36 43.6 1.06	122.6	37 43.5 1.06	122.5	55
	6	30 11.0 1.06	122.1	30 40.9 1.06	122.1	31 10.9 1.06	122.1	32 10.7 1.06	122.0	34 10.4 1.06	121.8	36 10.1 1.06	121.6	36 40.1 1.06	121.6	37 39.9 1.06	121.5	6
	7	30 07.4 1.06	121.1	30 37.4 1.06	121.1	31 07.3 1.06	121.0	32 07.2 1.06	120.9	34 06.9 1.06	120.8	36 06.6 1.06	120.6	36 36.5 1.06	120.6	37 36.3 1.06	120.5	7
	8	30 03.8 1.06	120.1	30 33.8 1.06	120.1	31 03.7 1.06	120.0	32 03.6 1.06	119.9	34 03.3 1.06	119.8	36 02.9 1.06	119.6	36 32.9 1.06	119.5	37 32.7 1.06	119.5	8
	9	30 00.2 1.06	119.1	30 30.1 1.06	119.0	31 00.1 1.06	119.0	31 59.9 1.06	118.9	33 59.6 1.06	118.7	35 59.3 1.06	118.6	36 29.2 1.06	118.5	37 29.0 1.06	118.4	9
	60	29 56.5 1.06	118.1	30 26.4 1.06	118.0	30 56.4 1.06	118.0	31 56.2 1.06	117.9	33 55.9 1.06	117.7	35 55.6 1.06	117.5	36 25.5 1.06	117.5	37 25.3 1.06	117.4	60
	1	29 52.8 1.06	117.0	30 22.7 1.06	117.0	30 52.7 1.06	117.0	31 52.5 1.06	116.9	33 52.2 1.06	116.7	35 51.9 1.06	116.5	36 21.8 1.06	116.5	37 21.6 1.06	116.4	1
	2	29 49.1 1.06	116.0	30 19.0 1.06	116.0	30 48.9 1.06	115.9	31 48.8 1.06	115.9	33 48.4 1.06	115.7	35 48.1 1.06	115.5	36 18.0 1.06	115.5	37 17.8 1.06	115.4	2
	3	29 45.3 1.06	115.0	30 15.2 1.06	115.0	30 45.1 1.06	114.9	31 45.0 1.06	114.8	33 44.6 1.06	114.7	35 44.3 1.06	114.5	36 14.2 1.06	114.4	37 14.0 1.06	114.3	3
	4	29 41.5 1.06	114.0	30 11.4 1.06	114.0	30 41.3 1.06	113.9	31 41.2 1.06	113.8	33 40.8 1.06	113.7	35 40.5 1.06	113.5	36 10.4 1.06	113.4	37 10.2 1.06	113.3	4
	65	29 37.6 1.06	113.0	30 07.6 1.06	112.9	30 37.5 1.06	112.9	31 37.3 1.06	112.8	33 37.0 1.06	112.6	35 36.6 1.06	112.5	36 06.5 1.06	112.4	37 06.3 1.06	112.3	65
	6	29 33.8 1.06	112.0	30 03.7 1.06	111.9	30 33.6 1.06	111.9	31 33.4 1.06	111.8	33 33.1 1.06	111.6	35 32.7 1.07	111.4	36 02.7 1.07	111.4	37 02.5 1.07	111.3	6
	7	29 29.9 1.07	111.0	29 59.8 1.07	110.9	30 29.7 1.07	110.9	31 29.5 1.07	110.8	33 29.2 1.07	110.6	35 28.8 1.07	110.4	35 58.7 1.07	110.4	36 58.5 1.07	110.3	7
	8	29 26.0 1.07	110.0	29 55.9 1.07	109.9	30 25.8 1.07	109.9	31 25.6 1.07	109.8	33 25.3 1.07	109.6	35 24.9 1.07	109.4	35 54.8 1.07	109.4	36 54.6 1.07	109.3	8
	9	29 22.0 1.07	108.9	29 51.9 1.07	108.9	30 21.8 1.07	108.9	31 21.7 1.07	108.8	33 21.3 1.07	108.6	35 20.9 1.07	108.4	35 50.8 1.07	108.3	36 50.6 1.07	108.2	9
	70	29 18.0 1.07	107.9	29 48.0 1.07	107.9	30 17.9 1.07	107.8	31 17.7 1.07	107.8	33 17.3 1.07	107.6	35 17.0 1.07	107.4	35 46.9 1.07	107.3	36 46.7 1.07	107.2	70
	1	29 14.0 1.07	106.9	29 44.0 1.07	106.9	30 13.9 1.07	106.8	31 13.7 1.07	106.7	33 13.3 1.07	106.6	35 13.0 1.07	106.4	35 42.9 1.07	106.3	36 42.7 1.07	106.2	1
	2	29 10.0 1.07	105.9	29 39.9 1.07	105.9	30 09.9 1.07	105.8	31 09.7 1.07	105.7	33 09.3 1.07	105.6	35 08.9 1.07	105.4	35 38.8 1.07	105.3	36 38.6 1.07	105.2	2
	3	29 06.0 1.07	104.9	29 35.9 1.07	104.9	30 05.8 1.07	104.8	31 05.6 1.07	104.7	33 05.3 1.07	104.5	35 04.9 1.07	104.3	35 34.8 1.07	104.3	36 34.6 1.07	104.2	3
	4	29 01.9 1.07	103.9	29 31.9 1.07	103.9	30 01.8 1.07	103.8	31 01.6 1.07	103.7	33 01.2 1.07	103.5	35 00.8 1.07	103.3	35 30.7 1.07	103.3	36 30.5 1.07	103.2	4
	75	28 57.9 1.07	102.9	29 27.8 1.07	102.8	29 57.7 1.07	102.8	30 57.5 1.07	102.7	32 57.1 1.07	102.5	34 56.7 1.07	102.3	35 26.6 1.07	102.3	36 26.4 1.07	102.2	75
	6	28 53.8 1.07	101.9	29 23.7 1.07	101.8	29 53.6 1.07	101.8	30 53.4 1.07	101.7	32 53.0 1.07	101.5	34 52.6 1.07	101.3	35 22.5 1.07	101.3	36 22.3 1.07	101.2	6
	7	28 49.7 1.07	100.9	29 19.6 1.07	100.8	29 49.5 1.07	100.8	30 49.3 1.07	100.7	32 48.9 1.07	100.5	34 48.5 1.07	100.3	35 18.4 1.07	100.3	36 18.2 1.07	100.2	7
	8	28 45.6 1.007	99.9	29 15.5 1.007	99.8	29 45.4 1.007	99.8	30 45.2 1.007	99.7	32 44.8 1.007	99.5	34 44.4 1.007	99.3	35 14.3 1.007	99.3	36 14.1 1.007	99.2	8
	9	28 41.4 1.007	98.9	29 11.3 1.007	98.8	29 41.3 1.007	98.8	30 41.1 1.007	98.7	32 40.7 1.007	98.5	34 40.3 1.007	98.3	35 10.2 1.007	98.3	36 10.0 1.007	98.2	9
	80	28 37.3 1.007	97.9	29 07.2 1.007	97.8	29 37.1 1.007	97.8	30 36.9 1.007	97.7	32 36.5 1.007	97.5	34 36.1 1.007	97.3	35 06.0 1.007	97.3	36 05.8 1.007	97.1	80
	1	28 33.1 1.007	96.9	29 03.1 1.007	96.8	29 33.0 1.007	96.8	30 32.8 1.007	96.7	32 32.4 1.007	96.5	34 32.0 1.007	96.3	35 01.9 1.007	96.3	36 01.6 1.007	96.1	1
	2	28 29.0 1.007	95.9	28 58.9 1.007	95.8	29 28.8 1.007	95.8	30 28.6 1.007	95.7	32 28.2 1.007	95.5	34 27.8 1.007	95.3	34 57.7 1.007	95.2	35 57.5 1.007	95.1	2
	3	28 24.8 1.007	94.9	28 54.7 1.007	94.8	29 24.6 1.007	94.8	30 24.4 1.007	94.7	32 24.0 1.007	94.5	34 23.6 1.007	94.3	34 53.5 1.007	94.2	35 53.3 1.007	94.1	3
	4	28 20.6 1.007	93.9	28 50.6 1.007	93.8	29 20.5 1.007	93.8	30 20.3 1.007	93.7	32 19.9 1.007	93.5	34 19.5 1.007	93.3	34 49.3 1.007	93.2	35 49.1 1.007	93.1	4
	85	28 16.5 1.007	92.9	28 46.4 1.007	92.8	29 16.3 1.007	92.8	30 16.1 1.007	92.7	32 15.7 1.007	92.5	34 15.3 1.007	92.3	34 45.2 1.007	92.2	35 45.0 1.007	92.1	85
	6	28 12.3 1.007	91.9	28 42.2 1.007	91.8	29 12.1 1.007	91.8	30 11.9 1.007	91.7	32 11.5 1.007	91.5	34 11.1 1.007	91.3	34 41.0 1.007	91.2	35 40.8 1.007	91.1	6
	7	28 08.1 1.007	90.9	28 38.0 1.007	90.8	29 07.9 1.007	90.8	30 07.7 1.007	90.7	32 07.3 1.007	90.5	34 06.9 1.007	90.3	34 36.8 1.007	90.2	35 36.6 1.007	90.1	7
	8	28 03.9 1.007	89.9	28 33.8 1.007	89.8	29 03.7 1.007	89.8	30 03.5 1.007	89.7	32 03.1 1.007	89.5	34 02.7 1.007	89.3	34 32.6 1.007	89.2	35 32.4 1.007	89.1	8
	9	27 59.7 1.007	88.9	28 29.6 1.007	88.8	28 59.5 1.007	88.8	29 59.4 1.007	88.7	31 59.0 1.007	88.5	33 58.5 1.007	88.3	34 28.4 1.007	88.3	35 28.2 1.007	88.1	9
	90	27 55.5 1.007	87.9	28 25.5 1.007	87.8	28 55.4 1.007	87.8	29 55.2 1.007	87.7	31 54.8 1.007	87.5	33 54.4 1.007	87.3	34 24.2 1.007	87.3	35 24.0 1.007	87.2	90

Lat 86°

H.A.	28° 00' Alt.	Δd Δt	Az.	28° 30' Alt.	Δd Δt	Az.	29° 00' Alt.	Δd Δt	Az.	30° 00' Alt.	Δd Δt	Az.	32° 00' Alt.	Δd Δt	Az.	34° 00' Alt.	Δd Δt	Az.	34° 30' Alt.	Δd Δt	Az.	35° 30' Alt.	Δd Δt	Az.	H.A.
91	27 51.4	1.007	86.9	28 21.3	1.007	86.8	28 51.2	1.007	86.8	29 51.0	1.007	86.7	31 50.6	1.007	86.5	33 50.2	1.007	86.3	34 20.1	1.007	86.3	35 19.9	1.007	86.2	91
2	27 47.2	1.007	85.9	28 17.1	1.007	85.8	28 47.0	1.007	85.8	29 46.8	1.007	85.7	31 46.4	1.007	85.5	33 46.0	1.007	85.3	34 15.9	1.007	85.3	35 15.7	1.007	85.2	2
3	27 43.0	1.007	84.9	28 12.9	1.007	84.8	28 42.8	1.007	84.8	29 42.6	1.007	84.7	31 42.2	1.007	84.5	33 41.8	1.007	84.3	34 11.7	1.007	84.3	35 11.5	1.007	84.2	3
4	27 38.9	1.007	83.9	28 08.8	1.007	83.9	28 38.7	1.007	83.8	29 38.5	1.007	83.7	31 38.1	1.007	83.5	33 37.7	1.007	83.3	34 07.6	1.007	83.3	35 07.4	1.007	83.2	4
95	27 34.7	1.007	82.9	28 04.6	1.007	82.9	28 34.5	1.007	82.8	29 34.3	1.007	82.7	31 33.9	1.007	82.5	33 33.5	1.007	82.3	34 03.4	1.007	82.3	35 03.2	1.007	82.2	95
6	27 30.5	1.007	81.9	28 00.5	1.007	81.9	28 30.4	1.007	81.8	29 30.2	1.007	81.7	31 29.8	1.007	81.5	33 29.4	1.007	81.3	33 59.3	1.007	81.3	34 59.1	1.007	81.2	6
7	27 26.4	1.007	80.9	27 56.3	1.007	80.9	28 26.2	1.007	80.8	29 26.0	1.007	80.7	31 25.6	1.007	80.6	33 25.2	1.007	80.4	33 55.1	1.007	80.3	34 54.9	1.007	80.2	7
8	27 22.3	1.007	79.9	27 52.2	1.007	79.9	28 22.1	1.007	79.8	29 21.9	1.007	79.7	31 21.5	1.007	79.6	33 21.1	1.007	79.4	33 51.0	1.007	79.3	34 50.8	1.007	79.2	8
9	27 18.2	1.007	78.9	27 48.1	1.007	78.9	28 18.0	1.007	78.8	29 17.8	1.007	78.8	31 17.4	1.007	78.6	33 17.0	1.007	78.4	33 46.9	1.007	78.3	34 46.7	1.007	78.2	9
100	27 14.1	1.007	77.9	27 44.0	1.007	77.9	28 13.9	1.007	77.9	29 13.7	1.007	77.8	31 13.3	1.007	77.6	33 12.9	1.007	77.4	33 42.8	1.007	77.3	34 42.6	1.007	77.2	100
1	27 10.0	1.007	77.0	27 39.9	1.007	76.9	28 09.8	1.007	76.9	29 09.6	1.007	76.8	31 09.2	1.007	76.6	33 08.8	1.007	76.4	33 38.7	1.007	76.4	34 38.5	1.007	76.3	1
2	27 05.9	1.007	76.0	27 35.8	1.007	75.9	28 05.7	1.007	75.9	29 05.6	1.007	75.8	31 05.2	1.007	75.6	33 04.8	1.007	75.4	33 34.7	1.007	75.4	34 34.5	1.007	75.3	2
3	27 01.9	1.007	75.0	27 31.8	1.007	74.9	28 01.7	1.007	74.9	29 01.5	1.007	74.8	31 01.1	1.007	74.6	33 00.7	1.007	74.4	33 30.6	1.007	74.4	34 30.4	1.007	74.3	3
4	26 57.8	1.007	74.0	27 27.7	1.007	73.9	27 57.7	1.007	73.9	28 57.5	1.007	73.8	30 57.1	1.007	73.6	32 56.7	1.007	73.4	33 26.6	1.007	73.4	34 26.4	1.007	73.3	4
105	26 53.8	1.007	73.0	27 23.7	1.007	73.0	27 53.6	1.007	72.9	28 53.5	1.007	72.8	30 53.1	1.007	72.6	32 52.7	1.007	72.5	33 22.6	1.007	72.4	34 22.4	1.007	72.3	105
6	26 49.8	1.007	72.0	27 19.7	1.007	72.0	27 49.7	1.007	71.9	28 49.5	1.007	71.8	30 49.1	1.007	71.7	32 48.7	1.007	71.5	33 18.6	1.007	71.4	34 18.5	1.007	71.3	6
7	26 45.9	1.007	71.0	27 15.8	1.007	71.0	27 45.7	1.007	70.9	28 45.5	1.007	70.9	30 45.2	1.007	70.7	32 44.8	1.007	70.5	33 14.7	1.007	70.4	34 14.5	1.007	70.4	7
8	26 41.9	1.007	70.0	27 11.8	1.007	70.0	27 41.7	1.007	70.0	28 41.6	1.007	69.9	30 41.2	1.007	69.7	32 40.9	1.006	69.5	33 10.8	1.007	69.5	34 10.6	1.006	69.4	8
9	26 38.0	1.006	69.1	27 07.9	1.006	69.0	27 37.8	1.006	69.0	28 37.7	1.006	68.9	30 37.3	1.006	68.7	32 36.9	1.006	68.5	33 06.9	1.006	68.5	34 06.7	1.006	68.4	9
110	26 34.1	1.006	68.1	27 04.0	1.006	68.0	27 33.9	1.006	68.0	28 33.8	1.006	67.9	30 33.4	1.006	67.7	32 33.1	1.006	67.6	33 03.0	1.006	67.5	34 02.8	1.006	67.4	110
1	26 30.2	1.006	67.1	27 00.1	1.006	67.0	27 30.1	1.006	67.0	28 29.9	1.006	66.9	30 29.6	1.006	66.8	32 29.2	1.006	66.6	32 59.1	1.006	66.5	33 58.9	1.006	66.4	1
2	26 26.4	1.006	66.1	26 56.3	1.006	66.1	27 26.2	1.006	66.0	28 26.1	1.006	65.9	30 25.7	1.006	65.8	32 25.4	1.006	65.5	32 55.3	1.006	65.5	33 55.1	1.006	65.5	2
3	26 22.6	1.006	65.1	26 52.5	1.006	65.1	27 22.4	1.006	65.0	28 22.3	1.006	65.0	30 21.9	1.006	64.8	32 21.6	1.006	64.6	32 51.5	1.006	64.6	33 51.3	1.006	64.5	3
4	26 18.8	1.006	64.1	26 48.7	1.006	64.1	27 18.6	1.006	64.1	28 18.5	1.006	64.0	30 18.2	1.006	63.8	32 17.8	1.006	63.6	32 47.7	1.006	63.6	33 47.6	1.006	63.5	4
115	26 15.0	1.006	63.2	26 45.0	1.006	63.1	27 14.9	1.006	63.1	28 14.7	1.006	63.0	30 14.4	1.006	62.8	32 14.1	1.006	62.7	32 44.0	1.006	62.6	33 43.8	1.006	62.5	115
6	26 11.3	1.006	62.2	26 41.2	1.006	62.1	27 11.2	1.006	62.1	28 11.0	1.006	62.0	30 10.7	1.006	61.9	32 10.4	1.006	61.7	32 40.3	1.006	61.6	33 40.1	1.006	61.5	6
7	26 07.6	1.006	61.2	26 37.6	1.006	61.2	27 07.5	1.006	61.1	28 07.3	1.006	61.0	30 07.0	1.006	60.9	32 06.7	1.006	60.7	32 36.6	1.006	60.7	33 36.5	1.006	60.6	7
8	26 04.0	1.006	60.2	26 33.9	1.006	60.2	27 03.8	1.006	60.1	28 03.7	1.006	60.1	30 03.4	1.006	59.9	32 03.1	1.006	59.7	32 33.0	1.006	59.7	33 32.8	1.006	59.6	8
9	26 00.4	1.006	59.2	26 30.3	1.006	59.2	27 00.2	1.006	59.2	28 00.1	1.006	59.1	29 59.8	1.006	58.9	31 59.5	1.006	58.8	32 29.4	1.006	58.7	33 29.3	1.006	58.6	9
120	25 56.8	1.006	58.3	26 26.7	1.006	58.2	26 56.7	1.006	58.2	27 56.5	1.006	58.1	29 56.2	1.006	57.9	31 55.9	1.006	57.8	32 25.9	1.006	57.7	33 25.7	1.006	57.7	120
1	25 53.3	1.006	57.3	26 23.2	1.006	57.2	26 53.1	1.006	57.2	27 53.0	1.006	57.1	29 52.7	1.006	57.0	31 52.4	1.006	56.8	32 22.3	1.006	56.8	33 22.2	1.006	56.7	1
2	25 49.8	1.006	56.3	26 19.7	1.006	56.2	26 49.6	1.006	56.2	27 49.5	1.006	56.1	29 49.2	1.006	56.0	31 48.9	1.006	55.8	32 18.9	1.006	55.8	33 18.7	1.006	55.7	2
3	25 46.3	1.006	55.3	26 16.2	1.006	55.3	26 46.2	1.006	55.2	27 46.0	1.006	55.2	29 45.8	1.006	55.0	31 45.5	1.006	54.9	32 15.4	1.006	54.8	33 15.3	1.006	54.7	3
4	25 42.9	1.006	54.3	26 12.8	1.006	54.3	26 42.7	1.006	54.3	27 42.6	1.006	54.2	29 42.4	1.006	54.0	31 42.1	1.006	53.9	32 12.0	1.006	53.8	33 11.9	1.006	53.8	4
125	25 39.5	1.006	53.4	26 09.4	1.006	53.3	26 39.4	1.006	53.3	27 39.2	1.006	53.2	29 39.0	1.006	53.1	31 38.7	1.006	52.9	32 08.7	1.006	52.9	33 08.5	1.006	52.8	125
6	25 36.2	1.005	52.4	26 06.1	1.006	52.3	26 36.0	1.006	52.3	27 35.9	1.005	52.2	29 35.7	1.005	52.1	31 35.4	1.005	51.9	32 05.3	1.005	51.9	33 05.2	1.005	51.8	6
7	25 32.9	1.005	51.4	26 02.8	1.006	51.4	26 32.7	1.005	51.3	27 32.6	1.005	51.3	29 32.4	1.005	51.1	31 32.1	1.005	51.0	32 02.1	1.005	50.9	33 01.9	1.005	50.9	7
8	25 29.6	1.005	50.4	25 59.6	1.005	50.4	26 29.5	1.005	50.4	27 29.4	1.005	50.3	29 29.1	1.005	50.1	31 28.9	1.005	50.0	31 58.8	1.005	50.0	32 58.7	1.005	49.9	8
9	25 26.4	1.005	49.5	25 56.4	1.005	49.4	26 26.3	1.005	49.4	27 26.2	1.005	49.3	29 26.0	1.005	49.2	31 25.7	1.005	49.0	31 55.7	1.005	49.0	32 55.5	1.005	48.9	9
130	25 23.2	1.005	48.5	25 53.2	1.005	48.4	26 23.1	1.005	48.4	27 23.0	1.005	48.3	29 22.8	1.005	48.2	31 22.6	1.005	48.1	31 52.5	1.005	48.0	32 52.4	1.005	47.9	130
1	25 20.1	1.005	47.5	25 50.1	1.005	47.5	26 20.0	1.005	47.4	27 19.9	1.005	47.4	29 19.7	1.005	47.2	31 19.5	1.005	47.1	31 49.4	1.005	47.1	32 49.3	1.005	47.0	1
2	25 17.1	1.005	46.5	25 47.0	1.005	46.5	26 17.0	1.005	46.5	27 16.9	1.005	46.4	29 16.7	1.005	46.3	31 16.5	1.005	46.1	31 46.4	1.005	46.1	32 46.3	1.005	46.0	2
3	25 14.1	1.005	45.6	25 44.0	1.005	45.5	26 14.0	1.005	45.5	27 13.9	1.005	45.4	29 13.7	1.005	45.3	31 13.5	1.005	45.2	31 43.4	1.005	45.1	32 43.3	1.005	45.0	3
4	25 11.1	1.005	44.6	25 41.1	1.005	44.5	26 11.0	1.005	44.5	27 10.9	1.005	44.5	29 10.7	1.005	44.3	31 10.5	1.005	44.2	31 40.5	1.005	44.2	32 40.4	1.005	44.1	4
135	25 08.2	1.005	43.6	25 38.1	1.005	43.5	26 08.1	1.005	43.5	27 08.0	1.005	43.5	29 07.8	1.005	43.4	31 07.6	1.005	43.2	31 37.6	1.005	43.2	32 37.5	1.005	43.1	135
6	25 05.3	1.005	42.6	25 35.3	1.005	42.6	26 05.2	1.005	42.6	27 05.2	1.005	42.5	29 05.0	1.005	42.4	31 04.9	1.005	42.3	31 34.7	1.005	42.2	32 34.6	1.005	42.2	6
7	25 02.5	1.005	41.7	25 32.5	1.005	41.6	26 02.4	1.005	41.6	27 02.4	1.005	41.5	29 02.2	1.005	41.4	31 02.0	1.005	41.3	31 32.0	1.005	41.3	32 31.9	1.005	41.2	7
8	24 59.8	1.004	40.7	25 29.7	1.004	40.7	25 59.7	1.004	40.6	26 59.6	1.004	40.6	28 59.4	1.004	40.4	30 59.3	1.004	40.3	31 29.2	1.004	40.3	32 29.1	1.004	40.2	8
9	24 57.1	1.004	39.7	25 27.0	1.004	39.7	25 57.0	1.004	39.7	26 56.9	1.004	39.6	28 56.7	1.004	39.5	30 56.6	1.004	39.4	31 26.5	1.004	39.3	32 26.5	1.004	39.3	9
140	24 54.4	1.004	38.7	25 24.4	1.004	38.7	25 54.3	1.004	38.7	26 54.3	1.004	38.6	28 54.1	1.004	38.5	30 54.0	1.004	38.4	31 23.9	1.004	38.4	32 23.8	1.004	38.3	140
1	24 51.8	1.004	37.8	25 21.8	1.004	37.7	25 51.8	1.004	37.7	26 51.7	1.004	37.7	28 51.5	1.004	37.5	30 51.4	1.004	37.4	31 21.3	1.004	37.4	32 21.3	1.004	37.3	1
2	24 49.3	1.004	36.8	25 19.3	1.004	36.8	25 49.2	1.004	36.7	26 49.2	1.004	36.7	28 49.0	1.004	36.6	30 48.9	1.004	36.5	31 18.8	1.004	36.4	32 18.8	1.004	36.4	2
3	24 46.8	1.004	35.8	25 16.8	1.004	35.8	25 46.8	1.004	35.8	26 46.7	1.004	35.7	28 46.5	1.004	35.6	30 46.4	1.004	35.5	31 16.4	1.004	35.5	32 16.3	1.004	35.4	3
4	24 44.4	1.004	34.9	25 14.4	1.004	34.8	25 44.3	1.004	34.8	26 44.3	1.004	34.7	28 44.1	1.004	34.6	30 44.0	1.004	34.5	31 14.0	1.004	34.5	32 13.9	1.004	34.5	4
145	24 42.0	1.004	33.9	25 12.0	1.004	33.9	25 42.0	1.004	33.8	26 41.9	1.004	33.8	28 41.8	1.004	33.7	30 41.7	1.004	33.6	31 11.6	1.004	33.5	32 11.6	1.004	33.5	145
6	24 39.7	1.004	32.9	25 09.7	1.004	32.9	25 39.7	1.004	32.9	26 39.6	1.004	32.8	28 39.5	1.004	32.7	30 39.4	1.004	32.6	31 09.3	1.004	32.6	32 09.3	1.004	32.5	6
7	24 37.5	1.004	31.9	25 07.5	1.004	31.9	25 37.4	1.004	31.9	26 37.4	1.004	31.8	28 37.3	1.004	31.7	30 37.2	1.004	31.6	31 07.1	1.004	31.6	32 07.1	1.004	31.6	7
8	24 35.3	1.004	31.0	25 05.3	1.004	30.9	25 35.2	1.004	30.9	26 35.2	1.004	30.9	28 35.1	1.004	30.8	30 35.0	1.004	30.7	31 05.0	1.004	30.7	32 04.9	1.004	30.6	8
9	24 33.2	1.003	30.0	25 03.2	1.003	30.0	25 33.1	1.003	30.0	26 33.1	1.003	29.9	28 33.0	1.003	29.8	30 32.9	1.003	29.7	31 02.9	1.003	29.7	32 02.8	1.003	29.6	9
150	24 31.1	1.003	29.0	25 01.1	1.003	29.0	25 31.1	1.003	29.0	26 31.0	1.003	28.9	28 30.9	1.003	28.9	30 30.8	1.003	28.8	31 00.8	1.003	28.7	32 00.8	1.003	28.7	150
1	24 29.1	1.003	28.1	24 59.1	1.003	28.0	25 29.1	1.003	28.0	26 29.0	1.003	28.0	28 28.9	1.003	27.9	30 28.9	1.003	27.8	30 58.8	1.003	27.8	31 58.8	1.003	27.7	1
2	24 27.2	1.003	27.1	24 57.2	1.003	27.1	25 27.1	1.003	27.0	26 27.1	1.003	27.0	28 27.0	1.003	26.9	30 26.9	1.003	26.8	30 56.9	1.003	26.8	31 56.9	1.003	26.8	2
3	24 25.3	1.003	26.1	24 55.3	1.003	26.1	25 25.3	1.003	26.1	26 25.2	1.003	26.0	28 25.1	1.003	26.0	30 25.1	1.003	25.9	30 55.1	1.003	25.9	31 55.0	1.003	25.8	3
4	24 23.5	1.003	25.2	24 53.5	1.003	25.1	25 23.5	1.003	25.1	26 23.4	1.003	25.1	28 23.4	1.003	25.0	30 23.3	1.003	24.9	30 53.3	1.003	24.9	31 53.2	1.003	24.9	4
155	24 21.7	1.003	24.2	24 51.7	1.003	24.2	25 21.7	1.003	24.1	26 21.7	1.003	24.1	28 21.6	1.003	24.0	30 21.5	1.003	24.0	30 51.5	1.003	23.9	31 51.5	1.003	23.9	155
6	24 20.1	1.003	23.2	24 50.0	1.003	23.2	25 20.0	1.003	23.2	26 20.0	1.003	23.1	28 19.9	1.003	23.1	30 19.9	1.003	23.0	30 49.9	1.003	23.0	31 49.8	1.003	22.9	6
7	24 18.4	1.003	22.2	24 48.4	1.003	22.2	25 18.4	1.003	22.2	26 18.4	1.003	22.2	28 18.3	1.003	22.1	30 18.3	1.003	22.0	30 48.3	1.003	22.0	31 48.2	1.003	22.0	7
8	24 16.9	1.002	21.3	24 46.9	1.002	21.3	25 16.9	1.002	21.2	26 16.8	1.002	21.2	28 16.8	1.002	21.1	30 16.7	1.002	21.1	30 46.7	1.002	21.1	31 46.7	1.002	21.0	8
9	24 15.4	1.002	20.3	24 45.4	1.002	20.3	25 15.4	1.002	20.3	26 15.4	1.002	20.2	28 15.3	1.002	20.2	30 15.3	1.002	20.1	30 45.3	1.002	20.1	31 45.3	1.002	20.1	9
160	24 14.0	1.002	19.3	24 44.0	1.002	19.3	25 14.0	1.002	19.3	26 13.9	1.002	19.3	28 13.9	1.002	19.2	30 13.9	1.002	19.2	30 43.8	1.002	19.1	31 43.8	1.002	19.1	160
1	24 12.6	1.002	18.4	24 42.6	1.002	18.4	25 12.6	1.002	18.3	26 12.6	1.002	18.3	28 12.6	1.002	18.3	30 12.5	1.002	18.2	30 42.5	1.002	18.2	31 42.5	1.002	18.2	1
2	24 11.3	1.002	17.4	24 41.3	1.002	17.4	25 11.3	1.002	17.4	26 11.3	1.002	17.4	28 11.3	1.002	17.3	30 11.2	1.002	17.2	30 41.2	1.002	17.2	31 41.2	1.002	17.2	2
3	24 10.1	1.002	16.4	24 40.1	1.002	16.4	25 10.1	1.002	16.4	26 10.1	1.002	16.4	28 10.1	1.002	16.3	30 10.0	1.002	16.3	30 40.0	1.002	16.3	31 40.0	1.002	16.2	3
4	24 09.0	1.002	15.5	24 39.0	1.002	15.5	25 09.0	1.002	15.4	26 09.0	1.002	15.4	28 08.9	1.002	15.4	30 08.9	1.002	15.3	30 38.9	1.002	15.3	31 38.9	1.002	15.3	4
165	24 07.9	1.002	14.5	24 37.9	1.002	14.5	25 07.9	1.002	14.5	26 07.9	1.002	14.5	28 07.9	1.002	14.4	30 07.8	1.002	14.4	30 37.8	1.002	14.4	31 37.8	1.002	14.3	165
6	24 06.9	1.002	13.5	24 36.9	1.002	13.5	25 06.9	1.002	13.5	26 06.9	1.002	13.5	28 06.8	1.002	.13.5	30 06.8	1.002	13.4	30 36.8	1.002	13.4	31 36.8	1.002	13.4	6
7	24 05.9	1.001	12.6	24 35.9	1.001	12.6	25 05.9	1.001	12.6	26 05.9	1.001	12.5	28 05.9	1.001	12.5	30 05.9	1.001	12.4	30 35.9	1.001	12.4	31 35.9	1.001	12.4	7
8	24 05.1	1.001	11.6	24 35.1	1.001	11.6	25 05.1	1.001	11.6	26 05.1	1.001	11.6	28 05.0	1.001	11.5	30 05.0	1.001	11.5	30 35.0	1.001	11.5	31 35.0	1.001	11.5	8
9	24 04.3	1.001	10.6	24 34.3	1.001	10.6	25 04.3	1.001	10.6	26 04.2	1.001	10.6	28 04.2	1.001	10.6	30 04.2	1.001	10.5	30 34.2	1.001	10.5	31 34.2	1.001	10.5	9
170	24 03.5	1.001	09.7	24 33.5	1.001	09.7	25 03.5	1.001	09.7	26 03.5	1.001	09.6	28 03.5	1.001	09.6	30 03.5	1.001	09.6	30 33.5	1.001	09.6	31 33.5	1.001	09.6	170
1	24 02.9	1.001	08.7	24 32.9	1.001	08.7	25 02.8	1.001	08.7	26 02.8	1.001	08.7	28 02.8	1.001	08.6	30 02.8	1.001	08.6	30 32.8	1.001	08.6	31 32.8	1.001	08.6	1
2	24 02.3	1.001	07.7	24 32.3	1.001	07.7	25 02.3	1.001	07.7	26 02.2	1.001	07.7	28 02.2	1.001	07.7	30 02.2	1.001	07.7	30 32.2	1.001	07.7	31 32.2	1.001	07.6	2
3	24 01.7	1.001	06.8	24 31.7	1.001	06.8	25 01.7	1.001	06.8	26 01.7	1.001	06.7	28 01.7	1.001	06.7	30 01.7	1.001	06.7	30 31.7	1.001	06.7	31 31.7	1.001	06.7	3
4	24 01.3	1.001	05.8	24 31.3	1.001	05.8	25 01.3	1.001	05.8	26 01.3	1.001	05.8	28 01.3	1.001	05.8	30 01.3	1.001	05.7	30 31.3	1.001	05.7	31 31.3	1.001	05.7	4
175	24 00.9	1.001	04.8	24 30.9	1.001	04.8	25 00.9	1.001	04.8	26 00.9	1.001	04.8	28 00.9	1.001	04.8	30 00.9	1.001	04.8	30 30.9	1.001	04.8	31 30.9	1.001	04.8	175
6	24 00.6	1.000	03.9	24 30.6	1.000	03.9	25 00.6	1.000	03.9	26 00.6	1.000	03.9	28 00.6	1.000	03.8	30 00.6	1.000	03.8	30 30.6	1.000	03.8	31 30.6	1.000	03.8	6
7	24 00.3	1.000	02.9	24 30.3	1.000	02.9	25 00.3	1.000	02.9	26 00.3	1.000	02.9	28 00.3	1.000	02.9	30 00.3	1.000	02.9	30 30.3	1.000	02.9	31 30.3	1.000	02.9	7
8	24 00.1	1.000	01.9	24 30.1	1.000	01.9	25 00.1	1.000	01.9	26 00.1	1.000	01.9	28 00.1	1.000	01.9	30 00.1	1.000	01.9	30 30.1	1.000	01.9	31 30.1	1.000	01.9	8
9	24 00.0	1.000	01.0	24 30.0	1.000	01.0	25 00.0	1.000	01.0	26 00.0	1.000	01.0	28 00.0	1.000	01.0	30 00.0	1.000	01.0	30 30.0	1.000	01.0	31 30.0	1.000	01.0	9
180	24 00.0	1.000	00.0	24 30.0	1.000	00.0	25 00.0	1.000	00.0	26 00.0	1.000	00.0	28 00.0	1.000	00.0	30 00.0	1.000	00.0	30 30.0	1.000	00.0	31 30.0	1.000	00.0	180

Lat. 87°

Lat. 88°

Lat. 89°

H.A.	36° 00′ Alt.	Δd Δt	Az.	37° 00′ Alt.	Δd Δt	Az.	38° 30′ Alt.	Δd Δt	Az.	40° 00′ Alt.	Δd Δt	Az.	42° 00′ Alt.	Δd Δt	Az.	42° 30′ Alt.	Δd Δt	Az.	43° 00′ Alt.	Δd Δt	Az.	45° 00′ Alt.	Δd Δt	Az.	H.A.
00	40 00.0	1.00	180.0	41 00.0	1.00	180.0	42 30.0	1.00	180.0	44 00.0	1.00	180.0	46 00.0	1.00	180.0	46 30.0	1.00	180.0	47 00.0	1.00	180.0	49 00.0	1.00	180.0	00
1	40 00.0	1.00	178.9	41 00.0	1.00	178.9	42 30.0	1.00	178.9	44 00.0	1.00	178.9	46 00.0	1.00	178.9	46 30.0	1.00	178.9	47 00.0	1.00	178.9	49 00.0	1.00	178.9	1
2	39 59.8	1.00	177.9	40 59.8	1.00	177.9	42 29.8	1.00	177.9	43 59.8	1.00	177.9	45 59.8	1.00	177.9	46 29.8	1.00	177.9	46 59.8	1.00	177.9	48 59.8	1.00	177.8	2
3	39 59.7	1.00	176.8	40 59.7	1.00	176.8	42 29.7	1.00	176.8	43 59.6	1.00	176.8	45 59.6	1.00	176.8	46 29.6	1.00	176.8	46 59.6	1.00	176.8	48 59.6	1.00	176.8	3
4	39 59.4	1.00	175.8	40 59.4	1.00	175.8	42 29.4	1.01	175.8	43 59.4	1.01	175.7	45 59.4	1.01	175.7	46 29.4	1.01	175.7	46 59.4	1.01	175.7	48 59.4	1.01	175.7	4
05	39 59.0	1.00	174.7	40 59.0	1.01	174.7	42 29.0	1.01	174.7	43 59.0	1.01	174.7	45 59.0	1.01	174.7	46 29.0	1.01	174.6	46 59.0	1.01	174.6	48 59.0	1.01	174.6	05
6	39 58.6	1.01	173.7	40 58.6	1.01	173.7	42 28.6	1.01	173.6	43 58.6	1.01	173.6	45 58.6	1.01	173.6	46 28.6	1.01	173.6	46 58.6	1.01	173.6	48 58.6	1.01	173.5	6
7	39 58.1	1.01	172.6	40 58.1	1.01	172.6	42 28.1	1.01	172.6	43 58.1	1.01	172.5	45 58.1	1.01	172.5	46 28.1	1.01	172.5	46 58.1	1.01	172.5	48 58.1	1.01	172.5	7
8	39 57.5	1.01	171.6	40 57.5	1.01	171.5	42 27.5	1.01	171.5	43 57.5	1.01	171.5	45 57.5	1.01	171.4	46 27.5	1.01	171.4	46 57.5	1.01	171.4	48 57.5	1.01	171.4	8
9	39 56.9	1.01	170.5	40 56.9	1.01	170.5	42 26.9	1.01	170.4	43 56.9	1.01	170.4	45 56.8	1.01	170.4	46 26.8	1.01	170.4	46 56.8	1.01	170.4	48 56.8	1.01	170.3	9
10	39 56.2	1.00	169.4	40 56.1	1.00	169.4	42 26.1	1.00	169.4	43 56.1	1.01	169.4	45 56.1	1.01	169.3	46 26.1	1.01	169.3	46 56.1	1.01	169.3	48 56.1	1.01	169.2	10
1	39 55.4	1.00	168.4	40 55.3	1.00	168.4	42 25.3	1.02	168.3	43 55.3	1.02	168.3	45 55.3	1.02	168.2	46 25.3	1.01	168.2	46 55.3	1.02	168.2	48 55.3	1.02	168.2	1
2	39 54.5	1.02	167.3	40 54.5	1.02	167.3	42 24.4	1.02	167.3	43 54.4	1.02	167.2	45 54.4	1.02	167.2	46 24.4	1.02	167.2	46 54.4	1.02	167.1	48 54.4	1.02	167.1	2
3	39 53.5	1.02	166.3	40 53.5	1.02	166.3	42 23.5	1.02	166.2	43 53.5	1.02	166.2	45 53.4	1.02	166.1	46 23.4	1.02	166.1	46 53.4	1.02	166.1	48 53.4	1.02	166.0	3
4	39 52.5	1.02	165.2	40 52.5	1.02	165.2	42 22.4	1.02	165.2	43 52.4	1.02	165.1	45 52.4	1.02	165.0	46 22.4	1.02	165.0	46 52.4	1.02	165.0	48 52.3	1.02	164.9	4
15	39 51.4	1.00	164.2	40 51.4	1.00	164.1	42 21.3	1.02	164.1	43 51.3	1.02	164.0	45 51.3	1.02	164.0	46 21.3	1.02	164.0	46 51.2	1.02	163.9	48 51.2	1.02	163.9	15
6	39 50.2	1.02	163.1	40 50.2	1.02	163.1	42 20.2	1.02	163.0	43 50.1	1.02	163.0	45 50.1	1.02	162.9	46 20.1	1.02	162.9	46 50.1	1.02	162.9	48 50.0	1.02	162.8	6
7	39 48.9	1.02	162.1	40 48.9	1.02	162.0	42 18.9	1.02	162.0	43 48.9	1.02	161.9	45 48.8	1.02	161.8	46 18.8	1.02	161.8	46 48.8	1.02	161.8	48 48.7	1.02	161.7	7
8	39 47.6	1.02	161.0	40 47.6	1.02	161.0	42 17.6	1.02	160.9	43 47.6	1.02	160.9	45 47.5	1.02	160.8	46 17.5	1.02	160.7	46 47.4	1.02	160.7	48 47.4	1.02	160.6	8
9	39 46.2	1.02	160.0	40 46.2	1.02	159.9	42 16.2	1.02	159.9	43 46.1	1.02	159.8	45 46.1	1.02	159.7	46 16.0	1.02	159.7	46 46.0	1.02	159.7	48 46.0	1.02	159.6	9
20	39 44.8	1.00	158.9	40 44.7	1.00	158.9	42 14.7	1.03	158.8	43 44.6	1.03	158.7	45 44.6	1.03	158.6	46 14.5	1.03	158.6	46 44.5	1.03	158.6	48 44.5	1.03	158.5	20
1	39 43.2	1.03	157.9	40 43.2	1.03	157.8	42 13.1	1.03	157.7	43 43.1	1.03	157.7	45 43.0	1.03	157.6	46 13.0	1.03	157.6	46 43.0	1.03	157.5	48 42.9	1.03	157.4	1
2	39 41.6	1.03	156.8	40 41.6	1.03	156.8	42 11.5	1.03	156.7	43 41.5	1.03	156.6	45 41.4	1.03	156.5	46 11.4	1.03	156.5	46 41.3	1.03	156.5	48 41.2	1.03	156.3	2
3	39 39.9	1.03	155.8	40 39.9	1.03	155.7	42 09.8	1.03	155.6	43 39.8	1.03	155.6	45 39.7	1.03	155.5	46 09.6	1.03	155.4	46 39.6	1.03	155.4	48 39.5	1.03	155.3	3
4	39 38.2	1.03	154.7	40 38.1	1.03	154.7	42 08.1	1.03	154.6	43 38.0	1.03	154.5	45 37.9	1.03	154.4	46 07.9	1.03	154.4	46 37.8	1.03	154.3	48 37.7	1.03	154.2	4
25	39 36.3	1.03	153.7	40 36.3	1.03	153.6	42 06.2	1.03	153.5	43 36.2	1.03	153.4	45 36.0	1.03	153.3	46 06.0	1.03	153.3	46 36.0	1.03	153.3	48 35.9	1.03	153.1	25
6	39 34.4	1.03	152.6	40 34.4	1.03	152.6	42 04.3	1.03	152.5	43 34.2	1.03	152.4	45 34.1	1.03	152.3	46 04.1	1.03	152.2	46 34.1	1.03	152.2	48 34.0	1.03	152.1	6
7	39 32.5	1.03	151.6	40 32.4	1.03	151.5	42 02.4	1.03	151.4	43 32.3	1.03	151.3	45 32.2	1.03	151.2	46 02.1	1.03	151.2	46 32.1	1.03	151.1	48 32.0	1.03	151.0	7
8	39 30.5	1.04	150.5	40 30.4	1.04	150.5	42 00.4	1.04	150.4	43 30.2	1.04	150.3	45 30.1	1.04	150.1	46 00.1	1.04	150.1	46 30.0	1.04	150.1	48 29.9	1.04	149.9	8
9	39 28.4	1.04	149.5	40 28.3	1.04	149.4	41 58.2	1.04	149.3	43 28.1	1.04	149.2	45 28.0	1.04	149.2	45 58.0	1.04	149.1	46 27.9	1.04	149.0	48 27.8	1.04	148.9	9
30	39 26.2	1.04	148.4	40 26.1	1.04	148.4	41 56.0	1.04	148.3	43 25.9	1.04	148.2	45 25.8	1.04	148.0	45 55.8	1.04	148.0	46 25.7	1.04	148.0	48 25.6	1.04	147.8	30
1	39 24.0	1.04	147.4	40 23.9	1.04	147.3	41 53.8	1.04	147.2	43 23.7	1.04	147.1	45 23.6	1.04	147.0	45 53.5	1.04	146.9	46 23.5	1.04	146.9	48 23.3	1.04	146.7	1
2	39 21.7	1.04	146.3	40 21.6	1.04	146.3	41 51.5	1.04	146.2	43 21.4	1.04	146.1	45 21.2	1.04	145.9	45 51.2	1.04	145.9	46 21.2	1.04	145.8	48 21.0	1.04	145.7	2
3	39 19.3	1.04	145.3	40 19.3	1.04	145.2	41 49.2	1.04	145.1	43 19.0	1.04	145.0	45 18.9	1.04	144.9	45 48.8	1.04	144.8	46 18.8	1.04	144.8	48 18.6	1.04	144.6	3
4	39 16.9	1.04	144.2	40 16.8	1.04	144.2	41 46.7	1.04	144.1	43 16.6	1.04	144.0	45 16.4	1.04	143.8	45 46.4	1.04	143.8	46 16.3	1.04	143.7	48 16.1	1.04	143.6	4
35	39 14.5	1.04	143.2	40 14.4	1.04	143.1	41 44.2	1.04	143.0	43 14.1	1.04	142.9	45 13.9	1.04	142.8	45 43.9	1.04	142.7	46 13.8	1.04	142.7	48 13.6	1.04	142.5	35
6	39 11.9	1.04	142.1	40 11.8	1.04	142.1	41 41.7	1.04	142.0	43 11.6	1.04	141.9	45 11.4	1.04	141.7	45 41.3	1.04	141.7	46 11.3	1.04	141.6	48 11.0	1.04	141.4	6
7	39 09.3	1.04	141.1	40 09.2	1.04	141.0	41 39.1	1.04	140.9	43 08.9	1.04	140.9	45 08.7	1.04	140.6	45 38.7	1.04	140.6	46 08.4	1.04	140.4	48 08.4	1.04	140.4	7
8	39 06.7	1.05	140.1	40 06.6	1.05	140.0	41 36.4	1.05	139.9	43 06.3	1.05	139.8	45 06.0	1.05	139.6	45 36.0	1.05	139.6	46 05.9	1.05	139.5	48 05.7	1.05	139.3	8
9	39 03.9	1.05	139.0	40 03.8	1.05	139.0	41 33.7	1.05	138.8	43 03.5	1.05	138.7	45 03.3	1.05	138.5	45 33.3	1.05	138.5	46 03.2	1.05	138.5	48 02.9	1.05	138.3	9
40	39 01.2	1.05	138.0	40 01.1	1.05	137.9	41 30.9	1.05	137.8	43 00.7	1.05	137.7	45 00.5	1.05	137.5	45 30.4	1.05	137.4	46 00.4	1.05	137.4	48 00.1	1.05	137.2	40
1	38 58.3	1.05	136.9	39 58.2	1.05	136.9	41 28.1	1.05	136.7	42 57.9	1.05	136.6	44 57.7	1.05	136.4	45 27.6	1.05	136.4	45 57.5	1.05	136.4	47 57.3	1.05	136.2	1
2	38 55.5	1.05	135.9	39 55.5	1.05	135.8	41 25.2	1.05	135.7	42 55.0	1.05	135.5	44 54.7	1.05	135.4	45 24.7	1.05	135.4	45 54.6	1.05	135.3	47 54.3	1.05	135.1	2
3	38 52.7	1.05	134.9	39 52.4	1.05	134.8	41 22.2	1.05	134.7	42 52.0	1.05	134.5	44 51.8	1.05	134.4	45 21.7	1.05	134.3	45 51.6	1.05	134.3	47 51.4	1.05	134.1	3
4	38 49.5	1.05	133.8	39 49.4	1.05	133.8	41 19.2	1.05	133.6	42 49.0	1.05	133.5	44 48.8	1.05	133.3	45 18.7	1.05	133.3	45 48.6	1.05	133.2	47 48.3	1.05	133.0	4
45	38 46.5	1.05	132.8	39 46.4	1.05	132.7	41 16.2	1.05	132.6	42 46.0	1.05	132.5	44 45.7	1.05	132.3	45 15.6	1.05	132.2	45 45.5	1.05	132.2	47 45.2	1.05	132.0	45
6	38 43.4	1.05	131.7	39 43.3	1.05	131.7	41 13.1	1.05	131.5	42 42.9	1.05	131.4	44 42.6	1.05	131.2	45 12.5	1.05	131.2	45 42.4	1.05	131.1	47 42.1	1.05	130.9	6
7	38 40.2	1.05	130.7	39 40.1	1.05	130.6	41 09.9	1.05	130.5	42 39.7	1.05	130.3	44 39.4	1.05	130.2	45 09.3	1.05	130.1	45 39.2	1.05	130.1	47 38.9	1.05	129.9	7
8	38 37.0	1.05	129.7	39 36.9	1.05	129.6	41 06.7	1.05	129.5	42 36.5	1.05	129.3	44 36.2	1.05	129.1	45 06.1	1.05	129.1	45 36.0	1.05	129.0	47 35.7	1.05	128.8	8
9	38 33.8	1.06	128.7	39 33.7	1.06	128.6	41 03.4	1.06	128.4	42 33.2	1.06	128.3	44 32.9	1.06	128.1	45 02.8	1.06	128.0	45 32.7	1.06	128.0	47 32.4	1.06	127.8	9
50	38 30.5	1.06	127.6	39 30.4	1.06	127.5	41 00.1	1.06	127.4	42 29.9	1.06	127.3	44 29.6	1.06	127.1	44 59.5	1.06	127.0	45 29.4	1.06	126.9	47 29.0	1.06	126.7	50
1	38 27.2	1.06	126.6	39 27.0	1.06	126.5	40 56.8	1.06	126.4	42 26.6	1.06	126.2	44 26.2	1.06	126.0	44 56.1	1.06	126.0	45 26.0	1.06	125.9	47 25.7	1.06	125.7	1
2	38 23.8	1.06	125.6	39 23.6	1.06	125.5	40 53.4	1.06	125.3	42 23.2	1.06	125.2	44 22.8	1.06	125.0	44 52.7	1.06	124.9	45 22.6	1.06	124.9	47 22.2	1.06	124.6	2
3	38 20.4	1.06	124.5	39 20.2	1.06	124.4	40 50.0	1.06	124.3	42 19.7	1.06	124.2	44 19.4	1.06	123.9	44 49.3	1.06	123.9	45 19.2	1.06	123.8	47 18.8	1.06	123.6	3
4	38 16.9	1.06	123.5	39 16.7	1.06	123.4	40 46.5	1.06	123.3	42 16.2	1.06	123.1	44 15.9	1.06	122.9	44 45.8	1.06	122.9	45 15.7	1.06	122.8	47 15.3	1.06	122.6	4
55	38 13.4	1.06	122.5	39 13.2	1.06	122.4	40 43.0	1.06	122.2	42 12.7	1.06	122.1	44 12.3	1.06	121.9	44 42.2	1.06	121.8	45 12.1	1.06	121.8	47 11.7	1.06	121.5	55
6	38 09.8	1.06	121.5	39 09.7	1.06	121.4	40 39.4	1.06	121.2	42 09.1	1.06	121.1	44 08.8	1.06	120.8	44 38.7	1.06	120.8	45 08.6	1.06	120.7	47 08.1	1.06	120.5	6
7	38 06.2	1.06	120.4	39 06.1	1.06	120.3	40 35.8	1.06	120.2	42 05.5	1.06	120.0	44 05.1	1.06	119.8	44 35.0	1.06	119.8	45 04.9	1.06	119.7	47 04.5	1.06	119.5	7
8	38 02.6	1.06	119.4	39 02.4	1.06	119.3	40 32.2	1.06	119.2	42 01.9	1.06	119.0	44 01.5	1.06	118.8	44 31.4	1.06	118.7	45 01.3	1.06	118.7	47 00.9	1.06	118.4	8
9	37 58.9	1.06	118.4	38 58.8	1.06	118.3	40 28.5	1.06	118.1	41 58.2	1.06	118.0	43 57.8	1.06	117.8	44 27.7	1.06	117.7	44 57.6	1.06	117.6	46 57.2	1.06	117.4	9
60	37 55.2	1.06	117.4	38 55.1	1.06	117.3	40 24.8	1.06	117.1	41 54.5	1.06	116.9	43 54.1	1.06	116.7	44 24.0	1.06	116.7	44 53.9	1.06	116.6	46 53.4	1.06	116.4	60
1	37 51.5	1.06	116.3	38 51.3	1.06	116.2	40 21.0	1.06	116.1	41 50.7	1.06	115.9	43 50.3	1.06	115.7	44 20.2	1.06	115.6	44 50.1	1.06	115.5	46 49.7	1.06	115.3	1
2	37 47.7	1.06	115.3	38 47.6	1.06	115.2	40 17.3	1.06	115.1	41 47.0	1.06	114.9	43 46.5	1.06	114.7	44 16.4	1.06	114.6	44 46.3	1.06	114.5	46 45.9	1.06	114.3	2
3	37 43.9	1.06	114.3	38 43.8	1.06	114.2	40 13.5	1.06	114.0	41 43.2	1.06	113.9	43 42.7	1.06	113.6	44 12.6	1.06	113.6	44 42.5	1.06	113.5	46 42.0	1.06	113.3	3
4	37 40.1	1.06	113.3	38 39.9	1.06	113.2	40 09.6	1.06	113.0	41 39.3	1.06	112.9	43 38.9	1.06	112.6	44 08.8	1.06	112.6	44 38.6	1.06	112.5	46 38.2	1.06	112.2	4
65	37 36.3	1.06	112.3	38 36.1	1.06	112.2	40 05.8	1.06	111.8	41 35.1	1.06	111.8	43 35.0	1.06	111.6	44 04.9	1.06	111.5	44 34.8	1.06	111.5	46 34.3	1.06	111.2	65
6	37 32.4	1.07	111.1	38 32.2	1.07	111.1	40 01.9	1.07	110.9	41 31.5	1.07	110.6	43 31.1	1.07	110.6	44 01.0	1.07	110.5	44 30.9	1.07	110.2	46 30.0	1.07	110.2	6
7	37 28.5	1.07	110.2	38 28.3	1.07	110.1	39 57.9	1.07	110.0	41 27.6	1.07	109.8	43 27.2	1.07	109.6	43 57.0	1.07	109.5	44 26.9	1.07	109.4	46 26.4	1.07	109.2	7
8	37 24.5	1.07	109.2	38 24.3	1.07	109.1	39 54.0	1.07	108.9	41 23.7	1.07	108.8	43 23.2	1.07	108.5	43 53.1	1.07	108.5	44 23.0	1.07	108.4	46 22.5	1.07	108.1	8
9	37 20.5	1.07	108.2	38 20.3	1.07	108.1	39 50.0	1.07	107.9	41 19.7	1.07	107.8	43 19.2	1.07	107.5	43 49.1	1.07	107.5	44 19.0	1.07	107.4	46 18.5	1.07	107.1	9
70	37 16.5	1.07	107.2	38 16.4	1.07	107.1	39 46.0	1.07	106.9	41 15.7	1.07	106.7	43 15.2	1.07	106.5	43 45.1	1.07	106.4	44 15.0	1.07	106.4	46 14.5	1.07	106.1	70
1	37 12.6	1.07	106.2	38 12.3	1.07	106.1	39 42.0	1.07	105.9	41 11.7	1.07	105.7	43 11.2	1.07	105.5	43 41.1	1.07	105.4	44 11.0	1.07	105.4	46 10.4	1.07	105.1	1
2	37 08.5	1.07	105.2	38 08.3	1.07	105.0	39 38.0	1.07	104.9	41 07.6	1.07	104.7	43 07.2	1.07	104.5	43 37.0	1.07	104.4	44 06.9	1.07	104.3	46 06.4	1.07	104.1	2
3	37 04.5	1.07	104.1	38 04.3	1.07	104.0	39 33.9	1.07	103.9	41 03.6	1.07	103.7	43 03.1	1.07	103.5	43 33.0	1.07	103.4	44 02.8	1.07	103.3	46 02.3	1.07	103.1	3
4	37 00.4	1.07	103.1	38 00.2	1.07	103.0	39 29.9	1.07	102.7	40 59.5	1.07	102.7	42 59.0	1.07	102.4	43 28.9	1.07	102.4	43 58.8	1.07	102.3	45 58.2	1.07	102.1	4
75	36 56.3	1.07	102.0	37 56.1	1.07	101.9	39 25.8	1.07	101.7	40 55.4	1.07	101.7	42 54.9	1.07	101.4	43 24.8	1.07	101.4	43 54.7	1.07	101.3	45 54.1	1.07	101.1	75
6	36 52.2	1.07	101.1	37 52.0	1.07	101.0	39 21.7	1.07	100.8	40 51.3	1.07	100.7	42 50.8	1.07	100.4	43 20.7	1.07	100.4	43 50.6	1.07	100.3	45 50.0	1.07	100.0	6
7	36 48.1	1.07	100.1	37 47.9	1.07	100.0	39 17.5	1.07	99.8	40 47.2	1.07	99.7	42 46.7	1.07	99.4	43 16.6	1.07	99.4	43 46.4	1.07	99.3	45 45.9	1.07	99.0	7
8	36 44.0	1.07	99.1	37 43.8	1.07	99.0	39 13.4	1.07	98.8	40 43.1	1.07	98.7	42 42.6	1.07	98.4	43 12.4	1.07	98.3	43 42.3	1.07	98.3	45 41.7	1.07	98.0	8
9	36 39.8	1.07	98.1	37 39.6	1.07	98.0	39 09.3	1.07	97.8	40 38.9	1.07	97.6	42 38.4	1.07	97.4	43 08.3	1.07	97.3	43 38.1	1.07	97.3	45 37.3	1.07	97.0	9
80	36 35.7	1.07	97.1	37 35.5	1.07	97.0	39 05.1	1.07	96.8	40 34.8	1.07	96.6	42 34.2	1.07	96.4	43 04.1	1.07	96.3	43 34.0	1.07	96.3	45 33.4	1.07	96.0	80
1	36 31.5	1.07	96.1	37 31.3	1.07	96.0	39 01.0	1.07	95.8	40 30.6	1.07	95.6	42 30.1	1.07	95.4	43 00.0	1.07	95.3	43 29.8	1.07	95.3	45 29.3	1.07	95.0	1
2	36 27.4	1.07	95.1	37 27.1	1.07	95.0	38 56.8	1.07	94.8	40 26.4	1.07	94.6	42 25.9	1.07	94.4	42 55.8	1.07	94.3	43 25.7	1.07	94.3	45 25.1	1.07	94.0	2
3	36 23.2	1.07	94.1	37 23.0	1.07	94.0	38 52.6	1.07	93.8	40 22.3	1.07	93.6	42 21.7	1.07	93.4	42 51.6	1.07	93.3	43 21.5	1.07	93.3	45 20.9	1.07	93.0	3
4	36 19.0	1.07	93.1	37 18.8	1.07	93.0	38 48.4	1.07	92.6	40 18.1	1.07	92.6	42 17.6	1.07	92.4	42 47.4	1.07	92.3	43 17.3	1.07	92.3	45 16.7	1.07	92.0	4
85	36 14.8	1.07	92.0	37 14.6	1.07	92.0	38 44.3	1.07	91.8	40 13.9	1.07	91.6	42 13.4	1.07	91.4	42 43.3	1.07	91.3	43 13.1	1.07	91.3	45 12.6	1.07	91.0	85
6	36 10.7	1.07	91.1	37 10.4	1.07	91.0	38 40.1	1.07	90.8	40 09.7	1.07	90.6	42 09.2	1.07	90.4	42 39.1	1.07	90.3	43 08.9	1.07	90.3	45 08.4	1.07	90.0	6
7	36 06.5	1.07	90.1	37 06.2	1.07	90.0	38 35.9	1.07	89.8	40 05.5	1.07	89.6	42 05.0	1.07	89.4	42 34.9	1.07	89.3	43 04.7	1.07	89.3	45 04.2	1.07	89.0	7
8	36 02.3	1.07	89.1	37 02.1	1.07	89.0	38 31.7	1.07	88.8	40 01.3	1.07	88.6	42 00.8	1.07	88.4	42 30.7	1.07	88.3	43 00.5	1.07	88.3	45 00.0	1.07	88.0	8
9	35 58.1	1.07	88.1	36 57.9	1.07	88.0	38 27.5	1.07	87.8	39 57.2	1.07	87.6	41 56.6	1.07	87.4	42 26.5	1.07	87.3	42 56.3	1.07	87.3	44 55.8	1.07	87.0	9
90	35 53.9	1.07	87.1	36 53.7	1.07	87.0	38 23.3	1.07	86.8	39 53.0	1.07	86.7	41 52.5	1.07	86.4	42 22.3	1.07	86.3	42 52.2	1.07	86.3	44 51.8	1.07	86.0	90

Lat. 86°

H.A.	36° 00' Alt. (Δd Δt)	Az.	37° 00' Alt. (Δd Δt)	Az.	38° 30' Alt. (Δd Δt)	Az.	40° 00' Alt. (Δd Δt)	Az.	42° 00' Alt. (Δd Δt)	Az.	42° 30' Alt. (Δd Δt)	Az.	43° 00' Alt. (Δd Δt)	Az.	45° 00' Alt. (Δd Δt)	Az.	H.A.
91	35 49.7 1.007	86.1	36 49.5 1.007	86.0	38 19.2 1.007	85.8	39 48.8 1.007	85.7	41 48.3 1.007	85.4	42 18.2 1.007	85.3	42 48.0 1.007	85.3	44 47.5 1.007	85.0	91
2	35 45.6 1.007	85.1	36 45.3 1.007	85.0	38 15.0 1.007	84.8	39 44.6 1.007	84.7	41 44.1 1.007	84.4	42 14.0 1.007	84.4	42 43.9 1.007	84.3	44 43.3 1.007	84.0	2
3	35 41.4 1.007	84.1	36 41.2 1.007	84.0	38 10.8 1.007	83.8	39 40.5 1.007	83.7	41 40.0 1.007	83.4	42 09.8 1.007	83.4	42 39.7 1.007	83.3	44 39.1 1.007	83.0	3
4	35 37.2 1.007	83.1	36 37.0 1.007	83.0	38 06.7 1.007	82.9	39 36.3 1.007	82.7	41 35.8 1.007	82.4	42 05.7 1.007	82.4	42 35.5 1.007	82.3	44 35.0 1.007	82.0	4
95	35 33.1 1.007	82.1	36 32.9 1.007	82.0	38 02.5 1.007	81.9	39 32.2 1.007	81.7	41 31.7 1.007	81.5	42 01.5 1.007	81.4	42 31.4 1.007	81.3	44 30.8 1.007	81.1	95
6	35 29.0 1.007	81.1	36 28.7 1.007	81.0	37 58.4 1.007	80.9	39 28.0 1.007	80.7	41 27.5 1.007	80.5	41 57.4 1.007	80.4	42 27.3 1.007	80.3	44 26.7 1.007	80.1	6
7	35 24.8 1.007	80.2	36 24.6 1.007	80.0	37 54.3 1.007	79.9	39 23.9 1.007	79.7	41 23.4 1.007	79.5	41 53.3 1.007	79.4	42 23.2 1.007	79.4	44 22.6 1.007	79.1	7
8	35 20.7 1.007	79.2	36 20.5 1.007	79.1	37 50.1 1.007	78.9	39 19.8 1.007	78.7	41 19.3 1.007	78.5	41 49.2 1.007	78.4	42 19.0 1.007	78.4	44 18.5 1.007	78.1	8
9	35 16.6 1.007	78.2	36 16.4 1.007	78.1	37 46.0 1.007	77.9	39 15.7 1.007	77.7	41 15.2 1.007	77.5	41 45.1 1.007	77.4	42 15.0 1.007	77.4	44 14.4 1.007	77.1	9
100	35 12.5 1.007	77.2	36 12.3 1.007	77.1	37 42.0 1.007	76.9	39 11.6 1.007	76.8	41 11.1 1.007	76.5	41 41.0 1.007	76.5	42 10.9 1.007	76.4	44 10.3 1.007	76.1	100
1	35 08.4 1.007	76.2	36 08.2 1.007	76.1	37 37.9 1.007	75.9	39 07.5 1.007	75.8	41 07.1 1.007	75.5	41 36.9 1.007	75.5	42 06.8 1.007	75.4	44 06.3 1.007	75.2	1
2	35 04.4 1.007	75.2	36 04.2 1.007	75.1	37 33.8 1.007	75.0	39 03.5 1.007	74.8	41 03.0 1.007	74.6	41 32.9 1.007	74.5	42 02.8 1.007	74.4	44 02.2 1.007	74.2	2
3	35 00.3 1.007	74.2	36 00.1 1.007	74.1	37 29.8 1.007	74.0	38 59.5 1.007	73.8	40 59.0 1.007	73.6	41 28.9 1.007	73.5	41 58.8 1.007	73.5	43 58.2 1.007	73.2	3
4	34 56.3 1.007	73.3	35 56.1 1.007	73.1	37 25.8 1.007	73.0	38 55.5 1.007	72.8	40 55.0 1.007	72.6	41 24.9 1.007	72.5	41 54.8 1.007	72.5	43 54.2 1.007	72.2	4
105	34 52.3 1.007	72.3	35 52.1 1.007	72.2	37 21.8 1.007	72.0	38 51.5 1.007	71.8	40 51.0 1.007	71.6	41 20.9 1.007	71.6	41 50.8 1.007	71.5	43 50.3 1.007	71.2	105
6	34 48.4 1.007	71.3	35 48.2 1.007	71.2	37 17.8 1.007	71.0	38 47.5 1.007	70.9	40 47.1 1.007	70.6	41 16.9 1.007	70.6	41 46.8 1.007	70.5	43 46.3 1.007	70.3	6
7	34 44.4 1.007	70.3	35 44.2 1.007	70.2	37 13.9 1.007	70.0	38 43.6 1.007	69.9	40 43.1 1.007	69.7	41 13.0 1.007	69.6	41 42.9 1.007	69.5	43 42.4 1.006	69.3	7
8	34 40.5 1.006	69.3	35 40.3 1.006	69.2	37 10.0 1.006	69.1	38 39.6 1.006	68.9	40 39.2 1.006	68.7	41 09.1 1.006	68.6	41 39.0 1.006	68.6	43 38.5 1.006	68.3	8
9	34 36.6 1.006	68.3	35 36.4 1.006	68.2	37 06.1 1.006	68.1	38 35.8 1.006	67.9	40 35.3 1.006	67.7	41 05.2 1.006	67.7	41 35.1 1.006	67.6	43 34.6 1.006	67.4	9
110	34 32.7 1.006	67.4	35 32.5 1.006	67.3	37 02.2 1.006	67.1	38 31.9 1.006	67.0	40 31.5 1.006	66.7	41 01.3 1.006	66.7	41 31.2 1.006	66.6	43 30.8 1.006	66.4	110
1	34 28.8 1.006	66.4	35 28.7 1.006	66.3	36 58.4 1.006	66.1	38 28.1 1.006	66.0	40 27.6 1.006	65.8	40 57.5 1.006	65.7	41 27.4 1.006	65.6	43 26.9 1.006	65.4	1
2	34 25.0 1.006	65.4	35 24.8 1.006	65.3	36 54.5 1.006	65.2	38 24.2 1.006	65.0	40 23.8 1.006	64.8	40 53.7 1.006	64.7	41 23.6 1.006	64.7	43 23.1 1.006	64.4	2
3	34 21.2 1.006	64.4	35 21.0 1.006	64.3	36 50.8 1.006	64.2	38 20.5 1.006	64.0	40 20.1 1.006	63.8	40 49.9 1.006	63.8	41 19.8 1.006	63.7	43 19.4 1.006	63.5	3
4	34 17.5 1.006	63.5	35 17.3 1.006	63.4	36 47.0 1.006	63.2	38 16.7 1.006	63.1	40 16.3 1.006	62.8	40 46.2 1.006	62.8	41 16.1 1.006	62.7	43 15.7 1.006	62.5	4
115	34 13.7 1.006	62.5	35 13.6 1.006	62.4	36 43.3 1.006	62.2	38 13.0 1.006	62.1	40 12.6 1.006	61.9	40 42.5 1.006	61.8	41 12.4 1.006	61.8	43 12.0 1.006	61.5	115
6	34 10.1 1.006	61.5	35 09.9 1.006	61.4	36 39.6 1.006	61.3	38 09.3 1.006	61.1	40 08.9 1.006	60.9	40 38.8 1.006	60.9	41 08.7 1.006	60.8	43 08.3 1.006	60.6	6
7	34 06.4 1.006	60.5	35 06.2 1.006	60.4	36 36.0 1.006	60.3	38 05.7 1.006	60.1	40 05.3 1.006	59.9	40 35.2 1.006	59.9	41 05.1 1.006	59.8	43 04.7 1.006	59.6	7
8	34 02.8 1.006	59.6	35 02.6 1.006	59.5	36 32.3 1.006	59.3	38 02.1 1.006	59.2	40 01.7 1.006	59.0	40 31.6 1.006	58.9	41 01.5 1.006	58.9	43 01.1 1.006	58.6	8
9	33 59.2 1.006	58.6	34 59.0 1.006	58.5	36 28.8 1.006	58.4	37 58.5 1.006	58.2	39 58.1 1.006	58.0	40 28.0 1.006	58.0	40 57.9 1.006	57.9	42 57.5 1.006	57.7	9
120	33 55.6 1.006	57.6	34 55.5 1.006	57.5	36 25.2 1.006	57.4	37 55.0 1.006	57.2	39 54.6 1.006	57.0	40 24.5 1.006	57.0	40 54.4 1.006	56.9	42 54.0 1.006	56.7	120
1	33 52.1 1.006	56.6	34 51.9 1.006	56.5	36 21.7 1.006	56.4	37 51.5 1.006	56.3	39 51.1 1.006	56.1	40 21.0 1.006	56.0	40 50.9 1.006	56.0	42 50.5 1.006	55.8	1
2	33 48.6 1.006	55.7	34 48.5 1.006	55.6	36 18.2 1.006	55.4	37 48.0 1.006	55.3	39 47.6 1.006	55.1	40 17.6 1.006	55.1	40 47.5 1.006	55.0	42 47.1 1.006	54.8	2
3	33 45.2 1.006	54.7	34 45.0 1.006	54.6	36 14.8 1.006	54.5	37 44.6 1.006	54.3	39 44.2 1.006	54.1	40 14.1 1.006	54.1	40 44.1 1.006	54.0	42 43.7 1.006	53.8	3
4	33 41.8 1.006	53.7	34 41.7 1.006	53.6	36 11.4 1.006	53.5	37 41.2 1.006	53.4	39 40.9 1.006	53.2	40 10.8 1.006	53.1	40 40.7 1.006	53.1	42 40.3 1.006	52.9	4
125	33 38.4 1.006	52.8	34 38.3 1.006	52.7	36 08.1 1.006	52.5	37 37.9 1.006	52.4	39 37.5 1.005	52.2	40 07.4 1.005	52.2	40 37.4 1.005	52.1	42 37.0 1.005	51.9	125
6	33 35.1 1.005	51.8	34 35.0 1.005	51.7	36 04.8 1.005	51.6	37 34.6 1.005	51.4	39 34.2 1.005	51.3	40 04.2 1.005	51.2	40 34.1 1.005	51.2	42 33.7 1.005	51.0	6
7	33 31.9 1.005	50.8	34 31.7 1.005	50.7	36 01.5 1.005	50.6	37 31.3 1.005	50.5	39 31.0 1.005	50.3	40 00.9 1.005	50.2	40 30.8 1.005	50.2	42 30.5 1.005	50.0	7
8	33 28.6 1.005	49.8	34 28.5 1.005	49.8	35 58.3 1.005	49.6	37 28.1 1.005	49.5	39 27.8 1.005	49.3	39 57.7 1.005	49.3	40 27.6 1.005	49.2	42 27.3 1.005	49.0	8
9	33 25.5 1.005	48.9	34 25.3 1.005	48.8	35 55.1 1.005	48.7	37 24.9 1.005	48.6	39 24.7 1.005	48.4	39 54.6 1.005	48.3	40 24.5 1.005	48.3	42 24.2 1.005	48.1	9
130	33 22.3 1.005	47.9	34 22.2 1.005	47.8	35 52.0 1.005	47.7	37 21.8 1.005	47.6	39 21.5 1.005	47.4	39 51.5 1.005	47.4	40 21.4 1.005	47.3	42 21.1 1.005	47.1	130
1	33 19.3 1.005	46.9	34 19.1 1.005	46.9	35 49.0 1.005	46.7	37 18.8 1.005	46.6	39 18.5 1.005	46.5	39 48.4 1.005	46.4	40 18.3 1.005	46.4	42 18.1 1.005	46.2	1
2	33 16.2 1.005	46.0	34 16.1 1.005	45.9	35 45.9 1.005	45.8	37 15.7 1.005	45.7	39 15.5 1.005	45.5	39 45.4 1.005	45.5	40 15.3 1.005	45.4	42 15.1 1.005	45.2	2
3	33 13.2 1.005	45.0	34 13.1 1.005	44.9	35 43.0 1.005	44.8	37 12.8 1.005	44.7	39 12.5 1.005	44.5	39 42.5 1.005	44.5	40 12.4 1.005	44.5	42 12.1 1.005	44.3	3
4	33 10.3 1.005	44.0	34 10.1 1.005	44.0	35 40.0 1.005	43.9	37 09.9 1.005	43.7	39 09.6 1.005	43.6	39 39.6 1.005	43.5	40 09.5 1.005	43.5	42 09.2 1.005	43.3	4
135	33 07.4 1.005	43.1	34 07.3 1.005	43.0	35 37.2 1.005	42.9	37 07.0 1.005	42.8	39 06.7 1.005	42.6	39 36.7 1.005	42.6	40 06.6 1.005	42.5	42 06.4 1.005	42.4	135
6	33 04.6 1.005	42.1	34 04.5 1.005	42.0	35 34.3 1.005	41.9	37 04.2 1.005	41.8	39 03.9 1.005	41.7	39 33.9 1.005	41.6	40 03.8 1.005	41.6	42 03.6 1.005	41.4	6
7	33 01.8 1.005	41.2	34 01.7 1.005	41.1	35 31.6 1.005	41.0	37 01.4 1.005	40.9	39 01.2 1.004	40.7	39 31.1 1.005	40.7	40 01.1 1.004	40.6	42 00.8 1.004	40.5	7
8	32 59.1 1.004	40.2	33 59.0 1.004	40.1	35 28.8 1.004	40.0	36 58.7 1.004	39.9	38 58.5 1.004	39.8	39 28.4 1.004	39.7	39 58.4 1.004	39.7	41 58.1 1.004	39.5	8
9	32 56.4 1.004	39.2	33 56.3 1.004	39.2	35 26.1 1.004	39.1	36 56.0 1.004	39.0	38 55.8 1.004	38.8	39 25.8 1.004	38.8	39 55.7 1.004	38.7	41 55.5 1.004	38.6	9
140	32 53.8 1.004	38.3	33 53.7 1.004	38.2	35 23.6 1.004	38.1	36 53.4 1.004	38.0	38 53.2 1.004	37.9	39 23.2 1.004	37.8	39 53.1 1.004	37.8	41 52.9 1.004	37.6	140
1	32 51.2 1.004	37.3	33 51.1 1.004	37.2	35 21.0 1.004	37.1	36 50.9 1.004	37.0	38 50.7 1.004	36.9	39 20.6 1.004	36.9	39 50.6 1.004	36.8	41 50.4 1.004	36.7	1
2	32 48.7 1.004	36.3	33 48.6 1.004	36.3	35 18.5 1.004	36.2	36 48.4 1.004	36.1	38 48.2 1.004	36.0	39 18.2 1.004	35.9	39 48.1 1.004	35.9	41 47.9 1.004	35.7	2
3	32 46.3 1.004	35.4	33 46.2 1.004	35.3	35 16.1 1.004	35.2	36 45.9 1.004	35.1	38 45.8 1.004	35.0	39 15.7 1.004	35.0	39 45.7 1.004	34.9	41 45.5 1.004	34.8	3
4	32 43.9 1.004	34.4	33 43.8 1.004	34.4	35 13.7 1.004	34.3	36 43.6 1.004	34.2	38 43.4 1.004	34.0	39 13.4 1.004	34.0	39 43.4 1.004	34.0	41 43.1 1.004	33.8	4
145	32 41.5 1.004	33.5	33 41.5 1.004	33.4	35 11.4 1.004	33.3	36 41.2 1.004	33.2	38 41.1 1.004	33.1	39 11.1 1.004	33.1	39 41.0 1.004	33.0	41 40.8 1.004	32.9	145
6	32 39.3 1.004	32.5	33 39.2 1.004	32.4	35 09.1 1.004	32.4	36 39.0 1.004	32.3	38 38.8 1.004	32.1	39 08.8 1.004	32.1	39 38.8 1.004	32.1	41 38.6 1.004	31.9	6
7	32 37.0 1.004	31.5	33 37.0 1.004	31.5	35 06.9 1.004	31.4	36 36.8 1.004	31.3	38 36.6 1.004	31.2	39 06.6 1.004	31.2	39 36.6 1.004	31.1	41 36.4 1.004	31.0	7
8	32 34.9 1.003	30.6	33 34.8 1.003	30.4	35 04.7 1.003	30.4	36 34.6 1.003	30.4	38 34.5 1.003	30.2	39 04.5 1.003	30.2	39 34.4 1.003	30.2	41 34.3 1.003	30.1	8
9	32 32.8 1.003	29.6	33 32.7 1.003	29.6	35 02.6 1.003	29.5	36 32.5 1.003	29.4	38 32.4 1.003	29.3	39 02.4 1.003	29.3	39 32.4 1.003	29.2	41 32.2 1.003	29.1	9
150	32 30.7 1.003	28.7	33 30.7 1.003	28.6	35 00.6 1.003	28.5	36 30.5 1.003	28.5	38 30.4 1.003	28.3	39 00.4 1.003	28.3	39 30.3 1.003	28.3	41 30.2 1.003	28.2	150
1	32 28.8 1.003	27.7	33 28.7 1.003	27.7	34 58.6 1.003	27.6	36 28.6 1.003	27.5	38 28.4 1.003	27.4	38 58.4 1.003	27.4	39 28.4 1.003	27.3	41 28.3 1.003	27.2	1
2	32 26.8 1.003	26.7	33 26.8 1.003	26.7	34 56.7 1.003	26.6	36 26.7 1.003	26.6	38 26.6 1.003	26.5	38 56.5 1.003	26.4	39 26.5 1.003	26.4	41 26.4 1.003	26.3	2
3	32 25.0 1.003	25.8	33 24.9 1.003	25.7	34 54.9 1.003	25.7	36 24.8 1.003	25.6	38 24.7 1.003	25.5	38 54.7 1.003	25.5	39 24.7 1.003	25.5	41 24.6 1.003	25.3	3
4	32 23.2 1.003	24.8	33 23.2 1.003	24.8	34 53.1 1.003	24.7	36 23.0 1.003	24.7	38 22.9 1.003	24.6	38 52.9 1.003	24.5	39 22.9 1.003	24.5	41 22.8 1.003	24.4	4
155	32 21.5 1.003	23.9	33 21.4 1.003	23.8	34 51.4 1.003	23.8	36 21.3 1.003	23.7	38 21.2 1.003	23.6	38 51.2 1.003	23.6	39 21.2 1.003	23.6	41 21.1 1.003	23.5	155
6	32 19.8 1.003	22.9	33 19.8 1.003	22.9	34 49.7 1.003	22.8	36 19.7 1.003	22.8	38 19.6 1.003	22.7	38 49.6 1.003	22.6	39 19.6 1.003	22.6	41 19.5 1.003	22.5	6
7	32 18.2 1.003	21.9	33 18.2 1.003	21.9	34 48.1 1.003	21.9	36 18.1 1.003	21.8	38 18.0 1.003	21.7	38 48.0 1.003	21.7	39 18.0 1.003	21.7	41 17.9 1.002	21.6	7
8	32 16.7 1.002	21.0	33 16.7 1.002	21.0	34 46.6 1.002	20.9	36 16.6 1.002	20.9	38 16.5 1.002	20.8	38 46.5 1.002	20.7	39 16.5 1.002	20.7	41 16.4 1.002	20.6	8
9	32 15.2 1.002	20.0	33 15.2 1.002	20.0	34 45.1 1.002	20.0	36 15.1 1.002	19.9	38 15.0 1.002	19.8	38 45.0 1.002	19.8	39 15.0 1.002	19.8	41 15.0 1.002	19.7	9
160	32 13.8 1.002	19.1	33 13.8 1.002	19.1	34 43.8 1.002	19.0	36 13.7 1.002	19.0	38 13.7 1.002	18.9	38 43.6 1.002	18.9	39 13.6 1.002	18.8	41 13.6 1.002	18.8	160
1	32 12.5 1.002	18.1	33 12.5 1.002	18.1	34 42.4 1.002	18.1	36 12.4 1.002	18.0	38 12.3 1.002	17.9	38 42.3 1.002	17.9	39 12.3 1.002	17.9	41 12.3 1.002	17.8	1
2	32 11.1 1.002	17.2	33 11.1 1.002	17.1	34 41.2 1.002	17.1	36 11.1 1.002	17.1	38 11.1 1.002	17.0	38 41.1 1.002	17.0	39 11.1 1.002	17.0	41 11.0 1.002	16.9	2
3	32 10.0 1.002	16.2	33 10.0 1.002	16.2	34 40.0 1.002	16.2	36 09.9 1.002	16.1	38 09.9 1.002	16.0	38 39.9 1.002	16.0	39 09.9 1.002	16.0	41 09.8 1.002	15.9	3
4	32 08.9 1.002	15.3	33 08.9 1.002	15.2	34 38.8 1.002	15.2	36 08.8 1.002	15.2	38 08.8 1.002	15.1	38 38.8 1.002	15.1	39 08.8 1.002	15.1	41 08.7 1.002	15.0	4
165	32 07.8 1.002	14.3	33 07.8 1.002	14.3	34 37.8 1.002	14.3	36 07.7 1.002	14.2	38 07.7 1.002	14.2	38 37.7 1.002	14.1	39 07.7 1.002	14.1	41 07.7 1.002	14.1	165
6	32 06.8 1.002	13.4	33 06.8 1.002	13.3	34 36.8 1.002	13.3	36 06.7 1.002	13.3	38 06.7 1.002	13.2	38 36.7 1.002	13.2	39 06.7 1.002	13.2	41 06.7 1.002	13.1	6
7	32 05.9 1.001	12.4	33 05.9 1.001	12.4	34 35.8 1.001	12.3	36 05.8 1.001	12.3	38 05.8 1.001	12.3	38 35.8 1.001	12.3	39 05.8 1.001	12.2	41 05.8 1.001	12.2	7
8	32 05.0 1.001	11.5	33 05.0 1.001	11.4	34 35.0 1.001	11.4	36 05.0 1.001	11.4	38 04.9 1.001	11.3	38 34.9 1.001	11.3	39 04.9 1.001	11.3	41 04.9 1.001	11.2	8
9	32 04.2 1.001	10.5	33 04.2 1.001	10.5	34 34.2 1.001	10.4	36 04.2 1.001	10.4	38 04.2 1.001	10.4	38 34.2 1.001	10.4	39 04.1 1.001	10.4	41 04.1 1.001	10.3	9
170	32 03.5 1.001	09.5	33 03.5 1.001	09.5	34 33.5 1.001	09.5	36 03.5 1.001	09.5	38 03.4 1.001	09.4	38 33.4 1.001	09.4	39 03.4 1.001	09.4	41 03.4 1.001	09.4	170
1	32 02.8 1.001	08.6	33 02.8 1.001	08.6	34 32.8 1.001	08.5	36 02.8 1.001	08.5	38 02.8 1.001	08.5	38 32.8 1.001	08.5	39 02.8 1.001	08.5	41 02.8 1.001	08.4	1
2	32 02.2 1.001	07.6	33 02.2 1.001	07.6	34 32.2 1.001	07.6	36 02.2 1.001	07.6	38 02.2 1.001	07.5	38 32.2 1.001	07.5	39 02.2 1.001	07.5	41 02.2 1.001	07.5	2
3	32 01.7 1.001	06.7	33 01.7 1.001	06.7	34 31.7 1.001	06.6	36 01.7 1.001	06.6	38 01.7 1.001	06.6	38 31.7 1.001	06.6	39 01.7 1.001	06.6	41 01.7 1.001	06.6	3
4	32 01.3 1.001	05.7	33 01.3 1.001	05.7	34 31.2 1.001	05.7	36 01.2 1.001	05.7	38 01.2 1.001	05.7	38 31.2 1.001	05.7	39 01.2 1.001	05.6	41 01.2 1.001	05.6	4
175	32 00.9 1.001	04.8	33 00.9 1.001	04.8	34 30.9 1.001	04.7	36 00.9 1.001	04.7	38 00.9 1.001	04.7	38 30.9 1.001	04.7	39 00.9 1.001	04.7	41 00.9 1.000	04.7	175
6	32 00.6 1.000	03.8	33 00.6 1.000	03.8	34 30.6 1.000	03.8	36 00.6 1.000	03.8	38 00.6 1.000	03.8	38 30.6 1.000	03.8	39 00.6 1.000	03.8	41 00.5 1.000	03.7	6
7	32 00.3 1.000	02.9	33 00.3 1.000	02.9	34 30.3 1.000	02.8	36 00.3 1.000	02.8	38 00.3 1.000	02.8	38 30.3 1.000	02.8	39 00.3 1.000	02.8	41 00.3 1.000	02.8	7
8	32 00.1 1.000	01.9	33 00.1 1.000	01.9	34 30.1 1.000	01.9	36 00.1 1.000	01.9	38 00.1 1.000	01.9	38 30.1 1.000	01.9	39 00.1 1.000	01.9	41 00.1 1.000	01.9	8
9	32 00.0 1.000	01.0	33 00.0 1.000	01.0	34 30.0 1.000	00.9	36 00.0 1.000	00.9	38 00.0 1.000	00.9	38 30.0 1.000	00.9	39 00.0 1.000	00.9	41 00.0 1.000	00.9	9
180	32 00.0 1.000	00.0	33 00.0 1.000	00.0	34 30.0 1.000	00.0	36 00.0 1.000	00.0	38 00.0 1.000	00.0	38 30.0 1.000	00.0	39 00.0 1.000	00.0	41 00.0 1.000	00.0	180

Lat. 86°
Lat. 87°
Lat. 88°
Lat. 89°

H.A.	46° 00' Alt. / Δd Δt / Az.	47° 00' Alt. / Δd Δt / Az.	48° 30' Alt. / Δd Δt / Az.	49° 30' Alt. / Δd Δt / Az.	50° 30' Alt. / Δd Δt / Az.	51° 30' Alt. / Δd Δt / Az.	52° 30' Alt. / Δd Δt / Az.	54° 00' Alt. / Δd Δt / Az.	H.A.
00	50 00.0 1.000 180.0	51 00.0 1.000 180.0	52 30.0 1.000 180.0	53 30.0 1.000 180.0	54 30.0 1.000 180.0	55 30.0 1.000 180.0	56 30.0 1.000 180.0	58 00.0 1.000 180.0	00
1	50 00.0 1.000 178.9	51 00.0 1.000 178.9	52 30.0 1.000 178.9	53 30.0 1.000 178.9	54 30.0 1.000 178.9	55 30.0 1.000 178.9	56 30.0 1.000 178.9	58 00.0 1.000 178.9	1
2	49 59.6 1.000 177.8	50 59.6 1.000 177.8	52 29.6 1.000 177.8	53 29.6 1.000 177.7	54 29.6 1.000 177.8	55 29.6 1.000 177.8	56 29.8 1.000 177.8	57 59.8 1.000 177.8	2
3	49 59.6 1.000 176.8	50 59.6 1.000 176.7	52 29.6 1.000 176.7	53 29.6 1.000 176.7	54 29.6 1.000 176.7	55 29.6 1.000 176.7	56 29.6 1.000 176.7	57 59.6 1.000 176.7	3
4	49 59.4 1.001 175.7	50 59.4 1.001 175.7	52 29.4 1.001 175.6	53 29.4 1.001 175.6	54 29.4 1.001 175.6	55 29.4 1.001 175.6	56 29.4 1.001 175.6	57 59.4 1.001 175.6	4
05	49 59.0 1.001 174.6	50 59.0 1.001 174.6	52 29.0 1.001 174.6	53 29.0 1.001 174.5	54 29.0 1.001 174.5	55 29.0 1.001 174.5	56 29.0 1.001 174.5	57 59.0 1.001 174.5	05
6	49 58.6 1.001 173.5	50 58.6 1.001 173.5	52 28.6 1.001 173.5	53 28.6 1.001 173.4	54 28.6 1.001 173.4	55 28.6 1.001 173.4	56 28.6 1.001 173.4	57 58.5 1.001 173.3	6
7	49 58.1 1.001 172.4	50 58.1 1.001 172.4	52 28.1 1.001 172.4	53 28.0 1.001 172.4	54 28.0 1.001 172.3	55 28.0 1.001 172.3	56 28.0 1.001 172.3	57 57.4 1.001 172.2	7
8	49 57.5 1.001 171.4	50 57.5 1.001 171.3	52 27.5 1.001 171.3	53 27.5 1.001 171.3	54 27.5 1.001 171.2	55 27.4 1.001 171.2	56 27.4 1.001 171.2	57 57.4 1.001 171.1	8
9	49 56.8 1.001 170.3	50 56.8 1.001 170.3	52 26.8 1.001 170.2	53 26.8 1.001 170.2	54 26.8 1.001 170.1	55 26.8 1.001 170.1	56 26.7 1.001 170.1	57 56.7 1.001 170.0	9
10	49 56.1 1.001 169.2	50 56.1 1.001 169.2	52 26.0 1.001 169.1	53 26.0 1.001 169.1	54 26.0 1.001 169.1	55 26.0 1.001 169.0	56 26.0 1.001 169.0	57 56.0 1.001 168.9	10
1	49 55.2 1.002 168.1	50 55.2 1.002 168.1	52 25.2 1.002 168.0	53 25.2 1.002 168.0	54 25.2 1.002 168.0	55 25.2 1.002 167.9	56 25.1 1.002 167.9	57 55.1 1.002 167.8	1
2	49 54.3 1.002 167.0	50 54.3 1.002 167.0	52 24.3 1.002 166.9	53 24.3 1.002 166.9	54 24.3 1.002 166.9	55 24.2 1.002 166.8	56 24.2 1.002 166.8	57 54.2 1.002 166.7	2
3	49 53.4 1.002 166.0	50 53.3 1.002 165.9	52 23.3 1.002 165.9	53 23.3 1.002 165.8	54 23.3 1.002 165.8	55 23.3 1.002 165.7	56 23.2 1.002 165.7	57 53.2 1.002 165.6	3
4	49 52.3 1.002 164.9	50 52.3 1.002 164.8	52 22.3 1.002 164.8	53 22.2 1.002 164.7	54 22.2 1.002 164.7	55 22.2 1.002 164.6	56 22.2 1.002 164.6	57 52.1 1.002 164.5	4
15	49 51.1 1.002 163.8	50 51.2 1.002 163.8	52 21.1 1.002 163.7	53 21.1 1.002 163.6	54 21.1 1.002 163.6	55 21.0 1.002 163.5	56 21.0 1.002 163.5	57 51.0 1.002 163.4	15
6	49 50.0 1.002 162.7	50 50.0 1.002 162.7	52 19.9 1.002 162.6	53 19.9 1.002 162.5	54 19.8 1.002 162.5	55 19.8 1.002 162.4	56 19.8 1.002 162.4	57 49.9 1.002 162.3	6
7	49 48.7 1.002 161.7	50 48.7 1.002 161.6	52 18.6 1.002 161.5	53 18.6 1.002 161.5	54 18.5 1.002 161.4	55 18.5 1.002 161.4	56 18.5 1.002 161.3	57 48.4 1.002 161.2	7
8	49 47.3 1.002 160.6	50 47.3 1.002 160.5	52 17.3 1.002 160.4	53 17.2 1.002 160.4	54 17.2 1.002 160.3	55 17.1 1.002 160.3	56 17.1 1.002 160.2	57 47.0 1.002 160.1	8
9	49 45.9 1.002 159.5	50 45.9 1.003 159.4	52 15.8 1.003 159.4	53 15.8 1.002 159.3	54 15.7 1.003 159.2	55 15.7 1.003 159.2	56 15.6 1.003 159.1	57 45.6 1.003 159.0	9
20	49 44.4 1.003 158.4	50 44.4 1.003 158.4	52 14.3 1.003 158.3	53 14.3 1.003 158.2	54 14.2 1.003 158.1	55 14.2 1.003 158.1	56 14.1 1.003 158.0	57 44.0 1.003 157.9	20
1	49 42.8 1.003 157.4	50 42.8 1.003 157.3	52 12.7 1.003 157.2	53 12.7 1.003 157.1	54 12.6 1.003 157.1	55 12.6 1.003 157.0	56 12.5 1.003 156.9	57 42.4 1.003 156.8	1
2	49 41.2 1.003 156.3	50 41.1 1.003 156.2	52 11.1 1.003 156.1	53 11.0 1.003 156.0	54 10.9 1.003 156.0	55 10.9 1.003 155.9	56 10.8 1.003 155.8	57 40.7 1.003 155.7	2
3	49 39.5 1.003 155.2	50 39.4 1.003 155.1	52 09.3 1.003 155.0	53 09.3 1.003 155.0	54 09.2 1.003 154.9	55 09.1 1.003 154.8	56 09.1 1.003 154.7	57 39.0 1.003 154.6	3
4	49 37.7 1.003 154.1	50 37.6 1.003 154.1	52 07.5 1.003 154.0	53 07.5 1.003 153.9	54 07.4 1.003 153.8	55 07.3 1.003 153.7	56 07.2 1.003 153.6	57 37.1 1.003 153.5	4
25	49 35.8 1.003 153.1	50 35.8 1.003 153.0	52 05.7 1.003 152.9	53 05.6 1.003 152.8	54 05.5 1.003 152.7	55 05.4 1.003 152.6	56 05.4 1.003 152.5	57 35.2 1.003 152.4	25
6	49 33.9 1.003 152.0	50 33.8 1.003 151.9	52 03.7 1.003 151.8	53 03.6 1.003 151.7	54 03.6 1.003 151.6	55 03.5 1.003 151.5	56 03.4 1.003 151.5	57 33.2 1.003 151.3	6
7	49 31.9 1.004 150.9	50 31.8 1.004 150.9	52 01.7 1.004 150.7	53 01.6 1.004 150.6	54 01.5 1.004 150.6	55 01.4 1.004 150.5	56 01.4 1.004 150.4	57 31.2 1.004 150.2	7
8	49 29.8 1.004 149.9	50 29.7 1.004 149.8	51 59.6 1.004 149.7	52 59.5 1.004 149.6	53 59.4 1.004 149.5	54 59.3 1.004 149.4	55 59.2 1.004 149.3	57 29.1 1.004 149.1	8
9	49 27.7 1.004 148.8	50 27.6 1.004 148.7	51 57.5 1.004 148.6	52 57.4 1.004 148.5	53 57.3 1.004 148.4	54 57.2 1.004 148.3	55 57.1 1.004 148.2	57 26.9 1.004 148.0	9
30	49 25.5 1.004 147.7	50 25.4 1.004 147.6	51 55.3 1.004 147.5	52 55.2 1.004 147.4	53 55.1 1.004 147.3	54 54.9 1.004 147.2	55 54.8 1.004 147.1	57 24.7 1.004 146.9	30
1	49 23.2 1.004 146.7	50 23.1 1.004 146.6	51 53.0 1.004 146.4	52 52.9 1.004 146.3	53 52.8 1.004 146.2	54 52.6 1.004 146.1	55 52.5 1.004 146.0	57 22.3 1.004 145.8	1
2	49 20.9 1.004 145.6	50 20.8 1.004 145.5	51 50.6 1.004 145.4	52 50.5 1.004 145.3	53 50.4 1.004 145.2	54 50.3 1.004 145.1	55 50.2 1.004 144.9	57 20.0 1.004 144.8	2
3	49 18.5 1.004 144.5	50 18.4 1.004 144.4	51 48.2 1.004 144.3	52 48.1 1.004 144.2	53 48.0 1.004 144.1	54 47.9 1.004 144.0	55 47.7 1.004 143.9	57 17.5 1.004 143.7	3
4	49 16.0 1.004 143.5	50 15.9 1.004 143.4	51 45.7 1.004 143.2	52 45.6 1.004 143.1	53 45.5 1.004 143.0	54 45.4 1.004 142.9	55 45.2 1.004 142.8	57 15.0 1.004 142.6	4
35	49 13.5 1.004 142.3	50 13.4 1.004 142.3	51 43.2 1.004 142.2	52 43.1 1.004 142.1	53 42.9 1.004 141.9	54 42.8 1.004 141.8	55 42.7 1.004 141.7	57 12.4 1.004 141.5	35
6	49 10.9 1.004 141.3	50 10.8 1.004 141.2	51 40.6 1.004 141.1	52 40.5 1.004 141.0	53 40.3 1.004 140.9	54 40.2 1.004 140.7	55 40.0 1.004 140.6	57 09.8 1.004 140.4	6
7	49 08.3 1.005 140.3	50 08.2 1.005 140.2	51 38.0 1.005 140.0	52 37.8 1.005 139.9	53 37.7 1.005 139.8	54 37.5 1.005 139.7	55 37.3 1.005 139.5	57 07.1 1.005 139.3	7
8	49 05.6 1.005 139.2	50 05.4 1.005 139.1	51 35.2 1.005 139.0	52 35.1 1.005 138.8	53 34.9 1.005 138.7	54 34.8 1.005 138.6	55 34.6 1.005 138.5	57 04.3 1.005 138.3	8
9	49 02.8 1.005 138.2	50 02.7 1.005 138.1	51 32.5 1.005 137.9	52 32.3 1.005 137.8	53 32.1 1.005 137.7	54 32.0 1.005 137.5	55 31.8 1.005 137.4	57 01.5 1.005 137.2	9
40	49 00.0 1.005 137.1	49 59.8 1.005 137.0	51 29.6 1.005 136.8	52 29.5 1.005 136.7	53 29.3 1.005 136.6	54 29.1 1.005 136.5	55 28.9 1.005 136.3	56 58.6 1.005 136.1	40
1	48 57.1 1.005 136.1	49 57.0 1.005 135.9	51 26.7 1.005 135.8	52 26.6 1.005 135.7	53 26.4 1.005 135.5	54 26.2 1.005 135.4	55 26.0 1.005 135.3	56 55.7 1.005 135.0	1
2	48 54.2 1.005 135.0	49 54.0 1.005 134.9	51 23.8 1.005 134.7	52 23.6 1.005 134.6	53 23.4 1.005 134.5	54 23.2 1.005 134.3	55 23.0 1.005 134.2	56 52.7 1.005 134.0	2
3	48 51.2 1.005 133.9	49 51.0 1.005 133.8	51 20.8 1.005 133.7	52 20.6 1.005 133.5	53 20.4 1.005 133.4	54 20.2 1.005 133.3	55 20.0 1.005 133.1	56 49.7 1.005 132.9	3
4	48 48.2 1.005 132.9	49 48.0 1.005 132.8	51 17.7 1.005 132.6	52 17.5 1.005 132.5	53 17.3 1.005 132.3	54 17.1 1.005 132.2	55 16.9 1.005 132.0	56 46.6 1.005 131.8	4
45	48 45.1 1.005 131.8	49 44.9 1.005 131.7	51 14.6 1.005 131.5	52 14.4 1.005 131.4	53 14.2 1.005 131.3	54 14.0 1.005 131.1	55 13.8 1.005 131.0	56 43.4 1.005 130.8	45
6	48 41.9 1.005 130.8	49 41.7 1.005 130.7	51 11.5 1.006 130.5	52 11.3 1.006 130.4	53 11.1 1.005 130.2	54 10.8 1.005 130.1	55 10.6 1.005 129.9	56 40.3 1.005 129.7	6
7	48 38.7 1.005 129.7	49 38.5 1.006 129.6	51 08.3 1.006 129.4	52 08.0 1.006 129.3	53 07.8 1.005 129.2	54 07.6 1.005 129.0	55 07.4 1.006 128.9	56 37.0 1.006 128.6	7
8	48 35.5 1.005 128.7	49 35.3 1.006 128.6	51 05.0 1.006 128.4	52 04.8 1.006 128.2	53 04.6 1.006 128.1	54 04.3 1.006 128.0	55 04.1 1.006 127.8	56 33.7 1.006 127.6	8
9	48 32.2 1.006 127.5	49 32.0 1.006 127.5	51 01.7 1.006 127.3	52 01.5 1.006 127.1	53 01.3 1.006 127.1	54 01.0 1.006 126.9	55 00.8 1.006 126.8	56 30.4 1.006 126.5	9
50	48 28.9 1.006 126.6	49 28.7 1.006 126.5	50 58.3 1.006 126.3	51 58.1 1.006 126.1	52 57.9 1.006 126.0	53 57.6 1.006 125.9	54 57.4 1.006 125.7	56 27.0 1.006 125.4	50
1	48 25.5 1.006 125.6	49 25.3 1.006 125.4	50 54.9 1.006 125.2	51 54.7 1.006 125.1	52 54.5 1.006 125.0	53 54.2 1.006 124.8	54 54.0 1.006 124.6	56 23.6 1.006 124.4	1
2	48 22.0 1.006 124.5	49 21.8 1.006 124.4	50 51.5 1.006 124.2	51 51.3 1.006 124.0	52 51.0 1.006 123.9	53 50.8 1.006 123.7	54 50.5 1.006 123.6	56 20.1 1.006 123.3	2
3	48 18.6 1.006 123.5	49 18.4 1.006 123.3	50 48.0 1.006 123.1	51 47.8 1.006 123.0	52 47.5 1.006 122.9	53 47.3 1.006 122.7	54 47.0 1.006 122.5	56 16.6 1.006 122.3	3
4	48 15.1 1.006 122.4	49 14.8 1.006 122.3	50 44.5 1.006 122.1	51 44.3 1.006 122.0	52 44.0 1.006 121.8	53 43.7 1.006 121.6	54 43.4 1.006 121.5	56 13.0 99 06 121.2	4
55	48 11.5 1.006 121.4	49 11.3 1.006 121.3	50 40.9 1.006 121.1	51 40.7 1.006 120.9	52 40.4 1.006 120.8	53 40.1 1.006 120.6	54 39.9 1.006 120.4	56 09.4 99 06 120.2	55
6	48 07.9 1.006 120.4	49 07.7 1.006 120.2	50 37.3 1.006 120.0	51 37.1 1.006 119.9	52 36.8 1.006 119.7	53 36.5 1.006 119.6	54 36.2 1.006 119.4	56 05.8 99 06 119.1	6
7	48 04.3 1.006 119.3	49 04.1 1.006 119.2	50 33.7 1.006 119.0	51 33.4 1.006 118.8	52 33.2 1.006 118.7	53 32.9 1.006 118.5	54 32.6 99 06 118.3	56 02.1 99 06 118.1	7
8	48 00.6 1.006 118.3	49 00.4 1.006 118.2	50 30.0 1.006 117.9	51 29.7 1.006 117.8	52 29.5 1.006 117.6	53 29.2 1.006 117.5	54 28.9 99 06 117.3	55 58.4 99 06 117.0	8
9	47 56.9 1.006 117.3	48 56.7 1.006 117.1	50 26.3 1.006 116.9	51 26.0 1.006 116.8	52 25.7 1.006 116.6	53 25.4 99 06 116.4	54 25.1 99 06 116.3	55 54.6 99 06 116.0	9
60	47 53.2 1.006 116.2	48 52.9 1.006 116.1	50 22.5 1.006 115.9	51 22.3 1.006 115.7	52 22.0 1.006 115.6	53 21.7 99 06 115.4	54 21.4 99 06 115.2	55 50.9 99 06 114.9	60
1	47 49.4 1.006 115.2	48 49.2 1.006 115.1	50 18.8 1.006 114.8	51 18.5 1.006 114.7	52 18.2 1.006 114.5	53 17.9 99 06 114.4	54 17.6 99 06 114.2	55 47.0 99 06 113.9	1
2	47 45.6 1.006 114.2	48 45.3 1.006 114.0	50 14.9 1.006 113.8	51 14.7 1.006 113.6	52 14.4 99 06 113.5	53 14.0 99 06 113.3	54 13.7 99 06 113.1	55 43.2 99 06 112.9	2
3	47 41.8 1.006 113.1	48 41.5 1.006 113.0	50 11.1 1.006 112.8	51 11.0 99 06 112.6	52 10.5 99 06 112.5	53 10.2 99 06 112.3	54 09.9 99 06 112.1	55 39.3 99 06 111.8	3
4	47 37.9 1.006 112.1	48 37.6 99 06 112.0	50 07.2 99 06 111.7	51 06.9 99 06 111.6	52 06.6 99 06 111.4	53 06.3 99 07 111.3	54 06.0 99 07 111.1	55 35.4 99 07 110.8	4
65	47 34.0 1.007 111.1	48 33.7 1.007 110.9	50 03.3 1.007 110.7	51 03.0 99 07 110.6	52 02.7 99 07 110.4	53 02.4 99 07 110.2	54 02.0 99 07 110.0	55 31.5 99 07 109.8	65
6	47 30.1 1.007 110.1	48 29.8 1.007 109.9	49 59.4 1.007 109.7	50 59.1 99 07 109.5	51 58.8 99 07 109.4	52 58.5 99 07 109.2	53 58.1 99 07 109.0	55 27.6 99 07 108.7	6
7	47 26.2 1.007 109.0	48 25.9 1.007 108.9	49 55.4 1.007 108.7	50 55.1 99 07 108.5	51 54.8 99 07 108.3	52 54.5 99 07 108.2	53 54.1 99 07 108.0	55 23.6 99 07 107.7	7
8	47 22.2 1.007 108.0	48 21.9 1.007 107.9	49 51.5 99 07 107.7	50 51.2 99 07 107.5	51 50.8 99 07 107.3	52 50.5 99 07 107.1	53 50.1 99 07 107.0	55 19.6 99 07 106.7	8
9	47 18.2 1.007 107.0	48 17.9 1.007 106.8	49 47.5 99 07 106.6	50 47.2 99 07 106.5	51 46.8 99 07 106.3	52 46.5 99 07 106.1	53 46.1 99 07 105.9	55 15.6 99 07 105.6	9
70	47 14.2 1.007 106.0	48 13.9 1.007 105.8	49 43.4 99 07 105.6	50 43.1 99 07 105.4	51 42.8 99 07 105.3	52 42.5 99 07 105.1	53 42.1 99 07 104.9	55 11.5 99 07 104.6	70
1	47 10.1 1.007 105.0	48 09.9 1.007 104.8	49 39.4 99 07 104.6	50 39.1 99 07 104.4	51 38.8 99 07 104.3	52 38.4 99 07 104.1	53 38.0 99 07 103.9	55 07.5 99 07 103.6	1
2	47 06.1 1.007 103.9	48 05.8 1.007 103.8	49 35.3 99 07 103.6	50 35.0 99 07 103.4	51 34.7 99 07 103.2	52 34.3 99 07 103.1	53 34.0 99 07 102.9	55 03.4 99 07 102.6	2
3	47 02.0 1.007 102.9	48 01.7 1.007 102.8	49 31.3 99 07 102.5	50 30.9 99 07 102.4	51 30.6 99 07 102.2	52 30.2 99 07 102.0	53 29.9 99 07 101.9	54 59.3 99 07 101.6	3
4	46 57.9 1.007 101.9	47 57.6 99 07 101.8	49 27.2 99 07 101.5	50 26.8 99 07 101.4	51 26.5 99 07 101.2	52 26.2 99 07 101.0	53 25.8 99 07 100.8	54 55.2 99 07 100.5	4
75	46 53.8 1.007 100.9	47 53.5 99 07 100.8	49 23.1 99 07 100.5	50 22.7 99 07 100.4	51 22.4 99 07 100.2	52 22.0 99 07 100.0	53 21.7 99 07 99.8	54 51.1 99 07 99.5	75
6	46 49.7 1.007 99.9	47 49.4 99 07 99.7	49 18.9 99 07 99.5	50 18.6 99 07 99.3	51 18.3 99 07 99.2	52 17.9 99 07 99.0	53 17.5 99 07 98.8	54 46.9 99 07 98.5	6
7	46 45.6 1.007 98.9	47 45.3 99 07 98.7	49 14.8 99 07 98.5	50 14.5 99 07 98.3	51 14.1 99 07 98.2	52 13.8 99 07 98.0	53 13.4 99 07 97.8	54 42.8 99 07 97.5	7
8	46 41.4 1.007 97.9	47 41.1 99 07 97.7	49 10.7 99 07 97.5	50 10.3 99 07 97.3	51 10.0 99 07 97.2	52 09.6 99 07 97.0	53 09.2 99 07 96.8	54 38.6 99 07 96.5	8
9	46 37.3 1.007 96.9	47 37.0 99 07 96.7	49 06.5 99 07 96.5	50 06.2 99 07 96.3	51 05.8 99 07 96.1	52 05.5 99 07 96.0	53 05.1 99 07 95.8	54 34.5 99 07 95.5	9
80	46 33.1 99 07 95.9	47 32.8 99 07 95.7	49 02.3 99 07 95.5	50 02.0 99 07 95.3	51 01.7 99 07 95.1	52 01.3 99 07 95.0	53 00.9 99 07 94.8	54 30.3 99 07 94.5	80
1	46 29.0 99 07 94.9	47 28.7 99 07 94.7	48 58.2 99 07 94.5	49 57.8 99 07 94.3	50 57.5 99 07 94.1	51 57.1 99 07 94.0	52 56.7 99 07 93.8	54 26.1 99 07 93.5	1
2	46 24.8 99 07 93.8	47 24.5 99 07 93.7	48 54.0 99 07 93.4	49 53.7 99 07 93.3	50 53.3 99 07 93.1	51 52.9 99 07 93.0	52 52.5 99 07 92.8	54 21.9 99 07 92.5	2
3	46 20.6 99 07 92.8	47 20.3 99 07 92.7	48 49.8 99 07 92.5	49 49.5 99 07 92.3	50 49.1 99 07 92.1	51 48.8 99 07 92.0	52 48.4 99 07 91.8	54 17.8 99 07 91.5	3
4	46 16.4 99 07 91.8	47 16.1 99 07 91.7	48 45.6 99 07 91.5	49 45.3 99 07 91.3	50 44.9 99 07 91.1	51 44.6 99 07 91.0	52 44.2 99 07 90.8	54 13.6 99 07 90.5	4
85	46 12.3 99 07 90.8	47 11.9 99 07 90.7	48 41.5 99 07 90.5	49 41.1 99 07 90.3	50 40.8 99 07 90.1	51 40.4 99 07 90.0	52 40.0 99 07 89.8	54 09.4 99 07 89.5	85
6	46 08.1 99 07 89.8	47 07.8 99 07 89.7	48 37.3 99 07 89.5	49 36.9 99 07 89.3	50 36.6 99 07 89.1	51 36.2 99 07 89.0	52 35.8 99 07 88.8	54 05.2 99 07 88.5	6
7	46 03.9 99 07 88.9	47 03.6 99 07 88.7	48 33.1 99 07 88.5	49 32.7 99 07 88.3	50 32.4 99 07 88.1	51 32.0 99 07 88.0	52 31.6 99 07 87.8	54 01.0 99 07 87.5	7
8	45 59.7 99 07 87.9	46 59.4 99 07 87.7	48 28.9 99 07 87.5	49 28.6 99 07 87.3	50 28.2 99 07 87.1	51 27.8 99 07 87.0	52 27.5 99 07 86.8	53 56.8 99 07 86.5	8
9	45 55.5 99 07 86.9	46 55.2 99 07 86.7	48 24.7 99 07 86.5	49 24.4 99 07 86.3	50 24.0 99 07 86.2	51 23.7 99 07 86.0	52 23.3 99 07 85.8	53 52.7 99 07 85.5	9
90	45 51.3 99 07 85.9	46 51.0 99 07 85.7	48 20.5 99 07 85.5	49 20.2 99 07 85.3	50 19.9 99 07 85.2	51 19.5 99 07 85.0	52 19.1 99 07 84.8	53 48.5 99 07 84.5	90

Lat. 86°

H.A.	46° 00' Alt.	Δd Δt	Az.	47° 00' Alt.	Δd Δt	Az.	48° 30' Alt.	Δd Δt	Az.	49° 30' Alt.	Δd Δt	Az.	50° 30' Alt.	Δd Δt	Az.	51° 30' Alt.	Δd Δt	Az.	52° 30' Alt.	Δd Δt	Az.	54° 00' Alt.	Δd Δt	Az.	H.A.
91	45 47.2	99 07	84.9	46 46.9	99 07	84.7	48 16.4	99 07	84.5	49 16.0	99 07	84.3	50 15.7	99 07	84.2	51 15.3	99 07	84.0	52 14.9	99 07	83.8	53 44.3	99 07	83.5	91
2	45 43.0	1.007	83.9	46 42.7	99 07	83.7	48 12.2	99 07	83.5	49 11.9	99 07	83.4	50 11.5	99 07	83.2	51 11.2	99 07	83.0	52 10.8	99 07	82.8	53 40.2	99 07	82.5	2
3	45 38.8	1.007	82.9	46 38.5	99 07	82.8	48 08.1	99 07	82.5	49 07.7	99 07	82.4	50 07.4	99 07	82.2	51 07.0	99 07	82.0	52 06.6	99 07	81.8	53 36.0	99 07	81.6	3
4	45 34.7	1.007	81.9	46 34.4	99 07	81.8	48 03.9	99 07	81.5	49 03.6	99 07	81.4	50 03.2	99 07	81.2	51 02.9	99 07	81.0	52 02.5	99 07	80.9	53 31.9	99 07	80.6	4
95	45 30.6	1.007	80.9	46 30.3	99 07	80.8	47 59.8	99 07	80.6	48 59.5	99 07	80.4	49 59.1	99 07	80.2	50 58.7	99 07	80.1	51 58.4	99 07	79.9	53 27.8	99 07	79.6	95
6	45 26.4	1.007	79.9	46 26.1	99 07	79.8	47 55.7	99 07	79.6	48 55.3	99 07	79.4	49 55.0	99 07	79.2	50 54.6	99 07	79.1	51 54.3	99 07	78.9	53 23.7	99 07	78.6	6
7	45 22.3	1.007	79.0	46 22.0	99 07	78.8	47 51.6	99 07	78.6	48 51.2	99 07	78.4	49 50.9	99 07	78.3	50 50.5	99 07	78.1	51 50.2	99 07	77.9	53 19.6	99 07	77.6	7
8	45 18.2	1.007	78.0	46 17.9	99 07	77.8	47 47.5	99 07	77.6	48 47.1	99 07	77.4	49 46.8	99 07	77.3	50 46.4	99 07	77.1	51 46.1	99 07	76.9	53 15.5	99 07	76.7	8
9	45 14.1	1.007	77.0	46 13.8	1.007	76.8	47 43.4	99 07	76.6	48 43.1	99 07	76.5	49 42.7	99 07	76.3	50 42.4	99 07	76.1	51 42.0	99 07	76.0	53 11.4	99 07	75.7	9
100	45 10.1	1.007	76.0	46 09.8	1.007	75.9	47 39.3	99 07	75.6	48 39.0	99 07	75.5	49 38.7	99 07	75.3	50 38.3	99 07	75.2	51 38.0	99 07	75.0	53 07.4	99 07	74.7	100
1	45 06.0	1.007	75.0	46 05.7	1.007	74.9	47 35.3	99 07	74.7	48 35.0	99 07	74.5	49 34.6	99 07	74.4	50 34.3	99 07	74.2	51 33.9	99 07	74.0	53 03.4	99 07	73.7	1
2	45 02.0	1.007	74.0	46 01.7	1.007	73.9	47 31.2	99 07	73.7	48 30.9	99 07	73.5	49 30.6	99 07	73.4	50 30.3	99 07	73.2	51 29.9	99 07	73.0	52 59.3	99 07	72.8	2
3	44 58.0	1.007	73.1	45 57.7	1.007	72.9	47 27.2	99 07	72.7	48 26.9	99 07	72.6	49 26.6	99 07	72.4	50 26.3	99 07	72.2	51 25.9	99 07	72.1	52 55.4	99 07	71.8	3
4	44 54.0	1.007	72.1	45 53.7	1.007	72.0	47 23.2	99 07	71.7	48 22.9	99 07	71.6	49 22.6	99 07	71.4	50 22.3	99 07	71.3	51 21.9	99 07	71.1	52 51.4	99 07	70.8	4
105	44 50.0	1.007	71.1	45 49.7	1.007	71.0	47 19.3	1.007	70.8	48 19.0	99 07	70.6	49 18.7	99 07	70.5	50 18.3	99 07	70.3	51 18.0	99 07	70.1	52 47.5	99 07	69.9	105
6	44 46.0	1.007	70.1	45 45.8	1.007	70.0	47 15.3	1.007	69.8	48 15.0	99 07	69.6	49 14.7	99 06	69.5	50 14.4	99 07	69.3	51 14.1	99 06	69.2	52 43.5	99 06	68.9	6
7	44 42.1	1.006	69.2	45 41.9	1.006	69.0	47 11.4	1.006	68.8	48 11.1	99 06	68.7	49 10.8	99 06	68.5	50 10.5	99 06	68.4	51 10.2	99 06	68.2	52 39.6	99 06	67.9	7
8	44 38.2	1.006	68.2	45 38.0	1.006	68.1	47 07.5	1.006	67.9	48 07.2	1.006	67.7	49 06.9	99 06	67.6	50 06.6	99 06	67.4	51 06.3	99 06	67.2	52 35.8	99 06	67.0	8
9	44 34.4	1.006	67.2	45 34.1	1.006	67.1	47 03.7	1.006	66.9	48 03.4	1.006	66.7	49 03.1	99 06	66.6	50 02.8	99 06	66.4	51 02.5	99 06	66.3	52 31.9	99 06	66.0	9
110	44 30.5	1.006	66.3	45 30.2	1.006	66.1	46 59.8	1.006	65.9	47 59.6	1.006	65.8	48 59.3	99 06	65.6	49 59.0	99 06	65.5	50 58.6	99 06	65.3	52 28.1	99 06	65.0	110
1	44 26.7	1.006	65.3	45 26.4	1.006	65.2	46 56.0	1.006	64.9	47 55.8	1.006	64.8	48 55.5	1.006	64.7	49 55.2	99 06	64.5	50 54.9	99 06	64.3	52 24.4	99 06	64.1	1
2	44 22.9	1.006	64.3	45 22.7	1.006	64.2	46 52.3	1.006	64.0	47 52.0	1.006	63.8	48 51.7	1.006	63.7	49 51.4	99 06	63.5	50 51.1	99 06	63.4	52 20.6	99 06	63.1	2
3	44 19.1	1.006	63.3	45 18.9	1.006	63.2	46 48.5	1.006	63.0	47 48.2	1.006	62.9	48 48.0	1.006	62.7	49 47.7	1.006	62.6	50 47.4	99 06	62.4	52 16.9	99 06	62.2	3
4	44 15.4	1.006	62.4	45 15.2	1.006	62.3	46 44.8	1.006	62.1	47 44.5	1.006	61.9	48 44.3	1.006	61.8	49 44.0	1.006	61.6	50 43.7	99 06	61.5	52 13.2	99 06	61.2	4
115	44 11.7	1.006	61.4	45 11.5	1.006	61.3	46 41.1	1.006	61.1	47 40.9	1.006	61.0	48 40.6	1.006	60.8	49 40.3	1.006	60.7	50 40.0	1.006	60.5	52 09.6	99 06	60.3	115
6	44 08.1	1.006	60.5	45 07.8	1.006	60.3	46 37.5	1.006	60.1	47 37.2	1.006	60.0	48 37.0	1.006	59.9	49 36.7	1.006	59.7	50 36.4	1.006	59.6	52 05.9	99 06	59.3	6
7	44 04.4	1.006	59.5	45 04.2	1.006	59.4	46 33.9	1.006	59.2	47 33.6	1.006	59.0	48 33.4	1.006	58.9	49 33.1	1.006	58.8	50 32.8	1.006	58.6	52 02.4	99 06	58.4	7
8	44 00.9	1.006	58.5	45 00.6	1.006	58.4	46 30.3	1.006	58.2	47 30.0	1.006	58.1	48 29.8	1.006	57.9	49 29.5	1.006	57.8	50 29.2	1.006	57.7	51 58.8	99 06	57.4	8
9	43 57.3	1.006	57.6	44 57.1	1.006	57.4	46 26.7	1.006	57.3	47 26.5	1.006	57.1	48 26.2	1.006	57.0	49 26.0	1.006	56.8	50 25.7	1.006	56.7	51 55.3	1.006	56.5	9
120	43 53.8	1.006	56.6	44 53.6	1.006	56.5	46 23.2	1.006	56.3	47 23.0	1.006	56.2	48 22.8	1.006	56.0	49 22.5	1.006	55.9	50 22.2	1.006	55.7	51 51.8	1.006	55.5	120
1	43 50.3	1.006	55.6	44 50.1	1.006	55.5	46 19.8	1.006	55.3	47 19.6	1.006	55.2	48 19.3	1.006	55.1	49 19.1	1.006	54.9	50 18.8	1.006	54.8	51 48.4	1.006	54.6	1
2	43 46.9	1.006	54.7	44 46.7	1.006	54.6	46 16.4	1.006	54.4	47 16.1	1.006	54.3	48 15.9	1.006	54.1	49 15.7	1.006	54.0	50 15.4	1.006	53.9	51 45.0	1.006	53.6	2
3	43 43.5	1.006	53.7	44 43.3	1.006	53.6	46 13.0	1.006	53.3	47 12.8	1.006	53.2	48 12.5	1.006	53.2	49 12.3	1.006	53.0	50 12.0	1.006	52.9	51 41.7	1.006	52.7	3
4	43 40.1	1.006	52.8	44 39.9	1.006	52.7	46 09.6	1.006	52.5	47 09.4	1.005	52.4	48 09.2	1.005	52.2	49 09.0	1.005	52.1	50 08.7	1.005	52.0	51 38.4	1.005	51.7	4
125	43 36.8	1.005	51.8	44 36.6	1.005	51.7	46 06.3	1.005	51.5	47 06.1	1.005	51.4	48 05.9	1.005	51.3	49 05.7	1.005	51.1	50 05.5	1.005	51.0	51 35.1	1.005	50.8	125
6	43 33.6	1.005	50.9	44 33.4	1.005	50.7	46 03.1	1.005	50.6	47 02.9	1.005	50.5	48 02.7	1.005	50.3	49 02.5	1.005	50.2	50 02.2	1.005	50.1	51 31.9	1.005	49.9	6
7	43 30.3	1.005	49.9	44 30.2	1.005	49.8	45 59.9	1.005	49.6	46 59.7	1.005	49.5	47 59.5	1.005	49.4	48 59.3	1.005	49.3	49 59.0	1.005	49.1	51 28.7	1.005	48.9	7
8	43 27.2	1.005	48.9	44 27.0	1.005	48.8	45 56.7	1.005	48.7	46 56.5	1.005	48.6	47 56.3	1.005	48.4	48 56.1	1.005	48.3	49 55.9	1.005	48.2	51 25.6	1.005	48.0	8
9	43 24.0	1.005	48.0	44 23.9	1.005	47.9	45 53.6	1.005	47.7	46 53.4	1.005	47.6	47 53.2	1.005	47.5	48 53.0	1.005	47.4	49 52.8	1.005	47.2	51 22.5	1.005	47.0	9
130	43 20.9	1.005	47.0	44 20.8	1.005	46.9	45 50.5	1.005	46.8	46 50.3	1.005	46.7	47 50.1	1.005	46.5	48 50.0	1.005	46.4	49 49.8	1.005	46.3	51 19.4	1.005	46.1	130
1	43 17.9	1.005	46.1	44 17.7	1.005	46.0	45 47.5	1.005	45.8	46 47.3	1.005	45.7	47 47.1	1.005	45.6	48 46.9	1.005	45.5	49 46.7	1.005	45.4	51 16.4	1.005	45.2	1
2	43 14.9	1.005	45.1	44 14.8	1.005	45.0	45 44.5	1.005	44.9	46 44.3	1.005	44.8	47 44.2	1.005	44.7	48 44.0	1.005	44.5	49 43.8	1.005	44.4	51 13.5	1.005	44.2	2
3	43 12.0	1.005	44.2	44 11.8	1.005	44.1	45 41.6	1.005	43.9	46 41.4	1.005	43.8	47 41.3	1.004	43.7	48 41.1	1.004	43.6	49 40.9	1.004	43.5	51 10.6	1.005	43.3	3
4	43 09.1	1.005	43.2	44 08.9	1.005	43.1	45 38.7	1.005	43.0	46 38.5	1.005	42.9	47 38.4	1.004	42.8	48 38.2	1.004	42.7	49 38.0	1.004	42.5	51 07.8	1.005	42.4	4
135	43 06.2	1.005	42.3	44 06.1	1.005	42.2	45 35.9	1.005	42.0	46 35.7	1.005	41.9	47 35.6	1.005	41.8	48 35.4	1.005	41.7	49 35.2	1.004	41.6	51 05.0	1.005	41.4	135
6	43 03.4	1.005	41.3	44 03.3	1.005	41.2	45 33.1	1.005	41.1	46 33.0	1.005	41.0	47 32.8	1.005	40.9	48 32.6	1.005	40.8	49 32.5	1.004	40.7	51 02.2	1.004	40.5	6
7	43 00.7	1.005	40.4	44 00.6	1.005	40.3	45 30.4	1.004	40.2	46 30.2	1.004	40.1	47 30.1	1.004	40.0	48 29.9	1.004	39.8	49 29.8	1.004	39.7	50 59.5	1.004	39.6	7
8	42 58.0	1.004	39.4	43 57.9	1.004	39.3	45 27.7	1.004	39.2	46 27.6	1.004	39.1	47 27.4	1.004	39.0	48 27.3	1.004	38.9	49 27.1	1.004	38.8	50 56.9	1.004	38.6	8
9	42 55.4	1.004	38.5	43 55.3	1.004	38.4	45 25.1	1.004	38.3	46 25.0	1.004	38.2	47 24.8	1.004	38.1	48 24.7	1.004	38.0	49 24.5	1.004	37.9	50 54.3	1.004	37.7	9
140	42 52.8	1.004	37.5	43 52.7	1.004	37.5	45 22.5	1.004	37.3	46 22.4	1.004	37.2	47 22.3	1.004	37.1	48 22.1	1.004	37.0	49 22.0	1.004	36.9	50 51.8	1.004	36.8	140
1	42 50.3	1.004	36.6	43 50.2	1.004	36.5	45 20.0	1.004	36.4	46 19.9	1.004	36.3	47 19.8	1.004	36.2	48 19.6	1.004	36.1	49 19.5	1.004	36.0	50 49.3	1.004	35.8	1
2	42 47.8	1.004	35.7	43 47.7	1.004	35.6	45 17.4	1.004	35.4	46 17.4	1.004	35.4	47 17.3	1.004	35.3	48 17.2	1.004	35.2	49 17.1	1.004	35.1	50 46.9	1.004	34.9	2
3	42 45.4	1.004	34.7	43 45.3	1.004	34.6	45 15.2	1.004	34.5	46 15.0	1.004	34.4	47 14.9	1.004	34.3	48 14.8	1.004	34.2	49 14.7	1.004	34.1	50 44.5	1.004	34.0	3
4	42 43.1	1.004	33.8	43 43.0	1.004	33.7	45 12.8	1.004	33.6	46 12.7	1.004	33.5	47 12.6	1.004	33.4	48 12.5	1.004	33.3	49 12.4	1.004	33.2	50 42.2	1.004	33.1	4
145	42 40.8	1.004	32.8	43 40.7	1.004	32.7	45 10.5	1.004	32.6	46 10.4	1.004	32.5	47 10.3	1.004	32.5	48 10.2	1.004	32.4	49 10.1	1.004	32.3	50 39.9	1.004	32.1	145
6	42 38.5	1.004	31.9	43 38.4	1.004	31.8	45 08.2	1.004	31.7	46 08.2	1.004	31.6	47 08.1	1.004	31.5	48 08.0	1.004	31.4	49 07.9	1.004	31.3	50 37.7	1.004	31.2	6
7	42 36.3	1.004	30.9	43 36.3	1.004	30.9	45 06.1	1.004	30.7	46 06.0	1.004	30.7	47 05.9	1.004	30.6	48 05.9	1.003	30.5	49 05.8	1.003	30.4	50 35.6	1.003	30.3	7
8	42 34.2	1.003	30.0	43 34.1	1.003	29.9	45 04.0	1.003	29.8	46 03.9	1.003	29.7	47 03.8	1.003	29.7	48 03.8	1.003	29.6	49 03.7	1.003	29.5	50 33.5	1.003	29.4	8
9	42 32.2	1.003	29.0	43 32.1	1.003	29.0	45 02.0	1.003	28.9	46 01.9	1.003	28.8	47 01.8	1.003	28.7	48 01.7	1.003	28.6	49 01.6	1.003	28.6	50 31.5	1.003	28.4	9
150	42 30.2	1.003	28.1	43 30.1	1.003	28.0	45 00.0	1.003	27.9	45 59.9	1.003	27.9	46 59.8	1.003	27.8	47 59.7	1.003	27.7	48 59.7	1.003	27.6	50 29.5	1.003	27.5	150
1	42 28.2	1.003	27.2	43 28.1	1.003	27.1	44 58.0	1.003	27.0	45 58.0	1.003	26.9	46 57.9	1.003	26.9	47 57.8	1.003	26.7	48 57.8	1.003	26.7	50 27.7	1.003	26.6	1
2	42 26.3	1.003	26.2	43 26.3	1.003	26.2	44 56.2	1.003	26.1	45 56.1	1.003	26.0	46 56.0	1.003	25.9	47 56.0	1.003	25.9	48 55.9	1.003	25.8	50 25.8	1.003	25.7	2
3	42 24.5	1.003	25.3	43 24.5	1.003	25.2	44 54.4	1.003	25.1	45 54.3	1.003	25.1	46 54.2	1.003	25.0	47 54.2	1.003	24.9	48 54.1	1.003	24.9	50 24.0	1.003	24.7	3
4	42 22.8	1.003	24.3	43 22.7	1.003	24.3	44 52.6	1.003	24.2	45 52.6	1.003	24.1	46 52.5	1.003	24.1	47 52.4	1.003	24.0	48 52.4	1.003	23.9	50 22.3	1.003	23.8	4
155	42 21.1	1.003	23.4	43 21.0	1.003	23.4	44 50.9	1.003	23.3	45 50.9	1.003	23.2	46 50.8	1.003	23.1	47 50.8	1.003	23.1	48 50.7	1.003	23.0	50 20.6	1.003	22.9	155
6	42 19.4	1.003	22.5	43 19.4	1.003	22.4	44 49.3	1.003	22.3	45 49.3	1.003	22.3	46 49.2	1.003	22.2	47 49.2	1.003	22.2	48 49.1	1.003	22.1	50 19.0	1.003	22.0	6
7	42 17.9	1.003	21.5	43 17.8	1.002	21.5	44 47.8	1.002	21.4	45 47.7	1.002	21.3	46 47.7	1.002	21.3	47 47.6	1.002	21.2	48 47.6	1.002	21.2	50 17.5	1.002	21.1	7
8	42 16.4	1.002	20.6	43 16.3	1.002	20.5	44 46.3	1.002	20.5	45 46.2	1.002	20.4	46 46.2	1.002	20.4	47 46.1	1.002	20.3	48 46.1	1.002	20.2	50 16.0	1.002	20.1	8
9	42 14.9	1.002	19.7	43 14.9	1.002	19.6	44 44.8	1.002	19.5	45 44.8	1.002	19.5	46 44.8	1.002	19.4	47 44.7	1.002	19.4	48 44.7	1.002	19.3	50 14.6	1.002	19.2	9
160	42 13.5	1.002	18.7	43 13.5	1.002	18.7	44 43.5	1.002	18.6	45 43.4	1.002	18.6	46 43.4	1.002	18.5	47 43.4	1.002	18.5	48 43.3	1.002	18.4	50 13.3	1.002	18.3	160
1	42 12.2	1.002	17.8	43 12.2	1.002	17.7	44 42.2	1.002	17.7	45 42.1	1.002	17.6	46 42.1	1.002	17.6	47 42.1	1.002	17.5	48 42.0	1.002	17.5	50 12.0	1.002	17.4	1
2	42 11.0	1.002	16.8	43 11.0	1.002	16.8	44 40.9	1.002	16.7	45 40.9	1.002	16.7	46 40.9	1.002	16.6	47 40.8	1.002	16.6	48 40.8	1.002	16.6	50 10.8	1.002	16.5	2
3	42 09.8	1.002	15.9	43 09.8	1.002	15.9	44 39.7	1.002	15.8	45 39.7	1.002	15.8	46 39.7	1.002	15.7	47 39.7	1.002	15.7	48 39.6	1.002	15.6	50 09.6	1.002	15.6	3
4	42 08.7	1.002	15.0	43 08.7	1.002	14.9	44 38.6	1.002	14.9	45 38.6	1.002	14.8	46 38.6	1.002	14.8	47 38.6	1.002	14.8	48 38.5	1.002	14.7	50 08.5	1.002	14.6	4
165	42 07.6	1.002	14.0	43 07.6	1.002	13.9	44 37.6	1.002	13.9	45 37.6	1.002	13.9	46 37.6	1.002	13.9	47 37.5	1.002	13.8	48 37.5	1.002	13.8	50 07.5	1.002	13.7	165
6	42 06.7	1.002	13.1	43 06.6	1.002	13.1	44 36.6	1.002	13.0	45 36.6	1.002	13.0	46 36.6	1.002	12.9	47 36.6	1.002	12.9	48 36.6	1.002	12.9	50 06.6	1.001	12.8	6
7	42 05.7	1.001	12.2	43 05.7	1.001	12.1	44 35.7	1.001	12.1	45 35.7	1.001	12.1	46 35.7	1.001	12.0	47 35.7	1.001	12.0	48 35.7	1.001	11.9	50 05.6	1.001	11.9	7
8	42 04.9	1.001	11.2	43 04.9	1.001	11.2	44 34.9	1.001	11.2	45 34.9	1.001	11.1	46 34.8	1.001	11.1	47 34.8	1.001	11.1	48 34.8	1.001	11.0	50 04.8	1.001	11.0	8
9	42 04.1	1.001	10.3	43 04.1	1.001	10.3	44 34.1	1.001	10.2	45 34.1	1.001	10.2	46 34.1	1.001	10.2	47 34.1	1.001	10.1	48 34.0	1.001	10.1	50 04.0	1.001	10.1	9
170	42 03.4	1.001	09.4	43 03.4	1.001	09.3	44 33.4	1.001	09.3	45 33.4	1.001	09.3	46 33.4	1.001	09.2	47 33.4	1.001	09.2	48 33.3	1.001	09.2	50 03.3	1.001	09.1	170
1	42 02.8	1.001	08.4	43 02.8	1.001	08.4	44 32.7	1.001	08.4	45 32.7	1.001	08.3	46 32.7	1.001	08.3	47 32.7	1.001	08.3	48 32.7	1.001	08.3	50 02.7	1.001	08.2	1
2	42 02.2	1.001	07.5	43 02.2	1.001	07.5	44 32.2	1.001	07.4	45 32.2	1.001	07.4	46 32.2	1.001	07.4	47 32.2	1.001	07.4	48 32.1	1.001	07.4	50 02.1	1.001	07.3	2
3	42 01.7	1.001	06.5	43 01.7	1.001	06.5	44 31.7	1.001	06.5	45 31.7	1.001	06.5	46 31.7	1.001	06.5	47 31.6	1.001	06.5	48 31.6	1.001	06.4	50 01.6	1.001	06.4	3
4	42 01.2	1.001	05.6	43 01.2	1.001	05.6	44 31.2	1.001	05.6	45 31.2	1.001	05.6	46 31.2	1.001	05.5	47 31.2	1.001	05.5	48 31.2	1.001	05.5	50 01.2	1.001	05.5	4
175	42 00.9	1.000	04.7	43 00.9	1.000	04.7	44 30.8	1.000	04.6	45 30.8	1.000	04.6	46 30.8	1.000	04.6	47 30.8	1.000	04.6	48 30.8	1.000	04.6	50 00.8	1.000	04.6	175
6	42 00.5	1.000	03.7	43 00.5	1.000	03.7	44 30.5	1.000	03.7	45 30.5	1.000	03.7	46 30.5	1.000	03.7	47 30.5	1.000	03.7	48 30.5	1.000	03.7	50 00.5	1.000	03.7	6
7	42 00.3	1.000	02.8	43 00.3	1.000	02.8	44 30.3	1.000	02.8	45 30.3	1.000	02.8	46 30.3	1.000	02.8	47 30.3	1.000	02.8	48 30.3	1.000	02.8	50 00.3	1.000	02.7	7
8	42 00.1	1.000	01.9	43 00.1	1.000	01.9	44 30.1	1.000	01.9	45 30.1	1.000	01.9	46 30.1	1.000	01.8	47 30.1	1.000	01.8	48 30.1	1.000	01.8	50 00.1	1.000	01.8	8
9	42 00.1	1.000	00.9	43 00.1	1.000	00.9	44 30.1	1.000	00.9	45 30.1	1.000	00.9	46 30.1	1.000	00.9	47 30.1	1.000	00.9	48 30.1	1.000	00.9	50 00.1	1.000	00.9	9
180	42 00.0	1.000	00.0	43 00.0	1.000	00.0	44 30.0	1.000	00.0	45 30.0	1.000	00.0	46 30.0	1.000	00.0	47 30.0	1.000	00.0	48 30.0	1.000	00.0	50 00.0	1.000	00.0	180

Lat. 87°

Lat. 88°

Lat. 89°

Lat. 86°

H.A.	54° 30' Alt.	Δd Δt	Az.	55° 00' Alt.	Δd Δt	Az.	56° 00' Alt.	Δd Δt	Az.	56° 30' Alt.	Δd Δt	Az.	57° 00' Alt.	Δd Δt	Az.	57° 30' Alt.	Δd Δt	Az.	59° 00' Alt.	Δd Δt	Az.	59° 30' Alt.	Δd Δt	Az.	H.A.
00	58 30.0	1.000	180.0	59 00.0	1.000	180.0	60 00.0	1.000	180.0	60 30.0	1.000	180.0	61 00.0	1.000	180.0	61 30.0	1.000	180.0	63 00.0	1.000	180.0	63 30.0	1.000	180.0	00
1	58 30.0	1.000	178.9	59 00.0	1.000	178.9	60 00.0	1.000	178.9	60 30.0	1.000	178.9	61 00.0	1.000	178.9	61 30.0	1.000	178.9	63 00.0	1.000	178.9	63 30.0	1.000	178.9	1
2	58 29.8	1.000	177.8	58 59.8	1.000	177.8	59 59.8	1.000	177.8	60 29.8	1.000	177.8	60 59.8	1.000	177.7	61 29.8	1.000	177.7	62 59.6	1.000	177.7	63 29.8	1.000	177.7	2
3	58 29.6	1.000	176.7	58 59.6	1.000	176.7	59 59.6	1.000	176.7	60 29.6	1.000	176.6	60 59.6	1.000	176.6	61 29.6	1.000	176.6	62 59.6	1.000	176.6	63 29.6	1.000	176.6	3
4	58 29.4	1.001	175.6	58 59.4	1.001	175.5	59 59.3	1.001	175.5	60 29.3	1.001	175.5	60 59.3	1.001	175.5	61 29.3	1.001	175.5	62 59.3	1.001	175.5	63 29.3	1.001	175.5	4
05	58 29.0	1.001	174.4	58 59.0	1.001	174.4	59 59.0	1.001	174.4	60 29.0	1.001	174.4	60 59.0	1.001	174.4	61 29.0	1.001	174.4	62 59.0	1.001	174.3	63 29.0	1.001	174.3	05
6	58 28.5	1.001	173.3	58 58.5	1.001	173.3	59 58.5	1.001	173.3	60 28.5	1.001	173.3	60 58.5	1.001	173.3	61 28.5	1.001	173.2	62 58.5	1.001	173.2	63 28.5	1.001	173.2	6
7	58 28.0	1.001	172.2	58 58.0	1.001	172.2	59 58.0	1.001	172.2	60 28.0	1.001	172.2	60 58.0	1.001	172.1	61 28.0	1.001	172.1	62 58.0	1.001	172.1	63 28.0	1.001	172.0	7
8	58 27.4	1.001	171.1	58 57.4	1.001	171.1	59 57.4	1.001	171.1	60 27.4	1.001	171.0	60 57.4	1.001	171.0	61 27.4	1.001	171.0	62 57.4	1.001	170.9	63 27.3	1.001	170.9	8
9	58 26.7	1.001	170.0	58 56.7	1.001	170.0	59 56.7	1.001	169.9	60 26.7	1.001	169.9	60 56.7	1.001	169.9	61 26.7	1.001	169.9	62 56.7	1.001	169.8	63 26.6	1.001	169.8	9
10	58 26.0	1.001	168.9	58 55.9	1.001	168.9	59 55.9	1.001	168.8	60 25.9	1.001	168.8	60 55.9	1.001	168.8	61 25.9	1.001	168.7	62 55.9	1.001	168.7	63 25.9	1.001	168.6	10
1	58 25.1	1.002	167.8	58 55.1	1.002	167.8	59 55.1	1.002	167.7	60 25.1	1.002	167.7	60 55.1	1.002	167.7	61 25.1	1.002	167.6	62 55.0	1.002	167.5	63 25.0	1.002	167.5	1
2	58 24.2	1.002	166.7	58 54.2	1.002	166.7	59 54.1	1.002	166.6	60 24.1	1.002	166.6	60 54.1	1.002	166.5	61 24.1	1.002	166.5	62 54.1	1.002	166.4	63 24.0	1.002	166.4	2
3	58 23.2	1.002	165.6	58 53.2	1.002	165.5	59 53.1	1.002	165.5	60 23.1	1.002	165.4	60 53.1	1.002	165.4	61 23.1	1.002	165.4	62 53.0	1.002	165.3	63 23.0	1.002	165.2	3
4	58 22.1	1.002	164.5	58 52.1	1.002	164.4	59 52.0	1.002	164.4	60 22.0	1.002	164.3	60 52.0	1.002	164.3	61 22.0	1.002	164.3	62 51.9	1.002	164.1	63 21.9	1.002	164.1	4
15	58 20.9	1.002	163.4	58 50.9	1.002	163.3	59 50.9	1.002	163.3	60 20.9	1.002	163.2	60 50.8	1.002	163.2	61 20.8	1.002	163.1	62 50.8	1.002	163.0	63 20.7	1.002	163.0	15
6	58 19.7	1.002	162.3	58 49.7	1.002	162.2	59 49.6	1.002	162.1	60 19.6	1.002	162.1	60 49.6	1.002	162.1	61 19.6	1.002	162.0	62 49.5	1.002	161.9	63 19.5	1.002	161.8	6
7	58 18.4	1.002	161.1	58 48.4	1.002	161.1	59 48.3	1.002	161.0	60 18.3	1.002	161.0	60 48.3	1.002	160.9	61 18.2	1.002	160.9	62 48.2	1.002	160.8	63 18.1	1.002	160.7	7
8	58 17.0	1.002	160.0	58 47.0	1.002	160.0	59 46.9	1.002	159.9	60 16.9	1.002	159.9	60 46.9	1.002	159.8	61 16.8	1.002	159.8	62 46.7	1.002	159.6	63 16.7	1.002	159.6	8
9	58 15.5	1.003	158.9	58 45.5	1.003	158.9	59 45.4	1.003	158.8	60 15.4	1.003	158.8	60 45.4	1.003	158.7	61 15.3	1.003	158.7	62 45.2	1.003	158.5	63 15.2	1.003	158.5	9
20	58 14.0	1.003	157.8	58 44.0	1.003	157.8	59 43.9	1.003	157.7	60 13.9	1.003	157.7	60 43.8	1.003	157.6	61 13.8	1.003	157.6	62 43.7	1.003	157.4	63 13.6	1.003	157.3	20
1	58 12.4	1.003	156.7	58 42.3	1.003	156.7	59 42.2	1.003	156.6	60 12.2	1.003	156.5	60 42.2	1.003	156.5	61 12.2	1.003	156.4	62 42.0	1.003	156.3	63 12.0	1.003	156.2	1
2	58 10.7	1.003	155.6	58 40.6	1.003	155.6	59 40.6	1.003	155.5	60 10.5	1.003	155.4	60 40.5	1.003	155.4	61 10.4	1.003	155.3	62 40.3	1.003	155.1	63 10.3	1.003	155.1	2
3	58 08.9	1.003	154.5	58 38.9	1.003	154.5	59 38.8	1.003	154.4	60 08.7	1.003	154.3	60 38.7	1.003	154.3	61 08.7	1.003	154.2	62 38.5	1.003	154.0	63 08.5	1.003	154.0	3
4	58 07.1	1.003	153.4	58 37.0	1.003	153.4	59 36.9	1.003	153.3	60 06.9	1.003	153.2	60 36.8	1.003	153.2	61 06.8	1.003	153.1	62 36.6	1.003	152.9	63 06.6	1.003	152.8	4
25	58 05.2	1.003	152.3	58 35.1	1.003	152.3	59 35.0	1.003	152.2	60 05.0	1.003	152.1	60 34.9	1.003	152.1	61 04.9	1.003	152.0	62 34.7	1.003	151.8	63 04.6	1.003	151.7	25
6	58 03.2	1.003	151.2	58 33.1	1.003	151.2	59 33.0	1.003	151.1	60 03.0	1.003	151.0	60 32.9	1.003	150.9	61 02.9	1.003	150.9	62 32.7	1.003	150.7	63 02.6	1.003	150.6	6
7	58 01.1	1.004	150.1	58 31.1	1.004	150.1	59 31.0	1.004	150.0	60 00.9	1.004	149.9	60 30.9	1.004	149.8	61 00.8	1.004	149.8	62 30.6	1.004	149.6	63 00.5	1.004	149.5	7
8	57 59.0	1.004	149.1	58 29.0	1.004	149.0	59 28.9	1.004	148.9	59 58.8	1.004	148.8	60 28.7	1.004	148.7	60 58.7	1.004	148.7	62 28.4	1.004	148.5	62 58.4	1.004	148.4	8
9	57 56.8	1.004	148.0	58 26.8	1.004	147.9	59 26.7	1.004	147.8	59 56.6	1.004	147.7	60 26.5	1.004	147.6	60 56.4	1.004	147.6	62 26.2	1.004	147.3	62 56.1	1.004	147.3	9
30	57 54.6	1.004	146.9	58 24.5	1.004	146.8	59 24.4	1.004	146.7	59 54.3	1.004	146.6	60 24.2	1.004	146.5	60 54.2	1.004	146.5	62 23.9	1.004	146.2	62 53.8	1.004	146.2	30
1	57 52.3	1.004	145.8	58 22.2	1.004	145.7	59 22.1	1.004	145.6	59 52.0	1.004	145.5	60 21.9	1.004	145.4	60 51.8	1.004	145.4	62 21.6	1.004	145.1	62 51.5	1.004	145.0	1
2	57 49.9	1.004	144.7	58 19.8	1.004	144.6	59 19.7	1.004	144.5	59 49.6	1.004	144.4	60 19.5	1.004	144.3	60 49.4	1.004	144.3	62 19.1	1.004	144.0	62 49.0	1.004	143.9	2
3	57 47.4	1.004	143.6	58 17.4	1.004	143.5	59 17.2	1.004	143.4	59 47.1	1.004	143.3	60 17.0	1.004	143.2	60 46.9	1.004	143.2	62 16.6	1.004	142.9	62 46.5	1.004	142.8	3
4	57 44.9	1.004	142.5	58 14.8	1.004	142.4	59 14.6	1.004	142.3	59 44.6	1.004	142.2	60 14.4	1.004	142.1	60 44.4	1.004	142.1	62 14.1	1.004	141.8	62 44.0	1.004	141.7	4
35	57 42.3	1.004	141.4	58 12.3	1.004	141.4	59 12.1	1.004	141.2	59 42.0	1.004	141.1	60 11.9	1.004	141.1	60 41.8	1.004	141.0	62 11.5	1.004	140.7	62 41.4	1.004	140.6	35
6	57 39.7	1.004	140.3	58 09.6	1.004	140.3	59 09.4	1.005	140.1	59 39.3	1.005	140.0	60 09.2	1.005	140.0	60 39.1	1.005	139.9	62 08.8	1.005	139.6	62 38.7	1.005	139.5	6
7	57 37.0	1.005	139.3	58 06.9	1.005	139.2	59 06.7	1.005	139.0	59 36.6	1.005	139.0	60 06.5	1.005	138.9	60 36.4	1.005	138.8	62 06.0	1.005	138.5	62 35.9	1.005	138.4	7
8	57 34.2	1.005	138.2	58 04.1	1.005	138.1	59 03.9	1.005	138.0	59 33.8	1.005	137.9	60 03.7	1.005	137.8	60 33.6	1.005	137.7	62 03.2	1.005	137.4	62 33.1	1.005	137.3	8
9	57 31.4	1.005	137.1	58 01.3	1.005	137.0	59 01.1	1.005	136.9	59 31.0	1.005	136.8	60 00.9	1.005	136.7	60 30.8	1.005	136.6	62 00.3	1.005	136.3	62 30.2	1.005	136.2	9
40	57 28.5	1.005	136.0	57 58.4	1.005	136.0	58 58.2	1.005	135.8	59 28.1	1.005	135.7	59 58.0	1.005	135.6	60 27.9	1.005	135.5	61 57.5	1.005	135.2	62 27.4	1.005	135.1	40
1	57 25.6	1.005	135.0	57 55.5	1.005	134.9	58 55.3	1.005	134.7	59 25.1	1.005	134.6	59 55.0	1.005	134.5	60 24.9	1.005	134.4	61 54.5	1.005	134.1	62 24.3	1.005	134.0	1
2	57 22.6	1.005	133.9	57 52.5	1.005	133.8	58 52.3	1.005	133.6	59 22.1	1.005	133.5	59 52.0	1.005	133.5	60 21.9	1.005	133.4	61 51.5	1.005	133.1	62 21.3	99 05	133.0	2
3	57 19.6	1.005	132.8	57 49.5	1.005	132.7	58 49.2	1.005	132.5	59 19.1	1.005	132.5	59 48.9	1.005	132.4	60 18.8	1.005	132.3	61 48.4	99 05	132.0	62 18.2	99 05	131.9	3
4	57 16.5	1.005	131.7	57 46.4	1.005	131.7	58 46.1	1.005	131.5	59 16.0	1.005	131.4	59 45.8	1.005	131.3	60 15.7	1.005	131.2	61 45.2	99 05	130.9	62 15.1	99 05	130.8	4
45	57 13.3	1.005	130.7	57 43.2	1.005	130.6	58 42.9	1.005	130.4	59 12.8	1.005	130.3	59 42.7	1.005	130.2	60 12.5	1.005	130.1	61 42.0	99 05	129.8	62 11.9	99 05	129.7	45
6	57 10.1	1.005	129.6	57 40.0	1.005	129.5	58 39.7	1.005	129.3	59 09.6	1.005	129.2	59 39.4	1.005	129.1	60 09.3	99 05	129.0	61 38.8	99 05	128.7	62 08.6	99 05	128.6	6
7	57 06.9	1.005	128.5	57 36.7	1.005	128.5	58 36.5	1.005	128.3	59 06.3	1.005	128.2	59 36.2	1.005	128.1	60 06.0	99 05	128.0	61 35.5	99 05	127.7	62 05.3	99 05	127.5	7
8	57 03.6	1.005	127.5	57 33.4	1.005	127.4	58 33.2	99 05	127.1	59 03.2	99 05	127.1	59 32.8	99 05	127.0	60 02.7	99 05	126.9	61 32.2	99 05	126.6	62 02.0	99 05	126.5	8
9	57 00.2	1.005	126.4	57 30.1	1.005	126.3	58 29.8	99 05	126.1	58 59.6	99 05	126.0	59 29.5	99 05	125.9	59 59.3	99 05	125.8	61 28.8	99 05	125.5	61 58.6	99 05	125.4	9
50	56 56.8	1.005	125.4	57 26.7	1.005	125.3	58 26.4	99 05	125.1	58 56.2	99 05	125.0	59 26.1	99 05	124.9	59 55.9	99 05	124.8	61 25.4	99 05	124.4	61 55.2	99 05	124.3	50
1	56 53.4	1.005	124.3	57 23.3	99 05	124.2	58 22.9	99 05	124.0	58 52.8	99 05	123.9	59 22.6	99 05	123.8	59 52.4	99 05	123.7	61 21.9	99 05	123.4	61 51.7	99 05	123.2	1
2	56 49.9	99 05	123.2	57 19.8	99 05	123.1	58 19.5	99 05	122.9	58 49.3	99 05	122.8	59 19.1	99 05	122.7	59 48.9	99 05	122.6	61 18.4	99 05	122.3	61 48.2	99 05	122.2	2
3	56 46.4	99 05	122.2	57 16.2	99 05	122.1	58 15.9	99 05	121.8	58 45.8	99 05	121.8	59 15.6	99 05	121.7	59 45.4	99 05	121.6	61 14.8	99 05	121.2	61 44.6	99 05	121.1	3
4	56 42.8	99 05	121.1	57 12.7	99 05	121.0	58 12.3	99 05	120.8	58 42.2	99 05	120.7	59 12.0	99 05	120.6	59 41.8	99 05	120.5	61 11.2	99 05	120.2	61 41.0	99 05	120.0	4
55	56 39.2	99 05	120.1	57 09.1	99 05	120.0	58 08.7	99 05	119.8	58 38.6	99 05	119.7	59 08.4	99 05	119.6	59 38.2	99 05	119.5	61 07.6	99 05	119.1	61 37.4	99 05	119.0	55
6	56 35.6	99 05	119.0	57 05.4	99 05	118.9	58 05.1	99 05	118.7	58 34.9	99 05	118.6	59 04.7	99 05	118.5	59 34.5	99 05	118.4	61 03.9	99 05	118.1	61 33.7	99 05	117.9	6
7	56 31.9	99 05	118.0	57 01.8	99 05	117.9	58 01.4	99 05	117.7	58 31.2	99 05	117.6	59 01.0	99 05	117.5	59 30.8	99 05	117.4	61 00.2	99 05	117.0	61 30.0	99 05	116.9	7
8	56 28.2	99 05	116.9	56 58.0	99 05	116.8	57 57.7	99 05	116.6	58 27.5	99 05	116.5	58 57.3	99 05	116.4	59 27.1	99 05	116.3	60 56.4	99 05	115.9	61 26.2	99 05	115.8	8
9	56 24.5	99 05	115.9	56 54.3	99 05	115.8	57 53.9	99 05	115.6	58 23.7	99 05	115.5	58 53.5	99 05	115.4	59 23.3	99 05	115.3	60 52.7	99 05	114.9	61 22.4	99 05	114.8	9
60	56 20.7	99 06	114.8	56 50.5	99 06	114.7	57 50.1	99 06	114.5	58 19.9	99 06	114.4	58 49.7	99 06	114.3	59 19.5	99 06	114.2	60 48.9	99 06	113.8	61 18.6	99 06	113.7	60
1	56 16.9	99 06	113.8	56 46.7	99 06	113.7	57 46.3	99 06	113.5	58 16.1	99 06	113.4	58 45.9	99 06	113.3	59 15.7	99 06	113.2	60 45.0	99 06	112.7	61 14.8	99 06	112.7	1
2	56 13.0	99 06	112.8	56 42.8	99 06	112.7	57 42.4	99 06	112.5	58 12.2	99 06	112.3	58 42.0	99 06	112.2	59 11.8	99 06	112.1	60 41.1	99 06	111.7	61 10.9	99 07	111.6	2
3	56 09.1	99 06	111.7	56 39.0	99 06	111.6	57 38.6	99 06	111.4	58 08.4	99 06	111.3	58 38.1	99 06	111.2	59 07.9	99 06	111.1	60 37.2	99 06	110.7	61 07.0	99 07	110.6	3
4	56 05.2	99 07	110.7	56 35.1	99 07	110.6	57 34.6	99 07	110.4	58 04.4	99 07	110.3	58 34.2	99 07	110.2	59 04.0	99 07	110.0	60 33.3	99 07	109.7	61 03.1	99 07	109.5	4
65	56 01.3	99 07	109.7	56 31.1	99 07	109.6	57 30.7	99 07	109.3	58 00.5	99 07	109.2	58 30.3	99 07	109.1	59 00.1	99 07	109.0	60 29.4	99 07	108.6	60 59.1	99 07	108.5	65
6	55 57.4	99 07	108.6	56 27.2	99 07	108.5	57 26.8	99 07	108.3	57 56.5	99 07	108.2	58 26.3	99 07	108.1	58 56.1	99 07	108.0	60 25.4	99 07	107.6	60 55.1	99 07	107.5	6
7	55 53.4	99 07	107.6	56 23.2	99 07	107.5	57 22.8	99 07	107.3	57 52.6	99 07	107.2	58 22.3	99 07	107.1	58 52.1	99 07	106.9	60 21.4	99 07	106.6	60 51.1	99 07	106.4	7
8	55 49.4	99 07	106.6	56 19.2	99 07	106.5	57 18.8	99 07	106.3	57 48.5	99 07	106.1	58 18.3	99 07	106.0	58 48.1	99 07	105.9	60 17.4	99 07	105.5	60 47.1	99 07	105.4	8
9	55 45.4	99 07	105.5	56 15.2	99 07	105.4	57 14.7	99 07	105.2	57 44.5	99 07	105.1	58 14.3	99 07	105.0	58 44.0	99 07	104.9	60 13.3	99 07	104.5	60 43.0	99 07	104.4	9
70	55 41.3	99 07	104.5	56 11.1	99 07	104.4	57 10.6	99 07	104.2	57 40.5	99 07	104.1	58 10.2	99 07	104.0	58 40.0	99 07	103.9	60 09.2	99 07	103.9	60 39.0	99 07	103.3	70
1	55 37.3	99 07	103.5	56 07.1	99 07	103.4	57 06.6	99 07	103.2	57 36.4	99 07	103.1	58 06.2	99 07	102.9	58 35.9	99 07	102.8	60 05.2	99 07	102.4	60 34.9	99 07	102.3	1
2	55 33.2	99 07	102.5	56 03.0	99 07	102.4	57 02.5	99 07	102.2	57 32.3	99 07	102.0	58 02.1	99 07	101.9	58 31.8	99 07	101.8	60 01.1	99 07	101.4	60 30.8	99 07	101.3	2
3	55 29.1	99 07	101.5	55 58.9	99 07	101.4	56 58.4	99 07	101.1	57 28.2	99 07	101.0	57 58.0	99 07	100.9	58 27.7	99 07	100.8	59 57.0	99 07	100.4	60 26.7	99 07	100.3	3
4	55 25.0	99 07	100.4	55 54.8	99 07	100.3	56 54.3	99 07	100.1	57 24.1	99 07	100.0	57 53.9	99 07	99.9	58 23.6	99 07	99.8	59 52.9	99 07	99.4	60 22.6	99 07	99.3	4
75	55 20.9	99 07	99.4	55 50.6	99 07	99.3	56 50.2	99 07	99.1	57 20.0	99 07	99.0	57 49.7	99 07	98.9	58 19.5	99 07	98.8	59 48.7	99 07	98.4	60 18.4	99 07	98.2	75
6	55 16.7	99 07	98.4	55 46.5	99 07	98.3	56 46.1	99 07	98.1	57 15.8	99 07	98.0	57 45.6	99 07	97.9	58 15.3	99 07	97.7	59 44.6	99 07	97.4	60 14.3	99 07	97.2	6
7	55 12.6	99 07	97.4	55 42.4	99 07	97.3	56 41.9	99 07	97.1	57 11.7	99 07	97.0	57 41.4	99 07	96.8	58 11.2	99 07	96.7	59 40.4	99 07	96.3	60 10.1	99 07	96.2	7
8	55 08.4	99 07	96.4	55 38.2	99 07	96.1	56 37.8	99 07	96.1	57 07.5	99 07	96.0	57 37.3	99 07	95.7	58 07.0	99 07	95.7	59 36.2	99 07	95.3	60 06.0	99 07	95.2	8
9	55 04.3	99 07	95.4	55 34.0	99 07	95.3	56 33.6	99 07	95.1	57 03.4	99 07	94.9	57 33.1	99 07	94.8	58 02.9	99 07	94.7	59 32.1	99 07	94.3	60 01.8	99 07	94.2	9
80	55 00.1	99 07	94.4	55 29.9	99 07	94.3	56 29.4	99 07	94.1	56 59.2	99 07	93.9	57 28.9	99 07	93.8	57 58.7	99 07	93.7	59 27.9	99 07	93.3	59 57.6	99 07	93.2	80
1	54 55.9	99 07	93.4	55 25.7	99 07	93.3	56 25.2	99 07	93.1	56 55.0	99 07	92.9	57 24.8	99 07	92.8	57 54.5	99 07	92.7	59 23.7	99 07	92.3	59 53.4	99 07	92.2	1
2	54 51.7	99 07	92.4	55 21.5	99 07	92.3	56 21.1	99 07	92.0	56 50.8	99 07	91.9	57 20.6	99 07	91.8	57 50.3	99 07	91.7	59 19.5	99 07	91.3	59 49.3	99 07	91.2	2
3	54 47.5	99 07	91.4	55 17.3	99 07	91.3	56 16.9	99 07	91.0	56 46.6	99 07	90.9	57 16.4	99 07	90.8	57 46.1	99 07	90.7	59 15.3	99 07	90.3	59 45.1	99 07	90.2	3
4	54 43.4	99 07	90.4	55 13.1	99 07	90.3	56 12.7	99 07	90.0	56 42.4	99 07	89.9	57 12.2	99 07	89.8	57 42.0	99 07	89.7	59 11.2	99 07	89.3	59 40.9	99 07	89.2	4
85	54 39.2	99 07	89.4	55 09.0	99 07	89.3	56 08.5	99 07	89.1	56 38.3	99 07	88.9	57 08.0	99 07	88.8	57 37.8	99 07	88.7	59 07.0	99 07	88.3	59 36.7	99 07	88.2	85
6	54 35.0	99 07	88.4	55 04.8	99 07	88.3	56 04.3	99 07	88.1	56 34.1	99 07	87.9	57 03.8	99 07	87.8	57 33.6	99 07	87.7	59 02.8	99 07	87.3	59 32.5	99 07	87.2	6
7	54 30.8	99 07	87.4	55 00.6	99 07	87.3	56 00.1	99 07	87.1	56 29.9	99 07	87.0	56 59.7	99 07	86.8	57 29.4	99 07	86.7	58 58.6	99 07	86.3	59 28.3	99 07	86.2	7
8	54 26.6	99 07	86.4	54 56.4	99 07	86.3	55 56.0	99 07	86.1	56 25.7	99 07	86.0	56 55.5	99 07	85.8	57 25.2	99 07	85.7	58 54.4	99 07	85.4	59 24.2	99 07	85.2	8
9	54 22.5	99 07	85.4	54 52.2	99 07	85.3	55 51.8	99 07	85.1	56 21.5	99 07	85.0	56 51.3	99 07	84.9	57 21.0	99 07	84.7	58 50.3	99 07	84.4	59 20.0	99 07	84.2	9
90	54 18.3	99 07	84.4	54 48.1	99 07	84.3	55 47.6	99 07	84.1	56 17.4	99 07	84.0	56 47.1	99 07	83.9	57 16.9	99 07	83.8	58 46.1	99 07	83.4	59 15.8	99 07	83.2	90

Lat. 86°

H.A.	54° 30' Alt. Δd Δt Az.	55° 00' Alt. Δd Δt Az.	56° 00' Alt. Δd Δt Az.	56° 30' Alt. Δd Δt Az.	57° 00' Alt. Δd Δt Az.	57° 30' Alt. Δd Δt Az.	59° 00' Alt. Δd Δt Az.	59° 30' Alt. Δd Δt Az.	H.A.
91	54 14.1 99 07 88.4	54 43.9 99 07 83.3	55 43.5 99 07 83.1	56 13.2 99 07 83.0	56 43.0 99 07 82.9	57 12.7 99 07 82.8	58 42.0 99 07 82.4	59 11.7 99 07 82.3	91
2	54 10.0 99 07 82.4	54 39.8 99 07 82.3	55 39.3 99 07 82.1	56 09.1 99 07 82.0	56 38.8 99 07 81.9	57 08.6 99 07 81.8	58 37.8 99 07 81.4	59 07.5 99 07 81.3	2
3	54 05.8 99 07 81.5	54 35.6 99 07 81.4	55 35.2 99 07 81.1	56 04.9 99 07 81.0	56 34.7 99 07 80.9	57 04.5 99 07 80.8	58 33.7 99 07 80.4	59 03.4 99 07 80.3	3
4	54 01.7 99 07 80.5	54 31.5 99 07 80.4	55 31.0 99 07 80.2	56 00.8 99 07 80.1	56 30.6 99 07 79.9	57 00.3 99 07 79.8	58 29.6 99 07 79.5	58 59.3 99 07 79.3	4
95	53 57.6 99 07 79.5	54 27.4 99 07 79.4	55 26.9 99 07 79.2	55 56.7 99 07 79.1	56 26.5 99 07 79.0	56 56.2 99 07 78.8	58 25.5 99 07 78.5	58 55.2 99 07 78.4	95
6	53 53.5 99 07 78.5	54 23.3 99 07 78.4	55 22.8 99 07 78.2	55 52.6 99 07 78.1	56 22.4 99 07 78.0	56 52.1 99 07 77.9	58 21.4 99 07 77.5	58 51.1 99 07 77.4	6
7	53 49.4 99 07 77.5	54 19.2 99 07 77.4	55 18.7 99 07 77.2	55 48.5 99 07 77.1	56 18.3 99 07 77.0	56 48.0 99 07 76.9	58 17.3 99 07 76.5	58 47.0 99 07 76.4	7
8	53 45.3 99 07 76.6	54 15.1 99 07 76.5	55 14.7 99 07 76.3	55 44.4 99 07 76.1	56 14.2 99 07 76.0	56 44.0 99 07 75.9	58 13.2 99 07 75.6	58 43.0 99 07 75.4	8
9	53 41.2 99 07 75.6	54 11.0 99 07 75.5	55 10.6 99 07 75.3	55 40.4 99 07 75.2	56 10.1 99 07 75.1	56 39.9 99 07 75.0	58 09.2 99 07 74.6	58 38.9 99 07 74.5	9
100	53 37.2 99 07 74.6	54 07.0 99 07 74.5	55 06.6 99 07 74.3	55 36.3 99 07 74.2	56 06.1 99 07 74.1	56 35.9 99 07 74.0	58 05.1 99 07 73.6	58 34.9 99 07 73.5	100
1	53 33.2 99 07 73.6	54 03.0 99 07 73.5	55 02.5 99 07 73.3	55 32.3 99 07 73.2	56 02.1 99 07 73.1	56 31.9 99 07 73.0	58 01.1 99 07 72.7	58 30.9 99 07 72.5	1
2	53 29.2 99 07 72.7	53 59.0 99 07 72.6	54 58.5 99 07 72.4	55 28.3 99 07 72.3	55 58.1 99 07 72.2	56 27.9 99 07 72.0	57 57.2 99 07 71.7	58 26.9 99 07 71.6	2
3	53 25.2 99 07 71.7	53 55.0 99 07 71.6	54 54.6 99 07 71.4	55 24.3 99 07 71.3	55 54.1 99 07 71.2	56 23.9 99 07 71.1	57 53.2 99 07 70.7	58 22.9 99 07 70.6	3
4	53 21.2 99 07 70.7	53 51.0 99 07 70.6	54 50.6 99 07 70.4	55 20.4 99 07 70.3	55 50.2 99 07 70.2	56 20.0 99 07 70.1	57 49.3 99 07 69.8	58 19.0 99 08 69.7	4
105	53 17.3 99 06 69.8	53 47.1 99 06 69.7	54 46.7 99 06 69.5	55 16.5 99 06 69.4	55 46.2 99 06 69.3	56 16.0 99 06 69.2	57 45.3 99 06 68.8	58 15.1 99 06 68.7	105
6	53 13.4 99 06 68.8	53 43.2 99 06 68.7	54 42.8 99 06 68.5	55 12.6 99 06 68.4	55 42.4 99 06 68.3	56 12.1 99 06 68.2	57 41.5 99 06 67.9	58 11.2 99 06 67.7	6
7	53 09.5 99 06 67.8	53 39.3 99 06 67.7	54 38.9 99 06 67.6	55 08.7 99 06 67.5	55 38.5 99 06 67.3	56 08.3 99 06 67.2	57 37.6 99 06 66.9	58 07.4 99 06 66.8	7
8	53 05.6 99 06 66.9	53 35.4 99 06 66.8	54 35.0 99 06 66.6	55 04.8 99 06 66.5	55 34.6 99 06 66.4	56 04.4 99 06 66.3	57 33.8 99 06 66.0	58 03.5 99 06 65.8	8
9	53 01.8 99 06 65.9	53 31.6 99 06 65.8	54 31.2 99 06 65.6	55 01.0 99 06 65.5	55 30.8 99 06 65.4	56 00.6 99 06 65.3	57 29.9 99 06 65.0	57 59.7 99 06 64.9	9
110	52 58.0 99 06 65.0	53 27.8 99 06 64.9	54 27.4 99 06 64.7	54 57.2 99 06 64.6	55 27.0 99 06 64.5	55 56.8 99 06 64.4	57 26.2 99 06 64.1	57 55.9 99 06 63.9	110
1	52 54.2 99 06 64.0	53 24.0 99 06 63.9	54 23.6 99 06 63.7	54 53.4 99 06 63.6	55 23.2 99 06 63.5	55 53.0 99 06 63.4	57 22.4 99 06 63.1	57 52.2 99 06 63.0	1
2	52 50.4 99 06 63.0	53 20.3 99 06 63.0	54 19.9 99 06 62.8	54 49.7 99 06 62.7	55 19.5 99 06 62.6	55 49.3 99 06 62.5	57 18.7 99 06 62.2	57 48.5 99 06 62.0	2
3	52 46.7 99 06 62.1	53 16.5 99 06 62.0	54 16.2 99 06 61.8	54 46.0 99 06 61.7	55 15.8 99 06 61.6	55 45.6 99 06 61.5	57 15.0 99 06 61.2	57 44.8 99 06 61.1	3
4	52 43.0 99 06 61.1	53 12.9 99 06 61.0	54 12.5 99 06 60.9	54 42.3 99 06 60.8	55 12.1 99 06 60.7	55 42.0 99 06 60.6	57 11.4 99 06 60.3	57 41.2 99 06 60.2	4
115	52 39.4 99 06 60.2	53 09.2 99 06 60.1	54 08.9 99 06 59.9	54 38.7 99 06 59.8	55 08.5 99 06 59.7	55 38.3 99 06 59.6	57 07.7 99 06 59.3	57 37.5 99 06 59.2	115
6	52 35.8 99 06 59.2	53 05.6 99 06 59.1	54 05.3 99 06 59.0	54 35.1 99 06 58.9	55 04.9 99 06 58.8	55 34.7 99 06 58.7	57 04.2 99 06 58.4	57 34.0 99 06 58.3	6
7	52 32.2 99 06 58.3	53 02.0 99 06 58.2	54 01.7 99 06 58.0	54 31.5 99 06 57.9	55 01.4 99 06 57.8	55 31.2 99 06 57.7	57 00.6 99 06 57.4	57 30.4 99 06 57.3	7
8	52 28.7 99 06 57.3	52 58.5 99 06 57.2	53 58.2 99 06 57.1	54 28.0 99 06 57.0	54 57.8 99 06 56.9	55 27.7 99 06 56.8	56 57.1 99 06 56.5	57 26.9 99 06 56.4	8
9	52 25.2 99 06 56.4	52 55.0 99 06 56.3	53 54.7 99 06 56.1	54 24.5 99 06 56.0	54 54.4 99 06 56.0	55 24.2 99 06 55.9	56 53.6 99 06 55.6	57 23.4 99 06 55.5	9
120	52 21.7 1.00 6 55.4	52 51.5 99 06 55.4	53 51.2 99 06 55.2	54 21.1 99 06 55.1	54 50.9 99 06 55.0	55 20.7 99 06 54.9	56 50.2 99 06 54.6	57 20.0 99 06 54.5	120
1	52 18.3 1.00 6 54.5	52 48.1 1.00 6 54.4	53 47.8 99 06 54.2	54 17.7 99 06 54.2	54 47.5 99 06 54.1	55 17.3 99 06 54.0	56 46.8 99 06 53.7	57 16.6 99 06 53.6	1
2	52 14.9 1.00 6 53.5	52 44.7 1.00 6 53.5	53 44.4 99 06 53.3	54 14.3 99 06 53.2	54 44.1 99 06 53.1	55 14.0 99 06 53.0	56 43.5 99 06 52.8	57 13.3 99 06 52.7	2
3	52 11.5 1.00 6 52.6	52 41.4 1.00 6 52.5	53 41.1 1.00 6 52.4	54 11.0 1.00 6 52.4	54 40.8 99 05 52.2	55 10.6 99 05 52.1	56 40.2 99 05 51.8	57 10.0 99 05 51.7	3
4	52 08.2 1.00 5 51.7	52 38.1 1.00 5 51.6	53 37.8 1.00 6 51.4	54 07.7 1.00 5 51.3	54 37.5 99 05 51.3	55 07.4 99 05 51.2	56 36.9 99 05 50.9	57 06.7 99 05 50.8	4
125	52 05.0 1.00 5 50.7	52 34.8 1.00 5 50.6	53 34.6 1.00 5 50.5	54 04.4 1.00 5 50.4	54 34.3 1.00 5 50.3	55 04.1 1.00 5 50.2	56 33.7 99 05 50.0	57 03.5 99 05 49.9	125
6	52 01.7 1.00 5 49.8	52 31.6 1.00 5 49.7	53 31.3 1.00 5 49.5	54 01.2 1.00 5 49.5	54 31.1 1.00 5 49.4	55 00.9 1.00 5 49.3	56 30.5 99 05 49.0	57 00.3 99 05 48.9	6
7	51 58.6 1.00 5 48.8	52 28.4 1.00 5 48.8	53 28.2 1.00 5 48.6	53 58.1 1.00 5 48.5	54 27.7 1.00 5 48.4	54 57.8 1.00 5 48.4	56 27.3 99 05 48.1	56 57.2 99 05 48.0	7
8	51 55.4 1.00 5 47.9	52 25.3 1.00 5 47.8	53 25.1 1.00 5 47.7	53 54.9 1.00 5 47.6	54 24.8 1.00 5 47.5	54 54.7 1.00 5 47.4	56 24.2 1.00 5 47.2	56 54.1 1.00 5 47.1	8
9	51 52.4 1.00 5 47.0	52 22.2 1.00 5 46.9	53 22.0 1.00 5 46.7	53 51.9 1.00 5 46.7	54 21.7 1.00 5 46.6	54 51.6 1.00 5 46.5	56 21.2 1.00 5 46.3	56 51.1 1.00 5 46.2	9
130	51 49.3 1.00 5 46.0	52 19.2 1.00 5 46.0	53 19.0 1.00 5 45.8	53 48.9 1.00 5 45.7	54 18.7 1.00 5 45.7	54 48.6 1.00 5 45.6	56 18.2 1.00 5 45.3	56 48.1 1.00 5 45.2	130
1	51 46.3 1.00 5 45.1	52 16.2 1.00 5 45.0	53 16.0 1.00 5 44.9	53 45.9 1.00 5 44.8	54 15.8 1.00 5 44.7	54 45.6 1.00 5 44.7	56 15.2 1.00 5 44.4	56 45.1 1.00 5 44.3	1
2	51 43.4 1.00 5 44.2	52 13.3 1.00 5 44.1	53 13.1 1.00 5 43.9	53 43.0 1.00 5 43.9	54 12.8 1.00 5 43.8	54 42.7 1.00 5 43.7	56 12.3 1.00 5 43.5	56 42.2 1.00 5 43.4	2
3	51 40.5 1.00 5 43.2	52 10.4 1.00 5 43.2	53 10.2 1.00 5 43.0	53 40.1 1.00 5 42.9	54 10.0 1.00 5 42.9	54 39.8 1.00 5 42.8	56 09.5 1.00 5 42.6	56 39.4 1.00 5 42.5	3
4	51 37.7 1.00 5 42.3	52 07.6 1.00 5 42.2	53 07.4 1.00 5 42.1	53 37.2 1.00 5 42.0	54 07.1 1.00 5 41.9	54 37.0 1.00 5 41.9	56 06.7 1.00 5 41.6	56 36.6 1.00 5 41.6	4
135	51 34.9 1.00 5 41.4	52 04.8 1.00 5 41.3	53 04.6 1.00 5 41.2	53 34.5 1.00 5 41.1	54 04.4 1.00 5 41.0	54 34.3 1.00 5 40.9	56 03.9 1.00 4 40.7	56 33.8 1.00 4 40.6	135
6	51 32.1 1.00 4 40.4	52 02.0 1.00 4 40.4	53 01.8 1.00 4 40.2	53 31.7 1.00 4 40.2	54 01.6 1.00 4 40.1	54 31.5 1.00 4 40.0	56 01.2 1.00 4 39.8	56 31.1 1.00 4 39.7	6
7	51 29.4 1.00 4 39.5	51 59.4 1.00 4 39.4	52 59.2 1.00 4 39.3	53 29.1 1.00 4 39.2	53 59.0 1.00 4 39.2	54 28.9 1.00 4 39.1	55 58.6 1.00 4 38.9	56 28.5 1.00 4 38.8	7
8	51 26.8 1.00 4 38.6	51 56.7 1.00 4 38.5	52 56.5 1.00 4 38.4	53 26.5 1.00 4 38.3	53 56.4 1.00 4 38.3	54 26.3 1.00 4 38.2	55 56.0 1.00 4 38.0	56 25.9 1.00 4 37.9	8
9	51 24.2 1.00 4 37.6	51 54.1 1.00 4 37.6	52 54.0 1.00 4 37.5	53 23.9 1.00 4 37.4	53 53.8 1.00 4 37.3	54 23.7 1.00 4 37.3	55 53.4 1.00 4 37.1	56 23.3 1.00 4 37.0	9
140	51 21.7 1.00 4 36.7	51 51.6 1.00 4 36.7	52 51.5 1.00 4 36.5	53 21.4 1.00 4 36.5	53 51.3 1.00 4 36.4	54 21.2 1.00 4 36.3	55 50.9 1.00 4 36.1	56 20.8 1.00 4 36.1	140
1	51 19.2 1.00 4 35.8	51 49.1 1.00 4 35.7	52 49.0 1.00 4 35.6	53 18.9 1.00 4 35.6	53 48.8 1.00 4 35.5	54 18.7 1.00 4 35.4	55 48.5 1.00 4 35.2	56 18.4 1.00 4 35.2	1
2	51 16.8 1.00 4 34.9	51 46.7 1.00 4 34.8	52 46.6 1.00 4 34.7	53 16.5 1.00 4 34.6	53 46.4 1.00 4 34.6	54 16.3 1.00 4 34.5	55 46.1 1.00 4 34.3	56 16.0 1.00 4 34.2	2
3	51 14.4 1.00 4 33.9	51 44.4 1.00 4 33.9	52 44.2 1.00 4 33.8	53 14.2 1.00 4 33.7	53 44.1 1.00 4 33.6	54 14.0 1.00 4 33.6	55 43.8 1.00 4 33.4	56 13.7 1.00 4 33.3	3
4	51 12.1 1.00 4 33.0	51 42.1 1.00 4 33.0	52 41.9 1.00 4 32.8	53 11.9 1.00 4 32.7	53 41.8 1.00 4 32.7	54 11.7 1.00 4 32.7	55 41.5 1.00 4 32.5	56 11.4 1.00 4 32.4	4
145	51 09.9 1.00 4 32.1	51 39.8 1.00 4 32.0	52 39.7 1.00 4 31.9	53 09.6 1.00 4 31.9	53 39.6 1.00 4 31.8	54 09.5 1.00 4 31.8	55 39.3 1.00 4 31.6	56 09.2 1.00 4 31.5	145
6	51 07.7 1.00 4 31.2	51 37.6 1.00 4 31.1	52 37.5 1.00 4 31.0	53 07.4 1.00 4 31.0	53 37.4 1.00 4 30.9	54 07.3 1.00 4 30.8	55 37.1 1.00 4 30.7	56 07.0 1.00 4 30.6	6
7	51 05.5 1.00 3 30.2	51 35.5 1.00 3 30.2	52 35.4 1.00 3 30.1	53 05.3 1.00 3 30.0	53 35.3 1.00 3 30.0	54 05.2 1.00 3 29.9	55 35.0 1.00 3 29.8	56 04.9 1.00 3 29.7	7
8	51 03.5 1.00 3 29.3	51 33.4 1.00 3 29.3	52 33.3 1.00 3 29.2	53 03.2 1.00 3 29.1	53 33.2 1.00 3 29.1	54 03.1 1.00 3 29.0	55 32.9 1.00 3 28.8	56 02.9 1.00 3 28.8	8
9	51 01.4 1.00 3 28.4	51 31.4 1.00 3 28.3	52 31.3 1.00 3 28.3	53 01.2 1.00 3 28.2	53 31.2 1.00 3 28.2	54 01.1 1.00 3 28.1	55 31.0 1.00 3 27.9	56 00.9 1.00 3 27.9	9
150	50 59.5 1.00 3 27.5	51 29.4 1.00 3 27.4	52 29.3 1.00 3 27.3	52 59.3 1.00 3 27.3	53 29.2 1.00 3 27.2	53 59.2 1.00 3 27.2	55 29.0 1.00 3 27.0	55 59.0 1.00 3 27.0	150
1	50 57.6 1.00 3 26.5	51 27.5 1.00 3 26.5	52 27.4 1.00 3 26.4	52 57.4 1.00 3 26.4	53 27.4 1.00 3 26.3	53 57.3 1.00 3 26.3	55 27.2 1.00 3 26.1	55 57.1 1.00 3 26.1	1
2	50 55.7 1.00 3 25.6	51 25.7 1.00 3 25.6	52 25.6 1.00 3 25.5	52 55.6 1.00 3 25.5	53 25.5 1.00 3 25.4	53 55.5 1.00 3 25.4	55 25.3 1.00 3 25.2	55 55.3 1.00 3 25.2	2
3	50 53.8 1.00 3 24.7	51 23.9 1.00 3 24.7	52 23.8 1.00 3 24.6	52 53.8 1.00 3 24.5	53 23.8 1.00 3 24.5	53 53.7 1.00 3 24.5	55 23.6 1.00 3 24.3	55 53.5 1.00 3 24.3	3
4	50 52.2 1.00 3 23.8	51 22.2 1.00 3 23.8	52 22.1 1.00 3 23.7	52 52.1 1.00 3 23.6	53 22.1 1.00 3 23.6	53 52.0 1.00 3 23.5	55 21.9 1.00 3 23.4	55 51.8 1.00 3 23.4	4
155	50 50.6 1.00 3 22.9	51 20.6 1.00 3 22.8	52 20.5 1.00 3 22.8	52 50.4 1.00 3 22.7	53 20.4 1.00 3 22.7	53 50.4 1.00 3 22.6	55 20.3 1.00 3 22.5	55 50.2 1.00 3 22.5	155
6	50 49.0 1.00 3 22.0	51 19.0 1.00 3 21.9	52 18.9 1.00 3 21.8	52 48.9 1.00 3 21.8	53 18.8 1.00 3 21.7	53 48.8 1.00 3 21.7	55 18.7 1.00 3 21.6	55 48.7 1.00 3 21.6	6
7	50 47.5 1.00 2 21.0	51 17.4 1.00 2 21.0	52 17.4 1.00 2 20.9	52 47.3 1.00 2 20.9	53 17.3 1.00 2 20.8	53 47.3 1.00 2 20.8	55 17.2 1.00 2 20.7	55 47.1 1.00 2 20.7	7
8	50 46.0 1.00 2 20.1	51 16.0 1.00 2 20.1	52 15.9 1.00 2 20.0	52 45.9 1.00 2 20.0	53 15.9 1.00 2 19.9	53 45.8 1.00 2 19.9	55 15.7 1.00 2 19.8	55 45.7 1.00 2 19.8	8
9	50 44.6 1.00 2 19.2	51 14.6 1.00 2 19.2	52 14.5 1.00 2 19.1	52 44.5 1.00 2 19.1	53 14.5 1.00 2 19.0	53 44.4 1.00 2 19.0	55 14.3 1.00 2 18.9	55 44.3 1.00 2 18.8	9
160	50 43.2 1.00 2 18.3	51 13.2 1.00 2 18.3	52 13.2 1.00 2 18.2	52 43.1 1.00 2 18.2	53 13.1 1.00 2 18.1	53 43.1 1.00 2 18.1	55 13.0 1.00 2 18.0	55 43.0 1.00 2 17.9	160
1	50 42.0 1.00 2 17.4	51 11.9 1.00 2 17.3	52 11.9 1.00 2 17.3	52 41.9 1.00 2 17.2	53 11.9 1.00 2 17.2	53 41.8 1.00 2 17.2	55 11.8 1.00 2 17.1	55 41.7 1.00 2 17.0	1
2	50 40.7 1.00 2 16.5	51 10.7 1.00 2 16.4	52 10.7 1.00 2 16.4	52 40.7 1.00 2 16.3	53 10.6 1.00 2 16.3	53 40.6 1.00 2 16.3	55 10.6 1.00 2 16.2	55 40.5 1.00 2 16.1	2
3	50 39.6 1.00 2 15.5	51 09.6 1.00 2 15.5	52 09.5 1.00 2 15.5	52 39.5 1.00 2 15.4	53 09.5 1.00 2 15.4	53 39.5 1.00 2 15.4	55 09.4 1.00 2 15.3	55 39.4 1.00 2 15.3	3
4	50 38.5 1.00 2 14.6	51 08.5 1.00 2 14.6	52 08.4 1.00 2 14.5	52 38.4 1.00 2 14.5	53 08.4 1.00 2 14.5	53 38.4 1.00 2 14.5	55 08.4 1.00 2 14.4	55 38.3 1.00 2 14.4	4
165	50 37.5 1.00 2 13.7	51 07.5 1.00 2 13.7	52 07.4 1.00 2 13.6	52 37.4 1.00 2 13.6	53 07.4 1.00 2 13.6	53 37.4 1.00 2 13.6	55 07.3 1.00 2 13.5	55 37.3 1.00 2 13.5	165
6	50 36.4 1.00 2 12.8	51 06.5 1.00 2 12.8	52 06.5 1.00 2 12.7	52 36.5 1.00 2 12.7	53 06.5 1.00 2 12.7	53 36.4 1.00 1 12.7	55 06.4 1.00 1 12.6	55 36.4 1.00 1 12.6	6
7	50 35.6 1.00 1 11.9	51 05.6 1.00 1 11.9	52 05.6 1.00 1 11.8	52 35.6 1.00 1 11.8	53 05.6 1.00 1 11.8	53 35.6 1.00 1 11.8	55 05.5 1.00 1 11.7	55 35.5 1.00 1 11.7	7
8	50 34.8 1.00 1 11.0	51 04.8 1.00 1 10.9	52 04.8 1.00 1 10.9	52 34.8 1.00 1 10.9	53 04.7 1.00 1 10.9	53 34.7 1.00 1 10.8	55 04.7 1.00 1 10.8	55 34.7 1.00 1 10.8	8
9	50 34.0 1.00 1 10.0	51 04.0 1.00 1 10.0	52 04.0 1.00 1 10.0	52 34.0 1.00 1 10.0	53 04.0 1.00 1 10.0	53 34.0 1.00 1 09.9	55 04.0 1.00 1 09.9	55 34.0 1.00 1 09.9	9
170	50 33.3 1.00 1 09.1	51 03.3 1.00 1 09.1	52 03.3 1.00 1 09.1	52 33.3 1.00 1 09.1	53 03.3 1.00 1 09.1	53 33.3 1.00 1 09.0	55 03.3 1.00 1 09.0	55 33.3 1.00 1 09.0	170
1	50 32.7 1.00 1 08.2	51 02.7 1.00 1 08.2	52 02.7 1.00 1 08.2	52 32.7 1.00 1 08.1	53 02.7 1.00 1 08.1	53 32.7 1.00 1 08.1	55 02.7 1.00 1 08.1	55 32.6 1.00 1 08.1	1
2	50 32.1 1.00 1 07.3	51 02.1 1.00 1 07.3	52 02.1 1.00 1 07.3	52 32.1 1.00 1 07.3	53 02.1 1.00 1 07.2	53 32.1 1.00 1 07.2	55 02.1 1.00 1 07.2	55 32.1 1.00 1 07.2	2
3	50 31.6 1.00 1 06.4	51 01.6 1.00 1 06.4	52 01.6 1.00 1 06.4	52 31.6 1.00 1 06.3	53 01.6 1.00 1 06.3	53 31.6 1.00 1 06.3	55 01.6 1.00 1 06.3	55 31.6 1.00 1 06.3	3
4	50 31.2 1.00 1 05.5	51 01.2 1.00 1 05.5	52 01.2 1.00 1 05.4	52 31.2 1.00 1 05.4	53 01.2 1.00 1 05.4	53 31.2 1.00 1 05.4	55 01.2 1.00 1 05.4	55 31.2 1.00 1 05.4	4
175	50 30.8 1.00 0 04.6	51 00.8 1.00 0 04.6	52 00.8 1.00 0 04.5	52 30.8 1.00 0 04.5	53 00.8 1.00 0 04.5	53 30.8 1.00 0 04.5	55 00.8 1.00 0 04.5	55 30.8 1.00 0 04.5	175
6	50 30.5 1.00 0 03.7	51 00.5 1.00 0 03.6	52 00.5 1.00 0 03.6	52 30.5 1.00 0 03.6	53 00.5 1.00 0 03.6	53 30.5 1.00 0 03.6	55 00.5 1.00 0 03.6	55 30.5 1.00 0 03.6	6
7	50 30.3 1.00 0 02.7	51 00.3 1.00 0 02.7	52 00.3 1.00 0 02.7	52 30.3 1.00 0 02.7	53 00.3 1.00 0 02.7	53 30.3 1.00 0 02.7	55 00.3 1.00 0 02.7	55 30.3 1.00 0 02.7	7
8	50 30.1 1.00 0 01.8	51 00.1 1.00 0 01.8	52 00.1 1.00 0 01.8	52 30.1 1.00 0 01.8	53 00.1 1.00 0 01.8	53 30.1 1.00 0 01.8	55 00.1 1.00 0 01.8	55 30.1 1.00 0 01.8	8
9	50 30.0 1.00 0 00.9	51 00.0 1.00 0 00.9	52 00.0 1.00 0 00.9	52 30.0 1.00 0 00.9	53 00.0 1.00 0 00.9	53 30.0 1.00 0 00.9	55 00.0 1.00 0 00.9	55 30.0 1.00 0 00.9	9
180	50 30.0 1.00 0 00.0	51 00.0 1.00 0 00.0	52 00.0 1.00 0 00.0	52 30.0 1.00 0 00.0	53 00.0 1.00 0 00.0	53 30.0 1.00 0 00.0	55 00.0 1.00 0 00.0	55 30.0 1.00 0 00.0	180

Lat. 87°

Lat. 88°

Each latitude cell is formatted as: **Alt° Alt′ Δd Δt Az°**

H.A.	60° 00′	60° 30′	62° 00′	62° 30′	63° 00′	69° 00′	69° 30′	74° 30′	H.A.
00	64 00.0 1.0 00 180.0	64 30.0 1.0 00 180.0	66 00.0 1.0 00 180.0	66 30.0 1.0 00 180.0	67 00.0 1.0 00 180.0	73 00.0 1.0 00 180.0	73 30.0 1.0 00 180.0	78 30.0 1.0 00 180.0	00
1	64 00.0 1.0 00 178.9	64 30.0 1.0 00 178.9	66 00.0 1.0 00 178.8	66 30.0 1.0 00 178.8	67 00.0 1.0 00 178.8	73 00.0 1.0 00 178.8	73 30.0 1.0 00 178.8	78 30.0 1.0 00 178.7	1
2	63 59.8 1.0 00 177.7	64 29.8 1.0 00 177.7	65 59.8 1.0 00 177.7	66 29.8 1.0 00 177.7	66 59.8 1.0 00 177.7	72 59.8 1.0 00 177.5	73 29.8 1.0 00 177.5	78 29.8 1.0 00 177.3	2
3	63 59.6 1.0 00 176.6	64 29.6 1.0 00 176.6	65 59.6 1.0 00 176.5	66 29.6 1.0 00 176.5	66 59.6 1.0 00 176.5	72 59.6 1.0 01 176.3	73 29.6 1.0 01 176.3	78 29.6 1.0 01 176.0	3
4	63 59.3 1.0 01 175.4	64 29.3 1.0 01 175.4	65 59.3 1.0 01 175.4	66 29.3 1.0 01 175.4	66 59.3 1.0 01 175.4	72 59.3 1.0 01 175.1	73 29.3 1.0 01 175.1	78 29.2 1.0 01 174.6	4
05	63 59.0 1.0 01 174.3	64 29.0 1.0 01 174.3	65 58.9 1.0 01 174.2	66 28.9 1.0 01 174.2	66 58.9 1.0 01 174.2	72 58.9 1.0 01 173.9	73 28.9 1.0 01 173.8	78 28.8 1.0 01 173.3	05
6	63 58.5 1.0 01 173.1	64 28.5 1.0 01 173.1	65 58.5 1.0 01 173.1	66 28.5 1.0 01 173.1	66 58.5 1.0 01 173.0	72 58.4 1.0 01 172.7	73 28.4 1.0 01 172.6	78 28.2 1.0 01 172.0	6
7	63 58.0 1.0 01 172.0	64 28.0 1.0 01 172.0	65 57.9 1.0 01 171.9	66 27.9 1.0 01 171.9	66 57.9 1.0 01 171.9	72 57.8 1.0 01 171.4	73 27.8 1.0 01 171.4	78 27.6 1.0 01 170.6	7
8	63 57.3 1.0 01 170.9	64 27.3 1.0 01 170.9	65 57.3 1.0 01 170.8	66 27.3 1.0 01 170.7	66 57.3 1.0 01 170.7	72 57.1 1.0 01 170.2	73 27.1 1.0 01 170.1	78 26.9 1.0 01 169.3	8
9	63 56.6 1.0 01 169.7	64 26.6 1.0 01 169.7	65 56.6 1.0 01 169.6	66 26.6 1.0 01 169.6	66 56.6 1.0 01 169.6	72 56.4 1.0 01 169.0	73 26.4 1.0 01 168.9	78 26.0 1.0 02 168.0	9
10	63 55.8 1.0 01 168.6	64 25.8 1.0 01 168.6	65 55.8 1.0 01 168.5	66 25.8 1.0 01 168.4	66 55.8 1.0 01 168.4	72 55.5 1.0 02 167.8	73 25.5 1.0 02 167.7	78 25.1 1.0 02 166.6	10
1	63 55.0 1.0 02 167.5	64 25.0 1.0 02 167.4	65 54.9 1.0 02 167.3	66 24.9 1.0 02 167.3	66 54.9 1.0 02 167.2	72 54.6 1.0 02 166.5	73 24.6 1.0 02 166.5	78 24.1 1.0 02 165.3	1
2	63 54.0 1.0 02 166.3	64 24.0 1.0 02 166.3	65 54.0 1.0 02 166.2	66 23.9 1.0 02 166.1	66 53.9 1.0 02 166.1	72 53.6 1.0 02 165.3	73 23.6 1.0 02 165.2	78 23.0 1.0 02 164.0	2
3	63 53.0 1.0 02 165.2	64 23.0 1.0 02 165.2	65 52.9 1.0 02 165.0	66 22.9 1.0 02 165.0	66 52.9 1.0 02 164.9	72 52.5 1.0 02 164.1	73 22.4 1.0 02 164.0	78 21.8 1.0 02 162.7	3
4	63 51.9 1.0 02 164.1	64 21.9 1.0 02 163.9	65 51.8 1.0 02 163.9	66 21.8 1.0 02 163.8	66 51.7 1.0 02 163.8	72 51.3 1.0 02 162.9	73 21.3 1.0 02 162.8	78 20.5 1.0 02 161.3	4
15	63 50.7 1.0 02 162.9	64 20.7 1.0 02 162.9	65 50.6 1.0 02 162.7	66 20.6 1.0 02 162.7	66 50.5 1.0 02 162.6	72 50.1 1.0 02 161.7	73 20.0 1.0 02 161.6	78 19.1 1.0 03 160.0	15
6	63 49.4 1.0 02 161.8	64 19.4 1.0 02 161.7	65 49.3 1.0 02 161.6	66 19.3 1.0 02 161.5	66 49.2 1.0 02 161.5	72 48.7 1.0 02 160.5	73 18.6 1.0 02 160.4	78 17.7 1.0 03 158.7	6
7	63 48.1 1.0 02 160.7	64 18.1 1.0 02 160.6	65 48.0 1.0 02 160.4	66 17.9 1.0 02 160.4	66 47.9 1.0 02 160.3	72 47.2 1.0 03 159.3	73 17.2 1.0 03 159.1	78 16.1 99 03 157.4	7
8	63 46.7 1.0 02 159.5	64 16.6 1.0 02 159.5	65 46.5 1.0 03 159.3	66 16.5 1.0 03 159.2	66 46.4 1.0 03 159.2	72 45.7 1.0 03 158.1	73 15.6 1.0 03 157.9	78 14.2 99 03 156.1	8
9	63 45.2 1.0 03 158.4	64 15.1 1.0 03 158.3	65 45.0 1.0 03 158.2	66 14.9 1.0 03 158.1	66 44.9 1.0 03 158.0	72 44.1 1.0 03 156.9	73 14.0 1.0 03 156.7	78 12.7 99 03 154.8	9
20	63 43.6 1.0 03 157.3	64 13.5 1.0 03 157.2	65 43.4 1.0 03 157.0	66 13.3 1.0 03 156.9	66 43.3 1.0 03 156.9	72 42.4 1.0 03 155.6	73 12.3 1.0 03 155.5	78 10.9 99 03 153.5	20
1	63 41.9 1.0 03 156.1	64 11.9 1.0 03 156.1	65 41.7 1.0 03 155.9	66 11.7 1.0 03 155.8	66 41.6 1.0 03 155.7	72 40.7 1.0 03 154.4	73 10.5 1.0 03 154.3	78 09.0 99 03 152.2	1
2	63 40.2 1.0 03 155.0	64 10.1 1.0 03 155.0	65 40.0 1.0 03 154.7	66 09.9 1.0 03 154.7	66 39.8 1.0 03 154.6	72 38.8 1.0 03 153.2	73 08.7 1.0 03 153.1	78 07.0 99 03 150.9	2
3	63 38.4 1.0 03 153.9	64 08.3 1.0 03 153.8	65 38.2 1.0 03 153.6	66 08.1 1.0 03 153.5	66 38.0 1.0 03 153.4	72 36.9 1.0 03 152.1	73 06.8 1.0 03 151.9	78 04.9 99 04 149.6	3
4	63 36.5 1.0 03 152.8	64 06.5 1.0 03 152.7	65 36.3 1.0 03 152.5	66 06.2 1.0 03 152.4	66 36.1 1.0 03 152.3	72 34.9 1.0 03 150.9	73 04.8 1.0 03 150.7	78 02.7 99 04 148.3	4
25	63 34.6 1.0 03 151.7	64 04.5 1.0 03 151.6	65 34.3 1.0 03 151.3	66 04.2 1.0 03 151.2	66 34.1 1.0 03 151.2	72 32.8 1.0 04 149.7	73 02.7 99 04 149.5	78 00.5 99 04 147.1	25
6	63 32.5 1.0 04 150.5	64 02.5 1.0 04 150.5	65 32.2 1.0 04 150.2	66 02.2 1.0 04 150.1	66 32.1 1.0 04 150.0	72 30.7 99 04 148.5	73 00.5 99 04 148.3	77 58.2 99 04 145.8	6
7	63 30.4 1.0 04 149.4	64 00.4 1.0 04 149.3	65 30.1 1.0 04 149.1	66 00.0 1.0 04 149.0	66 29.9 1.0 04 148.9	72 28.4 99 04 147.3	72 58.3 99 04 147.1	77 55.8 99 04 144.5	7
8	63 28.3 1.0 04 148.3	63 58.2 1.0 04 148.2	65 27.7 1.0 04 147.9	65 57.8 1.0 04 147.8	66 27.7 1.0 04 147.8	72 26.1 99 04 146.1	72 56.0 99 04 145.9	77 53.3 99 04 143.2	8
9	63 26.0 1.0 04 147.2	63 56.0 1.0 04 147.1	65 25.5 1.0 04 146.8	65 55.6 1.0 04 146.7	66 25.5 1.0 04 146.6	72 23.8 99 04 144.9	72 53.6 99 04 144.7	77 50.8 99 04 142.0	9
30	63 23.7 1.0 04 146.1	63 53.7 1.0 04 146.0	65 23.4 1.0 04 145.7	65 53.2 1.0 04 145.6	66 23.1 1.0 04 145.5	72 21.3 99 04 143.8	72 51.1 99 04 143.6	77 48.2 99 04 140.8	30
1	63 21.4 1.0 04 145.0	63 51.3 1.0 04 144.9	65 21.0 1.0 04 144.6	65 50.8 1.0 04 144.5	66 20.7 1.0 04 144.4	72 18.8 99 04 142.6	72 48.6 99 04 142.4	77 45.5 99 05 139.5	1
2	63 18.9 1.0 04 143.8	63 48.8 1.0 04 143.7	65 18.5 1.0 04 143.4	65 48.4 1.0 04 143.3	66 18.3 1.0 04 143.2	72 16.2 99 04 141.4	72 46.0 99 04 141.2	77 42.8 99 05 138.3	2
3	63 16.4 1.0 04 142.7	63 46.3 1.0 04 142.6	65 16.0 1.0 04 142.3	65 45.8 1.0 04 142.2	66 15.7 1.0 04 142.1	72 13.6 99 04 140.3	72 43.4 99 05 140.0	77 39.9 99 05 137.1	3
4	63 13.9 1.0 04 141.6	63 43.8 1.0 04 141.5	65 13.4 1.0 04 141.2	65 43.3 1.0 04 141.1	66 13.1 1.0 04 141.0	72 10.9 99 05 139.1	72 40.6 99 05 138.9	77 37.0 99 05 135.8	4
35	63 11.2 1.0 04 140.5	63 41.1 1.0 04 140.4	65 10.7 1.0 05 140.1	65 40.6 1.0 05 140.0	66 10.4 1.0 05 139.9	72 08.1 99 05 137.9	72 37.9 99 05 137.7	77 34.1 99 05 134.6	35
6	63 08.6 1.0 05 139.4	63 38.4 1.0 05 139.3	65 08.0 1.0 05 139.0	65 37.9 1.0 05 138.9	66 07.7 1.0 05 138.7	72 05.3 99 05 136.8	72 35.0 99 05 136.5	77 31.1 99 05 133.4	6
7	63 05.8 1.0 05 138.3	63 35.7 1.0 05 138.2	65 05.2 1.0 05 137.9	65 35.1 99 05 137.8	66 04.9 99 05 137.6	72 02.4 99 05 135.6	72 32.1 99 05 135.4	77 28.0 99 05 132.2	7
8	63 03.0 1.0 05 137.2	63 32.8 1.0 05 137.1	65 02.4 99 05 136.8	65 32.2 99 05 136.6	66 02.1 99 05 136.5	71 59.4 99 05 134.5	72 29.1 99 05 134.2	77 24.9 99 05 131.0	8
9	63 00.1 1.0 05 136.1	63 30.0 1.0 05 136.0	64 59.5 99 05 135.7	65 29.3 99 05 135.5	65 59.2 99 05 135.4	71 56.4 99 05 133.3	72 26.1 99 05 133.1	77 21.7 99 05 129.8	9
40	62 57.2 1.0 05 135.0	63 27.0 99 05 134.9	64 56.6 99 05 134.6	65 26.4 99 05 134.4	65 56.2 99 05 134.3	71 53.3 99 05 132.2	72 23.0 99 05 131.9	77 18.4 99 05 128.6	40
1	62 54.2 99 05 133.9	63 24.0 99 05 133.8	64 53.5 99 05 133.5	65 23.4 99 05 133.3	65 53.2 99 05 133.2	71 50.2 99 05 131.0	72 19.9 99 05 130.8	77 15.2 99 06 127.4	1
2	62 51.2 99 05 132.8	63 21.0 99 05 132.7	64 50.5 99 05 132.4	65 20.3 99 05 132.2	65 50.1 99 05 132.1	71 47.0 99 05 129.9	72 16.7 99 05 129.7	77 11.8 99 06 126.2	2
3	62 48.1 99 05 131.8	63 17.9 99 05 131.6	64 47.4 99 05 131.3	65 17.2 99 05 131.1	65 47.0 99 05 131.0	71 43.8 99 06 128.8	72 13.4 99 06 128.5	77 08.4 99 06 125.0	3
4	62 44.9 99 05 130.7	63 14.7 99 05 130.5	64 44.2 99 05 130.2	65 14.0 99 05 130.0	65 43.8 99 05 129.9	71 40.5 99 06 127.6	72 10.1 99 06 127.4	77 04.9 99 06 123.9	4
45	62 41.7 99 05 129.6	63 11.5 99 05 129.5	64 41.0 99 05 129.1	65 10.8 99 05 128.9	65 40.5 99 05 128.8	71 37.2 99 06 126.5	72 06.8 99 06 126.3	77 01.4 99 06 122.7	45
6	62 38.5 99 06 128.5	63 08.3 99 06 128.4	64 37.7 99 06 128.0	65 07.5 99 06 127.8	65 37.3 99 06 127.7	71 33.8 99 06 125.4	72 03.4 99 06 125.1	76 57.9 97 06 121.5	6
7	62 35.2 99 06 127.4	63 05.0 99 06 127.3	64 34.4 99 06 126.9	65 04.2 99 06 126.8	65 33.9 99 06 126.6	71 30.3 99 06 124.3	71 59.9 99 06 124.0	76 54.3 97 06 120.4	7
8	62 31.8 99 06 126.3	63 01.6 99 06 126.2	64 31.0 99 06 125.8	65 00.8 99 06 125.7	65 30.5 99 06 125.5	71 26.9 99 06 123.2	71 56.4 99 06 122.9	76 50.7 97 06 119.2	8
9	62 28.4 99 06 125.3	62 58.2 99 06 125.1	64 27.6 99 06 124.7	64 57.4 99 06 124.6	65 27.1 99 06 124.4	71 23.3 99 06 122.1	71 52.9 99 06 121.8	76 47.0 97 06 118.1	9
50	62 25.0 99 06 124.2	62 54.8 99 06 124.1	64 24.1 99 06 123.7	64 53.9 99 06 123.5	65 23.6 99 06 123.4	71 19.8 99 06 121.0	71 49.3 99 06 120.7	76 43.3 97 06 117.0	50
1	62 21.5 99 06 123.1	62 51.3 99 06 123.0	64 20.6 99 06 122.6	64 50.4 99 06 122.4	65 20.1 99 06 122.3	71 16.2 99 06 119.9	71 45.7 98 06 119.6	76 39.5 97 06 115.8	1
2	62 18.0 99 06 122.0	62 47.8 99 06 121.9	64 17.1 99 06 121.5	64 46.8 99 06 121.4	65 16.6 99 06 121.2	71 12.5 99 06 118.8	71 42.1 98 06 118.5	76 35.8 97 06 114.7	2
3	62 14.4 99 06 121.0	62 44.2 99 06 120.9	64 13.5 99 06 120.4	64 43.2 99 06 120.3	65 13.0 99 06 120.1	71 08.8 99 06 117.7	71 38.4 98 06 117.4	76 31.9 97 06 113.6	3
4	62 10.8 99 06 119.9	62 40.6 99 06 119.8	64 09.8 99 06 119.4	64 39.6 99 06 119.2	65 09.3 99 06 119.1	71 05.1 98 06 116.6	71 34.6 98 06 116.3	76 28.1 97 06 112.5	4
55	62 07.1 99 06 118.9	62 36.9 99 06 118.7	64 06.2 99 06 118.3	64 35.9 99 06 118.1	65 05.6 99 06 118.0	71 01.3 98 06 115.5	71 30.9 98 06 115.2	76 24.2 97 06 111.4	55
6	62 03.5 99 06 117.8	62 33.2 99 06 117.7	64 02.5 99 06 117.2	64 32.2 99 06 117.1	65 01.9 99 06 116.9	70 57.5 98 06 114.4	71 27.1 98 06 114.1	76 20.3 97 06 110.3	6
7	61 59.7 99 06 116.7	62 29.5 99 06 116.6	63 58.7 99 06 116.2	64 28.5 99 06 116.0	64 58.2 99 06 115.9	70 53.7 98 06 113.3	71 23.2 98 06 113.0	76 16.4 97 07 109.2	7
8	61 56.0 99 06 115.7	62 25.7 99 06 115.5	63 55.0 99 06 115.1	64 24.7 99 06 115.0	64 54.4 99 06 114.8	70 49.9 98 06 112.2	71 19.4 98 06 112.0	76 12.4 97 07 108.1	8
9	61 52.2 99 06 114.6	62 21.9 99 06 114.5	63 51.2 99 06 114.1	64 20.9 99 06 113.9	64 50.6 99 06 113.7	70 46.0 98 06 111.2	71 15.5 98 07 110.9	76 08.4 97 07 107.0	9
60	61 48.4 99 06 113.6	62 18.1 99 06 113.4	63 47.3 99 06 113.0	64 17.0 99 06 112.8	64 46.7 99 06 112.7	70 42.0 98 06 110.1	71 11.5 98 07 109.8	76 04.4 97 07 105.9	60
1	61 44.5 99 06 112.5	62 14.3 99 06 112.4	63 43.5 99 06 111.9	64 13.2 99 06 111.8	64 42.9 99 07 111.6	70 38.1 98 07 109.0	71 07.6 98 07 108.8	76 00.4 97 07 104.9	1
2	61 40.6 99 07 111.5	62 10.4 99 07 111.3	63 39.6 99 07 110.9	64 09.3 99 07 110.7	64 39.0 99 07 110.6	70 34.1 98 07 108.0	71 03.6 98 07 107.7	75 56.3 97 07 103.8	2
3	61 36.7 99 07 110.4	62 06.5 99 07 110.3	63 35.6 99 07 109.9	64 05.3 99 07 109.7	64 35.0 99 07 109.5	70 30.1 98 07 106.9	70 59.6 98 07 106.6	75 52.2 97 07 102.7	3
4	61 32.8 99 07 109.4	62 02.5 99 07 109.3	63 31.7 99 07 108.8	64 01.4 99 07 108.6	64 31.1 99 07 108.5	70 26.1 98 07 105.9	70 55.6 98 07 105.6	75 48.1 97 07 101.7	4
65	61 28.8 99 07 108.4	61 58.6 99 07 108.2	63 27.7 99 07 107.8	63 57.4 99 07 107.6	64 27.1 99 07 107.4	70 22.1 98 07 104.8	70 51.5 98 07 104.5	75 44.0 97 07 100.6	65
6	61 24.9 99 07 107.3	61 54.6 99 07 107.2	63 23.7 99 07 106.7	63 53.4 99 07 106.6	64 23.1 99 07 106.4	70 18.0 98 07 103.8	70 47.5 98 07 103.5	75 39.9 97 07 99.6	6
7	61 20.8 99 07 106.3	61 50.6 99 07 106.1	63 19.7 99 07 105.7	63 49.4 99 07 105.5	64 19.1 99 07 105.4	70 14.0 98 07 102.7	70 43.4 98 07 102.4	75 35.8 97 07 98.5	7
8	61 16.8 99 07 105.3	61 46.5 99 07 105.1	63 15.7 99 07 104.7	63 45.3 99 07 104.5	64 15.0 99 07 104.3	70 09.9 98 07 101.7	70 39.3 98 07 101.4	75 31.6 97 07 97.5	8
9	61 12.8 99 07 104.2	61 42.5 99 07 104.1	63 11.6 99 07 103.6	63 41.3 99 07 103.5	64 10.9 99 07 103.3	70 05.8 98 07 100.7	70 35.2 98 07 100.4	75 27.5 97 07 96.5	9
70	61 08.7 99 07 103.2	61 38.4 99 07 103.1	63 07.5 99 07 102.6	63 37.2 99 07 102.4	64 06.9 99 07 102.3	70 01.6 98 07 99.6	70 31.1 98 07 99.3	75 23.3 97 07 95.4	70
1	61 04.6 99 07 102.2	61 34.3 99 07 102.0	63 03.4 99 07 101.6	63 33.1 99 07 101.4	64 02.8 99 07 101.2	69 57.5 98 07 98.6	70 26.9 98 07 98.3	75 19.1 97 07 94.4	1
2	61 00.5 99 07 101.1	61 30.2 99 07 101.0	62 59.3 99 07 100.5	63 29.0 99 07 100.4	63 58.7 99 07 100.2	69 53.4 98 07 97.6	70 22.8 98 07 97.3	75 15.0 97 07 93.4	2
3	60 56.4 99 07 100.1	61 26.1 99 07 100.0	62 55.2 99 07 99.5	63 24.9 99 07 99.4	63 54.5 99 07 99.2	69 49.2 98 07 96.6	70 18.6 98 07 96.3	75 10.8 97 07 92.4	3
4	60 52.3 99 07 99.1	61 22.0 99 07 99.0	62 51.1 99 07 98.5	63 20.7 99 07 98.3	63 50.4 99 07 98.2	69 45.1 98 07 95.5	70 14.5 98 07 95.3	75 06.6 97 07 91.4	4
75	60 48.1 99 07 98.1	61 17.9 99 07 98.0	62 46.9 99 07 97.5	63 16.6 99 07 97.3	63 46.2 99 07 97.2	69 40.9 98 07 94.5	70 10.3 98 07 94.2	75 02.4 97 07 90.4	75
6	60 44.0 99 07 97.1	61 13.7 99 07 96.9	62 42.8 99 07 96.5	63 12.4 99 07 96.3	63 42.1 99 07 96.1	69 36.7 98 07 93.5	70 06.1 98 07 93.2	74 58.2 97 07 89.4	6
7	60 39.8 99 07 96.1	61 09.5 99 07 95.9	62 38.6 99 07 95.5	63 08.3 99 07 95.3	63 37.9 99 07 95.1	69 32.5 98 07 92.5	70 01.9 98 07 92.2	74 54.1 97 07 88.4	7
8	60 35.7 99 07 95.1	61 05.4 99 07 94.9	62 34.4 99 07 94.5	63 04.1 99 07 94.3	63 33.7 99 07 94.1	69 28.4 98 07 91.5	69 57.8 98 07 91.2	74 49.9 97 07 87.4	8
9	60 31.5 99 07 94.1	61 01.2 99 07 93.9	62 30.3 99 07 93.4	62 59.9 99 07 93.3	63 29.6 99 07 93.1	69 24.2 98 07 90.5	69 53.6 98 07 90.2	74 45.7 97 07 86.4	9
80	60 27.3 99 07 93.0	60 57.0 99 07 92.9	62 26.1 99 07 92.4	62 55.7 99 07 92.3	63 25.4 99 07 92.1	69 20.0 98 07 89.5	69 49.4 98 07 89.2	74 41.5 97 07 85.5	80
1	60 23.1 99 07 92.0	60 52.8 99 07 91.9	62 21.9 99 07 91.4	62 51.6 99 07 91.3	63 21.2 99 07 91.1	69 15.8 98 07 88.5	69 45.2 98 07 88.2	74 37.3 97 07 84.5	1
2	60 19.0 99 07 91.0	60 48.7 99 07 90.9	62 17.7 99 07 90.4	62 47.4 99 07 90.3	63 17.0 99 07 90.1	69 11.6 98 07 87.5	69 41.0 98 07 87.2	74 33.2 97 07 83.5	2
3	60 14.8 99 07 90.0	60 44.5 99 07 89.9	62 13.5 99 07 89.4	62 43.2 99 07 89.3	63 12.8 99 07 89.1	69 07.4 98 07 86.5	69 36.8 98 07 86.3	74 29.0 97 07 82.5	3
4	60 10.6 99 07 89.0	60 40.3 99 07 88.9	62 09.3 99 07 88.4	62 39.0 99 07 88.3	63 08.7 99 07 88.1	69 03.3 98 07 85.5	69 32.7 98 07 85.3	74 24.9 97 07 81.6	4
85	60 06.4 99 07 88.1	60 35.9 99 07 87.9	62 05.2 99 07 87.5	62 34.8 99 07 87.3	63 04.5 99 07 87.1	68 59.1 98 07 84.6	69 28.5 98 07 84.3	74 20.8 97 07 80.6	85
6	60 02.2 99 07 87.1	60 31.9 99 07 86.9	62 01.0 99 07 86.5	62 30.6 99 07 86.3	63 00.3 99 07 86.1	68 55.0 98 07 83.6	69 24.3 98 07 83.3	74 16.6 97 07 79.7	6
7	59 58.0 99 07 86.1	60 27.8 99 07 85.9	61 56.8 99 07 85.5	62 26.5 99 07 85.3	62 56.1 99 07 85.2	68 50.8 98 07 82.6	69 20.2 98 07 82.3	74 12.5 97 07 78.7	7
8	59 53.9 99 07 85.1	60 23.6 99 07 84.9	61 52.6 99 07 84.5	62 22.3 99 07 84.3	62 52.0 99 07 84.2	68 46.6 98 07 81.6	69 16.0 98 07 81.4	74 08.4 97 07 77.8	8
9	59 49.7 99 07 84.1	60 19.4 99 07 84.0	61 48.5 99 07 83.5	62 18.1 99 07 83.3	62 47.8 99 07 83.2	68 42.5 98 07 80.7	69 11.9 98 07 80.4	74 04.3 97 07 76.8	9
90	59 45.5 99 07 83.1	60 15.3 99 07 83.0	61 44.3 99 07 82.5	62 14.0 99 07 82.4	62 43.6 99 07 82.2	68 38.4 98 07 79.7	69 07.8 98 07 79.4	74 00.3 97 07 75.9	90

H.A.	60° 00' Alt.	Δd Δt	Az.	60° 30' Alt.	Δd Δt	Az.	62° 00' Alt.	Δd Δt	Az.	62° 30' Alt.	Δd Δt	Az.	63° 00' Alt.	Δd Δt	Az.	69° 00' Alt.	Δd Δt	Az.	69° 30' Alt.	Δd Δt	Az.	74° 30' Alt.	Δd Δt	Az.	H.A.
91	59 41.4	99 07	82.1	60 11.1	99 07	82.0	61 40.2	99 07	81.5	62 09.8	99 07	81.4	62 39.5	99 07	81.2	68 34.2	98 07	78.7	69 03.7	98 07	78.5	73 56.2	97 07	74.9	91
2	59 37.3	99 07	81.1	60 07.0	99 07	81.0	61 36.0	99 07	80.6	62 05.7	99 07	80.4	62 35.4	99 07	80.3	68 30.2	98 07	77.8	68 59.6	98 07	77.5	73 52.2	97 07	74.0	2
3	59 33.1	99 07	80.2	60 02.8	99 07	80.0	61 31.9	99 07	79.6	62 01.6	99 07	79.4	62 31.2	99 07	79.3	68 26.1	98 07	76.8	68 55.5	98 07	76.6	73 48.2	97 07	73.1	3
4	59 29.0	99 07	79.2	59 58.7	99 07	79.1	61 27.8	99 07	78.6	61 57.5	99 07	78.5	62 27.1	99 07	78.3	68 22.0	98 07	75.9	68 51.5	98 07	75.6	73 44.2	97 07	72.2	4
95	59 24.9	99 07	78.2	59 54.6	99 07	78.1	61 23.7	99 07	77.6	61 53.4	99 07	77.5	62 23.1	99 07	77.3	68 18.0	98 07	74.9	68 47.4	98 07	74.6	73 40.2	97 07	71.2	95
6	59 20.8	99 07	77.2	59 50.5	99 07	77.1	61 19.6	99 07	76.7	61 49.3	99 07	76.5	62 19.0	99 07	76.4	68 13.9	98 07	74.0	68 43.4	98 07	73.7	73 36.2	97 07	70.3	6
7	59 16.7	99 07	76.3	59 46.5	99 07	76.1	61 15.6	99 07	75.7	61 45.2	99 07	75.6	62 14.9	99 07	75.4	68 09.9	98 07	73.0	68 39.4	98 07	72.8	73 32.3	97 06	69.4	7
8	59 12.7	99 07	75.3	59 42.4	99 07	75.2	61 11.5	99 07	74.7	61 41.2	99 07	74.6	62 10.9	99 07	74.4	68 05.9	98 07	72.1	68 35.4	98 07	71.8	73 28.4	97 06	68.5	8
9	59 08.6	99 07	74.3	59 38.4	99 07	74.2	61 07.5	99 07	73.8	61 37.2	99 07	73.6	62 06.9	99 07	73.5	68 01.9	98 07	71.1	68 31.4	98 07	70.9	73 24.5	97 06	67.6	9
100	59 04.6	99 07	73.4	59 34.4	99 07	73.2	61 03.5	99 07	72.8	61 33.2	99 07	72.7	62 02.9	99 07	72.5	67 58.0	98 07	70.2	68 27.5	98 07	69.9	73 20.7	97 06	66.7	100
1	59 00.6	99 07	72.4	59 30.4	99 07	72.3	60 59.5	99 07	71.9	61 29.2	99 07	71.7	61 58.9	99 07	71.6	67 54.1	98 06	69.2	68 23.6	98 06	69.0	73 16.8	97 06	65.8	1
2	58 56.6	99 07	71.4	59 26.4	99 07	71.3	60 55.5	99 07	70.9	61 25.2	99 07	70.8	61 54.9	99 07	70.6	67 50.2	98 06	68.3	68 19.7	98 06	68.1	73 13.0	97 06	64.9	2
3	58 52.7	99 07	70.5	59 22.4	99 07	70.4	60 51.6	99 07	70.0	61 21.3	99 07	69.8	61 51.0	99 07	69.7	67 46.3	98 06	67.4	68 15.8	98 06	67.1	73 09.3	97 06	64.0	3
4	58 48.8	99 07	69.5	59 18.5	99 07	69.4	60 47.7	99 07	69.0	61 17.4	99 07	68.9	61 47.1	99 07	68.7	67 42.4	98 06	66.4	68 12.0	98 06	66.2	73 05.5	97 06	63.1	4
105	58 44.8	99 06	68.6	59 14.6	99 06	68.4	60 43.8	99 06	68.0	61 13.5	99 06	67.9	61 43.2	99 06	67.8	67 38.6	98 06	65.5	68 08.1	98 06	65.3	73 01.8	97 06	62.2	105
6	58 41.0	99 06	67.6	59 10.7	99 06	67.5	60 39.9	99 06	67.1	61 09.6	99 06	67.0	61 39.3	99 06	66.8	67 34.8	98 06	64.6	68 04.3	98 06	64.4	72 58.1	97 06	61.3	6
7	58 37.1	99 06	66.7	59 06.9	99 06	66.5	60 36.1	99 06	66.1	61 05.8	99 06	66.0	61 35.5	99 06	65.9	67 31.1	98 06	63.7	68 00.6	98 06	63.4	72 54.5	97 06	60.4	7
8	58 33.3	99 06	65.7	59 03.0	99 06	65.6	60 32.2	99 06	65.2	61 02.0	99 06	65.1	61 31.7	99 06	64.9	67 27.3	98 06	62.7	67 56.9	98 06	62.5	72 50.8	97 06	59.5	8
9	58 29.5	99 06	64.8	58 59.2	99 06	64.6	60 28.5	99 06	64.3	60 58.2	99 06	64.1	61 27.9	99 06	64.0	67 23.6	98 06	61.8	67 53.2	98 06	61.6	72 47.3	97 06	58.6	9
110	58 25.7	99 06	63.8	58 55.5	99 06	63.7	60 24.7	99 06	63.3	60 54.4	99 06	63.2	61 24.2	99 06	63.0	67 19.9	99 06	60.9	67 49.5	98 06	60.7	72 43.7	98 06	57.8	110
1	58 22.0	99 06	62.9	58 51.7	99 06	62.8	60 21.0	99 06	62.4	60 50.7	99 06	62.2	61 20.4	99 06	62.1	67 16.3	99 06	60.0	67 45.9	98 06	59.8	72 40.2	98 06	56.9	1
2	58 18.3	99 06	61.9	58 48.0	99 06	61.8	60 17.3	99 06	61.4	60 47.0	99 06	61.3	61 16.8	99 06	61.2	67 12.7	99 06	59.1	67 42.3	98 06	58.9	72 36.7	98 06	56.0	2
3	58 14.6	99 06	61.0	58 44.4	99 06	60.9	60 13.6	99 06	60.5	60 43.4	99 06	60.4	61 13.1	99 06	60.2	67 09.1	99 06	58.2	67 38.7	98 06	57.9	72 33.2	98 06	55.1	3
4	58 10.9	99 06	60.0	58 40.7	99 06	59.9	60 10.0	99 06	59.6	60 39.8	99 06	59.4	61 09.5	99 06	59.3	67 05.6	99 06	57.3	67 35.2	98 06	57.0	72 29.8	98 06	54.3	4
115	58 07.3	99 06	59.1	58 37.1	99 06	59.0	60 06.4	99 06	58.6	60 36.2	99 06	58.5	61 05.9	99 06	58.4	67 02.1	99 06	56.3	67 31.7	99 06	56.1	72 26.4	98 06	53.4	115
6	58 03.8	99 06	58.2	58 33.5	99 06	58.0	60 02.9	99 06	57.7	60 32.6	99 06	57.6	61 02.4	99 06	57.4	66 58.6	99 06	55.4	67 28.2	99 06	55.2	72 23.1	98 06	52.5	6
7	58 00.2	99 06	57.2	58 30.0	99 06	57.1	59 59.3	99 06	56.8	60 29.1	99 06	56.6	60 58.9	99 06	56.5	66 55.2	99 06	54.5	67 24.8	99 06	54.3	72 19.8	98 05	51.7	7
8	57 56.7	99 06	56.3	58 26.5	99 06	56.2	59 55.9	99 06	55.7	60 25.6	99 06	55.7	60 55.4	99 06	55.6	66 51.8	99 06	53.6	67 21.4	99 06	53.4	72 16.5	98 05	50.8	8
9	57 53.3	99 06	55.4	58 23.1	99 06	55.2	59 52.4	99 06	54.9	60 22.2	99 06	54.8	60 52.0	99 06	54.6	66 48.4	99 06	52.7	67 18.1	99 06	52.5	72 13.3	98 05	50.0	9
120	57 49.8	99 06	54.4	58 19.6	99 06	54.3	59 49.0	99 06	54.0	60 18.8	99 06	53.8	60 48.6	99 06	53.7	66 45.1	99 05	51.8	67 14.8	99 05	51.6	72 10.1	98 05	49.1	120
1	57 46.4	99 06	53.5	58 16.3	99 06	53.4	59 45.6	99 06	53.0	60 15.4	99 06	52.9	60 45.2	99 06	52.8	66 41.9	99 05	50.9	67 11.5	99 05	50.7	72 07.0	98 05	48.2	1
2	57 43.1	99 06	52.6	58 12.9	99 06	52.4	59 42.3	99 05	52.1	60 12.1	99 05	52.0	60 41.9	99 05	51.9	66 38.6	99 05	50.0	67 08.3	99 05	49.9	72 03.9	98 05	47.4	2
3	57 39.8	99 05	51.6	58 09.6	99 05	51.5	59 39.0	99 05	51.2	60 08.8	99 05	51.1	60 38.6	99 05	51.0	66 35.4	99 05	49.2	67 05.1	99 05	49.0	72 00.8	98 05	46.5	3
4	57 36.5	99 05	50.7	58 06.4	99 05	50.6	59 35.8	99 05	50.3	60 05.6	99 05	50.2	60 35.4	99 05	50.0	66 32.3	99 05	48.3	67 02.0	99 05	48.1	71 57.8	98 05	45.7	4
125	57 33.3	99 05	49.8	58 03.2	99 05	49.7	59 32.6	99 05	49.3	60 02.4	99 05	49.2	60 32.2	99 05	49.1	66 29.2	99 05	47.4	66 58.9	99 05	47.2	71 54.8	98 05	44.8	125
6	57 30.2	99 05	48.8	58 00.0	99 05	48.7	59 29.4	99 05	48.4	59 59.3	99 05	48.3	60 29.1	99 05	48.2	66 26.1	99 05	46.5	66 55.8	99 05	46.3	71 51.9	98 05	44.0	6
7	57 27.0	99 05	47.9	57 56.9	99 05	47.8	59 26.3	99 05	47.5	59 56.2	99 05	47.4	60 26.0	99 05	47.3	66 23.1	99 05	45.6	66 52.8	99 05	45.4	71 49.0	98 05	43.2	7
8	57 23.9	99 05	47.0	57 53.8	99 05	46.9	59 23.3	99 05	46.6	59 53.1	99 05	46.5	60 22.9	99 05	46.4	66 20.2	99 05	44.7	66 49.9	99 05	44.5	71 46.2	98 05	42.3	8
9	57 20.9	99 05	46.1	57 50.7	99 05	46.0	59 20.3	99 05	45.7	59 50.1	99 05	45.6	60 19.9	99 05	45.5	66 17.2	99 05	43.8	66 47.0	99 05	43.7	71 43.4	98 05	41.5	9
130	57 17.9	1.005	45.1	57 47.8	99 05	45.1	59 17.3	99 05	44.8	59 47.1	99 05	44.7	60 16.9	99 05	44.6	66 14.4	99 05	42.9	66 44.1	99 05	42.8	71 40.6	99 04	40.6	130
1	57 15.0	1.005	44.2	57 44.8	1.005	44.1	59 14.4	99 05	43.8	59 44.2	99 05	43.7	60 14.0	99 05	43.6	66 11.5	99 05	42.1	66 41.3	99 05	41.9	71 37.9	99 04	39.8	1
2	57 12.1	1.005	43.3	57 41.9	1.005	43.2	59 11.5	99 05	42.9	59 41.3	99 05	42.8	60 11.2	99 05	42.7	66 08.8	99 05	41.2	66 38.5	99 05	41.0	71 35.3	99 04	39.0	2
3	57 09.2	1.005	42.4	57 39.1	1.005	42.3	59 08.7	1.005	42.0	59 38.5	99 05	41.9	60 08.4	99 05	41.8	66 06.0	99 04	40.3	66 35.8	99 04	40.2	71 32.7	99 04	38.1	3
4	57 06.4	1.005	41.5	57 36.3	1.005	41.4	59 05.9	1.005	41.1	59 35.7	1.005	41.0	60 05.6	99 05	40.9	66 03.3	99 04	39.4	66 33.1	99 04	39.3	71 30.1	99 04	37.3	4
135	57 03.7	1.004	40.6	57 33.6	1.004	40.5	59 03.2	1.004	40.2	59 33.0	1.004	40.1	60 02.9	1.004	40.0	66 00.7	99 04	38.6	66 30.5	99 04	38.4	71 27.6	99 04	36.5	135
6	57 01.0	1.004	39.6	57 30.9	1.004	39.6	59 00.5	1.004	39.3	59 30.3	1.004	39.2	60 00.2	1.004	39.1	65 58.1	99 04	37.7	66 27.9	99 04	37.5	71 25.1	99 04	35.6	6
7	56 58.3	1.004	38.7	57 28.2	1.004	38.6	58 57.9	1.004	38.4	59 27.7	1.004	38.3	59 57.6	1.004	38.2	65 55.6	99 04	36.8	66 25.4	99 04	36.7	71 22.7	99 04	34.8	7
8	56 55.7	1.004	37.8	57 25.6	1.004	37.7	58 55.3	1.004	37.5	59 25.2	1.004	37.4	59 55.0	1.004	37.3	65 53.1	99 04	35.9	66 22.9	99 04	35.8	71 20.4	99 04	34.0	8
9	56 53.2	1.004	36.9	57 23.1	1.004	36.8	58 52.8	1.004	36.6	59 22.6	1.004	36.5	59 52.5	1.004	36.4	65 50.7	99 04	35.1	66 20.5	99 04	34.9	71 18.0	99 04	33.2	9
140	56 50.7	1.004	36.0	57 20.6	1.004	35.9	58 50.3	1.004	35.7	59 20.2	1.004	35.6	59 50.1	1.004	35.5	65 48.3	99 04	34.2	66 18.1	99 04	34.1	71 15.8	99 04	32.3	140
1	56 48.3	1.004	35.1	57 18.2	1.004	35.0	58 47.9	1.004	34.8	59 17.8	1.004	34.7	59 47.7	1.004	34.6	65 46.0	99 04	33.3	66 15.8	99 04	33.2	71 13.6	99 04	31.5	1
2	56 45.9	1.004	34.2	57 15.8	1.004	34.1	58 45.5	1.004	33.9	59 15.4	1.004	33.8	59 45.3	1.004	33.7	65 43.7	99 04	32.5	66 13.5	99 04	32.3	71 11.4	99 04	30.7	2
3	56 43.6	1.004	33.3	57 13.5	1.004	33.2	58 43.2	1.004	33.0	59 13.1	1.004	32.9	59 43.0	1.004	32.8	65 41.5	99 04	31.6	66 11.3	99 04	31.5	71 09.3	99 03	29.9	3
4	56 41.3	1.004	32.4	57 11.2	1.004	32.3	58 41.0	1.004	32.1	59 10.9	1.004	32.0	59 40.8	1.004	31.9	65 39.3	1.004	30.7	66 09.2	99 04	30.6	71 07.2	99 03	29.0	4
145	56 39.1	1.004	31.4	57 09.0	1.004	31.4	58 38.8	1.004	31.2	59 08.7	1.004	31.1	59 38.6	1.004	31.0	65 37.2	1.003	29.9	66 07.1	1.003	29.7	71 05.2	99 03	28.2	145
6	56 37.0	1.004	30.5	57 06.9	1.004	30.5	58 36.6	1.003	30.3	59 06.5	1.003	30.2	59 36.5	1.003	30.1	65 35.2	1.003	29.0	66 05.0	1.003	28.9	71 03.3	99 03	27.4	6
7	56 34.9	1.003	29.6	57 04.8	1.003	29.6	58 34.6	1.003	29.4	59 04.5	1.003	29.3	59 34.4	1.003	29.2	65 33.1	1.003	28.1	66 03.0	1.003	28.0	71 01.4	99 03	26.6	7
8	56 32.8	1.003	28.7	57 02.7	1.003	28.7	58 32.5	1.003	28.5	59 02.5	1.003	28.4	59 32.4	1.003	28.3	65 31.2	1.003	27.3	66 01.1	1.003	27.2	70 59.5	99 03	25.8	8
9	56 30.8	1.003	27.8	57 00.8	1.003	27.8	58 30.6	1.003	27.6	59 00.5	1.003	27.5	59 30.4	1.003	27.4	65 29.3	1.003	26.4	65 59.2	1.003	26.3	70 57.7	99 03	25.0	9
150	56 28.9	1.003	26.9	56 58.8	1.003	26.9	58 28.7	1.003	26.7	58 58.6	1.003	26.6	59 28.5	1.003	26.5	65 27.5	1.003	25.6	65 57.4	1.003	25.5	70 56.0	99 03	24.1	150
1	56 27.0	1.003	26.0	56 57.0	1.003	26.0	58 26.8	1.003	25.8	58 56.7	1.003	25.7	59 26.7	1.003	25.7	65 25.7	1.003	24.7	65 55.6	1.003	24.6	70 54.3	99 03	23.3	1
2	56 25.2	1.003	25.1	56 55.2	1.003	25.1	58 25.0	1.003	24.9	58 55.0	1.003	24.8	59 24.9	1.003	24.8	65 24.0	1.003	23.8	65 53.9	1.003	23.7	70 52.7	99 03	22.5	2
3	56 23.5	1.003	24.2	56 53.4	1.003	24.2	58 23.3	1.003	24.0	58 53.2	1.003	23.9	59 23.2	1.003	23.9	65 22.3	1.003	23.0	65 52.2	1.003	22.9	70 51.1	1.003	21.7	3
4	56 21.8	1.003	23.3	56 51.8	1.003	23.3	58 21.6	1.003	23.1	58 51.6	1.003	23.0	59 21.5	1.003	23.0	65 20.7	1.003	22.1	65 50.6	1.003	22.0	70 49.6	1.002	20.9	4
155	56 20.2	1.003	22.4	56 50.1	1.003	22.4	58 20.0	1.003	22.2	58 50.0	1.003	22.2	59 19.9	1.003	22.1	65 19.2	1.002	21.3	65 49.1	1.002	21.2	70 48.1	1.002	20.1	155
6	56 18.6	1.003	21.5	56 48.6	1.002	21.5	58 18.4	1.002	21.3	58 48.4	1.002	21.3	59 18.4	1.002	21.2	65 17.7	1.002	20.4	65 47.6	1.002	20.3	70 46.5	1.002	19.3	6
7	56 17.1	1.002	20.6	56 47.1	1.002	20.6	58 17.0	1.002	20.4	58 46.9	1.002	20.4	59 16.9	1.002	20.3	65 16.2	1.002	19.6	65 46.2	1.002	19.5	70 45.4	1.002	18.5	7
8	56 15.7	1.002	19.7	56 45.6	1.002	19.7	58 15.5	1.002	19.5	58 45.5	1.002	19.5	59 15.4	1.002	19.4	65 14.9	1.002	18.7	65 44.8	1.002	18.6	70 44.1	1.002	17.7	8
9	56 14.3	1.002	18.8	56 44.3	1.002	18.8	58 14.2	1.002	18.6	58 44.1	1.002	18.6	59 14.1	1.002	18.5	65 13.6	1.002	17.8	65 43.5	1.002	17.8	70 42.8	1.002	16.9	9
160	56 13.0	1.002	17.9	56 42.9	1.002	17.9	58 12.9	1.002	17.7	58 42.8	1.002	17.7	59 12.8	1.002	17.7	65 12.3	1.002	17.0	65 42.3	1.002	16.9	70 41.6	1.002	16.0	160
1	56 11.7	1.002	17.0	56 41.7	1.002	17.0	58 11.6	1.002	16.9	58 41.6	1.002	16.8	59 11.5	1.002	16.8	65 11.1	1.002	16.1	65 41.1	1.002	16.1	70 40.4	1.002	15.2	1
2	56 10.5	1.002	16.1	56 40.5	1.002	16.1	58 10.4	1.002	16.0	58 40.4	1.002	15.9	59 10.4	1.002	15.9	65 10.0	1.002	15.3	65 39.9	1.002	15.2	70 39.4	1.002	14.4	2
3	56 09.4	1.002	15.2	56 39.4	1.002	15.2	58 09.3	1.002	15.1	58 39.3	1.002	15.0	59 09.3	1.002	15.0	65 08.9	1.002	14.4	65 38.9	1.002	14.4	70 38.4	1.002	13.6	3
4	56 08.3	1.002	14.3	56 38.3	1.002	14.3	58 08.2	1.002	14.2	58 38.2	1.002	14.2	59 08.2	1.002	14.1	65 07.9	1.002	13.6	65 37.9	1.002	13.5	70 37.5	1.002	12.8	4
165	56 07.3	1.001	13.4	56 37.3	1.001	13.4	58 07.3	1.001	13.3	58 37.2	1.001	13.3	59 07.2	1.001	13.2	65 06.9	1.001	12.7	65 36.9	1.001	12.7	70 36.6	1.001	12.0	165
6	56 06.4	1.001	12.5	56 36.4	1.001	12.5	58 06.3	1.001	12.4	58 36.3	1.001	12.4	59 06.3	1.001	12.4	65 06.0	1.001	11.9	65 36.0	1.001	11.8	70 35.7	1.001	11.2	6
7	56 05.5	1.001	11.6	56 35.5	1.001	11.6	58 05.5	1.001	11.5	58 35.4	1.001	11.5	59 05.4	1.001	11.5	65 05.2	1.001	11.0	65 35.2	1.001	11.0	70 34.9	1.001	10.4	7
8	56 04.7	1.001	10.7	56 34.7	1.001	10.7	58 04.6	1.001	10.6	58 34.6	1.001	10.6	59 04.6	1.001	10.6	65 04.4	1.001	10.2	65 34.4	1.001	10.1	70 34.2	1.001	09.6	8
9	56 03.9	1.001	09.8	56 33.9	1.001	09.8	58 03.9	1.001	09.8	58 33.9	1.001	09.7	59 03.9	1.001	09.7	65 03.7	1.001	09.3	65 33.7	1.001	09.3	70 33.5	1.001	08.8	9
170	56 03.3	1.001	08.9	56 33.3	1.001	08.9	58 03.2	1.001	08.9	58 33.2	1.001	08.8	59 03.2	1.001	08.8	65 03.1	1.001	08.5	65 33.1	1.001	08.4	70 32.9	1.001	08.0	170
1	56 02.6	1.001	08.0	56 32.6	1.001	08.0	58 02.6	1.001	08.0	58 32.6	1.001	08.0	59 02.6	1.001	07.9	65 02.5	1.001	07.6	65 32.5	1.001	07.6	70 32.4	1.001	07.2	1
2	56 02.1	1.001	07.2	56 32.1	1.001	07.1	58 02.1	1.001	07.1	58 32.1	1.001	07.1	59 02.1	1.001	07.1	65 02.0	1.001	06.8	65 32.0	1.001	06.8	70 31.9	1.001	06.4	2
3	56 01.6	1.001	06.3	56 31.6	1.001	06.2	58 01.6	1.001	06.2	58 31.6	1.001	06.2	59 01.6	1.001	06.2	65 01.5	1.001	05.9	65 31.5	1.001	05.9	70 31.4	1.001	05.6	3
4	56 01.2	1.001	05.4	56 31.2	1.001	05.4	58 01.2	1.001	05.3	58 31.2	1.001	05.3	59 01.2	1.001	05.3	65 01.1	1.001	05.1	65 31.1	1.001	05.1	70 31.0	1.001	04.8	4
175	56 00.8	1.000	04.5	56 30.8	1.000	04.5	58 00.8	1.000	04.4	58 30.8	1.000	04.4	59 00.8	1.000	04.4	65 00.8	1.000	04.2	65 30.8	1.000	04.2	70 30.7	1.000	04.0	175
6	56 00.5	1.000	03.6	56 30.5	1.000	03.6	58 00.5	1.000	03.5	58 30.5	1.000	03.5	59 00.5	1.000	03.5	65 00.5	1.000	03.4	65 30.5	1.000	03.4	70 30.5	1.000	03.2	6
7	56 00.3	1.000	02.7	56 30.3	1.000	02.7	58 00.3	1.000	02.7	58 30.3	1.000	02.7	59 00.3	1.000	02.6	65 00.3	1.000	02.5	65 30.3	1.000	02.5	70 30.3	1.000	02.4	7
8	56 00.1	1.000	01.8	56 30.1	1.000	01.8	58 00.1	1.000	01.8	58 30.1	1.000	01.8	59 00.1	1.000	01.8	65 00.1	1.000	01.7	65 30.1	1.000	01.7	70 30.1	1.000	01.6	8
9	56 00.1	1.000	00.9	56 30.1	1.000	00.9	58 00.1	1.000	00.9	58 30.1	1.000	00.9	59 00.1	1.000	00.9	65 00.1	1.000	00.8	65 30.1	1.000	00.8	70 30.1	1.000	00.8	9
180	56 00.0	1.000	00.0	56 30.0	1.000	00.0	58 00.0	1.000	00.0	58 30.0	1.000	00.0	59 00.0	1.000	00.0	65 00.0	1.000	00.0	65 30.0	1.000	00.0	70 30.0	1.000	00.0	180

STAR IDENTIFICATION TABLE

ALTITUDE

Lat. 86°

AZ.	4° Dec.	4° H.A.	8° Dec.	8° H.A.	12° Dec.	12° H.A.	16° Dec.	16° H.A.	20° Dec.	20° H.A.	24° Dec.	24° H.A.	28° Dec.	28° H.A.	32° Dec.	32° H.A.	36° Dec.	36° H.A.	40° Dec.	40° H.A.	44° Dec.	44° H.A.	AZ.
00	08	180	12	180	16	180	20	180	24	180	28	180	32	180	36	180	40	180	44	180	48	180	00
4	08	176	12	176	16	176	20	176	24	176	28	176	32	176	36	176	40	176	44	176	48	176	4
8	08	172	12	172	16	172	20	172	24	172	28	172	32	172	36	172	40	172	44	171	48	171	8
12	08	168	12	168	16	168	20	168	24	168	28	168	32	168	36	167	40	167	44	167	48	167	12
16	08	164	12	164	16	164	20	164	24	164	28	163	32	163	36	163	40	163	44	163	48	163	16
20	08	160	12	160	16	160	20	160	24	159	28	159	32	159	36	159	40	159	44	159	48	159	20
24	08	156	12	156	16	156	20	155	24	155	28	155	32	155	36	155	40	155	44	155	48	154	24
28	08	152	12	152	16	152	20	151	24	151	28	151	32	151	36	151	40	151	44	150	47	150	28
32	07	148	11	148	15	147	19	147	23	147	27	147	31	147	35	147	39	146	43	146	47	146	32
36	07	144	11	144	15	143	19	143	23	143	27	143	31	143	35	142	39	142	43	142	47	142	36
40	07	140	11	140	15	139	19	139	23	139	27	139	31	139	35	138	39	138	43	138	47	137	40
44	07	136	11	136	15	135	19	135	23	135	27	135	31	135	35	134	39	134	43	133	47	133	44
48	07	132	11	132	15	131	19	131	23	131	27	131	31	130	35	130	39	130	43	129	47	129	48
52	06	128	10	127	14	127	18	127	22	127	26	127	30	126	34	126	38	126	42	125	46	125	52
56	06	124	10	123	14	123	18	123	22	123	26	122	30	122	34	122	38	121	42	121	46	121	56
60	06	120	10	119	14	119	18	119	22	119	26	118	30	118	34	118	38	117	42	117	46	116	60
64	06	116	10	115	14	115	18	115	22	115	26	114	30	114	34	114	38	113	42	113	46	112	64
68	05	112	09	111	13	111	17	111	21	111	25	110	29	110	33	110	37	109	41	109	45	108	68
72	05	108	09	107	13	107	17	107	21	107	25	106	29	106	33	106	37	105	41	105	45	104	72
76	05	104	09	103	13	103	17	103	21	103	25	102	29	102	33	102	37	101	41	101	45	100	76
80	05	100	09	99	13	99	17	99	21	99	25	98	29	98	33	97	37	97	41	97	45	96	80
84	04	96	08	95	12	95	16	95	20	95	24	94	28	94	32	93	36	93	40	93	44	92	84
88	04	92	08	91	12	91	16	91	20	91	24	90	28	90	32	89	36	89	40	89	44	88	88
92	04	88	08	87	12	87	16	87	20	87	24	86	28	86	32	86	36	85	40	85	44	84	92
96	04	84	08	83	12	83	16	83	20	83	24	82	28	82	31	82	35	81	39	81	43	80	96
100	03	80	07	79	11	79	15	79	19	79	23	78	27	78	31	78	35	77	39	77	43	76	100
104	03	76	07	75	11	75	15	75	19	75	23	74	27	74	31	74	35	73	39	73	43	72	104
108	03	72	07	72	11	71	15	71	19	71	23	70	27	70	31	70	35	69	39	69	43	68	108
112	02	68	06	68	10	67	14	67	18	67	22	66	26	66	30	66	34	65	38	65	42	65	112
116	02	64	06	64	10	63	14	63	18	63	22	62	26	62	30	62	34	62	38	61	42	61	116
120	02	60	06	60	10	59	14	59	18	59	22	59	26	58	30	58	34	58	38	57	42	57	120
124	02	56	06	56	10	55	14	55	18	55	22	55	26	54	30	54	34	54	38	53	42	53	124
128	02	52	06	52	10	51	14	51	18	51	22	51	25	50	29	50	33	50	37	50	41	49	128
132	01	48	05	48	09	47	13	47	17	47	21	47	25	47	29	46	33	46	37	46	41	45	132
136	01	44	05	44	09	43	13	43	17	43	21	43	25	43	29	42	33	42	37	42	41	42	136
140	01	40	05	40	09	40	13	39	17	39	21	39	25	39	29	39	33	38	37	38	41	38	140
144	01	36	05	36	09	36	13	35	17	35	21	35	25	35	29	35	33	34	37	34	41	34	144
148	01	32	05	32	09	32	13	31	17	31	21	31	25	31	29	31	33	31	37	30	41	30	148
152	00	28	04	28	08	28	12	28	16	27	20	27	24	27	28	27	32	27	36	27	40	26	152
156	00	24	04	24	08	24	12	24	16	23	20	23	24	23	28	23	32	23	36	23	40	23	156
160	00	20	04	20	08	20	12	20	16	20	20	19	24	19	28	19	32	19	36	19	40	19	160
164	00	16	04	16	08	16	12	16	16	16	20	16	24	15	28	15	32	15	36	15	40	15	164
168	00	12	04	12	08	12	12	12	16	12	20	12	24	12	28	12	32	11	36	11	40	11	168
172	00	08	04	08	08	08	12	08	16	08	20	08	24	08	28	08	32	08	36	08	40	08	172
176	00	04	04	04	08	04	12	04	16	04	20	04	24	04	28	04	32	04	36	04	40	04	176
180	00	00	04	00	08	00	12	00	16	00	20	00	24	00	28	00	32	00	36	00	40	00	180
	4°		8°		12°		16°		20°		24°		28°		32°		36°		40°		44°		

FIGURES IN ITALICS INDICATE THAT DECLINATION IS OF CONTRARY NAME TO LATITUDE

STAR IDENTIFICATION TABLE

ALTITUDE

Lat. 86°

AZ.	48° Dec.	48° H.A.	52° Dec.	52° H.A.	56° Dec.	56° H.A.	60° Dec.	60° H.A.	64° Dec.	64° H.A.	68° Dec.	68° H.A.	72° Dec.	72° H.A.	76° Dec.	76° H.A.	80° Dec.	80° H.A.	84° Dec.	84° H.A.	88° Dec.	88° H.A.	AZ.
°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
00	52	180	56	180	60	180	64	180	68	180	72	180	76	180	80	180	84	180	88	180	88	00	00
4	52	176	56	176	60	176	64	175	68	175	72	175	76	175	80	174	84	173	88	168	88	04	4
8	52	171	56	171	60	171	64	171	68	171	72	170	76	170	80	169	84	167	88	157	88	08	8
12	52	167	56	167	60	167	64	166	68	166	72	165	76	165	80	163	84	160	88	146	88	12	12
16	52	163	56	162	60	162	64	162	68	161	72	161	76	160	80	158	84	154	88	137	88	15	16
20	52	158	56	158	60	158	64	157	68	157	72	156	76	155	80	153	84	148	87	129	88	18	20
24	52	154	56	154	60	153	64	153	68	152	72	151	76	150	80	147	83	142	87	121	88	21	24
28	51	150	55	149	59	149	63	148	67	148	71	146	75	145	79	142	83	136	87	115	88	23	28
32	51	145	55	145	59	144	63	144	67	143	71	142	75	140	79	137	83	130	87	109	88	25	32
36	51	141	55	141	59	140	63	139	67	138	71	137	75	135	79	132	83	125	86	104	87	26	36
40	51	137	55	136	59	136	63	135	67	134	71	133	75	131	79	127	83	120	86	99	87	28	40
44	51	133	55	132	59	131	63	131	67	130	71	128	75	126	79	122	82	115	86	94	87	28	44
48	51	128	55	128	59	127	63	126	66	125	70	124	74	121	78	118	82	110	86	90	87	29	48
52	50	124	54	124	58	123	62	122	66	121	70	119	74	117	78	113	82	106	85	86	87	30	52
56	50	120	54	119	58	119	62	118	66	117	70	115	74	112	78	109	82	101	85	83	87	30	56
60	50	116	54	115	58	115	62	114	66	112	70	111	74	108	78	104	81	97	85	79	87	30	60
64	50	112	54	111	58	110	62	109	66	108	69	106	73	104	77	100	81	93	84	76	86	30	64
68	49	108	53	107	57	106	61	105	65	104	69	102	73	100	77	96	81	89	84	73	86	30	68
72	49	104	53	103	57	102	61	101	65	100	69	98	73	96	77	92	80	85	84	70	86	29	72
76	49	100	53	99	57	98	61	97	65	96	69	94	73	92	76	88	80	81	84	66	86	29	76
80	49	96	53	95	56	94	60	93	64	92	68	90	72	88	76	84	80	77	83	64	86	28	80
84	48	92	52	91	56	90	60	89	64	88	68	86	72	84	76	80	80	74	83	61	86	28	84
88	48	88	52	87	56	86	60	85	64	84	68	82	72	80	76	76	79	70	83	58	86	27	88
92	48	84	52	83	56	82	60	81	64	80	68	78	71	76	75	73	79	67	83	55	85	26	92
96	47	80	51	79	55	78	59	77	63	76	67	74	71	72	75	69	79	63	82	52	85	25	96
100	47	76	51	75	55	74	59	73	63	72	67	71	71	68	75	65	79	60	82	50	85	24	100
104	47	72	51	71	55	70	59	70	63	68	67	67	71	65	75	62	78	57	82	47	85	23	104
108	47	68	51	67	55	67	59	66	63	65	66	63	70	61	74	58	78	53	82	44	85	22	108
112	46	64	50	63	54	63	58	62	62	61	66	59	70	58	74	55	78	50	82	42	85	21	112
116	46	60	50	60	54	59	58	58	62	57	66	56	70	54	74	51	78	47	81	39	85	20	116
120	46	56	50	56	54	55	58	54	62	53	66	52	70	51	74	48	78	44	81	37	85	19	120
124	46	53	50	52	54	51	58	51	62	50	66	49	70	47	73	45	77	41	81	34	85	18	124
128	45	49	49	48	53	48	57	47	61	46	65	45	69	44	73	41	77	38	81	32	85	17	128
132	45	45	49	44	53	44	57	43	61	43	65	41	69	40	73	38	77	35	81	29	84	16	132
136	45	41	49	41	53	40	57	40	61	39	65	38	69	37	73	35	77	32	81	27	84	14	136
140	45	37	49	37	53	37	57	36	61	35	65	34	69	33	73	32	77	29	81	24	84	13	140
144	45	34	49	33	53	33	57	32	61	32	65	31	69	30	73	28	77	26	80	22	84	12	144
148	45	30	49	30	53	29	57	29	61	28	65	27	69	27	72	25	76	23	80	19	84	11	148
152	44	26	48	26	52	26	56	25	60	25	64	24	68	23	72	22	76	20	80	17	84	09	152
156	44	22	48	22	52	22	56	22	60	21	64	21	68	20	72	19	76	17	80	14	84	08	156
160	44	19	48	18	52	18	56	18	60	18	64	17	68	17	72	16	76	14	80	12	84	07	160
164	44	15	48	15	52	15	56	14	60	14	64	14	68	13	72	13	76	12	80	10	84	05	164
168	44	11	48	11	52	11	56	11	60	11	64	10	68	10	72	09	76	09	80	07	84	04	168
172	44	07	48	07	52	07	56	07	60	07	64	07	68	07	72	06	76	06	80	05	84	03	172
176	44	04	48	04	52	04	56	04	60	04	64	03	68	03	72	03	76	03	80	02	84	01	176
180	44	00	48	00	52	00	56	00	60	00	64	00	68	00	72	00	76	00	80	00	84	00	180
	48°		52°		56°		60°		64°		68°		72°		76°		80°		84°		88°	

Lat. 87°

Lat. 88°

FIGURES IN ITALICS INDICATE THAT DECLINATION IS OF CONTRARY NAME TO LATITUDE

H.A.	0° 00'	0° 30'	1° 00'	1° 30'	2° 00'	2° 30'	3° 00'	3° 30'	H.A.
	Alt. — Az.	Alt. — Az.	Alt. — Az.	Alt. — Az.	Alt. — Az.	Alt. — Az.	Alt. — Az.	Alt. — Az.	
	° ' Δd Δt °	° ' Δd Δt °	° ' Δd Δt °	° ' Δd Δt °	° ' Δd Δt °	° ' Δd Δt °	° ' Δd Δt °	° ' Δd Δt °	
00					5 00.0 1.0 00 180.0	5 30.0 1.0 00 180.0	6 00.0 1.0 00 180.0	6 30.0 1.0 00 180.0	00
1						5 30.0 1.0 00 179.0	6 00.0 1.0 00 179.0	6 30.0 1.0 00 179.0	1
2						5 29.9 1.0 00 178.0	5 59.9 1.0 00 178.0	6 29.9 1.0 00 178.0	2
3						5 29.8 1.0 00 177.0	5 59.8 1.0 00 177.0	6 29.8 1.0 00 177.0	3
4						5 29.6 1.0 00 176.0	5 59.6 1.0 00 176.0	6 29.6 1.0 00 176.0	4
05						5 29.3 1.0 00 175.0	5 59.3 1.0 00 175.0	6 29.3 1.0 00 175.0	05
6						5 29.0 1.0 01 174.0	5 59.0 1.0 01 174.0	6 29.0 1.0 01 174.0	6
7						5 28.7 1.0 01 173.0	5 58.7 1.0 01 173.0	6 28.7 1.0 01 173.0	7
8						5 28.2 1.0 01 172.0	5 58.2 1.0 01 172.0	6 28.2 1.0 01 172.0	8
9						5 27.8 1.0 01 171.0	5 57.8 1.0 01 171.0	6 27.8 1.0 01 171.0	9
10						5 27.3 1.0 01 170.0	5 57.3 1.0 01 170.0	6 27.3 1.0 01 170.0	10
1						5 26.7 1.0 01 169.0	5 56.7 1.0 01 169.0	6 26.7 1.0 01 169.0	1
2						5 26.1 1.0 01 168.0	5 56.1 1.0 01 168.0	6 26.1 1.0 01 167.9	2
3						5 25.4 1.0 01 167.0	5 55.4 1.0 01 166.9	6 25.4 1.0 01 166.9	3
4						5 24.6 1.0 01 165.9	5 54.6 1.0 01 165.9	6 24.6 1.0 01 165.9	4
15						5 23.8 1.0 01 164.9	5 53.8 1.0 01 164.9	6 23.8 1.0 01 164.9	15
6						5 23.0 1.0 01 163.9	5 53.0 1.0 02 163.9	6 23.0 1.0 02 163.9	6
7						5 22.1 1.0 02 162.9	5 52.1 1.0 02 162.9	6 22.1 1.0 02 162.9	7
8						5 21.2 1.0 02 161.9	5 51.2 1.0 02 161.9	6 21.2 1.0 02 161.9	8
9						5 20.2 1.0 02 160.9	5 50.2 1.0 02 160.9	6 20.2 1.0 02 160.9	9
20						5 19.1 1.0 02 159.9	5 49.1 1.0 02 159.9	6 19.1 1.0 02 159.9	20
1						5 18.0 1.0 02 158.9	5 48.0 1.0 02 158.9	6 18.0 1.0 02 158.9	1
2						5 16.9 1.0 02 157.9	5 46.8 1.0 02 157.9	6 16.8 1.0 02 157.9	2
3						5 15.6 1.0 02 156.9	5 45.6 1.0 02 156.9	6 15.6 1.0 02 156.9	3
4						5 14.4 1.0 02 155.9	5 44.4 1.0 02 155.9	6 14.4 1.0 02 155.9	4
25						5 13.1 1.0 02 154.9	5 43.1 1.0 02 154.9	6 13.1 1.0 02 154.9	25
6						5 11.7 1.0 02 153.9	5 41.7 1.0 02 153.9	6 11.7 1.0 02 153.9	6
7						5 10.3 1.0 02 152.9	5 40.3 1.0 02 152.9	6 10.3 1.0 02 152.9	7
8						5 08.9 1.0 02 151.9	5 38.9 1.0 03 151.9	6 08.9 1.0 02 151.9	8
9						5 07.4 1.0 03 150.9	5 37.4 1.0 03 150.9	6 07.3 1.0 03 150.9	9
30						5 05.8 1.0 03 149.9	5 35.8 1.0 03 149.9	6 05.8 1.0 03 149.9	30
1						5 04.2 1.0 03 148.9	5 34.2 1.0 03 148.9	6 04.2 1.0 03 148.9	1
2						5 02.6 1.0 03 147.9	5 32.6 1.0 03 147.9	6 02.5 1.0 03 147.9	2
3						5 00.9 1.0 03 146.9	5 30.9 1.0 03 146.9	6 00.9 1.0 03 146.9	3
4							5 29.1 1.0 03 145.9	5 59.1 1.0 03 145.9	4
35							5 27.3 1.0 03 144.9	5 57.3 1.0 03 144.9	35
6							5 25.5 1.0 03 143.9	5 55.5 1.0 03 143.9	6
7							5 23.6 1.0 03 142.9	5 53.6 1.0 03 142.9	7
8							5 21.7 1.0 03 141.9	5 51.7 1.0 03 141.8	8
9							5 19.8 1.0 03 140.9	5 49.7 1.0 03 140.8	9
40							5 17.8 1.0 03 139.9	5 47.7 1.0 03 139.8	40
1							5 15.7 1.0 03 138.9	5 45.7 1.0 03 138.8	1
2							5 13.6 1.0 04 137.9	5 43.6 1.0 04 137.8	2
3							5 11.5 1.0 04 136.9	5 41.5 1.0 04 136.8	3
4							5 09.3 1.0 04 135.9	5 39.3 1.0 04 135.8	4
45							5 07.1 1.0 04 134.8	5 37.1 1.0 04 134.8	45
6							5 04.9 1.0 04 133.8	5 34.9 1.0 04 133.8	6
7							5 02.6 1.0 04 132.8	5 32.6 1.0 04 132.8	7
8							5 00.3 1.0 04 131.8	5 30.3 1.0 04 131.8	8
9								5 27.9 1.0 04 130.8	9
50								5 25.5 1.0 04 129.8	50
1								5 23.1 1.0 04 128.8	1
2								5 20.6 1.0 04 127.8	2
3								5 18.1 1.0 04 126.8	3
4								5 15.6 1.0 04 125.8	4
55								5 13.0 1.0 04 124.8	55
6								5 10.4 1.0 04 123.8	6
7								5 07.8 1.0 04 122.8	7
8								5 05.1 1.0 04 121.8	8
9								5 02.5 1.0 05 120.8	9

H.A.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	H.A.	Lat. 87°
°	° ′ Δd Δt °	° ′ Δd Δt °	° ′ Δd Δt °	° ′ Δd Δt °	° ′ Δd Δt °	° ′ Δd Δt °	° ′ Δd Δt °	° ′ Δd Δt °	°	
										Lat. 87°
										La 88
H.A.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	H.A.	
°	° ′ Δd Δt °	° ′ Δd Δt °	° ′ Δd Δt °	° ′ Δd Δt °	° ′ Δd Δt °	° ′ Δd Δt °	° ′ Δd Δt °	° ′ Δd Δt °	°	

DECLINATION SAME NAME AS LATITUDE

Lat. 17°

H.A.	4° 00' Alt. / Δd Δt / Az.	4° 30' Alt. / Δd Δt / Az.	5° 00' Alt. / Δd Δt / Az.	5° 30' Alt. / Δd Δt / Az.	6° 00' Alt. / Δd Δt / Az.	6° 30' Alt. / Δd Δt / Az.	7° 00' Alt. / Δd Δt / Az.	7° 30' Alt. / Δd Δt / Az.	H.A.
00	7 00.9 1.00 0 180.0	7 30.9 1.00 0 180.0	8 00.9 1.00 0 180.0	8 30.9 1.00 0 180.0	9 00.9 1.00 0 180.0	9 30.9 1.00 0 180.0	10 00.9 1.00 0 180.0	10 30.9 1.00 0 180.0	00
1	7 00.9 1.00 0 179.0	7 30.9 1.00 0 179.0	8 00.0 1.00 0 179.0	8 30.0 1.00 0 179.0	9 00.0 1.00 0 179.0	9 30.9 1.00 0 179.0	10 00.0 1.00 0 179.0	10 30.9 1.00 0 179.0	1
2	6 59.9 1.00 0 178.0	7 29.9 1.00 0 178.0	7 59.9 1.00 0 178.0	8 29.9 1.00 0 178.0	8 59.9 1.00 0 178.0	9 29.9 1.00 0 178.0	9 59.9 1.00 0 178.0	10 29.9 1.00 0 178.0	2
3	6 59.6 1.00 0 177.0	7 29.8 1.00 0 177.0	7 59.8 1.00 0 177.0	8 29.8 1.00 0 177.0	8 59.8 1.00 0 177.0	9 29.8 1.00 0 177.0	9 59.8 1.00 0 177.0	10 29.8 1.00 0 177.0	3
4	6 59.6 1.00 0 176.0	7 29.6 1.00 0 176.0	7 59.6 1.00 0 176.0	8 29.6 1.00 0 176.0	8 59.6 1.00 0 176.0	9 29.6 1.00 0 176.0	9 59.6 1.00 0 176.0	10 29.6 1.00 0 176.0	4
05	6 59.3 1.00 1 175.0	7 29.3 1.00 1 175.0	7 59.3 1.00 1 175.0	8 29.3 1.00 1 175.0	8 59.3 1.00 1 175.0	9 29.3 1.00 1 175.0	9 59.3 1.00 1 175.0	10 29.3 1.00 1 175.0	05
6	6 59.0 1.00 1 174.0	7 29.0 1.00 1 174.0	7 59.0 1.00 1 174.0	8 29.0 1.00 1 174.0	8 59.0 1.00 1 174.0	9 29.0 1.00 1 174.0	9 59.0 1.00 1 174.0	10 29.0 1.00 1 174.0	6
7	6 58.7 1.00 1 173.0	7 28.7 1.00 1 173.0	7 58.7 1.00 1 173.0	8 28.6 1.00 1 173.0	8 58.6 1.00 1 172.9	9 28.6 1.00 1 172.9	9 58.6 1.00 1 172.9	10 28.6 1.00 1 172.9	7
8	6 58.2 1.00 1 172.0	7 28.2 1.00 1 172.0	7 58.2 1.00 1 172.0	8 28.2 1.00 1 171.9	8 58.2 1.00 1 171.9	9 28.2 1.00 1 171.9	9 58.2 1.00 1 171.9	10 28.2 1.00 1 171.9	8
9	6 57.8 1.00 1 171.0	7 27.8 1.00 1 171.0	7 57.8 1.00 1 170.9	8 27.8 1.00 1 170.9	8 57.8 1.00 1 170.9	9 27.8 1.00 1 170.9	9 57.8 1.00 1 170.9	10 27.8 1.00 1 170.9	9
10	6 57.3 1.00 1 170.0	7 27.3 1.00 1 169.9	7 57.3 1.00 1 169.9	8 27.2 1.00 1 169.9	8 57.2 1.00 1 169.9	9 27.2 1.00 1 169.9	9 57.2 1.00 1 169.9	10 27.2 1.00 1 169.9	10
1	6 56.7 1.00 1 168.9	7 26.7 1.00 1 168.9	7 56.7 1.00 1 168.9	8 26.7 1.00 1 168.9	8 56.7 1.00 1 168.9	9 26.7 1.00 1 168.9	9 56.7 1.00 1 168.9	10 26.7 1.00 1 168.9	1
2	6 56.0 1.00 1 167.9	7 26.0 1.00 1 167.9	7 56.0 1.00 1 167.9	8 26.0 1.00 1 167.9	8 56.0 1.00 1 167.9	9 26.0 1.00 1 167.9	9 56.0 1.00 1 167.9	10 26.0 1.00 1 167.9	2
3	6 55.4 1.00 1 166.9	7 25.4 1.00 1 166.9	7 55.4 1.00 1 166.9	8 25.4 1.00 1 166.9	8 55.4 1.00 1 166.9	9 25.4 1.00 1 166.9	9 55.4 1.00 1 166.9	10 25.4 1.00 1 166.9	3
4	6 54.6 1.00 1 165.9	7 24.6 1.00 1 165.9	7 54.6 1.00 1 165.9	8 24.6 1.00 1 165.9	8 54.6 1.00 1 165.9	9 24.6 1.00 1 165.9	9 54.6 1.00 1 165.9	10 24.6 1.00 1 165.9	4
15	6 53.8 1.00 1 164.9	7 23.8 1.00 1 164.9	7 53.8 1.00 1 164.9	8 23.8 1.00 1 164.9	8 53.8 1.00 1 164.9	9 23.8 1.00 1 164.9	9 53.8 1.00 1 164.9	10 23.8 1.00 1 164.9	15
6	6 53.0 1.00 2 163.9	7 23.0 1.00 2 163.9	7 53.0 1.00 1 163.9	8 23.0 1.00 2 163.9	8 53.0 1.00 2 163.9	9 23.0 1.00 2 163.9	9 53.0 1.00 2 163.9	10 23.0 1.00 2 163.9	6
7	6 52.1 1.00 2 162.9	7 22.1 1.00 2 162.9	7 52.1 1.00 2 162.9	8 22.1 1.00 2 162.9	8 52.1 1.00 2 162.9	9 22.1 1.00 2 162.9	9 52.1 1.00 2 162.9	10 22.1 1.00 2 162.9	7
8	6 51.2 1.00 2 161.9	7 21.1 1.00 2 161.9	7 51.1 1.00 2 161.9	8 21.1 1.00 2 161.9	8 51.1 1.00 2 161.9	9 21.1 1.00 2 161.9	9 51.1 1.00 2 161.9	10 21.1 1.00 2 161.9	8
9	6 50.2 1.00 2 160.9	7 20.1 1.00 2 160.9	7 50.1 1.00 2 160.9	8 20.1 1.00 2 160.9	8 50.1 1.00 2 160.9	9 20.1 1.00 2 160.9	9 50.1 1.00 2 160.9	10 20.1 1.00 2 160.8	9
20	6 49.1 1.00 2 159.9	7 19.1 1.00 2 159.9	7 49.1 1.00 2 159.9	8 19.1 1.00 2 159.9	8 49.1 1.00 2 159.9	9 19.1 1.00 2 159.9	9 49.1 1.00 2 159.8	10 19.1 1.00 2 159.8	20
1	6 48.0 1.00 2 158.9	7 18.0 1.00 2 158.9	7 48.0 1.00 2 158.9	8 18.0 1.00 2 158.9	8 48.0 1.00 2 158.9	9 18.0 1.00 2 158.9	9 48.0 1.00 2 158.8	10 18.0 1.00 2 158.8	1
2	6 46.8 1.00 2 157.9	7 16.8 1.00 2 157.9	7 46.8 1.00 2 157.9	8 16.8 1.00 2 157.9	8 46.8 1.00 2 157.9	9 16.8 1.00 2 157.8	9 46.8 1.00 2 157.8	10 16.8 1.00 2 157.8	2
3	6 45.6 1.00 2 156.9	7 15.6 1.00 2 156.9	7 45.6 1.00 2 156.9	8 15.6 1.00 2 156.9	8 45.6 1.00 2 156.8	9 15.6 1.00 2 156.8	9 45.6 1.00 2 156.8	10 15.6 1.00 2 156.8	3
4	6 44.4 1.00 2 155.9	7 14.4 1.00 2 155.9	7 44.4 1.00 2 155.9	8 14.4 1.00 2 155.9	8 44.3 1.00 2 155.8	9 14.3 1.00 2 155.8	9 44.3 1.00 2 155.8	10 14.3 1.00 2 155.8	4
25	6 43.1 1.00 2 154.9	7 13.1 1.00 2 154.9	7 43.0 1.00 2 154.9	8 13.0 1.00 2 154.8	8 43.0 1.00 2 154.8	9 13.0 1.00 2 154.8	9 43.0 1.00 2 154.8	10 13.0 1.00 2 154.8	25
6	6 41.7 1.00 2 153.9	7 11.7 1.00 2 153.9	7 41.7 1.00 2 153.8	8 11.7 1.00 2 153.8	8 41.7 1.00 2 153.8	9 11.7 1.00 2 153.8	9 41.7 1.00 2 153.8	10 11.6 1.00 2 153.8	6
7	6 40.3 1.00 2 152.9	7 10.3 1.00 2 152.9	7 40.3 1.00 2 152.8	8 10.3 1.00 2 152.8	8 40.3 1.00 2 152.8	9 10.3 1.00 2 152.8	9 40.2 1.00 2 152.8	10 10.2 1.00 2 152.8	7
8	6 38.8 1.00 3 151.9	7 08.8 1.00 2 151.9	7 38.8 1.00 2 151.8	8 08.8 1.00 3 151.8	8 38.8 1.00 2 151.8	9 08.8 1.00 3 151.8	9 38.8 1.00 3 151.8	10 08.8 1.00 3 151.8	8
9	6 37.3 1.00 3 150.9	7 07.3 1.00 3 150.9	7 37.3 1.00 3 150.8	8 07.3 1.00 3 150.8	8 37.3 1.00 3 150.8	9 07.3 1.00 3 150.8	9 37.3 1.00 3 150.8	10 07.3 1.00 3 150.8	9
30	6 35.8 1.00 3 149.9	7 05.8 1.00 3 149.8	7 35.8 1.00 3 149.8	8 05.8 1.00 3 149.8	8 35.7 1.00 3 149.8	9 05.7 1.00 3 149.8	9 35.7 1.00 3 149.8	10 05.7 1.00 3 149.8	30
1	6 34.2 1.00 3 148.9	7 04.2 1.00 3 148.8	7 34.2 1.00 3 148.8	8 04.2 1.00 3 148.8	8 34.1 1.00 3 148.8	9 04.1 1.00 3 148.8	9 34.1 1.00 3 148.8	10 04.1 1.00 3 148.8	1
2	6 32.5 1.00 3 147.9	7 02.5 1.00 3 147.8	7 32.5 1.00 3 147.8	8 02.5 1.00 3 147.8	8 32.5 1.00 3 147.8	9 02.5 1.00 3 147.8	9 32.5 1.00 3 147.8	10 02.5 1.00 3 147.8	2
3	6 30.8 1.00 3 146.8	7 00.8 1.00 3 146.8	7 30.8 1.00 3 146.8	8 00.8 1.00 3 146.8	8 30.8 1.00 3 146.8	9 00.8 1.00 3 146.8	9 30.8 1.00 3 146.8	10 00.8 1.00 3 146.7	3
4	6 29.1 1.00 3 145.8	6 59.1 1.00 3 145.8	7 29.1 1.00 3 145.8	7 59.1 1.00 3 145.8	8 29.1 1.00 3 145.8	8 59.0 1.00 3 145.8	9 29.0 1.00 3 145.8	9 59.0 1.00 3 145.7	4
35	6 27.3 1.00 3 144.8	6 57.3 1.00 3 144.8	7 27.3 1.00 3 144.8	7 57.3 1.00 3 144.8	8 27.3 1.00 3 144.8	8 57.2 1.00 3 144.8	9 27.2 1.00 3 144.8	9 57.2 1.00 3 144.7	35
6	6 25.5 1.00 3 143.8	6 55.5 1.00 3 143.8	7 25.5 1.00 3 143.8	7 55.4 1.00 3 143.8	8 25.4 1.00 3 143.8	8 55.4 1.00 3 143.8	9 25.4 1.00 3 143.7	9 55.4 1.00 3 143.7	6
7	6 23.6 1.00 3 142.8	6 53.6 1.00 3 142.8	7 23.6 1.00 3 142.8	7 53.6 1.00 3 142.8	8 23.5 1.00 3 142.8	8 53.5 1.00 3 142.8	9 23.5 1.00 3 142.7	9 53.5 1.00 3 142.7	7
8	6 21.7 1.00 3 141.8	6 51.7 1.00 3 141.8	7 21.7 1.00 3 141.8	7 51.6 1.00 3 141.8	8 21.6 1.00 3 141.8	8 51.6 1.00 3 141.7	9 21.6 1.00 3 141.7	9 51.6 1.00 3 141.7	8
9	6 19.7 1.00 3 140.8	6 49.7 1.00 3 140.8	7 19.7 1.00 3 140.8	7 49.7 1.00 3 140.8	8 19.7 1.00 3 140.8	8 49.6 1.00 3 140.7	9 19.6 1.00 3 140.7	9 49.6 1.00 3 140.7	9
40	6 17.7 1.00 3 139.8	6 47.7 1.00 3 139.8	7 17.7 1.00 3 139.8	7 47.7 1.00 3 139.8	8 17.7 1.00 3 139.8	8 47.6 1.00 3 139.7	9 17.6 1.00 3 139.7	9 47.6 1.00 3 139.7	40
1	6 15.7 1.00 4 138.8	6 45.7 1.00 4 138.8	7 15.6 1.00 4 138.8	7 45.6 1.00 4 138.8	8 15.6 1.00 4 138.8	8 45.6 1.00 4 138.7	9 15.6 1.00 4 138.7	9 45.6 1.00 4 138.7	1
2	6 13.6 1.00 4 137.8	6 43.6 1.00 4 137.8	7 13.6 1.00 4 137.8	7 43.5 1.00 4 137.8	8 13.5 1.00 4 137.7	8 43.5 1.00 4 137.7	9 13.5 1.00 4 137.7	9 43.5 1.00 4 137.7	2
3	6 11.5 1.00 4 136.8	6 41.4 1.00 4 136.8	7 11.4 1.00 4 136.8	7 41.4 1.00 4 136.8	8 11.4 1.00 4 136.7	8 41.4 1.00 4 136.7	9 11.3 1.00 4 136.7	9 41.3 1.00 4 136.7	3
4	6 09.3 1.00 4 135.8	6 39.3 1.00 4 135.8	7 09.3 1.00 4 135.8	7 39.2 1.00 4 135.8	8 09.2 1.00 4 135.7	8 39.2 1.00 4 135.7	9 09.2 1.00 4 135.7	9 39.2 1.00 4 135.7	4
45	6 07.1 1.00 4 134.8	6 37.1 1.00 4 134.8	7 07.0 1.00 4 134.8	7 37.0 1.00 4 134.8	8 07.0 1.00 4 134.7	8 37.0 1.00 4 134.7	9 07.0 1.00 4 134.7	9 36.9 1.00 4 134.7	45
6	6 04.8 1.00 4 133.8	6 34.8 1.00 4 133.8	7 04.8 1.00 4 133.8	7 34.8 1.00 4 133.8	8 04.8 1.00 4 133.7	8 34.7 1.00 4 133.7	9 04.7 1.00 4 133.7	9 34.7 1.00 4 133.7	6
7	6 02.6 1.00 4 132.8	6 32.5 1.00 4 132.8	7 02.5 1.00 4 132.8	7 32.5 1.00 4 132.7	8 02.5 1.00 4 132.7	8 32.4 1.00 4 132.7	9 02.4 1.00 4 132.7	9 32.4 1.00 4 132.7	7
8	6 00.2 1.00 4 131.8	6 30.2 1.00 4 131.8	7 00.2 1.00 4 131.8	7 30.2 1.00 4 131.7	8 00.1 1.00 4 131.7	8 30.1 1.00 4 131.7	9 00.1 1.00 4 131.7	9 30.1 1.00 4 131.7	8
9	5 57.9 1.00 4 130.8	6 27.8 1.00 4 130.8	6 57.8 1.00 4 130.8	7 27.8 1.00 4 130.7	7 57.8 1.00 4 130.7	8 27.8 1.00 4 130.7	8 57.7 1.00 4 130.7	9 27.7 1.00 4 130.7	9
50	5 55.5 1.00 4 129.8	6 25.5 1.00 4 129.8	6 55.4 1.00 4 129.8	7 25.4 1.00 4 129.7	7 55.4 1.00 4 129.7	8 25.4 1.00 4 129.7	8 55.3 1.00 4 129.7	9 25.3 1.00 4 129.7	50
1	5 53.0 1.00 4 128.8	6 23.0 1.00 4 128.8	6 53.0 1.00 4 128.8	7 23.0 1.00 4 128.7	7 52.9 1.00 4 128.7	8 22.9 1.00 4 128.7	8 52.9 1.00 4 128.7	9 22.9 1.00 4 128.7	1
2	5 50.6 1.00 4 127.8	6 20.6 1.00 4 127.8	6 50.5 1.00 4 127.7	7 20.5 1.00 4 127.7	7 50.5 1.00 4 127.7	8 20.5 1.00 4 127.7	8 50.4 1.00 4 127.7	9 20.4 1.00 4 127.6	2
3	5 48.1 1.00 4 126.8	6 18.1 1.00 4 126.8	6 48.0 1.00 4 126.7	7 18.0 1.00 4 126.7	7 48.0 1.00 4 126.7	8 18.0 1.00 4 126.7	8 47.9 1.00 4 126.7	9 17.9 1.00 4 126.6	3
4	5 45.6 1.00 4 125.8	6 15.5 1.00 4 125.8	6 45.5 1.00 4 125.7	7 15.5 1.00 4 125.7	7 45.4 1.00 4 125.7	8 15.4 1.00 4 125.7	8 45.4 1.00 4 125.7	9 15.4 1.00 4 125.6	4
55	5 43.0 1.00 4 124.8	6 13.0 1.00 4 124.8	6 42.9 1.00 4 124.7	7 12.9 1.00 4 124.7	7 42.9 1.00 4 124.7	8 12.8 1.00 4 124.7	8 42.8 1.00 4 124.7	9 12.8 1.00 4 124.6	55
6	5 40.4 1.00 4 123.8	6 10.4 1.00 4 123.8	6 40.3 1.00 4 123.7	7 10.3 1.00 4 123.7	7 40.3 1.00 4 123.7	8 10.3 1.00 4 123.7	8 40.2 1.00 4 123.7	9 10.2 1.00 4 123.6	6
7	5 37.8 1.00 4 122.8	6 07.7 1.00 4 122.8	6 37.7 1.00 4 122.7	7 07.7 1.00 4 122.7	7 37.7 1.00 4 122.7	8 07.6 1.00 4 122.7	8 37.6 1.00 4 122.7	9 07.6 1.00 4 122.6	7
8	5 35.1 1.00 4 121.8	6 05.1 1.00 4 121.8	6 35.1 1.00 4 121.7	7 05.0 1.00 4 121.7	7 35.0 1.00 4 121.7	8 05.0 1.00 4 121.7	8 34.9 1.00 4 121.7	9 04.9 1.00 4 121.6	8
9	5 32.4 1.00 5 120.8	6 02.4 1.00 5 120.8	6 32.4 1.00 4 120.7	7 02.3 1.00 5 120.7	7 32.3 1.00 5 120.7	8 02.3 1.00 5 120.7	8 32.2 1.00 5 120.6	9 02.2 1.00 5 120.6	9
60	5 29.7 1.00 5 119.8	5 59.7 1.00 5 119.8	6 29.7 1.00 5 119.7	6 59.6 1.00 5 119.7	7 29.6 1.00 5 119.7	7 59.6 1.00 5 119.7	8 29.5 1.00 5 119.6	8 59.5 1.00 5 119.6	60
1	5 27.0 1.00 5 118.8	5 57.0 1.00 5 118.8	6 26.9 1.00 5 118.7	6 56.9 1.00 5 118.7	7 26.9 1.00 5 118.7	7 56.8 1.00 5 118.7	8 26.8 1.00 5 118.6	8 56.8 1.00 5 118.6	1
2	5 24.2 1.00 5 117.8	5 54.2 1.00 5 117.8	6 24.2 1.00 5 117.7	6 54.1 1.00 5 117.7	7 24.1 1.00 5 117.7	7 54.1 1.00 5 117.7	8 24.0 1.00 5 117.6	8 54.0 1.00 5 117.6	2
3	5 21.4 1.00 5 116.8	5 51.4 1.00 5 116.8	6 21.4 1.00 5 116.7	6 51.3 1.00 5 116.7	7 21.3 1.00 5 116.7	7 51.3 1.00 5 116.7	8 21.2 1.00 5 116.6	8 51.2 1.00 5 116.6	3
4	5 18.6 1.00 5 115.8	5 48.6 1.00 5 115.8	6 18.5 1.00 5 115.7	6 48.5 1.00 5 115.7	7 18.5 1.00 5 115.7	7 48.4 1.00 5 115.7	8 18.4 1.00 5 115.6	8 48.4 1.00 5 115.6	4
65	5 15.8 1.00 5 114.8	5 45.7 1.00 5 114.8	6 15.7 1.00 5 114.7	6 45.7 1.00 5 114.7	7 15.6 1.00 5 114.7	7 45.6 1.00 5 114.7	8 15.6 1.00 5 114.6	8 45.5 1.00 5 114.6	65
6	5 12.9 1.00 5 113.8	5 42.9 1.00 5 113.8	6 12.8 1.00 5 113.7	6 42.8 1.00 5 113.7	7 12.8 1.00 5 113.7	7 42.7 1.00 5 113.7	8 12.7 1.00 5 113.6	8 42.7 1.00 5 113.6	6
7	5 10.0 1.00 5 112.8	5 40.0 1.00 5 112.8	6 10.0 1.00 5 112.7	6 39.9 1.00 5 112.7	7 09.9 1.00 5 112.7	7 39.8 1.00 5 112.7	8 09.8 1.00 5 112.6	8 39.8 1.00 5 112.6	7
8	5 07.1 1.00 5 111.8	5 37.1 1.00 5 111.8	6 07.0 1.00 5 111.7	6 37.0 1.00 5 111.7	7 07.0 1.00 5 111.7	7 36.9 1.00 5 111.7	8 06.9 1.00 5 111.6	8 36.9 1.00 5 111.6	8
9	5 04.2 1.00 5 110.8	5 34.2 1.00 5 110.8	6 04.1 1.00 5 110.7	6 34.1 1.00 5 110.7	7 04.0 1.00 5 110.7	7 34.0 1.00 5 110.7	8 04.0 1.00 5 110.6	8 33.9 1.00 5 110.6	9
70	5 01.2 1.00 5 109.8	5 31.2 1.00 5 109.7	6 01.2 1.00 5 109.7	6 31.1 1.00 5 109.7	7 01.1 1.00 5 109.7	7 31.1 1.00 5 109.7	8 01.0 1.00 5 109.6	8 31.0 1.00 5 109.6	70
1		5 28.2 1.00 5 108.8	5 58.2 1.00 5 108.7	6 28.2 1.00 5 108.7	6 58.1 1.00 5 108.7	7 28.1 1.00 5 108.7	7 58.1 1.00 5 108.6	8 28.0 1.00 5 108.6	1
2		5 25.3 1.00 5 107.8	5 55.2 1.00 5 107.7	6 25.2 1.00 5 107.7	6 55.2 1.00 5 107.7	7 25.1 1.00 5 107.7	7 55.1 1.00 5 107.6	8 25.0 1.00 5 107.6	2
3		5 22.3 1.00 5 106.8	5 52.2 1.00 5 106.7	6 22.2 1.00 5 106.7	6 52.2 1.00 5 106.7	7 22.1 1.00 5 106.7	7 52.1 1.00 5 106.6	8 22.0 1.00 5 106.6	3
4		5 19.3 1.00 5 105.8	5 49.2 1.00 5 105.7	6 19.2 1.00 5 105.7	6 49.1 1.00 5 105.7	7 19.1 1.00 5 105.7	7 49.1 1.00 5 105.6	8 19.0 1.00 5 105.6	4
75		5 16.2 1.00 5 104.8	5 46.2 1.00 5 104.7	6 16.1 1.00 5 104.7	6 46.1 1.00 5 104.7	7 16.1 1.00 5 104.7	7 46.0 1.00 5 104.6	8 16.0 1.00 5 104.6	75
6		5 13.2 1.00 5 103.8	5 43.1 1.00 5 103.7	6 13.1 1.00 5 103.7	6 43.1 1.00 5 103.7	7 13.0 1.00 5 103.6	7 43.0 1.00 5 103.6	8 12.9 1.00 5 103.6	6
7		5 10.1 1.00 5 102.8	5 40.1 1.00 5 102.7	6 10.0 1.00 5 102.7	6 40.0 1.00 5 102.7	7 10.0 1.00 5 102.6	7 39.9 1.00 5 102.6	8 09.9 1.00 5 102.6	7
8		5 07.1 1.00 5 101.8	5 37.0 1.00 5 101.7	6 07.0 1.00 5 101.7	6 36.9 1.00 5 101.7	7 06.9 1.00 5 101.6	7 36.9 1.00 5 101.6	8 06.8 1.00 5 101.6	8
9		5 04.0 1.00 5 100.8	5 33.9 1.00 5 100.7	6 03.9 1.00 5 100.7	6 33.9 1.00 5 100.7	7 03.8 1.00 5 100.7	7 33.8 1.00 5 100.6	8 03.7 1.00 5 100.6	9
80		5 00.9 1.00 5 99.8	5 30.8 1.00 5 99.7	6 00.8 1.00 5 99.7	6 30.8 1.00 5 99.7	7 00.7 1.00 5 99.6	7 30.7 1.00 5 99.6	8 00.6 1.00 5 99.6	80
1			5 27.7 1.00 5 98.7	5 57.7 1.00 5 98.7	6 27.7 1.00 5 98.7	6 57.6 1.00 5 98.6	7 27.6 1.00 5 98.6	7 57.5 1.00 5 98.6	1
2			5 24.6 1.00 5 97.7	5 54.6 1.00 5 97.7	6 24.6 1.00 5 97.7	6 54.5 1.00 5 97.6	7 24.5 1.00 5 97.6	7 54.4 1.00 5 97.6	2
3			5 21.5 1.00 5 96.7	5 51.5 1.00 5 96.7	6 21.4 1.00 5 96.7	6 51.4 1.00 5 96.6	7 21.4 1.00 5 96.6	7 51.3 1.00 5 96.6	3
4			5 18.4 1.00 5 95.7	5 48.4 1.00 5 95.7	6 18.3 1.00 5 95.7	6 48.3 1.00 5 95.6	7 18.2 1.00 5 95.6	7 48.2 1.00 5 95.6	4
85			5 15.3 1.00 5 94.7	5 45.2 1.00 5 94.7	6 15.2 1.00 5 94.7	6 45.1 1.00 5 94.6	7 15.1 1.00 5 94.6	7 45.1 1.00 5 94.6	85
6			5 12.1 1.00 5 93.7	5 42.1 1.00 5 93.7	6 12.1 1.00 5 93.7	6 42.0 1.00 5 93.6	7 12.0 1.00 5 93.6	7 41.9 1.00 5 93.6	6
7			5 09.0 1.00 5 92.7	5 39.0 1.00 5 92.7	6 08.9 1.00 5 92.7	6 38.9 1.00 5 92.6	7 08.8 1.00 5 92.6	7 38.8 1.00 5 92.6	7
8			5 05.9 1.00 5 91.7	5 35.8 1.00 5 91.7	6 05.8 1.00 5 91.7	6 35.7 1.00 5 91.6	7 05.7 1.00 5 91.6	7 35.7 1.00 5 91.6	8
9			5 02.7 1.00 5 90.7	5 32.7 1.00 5 90.7	6 02.7 1.00 5 90.7	6 32.6 1.00 5 90.6	7 02.6 1.00 5 90.6	7 32.5 1.00 5 90.6	9
90				5 29.5 1.00 5 89.7	5 59.5 1.00 5 89.7	6 29.5 1.00 5 89.7	6 59.4 1.00 5 89.6	7 29.4 1.00 5 89.6	90

Lat. 87°

H.A.	4° 00' Alt. / Δd Δt / Az.	4° 30'	5° 00'	5° 30'	6° 00'	6° 30'	7° 00'	7° 30'	H.A.
91				5 26.4 1.005 88.7	5 56.4 1.005 88.7	6 26.3 1.005 88.7	6 56.3 1.005 88.6	7 26.2 1.005 88.6	91
2				5 23.3 1.005 87.7	5 53.2 1.005 87.7	6 23.2 1.005 87.7	6 53.1 1.005 87.6	7 23.1 1.005 87.6	2
3				5 20.1 1.005 86.7	5 50.1 1.005 86.7	6 20.0 1.005 86.7	6 50.0 1.005 86.6	7 20.0 1.005 86.6	3
4				5 17.0 1.005 85.7	5 47.0 1.005 85.7	6 16.9 1.005 85.7	6 46.9 1.005 85.6	7 16.8 1.005 85.6	4
95				5 13.9 1.005 84.7	5 43.8 1.005 84.7	6 13.8 1.005 84.7	6 43.7 1.005 84.6	7 13.7 1.005 84.6	95
6				5 10.7 1.005 83.7	5 40.7 1.005 83.7	6 10.7 1.005 83.7	6 40.6 1.005 83.6	7 10.6 1.005 83.6	6
7				5 07.6 1.005 82.7	5 37.6 1.005 82.7	6 07.5 1.005 82.7	6 37.5 1.005 82.6	7 07.5 1.005 82.6	7
8				5 04.5 1.005 81.7	5 34.5 1.005 81.7	6 04.4 1.005 81.7	6 34.4 1.005 81.6	7 04.4 1.005 81.6	8
9				5 01.4 1.005 80.7	5 31.4 1.005 80.7	6 01.3 1.005 80.7	6 31.3 1.005 80.6	7 01.2 1.005 80.6	9
100					5 28.3 1.005 79.7	5 58.2 1.005 79.7	6 28.2 1.005 79.7	6 58.2 1.005 79.6	100
1					5 25.2 1.005 78.7	5 55.2 1.005 78.7	6 25.1 1.005 78.7	6 55.1 1.005 78.6	1
2					5 22.1 1.005 77.7	5 52.1 1.005 77.7	6 22.0 1.005 77.7	6 52.0 1.005 77.6	2
3					5 19.1 1.005 76.7	5 49.0 1.005 76.7	6 19.0 1.005 76.7	6 48.9 1.005 76.6	3
4					5 16.0 1.005 75.7	5 46.0 1.005 75.7	6 15.9 1.005 75.7	6 45.9 1.005 75.6	4
105					5 13.0 1.005 74.7	5 42.9 1.005 74.7	6 12.9 1.005 74.7	6 42.9 1.005 74.6	105
6					5 09.9 1.005 73.7	5 39.9 1.005 73.7	6 09.9 1.005 73.7	6 39.8 1.005 73.6	6
7					5 06.9 1.005 72.7	5 36.9 1.005 72.7	6 06.9 1.005 72.7	6 36.8 1.005 72.6	7
8					5 04.0 1.005 71.7	5 33.9 1.005 71.7	6 03.9 1.005 71.7	6 33.8 1.005 71.6	8
9					5 01.0 1.005 70.7	5 30.9 1.005 70.7	6 00.9 1.005 70.7	6 30.9 1.005 70.7	9
110						5 28.0 1.005 69.7	5 58.0 1.005 69.7	6 27.9 1.005 69.7	110
1						5 25.1 1.005 68.7	5 55.0 1.005 68.7	6 25.0 1.005 68.7	1
2						5 22.1 1.005 67.7	5 52.1 1.005 67.7	6 22.1 1.005 67.7	2
3						5 19.2 1.005 66.7	5 49.2 1.005 66.7	6 19.2 1.005 66.7	3
4						5 16.4 1.005 65.7	5 46.3 1.005 65.7	6 16.3 1.005 65.7	4
115						5 13.5 1.005 64.7	5 43.5 1.005 64.7	6 13.4 1.005 64.7	115
6						5 10.7 1.005 63.7	5 40.7 1.005 63.7	6 10.6 1.005 63.7	6
7						5 07.9 1.005 62.7	5 37.9 1.005 62.7	6 07.8 1.005 62.7	7
8						5 05.1 1.005 61.7	5 35.1 1.005 61.7	6 05.0 1.005 61.7	8
9						5 02.4 1.005 60.7	5 32.3 1.005 60.7	6 02.3 1.005 60.7	9
120							5 29.6 1.004 59.7	5 59.6 1.004 59.7	120
1							5 26.9 1.004 58.7	5 56.9 1.004 58.7	1
2							5 24.2 1.004 57.7	5 54.2 1.004 57.7	2
3							5 21.6 1.004 56.7	5 51.6 1.004 56.7	3
4							5 19.0 1.004 55.7	5 49.0 1.004 55.7	4
125							5 16.4 1.004 54.7	5 46.4 1.004 54.7	125
6							5 13.9 1.004 53.7	5 43.8 1.004 53.7	6
7							5 11.3 1.004 52.7	5 41.3 1.004 52.7	7
8							5 08.9 1.004 51.7	5 38.8 1.004 51.7	8
9							5 06.4 1.004 50.8	5 36.4 1.004 50.7	9
130							5 04.0 1.004 49.8	5 34.0 1.004 49.7	130
1							5 01.6 1.004 48.8	5 31.6 1.004 48.7	1
2								5 29.2 1.004 47.7	2
3								5 26.9 1.004 46.8	3
4								5 24.7 1.004 45.8	4
135								5 22.4 1.004 44.8	135
6								5 20.2 1.004 43.8	6
7								5 18.1 1.004 42.8	7
8								5 16.0 1.003 41.8	8
9								5 13.9 1.003 40.8	9
140								5 11.9 1.003 39.8	140
1								5 09.9 1.003 38.8	1
2								5 07.9 1.003 37.8	2
3								5 06.0 1.003 36.8	3
4								5 04.2 1.003 35.8	4
145								5 02.4 1.003 34.8	145
6								5 00.6 1.003 33.8	6

Lat. 88°

Lat. 87°

H.A.	8°00' Alt.	Δd Δt	Az.	8°30' Alt.	Δd Δt	Az.	9°00' Alt.	Δd Δt	Az.	9°30' Alt.	Δd Δt	Az.	10°00' Alt.	Δd Δt	Az.	10°30' Alt.	Δd Δt	Az.	11°00' Alt.	Δd Δt	Az.	11°30' Alt.	Δd Δt	Az.	H.A.
00	11 00.0	1.000	180.0	11 30.0	1.000	180.0	12 00.0	1.000	180.0	12 30.0	1.000	180.0	13 00.0	1.000	180.0	13 30.0	1.000	180.0	14 00.0	1.000	180.0	14 30.0	1.000	180.0	00
1	11 00.0	1.000	179.0	11 30.0	1.000	179.0	12 00.0	1.000	179.0	12 30.0	1.000	179.0	13 00.0	1.000	179.0	13 30.0	1.000	179.0	14 00.0	1.000	179.0	14 30.0	1.000	179.0	1
2	10 59.9	1.000	178.0	11 29.9	1.000	178.0	11 59.9	1.000	178.0	12 29.9	1.000	178.0	12 59.9	1.000	178.0	13 29.9	1.000	178.0	13 59.9	1.000	178.0	14 29.9	1.000	178.0	2
3	10 59.8	1.000	177.0	11 29.8	1.000	177.0	11 59.8	1.000	177.0	12 29.8	1.000	177.0	12 59.8	1.000	177.0	13 29.8	1.000	177.0	13 59.7	1.000	177.0	14 29.8	1.000	177.0	3
4	10 59.6	1.000	176.0	11 29.6	1.000	176.0	11 59.6	1.000	176.0	12 29.6	1.000	176.0	12 59.6	1.000	176.0	13 29.6	1.000	176.0	13 59.6	1.000	176.0	14 29.6	1.000	176.0	4
05	10 59.3	1.001	175.0	11 29.3	1.001	175.0	11 59.3	1.001	175.0	12 29.3	1.001	174.9	12 59.3	1.001	174.9	13 29.3	1.000	174.9	13 59.3	1.000	174.9	14 29.3	1.000	174.9	05
6	10 59.0	1.001	173.9	11 29.0	1.001	173.9	11 59.0	1.001	173.9	12 29.0	1.001	173.9	12 59.0	1.001	173.9	13 29.0	1.001	173.9	13 59.0	1.001	173.9	14 29.0	1.001	173.9	6
7	10 58.6	1.001	172.9	11 28.6	1.001	172.9	11 58.6	1.001	172.9	12 28.6	1.001	172.9	12 58.6	1.001	172.9	13 28.6	1.001	172.9	13 58.6	1.001	172.9	14 28.6	1.001	172.9	7
8	10 58.2	1.001	171.9	11 28.2	1.001	171.9	11 58.2	1.001	171.9	12 28.2	1.001	171.9	12 58.2	1.001	171.9	13 28.2	1.001	171.9	13 58.2	1.001	171.9	14 28.2	1.001	171.9	8
9	10 57.8	1.001	170.9	11 27.8	1.001	170.9	11 57.8	1.001	170.9	12 27.8	1.001	170.9	12 57.8	1.001	170.9	13 27.8	1.001	170.9	13 57.8	1.001	170.9	14 27.8	1.001	170.9	9
10	10 57.2	1.001	169.9	11 27.2	1.001	169.9	11 57.2	1.001	169.9	12 27.2	1.001	169.9	12 57.2	1.001	169.9	13 27.2	1.001	169.9	13 57.2	1.001	169.9	14 27.2	1.001	169.9	10
1	10 56.7	1.001	168.9	11 26.7	1.001	168.9	11 56.7	1.001	168.9	12 26.7	1.001	168.9	12 56.7	1.001	168.9	13 26.7	1.001	168.9	13 56.7	1.001	168.9	14 26.7	1.001	168.9	1
2	10 56.0	1.001	167.9	11 26.0	1.001	167.9	11 56.0	1.001	167.9	12 26.0	1.001	167.9	12 56.0	1.001	167.9	13 26.0	1.001	167.9	13 56.0	1.001	167.9	14 26.0	1.001	167.9	2
3	10 55.3	1.001	166.9	11 25.3	1.001	166.9	11 55.3	1.001	166.9	12 25.3	1.001	166.9	12 55.3	1.001	166.9	13 25.3	1.001	166.9	13 55.3	1.001	166.8	14 25.3	1.001	166.8	3
4	10 54.6	1.001	165.9	11 24.6	1.001	165.9	11 54.6	1.001	165.9	12 24.6	1.001	165.9	12 54.6	1.001	165.9	13 24.6	1.001	165.8	13 54.6	1.001	165.8	14 24.6	1.001	165.8	4
15	10 53.8	1.001	164.9	11 23.8	1.001	164.9	11 53.8	1.001	164.9	12 23.8	1.001	164.8	12 53.8	1.001	164.8	13 23.8	1.001	164.8	13 53.8	1.001	164.8	14 23.8	1.001	164.8	15
6	10 53.0	1.002	163.9	11 23.0	1.002	163.9	11 53.0	1.002	163.8	12 23.0	1.002	163.8	12 53.0	1.002	163.8	13 23.0	1.002	163.8	13 53.0	1.002	163.8	14 22.9	1.002	163.8	6
7	10 52.1	1.002	162.9	11 22.1	1.002	162.8	11 52.1	1.002	162.8	12 22.1	1.002	162.8	12 52.1	1.002	162.8	13 22.1	1.002	162.8	13 52.0	1.002	162.8	14 22.0	1.002	162.8	7
8	10 51.1	1.002	161.8	11 21.1	1.002	161.8	11 51.1	1.002	161.8	12 21.1	1.002	161.8	12 51.1	1.002	161.8	13 21.1	1.002	161.8	13 51.1	1.002	161.8	14 21.1	1.002	161.8	8
9	10 50.1	1.002	160.8	11 20.1	1.002	160.8	11 50.1	1.002	160.8	12 20.1	1.002	160.8	12 50.1	1.002	160.8	13 20.1	1.002	160.8	13 50.1	1.002	160.8	14 20.1	1.002	160.8	9
20	10 49.1	1.002	159.8	11 19.1	1.002	159.8	11 49.0	1.002	159.8	12 19.0	1.002	159.8	12 49.0	1.002	159.8	13 19.0	1.002	159.8	13 49.0	1.002	159.8	14 19.0	1.002	159.8	20
1	10 47.9	1.002	158.8	11 17.9	1.002	158.8	11 47.9	1.002	158.8	12 17.9	1.002	158.8	12 47.9	1.002	158.8	13 17.9	1.002	158.8	13 47.9	1.002	158.8	14 17.9	1.002	158.8	1
2	10 46.8	1.002	157.8	11 16.8	1.002	157.8	11 46.8	1.002	157.8	12 16.8	1.002	157.8	12 46.8	1.002	157.8	13 16.8	1.002	157.8	13 46.8	1.002	157.7	14 16.7	1.002	157.7	2
3	10 45.6	1.002	156.8	11 15.6	1.002	156.8	11 45.6	1.002	156.8	12 15.6	1.002	156.8	12 45.6	1.002	156.8	13 15.5	1.002	156.8	13 45.5	1.002	156.7	14 15.5	1.002	156.7	3
4	10 44.3	1.002	155.8	11 14.3	1.002	155.8	11 44.3	1.002	155.8	12 14.3	1.002	155.8	12 44.3	1.002	155.8	13 14.3	1.002	155.7	13 44.3	1.002	155.7	14 14.3	1.002	155.7	4
25	10 43.0	1.002	154.8	11 13.0	1.002	154.8	11 43.0	1.002	154.8	12 13.0	1.002	154.8	12 43.0	1.002	154.7	13 13.0	1.002	154.7	13 43.0	1.002	154.7	14 12.9	1.002	154.7	25
6	10 41.6	1.002	153.8	11 11.6	1.002	153.8	11 41.6	1.002	153.7	12 11.6	1.002	153.7	12 41.6	1.002	153.7	13 11.6	1.002	153.7	13 41.6	1.002	153.7	14 11.6	1.002	153.7	6
7	10 40.2	1.002	152.8	11 10.2	1.002	152.8	11 40.2	1.002	152.8	12 10.2	1.002	152.7	12 40.2	1.002	152.7	13 10.2	1.002	152.7	13 40.2	1.002	152.7	14 10.2	1.002	152.7	7
8	10 38.8	1.003	151.8	11 08.8	1.003	151.8	11 38.7	1.003	151.7	12 08.7	1.002	151.7	12 38.7	1.002	151.7	13 08.7	1.002	151.7	13 38.7	1.003	151.7	14 08.7	1.003	151.7	8
9	10 37.3	1.003	150.8	11 07.2	1.003	150.7	11 37.2	1.003	150.7	12 07.2	1.003	150.7	12 37.2	1.003	150.7	13 07.2	1.003	150.7	13 37.2	1.003	150.7	14 07.2	1.003	150.7	9
30	10 35.7	1.003	149.8	11 05.7	1.003	149.7	11 35.7	1.003	149.7	12 05.7	1.003	149.7	12 35.7	1.003	149.7	13 05.6	1.003	149.7	13 35.6	1.003	149.7	14 05.6	1.003	149.7	30
1	10 34.1	1.003	148.7	11 04.1	1.003	148.7	11 34.1	1.003	148.7	12 04.1	1.003	148.7	12 34.0	1.003	148.7	13 04.0	1.003	148.7	13 34.0	1.003	148.7	14 04.0	1.003	148.6	1
2	10 32.4	1.003	147.7	11 02.4	1.003	147.7	11 32.4	1.003	147.7	12 02.4	1.003	147.7	12 32.4	1.003	147.7	13 02.4	1.003	147.7	13 32.4	1.003	147.7	14 02.4	1.003	147.6	2
3	10 30.7	1.003	146.7	11 00.7	1.003	146.7	11 30.7	1.003	146.7	12 00.7	1.003	146.7	12 30.7	1.003	146.7	13 00.7	1.003	146.7	13 30.7	1.003	146.6	14 00.7	1.003	146.6	3
4	10 29.0	1.003	145.7	10 59.0	1.003	145.7	11 29.0	1.003	145.7	11 59.0	1.003	145.7	12 28.9	1.003	145.7	12 58.9	1.003	145.6	13 28.9	1.003	145.6	13 58.9	1.003	145.6	4
35	10 27.2	1.003	144.7	10 57.2	1.003	144.7	11 27.2	1.003	144.7	11 57.2	1.003	144.7	12 27.1	1.003	144.6	12 57.1	1.003	144.6	13 27.1	1.003	144.6	13 57.1	1.003	144.6	35
6	10 25.4	1.003	143.7	10 55.4	1.003	143.7	11 25.3	1.003	143.7	11 55.3	1.003	143.7	12 25.3	1.003	143.6	12 55.3	1.003	143.6	13 25.3	1.003	143.6	13 55.3	1.003	143.6	6
7	10 23.5	1.003	142.7	10 53.5	1.003	142.7	11 23.5	1.003	142.7	11 53.4	1.003	142.7	12 23.4	1.003	142.6	12 53.4	1.003	142.6	13 23.4	1.003	142.6	13 53.4	1.003	142.6	7
8	10 21.6	1.003	141.7	10 51.5	1.003	141.7	11 21.5	1.003	141.7	11 51.5	1.003	141.7	12 21.5	1.003	141.6	12 51.5	1.003	141.6	13 21.5	1.003	141.6	13 51.5	1.003	141.6	8
9	10 19.6	1.003	140.7	10 49.6	1.003	140.7	11 19.6	1.003	140.7	11 49.5	1.003	140.6	12 19.5	1.003	140.6	12 49.5	1.003	140.6	13 19.5	1.003	140.6	13 49.5	1.003	140.6	9
40	10 17.6	1.003	139.7	10 47.6	1.003	139.7	11 17.6	1.003	139.7	11 47.5	1.003	139.6	12 17.5	1.003	139.6	12 47.5	1.003	139.6	13 17.5	1.003	139.6	13 47.5	1.003	139.6	40
1	10 15.5	1.004	138.7	10 45.5	1.004	138.7	11 15.5	1.004	138.6	11 45.5	1.004	138.6	12 15.5	1.004	138.6	12 45.4	1.004	138.6	13 15.4	1.004	138.6	13 45.4	1.004	138.6	1
2	10 13.4	1.004	137.7	10 43.4	1.004	137.7	11 13.4	1.004	137.6	11 43.4	1.004	137.6	12 13.4	1.004	137.6	12 43.3	1.004	137.6	13 13.3	1.004	137.6	13 43.3	1.004	137.5	2
3	10 11.3	1.004	136.7	10 41.3	1.004	136.7	11 11.3	1.004	136.6	11 41.2	1.004	136.6	12 11.2	1.004	136.6	12 41.2	1.004	136.6	13 11.2	1.004	136.6	13 41.2	1.004	136.5	3
4	10 09.1	1.004	135.7	10 39.1	1.004	135.6	11 09.1	1.004	135.6	11 39.1	1.004	135.6	12 09.0	1.004	135.6	12 39.0	1.004	135.6	13 09.0	1.004	135.6	13 39.0	1.004	135.5	4
45	10 06.9	1.004	134.7	10 36.9	1.004	134.6	11 06.9	1.004	134.6	11 36.9	1.004	134.6	12 06.9	1.004	134.6	12 36.8	1.004	134.6	13 06.8	1.004	134.5	13 36.8	1.004	134.5	45
6	10 04.7	1.004	133.7	10 34.6	1.004	133.6	11 04.6	1.004	133.6	11 34.6	1.004	133.6	12 04.6	1.004	133.6	12 34.6	1.004	133.6	13 04.5	1.004	133.5	13 34.5	1.004	133.5	6
7	10 02.4	1.004	132.7	10 32.4	1.004	132.6	11 02.3	1.004	132.6	11 32.3	1.004	132.6	12 02.3	1.004	132.6	12 32.3	1.004	132.6	13 02.2	1.004	132.5	13 32.2	1.004	132.5	7
8	10 00.0	1.004	131.6	10 30.0	1.004	131.6	11 00.0	1.004	131.6	11 30.0	1.004	131.6	12 00.0	1.004	131.6	12 29.9	1.004	131.5	12 59.9	1.004	131.5	13 29.9	1.004	131.5	8
9	9 57.7	1.004	130.6	10 27.7	1.004	130.6	10 57.6	1.004	130.6	11 27.6	1.004	130.6	11 57.6	1.004	130.6	12 27.6	1.004	130.5	12 57.5	1.004	130.5	13 27.5	1.004	130.5	9
50	9 55.5	1.004	129.6	10 25.5	1.004	129.6	10 55.5	1.004	129.6	11 25.5	1.004	129.6	11 55.5	1.004	129.6	12 25.5	1.004	129.5	12 55.1	1.004	129.5	13 25.1	1.004	129.5	50
1	9 52.8	1.004	128.6	10 22.8	1.004	128.6	10 52.8	1.004	128.6	11 22.8	1.004	128.6	11 52.7	1.004	128.5	12 22.7	1.004	128.5	12 52.7	1.004	128.5	13 22.7	1.004	128.5	1
2	9 50.4	1.004	127.6	10 20.3	1.004	127.6	10 50.3	1.004	127.6	11 20.3	1.004	127.6	11 50.3	1.004	127.5	12 20.2	1.004	127.5	12 50.2	1.004	127.5	13 20.2	1.004	127.5	2
3	9 47.9	1.004	126.6	10 17.8	1.004	126.6	10 47.8	1.004	126.6	11 17.8	1.004	126.6	11 47.8	1.004	126.5	12 17.7	1.004	126.5	12 47.7	1.004	126.5	13 17.7	1.004	126.5	3
4	9 45.3	1.004	125.6	10 15.3	1.004	125.6	10 45.3	1.004	125.6	11 15.3	1.004	125.6	11 45.2	1.004	125.5	12 15.2	1.004	125.5	12 45.2	1.004	125.5	13 15.1	1.004	125.5	4
55	9 42.8	1.004	124.6	10 12.7	1.004	124.6	10 42.7	1.004	124.6	11 12.7	1.004	124.5	11 42.7	1.004	124.5	12 12.6	1.004	124.5	12 42.6	1.004	124.5	13 12.6	1.004	124.5	55
6	9 40.2	1.004	123.6	10 10.1	1.004	123.6	10 40.1	1.004	123.6	11 10.1	1.004	123.5	11 40.0	1.004	123.5	12 10.0	1.004	123.5	12 40.0	1.004	123.5	13 10.0	1.004	123.5	6
7	9 37.5	1.004	122.6	10 07.5	1.004	122.6	10 37.5	1.004	122.6	11 07.4	1.004	122.5	11 37.4	1.004	122.5	12 07.4	1.004	122.5	12 37.4	1.004	122.5	13 07.3	1.004	122.5	7
8	9 34.9	1.004	121.6	10 04.8	1.004	121.6	10 34.8	1.004	121.6	11 04.8	1.004	121.5	11 34.8	1.004	121.5	12 04.7	1.004	121.5	12 34.7	1.004	121.5	13 04.7	1.004	121.4	8
9	9 32.2	1.005	120.6	10 02.2	1.005	120.6	10 32.1	1.005	120.6	11 02.1	1.005	120.5	11 32.1	1.005	120.5	12 02.0	1.005	120.5	12 32.0	1.005	120.5	13 02.0	1.005	120.5	9
60	9 29.5	1.005	119.6	9 59.4	1.005	119.6	10 29.4	1.005	119.6	10 59.4	1.005	119.5	11 29.3	1.005	119.5	11 59.3	1.005	119.5	12 29.3	1.005	119.5	12 59.2	1.005	119.4	60
1	9 26.7	1.005	118.6	9 56.7	1.005	118.6	10 26.7	1.005	118.5	10 56.6	1.005	118.5	11 26.6	1.005	118.5	11 56.6	1.005	118.5	12 26.5	1.005	118.5	12 56.5	1.005	118.4	1
2	9 24.0	1.005	117.6	9 53.9	1.005	117.6	10 23.9	1.005	117.5	10 53.9	1.005	117.5	11 23.8	1.005	117.5	11 53.8	1.005	117.5	12 23.8	1.005	117.4	12 53.7	1.005	117.4	2
3	9 21.2	1.005	116.6	9 51.1	1.005	116.6	10 21.1	1.005	116.5	10 51.1	1.005	116.5	11 21.0	1.005	116.5	11 51.0	1.005	116.5	12 21.0	1.005	116.4	12 50.9	1.005	116.4	3
4	9 18.3	1.005	115.6	9 48.3	1.005	115.6	10 18.3	1.005	115.5	10 48.2	1.005	115.5	11 18.2	1.005	115.5	11 48.2	1.005	115.5	12 18.1	1.005	115.4	12 48.1	1.005	115.4	4
65	9 15.5	1.005	114.6	9 45.5	1.005	114.5	10 15.4	1.005	114.5	10 45.4	1.005	114.5	11 15.4	1.005	114.5	11 45.3	1.005	114.5	12 15.3	1.005	114.4	12 45.3	1.005	114.4	65
6	9 12.6	1.005	113.6	9 42.6	1.005	113.6	10 12.6	1.005	113.5	10 42.5	1.005	113.5	11 12.5	1.005	113.5	11 42.5	1.005	113.5	12 12.4	1.005	113.4	12 42.4	1.005	113.4	6
7	9 09.7	1.005	112.6	9 39.7	1.005	112.6	10 09.7	1.005	112.5	10 39.6	1.005	112.5	11 09.6	1.005	112.5	11 39.6	1.005	112.5	12 09.5	1.005	112.4	12 39.5	1.005	112.4	7
8	9 06.8	1.005	111.6	9 36.8	1.005	111.6	10 06.8	1.005	111.5	10 36.7	1.005	111.5	11 06.7	1.005	111.5	11 36.7	1.005	111.5	12 06.6	1.005	111.4	12 36.6	1.005	111.4	8
9	9 03.9	1.005	110.6	9 33.9	1.005	110.6	10 03.8	1.005	110.5	10 33.8	1.005	110.5	11 03.8	1.005	110.5	11 33.7	1.005	110.5	12 03.7	1.005	110.4	12 33.6	1.005	110.4	9
70	9 01.0	1.005	109.6	9 30.9	1.005	109.6	10 00.9	1.005	109.5	10 30.8	1.005	109.5	11 00.8	1.005	109.5	11 30.8	1.005	109.5	12 00.7	1.005	109.4	12 30.7	1.005	109.4	70
1	8 58.0	1.005	108.6	9 27.9	1.005	108.6	9 57.9	1.005	108.5	10 27.9	1.005	108.5	10 57.8	1.005	108.5	11 27.8	1.005	108.4	11 57.8	1.005	108.4	12 27.7	1.005	108.4	1
2	8 55.0	1.005	107.6	9 25.0	1.005	107.5	9 54.9	1.005	107.5	10 24.9	1.005	107.5	10 54.8	1.005	107.5	11 24.8	1.005	107.4	11 54.8	1.005	107.4	12 24.7	1.005	107.4	2
3	8 52.0	1.005	106.6	9 22.0	1.005	106.5	9 51.9	1.005	106.5	10 21.9	1.005	106.5	10 51.8	1.005	106.5	11 21.8	1.005	106.4	11 51.8	1.005	106.4	12 21.7	1.005	106.4	3
4	8 49.0	1.005	105.6	9 18.9	1.005	105.5	9 48.9	1.005	105.5	10 18.9	1.005	105.5	10 48.8	1.005	105.5	11 18.8	1.005	105.4	11 48.7	1.005	105.4	12 18.7	1.005	105.4	4
75	8 45.9	1.005	104.6	9 15.9	1.005	104.5	9 45.9	1.005	104.5	10 15.8	1.005	104.5	10 45.8	1.005	104.5	11 15.8	1.005	104.4	11 45.7	1.005	104.4	12 15.7	1.005	104.4	75
6	8 42.9	1.005	103.6	9 12.9	1.005	103.5	9 42.8	1.005	103.5	10 12.8	1.005	103.5	10 42.7	1.005	103.5	11 12.7	1.005	103.4	11 42.7	1.005	103.4	12 12.6	1.005	103.4	6
7	8 39.8	1.005	102.6	9 09.8	1.005	102.5	9 39.8	1.005	102.5	10 09.7	1.005	102.5	10 39.7	1.005	102.5	11 09.6	1.005	102.4	11 39.6	1.005	102.4	12 09.6	1.005	102.4	7
8	8 36.8	1.005	101.6	9 06.7	1.005	101.5	9 36.7	1.005	101.5	10 06.6	1.005	101.5	10 36.6	1.005	101.5	11 06.5	1.005	101.4	11 36.5	1.005	101.4	12 06.5	1.005	101.4	8
9	8 33.7	1.005	100.6	9 03.7	1.005	100.5	9 33.6	1.005	100.5	10 03.6	1.005	100.5	10 33.5	1.005	100.5	11 03.5	1.005	100.4	11 33.4	1.005	100.4	12 03.4	1.005	100.4	9
80	8 30.6	1.005	99.6	9 00.6	1.005	99.5	9 30.5	1.005	99.5	10 00.5	1.005	99.5	10 30.4	1.005	99.4	11 00.4	1.005	99.4	11 30.4	1.005	99.4	12 00.3	1.005	99.4	80
1	8 27.5	1.005	98.6	8 57.5	1.005	98.5	9 27.4	1.005	98.5	9 57.4	1.005	98.5	10 27.3	1.005	98.5	10 57.3	1.005	98.4	11 27.3	1.005	98.4	11 57.2	1.005	98.4	1
2	8 24.4	1.005	97.6	8 54.3	1.005	97.5	9 24.3	1.005	97.5	9 54.3	1.005	97.5	10 24.2	1.005	97.4	10 54.2	1.005	97.4	11 24.1	1.005	97.4	11 54.1	1.005	97.4	2
3	8 21.3	1.005	96.6	8 51.2	1.005	96.5	9 21.2	1.005	96.5	9 51.1	1.005	96.5	10 21.1	1.005	96.4	10 51.1	1.005	96.4	11 21.0	1.005	96.4	11 51.0	1.005	96.4	3
4	8 18.2	1.005	95.6	8 48.1	1.005	95.5	9 18.1	1.005	95.5	9 48.0	1.005	95.5	10 18.0	1.005	95.4	10 47.9	1.005	95.4	11 17.9	1.005	95.4	11 47.9	1.005	95.4	4
85	8 15.0	1.005	94.6	8 45.0	1.005	94.5	9 14.9	1.005	94.5	9 44.9	1.005	94.5	10 14.9	1.005	94.4	10 44.8	1.005	94.4	11 14.8	1.005	94.4	11 44.7	1.005	94.4	85
6	8 11.9	1.005	93.6	8 41.9	1.005	93.5	9 11.8	1.005	93.5	9 41.8	1.005	93.5	10 11.7	1.005	93.4	10 41.7	1.005	93.4	11 11.6	1.005	93.4	11 41.6	1.005	93.4	6
7	8 08.8	1.005	92.6	8 38.7	1.005	92.5	9 08.7	1.005	92.5	9 38.6	1.005	92.5	10 08.6	1.005	92.4	10 38.5	1.005	92.4	11 08.5	1.005	92.4	11 38.5	1.005	92.4	7
8	8 05.6	1.005	91.6	8 35.6	1.005	91.5	9 05.5	1.005	91.5	9 35.5	1.005	91.5	10 05.4	1.005	91.4	10 35.4	1.005	91.4	11 05.4	1.005	91.4	11 35.3	1.005	91.4	8
9	8 02.5	1.005	90.6	8 32.4	1.005	90.5	9 02.4	1.005	90.5	9 32.4	1.005	90.5	10 02.3	1.005	90.5	10 32.3	1.005	90.4	11 02.2	1.005	90.4	11 32.2	1.005	90.4	9
90	7 59.3	1.005	89.6	8 29.3	1.005	89.6	8 59.3	1.005	89.5	9 29.2	1.005	89.5	9 59.2	1.005	89.5	10 29.1	1.005	89.4	10 59.1	1.005	89.4	11 29.0	1.005	89.4	90

Lat. 87°

H.A.	8° 00'			8° 30'			9° 00'			9° 30'			10° 00'			10° 30'			11° 00'			11° 30'			H.A.
	Alt.	Δd Δt	Az.	Alt.	Δd Δt	Az.	Alt.	Δd Δt	Az.	Alt.	Δd Δt	Az.	Alt.	Δd Δt	Az.	Alt.	Δd Δt	Az.	Alt.	Δd Δt	Az.	Alt.	Δd Δt	Az.	
91	7 56.2	1.005	88.6	8 26.2	1.005	88.6	8 56.1	1.005	88.5	9 26.1	1.005	88.5	9 56.0	1.005	88.5	10 26.0	1.005	88.4	10 55.9	1.005	88.4	11 25.9	1.005	88.4	91
2	7 53.1	1.005	87.6	8 23.0	1.005	87.6	8 53.0	1.005	87.5	9 22.9	1.005	87.5	9 52.9	1.005	87.5	10 22.8	1.005	87.4	10 52.8	1.005	87.4	11 22.8	1.005	87.4	2
3	7 49.9	1.005	86.6	8 19.9	1.005	86.6	8 49.8	1.005	86.5	9 19.8	1.005	86.5	9 49.8	1.005	86.5	10 19.7	1.005	86.4	10 49.7	1.005	86.4	11 19.6	1.005	86.4	3
4	7 46.8	1.005	85.6	8 16.7	1.005	85.6	8 46.7	1.005	85.5	9 16.7	1.005	85.5	9 46.6	1.005	85.5	10 16.6	1.005	85.4	10 46.5	1.005	85.4	11 16.5	1.005	85.4	4
95	7 43.7	1.005	84.6	8 13.6	1.005	84.6	8 43.6	1.005	84.5	9 13.5	1.005	84.5	9 43.5	1.005	84.5	10 13.5	1.005	84.5	10 43.4	1.005	84.4	11 13.4	1.005	84.4	95
6	7 40.5	1.005	83.6	8 10.5	1.005	83.6	8 40.5	1.005	83.5	9 10.4	1.005	83.5	9 40.4	1.005	83.5	10 10.3	1.005	83.5	10 40.3	1.005	83.4	11 10.2	1.005	83.4	6
7	7 37.4	1.005	82.6	8 07.4	1.005	82.6	8 37.3	1.005	82.5	9 07.3	1.005	82.5	9 37.3	1.005	82.5	10 07.2	1.005	82.5	10 37.2	1.005	82.4	11 07.1	1.005	82.4	7
8	7 34.3	1.005	81.6	8 04.3	1.005	81.6	8 34.2	1.005	81.5	9 04.2	1.005	81.5	9 34.1	1.005	81.5	10 04.1	1.005	81.5	10 34.1	1.005	81.4	11 04.0	1.005	81.4	8
9	7 31.2	1.005	80.6	8 01.2	1.005	80.6	8 31.1	1.005	80.5	9 01.1	1.005	80.5	9 31.0	1.005	80.5	10 01.0	1.005	80.5	10 31.0	1.005	80.4	11 00.9	1.005	80.4	9
100	7 28.1	1.005	79.6	7 58.1	1.005	79.6	8 28.0	1.005	79.5	8 58.0	1.005	79.5	9 28.0	1.005	79.5	9 57.9	1.005	79.5	10 27.9	1.005	79.4	10 57.8	1.005	79.4	100
1	7 25.0	1.005	78.6	7 55.0	1.005	78.6	8 25.0	1.005	78.5	8 54.9	1.005	78.5	9 24.9	1.005	78.5	9 54.8	1.005	78.5	10 24.8	1.005	78.4	10 54.7	1.005	78.4	1
2	7 22.0	1.005	77.6	7 51.9	1.005	77.6	8 21.9	1.005	77.6	8 51.8	1.005	77.5	9 21.8	1.005	77.5	9 51.8	1.005	77.5	10 21.7	1.005	77.4	10 51.7	1.005	77.4	2
3	7 18.9	1.005	76.6	7 48.9	1.005	76.6	8 18.8	1.005	76.6	8 48.8	1.005	76.5	9 18.7	1.005	76.5	9 48.7	1.005	76.5	10 18.7	1.005	76.4	10 48.6	1.005	76.4	3
4	7 15.9	1.005	75.6	7 45.8	1.005	75.6	8 15.8	1.005	75.6	8 45.7	1.005	75.5	9 15.7	1.005	75.5	9 45.7	1.005	75.5	10 15.6	1.005	75.5	10 45.6	1.005	75.4	4
105	7 12.8	1.005	74.6	7 42.8	1.005	74.6	8 12.7	1.005	74.6	8 42.7	1.005	74.5	9 12.7	1.005	74.5	9 42.6	1.005	74.5	10 12.6	1.005	74.5	10 42.5	1.005	74.4	105
6	7 09.8	1.005	73.6	7 39.8	1.005	73.6	8 09.7	1.005	73.6	8 39.7	1.005	73.5	9 09.6	1.005	73.5	9 39.6	1.005	73.5	10 09.6	1.005	73.5	10 39.5	1.005	73.4	6
7	7 06.8	1.005	72.6	7 36.8	1.005	72.6	8 06.7	1.005	72.6	8 36.7	1.005	72.5	9 06.6	1.005	72.5	9 36.6	1.005	72.5	10 06.6	1.005	72.5	10 36.5	1.005	72.4	7
8	7 03.8	1.005	71.6	7 33.8	1.005	71.6	8 03.7	1.005	71.6	8 33.7	1.005	71.5	9 03.7	1.005	71.5	9 33.6	1.005	71.5	10 03.5	1.005	71.5	10 33.5	1.005	71.4	8
9	7 00.8	1.005	70.6	7 30.8	1.005	70.6	8 00.8	1.005	70.6	8 30.7	1.005	70.6	9 00.7	1.005	70.5	9 30.6	1.005	70.5	10 00.6	1.005	70.5	10 30.6	1.005	70.5	9
110	6 57.9	1.005	69.6	7 27.8	1.005	69.6	7 57.8	1.005	69.6	8 27.8	1.005	69.6	8 57.7	1.005	69.5	9 27.7	1.005	69.5	9 57.7	1.005	69.5	10 27.6	1.005	69.5	110
1	6 54.9	1.005	68.6	7 24.9	1.005	68.6	7 54.9	1.005	68.6	8 24.8	1.005	68.6	8 54.8	1.005	68.5	9 24.8	1.005	68.5	9 54.7	1.005	68.5	10 24.7	1.005	68.5	1
2	6 52.0	1.005	67.6	7 22.0	1.005	67.6	7 52.0	1.005	67.6	8 21.9	1.005	67.6	8 51.9	1.005	67.5	9 21.8	1.005	67.5	9 51.8	1.005	67.5	10 21.8	1.005	67.5	2
3	6 49.1	1.005	66.6	7 19.1	1.005	66.6	7 49.1	1.005	66.6	8 19.0	1.005	66.6	8 49.0	1.005	66.5	9 19.0	1.005	66.5	9 48.9	1.005	66.5	10 18.9	1.005	66.5	3
4	6 46.3	1.005	65.6	7 16.2	1.005	65.6	7 46.2	1.005	65.6	8 16.2	1.005	65.6	8 46.1	1.005	65.5	9 16.1	1.005	65.5	9 46.1	1.005	65.5	10 16.0	1.005	65.5	4
115	6 43.4	1.005	64.6	7 13.4	1.005	64.6	7 43.3	1.005	64.6	8 13.3	1.005	64.6	8 43.3	1.005	64.6	9 13.2	1.005	64.5	9 43.2	1.005	64.5	10 13.2	1.005	64.5	115
6	6 40.6	1.005	63.7	7 10.6	1.005	63.6	7 40.5	1.005	63.6	8 10.5	1.005	63.6	8 40.5	1.005	63.6	9 10.4	1.005	63.5	9 40.4	1.005	63.5	10 10.4	1.005	63.5	6
7	6 37.8	1.005	62.7	7 07.8	1.005	62.6	7 37.7	1.005	62.6	8 07.7	1.005	62.6	8 37.7	1.005	62.6	9 07.6	1.005	62.5	9 37.6	1.005	62.5	10 07.6	1.005	62.5	7
8	6 35.0	1.005	61.7	7 05.0	1.005	61.6	7 34.9	1.005	61.6	8 04.9	1.005	61.6	8 34.9	1.005	61.6	9 04.8	1.005	61.5	9 34.8	1.005	61.5	10 04.8	1.005	61.5	8
9	6 32.3	1.005	60.7	7 02.2	1.005	60.6	7 32.2	1.005	60.6	8 02.2	1.005	60.6	8 32.1	1.005	60.6	9 02.1	1.005	60.5	9 32.1	1.005	60.5	10 02.0	1.005	60.5	9
120	6 29.5	1.004	59.7	6 59.5	1.004	59.6	7 29.5	1.004	59.6	7 59.4	1.004	59.6	8 29.4	1.004	59.6	8 59.4	1.004	59.6	9 29.3	1.004	59.5	9 59.3	1.004	59.5	120
1	6 26.8	1.004	58.7	6 56.8	1.004	58.7	7 26.8	1.004	58.6	7 56.7	1.004	58.6	8 26.7	1.004	58.6	8 56.7	1.004	58.6	9 26.7	1.004	58.5	9 56.6	1.004	58.5	1
2	6 24.2	1.004	57.7	6 54.1	1.004	57.7	7 24.1	1.004	57.6	7 54.1	1.004	57.6	8 24.1	1.004	57.6	8 54.0	1.004	57.6	9 24.0	1.004	57.5	9 54.0	1.004	57.5	2
3	6 21.5	1.004	56.7	6 51.5	1.004	56.7	7 21.5	1.004	56.6	7 51.4	1.004	56.6	8 21.4	1.004	56.6	8 51.4	1.004	56.6	9 21.4	1.004	56.5	9 51.3	1.004	56.5	3
4	6 18.9	1.004	55.7	6 48.9	1.004	55.7	7 18.9	1.004	55.6	7 48.8	1.004	55.6	8 18.8	1.004	55.6	8 48.8	1.004	55.6	9 18.8	1.004	55.5	9 48.7	1.004	55.5	4
125	6 16.3	1.004	54.7	6 46.3	1.004	54.7	7 16.3	1.004	54.6	7 46.3	1.004	54.6	8 16.2	1.004	54.6	8 46.2	1.004	54.6	9 16.2	1.004	54.6	9 46.1	1.004	54.5	125
6	6 13.8	1.004	53.7	6 43.8	1.004	53.7	7 13.7	1.004	53.7	7 43.7	1.004	53.6	8 13.7	1.004	53.6	8 43.7	1.004	53.6	9 13.6	1.004	53.6	9 43.6	1.004	53.5	6
7	6 11.3	1.004	52.7	6 41.3	1.004	52.7	7 11.2	1.004	52.7	7 41.2	1.004	52.6	8 11.2	1.004	52.6	8 41.2	1.004	52.6	9 11.1	1.004	52.6	9 41.1	1.004	52.5	7
8	6 08.8	1.004	51.7	6 38.8	1.004	51.7	7 08.8	1.004	51.7	7 38.7	1.004	51.6	8 08.7	1.004	51.6	8 38.7	1.004	51.6	9 08.6	1.004	51.6	9 38.6	1.004	51.6	8
9	6 06.4	1.004	50.7	6 36.3	1.004	50.7	7 06.3	1.004	50.7	7 36.3	1.004	50.7	8 06.3	1.004	50.6	8 36.2	1.004	50.6	9 06.2	1.004	50.6	9 36.2	1.004	50.6	9
130	6 03.9	1.004	49.7	6 33.9	1.004	49.7	7 03.9	1.004	49.7	7 33.9	1.004	49.7	8 03.8	1.004	49.6	8 33.8	1.004	49.6	9 03.8	1.004	49.6	9 33.8	1.004	49.6	130
1	6 01.6	1.004	48.7	6 31.5	1.004	48.7	7 01.5	1.004	48.7	7 31.5	1.004	48.7	8 01.5	1.004	48.6	8 31.4	1.004	48.6	9 01.4	1.004	48.6	9 31.4	1.004	48.6	1
2	5 59.2	1.004	47.7	6 29.2	1.004	47.7	6 59.2	1.004	47.7	7 29.2	1.004	47.7	7 59.1	1.004	47.6	8 29.1	1.004	47.6	8 59.1	1.004	47.6	9 29.1	1.004	47.6	2
3	5 56.9	1.004	46.7	6 26.9	1.004	46.7	6 56.9	1.004	46.7	7 26.9	1.004	46.7	7 56.8	1.004	46.7	8 26.8	1.004	46.6	8 56.8	1.004	46.6	9 26.8	1.004	46.6	3
4	5 54.6	1.004	45.7	6 24.6	1.004	45.7	6 54.6	1.004	45.7	7 24.6	1.004	45.7	7 54.6	1.004	45.7	8 24.5	1.004	45.6	8 54.5	1.004	45.6	9 24.5	1.004	45.6	4
135	5 52.4	1.004	44.7	6 22.4	1.004	44.7	6 52.4	1.004	44.7	7 22.4	1.004	44.7	7 52.3	1.004	44.7	8 22.3	1.004	44.6	8 52.3	1.004	44.6	9 22.3	1.004	44.6	135
6	5 50.2	1.004	43.7	6 20.2	1.004	43.7	6 50.2	1.004	43.7	7 20.1	1.004	43.7	7 50.1	1.004	43.7	8 20.1	1.004	43.7	8 50.1	1.004	43.6	9 20.1	1.004	43.6	6
7	5 48.1	1.004	42.7	6 18.1	1.004	42.7	6 48.0	1.004	42.7	7 18.0	1.004	42.7	7 48.0	1.004	42.7	8 18.0	1.004	42.7	8 48.0	1.004	42.6	9 17.9	1.004	42.6	7
8	5 46.0	1.003	41.8	6 15.9	1.003	41.7	6 45.9	1.003	41.7	7 15.9	1.003	41.7	7 45.9	1.003	41.7	8 15.9	1.003	41.7	8 45.9	1.003	41.7	9 15.8	1.003	41.6	8
9	5 43.9	1.003	40.8	6 13.9	1.003	40.7	6 43.9	1.003	40.7	7 13.8	1.003	40.7	7 43.8	1.003	40.7	8 13.8	1.003	40.7	8 43.8	1.003	40.7	9 13.8	1.003	40.6	9
140	5 41.9	1.003	39.8	6 11.8	1.003	39.8	6 41.8	1.003	39.7	7 11.8	1.003	39.7	7 41.8	1.003	39.7	8 11.8	1.003	39.7	8 41.8	1.003	39.7	9 11.7	1.003	39.6	140
1	5 39.9	1.003	38.8	6 09.9	1.003	38.8	6 39.8	1.003	38.7	7 09.8	1.003	38.7	7 39.8	1.003	38.7	8 09.8	1.003	38.7	8 39.8	1.003	38.7	9 09.8	1.003	38.7	1
2	5 37.9	1.003	37.8	6 07.9	1.003	37.8	6 37.9	1.003	37.7	7 07.9	1.003	37.7	7 37.9	1.003	37.7	8 07.9	1.003	37.7	8 37.8	1.003	37.7	9 07.8	1.003	37.7	2
3	5 36.0	1.003	36.8	6 06.0	1.003	36.8	6 36.0	1.003	36.8	7 06.0	1.003	36.7	7 36.0	1.003	36.7	8 06.0	1.003	36.7	8 35.9	1.003	36.7	9 05.9	1.003	36.7	3
4	5 34.2	1.003	35.8	6 04.2	1.003	35.8	6 34.1	1.003	35.8	7 04.1	1.003	35.8	7 34.1	1.003	35.7	8 04.1	1.003	35.7	8 34.1	1.003	35.7	9 04.1	1.003	35.7	4
145	5 32.4	1.003	34.8	6 02.3	1.003	34.8	6 32.3	1.003	34.8	7 02.3	1.003	34.8	7 32.3	1.003	34.7	8 02.3	1.003	34.7	8 32.3	1.003	34.7	9 02.3	1.003	34.7	145
6	5 30.6	1.003	33.8	6 00.6	1.003	33.8	6 30.6	1.003	33.8	7 00.5	1.003	33.8	7 30.5	1.003	33.7	8 00.5	1.003	33.7	8 30.5	1.003	33.7	9 00.5	1.003	33.7	6
7	5 28.9	1.003	32.8	5 58.9	1.003	32.8	6 28.8	1.003	32.8	6 58.8	1.003	32.8	7 28.8	1.003	32.7	7 58.8	1.003	32.7	8 28.8	1.003	32.7	8 58.8	1.003	32.7	7
8	5 27.2	1.003	31.8	5 57.2	1.003	31.8	6 27.2	1.003	31.8	6 57.2	1.003	31.8	7 27.1	1.003	31.8	7 57.1	1.003	31.7	8 27.1	1.003	31.7	8 57.1	1.003	31.7	8
9	5 25.6	1.003	30.8	5 55.5	1.003	30.8	6 25.5	1.003	30.8	6 55.5	1.003	30.8	7 25.5	1.003	30.8	7 55.5	1.003	30.7	8 25.5	1.003	30.7	8 55.5	1.003	30.7	9
150	5 24.0	1.003	29.8	5 54.0	1.003	29.8	6 23.9	1.003	29.8	6 53.9	1.003	29.8	7 23.9	1.003	29.8	7 53.9	1.003	29.8	8 23.9	1.003	29.7	8 53.9	1.003	29.7	150
1	5 22.4	1.002	28.8	5 52.4	1.002	28.8	6 22.4	1.002	28.8	6 52.4	1.002	28.8	7 22.4	1.002	28.8	7 52.4	1.002	28.8	8 22.4	1.002	28.8	8 52.4	1.002	28.7	1
2	5 20.9	1.002	27.8	5 50.9	1.002	27.8	6 20.9	1.002	27.8	6 50.9	1.002	27.8	7 20.9	1.002	27.8	7 50.9	1.002	27.8	8 20.9	1.002	27.8	8 50.9	1.002	27.7	2
3	5 19.5	1.002	26.8	5 49.5	1.002	26.8	6 19.5	1.002	26.8	6 49.5	1.002	26.8	7 19.5	1.002	26.8	7 49.5	1.002	26.8	8 19.4	1.002	26.8	8 49.4	1.002	26.8	3
4	5 18.1	1.002	25.8	5 48.1	1.002	25.8	6 18.1	1.002	25.8	6 48.1	1.002	25.8	7 18.1	1.002	25.8	7 48.1	1.002	25.8	8 18.1	1.002	25.8	8 48.0	1.002	25.8	4
155	5 16.8	1.002	24.9	5 46.8	1.002	24.8	6 16.8	1.002	24.8	6 46.7	1.002	24.8	7 16.7	1.002	24.8	7 46.7	1.002	24.8	8 16.7	1.002	24.8	8 46.7	1.002	24.8	155
6	5 15.5	1.002	23.9	5 45.5	1.002	23.8	6 15.5	1.002	23.8	6 45.4	1.002	23.8	7 15.4	1.002	23.8	7 45.4	1.002	23.8	8 15.4	1.002	23.8	8 45.4	1.002	23.8	6
7	5 14.2	1.002	22.9	5 44.2	1.002	22.9	6 14.2	1.002	22.8	6 44.2	1.002	22.8	7 14.2	1.002	22.8	7 44.2	1.002	22.8	8 14.2	1.002	22.8	8 44.2	1.002	22.8	7
8	5 13.0	1.002	21.9	5 43.0	1.002	21.9	6 13.0	1.002	21.9	6 43.0	1.002	21.8	7 13.0	1.002	21.8	7 43.0	1.002	21.8	8 13.0	1.002	21.8	8 43.0	1.002	21.8	8
9	5 11.9	1.002	20.9	5 41.9	1.002	20.9	6 11.9	1.002	20.9	6 41.9	1.002	20.8	7 11.9	1.002	20.8	7 41.9	1.002	20.8	8 11.8	1.002	20.8	8 41.8	1.002	20.8	9
160	5 10.8	1.002	19.9	5 40.8	1.002	19.9	6 10.8	1.002	19.9	6 40.8	1.002	19.9	7 10.8	1.002	19.9	7 40.8	1.002	19.8	8 10.8	1.002	19.8	8 40.8	1.002	19.8	160
1	5 09.7	1.002	18.9	5 39.7	1.002	18.9	6 09.7	1.002	18.9	6 39.7	1.002	18.9	7 09.7	1.002	18.9	7 39.7	1.002	18.8	8 09.7	1.002	18.8	8 39.7	1.002	18.8	1
2	5 08.8	1.002	17.9	5 38.8	1.002	17.9	6 08.7	1.002	17.9	6 38.7	1.002	17.9	7 08.7	1.002	17.9	7 38.7	1.002	17.9	8 08.7	1.002	17.8	8 38.7	1.002	17.8	2
3	5 07.8	1.001	16.9	5 37.8	1.001	16.9	6 07.8	1.002	16.9	6 37.8	1.001	16.9	7 07.8	1.001	16.9	7 37.8	1.001	16.9	8 07.8	1.001	16.9	8 37.8	1.001	16.8	3
4	5 06.9	1.001	15.9	5 36.9	1.001	15.9	6 06.9	1.001	15.9	6 36.9	1.001	15.9	7 06.9	1.001	15.9	7 36.9	1.001	15.9	8 06.9	1.001	15.9	8 36.9	1.001	15.9	4
165	5 06.1	1.001	14.9	5 36.1	1.001	14.9	6 06.1	1.001	14.9	6 36.1	1.001	14.9	7 06.1	1.001	14.9	7 36.1	1.001	14.9	8 06.1	1.001	14.9	8 36.1	1.001	14.9	165
6	5 05.3	1.001	13.9	5 35.3	1.001	13.9	6 05.3	1.001	13.9	6 35.3	1.001	13.9	7 05.3	1.001	13.9	7 35.3	1.001	13.9	8 05.3	1.001	13.9	8 35.3	1.001	13.9	6
7	5 04.6	1.001	12.9	5 34.6	1.001	12.9	6 04.6	1.001	12.9	6 34.6	1.001	12.9	7 04.6	1.001	12.9	7 34.6	1.001	12.9	8 04.6	1.001	12.9	8 34.6	1.001	12.9	7
8	5 03.9	1.001	11.9	5 33.9	1.001	11.9	6 03.9	1.001	11.9	6 33.9	1.001	11.9	7 03.9	1.001	11.9	7 33.9	1.001	11.9	8 03.9	1.001	11.9	8 33.9	1.001	11.9	8
9	5 03.3	1.001	10.9	5 33.3	1.001	10.9	6 03.3	1.001	10.9	6 33.3	1.001	10.9	7 03.3	1.001	10.9	7 33.3	1.001	10.9	8 03.3	1.001	10.9	8 33.3	1.001	10.9	9
170	5 02.7	1.001	09.9	5 32.7	1.001	09.9	6 02.7	1.001	09.9	6 32.7	1.001	09.9	7 02.7	1.001	09.9	7 32.7	1.001	09.9	8 02.7	1.001	09.9	8 32.7	1.001	09.9	170
1	5 02.2	1.001	08.9	5 32.2	1.001	08.9	6 02.2	1.001	08.9	6 32.2	1.001	08.9	7 02.2	1.001	08.9	7 32.2	1.001	08.9	8 02.2	1.001	08.9	8 32.2	1.001	08.9	1
2	5 01.7	1.001	08.0	5 31.7	1.001	07.9	6 01.7	1.001	07.9	6 31.7	1.001	07.9	7 01.7	1.001	07.9	7 31.7	1.001	07.9	8 01.7	1.001	07.9	8 31.7	1.001	07.9	2
3	5 01.3	1.001	07.0	5 31.3	1.001	07.0	6 01.3	1.001	07.0	6 31.3	1.001	06.9	7 01.3	1.001	06.9	7 31.3	1.001	06.9	8 01.3	1.001	06.9	8 31.3	1.001	06.9	3
4	5 01.0	1.000	06.0	5 31.0	1.000	06.0	6 01.0	1.000	06.0	6 31.0	1.000	06.0	7 01.0	1.000	06.0	7 31.0	1.000	06.0	8 01.0	1.000	05.9	8 31.0	1.000	05.9	4
175	5 00.7		05.0	5 30.7		05.0	6 00.7		05.0	6 30.7		05.0	7 00.7		05.0	7 30.7		05.0	8 00.7		05.0	8 30.7		05.0	175
6	5 00.4	1.000	04.0	5 30.4	1.000	04.0	6 00.4	1.000	04.0	6 30.4	1.000	04.0	7 00.4	1.000	04.0	7 30.4	1.000	04.0	8 00.4	1.000	04.0	8 30.4	1.000	04.0	6
7	5 00.2	1.000	03.0	5 30.2	1.000	03.0	6 00.2	1.000	03.0	6 30.2	1.000	03.0	7 00.2	1.000	03.0	7 30.2	1.000	03.0	8 00.2	1.000	03.0	8 30.2	1.000	03.0	7
8	5 00.1	1.000	02.0	5 30.1	1.000	02.0	6 00.1	1.000	02.0	6 30.1	1.000	02.0	7 00.1	1.000	02.0	7 30.1	1.000	02.0	8 00.1	1.000	02.0	8 30.1	1.000	02.0	8
9	5 00.0	1.000	01.0	5 30.0	1.000	01.0	6 00.0	1.000	01.0	6 30.0	1.000	01.0	7 00.0	1.000	01.0	7 30.0	1.000	01.0	8 00.0	1.000	01.0	8 30.0	1.000	01.0	9
180	5 00.0	1.000	00.0	5 30.0	1.000	00.0	6 00.0	1.000	00.0	6 30.0	1.000	00.0	7 00.0	1.000	00.0	7 30.0	1.000	00.0	8 00.0	1.000	00.0	8 30.0	1.000	00.0	180

Lat. 88°

Lat. 89°

Lat. 86°

H.A.	60° 00′	60° 30′	62° 00′	62° 30′	63° 00′	69° 00′	69° 30′	74° 30′	H.A.
	Alt. Δd Δt Az.	Alt. Δd Δt Az.	Alt. Δd Δt Az.	Alt. Δd Δt Az.	Alt. Δd Δt Az.	Alt. Δd Δt Az.	Alt. Δd Δt Az.	Alt. Δd Δt Az.	
00	64 00.0 1.00 180.0	64 30.0 1.00 180.0	66 00.0 1.00 180.0	66 30.0 1.00 180.0	67 00.0 1.00 180.0	73 00.0 1.00 180.0	73 30.0 1.00 180.0	78 30.0 1.00 180.0	00
1	64 00.0 1.00 178.9	64 30.0 1.00 178.9	66 00.0 1.00 178.8	66 30.0 1.00 178.8	67 00.0 1.00 178.8	73 00.0 1.00 178.8	73 30.0 1.00 178.8	78 30.0 1.00 178.7	1
2	63 59.8 1.00 177.7	64 29.8 1.00 177.7	65 59.8 1.00 177.7	66 29.8 1.00 177.7	66 59.8 1.00 177.7	72 59.8 1.00 177.5	73 29.8 1.00 177.5	78 29.8 1.00 177.3	2
3	63 59.6 1.00 176.6	64 29.6 1.00 176.6	65 59.6 1.00 176.5	66 29.6 1.00 176.5	66 59.6 1.00 176.5	72 59.6 1.00 01 176.3	73 29.6 1.00 01 176.3	78 29.6 1.00 01 176.0	3
4	63 59.3 1.00 01 175.4	64 29.3 1.00 01 175.4	65 59.3 1.00 01 175.4	66 29.3 1.00 01 175.4	66 59.3 1.00 01 175.4	72 59.3 1.00 01 175.1	73 29.3 1.00 01 175.1	78 29.2 1.00 01 174.6	4
05	63 59.0 1.00 01 174.3	64 29.0 1.00 01 174.3	65 58.9 1.00 01 174.2	66 28.9 1.00 01 174.2	66 58.9 1.00 01 174.2	72 58.9 1.00 01 173.9	73 28.9 1.00 01 173.8	78 28.8 1.00 01 173.3	05
6	63 58.5 1.00 01 173.2	64 28.5 1.00 01 173.1	65 58.5 1.00 01 173.1	66 28.5 1.00 01 173.1	66 58.5 1.00 01 173.0	72 58.4 1.00 01 172.7	73 28.4 1.00 01 172.6	78 28.2 1.00 01 172.0	6
7	63 58.0 1.00 01 172.0	64 28.0 1.00 01 172.0	65 57.9 1.00 01 171.9	66 27.9 1.00 01 171.9	66 57.9 1.00 01 171.9	72 57.9 1.00 01 171.4	73 27.8 1.00 01 171.4	78 27.6 1.00 01 170.6	7
8	63 57.3 1.00 01 170.9	64 27.3 1.00 01 170.9	65 57.3 1.00 01 170.8	66 27.3 1.00 01 170.7	66 57.3 1.00 01 170.7	72 57.1 1.00 01 170.2	73 27.1 1.00 01 170.1	78 26.9 1.00 01 169.3	8
9	63 56.6 1.00 01 169.7	64 26.6 1.00 01 169.7	65 56.6 1.00 01 169.6	66 26.6 1.00 01 169.6	66 56.6 1.00 01 169.6	72 56.4 1.00 01 169.0	73 26.4 1.00 01 168.9	78 26.0 1.00 02 168.0	9
10	63 55.8 1.00 01 168.6	64 25.8 1.00 01 168.6	65 55.8 1.00 01 168.5	66 25.8 1.00 01 168.4	66 55.8 1.00 01 168.4	72 55.5 1.00 02 167.8	73 25.5 1.00 02 167.7	78 25.1 1.00 02 166.6	10
1	63 55.0 1.00 02 167.5	64 25.0 1.00 02 167.4	65 54.9 1.00 02 167.3	66 24.9 1.00 02 167.3	66 54.9 1.00 02 167.2	72 54.6 1.00 02 166.5	73 24.6 1.00 02 166.5	78 24.1 1.00 02 165.3	1
2	63 54.0 1.00 02 166.3	64 24.0 1.00 02 166.3	65 54.0 1.00 02 166.2	66 23.9 1.00 02 166.1	66 53.9 1.00 02 166.1	72 53.6 1.00 02 165.3	73 23.6 1.00 02 165.2	78 23.0 1.00 02 164.0	2
3	63 53.0 1.00 02 165.2	64 23.0 1.00 02 165.2	65 52.9 1.00 02 165.0	66 22.9 1.00 02 165.0	66 52.9 1.00 02 164.9	72 52.5 1.00 02 164.1	73 22.4 1.00 02 164.0	78 21.8 1.00 02 162.7	3
4	63 51.9 1.00 02 164.1	64 21.9 1.00 02 164.0	65 51.8 1.00 02 163.9	66 21.8 1.00 02 163.8	66 51.7 1.00 02 163.8	72 51.3 1.00 02 162.9	73 21.3 1.00 02 162.8	78 20.5 1.00 02 161.3	4
15	63 50.7 1.00 02 162.9	64 20.7 1.00 02 162.9	65 50.6 1.00 02 162.7	66 20.6 1.00 02 162.7	66 50.5 1.00 02 162.6	72 50.0 1.00 02 161.7	73 20.0 1.00 02 161.6	78 19.1 1.00 02 160.0	15
6	63 49.4 1.00 02 161.8	64 19.3 1.00 02 161.7	65 49.3 1.00 02 161.6	66 19.3 1.00 02 161.5	66 49.2 1.00 02 161.5	72 48.7 1.00 02 160.5	73 18.6 1.00 02 160.4	78 17.7 1.00 02 158.7	6
7	63 48.1 1.00 02 160.7	64 18.1 1.00 02 160.6	65 48.0 1.00 02 160.4	66 17.9 1.00 02 160.4	66 47.9 1.00 02 160.3	72 47.2 1.00 02 159.3	73 17.2 1.00 03 159.1	78 16.1 1.00 03 157.4	7
8	63 46.7 1.00 02 159.5	64 16.6 1.00 02 159.5	65 46.5 1.00 03 159.3	66 16.5 1.00 03 159.2	66 46.4 1.00 03 159.2	72 45.7 1.00 03 158.1	73 15.6 1.00 03 157.9	78 14.4 99 03 156.1	8
9	63 45.2 1.00 03 158.4	64 15.1 1.00 03 158.3	65 45.0 1.00 03 158.2	66 14.9 1.00 03 158.1	66 44.9 1.00 03 158.0	72 44.1 1.00 03 156.9	73 14.0 1.00 03 156.7	78 12.7 99 03 154.8	9
20	63 43.6 1.00 03 157.3	64 13.5 1.00 03 157.2	65 43.4 1.00 03 157.0	66 13.3 1.00 03 156.9	66 43.3 1.00 03 156.9	72 42.4 1.00 03 155.6	73 12.3 1.00 03 155.5	78 10.9 99 03 153.5	20
1	63 41.9 1.00 03 156.1	64 11.9 1.00 03 156.1	65 41.7 1.00 03 155.8	66 11.7 1.00 03 155.8	66 41.6 1.00 03 155.7	72 40.7 1.00 03 154.3	73 10.5 1.00 03 154.3	78 09.0 99 03 152.2	1
2	63 40.2 1.00 03 155.0	64 10.1 1.00 03 155.0	65 40.0 1.00 03 154.7	66 09.9 1.00 03 154.7	66 39.8 1.00 03 154.6	72 38.8 1.00 03 153.2	73 08.7 1.00 03 153.1	78 07.0 99 03 150.9	2
3	63 38.4 1.00 03 153.9	64 08.3 1.00 03 153.8	65 38.2 1.00 03 153.6	66 08.1 1.00 03 153.5	66 38.0 1.00 03 153.4	72 36.9 1.00 03 152.1	73 06.8 1.00 03 151.9	78 04.9 99 04 149.6	3
4	63 36.5 1.00 03 152.8	64 06.5 1.00 03 152.7	65 36.3 1.00 03 152.5	66 06.2 1.00 03 152.4	66 36.1 1.00 03 152.3	72 34.9 1.00 03 150.9	73 04.8 1.00 03 150.7	78 02.7 99 04 148.3	4
25	63 34.6 1.00 03 151.7	64 04.5 1.00 03 151.6	65 34.3 1.00 03 151.3	66 04.2 1.00 03 151.2	66 34.1 1.00 03 151.2	72 32.8 1.00 04 149.7	73 02.7 99 04 149.5	78 00.5 99 04 147.1	25
6	63 32.5 1.00 04 150.6	64 02.5 1.00 04 150.5	65 32.2 1.00 04 150.2	66 02.2 1.00 04 150.1	66 32.1 1.00 04 150.0	72 30.7 99 04 148.5	73 00.5 99 04 148.3	77 58.2 99 04 145.8	6
7	63 30.4 1.00 04 149.4	64 00.4 1.00 04 149.3	65 30.1 1.00 04 149.1	66 00.0 1.00 04 149.0	66 29.9 1.00 04 148.9	72 28.4 99 04 147.3	72 58.3 99 04 147.1	77 55.8 99 04 144.5	7
8	63 28.3 1.00 04 148.3	63 58.2 1.00 04 148.2	65 27.9 1.00 04 147.9	65 57.8 1.00 04 147.8	66 27.7 1.00 04 147.7	72 26.1 99 04 146.1	72 56.0 99 04 145.9	77 53.3 99 04 143.3	8
9	63 26.0 1.00 04 147.2	63 56.0 1.00 04 147.1	65 25.7 1.00 04 146.8	65 55.6 1.00 04 146.7	66 25.5 1.00 04 146.6	72 23.8 99 04 144.9	72 53.6 99 04 144.7	77 50.8 99 04 142.0	9
30	63 23.7 1.00 04 146.1	63 53.7 1.00 04 146.0	65 23.4 1.00 04 145.6	65 53.2 1.00 04 145.6	66 23.1 1.00 04 145.5	72 21.3 99 04 143.6	72 51.1 99 04 143.6	77 48.2 99 04 140.8	30
1	63 21.4 1.00 04 145.0	63 51.3 1.00 04 144.9	65 21.0 1.00 04 144.6	65 50.8 1.00 04 144.5	66 20.7 1.00 04 144.4	72 18.8 99 04 142.6	72 48.6 99 04 142.4	77 45.5 99 05 139.5	1
2	63 18.9 1.00 04 143.8	63 48.8 1.00 04 143.7	65 18.5 1.00 04 143.4	65 48.4 1.00 04 143.3	66 18.3 1.00 04 143.2	72 16.2 99 04 141.4	72 46.0 99 04 141.2	77 42.8 98 05 138.3	2
3	63 16.4 1.00 04 142.7	63 46.3 1.00 04 142.6	65 16.0 1.00 04 142.3	65 45.8 1.00 04 142.2	66 15.7 1.00 04 142.1	72 13.6 99 04 140.3	72 43.4 98 05 140.0	77 39.9 98 05 137.1	3
4	63 13.9 1.00 04 141.6	63 43.8 1.00 04 141.5	65 13.4 1.00 04 141.2	65 43.3 1.00 04 141.1	66 13.1 1.00 04 141.0	72 10.9 99 05 139.1	72 40.6 99 05 138.9	77 37.0 98 05 135.8	4
35	63 11.2 1.00 04 140.5	63 41.1 1.00 04 140.4	65 10.7 1.00 05 140.1	65 40.6 1.00 05 140.0	66 10.4 1.00 05 139.9	72 08.1 99 05 137.9	72 37.9 99 05 137.7	77 34.1 98 05 134.6	35
6	63 08.6 1.00 05 139.4	63 38.4 1.00 05 139.3	65 08.0 1.00 05 139.0	65 37.9 1.00 05 138.9	66 07.7 1.00 05 138.7	72 05.3 99 05 136.8	72 35.0 99 05 136.5	77 31.1 98 05 133.4	6
7	63 05.8 1.00 05 138.3	63 35.7 1.00 05 138.2	65 05.2 1.00 05 137.9	65 35.1 99 05 137.8	66 04.9 99 05 137.6	72 02.4 99 05 135.6	72 32.1 99 05 135.4	77 28.0 98 05 132.2	7
8	63 03.0 1.00 05 137.2	63 32.8 1.00 05 137.1	65 02.4 1.00 05 136.8	65 32.2 99 05 136.6	66 02.1 99 05 136.5	71 59.4 99 05 134.5	72 29.1 99 05 134.2	77 24.7 98 05 131.0	8
9	63 00.1 1.00 05 136.1	63 30.0 1.00 05 135.9	64 59.5 99 05 135.7	65 29.3 99 05 135.5	65 59.2 99 05 135.4	71 56.4 99 05 133.3	72 26.1 99 05 133.1	77 21.7 98 05 129.8	9
40	62 57.2 1.00 05 135.0	63 27.0 99 05 134.9	64 56.6 99 05 134.6	65 26.4 99 05 134.4	65 56.2 99 05 134.3	71 53.3 99 05 132.2	72 23.0 99 05 131.9	77 18.4 98 06 128.6	40
1	62 54.2 99 05 133.9	63 24.0 99 05 133.8	64 53.5 99 05 133.5	65 23.4 99 05 133.3	65 53.2 99 05 133.2	71 50.2 99 05 131.0	72 19.9 99 05 130.8	77 15.2 98 06 127.4	1
2	62 51.2 99 05 132.8	63 21.0 99 05 132.7	64 50.5 99 05 132.4	65 20.3 99 05 132.2	65 50.1 99 05 132.1	71 47.0 99 05 129.9	72 16.7 99 05 129.7	77 11.8 98 06 126.2	2
3	62 48.1 99 05 131.8	63 17.9 99 05 131.6	64 47.4 99 05 131.3	65 17.2 99 05 131.1	65 47.0 99 05 131.0	71 43.8 99 05 128.8	72 13.4 98 06 128.5	77 08.4 98 06 125.0	3
4	62 44.9 99 05 130.7	63 14.7 99 05 130.5	64 44.2 99 05 130.2	65 14.0 99 05 130.0	65 43.8 99 05 129.9	71 40.5 99 06 127.6	72 10.1 99 06 127.4	77 04.9 98 06 123.9	4
45	62 41.7 99 05 129.6	63 11.5 99 05 129.5	64 41.0 99 05 129.1	65 10.8 99 05 128.9	65 40.5 99 05 128.8	71 37.2 99 06 126.5	72 06.8 99 06 126.3	77 01.4 98 06 122.7	45
6	62 38.5 99 06 128.5	63 08.3 99 06 128.4	64 37.7 99 06 128.0	65 07.5 99 06 127.8	65 37.3 99 06 127.7	71 33.8 99 06 125.4	72 03.4 99 06 125.1	76 57.9 97 06 121.5	6
7	62 35.2 99 06 127.4	63 05.0 99 06 127.3	64 34.4 99 06 126.9	65 04.2 99 06 126.8	65 33.9 99 06 126.6	71 30.3 99 06 124.3	71 59.9 99 06 124.0	76 54.5 97 06 120.4	7
8	62 31.8 99 06 126.3	63 01.6 99 06 126.2	64 31.0 99 06 125.8	65 00.8 99 06 125.7	65 30.5 99 06 125.5	71 26.9 99 06 123.2	71 56.4 99 06 122.9	76 50.7 97 06 119.2	8
9	62 28.4 99 06 125.3	62 58.2 99 06 125.1	64 27.6 99 06 124.7	64 57.4 99 06 124.6	65 27.1 99 06 124.4	71 23.3 99 06 122.1	71 52.9 99 06 121.8	76 47.0 97 06 118.1	9
50	62 25.0 99 06 124.2	62 54.8 99 06 124.1	64 24.1 99 06 123.7	64 53.9 99 06 123.5	65 23.6 99 06 123.4	71 19.8 99 06 121.0	71 49.3 99 06 120.7	76 43.3 97 06 117.0	50
1	62 21.5 99 06 123.1	62 51.3 99 06 123.0	64 20.6 99 06 122.6	64 50.4 99 06 122.4	65 20.1 99 06 122.3	71 16.2 99 06 119.9	71 45.7 98 06 119.6	76 39.5 97 06 115.8	1
2	62 18.0 99 06 122.0	62 47.8 99 06 121.9	64 17.1 99 06 121.5	64 46.8 99 06 121.4	65 16.6 99 06 121.2	71 12.6 99 06 118.8	71 42.1 98 06 118.5	76 35.8 97 06 114.7	2
3	62 14.4 99 06 121.0	62 44.2 99 06 120.9	64 13.5 99 06 120.5	64 43.2 99 06 120.3	65 13.0 99 06 120.1	71 08.8 99 06 117.7	71 38.4 98 06 117.4	76 31.9 97 06 113.6	3
4	62 10.8 99 06 119.9	62 40.6 99 06 119.8	64 09.8 99 06 119.4	64 39.6 99 06 119.2	65 09.3 99 06 119.1	71 05.1 98 06 116.6	71 34.6 98 06 116.3	76 28.1 97 06 112.5	4
55	62 07.1 99 06 118.9	62 36.9 99 06 118.7	64 06.2 99 06 118.3	64 35.9 99 06 118.1	65 05.6 99 06 118.0	71 01.3 98 06 115.5	71 30.9 98 06 115.2	76 24.2 97 06 111.4	55
6	62 03.5 99 06 117.8	62 33.2 99 06 117.7	64 02.5 99 06 117.2	64 32.2 99 06 117.1	65 01.9 99 06 116.9	70 57.5 98 06 114.4	71 27.1 98 06 114.1	76 20.3 97 07 110.3	6
7	61 59.7 99 06 116.7	62 29.5 99 06 116.6	63 58.7 99 06 116.2	64 28.5 99 06 116.0	64 58.2 99 06 115.9	70 53.7 98 06 113.3	71 23.2 98 06 113.0	76 16.4 97 07 109.2	7
8	61 56.0 99 06 115.7	62 25.7 99 06 115.5	63 55.0 99 06 115.1	64 24.7 99 06 115.0	64 54.4 99 06 114.8	70 49.9 98 06 112.2	71 19.4 98 06 112.0	76 12.4 97 07 108.1	8
9	61 52.2 99 06 114.6	62 21.9 99 06 114.5	63 51.2 99 06 114.1	64 20.9 99 06 113.9	64 50.6 99 06 113.7	70 46.0 98 07 111.2	71 15.5 98 07 110.9	76 08.4 97 07 107.0	9
60	61 48.4 99 06 113.6	62 18.1 99 06 113.4	63 47.3 99 06 113.0	64 17.0 99 06 112.8	64 46.7 99 06 112.7	70 42.0 98 07 110.1	71 11.5 98 07 109.8	76 04.4 97 07 105.9	60
1	61 44.5 99 07 112.5	62 14.3 99 07 112.4	63 43.5 99 06 111.9	64 13.2 99 06 111.8	64 42.9 99 07 111.6	70 38.0 98 07 109.0	71 07.6 98 07 108.7	76 00.4 97 07 104.9	1
2	61 40.6 99 07 111.5	62 10.4 99 07 111.3	63 39.6 99 07 110.8	64 09.3 99 07 110.7	64 39.0 99 07 110.6	70 34.1 98 07 107.9	71 03.6 98 07 107.7	75 56.3 97 07 103.8	2
3	61 36.7 99 07 110.4	62 06.5 99 07 110.3	63 35.6 99 07 109.9	64 05.3 99 07 109.7	64 35.0 99 07 109.5	70 30.1 98 07 106.9	70 59.6 98 07 106.6	75 52.2 97 07 102.7	3
4	61 32.8 99 07 109.4	62 02.5 99 07 109.3	63 31.7 99 07 108.8	64 01.4 99 07 108.6	64 31.1 99 07 108.5	70 26.1 98 07 105.9	70 55.6 98 07 105.6	75 48.1 97 07 101.7	4
65	61 28.8 99 07 108.4	61 58.6 99 07 108.2	63 27.7 99 07 107.8	63 57.4 99 07 107.6	64 27.1 99 07 107.4	70 22.1 98 07 104.8	70 51.5 98 07 104.5	75 44.0 97 07 100.6	65
6	61 24.9 99 07 107.3	61 54.6 99 07 107.2	63 23.7 99 07 106.7	63 53.4 99 07 106.6	64 23.1 99 07 106.4	70 18.0 98 07 103.8	70 47.5 99 07 103.5	75 39.9 97 07 99.6	6
7	61 20.8 99 07 106.3	61 50.6 99 07 106.1	63 19.7 99 07 105.7	63 49.4 99 07 105.5	64 19.1 99 07 105.4	70 14.0 98 07 102.7	70 43.4 98 07 102.4	75 35.8 97 07 98.5	7
8	61 16.8 99 07 105.3	61 46.5 99 07 105.1	63 15.7 99 07 104.7	63 45.3 99 07 104.5	64 15.0 99 07 104.3	70 09.9 98 07 101.7	70 39.3 98 07 101.4	75 31.6 97 07 97.5	8
9	61 12.8 99 07 104.2	61 42.5 99 07 104.1	63 11.6 99 07 103.6	63 41.3 99 07 103.5	64 10.9 99 07 103.3	70 05.8 98 07 100.7	70 35.2 98 07 100.4	75 27.5 97 07 96.5	9
70	61 08.7 99 07 103.2	61 38.4 99 07 103.1	63 07.5 99 07 102.6	63 37.2 99 07 102.4	64 06.9 99 07 102.3	70 01.6 98 07 99.6	70 31.1 98 07 99.3	75 23.3 97 07 95.4	70
1	61 04.6 99 07 102.2	61 34.3 99 07 102.0	63 03.4 99 07 101.6	63 33.1 99 07 101.4	64 02.8 99 07 101.2	69 57.5 98 07 98.6	70 26.9 98 07 98.3	75 19.1 97 07 94.4	1
2	61 00.5 99 07 101.1	61 30.2 99 07 101.0	62 59.3 99 07 100.5	63 29.0 99 07 100.4	63 58.7 99 07 100.2	69 53.4 98 07 97.6	70 22.8 98 07 97.3	75 15.0 97 07 93.4	2
3	60 56.4 99 07 100.1	61 26.1 99 07 100.0	62 55.2 99 07 99.5	63 24.9 99 07 99.4	63 54.5 99 07 99.2	69 49.2 98 07 96.6	70 18.6 98 07 96.3	75 10.8 97 07 92.4	3
4	60 52.3 99 07 99.1	61 22.0 99 07 99.0	62 51.1 99 07 98.5	63 20.7 99 07 98.3	63 50.4 99 07 98.2	69 45.1 98 07 95.5	70 14.5 98 07 95.3	75 06.6 97 07 91.4	4
75	60 48.1 99 07 98.1	61 17.9 99 07 98.0	62 46.9 99 07 97.5	63 16.6 99 07 97.3	63 46.2 99 07 97.2	69 40.9 98 07 94.5	70 10.3 98 07 94.2	75 02.4 97 07 90.4	75
6	60 44.0 99 07 97.1	61 13.7 99 07 96.9	62 42.8 99 07 96.5	63 12.4 99 07 96.3	63 42.1 99 07 96.1	69 36.7 98 07 93.5	70 06.1 98 07 93.2	74 58.2 97 07 89.4	6
7	60 39.8 99 07 96.1	61 09.5 99 07 95.9	62 38.6 99 07 95.5	63 08.3 99 07 95.3	63 37.9 99 07 95.1	69 32.5 98 07 92.5	70 01.9 98 07 92.2	74 54.1 97 07 88.4	7
8	60 35.7 99 07 95.1	61 05.4 99 07 94.9	62 34.4 99 07 94.5	63 04.1 99 07 94.3	63 33.7 99 07 94.1	69 28.4 98 07 91.5	69 57.8 98 07 91.2	74 49.9 97 07 87.4	8
9	60 31.5 99 07 94.1	61 01.2 99 07 93.9	62 30.3 99 07 93.4	62 59.9 99 07 93.3	63 29.6 99 07 93.1	69 24.2 98 07 90.5	69 53.6 98 07 90.2	74 45.7 97 07 86.4	9
80	60 27.3 99 07 93.0	60 57.0 99 07 92.9	62 26.1 99 07 92.4	62 55.7 99 07 92.3	63 25.4 99 07 92.1	69 20.0 98 07 89.5	69 49.4 97 07 89.2	74 41.5 97 07 85.5	80
1	60 23.1 99 07 92.0	60 52.8 99 07 91.9	62 21.9 99 07 91.4	62 51.6 99 07 91.3	63 21.2 99 07 91.1	69 15.8 98 07 88.5	69 45.2 98 07 88.2	74 37.3 97 07 84.5	1
2	60 19.0 99 07 91.0	60 48.7 99 07 90.9	62 17.7 99 07 90.4	62 47.4 99 07 90.3	63 17.0 99 07 90.1	69 11.6 98 07 87.5	69 41.0 98 07 87.2	74 33.2 97 07 83.5	2
3	60 14.8 99 07 90.0	60 44.5 99 07 89.9	62 13.5 99 07 89.4	62 43.2 99 07 89.3	63 12.8 99 07 89.1	69 07.4 98 07 86.5	69 36.8 98 07 86.3	74 29.0 97 07 82.5	3
4	60 10.6 99 07 89.0	60 40.3 99 07 88.9	62 09.3 99 07 88.4	62 39.0 99 07 88.3	63 08.7 99 07 88.1	69 03.3 98 07 85.5	69 32.7 98 07 85.3	74 24.9 97 07 81.6	4
85	60 06.4 99 07 88.1	60 36.1 99 07 87.9	62 05.2 99 07 87.5	62 34.8 99 07 87.3	63 04.5 99 07 87.1	68 59.1 98 07 84.6	69 28.5 98 07 84.3	74 20.8 97 07 80.6	85
6	60 02.2 99 07 87.1	60 31.9 99 07 86.9	62 01.0 99 07 86.5	62 30.6 99 07 86.3	63 00.3 99 07 86.1	68 54.9 98 07 83.6	69 24.3 98 07 83.3	74 16.6 97 07 79.7	6
7	59 58.0 99 07 86.1	60 27.8 99 07 85.9	61 56.8 99 07 85.5	62 26.5 99 07 85.3	62 56.1 99 07 85.2	68 50.8 98 07 82.6	69 20.2 98 07 82.3	74 12.5 97 07 78.7	7
8	59 53.9 99 07 85.1	60 23.6 99 07 84.9	61 52.6 99 07 84.5	62 22.3 99 07 84.3	62 52.0 99 07 84.2	68 46.6 98 07 81.6	69 16.0 98 07 81.4	74 08.4 97 07 77.8	8
9	59 49.7 99 07 84.1	60 19.4 99 07 84.0	61 48.5 99 07 83.5	62 18.1 99 07 83.3	62 47.8 99 07 83.2	68 42.5 98 07 80.7	69 11.9 98 07 80.4	74 04.3 97 07 76.8	9
90	59 45.5 99 07 83.1	60 15.3 99 07 83.0	61 44.3 99 07 82.5	62 14.0 99 07 82.4	62 43.6 99 07 82.2	68 38.4 98 07 79.7	69 07.8 98 07 79.4	74 00.3 97 07 75.9	90

Lat. 86°

H.A.	60° 00' Alt.	Δd Δt	Az.	60° 30' Alt.	Δd Δt	Az.	62° 00' Alt.	Δd Δt	Az.	62° 30' Alt.	Δd Δt	Az.	63° 00' Alt.	Δd Δt	Az.	69° 00' Alt.	Δd Δt	Az.	69° 30' Alt.	Δd Δt	Az.	74° 30' Alt.	Δd Δt	Az.	H.A.
91	59 41.4	99 07	82.1	60 11.1	99 07	82.0	61 40.2	99 07	81.5	62 09.8	99 07	81.4	62 39.5	99 07	81.2	68 34.2	98 07	78.7	69 03.7	98 07	78.5	73 56.2	97 07	74.9	91
2	59 37.3	99 07	81.1	60 07.0	99 07	81.0	61 36.0	99 07	80.6	62 05.7	99 07	80.4	62 35.4	99 07	80.3	68 30.2	98 07	77.8	68 59.6	98 07	77.5	73 52.2	97 07	74.0	2
3	59 33.1	99 07	80.2	60 02.8	99 07	80.0	61 31.9	99 07	79.6	62 01.6	99 07	79.4	62 31.2	99 07	79.3	68 26.1	98 07	76.8	68 55.5	98 07	76.6	73 48.2	97 07	73.1	3
4	59 29.0	99 07	79.2	59 58.7	99 07	79.1	61 27.8	99 07	78.6	61 57.5	99 07	78.5	62 27.1	99 07	78.3	68 22.0	98 07	75.9	68 51.5	98 07	75.6	73 44.2	97 07	72.2	4
95	59 24.9	99 07	78.2	59 54.6	99 07	78.1	61 23.7	99 07	77.6	61 53.4	99 07	77.5	62 23.1	99 07	77.3	68 18.0	98 07	74.9	68 47.4	98 07	74.6	73 40.2	97 07	71.2	95
6	59 20.8	99 07	77.2	59 50.5	99 07	77.1	61 19.6	99 07	76.7	61 49.3	99 07	76.5	62 19.0	99 07	76.4	68 13.9	98 07	74.0	68 43.4	98 07	73.7	73 36.2	97 07	70.3	6
7	59 16.7	99 07	76.3	59 46.5	99 07	76.1	61 15.6	99 07	75.7	61 45.2	99 07	75.6	62 14.9	99 07	75.4	68 09.9	98 07	73.0	68 39.4	98 07	72.8	73 32.3	97 06	69.4	7
8	59 12.7	99 07	75.3	59 42.4	99 07	75.2	61 11.5	99 07	74.7	61 41.2	99 07	74.6	62 10.9	99 07	74.4	68 05.9	98 07	72.1	68 35.4	98 07	71.8	73 28.4	97 06	68.5	8
9	59 08.6	99 07	74.3	59 38.4	99 07	74.2	61 07.5	99 07	73.8	61 37.2	99 07	73.6	62 06.9	99 07	73.5	68 01.9	98 07	71.1	68 31.4	98 07	70.9	73 24.5	97 06	67.6	9
100	59 04.6	99 07	73.2	59 34.4	99 07	73.2	61 03.5	99 07	72.8	61 33.2	99 07	72.7	62 02.9	99 07	72.5	67 58.0	98 07	70.2	68 27.5	98 07	69.9	73 20.7	97 06	66.7	100
1	59 00.6	99 07	72.4	59 30.4	99 07	72.3	60 59.5	99 07	71.9	61 29.2	99 07	71.7	61 58.9	99 07	71.6	67 54.1	98 06	69.2	68 23.6	98 06	69.0	73 16.8	97 06	65.8	1
2	58 56.6	99 07	71.4	59 26.4	99 07	71.3	60 55.5	99 07	70.9	61 25.2	99 07	70.8	61 54.9	99 07	70.6	67 50.2	98 06	68.3	68 19.7	98 06	68.1	73 13.0	97 06	64.9	2
3	58 52.7	99 07	70.5	59 22.4	99 07	70.4	60 51.6	99 07	70.0	61 21.3	99 07	69.8	61 51.0	99 07	69.7	67 46.3	98 06	67.4	68 15.8	98 06	67.1	73 09.3	97 06	64.0	3
4	58 48.8	99 06	69.5	59 18.5	99 06	69.4	60 47.7	99 06	69.0	61 17.4	99 06	68.9	61 47.1	99 06	68.7	67 42.4	98 06	66.4	68 12.0	98 06	66.2	73 05.5	97 06	63.1	4
105	58 44.8	99 06	68.6	59 14.6	99 06	68.4	60 43.8	99 06	68.0	61 13.5	99 06	67.9	61 43.2	99 06	67.8	67 38.6	98 06	65.5	68 08.1	98 06	65.3	73 01.8	97 06	62.2	105
6	58 41.0	99 06	67.6	59 10.7	99 06	67.5	60 39.9	99 06	67.1	61 09.6	99 06	67.0	61 39.3	99 06	66.8	67 34.8	98 06	64.6	68 04.3	98 06	64.4	72 58.1	97 06	61.3	6
7	58 37.1	99 06	66.7	59 06.9	99 06	66.5	60 36.1	99 06	66.1	61 05.8	99 06	66.0	61 35.5	99 06	65.9	67 31.1	98 06	63.7	68 00.6	98 06	63.4	72 54.5	97 06	60.4	7
8	58 33.3	99 06	65.7	59 03.0	99 06	65.6	60 32.2	99 06	65.2	61 02.0	99 06	65.1	61 31.7	99 06	64.9	67 27.3	98 06	62.7	67 56.9	98 06	62.5	72 50.8	97 06	59.5	8
9	58 29.5	99 06	64.8	58 59.2	99 06	64.6	60 28.5	99 06	64.3	60 58.2	99 06	64.1	61 27.9	99 06	64.0	67 23.5	98 06	61.8	67 53.2	98 06	61.6	72 47.3	97 06	58.6	9
110	58 25.7	99 06	63.8	58 55.5	99 06	63.7	60 24.7	99 06	63.3	60 54.4	99 06	63.2	61 24.2	99 06	63.0	67 19.9	99 06	60.9	67 49.5	98 06	60.7	72 43.7	98 06	57.8	110
1	58 22.0	99 06	62.9	58 51.7	99 06	62.8	60 21.0	99 06	62.4	60 50.7	99 06	62.2	61 20.4	99 06	62.1	67 16.3	99 06	60.0	67 45.9	99 06	59.8	72 40.2	98 06	56.9	1
2	58 18.3	99 06	61.9	58 48.0	99 06	61.8	60 17.3	99 06	61.4	60 47.0	99 06	61.3	61 16.8	99 06	61.2	67 12.7	99 06	59.1	67 42.3	99 06	58.9	72 36.7	98 06	56.0	2
3	58 14.6	99 06	61.0	58 44.4	99 06	60.9	60 13.6	99 06	60.5	60 43.4	99 06	60.4	61 13.1	99 06	60.2	67 09.1	99 06	58.2	67 38.7	99 06	57.9	72 33.2	98 06	55.1	3
4	58 10.9	99 06	60.0	58 40.7	99 06	59.9	60 10.0	99 06	59.6	60 39.8	99 06	59.4	61 09.5	99 06	59.3	67 05.6	99 06	57.3	67 35.2	99 06	57.0	72 29.8	98 06	54.3	4
115	58 07.3	99 06	59.1	58 37.1	99 06	59.0	60 06.4	99 06	58.6	60 36.2	99 06	58.5	61 05.9	99 06	58.4	67 02.1	99 06	56.3	67 31.7	99 06	56.1	72 26.4	98 06	53.4	115
6	58 03.8	99 06	58.2	58 33.5	99 06	58.0	60 02.9	99 06	57.7	60 32.6	99 06	57.6	61 02.4	99 06	57.4	66 58.6	99 06	55.4	67 28.2	99 06	55.2	72 23.1	98 06	52.5	6
7	58 00.2	99 06	57.2	58 30.0	99 06	57.1	59 59.3	99 06	56.8	60 29.1	99 06	56.6	60 58.9	99 06	56.5	66 55.2	99 06	54.5	67 24.8	99 06	54.3	72 19.8	98 05	51.7	7
8	57 56.7	99 06	56.3	58 26.5	99 06	56.2	59 55.9	99 06	55.8	60 25.6	99 06	55.7	60 55.4	99 06	55.6	66 51.8	99 06	53.6	67 21.4	99 06	53.4	72 16.5	98 05	50.8	8
9	57 53.3	99 06	55.4	58 23.1	99 06	55.2	59 52.4	99 06	54.9	60 22.2	99 06	54.8	60 52.0	99 06	54.6	66 48.4	99 06	52.7	67 18.1	99 06	52.5	72 13.3	98 05	50.0	9
120	57 49.8	99 06	54.4	58 19.6	99 06	54.3	59 49.0	99 06	54.0	60 18.8	99 06	53.8	60 48.6	99 06	53.7	66 45.1	99 05	51.8	67 14.8	99 05	51.6	72 10.1	98 05	49.1	120
1	57 46.4	99 06	53.5	58 16.3	99 06	53.4	59 45.6	99 06	53.0	60 15.4	99 06	52.9	60 45.2	99 06	52.8	66 41.9	99 05	50.9	67 11.5	99 05	50.7	72 07.0	98 05	48.2	1
2	57 43.1	99 06	52.6	58 12.9	99 06	52.4	59 42.3	99 05	52.1	60 12.1	99 05	52.0	60 41.9	99 05	51.9	66 38.6	99 05	50.0	67 08.3	99 05	49.9	72 03.9	98 05	47.4	2
3	57 39.8	99 05	51.6	58 09.6	99 05	51.5	59 39.0	99 05	51.2	60 08.8	99 05	51.1	60 38.6	99 05	51.0	66 35.4	99 05	49.2	67 05.1	99 05	49.0	72 00.8	98 05	46.5	3
4	57 36.5	99 05	50.7	58 06.4	99 05	50.6	59 35.8	99 05	50.3	60 05.6	99 05	50.2	60 35.4	99 05	50.0	66 32.3	99 05	48.3	67 02.0	99 05	48.1	71 57.8	98 05	45.7	4
125	57 33.3	99 05	49.8	58 03.2	99 05	49.7	59 32.6	99 05	49.3	60 02.4	99 05	49.2	60 32.3	99 05	49.1	66 29.2	99 05	47.4	66 58.9	99 05	47.2	71 54.8	98 05	44.8	125
6	57 30.2	99 05	48.8	58 00.0	99 05	48.7	59 29.4	99 05	48.4	59 59.3	99 05	48.3	60 29.1	99 05	48.2	66 26.1	99 05	46.5	66 55.8	99 05	46.3	71 51.9	98 05	44.0	6
7	57 27.0	99 05	47.9	57 56.9	99 05	47.8	59 26.3	99 05	47.5	59 56.2	99 05	47.4	60 26.0	99 05	47.3	66 23.1	99 05	45.6	66 52.8	99 05	45.4	71 49.0	98 05	43.2	7
8	57 23.9	99 05	47.0	57 53.8	99 05	46.9	59 23.3	99 05	46.6	59 53.1	99 05	46.5	60 22.9	99 05	46.4	66 20.2	99 05	44.7	66 49.9	99 05	44.5	71 46.2	98 05	42.3	8
9	57 20.9	99 05	46.1	57 50.7	99 05	46.0	59 20.3	99 05	45.7	59 50.1	99 05	45.6	60 19.9	99 05	45.5	66 17.2	99 05	43.8	66 47.0	99 05	43.7	71 43.4	98 05	41.5	9
130	57 17.9	1.0 05	45.1	57 47.8	99 05	45.1	59 17.3	99 05	44.8	59 47.1	99 05	44.7	60 16.9	99 05	44.6	66 14.4	99 05	42.9	66 44.1	99 05	42.8	71 40.6	99 04	40.6	130
1	57 15.0	1.0 05	44.2	57 44.8	1.0 05	44.1	59 14.4	99 05	43.8	59 44.2	99 05	43.7	60 14.0	99 05	43.6	66 11.5	99 05	42.1	66 41.3	99 05	41.9	71 37.9	99 04	39.8	1
2	57 12.1	1.0 05	43.3	57 41.9	1.0 05	43.2	59 11.5	99 05	42.9	59 41.3	99 05	42.8	60 11.2	99 05	42.7	66 08.8	99 05	41.2	66 38.5	99 05	41.0	71 35.3	99 04	39.0	2
3	57 09.2	1.0 05	42.4	57 39.1	1.0 05	42.3	59 08.7	1.0 05	42.0	59 38.5	99 05	41.9	60 08.4	99 05	41.8	66 06.0	99 04	40.3	66 35.8	99 04	40.2	71 32.7	99 04	38.1	3
4	57 06.4	1.0 05	41.5	57 36.3	1.0 05	41.4	59 05.9	1.0 05	41.1	59 35.7	1.0 05	41.0	60 05.6	99 05	40.9	66 03.3	99 04	39.4	66 33.1	99 04	39.3	71 30.1	99 04	37.3	4
135	57 03.7	1.0 04	40.6	57 33.6	1.0 04	40.5	59 03.2	1.0 04	40.2	59 33.0	1.0 04	40.1	60 02.9	1.0 04	40.0	66 00.7	99 04	38.6	66 30.5	99 04	38.4	71 27.6	99 04	36.5	135
6	57 01.0	1.0 04	39.6	57 30.9	1.0 04	39.6	59 00.5	1.0 04	39.3	59 30.3	1.0 04	39.2	60 00.2	1.0 04	39.1	65 58.1	99 04	37.7	66 27.9	99 04	37.5	71 25.1	99 04	35.6	6
7	56 58.3	1.0 04	38.7	57 28.2	1.0 04	38.6	58 57.9	1.0 04	38.4	59 27.7	1.0 04	38.3	59 57.6	1.0 04	38.2	65 55.5	99 04	36.8	66 25.4	99 04	36.7	71 22.7	99 04	34.8	7
8	56 55.7	1.0 04	37.8	57 25.6	1.0 04	37.7	58 55.3	1.0 04	37.5	59 25.2	1.0 04	37.4	59 55.0	1.0 04	37.3	65 53.1	99 04	35.9	66 22.9	99 04	35.8	71 20.4	99 04	34.0	8
9	56 53.2	1.0 04	36.9	57 23.1	1.0 04	36.8	58 52.8	1.0 04	36.6	59 22.6	1.0 04	36.5	59 52.5	1.0 04	36.4	65 50.7	99 04	35.1	66 20.5	99 04	34.9	71 18.0	99 04	33.2	9
140	56 50.7	1.0 04	36.0	57 20.6	1.0 04	35.9	58 50.3	1.0 04	35.7	59 20.2	1.0 04	35.6	59 50.1	1.0 04	35.5	65 48.3	99 04	34.2	66 18.1	99 04	34.1	71 15.8	99 04	32.3	140
1	56 48.3	1.0 04	35.1	57 18.2	1.0 04	35.0	58 47.9	1.0 04	34.8	59 17.8	1.0 04	34.7	59 47.7	1.0 04	34.6	65 46.0	99 04	33.3	66 15.8	99 04	33.2	71 13.6	99 04	31.5	1
2	56 45.9	1.0 04	34.2	57 15.8	1.0 04	34.1	58 45.5	1.0 04	33.9	59 15.4	1.0 04	33.8	59 45.3	1.0 04	33.7	65 43.7	99 04	32.5	66 13.5	99 04	32.3	71 11.4	99 04	30.7	2
3	56 43.6	1.0 04	33.3	57 13.5	1.0 04	33.2	58 43.2	1.0 04	33.0	59 13.1	1.0 04	32.9	59 43.0	1.0 04	32.8	65 41.5	99 04	31.6	66 11.3	99 04	31.5	71 09.3	99 03	29.9	3
4	56 41.3	1.0 04	32.4	57 11.2	1.0 04	32.3	58 41.0	1.0 04	32.1	59 10.9	1.0 04	32.0	59 40.8	1.0 04	31.9	65 39.3	1.0 04	30.7	66 09.2	99 04	30.6	71 07.2	99 03	29.0	4
145	56 39.1	1.0 04	31.4	57 09.0	1.0 04	31.4	58 38.8	1.0 04	31.2	59 08.7	1.0 04	31.1	59 38.6	1.0 04	31.0	65 37.2	1.0 03	29.9	66 07.1	1.0 03	29.7	71 05.2	99 03	28.2	145
6	56 37.0	1.0 04	30.5	57 06.9	1.0 04	30.5	58 36.6	1.0 03	30.3	59 06.5	1.0 03	30.2	59 36.5	1.0 03	30.1	65 35.2	1.0 03	29.0	66 05.0	1.0 03	28.9	71 03.3	99 03	27.4	6
7	56 34.9	1.0 03	29.6	57 04.8	1.0 03	29.6	58 34.5	1.0 03	29.4	59 04.5	1.0 03	29.3	59 34.4	1.0 03	29.2	65 33.1	1.0 03	28.1	66 03.0	1.0 03	28.0	71 01.4	99 03	26.6	7
8	56 32.8	1.0 03	28.7	57 02.7	1.0 03	28.7	58 32.5	1.0 03	28.5	59 02.5	1.0 03	28.4	59 32.4	1.0 03	28.3	65 31.2	1.0 03	27.3	66 01.1	1.0 03	27.2	70 59.5	99 03	25.8	8
9	56 30.8	1.0 03	27.8	57 00.8	1.0 03	27.8	58 30.6	1.0 03	27.6	59 00.5	1.0 03	27.5	59 30.4	1.0 03	27.4	65 29.3	1.0 03	26.4	65 59.2	1.0 03	26.3	70 57.7	99 03	25.0	9
150	56 28.9	1.0 03	26.9	56 58.8	1.0 03	26.9	58 28.7	1.0 03	26.7	58 58.6	1.0 03	26.6	59 28.5	1.0 03	26.5	65 27.5	1.0 03	25.6	65 57.4	1.0 03	25.5	70 56.0	99 03	24.1	150
1	56 27.0	1.0 03	26.0	56 57.0	1.0 03	26.0	58 26.8	1.0 03	25.8	58 56.7	1.0 03	25.7	59 26.7	1.0 03	25.7	65 25.7	1.0 03	24.7	65 55.6	1.0 03	24.6	70 54.3	99 03	23.3	1
2	56 25.2	1.0 03	25.1	56 55.2	1.0 03	25.1	58 25.0	1.0 03	24.9	58 55.0	1.0 03	24.8	59 24.9	1.0 03	24.8	65 24.0	1.0 03	23.8	65 53.9	1.0 03	23.7	70 52.7	99 03	22.5	2
3	56 23.5	1.0 03	24.2	56 53.4	1.0 03	24.2	58 23.3	1.0 03	24.0	58 53.2	1.0 03	23.9	59 23.2	1.0 03	23.9	65 22.3	1.0 03	23.0	65 52.2	1.0 03	22.9	70 51.1	1.0 03	21.7	3
4	56 21.8	1.0 03	23.3	56 51.8	1.0 03	23.3	58 21.6	1.0 03	23.1	58 51.6	1.0 03	23.0	59 21.5	1.0 03	23.0	65 20.7	1.0 03	22.1	65 50.6	1.0 03	22.0	70 49.6	1.0 02	20.9	4
155	56 20.2	1.0 03	22.4	56 50.1	1.0 03	22.4	58 20.0	1.0 03	22.2	58 50.0	1.0 03	22.2	59 19.9	1.0 03	22.1	65 19.2	1.0 02	21.3	65 49.1	1.0 02	21.2	70 48.1	1.0 02	20.1	155
6	56 18.6	1.0 03	21.5	56 48.6	1.0 02	21.5	58 18.4	1.0 02	21.3	58 48.4	1.0 02	21.3	59 18.4	1.0 02	21.2	65 17.7	1.0 02	20.4	65 47.6	1.0 02	20.3	70 46.7	1.0 02	19.3	6
7	56 17.1	1.0 02	20.6	56 47.1	1.0 02	20.6	58 17.0	1.0 02	20.4	58 46.9	1.0 02	20.4	59 16.9	1.0 02	20.3	65 16.2	1.0 02	19.6	65 46.2	1.0 02	19.5	70 45.4	1.0 02	18.5	7
8	56 15.7	1.0 02	19.7	56 45.6	1.0 02	19.7	58 15.5	1.0 02	19.5	58 45.5	1.0 02	19.5	59 15.4	1.0 02	19.4	65 14.9	1.0 02	18.7	65 44.8	1.0 02	18.6	70 44.1	1.0 02	17.7	8
9	56 14.3	1.0 02	18.8	56 44.3	1.0 02	18.8	58 14.2	1.0 02	18.6	58 44.1	1.0 02	18.6	59 14.1	1.0 02	18.5	65 13.6	1.0 02	17.8	65 43.5	1.0 02	17.8	70 42.8	1.0 02	16.9	9
160	56 13.0	1.0 02	17.9	56 42.9	1.0 02	17.9	58 12.9	1.0 02	17.7	58 42.8	1.0 02	17.7	59 12.8	1.0 02	17.7	65 12.3	1.0 02	17.0	65 42.3	1.0 02	16.9	70 41.6	1.0 02	16.0	160
1	56 11.7	1.0 02	17.0	56 41.7	1.0 02	17.0	58 11.6	1.0 02	16.9	58 41.6	1.0 02	16.8	59 11.5	1.0 02	16.8	65 11.1	1.0 02	16.1	65 41.1	1.0 02	16.1	70 40.5	1.0 02	15.2	1
2	56 10.5	1.0 02	16.1	56 40.5	1.0 02	16.1	58 10.4	1.0 02	16.0	58 40.4	1.0 02	15.9	59 10.4	1.0 02	15.9	65 10.0	1.0 02	15.3	65 39.9	1.0 02	15.2	70 39.4	1.0 02	14.4	2
3	56 09.4	1.0 02	15.2	56 39.4	1.0 02	15.2	58 09.3	1.0 02	15.1	58 39.3	1.0 02	15.0	59 09.3	1.0 02	15.0	65 08.9	1.0 02	14.4	65 38.9	1.0 02	14.4	70 38.4	1.0 02	13.6	3
4	56 08.3	1.0 02	14.3	56 38.3	1.0 02	14.3	58 08.2	1.0 02	14.2	58 38.2	1.0 02	14.2	59 08.2	1.0 02	14.1	65 07.9	1.0 02	13.6	65 37.9	1.0 02	13.5	70 37.5	1.0 02	12.8	4
165	56 07.3	1.0 02	13.4	56 37.3	1.0 02	13.4	58 07.3	1.0 02	13.3	58 37.2	1.0 02	13.3	59 07.2	1.0 02	13.2	65 06.9	1.0 02	12.7	65 36.9	1.0 01	12.7	70 36.6	1.0 01	12.0	165
6	56 06.4	1.0 01	12.5	56 36.4	1.0 01	12.5	58 06.3	1.0 01	12.4	58 36.3	1.0 01	12.4	59 06.3	1.0 01	12.4	65 06.0	1.0 01	11.9	65 36.0	1.0 01	11.8	70 35.7	1.0 01	11.2	6
7	56 05.5	1.0 01	11.6	56 35.5	1.0 01	11.6	58 05.5	1.0 01	11.5	58 35.4	1.0 01	11.5	59 05.4	1.0 01	11.5	65 05.2	1.0 01	11.0	65 35.1	1.0 01	11.0	70 34.9	1.0 01	10.4	7
8	56 04.7	1.0 01	10.7	56 34.7	1.0 01	10.7	58 04.6	1.0 01	10.6	58 34.6	1.0 01	10.6	59 04.6	1.0 01	10.6	65 04.4	1.0 01	10.2	65 34.4	1.0 01	10.1	70 34.2	1.0 01	09.6	8
9	56 03.9	1.0 01	09.8	56 33.9	1.0 01	09.8	58 03.9	1.0 01	09.8	58 33.9	1.0 01	09.7	59 03.9	1.0 01	09.7	65 03.7	1.0 01	09.3	65 33.7	1.0 01	09.3	70 33.5	1.0 01	08.8	9
170	56 03.3	1.0 01	08.9	56 33.3	1.0 01	08.9	58 03.3	1.0 01	08.9	58 33.3	1.0 01	08.8	59 03.2	1.0 01	08.8	65 03.1	1.0 01	08.5	65 33.1	1.0 01	08.4	70 32.9	1.0 01	08.0	170
1	56 02.6	1.0 01	08.0	56 32.6	1.0 01	08.0	58 02.6	1.0 01	08.0	58 32.6	1.0 01	08.0	59 02.6	1.0 01	07.9	65 02.5	1.0 01	07.6	65 32.5	1.0 01	07.6	70 32.4	1.0 01	07.2	1
2	56 02.1	1.0 01	07.2	56 32.1	1.0 01	07.1	58 02.1	1.0 01	07.1	58 32.1	1.0 01	07.1	59 02.1	1.0 01	07.1	65 02.0	1.0 01	06.8	65 32.0	1.0 01	06.8	70 31.9	1.0 01	06.4	2
3	56 01.6	1.0 01	06.3	56 31.6	1.0 01	06.2	58 01.6	1.0 01	06.2	58 31.6	1.0 01	06.2	59 01.6	1.0 01	06.2	65 01.5	1.0 01	05.9	65 31.5	1.0 01	05.9	70 31.4	1.0 01	05.6	3
4	56 01.2	1.0 01	05.4	56 31.2	1.0 01	05.4	58 01.2	1.0 01	05.3	58 31.2	1.0 01	05.3	59 01.2	1.0 01	05.3	65 01.1	1.0 01	05.1	65 31.1	1.0 01	05.1	70 31.0	1.0 01	04.8	4
175	56 00.8	1.0 00	04.5	56 30.8	1.0 00	04.5	58 00.8	1.0 00	04.4	58 30.8	1.0 00	04.4	59 00.8	1.0 00	04.4	65 00.8	1.0 00	04.2	65 30.8	1.0 00	04.2	70 30.7	1.0 00	04.0	175
6	56 00.5	1.0 00	03.6	56 30.5	1.0 00	03.6	58 00.5	1.0 00	03.5	58 30.5	1.0 00	03.5	59 00.5	1.0 00	03.5	65 00.5	1.0 00	03.4	65 30.5	1.0 00	03.4	70 30.5	1.0 00	03.2	6
7	56 00.3	1.0 00	02.7	56 30.3	1.0 00	02.7	58 00.3	1.0 00	02.7	58 30.3	1.0 00	02.7	59 00.3	1.0 00	02.6	65 00.3	1.0 00	02.5	65 30.3	1.0 00	02.5	70 30.3	1.0 00	02.4	7
8	56 00.1	1.0 00	01.8	56 30.1	1.0 00	01.8	58 00.1	1.0 00	01.8	58 30.1	1.0 00	01.8	59 00.1	1.0 00	01.8	65 00.1	1.0 00	01.7	65 30.1	1.0 00	01.7	70 30.1	1.0 00	01.6	8
9	56 00.0	1.0 00	00.9	56 30.0	1.0 00	00.9	58 00.0	1.0 00	00.9	58 30.0	1.0 00	00.9	59 00.0	1.0 00	00.9	65 00.0	1.0 00	00.8	65 30.0	1.0 00	00.8	70 30.0	1.0 00	00.8	9
180	56 00.0	1.0 00	00.0	56 30.0	1.0 00	00.0	58 00.0	1.0 00	00.0	58 30.0	1.0 00	00.0	59 00.0	1.0 00	00.0	65 00.0	1.0 00	00.0	65 30.0	1.0 00	00.0	70 30.0	1.0 00	00.0	180

Lat. 87°

Lat. 88°

Lat. 89°

STAR IDENTIFICATION TABLE

ALTITUDE

Lat. 86°

AZ.	4° Dec.	4° H.A.	8° Dec.	8° H.A.	12° Dec.	12° H.A.	16° Dec.	16° H.A.	20° Dec.	20° H.A.	24° Dec.	24° H.A.	28° Dec.	28° H.A.	32° Dec.	32° H.A.	36° Dec.	36° H.A.	40° Dec.	40° H.A.	44° Dec.	44° H.A.	AZ.
00	08	180	12	180	16	180	20	180	24	180	28	180	32	180	36	180	40	180	44	180	48	180	00
4	08	176	12	176	16	176	20	176	24	176	28	176	32	176	36	176	40	176	44	176	48	176	4
8	08	172	12	172	16	172	20	172	24	172	28	172	32	172	36	172	40	172	44	171	48	171	8
12	08	168	12	168	16	168	20	168	24	168	28	168	32	168	36	167	40	167	44	167	48	167	12
16	08	164	12	164	16	164	20	164	24	164	28	163	32	163	36	163	40	163	44	163	48	163	16
20	08	160	12	160	16	160	20	160	24	159	28	159	32	159	36	159	40	159	44	159	48	159	20
24	08	156	12	156	16	156	20	155	24	155	28	155	32	155	36	155	40	155	44	155	48	154	24
28	08	152	12	152	16	152	20	151	24	151	28	151	32	151	36	151	40	151	44	150	47	150	28
32	07	148	11	148	15	147	19	147	23	147	27	147	31	147	35	147	39	146	43	146	47	146	32
36	07	144	11	144	15	143	19	143	23	143	27	143	31	143	35	142	39	142	43	142	47	142	36
40	07	140	11	140	15	139	19	139	23	139	27	139	31	139	35	138	39	138	43	138	47	137	40
44	07	136	11	136	15	135	19	135	23	135	27	135	31	135	35	134	39	134	43	133	47	133	44
48	07	132	11	132	15	131	19	131	23	131	27	131	31	130	35	130	39	130	43	129	47	129	48
52	06	128	10	127	14	127	18	127	22	127	26	127	30	126	34	126	38	126	42	125	46	125	52
56	06	124	10	123	14	123	18	123	22	123	26	122	30	122	34	122	38	121	42	121	46	121	56
60	06	120	10	119	14	119	18	119	22	119	26	118	30	118	34	118	38	117	42	117	46	116	60
64	06	116	10	115	14	115	18	115	22	115	26	114	30	114	34	114	38	113	42	113	46	112	64
68	05	112	09	111	13	111	17	111	21	111	25	110	29	110	33	110	37	109	41	109	45	108	68
72	05	108	09	107	13	107	17	107	21	107	25	106	29	106	33	106	37	105	41	105	45	104	72
76	05	104	09	103	13	103	17	103	21	103	25	102	29	102	33	102	37	101	41	101	45	100	76
80	05	100	09	99	13	99	17	99	21	99	25	98	29	98	33	97	37	97	41	97	45	96	80
84	04	96	08	95	12	95	16	95	20	95	24	94	28	94	32	93	36	93	40	93	44	92	84
88	04	92	08	91	12	91	16	91	20	91	24	90	28	90	32	89	36	89	40	89	44	88	88
92	04	88	08	87	12	87	16	87	20	87	24	86	28	86	32	86	36	85	40	85	44	84	92
96	04	84	08	83	12	83	16	83	20	83	24	82	28	82	31	82	35	81	39	81	43	80	96
100	03	80	07	79	11	79	15	79	19	79	23	78	27	78	31	78	35	77	39	77	43	76	100
104	03	76	07	75	11	75	15	75	19	75	23	74	27	74	31	74	35	73	39	73	43	72	104
108	03	72	07	72	11	71	15	71	19	71	23	70	27	70	31	70	35	69	39	69	43	68	108
112	02	68	06	68	10	67	14	67	18	67	22	66	26	66	30	66	34	65	38	65	42	65	112
116	02	64	06	64	10	63	14	63	18	63	22	62	26	62	30	62	34	62	38	61	42	61	116
120	02	60	06	60	10	59	14	59	18	59	22	59	26	58	30	58	34	58	38	57	42	57	120
124	02	56	06	56	10	55	14	55	18	55	22	55	26	54	30	54	34	54	38	53	42	53	124
128	02	52	06	52	10	51	14	51	18	51	22	51	25	50	29	50	33	50	37	50	41	49	128
132	01	48	05	48	09	47	13	47	17	47	21	47	25	47	29	46	33	46	37	46	41	45	132
136	01	44	05	44	09	43	13	43	17	43	21	43	25	43	29	42	33	42	37	42	41	42	136
140	01	40	05	40	09	40	13	39	17	39	21	39	25	39	29	39	33	38	37	38	41	38	140
144	01	36	05	36	09	36	13	35	17	35	21	35	25	35	29	35	33	34	37	34	41	34	144
148	01	32	05	32	09	32	13	31	17	31	21	31	25	31	29	31	33	31	37	30	41	30	148
152	00	28	04	28	08	28	12	28	16	27	20	27	24	27	28	27	32	27	36	27	40	26	152
156	00	24	04	24	08	24	12	24	16	23	20	23	24	23	28	23	32	23	36	23	40	23	156
160	00	20	04	20	08	20	12	20	16	20	20	19	24	19	28	19	32	19	36	19	40	19	160
164	00	16	04	16	08	16	12	16	16	16	20	16	24	15	28	15	32	15	36	15	40	15	164
168	00	12	04	12	08	12	12	12	16	12	20	12	24	12	28	12	32	11	36	11	40	11	168
172	00	08	04	08	08	08	12	08	16	08	20	08	24	08	28	08	32	08	36	08	40	08	172
176	00	04	04	04	08	04	12	04	16	04	20	04	24	04	28	04	32	04	36	04	40	04	176
180	00	00	04	00	08	00	12	00	16	00	20	00	24	00	28	00	32	00	36	00	40	00	180
	4°		8°		12°		16°		20°		24°		28°		32°		36°		40°		44°		

FIGURES IN ITALICS INDICATE THAT DECLINATION IS OF CONTRARY NAME TO LATITUDE

STAR IDENTIFICATION TABLE

ALTITUDE

AZ.	48°		52°		56°		60°		64°		68°		72°		76°		80°		84°		88°		AZ.
	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	
00	52	180	56	180	60	180	64	180	68	180	72	180	76	180	80	180	84	180	88	180	88	00	00
4	52	176	56	176	60	176	64	175	68	175	72	175	76	175	80	174	84	173	88	168	88	04	4
8	52	171	56	171	60	171	64	171	68	171	72	170	76	170	80	169	84	167	88	157	88	08	8
12	52	167	56	167	60	167	64	166	68	166	72	165	76	165	80	163	84	160	88	146	88	12	12
16	52	163	56	162	60	162	64	162	68	161	72	161	76	160	80	158	84	154	88	137	88	15	16
20	52	158	56	158	60	158	64	157	68	157	72	156	76	155	80	153	84	148	87	129	88	18	20
24	52	154	56	154	60	153	64	153	68	152	72	151	76	150	80	147	83	142	87	121	88	21	24
28	51	150	55	149	59	149	63	148	67	148	71	146	75	145	79	142	83	136	87	115	88	23	28
32	51	145	55	145	59	144	63	144	67	143	71	142	75	140	79	137	83	130	87	109	88	25	32
36	51	141	55	141	59	140	63	139	67	138	71	137	75	135	79	132	83	125	86	104	87	26	36
40	51	137	55	136	59	136	63	135	67	134	71	133	75	131	79	127	83	120	86	99	87	28	40
44	51	133	55	132	59	131	63	131	67	130	71	128	75	126	79	122	82	115	86	94	87	28	44
48	51	128	55	128	59	127	63	126	66	125	70	124	74	121	78	118	82	110	86	90	87	29	48
52	50	124	54	124	58	123	62	122	66	121	70	119	74	117	78	113	82	106	85	86	87	30	52
56	50	120	54	119	58	119	62	118	66	117	70	115	74	112	78	109	82	101	85	83	87	30	56
60	50	116	54	115	58	115	62	114	66	112	70	111	74	108	78	104	81	97	85	79	87	30	60
64	50	112	54	111	58	110	62	109	66	108	69	106	73	104	77	100	81	93	84	76	86	30	64
68	49	108	53	107	57	106	61	105	65	104	69	102	73	100	77	96	81	89	84	73	86	30	68
72	49	104	53	103	57	102	61	101	65	100	69	98	73	96	77	92	80	85	84	70	86	29	72
76	49	100	53	99	57	98	61	97	65	96	69	94	73	92	76	88	80	81	84	66	86	29	76
80	49	96	53	95	56	94	60	93	64	92	68	90	72	88	76	84	80	77	83	64	86	28	80
84	48	92	52	91	56	90	60	89	64	88	68	86	72	84	76	80	80	74	83	61	86	28	84
88	48	88	52	87	56	86	60	85	64	84	68	82	72	80	76	76	79	70	83	58	86	27	88
92	48	84	52	83	56	82	60	81	64	80	68	78	71	76	75	73	79	67	83	55	85	26	92
96	47	80	51	79	55	78	59	77	63	76	67	74	71	72	75	69	79	63	82	52	85	25	96
100	47	76	51	75	55	74	59	73	63	72	67	71	71	68	75	65	79	60	82	50	85	24	100
104	47	72	51	71	55	70	59	70	63	68	67	67	71	65	75	62	78	57	82	47	85	23	104
108	47	68	51	67	55	67	59	66	63	65	66	63	70	61	74	58	78	53	82	44	85	22	108
112	46	64	50	63	54	63	58	62	62	61	66	59	70	58	74	55	78	50	82	42	85	21	112
116	46	60	50	60	54	59	58	58	62	57	66	56	70	54	74	51	78	47	81	39	85	20	116
120	46	56	50	56	54	55	58	54	62	53	66	52	70	51	74	48	78	44	81	37	85	19	120
124	46	53	50	52	54	51	58	51	62	50	66	49	70	47	73	45	77	41	81	34	85	18	124
128	45	49	49	48	53	48	57	47	61	46	65	45	69	44	73	41	77	38	81	32	85	17	128
132	45	45	49	44	53	44	57	43	61	43	65	41	69	40	73	38	77	35	81	29	84	16	132
136	45	41	49	41	53	40	57	40	61	39	65	38	69	37	73	35	77	32	81	27	84	14	136
140	45	37	49	37	53	37	57	36	61	35	65	34	69	33	73	32	77	29	81	24	84	13	140
144	45	34	49	33	53	33	57	32	61	32	65	31	69	30	73	28	77	26	80	22	84	12	144
148	45	30	49	30	53	29	57	29	61	28	65	27	69	27	72	25	76	23	80	19	84	11	148
152	44	26	48	26	52	26	56	25	60	25	64	24	68	23	72	22	76	20	80	17	84	09	152
156	44	22	48	22	52	22	56	22	60	21	64	21	68	20	72	19	76	17	80	14	84	08	156
160	44	19	48	18	52	18	56	18	60	18	64	17	68	17	72	16	76	14	80	12	84	07	160
164	44	15	48	15	52	15	56	14	60	14	64	14	68	13	72	13	76	12	80	10	84	05	164
168	44	11	48	11	52	11	56	11	60	11	64	10	68	10	72	09	76	09	80	07	84	04	168
172	44	07	48	07	52	07	56	07	60	07	64	07	68	07	72	06	76	06	80	05	84	03	172
176	44	04	48	04	52	04	56	04	60	04	64	03	68	03	72	03	76	03	80	02	84	01	176
180	44	00	48	00	52	00	56	00	60	00	64	00	68	00	72	00	76	00	80	00	84	00	180
	48°		52°		56°		60°		64°		68°		72°		76°		80°		84°		88°		

FIGURES IN ITALICS INDICATE THAT DECLINATION IS OF CONTRARY NAME TO LATITUDE

10—48722-1

Lat. 87°

H.A.	0° 00' Alt. Δd Δt Az.	0° 30' Alt. Δd Δt Az.	1° 00' Alt. Δd Δt Az.	1° 30' Alt. Δd Δt Az.	2° 00' Alt. Δd Δt Az.	2° 30' Alt. Δd Δt Az.	3° 00' Alt. Δd Δt Az.	3° 30' Alt. Δd Δt Az.	H.A.
00					5 00.0 1.000 180.0	5 30.0 1.000 180.0	6 00.0 1.000 180.0	6 30.0 1.000 180.0	00
1						5 30.0 1.000 179.0	6 00.0 1.000 179.0	6 30.0 1.000 179.0	1
2						5 29.9 1.000 178.0	5 59.9 1.000 178.0	6 29.9 1.000 178.0	2
3						5 29.8 1.000 177.0	5 59.8 1.000 177.0	6 29.8 1.000 177.0	3
4						5 29.6 1.000 176.0	5 59.6 1.000 176.0	6 29.6 1.000 176.0	4
05						5 29.3 1.000 175.0	5 59.3 1.000 175.0	6 29.3 1.000 175.0	05
6						5 29.0 1.001 174.0	5 59.0 1.001 174.0	6 29.0 1.001 174.0	6
7						5 28.7 1.001 173.0	5 58.7 1.001 173.0	6 28.7 1.001 173.0	7
8						5 28.2 1.001 172.0	5 58.2 1.001 172.0	6 28.2 1.001 172.0	8
9						5 27.8 1.001 171.0	5 57.8 1.001 171.0	6 27.8 1.001 171.0	9
10						5 27.3 1.001 170.0	5 57.3 1.001 170.0	6 27.3 1.001 170.0	10
1						5 26.7 1.001 169.0	5 56.7 1.001 169.0	6 26.7 1.001 169.0	1
2						5 26.1 1.001 168.0	5 56.1 1.001 168.0	6 26.1 1.001 167.9	2
3						5 25.4 1.001 167.0	5 55.4 1.001 166.9	6 25.4 1.001 166.9	3
4						5 24.6 1.001 165.9	5 54.6 1.001 165.9	6 24.6 1.001 165.9	4
15						5 23.8 1.001 164.9	5 53.8 1.001 164.9	6 23.8 1.001 164.9	15
6						5 23.0 1.001 163.9	5 53.0 1.002 163.9	6 23.0 1.002 163.9	6
7						5 22.1 1.002 162.9	5 52.1 1.002 162.9	6 22.1 1.002 162.9	7
8						5 21.2 1.002 161.9	5 51.2 1.002 161.9	6 21.2 1.002 161.9	8
9						5 20.2 1.002 160.9	5 50.2 1.002 160.9	6 20.2 1.002 160.9	9
20						5 19.1 1.002 159.9	5 49.1 1.002 159.9	6 19.1 1.002 159.9	20
1						5 18.0 1.002 158.9	5 48.0 1.002 158.9	6 18.0 1.002 158.9	1
2						5 16.9 1.002 157.9	5 46.9 1.002 157.9	6 16.9 1.002 157.9	2
3						5 15.6 1.002 156.9	5 45.6 1.002 156.9	6 15.6 1.002 156.9	3
4						5 14.4 1.002 155.9	5 44.4 1.002 155.9	6 14.4 1.002 155.9	4
25						5 13.1 1.002 154.9	5 43.1 1.002 154.9	6 13.1 1.002 154.9	25
6						5 11.7 1.002 153.9	5 41.7 1.002 153.9	6 11.7 1.002 153.9	6
7						5 10.3 1.002 152.9	5 40.3 1.002 152.9	6 10.3 1.002 152.9	7
8						5 08.9 1.002 151.9	5 38.9 1.003 151.9	6 08.9 1.002 151.9	8
9						5 07.4 1.003 150.9	5 37.4 1.003 150.9	6 07.3 1.003 150.9	9
30						5 05.8 1.003 149.9	5 35.8 1.003 149.9	6 05.8 1.003 149.9	30
1						5 04.2 1.003 148.9	5 34.2 1.003 148.9	6 04.2 1.003 148.9	1
2						5 02.6 1.003 147.9	5 32.6 1.003 147.9	6 02.5 1.003 147.9	2
3						5 00.9 1.003 146.9	5 30.9 1.003 146.9	6 00.9 1.003 146.9	3
4							5 29.1 1.003 145.9	5 59.1 1.003 145.9	4
35							5 27.3 1.003 144.9	5 57.3 1.003 144.9	35
6							5 25.5 1.003 143.9	5 55.5 1.003 143.9	6
7							5 23.6 1.003 142.9	5 53.6 1.003 142.9	7
8							5 21.7 1.003 141.9	5 51.7 1.003 141.8	8
9							5 19.8 1.003 140.9	5 49.7 1.003 140.8	9
40							5 17.8 1.003 139.9	5 47.7 1.003 139.8	40
1							5 15.7 1.003 138.9	5 45.7 1.003 138.8	1
2							5 13.6 1.004 137.9	5 43.6 1.004 137.8	2
3							5 11.5 1.004 136.9	5 41.5 1.004 136.8	3
4							5 09.3 1.004 135.9	5 39.3 1.004 135.8	4
45							5 07.1 1.004 134.8	5 37.1 1.004 134.8	45
6							5 04.9 1.004 133.8	5 34.9 1.004 133.8	6
7							5 02.6 1.004 132.8	5 32.6 1.004 132.8	7
8							5 00.3 1.004 131.8	5 30.3 1.004 131.8	8
9								5 27.9 1.004 130.8	9
50								5 25.5 1.004 129.8	50
1								5 23.1 1.004 128.8	1
2								5 20.6 1.004 127.8	2
3								5 18.1 1.004 126.8	3
4								5 15.6 1.004 125.8	4
55								5 13.0 1.004 124.8	55
6								5 10.4 1.004 123.8	6
7								5 07.8 1.004 122.8	7
8								5 05.1 1.004 121.8	8
9								5 02.5 1.005 120.8	9

H.A.	Alt.	Az.	Alt.	Az.	Alt.	Az.	Alt.	Az.	Alt.	Az.	Alt.	Az.	Alt.	Az.	Alt.	Az.	H.A.	Lat. 87°
°	° ′ Δd Δt °		° ′ Δd Δt °		° ′ Δd Δt °		° ′ Δd Δt °		° ′ Δd Δt °		° ′ Δd Δt °		° ′ Δd Δt °		° ′ Δd Δt °		°	

Lat. 87°

Lat 88°

Lat. 87°

H.A.	4° 00'	4° 30'	5° 00'	5° 30'	6° 00'	6° 30'	7° 00'	7° 30'	H.A.
	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	
	° ' AdΔt °	° ' AdΔt °	° ' AdΔt °	° ' AdΔt °	° ' AdΔt °	° ' AdΔt °	° ' AdΔt °	° ' AdΔt °	
00	7 00.0 1.000 180.0	7 30.0 1.000 180.0	8 00.0 1.000 180.0	8 30.0 1.000 180.0	9 00.0 1.000 180.0	9 30.0 1.000 180.0	10 00.0 1.000 180.0	10 30.0 1.000 180.0	00
1	7 00.0 1.000 179.0	7 30.0 1.000 179.0	8 00.0 1.000 179.0	8 30.0 1.000 179.0	9 00.0 1.000 179.0	9 30.0 1.000 179.0	10 00.0 1.000 179.0	10 30.0 1.000 179.0	1
2	6 59.9 1.000 178.0	7 29.9 1.000 178.0	7 59.9 1.000 178.0	8 29.9 1.000 178.0	8 59.9 1.000 178.0	9 29.9 1.000 178.0	9 59.9 1.000 178.0	10 29.9 1.000 178.0	2
3	6 59.9 1.000 177.0	7 29.8 1.000 177.0	7 59.8 1.000 177.0	8 29.8 1.000 177.0	8 59.8 1.000 177.0	9 29.8 1.000 177.0	9 59.8 1.000 177.0	10 29.8 1.000 177.0	3
4	6 59.6 1.000 176.0	7 29.6 1.000 176.0	7 59.6 1.000 176.0	8 29.6 1.000 176.0	8 59.6 1.000 176.0	9 29.6 1.000 176.0	9 59.6 1.000 176.0	10 29.6 1.000 176.0	4
05	6 59.3 1.000 175.0	7 29.3 1.001 175.0	7 59.3 1.001 175.0	8 29.3 1.001 175.0	8 59.3 1.001 175.0	9 29.3 1.001 175.0	9 59.3 1.001 175.0	10 29.3 1.001 175.0	05
6	6 59.0 1.001 174.0	7 29.0 1.001 174.0	7 59.0 1.001 174.0	8 29.0 1.001 174.0	8 59.0 1.001 174.0	9 29.0 1.001 174.0	9 59.0 1.001 174.0	10 29.0 1.001 174.0	6
7	6 58.7 1.001 173.0	7 28.7 1.001 173.0	7 58.7 1.001 173.0	8 28.6 1.001 173.0	8 58.6 1.001 173.0	9 28.6 1.001 172.9	9 58.6 1.001 172.9	10 28.6 1.001 172.9	7
8	6 58.2 1.001 172.0	7 28.2 1.001 172.0	7 58.2 1.001 171.9	8 28.2 1.001 171.9	8 58.2 1.001 171.9	9 28.2 1.001 171.9	9 58.2 1.001 171.9	10 28.2 1.001 171.9	8
9	6 57.8 1.001 171.0	7 27.8 1.001 171.0	7 57.8 1.001 170.9	8 27.8 1.001 170.9	8 57.8 1.001 170.9	9 27.8 1.001 170.9	9 57.8 1.001 170.9	10 27.8 1.001 170.9	9
10	6 57.3 1.001 170.0	7 27.3 1.001 169.9	7 57.3 1.001 169.9	8 27.2 1.001 169.9	8 57.2 1.001 169.9	9 27.2 1.001 169.9	9 57.2 1.001 169.9	10 27.2 1.001 169.9	10
1	6 56.7 1.001 168.9	7 26.7 1.001 168.9	7 56.7 1.001 168.9	8 26.7 1.001 168.9	8 56.7 1.001 168.9	9 26.7 1.001 168.9	9 56.7 1.001 168.9	10 26.7 1.001 168.9	1
2	6 56.0 1.001 167.9	7 26.0 1.001 167.9	7 56.0 1.001 167.9	8 26.0 1.001 167.9	8 56.0 1.001 167.9	9 26.0 1.001 167.9	9 56.0 1.001 167.9	10 26.0 1.001 167.9	2
3	6 55.4 1.001 166.9	7 25.4 1.001 166.9	7 55.4 1.001 166.9	8 25.4 1.001 166.9	8 55.4 1.001 166.9	9 25.4 1.001 166.9	9 55.4 1.001 166.9	10 25.4 1.001 166.9	3
4	6 54.6 1.001 165.9	7 24.6 1.001 165.9	7 54.6 1.001 165.9	8 24.6 1.001 165.9	8 54.6 1.001 165.9	9 24.6 1.001 165.9	9 54.6 1.001 165.9	10 24.6 1.001 165.9	4
15	6 53.8 1.001 164.9	7 23.8 1.001 164.9	7 53.8 1.001 164.9	8 23.8 1.001 164.9	8 53.8 1.001 164.9	9 23.8 1.001 164.9	9 53.8 1.001 164.9	10 23.8 1.001 164.9	15
6	6 53.0 1.002 163.9	7 23.0 1.002 163.9	7 53.0 1.001 163.9	8 23.0 1.002 163.9	8 53.0 1.002 163.9	9 23.0 1.002 163.9	9 53.0 1.002 163.9	10 23.0 1.002 163.9	6
7	6 52.1 1.002 162.9	7 22.1 1.002 162.9	7 52.1 1.002 162.9	8 22.1 1.002 162.9	8 52.1 1.002 162.9	9 22.1 1.002 162.9	9 52.1 1.002 162.9	10 22.1 1.002 162.9	7
8	6 51.2 1.002 161.9	7 21.1 1.002 161.9	7 51.1 1.002 161.9	8 21.1 1.002 161.9	8 51.1 1.002 161.9	9 21.1 1.002 161.9	9 51.1 1.002 161.9	10 21.1 1.002 161.9	8
9	6 50.2 1.002 160.9	7 20.1 1.002 160.9	7 50.1 1.002 160.9	8 20.1 1.002 160.9	8 50.1 1.002 160.9	9 20.1 1.002 160.9	9 50.1 1.002 160.9	10 20.1 1.002 160.8	9
20	6 49.1 1.002 159.9	7 19.1 1.002 159.9	7 49.1 1.002 159.9	8 19.1 1.002 159.9	8 49.1 1.002 159.9	9 19.1 1.002 159.9	9 49.1 1.002 159.8	10 19.1 1.002 159.8	20
1	6 48.0 1.002 158.9	7 18.0 1.002 158.9	7 48.0 1.002 158.9	8 18.0 1.002 158.9	8 48.0 1.002 158.9	9 18.0 1.002 158.9	9 48.0 1.002 158.8	10 18.0 1.002 158.8	1
2	6 46.8 1.002 157.9	7 16.8 1.002 157.9	7 46.8 1.002 157.9	8 16.8 1.002 157.9	8 46.8 1.002 157.9	9 16.8 1.002 157.8	9 46.8 1.002 157.8	10 16.8 1.002 157.8	2
3	6 45.6 1.002 156.9	7 15.6 1.002 156.9	7 45.6 1.002 156.9	8 15.6 1.002 156.9	8 45.6 1.002 156.8	9 15.6 1.002 156.8	9 45.6 1.002 156.8	10 15.6 1.002 156.8	3
4	6 44.4 1.002 155.9	7 14.4 1.002 155.9	7 44.4 1.002 155.9	8 14.4 1.002 155.9	8 44.3 1.002 155.8	9 14.3 1.002 155.8	9 44.3 1.002 155.8	10 14.3 1.002 155.8	4
25	6 43.1 1.002 154.9	7 13.1 1.002 154.9	7 43.0 1.002 154.9	8 13.0 1.002 154.8	8 43.0 1.002 154.8	9 13.0 1.002 154.8	9 43.0 1.002 154.8	10 13.0 1.002 154.8	25
6	6 41.7 1.002 153.9	7 11.7 1.002 153.9	7 41.7 1.002 153.9	8 11.7 1.002 153.8	8 41.7 1.002 153.8	9 11.7 1.002 153.8	9 41.7 1.002 153.8	10 11.6 1.002 153.8	6
7	6 40.3 1.002 152.9	7 10.3 1.002 152.9	7 40.3 1.002 152.8	8 10.3 1.002 152.8	8 40.3 1.002 152.8	9 10.3 1.002 152.8	9 40.2 1.002 152.8	10 10.2 1.002 152.8	7
8	6 38.8 1.003 151.9	7 08.8 1.002 151.9	7 38.8 1.003 151.8	8 08.8 1.003 151.8	8 38.8 1.003 151.8	9 08.8 1.003 151.8	9 38.8 1.003 151.8	10 08.8 1.003 151.8	8
9	6 37.3 1.003 150.9	7 07.3 1.003 150.9	7 37.3 1.003 150.8	8 07.3 1.003 150.8	8 37.3 1.003 150.8	9 07.3 1.003 150.8	9 37.3 1.003 150.8	10 07.3 1.003 150.8	9
30	6 35.8 1.003 149.9	7 05.8 1.003 149.8	7 35.8 1.003 149.8	8 05.8 1.003 149.8	8 35.7 1.003 149.8	9 05.7 1.003 149.8	9 35.7 1.003 149.8	10 05.7 1.003 149.8	30
1	6 34.2 1.003 148.9	7 04.2 1.003 148.8	7 34.2 1.003 148.8	8 04.2 1.003 148.8	8 34.1 1.003 148.8	9 04.1 1.003 148.8	9 34.1 1.003 148.8	10 04.1 1.003 148.8	1
2	6 32.5 1.003 147.9	7 02.5 1.003 147.8	7 32.5 1.003 147.8	8 02.5 1.003 147.8	8 32.5 1.003 147.8	9 02.5 1.003 147.8	9 32.5 1.003 147.8	10 02.5 1.003 147.8	2
3	6 30.8 1.003 146.8	7 00.8 1.003 146.8	7 30.8 1.003 146.8	8 00.8 1.003 146.8	8 30.8 1.003 146.8	9 00.8 1.003 146.8	9 30.8 1.003 146.8	10 00.8 1.003 146.7	3
4	6 29.1 1.003 145.8	6 59.1 1.003 145.8	7 29.1 1.003 145.8	7 59.1 1.003 145.8	8 29.1 1.003 145.8	8 59.0 1.003 145.8	9 29.0 1.003 145.8	9 59.0 1.003 145.7	4
35	6 27.3 1.003 144.8	6 57.3 1.003 144.8	7 27.3 1.003 144.8	7 57.3 1.003 144.8	8 27.3 1.003 144.8	8 57.2 1.003 144.8	9 27.2 1.003 144.8	9 57.2 1.003 144.7	35
6	6 25.5 1.003 143.8	6 55.5 1.003 143.8	7 25.5 1.003 143.8	7 55.4 1.003 143.8	8 25.4 1.003 143.8	8 55.4 1.003 143.8	9 25.4 1.003 143.7	9 55.4 1.003 143.7	6
7	6 23.6 1.003 142.8	6 53.6 1.003 142.8	7 23.6 1.003 142.8	7 53.6 1.003 142.8	8 23.5 1.003 142.8	8 53.5 1.003 142.8	9 23.5 1.003 142.7	9 53.5 1.003 142.7	7
8	6 21.7 1.003 141.8	6 51.7 1.003 141.8	7 21.7 1.003 141.8	7 51.6 1.003 141.8	8 21.6 1.003 141.8	8 51.6 1.003 141.8	9 21.6 1.003 141.7	9 51.6 1.003 141.7	8
9	6 19.7 1.003 140.8	6 49.7 1.003 140.8	7 19.7 1.003 140.8	7 49.7 1.003 140.8	8 19.7 1.003 140.8	8 49.6 1.003 140.7	9 19.6 1.003 140.7	9 49.6 1.003 140.7	9
40	6 17.7 1.003 139.8	6 47.7 1.003 139.8	7 17.7 1.003 139.8	7 47.7 1.003 139.8	8 17.7 1.003 139.8	8 47.6 1.003 139.7	9 17.6 1.003 139.7	9 47.6 1.003 139.7	40
1	6 15.7 1.004 138.8	6 45.7 1.004 138.8	7 15.6 1.004 138.8	7 45.6 1.004 138.8	8 15.6 1.004 138.8	8 45.6 1.004 138.7	9 15.6 1.004 138.7	9 45.6 1.004 138.7	1
2	6 13.6 1.004 137.8	6 43.6 1.004 137.8	7 13.6 1.004 137.8	7 43.5 1.004 137.8	8 13.5 1.004 137.7	8 43.5 1.004 137.7	9 13.5 1.004 137.7	9 43.5 1.004 137.7	2
3	6 11.5 1.004 136.8	6 41.4 1.004 136.8	7 11.4 1.004 136.8	7 41.4 1.004 136.8	8 11.4 1.004 136.7	8 41.4 1.004 136.7	9 11.3 1.004 136.7	9 41.3 1.004 136.7	3
4	6 09.3 1.004 135.8	6 39.3 1.004 135.8	7 09.3 1.004 135.8	7 39.2 1.004 135.8	8 09.2 1.004 135.7	8 39.2 1.004 135.7	9 09.2 1.004 135.7	9 39.2 1.004 135.7	4
45	6 07.1 1.004 134.8	6 37.1 1.004 134.8	7 07.0 1.004 134.8	7 37.0 1.004 134.8	8 07.0 1.004 134.7	8 37.0 1.004 134.7	9 07.0 1.004 134.7	9 36.9 1.004 134.7	45
6	6 04.8 1.004 133.8	6 34.8 1.004 133.8	7 04.8 1.004 133.8	7 34.8 1.004 133.8	8 04.8 1.004 133.7	8 34.7 1.004 133.7	9 04.7 1.004 133.7	9 34.7 1.004 133.7	6
7	6 02.6 1.004 132.8	6 32.5 1.004 132.8	7 02.5 1.004 132.8	7 32.5 1.004 132.7	8 02.5 1.004 132.7	8 32.4 1.004 132.7	9 02.4 1.004 132.7	9 32.4 1.004 132.7	7
8	6 00.2 1.004 131.8	6 30.2 1.004 131.8	7 00.2 1.004 131.8	7 30.2 1.004 131.7	8 00.1 1.004 131.7	8 30.1 1.004 131.7	9 00.1 1.004 131.7	9 30.1 1.004 131.7	8
9	5 57.9 1.004 130.8	6 27.8 1.004 130.8	6 57.8 1.004 130.8	7 27.8 1.004 130.7	7 57.8 1.004 130.7	8 27.8 1.004 130.7	8 57.7 1.004 130.7	9 27.7 1.004 130.7	9
50	5 55.5 1.004 129.8	6 25.5 1.004 129.8	6 55.4 1.004 129.8	7 25.4 1.004 129.7	7 55.4 1.004 129.7	8 25.4 1.004 129.7	8 55.3 1.004 129.7	9 25.3 1.004 129.7	50
1	5 53.0 1.004 128.8	6 23.0 1.004 128.8	6 53.0 1.004 128.8	7 23.0 1.004 128.7	7 52.9 1.004 128.7	8 22.9 1.004 128.7	8 52.9 1.004 128.7	9 22.9 1.004 128.7	1
2	5 50.6 1.004 127.8	6 20.6 1.004 127.8	6 50.5 1.004 127.8	7 20.5 1.004 127.7	7 50.5 1.004 127.7	8 20.5 1.004 127.7	8 50.4 1.004 127.7	9 20.4 1.004 127.6	2
3	5 48.1 1.004 126.8	6 18.1 1.004 126.8	6 48.0 1.004 126.8	7 18.0 1.004 126.7	7 48.0 1.004 126.7	8 18.0 1.004 126.7	8 47.9 1.004 126.7	9 17.9 1.004 126.6	3
4	5 45.6 1.004 125.8	6 15.5 1.004 125.8	6 45.5 1.004 125.7	7 15.5 1.004 125.7	7 45.4 1.004 125.7	8 15.4 1.004 125.7	8 45.4 1.004 125.7	9 15.4 1.004 125.6	4
55	5 43.0 1.004 124.8	6 13.0 1.004 124.8	6 42.9 1.004 124.7	7 12.9 1.004 124.7	7 42.9 1.004 124.7	8 12.8 1.004 124.7	8 42.8 1.004 124.7	9 12.8 1.004 124.6	55
6	5 40.4 1.004 123.8	6 10.4 1.004 123.8	6 40.3 1.004 123.7	7 10.3 1.004 123.7	7 40.3 1.004 123.7	8 10.3 1.004 123.7	8 40.2 1.004 123.7	9 10.2 1.004 123.6	6
7	5 37.8 1.004 122.8	6 07.7 1.004 122.8	6 37.7 1.004 122.7	7 07.7 1.004 122.7	7 37.7 1.004 122.7	8 07.6 1.004 122.7	8 37.6 1.004 122.7	9 07.6 1.004 122.6	7
8	5 35.1 1.004 121.8	6 05.1 1.004 121.8	6 35.1 1.004 121.7	7 05.0 1.004 121.7	7 35.0 1.004 121.7	8 05.0 1.004 121.7	8 34.9 1.004 121.7	9 04.9 1.004 121.6	8
9	5 32.4 1.005 120.8	6 02.4 1.005 120.8	6 32.4 1.004 120.7	7 02.3 1.004 120.7	7 32.3 1.005 120.7	8 02.3 1.005 120.7	8 32.2 1.005 120.6	9 02.2 1.005 120.6	9
60	5 29.7 1.005 119.8	5 59.7 1.005 119.8	6 29.7 1.005 119.7	6 59.6 1.005 119.7	7 29.6 1.005 119.7	7 59.6 1.005 119.7	8 29.5 1.005 119.6	8 59.5 1.005 119.6	60
1	5 27.0 1.005 118.8	5 57.0 1.005 118.8	6 26.9 1.005 118.7	6 56.9 1.005 118.7	7 26.9 1.005 118.7	7 56.8 1.005 118.7	8 26.8 1.005 118.6	8 56.8 1.005 118.6	1
2	5 24.2 1.005 117.8	5 54.2 1.005 117.8	6 24.2 1.005 117.7	6 54.1 1.005 117.7	7 24.1 1.005 117.7	7 54.1 1.005 117.7	8 24.0 1.005 117.6	8 54.0 1.005 117.6	2
3	5 21.4 1.005 116.8	5 51.4 1.005 116.8	6 21.4 1.005 116.7	6 51.3 1.005 116.7	7 21.3 1.005 116.7	7 51.3 1.005 116.7	8 21.2 1.005 116.6	8 51.2 1.005 116.6	3
4	5 18.6 1.005 115.8	5 48.6 1.005 115.8	6 18.5 1.005 115.7	6 48.5 1.005 115.7	7 18.5 1.005 115.7	7 48.4 1.005 115.7	8 18.4 1.005 115.6	8 48.4 1.005 115.6	4
65	5 15.8 1.005 114.8	5 45.7 1.005 114.8	6 15.7 1.005 114.7	6 45.7 1.005 114.7	7 15.6 1.005 114.7	7 45.6 1.005 114.7	8 15.6 1.005 114.6	8 45.5 1.005 114.6	65
6	5 12.9 1.005 113.8	5 42.9 1.005 113.8	6 12.8 1.005 113.7	6 42.8 1.005 113.7	7 12.8 1.005 113.7	7 42.7 1.005 113.7	8 12.7 1.005 113.6	8 42.7 1.005 113.6	6
7	5 10.0 1.005 112.8	5 40.0 1.005 112.8	6 10.0 1.005 112.7	6 39.9 1.005 112.7	7 09.9 1.005 112.7	7 39.8 1.005 112.7	8 09.8 1.005 112.6	8 39.8 1.005 112.6	7
8	5 07.1 1.005 111.8	5 37.1 1.005 111.8	6 07.0 1.005 111.7	6 37.0 1.005 111.7	7 07.0 1.005 111.7	7 36.9 1.005 111.7	8 06.9 1.005 111.6	8 36.9 1.005 111.6	8
9	5 04.2 1.005 110.8	5 34.2 1.005 110.8	6 04.1 1.005 110.7	6 34.1 1.005 110.7	7 04.0 1.005 110.7	7 34.0 1.005 110.7	8 04.0 1.005 110.6	8 33.9 1.005 110.6	9
70	5 01.2 1.005 109.8	5 31.2 1.005 109.8	6 01.2 1.005 109.7	6 31.1 1.005 109.7	7 01.1 1.005 109.7	7 31.1 1.005 109.7	8 01.0 1.005 109.6	8 31.0 1.005 109.6	70
1		5 28.2 1.005 108.8	5 58.2 1.005 108.7	6 28.2 1.005 108.7	6 58.1 1.005 108.7	7 28.1 1.005 108.7	7 58.1 1.005 108.6	8 28.0 1.005 108.6	1
2		5 25.3 1.005 107.8	5 55.3 1.005 107.7	6 25.2 1.005 107.7	6 55.2 1.005 107.7	7 25.1 1.005 107.7	7 55.1 1.005 107.6	8 25.0 1.005 107.6	2
3		5 22.3 1.005 106.8	5 52.2 1.005 106.7	6 22.2 1.005 106.7	6 52.2 1.005 106.7	7 22.1 1.005 106.7	7 52.1 1.005 106.6	8 22.0 1.005 106.6	3
4		5 19.3 1.005 105.8	5 49.2 1.005 105.7	6 19.1 1.005 105.7	6 49.1 1.005 105.7	7 19.1 1.005 105.6	7 49.1 1.005 105.6	8 19.0 1.005 105.6	4
75		5 16.2 1.005 104.8	5 46.2 1.005 104.7	6 16.1 1.005 104.7	6 46.1 1.005 104.7	7 16.1 1.005 104.7	7 46.0 1.005 104.6	8 16.0 1.005 104.6	75
6		5 13.2 1.005 103.8	5 43.1 1.005 103.7	6 13.1 1.005 103.7	6 43.1 1.005 103.7	7 13.0 1.005 103.6	7 43.0 1.005 103.6	8 12.9 1.005 103.6	6
7		5 10.1 1.005 102.8	5 40.1 1.005 102.7	6 10.0 1.005 102.7	6 40.0 1.005 102.7	7 10.0 1.005 102.6	7 39.9 1.005 102.6	8 09.9 1.005 102.6	7
8		5 07.1 1.005 101.8	5 37.0 1.005 101.7	6 07.0 1.005 101.7	6 36.9 1.005 101.7	7 06.9 1.005 101.6	7 36.9 1.005 101.6	8 06.8 1.005 101.6	8
9		5 04.0 1.005 100.8	5 33.9 1.005 100.7	6 03.9 1.005 100.7	6 33.9 1.005 100.7	7 03.8 1.005 100.6	7 33.8 1.005 100.6	8 03.7 1.005 100.6	9
80		5 00.9 1.005 99.8	5 30.8 1.005 99.7	6 00.8 1.005 99.7	6 30.8 1.005 99.7	7 00.7 1.005 99.7	7 30.7 1.005 99.6	8 00.6 1.005 99.6	80
1			5 27.7 1.005 98.7	5 57.7 1.005 98.7	6 27.7 1.005 98.7	6 57.6 1.005 98.7	7 27.6 1.005 98.6	7 57.5 1.005 98.6	1
2			5 24.6 1.005 97.7	5 54.6 1.005 97.7	6 24.6 1.005 97.7	6 54.5 1.005 97.7	7 24.5 1.005 97.6	7 54.4 1.005 97.6	2
3			5 21.5 1.005 96.7	5 51.5 1.005 96.7	6 21.4 1.005 96.7	6 51.4 1.005 96.7	7 21.4 1.005 96.6	7 51.3 1.005 96.6	3
4			5 18.4 1.005 95.7	5 48.4 1.005 95.7	6 18.3 1.005 95.7	6 48.3 1.005 95.7	7 18.2 1.005 95.6	7 48.2 1.005 95.6	4
85			5 15.3 1.005 94.7	5 45.2 1.005 94.7	6 15.2 1.005 94.7	6 45.1 1.005 94.7	7 15.1 1.005 94.6	7 45.1 1.005 94.6	85
6			5 12.1 1.005 93.7	5 42.1 1.005 93.7	6 12.1 1.005 93.7	6 42.0 1.005 93.7	7 12.0 1.005 93.6	7 41.9 1.005 93.6	6
7			5 09.0 1.005 92.7	5 39.0 1.005 92.7	6 08.9 1.005 92.7	6 38.9 1.005 92.7	7 08.8 1.005 92.6	7 38.8 1.005 92.6	7
8			5 05.9 1.005 91.7	5 35.8 1.005 91.7	6 05.8 1.005 91.7	6 35.7 1.005 91.7	7 05.7 1.005 91.6	7 35.7 1.005 91.6	8
9			5 02.7 1.005 90.7	5 32.7 1.005 90.7	6 02.6 1.005 90.7	6 32.6 1.005 90.7	7 02.6 1.005 90.6	7 32.6 1.005 90.6	9
90				5 29.5 1.005 89.7	5 59.5 1.005 89.7	6 29.5 1.005 89.7	6 59.4 1.005 89.6	7 29.4 1.005 89.6	90

Lat. 87°

H.A.	4° 00' Alt. Δd Δt Az.	4° 30' Alt. Δd Δt Az.	5° 00' Alt. Δd Δt Az.	5° 30' Alt. Δd Δt Az.	6° 00' Alt. Δd Δt Az.	6° 30' Alt. Δd Δt Az.	7° 00' Alt. Δd Δt Az.	7° 30' Alt. Δd Δt Az.	H.A.
91				5 26.4 1.005 88.7	5 56.4 1.005 88.7	6 26.3 1.005 88.7	6 56.3 1.005 88.6	7 26.2 1.005 88.6	91
2				5 23.3 1.005 87.7	5 53.2 1.005 87.7	6 23.2 1.005 87.7	6 53.1 1.005 87.6	7 23.1 1.005 87.6	2
3				5 20.1 1.005 86.7	5 50.1 1.005 86.7	6 20.0 1.005 86.7	6 50.0 1.005 86.6	7 20.0 1.005 86.6	3
4				5 17.0 1.005 85.7	5 47.0 1.005 85.7	6 16.9 1.005 85.7	6 46.9 1.005 85.6	7 16.8 1.005 85.6	4
95				5 13.9 1.005 84.7	5 43.8 1.005 84.7	6 13.8 1.005 84.7	6 43.7 1.005 84.6	7 13.7 1.005 84.6	95
6				5 10.7 1.005 83.7	5 40.7 1.005 83.7	6 10.7 1.005 83.7	6 40.6 1.005 83.6	7 10.6 1.005 83.6	6
7				5 07.6 1.005 82.7	5 37.6 1.005 82.7	6 07.5 1.005 82.7	6 37.5 1.005 82.6	7 07.5 1.005 82.6	7
8				5 04.5 1.005 81.7	5 34.5 1.005 81.7	6 04.4 1.005 81.7	6 34.4 1.005 81.6	7 04.4 1.005 81.6	8
9				5 01.4 1.005 80.7	5 31.4 1.005 80.7	6 01.3 1.005 80.7	6 31.3 1.005 80.6	7 01.2 1.005 80.6	9
100					5 28.3 1.005 79.7	5 58.2 1.005 79.7	6 28.2 1.005 79.7	6 58.2 1.005 79.6	100
1					5 25.2 1.005 78.7	5 55.2 1.005 78.7	6 25.1 1.005 78.7	6 55.1 1.005 78.6	1
2					5 22.1 1.005 77.7	5 52.1 1.005 77.7	6 22.0 1.005 77.7	6 52.0 1.005 77.6	2
3					5 19.1 1.005 76.7	5 49.0 1.005 76.7	6 19.0 1.005 76.7	6 48.9 1.005 76.6	3
4					5 16.0 1.005 75.7	5 46.0 1.005 75.7	6 15.9 1.005 75.7	6 45.9 1.005 75.6	4
105					5 13.0 1.005 74.7	5 42.9 1.005 74.7	6 12.9 1.005 74.7	6 42.9 1.005 74.6	105
6					5 09.9 1.005 73.7	5 39.9 1.005 73.7	6 09.9 1.005 73.7	6 39.8 1.005 73.6	6
7					5 06.9 1.005 72.7	5 36.9 1.005 72.7	6 06.9 1.005 72.7	6 36.8 1.005 72.6	7
8					5 04.0 1.005 71.7	5 33.9 1.005 71.7	6 03.9 1.005 71.7	6 33.8 1.005 71.6	8
9					5 01.0 1.005 70.7	5 30.9 1.005 70.7	6 00.9 1.005 70.7	6 30.9 1.005 70.7	9
110						5 28.0 1.005 69.7	5 58.0 1.005 69.7	6 27.9 1.005 69.7	110
1						5 25.1 1.005 68.7	5 55.0 1.005 68.7	6 25.0 1.005 68.7	1
2						5 22.1 1.005 67.7	5 52.1 1.005 67.7	6 22.1 1.005 67.7	2
3						5 19.2 1.005 66.7	5 49.2 1.005 66.7	6 19.2 1.005 66.7	3
4						5 16.4 1.005 65.7	5 46.3 1.005 65.7	6 16.3 1.005 65.7	4
115						5 13.5 1.005 64.7	5 43.5 1.005 64.7	6 13.4 1.005 64.7	115
6						5 10.7 1.005 63.7	5 40.7 1.005 63.7	6 10.6 1.005 63.7	6
7						5 07.9 1.005 62.7	5 37.9 1.005 62.7	6 07.8 1.005 62.7	7
8						5 05.1 1.005 61.7	5 35.1 1.005 61.7	6 05.0 1.005 61.7	8
9						5 02.4 1.005 60.7	5 32.3 1.005 60.7	6 02.3 1.005 60.7	9
120							5 29.6 1.004 59.7	5 59.6 1.004 59.7	120
1							5 26.9 1.004 58.7	5 56.9 1.004 58.7	1
2							5 24.2 1.004 57.7	5 54.2 1.004 57.7	2
3							5 21.6 1.004 56.7	5 51.6 1.004 56.7	3
4							5 19.0 1.004 55.7	5 49.0 1.004 55.7	4
125							5 16.4 1.004 54.7	5 46.4 1.004 54.7	125
6							5 13.9 1.004 53.7	5 43.8 1.004 53.7	6
7							5 11.3 1.004 52.7	5 41.3 1.004 52.7	7
8							5 08.9 1.004 51.7	5 38.8 1.004 51.7	8
9							5 06.4 1.004 50.8	5 36.4 1.004 50.7	9
130							5 04.0 1.004 49.8	5 34.0 1.004 49.7	130
1							5 01.6 1.004 48.8	5 31.6 1.004 48.7	1
2								5 29.2 1.004 47.7	2
3								5 26.9 1.004 46.8	3
4								5 24.7 1.004 45.8	4
135								5 22.4 1.004 44.8	135
6								5 20.2 1.004 43.8	6
7								5 18.1 1.004 42.8	7
8								5 16.0 1.003 41.8	8
9								5 13.9 1.003 40.8	9
140								5 11.9 1.003 39.8	140
1								5 09.9 1.003 38.8	1
2								5 07.9 1.003 37.8	2
3								5 06.0 1.003 36.8	3
4								5 04.2 1.003 35.8	4
145								5 02.4 1.003 34.8	145
6								5 00.6 1.003 33.8	6

Lat. 88°

Lat. 89°

Lat. 87°

Declination columns: 8°00′, 8°30′, 9°00′, 9°30′, 10°00′, 10°30′, 11°00′, 11°30′. Each column gives Alt., Δd Δt, Az. (Az. and Δd Δt are common to all declinations in a given row.)

H.A.	Δd Δt	8°00′ Alt	8°30′ Alt	9°00′ Alt	9°30′ Alt	10°00′ Alt	10°30′ Alt	11°00′ Alt	11°30′ Alt	Az.	H.A.
00	1.000	11 00.9	11 30.9	12 00.9	12 30.9	13 00.9	13 30.9	14 00.9	14 30.9	180.0	00
1	1.000	11 00.0	11 30.0	12 00.0	12 30.0	13 00.0	13 30.0	14 00.0	14 30.0	179.0	1
2	1.000	10 59.9	11 29.9	11 59.9	12 29.9	12 59.9	13 29.9	13 59.7	14 29.9	178.0	2
3	1.000	10 59.8	11 29.8	11 59.8	12 29.8	12 59.8	13 29.8	13 59.7	14 29.8	177.0	3
4	1.000	10 59.6	11 29.6	11 59.6	12 29.6	12 59.6	13 29.6	13 59.6	14 29.6	176.0	4
05	1.001	10 59.3	11 29.3	11 59.3	12 29.3	12 59.3	13 29.3	13 59.3	14 29.3	175.0 / 174.9	05
6	1.001	10 59.0	11 29.0	11 59.0	12 29.0	12 59.0	13 29.0	13 59.0	14 29.0	173.9	6
7	1.001	10 58.6	11 28.6	11 58.6	12 28.6	12 58.6	13 28.6	13 58.6	14 28.6	172.9	7
8	1.001	10 58.2	11 28.2	11 58.2	12 28.2	12 58.2	13 28.2	13 58.2	14 28.2	171.9	8
9	1.001	10 57.8	11 27.8	11 57.8	12 27.8	12 57.8	13 27.8	13 57.8	14 27.8	170.9	9
10	1.001	10 57.2	11 27.2	11 57.2	12 27.2	12 57.2	13 27.2	13 57.2	14 27.2	169.9	10
1	1.001	10 56.7	11 26.7	11 56.7	12 26.7	12 56.7	13 26.7	13 56.7	14 26.7	168.9	1
2	1.001	10 56.0	11 26.0	11 56.0	12 26.0	12 56.0	13 26.0	13 56.0	14 26.0	167.9	2
3	1.001	10 55.3	11 25.3	11 55.3	12 25.3	12 55.3	13 25.3	13 55.3	14 25.3	166.9 / 166.8	3
4	1.001	10 54.6	11 24.6	11 54.6	12 24.6	12 54.6	13 24.6	13 54.6	14 24.6	165.9 / 165.8	4
15	1.001	10 53.8	11 23.8	11 53.8	12 23.8	12 53.8	13 23.8	13 53.8	14 23.8	164.9 / 164.8	15
6	1.002	10 53.0	11 23.0	11 53.0	12 23.0	12 53.0	13 23.0	13 53.0	14 22.9	163.9 / 163.8	6
7	1.002	10 52.1	11 22.1	11 52.1	12 22.1	12 52.1	13 22.1	13 52.0	14 22.0	162.9 / 162.8	7
8	1.002	10 51.1	11 21.1	11 51.1	12 21.1	12 51.1	13 21.1	13 51.1	14 21.1	161.8	8
9	1.002	10 50.1	11 20.1	11 50.1	12 20.1	12 50.1	13 20.1	13 50.1	14 20.1	160.8	9
20	1.002	10 49.1	11 19.1	11 49.0	12 19.0	12 49.0	13 19.0	13 49.0	14 19.0	159.8	20
1	1.002	10 47.9	11 17.9	11 47.9	12 17.9	12 47.9	13 17.9	13 47.9	14 17.9	158.8	1
2	1.002	10 46.8	11 16.8	11 46.8	12 16.8	12 46.8	13 16.8	13 46.8	14 16.7	157.8 / 157.7	2
3	1.002	10 45.6	11 15.6	11 45.6	12 15.6	12 45.6	13 15.5	13 45.5	14 15.5	156.8 / 156.7	3
4	1.002	10 44.3	11 14.3	11 44.3	12 14.3	12 44.3	13 14.3	13 44.3	14 14.3	155.8 / 155.7	4
25	1.002	10 43.0	11 13.0	11 43.0	12 13.0	12 43.0	13 13.0	13 43.0	14 12.9	154.8 / 154.7	25
6	1.002	10 41.6	11 11.6	11 41.6	12 11.6	12 41.6	13 11.6	13 41.6	14 11.6	153.8 / 153.7	6
7	1.002	10 40.2	11 10.2	11 40.2	12 10.2	12 40.2	13 10.2	13 40.2	14 10.2	152.8 / 152.7	7
8	1.003	10 38.8	11 08.8	11 38.7	12 08.7	12 38.7	13 08.7	13 38.7	14 08.7	151.8 / 151.7	8
9	1.003	10 37.3	11 07.2	11 37.2	12 07.2	12 37.2	13 07.2	13 37.2	14 07.2	150.8 / 150.7	9
30	1.003	10 35.7	11 05.7	11 35.7	12 05.7	12 35.7	13 05.6	13 35.6	14 05.6	149.7	30
1	1.003	10 34.1	11 04.1	11 34.1	12 04.1	12 34.1	13 04.1	13 34.1	14 04.0	148.7 / 148.6	1
2	1.003	10 32.4	11 02.4	11 32.4	12 02.4	12 32.4	13 02.4	13 32.4	14 02.4	147.7 / 147.6	2
3	1.003	10 30.7	11 00.7	11 30.7	12 00.7	12 30.7	13 00.7	13 30.7	14 00.7	146.7 / 146.6	3
4	1.003	10 29.0	10 59.0	11 29.0	11 59.0	12 28.9	12 58.9	13 28.9	13 58.9	145.7 / 145.6	4
35	1.003	10 27.2	10 57.2	11 27.2	11 57.2	12 27.1	12 57.1	13 27.1	13 57.1	144.7 / 144.6	35
6	1.003	10 25.4	10 55.4	11 25.3	11 55.3	12 25.3	12 55.3	13 25.3	13 55.3	143.7 / 143.6	6
7	1.003	10 23.5	10 53.5	11 23.5	11 53.4	12 23.4	12 53.4	13 23.4	13 53.4	142.7 / 142.6	7
8	1.003	10 21.6	10 51.5	11 21.5	11 51.5	12 21.5	12 51.5	13 21.5	13 51.5	141.7 / 141.6	8
9	1.003	10 19.6	10 49.6	11 19.5	11 49.5	12 19.5	12 49.5	13 19.5	13 49.5	140.7 / 140.6	9
40	1.003	10 17.6	10 47.6	11 17.6	11 47.5	12 17.5	12 47.5	13 17.5	13 47.5	139.7 / 139.6	40
1	1.004	10 15.5	10 45.5	11 15.5	11 45.5	12 15.5	12 45.4	13 15.4	13 45.4	138.7 / 138.6	1
2	1.004	10 13.4	10 43.4	11 13.4	11 43.4	12 13.4	12 43.3	13 13.3	13 43.3	137.7 / 137.6 / 137.5	2
3	1.004	10 11.3	10 41.3	11 11.2	11 41.2	12 11.2	12 41.2	13 11.2	13 41.2	136.7 / 136.6 / 136.5	3
4	1.004	10 09.1	10 39.1	11 09.1	11 39.1	12 09.0	12 39.0	13 09.0	13 39.0	135.7 / 135.6 / 135.5	4
45	1.004	10 06.9	10 36.9	11 06.9	11 36.9	12 06.8	12 36.8	13 06.8	13 36.8	134.7 / 134.6 / 134.5	45
6	1.004	10 04.7	10 34.6	11 04.6	11 34.6	12 04.6	12 34.6	13 04.5	13 34.5	133.7 / 133.6 / 133.5	6
7	1.004	10 02.4	10 32.4	11 02.3	11 32.3	12 02.3	12 32.3	13 02.2	13 32.2	132.7 / 132.6 / 132.5	7
8	1.004	10 00.0	10 29.9	10 59.9	11 29.9	11 59.9	12 29.9	12 59.9	13 29.9	131.6 / 131.5	8
9	1.004	9 57.7	10 27.7	10 57.6	11 27.6	11 57.6	12 27.6	12 57.6	13 27.5	130.6 / 130.5	9
50	1.004	9 55.3	10 25.3	10 55.2	11 25.2	11 55.2	12 25.2	12 55.1	13 25.1	129.6 / 129.5	50
1	1.004	9 52.8	10 22.8	10 52.8	11 22.8	11 52.7	12 22.7	12 52.7	13 22.7	128.6 / 128.5	1
2	1.004	9 50.4	10 20.3	10 50.3	11 20.3	11 50.3	12 20.2	12 50.2	13 20.2	127.6 / 127.5	2
3	1.004	9 47.9	10 17.8	10 47.8	11 17.8	11 47.8	12 17.7	12 47.7	13 17.7	126.6 / 126.5	3
4	1.004	9 45.3	10 15.3	10 45.3	11 15.3	11 45.2	12 15.2	12 45.2	13 15.1	125.6 / 125.5	4
55	1.004	9 42.8	10 12.7	10 42.7	11 12.7	11 42.7	12 12.6	12 42.6	13 12.6	124.6 / 124.5	55
6	1.004	9 40.2	10 10.1	10 40.1	11 10.1	11 40.0	12 10.0	12 40.0	13 10.0	123.6 / 123.5	6
7	1.004	9 37.5	10 07.5	10 37.5	11 07.4	11 37.4	12 07.3	12 37.3	13 07.3	122.6 / 122.5	7
8	1.004	9 34.9	10 04.8	10 34.8	11 04.8	11 34.8	12 04.7	12 34.7	13 04.7	121.6 / 121.5 / 121.4	8
9	1.005	9 32.2	10 02.2	10 32.1	11 02.1	11 32.1	12 02.0	12 32.0	13 02.0	120.6 / 120.5 / 120.4	9
60	1.005	9 29.5	9 59.4	10 29.4	10 59.4	11 29.3	11 59.3	12 29.3	12 59.2	119.6 / 119.5 / 119.4	60
1	1.005	9 26.7	9 56.7	10 26.7	10 56.6	11 26.6	11 56.6	12 26.5	12 56.5	118.6 / 118.5 / 118.4	1
2	1.005	9 24.0	9 53.9	10 23.9	10 53.9	11 23.8	11 53.8	12 23.8	12 53.7	117.6 / 117.5	2
3	1.005	9 21.2	9 51.1	10 21.1	10 51.1	11 21.0	11 51.0	12 21.0	12 50.9	116.6 / 116.5 / 116.4	3
4	1.005	9 18.3	9 48.3	10 18.3	10 48.2	11 18.2	11 48.2	12 18.1	12 48.1	115.6 / 115.5 / 115.4	4
65	1.005	9 15.5	9 45.5	10 15.4	10 45.4	11 15.4	11 45.3	12 15.3	12 45.3	114.6 / 114.5 / 114.4	65
6	1.005	9 12.6	9 42.6	10 12.6	10 42.5	11 12.5	11 42.5	12 12.4	12 42.4	113.6 / 113.5 / 113.4	6
7	1.005	9 09.7	9 39.7	10 09.7	10 39.6	11 09.6	11 39.6	12 09.5	12 39.5	112.6 / 112.5 / 112.4	7
8	1.005	9 06.8	9 36.8	10 06.8	10 36.7	11 06.7	11 36.6	12 06.6	12 36.6	111.6 / 111.5 / 111.4	8
9	1.005	9 03.9	9 33.9	10 03.8	10 33.8	11 03.8	11 33.7	12 03.7	12 33.6	110.6 / 110.5 / 110.4	9
70	1.005	9 01.0	9 30.9	10 00.9	10 30.8	11 00.8	11 30.8	12 00.7	12 30.7	109.6 / 109.5 / 109.4	70
1	1.005	8 58.0	9 27.9	9 57.9	10 27.9	10 57.8	11 27.8	11 57.8	12 27.7	108.6 / 108.5 / 108.4	1
2	1.005	8 55.0	9 25.0	9 54.9	10 24.9	10 54.9	11 24.8	11 54.8	12 24.7	107.6 / 107.5 / 107.4	2
3	1.005	8 52.0	9 22.0	9 51.9	10 21.9	10 51.8	11 21.8	11 51.8	12 21.7	106.6 / 106.5 / 106.4	3
4	1.005	8 49.0	9 18.9	9 48.9	10 18.9	10 48.8	11 18.8	11 48.7	12 18.7	105.6 / 105.5 / 105.4	4
75	1.005	8 45.9	9 15.9	9 45.9	10 15.8	10 45.8	11 15.8	11 45.7	12 15.7	104.6 / 104.5 / 104.4	75
6	1.005	8 42.9	9 12.9	9 42.8	10 12.8	10 42.7	11 12.7	11 42.7	12 12.6	103.6 / 103.5 / 103.4	6
7	1.005	8 39.8	9 09.8	9 39.8	10 09.7	10 39.7	11 09.6	11 39.6	12 09.5	102.6 / 102.5 / 102.4	7
8	1.005	8 36.8	9 06.7	9 36.7	10 06.7	10 36.6	11 06.6	11 36.5	12 06.5	101.6 / 101.5 / 101.4	8
9	1.005	8 33.7	9 03.7	9 33.6	10 03.6	10 33.5	11 03.5	11 33.4	12 03.4	100.6 / 100.5 / 100.4	9
80	1.005	8 30.6	9 00.6	9 30.5	10 00.5	10 30.4	11 00.4	11 30.4	12 00.3	99.6 / 99.5 / 99.4	80
1	1.005	8 27.5	8 57.5	9 27.4	9 57.4	10 27.3	10 57.3	11 27.3	11 57.2	98.6 / 98.5 / 98.4	1
2	1.005	8 24.4	8 54.3	9 24.3	9 54.3	10 24.2	10 54.2	11 24.1	11 54.1	97.6 / 97.5 / 97.4	2
3	1.005	8 21.3	8 51.2	9 21.2	9 51.1	10 21.1	10 51.1	11 21.0	11 51.0	96.6 / 96.5 / 96.4	3
4	1.005	8 18.2	8 48.1	9 18.1	9 48.0	10 18.0	10 47.9	11 17.9	11 47.9	95.6 / 95.5 / 95.4	4
85	1.005	8 15.0	8 45.0	9 14.9	9 44.9	10 14.9	10 44.8	11 14.8	11 44.7	94.6 / 94.5 / 94.4	85
6	1.005	8 11.9	8 41.9	9 11.8	9 41.8	10 11.7	10 41.7	11 11.6	11 41.6	93.6 / 93.5 / 93.4	6
7	1.005	8 08.8	8 38.7	9 08.7	9 38.6	10 08.6	10 38.5	11 08.5	11 38.5	92.6 / 92.5 / 92.4	7
8	1.005	8 05.6	8 35.6	9 05.5	9 35.5	10 05.4	10 35.4	11 05.4	11 35.3	91.6 / 91.5 / 91.4	8
9	1.005	8 02.5	8 32.4	9 02.4	9 32.4	10 02.3	10 32.3	11 02.2	11 32.2	90.6 / 90.5 / 90.4	9
90	1.005	7 59.3	8 29.3	8 59.3	9 29.2	9 59.2	10 29.1	10 59.1	11 29.0	89.6 / 89.5 / 89.4	90

Lat. 87°

H.A.	8°00′ Alt.	Δd Δt	Az.	8°30′ Alt.	Δd Δt	Az.	9°00′ Alt.	Δd Δt	Az.	9°30′ Alt.	Δd Δt	Az.	10°00′ Alt.	Δd Δt	Az.	10°30′ Alt.	Δd Δt	Az.	11°00′ Alt.	Δd Δt	Az.	11°30′ Alt.	Δd Δt	Az.	H.A.
91	7 56.2	1.005	88.6	8 26.2	1.005	88.6	8 56.1	1.005	88.5	9 26.1	1.005	88.5	9 56.0	1.005	88.5	10 26.0	1.005	88.4	10 55.9	1.005	88.4	11 25.9	1.005	88.4	91
2	7 53.1	1.005	87.6	8 23.0	1.005	87.6	8 53.0	1.005	87.5	9 22.9	1.005	87.5	9 52.9	1.005	87.5	10 22.8	1.005	87.4	10 52.8	1.005	87.4	11 22.8	1.005	87.4	2
3	7 49.9	1.005	86.6	8 19.9	1.005	86.6	8 49.8	1.005	86.5	9 19.8	1.005	86.5	9 49.8	1.005	86.5	10 19.7	1.005	86.4	10 49.7	1.005	86.4	11 19.6	1.005	86.4	3
4	7 46.8	1.005	85.6	8 16.7	1.005	85.6	8 46.7	1.005	85.5	9 16.7	1.005	85.5	9 46.6	1.005	85.5	10 16.6	1.005	85.5	10 46.5	1.005	85.4	11 16.5	1.005	85.4	4
95	7 43.7	1.005	84.6	8 13.6	1.005	84.6	8 43.6	1.005	84.5	9 13.5	1.005	84.5	9 43.5	1.005	84.5	10 13.5	1.005	84.5	10 43.4	1.005	84.4	11 13.4	1.005	84.4	95
6	7 40.5	1.005	83.6	8 10.5	1.005	83.6	8 40.5	1.005	83.5	9 10.4	1.005	83.5	9 40.4	1.005	83.5	10 10.3	1.005	83.5	10 40.3	1.005	83.4	11 10.2	1.005	83.4	6
7	7 37.4	1.005	82.6	8 07.4	1.005	82.6	8 37.3	1.005	82.5	9 07.3	1.005	82.5	9 37.3	1.005	82.5	10 07.2	1.005	82.5	10 37.2	1.005	82.4	11 07.1	1.005	82.4	7
8	7 34.3	1.005	81.6	8 04.3	1.005	81.6	8 34.2	1.005	81.5	9 04.2	1.005	81.5	9 34.1	1.005	81.5	10 04.1	1.005	81.5	10 34.1	1.005	81.4	11 04.0	1.005	81.4	8
9	7 31.2	1.005	80.6	8 01.2	1.005	80.6	8 31.1	1.005	80.5	9 01.1	1.005	80.5	9 31.0	1.005	80.5	10 01.0	1.005	80.5	10 31.0	1.005	80.4	11 00.9	1.005	80.4	9
100	7 28.1	1.005	79.6	7 58.1	1.005	79.6	8 28.0	1.005	79.5	8 58.0	1.005	79.5	9 28.0	1.005	79.5	9 57.9	1.005	79.5	10 27.9	1.005	79.4	10 57.8	1.005	79.4	100
1	7 25.0	1.005	78.6	7 55.0	1.005	78.6	8 25.0	1.005	78.5	8 54.9	1.005	78.5	9 24.9	1.005	78.5	9 54.8	1.005	78.5	10 24.8	1.005	78.4	10 54.7	1.005	78.4	1
2	7 22.0	1.005	77.6	7 51.9	1.005	77.6	8 21.9	1.005	77.6	8 51.8	1.005	77.5	9 21.8	1.005	77.5	9 51.8	1.005	77.5	10 21.7	1.005	77.4	10 51.7	1.005	77.4	2
3	7 18.9	1.005	76.6	7 48.8	1.005	76.6	8 18.8	1.005	76.6	8 48.8	1.005	76.5	9 18.8	1.005	76.5	9 48.7	1.005	76.5	10 18.7	1.005	76.5	10 48.6	1.005	76.4	3
4	7 15.9	1.005	75.6	7 45.8	1.005	75.6	8 15.8	1.005	75.6	8 45.7	1.005	75.5	9 15.7	1.005	75.5	9 45.7	1.005	75.5	10 15.6	1.005	75.5	10 45.6	1.005	75.4	4
105	7 12.8	1.005	74.6	7 42.8	1.005	74.6	8 12.7	1.005	74.6	8 42.7	1.005	74.5	9 12.7	1.005	74.5	9 42.6	1.005	74.5	10 12.6	1.005	74.5	10 42.5	1.005	74.4	105
6	7 09.8	1.005	73.6	7 39.8	1.005	73.6	8 09.7	1.005	73.6	8 39.7	1.005	73.5	9 09.6	1.005	73.5	9 39.6	1.005	73.5	10 09.6	1.005	73.5	10 39.5	1.005	73.4	6
7	7 06.8	1.005	72.6	7 36.8	1.005	72.6	8 06.7	1.005	72.6	8 36.7	1.005	72.5	9 06.6	1.005	72.5	9 36.6	1.005	72.5	10 06.5	1.005	72.5	10 36.5	1.005	72.4	7
8	7 03.8	1.005	71.6	7 33.8	1.005	71.6	8 03.7	1.005	71.6	8 33.7	1.005	71.5	9 03.7	1.005	71.5	9 33.6	1.005	71.5	10 03.6	1.005	71.5	10 33.5	1.005	71.4	8
9	7 00.8	1.005	70.6	7 30.8	1.005	70.6	8 00.8	1.005	70.6	8 30.7	1.005	70.6	9 00.7	1.005	70.5	9 30.6	1.005	70.5	10 00.6	1.005	70.5	10 30.6	1.005	70.5	9
110	6 57.9	1.005	69.6	7 27.8	1.005	69.6	7 57.8	1.005	69.6	8 27.8	1.005	69.6	8 57.7	1.005	69.5	9 27.7	1.005	69.5	9 57.7	1.005	69.5	10 27.6	1.005	69.5	110
1	6 54.9	1.005	68.6	7 24.9	1.005	68.6	7 54.9	1.005	68.6	8 24.8	1.005	68.6	8 54.8	1.005	68.5	9 24.8	1.005	68.5	9 54.7	1.005	68.5	10 24.7	1.005	68.5	1
2	6 52.0	1.005	67.6	7 22.0	1.005	67.6	7 52.0	1.005	67.6	8 21.9	1.005	67.6	8 51.9	1.005	67.5	9 21.8	1.005	67.5	9 51.8	1.005	67.5	10 21.8	1.005	67.5	2
3	6 49.1	1.005	66.6	7 19.1	1.005	66.6	7 49.1	1.005	66.6	8 19.0	1.005	66.6	8 49.0	1.005	66.5	9 19.0	1.005	66.5	9 48.9	1.005	66.5	10 18.9	1.005	66.5	3
4	6 46.3	1.005	65.6	7 16.2	1.005	65.6	7 46.2	1.005	65.6	8 16.2	1.005	65.6	8 46.1	1.005	65.5	9 16.1	1.005	65.5	9 46.1	1.005	65.5	10 16.0	1.005	65.5	4
115	6 43.4	1.005	64.6	7 13.4	1.005	64.6	7 43.3	1.005	64.6	8 13.3	1.005	64.6	8 43.3	1.005	64.6	9 13.2	1.005	64.5	9 43.2	1.005	64.5	10 13.2	1.005	64.5	115
6	6 40.6	1.005	63.7	7 10.6	1.005	63.6	7 40.5	1.005	63.6	8 10.5	1.005	63.6	8 40.5	1.005	63.6	9 10.4	1.005	63.5	9 40.4	1.005	63.5	10 10.4	1.005	63.5	6
7	6 37.8	1.005	62.7	7 07.8	1.005	62.6	7 37.7	1.005	62.6	8 07.7	1.005	62.6	8 37.7	1.005	62.6	9 07.6	1.005	62.5	9 37.6	1.005	62.5	10 07.6	1.005	62.5	7
8	6 35.0	1.005	61.7	7 05.0	1.005	61.6	7 34.9	1.005	61.6	8 04.9	1.005	61.6	8 34.9	1.005	61.6	9 04.8	1.005	61.5	9 34.8	1.005	61.5	10 04.8	1.005	61.5	8
9	6 32.3	1.005	60.7	7 02.2	1.005	60.6	7 32.2	1.005	60.6	8 02.2	1.005	60.6	8 32.1	1.005	60.6	9 02.1	1.005	60.5	9 32.1	1.005	60.5	10 02.0	1.005	60.5	9
120	6 29.5	1.004	59.7	6 59.5	1.004	59.6	7 29.5	1.004	59.6	7 59.4	1.004	59.6	8 29.4	1.004	59.6	8 59.4	1.004	59.6	9 29.3	1.004	59.5	9 59.3	1.004	59.5	120
1	6 26.8	1.004	58.7	6 56.8	1.004	58.7	7 26.8	1.004	58.6	7 56.7	1.004	58.6	8 26.7	1.004	58.6	8 56.7	1.004	58.6	9 26.7	1.004	58.5	9 56.6	1.004	58.5	1
2	6 24.2	1.004	57.7	6 54.1	1.004	57.7	7 24.1	1.004	57.6	7 54.1	1.004	57.6	8 24.1	1.004	57.6	8 54.0	1.004	57.6	9 24.0	1.004	57.5	9 54.0	1.004	57.5	2
3	6 21.5	1.004	56.7	6 51.5	1.004	56.7	7 21.5	1.004	56.6	7 51.4	1.004	56.6	8 21.4	1.004	56.6	8 51.4	1.004	56.6	9 21.4	1.004	56.5	9 51.3	1.004	56.5	3
4	6 18.9	1.004	55.7	6 48.9	1.004	55.7	7 18.9	1.004	55.6	7 48.8	1.004	55.6	8 18.8	1.004	55.6	8 48.8	1.004	55.6	9 18.8	1.004	55.6	9 48.7	1.004	55.5	4
125	6 16.3	1.004	54.7	6 46.3	1.004	54.7	7 16.3	1.004	54.6	7 46.3	1.004	54.6	8 16.2	1.004	54.6	8 46.2	1.004	54.6	9 16.2	1.004	54.6	9 46.1	1.004	54.5	125
6	6 13.8	1.004	53.7	6 43.8	1.004	53.7	7 13.7	1.004	53.6	7 43.7	1.004	53.6	8 13.7	1.004	53.6	8 43.7	1.004	53.6	9 13.6	1.004	53.6	9 43.6	1.004	53.5	6
7	6 11.3	1.004	52.7	6 41.3	1.004	52.7	7 11.2	1.004	52.7	7 41.2	1.004	52.6	8 11.2	1.004	52.6	8 41.2	1.004	52.6	9 11.1	1.004	52.6	9 41.1	1.004	52.6	7
8	6 08.8	1.004	51.7	6 38.8	1.004	51.7	7 08.8	1.004	51.7	7 38.7	1.004	51.6	8 08.7	1.004	51.6	8 38.7	1.004	51.6	9 08.6	1.004	51.6	9 38.6	1.004	51.6	8
9	6 06.4	1.004	50.7	6 36.3	1.004	50.7	7 06.3	1.004	50.7	7 36.3	1.004	50.7	8 06.3	1.004	50.6	8 36.2	1.004	50.6	9 06.2	1.004	50.6	9 36.2	1.004	50.6	9
130	6 03.9	1.004	49.7	6 33.9	1.004	49.7	7 03.9	1.004	49.7	7 33.9	1.004	49.7	8 03.8	1.004	49.6	8 33.8	1.004	49.6	9 03.8	1.004	49.6	9 33.8	1.004	49.6	130
1	6 01.6	1.004	48.7	6 31.5	1.004	48.7	7 01.5	1.004	48.7	7 31.5	1.004	48.7	8 01.5	1.004	48.6	8 31.4	1.004	48.6	9 01.4	1.004	48.6	9 31.4	1.004	48.6	1
2	5 59.2	1.004	47.7	6 29.2	1.004	47.7	6 59.2	1.004	47.7	7 29.2	1.004	47.7	7 59.1	1.004	47.6	8 29.1	1.004	47.6	8 59.1	1.004	47.6	9 29.1	1.004	47.6	2
3	5 56.9	1.004	46.7	6 26.9	1.004	46.7	6 56.9	1.004	46.7	7 26.9	1.004	46.7	7 56.8	1.004	46.7	8 26.8	1.004	46.6	8 56.8	1.004	46.6	9 26.8	1.004	46.6	3
4	5 54.6	1.004	45.7	6 24.6	1.004	45.7	6 54.6	1.004	45.7	7 24.6	1.004	45.7	7 54.6	1.004	45.7	8 24.5	1.004	45.6	8 54.5	1.004	45.6	9 24.5	1.004	45.6	4
135	5 52.4	1.004	44.7	6 22.4	1.004	44.7	6 52.4	1.004	44.7	7 22.4	1.004	44.7	7 52.3	1.004	44.7	8 22.3	1.004	44.6	8 52.3	1.004	44.6	9 22.3	1.004	44.6	135
6	5 50.2	1.004	43.7	6 20.2	1.004	43.7	6 50.2	1.004	43.7	7 20.1	1.004	43.7	7 50.1	1.004	43.7	8 20.1	1.004	43.7	8 50.1	1.004	43.6	9 20.1	1.004	43.6	6
7	5 48.1	1.004	42.8	6 18.1	1.004	42.7	6 48.0	1.004	42.7	7 18.0	1.004	42.7	7 48.0	1.004	42.7	8 18.0	1.004	42.7	8 48.0	1.004	42.6	9 17.9	1.004	42.6	7
8	5 46.0	1.003	41.8	6 15.9	1.003	41.7	6 45.9	1.003	41.7	7 15.9	1.003	41.7	7 45.9	1.003	41.7	8 15.9	1.003	41.7	8 45.9	1.003	41.7	9 15.8	1.003	41.6	8
9	5 43.9	1.003	40.8	6 13.9	1.003	40.7	6 43.9	1.003	40.7	7 13.8	1.003	40.7	7 43.8	1.003	40.7	8 13.8	1.003	40.7	8 43.8	1.003	40.7	9 13.8	1.003	40.6	9
140	5 41.9	1.003	39.8	6 11.8	1.003	39.8	6 41.8	1.003	39.7	7 11.8	1.003	39.7	7 41.8	1.003	39.7	8 11.8	1.003	39.7	8 41.8	1.003	39.7	9 11.7	1.003	39.6	140
1	5 39.9	1.003	38.8	6 09.9	1.003	38.8	6 39.8	1.003	38.7	7 09.8	1.003	38.7	7 39.8	1.003	38.7	8 09.8	1.003	38.7	8 39.8	1.003	38.7	9 09.8	1.003	38.7	1
2	5 37.9	1.003	37.8	6 07.9	1.003	37.8	6 37.9	1.003	37.7	7 07.9	1.003	37.7	7 37.9	1.003	37.7	8 07.9	1.003	37.7	8 37.8	1.003	37.7	9 07.8	1.003	37.7	2
3	5 36.0	1.003	36.8	6 06.0	1.003	36.8	6 36.0	1.003	36.8	7 06.0	1.003	36.8	7 36.0	1.003	36.7	8 06.0	1.003	36.7	8 35.9	1.003	36.7	9 05.9	1.003	36.7	3
4	5 34.2	1.003	35.8	6 04.2	1.003	35.8	6 34.1	1.003	35.8	7 04.1	1.003	35.8	7 34.1	1.003	35.7	8 04.1	1.003	35.7	8 34.1	1.003	35.7	9 04.1	1.003	35.7	4
145	5 32.4	1.003	34.8	6 02.3	1.003	34.8	6 32.3	1.003	34.8	7 02.3	1.003	34.8	7 32.3	1.003	34.7	8 02.3	1.003	34.7	8 32.3	1.003	34.7	9 02.3	1.003	34.7	145
6	5 30.6	1.003	33.8	6 00.6	1.003	33.8	6 30.6	1.003	33.8	7 00.5	1.003	33.8	7 30.5	1.003	33.8	8 00.5	1.003	33.7	8 30.5	1.003	33.7	9 00.5	1.003	33.7	6
7	5 28.9	1.003	32.8	5 58.9	1.003	32.8	6 28.8	1.003	32.8	6 58.8	1.003	32.8	7 28.8	1.003	32.7	7 58.8	1.003	32.7	8 28.8	1.003	32.7	8 58.8	1.003	32.7	7
8	5 27.2	1.003	31.8	5 57.2	1.003	31.8	6 27.2	1.003	31.8	6 57.2	1.003	31.8	7 27.1	1.003	31.8	7 57.1	1.003	31.7	8 27.1	1.003	31.7	8 57.1	1.003	31.7	8
9	5 25.6	1.003	30.8	5 55.5	1.003	30.8	6 25.5	1.003	30.8	6 55.5	1.003	30.8	7 25.5	1.003	30.8	7 55.5	1.003	30.8	8 25.5	1.003	30.7	8 55.5	1.003	30.7	9
150	5 24.0	1.003	29.8	5 54.0	1.003	29.8	6 23.9	1.003	29.8	6 53.9	1.003	29.8	7 23.9	1.003	29.8	7 53.9	1.003	29.8	8 23.9	1.003	29.7	8 53.9	1.003	29.7	150
1	5 22.4	1.002	28.8	5 52.4	1.002	28.8	6 22.4	1.002	28.8	6 52.4	1.002	28.8	7 22.4	1.002	28.8	7 52.4	1.002	28.8	8 22.4	1.002	28.8	8 52.4	1.002	28.7	1
2	5 20.9	1.002	27.8	5 50.9	1.002	27.8	6 20.9	1.002	27.8	6 50.9	1.002	27.8	7 20.9	1.002	27.8	7 50.9	1.002	27.8	8 20.9	1.002	27.8	8 50.9	1.002	27.7	2
3	5 19.5	1.002	26.8	5 49.5	1.002	26.8	6 19.5	1.002	26.8	6 49.5	1.002	26.8	7 19.5	1.002	26.8	7 49.5	1.002	26.8	8 19.4	1.002	26.8	8 49.4	1.002	26.8	3
4	5 18.1	1.002	25.8	5 48.1	1.002	25.8	6 18.1	1.002	25.8	6 48.1	1.002	25.8	7 18.1	1.002	25.8	7 48.1	1.002	25.8	8 18.1	1.002	25.8	8 48.0	1.002	25.8	4
155	5 16.7	1.002	24.9	5 46.7	1.002	24.8	6 16.7	1.002	24.8	6 46.7	1.002	24.8	7 16.7	1.002	24.8	7 46.7	1.002	24.8	8 16.7	1.002	24.8	8 46.7	1.002	24.8	155
6	5 15.5	1.002	23.9	5 45.5	1.002	23.8	6 15.5	1.002	23.8	6 45.4	1.002	23.8	7 15.4	1.002	23.8	7 45.4	1.002	23.8	8 15.4	1.002	23.8	8 45.4	1.002	23.8	6
7	5 14.2	1.002	22.9	5 44.2	1.002	22.9	6 14.2	1.002	22.8	6 44.2	1.002	22.8	7 14.2	1.002	22.8	7 44.2	1.002	22.8	8 14.2	1.002	22.8	8 44.2	1.002	22.8	7
8	5 13.0	1.002	21.9	5 43.0	1.002	21.9	6 13.0	1.002	21.9	6 43.0	1.002	21.8	7 13.0	1.002	21.8	7 43.0	1.002	21.8	8 13.0	1.002	21.8	8 43.0	1.002	21.8	8
9	5 11.9	1.002	20.9	5 41.9	1.002	20.9	6 11.9	1.002	20.9	6 41.9	1.002	20.9	7 11.9	1.002	20.8	7 41.9	1.002	20.8	8 11.8	1.002	20.8	8 41.8	1.002	20.8	9
160	5 10.8	1.002	19.9	5 40.8	1.002	19.9	6 10.8	1.002	19.9	6 40.8	1.002	19.9	7 10.8	1.002	19.8	7 40.8	1.002	19.8	8 10.8	1.002	19.8	8 40.8	1.002	19.8	160
1	5 09.7	1.002	18.9	5 39.7	1.002	18.9	6 09.7	1.002	18.9	6 39.7	1.002	18.9	7 09.7	1.002	18.9	7 39.7	1.002	18.9	8 09.7	1.002	18.8	8 39.7	1.002	18.8	1
2	5 08.8	1.002	17.9	5 38.8	1.002	17.9	6 08.7	1.002	17.9	6 38.7	1.002	17.9	7 08.7	1.002	17.9	7 38.7	1.002	17.9	8 08.7	1.002	17.8	8 38.7	1.002	17.8	2
3	5 07.8	1.001	16.9	5 37.8	1.001	16.9	6 07.8	1.002	16.9	6 37.8	1.001	16.9	7 07.8	1.001	16.9	7 37.8	1.001	16.9	8 07.8	1.001	16.9	8 37.8	1.001	16.8	3
4	5 06.9	1.001	15.9	5 36.9	1.001	15.9	6 06.9	1.001	15.9	6 36.9	1.001	15.9	7 06.9	1.001	15.9	7 36.9	1.001	15.9	8 06.9	1.001	15.9	8 36.9	1.001	15.9	4
165	5 06.1	1.001	14.9	5 36.1	1.001	14.9	6 06.1	1.001	14.9	6 36.1	1.001	14.9	7 06.1	1.001	14.9	7 36.1	1.001	14.9	8 06.1	1.001	14.9	8 36.1	1.001	14.9	165
6	5 05.3	1.001	13.9	5 35.3	1.001	13.9	6 05.3	1.001	13.9	6 35.3	1.001	13.9	7 05.3	1.001	13.9	7 35.3	1.001	13.9	8 05.3	1.001	13.9	8 35.3	1.001	13.9	6
7	5 04.6	1.001	12.9	5 34.6	1.001	12.9	6 04.6	1.001	12.9	6 34.6	1.001	12.9	7 04.6	1.001	12.9	7 34.6	1.001	12.9	8 04.6	1.001	12.9	8 34.6	1.001	12.9	7
8	5 03.9	1.001	11.9	5 33.9	1.001	11.9	6 03.9	1.001	11.9	6 33.9	1.001	11.9	7 03.9	1.001	11.9	7 33.9	1.001	11.9	8 03.9	1.001	11.9	8 33.9	1.001	11.9	8
9	5 03.3	1.001	10.9	5 33.3	1.001	10.9	6 03.3	1.001	10.9	6 33.3	1.001	10.9	7 03.3	1.001	10.9	7 33.3	1.001	10.9	8 03.3	1.001	10.9	8 33.3	1.001	10.9	9
170	5 02.7	1.001	09.9	5 32.7	1.001	09.9	6 02.7	1.001	09.9	6 32.7	1.001	09.9	7 02.7	1.001	09.9	7 32.7	1.001	09.9	8 02.7	1.001	09.9	8 32.7	1.001	09.9	170
1	5 02.2	1.001	08.9	5 32.2	1.001	08.9	6 02.2	1.001	08.9	6 32.2	1.001	08.9	7 02.2	1.001	08.9	7 32.2	1.001	08.9	8 02.2	1.001	08.9	8 32.2	1.001	08.9	1
2	5 01.7	1.001	08.0	5 31.7	1.001	07.9	6 01.7	1.001	07.9	6 31.7	1.001	07.9	7 01.7	1.001	07.9	7 31.7	1.001	07.9	8 01.7	1.001	07.9	8 31.7	1.001	07.9	2
3	5 01.3	1.001	07.0	5 31.3	1.001	07.0	6 01.3	1.001	07.0	6 31.3	1.001	06.9	7 01.3	1.001	06.9	7 31.3	1.001	06.9	8 01.3	1.001	06.9	8 31.3	1.001	06.9	3
4	5 01.0	1.000	06.0	5 31.0	1.000	06.0	6 01.0	1.000	06.0	6 31.0	1.000	06.0	7 01.0	1.000	06.0	7 31.0	1.000	06.0	8 01.0	1.000	05.9	8 31.0	1.000	05.9	4
175	5 00.7	1.000	05.0	5 30.7	1.000	05.0	6 00.7	1.000	05.0	6 30.7	1.000	05.0	7 00.7	1.000	05.0	7 30.7	1.000	05.0	8 00.7	1.000	05.0	8 30.7	1.000	05.0	175
6	5 00.4	1.000	04.0	5 30.4	1.000	04.0	6 00.4	1.000	04.0	6 30.4	1.000	04.0	7 00.4	1.000	04.0	7 30.4	1.000	04.0	8 00.4	1.000	04.0	8 30.4	1.000	04.0	6
7	5 00.2	1.000	03.0	5 30.2	1.000	03.0	6 00.2	1.000	03.0	6 30.2	1.000	03.0	7 00.2	1.000	03.0	7 30.2	1.000	03.0	8 00.2	1.000	03.0	8 30.2	1.000	03.0	7
8	5 00.1	1.000	02.0	5 30.1	1.000	02.0	6 00.1	1.000	02.0	6 30.1	1.000	02.0	7 00.1	1.000	02.0	7 30.1	1.000	02.0	8 00.1	1.000	02.0	8 30.1	1.000	02.0	8
9	5 00.0	1.000	01.0	5 30.0	1.000	01.0	6 00.0	1.000	01.0	6 30.0	1.000	01.0	7 00.0	1.000	01.0	7 30.0	1.000	01.0	8 00.0	1.000	01.0	8 30.0	1.000	01.0	9
180	5 00.0	1.000	00.0	5 30.0	1.000	00.0	6 00.0	1.000	00.0	6 30.0	1.000	00.0	7 00.0	1.000	00.0	7 30.0	1.000	00.0	8 00.0	1.000	00.0	8 30.0	1.000	00.0	180

Lat. 88°

Lat. 89°

Lat. 87°

H.A.	12° 00' Alt.	Δd Δt	Az.	12° 30' Alt.	Δd Δt	Az.	13° 00' Alt.	Δd Δt	Az.	13° 30' Alt.	Δd Δt	Az.	14° 00' Alt.	Δd Δt	Az.	14° 30' Alt.	Δd Δt	Az.	15° 00' Alt.	Δd Δt	Az.	15° 30' Alt.	Δd Δt	Az.	H.A.
00	15 00.0	1.000	180.0	15 30.0	1.000	180.0	16 00.0	1.000	180.0	16 30.0	1.000	180.0	17 00.0	1.000	180.0	17 30.0	1.000	180.0	18 00.0	1.000	180.0	18 30.0	1.000	180.0	00
1	15 00.0	1.000	179.0	15 30.0	1.000	179.0	16 00.0	1.000	179.0	16 30.0	1.000	179.0	17 00.0	1.000	179.0	17 30.0	1.000	179.0	18 00.0	1.000	179.0	18 30.0	1.000	179.0	1
2	14 59.9	1.000	178.0	15 29.9	1.000	178.0	15 59.9	1.000	178.0	16 29.9	1.000	178.0	16 59.9	1.000	178.0	17 29.9	1.000	178.0	17 59.9	1.000	178.0	18 29.9	1.000	178.0	2
3	14 59.8	1.000	177.0	15 29.7	1.000	177.0	15 59.7	1.000	177.0	16 29.7	1.000	177.0	16 59.7	1.000	177.0	17 29.7	1.000	177.0	17 59.7	1.000	177.0	18 29.7	1.000	177.0	3
4	14 59.6	1.000	175.9	15 29.6	1.000	175.9	15 59.6	1.000	175.9	16 29.6	1.000	175.9	16 59.6	1.000	175.9	17 29.6	1.000	175.9	17 59.6	1.000	175.9	18 29.6	1.000	175.9	4
05	14 59.3	1.000	174.9	15 29.3	1.000	174.9	15 59.3	1.000	174.9	16 29.3	1.000	174.9	16 59.3	1.000	174.9	17 29.3	1.000	174.9	17 59.3	1.000	174.9	18 29.3	1.000	174.9	05
6	14 59.0	1.001	173.9	15 29.0	1.001	173.9	15 59.0	1.001	173.9	16 29.0	1.001	173.9	16 59.0	1.001	173.9	17 29.0	1.001	173.9	17 59.0	1.001	173.9	18 29.0	1.001	173.9	6
7	14 58.6	1.001	172.9	15 28.6	1.001	172.9	15 58.6	1.001	172.9	16 28.6	1.001	172.9	16 58.6	1.001	172.9	17 28.6	1.001	172.9	17 58.6	1.001	172.9	18 28.6	1.001	172.9	7
8	14 58.2	1.001	171.9	15 28.2	1.001	171.9	15 58.2	1.001	171.9	16 28.2	1.001	171.9	16 58.2	1.001	171.9	17 28.2	1.001	171.9	17 58.2	1.001	171.9	18 28.2	1.001	171.9	8
9	14 57.8	1.001	170.9	15 27.8	1.001	170.9	15 57.8	1.001	170.9	16 27.8	1.001	170.9	16 57.8	1.001	170.9	17 27.8	1.001	170.9	17 57.8	1.001	170.9	18 27.7	1.001	170.9	9
10	14 57.2	1.001	169.9	15 27.2	1.001	169.9	15 57.2	1.001	169.9	16 27.2	1.001	169.9	16 57.2	1.001	169.9	17 27.2	1.001	169.8	17 57.2	1.001	169.8	18 27.2	1.001	169.8	10
1	14 56.7	1.001	168.9	15 26.7	1.001	168.9	15 56.6	1.001	168.9	16 26.6	1.001	168.8	16 56.6	1.001	168.8	17 26.6	1.001	168.8	17 56.6	1.001	168.8	18 26.6	1.001	168.8	1
2	14 56.0	1.001	167.8	15 26.0	1.001	167.8	15 56.0	1.001	167.8	16 26.0	1.001	167.8	16 56.0	1.001	167.8	17 26.0	1.001	167.8	17 56.0	1.001	167.8	18 26.0	1.001	167.8	2
3	14 55.3	1.001	166.8	15 25.3	1.001	166.8	15 55.3	1.001	166.8	16 25.3	1.001	166.8	16 55.3	1.001	166.8	17 25.3	1.001	166.8	17 55.3	1.001	166.8	18 25.3	1.001	166.8	3
4	14 54.6	1.001	165.8	15 24.6	1.001	165.8	15 54.6	1.001	165.8	16 24.6	1.001	165.8	16 54.6	1.001	165.8	17 24.6	1.001	165.8	17 54.6	1.001	165.8	18 24.6	1.001	165.8	4
15	14 53.8	1.001	164.8	15 23.8	1.001	164.8	15 53.8	1.001	164.8	16 23.8	1.001	164.8	16 53.8	1.001	164.8	17 23.8	1.001	164.8	17 53.8	1.001	164.8	18 23.8	1.001	164.8	15
6	14 52.9	1.002	163.8	15 22.9	1.002	163.8	15 52.9	1.002	163.8	16 22.9	1.002	163.8	16 52.9	1.002	163.8	17 22.9	1.002	163.8	17 52.9	1.002	163.8	18 22.9	1.002	163.7	6
7	14 52.0	1.002	162.8	15 22.0	1.002	162.8	15 52.0	1.002	162.8	16 22.0	1.002	162.8	16 52.0	1.002	162.7	17 22.0	1.002	162.7	17 52.0	1.002	162.7	18 22.0	1.002	162.7	7
8	14 51.1	1.002	161.8	15 21.1	1.002	161.8	15 51.1	1.002	161.8	16 21.1	1.002	161.8	16 51.1	1.002	161.7	17 21.1	1.002	161.7	17 51.1	1.002	161.7	18 21.1	1.002	161.7	8
9	14 50.1	1.002	160.8	15 20.1	1.002	160.8	15 50.1	1.002	160.7	16 20.1	1.002	160.7	16 50.1	1.002	160.7	17 20.1	1.002	160.7	17 50.0	1.002	160.7	18 20.0	1.002	160.7	9
20	14 49.0	1.002	159.8	15 19.0	1.002	159.7	15 49.0	1.002	159.7	16 19.0	1.002	159.7	16 49.0	1.002	159.7	17 19.0	1.002	159.7	17 49.0	1.002	159.7	18 19.0	1.002	159.7	20
1	14 47.9	1.002	158.7	15 17.9	1.002	158.7	15 47.9	1.002	158.7	16 17.9	1.002	158.7	16 47.9	1.002	158.7	17 17.9	1.002	158.7	17 47.9	1.002	158.7	18 17.9	1.002	158.7	1
2	14 46.7	1.002	157.7	15 16.7	1.002	157.7	15 46.7	1.002	157.7	16 16.7	1.002	157.7	16 46.7	1.002	157.7	17 16.7	1.002	157.7	17 46.7	1.002	157.7	18 16.7	1.002	157.7	2
3	14 45.5	1.002	156.7	15 15.5	1.002	156.7	15 45.5	1.002	156.7	16 15.5	1.002	156.7	16 45.5	1.002	156.7	17 15.5	1.002	156.7	17 45.5	1.002	156.7	18 15.5	1.002	156.6	3
4	14 44.3	1.002	155.7	15 14.3	1.002	155.7	15 44.2	1.002	155.7	16 14.2	1.002	155.7	16 44.2	1.002	155.7	17 14.2	1.002	155.7	17 44.2	1.002	155.6	18 14.2	1.002	155.6	4
25	14 42.9	1.002	154.7	15 12.9	1.002	154.7	15 42.9	1.002	154.7	16 12.9	1.002	154.7	16 42.9	1.002	154.6	17 12.9	1.002	154.6	17 42.9	1.002	154.6	18 12.9	1.002	154.6	25
6	14 41.6	1.002	153.7	15 11.6	1.002	153.7	15 41.6	1.002	153.7	16 11.5	1.002	153.6	16 41.5	1.002	153.6	17 11.5	1.002	153.6	17 41.5	1.002	153.6	18 11.5	1.002	153.6	6
7	14 40.2	1.002	152.7	15 10.1	1.002	152.7	15 40.1	1.002	152.6	16 10.1	1.002	152.6	16 40.1	1.002	152.6	17 10.1	1.002	152.6	17 40.1	1.002	152.6	18 10.1	1.002	152.6	7
8	14 38.7	1.003	151.7	15 08.7	1.003	151.7	15 38.7	1.003	151.6	16 08.7	1.003	151.6	16 38.7	1.003	151.6	17 08.6	1.003	151.6	17 38.6	1.003	151.6	18 08.6	1.003	151.6	8
9	14 37.2	1.003	150.7	15 07.2	1.003	150.6	15 37.2	1.003	150.6	16 07.1	1.003	150.6	16 37.1	1.003	150.6	17 07.1	1.003	150.6	17 37.1	1.003	150.6	18 07.1	1.003	150.6	9
30	14 35.6	1.003	149.6	15 05.6	1.003	149.6	15 35.6	1.003	149.6	16 05.6	1.003	149.6	16 35.6	1.003	149.6	17 05.6	1.003	149.6	17 35.5	1.003	149.6	18 05.5	1.003	149.5	30
1	14 34.0	1.003	148.6	15 04.0	1.003	148.6	15 34.0	1.003	148.6	16 04.0	1.003	148.6	16 34.0	1.003	148.6	17 03.9	1.003	148.6	17 33.9	1.003	148.5	18 03.9	1.003	148.5	1
2	14 32.3	1.003	147.6	15 02.3	1.003	147.6	15 32.3	1.003	147.6	16 02.3	1.003	147.6	16 32.3	1.003	147.6	17 02.3	1.003	147.5	17 32.3	1.003	147.5	18 02.3	1.003	147.5	2
3	14 30.6	1.003	146.6	15 00.6	1.003	146.6	15 30.6	1.003	146.6	16 00.6	1.003	146.6	16 30.6	1.003	146.6	17 00.6	1.003	146.5	17 30.6	1.003	146.5	18 00.5	1.003	146.5	3
4	14 28.9	1.003	145.6	14 58.9	1.003	145.6	15 28.9	1.003	145.6	15 58.8	1.003	145.6	16 28.8	1.003	145.5	16 58.8	1.003	145.5	17 28.8	1.003	145.5	17 58.8	1.003	145.5	4
35	14 27.1	1.003	144.6	14 57.1	1.003	144.6	15 27.1	1.003	144.6	15 57.0	1.003	144.5	16 27.0	1.003	144.5	16 57.0	1.003	144.5	17 27.0	1.003	144.5	17 57.0	1.003	144.5	35
6	14 25.2	1.003	143.6	14 55.2	1.003	143.6	15 25.2	1.003	143.6	15 55.2	1.003	143.6	16 25.2	1.003	143.5	16 55.2	1.003	143.5	17 25.2	1.003	143.5	17 55.1	1.003	143.5	6
7	14 23.4	1.003	142.6	14 53.3	1.003	142.6	15 23.3	1.003	142.5	15 53.3	1.003	142.5	16 23.3	1.003	142.5	16 53.3	1.003	142.5	17 23.3	1.003	142.5	17 53.3	1.003	142.5	7
8	14 21.4	1.003	141.6	14 51.4	1.003	141.5	15 21.4	1.003	141.5	15 51.4	1.003	141.5	16 21.4	1.003	141.5	16 51.4	1.003	141.5	17 21.3	1.003	141.5	17 51.3	1.003	141.4	8
9	14 19.5	1.003	140.6	14 49.4	1.003	140.5	15 19.4	1.003	140.5	15 49.4	1.003	140.5	16 19.4	1.003	140.5	16 49.4	1.003	140.5	17 19.4	1.003	140.4	17 49.3	1.003	140.4	9
40	14 17.4	1.003	139.5	14 47.4	1.003	139.5	15 17.4	1.003	139.5	15 47.4	1.003	139.5	16 17.4	1.003	139.5	16 47.4	1.003	139.5	17 17.3	1.003	139.4	17 47.3	1.003	139.4	40
1	14 15.4	1.004	138.5	14 45.4	1.004	138.5	15 15.3	1.004	138.5	15 45.3	1.004	138.5	16 15.3	1.004	138.5	16 45.3	1.004	138.4	17 15.3	1.004	138.4	17 45.3	1.004	138.4	1
2	14 13.3	1.004	137.5	14 43.3	1.004	137.5	15 13.2	1.004	137.5	15 43.2	1.004	137.5	16 13.2	1.004	137.5	16 43.2	1.004	137.4	17 13.2	1.004	137.4	17 43.1	1.004	137.4	2
3	14 11.1	1.004	136.5	14 41.1	1.004	136.5	15 11.1	1.004	136.5	15 41.1	1.004	136.5	16 11.1	1.004	136.4	16 41.0	1.004	136.4	17 11.0	1.004	136.4	17 41.0	1.004	136.4	3
4	14 09.0	1.004	135.5	14 38.9	1.004	135.5	15 08.9	1.004	135.5	15 38.9	1.004	135.5	16 08.9	1.004	135.4	16 38.9	1.004	135.4	17 08.8	1.004	135.4	17 38.8	1.004	135.4	4
45	14 06.7	1.004	134.5	14 36.7	1.004	134.5	15 06.7	1.004	134.4	15 36.7	1.004	134.4	16 06.7	1.004	134.4	16 36.6	1.004	134.4	17 06.6	1.004	134.4	17 36.6	1.004	134.3	45
6	14 04.5	1.004	133.5	14 34.5	1.004	133.5	15 04.4	1.004	133.5	15 34.4	1.004	133.4	16 04.4	1.004	133.4	16 34.4	1.004	133.4	17 04.3	1.004	133.4	17 34.3	1.004	133.4	6
7	14 02.2	1.004	132.5	14 32.2	1.004	132.5	15 02.1	1.004	132.4	15 32.1	1.004	132.4	16 02.1	1.004	132.4	16 32.1	1.004	132.4	17 02.0	1.004	132.4	17 32.0	1.004	132.3	7
8	13 59.9	1.004	131.5	14 29.8	1.004	131.5	14 59.8	1.004	131.4	15 29.8	1.004	131.4	15 59.8	1.004	131.4	16 29.7	1.004	131.4	16 59.7	1.004	131.4	17 29.7	1.004	131.3	8
9	13 57.5	1.004	130.5	14 27.5	1.004	130.5	14 57.4	1.004	130.4	15 27.4	1.004	130.4	15 57.4	1.004	130.4	16 27.4	1.004	130.4	16 57.3	1.004	130.3	17 27.3	1.004	130.3	9
50	13 55.1	1.004	129.5	14 25.1	1.004	129.4	14 55.0	1.004	129.4	15 25.0	1.004	129.4	15 55.0	1.004	129.4	16 24.9	1.004	129.4	16 54.9	1.004	129.3	17 24.9	1.004	129.3	50
1	13 52.6	1.004	128.5	14 22.6	1.004	128.4	14 52.6	1.004	128.4	15 22.6	1.004	128.4	15 52.5	1.004	128.4	16 22.5	1.004	128.3	16 52.5	1.004	128.3	17 22.4	1.004	128.3	1
2	13 50.2	1.004	127.5	14 20.1	1.004	127.4	14 50.1	1.004	127.4	15 20.1	1.004	127.4	15 50.1	1.004	127.4	16 20.0	1.004	127.3	16 50.0	1.004	127.3	17 20.0	1.004	127.3	2
3	13 47.7	1.004	126.4	14 17.6	1.004	126.4	14 47.6	1.004	126.4	15 17.6	1.004	126.4	15 47.5	1.004	126.4	16 17.5	1.004	126.3	16 47.5	1.004	126.3	17 17.5	1.004	126.3	3
4	13 45.1	1.004	125.4	14 15.1	1.004	125.4	14 45.1	1.004	125.4	15 15.0	1.004	125.4	15 45.0	1.004	125.4	16 15.0	1.004	125.3	16 44.9	1.004	125.3	17 14.9	1.004	125.3	4
55	13 42.5	1.004	124.4	14 12.5	1.004	124.4	14 42.5	1.004	124.4	15 12.4	1.004	124.4	15 42.4	1.004	124.3	16 12.4	1.004	124.3	16 42.4	1.004	124.3	17 12.3	1.004	124.3	55
6	13 39.9	1.004	123.4	14 09.9	1.004	123.4	14 39.9	1.004	123.4	15 09.8	1.004	123.4	15 39.8	1.004	123.3	16 09.8	1.004	123.3	16 39.7	1.004	123.3	17 09.7	1.004	123.3	6
7	13 37.3	1.004	122.4	14 07.3	1.004	122.4	14 37.2	1.004	122.4	15 07.2	1.004	122.4	15 37.2	1.004	122.3	16 07.1	1.004	122.3	16 37.1	1.004	122.3	17 07.1	1.004	122.3	7
8	13 34.6	1.004	121.4	14 04.6	1.004	121.4	14 34.6	1.004	121.4	15 04.5	1.004	121.4	15 34.5	1.004	121.3	16 04.5	1.004	121.3	16 34.4	1.004	121.3	17 04.4	1.004	121.3	8
9	13 31.9	1.005	120.4	14 01.9	1.005	120.4	14 31.9	1.005	120.4	15 01.8	1.005	120.3	15 31.8	1.005	120.3	16 01.8	1.005	120.3	16 31.7	1.005	120.3	17 01.7	1.005	120.2	9
60	13 29.2	1.005	119.4	13 59.2	1.005	119.4	14 29.1	1.005	119.4	14 59.1	1.005	119.3	15 29.1	1.005	119.3	15 59.0	1.005	119.3	16 29.0	1.005	119.3	16 59.0	1.005	119.2	60
1	13 26.5	1.005	118.4	13 56.4	1.005	118.4	14 26.4	1.005	118.4	14 56.4	1.005	118.3	15 26.3	1.005	118.3	15 56.3	1.005	118.3	16 26.3	1.005	118.3	16 56.2	1.005	118.2	1
2	13 23.7	1.005	117.4	13 53.7	1.005	117.4	14 23.6	1.005	117.4	14 53.6	1.005	117.3	15 23.6	1.005	117.3	15 53.5	1.005	117.3	16 23.5	1.005	117.2	16 53.4	1.005	117.2	2
3	13 20.9	1.005	116.4	13 50.9	1.005	116.4	14 20.8	1.005	116.4	14 50.8	1.005	116.3	15 20.8	1.005	116.3	15 50.7	1.005	116.3	16 20.7	1.005	116.2	16 50.6	1.005	116.2	3
4	13 18.1	1.005	115.4	13 48.0	1.005	115.4	14 18.0	1.005	115.3	14 48.0	1.005	115.3	15 17.9	1.005	115.3	15 47.9	1.005	115.3	16 17.9	1.005	115.2	16 47.8	1.005	115.2	4
65	13 15.2	1.005	114.4	13 45.2	1.005	114.4	14 15.1	1.005	114.3	14 45.1	1.005	114.3	15 15.1	1.005	114.3	15 45.0	1.005	114.3	16 15.0	1.005	114.2	16 45.0	1.005	114.2	65
6	13 12.3	1.005	113.4	13 42.3	1.005	113.4	14 12.3	1.005	113.3	14 42.2	1.005	113.3	15 12.2	1.005	113.3	15 42.2	1.005	113.3	16 12.1	1.005	113.2	16 42.1	1.005	113.2	6
7	13 09.5	1.005	112.4	13 39.4	1.005	112.4	14 09.4	1.005	112.3	14 39.3	1.005	112.3	15 09.3	1.005	112.3	15 39.3	1.005	112.2	16 09.2	1.005	112.2	16 39.2	1.005	112.2	7
8	13 06.5	1.005	111.4	13 36.5	1.005	111.4	14 06.5	1.005	111.3	14 36.4	1.005	111.3	15 06.4	1.005	111.3	15 36.3	1.005	111.2	16 06.3	1.005	111.2	16 36.3	1.005	111.2	8
9	13 03.6	1.005	110.4	13 33.6	1.005	110.4	14 03.5	1.005	110.3	14 33.5	1.005	110.3	15 03.5	1.005	110.3	15 33.4	1.005	110.2	16 03.4	1.005	110.2	16 33.3	1.005	110.2	9
70	13 00.7	1.005	109.4	13 30.6	1.005	109.3	14 00.6	1.005	109.3	14 30.5	1.005	109.3	15 00.5	1.005	109.3	15 30.5	1.005	109.2	16 00.4	1.005	109.2	16 30.4	1.005	109.2	70
1	12 57.7	1.005	108.4	13 27.6	1.005	108.3	13 57.6	1.005	108.3	14 27.6	1.005	108.3	14 57.5	1.005	108.3	15 27.5	1.005	108.2	15 57.4	1.005	108.2	16 27.4	1.005	108.2	1
2	12 54.7	1.005	107.4	13 24.7	1.005	107.3	13 54.6	1.005	107.3	14 24.6	1.005	107.3	14 54.5	1.005	107.3	15 24.5	1.005	107.2	15 54.5	1.005	107.2	16 24.4	1.005	107.2	2
3	12 51.7	1.005	106.4	13 21.6	1.005	106.3	13 51.6	1.005	106.3	14 21.6	1.005	106.3	14 51.5	1.005	106.3	15 21.5	1.005	106.2	15 51.4	1.005	106.2	16 21.4	1.005	106.2	3
4	12 48.7	1.005	105.4	13 18.6	1.005	105.3	13 48.6	1.005	105.3	14 18.5	1.005	105.3	14 48.5	1.005	105.3	15 18.5	1.005	105.2	15 48.4	1.005	105.2	16 18.4	1.005	105.2	4
75	12 45.6	1.005	104.4	13 15.6	1.005	104.3	13 45.5	1.005	104.3	14 15.5	1.005	104.3	14 45.5	1.005	104.3	15 15.4	1.005	104.2	15 45.4	1.005	104.2	16 15.3	1.005	104.2	75
6	12 42.6	1.005	103.4	13 12.5	1.005	103.3	13 42.5	1.005	103.3	14 12.5	1.005	103.3	14 42.4	1.005	103.3	15 12.4	1.005	103.2	15 42.3	1.005	103.2	16 12.3	1.005	103.2	6
7	12 39.5	1.005	102.4	13 09.5	1.005	102.3	13 39.4	1.005	102.3	14 09.4	1.005	102.3	14 39.4	1.005	102.2	15 09.3	1.005	102.2	15 39.3	1.005	102.2	16 09.2	1.005	102.2	7
8	12 36.4	1.005	101.4	13 06.4	1.005	101.3	13 36.4	1.005	101.3	14 06.3	1.005	101.3	14 36.3	1.005	101.2	15 06.2	1.005	101.2	15 36.2	1.005	101.2	16 06.2	1.005	101.2	8
9	12 33.4	1.005	100.4	13 03.3	1.005	100.3	13 33.3	1.005	100.3	14 03.2	1.005	100.3	14 33.2	1.005	100.3	15 03.2	1.005	100.2	15 33.1	1.005	100.2	16 03.1	1.005	100.2	9
80	12 30.3	1.005	99.4	13 00.2	1.005	99.3	13 30.2	1.005	99.3	14 00.1	1.005	99.3	14 30.1	1.005	99.2	15 00.1	1.005	99.2	15 30.0	1.005	99.2	16 00.0	1.005	99.2	80
1	12 27.2	1.005	98.4	12 57.1	1.005	98.3	13 27.1	1.005	98.3	13 57.0	1.005	98.3	14 27.0	1.005	98.2	14 57.0	1.005	98.2	15 26.9	1.005	98.2	15 56.9	1.005	98.2	1
2	12 24.1	1.005	97.4	12 54.0	1.005	97.3	13 24.0	1.005	97.3	13 53.9	1.005	97.3	14 23.9	1.005	97.2	14 53.8	1.005	97.2	15 23.8	1.005	97.2	15 53.8	1.005	97.2	2
3	12 20.9	1.005	96.4	12 50.9	1.005	96.3	13 20.9	1.005	96.3	13 50.8	1.005	96.3	14 20.8	1.005	96.2	14 50.7	1.005	96.2	15 20.7	1.005	96.2	15 50.6	1.005	96.2	3
4	12 17.8	1.005	95.4	12 47.8	1.005	95.3	13 17.7	1.005	95.3	13 47.7	1.005	95.3	14 17.6	1.005	95.2	14 47.6	1.005	95.2	15 17.6	1.005	95.2	15 47.5	1.005	95.2	4
85	12 14.7	1.005	94.4	12 44.6	1.005	94.3	13 14.6	1.005	94.3	13 44.6	1.005	94.3	14 14.5	1.005	94.2	14 44.5	1.005	94.2	15 14.4	1.005	94.2	15 44.4	1.005	94.2	85
6	12 11.6	1.005	93.4	12 41.5	1.005	93.3	13 11.5	1.005	93.3	13 41.4	1.005	93.3	14 11.4	1.005	93.2	14 41.3	1.005	93.2	15 11.3	1.005	93.2	15 41.2	1.005	93.2	6
7	12 08.4	1.005	92.4	12 38.4	1.005	92.3	13 08.3	1.005	92.3	13 38.3	1.005	92.3	14 08.2	1.005	92.2	14 38.2	1.005	92.2	15 08.2	1.005	92.2	15 38.1	1.005	92.2	7
8	12 05.3	1.005	91.4	12 35.2	1.005	91.3	13 05.2	1.005	91.3	13 35.1	1.005	91.3	14 05.1	1.005	91.2	14 35.1	1.005	91.2	15 05.0	1.005	91.2	15 35.0	1.005	91.2	8
9	12 02.1	1.005	90.4	12 32.1	1.005	90.3	13 02.1	1.005	90.3	13 32.0	1.005	90.3	14 02.0	1.005	90.3	14 31.9	1.005	90.2	15 01.9	1.005	90.2	15 31.8	1.005	90.2	9
90	11 59.0	1.005	89.4	12 29.0	1.005	89.3	12 58.9	1.005	89.3	13 28.9	1.005	89.3	13 58.8	1.005	89.3	14 28.8	1.005	89.2	14 58.7	1.005	89.2	15 28.7	1.005	89.2	90

Lat. 87°

H.A.	12° 00' Alt.	Δd Δt	Az.	12° 30' Alt.	Δd Δt	Az.	13° 00' Alt.	Δd Δt	Az.	13° 30' Alt.	Δd Δt	Az.	14° 00' Alt.	Δd Δt	Az.	14° 30' Alt.	Δd Δt	Az.	15° 00' Alt.	Δd Δt	Az.	15° 30' Alt.	Δd Δt	Az.	H.A.
91	11 55.9	1.005	88.4	12 25.8	1.005	88.3	12 55.8	1.005	88.3	13 25.7	1.005	88.3	13 55.7	1.005	88.3	14 25.6	1.005	88.2	14 55.6	1.005	88.2	15 25.6	1.005	88.2	91
2	11 52.7	1.005	87.4	12 22.7	1.005	87.3	12 52.6	1.005	87.3	13 22.6	1.005	87.3	13 52.5	1.005	87.3	14 22.5	1.005	87.2	14 52.5	1.005	87.2	15 22.4	1.005	87.2	2
3	11 49.6	1.005	86.4	12 19.5	1.005	86.3	12 49.5	1.005	86.3	13 19.5	1.005	86.3	13 49.4	1.005	86.3	14 19.4	1.005	86.2	14 49.3	1.005	86.2	15 19.3	1.005	86.2	3
4	11 46.5	1.005	85.4	12 16.4	1.005	85.3	12 46.4	1.005	85.3	13 16.3	1.005	85.3	13 46.3	1.005	85.3	14 16.2	1.005	85.2	14 46.2	1.005	85.2	15 16.2	1.005	85.2	4
95	11 43.3	1.005	84.4	12 13.3	1.005	84.3	12 43.2	1.005	84.3	13 13.2	1.005	84.3	13 43.2	1.005	84.3	14 13.1	1.005	84.2	14 43.1	1.005	84.2	15 13.0	1.005	84.2	95
6	11 40.2	1.005	83.4	12 10.2	1.005	83.3	12 40.1	1.005	83.3	13 10.1	1.005	83.3	13 40.1	1.005	83.3	14 10.0	1.005	83.2	14 39.9	1.005	83.2	15 09.9	1.005	83.2	6
7	11 37.1	1.005	82.4	12 07.0	1.005	82.4	12 37.0	1.005	82.3	13 07.0	1.005	82.3	13 36.9	1.005	82.3	14 06.9	1.005	82.2	14 36.8	1.005	82.2	15 06.8	1.005	82.2	7
8	11 34.0	1.005	81.4	12 03.9	1.005	81.4	12 33.9	1.005	81.3	13 03.9	1.005	81.3	13 33.8	1.005	81.3	14 03.8	1.005	81.2	14 33.7	1.005	81.2	15 03.7	1.005	81.2	8
9	11 30.9	1.005	80.4	12 00.8	1.005	80.4	12 30.8	1.005	80.3	13 00.8	1.005	80.3	13 30.7	1.005	80.3	14 00.7	1.005	80.2	14 30.6	1.005	80.2	15 00.6	1.005	80.2	9
100	11 27.8	1.005	79.4	11 57.7	1.005	79.4	12 27.7	1.005	79.3	12 57.7	1.005	79.3	13 27.6	1.005	79.3	13 57.6	1.005	79.3	14 27.5	1.005	79.2	14 57.5	1.005	79.2	100
1	11 24.6	1.005	78.4	11 54.7	1.005	78.4	12 24.6	1.005	78.3	12 54.6	1.005	78.3	13 24.5	1.005	78.3	13 54.5	1.005	78.3	14 24.5	1.005	78.2	14 54.4	1.005	78.2	1
2	11 21.6	1.005	77.4	11 51.6	1.005	77.4	12 21.6	1.005	77.3	12 51.5	1.005	77.3	13 21.5	1.005	77.3	13 51.4	1.005	77.3	14 21.4	1.005	77.2	14 51.3	1.005	77.2	2
3	11 18.6	1.005	76.4	11 48.5	1.005	76.4	12 18.5	1.005	76.3	12 48.5	1.005	76.3	13 18.4	1.005	76.3	13 48.4	1.005	76.3	14 18.3	1.005	76.2	14 48.3	1.005	76.2	3
4	11 15.5	1.005	75.4	11 45.5	1.005	75.4	12 15.5	1.005	75.3	12 45.4	1.005	75.3	13 15.4	1.005	75.3	13 45.3	1.005	75.3	14 15.3	1.005	75.2	14 45.2	1.005	75.2	4
105	11 12.5	1.005	74.4	11 42.5	1.005	74.4	12 12.4	1.005	74.4	12 42.4	1.005	74.3	13 12.3	1.005	74.3	13 42.3	1.005	74.3	14 12.3	1.005	74.2	14 42.2	1.005	74.2	105
6	11 09.5	1.005	73.4	11 39.4	1.005	73.4	12 09.4	1.005	73.4	12 39.4	1.005	73.3	13 09.3	1.005	73.3	13 39.3	1.005	73.3	14 09.2	1.005	73.3	14 39.2	1.005	73.2	6
7	11 06.5	1.005	72.4	11 36.4	1.005	72.4	12 06.4	1.005	72.4	12 36.4	1.005	72.3	13 06.3	1.005	72.3	13 36.3	1.005	72.3	14 06.2	1.005	72.3	14 36.2	1.005	72.2	7
8	11 03.5	1.005	71.4	11 33.5	1.005	71.4	12 03.4	1.005	71.4	12 33.4	1.005	71.3	13 03.3	1.005	71.3	13 33.3	1.005	71.3	14 03.3	1.005	71.3	14 33.2	1.005	71.2	8
9	11 00.5	1.005	70.4	11 30.5	1.005	70.4	12 00.5	1.005	70.4	12 30.4	1.005	70.3	13 00.4	1.005	70.3	13 30.3	1.005	70.3	14 00.3	1.005	70.3	14 30.3	1.005	70.2	9
110	10 57.6	1.005	69.4	11 27.5	1.005	69.4	11 57.5	1.005	69.4	12 27.5	1.005	69.4	12 57.4	1.005	69.3	13 27.4	1.005	69.3	13 57.4	1.005	69.3	14 27.3	1.005	69.2	110
1	10 54.6	1.005	68.4	11 24.6	1.005	68.4	11 54.6	1.005	68.4	12 24.5	1.005	68.4	12 54.5	1.005	68.3	13 24.5	1.005	68.3	13 54.4	1.005	68.3	14 24.4	1.005	68.3	1
2	10 51.7	1.005	67.4	11 21.7	1.005	67.4	11 51.7	1.005	67.4	12 21.6	1.005	67.4	12 51.6	1.005	67.3	13 21.6	1.005	67.3	13 51.5	1.005	67.3	14 21.5	1.005	67.3	2
3	10 48.8	1.005	66.4	11 18.8	1.005	66.4	11 48.8	1.005	66.4	12 18.7	1.005	66.4	12 48.7	1.005	66.3	13 18.7	1.005	66.3	13 48.6	1.005	66.3	14 18.6	1.005	66.3	3
4	10 46.0	1.005	65.4	11 15.9	1.005	65.4	11 45.9	1.005	65.4	12 15.9	1.005	65.4	12 45.8	1.005	65.4	13 15.8	1.005	65.3	13 45.8	1.005	65.3	14 15.7	1.005	65.3	4
115	10 43.1	1.005	64.5	11 13.1	1.005	64.4	11 43.1	1.005	64.4	12 13.0	1.005	64.4	12 43.0	1.005	64.4	13 13.0	1.005	64.3	13 42.9	1.005	64.3	14 12.9	1.005	64.3	115
6	10 40.3	1.005	63.5	11 10.3	1.005	63.4	11 40.2	1.005	63.4	12 10.2	1.005	63.4	12 40.2	1.005	63.4	13 10.1	1.005	63.3	13 40.1	1.005	63.3	14 10.1	1.005	63.3	6
7	10 37.5	1.005	62.5	11 07.5	1.005	62.4	11 37.5	1.005	62.4	12 07.4	1.005	62.4	12 37.4	1.005	62.4	13 07.3	1.005	62.3	13 37.3	1.005	62.3	14 07.3	1.005	62.3	7
8	10 34.7	1.005	61.5	11 04.7	1.005	61.4	11 34.7	1.005	61.4	12 04.6	1.005	61.4	12 34.6	1.005	61.4	13 04.6	1.005	61.4	13 34.5	1.005	61.3	14 04.5	1.005	61.3	8
9	10 32.0	1.005	60.5	11 02.0	1.005	60.5	11 31.9	1.005	60.4	12 01.9	1.005	60.4	12 31.9	1.005	60.4	13 01.8	1.005	60.4	13 31.8	1.005	60.3	14 01.8	1.005	60.3	9
120	10 29.3	1.004	59.5	10 59.3	1.004	59.5	11 29.2	1.004	59.4	11 59.2	1.004	59.4	12 29.2	1.004	59.4	12 59.1	1.004	59.4	13 29.1	1.004	59.3	13 59.1	1.004	59.3	120
1	10 26.6	1.004	58.5	10 56.6	1.004	58.5	11 26.5	1.004	58.4	11 56.5	1.004	58.4	12 26.5	1.004	58.4	12 56.4	1.004	58.4	13 26.4	1.004	58.4	13 56.4	1.004	58.3	1
2	10 23.9	1.004	57.5	10 53.9	1.004	57.5	11 23.9	1.004	57.5	11 53.8	1.004	57.4	12 23.8	1.004	57.4	12 53.8	1.004	57.4	13 23.7	1.004	57.4	13 53.7	1.004	57.3	2
3	10 21.3	1.004	56.5	10 51.3	1.004	56.5	11 21.2	1.004	56.5	11 51.2	1.004	56.4	12 21.2	1.004	56.4	12 51.1	1.004	56.4	13 21.1	1.004	56.4	13 51.1	1.004	56.3	3
4	10 18.7	1.004	55.5	10 48.7	1.004	55.5	11 18.6	1.004	55.5	11 48.6	1.004	55.4	12 18.6	1.004	55.4	12 48.5	1.004	55.4	13 18.5	1.004	55.4	13 48.5	1.004	55.4	4
125	10 16.1	1.004	54.5	10 46.1	1.004	54.5	11 16.1	1.004	54.5	11 46.0	1.004	54.5	12 16.0	1.004	54.4	12 46.0	1.004	54.4	13 15.9	1.004	54.4	13 45.9	1.004	54.4	125
6	10 13.6	1.004	53.5	10 43.6	1.004	53.5	11 13.5	1.004	53.5	11 43.5	1.004	53.5	12 13.5	1.004	53.4	12 43.4	1.004	53.4	13 13.4	1.004	53.4	13 43.4	1.004	53.4	6
7	10 11.1	1.004	52.5	10 41.0	1.004	52.5	11 11.0	1.004	52.5	11 41.0	1.004	52.5	12 11.0	1.004	52.4	12 40.9	1.004	52.4	13 10.9	1.004	52.4	13 40.9	1.004	52.4	7
8	10 08.6	1.004	51.5	10 38.6	1.004	51.5	11 08.5	1.004	51.5	11 38.5	1.004	51.5	12 08.5	1.004	51.4	12 38.5	1.004	51.4	13 08.4	1.004	51.4	13 38.4	1.004	51.4	8
9	10 06.2	1.004	50.5	10 36.1	1.004	50.5	11 06.1	1.004	50.5	11 36.1	1.004	50.5	12 06.0	1.004	50.5	12 36.0	1.004	50.4	13 06.0	1.004	50.4	13 36.0	1.004	50.4	9
130	10 03.7	1.004	49.6	10 33.7	1.004	49.5	11 03.7	1.004	49.5	11 33.7	1.004	49.5	12 03.6	1.004	49.5	12 33.6	1.004	49.4	13 03.6	1.004	49.4	13 33.6	1.004	49.4	130
1	10 01.4	1.004	48.6	10 31.3	1.004	48.5	11 01.3	1.004	48.5	11 31.3	1.004	48.5	12 01.3	1.004	48.5	12 31.3	1.004	48.5	13 01.2	1.004	48.4	13 31.2	1.004	48.4	1
2	9 59.0	1.004	47.6	10 29.0	1.004	47.5	10 59.0	1.004	47.5	11 29.0	1.004	47.5	11 58.9	1.004	47.5	12 28.9	1.004	47.5	12 58.9	1.004	47.4	13 28.9	1.004	47.4	2
3	9 56.7	1.004	46.6	10 26.7	1.004	46.6	10 56.7	1.004	46.5	11 26.7	1.004	46.5	11 56.6	1.004	46.5	12 26.6	1.004	46.5	12 56.6	1.004	46.5	13 26.6	1.004	46.4	3
4	9 54.5	1.004	45.6	10 24.5	1.004	45.6	10 54.4	1.004	45.5	11 24.4	1.004	45.5	11 54.4	1.004	45.5	12 24.3	1.004	45.5	12 54.3	1.004	45.5	13 24.3	1.004	45.4	4
135	9 52.3	1.004	44.6	10 22.2	1.004	44.6	10 52.2	1.004	44.6	11 22.2	1.004	44.5	11 52.2	1.004	44.5	12 22.1	1.004	44.5	12 52.1	1.004	44.5	13 22.1	1.004	44.5	135
6	9 50.1	1.004	43.6	10 20.0	1.004	43.6	10 50.0	1.004	43.6	11 20.0	1.004	43.5	11 50.0	1.004	43.5	12 20.0	1.004	43.5	12 49.9	1.004	43.5	13 19.9	1.004	43.5	6
7	9 47.9	1.004	42.6	10 17.9	1.004	42.6	10 47.9	1.004	42.6	11 17.9	1.004	42.6	11 47.8	1.004	42.5	12 17.8	1.004	42.5	12 47.8	1.004	42.5	13 17.8	1.004	42.5	7
8	9 45.8	1.003	41.6	10 15.8	1.003	41.6	10 45.8	1.003	41.6	11 15.8	1.003	41.6	11 45.7	1.003	41.5	12 15.7	1.003	41.5	12 45.7	1.003	41.5	13 15.7	1.003	41.5	8
9	9 43.8	1.003	40.6	10 13.7	1.003	40.6	10 43.7	1.003	40.6	11 13.7	1.003	40.6	11 43.7	1.003	40.6	12 13.6	1.003	40.5	12 43.6	1.003	40.5	13 13.6	1.003	40.5	9
140	9 41.7	1.003	39.6	10 11.7	1.003	39.6	10 41.7	1.003	39.6	11 11.7	1.003	39.6	11 41.7	1.003	39.6	12 11.6	1.003	39.5	12 41.6	1.003	39.5	13 11.6	1.003	39.5	140
1	9 39.7	1.003	38.6	10 09.7	1.003	38.6	10 39.7	1.003	38.6	11 09.7	1.003	38.6	11 39.7	1.003	38.6	12 09.7	1.003	38.6	12 39.6	1.003	38.5	13 09.6	1.003	38.5	1
2	9 37.8	1.003	37.6	10 07.8	1.003	37.6	10 37.8	1.003	37.6	11 07.8	1.003	37.6	11 37.7	1.003	37.6	12 07.7	1.003	37.6	12 37.7	1.003	37.5	13 07.7	1.003	37.5	2
3	9 35.9	1.003	36.7	10 05.9	1.003	36.6	10 35.9	1.003	36.6	11 05.9	1.003	36.6	11 35.8	1.003	36.6	12 05.8	1.003	36.6	12 35.8	1.003	36.6	13 05.8	1.003	36.5	3
4	9 34.1	1.003	35.7	10 04.0	1.003	35.6	10 34.0	1.003	35.6	11 04.0	1.003	35.6	11 34.0	1.003	35.6	12 04.0	1.003	35.6	12 34.0	1.003	35.6	13 04.0	1.003	35.5	4
145	9 32.2	1.003	34.7	10 02.2	1.003	34.7	10 32.2	1.003	34.6	11 02.2	1.003	34.6	11 32.2	1.003	34.6	12 02.2	1.003	34.6	12 32.2	1.003	34.6	13 02.1	1.003	34.6	145
6	9 30.5	1.003	33.7	10 00.5	1.003	33.7	10 30.5	1.003	33.7	11 00.4	1.003	33.6	11 30.4	1.003	33.6	12 00.4	1.003	33.6	12 30.4	1.003	33.6	13 00.4	1.003	33.6	6
7	9 28.8	1.003	32.7	9 58.8	1.003	32.7	10 28.7	1.003	32.7	10 58.7	1.003	32.6	11 28.7	1.003	32.6	11 58.7	1.003	32.6	12 28.7	1.003	32.6	12 58.7	1.003	32.6	7
8	9 27.1	1.003	31.7	9 57.1	1.003	31.7	10 27.1	1.003	31.7	10 57.1	1.003	31.7	11 27.0	1.003	31.6	11 57.0	1.003	31.6	12 27.0	1.003	31.6	12 57.0	1.003	31.6	8
9	9 25.5	1.003	30.7	9 55.5	1.003	30.7	10 25.4	1.003	30.7	10 55.4	1.003	30.7	11 25.4	1.003	30.7	11 55.4	1.003	30.6	12 25.4	1.003	30.6	12 55.4	1.003	30.6	9
150	9 23.9	1.003	29.7	9 53.9	1.003	29.7	10 23.9	1.003	29.7	10 53.9	1.003	29.7	11 23.8	1.003	29.7	11 53.8	1.003	29.6	12 23.8	1.003	29.6	12 53.8	1.003	29.6	150
1	9 22.4	1.002	28.7	9 52.3	1.002	28.7	10 22.3	1.002	28.7	10 52.3	1.002	28.7	11 22.3	1.002	28.7	11 52.3	1.002	28.7	12 22.3	1.002	28.6	12 52.3	1.002	28.6	1
2	9 20.9	1.002	27.7	9 50.9	1.002	27.7	10 20.8	1.002	27.7	10 50.8	1.002	27.7	11 20.8	1.002	27.7	11 50.8	1.002	27.7	12 20.8	1.002	27.7	12 50.8	1.002	27.6	2
3	9 19.4	1.002	26.7	9 49.4	1.002	26.7	10 19.4	1.002	26.7	10 49.4	1.002	26.7	11 19.4	1.002	26.7	11 49.4	1.002	26.7	12 19.4	1.002	26.7	12 49.4	1.002	26.7	3
4	9 18.0	1.002	25.8	9 48.0	1.002	25.7	10 18.0	1.002	25.7	10 48.0	1.002	25.7	11 18.0	1.002	25.7	11 48.0	1.002	25.7	12 18.0	1.002	25.7	12 48.0	1.002	25.7	4
155	9 16.7	1.002	24.8	9 46.7	1.002	24.8	10 16.7	1.002	24.7	10 46.7	1.002	24.7	11 16.7	1.002	24.7	11 46.7	1.002	24.7	12 16.7	1.002	24.7	12 46.6	1.002	24.7	155
6	9 15.4	1.002	23.8	9 45.4	1.002	23.8	10 15.4	1.002	23.7	10 45.4	1.002	23.7	11 15.4	1.002	23.7	11 45.4	1.002	23.7	12 15.4	1.002	23.7	12 45.4	1.002	23.7	6
7	9 14.2	1.002	22.8	9 44.2	1.002	22.8	10 14.2	1.002	22.8	10 44.2	1.002	22.7	11 14.1	1.002	22.7	11 44.1	1.002	22.7	12 14.1	1.002	22.7	12 44.1	1.002	22.7	7
8	9 13.0	1.002	21.8	9 43.0	1.002	21.8	10 13.0	1.002	21.8	10 43.0	1.002	21.8	11 13.0	1.002	21.8	11 42.9	1.002	21.7	12 12.9	1.002	21.7	12 42.9	1.002	21.7	8
9	9 11.8	1.002	20.8	9 41.8	1.002	20.8	10 11.8	1.002	20.8	10 41.8	1.002	20.8	11 11.8	1.002	20.8	11 41.8	1.002	20.8	12 11.8	1.002	20.7	12 41.8	1.002	20.7	9
160	9 10.7	1.002	19.8	9 40.7	1.002	19.8	10 10.7	1.002	19.8	10 40.7	1.002	19.8	11 10.7	1.002	19.8	11 40.7	1.002	19.8	12 10.7	1.002	19.8	12 40.7	1.002	19.7	160
1	9 09.7	1.002	18.8	9 39.7	1.002	18.8	10 09.7	1.002	18.8	10 39.7	1.002	18.8	11 09.7	1.002	18.8	11 39.7	1.002	18.8	12 09.7	1.002	18.8	12 39.7	1.002	18.8	1
2	9 08.7	1.002	17.8	9 38.7	1.002	17.8	10 08.7	1.002	17.8	10 38.7	1.002	17.8	11 08.7	1.002	17.8	11 38.7	1.002	17.8	12 08.7	1.002	17.8	12 38.7	1.002	17.8	2
3	9 07.8	1.001	16.8	9 37.8	1.001	16.8	10 07.8	1.001	16.8	10 37.8	1.001	16.8	11 07.8	1.001	16.8	11 37.8	1.001	16.8	12 07.8	1.001	16.8	12 37.8	1.001	16.8	3
4	9 06.9	1.001	15.8	9 36.9	1.001	15.8	10 06.9	1.001	15.8	10 36.9	1.001	15.8	11 06.9	1.001	15.8	11 36.9	1.001	15.8	12 06.9	1.001	15.8	12 36.9	1.001	15.8	4
165	9 06.1	1.001	14.9	9 36.1	1.001	14.8	10 06.1	1.001	14.8	10 36.1	1.001	14.8	11 06.1	1.001	14.8	11 36.1	1.001	14.8	12 06.1	1.001	14.8	12 36.1	1.001	14.8	165
6	9 05.3	1.001	13.9	9 35.3	1.001	13.9	10 05.3	1.001	13.9	10 35.3	1.001	13.8	11 05.3	1.001	13.8	11 35.3	1.001	13.8	12 05.3	1.001	13.8	12 35.3	1.001	13.8	6
7	9 04.6	1.001	12.9	9 34.6	1.001	12.9	10 04.6	1.001	12.9	10 34.6	1.001	12.9	11 04.6	1.001	12.9	11 34.6	1.001	12.8	12 04.6	1.001	12.8	12 34.6	1.001	12.8	7
8	9 03.9	1.001	11.9	9 33.9	1.001	11.9	10 03.9	1.001	11.9	10 33.9	1.001	11.9	11 03.9	1.001	11.9	11 33.9	1.001	11.9	12 03.9	1.001	11.8	12 33.9	1.001	11.8	8
9	9 03.3	1.001	10.9	9 33.3	1.001	10.9	10 03.3	1.001	10.9	10 33.3	1.001	10.9	11 03.3	1.001	10.9	11 33.3	1.001	10.9	12 03.3	1.001	10.9	12 33.3	1.001	10.9	9
170	9 02.7	1.001	09.9	9 32.7	1.001	09.9	10 02.7	1.001	09.9	10 32.7	1.001	09.9	11 02.7	1.001	09.9	11 32.7	1.001	09.9	12 02.7	1.001	09.9	12 32.7	1.001	09.9	170
1	9 02.2	1.001	08.9	9 32.2	1.001	08.9	10 02.2	1.001	08.9	10 32.2	1.001	08.9	11 02.2	1.001	08.9	11 32.2	1.001	08.9	12 02.2	1.001	08.9	12 32.2	1.001	08.9	1
2	9 01.7	1.001	07.9	9 31.7	1.001	07.9	10 01.7	1.001	07.9	10 31.7	1.001	07.9	11 01.7	1.001	07.9	11 31.7	1.001	07.9	12 01.7	1.001	07.9	12 31.7	1.001	07.9	2
3	9 01.3	1.001	06.9	9 31.3	1.001	06.9	10 01.3	1.001	06.9	10 31.3	1.001	06.9	11 01.3	1.001	06.9	11 31.3	1.001	06.9	12 01.3	1.001	06.9	12 31.3	1.001	06.9	3
4	9 01.0	1.000	05.9	9 31.0	1.000	05.9	10 01.0	1.000	05.9	10 31.0	1.000	05.9	11 01.0	1.000	05.9	11 31.0	1.000	05.9	12 01.0	1.000	05.9	12 31.0	1.000	05.9	4
175	9 00.7	1.000	05.0	9 30.7	1.000	04.9	10 00.7	1.000	04.9	10 30.7	1.000	04.9	11 00.7	1.000	04.9	11 30.7	1.000	04.9	12 00.7	1.000	04.9	12 30.7	1.000	04.9	175
6	9 00.4	1.000	04.0	9 30.4	1.000	04.0	10 00.4	1.000	04.0	10 30.4	1.000	04.0	11 00.4	1.000	04.0	11 30.4	1.000	04.0	12 00.4	1.000	04.0	12 30.4	1.000	03.9	6
7	9 00.2	1.000	03.0	9 30.2	1.000	03.0	10 00.2	1.000	03.0	10 30.2	1.000	03.0	11 00.2	1.000	03.0	11 30.2	1.000	03.0	12 00.2	1.000	03.0	12 30.2	1.000	03.0	7
8	9 00.1	1.000	02.0	9 30.1	1.000	02.0	10 00.1	1.000	02.0	10 30.1	1.000	02.0	11 00.1	1.000	02.0	11 30.1	1.000	02.0	12 00.1	1.000	02.0	12 30.1	1.000	02.0	8
9	9 00.0	1.000	01.0	9 30.0	1.000	01.0	10 00.0	1.000	01.0	10 30.0	1.000	01.0	11 00.0	1.000	01.0	11 30.0	1.000	01.0	12 00.0	1.000	01.0	12 30.0	1.000	01.0	9
180	9 00.0	1.000	00.0	9 30.0	1.000	00.0	10 00.0	1.000	00.0	10 30.0	1.000	00.0	11 00.0	1.000	00.0	11 30.0	1.000	00.0	12 00.0	1.000	00.0	12 30.0	1.000	00.0	180

Lat. 88°

Lat. 89°

Lat. 87°

H.A.	16° 00' Alt	Δd Δt	Az.	16° 30' Alt	Δd Δt	Az.	17° 00' Alt	Δd Δt	Az.	17° 30' Alt	Δd Δt	Az.	18° 00' Alt	Δd Δt	Az.	18° 30' Alt	Δd Δt	Az.	19° 00' Alt	Δd Δt	Az.	19° 30' Alt	Δd Δt	Az.	H.A.
00	19 00.0	1.000	180.0	19 30.0	1.000	180.0	20 00.0	1.000	180.0	20 30.0	1.000	180.0	21 00.0	1.000	180.0	21 30.0	1.000	180.0	22 00.0	1.000	180.0	22 30.0	1.000	180.0	00
1	19 00.0	1.000	179.0	19 30.0	1.000	179.0	20 00.0	1.000	179.0	20 30.0	1.000	179.0	21 00.0	1.000	179.0	21 30.0	1.000	179.0	22 00.0	1.000	179.0	22 30.0	1.000	179.0	1
2	18 59.9	1.000	178.0	19 29.9	1.000	178.0	19 59.9	1.000	178.0	20 29.9	1.000	178.0	20 59.9	1.000	178.0	21 29.9	1.000	178.0	21 59.9	1.000	178.0	22 29.9	1.000	178.0	2
3	18 59.7	1.000	177.0	19 29.7	1.000	176.9	19 59.7	1.000	176.9	20 29.7	1.000	176.9	20 59.7	1.000	176.9	21 29.7	1.000	176.9	21 59.7	1.000	176.9	22 29.7	1.000	176.9	3
4	18 59.6	1.000	175.9	19 29.6	1.000	175.9	19 59.6	1.000	175.9	20 29.6	1.000	175.9	20 59.6	1.000	175.9	21 29.6	1.000	175.9	21 59.6	1.000	175.9	22 29.6	1.000	175.9	4
05	18 59.3	1.000	174.9	19 29.3	1.000	174.9	19 59.3	1.000	174.9	20 29.3	1.000	174.9	20 59.3	1.000	174.9	21 29.3	1.000	174.9	21 59.3	1.000	174.9	22 29.3	1.000	174.9	05
6	18 59.0	1.001	173.9	19 29.0	1.001	173.9	19 59.0	1.001	173.9	20 29.0	1.001	173.9	20 59.0	1.001	173.9	21 29.0	1.001	173.9	21 59.0	1.001	173.9	22 29.0	1.001	173.9	6
7	18 58.6	1.001	172.9	19 28.6	1.001	172.9	19 58.6	1.001	172.9	20 28.6	1.001	172.9	20 58.6	1.001	172.9	21 28.6	1.001	172.9	21 58.6	1.001	172.9	22 28.6	1.001	172.9	7
8	18 58.2	1.001	171.9	19 28.2	1.001	171.9	19 58.2	1.001	171.9	20 28.2	1.001	171.9	20 58.2	1.001	171.9	21 28.2	1.001	171.8	21 58.2	1.001	171.8	22 28.2	1.001	171.8	8
9	18 57.7	1.001	170.9	19 27.7	1.001	170.8	19 57.7	1.001	170.8	20 27.7	1.001	170.8	20 57.7	1.001	170.8	21 27.7	1.001	170.8	21 57.7	1.001	170.8	22 27.7	1.001	170.8	9
10	18 57.2	1.001	169.8	19 27.2	1.001	169.8	19 57.2	1.001	169.8	20 27.2	1.001	169.8	20 57.2	1.001	169.8	21 27.2	1.001	169.8	21 57.2	1.001	169.8	22 27.2	1.001	169.8	10
1	18 56.6	1.001	168.8	19 26.6	1.001	168.8	19 56.6	1.001	168.8	20 26.6	1.001	168.8	20 56.6	1.001	168.8	21 26.6	1.001	168.8	21 56.6	1.001	168.8	22 26.6	1.001	168.8	1
2	18 56.0	1.001	167.8	19 26.0	1.001	167.8	19 56.0	1.001	167.8	20 26.0	1.001	167.8	20 56.0	1.001	167.8	21 26.0	1.001	167.8	21 56.0	1.001	167.8	22 26.0	1.001	167.8	2
3	18 55.3	1.001	166.8	19 25.3	1.001	166.8	19 55.3	1.001	166.8	20 25.3	1.001	166.8	20 55.3	1.001	166.8	21 25.3	1.001	166.8	21 55.3	1.001	166.7	22 25.3	1.001	166.7	3
4	18 54.6	1.001	165.8	19 24.6	1.001	165.8	19 54.6	1.001	165.8	20 24.6	1.001	165.7	20 54.6	1.001	165.7	21 24.6	1.001	165.7	21 54.6	1.001	165.7	22 24.6	1.001	165.7	4
15	18 53.8	1.001	164.8	19 23.8	1.001	164.7	19 53.8	1.001	164.7	20 23.8	1.001	164.7	20 53.8	1.001	164.7	21 23.8	1.001	164.7	21 53.8	1.001	164.7	22 23.7	1.001	164.7	15
6	18 52.9	1.002	163.7	19 22.9	1.002	163.7	19 52.9	1.002	163.7	20 22.9	1.002	163.7	20 52.9	1.002	163.7	21 22.9	1.002	163.7	21 52.9	1.002	163.7	22 22.9	1.002	163.7	6
7	18 52.0	1.002	162.7	19 22.0	1.002	162.7	19 52.0	1.002	162.7	20 22.0	1.002	162.7	20 52.0	1.002	162.7	21 22.0	1.002	162.7	21 52.0	1.002	162.7	22 22.0	1.002	162.7	7
8	18 51.1	1.002	161.7	19 21.0	1.002	161.7	19 51.0	1.002	161.7	20 21.0	1.002	161.7	20 51.0	1.002	161.7	21 21.0	1.002	161.7	21 51.0	1.002	161.6	22 21.0	1.002	161.6	8
9	18 50.0	1.002	160.7	19 20.0	1.002	160.7	19 50.0	1.002	160.7	20 20.0	1.002	160.7	20 50.0	1.002	160.7	21 20.0	1.002	160.6	21 50.0	1.002	160.6	22 20.0	1.002	160.6	9
20	18 49.0	1.002	159.7	19 19.0	1.002	159.7	19 49.0	1.002	159.7	20 19.0	1.002	159.6	20 49.0	1.002	159.6	21 18.9	1.002	159.6	21 48.9	1.002	159.6	22 18.9	1.002	159.6	20
1	18 47.9	1.002	158.7	19 17.9	1.002	158.6	19 47.8	1.002	158.6	20 17.8	1.002	158.6	20 47.8	1.002	158.6	21 17.8	1.002	158.6	21 47.8	1.002	158.6	22 17.8	1.002	158.6	1
2	18 46.7	1.002	157.6	19 16.7	1.002	157.6	19 46.7	1.002	157.6	20 16.7	1.002	157.6	20 46.7	1.002	157.6	21 16.7	1.002	157.6	21 46.7	1.002	157.6	22 16.6	1.002	157.6	2
3	18 45.5	1.002	156.6	19 15.5	1.002	156.6	19 45.5	1.002	156.6	20 15.4	1.002	156.6	20 45.4	1.002	156.6	21 15.4	1.002	156.6	21 45.4	1.002	156.6	22 15.4	1.002	156.5	3
4	18 44.2	1.002	155.6	19 14.2	1.002	155.6	19 44.2	1.002	155.6	20 14.2	1.002	155.6	20 44.2	1.002	155.6	21 14.2	1.002	155.6	21 44.2	1.002	155.5	22 14.1	1.002	155.5	4
25	18 42.9	1.002	154.6	19 12.9	1.002	154.6	19 42.9	1.002	154.6	20 12.9	1.002	154.6	20 42.8	1.002	154.6	21 12.8	1.002	154.5	21 42.8	1.002	154.5	22 12.8	1.002	154.5	25
6	18 41.5	1.002	153.6	19 11.5	1.002	153.6	19 41.5	1.002	153.5	20 11.5	1.002	153.5	20 41.5	1.002	153.5	21 11.5	1.002	153.5	21 41.5	1.002	153.5	22 11.4	1.002	153.5	6
7	18 40.1	1.002	152.6	19 10.1	1.002	152.6	19 40.1	1.002	152.5	20 10.1	1.002	152.5	20 40.0	1.002	152.5	21 10.0	1.002	152.5	21 40.0	1.002	152.5	22 10.0	1.002	152.5	7
8	18 38.6	1.003	151.6	19 08.6	1.003	151.5	19 38.6	1.003	151.5	20 08.6	1.003	151.5	20 38.6	1.003	151.5	21 08.6	1.003	151.5	21 38.6	1.003	151.5	22 08.5	1.003	151.5	8
9	18 37.1	1.003	150.5	19 07.1	1.003	150.5	19 37.1	1.003	150.5	20 07.1	1.003	150.5	20 37.0	1.003	150.5	21 07.0	1.003	150.5	21 37.0	1.003	150.5	22 07.0	1.003	150.4	9
30	18 35.5	1.003	149.5	19 05.5	1.003	149.5	19 35.5	1.003	149.5	20 05.5	1.003	149.5	20 35.5	1.003	149.5	21 05.5	1.003	149.5	21 35.5	1.003	149.4	22 05.4	1.003	149.4	30
1	18 33.9	1.003	148.5	19 03.9	1.003	148.5	19 33.9	1.003	148.5	20 03.8	1.003	148.5	20 33.8	1.003	148.4	21 03.8	1.003	148.4	21 33.8	1.003	148.4	22 03.8	1.003	148.4	1
2	18 32.2	1.003	147.5	19 02.2	1.003	147.5	19 32.2	1.003	147.5	20 02.2	1.003	147.5	20 32.2	1.003	147.4	21 02.2	1.003	147.4	21 32.2	1.003	147.4	22 02.2	1.003	147.4	2
3	18 30.5	1.003	146.5	19 00.5	1.003	146.5	19 30.5	1.003	146.5	20 00.5	1.003	146.4	20 30.5	1.003	146.4	21 00.5	1.003	146.4	21 30.5	1.003	146.4	22 00.4	1.003	146.4	3
4	18 28.8	1.003	145.5	18 58.8	1.003	145.5	19 28.7	1.003	145.4	19 58.7	1.003	145.4	20 28.7	1.003	145.4	20 58.7	1.003	145.4	21 28.7	1.003	145.4	21 58.7	1.003	145.4	4
35	18 27.0	1.003	144.5	18 57.0	1.003	144.4	19 27.0	1.003	144.4	19 56.9	1.003	144.4	20 26.9	1.003	144.4	20 56.9	1.003	144.4	21 26.9	1.003	144.4	21 56.9	1.003	144.3	35
6	18 25.1	1.003	143.4	18 55.1	1.003	143.4	19 25.1	1.003	143.4	19 55.1	1.003	143.4	20 25.1	1.003	143.4	20 55.0	1.003	143.4	21 25.0	1.003	143.3	21 55.0	1.003	143.3	6
7	18 23.2	1.003	142.4	18 53.2	1.003	142.4	19 23.2	1.003	142.4	19 53.2	1.003	142.4	20 23.2	1.003	142.4	20 53.2	1.003	142.3	21 23.1	1.003	142.3	21 53.1	1.003	142.3	7
8	18 21.3	1.003	141.4	18 51.3	1.003	141.4	19 21.3	1.003	141.4	19 51.2	1.003	141.4	20 21.2	1.003	141.3	20 51.2	1.003	141.3	21 21.2	1.003	141.3	21 51.2	1.003	141.3	8
9	18 19.3	1.003	140.4	18 49.3	1.003	140.4	19 19.3	1.003	140.4	19 49.2	1.003	140.4	20 19.2	1.003	140.3	20 49.2	1.003	140.3	21 19.2	1.003	140.3	21 49.2	1.003	140.3	9
40	18 17.3	1.003	139.4	18 47.3	1.003	139.3	19 17.3	1.003	139.3	19 47.2	1.003	139.3	20 17.2	1.003	139.3	20 47.2	1.003	139.3	21 17.2	1.003	139.3	21 47.2	1.003	139.3	40
1	18 15.2	1.004	138.4	18 45.2	1.004	138.4	19 15.2	1.004	138.4	19 45.2	1.004	138.3	20 15.2	1.004	138.3	20 45.1	1.004	138.3	21 15.1	1.004	138.3	21 45.1	1.004	138.3	1
2	18 13.1	1.004	137.4	18 43.1	1.004	137.4	19 13.1	1.004	137.3	19 43.1	1.004	137.3	20 13.0	1.004	137.3	20 43.0	1.004	137.3	21 13.0	1.004	137.3	21 43.0	1.004	137.2	2
3	18 11.0	1.004	136.4	18 41.0	1.004	136.3	19 10.9	1.004	136.3	19 40.9	1.004	136.3	20 10.9	1.004	136.3	20 40.9	1.004	136.3	21 10.9	1.004	136.2	21 40.8	1.004	136.2	3
4	18 08.8	1.004	135.4	18 38.8	1.004	135.3	19 08.7	1.004	135.3	19 38.7	1.004	135.3	20 08.7	1.004	135.3	20 38.7	1.004	135.3	21 08.7	1.004	135.2	21 38.6	1.004	135.2	4
45	18 06.6	1.004	134.3	18 36.5	1.004	134.3	19 06.5	1.004	134.3	19 36.5	1.004	134.3	20 06.5	1.004	134.3	20 36.5	1.004	134.2	21 06.4	1.004	134.2	21 36.4	1.004	134.2	45
6	18 04.3	1.004	133.3	18 34.3	1.004	133.3	19 04.3	1.004	133.3	19 34.2	1.004	133.3	20 04.2	1.004	133.3	20 34.2	1.004	133.2	21 04.2	1.004	133.2	21 34.1	1.004	133.2	6
7	18 02.0	1.004	132.3	18 32.0	1.004	132.3	19 02.0	1.004	132.3	19 31.9	1.004	132.3	20 01.9	1.004	132.2	20 31.9	1.004	132.2	21 01.9	1.004	132.2	21 31.8	1.004	132.2	7
8	17 59.7	1.004	131.3	18 29.6	1.004	131.3	18 59.6	1.004	131.3	19 29.6	1.004	131.2	19 59.6	1.004	131.2	20 29.5	1.004	131.2	20 59.5	1.004	131.2	21 29.5	1.004	131.2	8
9	17 57.3	1.004	130.3	18 27.3	1.004	130.3	18 57.2	1.004	130.2	19 27.2	1.004	130.2	19 57.2	1.004	130.2	20 27.2	1.004	130.2	20 57.1	1.004	130.1	21 27.1	1.004	130.1	9
50	17 54.9	1.004	129.3	18 24.8	1.004	129.3	18 54.8	1.004	129.3	19 24.8	1.004	129.2	19 54.8	1.004	129.2	20 24.7	1.004	129.2	20 54.7	1.004	129.2	21 24.7	1.004	129.1	50
1	17 52.4	1.004	128.3	18 22.4	1.004	128.3	18 52.4	1.004	128.2	19 22.3	1.004	128.2	19 52.3	1.004	128.2	20 22.3	1.004	128.2	20 52.3	1.004	128.1	21 22.2	1.004	128.1	1
2	17 49.9	1.004	127.3	18 19.9	1.004	127.3	18 49.9	1.004	127.2	19 19.9	1.004	127.2	19 49.8	1.004	127.2	20 19.8	1.004	127.2	20 49.8	1.004	127.1	21 19.7	1.004	127.1	2
3	17 47.4	1.004	126.3	18 17.4	1.004	126.2	18 47.4	1.004	126.2	19 17.3	1.004	126.2	19 47.3	1.004	126.2	20 17.3	1.004	126.1	20 47.2	1.004	126.1	21 17.2	1.004	126.1	3
4	17 44.9	1.004	125.3	18 14.8	1.004	125.2	18 44.8	1.004	125.2	19 14.8	1.004	125.2	19 44.8	1.004	125.2	20 14.7	1.004	125.1	20 44.7	1.004	125.1	21 14.7	1.004	125.1	4
55	17 42.3	1.004	124.3	18 12.3	1.004	124.2	18 42.2	1.004	124.2	19 12.2	1.004	124.2	19 42.2	1.004	124.2	20 12.1	1.004	124.1	20 42.1	1.004	124.1	21 12.1	1.004	124.1	55
6	17 39.7	1.004	123.2	18 09.7	1.004	123.2	18 39.6	1.004	123.2	19 09.6	1.004	123.2	19 39.6	1.004	123.1	20 09.5	1.004	123.1	20 39.5	1.004	123.1	21 09.5	1.004	123.1	6
7	17 37.0	1.004	122.2	18 07.0	1.004	122.2	18 37.0	1.004	122.2	19 06.9	1.004	122.2	19 36.9	1.004	122.1	20 06.9	1.004	122.1	20 36.9	1.004	122.1	21 06.8	1.004	122.1	7
8	17 34.4	1.004	121.2	18 04.3	1.004	121.2	18 34.3	1.005	121.2	19 04.3	1.005	121.1	19 34.2	1.005	121.1	20 04.2	1.005	121.1	20 34.2	1.005	121.1	21 04.1	1.005	121.1	8
9	17 31.7	1.005	120.2	18 01.6	1.005	120.2	18 31.6	1.005	120.2	19 01.6	1.005	120.1	19 31.5	1.005	120.1	20 01.5	1.005	120.1	20 31.5	1.005	120.1	21 01.4	1.005	120.0	9
60	17 28.9	1.005	119.2	17 58.9	1.005	119.2	18 28.9	1.005	119.1	18 58.8	1.005	119.1	19 28.8	1.005	119.1	19 58.8	1.005	119.1	20 28.7	1.005	119.1	20 58.7	1.005	119.0	60
1	17 26.2	1.005	118.2	17 56.2	1.005	118.2	18 26.1	1.005	118.2	18 56.1	1.005	118.1	19 26.1	1.005	118.1	19 56.0	1.005	118.1	20 26.0	1.005	118.1	20 55.9	1.005	118.0	1
2	17 23.4	1.005	117.2	17 53.4	1.005	117.2	18 23.3	1.005	117.1	18 53.3	1.005	117.1	19 23.3	1.005	117.1	19 53.2	1.005	117.1	20 23.2	1.005	117.0	20 53.2	1.005	117.0	2
3	17 20.6	1.005	116.2	17 50.6	1.005	116.2	18 20.5	1.005	116.1	18 50.5	1.005	116.1	19 20.5	1.005	116.1	19 50.4	1.005	116.1	20 20.4	1.005	116.0	20 50.4	1.005	116.0	3
4	17 17.8	1.005	115.2	17 47.7	1.005	115.2	18 17.7	1.005	115.1	18 47.7	1.005	115.1	19 17.6	1.005	115.1	19 47.6	1.005	115.1	20 17.6	1.005	115.0	20 47.5	1.005	115.0	4
65	17 14.9	1.005	114.2	17 44.9	1.005	114.2	18 14.9	1.005	114.1	18 44.8	1.005	114.1	19 14.8	1.005	114.1	19 44.7	1.005	114.1	20 14.7	1.005	114.0	20 44.7	1.005	114.0	65
6	17 12.0	1.005	113.2	17 42.0	1.005	113.2	18 12.0	1.005	113.1	18 41.9	1.005	113.1	19 11.9	1.005	113.1	19 41.9	1.005	113.0	20 11.8	1.005	113.0	20 41.8	1.005	113.0	6
7	17 09.2	1.005	112.2	17 39.1	1.005	112.1	18 09.1	1.005	112.1	18 39.0	1.005	112.1	19 09.0	1.005	112.1	19 39.0	1.005	112.0	20 08.9	1.005	112.0	20 38.9	1.005	112.0	7
8	17 06.2	1.005	111.2	17 36.2	1.005	111.1	18 06.2	1.005	111.1	18 36.1	1.005	111.1	19 06.1	1.005	111.1	19 36.0	1.005	111.0	20 06.0	1.005	111.0	20 36.0	1.005	111.0	8
9	17 03.3	1.005	110.2	17 33.3	1.005	110.1	18 03.2	1.005	110.1	18 33.2	1.005	110.1	19 03.1	1.005	110.1	19 33.1	1.005	110.0	20 03.1	1.005	110.0	20 33.0	1.005	110.0	9
70	17 00.3	1.005	109.2	17 30.3	1.005	109.1	18 00.3	1.005	109.1	18 30.2	1.005	109.1	19 00.2	1.005	109.1	19 30.1	1.005	109.0	20 00.1	1.005	109.0	20 30.1	1.005	109.0	70
1	16 57.4	1.005	108.2	17 27.3	1.005	108.1	17 57.3	1.005	108.1	18 27.2	1.005	108.1	18 57.2	1.005	108.0	19 27.2	1.005	108.0	19 57.1	1.005	108.0	20 27.1	1.005	108.0	1
2	16 54.4	1.005	107.2	17 24.3	1.005	107.1	17 54.3	1.005	107.1	18 24.2	1.005	107.1	18 54.2	1.005	107.0	19 24.2	1.005	107.0	19 54.1	1.005	107.0	20 24.1	1.005	107.0	2
3	16 51.4	1.005	106.2	17 21.3	1.005	106.1	17 51.3	1.005	106.1	18 21.2	1.005	106.1	18 51.2	1.005	106.0	19 21.2	1.005	106.0	19 51.1	1.005	106.0	20 21.1	1.005	106.0	3
4	16 48.3	1.005	105.2	17 18.3	1.005	105.1	17 48.3	1.005	105.1	18 18.2	1.005	105.1	18 48.2	1.005	105.0	19 18.1	1.005	105.0	19 48.1	1.005	105.0	20 18.0	1.005	105.0	4
75	16 45.3	1.005	104.1	17 15.3	1.005	104.1	17 45.2	1.005	104.1	18 15.2	1.005	104.1	18 45.1	1.005	104.0	19 15.1	1.005	104.0	19 45.0	1.005	104.0	20 15.0	1.005	103.9	75
6	16 42.3	1.005	103.1	17 12.2	1.005	103.1	17 42.2	1.005	103.1	18 12.1	1.005	103.1	18 42.1	1.005	103.0	19 12.0	1.005	103.0	19 42.0	1.005	103.0	20 11.9	1.005	102.9	6
7	16 39.2	1.005	102.1	17 09.1	1.005	102.1	17 39.1	1.005	102.1	18 09.1	1.005	102.1	18 39.0	1.005	102.0	19 09.0	1.005	102.0	19 38.9	1.005	101.9	20 08.9	1.005	101.9	7
8	16 36.1	1.005	101.1	17 06.1	1.005	101.1	17 36.0	1.005	101.1	18 06.0	1.005	101.1	18 35.9	1.005	101.0	19 05.9	1.005	101.0	19 35.8	1.005	101.0	20 05.8	1.005	100.9	8
9	16 33.0	1.005	100.1	17 03.0	1.005	100.1	17 32.9	1.005	100.1	18 02.9	1.005	100.1	18 32.9	1.005	100.0	19 02.8	1.005	100.0	19 32.8	1.005	100.0	20 02.7	1.005	99.9	9
80	16 29.9	1.005	99.1	16 59.9	1.005	99.1	17 29.8	1.005	99.1	17 59.8	1.005	99.1	18 29.8	1.005	99.0	18 59.7	1.005	99.0	19 29.7	1.005	99.0	19 59.6	1.005	98.9	80
1	16 26.8	1.005	98.1	16 56.8	1.005	98.1	17 26.7	1.005	98.1	17 56.7	1.005	98.1	18 26.6	1.005	98.0	18 56.6	1.005	98.0	19 26.6	1.005	98.0	19 56.5	1.005	97.9	1
2	16 23.7	1.005	97.1	16 53.7	1.005	97.1	17 23.6	1.005	97.1	17 53.6	1.005	97.1	18 23.5	1.005	97.0	18 53.5	1.005	97.0	19 23.4	1.005	97.0	19 53.4	1.005	96.9	2
3	16 20.6	1.005	96.1	16 50.5	1.005	96.1	17 20.5	1.005	96.1	17 50.5	1.005	96.0	18 20.4	1.005	96.0	18 50.4	1.005	96.0	19 20.3	1.005	96.0	19 50.3	1.005	95.9	3
4	16 17.5	1.005	95.1	16 47.4	1.005	95.1	17 17.4	1.005	95.1	17 47.3	1.005	95.0	18 17.3	1.005	95.0	18 47.2	1.005	95.0	19 17.2	1.005	95.0	19 47.2	1.005	94.9	4
85	16 14.3	1.005	94.1	16 44.3	1.005	94.1	17 14.2	1.005	94.1	17 44.2	1.005	94.0	18 14.2	1.005	94.0	18 44.1	1.005	94.0	19 14.1	1.005	94.0	19 44.0	1.005	93.9	85
6	16 11.2	1.005	93.1	16 41.2	1.005	93.1	17 11.1	1.005	93.1	17 41.1	1.005	93.0	18 11.0	1.005	93.0	18 41.0	1.005	93.0	19 10.9	1.005	93.0	19 40.9	1.005	92.9	6
7	16 08.1	1.005	92.1	16 38.0	1.005	92.1	17 08.0	1.005	92.1	17 37.9	1.005	92.0	18 07.9	1.005	92.0	18 37.8	1.005	92.0	19 07.8	1.005	92.0	19 37.8	1.005	91.9	7
8	16 04.9	1.005	91.1	16 34.9	1.005	91.1	17 04.8	1.005	91.1	17 34.8	1.005	91.0	18 04.7	1.005	91.0	18 34.7	1.005	91.0	19 04.7	1.005	91.0	19 34.6	1.005	90.9	8
9	16 01.8	1.005	90.1	16 31.7	1.005	90.1	17 01.7	1.005	90.1	17 31.7	1.005	90.0	18 01.6	1.005	90.0	18 31.6	1.005	90.0	19 01.5	1.005	90.0	19 31.5	1.005	89.9	9
90	15 58.6	1.005	89.1	16 28.6	1.005	89.1	16 58.6	1.005	89.1	17 28.5	1.005	89.1	17 58.5	1.005	89.0	18 28.4	1.005	89.0	18 58.4	1.005	89.0	19 28.3	1.005	88.9	90

H.A.	16° 00' Alt.	Az.	16° 30' Alt.	Az.	17° 00' Alt.	Az.	17° 30' Alt.	Az.	18° 00' Alt.	Az.	18° 30' Alt.	Az.	19° 00' Alt.	Az.	19° 30' Alt.	Az.	H.A.
91	15 55.5 1.0 05	88.1	16 25.5 1.0 05	88.1	16 55.4 1.0 05	88.1	17 25.4 1.0 05	88.1	17 55.3 1.0 05	88.0	18 25.3 1.0 05	88.0	18 55.2 1.0 05	88.0	19 25.2 1.0 05	87.9	91
2	15 52.4 1.0 05	87.1	16 22.3 1.0 05	87.1	16 52.3 1.0 05	87.1	17 22.2 1.0 05	87.1	17 52.2 1.0 05	87.0	18 22.1 1.0 05	87.0	18 52.1 1.0 05	87.0	19 22.1 1.0 05	86.9	2
3	15 49.2 1.0 05	86.1	16 19.2 1.0 05	86.1	16 49.1 1.0 05	86.1	17 19.1 1.0 05	86.1	17 49.1 1.0 05	86.0	18 19.0 1.0 05	86.0	18 49.0 1.0 05	86.0	19 18.9 1.0 05	85.9	3
4	15 46.1 1.0 05	85.1	16 16.1 1.0 05	85.1	16 46.0 1.0 05	85.1	17 16.0 1.0 05	85.1	17 45.9 1.0 05	85.0	18 15.9 1.0 05	85.0	18 45.8 1.0 05	85.0	19 15.8 1.0 05	84.9	4
95	15 43.0 1.0 05	84.2	16 12.9 1.0 05	84.1	16 42.9 1.0 05	84.1	17 12.8 1.0 05	84.1	17 42.8 1.0 05	84.0	18 12.8 1.0 05	84.0	18 42.7 1.0 05	84.0	19 12.7 1.0 05	84.0	95
6	15 39.9 1.0 05	83.2	16 09.8 1.0 05	83.1	16 39.8 1.0 05	83.1	17 09.7 1.0 05	83.1	17 39.7 1.0 05	83.0	18 09.6 1.0 05	83.0	18 39.6 1.0 05	83.0	19 09.5 1.0 05	83.0	6
7	15 36.7 1.0 05	82.2	16 06.7 1.0 05	82.1	16 36.7 1.0 05	82.1	17 06.6 1.0 05	82.1	17 36.6 1.0 05	82.0	18 06.5 1.0 05	82.0	18 36.5 1.0 05	82.0	19 06.4 1.0 05	82.0	7
8	15 33.6 1.0 05	81.2	16 03.6 1.0 05	81.1	16 33.6 1.0 05	81.1	17 03.5 1.0 05	81.1	17 33.5 1.0 05	81.0	18 03.4 1.0 05	81.0	18 33.4 1.0 05	81.0	19 03.3 1.0 05	81.0	8
9	15 30.5 1.0 05	80.2	16 00.5 1.0 05	80.1	16 30.5 1.0 05	80.1	17 00.5 1.0 05	80.1	17 30.4 1.0 05	80.1	18 00.3 1.0 05	80.1	18 30.3 1.0 05	80.0	19 00.2 1.0 05	80.0	9
100	15 27.4 1.0 05	79.2	15 57.4 1.0 05	79.1	16 27.4 1.0 05	79.1	16 57.3 1.0 05	79.1	17 27.3 1.0 05	79.1	17 57.2 1.0 05	79.0	18 27.2 1.0 05	79.0	18 57.1 1.0 05	79.0	100
1	15 24.4 1.0 05	78.2	15 54.3 1.0 05	78.1	16 24.3 1.0 05	78.1	16 54.2 1.0 05	78.1	17 24.2 1.0 05	78.1	17 54.2 1.0 05	78.0	18 24.1 1.0 05	78.0	18 54.1 1.0 05	78.0	1
2	15 21.3 1.0 05	77.2	15 51.3 1.0 05	77.2	16 21.2 1.0 05	77.1	16 51.2 1.0 05	77.1	17 21.1 1.0 05	77.1	17 51.1 1.0 05	77.0	18 21.0 1.0 05	77.0	18 51.0 1.0 05	77.0	2
3	15 18.2 1.0 05	76.2	15 48.2 1.0 05	76.2	16 18.2 1.0 05	76.1	16 48.1 1.0 05	76.1	17 18.1 1.0 05	76.1	17 48.0 1.0 05	76.0	18 18.0 1.0 05	76.0	18 47.9 1.0 05	76.0	3
4	15 15.2 1.0 05	75.2	15 45.2 1.0 05	75.2	16 15.1 1.0 05	75.1	16 45.1 1.0 05	75.1	17 15.0 1.0 05	75.1	17 45.0 1.0 05	75.0	18 15.0 1.0 05	75.0	18 44.9 1.0 05	75.0	4
105	15 12.2 1.0 05	74.2	15 42.1 1.0 05	74.2	16 12.1 1.0 05	74.1	16 42.1 1.0 05	74.1	17 12.0 1.0 05	74.1	17 42.0 1.0 05	74.1	18 11.9 1.0 05	74.0	18 41.9 1.0 05	74.0	105
6	15 09.2 1.0 05	73.2	15 39.1 1.0 05	73.2	16 09.1 1.0 05	73.1	16 39.0 1.0 05	73.1	17 09.0 1.0 05	73.1	17 39.0 1.0 05	73.1	18 08.9 1.0 05	73.0	18 38.9 1.0 05	73.0	6
7	15 06.2 1.0 05	72.2	15 36.1 1.0 05	72.2	16 06.1 1.0 05	72.1	16 36.0 1.0 05	72.1	17 06.0 1.0 05	72.1	17 36.0 1.0 05	72.1	18 05.9 1.0 05	72.0	18 35.9 1.0 05	72.0	7
8	15 03.2 1.0 05	71.2	15 33.1 1.0 05	71.2	16 03.1 1.0 05	71.2	16 33.1 1.0 05	71.1	17 03.0 1.0 05	71.1	17 33.0 1.0 05	71.1	18 02.9 1.0 05	71.0	18 32.9 1.0 05	71.0	8
9	15 00.2 1.0 05	70.2	15 30.2 1.0 05	70.2	16 00.1 1.0 05	70.2	16 30.1 1.0 05	70.1	17 00.1 1.0 05	70.1	17 30.0 1.0 05	70.1	18 00.0 1.0 05	70.1	18 29.9 1.0 05	70.0	9
110	14 57.3 1.0 05	69.2	15 27.2 1.0 05	69.2	15 57.2 1.0 05	69.2	16 27.2 1.0 05	69.1	16 57.1 1.0 05	69.1	17 27.1 1.0 05	69.1	17 57.0 1.0 05	69.1	18 27.0 1.0 05	69.0	110
1	14 54.3 1.0 05	68.2	15 24.3 1.0 05	68.2	15 54.3 1.0 05	68.2	16 24.2 1.0 05	68.1	16 54.2 1.0 05	68.1	17 24.1 1.0 05	68.1	17 54.1 1.0 05	68.1	18 24.1 1.0 05	68.0	1
2	14 51.4 1.0 05	67.2	15 21.4 1.0 05	67.2	15 51.4 1.0 05	67.2	16 21.3 1.0 05	67.2	16 51.3 1.0 05	67.1	17 21.3 1.0 05	67.1	17 51.2 1.0 05	67.1	18 21.2 1.0 05	67.0	2
3	14 48.6 1.0 05	66.2	15 18.5 1.0 05	66.2	15 48.5 1.0 05	66.2	16 18.4 1.0 05	66.2	16 48.4 1.0 05	66.1	17 18.4 1.0 05	66.1	17 48.3 1.0 05	66.1	18 18.3 1.0 05	66.1	3
4	14 45.7 1.0 05	65.2	15 15.7 1.0 05	65.2	15 45.6 1.0 05	65.2	16 15.6 1.0 05	65.2	16 45.5 1.0 05	65.1	17 15.5 1.0 05	65.1	17 45.5 1.0 05	65.1	18 15.4 1.0 05	65.1	4
115	14 42.9 1.0 05	64.3	15 12.8 1.0 05	64.2	15 42.8 1.0 05	64.2	16 12.7 1.0 05	64.2	16 42.7 1.0 05	64.2	17 12.7 1.0 05	64.1	17 42.6 1.0 05	64.1	18 12.6 1.0 05	64.1	115
6	14 40.0 1.0 05	63.3	15 10.0 1.0 05	63.2	15 40.0 1.0 05	63.2	16 09.9 1.0 05	63.2	16 39.9 1.0 05	63.2	17 09.9 1.0 05	63.1	17 39.8 1.0 05	63.1	18 09.8 1.0 05	63.1	6
7	14 37.2 1.0 05	62.3	15 07.2 1.0 05	62.2	15 37.2 1.0 05	62.2	16 07.1 1.0 05	62.2	16 37.1 1.0 05	62.2	17 07.1 1.0 05	62.1	17 37.0 1.0 05	62.1	18 07.0 1.0 05	62.1	7
8	14 34.5 1.0 05	61.3	15 04.4 1.0 05	61.3	15 34.4 1.0 05	61.2	16 04.4 1.0 05	61.2	16 34.3 1.0 05	61.2	17 04.3 1.0 05	61.2	17 34.3 1.0 05	61.1	18 04.2 1.0 05	61.1	8
9	14 31.7 1.0 05	60.3	15 01.7 1.0 04	60.3	15 31.7 1.0 04	60.2	16 01.6 1.0 04	60.2	16 31.6 1.0 04	60.2	17 01.6 1.0 04	60.2	17 31.5 1.0 04	60.1	18 01.5 1.0 04	60.1	9
120	14 29.0 1.0 04	59.3	14 59.0 1.0 04	59.3	15 29.0 1.0 04	59.2	15 58.9 1.0 04	59.2	16 28.9 1.0 04	59.2	16 58.9 1.0 04	59.2	17 28.8 1.0 04	59.1	17 58.8 1.0 04	59.1	120
1	14 26.3 1.0 04	58.3	14 56.3 1.0 04	58.3	15 26.3 1.0 04	58.3	15 56.2 1.0 04	58.2	16 26.2 1.0 04	58.2	16 56.2 1.0 04	58.2	17 26.1 1.0 04	58.2	17 56.1 1.0 04	58.1	1
2	14 23.7 1.0 04	57.3	14 53.6 1.0 04	57.3	15 23.6 1.0 04	57.3	15 53.6 1.0 04	57.2	16 23.6 1.0 04	57.2	16 53.5 1.0 04	57.2	17 23.5 1.0 04	57.2	17 53.5 1.0 04	57.1	2
3	14 21.1 1.0 04	56.3	14 51.0 1.0 04	56.3	15 21.0 1.0 04	56.3	15 51.0 1.0 04	56.2	16 20.9 1.0 04	56.2	16 50.9 1.0 04	56.2	17 20.9 1.0 04	56.2	17 50.8 1.0 04	56.1	3
4	14 18.5 1.0 04	55.3	14 48.4 1.0 04	55.3	15 18.4 1.0 04	55.3	15 48.4 1.0 04	55.3	16 18.3 1.0 04	55.2	16 48.3 1.0 04	55.2	17 18.3 1.0 04	55.2	17 48.2 1.0 04	55.2	4
125	14 15.9 1.0 04	54.3	14 45.9 1.0 04	54.3	15 15.8 1.0 04	54.3	15 45.8 1.0 04	54.3	16 15.8 1.0 04	54.2	16 45.7 1.0 04	54.2	17 15.7 1.0 04	54.2	17 45.7 1.0 04	54.2	125
6	14 13.4 1.0 04	53.3	14 43.3 1.0 04	53.3	15 13.3 1.0 04	53.3	15 43.3 1.0 04	53.3	16 13.2 1.0 04	53.3	16 43.2 1.0 04	53.2	17 13.2 1.0 04	53.2	17 43.1 1.0 04	53.2	6
7	14 10.9 1.0 04	52.4	14 40.8 1.0 04	52.3	15 10.8 1.0 04	52.3	15 40.8 1.0 04	52.3	16 10.7 1.0 04	52.3	16 40.7 1.0 04	52.2	17 10.7 1.0 04	52.2	17 40.7 1.0 04	52.2	7
8	14 08.4 1.0 04	51.4	14 38.4 1.0 04	51.3	15 08.3 1.0 04	51.3	15 38.3 1.0 04	51.3	16 08.3 1.0 04	51.3	16 38.2 1.0 04	51.3	17 08.2 1.0 04	51.2	17 38.2 1.0 04	51.2	8
9	14 05.9 1.0 04	50.4	14 35.9 1.0 04	50.4	15 05.9 1.0 04	50.3	15 35.9 1.0 04	50.3	16 05.8 1.0 04	50.3	16 35.8 1.0 04	50.3	17 05.8 1.0 04	50.2	17 35.8 1.0 04	50.2	9
130	14 03.5 1.0 04	49.4	14 33.5 1.0 04	49.4	15 03.5 1.0 04	49.3	15 33.5 1.0 04	49.3	16 03.4 1.0 04	49.3	16 33.4 1.0 04	49.3	17 03.4 1.0 04	49.3	17 33.4 1.0 04	49.2	130
1	14 01.2 1.0 04	48.4	14 31.2 1.0 04	48.4	15 01.1 1.0 04	48.4	15 31.1 1.0 04	48.3	16 01.1 1.0 04	48.3	16 31.1 1.0 04	48.3	17 01.0 1.0 04	48.3	17 31.0 1.0 04	48.2	1
2	13 58.8 1.0 04	47.4	14 28.8 1.0 04	47.4	14 58.8 1.0 04	47.4	15 28.8 1.0 04	47.3	15 58.7 1.0 04	47.3	16 28.7 1.0 04	47.3	16 58.7 1.0 04	47.3	17 28.7 1.0 04	47.3	2
3	13 56.6 1.0 04	46.4	14 26.5 1.0 04	46.4	14 56.5 1.0 04	46.4	15 26.5 1.0 04	46.4	15 56.5 1.0 04	46.3	16 26.4 1.0 04	46.3	16 56.4 1.0 04	46.3	17 26.4 1.0 04	46.3	3
4	13 54.3 1.0 04	45.4	14 24.3 1.0 04	45.4	14 54.3 1.0 04	45.4	15 24.2 1.0 04	45.4	15 54.2 1.0 04	45.3	16 24.2 1.0 04	45.3	16 54.2 1.0 04	45.3	17 24.1 1.0 04	45.3	4
135	13 52.1 1.0 04	44.4	14 22.1 1.0 04	44.4	14 52.0 1.0 04	44.4	15 22.0 1.0 04	44.4	15 52.0 1.0 04	44.4	16 22.0 1.0 04	44.3	16 51.9 1.0 04	44.3	17 21.9 1.0 04	44.3	135
6	13 49.9 1.0 04	43.4	14 19.9 1.0 04	43.4	14 49.9 1.0 04	43.4	15 19.8 1.0 04	43.4	15 49.8 1.0 04	43.4	16 19.8 1.0 04	43.4	16 49.8 1.0 04	43.3	17 19.8 1.0 04	43.3	6
7	13 47.8 1.0 04	42.5	14 17.7 1.0 04	42.4	14 47.7 1.0 04	42.4	15 17.7 1.0 03	42.4	15 47.7 1.0 03	42.4	16 17.7 1.0 03	42.4	16 47.6 1.0 03	42.3	17 17.6 1.0 03	42.3	7
8	13 45.7 1.0 04	41.5	14 15.6 1.0 03	41.4	14 45.6 1.0 03	41.4	15 15.6 1.0 03	41.4	15 45.6 1.0 03	41.4	16 15.6 1.0 03	41.4	16 45.5 1.0 03	41.4	17 15.5 1.0 03	41.3	8
9	13 43.6 1.0 03	40.5	14 13.6 1.0 03	40.5	14 43.6 1.0 03	40.4	15 13.5 1.0 03	40.4	15 43.5 1.0 03	40.4	16 13.5 1.0 03	40.4	16 43.5 1.0 03	40.4	17 13.5 1.0 03	40.4	9
140	13 41.6 1.0 03	39.5	14 11.6 1.0 03	39.5	14 41.5 1.0 03	39.5	15 11.5 1.0 03	39.4	15 41.5 1.0 03	39.4	16 11.5 1.0 03	39.4	16 41.5 1.0 03	39.4	17 11.5 1.0 03	39.4	140
1	13 39.6 1.0 03	38.5	14 09.6 1.0 03	38.5	14 39.6 1.0 03	38.5	15 09.5 1.0 03	38.4	15 39.5 1.0 03	38.4	16 09.5 1.0 03	38.4	16 39.5 1.0 03	38.4	17 09.5 1.0 03	38.4	1
2	13 37.7 1.0 03	37.5	14 07.7 1.0 03	37.5	14 37.6 1.0 03	37.5	15 07.6 1.0 03	37.5	15 37.6 1.0 03	37.4	16 07.6 1.0 03	37.4	16 37.6 1.0 03	37.4	17 07.6 1.0 03	37.4	2
3	13 35.8 1.0 03	36.5	14 05.8 1.0 03	36.5	14 35.8 1.0 03	36.5	15 05.7 1.0 03	36.5	15 35.7 1.0 03	36.5	16 05.7 1.0 03	36.4	16 35.7 1.0 03	36.4	17 05.7 1.0 03	36.4	3
4	13 33.9 1.0 03	35.5	14 03.9 1.0 03	35.5	14 33.9 1.0 03	35.5	15 03.9 1.0 03	35.5	15 33.9 1.0 03	35.5	16 03.9 1.0 03	35.5	16 33.8 1.0 03	35.4	17 03.8 1.0 03	35.4	4
145	13 32.1 1.0 03	34.5	14 02.1 1.0 03	34.5	14 32.1 1.0 03	34.5	15 02.1 1.0 03	34.5	15 32.1 1.0 03	34.5	16 02.1 1.0 03	34.5	16 32.0 1.0 03	34.5	17 02.0 1.0 03	34.4	145
6	13 30.4 1.0 03	33.6	14 00.4 1.0 03	33.5	14 30.3 1.0 03	33.5	15 00.3 1.0 03	33.5	15 30.3 1.0 03	33.5	16 00.3 1.0 03	33.5	16 30.3 1.0 03	33.5	17 00.3 1.0 03	33.5	6
7	13 28.7 1.0 03	32.6	13 58.7 1.0 03	32.6	14 28.6 1.0 03	32.5	14 58.6 1.0 03	32.5	15 28.6 1.0 03	32.5	15 58.6 1.0 03	32.5	16 28.6 1.0 03	32.5	16 58.6 1.0 03	32.5	7
8	13 27.0 1.0 03	31.6	13 57.0 1.0 03	31.6	14 27.0 1.0 03	31.6	14 57.0 1.0 03	31.5	15 27.0 1.0 03	31.5	15 56.9 1.0 03	31.5	16 26.9 1.0 03	31.5	16 56.9 1.0 03	31.5	8
9	13 25.4 1.0 03	30.6	13 55.4 1.0 03	30.6	14 25.4 1.0 03	30.6	14 55.3 1.0 03	30.6	15 25.3 1.0 03	30.5	15 55.3 1.0 03	30.5	16 25.3 1.0 03	30.5	16 55.3 1.0 03	30.5	9
150	13 23.8 1.0 03	29.6	13 53.8 1.0 03	29.6	14 23.8 1.0 03	29.6	14 53.8 1.0 03	29.6	15 23.8 1.0 03	29.6	15 53.7 1.0 03	29.5	16 23.7 1.0 03	29.5	16 53.7 1.0 03	29.5	150
1	13 22.3 1.0 02	28.6	13 52.3 1.0 02	28.6	14 22.3 1.0 02	28.6	14 52.2 1.0 02	28.6	15 22.2 1.0 02	28.6	15 52.2 1.0 02	28.6	16 22.2 1.0 02	28.5	16 52.2 1.0 02	28.5	1
2	13 20.8 1.0 02	27.6	13 50.8 1.0 02	27.6	14 20.8 1.0 02	27.6	14 50.8 1.0 02	27.6	15 20.8 1.0 02	27.6	15 50.7 1.0 02	27.6	16 20.7 1.0 02	27.5	16 50.7 1.0 02	27.5	2
3	13 19.4 1.0 02	26.6	13 49.3 1.0 02	26.6	14 19.3 1.0 02	26.6	14 49.3 1.0 02	26.6	15 19.3 1.0 02	26.6	15 49.3 1.0 02	26.6	16 19.3 1.0 02	26.6	16 49.2 1.0 02	26.5	3
4	13 18.0 1.0 02	25.7	13 48.0 1.0 02	25.6	14 18.0 1.0 02	25.6	14 47.9 1.0 02	25.6	15 17.9 1.0 02	25.6	15 47.9 1.0 02	25.6	16 17.9 1.0 02	25.6	16 47.9 1.0 02	25.6	4
155	13 16.6 1.0 02	24.7	13 46.6 1.0 02	24.7	14 16.6 1.0 02	24.6	14 46.6 1.0 02	24.6	15 16.6 1.0 02	24.6	15 46.6 1.0 02	24.6	16 16.6 1.0 02	24.6	16 46.6 1.0 02	24.6	155
6	13 15.4 1.0 02	23.7	13 45.3 1.0 02	23.7	14 15.3 1.0 02	23.7	14 45.3 1.0 02	23.6	15 15.3 1.0 02	23.6	15 45.3 1.0 02	23.6	16 15.3 1.0 02	23.6	16 45.3 1.0 02	23.6	6
7	13 14.1 1.0 02	22.7	13 44.1 1.0 02	22.7	14 14.1 1.0 02	22.7	14 44.1 1.0 02	22.7	15 14.1 1.0 02	22.7	15 44.1 1.0 02	22.6	16 14.1 1.0 02	22.6	16 44.1 1.0 02	22.6	7
8	13 12.9 1.0 02	21.7	13 42.9 1.0 02	21.7	14 12.9 1.0 02	21.7	14 42.9 1.0 02	21.7	15 12.9 1.0 02	21.7	15 42.9 1.0 02	21.7	16 12.9 1.0 02	21.6	16 42.9 1.0 02	21.6	8
9	13 11.8 1.0 02	20.7	13 41.8 1.0 02	20.7	14 11.8 1.0 02	20.7	14 41.8 1.0 02	20.7	15 11.8 1.0 02	20.7	15 41.8 1.0 02	20.7	16 11.8 1.0 02	20.7	16 41.8 1.0 02	20.7	9
160	13 10.7 1.0 02	19.7	13 40.7 1.0 02	19.7	14 10.7 1.0 02	19.7	14 40.7 1.0 02	19.7	15 10.7 1.0 02	19.7	15 40.7 1.0 02	19.7	16 10.7 1.0 02	19.7	16 40.7 1.0 02	19.7	160
1	13 09.7 1.0 02	18.7	13 39.7 1.0 02	18.7	14 09.7 1.0 02	18.7	14 39.7 1.0 02	18.7	15 09.7 1.0 02	18.7	15 39.6 1.0 02	18.7	16 09.6 1.0 02	18.7	16 39.6 1.0 02	18.7	1
2	13 08.7 1.0 02	17.8	13 38.7 1.0 02	17.8	14 08.7 1.0 01	17.7	14 38.7 1.0 01	17.7	15 08.7 1.0 01	17.7	15 38.7 1.0 01	17.7	16 08.7 1.0 01	17.7	16 38.7 1.0 01	17.7	2
3	13 07.8 1.0 01	16.8	13 37.8 1.0 01	16.8	14 07.8 1.0 01	16.8	14 37.8 1.0 01	16.7	15 07.7 1.0 01	16.7	15 37.7 1.0 01	16.7	16 07.7 1.0 01	16.7	16 37.7 1.0 01	16.7	3
4	13 06.9 1.0 01	15.8	13 36.9 1.0 01	15.8	14 06.9 1.0 01	15.8	14 36.9 1.0 01	15.8	15 06.9 1.0 01	15.8	15 36.9 1.0 01	15.7	16 06.9 1.0 01	15.7	16 36.9 1.0 01	15.7	4
165	13 06.0 1.0 01	14.8	13 36.0 1.0 01	14.8	14 06.0 1.0 01	14.8	14 36.0 1.0 01	14.8	15 06.0 1.0 01	14.8	15 36.0 1.0 01	14.8	16 06.0 1.0 01	14.8	16 36.0 1.0 01	14.7	165
6	13 05.3 1.0 01	13.8	13 35.3 1.0 01	13.8	14 05.3 1.0 01	13.8	14 35.3 1.0 01	13.8	15 05.3 1.0 01	13.8	15 35.3 1.0 01	13.8	16 05.3 1.0 01	13.8	16 35.3 1.0 01	13.8	6
7	13 04.5 1.0 01	12.8	13 34.5 1.0 01	12.8	14 04.5 1.0 01	12.8	14 34.5 1.0 01	12.8	15 04.5 1.0 01	12.8	15 34.5 1.0 01	12.8	16 04.5 1.0 01	12.8	16 34.5 1.0 01	12.8	7
8	13 03.9 1.0 01	11.8	13 33.9 1.0 01	11.8	14 03.9 1.0 01	11.8	14 33.9 1.0 01	11.8	15 03.9 1.0 01	11.8	15 33.9 1.0 01	11.8	16 03.9 1.0 01	11.8	16 33.9 1.0 01	11.8	8
9	13 03.3 1.0 01	10.9	13 33.3 1.0 01	10.8	14 03.3 1.0 01	10.8	14 33.3 1.0 01	10.8	15 03.3 1.0 01	10.8	15 33.3 1.0 01	10.8	16 03.3 1.0 01	10.8	16 33.3 1.0 01	10.8	9
170	13 02.7 1.0 01	09.9	13 32.7 1.0 01	09.9	14 02.7 1.0 01	09.9	14 32.7 1.0 01	09.9	15 02.7 1.0 01	09.8	15 32.7 1.0 01	09.8	16 02.7 1.0 01	09.8	16 32.7 1.0 01	09.8	170
1	13 02.2 1.0 01	08.9	13 32.2 1.0 01	08.9	14 02.2 1.0 01	08.9	14 32.2 1.0 01	08.9	15 02.2 1.0 01	08.9	15 32.2 1.0 01	08.9	16 02.2 1.0 01	08.9	16 32.2 1.0 01	08.8	1
2	13 01.7 1.0 01	07.9	13 31.7 1.0 01	07.9	14 01.7 1.0 01	07.9	14 31.7 1.0 01	07.9	15 01.7 1.0 01	07.9	15 31.7 1.0 01	07.9	16 01.7 1.0 01	07.9	16 31.7 1.0 01	07.9	2
3	13 01.3 1.0 01	06.9	13 31.3 1.0 01	06.9	14 01.3 1.0 01	06.9	14 31.3 1.0 01	06.9	15 01.3 1.0 01	06.9	15 31.3 1.0 01	06.9	16 01.3 1.0 01	06.9	16 31.3 1.0 01	06.9	3
4	13 01.0 1.0 00	05.9	13 31.0 1.0 00	05.9	14 01.0 1.0 00	05.9	14 31.0 1.0 00	05.9	15 01.0 1.0 00	05.9	15 31.0 1.0 00	05.9	16 01.0 1.0 00	05.9	16 31.0 1.0 00	05.9	4
175	13 00.7 1.0 00	04.9	13 30.7 1.0 00	04.9	14 00.7 1.0 00	04.9	14 30.7 1.0 00	04.9	15 00.7 1.0 00	04.9	15 30.7 1.0 00	04.9	16 00.7 1.0 00	04.9	16 30.7 1.0 00	04.9	175
6	13 00.4 1.0 00	03.9	13 30.4 1.0 00	03.9	14 00.4 1.0 00	03.9	14 30.4 1.0 00	03.9	15 00.4 1.0 00	03.9	15 30.4 1.0 00	03.9	16 00.4 1.0 00	03.9	16 30.4 1.0 00	03.9	6
7	13 00.2 1.0 00	03.0	13 30.2 1.0 00	03.0	14 00.2 1.0 00	03.0	14 30.2 1.0 00	03.0	15 00.2 1.0 00	03.0	15 30.2 1.0 00	03.0	16 00.2 1.0 00	03.0	16 30.2 1.0 00	02.9	7
8	13 00.1 1.0 00	02.0	13 30.1 1.0 00	02.0	14 00.1 1.0 00	02.0	14 30.1 1.0 00	02.0	15 00.1 1.0 00	02.0	15 30.1 1.0 00	02.0	16 00.1 1.0 00	02.0	16 30.1 1.0 00	02.0	8
9	13 00.0 1.0 00	01.0	13 30.0 1.0 00	01.0	14 00.0 1.0 00	01.0	14 30.0 1.0 00	01.0	15 00.0 1.0 00	01.0	15 30.0 1.0 00	01.0	16 00.0 1.0 00	01.0	16 30.0 1.0 00	01.0	9
180	13 00.0 1.0 00	00.0	13 30.0 1.0 00	00.0	14 00.0 1.0 00	00.0	14 30.0 1.0 00	00.0	15 00.0 1.0 00	00.0	15 30.0 1.0 00	00.0	16 00.0 1.0 00	00.0	16 30.0 1.0 00	00.0	180

Lat. 87° — Declination Same Name as Latitude

Each cell: Alt. (° ′) Δd Δt Az. (°)

H.A.	20° 00′	20° 30′	21° 00′	21° 30′	22° 00′	22° 30′	23° 00′	23° 30′	H.A.
00	23 00.0 1.0 00 180.0	23 30.0 1.0 00 180.0	24 00.0 1.0 00 180.0	24 30.0 1.0 00 180.0	25 00.0 1.0 00 180.0	25 30.0 1.0 00 180.0	26 00.0 1.0 00 180.0	26 30.0 1.0 00 180.0	00
1	23 00.0 1.0 00 179.0	23 30.0 1.0 00 179.0	24 00.0 1.0 00 179.0	24 30.0 1.0 00 179.0	25 00.0 1.0 00 179.0	25 30.0 1.0 00 179.0	26 00.0 1.0 00 179.0	26 30.0 1.0 00 179.0	1
2	22 59.9 1.0 00 178.0	23 29.9 178.0	23 59.9 178.0	24 29.9 178.0	24 59.9 178.0	25 29.9 178.0	25 59.9 178.0	26 29.9 178.0	2
3	22 59.7 1.0 00 176.9	23 29.7 176.9	23 59.7 176.9	24 29.7 176.9	24 59.7 176.9	25 29.7 176.9	25 59.7 176.9	26 29.7 176.9	3
4	22 59.6 1.0 00 175.9	23 29.6 175.9	23 59.6 175.9	24 29.6 175.9	24 59.6 175.9	25 29.6 175.9	25 59.6 175.9	26 29.6 175.9	4
05	22 59.3 1.0 00 174.9	23 29.3 174.9	23 59.3 174.9	24 29.3 174.9	24 59.3 174.9	25 29.3 174.9	25 59.3 1.0 01 174.9	26 29.3 1.0 01 174.9	05
6	22 59.0 1.0 01 173.9	23 29.0 173.9	23 59.0 173.9	24 29.0 173.9	24 59.0 173.9	25 29.0 173.9	25 59.0 173.9	26 29.0 173.9	6
7	22 58.6 1.0 01 172.9	23 28.6 172.9	23 58.6 172.8	24 28.6 172.8	24 58.6 172.8	25 28.6 172.8	25 58.6 172.8	26 28.6 172.8	7
8	22 58.2 1.0 01 171.8	23 28.2 171.8	23 58.2 171.8	24 28.2 171.8	24 58.2 171.8	25 28.2 171.8	25 58.2 171.8	26 28.2 171.8	8
9	22 57.9 1.0 01 170.8	23 27.9 170.8	23 57.7 170.8	24 27.7 170.8	24 57.7 170.8	25 27.7 170.8	25 57.7 170.8	26 27.7 170.8	9
10	22 57.2 1.0 01 169.8	23 27.2 169.8	23 57.2 169.8	24 27.2 169.8	24 57.2 169.8	25 27.2 169.8	25 57.2 169.8	26 27.2 169.8	10
1	22 56.6 1.0 01 168.8	23 26.6 168.8	23 56.6 168.8	24 26.6 168.8	24 56.6 168.7	25 26.6 168.7	25 56.6 168.7	26 26.6 168.7	1
2	22 56.0 1.0 01 167.8	23 26.0 167.7	23 56.0 167.7	24 26.0 167.7	24 56.0 167.7	25 26.0 167.7	25 56.0 167.7	26 26.0 167.7	2
3	22 55.3 1.0 01 166.7	23 25.3 166.7	23 55.3 166.7	24 25.3 166.7	24 55.3 166.7	25 25.3 166.7	25 55.3 166.7	26 25.3 166.7	3
4	22 54.5 1.0 01 165.7	23 24.5 165.7	23 54.5 165.7	24 24.5 165.7	24 54.5 165.7	25 24.5 165.7	25 54.5 165.7	26 24.5 165.7	4
15	22 53.7 1.0 01 164.7	23 23.7 164.7	23 53.7 164.7	24 23.7 164.7	24 53.7 164.7	25 23.7 164.7	25 53.7 164.6	26 23.7 164.6	15
6	22 52.9 1.0 02 163.7	23 22.9 163.7	23 52.9 163.7	24 22.9 163.6	24 52.9 163.6	25 22.9 163.6	25 52.0 163.6	26 22.9 163.6	6
7	22 52.0 1.0 02 162.7	23 22.0 162.6	23 52.0 162.6	24 22.0 162.6	24 52.0 162.6	25 22.0 162.6	25 52.0 162.6	26 21.9 162.6	7
8	22 51.0 1.0 02 161.6	23 21.0 161.6	23 51.0 161.6	24 21.0 161.6	24 51.0 161.6	25 21.0 161.6	25 51.0 161.6	26 21.0 161.6	8
9	22 50.0 1.0 02 160.6	23 20.0 160.6	23 50.0 160.6	24 20.0 160.6	24 50.0 160.6	25 20.0 160.6	25 50.0 160.6	26 20.0 160.5	9
20	22 48.9 1.0 02 159.6	23 18.9 159.6	23 48.9 159.6	24 18.9 159.6	24 48.9 159.6	25 18.9 159.6	25 48.9 159.5	26 18.9 159.5	20
1	22 47.8 1.0 02 158.6	23 17.8 158.6	23 47.8 158.6	24 17.8 158.5	24 47.8 158.5	25 17.8 158.5	25 47.8 158.5	26 17.8 158.5	1
2	22 46.6 1.0 02 157.6	23 16.6 157.5	23 46.6 157.5	24 16.6 157.5	24 46.6 157.5	25 16.6 157.5	25 46.6 157.5	26 16.6 157.5	2
3	22 45.4 1.0 02 156.5	23 15.4 156.5	23 45.4 156.5	24 15.4 156.5	24 45.4 156.5	25 15.4 156.5	25 45.4 156.5	26 15.4 156.5	3
4	22 44.1 1.0 02 155.5	23 14.1 155.5	23 44.1 155.5	24 14.1 155.5	24 44.1 155.5	25 14.1 155.5	25 44.1 155.4	26 14.1 155.4	4
25	22 42.8 1.0 02 154.5	23 12.8 154.5	23 42.8 154.5	24 12.8 154.5	24 42.8 154.4	25 12.8 154.4	25 42.8 154.4	26 12.7 154.4	25
6	22 41.4 1.0 02 153.5	23 11.4 153.5	23 41.4 153.5	24 11.4 153.4	24 41.4 153.4	25 11.4 153.4	25 41.4 153.4	26 11.4 153.4	6
7	22 40.0 1.0 02 152.5	23 10.0 152.4	23 40.0 152.4	24 10.0 152.4	24 40.0 152.4	25 10.0 152.4	25 39.9 152.4	26 09.9 152.4	7
8	22 38.5 1.0 03 151.4	23 08.5 151.4	23 38.5 151.4	24 08.5 151.4	24 38.5 151.4	25 08.5 151.4	25 38.5 151.3	26 08.5 151.3	8
9	22 37.0 1.0 03 150.4	23 07.0 150.4	23 37.0 150.4	24 07.0 150.4	24 37.0 150.4	25 06.9 150.4	25 36.9 150.3	26 06.9 150.3	9
30	22 35.4 1.0 03 149.4	23 05.4 149.4	23 35.4 149.4	24 05.4 149.4	24 35.4 149.3	25 05.4 149.3	25 35.4 149.3	26 05.3 149.3	30
1	22 33.8 1.0 03 148.4	23 03.8 148.4	23 33.8 148.4	24 03.8 148.3	24 33.8 148.3	25 03.7 148.3	25 33.7 148.3	26 03.7 148.3	1
2	22 32.1 1.0 03 147.4	23 02.1 147.4	23 32.1 147.3	24 02.1 147.3	24 32.1 147.3	25 02.1 147.3	25 32.1 147.3	26 02.0 147.3	2
3	22 30.4 1.0 03 146.4	23 00.4 146.3	23 30.4 146.3	24 00.4 146.3	24 30.4 146.3	25 00.3 146.3	25 30.3 146.2	26 00.3 146.2	3
4	22 28.7 1.0 03 145.3	22 58.6 145.3	23 28.6 145.3	23 58.6 145.3	24 28.6 145.3	24 58.6 145.3	25 28.6 145.2	25 58.6 145.2	4
35	22 26.9 1.0 03 144.3	22 56.8 144.3	23 26.8 144.3	23 56.8 144.3	24 26.8 144.3	24 56.8 144.2	25 26.8 144.2	25 56.7 144.2	35
6	22 25.0 1.0 03 143.3	22 55.0 143.3	23 25.0 143.3	23 54.9 143.3	24 24.9 143.2	24 54.9 143.2	25 24.9 143.2	25 54.9 143.2	6
7	22 23.1 1.0 03 142.3	22 53.1 142.3	23 23.1 142.3	23 53.0 142.2	24 23.0 142.2	24 53.0 142.2	25 23.0 142.2	25 53.0 142.2	7
8	22 21.2 1.0 03 141.3	22 51.1 141.3	23 21.1 141.2	23 51.1 141.2	24 21.1 141.2	24 51.1 141.2	25 21.1 141.2	25 51.1 141.1	8
9	22 19.2 1.0 03 140.3	22 49.2 140.2	23 19.1 140.2	23 49.1 140.2	24 19.1 140.2	24 49.1 140.2	25 19.1 140.1	25 49.0 140.1	9
40	22 17.1 1.0 03 139.2	22 47.1 139.2	23 17.1 139.2	23 47.1 139.2	24 17.1 139.2	24 47.0 139.1	25 17.0 139.1	25 47.0 139.1	40
1	22 15.1 1.0 04 138.2	22 45.1 138.2	23 15.0 138.2	23 45.0 138.2	24 15.0 138.2	24 45.0 138.1	25 14.9 138.1	25 44.9 138.1	1
2	22 13.0 1.0 04 137.2	22 42.9 137.2	23 12.9 137.2	23 42.8 137.1	24 12.9 137.1	24 42.8 137.1	25 12.8 137.1	25 42.8 137.1	2
3	22 10.8 1.0 04 136.2	22 40.8 136.2	23 10.8 136.2	23 40.7 136.1	24 10.7 136.1	24 40.7 136.1	25 10.7 136.1	25 40.6 136.1	3
4	22 08.6 1.0 04 135.2	22 38.6 135.2	23 08.6 135.1	23 38.5 135.1	24 08.5 135.1	24 38.5 135.1	25 08.5 135.1	25 38.4 135.0	4
45	22 06.4 1.0 04 134.2	22 36.4 134.2	23 06.3 134.1	23 36.3 134.1	24 06.3 134.1	24 36.3 134.1	25 06.2 134.0	25 36.2 134.0	45
6	22 04.1 1.0 04 133.2	22 34.1 133.1	23 04.1 133.1	23 34.0 133.1	24 04.0 133.1	24 34.0 133.1	25 04.0 133.0	25 33.9 133.0	6
7	22 01.8 1.0 04 132.2	22 31.8 132.1	23 01.7 132.1	23 31.7 132.1	24 01.7 132.1	24 31.7 132.0	25 01.6 132.0	25 31.6 132.0	7
8	21 59.5 1.0 04 131.1	22 29.4 131.1	22 59.4 131.1	23 29.4 131.1	23 59.3 131.0	24 29.3 131.0	24 59.3 131.0	25 29.3 131.0	8
9	21 57.1 1.0 04 130.1	22 27.0 130.1	22 57.0 130.1	23 27.0 130.1	23 57.0 130.0	24 26.9 130.0	24 56.9 130.0	25 26.9 130.0	9
50	21 54.7 1.0 04 129.1	22 24.6 129.1	22 54.6 129.1	23 24.6 129.0	23 54.5 129.0	24 24.5 129.0	24 54.5 129.0	25 24.4 128.9	50
1	21 52.2 1.0 04 128.1	22 22.2 128.1	22 52.1 128.1	23 22.1 128.0	23 52.1 128.0	24 22.1 128.0	24 52.0 128.0	25 22.0 127.9	1
2	21 49.7 1.0 04 127.1	22 19.7 127.1	22 49.6 127.0	23 19.6 127.0	23 49.6 127.0	24 19.6 127.0	24 49.5 126.9	25 19.5 126.9	2
3	21 47.2 1.0 04 126.1	22 17.2 126.1	22 47.1 126.0	23 17.1 126.0	23 47.1 126.0	24 17.0 126.0	24 47.0 125.9	25 17.0 125.9	3
4	21 44.6 1.0 04 125.1	22 14.6 125.1	22 44.6 125.0	23 14.5 125.0	23 44.5 125.0	24 14.5 124.9	24 44.4 124.9	25 14.4 124.9	4
55	21 42.0 1.0 04 124.1	22 12.0 124.0	22 42.0 124.0	23 12.0 124.0	23 41.9 124.0	24 11.9 123.9	24 41.9 123.9	25 11.8 123.9	55
6	21 39.4 1.0 04 123.1	22 09.3 123.0	22 39.4 123.0	23 09.3 123.0	23 39.3 122.9	24 09.3 122.9	24 39.2 122.9	25 09.2 122.9	6
7	21 36.8 1.0 04 122.0	22 06.8 122.0	22 36.7 122.0	23 06.7 122.0	23 36.6 121.9	24 06.6 121.9	24 36.6 121.9	25 06.5 121.9	7
8	21 34.1 1.0 04 121.0	22 04.1 121.0	22 34.0 121.0	23 04.0 121.0	23 34.0 120.9	24 03.9 120.9	24 33.9 120.9	25 03.9 120.8	8
9	21 31.4 1.0 05 120.0	22 01.4 120.0	22 31.3 120.0	23 01.3 119.9	23 31.3 119.9	24 01.2 119.9	24 31.2 119.9	25 01.2 119.8	9
60	21 28.7 1.0 05 119.0	21 58.6 119.0	22 28.6 119.0	22 58.6 118.9	23 28.5 118.9	23 58.5 118.9	24 28.5 118.9	24 58.4 118.8	60
1	21 25.9 1.0 05 118.0	21 55.9 118.0	22 25.8 117.9	22 55.8 117.9	23 25.8 117.9	23 55.7 117.9	24 25.7 117.8	24 55.6 117.8	1
2	21 23.1 1.0 05 117.0	21 53.1 117.0	22 23.1 116.9	22 53.0 116.9	23 23.0 116.9	23 52.9 116.9	24 22.9 116.8	24 52.9 116.8	2
3	21 20.3 1.0 05 116.0	21 50.3 116.0	22 20.2 115.9	22 50.2 115.9	23 20.2 115.9	23 50.1 115.8	24 20.1 115.8	24 50.0 115.8	3
4	21 17.5 1.0 05 115.0	21 47.4 115.0	22 17.4 114.9	22 47.4 114.9	23 17.3 114.9	23 47.3 114.8	24 17.2 114.8	24 47.2 114.8	4
65	21 14.6 1.0 05 114.0	21 44.6 113.9	22 14.5 113.9	22 44.5 113.9	23 14.5 113.8	23 44.4 113.8	24 14.4 113.8	24 44.3 113.8	65
6	21 11.7 1.0 05 113.0	21 41.7 112.9	22 11.7 112.9	22 41.6 112.9	23 11.6 112.8	23 41.5 112.8	24 11.5 112.8	24 41.5 112.8	6
7	21 08.8 1.0 05 112.0	21 38.8 111.9	22 08.8 111.9	22 38.7 111.9	23 08.7 111.8	23 38.6 111.8	24 08.6 111.8	24 38.6 111.8	7
8	21 05.9 1.0 05 111.0	21 35.9 110.9	22 05.8 110.9	22 35.8 110.9	23 05.8 110.8	23 35.7 110.8	24 05.7 110.8	24 35.6 110.8	8
9	21 02.9 1.0 05 109.9	21 32.9 109.9	22 02.9 109.9	22 32.8 109.8	23 02.8 109.8	23 32.8 109.8	24 02.7 109.8	24 32.7 109.7	9
70	21 00.0 1.0 05 108.9	21 30.0 108.9	21 59.9 108.8	22 29.9 108.8	22 59.9 108.8	23 29.8 108.8	23 59.8 108.8	24 29.7 108.7	70
1	20 57.0 1.0 05 107.9	21 27.0 107.9	21 57.0 107.9	22 26.9 107.8	22 56.9 107.8	23 26.8 107.8	23 56.8 107.8	24 26.7 107.7	1
2	20 54.0 1.0 05 106.9	21 24.0 106.9	21 54.0 106.9	22 23.9 106.8	22 53.9 106.8	23 23.8 106.8	23 53.8 106.8	24 23.7 106.7	2
3	20 51.0 1.0 05 105.9	21 21.0 105.9	21 50.9 105.9	22 20.9 105.8	22 50.9 105.8	23 20.8 105.8	23 50.8 105.8	24 20.7 105.7	3
4	20 48.0 1.0 05 104.9	21 18.0 104.9	21 47.9 104.9	22 17.9 104.8	22 47.9 104.8	23 17.8 104.8	23 47.7 104.7	24 17.7 104.7	4
75	20 45.0 1.0 05 103.9	21 14.9 103.9	21 44.9 103.9	22 14.9 103.8	22 44.8 103.8	23 14.7 103.8	23 44.7 103.7	24 14.6 103.7	75
6	20 41.9 1.0 05 102.9	21 11.9 102.9	21 41.8 102.9	22 11.8 102.8	22 41.7 102.8	23 11.7 102.8	23 41.6 102.7	24 11.6 102.7	6
7	20 38.8 1.0 05 101.9	21 08.8 101.9	21 38.7 101.9	22 08.7 101.8	22 38.7 101.8	23 08.6 101.8	23 38.6 101.7	24 08.5 101.7	7
8	20 35.7 1.0 05 100.9	21 05.7 100.9	21 35.7 100.9	22 05.6 100.8	22 35.6 100.8	23 05.6 100.8	23 35.5 100.7	24 05.4 100.7	8
9	20 32.7 1.0 05 99.9	21 02.6 99.9	21 32.6 99.9	22 02.5 99.8	22 32.5 99.8	23 02.4 99.8	23 32.4 99.7	24 02.3 99.7	9
80	20 29.6 1.0 05 98.9	20 59.5 98.9	21 29.5 98.8	21 59.4 98.8	22 29.4 98.8	22 59.3 98.8	23 29.3 98.7	23 59.2 98.7	80
1	20 26.5 1.0 05 97.9	20 56.4 97.9	21 26.4 97.8	21 56.3 97.8	22 26.3 97.8	22 56.2 97.8	23 26.2 97.7	23 56.1 97.7	1
2	20 23.4 1.0 05 96.9	20 53.3 96.9	21 23.3 96.8	21 53.2 96.8	22 23.2 96.8	22 53.1 96.8	23 23.1 96.7	23 53.0 96.7	2
3	20 20.2 1.0 05 95.9	20 50.2 95.9	21 20.1 95.8	21 50.1 95.8	22 20.0 95.8	22 50.0 95.8	23 20.0 95.7	23 49.9 95.7	3
4	20 17.1 1.0 05 94.9	20 47.1 94.9	21 17.0 94.8	21 47.0 94.8	22 16.9 94.8	22 46.9 94.8	23 16.8 94.7	23 46.8 94.7	4
85	20 14.0 1.0 05 93.9	20 43.9 93.9	21 13.9 93.8	21 43.8 93.8	22 13.8 93.8	22 43.7 93.8	23 13.7 93.7	23 43.6 93.7	85
6	20 10.8 1.0 05 92.9	20 40.8 92.9	21 10.7 92.8	21 40.7 92.8	22 10.7 92.8	22 40.6 92.8	23 10.6 92.7	23 40.5 92.7	6
7	20 07.7 1.0 05 91.9	20 37.7 91.9	21 07.6 91.8	21 37.6 91.8	22 07.5 91.8	22 37.5 91.8	23 07.4 91.7	23 37.4 91.7	7
8	20 04.6 1.0 05 90.9	20 34.5 90.9	21 04.5 90.8	21 34.4 90.8	22 04.4 90.8	22 34.3 90.8	23 04.3 90.7	23 34.2 90.7	8
9	20 01.4 1.0 05 89.9	20 31.4 89.9	21 01.3 89.8	21 31.3 89.8	22 01.2 89.8	22 31.2 89.8	23 01.1 89.7	23 31.1 89.7	9
90	19 58.3 1.0 05 88.9	20 28.2 88.9	20 58.2 88.8	21 28.1 88.8	21 58.1 88.8	22 28.0 88.8	22 58.0 88.7	23 28.0 88.7	90

Lat. 87°

H.A.	20° 00' Alt.	Δd Δt	Az.	20° 30' Alt.	Δd Δt	Az.	21° 00' Alt.	Δd Δt	Az.	21° 30' Alt.	Δd Δt	Az.	22° 00' Alt.	Δd Δt	Az.	22° 30' Alt.	Δd Δt	Az.	23° 00' Alt.	Δd Δt	Az.	23° 30' Alt.	Δd Δt	Az.	H.A.
91	19 55.1	1.005	87.9	20 25.1	1.005	87.9	20 55.1	1.005	87.9	21 25.0	1.005	87.8	21 55.0	1.005	87.8	22 24.9	1.005	87.8	22 54.9	1.005	87.7	23 24.8	1.005	87.7	91
2	19 52.0	1.005	86.9	20 22.0	1.005	86.9	20 51.9	1.005	86.9	21 21.9	1.005	86.8	21 51.8	1.005	86.8	22 21.8	1.005	86.8	22 51.7	1.005	86.7	23 21.7	1.005	86.7	2
3	19 48.9	1.005	85.9	20 18.8	1.005	85.9	20 48.8	1.005	85.9	21 18.7	1.005	85.8	21 48.7	1.005	85.8	22 18.6	1.005	85.8	22 48.6	1.005	85.7	23 18.5	1.005	85.7	3
4	19 45.7	1.005	84.9	20 15.7	1.005	84.9	20 45.7	1.005	84.9	21 15.6	1.005	84.8	21 45.6	1.005	84.8	22 15.5	1.005	84.8	22 45.5	1.005	84.7	23 15.4	1.005	84.7	4
95	19 42.6	1.005	83.9	20 12.6	1.005	83.9	20 42.5	1.005	83.9	21 12.5	1.005	83.8	21 42.4	1.005	83.8	22 12.4	1.005	83.8	22 42.3	1.005	83.7	23 12.3	1.005	83.7	95
6	19 39.5	1.005	82.9	20 09.5	1.005	82.9	20 39.4	1.005	82.9	21 09.4	1.005	82.8	21 39.3	1.005	82.8	22 09.3	1.005	82.8	22 39.2	1.005	82.7	23 09.2	1.005	82.7	6
7	19 36.4	1.005	81.9	20 06.3	1.005	81.9	20 36.3	1.005	81.9	21 06.2	1.005	81.8	21 36.2	1.005	81.8	22 06.2	1.005	81.8	22 36.1	1.005	81.8	23 06.1	1.005	81.7	7
8	19 33.3	1.005	80.9	20 03.2	1.005	80.9	20 33.2	1.005	80.9	21 03.1	1.005	80.8	21 33.1	1.005	80.8	22 03.1	1.005	80.8	22 33.0	1.005	80.8	23 03.0	1.005	80.7	8
9	19 30.2	1.005	79.9	20 00.1	1.005	79.9	20 30.1	1.005	79.9	21 00.0	1.005	79.8	21 30.0	1.005	79.8	22 00.0	1.005	79.8	22 29.9	1.005	79.8	22 59.9	1.005	79.7	9
100	19 27.1	1.005	78.9	19 57.1	1.005	78.9	20 27.0	1.005	78.9	20 57.0	1.005	78.9	21 26.9	1.005	78.8	21 56.9	1.005	78.8	22 26.8	1.005	78.8	22 56.8	1.005	78.7	100
1	19 24.0	1.005	77.9	19 54.0	1.005	77.9	20 23.9	1.005	77.9	20 53.9	1.005	77.9	21 23.8	1.005	77.8	21 53.8	1.005	77.8	22 23.7	1.005	77.8	22 53.7	1.005	77.7	1
2	19 21.0	1.005	77.0	19 50.9	1.005	76.9	20 20.9	1.005	76.9	20 50.8	1.005	76.9	21 20.8	1.005	76.8	21 50.7	1.005	76.8	22 20.7	1.005	76.8	22 50.6	1.005	76.7	2
3	19 17.9	1.005	76.0	19 47.9	1.005	75.9	20 17.8	1.005	75.9	20 47.8	1.005	75.9	21 17.7	1.005	75.8	21 47.7	1.005	75.8	22 17.6	1.005	75.8	22 47.6	1.005	75.8	3
4	19 14.9	1.005	75.0	19 44.8	1.005	74.9	20 14.8	1.005	74.9	20 44.7	1.005	74.9	21 14.7	1.005	74.8	21 44.6	1.005	74.8	22 14.6	1.005	74.8	22 44.6	1.005	74.8	4
105	19 11.8	1.005	74.0	19 41.8	1.005	73.9	20 11.8	1.005	73.9	20 41.7	1.005	73.9	21 11.7	1.005	73.9	21 41.6	1.005	73.8	22 11.6	1.005	73.8	22 41.5	1.005	73.8	105
6	19 08.8	1.005	73.0	19 38.8	1.005	72.9	20 08.7	1.005	72.9	20 38.7	1.005	72.9	21 08.7	1.005	72.9	21 38.6	1.005	72.8	22 08.6	1.005	72.8	22 38.5	1.005	72.8	6
7	19 05.8	1.005	72.0	19 35.8	1.005	72.0	20 05.8	1.005	71.9	20 35.7	1.005	71.9	21 05.7	1.005	71.9	21 35.6	1.005	71.8	22 05.6	1.005	71.8	22 35.5	1.005	71.8	7
8	19 02.9	1.005	71.0	19 32.8	1.005	71.0	20 02.8	1.005	70.9	20 32.7	1.005	70.9	21 02.7	1.005	70.9	21 32.6	1.005	70.8	22 02.6	1.005	70.8	22 32.6	1.005	70.8	8
9	18 59.9	1.005	70.0	19 29.9	1.005	70.0	19 59.8	1.005	69.9	20 29.8	1.005	69.9	20 59.7	1.005	69.9	21 29.7	1.005	69.9	21 59.6	1.005	69.8	22 29.6	1.005	69.8	9
110	18 57.0	1.005	69.0	19 26.9	1.005	69.0	19 56.9	1.005	69.0	20 26.8	1.005	68.9	20 56.8	1.005	68.9	21 26.8	1.005	68.9	21 56.7	1.005	68.8	22 26.7	1.005	68.8	110
1	18 54.0	1.005	68.0	19 24.0	1.005	68.0	19 54.0	1.005	68.0	20 23.9	1.005	67.9	20 53.9	1.005	67.9	21 23.8	1.005	67.9	21 53.8	1.005	67.8	22 23.7	1.005	67.8	1
2	18 51.1	1.005	67.0	19 21.1	1.005	67.0	19 51.1	1.005	67.0	20 21.0	1.005	66.9	20 51.0	1.005	66.9	21 20.9	1.005	66.9	21 50.9	1.005	66.9	22 20.9	1.005	66.8	2
3	18 48.3	1.005	66.0	19 18.2	1.005	66.0	19 48.2	1.005	66.0	20 18.1	1.005	65.9	20 48.1	1.005	65.9	21 18.1	1.005	65.9	21 48.0	1.005	65.9	22 18.0	1.005	65.8	3
4	18 45.4	1.005	65.0	19 15.4	1.005	65.0	19 45.3	1.005	65.0	20 15.3	1.005	65.0	20 45.2	1.005	64.9	21 15.2	1.005	64.9	21 45.2	1.005	64.9	22 15.1	1.005	64.8	4
115	18 42.6	1.005	64.0	19 12.5	1.005	64.0	19 42.5	1.005	64.0	20 12.4	1.005	64.0	20 42.4	1.005	63.9	21 12.4	1.005	63.9	21 42.3	1.005	63.9	22 12.3	1.005	63.9	115
6	18 39.7	1.005	63.1	19 09.7	1.005	63.0	19 39.7	1.005	63.0	20 09.6	1.005	63.0	20 39.6	1.005	63.0	21 09.6	1.005	62.9	21 39.5	1.005	62.9	22 09.5	1.005	62.9	6
7	18 37.0	1.005	62.1	19 06.9	1.005	62.0	19 36.9	1.005	62.0	20 06.9	1.005	62.0	20 36.8	1.005	62.0	21 06.8	1.005	61.9	21 36.7	1.005	61.9	22 06.7	1.005	61.9	7
8	18 34.2	1.005	61.1	19 04.1	1.005	61.1	19 34.1	1.005	61.0	20 04.1	1.005	61.0	20 34.1	1.005	61.0	21 04.0	1.005	60.9	21 34.0	1.005	60.9	22 03.9	1.005	60.9	8
9	18 31.5	1.005	60.1	19 01.4	1.005	60.1	19 31.4	1.005	60.0	20 01.4	1.005	60.0	20 31.3	1.005	60.0	21 01.3	1.004	60.0	21 31.3	1.004	59.9	22 01.2	1.004	59.9	9
120	18 28.8	1.004	59.1	18 58.7	1.004	59.1	19 28.7	1.004	59.0	19 58.7	1.004	59.0	20 28.6	1.004	59.0	20 58.6	1.004	59.0	21 28.5	1.004	58.9	21 58.5	1.004	58.9	120
1	18 26.1	1.004	58.1	18 56.0	1.004	58.1	19 26.0	1.004	58.1	19 56.0	1.004	58.0	20 25.9	1.004	58.0	20 55.9	1.004	58.0	21 25.9	1.004	58.0	21 55.8	1.004	57.9	1
2	18 23.4	1.004	57.1	18 53.4	1.004	57.1	19 23.4	1.004	57.1	19 53.3	1.004	57.0	20 23.3	1.004	57.0	20 53.3	1.004	57.0	21 23.2	1.004	57.0	21 53.2	1.004	56.9	2
3	18 20.8	1.004	56.1	18 50.8	1.004	56.1	19 20.7	1.004	56.1	19 50.7	1.004	56.1	20 20.7	1.004	56.0	20 50.6	1.004	56.0	21 20.6	1.004	56.0	21 50.6	1.004	56.0	3
4	18 18.2	1.004	55.1	18 48.2	1.004	55.1	19 18.1	1.004	55.1	19 48.1	1.004	55.1	20 18.1	1.004	55.0	20 48.1	1.004	55.0	21 18.0	1.004	55.0	21 48.0	1.004	55.0	4
125	18 15.6	1.004	54.2	18 45.6	1.004	54.1	19 15.6	1.004	54.1	19 45.6	1.004	54.1	20 15.5	1.004	54.1	20 45.5	1.004	54.0	21 15.5	1.004	54.0	21 45.4	1.004	54.0	125
6	18 13.1	1.004	53.2	18 43.1	1.004	53.1	19 13.1	1.004	53.1	19 43.0	1.004	53.1	20 13.0	1.004	53.1	20 43.0	1.004	53.0	21 12.9	1.004	53.0	21 42.9	1.004	53.0	6
7	18 10.6	1.004	52.2	18 40.6	1.004	52.2	19 10.6	1.004	52.2	19 40.5	1.004	52.1	20 10.5	1.004	52.1	20 40.5	1.004	52.1	21 10.4	1.004	52.0	21 40.4	1.004	52.0	7
8	18 08.2	1.004	51.2	18 38.1	1.004	51.2	19 08.1	1.004	51.1	19 38.1	1.004	51.1	20 08.0	1.004	51.1	20 38.0	1.004	51.1	21 08.0	1.004	51.0	21 38.0	1.004	51.0	8
9	18 05.7	1.004	50.2	18 35.7	1.004	50.2	19 05.7	1.004	50.2	19 35.6	1.004	50.2	20 05.6	1.004	50.1	20 35.6	1.004	50.1	21 05.6	1.004	50.1	21 35.5	1.004	50.0	9
130	18 03.3	1.004	49.2	18 33.3	1.004	49.2	19 03.3	1.004	49.2	19 33.3	1.004	49.1	20 03.2	1.004	49.1	20 33.2	1.004	49.1	21 03.2	1.004	49.1	21 33.1	1.004	49.1	130
1	18 01.0	1.004	48.2	18 30.9	1.004	48.2	19 00.9	1.004	48.2	19 30.9	1.004	48.2	20 00.9	1.004	48.1	20 30.8	1.004	48.1	21 00.8	1.004	48.1	21 30.8	1.004	48.1	1
2	17 58.7	1.004	47.2	18 28.6	1.004	47.2	18 58.6	1.004	47.2	19 28.6	1.004	47.2	19 58.5	1.004	47.2	20 28.5	1.004	47.1	20 58.5	1.004	47.1	21 28.5	1.004	47.1	2
3	17 56.4	1.004	46.3	18 26.3	1.004	46.2	18 56.3	1.004	46.2	19 26.3	1.004	46.2	19 56.3	1.004	46.2	20 26.2	1.004	46.1	20 56.2	1.004	46.1	21 26.2	1.004	46.1	3
4	17 54.1	1.004	45.3	18 24.1	1.004	45.2	18 54.1	1.004	45.2	19 24.0	1.004	45.2	19 54.0	1.004	45.2	20 24.0	1.004	45.2	20 54.0	1.004	45.1	21 23.9	1.004	45.1	4
135	17 51.9	1.004	44.3	18 21.9	1.004	44.3	18 51.9	1.004	44.2	19 21.8	1.004	44.2	19 51.8	1.004	44.2	20 21.8	1.004	44.2	20 51.8	1.004	44.2	21 21.7	1.004	44.1	135
6	17 49.7	1.004	43.3	18 19.7	1.004	43.3	18 49.7	1.004	43.2	19 19.7	1.004	43.2	19 49.6	1.004	43.2	20 19.6	1.004	43.2	20 49.6	1.004	43.2	21 19.6	1.004	43.1	6
7	17 47.6	1.004	42.3	18 17.5	1.004	42.3	18 47.6	1.004	42.3	19 17.5	1.003	42.2	19 47.5	1.003	42.2	20 17.5	1.003	42.2	20 47.5	1.003	42.2	21 17.4	1.003	42.2	7
8	17 45.5	1.003	41.3	18 15.5	1.003	41.3	18 45.5	1.003	41.3	19 15.4	1.003	41.3	19 45.4	1.003	41.2	20 15.4	1.003	41.2	20 45.4	1.003	41.2	21 15.4	1.003	41.2	8
9	17 43.4	1.003	40.3	18 13.4	1.003	40.3	18 43.4	1.003	40.3	19 13.4	1.003	40.3	19 43.4	1.003	40.3	20 13.4	1.003	40.2	20 43.3	1.003	40.2	21 13.3	1.003	40.2	9
140	17 41.4	1.003	39.3	18 11.4	1.003	39.3	18 41.4	1.003	39.3	19 11.4	1.003	39.3	19 41.4	1.003	39.3	20 11.3	1.003	39.3	20 41.3	1.003	39.2	21 11.3	1.003	39.2	140
1	17 39.5	1.003	38.4	18 09.5	1.003	38.3	18 39.4	1.003	38.3	19 09.4	1.003	38.3	19 39.4	1.003	38.3	20 09.4	1.003	38.3	20 39.4	1.003	38.3	21 09.3	1.003	38.2	1
2	17 37.5	1.003	37.4	18 07.5	1.003	37.4	18 37.5	1.003	37.3	19 07.5	1.003	37.3	19 37.5	1.003	37.3	20 07.5	1.003	37.3	20 37.4	1.003	37.3	21 07.4	1.003	37.2	2
3	17 35.7	1.003	36.4	18 05.6	1.003	36.4	18 35.6	1.003	36.4	19 05.6	1.003	36.4	19 35.6	1.003	36.3	20 05.6	1.003	36.3	20 35.6	1.003	36.3	21 05.5	1.003	36.3	3
4	17 33.8	1.003	35.4	18 03.8	1.003	35.4	18 33.8	1.003	35.4	19 03.8	1.003	35.4	19 33.8	1.003	35.3	20 03.7	1.003	35.3	20 33.7	1.003	35.3	21 03.7	1.003	35.3	4
145	17 32.0	1.003	34.4	18 02.0	1.003	34.4	18 32.0	1.003	34.4	19 02.0	1.003	34.4	19 32.0	1.003	34.4	20 01.9	1.003	34.3	20 31.9	1.003	34.3	21 01.9	1.003	34.3	145
6	17 30.3	1.003	33.4	18 00.3	1.003	33.4	18 30.2	1.003	33.4	19 00.2	1.003	33.4	19 30.2	1.003	33.4	20 00.2	1.003	33.4	20 30.2	1.003	33.3	21 00.2	1.003	33.3	6
7	17 28.6	1.003	32.4	17 58.5	1.003	32.4	18 28.5	1.003	32.4	18 58.5	1.003	32.4	19 28.5	1.003	32.4	19 58.5	1.003	32.4	20 28.5	1.003	32.4	20 58.5	1.003	32.3	7
8	17 26.9	1.003	31.5	17 56.9	1.003	31.4	18 26.9	1.003	31.4	18 56.9	1.003	31.4	19 26.8	1.003	31.4	19 56.8	1.003	31.4	20 26.8	1.003	31.4	20 56.8	1.003	31.4	8
9	17 25.3	1.003	30.5	17 55.3	1.003	30.5	18 25.3	1.003	30.5	18 55.2	1.003	30.4	19 25.2	1.003	30.4	19 55.2	1.003	30.4	20 25.2	1.003	30.4	20 55.2	1.003	30.4	9
150	17 23.7	1.003	29.5	17 53.7	1.003	29.5	18 23.7	1.003	29.5	18 53.7	1.003	29.5	19 23.7	1.003	29.4	19 53.7	1.003	29.4	20 23.6	1.003	29.4	20 53.6	1.003	29.4	150
1	17 22.2	1.002	28.5	17 52.2	1.002	28.5	18 22.2	1.002	28.5	18 52.2	1.002	28.5	19 22.1	1.002	28.5	19 52.1	1.002	28.4	20 22.1	1.002	28.4	20 52.1	1.002	28.4	1
2	17 20.7	1.002	27.5	17 50.7	1.002	27.5	18 20.7	1.002	27.5	18 50.7	1.002	27.5	19 20.7	1.002	27.5	19 50.7	1.002	27.5	20 20.7	1.002	27.4	20 50.6	1.002	27.4	2
3	17 19.3	1.002	26.5	17 49.3	1.002	26.5	18 19.3	1.002	26.5	18 49.2	1.002	26.5	19 19.2	1.002	26.5	19 49.2	1.002	26.5	20 19.2	1.002	26.5	20 49.2	1.002	26.4	3
4	17 17.9	1.002	25.6	17 47.9	1.002	25.5	18 17.9	1.002	25.5	18 47.9	1.002	25.5	19 17.9	1.002	25.5	19 47.9	1.002	25.5	20 17.9	1.002	25.5	20 47.8	1.002	25.5	4
155	17 16.6	1.002	24.6	17 46.6	1.002	24.6	18 16.6	1.002	24.6	18 46.6	1.002	24.5	19 16.5	1.002	24.5	19 46.5	1.002	24.5	20 16.5	1.002	24.5	20 46.5	1.002	24.5	155
6	17 15.3	1.002	23.6	17 45.3	1.002	23.6	18 15.3	1.002	23.6	18 45.3	1.002	23.6	19 15.3	1.002	23.5	19 45.3	1.002	23.5	20 15.2	1.002	23.5	20 45.2	1.002	23.5	6
7	17 14.1	1.002	22.6	17 44.1	1.002	22.6	18 14.0	1.002	22.6	18 44.0	1.002	22.6	19 14.0	1.002	22.6	19 44.0	1.002	22.6	20 14.0	1.002	22.5	20 44.0	1.002	22.5	7
8	17 12.9	1.002	21.6	17 42.9	1.002	21.6	18 12.9	1.002	21.6	18 42.9	1.002	21.6	19 12.9	1.002	21.6	19 42.8	1.002	21.6	20 12.8	1.002	21.6	20 42.8	1.002	21.5	8
9	17 11.7	1.002	20.6	17 41.7	1.002	20.6	18 11.7	1.002	20.6	18 41.7	1.002	20.6	19 11.7	1.002	20.6	19 41.7	1.002	20.6	20 11.7	1.002	20.6	20 41.7	1.002	20.6	9
160	17 10.7	1.002	19.7	17 40.7	1.002	19.6	18 10.7	1.002	19.6	18 40.7	1.002	19.6	19 10.6	1.002	19.6	19 40.6	1.002	19.6	20 10.6	1.002	19.6	20 40.6	1.002	19.6	160
1	17 09.6	1.002	18.7	17 39.6	1.002	18.7	18 09.6	1.002	18.7	18 39.6	1.002	18.6	19 09.6	1.002	18.6	19 39.6	1.002	18.6	20 09.6	1.002	18.6	20 39.6	1.002	18.6	1
2	17 08.7	1.002	17.7	17 38.7	1.002	17.7	18 08.6	1.002	17.7	18 38.6	1.002	17.7	19 08.6	1.002	17.7	19 38.6	1.002	17.6	20 08.6	1.002	17.6	20 38.6	1.002	17.6	2
3	17 07.7	1.001	16.7	17 37.7	1.001	16.7	18 07.7	1.001	16.7	18 37.7	1.001	16.7	19 07.7	1.001	16.7	19 37.7	1.001	16.7	20 07.7	1.001	16.7	20 37.7	1.001	16.6	3
4	17 06.9	1.001	15.7	17 36.8	1.001	15.7	18 06.8	1.001	15.7	18 36.8	1.001	15.7	19 06.8	1.001	15.7	19 36.8	1.001	15.7	20 06.8	1.001	15.7	20 36.8	1.001	15.7	4
165	17 06.0	1.001	14.7	17 36.0	1.001	14.7	18 06.0	1.001	14.7	18 36.0	1.001	14.7	19 06.0	1.001	14.7	19 36.0	1.001	14.7	20 06.0	1.001	14.7	20 36.0	1.001	14.7	165
6	17 05.3	1.001	13.8	17 35.2	1.001	13.8	18 05.2	1.001	13.7	18 35.2	1.001	13.7	19 05.2	1.001	13.7	19 35.2	1.001	13.7	20 05.2	1.001	13.7	20 35.2	1.001	13.7	6
7	17 04.5	1.001	12.8	17 34.5	1.001	12.8	18 04.5	1.001	12.8	18 34.5	1.001	12.7	19 04.5	1.001	12.7	19 34.5	1.001	12.7	20 04.5	1.001	12.7	20 34.5	1.001	12.7	7
8	17 03.9	1.001	11.8	17 33.9	1.001	11.8	18 03.9	1.001	11.8	18 33.9	1.001	11.8	19 03.9	1.001	11.8	19 33.9	1.001	11.8	20 03.9	1.001	11.8	20 33.9	1.001	11.8	8
9	17 03.2	1.001	10.8	17 33.2	1.001	10.8	18 03.2	1.001	10.8	18 33.2	1.001	10.8	19 03.2	1.001	10.8	19 33.2	1.001	10.8	20 03.2	1.001	10.8	20 33.2	1.001	10.8	9
170	17 02.7	1.001	09.8	17 32.7	1.001	09.8	18 02.7	1.001	09.8	18 32.7	1.001	09.8	19 02.7	1.001	09.8	19 32.7	1.001	09.8	20 02.7	1.001	09.8	20 32.7	1.001	09.8	170
1	17 02.2	1.001	08.8	17 32.2	1.001	08.8	18 02.2	1.001	08.8	18 32.2	1.001	08.8	19 02.2	1.001	08.8	19 32.2	1.001	08.8	20 02.2	1.001	08.8	20 32.2	1.001	08.8	1
2	17 01.7	1.001	07.9	17 31.7	1.001	07.9	18 01.7	1.001	07.9	18 31.7	1.001	07.8	19 01.7	1.001	07.8	19 31.7	1.001	07.8	20 01.7	1.001	07.8	20 31.7	1.001	07.8	2
3	17 01.3	1.001	06.9	17 31.3	1.001	06.9	18 01.3	1.001	06.9	18 31.3	1.001	06.9	19 01.3	1.001	06.9	19 31.3	1.001	06.9	20 01.3	1.001	06.9	20 31.3	1.001	06.9	3
4	17 01.0	1.000	05.9	17 31.0	1.000	05.9	18 01.0	1.000	05.9	18 31.0	1.000	05.9	19 01.0	1.000	05.9	19 31.0	1.000	05.9	20 01.0	1.000	05.9	20 31.0	1.000	05.9	4
175	17 00.7	1.000	04.9	17 30.7	1.000	04.9	18 00.7	1.000	04.9	18 30.7	1.000	04.9	19 00.7	1.000	04.9	19 30.7	1.000	04.9	20 00.7	1.000	04.9	20 30.7	1.000	04.9	175
6	17 00.4	1.000	03.9	17 30.4	1.000	03.9	18 00.4	1.000	03.9	18 30.4	1.000	03.9	19 00.4	1.000	03.9	19 30.4	1.000	03.9	20 00.4	1.000	03.9	20 30.4	1.000	03.9	6
7	17 00.1	1.000	02.9	17 30.1	1.000	02.9	18 00.1	1.000	02.9	18 30.1	1.000	02.9	19 00.1	1.000	02.9	19 30.1	1.000	02.9	20 00.1	1.000	02.9	20 30.1	1.000	02.9	7
8	17 00.1	1.000	02.0	17 30.1	1.000	02.0	18 00.1	1.000	02.0	18 30.1	1.000	02.0	19 00.1	1.000	02.0	19 30.1	1.000	02.0	20 00.1	1.000	02.0	20 30.1	1.000	02.0	8
9	17 00.0	1.000	01.0	17 30.0	1.000	01.0	18 00.0	1.000	01.0	18 30.0	1.000	01.0	19 00.0	1.000	01.0	19 30.0	1.000	01.0	20 00.0	1.000	01.0	20 30.0	1.000	01.0	9
180	17 00.0	1.000	00.0	17 30.0	1.000	00.0	18 00.0	1.000	00.0	18 30.0	1.000	00.0	19 00.0	1.000	00.0	19 30.0	1.000	00.0	20 00.0	1.000	00.0	20 30.0	1.000	00.0	180

Lat. 88°

Lat. 89°

Lat. 87°

H.A.	24° 00' Alt.	Az.	24° 30' Alt.	Az.	25° 00' Alt.	Az.	25° 30' Alt.	Az.	26° 00' Alt.	Az.	26° 30' Alt.	Az.	27° 00' Alt.	Az.	27° 30' Alt.	Az.	H.A.
00	27 00.0 1.0 00	180.0	27 30.0 1.0 00	180.0	28 00.0 1.0 00	180.0	28 30.0 1.0 00	180.0	29 00.0 1.0 00	180.0	29 30.0 1.0 00	180.0	30 00.0 1.0 00	180.0	30 30.0 1.0 00	180.0	00
1	27 00.0 1.0 00	179.0	27 30.0 1.0 00	179.0	28 00.0 1.0 00	179.0	28 30.0 1.0 00	179.0	29 00.0 1.0 00	179.0	29 30.0 1.0 00	179.0	30 00.0 1.0 00	179.0	30 30.0 1.0 00	179.0	1
2	26 59.9 1.0 00	177.9	27 29.9 1.0 00	177.9	27 59.9 1.0 00	177.9	28 29.9 1.0 00	177.9	28 59.9 1.0 00	177.9	29 29.9 1.0 00	177.9	29 59.9 1.0 00	177.9	30 29.9 1.0 00	177.9	2
3	26 59.7 1.0 00	176.9	27 29.7 1.0 00	176.9	27 59.7 1.0 00	176.9	28 29.7 1.0 00	176.9	28 59.7 1.0 00	176.9	29 29.7 1.0 00	176.9	29 59.7 1.0 00	176.9	30 29.7 1.0 00	176.9	3
4	26 59.6 1.0 00	175.9	27 29.5 1.0 00	175.9	27 59.5 1.0 00	175.9	28 29.5 1.0 00	175.9	28 59.5 1.0 00	175.9	29 29.5 1.0 00	175.9	29 59.5 1.0 00	175.9	30 29.5 1.0 00	175.9	4
05	26 59.3 1.0 01	174.9	27 29.3 1.0 01	174.9	27 59.3 1.0 01	174.9	28 29.3 1.0 01	174.9	28 59.3 1.0 01	174.9	29 29.3 1.0 01	174.9	29 59.3 1.0 01	174.9	30 29.3 1.0 01	174.9	05
6	26 59.0 1.0 01	173.8	27 29.0 1.0 01	173.8	27 59.0 1.0 01	173.8	28 29.0 1.0 01	173.8	28 59.0 1.0 01	173.8	29 29.0 1.0 01	173.8	29 59.0 1.0 01	173.8	30 29.0 1.0 01	173.8	6
7	26 58.6 1.0 01	172.8	27 28.6 1.0 01	172.8	27 58.6 1.0 01	172.8	28 28.6 1.0 01	172.8	28 58.6 1.0 01	172.8	29 28.6 1.0 01	172.8	29 58.6 1.0 01	172.8	30 28.6 1.0 01	172.8	7
8	26 58.2 1.0 01	171.8	27 28.2 1.0 01	171.8	27 58.2 1.0 01	171.8	28 28.2 1.0 01	171.8	28 58.2 1.0 01	171.8	29 28.2 1.0 01	171.8	29 58.2 1.0 01	171.8	30 28.2 1.0 01	171.8	8
9	26 57.7 1.0 01	170.8	27 27.7 1.0 01	170.8	27 57.7 1.0 01	170.8	28 27.7 1.0 01	170.8	28 57.7 1.0 01	170.8	29 27.7 1.0 01	170.7	29 57.7 1.0 01	170.7	30 27.7 1.0 01	170.7	9
10	26 57.2 1.0 01	169.7	27 27.2 1.0 01	169.7	27 57.2 1.0 01	169.7	28 27.2 1.0 01	169.7	28 57.2 1.0 01	169.7	29 27.2 1.0 01	169.7	29 57.2 1.0 01	169.7	30 27.2 1.0 01	169.7	10
1	26 56.6 1.0 01	168.7	27 26.6 1.0 01	168.7	27 56.6 1.0 01	168.7	28 26.6 1.0 01	168.7	28 56.6 1.0 01	168.7	29 26.6 1.0 01	168.7	29 56.6 1.0 01	168.7	30 26.6 1.0 01	168.7	1
2	26 56.0 1.0 01	167.7	27 26.0 1.0 01	167.7	27 56.0 1.0 01	167.7	28 26.0 1.0 01	167.7	28 56.0 1.0 01	167.7	29 26.0 1.0 01	167.7	29 56.0 1.0 01	167.7	30 26.0 1.0 01	167.6	2
3	26 55.3 1.0 01	166.7	27 25.3 1.0 01	166.7	27 55.3 1.0 01	166.7	28 25.3 1.0 01	166.7	28 55.3 1.0 01	166.6	29 25.3 1.0 01	166.6	29 55.3 1.0 01	166.6	30 25.3 1.0 01	166.6	3
4	26 54.5 1.0 01	165.7	27 24.5 1.0 01	165.6	27 54.5 1.0 01	165.6	28 24.5 1.0 01	165.6	28 54.5 1.0 01	165.6	29 24.5 1.0 01	165.6	29 54.5 1.0 01	165.6	30 24.5 1.0 01	165.6	4
15	26 53.7 1.0 01	164.6	27 23.7 1.0 01	164.6	27 53.7 1.0 01	164.6	28 23.7 1.0 01	164.6	28 53.7 1.0 01	164.6	29 23.7 1.0 01	164.6	29 53.7 1.0 01	164.6	30 23.7 1.0 01	164.6	15
6	26 52.9 1.0 02	163.6	27 22.9 1.0 02	163.6	27 52.8 1.0 02	163.6	28 22.8 1.0 02	163.6	28 52.8 1.0 02	163.6	29 22.8 1.0 02	163.6	29 52.8 1.0 02	163.5	30 22.8 1.0 02	163.5	6
7	26 51.9 1.0 02	162.6	27 21.9 1.0 02	162.6	27 51.9 1.0 02	162.6	28 21.9 1.0 02	162.5	28 51.9 1.0 02	162.5	29 21.9 1.0 02	162.5	29 51.9 1.0 02	162.5	30 21.9 1.0 02	162.5	7
8	26 51.0 1.0 02	161.6	27 21.0 1.0 02	161.5	27 51.0 1.0 02	161.5	28 21.0 1.0 02	161.5	28 51.0 1.0 02	161.5	29 21.0 1.0 02	161.5	29 50.9 1.0 02	161.5	30 20.9 1.0 02	161.5	8
9	26 50.0 1.0 02	160.5	27 20.0 1.0 02	160.5	27 49.9 1.0 02	160.5	28 19.9 1.0 02	160.5	28 49.9 1.0 02	160.5	29 19.9 1.0 02	160.5	29 49.9 1.0 02	160.5	30 19.8 1.0 02	160.5	9
20	26 48.9 1.0 02	159.5	27 18.9 1.0 02	159.5	27 48.9 1.0 02	159.5	28 18.9 1.0 02	159.5	28 48.9 1.0 02	159.4	29 18.9 1.0 02	159.4	29 48.8 1.0 02	159.4	30 18.8 1.0 02	159.4	20
1	26 47.8 1.0 02	158.5	27 17.8 1.0 02	158.5	27 47.7 1.0 02	158.5	28 17.7 1.0 02	158.4	28 47.7 1.0 02	158.4	29 17.7 1.0 02	158.4	29 47.7 1.0 02	158.4	30 17.7 1.0 02	158.4	1
2	26 46.6 1.0 02	157.5	27 16.6 1.0 02	157.4	27 46.6 1.0 02	157.4	28 16.6 1.0 02	157.4	28 46.6 1.0 02	157.4	29 16.5 1.0 02	157.4	29 46.5 1.0 02	157.4	30 16.5 1.0 02	157.4	2
3	26 45.4 1.0 02	156.4	27 15.3 1.0 02	156.4	27 45.3 1.0 02	156.4	28 15.3 1.0 02	156.4	28 45.3 1.0 02	156.4	29 15.3 1.0 02	156.4	29 45.3 1.0 02	156.4	30 15.3 1.0 02	156.3	3
4	26 44.1 1.0 02	155.4	27 14.1 1.0 02	155.4	27 44.1 1.0 02	155.4	28 14.0 1.0 02	155.4	28 44.0 1.0 02	155.4	29 14.0 1.0 02	155.3	29 44.0 1.0 02	155.3	30 14.0 1.0 02	155.3	4
25	26 42.7 1.0 02	154.4	27 12.7 1.0 02	154.4	27 42.7 1.0 02	154.4	28 12.7 1.0 02	154.3	28 42.7 1.0 02	154.3	29 12.7 1.0 02	154.3	29 42.7 1.0 02	154.3	30 12.7 1.0 02	154.3	25
6	26 41.4 1.0 02	153.4	27 11.3 1.0 02	153.4	27 41.3 1.0 02	153.3	28 11.3 1.0 02	153.3	28 41.3 1.0 02	153.3	29 11.3 1.0 02	153.3	29 41.3 1.0 02	153.3	30 11.3 1.0 02	153.3	6
7	26 39.9 1.0 02	152.3	27 09.9 1.0 02	152.3	27 39.9 1.0 02	152.3	28 09.9 1.0 02	152.3	28 39.9 1.0 02	152.3	29 09.9 1.0 02	152.3	29 39.9 1.0 02	152.3	30 09.8 1.0 02	152.2	7
8	26 38.4 1.0 03	151.3	27 08.4 1.0 03	151.3	27 38.4 1.0 03	151.3	28 08.4 1.0 03	151.3	28 38.4 1.0 03	151.3	29 08.4 1.0 03	151.2	29 38.4 1.0 03	151.2	30 08.4 1.0 03	151.2	8
9	26 36.9 1.0 03	150.3	27 06.9 1.0 03	150.3	27 36.9 1.0 03	150.3	28 06.9 1.0 03	150.3	28 36.9 1.0 03	150.2	29 06.8 1.0 03	150.2	29 36.8 1.0 03	150.2	30 06.8 1.0 03	150.2	9
30	26 35.3 1.0 03	149.3	27 05.3 1.0 03	149.3	27 35.3 1.0 03	149.3	28 05.3 1.0 03	149.2	28 35.3 1.0 03	149.2	29 05.3 1.0 03	149.2	29 35.3 1.0 03	149.2	30 05.2 1.0 03	149.2	30
1	26 33.7 1.0 03	148.3	27 03.7 1.0 03	148.2	27 33.7 1.0 03	148.2	28 03.7 1.0 03	148.2	28 33.6 1.0 03	148.2	29 03.6 1.0 03	148.2	29 33.6 1.0 03	148.2	30 03.6 1.0 03	148.1	1
2	26 32.0 1.0 03	147.2	27 02.0 1.0 03	147.2	27 32.0 1.0 03	147.2	28 02.0 1.0 03	147.2	28 32.0 1.0 03	147.2	29 02.0 1.0 03	147.2	29 31.9 1.0 03	147.1	30 01.9 1.0 03	147.1	2
3	26 30.3 1.0 03	146.2	27 00.3 1.0 03	146.2	27 30.3 1.0 03	146.2	28 00.3 1.0 03	146.2	28 30.2 1.0 03	146.1	29 00.2 1.0 03	146.1	29 30.2 1.0 03	146.1	30 00.2 1.0 03	146.1	3
4	26 28.5 1.0 03	145.2	26 58.5 1.0 03	145.2	27 28.5 1.0 03	145.2	27 58.5 1.0 03	145.1	28 28.5 1.0 03	145.1	28 58.5 1.0 03	145.1	29 28.4 1.0 03	145.1	29 58.4 1.0 03	145.1	4
35	26 26.7 1.0 03	144.2	26 56.7 1.0 03	144.2	27 26.7 1.0 03	144.1	27 56.7 1.0 03	144.1	28 26.7 1.0 03	144.1	28 56.6 1.0 03	144.1	29 26.6 1.0 03	144.1	29 56.6 1.0 03	144.0	35
6	26 24.9 1.0 03	143.2	26 54.8 1.0 03	143.1	27 24.8 1.0 03	143.1	27 54.8 1.0 03	143.1	28 24.8 1.0 03	143.1	28 54.8 1.0 03	143.1	29 24.8 1.0 03	143.0	29 54.7 1.0 03	143.0	6
7	26 23.0 1.0 03	142.1	26 52.9 1.0 03	142.1	27 22.9 1.0 03	142.1	27 52.9 1.0 03	142.1	28 22.9 1.0 03	142.1	28 52.9 1.0 03	142.0	29 22.8 1.0 03	142.0	29 52.8 1.0 03	142.0	7
8	26 21.0 1.0 03	141.1	26 51.0 1.0 03	141.1	27 21.0 1.0 03	141.1	27 50.9 1.0 03	141.1	28 20.9 1.0 03	141.0	28 50.9 1.0 03	141.0	29 20.9 1.0 03	141.0	29 50.9 1.0 03	141.0	8
9	26 19.0 1.0 03	140.1	26 49.0 1.0 03	140.1	27 19.0 1.0 03	140.1	27 49.0 1.0 03	140.0	28 18.9 1.0 03	140.0	28 48.9 1.0 03	140.0	29 18.9 1.0 03	140.0	29 48.9 1.0 03	140.0	9
40	26 17.0 1.0 03	139.1	26 47.0 1.0 03	139.1	27 16.9 1.0 03	139.0	27 46.9 1.0 03	139.0	28 16.9 1.0 03	139.0	28 46.9 1.0 03	139.0	29 16.8 1.0 03	139.0	29 46.8 1.0 03	138.9	40
1	26 14.9 1.0 04	138.1	26 44.9 1.0 04	138.0	27 14.9 1.0 04	138.0	27 44.8 1.0 04	138.0	28 14.8 1.0 04	138.0	28 44.8 1.0 04	138.0	29 14.8 1.0 04	137.9	29 44.7 1.0 04	137.9	1
2	26 12.8 1.0 04	137.1	26 42.8 1.0 04	137.0	27 12.7 1.0 04	137.0	27 42.7 1.0 04	137.0	28 12.7 1.0 04	137.0	28 42.7 1.0 04	136.9	29 12.6 1.0 04	136.9	29 42.6 1.0 04	136.9	2
3	26 10.6 1.0 04	136.0	26 40.6 1.0 04	136.0	27 10.6 1.0 04	136.0	27 40.6 1.0 04	136.0	28 10.5 1.0 04	135.9	28 40.5 1.0 04	135.9	29 10.5 1.0 04	135.9	29 40.5 1.0 04	135.9	3
4	26 08.4 1.0 04	135.0	26 38.4 1.0 04	135.0	27 08.4 1.0 04	135.0	27 38.3 1.0 04	134.9	28 08.3 1.0 04	134.9	28 38.3 1.0 04	134.9	29 08.3 1.0 04	134.9	29 38.3 1.0 04	134.9	4
45	26 06.2 1.0 04	134.0	26 36.2 1.0 04	134.0	27 06.1 1.0 04	134.0	27 36.1 1.0 04	133.9	28 06.1 1.0 04	133.9	28 36.1 1.0 04	133.9	29 06.0 1.0 04	133.9	29 36.0 1.0 04	133.8	45
6	26 03.9 1.0 04	133.0	26 33.9 1.0 04	133.0	27 03.9 1.0 04	132.9	27 33.8 1.0 04	132.9	28 03.8 1.0 04	132.9	28 33.8 1.0 04	132.9	29 03.7 1.0 04	132.8	29 33.7 1.0 04	132.8	6
7	26 01.6 1.0 04	132.0	26 31.6 1.0 04	131.9	27 01.5 1.0 04	131.9	27 31.5 1.0 04	131.9	28 01.5 1.0 04	131.9	28 31.4 1.0 04	131.8	29 01.4 1.0 04	131.8	29 31.4 1.0 04	131.8	7
8	25 59.2 1.0 04	131.0	26 29.2 1.0 04	130.9	26 59.2 1.0 04	130.9	27 29.2 1.0 04	130.9	27 59.1 1.0 04	130.9	28 29.1 1.0 04	130.8	28 59.1 1.0 04	130.8	29 29.0 1.0 04	130.8	8
9	25 56.8 1.0 04	129.9	26 26.8 1.0 04	129.9	26 56.8 1.0 04	129.9	27 26.8 1.0 04	129.9	27 56.7 1.0 04	129.8	28 26.7 1.0 04	129.8	28 56.7 1.0 04	129.8	29 26.6 1.0 04	129.8	9
50	25 54.4 1.0 04	128.9	26 24.4 1.0 04	128.9	26 54.4 1.0 04	128.9	27 24.3 1.0 04	128.8	27 54.3 1.0 04	128.8	28 24.3 1.0 04	128.8	28 54.2 1.0 04	128.8	29 24.2 1.0 04	128.7	50
1	25 52.0 1.0 04	127.9	26 21.9 1.0 04	127.9	26 51.9 1.0 04	127.9	27 21.9 1.0 04	127.8	27 51.8 1.0 04	127.8	28 21.8 1.0 04	127.8	28 51.8 1.0 04	127.7	29 21.7 1.0 04	127.7	1
2	25 49.5 1.0 04	126.9	26 19.4 1.0 04	126.9	26 49.4 1.0 04	126.8	27 19.4 1.0 04	126.8	27 49.3 1.0 04	126.8	28 19.3 1.0 04	126.8	28 49.3 1.0 04	126.7	29 19.2 1.0 04	126.7	2
3	25 46.9 1.0 04	125.9	26 16.9 1.0 04	125.9	26 46.9 1.0 04	125.8	27 16.8 1.0 04	125.8	27 46.8 1.0 04	125.7	28 16.8 1.0 04	125.7	28 46.7 1.0 04	125.7	29 16.7 1.0 04	125.7	3
4	25 44.4 1.0 04	124.9	26 14.3 1.0 04	124.8	26 44.3 1.0 04	124.8	27 14.3 1.0 04	124.8	27 44.2 1.0 04	124.8	28 14.2 1.0 04	124.7	28 44.2 1.0 04	124.7	29 14.1 1.0 04	124.7	4
55	25 41.8 1.0 04	123.9	26 11.8 1.0 04	123.8	26 41.7 1.0 04	123.8	27 11.7 1.0 04	123.8	27 41.6 1.0 04	123.7	28 11.6 1.0 04	123.7	28 41.6 1.0 04	123.7	29 11.5 1.0 04	123.7	55
6	25 39.2 1.0 04	122.8	26 09.1 1.0 04	122.8	26 39.1 1.0 04	122.8	27 09.1 1.0 04	122.8	27 39.0 1.0 04	122.7	28 09.0 1.0 04	122.7	28 38.9 1.0 04	122.7	29 08.9 1.0 04	122.6	6
7	25 36.5 1.0 04	121.8	26 06.5 1.0 04	121.8	26 36.4 1.0 04	121.7	27 06.4 1.0 04	121.7	27 36.4 1.0 04	121.7	28 06.3 1.0 04	121.7	28 36.3 1.0 04	121.7	29 06.3 1.0 04	121.6	7
8	25 33.8 1.0 05	120.8	26 03.8 1.0 05	120.8	26 33.8 1.0 05	120.8	27 03.7 1.0 05	120.7	27 33.7 1.0 05	120.7	28 03.6 1.0 05	120.7	28 33.6 1.0 05	120.6	29 03.6 1.0 05	120.6	8
9	25 31.1 1.0 05	119.8	26 01.1 1.0 05	119.8	26 31.0 1.0 05	119.8	27 01.0 1.0 05	119.7	27 31.0 1.0 05	119.7	28 00.9 1.0 05	119.7	28 30.9 1.0 05	119.6	29 00.8 1.0 05	119.6	9
60	25 28.4 1.0 05	118.8	25 58.3 1.0 05	118.8	26 28.3 1.0 05	118.7	26 58.3 1.0 05	118.7	27 28.2 1.0 05	118.7	27 58.2 1.0 05	118.7	28 28.1 1.0 05	118.6	28 58.1 1.0 05	118.6	60
1	25 25.6 1.0 05	117.8	25 55.6 1.0 05	117.8	26 25.5 1.0 05	117.7	26 55.5 1.0 05	117.7	27 25.5 1.0 05	117.7	27 55.4 1.0 05	117.6	28 25.4 1.0 05	117.6	28 55.3 1.0 05	117.6	1
2	25 22.8 1.0 05	116.8	25 52.8 1.0 05	116.7	26 22.7 1.0 05	116.7	26 52.7 1.0 05	116.7	27 22.7 1.0 05	116.6	27 52.6 1.0 05	116.6	28 22.6 1.0 05	116.6	28 52.5 1.0 05	116.5	2
3	25 20.0 1.0 05	115.8	25 50.0 1.0 05	115.7	26 19.9 1.0 05	115.7	26 49.9 1.0 05	115.7	27 19.8 1.0 05	115.6	27 49.8 1.0 05	115.6	28 19.8 1.0 05	115.6	28 49.7 1.0 05	115.5	3
4	25 17.2 1.0 05	114.8	25 47.1 1.0 05	114.7	26 17.1 1.0 05	114.7	26 47.0 1.0 05	114.7	27 17.0 1.0 05	114.6	27 47.0 1.0 05	114.6	28 16.9 1.0 05	114.6	28 46.9 1.0 05	114.5	4
65	25 14.3 1.0 05	113.7	25 44.3 1.0 05	113.7	26 14.2 1.0 05	113.7	26 44.2 1.0 05	113.7	27 14.1 1.0 05	113.6	27 44.1 1.0 05	113.6	28 14.0 1.0 05	113.6	28 44.0 1.0 05	113.5	65
6	25 11.4 1.0 05	112.7	25 41.4 1.0 05	112.7	26 11.3 1.0 05	112.7	26 41.3 1.0 05	112.6	27 11.2 1.0 05	112.6	27 41.2 1.0 05	112.6	28 11.2 1.0 05	112.6	28 41.1 1.0 05	112.5	6
7	25 08.5 1.0 05	111.7	25 38.5 1.0 05	111.7	26 08.4 1.0 05	111.7	26 38.4 1.0 05	111.6	27 08.3 1.0 05	111.6	27 38.3 1.0 05	111.6	28 08.2 1.0 05	111.6	28 38.2 1.0 05	111.5	7
8	25 05.6 1.0 05	110.7	25 35.5 1.0 05	110.7	26 05.5 1.0 05	110.7	26 35.5 1.0 05	110.6	27 05.4 1.0 05	110.6	27 35.4 1.0 05	110.6	28 05.3 1.0 05	110.5	28 35.3 1.0 05	110.5	8
9	25 02.6 1.0 05	109.7	25 32.6 1.0 05	109.7	26 02.5 1.0 05	109.7	26 32.5 1.0 05	109.6	27 02.5 1.0 05	109.6	27 32.4 1.0 05	109.6	28 02.4 1.0 05	109.5	28 32.3 1.0 05	109.5	9
70	24 59.7 1.0 05	108.7	25 29.6 1.0 05	108.7	25 59.6 1.0 05	108.6	26 29.5 1.0 05	108.6	26 59.5 1.0 05	108.6	27 29.4 1.0 05	108.6	27 59.4 1.0 05	108.5	28 29.4 1.0 05	108.5	70
1	24 56.7 1.0 05	107.7	25 26.6 1.0 05	107.7	25 56.6 1.0 05	107.6	26 26.6 1.0 05	107.6	26 56.5 1.0 05	107.6	27 26.5 1.0 05	107.6	27 56.4 1.0 05	107.5	28 26.4 1.0 05	107.5	1
2	24 53.7 1.0 05	106.7	25 23.6 1.0 05	106.7	25 53.6 1.0 05	106.6	26 23.6 1.0 05	106.6	26 53.5 1.0 05	106.6	27 23.4 1.0 05	106.5	27 53.4 1.0 05	106.5	28 23.4 1.0 05	106.5	2
3	24 50.7 1.0 05	105.7	25 20.6 1.0 05	105.7	25 50.6 1.0 05	105.6	26 20.5 1.0 05	105.6	26 50.5 1.0 05	105.6	27 20.4 1.0 05	105.5	27 50.4 1.0 05	105.5	28 20.3 1.0 05	105.5	3
4	24 47.6 1.0 05	104.7	25 17.6 1.0 05	104.7	25 47.6 1.0 05	104.6	26 17.5 1.0 05	104.6	26 47.5 1.0 05	104.6	27 17.4 1.0 05	104.5	27 47.4 1.0 05	104.5	28 17.3 1.0 05	104.5	4
75	24 44.6 1.0 05	103.7	25 14.6 1.0 05	103.7	25 44.5 1.0 05	103.6	26 14.5 1.0 05	103.6	26 44.4 1.0 05	103.6	27 14.4 1.0 05	103.5	27 44.3 1.0 05	103.5	28 14.3 1.0 05	103.5	75
6	24 41.5 1.0 05	102.7	25 11.4 1.0 05	102.7	25 41.4 1.0 05	102.6	26 11.4 1.0 05	102.6	26 41.4 1.0 05	102.6	27 11.3 1.0 05	102.5	27 41.3 1.0 05	102.5	28 11.2 1.0 05	102.5	6
7	24 38.5 1.0 05	101.7	25 08.4 1.0 05	101.6	25 38.4 1.0 05	101.6	26 08.3 1.0 05	101.6	26 38.3 1.0 05	101.5	27 08.2 1.0 05	101.5	27 38.2 1.0 05	101.5	28 08.1 1.0 05	101.5	7
8	24 35.4 1.0 05	100.7	25 05.3 1.0 05	100.6	25 35.3 1.0 05	100.6	26 05.2 1.0 05	100.6	26 35.2 1.0 05	100.5	27 05.1 1.0 05	100.5	27 35.1 1.0 05	100.5	28 05.0 1.0 05	100.4	8
9	24 32.3 1.0 05	99.7	25 02.3 1.0 05	99.6	25 32.2 1.0 05	99.6	26 02.2 1.0 05	99.6	26 32.1 1.0 05	99.5	27 02.1 1.0 05	99.5	27 32.0 1.0 05	99.5	28 02.0 1.0 05	99.4	9
80	24 29.2 1.0 05	98.7	24 59.2 1.0 05	98.6	25 29.1 1.0 05	98.6	25 59.1 1.0 05	98.6	26 29.0 1.0 05	98.5	26 59.0 1.0 05	98.5	27 28.9 1.0 05	98.5	27 58.9 1.0 05	98.4	80
1	24 26.1 1.0 05	97.7	24 56.1 1.0 05	97.6	25 25.9 1.0 05	97.6	25 55.9 1.0 05	97.6	26 25.9 1.0 05	97.5	26 55.8 1.0 05	97.5	27 25.8 1.0 05	97.5	27 55.7 1.0 05	97.4	1
2	24 23.0 1.0 05	96.7	24 52.9 1.0 05	96.6	25 22.9 1.0 05	96.6	25 52.8 1.0 05	96.6	26 22.8 1.0 05	96.5	26 52.7 1.0 05	96.5	27 22.7 1.0 05	96.5	27 52.6 1.0 05	96.4	2
3	24 19.9 1.0 05	95.7	24 49.8 1.0 05	95.6	25 19.8 1.0 05	95.6	25 49.7 1.0 05	95.5	26 19.7 1.0 05	95.5	26 49.6 1.0 05	95.5	27 19.6 1.0 05	95.5	27 49.5 1.0 05	95.4	3
4	24 16.7 1.0 05	94.7	24 46.7 1.0 05	94.6	25 16.6 1.0 05	94.6	25 46.6 1.0 05	94.6	26 16.5 1.0 05	94.5	26 46.5 1.0 05	94.5	27 16.4 1.0 05	94.5	27 46.4 1.0 05	94.4	4
85	24 13.6 1.0 05	93.7	24 43.5 1.0 05	93.6	25 13.5 1.0 05	93.6	25 43.4 1.0 05	93.6	26 13.4 1.0 05	93.5	26 43.3 1.0 05	93.5	27 13.3 1.0 05	93.5	27 43.2 1.0 05	93.4	85
6	24 10.5 1.0 05	92.7	24 40.4 1.0 05	92.6	25 10.4 1.0 05	92.6	25 40.3 1.0 05	92.6	26 10.3 1.0 05	92.5	26 40.2 1.0 05	92.5	27 10.2 1.0 05	92.5	27 40.1 1.0 05	92.4	6
7	24 07.3 1.0 05	91.7	24 37.3 1.0 05	91.6	25 07.3 1.0 05	91.6	25 37.2 1.0 05	91.6	26 07.1 1.0 05	91.5	26 37.1 1.0 05	91.5	27 07.0 1.0 05	91.5	27 37.0 1.0 05	91.4	7
8	24 04.2 1.0 05	90.7	24 34.1 1.0 05	90.6	25 04.1 1.0 05	90.6	25 34.0 1.0 05	90.6	26 04.0 1.0 05	90.5	26 33.9 1.0 05	90.5	27 03.9 1.0 05	90.5	27 33.8 1.0 05	90.4	8
9	24 01.0 1.0 05	89.7	24 31.0 1.0 05	89.6	25 00.9 1.0 05	89.6	25 30.9 1.0 05	89.6	26 00.8 1.0 05	89.5	26 30.8 1.0 05	89.5	27 00.7 1.0 05	89.5	27 30.7 1.0 05	89.4	9
90	23 57.9 1.0 05	88.7	24 27.9 1.0 05	88.6	24 57.8 1.0 05	88.6	25 27.8 1.0 05	88.6	25 57.7 1.0 05	88.5	26 27.7 1.0 05	88.5	26 57.6 1.0 05	88.5	27 27.5 1.0 05	88.4	90

Lat. 87°

H.A.	24° 00' Alt.	Δd Δt	Az.	24° 30' Alt.	Δd Δt	Az.	25° 00' Alt.	Δd Δt	Az.	25° 30' Alt.	Δd Δt	Az.	26° 00' Alt.	Δd Δt	Az.	26° 30' Alt.	Δd Δt	Az.	27° 00' Alt.	Δd Δt	Az.	27° 30' Alt.	Δd Δt	Az.	H.A.
91	23 54.8	1.005	87.7	24 24.7	1.005	87.6	24 54.7	1.005	87.6	25 24.6	1.005	87.6	25 54.6	1.005	87.5	26 24.5	1.005	87.5	26 54.5	1.005	87.5	27 24.4	1.005	87.4	91
2	23 51.6	1.005	86.7	24 21.6	1.005	86.6	24 51.5	1.005	86.6	25 21.5	1.005	86.6	25 51.4	1.005	86.5	26 21.4	1.005	86.5	26 51.3	1.005	86.5	27 21.3	1.005	86.4	2
3	23 48.5	1.005	85.7	24 18.4	1.005	85.6	24 48.4	1.005	85.6	25 18.3	1.005	85.6	25 48.3	1.005	85.5	26 18.2	1.005	85.5	26 48.2	1.005	85.5	27 18.1	1.005	85.4	3
4	23 45.4	1.005	84.7	24 15.3	1.005	84.6	24 45.3	1.005	84.6	25 15.2	1.005	84.6	25 45.2	1.005	84.6	26 15.1	1.005	84.5	26 45.1	1.005	84.5	27 15.0	1.005	84.5	4
95	23 42.2	1.005	83.7	24 12.1	1.005	83.6	24 42.1	1.005	83.6	25 12.1	1.005	83.6	25 42.0	1.005	83.6	26 12.0	1.005	83.5	26 41.9	1.005	83.5	27 11.9	1.005	83.5	95
6	23 39.1	1.005	82.7	24 09.1	1.005	82.7	24 39.0	1.005	82.6	25 09.0	1.005	82.6	25 38.9	1.005	82.6	26 08.9	1.005	82.5	26 38.8	1.005	82.5	27 08.8	1.005	82.5	6
7	23 36.0	1.005	81.7	24 06.0	1.005	81.7	24 35.9	1.005	81.6	25 05.9	1.005	81.6	25 35.8	1.005	81.6	26 05.8	1.005	81.5	26 35.7	1.005	81.5	27 05.7	1.005	81.5	7
8	23 32.9	1.005	80.7	24 02.9	1.005	80.7	24 32.8	1.005	80.6	25 02.8	1.005	80.6	25 32.7	1.005	80.6	26 02.7	1.005	80.5	26 32.6	1.005	80.5	27 02.6	1.005	80.5	8
9	23 29.8	1.005	79.7	23 59.8	1.005	79.7	24 29.7	1.005	79.6	24 59.7	1.005	79.6	25 29.6	1.005	79.6	25 59.6	1.005	79.5	26 29.5	1.005	79.5	26 59.5	1.005	79.5	9
100	23 26.6	1.005	78.7	23 56.7	1.005	78.7	24 26.6	1.005	78.6	24 56.6	1.005	78.6	25 26.5	1.005	78.6	25 56.5	1.005	78.5	26 26.4	1.005	78.5	26 56.4	1.005	78.5	100
1	23 23.7	1.005	77.7	23 53.6	1.005	77.7	24 23.6	1.005	77.6	24 53.5	1.005	77.6	25 23.5	1.005	77.6	25 53.4	1.005	77.6	26 23.4	1.005	77.5	26 53.3	1.005	77.5	1
2	23 20.6	1.005	76.7	23 50.5	1.005	76.7	24 20.5	1.005	76.7	24 50.5	1.005	76.6	25 20.4	1.005	76.6	25 50.4	1.005	76.6	26 20.3	1.005	76.5	26 50.3	1.005	76.5	2
3	23 17.5	1.005	75.7	23 47.5	1.005	75.7	24 17.5	1.005	75.7	24 47.4	1.005	75.6	25 17.4	1.005	75.6	25 47.3	1.005	75.6	26 17.3	1.005	75.5	26 47.2	1.005	75.5	3
4	23 14.5	1.005	74.7	23 44.5	1.005	74.7	24 14.4	1.005	74.7	24 44.4	1.005	74.6	25 14.3	1.005	74.6	25 44.3	1.005	74.6	26 14.2	1.005	74.5	26 44.2	1.005	74.5	4
105	23 11.5	1.005	73.7	23 41.4	1.005	73.7	24 11.4	1.005	73.7	24 41.3	1.005	73.6	25 11.3	1.005	73.6	25 41.3	1.005	73.6	26 11.2	1.005	73.6	26 41.2	1.005	73.5	105
6	23 08.5	1.005	72.7	23 38.4	1.005	72.7	24 08.3	1.005	72.7	24 38.3	1.005	72.7	25 08.3	1.005	72.6	25 38.3	1.005	72.6	26 08.2	1.005	72.6	26 38.2	1.005	72.5	6
7	23 05.5	1.005	71.8	23 35.4	1.005	71.7	24 05.4	1.005	71.7	24 35.4	1.005	71.7	25 05.3	1.005	71.6	25 35.3	1.005	71.6	26 05.2	1.005	71.6	26 35.2	1.005	71.5	7
8	23 02.5	1.005	70.8	23 32.5	1.005	70.7	24 02.4	1.005	70.7	24 32.4	1.005	70.7	25 02.3	1.005	70.6	25 32.3	1.005	70.6	26 02.2	1.005	70.6	26 32.2	1.005	70.6	8
9	22 59.6	1.005	69.8	23 29.5	1.005	69.7	23 59.5	1.005	69.7	24 29.4	1.005	69.7	24 59.4	1.005	69.7	25 29.3	1.005	69.6	25 59.3	1.005	69.6	26 29.2	1.005	69.6	9
110	22 56.6	1.005	68.8	23 26.6	1.005	68.8	23 56.5	1.005	68.7	24 26.5	1.005	68.7	24 56.4	1.005	68.7	25 26.4	1.005	68.6	25 56.4	1.005	68.6	26 26.3	1.005	68.6	110
1	22 53.7	1.005	67.8	23 23.7	1.005	67.8	23 53.6	1.005	67.7	24 23.6	1.005	67.7	24 53.5	1.005	67.7	25 23.5	1.005	67.6	25 53.4	1.005	67.6	26 23.4	1.005	67.6	1
2	22 50.8	1.005	66.8	23 20.8	1.005	66.8	23 50.7	1.005	66.7	24 20.7	1.005	66.7	24 50.6	1.005	66.7	25 20.6	1.005	66.7	25 50.6	1.005	66.6	26 20.5	1.005	66.6	2
3	22 47.9	1.005	65.8	23 17.9	1.005	65.8	23 47.9	1.005	65.8	24 17.8	1.005	65.7	24 47.8	1.005	65.7	25 17.7	1.005	65.7	25 47.7	1.005	65.6	26 17.6	1.005	65.6	3
4	22 45.1	1.005	64.8	23 15.0	1.005	64.8	23 45.0	1.005	64.8	24 15.0	1.005	64.7	24 44.9	1.005	64.7	25 14.9	1.005	64.7	25 44.8	1.005	64.6	26 14.8	1.005	64.6	4
115	22 42.3	1.005	63.8	23 12.2	1.005	63.8	23 42.2	1.005	63.8	24 12.1	1.005	63.7	24 42.1	1.005	63.7	25 12.0	1.005	63.7	25 42.0	1.005	63.7	26 12.0	1.005	63.6	115
6	22 39.4	1.005	62.8	23 09.4	1.005	62.8	23 39.4	1.005	62.8	24 09.3	1.005	62.8	24 39.3	1.005	62.7	25 09.2	1.005	62.7	25 39.2	1.005	62.7	26 09.2	1.005	62.6	6
7	22 36.7	1.005	61.9	23 06.6	1.005	61.8	23 36.6	1.005	61.8	24 06.5	1.005	61.8	24 36.5	1.005	61.7	25 06.5	1.005	61.7	25 36.4	1.005	61.7	26 06.4	1.005	61.7	7
8	22 33.9	1.005	60.9	23 03.9	1.005	60.8	23 33.8	1.005	60.8	24 03.8	1.005	60.8	24 33.8	1.005	60.8	25 03.7	1.005	60.7	25 33.7	1.005	60.7	26 03.6	1.005	60.7	8
9	22 31.2	1.004	59.9	23 01.1	1.004	59.9	23 31.1	1.004	59.8	24 01.1	1.004	59.8	24 31.0	1.004	59.8	25 01.0	1.004	59.7	25 31.0	1.004	59.7	26 00.9	1.004	59.7	9
120	22 28.5	1.004	58.9	22 58.4	1.004	58.9	23 28.4	1.004	58.8	23 58.4	1.004	58.8	24 28.3	1.004	58.8	24 58.3	1.004	58.8	25 28.3	1.004	58.7	25 58.2	1.004	58.7	120
1	22 25.8	1.004	57.9	22 55.8	1.004	57.9	23 25.7	1.004	57.9	23 55.7	1.004	57.8	24 25.7	1.004	57.8	24 55.6	1.004	57.8	25 25.6	1.004	57.7	25 55.5	1.004	57.7	1
2	22 23.2	1.004	56.9	22 53.1	1.004	56.9	23 23.1	1.004	56.9	23 53.0	1.004	56.8	24 23.0	1.004	56.8	24 53.0	1.004	56.8	25 22.9	1.004	56.8	25 52.9	1.004	56.7	2
3	22 20.5	1.004	55.9	22 50.5	1.004	55.9	23 20.5	1.004	55.9	23 50.4	1.004	55.9	24 20.4	1.004	55.8	24 50.4	1.004	55.8	25 20.3	1.004	55.8	25 50.3	1.004	55.7	3
4	22 18.0	1.004	54.9	22 47.9	1.004	54.9	23 17.9	1.004	54.9	23 47.9	1.004	54.9	24 17.8	1.004	54.8	24 47.8	1.004	54.8	25 17.8	1.004	54.8	25 47.7	1.004	54.8	4
125	22 15.4	1.004	53.9	22 45.4	1.004	53.9	23 15.3	1.004	53.9	23 45.3	1.004	53.9	24 15.3	1.004	53.9	24 45.2	1.004	53.8	25 15.2	1.004	53.8	25 45.2	1.004	53.8	125
6	22 12.9	1.004	53.0	22 42.8	1.004	52.9	23 12.8	1.004	52.9	23 42.8	1.004	52.9	24 12.7	1.004	52.9	24 42.7	1.004	52.8	25 12.7	1.004	52.8	25 42.6	1.004	52.8	6
7	22 10.4	1.004	52.0	22 40.4	1.004	52.0	23 10.3	1.004	51.9	23 40.3	1.004	51.9	24 10.3	1.004	51.9	24 40.2	1.004	51.9	25 10.2	1.004	51.8	25 40.2	1.004	51.8	7
8	22 07.9	1.004	51.0	22 37.9	1.004	51.0	23 07.9	1.004	51.0	23 37.8	1.004	50.9	24 07.8	1.004	50.9	24 37.8	1.004	50.9	25 07.7	1.004	50.9	25 37.7	1.004	50.8	8
9	22 05.5	1.004	50.0	22 35.5	1.004	50.0	23 05.4	1.004	50.0	23 35.4	1.004	49.9	24 05.4	1.004	49.9	24 35.4	1.004	49.9	25 05.3	1.004	49.9	25 35.3	1.004	49.8	9
130	22 03.1	1.004	49.0	22 33.1	1.004	49.0	23 03.1	1.004	49.0	23 33.0	1.004	49.0	24 03.0	1.004	48.9	24 33.0	1.004	48.9	25 02.9	1.004	48.9	25 32.9	1.004	48.9	130
1	22 00.8	1.004	48.0	22 30.7	1.004	48.0	23 00.7	1.004	48.0	23 30.7	1.004	48.0	24 00.7	1.004	48.0	24 30.6	1.004	47.9	25 00.6	1.004	47.9	25 30.6	1.004	47.9	1
2	21 58.4	1.004	47.1	22 28.4	1.004	47.0	22 58.4	1.004	47.0	23 28.4	1.004	47.0	23 58.3	1.004	47.0	24 28.3	1.004	46.9	24 58.3	1.004	46.9	25 28.3	1.004	46.9	2
3	21 56.2	1.004	46.1	22 26.1	1.004	46.1	22 56.1	1.004	46.0	23 26.1	1.004	46.0	23 56.1	1.004	46.0	24 26.0	1.004	46.0	24 56.0	1.004	46.0	25 26.0	1.004	45.9	3
4	21 53.9	1.004	45.1	22 23.9	1.004	45.1	22 53.9	1.004	45.0	23 23.8	1.004	45.0	23 53.8	1.004	45.0	24 23.8	1.004	45.0	24 53.8	1.004	45.0	25 23.7	1.004	44.9	4
135	21 51.7	1.004	44.1	22 21.7	1.004	44.1	22 51.7	1.004	44.1	23 21.6	1.004	44.0	23 51.6	1.004	44.0	24 21.6	1.004	44.0	24 51.6	1.004	44.0	25 21.5	1.004	44.0	135
6	21 49.6	1.004	43.1	22 19.5	1.004	43.1	22 49.5	1.004	43.1	23 19.5	1.004	43.1	23 49.5	1.004	43.0	24 19.4	1.004	43.0	24 49.4	1.004	43.0	25 19.4	1.004	43.0	6
7	21 47.4	1.003	42.1	22 17.4	1.003	42.1	22 47.4	1.003	42.1	23 17.4	1.003	42.1	23 47.3	1.003	42.1	24 17.3	1.003	42.0	24 47.3	1.003	42.0	25 17.3	1.003	42.0	7
8	21 45.3	1.003	41.2	22 15.3	1.003	41.1	22 45.3	1.003	41.1	23 15.3	1.003	41.1	23 45.3	1.003	41.1	24 15.2	1.003	41.1	24 45.2	1.003	41.0	25 15.2	1.003	41.0	8
9	21 43.3	1.003	40.2	22 13.3	1.003	40.2	22 43.2	1.003	40.1	23 13.3	1.003	40.1	23 43.2	1.003	40.1	24 13.2	1.003	40.1	24 43.2	1.003	40.1	25 13.1	1.003	40.0	9
140	21 41.3	1.003	39.2	22 11.3	1.003	39.2	22 41.2	1.003	39.2	23 11.2	1.003	39.1	23 41.2	1.003	39.1	24 11.1	1.003	39.1	24 41.1	1.003	39.1	25 11.1	1.003	39.1	140
1	21 39.3	1.003	38.2	22 09.3	1.003	38.2	22 39.3	1.003	38.2	23 09.3	1.003	38.2	23 39.2	1.003	38.1	24 09.2	1.003	38.1	24 39.2	1.003	38.1	25 09.2	1.003	38.1	1
2	21 37.4	1.003	37.2	22 07.4	1.003	37.2	22 37.4	1.003	37.2	23 07.3	1.003	37.2	23 37.3	1.003	37.2	24 07.3	1.003	37.1	24 37.3	1.003	37.1	25 07.3	1.003	37.1	2
3	21 35.5	1.003	36.2	22 05.5	1.003	36.2	22 35.5	1.003	36.2	23 05.5	1.003	36.2	23 35.5	1.003	36.2	24 05.4	1.003	36.2	24 35.4	1.003	36.1	25 05.4	1.003	36.1	3
4	21 33.7	1.003	35.3	22 03.7	1.003	35.2	22 33.7	1.003	35.2	23 03.6	1.003	35.2	23 33.6	1.003	35.2	24 03.6	1.003	35.2	24 33.6	1.003	35.2	25 03.6	1.003	35.1	4
145	21 31.9	1.003	34.3	22 01.9	1.003	34.3	22 31.9	1.003	34.2	23 01.8	1.003	34.2	23 31.8	1.003	34.2	24 01.8	1.003	34.2	24 31.8	1.003	34.2	25 01.8	1.003	34.2	145
6	21 30.1	1.003	33.3	22 00.1	1.003	33.3	22 30.1	1.003	33.3	23 00.1	1.003	33.3	23 30.1	1.003	33.2	24 00.1	1.003	33.2	24 30.1	1.003	33.2	25 00.0	1.003	33.2	6
7	21 28.4	1.003	32.3	21 58.4	1.003	32.3	22 28.4	1.003	32.3	22 58.4	1.003	32.3	23 28.4	1.003	32.3	23 58.4	1.003	32.2	24 28.4	1.003	32.2	24 58.3	1.003	32.2	7
8	21 26.8	1.003	31.3	21 56.8	1.003	31.3	22 26.8	1.003	31.3	22 56.8	1.003	31.3	23 26.7	1.003	31.3	23 56.7	1.003	31.3	24 26.7	1.003	31.2	24 56.7	1.003	31.2	8
9	21 25.2	1.003	30.3	21 55.2	1.003	30.3	22 25.2	1.003	30.3	22 55.1	1.003	30.3	23 25.1	1.003	30.3	23 55.1	1.003	30.3	24 25.1	1.003	30.3	24 55.1	1.003	30.2	9
150	21 23.6	1.003	29.4	21 53.6	1.003	29.4	22 23.6	1.003	29.3	22 53.6	1.003	29.3	23 23.6	1.003	29.3	23 53.6	1.003	29.3	24 23.5	1.003	29.3	24 53.6	1.003	29.3	150
1	21 22.1	1.002	28.4	21 52.1	1.002	28.4	22 22.1	1.002	28.4	22 52.1	1.002	28.4	23 22.1	1.002	28.3	23 52.0	1.002	28.3	24 22.0	1.002	28.3	24 52.0	1.002	28.3	1
2	21 20.6	1.002	27.4	21 50.6	1.002	27.4	22 20.6	1.002	27.4	22 50.6	1.002	27.4	23 20.6	1.002	27.4	23 50.6	1.002	27.3	24 20.6	1.002	27.3	24 50.6	1.002	27.3	2
3	21 19.2	1.002	26.4	21 49.2	1.002	26.4	22 19.2	1.002	26.4	22 49.2	1.002	26.4	23 19.2	1.002	26.4	23 49.2	1.002	26.4	24 19.1	1.002	26.4	24 49.1	1.002	26.3	3
4	21 17.8	1.002	25.4	21 47.8	1.002	25.4	22 17.8	1.002	25.4	22 47.8	1.002	25.4	23 17.8	1.002	25.4	23 47.8	1.002	25.4	24 17.8	1.002	25.4	24 47.8	1.002	25.4	4
155	21 16.5	1.002	24.5	21 46.5	1.002	24.5	22 16.5	1.002	24.5	22 46.5	1.002	24.4	23 16.5	1.002	24.4	23 46.5	1.002	24.4	24 16.5	1.002	24.4	24 46.4	1.002	24.4	155
6	21 15.2	1.002	23.5	21 45.2	1.002	23.5	22 15.2	1.002	23.5	22 45.2	1.002	23.5	23 15.2	1.002	23.4	23 45.2	1.002	23.4	24 15.2	1.002	23.4	24 45.2	1.002	23.4	6
7	21 14.0	1.002	22.5	21 44.0	1.002	22.5	22 14.0	1.002	22.5	22 44.0	1.002	22.5	23 14.0	1.002	22.5	23 44.0	1.002	22.5	24 14.0	1.002	22.4	24 44.0	1.002	22.4	7
8	21 12.8	1.002	21.5	21 42.8	1.002	21.5	22 12.8	1.002	21.5	22 42.8	1.002	21.5	23 12.8	1.002	21.5	23 42.8	1.002	21.5	24 12.8	1.002	21.5	24 42.8	1.002	21.5	8
9	21 11.7	1.002	20.6	21 41.7	1.002	20.5	22 11.7	1.002	20.5	22 41.7	1.002	20.5	23 11.7	1.002	20.5	23 41.7	1.002	20.5	24 11.7	1.002	20.5	24 41.7	1.002	20.5	9
160	21 10.6	1.002	19.6	21 40.6	1.002	19.6	22 10.6	1.002	19.6	22 40.6	1.002	19.5	23 10.6	1.002	19.5	23 40.6	1.002	19.5	24 10.6	1.002	19.5	24 40.6	1.002	19.5	160
1	21 09.6	1.002	18.6	21 39.6	1.002	18.6	22 09.6	1.002	18.6	22 39.6	1.002	18.6	23 09.6	1.002	18.6	23 39.6	1.002	18.5	24 09.6	1.002	18.5	24 39.6	1.002	18.5	1
2	21 08.6	1.002	17.6	21 38.6	1.002	17.6	22 08.6	1.002	17.6	22 38.6	1.002	17.6	23 08.6	1.002	17.6	23 38.6	1.002	17.6	24 08.6	1.002	17.6	24 38.6	1.002	17.6	2
3	21 07.7	1.001	16.6	21 37.7	1.001	16.6	22 07.7	1.001	16.6	22 37.7	1.001	16.6	23 07.7	1.001	16.6	23 37.7	1.001	16.6	24 07.7	1.001	16.6	24 37.7	1.001	16.6	3
4	21 06.8	1.001	15.7	21 36.8	1.001	15.7	22 06.8	1.001	15.6	22 36.8	1.001	15.6	23 06.8	1.001	15.6	23 36.8	1.001	15.6	24 06.8	1.001	15.6	24 36.8	1.001	15.6	4
165	21 06.0	1.001	14.7	21 36.0	1.001	14.7	22 06.0	1.001	14.7	22 36.0	1.001	14.7	23 06.0	1.001	14.6	23 36.0	1.001	14.6	24 06.0	1.001	14.6	24 36.0	1.001	14.6	165
6	21 05.2	1.001	13.7	21 35.2	1.001	13.7	22 05.2	1.001	13.7	22 35.2	1.001	13.7	23 05.2	1.001	13.7	23 35.2	1.001	13.7	24 05.2	1.001	13.7	24 35.2	1.001	13.6	6
7	21 04.5	1.001	12.7	21 34.5	1.001	12.7	22 04.5	1.001	12.7	22 34.5	1.001	12.7	23 04.5	1.001	12.7	23 34.5	1.001	12.7	24 04.5	1.001	12.7	24 34.5	1.001	12.7	7
8	21 03.8	1.001	11.7	21 33.8	1.001	11.7	22 03.8	1.001	11.7	22 33.8	1.001	11.7	23 03.8	1.001	11.7	23 33.8	1.001	11.7	24 03.8	1.001	11.7	24 33.8	1.001	11.7	8
9	21 03.2	1.001	10.8	21 33.2	1.001	10.8	22 03.2	1.001	10.8	22 33.2	1.001	10.7	23 03.2	1.001	10.7	23 33.2	1.001	10.7	24 03.2	1.001	10.7	24 33.2	1.001	10.7	9
170	21 02.7	1.001	09.8	21 32.7	1.001	09.8	22 02.7	1.001	09.8	22 32.7	1.001	09.8	23 02.7	1.001	09.8	23 32.7	1.001	09.8	24 02.7	1.001	09.8	24 32.7	1.001	09.7	170
1	21 02.2	1.001	08.8	21 32.2	1.001	08.8	22 02.2	1.001	08.8	22 32.2	1.001	08.8	23 02.2	1.001	08.8	23 32.2	1.001	08.8	24 02.2	1.001	08.8	24 32.2	1.001	08.8	1
2	21 01.7	1.001	07.8	21 31.7	1.001	07.8	22 01.7	1.001	07.8	22 31.7	1.001	07.8	23 01.7	1.001	07.8	23 31.7	1.001	07.8	24 01.7	1.001	07.8	24 31.7	1.001	07.8	2
3	21 01.3	1.001	06.9	21 31.3	1.001	06.8	22 01.3	1.001	06.8	22 31.3	1.001	06.8	23 01.3	1.001	06.8	23 31.3	1.001	06.8	24 01.3	1.001	06.8	24 31.3	1.001	06.8	3
4	21 01.0	1.000	05.9	21 31.0	1.000	05.9	22 01.0	1.000	05.9	22 31.0	1.000	05.9	23 01.0	1.000	05.9	23 31.0	1.000	05.9	24 01.0	1.000	05.8	24 31.0	1.000	05.8	4
175	21 00.7	1.000	04.9	21 30.7	1.000	04.9	22 00.7	1.000	04.9	22 30.7	1.000	04.9	23 00.7	1.000	04.9	23 30.7	1.000	04.9	24 00.7	1.000	04.9	24 30.7	1.000	04.9	175
6	21 00.4	1.000	03.9	21 30.4	1.000	03.9	22 00.4	1.000	03.9	22 30.4	1.000	03.9	23 00.4	1.000	03.9	23 30.4	1.000	03.9	24 00.4	1.000	03.9	24 30.4	1.000	03.9	6
7	21 00.2	1.000	02.9	21 30.2	1.000	02.9	22 00.2	1.000	02.9	22 30.2	1.000	02.9	23 00.2	1.000	02.9	23 30.2	1.000	02.9	24 00.2	1.000	02.9	24 30.2	1.000	02.9	7
8	21 00.1	1.000	02.0	21 30.1	1.000	02.0	22 00.1	1.000	02.0	22 30.1	1.000	02.0	23 00.1	1.000	02.0	23 30.1	1.000	02.0	24 00.0	1.000	02.0	24 30.1	1.000	01.9	8
9	21 00.0	1.000	01.0	21 30.0	1.000	01.0	22 00.1	1.000	01.0	22 30.0	1.000	01.0	23 00.0	1.000	01.0	23 30.0	1.000	01.0	24 00.0	1.000	01.0	24 30.0	1.000	01.0	9
180	21 00.0	1.000	00.0	21 30.0	1.000	00.0	22 00.0	1.000	00.0	22 30.0	1.000	00.0	23 00.0	1.000	00.0	23 30.0	1.000	00.0	24 00.0	1.000	00.0	24 30.0	1.000	00.0	180

Lat. 88°

Lat. 89°

Lat. 87°

H.A.	28° 00′ (Alt. / Δd Δt / Az.)	28° 30′	29° 00′	30° 00′	32° 00′	34° 00′	34° 30′	35° 30′	H.A.
00	31 00.0 1.00 180.0	31 30.0 1.00 180.0	32 00.0 1.00 180.0	33 00.0 1.00 180.0	35 00.0 1.00 180.0	37 00.0 1.00 180.0	37 30.0 1.00 180.0	38 30.0 1.00 180.0	00
1	31 00.0 1.00 179.0	31 30.0 1.00 179.0	32 00.0 1.00 179.0	33 00.0 1.00 179.0	35 00.0 1.00 179.0	37 00.0 1.00 179.0	37 30.0 1.00 179.0	38 30.0 1.00 179.0	1
2	30 59.9 1.00 177.9	31 29.9 1.00 177.9	31 59.9 1.00 177.9	32 59.9 1.00 177.9	34 59.9 1.00 177.9	36 59.9 1.00 177.9	37 29.9 1.00 177.9	38 29.9 1.00 177.9	2
3	30 59.7 1.00 176.9	31 29.7 1.00 176.9	31 59.7 1.00 176.9	32 59.7 1.00 176.9	34 59.7 1.00 176.9	36 59.7 1.00 176.9	37 29.7 1.00 176.9	38 29.7 1.00 176.9	3
4	30 59.5 1.00 175.9	31 29.5 1.00 175.9	31 59.5 1.00 175.9	32 59.5 1.00 175.9	34 59.5 1.00 175.9	36 59.5 1.00 175.8	37 29.5 1.00 175.8	38 29.5 1.00 175.8	4
05	30 59.3 1.01 174.8	31 29.3 1.01 174.8	31 59.3 1.01 174.8	32 59.3 1.01 174.8	34 59.3 1.01 174.8	36 59.3 1.00 174.8	37 29.3 1.01 174.8	38 29.3 1.01 174.8	05
6	30 59.0 1.01 173.8	31 29.0 1.01 173.8	31 59.0 1.01 173.8	32 59.0 1.01 173.8	34 59.0 1.01 173.8	36 59.0 1.01 173.8	37 29.0 1.01 173.8	38 29.0 1.01 173.8	6
7	30 58.6 1.01 172.8	31 28.6 1.01 172.8	31 58.6 1.01 172.8	32 58.6 1.01 172.8	34 58.6 1.01 172.8	36 58.6 1.01 172.7	37 28.6 1.01 172.7	38 28.6 1.01 172.7	7
8	30 58.2 1.01 171.8	31 28.2 1.01 171.8	31 58.2 1.01 171.8	32 58.2 1.01 171.7	34 58.2 1.01 171.7	36 58.2 1.01 171.7	37 28.2 1.01 171.7	38 28.2 1.01 171.7	8
9	30 57.7 1.01 170.7	31 27.7 1.01 170.7	31 57.7 1.01 170.7	32 57.7 1.01 170.7	34 57.7 1.01 170.7	36 57.7 1.01 170.7	37 27.7 1.01 170.7	38 27.7 1.01 170.6	9
10	30 57.2 1.01 169.7	31 27.2 1.01 169.7	31 57.2 1.01 169.7	32 57.2 1.01 169.7	34 57.2 1.01 169.6	36 57.2 1.01 169.6	37 27.2 1.01 169.6	38 27.2 1.01 169.6	10
1	30 56.6 1.01 168.7	31 26.6 1.01 168.7	31 56.6 1.01 168.7	32 56.6 1.01 168.6	34 56.6 1.01 168.6	36 56.6 1.01 168.6	37 26.6 1.01 168.6	38 26.6 1.01 168.6	1
2	30 56.0 1.01 167.6	31 25.9 1.01 167.6	31 55.9 1.01 167.6	32 55.9 1.01 167.6	34 55.9 1.01 167.6	36 55.9 1.01 167.5	37 25.9 1.01 167.5	38 25.9 1.01 167.5	2
3	30 55.3 1.01 166.6	31 25.2 1.01 166.6	31 55.2 1.01 166.6	32 55.2 1.01 166.6	34 55.2 1.01 166.5	36 55.2 1.01 166.5	37 25.2 1.01 166.5	38 25.2 1.01 166.5	3
4	30 54.5 1.01 165.6	31 24.5 1.01 165.6	31 54.5 1.01 165.6	32 54.5 1.01 165.5	34 54.5 1.01 165.5	36 54.5 1.01 165.5	37 24.5 1.01 165.5	38 24.4 1.01 165.4	4
15	30 53.7 1.01 164.6	31 23.7 1.01 164.6	31 53.7 1.01 164.5	32 53.7 1.01 164.5	34 53.7 1.01 164.5	36 53.6 1.01 164.4	37 23.6 1.01 164.4	38 23.6 1.01 164.4	15
6	30 52.8 1.02 163.5	31 22.8 1.02 163.5	31 52.8 1.02 163.5	32 52.8 1.02 163.5	34 52.8 1.02 163.4	36 52.8 1.02 163.4	37 22.8 1.02 163.4	38 22.8 1.02 163.4	6
7	30 51.9 1.02 162.5	31 21.9 1.02 162.5	31 51.9 1.02 162.5	32 51.9 1.02 162.5	34 51.9 1.02 162.4	36 51.8 1.02 162.4	37 21.8 1.02 162.4	38 21.8 1.02 162.3	7
8	30 50.9 1.02 161.5	31 20.9 1.02 161.5	31 50.9 1.02 161.4	32 50.9 1.02 161.4	34 50.9 1.02 161.4	36 50.9 1.02 161.3	37 20.9 1.02 161.3	38 20.8 1.02 161.3	8
9	30 49.9 1.02 160.4	31 19.9 1.02 160.4	31 49.9 1.02 160.4	32 49.9 1.02 160.4	34 49.8 1.02 160.3	36 49.8 1.02 160.3	37 19.8 1.02 160.3	38 19.8 1.02 160.3	9
20	30 48.8 1.02 159.4	31 18.8 1.02 159.4	31 48.8 1.02 159.4	32 48.8 1.02 159.4	34 48.8 1.02 159.3	36 48.8 1.02 159.3	37 18.7 1.02 159.2	38 18.7 1.02 159.2	20
1	30 47.7 1.02 158.4	31 17.7 1.02 158.4	31 47.7 1.02 158.4	32 47.7 1.02 158.3	34 47.6 1.02 158.3	36 47.6 1.02 158.2	37 17.6 1.02 158.2	38 17.6 1.02 158.2	1
2	30 46.5 1.02 157.4	31 16.5 1.02 157.3	31 46.5 1.02 157.3	32 46.5 1.02 157.3	34 46.5 1.02 157.2	36 46.4 1.02 157.2	37 16.4 1.02 157.1	38 16.4 1.02 157.1	2
3	30 45.3 1.02 156.3	31 15.3 1.02 156.3	31 45.3 1.02 156.3	32 45.3 1.02 156.3	34 45.2 1.02 156.2	36 45.2 1.02 156.2	37 15.2 1.02 156.1	38 15.1 1.02 156.1	3
4	30 44.0 1.02 155.3	31 14.0 1.02 155.3	31 44.0 1.02 155.3	32 44.0 1.02 155.2	34 43.9 1.02 155.2	36 43.9 1.02 155.1	37 13.9 1.02 155.1	38 13.8 1.02 155.1	4
25	30 42.7 1.02 154.3	31 12.7 1.02 154.3	31 42.6 1.02 154.2	32 42.6 1.02 154.2	34 42.6 1.02 154.2	36 42.5 1.02 154.1	37 12.5 1.02 154.1	38 12.5 1.02 154.0	25
6	30 41.3 1.02 153.3	31 11.3 1.02 153.2	31 41.3 1.02 153.2	32 41.2 1.02 153.2	34 41.2 1.02 153.1	36 41.1 1.02 153.1	37 11.1 1.02 153.0	38 11.1 1.02 153.0	6
7	30 39.8 1.02 152.2	31 09.8 1.02 152.2	31 39.8 1.02 152.2	32 39.8 1.02 152.2	34 39.7 1.02 152.1	36 39.7 1.02 152.0	37 09.7 1.02 152.0	38 09.6 1.02 152.0	7
8	30 38.3 1.03 151.2	31 08.3 1.03 151.2	31 38.3 1.03 151.1	32 38.3 1.03 151.1	34 38.2 1.03 151.1	36 38.2 1.03 151.0	37 08.2 1.03 151.0	38 08.1 1.03 150.9	8
9	30 36.8 1.03 150.2	31 06.8 1.03 150.2	31 36.8 1.03 150.1	32 36.8 1.03 150.1	34 36.7 1.03 150.0	36 36.7 1.03 150.0	37 06.6 1.03 149.9	38 06.6 1.03 149.9	9
30	30 35.2 1.03 149.1	31 05.2 1.03 149.1	31 35.2 1.03 149.1	32 35.2 1.03 149.1	34 35.1 1.03 149.0	36 35.0 1.03 148.9	37 05.0 1.03 148.9	38 05.0 1.03 148.9	30
1	30 33.6 1.03 148.1	31 03.6 1.03 148.1	31 33.6 1.03 148.1	32 33.5 1.03 148.0	34 33.5 1.03 148.0	36 33.4 1.03 147.9	37 03.4 1.03 147.9	38 03.4 1.03 147.8	1
2	30 31.9 1.03 147.1	31 01.9 1.03 147.1	31 31.9 1.03 147.1	32 31.8 1.03 147.0	34 31.8 1.03 146.9	36 31.7 1.03 146.9	37 01.7 1.03 146.8	38 01.7 1.03 146.8	2
3	30 30.2 1.03 146.1	31 00.2 1.03 146.1	31 30.1 1.03 146.0	32 30.1 1.03 146.0	34 30.0 1.03 145.9	36 30.0 1.03 145.8	36 59.9 1.03 145.8	37 59.9 1.03 145.8	3
4	30 28.4 1.03 145.0	30 58.4 1.03 145.0	31 28.4 1.03 145.0	32 28.3 1.03 145.0	34 28.3 1.03 144.9	36 28.2 1.03 144.8	36 58.2 1.03 144.8	37 58.1 1.03 144.7	4
35	30 26.6 1.03 144.0	30 56.6 1.03 144.0	31 26.5 1.03 144.0	32 26.5 1.03 143.9	34 26.4 1.03 143.9	36 26.3 1.03 143.8	36 56.3 1.03 143.7	37 56.3 1.03 143.7	35
6	30 24.7 1.03 143.0	30 54.7 1.03 143.0	31 24.7 1.03 143.0	32 24.6 1.03 142.9	34 24.6 1.03 142.8	36 24.5 1.03 142.7	36 54.4 1.03 142.7	37 54.4 1.03 142.7	6
7	30 22.8 1.03 142.0	30 52.8 1.03 142.0	31 22.8 1.03 141.9	32 22.7 1.03 141.9	34 22.6 1.03 141.8	36 22.5 1.03 141.7	36 52.5 1.03 141.7	37 52.5 1.03 141.6	7
8	30 20.8 1.03 141.0	30 50.8 1.03 140.9	31 20.8 1.03 140.9	32 20.8 1.03 140.9	34 20.7 1.03 140.8	36 20.6 1.03 140.7	36 50.6 1.03 140.7	37 50.5 1.03 140.6	8
9	30 18.8 1.03 139.9	30 48.8 1.03 139.9	31 18.8 1.03 139.9	32 18.8 1.03 139.8	34 18.7 1.03 139.7	36 18.6 1.03 139.7	36 48.5 1.03 139.6	37 48.5 1.03 139.6	9
40	30 16.8 1.03 138.9	30 46.8 1.03 138.9	31 16.8 1.03 138.9	32 16.7 1.04 138.8	34 16.6 1.04 138.7	36 16.5 1.04 138.6	36 46.5 1.04 138.6	37 46.4 1.04 138.5	40
1	30 14.7 1.04 137.9	30 44.7 1.04 137.9	31 14.7 1.04 137.8	32 14.6 1.04 137.8	34 14.5 1.04 137.7	36 14.4 1.04 137.6	36 44.4 1.04 137.6	37 44.3 1.04 137.5	1
2	30 12.6 1.04 136.9	30 42.6 1.04 136.8	31 12.5 1.04 136.8	32 12.5 1.04 136.8	34 12.4 1.04 136.7	36 12.3 1.04 136.6	36 42.2 1.04 136.5	37 42.2 1.04 136.5	2
3	30 10.4 1.04 135.8	30 40.4 1.04 135.8	31 10.4 1.04 135.8	32 10.3 1.04 135.8	34 10.2 1.04 135.6	36 10.1 1.04 135.5	36 40.1 1.04 135.5	37 40.0 1.04 135.5	3
4	30 08.2 1.04 134.8	30 38.2 1.04 134.8	31 08.2 1.04 134.8	32 08.1 1.04 134.7	34 08.0 1.04 134.6	36 07.9 1.04 134.5	36 37.8 1.04 134.5	37 37.8 1.04 134.4	4
45	30 06.0 1.04 133.8	30 35.9 1.04 133.8	31 05.9 1.04 133.8	32 05.9 1.04 133.7	34 05.7 1.04 133.6	36 05.6 1.04 133.5	36 35.6 1.04 133.5	37 35.5 1.04 133.4	45
6	30 03.7 1.04 132.8	30 33.7 1.04 132.8	31 03.6 1.04 132.7	32 03.6 1.04 132.7	34 03.4 1.04 132.6	36 03.3 1.04 132.5	36 33.3 1.04 132.4	37 33.2 1.04 132.4	6
7	30 01.4 1.04 131.8	30 31.3 1.04 131.7	31 01.3 1.04 131.7	32 01.2 1.04 131.7	34 01.1 1.04 131.6	36 01.0 1.04 131.4	36 31.0 1.04 131.4	37 30.9 1.04 131.4	7
8	29 59.0 1.04 130.8	30 29.0 1.04 130.7	30 58.9 1.04 130.7	31 58.9 1.04 130.6	33 58.8 1.04 130.5	35 58.6 1.04 130.4	36 28.5 1.04 130.4	37 28.5 1.04 130.3	8
9	29 56.6 1.04 129.7	30 26.6 1.04 129.7	30 56.5 1.04 129.7	31 56.5 1.04 129.6	33 56.3 1.04 129.5	35 56.2 1.04 129.4	36 26.2 1.04 129.4	37 26.1 1.04 129.3	9
50	29 54.2 1.04 128.7	30 24.1 1.04 128.7	30 54.1 1.04 128.7	31 54.0 1.04 128.6	33 53.9 1.04 128.5	35 53.8 1.04 128.4	36 23.7 1.04 128.3	37 23.6 1.04 128.3	50
1	29 51.7 1.04 127.7	30 21.7 1.04 127.7	30 51.6 1.04 127.6	31 51.6 1.04 127.6	33 51.4 1.04 127.5	35 51.3 1.04 127.4	36 21.2 1.04 127.3	37 21.2 1.04 127.3	1
2	29 49.2 1.04 126.7	30 19.1 1.04 126.6	30 49.1 1.04 126.6	31 49.1 1.04 126.6	33 48.8 1.04 126.3	35 48.8 1.04 126.3	36 18.7 1.04 126.3	37 18.6 1.04 126.2	2
3	29 46.7 1.04 125.7	30 16.6 1.04 125.6	30 46.6 1.04 125.6	31 46.5 1.04 125.6	33 46.4 1.04 125.4	35 46.2 1.04 125.3	36 16.2 1.04 125.3	37 16.1 1.04 125.2	3
4	29 44.1 1.04 124.6	30 14.1 1.04 124.6	30 44.0 1.04 124.6	31 44.0 1.04 124.5	33 43.8 1.04 124.4	35 43.6 1.04 124.3	36 13.6 1.04 124.3	37 13.5 1.04 124.2	4
55	29 41.5 1.04 123.6	30 11.5 1.04 123.6	30 41.4 1.04 123.6	31 41.4 1.04 123.5	33 41.2 1.04 123.4	35 41.0 1.04 123.3	36 11.0 1.04 123.2	37 10.9 1.04 123.2	55
6	29 38.9 1.04 122.6	30 08.8 1.04 122.6	30 38.8 1.04 122.5	31 38.7 1.04 122.5	33 38.6 1.04 122.3	35 38.4 1.04 122.3	36 08.4 1.04 122.2	37 08.3 1.04 122.2	6
7	29 36.2 1.04 121.6	30 06.2 1.04 121.6	30 36.1 1.04 121.5	31 36.1 1.04 121.5	33 35.9 1.04 121.4	35 35.7 1.04 121.2	36 05.7 1.04 121.2	37 05.6 1.04 121.1	7
8	29 33.5 1.05 120.6	30 03.5 1.05 120.6	30 33.4 1.05 120.5	31 33.4 1.05 120.5	33 33.2 1.05 120.3	35 33.0 1.05 120.2	36 03.0 1.05 120.2	37 02.9 1.05 120.1	8
9	29 30.8 1.05 119.6	30 00.8 1.05 119.5	30 30.7 1.05 119.5	31 30.6 1.05 119.5	33 30.5 1.05 119.3	35 30.3 1.05 119.2	36 00.2 1.05 119.2	37 00.2 1.05 119.1	9
60	29 28.1 1.05 118.6	29 58.0 1.05 118.5	30 28.0 1.05 118.5	31 27.9 1.05 118.4	33 27.7 1.05 118.3	35 27.5 1.05 118.2	35 57.5 1.05 118.1	36 57.4 1.05 118.1	60
1	29 25.3 1.05 117.6	29 55.2 1.05 117.5	30 25.2 1.05 117.5	31 25.1 1.05 117.3	33 24.9 1.05 117.3	35 24.8 1.05 117.2	35 54.7 1.05 117.1	36 54.6 1.05 117.1	1
2	29 22.5 1.05 116.6	29 52.5 1.05 116.5	30 22.4 1.05 116.5	31 22.3 1.05 116.4	33 22.1 1.05 116.3	35 22.0 1.05 116.2	35 51.9 1.05 116.1	36 51.8 1.05 116.0	2
3	29 19.7 1.05 115.5	29 49.6 1.05 115.5	30 19.6 1.05 115.5	31 19.5 1.05 115.4	33 19.3 1.05 115.3	35 19.1 1.05 115.1	35 49.1 1.05 115.1	36 49.0 1.05 115.0	3
4	29 16.8 1.05 114.5	29 46.8 1.05 114.5	30 16.7 1.05 114.5	31 16.7 1.05 114.4	33 16.5 1.05 114.3	35 16.3 1.05 114.1	35 46.2 1.05 114.1	36 46.1 1.05 114.0	4
65	29 14.0 1.05 113.5	29 43.9 1.05 113.5	30 13.9 1.05 113.4	31 13.8 1.05 113.4	33 13.6 1.05 113.2	35 13.4 1.05 113.1	35 43.3 1.05 113.1	36 43.2 1.05 113.0	65
6	29 11.1 1.05 112.5	29 41.0 1.05 112.5	30 11.0 1.05 112.4	31 10.9 1.05 112.4	33 10.7 1.05 112.2	35 10.5 1.05 112.1	35 40.4 1.05 112.1	36 40.3 1.05 112.0	6
7	29 08.2 1.05 111.5	29 38.1 1.05 111.5	30 08.1 1.05 111.4	31 08.0 1.05 111.4	33 07.8 1.05 111.2	35 07.6 1.05 111.1	35 37.5 1.05 111.0	36 37.4 1.05 111.0	7
8	29 05.2 1.05 110.5	29 35.2 1.05 110.4	30 05.1 1.05 110.4	31 05.0 1.05 110.3	33 04.8 1.05 110.2	35 04.6 1.05 110.1	35 34.6 1.05 110.0	36 34.5 1.05 110.0	8
9	29 02.3 1.05 109.5	29 32.2 1.05 109.4	30 02.2 1.05 109.4	31 02.1 1.05 109.3	33 01.9 1.05 109.2	35 01.7 1.05 109.1	35 31.6 1.05 109.0	36 31.5 1.05 109.0	9
70	28 59.3 1.05 108.5	29 29.3 1.05 108.4	29 59.2 1.05 108.4	30 59.1 1.05 108.3	32 58.9 1.05 108.2	34 58.7 1.05 108.1	35 28.6 1.05 108.0	36 28.5 1.05 107.9	70
1	28 56.3 1.05 107.5	29 26.3 1.05 107.4	29 56.2 1.05 107.4	30 56.1 1.05 107.3	32 55.9 1.05 107.2	34 55.7 1.05 107.0	35 25.6 1.05 107.0	36 25.5 1.05 106.9	1
2	28 53.3 1.05 106.4	29 23.3 1.05 106.4	29 53.2 1.05 106.4	30 53.1 1.05 106.3	32 52.9 1.05 106.2	34 52.7 1.05 106.0	35 22.6 1.05 106.0	36 22.5 1.05 105.9	2
3	28 50.3 1.05 105.4	29 20.2 1.05 105.4	29 50.2 1.05 105.4	30 50.1 1.05 105.3	32 49.9 1.05 105.2	34 49.7 1.05 105.0	35 19.6 1.05 105.0	36 19.5 1.05 104.9	3
4	28 47.3 1.05 104.4	29 17.2 1.05 104.4	29 47.2 1.05 104.4	30 47.1 1.05 104.3	32 46.8 1.05 104.2	34 46.6 1.05 104.0	35 16.6 1.05 104.0	36 16.5 1.05 103.9	4
75	28 44.2 1.05 103.4	29 14.2 1.05 103.4	29 44.1 1.05 103.4	30 44.0 1.05 103.3	32 43.8 1.05 103.2	34 43.5 1.05 103.0	35 13.5 1.05 103.0	36 13.4 1.05 102.9	75
6	28 41.2 1.05 102.4	29 11.1 1.05 102.4	29 41.1 1.05 102.4	30 40.9 1.05 102.3	32 40.7 1.05 102.1	34 40.5 1.05 102.0	35 10.5 1.05 102.0	36 10.3 1.05 101.9	6
7	28 38.1 1.05 101.4	29 08.0 1.05 101.4	29 38.0 1.05 101.4	30 37.9 1.05 101.3	32 37.7 1.05 101.1	34 37.4 1.05 101.0	35 07.4 1.05 101.0	36 07.3 1.05 100.9	7
8	28 35.0 1.05 100.4	29 04.9 1.05 100.4	29 34.9 1.05 100.3	30 34.8 1.05 100.3	32 34.6 1.05 100.1	34 34.3 1.05 100.0	35 04.3 1.05 100.0	36 04.2 1.05 99.9	8
9	28 31.9 1.05 99.4	29 01.9 1.05 99.4	29 31.8 1.05 99.3	30 31.7 1.05 99.3	32 31.5 1.05 99.1	34 31.2 1.05 99.0	35 01.2 1.05 99.0	36 01.1 1.05 98.9	9
80	28 28.8 1.05 98.4	28 58.8 1.05 98.4	29 28.7 1.05 98.3	30 28.6 1.05 98.3	32 28.4 1.05 98.1	34 28.1 1.05 98.0	34 58.1 1.05 97.9	35 58.0 1.05 97.9	80
1	28 25.7 1.05 97.4	28 55.6 1.05 97.4	29 25.6 1.05 97.3	30 25.5 1.05 97.3	32 25.3 1.05 97.1	34 25.0 1.05 97.0	34 55.0 1.05 96.9	35 54.8 1.05 96.9	1
2	28 22.6 1.05 96.4	28 52.5 1.05 96.4	29 22.5 1.05 96.3	30 22.4 1.05 96.3	32 22.1 1.05 96.1	34 21.9 1.05 96.0	34 51.8 1.05 95.9	35 51.7 1.05 95.9	2
3	28 19.5 1.05 95.4	28 49.4 1.05 95.4	29 19.3 1.05 95.3	30 19.2 1.05 95.3	32 19.0 1.05 95.1	34 18.8 1.05 95.0	34 48.7 1.05 94.9	35 48.6 1.05 94.9	3
4	28 16.3 1.05 94.4	28 46.3 1.05 94.4	29 16.2 1.05 94.3	30 16.1 1.05 94.3	32 15.9 1.05 94.1	34 15.7 1.05 94.0	34 45.6 1.05 93.9	35 45.5 1.05 93.9	4
85	28 13.2 1.05 93.4	28 43.1 1.05 93.4	29 13.1 1.05 93.3	30 13.0 1.05 93.3	32 12.8 1.05 93.1	34 12.5 1.05 93.0	34 42.5 1.05 92.9	35 42.3 1.05 92.9	85
6	28 10.1 1.05 92.4	28 40.0 1.05 92.4	29 09.9 1.05 92.3	30 09.8 1.05 92.3	32 09.6 1.05 92.1	34 09.4 1.05 92.0	34 39.3 1.05 91.9	35 39.2 1.05 91.9	6
7	28 06.9 1.05 91.4	28 36.9 1.05 91.4	29 06.8 1.05 91.3	30 06.7 1.05 91.3	32 06.5 1.05 91.1	34 06.2 1.05 91.0	34 36.2 1.05 90.9	35 36.1 1.05 90.9	7
8	28 03.8 1.05 90.4	28 33.7 1.05 90.4	29 03.7 1.05 90.3	30 03.6 1.05 90.3	32 03.3 1.05 90.1	34 03.1 1.05 90.0	34 33.0 1.05 89.9	35 32.9 1.05 89.9	8
9	28 00.6 1.05 89.4	28 30.6 1.05 89.4	29 00.5 1.05 89.3	30 00.4 1.05 89.3	32 00.2 1.05 89.1	34 00.0 1.05 89.0	34 29.9 1.05 88.9	35 29.8 1.05 88.9	9
90	27 57.5 1.05 88.4	28 27.4 1.05 88.4	28 57.4 1.05 88.3	29 57.3 1.05 88.3	31 57.1 1.05 88.1	33 56.8 1.05 88.0	34 26.8 1.05 87.9	35 26.6 1.05 87.9	90

H.A.	28° 00' Alt.	Δd Δt	Az.	28° 30' Alt.	Δd Δt	Az.	29° 00' Alt.	Δd Δt	Az.	30° 00' Alt.	Δd Δt	Az.	32° 00' Alt.	Δd Δt	Az.	34° 00' Alt.	Δd Δt	Az.	34° 30' Alt.	Δd Δt	Az.	35° 30' Alt.	Δd Δt	Az.	H.A.
91	27 54.4	1.005	87.4	28 24.3	1.005	87.4	28 54.3	1.005	87.3	29 54.1	1.005	87.3	31 53.9	1.005	87.1	33 53.7	1.005	87.0	34 23.6	1.005	86.9	35 23.5	1.005	86.9	91
2	27 51.2	1.005	86.4	28 21.2	1.005	86.4	28 51.1	1.005	86.3	29 51.0	1.005	86.3	31 50.8	1.005	86.1	33 50.6	1.005	86.0	34 20.5	1.005	85.9	35 20.4	1.005	85.9	2
3	27 48.1	1.005	85.4	28 18.0	1.005	85.4	28 48.0	1.005	85.3	29 47.9	1.005	85.3	31 47.7	1.005	85.1	33 47.4	1.005	85.0	34 17.4	1.005	85.0	35 17.2	1.005	84.9	3
4	27 45.0	1.005	84.4	28 14.9	1.005	84.4	28 44.9	1.005	84.4	29 44.7	1.005	84.3	31 44.5	1.005	84.1	33 44.3	1.005	84.0	34 14.2	1.005	84.0	35 14.1	1.005	83.9	4
95	27 41.8	1.005	83.4	28 11.8	1.005	83.4	28 41.7	1.005	83.4	29 41.6	1.005	83.3	31 41.4	1.005	83.1	33 41.2	1.005	83.0	34 11.1	1.005	83.0	35 11.0	1.005	82.9	95
6	27 38.7	1.005	82.4	28 08.7	1.005	82.4	28 38.6	1.005	82.4	29 38.5	1.005	82.3	31 38.3	1.005	82.2	33 38.1	1.005	82.0	34 08.0	1.005	82.0	35 07.9	1.005	81.9	6
7	27 35.6	1.005	81.4	28 05.6	1.005	81.4	28 35.5	1.005	81.4	29 35.4	1.005	81.3	31 35.2	1.005	81.2	33 35.0	1.005	81.0	34 04.9	1.005	81.0	35 04.8	1.005	80.9	7
8	27 32.5	1.005	80.4	28 02.5	1.005	80.4	28 32.4	1.005	80.4	29 32.3	1.005	80.3	31 32.1	1.005	80.2	33 31.9	1.005	80.0	34 01.8	1.005	80.0	35 01.7	1.005	79.9	8
9	27 29.4	1.005	79.4	27 59.4	1.005	79.4	28 29.3	1.005	79.4	29 29.2	1.005	79.3	31 29.0	1.005	79.2	33 28.8	1.005	79.0	33 58.7	1.005	79.0	34 58.6	1.005	78.9	9
100	27 26.3	1.005	78.5	27 56.3	1.005	78.4	28 26.2	1.005	78.4	29 26.1	1.005	78.3	31 25.9	1.005	78.2	33 25.7	1.005	78.0	33 55.6	1.005	78.0	34 55.5	1.005	77.9	100
1	27 23.3	1.005	77.5	27 53.2	1.005	77.4	28 23.2	1.005	77.4	29 23.1	1.005	77.3	31 22.8	1.005	77.2	33 22.6	1.005	77.0	33 52.6	1.005	77.0	34 52.5	1.005	76.9	1
2	27 20.2	1.005	76.5	27 50.2	1.005	76.4	28 20.1	1.005	76.4	29 20.0	1.005	76.3	31 19.8	1.005	76.2	33 19.6	1.005	76.1	33 49.5	1.005	76.0	34 49.4	1.005	75.9	2
3	27 17.2	1.005	75.5	27 47.1	1.005	75.4	28 17.1	1.005	75.4	29 17.0	1.005	75.3	31 16.8	1.005	75.2	33 16.5	1.005	75.1	33 46.5	1.005	75.0	34 46.4	1.005	75.0	3
4	27 14.1	1.005	74.5	27 44.1	1.005	74.4	28 14.0	1.005	74.4	29 13.9	1.005	74.4	31 13.7	1.005	74.2	33 13.5	1.005	74.1	33 43.5	1.005	74.0	34 43.3	1.005	74.0	4
105	27 11.1	1.005	73.5	27 41.1	1.005	73.5	28 11.0	1.005	73.4	29 10.9	1.005	73.4	31 10.7	1.005	73.2	33 10.5	1.005	73.1	33 40.4	1.005	73.0	34 40.3	1.005	73.0	105
6	27 08.1	1.005	72.5	27 38.1	1.005	72.5	28 08.0	1.005	72.4	29 07.9	1.005	72.4	31 07.7	1.005	72.2	33 07.5	1.005	72.1	33 37.4	1.005	72.1	34 37.3	1.005	72.0	6
7	27 05.1	1.005	71.5	27 35.1	1.005	71.5	28 05.0	1.005	71.4	29 04.9	1.005	71.4	31 04.7	1.005	71.2	33 04.5	1.005	71.1	33 34.5	1.005	71.1	34 34.4	1.005	71.0	7
8	27 02.2	1.005	70.5	27 32.1	1.005	70.5	28 02.1	1.005	70.5	29 02.0	1.005	70.4	31 01.8	1.005	70.3	33 01.6	1.005	70.1	33 31.5	1.005	70.1	34 31.4	1.005	70.0	8
9	26 59.2	1.005	69.5	27 29.2	1.005	69.5	27 59.1	1.005	69.5	28 59.0	1.005	69.4	30 58.8	1.005	69.3	32 58.6	1.005	69.1	33 28.6	1.005	69.1	34 28.5	1.005	69.0	9
110	26 56.3	1.005	68.5	27 26.2	1.005	68.5	27 56.2	1.005	68.5	28 56.1	1.005	68.4	30 55.9	1.005	68.3	32 55.7	1.005	68.1	33 25.6	1.005	68.1	34 25.5	1.005	68.0	110
1	26 53.4	1.005	67.6	27 23.3	1.005	67.5	27 53.3	1.005	67.5	28 53.2	1.005	67.4	30 53.0	1.005	67.3	32 52.8	1.005	67.2	33 22.7	1.005	67.1	34 22.6	1.005	67.1	1
2	26 50.5	1.005	66.6	27 20.4	1.005	66.5	27 50.4	1.005	66.5	28 50.3	1.005	66.4	30 50.1	1.005	66.3	32 49.9	1.005	66.2	33 19.9	1.005	66.1	34 19.7	1.005	66.1	2
3	26 47.6	1.005	65.6	27 17.6	1.005	65.5	27 47.5	1.005	65.5	28 47.4	1.005	65.5	30 47.2	1.005	65.3	32 47.0	1.005	65.2	33 17.0	1.005	65.2	34 16.9	1.005	65.1	3
4	26 44.7	1.005	64.6	27 14.7	1.005	64.6	27 44.7	1.005	64.5	28 44.6	1.005	64.5	30 44.4	1.005	64.3	32 44.2	1.005	64.2	33 14.2	1.005	64.2	34 14.1	1.005	64.1	4
115	26 41.9	1.005	63.6	27 11.9	1.005	63.6	27 41.8	1.005	63.5	28 41.8	1.005	63.5	30 41.6	1.005	63.4	32 41.4	1.005	63.2	33 11.3	1.005	63.2	34 11.2	1.005	63.1	115
6	26 39.1	1.005	62.6	27 09.1	1.005	62.6	27 39.0	1.005	62.6	28 39.0	1.005	62.5	30 38.8	1.005	62.4	32 38.6	1.005	62.2	33 08.5	1.005	62.2	34 08.5	1.005	62.1	6
7	26 36.3	1.005	61.6	27 06.3	1.005	61.6	27 36.3	1.005	61.6	28 36.2	1.005	61.5	30 36.0	1.005	61.4	32 35.8	1.005	61.3	33 05.8	1.005	61.2	34 05.7	1.005	61.2	7
8	26 33.6	1.005	60.6	27 03.6	1.005	60.6	27 33.5	1.005	60.6	28 33.4	1.005	60.5	30 33.3	1.005	60.4	32 33.1	1.005	60.3	33 03.0	1.005	60.2	34 02.9	1.005	60.2	8
9	26 30.9	1.004	59.7	27 00.8	1.004	59.6	27 30.8	1.004	59.6	28 30.7	1.004	59.5	30 30.5	1.004	59.4	32 30.4	1.004	59.3	33 00.3	1.004	59.3	34 00.2	1.004	59.2	9
120	26 28.2	1.004	58.7	26 58.1	1.004	58.6	27 28.1	1.004	58.6	28 28.0	1.004	58.6	30 27.9	1.004	58.4	32 27.7	1.004	58.3	32 57.6	1.004	58.3	33 57.6	1.004	58.2	120
1	26 25.5	1.004	57.7	26 55.5	1.004	57.7	27 25.4	1.004	57.6	28 25.4	1.004	57.6	30 25.2	1.004	57.5	32 25.0	1.004	57.3	32 55.0	1.004	57.3	33 54.9	1.004	57.2	1
2	26 22.9	1.004	56.7	26 52.8	1.004	56.7	27 22.8	1.004	56.6	28 22.7	1.004	56.6	30 22.6	1.004	56.5	32 22.4	1.004	56.4	32 52.4	1.004	56.3	33 52.3	1.004	56.3	2
3	26 20.3	1.004	55.7	26 50.2	1.004	55.7	27 20.2	1.004	55.7	28 20.1	1.004	55.6	30 20.0	1.004	55.5	32 19.8	1.004	55.4	32 49.8	1.004	55.3	33 49.7	1.004	55.3	3
4	26 17.7	1.004	54.7	26 47.6	1.004	54.7	27 17.6	1.004	54.7	28 17.5	1.004	54.6	30 17.4	1.004	54.5	32 17.2	1.004	54.4	32 47.2	1.004	54.4	33 47.1	1.004	54.3	4
125	26 15.1	1.004	53.8	26 45.1	1.004	53.7	27 15.1	1.004	53.7	28 15.0	1.004	53.6	30 14.8	1.004	53.5	32 14.7	1.004	53.4	32 44.7	1.004	53.4	33 44.6	1.004	53.3	125
6	26 12.6	1.004	52.8	26 42.6	1.004	52.7	27 12.5	1.004	52.7	28 12.5	1.004	52.7	30 12.3	1.004	52.5	32 12.2	1.004	52.4	32 42.2	1.004	52.4	33 42.1	1.004	52.3	6
7	26 10.1	1.004	51.8	26 40.1	1.004	51.8	27 10.1	1.004	51.7	28 10.0	1.004	51.7	30 09.9	1.004	51.6	32 09.7	1.004	51.5	32 39.7	1.004	51.4	33 39.6	1.004	51.4	7
8	26 07.7	1.004	50.8	26 37.7	1.004	50.8	27 07.6	1.004	50.8	28 07.6	1.004	50.7	30 07.4	1.004	50.6	32 07.3	1.004	50.5	32 37.2	1.004	50.4	33 37.2	1.004	50.4	8
9	26 05.3	1.004	49.8	26 35.2	1.004	49.8	27 05.2	1.004	49.8	28 05.1	1.004	49.7	30 05.0	1.004	49.6	32 04.9	1.004	49.5	32 34.8	1.004	49.5	33 34.8	1.004	49.4	9
130	26 02.9	1.004	48.8	26 32.9	1.004	48.8	27 02.8	1.004	48.8	28 02.8	1.004	48.7	30 02.6	1.004	48.6	32 02.5	1.004	48.5	32 32.5	1.004	48.5	33 32.4	1.004	48.4	130
1	26 00.5	1.004	47.9	26 30.5	1.004	47.8	27 00.5	1.004	47.8	28 00.4	1.004	47.8	30 00.3	1.004	47.7	32 00.1	1.004	47.5	32 30.1	1.004	47.5	33 30.1	1.004	47.5	1
2	25 58.2	1.004	46.9	26 28.2	1.004	46.8	26 58.1	1.004	46.8	27 58.1	1.004	46.8	29 58.0	1.004	46.7	31 57.9	1.004	46.6	32 27.8	1.004	46.5	33 27.8	1.004	46.5	2
3	25 56.0	1.004	45.9	26 25.9	1.004	45.9	26 55.9	1.004	45.8	27 55.8	1.004	45.8	29 55.7	1.004	45.7	31 55.6	1.004	45.6	32 25.6	1.004	45.6	33 25.5	1.004	45.5	3
4	25 53.7	1.004	44.9	26 23.7	1.004	44.9	26 53.7	1.004	44.9	27 53.6	1.004	44.8	29 53.5	1.004	44.7	31 53.4	1.004	44.6	32 23.4	1.004	44.6	33 23.3	1.004	44.5	4
135	25 51.5	1.004	43.9	26 21.5	1.004	43.9	26 51.5	1.004	43.9	27 51.4	1.004	43.8	29 51.3	1.004	43.7	31 51.2	1.004	43.6	32 21.2	1.004	43.6	33 21.1	1.004	43.6	135
6	25 49.4	1.004	43.0	26 19.3	1.004	42.9	26 49.3	1.004	42.9	27 49.3	1.004	42.9	29 49.2	1.004	42.8	31 49.1	1.004	42.7	32 19.0	1.004	42.6	33 19.0	1.004	42.6	6
7	25 47.2	1.003	42.0	26 17.2	1.003	42.0	26 47.2	1.003	41.9	27 47.1	1.003	41.9	29 47.0	1.003	41.8	31 46.9	1.003	41.7	32 16.9	1.003	41.7	33 16.9	1.003	41.6	7
8	25 45.2	1.003	41.0	26 15.1	1.003	41.0	26 45.1	1.003	40.9	27 45.1	1.003	40.9	29 45.0	1.003	40.8	31 44.9	1.003	40.7	32 14.8	1.003	40.7	33 14.8	1.003	40.6	8
9	25 43.1	1.003	40.0	26 13.1	1.003	40.0	26 43.1	1.003	40.0	27 43.0	1.003	39.9	29 42.9	1.003	39.8	31 42.8	1.003	39.7	32 12.8	1.003	39.7	33 12.8	1.003	39.7	9
140	25 41.1	1.003	39.0	26 11.1	1.003	39.0	26 41.1	1.003	39.0	27 41.0	1.003	38.9	29 41.0	1.003	38.9	31 40.9	1.003	38.8	32 10.8	1.003	38.7	33 10.8	1.003	38.7	140
1	25 39.2	1.003	38.1	26 09.1	1.003	38.0	26 39.1	1.003	38.0	27 39.1	1.003	38.0	29 39.0	1.003	37.9	31 38.9	1.003	37.8	32 08.9	1.003	37.8	33 08.8	1.003	37.7	1
2	25 37.3	1.003	37.1	26 07.2	1.003	37.1	26 37.2	1.003	37.0	27 37.2	1.003	37.0	29 37.1	1.003	36.9	31 37.0	1.003	36.8	32 07.0	1.003	36.8	33 06.9	1.003	36.8	2
3	25 35.4	1.003	36.1	26 05.4	1.003	36.1	26 35.3	1.003	36.1	27 35.3	1.003	36.0	29 35.2	1.003	35.9	31 35.1	1.003	35.9	32 05.1	1.003	35.8	33 05.1	1.003	35.8	3
4	25 33.6	1.003	35.1	26 03.5	1.003	35.1	26 33.5	1.003	35.1	27 33.5	1.003	35.0	29 33.4	1.003	35.0	31 33.3	1.003	34.9	32 03.3	1.003	34.9	33 03.3	1.003	34.8	4
145	25 31.8	1.003	34.1	26 01.8	1.003	34.1	26 31.7	1.003	34.1	27 31.7	1.003	34.1	29 31.6	1.003	34.0	31 31.6	1.003	33.9	32 01.5	1.003	33.9	33 01.5	1.003	33.8	145
6	25 30.0	1.003	33.2	26 00.0	1.003	33.1	26 30.0	1.003	33.1	27 30.0	1.003	33.1	29 29.9	1.003	33.0	31 29.8	1.003	32.9	31 59.8	1.003	32.9	32 59.8	1.003	32.9	6
7	25 28.3	1.003	32.2	25 58.3	1.003	32.2	26 28.3	1.003	32.2	27 28.3	1.003	32.1	29 28.2	1.003	32.0	31 28.1	1.003	32.0	31 58.1	1.003	31.9	32 58.1	1.003	31.9	7
8	25 26.7	1.003	31.2	25 56.7	1.003	31.2	26 26.7	1.003	31.2	27 26.6	1.003	31.1	29 26.6	1.003	31.1	31 26.5	1.003	31.0	31 56.5	1.003	31.0	32 56.5	1.003	30.9	8
9	25 25.1	1.003	30.2	25 55.1	1.003	30.2	26 25.1	1.003	30.2	27 25.0	1.003	30.2	29 25.0	1.003	30.1	31 24.9	1.003	30.0	31 54.9	1.003	30.0	32 54.9	1.003	30.0	9
150	25 23.5	1.002	29.3	25 53.5	1.003	29.2	26 23.5	1.002	29.2	27 23.5	1.002	29.2	29 23.4	1.002	29.1	31 23.4	1.002	29.1	31 53.3	1.002	29.0	32 53.3	1.002	29.0	150
1	25 22.0	1.002	28.3	25 52.0	1.002	28.3	26 22.0	1.002	28.2	27 22.0	1.002	28.2	29 21.9	1.002	28.1	31 21.9	1.002	28.1	31 51.8	1.002	28.1	32 51.8	1.002	28.0	1
2	25 20.5	1.002	27.3	25 50.5	1.002	27.3	26 20.5	1.002	27.3	27 20.5	1.002	27.2	29 20.5	1.002	27.2	31 20.4	1.002	27.1	31 50.4	1.002	27.1	32 50.4	1.002	27.1	2
3	25 19.1	1.002	26.3	25 49.1	1.002	26.3	26 19.1	1.002	26.3	27 19.1	1.002	26.3	29 19.0	1.002	26.2	31 19.0	1.002	26.1	31 49.0	1.002	26.1	32 49.0	1.002	26.1	3
4	25 17.8	1.002	25.3	25 47.8	1.002	25.3	26 17.7	1.002	25.3	27 17.7	1.002	25.3	29 17.7	1.002	25.2	31 17.6	1.002	25.2	31 47.6	1.002	25.2	32 47.6	1.002	25.1	4
155	25 16.4	1.002	24.4	25 46.4	1.002	24.4	26 16.4	1.002	24.3	27 16.4	1.002	24.3	29 16.4	1.002	24.3	31 16.3	1.002	24.2	31 46.3	1.002	24.2	32 46.3	1.002	24.2	155
6	25 15.2	1.002	23.4	25 45.2	1.002	23.4	26 15.2	1.002	23.4	27 15.1	1.002	23.3	29 15.1	1.002	23.3	31 15.1	1.002	23.2	31 45.1	1.002	23.2	32 45.0	1.002	23.2	6
7	25 13.9	1.002	22.4	25 43.9	1.002	22.4	26 13.9	1.002	22.4	27 13.9	1.002	22.4	29 13.9	1.002	22.3	31 13.8	1.002	22.3	31 43.8	1.002	22.2	32 43.8	1.002	22.2	7
8	25 12.8	1.002	21.4	25 42.8	1.002	21.4	26 12.8	1.002	21.4	27 12.7	1.002	21.4	29 12.7	1.002	21.3	31 12.7	1.002	21.3	31 42.7	1.002	21.3	32 42.7	1.002	21.3	8
9	25 11.6	1.002	20.5	25 41.6	1.002	20.5	26 11.6	1.002	20.4	27 11.6	1.002	20.4	29 11.6	1.002	20.4	31 11.6	1.002	20.3	31 41.6	1.002	20.3	32 41.5	1.002	20.3	9
160	25 10.6	1.002	19.5	25 40.6	1.002	19.5	26 10.6	1.002	19.5	27 10.6	1.002	19.4	29 10.5	1.002	19.4	31 10.5	1.002	19.4	31 40.5	1.002	19.3	32 40.5	1.002	19.3	160
1	25 09.6	1.002	18.5	25 39.6	1.002	18.5	26 09.5	1.002	18.5	27 09.5	1.002	18.5	29 09.5	1.002	18.4	31 09.5	1.002	18.4	31 39.5	1.002	18.4	32 39.5	1.002	18.4	1
2	25 08.6	1.002	17.5	25 38.6	1.002	17.5	26 08.6	1.002	17.5	27 08.6	1.002	17.5	29 08.5	1.002	17.5	31 08.5	1.002	17.4	31 38.5	1.002	17.4	32 38.5	1.002	17.4	2
3	25 07.7	1.001	16.6	25 37.7	1.001	16.6	26 07.7	1.001	16.5	27 07.6	1.001	16.5	29 07.6	1.001	16.5	31 07.6	1.001	16.4	31 37.6	1.001	16.4	32 37.6	1.001	16.4	3
4	25 06.8	1.001	15.6	25 36.8	1.001	15.6	26 06.8	1.001	15.6	27 06.8	1.001	15.6	29 06.8	1.001	15.5	31 06.7	1.001	15.5	31 36.7	1.001	15.5	32 36.7	1.001	15.5	4
165	25 06.0	1.001	14.6	25 36.0	1.001	14.6	26 06.0	1.001	14.6	27 06.0	1.001	14.6	29 05.9	1.001	14.5	31 05.9	1.001	14.5	31 35.9	1.001	14.5	32 35.9	1.001	14.5	165
6	25 05.2	1.001	13.6	25 35.2	1.001	13.6	26 05.2	1.001	13.6	27 05.2	1.001	13.6	29 05.2	1.001	13.6	31 05.2	1.001	13.5	31 35.2	1.001	13.5	32 35.2	1.001	13.5	6
7	25 04.5	1.001	12.7	25 34.5	1.001	12.7	26 04.5	1.001	12.7	27 04.5	1.001	12.6	29 04.4	1.001	12.6	31 04.5	1.001	12.6	31 34.5	1.001	12.6	32 34.5	1.001	12.6	7
8	25 03.8	1.001	11.7	25 33.8	1.001	11.7	26 03.8	1.001	11.7	27 03.8	1.001	11.7	29 03.8	1.001	11.6	31 03.8	1.001	11.6	31 33.8	1.001	11.6	32 33.8	1.001	11.6	8
9	25 03.2	1.001	10.7	25 33.2	1.001	10.7	26 03.2	1.001	10.7	27 03.2	1.001	10.7	29 03.2	1.001	10.7	31 03.2	1.001	10.6	31 33.2	1.001	10.6	32 33.2	1.001	10.6	9
170	25 02.7	1.001	09.7	25 32.7	1.001	09.7	26 02.7	1.001	09.7	27 02.7	1.001	09.7	29 02.7	1.001	09.7	31 02.6	1.001	09.7	31 32.6	1.001	09.7	32 32.6	1.001	09.7	170
1	25 02.2	1.001	08.8	25 32.2	1.001	08.8	26 02.2	1.001	08.7	27 02.2	1.001	08.7	29 02.1	1.001	08.7	31 02.1	1.001	08.7	31 32.1	1.001	08.7	32 32.1	1.001	08.7	1
2	25 01.7	1.001	07.8	25 31.7	1.001	07.8	26 01.7	1.001	07.8	27 01.7	1.001	07.8	29 01.7	1.001	07.7	31 01.7	1.001	07.7	31 31.7	1.001	07.7	32 31.7	1.001	07.7	2
3	25 01.3	1.001	06.8	25 31.3	1.001	06.8	26 01.3	1.001	06.8	27 01.3	1.001	06.8	29 01.3	1.001	06.8	31 01.3	1.001	06.8	31 31.3	1.001	06.8	32 31.3	1.001	06.8	3
4	25 01.0	1.000	05.8	25 31.0	1.000	05.8	26 01.0	1.000	05.8	27 01.0	1.000	05.8	29 01.0	1.000	05.8	31 01.0	1.000	05.8	31 31.0	1.000	05.8	32 31.0	1.000	05.8	4
175	25 00.7	1.000	04.9	25 30.7	1.000	04.9	26 00.7	1.000	04.9	27 00.7	1.000	04.9	29 00.7	1.000	04.8	31 00.7	1.000	04.8	31 30.7	1.000	04.8	32 30.7	1.000	04.8	175
6	25 00.4	1.000	03.9	25 30.4	1.000	03.9	26 00.4	1.000	03.9	27 00.4	1.000	03.9	29 00.4	1.000	03.9	31 00.4	1.000	03.9	31 30.4	1.000	03.9	32 30.4	1.000	03.9	6
7	25 00.2	1.000	02.9	25 30.2	1.000	02.9	26 00.2	1.000	02.9	27 00.2	1.000	02.9	29 00.2	1.000	02.9	31 00.2	1.000	02.9	31 30.2	1.000	02.9	32 30.2	1.000	02.9	7
8	25 00.1	1.000	01.9	25 30.1	1.000	01.9	26 00.1	1.000	01.9	27 00.1	1.000	01.9	29 00.1	1.000	01.9	31 00.1	1.000	01.9	31 30.1		01.9	32 30.1	1.000	01.9	8
9	25 00.0	1.000	01.0	25 30.0	1.000	01.0	26 00.0	1.000	01.0	27 00.0	1.000	01.0	29 00.0	1.000	01.0	31 00.0	1.000	01.0	31 30.0	1.000	01.0	32 30.0	1.000	01.0	9
180	25 00.0	1.000	00.0	25 30.0	1.000	00.0	26 00.0	1.000	00.0	27 00.0	1.000	00.0	29 00.0	1.000	00.0	31 00.0	1.000	00.0	31 30.0	1.000	00.0	32 30.0	1.000	00.0	180

Lat. 87°

H.A.	36° 00' (Alt. / Δd Δt / Az.)	37° 00' (Alt. / Δd Δt / Az.)	38° 30' (Alt. / Δd Δt / Az.)	40° 00' (Alt. / Δd Δt / Az.)	42° 00' (Alt. / Δd Δt / Az.)	42° 30' (Alt. / Δd Δt / Az.)	43° 00' (Alt. / Δd Δt / Az.)	45° 00' (Alt. / Δd Δt / Az.)	H.A.
00	39 00.0 1.0 00 180.0	40 00.0 1.0 00 180.0	41 30.0 1.0 00 180.0	43 00.0 1.0 00 180.0	45 00.0 1.0 00 180.0	45 30.0 1.0 00 180.0	46 00.0 1.0 00 180.0	48 00.0 1.0 00 180.0	00
1	39 00.0 1.0 00 179.0	40 00.0 1.0 00 179.0	41 30.0 1.0 00 179.0	43 00.0 1.0 00 179.0	45 00.0 1.0 00 178.9	45 30.0 1.0 00 178.9	46 00.0 1.0 00 178.9	48 00.0 1.0 00 178.9	1
2	38 59.9 1.0 00 177.9	39 59.9 1.0 00 177.9	41 29.9 1.0 00 177.9	42 59.9 1.0 00 177.9	44 59.9 1.0 00 177.9	45 29.9 1.0 00 177.9	45 59.9 1.0 00 177.9	47 59.9 1.0 00 177.9	2
3	38 59.7 1.0 00 176.9	39 59.7 1.0 00 176.9	41 29.7 1.0 00 176.9	42 59.7 1.0 00 176.9	44 59.7 1.0 00 176.8	45 29.7 1.0 00 176.8	45 59.7 1.0 00 176.8	47 59.7 1.0 00 176.8	3
4	38 59.5 1.0 00 175.8	39 59.5 1.0 00 175.8	41 29.5 1.0 00 175.8	42 59.5 1.0 00 175.8	44 59.5 1.0 00 175.8	45 29.5 1.0 00 175.8	45 59.5 1.0 00 175.8	47 59.5 1.0 00 175.8	4
05	38 59.3 1.0 01 174.8	39 59.3 1.0 01 174.8	41 29.3 1.0 01 174.8	42 59.3 1.0 01 174.8	44 59.3 1.0 01 174.7	45 29.3 1.0 01 174.7	45 59.3 1.0 01 174.7	47 59.3 1.0 01 174.7	05
6	38 59.0 1.0 01 173.8	39 59.0 1.0 01 173.7	41 29.0 1.0 01 173.7	42 59.0 1.0 01 173.7	44 59.0 1.0 01 173.7	45 29.0 1.0 01 173.7	45 59.0 1.0 01 173.7	47 59.0 1.0 01 173.7	6
7	38 58.6 1.0 01 172.7	39 58.6 1.0 01 172.7	41 28.6 1.0 01 172.7	42 58.6 1.0 01 172.7	44 58.6 1.0 01 172.6	45 28.6 1.0 01 172.6	45 58.6 1.0 01 172.6	47 58.6 1.0 01 172.6	7
8	38 58.2 1.0 01 171.7	39 58.2 1.0 01 171.7	41 28.2 1.0 01 171.6	42 58.2 1.0 01 171.6	44 58.2 1.0 01 171.6	45 28.2 1.0 01 171.6	45 58.2 1.0 01 171.6	47 58.2 1.0 01 171.5	8
9	38 57.7 1.0 01 170.6	39 57.7 1.0 01 170.6	41 27.7 1.0 01 170.6	42 57.7 1.0 01 170.6	44 57.7 1.0 01 170.5	45 27.7 1.0 01 170.5	45 57.7 1.0 01 170.5	47 57.7 1.0 01 170.5	9
10	38 57.2 1.0 01 169.6	39 57.2 1.0 01 169.6	41 27.1 1.0 01 169.6	42 57.1 1.0 01 169.5	44 57.1 1.0 01 169.5	45 27.1 1.0 01 169.5	45 57.1 1.0 01 169.5	47 57.1 1.0 01 169.4	10
1	38 56.6 1.0 01 168.6	39 56.6 1.0 01 168.5	41 26.5 1.0 01 168.5	42 56.5 1.0 01 168.5	44 56.5 1.0 01 168.4	45 26.5 1.0 01 168.4	45 56.5 1.0 01 168.4	47 56.5 1.0 01 168.4	1
2	38 55.9 1.0 01 167.5	39 55.9 1.0 01 167.5	41 25.9 1.0 01 167.5	42 55.9 1.0 01 167.4	44 55.9 1.0 01 167.4	45 25.9 1.0 01 167.4	45 55.8 1.0 01 167.4	47 55.8 1.0 01 167.3	2
3	38 55.2 1.0 01 166.5	39 55.2 1.0 01 166.5	41 25.2 1.0 01 166.4	42 55.2 1.0 01 166.4	44 55.2 1.0 01 166.3	45 25.2 1.0 01 166.3	45 55.1 1.0 01 166.3	47 55.1 1.0 01 166.3	3
4	38 54.4 1.0 01 165.4	39 54.4 1.0 01 165.4	41 24.4 1.0 01 165.4	42 54.4 1.0 01 165.3	44 54.4 1.0 01 165.3	45 24.4 1.0 01 165.3	45 54.4 1.0 01 165.3	47 54.4 1.0 01 165.2	4
15	38 53.6 1.0 01 164.4	39 53.6 1.0 01 164.4	41 23.6 1.0 01 164.3	42 53.6 1.0 01 164.3	44 53.6 1.0 01 164.2	45 23.6 1.0 01 164.2	45 53.6 1.0 01 164.2	47 53.5 1.0 01 164.2	15
6	38 52.8 1.0 02 163.4	39 52.7 1.0 02 163.3	41 22.7 1.0 02 163.3	42 52.7 1.0 02 163.3	44 52.7 1.0 02 163.2	45 22.7 1.0 02 163.2	45 52.7 1.0 02 163.2	47 52.6 1.0 02 163.1	6
7	38 51.8 1.0 02 162.3	39 51.8 1.0 02 162.3	41 21.8 1.0 02 162.2	42 51.8 1.0 02 162.2	44 51.7 1.0 02 162.1	45 21.7 1.0 02 162.1	45 51.7 1.0 02 162.1	47 51.7 1.0 02 162.1	7
8	38 50.8 1.0 02 161.3	39 50.8 1.0 02 161.2	41 20.8 1.0 02 161.2	42 50.8 1.0 02 161.2	44 50.8 1.0 02 161.1	45 20.8 1.0 02 161.1	45 50.7 1.0 02 161.1	47 50.7 1.0 02 161.0	8
9	38 49.8 1.0 02 160.2	39 49.8 1.0 02 160.2	41 19.8 1.0 02 160.2	42 49.7 1.0 02 160.1	44 49.7 1.0 02 160.1	45 19.7 1.0 02 160.0	45 49.7 1.0 02 160.0	47 49.7 1.0 02 159.9	9
20	38 48.7 1.0 02 159.2	39 48.7 1.0 02 159.1	41 18.7 1.0 02 159.1	42 48.7 1.0 02 159.1	44 48.6 1.0 02 159.0	45 18.6 1.0 02 159.0	45 48.6 1.0 02 159.0	47 48.6 1.0 02 158.9	20
1	38 47.6 1.0 02 158.2	39 47.6 1.0 02 158.1	41 17.5 1.0 02 158.1	42 47.5 1.0 02 158.0	44 47.5 1.0 02 158.0	45 17.5 1.0 02 157.9	45 47.4 1.0 02 157.9	47 47.4 1.0 02 157.8	1
2	38 46.4 1.0 02 157.1	39 46.4 1.0 02 157.1	41 16.3 1.0 02 157.0	42 46.3 1.0 02 157.0	44 46.3 1.0 02 156.9	45 16.2 1.0 02 156.9	45 46.2 1.0 02 156.9	47 46.2 1.0 02 156.8	2
3	38 45.1 1.0 02 156.1	39 45.1 1.0 02 156.1	41 15.1 1.0 02 156.0	42 45.0 1.0 02 155.9	44 45.0 1.0 02 155.9	45 15.0 1.0 02 155.8	45 45.0 1.0 02 155.8	47 44.9 1.0 02 155.7	3
4	38 43.8 1.0 02 155.1	39 43.8 1.0 02 155.0	41 13.8 1.0 02 155.0	42 43.7 1.0 02 154.9	44 43.7 1.0 02 154.8	45 13.7 1.0 02 154.8	45 43.7 1.0 02 154.8	47 43.6 1.0 02 154.7	4
25	38 42.5 1.0 02 154.0	39 42.5 1.0 02 153.9	41 12.4 1.0 02 153.9	42 42.4 1.0 02 153.9	44 42.3 1.0 02 153.8	45 12.3 1.0 02 153.8	45 42.3 1.0 02 153.7	47 42.2 1.0 02 153.7	25
6	38 41.1 1.0 02 153.0	39 41.1 1.0 02 152.9	41 11.0 1.0 02 152.9	42 41.0 1.0 02 152.8	44 40.9 1.0 02 152.7	45 10.9 1.0 02 152.7	45 40.9 1.0 02 152.7	47 40.8 1.0 02 152.6	6
7	38 39.6 1.0 02 151.9	39 39.6 1.0 02 151.9	41 09.6 1.0 03 151.8	42 39.5 1.0 03 151.8	44 39.5 1.0 03 151.7	45 09.4 1.0 03 151.7	45 39.4 1.0 03 151.6	47 39.3 1.0 03 151.5	7
8	38 38.1 1.0 03 150.9	39 38.1 1.0 03 150.9	41 08.1 1.0 03 150.8	42 38.0 1.0 03 150.7	44 37.9 1.0 03 150.6	45 07.9 1.0 03 150.6	45 37.9 1.0 03 150.6	47 37.8 1.0 03 150.5	8
9	38 36.5 1.0 03 149.9	39 36.5 1.0 03 149.8	41 06.5 1.0 03 149.8	42 36.4 1.0 03 149.7	44 36.4 1.0 03 149.6	45 06.4 1.0 03 149.6	45 36.3 1.0 03 149.5	47 36.3 1.0 03 149.4	9
30	38 35.0 1.0 03 148.8	39 34.9 1.0 03 148.8	41 04.9 1.0 03 148.7	42 34.8 1.0 03 148.7	44 34.8 1.0 03 148.6	45 04.7 1.0 03 148.5	45 34.7 1.0 03 148.5	47 34.6 1.0 03 148.4	30
1	38 33.3 1.0 03 147.8	39 33.3 1.0 03 147.8	41 03.2 1.0 03 147.7	42 33.2 1.0 03 147.6	44 33.1 1.0 03 147.5	45 03.1 1.0 03 147.5	45 33.1 1.0 03 147.5	47 33.0 1.0 03 147.3	1
2	38 31.6 1.0 03 146.8	39 31.6 1.0 03 146.7	41 01.5 1.0 03 146.7	42 31.5 1.0 03 146.6	44 31.4 1.0 03 146.5	45 01.4 1.0 03 146.4	45 31.3 1.0 03 146.4	47 31.2 1.0 03 146.3	2
3	38 29.9 1.0 03 145.7	39 29.8 1.0 03 145.7	40 59.8 1.0 03 145.6	42 29.7 1.0 03 145.5	44 29.6 1.0 03 145.4	44 59.6 1.0 03 145.4	45 29.6 1.0 03 145.4	47 29.5 1.0 03 145.3	3
4	38 28.1 1.0 03 144.7	39 28.1 1.0 03 144.7	40 58.0 1.0 03 144.6	42 27.7 1.0 03 144.5	44 27.8 1.0 03 144.4	44 57.8 1.0 03 144.4	45 27.8 1.0 03 144.3	47 27.7 1.0 03 144.2	4
35	38 26.3 1.0 03 143.7	39 26.2 1.0 03 143.6	40 56.1 1.0 03 143.5	42 26.1 1.0 03 143.5	44 26.0 1.0 03 143.4	44 55.9 1.0 03 143.3	45 25.9 1.0 03 143.3	47 25.8 1.0 03 143.2	35
6	38 24.4 1.0 03 142.6	39 24.3 1.0 03 142.6	40 54.3 1.0 03 142.5	42 24.2 1.0 03 142.4	44 24.1 1.0 03 142.3	44 54.0 1.0 03 142.3	45 24.0 1.0 03 142.2	47 23.9 1.0 03 142.1	6
7	38 22.5 1.0 03 141.6	39 22.4 1.0 03 141.6	40 52.3 1.0 03 141.5	42 22.2 1.0 03 141.4	44 22.1 1.0 03 141.3	44 52.1 1.0 03 141.2	45 22.1 1.0 03 141.2	47 21.9 1.0 03 141.1	7
8	38 20.5 1.0 03 140.6	39 20.4 1.0 03 140.5	40 50.3 1.0 03 140.4	42 20.3 1.0 03 140.4	44 20.1 1.0 03 140.2	44 50.1 1.0 03 140.2	45 20.1 1.0 03 140.2	47 20.0 1.0 03 140.0	8
9	38 18.5 1.0 03 139.5	39 18.4 1.0 03 139.5	40 48.3 1.0 03 139.4	42 18.2 1.0 03 139.3	44 18.1 1.0 03 139.2	44 48.1 1.0 03 139.2	45 18.1 1.0 03 139.1	47 17.9 1.0 03 139.0	9
40	38 16.4 1.0 04 138.5	39 16.3 1.0 04 138.5	40 46.3 1.0 04 138.4	42 16.2 1.0 04 138.3	44 16.0 1.0 04 138.2	44 46.0 1.0 04 138.1	45 16.0 1.0 04 138.1	47 15.8 1.0 04 138.0	40
1	38 14.3 1.0 04 137.5	39 14.2 1.0 04 137.4	40 44.2 1.0 04 137.3	42 14.1 1.0 04 137.3	44 13.9 1.0 04 137.1	44 43.9 1.0 04 137.1	45 13.9 1.0 04 137.1	47 13.7 1.0 04 136.9	1
2	38 12.2 1.0 04 136.5	39 12.1 1.0 04 136.4	40 42.0 1.0 04 136.3	42 11.9 1.0 04 136.2	44 11.8 1.0 04 136.1	44 41.7 1.0 04 136.1	45 11.7 1.0 04 136.0	47 11.5 1.0 04 135.9	2
3	38 10.0 1.0 04 135.4	39 09.9 1.0 04 135.4	40 39.8 1.0 04 135.3	42 09.7 1.0 04 135.2	44 09.6 1.0 04 135.1	44 39.5 1.0 04 135.0	45 09.5 1.0 04 135.0	47 09.3 1.0 04 134.8	3
4	38 07.8 1.0 04 134.4	39 07.7 1.0 04 134.3	40 37.6 1.0 04 134.3	42 07.5 1.0 04 134.2	44 07.3 1.0 04 134.0	44 37.3 1.0 04 134.0	45 07.3 1.0 04 133.9	47 07.1 1.0 04 133.8	4
45	38 05.5 1.0 04 133.4	39 05.4 1.0 04 133.3	40 35.3 1.0 04 133.2	42 05.2 1.0 04 133.1	44 05.1 1.0 04 133.0	44 35.0 1.0 04 132.9	45 05.0 1.0 04 132.9	47 04.8 1.0 04 132.8	45
6	38 03.2 1.0 04 132.3	39 03.1 1.0 04 132.3	40 33.0 1.0 04 132.2	42 02.9 1.0 04 132.1	44 02.7 1.0 04 132.0	44 32.7 1.c 04 131.9	45 02.7 1.0 04 131.9	47 02.5 1.0 04 131.7	6
7	38 00.8 1.0 04 131.3	39 00.8 1.0 04 131.3	40 30.7 1.0 04 131.2	42 00.5 1.0 04 131.1	44 00.4 1.0 04 130.9	44 30.3 1.0 04 130.9	45 00.3 1.0 04 130.8	47 00.1 1.0 04 130.7	7
8	37 58.5 1.0 04 130.3	38 58.4 1.0 04 130.2	40 28.3 1.0 04 130.1	41 58.2 1.0 04 130.0	43 58.0 1.0 04 129.9	44 27.7 1.0 04 129.8	44 57.9 1.0 04 129.8	46 57.7 1.0 04 129.6	8
9	37 56.1 1.0 04 129.3	38 56.0 1.0 04 129.2	40 25.9 1.0 04 129.1	41 55.7 1.0 04 129.0	43 55.6 1.0 04 128.9	44 25.5 1.0 04 128.8	44 55.5 1.0 04 128.8	46 55.3 1.0 04 128.6	9
50	37 53.6 1.0 04 128.2	38 53.5 1.0 04 128.2	40 23.4 1.0 04 128.1	41 53.3 1.0 04 128.0	43 53.1 1.0 04 127.8	44 23.1 1.0 04 127.8	44 53.0 1.0 04 127.7	46 52.8 1.0 04 127.6	50
1	37 51.1 1.0 04 127.2	38 51.0 1.0 04 127.2	40 20.9 1.0 04 127.1	41 50.8 1.0 04 126.9	43 50.6 1.0 04 126.8	44 20.6 1.0 04 126.8	44 50.5 1.0 04 126.7	46 50.3 1.0 04 126.6	1
2	37 48.6 1.0 04 126.2	38 48.5 1.0 04 126.1	40 18.4 1.0 04 126.0	41 48.3 1.0 04 125.9	43 48.1 1.0 04 125.8	44 18.0 1.0 04 125.7	44 48.0 1.0 04 125.7	46 47.8 1.0 04 125.5	2
3	37 46.1 1.0 04 125.2	38 46.0 1.0 04 125.1	40 15.8 1.0 04 125.0	41 45.7 1.0 04 124.9	43 45.5 1.0 04 124.7	44 15.5 1.0 04 124.7	44 45.4 1.0 04 124.6	46 45.2 1.0 04 124.5	3
4	37 43.5 1.0 04 124.2	38 43.4 1.0 04 124.1	40 13.3 1.0 04 124.0	41 43.1 1.0 04 123.9	43 42.9 1.0 04 123.7	44 12.9 1.0 04 123.7	44 42.8 1.0 04 123.6	46 42.6 1.0 04 123.5	4
55	37 40.9 1.0 04 123.1	38 40.8 1.0 04 123.1	40 10.6 1.0 04 123.0	41 40.5 1.0 04 122.8	43 40.3 1.0 04 122.7	44 10.2 1.0 04 122.6	44 40.2 1.0 04 122.6	46 40.0 1.0 04 122.4	55
6	37 38.2 1.0 04 122.1	38 38.1 1.0 04 122.0	40 08.0 1.0 04 121.9	41 37.8 1.0 04 121.8	43 37.6 1.0 04 121.7	44 07.6 1.0 04 121.6	44 37.5 1.0 04 121.6	46 37.3 1.0 04 121.4	6
7	37 35.5 1.0 05 121.1	38 35.5 1.0 04 121.0	40 05.3 1.0 04 120.8	41 35.2 1.0 04 120.8	43 34.9 1.0 04 120.6	44 04.9 1.0 05 120.6	44 34.8 1.0 05 120.6	46 34.6 1.0 05 120.4	7
8	37 32.8 1.0 05 120.1	38 32.7 1.0 05 120.0	40 02.6 1.0 05 119.9	41 32.4 1.0 05 119.8	43 32.2 1.0 05 119.6	44 02.2 1.0 05 119.6	44 32.1 1.0 05 119.5	46 31.9 1.0 05 119.3	8
9	37 30.1 1.0 05 119.1	38 30.0 1.0 05 119.0	39 59.9 1.0 05 118.9	41 29.7 1.0 05 118.8	43 29.5 1.0 05 118.6	43 59.4 1.0 05 118.6	44 29.4 1.0 05 118.5	46 29.1 1.0 05 118.3	9
60	37 27.4 1.0 05 118.0	38 27.3 1.0 05 118.0	39 57.1 1.0 05 117.9	41 26.9 1.0 05 117.7	43 26.7 1.0 05 117.6	43 56.7 1.0 05 117.5	44 26.6 1.0 05 117.5	46 26.3 1.0 05 117.3	60
1	37 24.6 1.0 05 117.0	38 24.5 1.0 05 117.0	39 54.3 1.0 05 116.8	41 24.1 1.0 05 116.7	43 23.9 1.0 05 116.6	43 53.9 1.0 05 116.5	44 23.8 1.0 05 116.5	46 23.5 1.0 05 116.3	1
2	37 21.8 1.0 05 116.0	38 21.7 1.0 05 115.9	39 51.5 1.0 05 115.8	41 21.3 1.0 05 115.7	43 21.1 1.0 05 115.5	43 51.0 1.0 05 115.5	44 21.0 1.0 05 115.4	46 20.7 1.0 05 115.2	2
3	37 18.9 1.0 05 115.0	38 18.8 1.0 05 114.9	39 48.7 1.0 05 114.8	41 18.5 1.0 05 114.7	43 18.2 1.0 05 114.5	43 48.2 1.0 05 114.5	44 18.1 1.0 05 114.4	46 17.9 1.0 05 114.2	3
4	37 16.1 1.0 05 114.0	38 16.0 1.0 05 113.9	39 45.8 1.0 05 113.8	41 15.6 1.0 05 113.7	43 15.4 1.0 05 113.5	43 45.3 1.0 05 113.4	44 15.3 1.0 05 113.4	46 15.0 1.0 05 113.2	4
65	37 13.2 1.0 05 113.0	38 13.1 1.0 05 112.9	39 42.9 1.0 05 112.8	41 12.7 1.0 05 112.6	43 12.5 1.0 05 112.5	43 42.4 1.0 05 112.4	44 12.4 1.0 05 112.4	46 12.1 1.0 05 112.2	65
6	37 10.3 1.0 05 111.9	38 10.2 1.0 05 111.8	39 40.0 1.0 05 111.8	41 09.8 1.0 05 111.6	43 09.6 1.0 05 111.5	43 39.5 1.0 05 111.4	44 09.4 1.0 05 111.4	46 09.2 1.0 05 111.2	6
7	37 07.4 1.0 05 110.9	38 07.2 1.0 05 110.8	39 37.1 1.0 05 110.7	41 06.9 1.0 05 110.6	43 06.6 1.0 05 110.4	43 36.6 1.0 05 110.4	44 06.5 1.0 05 110.3	46 06.2 1.0 05 110.2	7
8	37 04.4 1.0 05 109.9	38 04.3 1.0 05 109.8	39 34.1 1.0 05 109.7	41 03.9 1.0 05 109.6	43 03.7 1.0 05 109.4	43 33.6 1.0 05 109.4	44 03.6 1.0 05 109.3	46 03.3 1.0 05 109.1	8
9	37 01.5 1.0 05 108.9	38 01.3 1.0 05 108.8	39 31.2 1.0 05 108.7	41 01.0 1.0 05 108.6	43 00.7 1.0 05 108.4	43 30.7 1.0 05 108.4	44 00.6 1.0 05 108.3	46 00.3 1.0 05 108.1	9
70	36 58.5 1.0 05 107.9	37 58.4 1.0 05 107.8	39 28.2 1.0 05 107.7	40 58.0 1.0 05 107.6	42 57.7 1.0 05 107.4	43 27.7 1.0 05 107.4	43 57.6 1.0 05 107.3	45 57.3 1.0 05 107.1	70
1	36 55.5 1.0 05 106.9	37 55.4 1.0 05 106.8	39 25.2 1.0 05 106.7	40 55.0 1.0 05 106.6	42 54.7 1.0 05 106.4	43 24.7 1.0 05 106.3	43 54.6 1.0 05 106.3	45 54.3 1.0 05 106.1	1
2	36 52.5 1.0 05 105.9	37 52.3 1.0 05 105.8	39 22.2 1.0 05 105.7	40 52.0 1.0 05 105.6	42 51.7 1.0 05 105.3	43 21.6 1.0 05 105.3	43 51.6 1.0 05 105.3	45 51.3 1.0 05 105.1	2
3	36 49.4 1.0 05 104.9	37 49.3 1.0 05 104.8	39 19.1 1.0 05 104.7	40 48.9 1.0 05 104.5	42 48.7 1.0 05 104.4	43 18.6 1.0 05 104.3	43 48.5 1.0 05 104.3	45 48.2 1.0 05 104.1	3
4	36 46.4 1.0 05 103.9	37 46.3 1.0 05 103.8	39 16.1 1.0 05 103.7	40 45.9 1.0 05 103.5	42 45.6 1.0 05 103.4	43 15.6 1.0 05 103.3	43 45.5 1.0 05 103.3	45 45.2 1.0 05 103.1	4
75	36 43.3 1.0 05 102.9	37 43.2 1.0 05 102.8	39 13.0 1.0 05 102.7	40 42.8 1.0 05 102.5	42 42.6 1.0 05 102.3	43 12.5 1.0 05 102.3	43 42.4 1.0 05 102.2	45 42.1 1.0 05 102.0	75
6	36 40.3 1.0 05 101.8	37 40.2 1.0 05 101.8	39 10.0 1.0 05 101.6	40 39.8 1.0 05 101.5	42 39.5 1.0 05 101.3	43 09.4 1.0 05 101.2	43 39.3 1.0 05 101.2	45 39.0 1.0 05 101.0	6
7	36 37.2 1.0 05 100.8	37 37.1 1.0 05 100.8	39 06.9 1.0 05 100.6	40 36.7 1.0 05 100.5	42 36.4 1.0 05 100.3	43 06.3 1.0 05 100.3	43 36.3 1.0 05 100.2	45 36.0 1.0 05 100.0	7
8	36 34.1 1.0 05 99.8	37 34.0 1.0 05 99.8	39 03.8 1.0 05 99.6	40 33.6 1.0 05 99.5	42 33.3 1.0 05 99.3	43 03.2 1.0 05 99.3	43 33.2 1.0 05 99.2	45 32.9 1.0 05 99.0	8
9	36 31.0 1.0 05 98.8	37 30.9 1.0 05 98.8	39 00.7 1.0 05 98.6	40 30.5 1.0 05 98.5	42 30.2 1.0 05 98.3	43 00.1 1.0 05 98.3	43 30.1 1.0 05 98.2	45 29.7 1.0 05 98.0	9
80	36 27.9 1.0 05 97.8	37 27.8 1.0 05 97.7	38 57.6 1.0 05 97.6	40 27.4 1.0 05 97.5	42 27.1 1.0 05 97.3	42 57.0 1.0 05 97.3	43 26.9 1.0 05 97.2	45 26.6 1.0 05 97.0	80
1	36 24.8 1.0 05 96.8	37 24.7 1.0 05 96.8	38 54.5 1.0 05 96.6	40 24.3 1.0 05 96.5	42 24.0 1.0 05 96.3	42 53.9 1.0 05 96.3	43 23.8 1.0 05 96.2	45 23.5 1.0 05 96.0	1
2	36 21.7 1.0 05 95.8	37 21.5 1.0 05 95.7	38 51.3 1.0 05 95.6	40 21.1 1.0 05 95.5	42 20.9 1.0 05 95.3	42 50.8 1.0 05 95.3	43 20.7 1.0 05 95.2	45 20.4 1.0 05 95.0	2
3	36 18.5 1.0 05 94.8	37 18.4 1.0 05 94.7	38 48.2 1.0 05 94.6	40 18.0 1.0 05 94.5	42 17.7 1.0 05 94.3	42 47.7 1.0 05 94.2	43 17.6 1.0 05 94.2	45 17.3 1.0 05 94.0	3
4	36 15.4 1.0 05 93.8	37 15.3 1.0 05 93.7	38 45.1 1.0 05 93.6	40 14.9 1.0 05 93.5	42 14.6 1.0 05 93.3	42 44.5 1.0 05 93.2	43 14.4 1.0 05 93.2	45 14.1 1.0 05 93.0	4
85	36 12.3 1.0 05 92.8	37 12.1 1.0 05 92.7	38 41.9 1.0 05 92.6	40 11.7 1.0 05 92.5	42 11.5 1.0 05 92.3	42 41.4 1.0 05 92.2	43 11.3 1.0 05 92.2	45 11.0 1.0 05 92.0	85
6	36 09.1 1.0 05 91.8	37 09.0 1.0 05 91.7	38 38.8 1.0 05 91.6	40 08.6 1.0 05 91.5	42 08.3 1.0 05 91.3	42 38.2 1.0 05 91.2	43 08.2 1.0 05 91.2	45 07.8 1.0 05 91.0	6
7	36 06.0 1.0 05 90.8	37 05.9 1.0 05 90.7	38 35.7 1.0 05 90.6	40 05.5 1.0 05 90.5	42 05.2 1.0 05 90.3	42 35.1 1.0 05 90.2	43 05.0 1.0 05 90.2	45 04.7 1.0 05 90.0	7
8	36 02.9 1.0 05 89.8	37 02.7 1.0 05 89.7	38 32.5 1.0 05 89.6	40 02.3 1.0 05 89.5	42 02.0 1.0 05 89.3	42 32.0 1.0 05 89.2	43 01.9 1.0 05 89.2	45 01.6 1.0 05 89.0	8
9	35 59.7 1.0 05 88.8	36 59.6 1.0 05 88.7	38 29.4 1.0 05 88.6	39 59.2 1.0 05 88.5	41 58.9 1.0 05 88.3	42 28.8 1.0 05 88.3	42 58.7 1.0 05 88.2	44 58.4 1.0 05 88.0	9
90	35 56.6 1.0 05 87.8	36 56.5 1.0 05 87.7	38 26.3 1.0 05 87.6	39 56.0 1.0 05 87.5	41 55.8 1.0 05 87.3	42 25.7 1.0 05 87.3	42 55.6 1.0 05 87.2	44 55.3 1.0 05 87.0	90

Lat. 87°

H.A.	36° 00' Alt.	Δd Δt	Az.	37° 00' Alt.	Δd Δt	Az.	38° 30' Alt.	Δd Δt	Az.	40° 00' Alt.	Δd Δt	Az.	42° 00' Alt.	Δd Δt	Az.	42° 30' Alt.	Δd Δt	Az.	43° 00' Alt.	Δd Δt	Az.	45° 00' Alt.	Δd Δt	Az.	H.A.
91	35 53.4	1.005	86.8	36 53.3	1.005	86.7	38 23.1	1.005	86.6	39 52.9	1.005	86.5	41 52.6	1.005	86.3	42 22.6	1.005	86.3	42 52.5	1.005	86.2	44 52.2	1.005	86.0	91
2	35 50.3	1.005	85.8	36 50.2	1.005	85.7	38 20.0	1.005	85.6	39 49.8	1.005	85.5	41 49.5	1.005	85.3	42 19.4	1.005	85.3	42 49.3	1.005	85.2	44 49.0	1.005	85.0	2
3	35 47.2	1.005	84.8	36 47.1	1.005	84.8	38 16.9	1.005	84.6	39 46.7	1.005	84.5	41 46.4	1.005	84.3	42 16.3	1.005	84.3	42 46.3	1.005	84.2	44 45.9	1.005	84.0	3
4	35 44.1	1.005	83.8	36 43.9	1.005	83.8	38 13.7	1.005	83.6	39 43.5	1.005	83.5	41 43.2	1.005	83.3	42 13.2	1.005	83.3	42 43.1	1.005	83.2	44 42.8	1.005	83.0	4
95	35 40.9	1.005	82.8	36 40.8	1.005	82.8	38 10.6	1.005	82.6	39 40.4	1.005	82.5	41 40.1	1.005	82.3	42 10.1	1.005	82.3	42 40.0	1.005	82.2	44 39.7	1.005	82.0	95
6	35 37.8	1.005	81.9	36 37.7	1.005	81.8	38 07.5	1.005	81.6	39 37.3	1.005	81.5	41 37.0	1.005	81.3	42 06.9	1.005	81.3	42 36.9	1.005	81.2	44 36.6	1.005	81.0	6
7	35 34.7	1.005	80.9	36 34.6	1.005	80.8	38 04.4	1.005	80.7	39 34.2	1.005	80.5	41 33.9	1.005	80.3	42 03.8	1.005	80.3	42 33.8	1.005	80.3	44 33.5	1.005	80.1	7
8	35 31.6	1.005	79.9	36 31.5	1.005	79.8	38 01.3	1.005	79.7	39 31.1	1.005	79.5	41 30.8	1.005	79.4	42 00.8	1.005	79.3	42 30.7	1.005	79.3	44 30.4	1.005	79.1	8
9	35 28.5	1.005	78.9	36 28.4	1.005	78.8	37 58.2	1.005	78.7	39 28.0	1.005	78.5	41 27.7	1.005	78.4	41 57.7	1.005	78.3	42 27.6	1.005	78.3	44 27.3	1.005	78.1	9
100	35 25.5	1.005	77.9	36 25.4	1.005	77.8	37 55.1	1.005	77.7	39 25.0	1.005	77.6	41 24.7	1.005	77.4	41 54.6	1.005	77.3	42 24.5	1.005	77.3	44 24.2	1.005	77.1	100
1	35 22.4	1.005	76.9	36 22.3	1.005	76.8	37 52.1	1.005	76.7	39 21.9	1.005	76.6	41 21.6	1.005	76.4	41 51.5	1.005	76.3	42 21.5	1.005	76.3	44 21.2	1.005	76.1	1
2	35 19.3	1.005	75.9	36 19.2	1.005	75.8	37 49.0	1.005	75.7	39 18.8	1.005	75.6	41 18.6	1.005	75.4	41 48.5	1.005	75.4	42 18.4	1.005	75.3	44 18.1	1.005	75.1	2
3	35 16.3	1.005	74.9	36 16.2	1.005	74.8	37 46.0	1.005	74.7	39 15.8	1.005	74.6	41 15.5	1.005	74.4	41 45.5	1.005	74.4	42 15.4	1.005	74.3	44 15.1	1.005	74.1	3
4	35 13.3	1.005	73.9	36 13.2	1.005	73.8	37 43.0	1.005	73.7	39 12.8	1.005	73.6	41 12.5	1.005	73.4	41 42.5	1.005	73.4	42 12.4	1.005	73.3	44 12.1	1.005	73.1	4
105	35 10.3	1.005	72.9	36 10.2	1.005	72.9	37 40.0	1.005	72.7	39 09.8	1.005	72.6	41 09.5	1.005	72.4	41 39.5	1.005	72.4	42 09.4	1.005	72.4	44 09.1	1.005	72.2	105
6	35 07.3	1.005	71.9	36 07.2	1.005	71.9	37 37.0	1.005	71.8	39 06.8	1.005	71.6	41 06.5	1.005	71.5	41 36.5	1.005	71.4	42 06.4	1.005	71.4	44 06.1	1.005	71.2	6
7	35 04.3	1.005	71.0	36 04.2	1.005	70.9	37 34.0	1.005	70.8	39 03.8	1.005	70.6	41 03.6	1.005	70.5	41 33.5	1.005	70.4	42 03.4	1.005	70.4	44 03.2	1.005	70.2	7
8	35 01.3	1.005	70.0	36 01.2	1.005	69.9	37 31.1	1.005	69.8	39 00.9	1.005	69.7	41 00.6	1.005	69.5	41 30.6	1.005	69.4	42 00.5	1.005	69.4	44 00.2	1.005	69.2	8
9	34 58.4	1.005	69.0	35 58.3	1.005	68.9	37 28.1	1.005	68.8	38 57.9	1.005	68.7	40 57.7	1.005	68.5	41 27.6	1.005	68.5	41 57.6	1.005	68.4	43 57.3	1.005	68.2	9
110	34 55.5	1.005	68.0	35 55.4	1.005	67.9	37 25.2	1.005	67.8	38 55.0	1.005	67.7	40 54.8	1.005	67.5	41 24.7	1.005	67.5	41 54.6	1.005	67.4	43 54.4	1.005	67.3	110
1	34 52.6	1.005	67.0	35 52.5	1.005	66.9	37 22.3	1.005	66.8	38 52.1	1.005	66.7	40 51.9	1.005	66.5	41 21.8	1.005	66.5	41 51.8	1.005	66.5	43 51.5	1.005	66.3	1
2	34 49.7	1.005	66.0	35 49.6	1.005	66.0	37 19.4	1.005	65.8	38 49.3	1.005	65.7	40 49.0	1.005	65.6	41 19.0	1.005	65.5	41 48.9	1.005	65.5	43 48.6	1.005	65.3	2
3	34 46.8	1.005	65.1	35 46.7	1.005	65.0	37 16.6	1.005	64.9	38 46.4	1.005	64.8	40 46.2	1.005	64.6	41 16.1	1.005	64.5	41 46.0	1.005	64.5	43 45.8	1.005	64.3	3
4	34 44.0	1.005	64.1	35 43.9	1.005	64.0	37 13.7	1.005	63.9	38 43.6	1.005	63.8	40 43.3	1.005	63.6	41 13.3	1.005	63.6	41 43.2	1.005	63.5	43 43.0	1.005	63.3	4
115	34 41.2	1.005	63.1	35 41.1	1.005	63.0	37 10.9	1.005	62.9	38 40.8	1.005	62.8	40 40.5	1.005	62.6	41 10.5	1.005	62.6	41 40.4	1.005	62.5	43 40.2	1.005	62.4	115
6	34 38.4	1.005	62.1	35 38.3	1.005	62.0	37 08.1	1.005	61.9	38 38.0	1.005	61.8	40 37.8	1.005	61.7	41 07.7	1.005	61.6	41 37.6	1.005	61.6	43 37.4	1.005	61.4	6
7	34 35.6	1.005	61.1	35 35.5	1.005	61.1	37 05.4	1.005	60.9	38 35.2	1.005	60.8	40 35.0	1.005	60.7	41 05.0	1.005	60.6	41 34.9	1.005	60.6	43 34.7	1.005	60.4	7
8	34 32.9	1.004	60.1	35 32.8	1.004	60.1	37 02.7	1.005	60.0	38 32.5	1.005	59.9	40 32.3	1.005	59.7	41 02.2	1.005	59.7	41 32.1	1.005	59.6	43 31.9	1.005	59.4	8
9	34 30.2	1.004	59.2	35 30.1	1.004	59.1	37 00.0	1.004	59.0	38 29.8	1.004	58.9	40 29.6	1.004	58.7	40 59.5	1.004	58.7	41 29.5	1.004	58.6	43 29.2	1.004	58.5	9
120	34 27.5	1.004	58.2	35 27.4	1.004	58.1	36 57.3	1.004	58.0	38 27.1	1.004	57.9	40 26.9	1.004	57.7	40 56.9	1.004	57.7	41 26.8	1.004	57.7	43 26.6	1.004	57.5	120
1	34 24.9	1.004	57.2	35 24.8	1.004	57.1	36 54.6	1.004	57.0	38 24.5	1.004	56.9	40 24.3	1.004	56.8	40 54.2	1.004	56.7	41 24.2	1.004	56.7	43 24.0	1.004	56.5	1
2	34 22.2	1.004	56.2	35 22.1	1.004	56.2	36 52.0	1.004	56.1	38 21.9	1.004	55.9	40 21.7	1.004	55.8	40 51.6	1.004	55.8	41 21.6	1.004	55.7	43 21.3	1.004	55.6	2
3	34 19.6	1.004	55.2	35 19.6	1.004	55.2	36 49.4	1.004	55.1	38 19.3	1.004	55.0	40 19.1	1.004	54.8	40 49.0	1.004	54.8	41 19.0	1.004	54.8	43 18.8	1.004	54.6	3
4	34 17.1	1.004	54.3	35 17.0	1.004	54.2	36 46.9	1.004	54.1	38 16.7	1.004	54.0	40 16.5	1.004	53.9	40 46.5	1.004	53.8	41 16.4	1.004	53.8	43 16.2	1.004	53.6	4
125	34 14.5	1.004	53.3	35 14.5	1.004	53.2	36 44.3	1.004	53.1	38 14.2	1.004	53.0	40 14.0	1.004	52.9	40 44.0	1.004	52.8	41 13.9	1.004	52.8	43 13.7	1.004	52.7	125
6	34 12.0	1.004	52.3	35 12.0	1.004	52.3	36 41.8	1.004	52.2	38 11.7	1.004	52.1	40 11.5	1.004	51.9	40 41.5	1.004	51.9	41 11.4	1.004	51.8	43 11.2	1.004	51.7	6
7	34 09.6	1.004	51.3	35 09.5	1.004	51.3	36 39.4	1.004	51.2	38 09.2	1.004	51.1	40 09.1	1.004	50.9	40 39.0	1.004	50.9	41 09.0	1.004	50.9	43 08.8	1.004	50.7	7
8	34 07.1	1.004	50.4	35 07.1	1.004	50.3	36 36.9	1.004	50.2	38 06.8	1.004	50.1	40 06.7	1.004	50.0	40 36.6	1.004	49.9	41 06.6	1.004	49.9	43 06.4	1.004	49.7	8
9	34 04.7	1.004	49.4	35 04.7	1.004	49.3	36 34.5	1.004	49.2	38 04.4	1.004	49.1	40 04.3	1.004	49.0	40 34.2	1.004	49.0	41 04.2	1.004	48.9	43 04.0	1.004	48.8	9
130	34 02.4	1.004	48.4	35 02.3	1.004	48.3	36 32.2	1.004	48.3	38 02.1	1.004	48.2	40 01.9	1.004	48.0	40 31.9	1.004	48.0	41 01.8	1.004	48.0	43 01.7	1.004	47.8	130
1	34 00.0	1.004	47.4	35 00.0	1.004	47.4	36 29.9	1.004	47.3	37 59.8	1.004	47.2	39 59.6	1.004	47.1	40 29.6	1.004	47.0	40 59.5	1.004	47.0	42 59.3	1.004	46.8	1
2	33 57.7	1.004	46.5	34 57.7	1.004	46.4	36 27.6	1.004	46.3	37 57.5	1.004	46.2	39 57.3	1.004	46.1	40 27.3	1.004	46.1	40 57.2	1.004	46.0	42 57.1	1.004	45.9	2
3	33 55.5	1.004	45.5	34 55.4	1.004	45.4	36 25.3	1.004	45.3	37 55.2	1.004	45.3	39 55.1	1.004	45.1	40 25.0	1.004	45.1	40 55.0	1.004	45.1	42 54.8	1.004	44.9	3
4	33 53.3	1.004	44.5	34 53.2	1.004	44.5	36 23.1	1.004	44.4	37 53.0	1.004	44.3	39 52.9	1.004	44.2	40 22.8	1.004	44.1	40 52.8	1.004	44.1	42 52.6	1.004	44.0	4
135	33 51.1	1.004	43.5	34 51.0	1.004	43.5	36 20.9	1.004	43.4	37 50.8	1.004	43.3	39 50.7	1.004	43.2	40 20.7	1.004	43.2	40 50.6	1.004	43.1	42 50.5	1.004	43.0	135
6	33 48.9	1.004	42.6	34 48.9	1.004	42.5	36 18.8	1.004	42.4	37 48.7	1.004	42.3	39 48.6	1.003	42.2	40 18.5	1.003	42.2	40 48.5	1.003	42.2	42 48.4	1.003	42.0	6
7	33 46.8	1.003	41.6	34 46.8	1.003	41.5	36 16.7	1.003	41.5	37 46.6	1.003	41.4	39 46.5	1.003	41.3	40 16.4	1.003	41.2	40 46.4	1.003	41.2	42 46.3	1.003	41.1	7
8	33 44.8	1.003	40.6	34 44.7	1.003	40.6	36 14.6	1.003	40.5	37 44.5	1.003	40.4	39 44.4	1.003	40.3	40 14.4	1.003	40.3	40 44.4	1.003	40.2	42 44.2	1.003	40.1	8
9	33 42.7	1.003	39.6	34 42.7	1.003	39.6	36 12.6	1.003	39.5	37 42.5	1.003	39.4	39 42.4	1.003	39.3	40 12.4	1.003	39.3	40 42.4	1.003	39.3	42 42.2	1.003	39.1	9
140	33 40.8	1.003	38.7	34 40.7	1.003	38.6	36 10.6	1.003	38.6	37 40.6	1.003	38.5	39 40.4	1.003	38.4	40 10.4	1.003	38.3	40 40.4	1.003	38.3	42 40.3	1.003	38.2	140
1	33 38.8	1.003	37.7	34 38.8	1.003	37.7	36 08.7	1.003	37.6	37 38.6	1.003	37.5	39 38.5	1.003	37.4	40 08.5	1.003	37.4	40 38.5	1.003	37.3	42 38.3	1.003	37.2	1
2	33 36.9	1.003	36.7	34 36.9	1.003	36.7	36 06.8	1.003	36.6	37 36.7	1.003	36.5	39 36.6	1.003	36.4	40 06.6	1.003	36.4	40 36.6	1.003	36.4	42 36.5	1.003	36.3	2
3	33 35.1	1.003	35.8	34 35.0	1.003	35.7	36 05.0	1.003	35.6	37 34.9	1.003	35.6	39 34.8	1.003	35.5	40 04.8	1.003	35.4	40 34.7	1.003	35.4	42 34.6	1.003	35.3	3
4	33 33.3	1.003	34.8	34 33.2	1.003	34.7	36 03.1	1.003	34.7	37 33.1	1.003	34.6	39 33.0	1.003	34.5	40 03.0	1.003	34.5	40 32.9	1.003	34.5	42 32.8	1.003	34.3	4
145	33 31.5	1.003	33.8	34 31.4	1.003	33.8	36 01.4	1.003	33.7	37 31.3	1.003	33.6	39 31.2	1.003	33.5	40 01.2	1.003	33.5	40 31.2	1.003	33.5	42 31.1	1.003	33.4	145
6	33 29.8	1.003	32.9	34 29.7	1.003	32.8	35 59.7	1.003	32.7	37 29.6	1.003	32.7	39 29.5	1.003	32.6	39 59.5	1.003	32.6	40 29.5	1.003	32.5	42 29.4	1.003	32.4	6
7	33 28.1	1.003	31.9	34 28.0	1.003	31.8	35 58.0	1.003	31.8	37 27.9	1.003	31.7	39 27.8	1.003	31.6	39 57.8	1.003	31.6	40 27.8	1.003	31.6	42 27.7	1.003	31.5	7
8	33 26.4	1.003	30.9	34 26.4	1.003	30.9	35 56.4	1.003	30.8	37 26.3	1.003	30.7	39 26.2	1.003	30.7	39 56.2	1.003	30.6	40 26.2	1.003	30.6	42 26.1	1.003	30.5	8
9	33 24.8	1.003	29.9	34 24.8	1.003	29.9	35 54.8	1.003	29.8	37 24.7	1.003	29.8	39 24.6	1.003	29.7	39 54.6	1.003	29.7	40 24.6	1.003	29.6	42 24.5	1.003	29.6	9
150	33 23.3	1.002	29.0	34 23.3	1.002	28.9	35 53.2	1.002	28.9	37 23.2	1.002	28.8	39 23.1	1.002	28.7	39 53.1	1.002	28.7	40 23.1	1.002	28.7	42 23.0	1.002	28.6	150
1	33 21.8	1.002	28.0	34 21.8	1.002	28.0	35 51.7	1.002	27.9	37 21.7	1.002	27.9	39 21.6	1.002	27.8	39 51.6	1.002	27.8	40 21.6	1.002	27.7	42 21.5	1.002	27.6	1
2	33 20.4	1.002	27.0	34 20.3	1.002	27.0	35 50.2	1.002	26.9	37 20.2	1.002	26.9	39 20.2	1.002	26.8	39 50.2	1.002	26.8	40 20.2	1.002	26.8	42 20.1	1.002	26.7	2
3	33 19.0	1.002	26.1	34 18.9	1.002	26.0	35 48.9	1.002	26.0	37 18.8	1.002	25.9	39 18.8	1.002	25.9	39 48.8	1.002	25.8	40 18.7	1.002	25.8	42 18.7	1.002	25.7	3
4	33 17.6	1.002	25.1	34 17.6	1.002	25.1	35 47.5	1.002	25.0	37 17.5	1.002	25.0	39 17.4	1.002	24.9	39 47.4	1.002	24.9	40 17.4	1.002	24.9	42 17.4	1.002	24.8	4
155	33 16.3	1.002	24.1	34 16.3	1.002	24.1	35 46.2	1.002	24.1	37 16.2	1.002	24.0	39 16.2	1.002	23.9	39 46.1	1.002	23.9	40 16.1	1.002	23.9	42 16.1	1.002	23.8	155
6	33 15.0	1.002	23.2	34 15.0	1.002	23.1	35 45.0	1.002	23.1	37 14.9	1.002	23.0	39 14.9	1.002	23.0	39 44.9	1.002	23.0	40 14.9	1.002	22.9	42 14.8	1.002	22.9	6
7	33 13.8	1.002	22.2	34 13.8	1.002	22.2	35 43.8	1.002	22.1	37 13.7	1.002	22.1	39 13.7	1.002	22.0	39 43.7	1.002	22.0	40 13.7	1.002	22.0	42 13.7	1.002	21.9	7
8	33 12.7	1.002	21.2	34 12.6	1.002	21.2	35 42.6	1.002	21.2	37 12.6	1.002	21.1	39 12.5	1.002	21.1	39 42.5	1.002	21.0	40 12.5	1.002	21.0	42 12.5	1.002	21.0	8
9	33 11.5	1.002	20.3	34 11.5	1.002	20.2	35 41.5	1.002	20.2	37 11.5	1.002	20.2	39 11.4	1.002	20.1	39 41.4	1.002	20.1	40 11.4	1.002	20.1	42 11.4	1.002	20.0	9
160	33 10.5	1.002	19.3	34 10.5	1.002	19.3	35 40.4	1.002	19.2	37 10.4	1.002	19.2	39 10.4	1.002	19.1	39 40.4	1.002	19.1	40 10.4	1.002	19.1	42 10.3	1.002	19.0	160
1	33 09.5	1.002	18.3	34 09.5	1.002	18.3	35 39.4	1.002	18.3	37 09.4	1.002	18.2	39 09.4	1.002	18.2	39 39.4	1.002	18.2	40 09.4	1.002	18.2	42 09.3	1.002	18.1	1
2	33 08.5	1.002	17.4	34 08.5	1.002	17.3	35 38.5	1.002	17.3	37 08.5	1.002	17.3	39 08.4	1.002	17.2	39 38.4	1.002	17.2	40 08.4	1.002	17.2	42 08.4	1.002	17.1	2
3	33 07.6	1.001	16.4	34 07.6	1.001	16.4	35 37.6	1.001	16.3	37 07.5	1.001	16.3	39 07.5	1.001	16.3	39 37.5	1.001	16.3	40 07.5	1.001	16.2	42 07.5	1.001	16.2	3
4	33 06.7	1.001	15.4	34 06.7	1.001	15.4	35 36.7	1.001	15.4	37 06.7	1.001	15.4	39 06.7	1.001	15.3	39 36.7	1.001	15.3	40 06.7	1.001	15.3	42 06.6	1.001	15.2	4
165	33 05.9	1.001	14.5	34 05.9	1.001	14.5	35 35.9	1.001	14.4	37 05.9	1.001	14.4	39 05.9	1.001	14.3	39 35.9	1.001	14.3	40 05.9	1.001	14.3	42 05.8	1.001	14.3	165
6	33 05.2	1.001	13.5	34 05.2	1.001	13.5	35 35.1	1.001	13.5	37 05.1	1.001	13.5	39 05.1	1.001	13.4	39 35.1	1.001	13.4	40 05.1	1.001	13.4	42 05.1	1.001	13.3	6
7	33 04.4	1.001	12.5	34 04.4	1.001	12.5	35 34.4	1.001	12.5	37 04.4	1.001	12.5	39 04.4	1.001	12.4	39 34.4	1.001	12.4	40 04.4	1.001	12.4	42 04.4	1.001	12.4	7
8	33 03.8	1.001	11.6	34 03.8	1.001	11.6	35 33.8	1.001	11.5	37 03.8	1.001	11.5	39 03.8	1.001	11.5	39 33.8	1.001	11.5	40 03.8	1.001	11.5	42 03.7	1.001	11.4	8
9	33 03.2	1.001	10.6	34 03.2	1.001	10.6	35 33.2	1.001	10.6	37 03.2	1.001	10.6	39 03.2	1.001	10.5	39 33.2	1.001	10.5	40 03.2	1.001	10.5	42 03.1	1.001	10.5	9
170	33 02.6	1.001	09.6	34 02.6	1.001	09.6	35 32.6	1.001	09.6	37 02.6	1.001	09.6	39 02.6	1.001	09.6	39 32.6	1.001	09.6	40 02.6	1.001	09.5	42 02.6	1.001	09.5	170
1	33 02.1	1.001	08.7	34 02.1	1.001	08.7	35 32.1	1.001	08.7	37 02.1	1.001	08.6	39 02.1	1.001	08.6	39 32.1	1.001	08.6	40 02.1	1.001	08.6	42 02.1	1.001	08.6	1
2	33 01.7	1.001	07.7	34 01.7	1.001	07.7	35 31.7	1.001	07.7	37 01.7	1.001	07.7	39 01.7	1.001	07.7	39 31.7	1.001	07.6	40 01.7	1.001	07.6	42 01.7	1.001	07.6	2
3	33 01.3	1.001	06.8	34 01.3	1.001	06.7	35 31.3	1.001	06.7	37 01.3	1.001	06.7	39 01.3	1.001	06.7	39 31.3	1.001	06.7	40 01.3	1.001	06.7	42 01.3	1.001	06.7	3
4	33 01.0	1.000	05.8	34 01.0	1.000	05.8	35 30.9	1.000	05.8	37 00.9	1.000	05.8	39 00.9	1.000	05.7	39 30.9	1.000	05.7	40 00.9	1.000	05.7	42 00.9	1.000	05.7	4
175	33 00.7	1.000	04.8	34 00.7	1.000	04.8	35 30.7	1.000	04.8	37 00.7	1.000	04.8	39 00.7	1.000	04.8	39 30.7	1.000	04.8	40 00.7	1.000	04.8	42 00.7	1.000	04.8	175
6	33 00.4	1.000	03.9	34 00.4	1.000	03.9	35 30.4	1.000	03.8	37 00.4	1.000	03.9	39 00.4	1.000	03.9	39 30.4	1.000	03.8	40 00.4	1.000	03.8	42 00.4	1.000	03.8	6
7	33 00.2	1.000	02.9	34 00.2	1.000	02.9	35 30.2	1.000	02.9	37 00.2	1.000	02.9	39 00.2	1.000	02.9	39 30.2	1.000	02.9	40 00.2	1.000	02.9	42 00.2	1.000	02.9	7
8	33 00.1	1.000	01.9	34 00.1	1.000	01.9	35 30.1	1.000	01.9	37 00.1	1.000	01.9	39 00.1	1.000	01.9	39 30.1	1.000	01.9	40 00.1	1.000	01.9	42 00.1	1.000	01.9	8
9	33 00.0	1.000	01.0	34 00.0	1.000	01.0	35 30.0	1.000	01.0	37 00.0	1.000	01.0	39 00.0	1.000	01.0	39 30.0	1.000	01.0	40 00.0	1.000	01.0	42 00.0	1.000	01.0	9
180	33 00.0	1.000	00.0	34 00.0	1.000	00.0	35 30.0	1.000	00.0	37 00.0	1.000	00.0	39 00.0	1.000	00.0	39 30.0	1.000	00.0	40 00.0	1.000	00.0	42 00.0	1.000	00.0	180

Lat. 88°

Lat. 87°

H.A.	46° 00' Alt. — Δd Δt — Az.	47° 00' Alt. — Δd Δt — Az.	48° 30' Alt. — Δd Δt — Az.	49° 30' Alt. — Δd Δt — Az.	50° 30' Alt. — Δd Δt — Az.	51° 30' Alt. — Δd Δt — Az.	52° 30' Alt. — Δd Δt — Az.	54° 00' Alt. — Δd Δt — Az.	H.A.
00	49 00.0 1.000 180.0	50 00.0 1.000 180.0	51 30.0 1.000 180.0	52 30.0 1.000 180.0	53 30.0 1.000 180.0	54 30.0 1.000 180.0	55 30.0 1.000 180.0	57 00.0 1.000 180.0	00
1	49 00.0 1.000 178.9	50 00.0 1.000 178.9	51 30.0 1.000 178.9	52 30.0 1.000 178.9	53 30.0 1.000 178.9	54 30.0 1.000 178.9	55 30.0 1.000 178.9	57 00.0 1.000 178.9	1
2	48 59.9 1.000 177.9	49 59.9 1.000 177.9	51 29.9 1.000 177.9	52 29.9 1.000 177.9	53 29.9 1.000 177.9	54 29.9 1.000 177.9	55 29.9 1.000 177.9	56 59.9 1.000 177.8	2
3	48 59.7 1.000 176.8	49 59.7 1.000 176.8	51 29.7 1.000 176.8	52 29.7 1.000 176.8	53 29.7 1.000 176.8	54 29.7 1.000 176.8	55 29.7 1.000 176.8	56 59.7 1.000 176.8	3
4	48 59.5 1.000 175.8	49 59.5 1.000 175.8	51 29.5 1.000 175.7	52 29.5 1.000 175.7	53 29.5 1.000 175.7	54 29.5 1.000 175.7	55 29.5 1.000 175.7	56 59.5 1.000 175.7	4
05	48 59.3 1.001 174.7	49 59.3 1.001 174.7	51 29.3 1.001 174.7	52 29.3 1.001 174.7	53 29.3 1.001 174.7	54 29.3 1.001 174.6	55 29.3 1.001 174.6	56 59.3 1.001 174.6	05
6	48 59.0 1.001 173.6	49 59.0 1.001 173.6	51 29.0 1.001 173.6	52 28.9 1.001 173.6	53 28.9 1.001 173.6	54 28.9 1.001 173.6	55 28.9 1.001 173.6	56 58.9 1.001 173.5	6
7	48 58.6 1.001 172.6	49 58.6 1.001 172.6	51 28.6 1.001 172.5	52 28.6 1.001 172.5	53 28.6 1.001 172.5	54 28.6 1.001 172.5	55 28.6 1.001 172.5	56 58.6 1.001 172.4	7
8	48 58.1 1.001 171.5	49 58.1 1.001 171.5	51 28.1 1.001 171.5	52 28.1 1.001 171.5	53 28.1 1.001 171.4	54 28.1 1.001 171.4	55 28.1 1.001 171.4	56 58.1 1.001 171.4	8
9	48 57.7 1.001 170.5	49 57.6 1.001 170.5	51 27.6 1.001 170.4	52 27.6 1.001 170.4	53 27.6 1.001 170.4	54 27.6 1.001 170.4	55 27.6 1.001 170.3	56 57.6 1.001 170.3	9
10	48 57.1 1.001 169.4	49 57.1 1.001 169.4	51 27.1 1.001 169.4	52 27.1 1.001 169.3	53 27.1 1.001 169.3	54 27.1 1.001 169.3	55 27.1 1.001 169.3	56 57.1 1.001 169.2	10
1	48 56.5 1.001 168.4	49 56.5 1.001 168.3	51 26.5 1.001 168.3	52 26.5 1.001 168.3	53 26.5 1.001 168.2	54 26.5 1.001 168.2	55 26.4 1.001 168.2	56 56.4 1.001 168.1	1
2	48 55.8 1.001 167.3	49 55.8 1.001 167.3	51 25.8 1.001 167.2	52 25.8 1.001 167.2	53 25.8 1.001 167.2	54 25.8 1.001 167.1	55 25.8 1.001 167.1	56 55.8 1.001 167.1	2
3	48 55.1 1.001 166.2	49 55.1 1.001 166.2	51 25.1 1.001 166.2	52 25.1 1.001 166.1	53 25.1 1.001 166.1	54 25.1 1.001 166.1	55 25.0 1.001 166.0	56 55.0 1.001 166.0	3
4	48 54.3 1.001 165.2	49 54.3 1.001 165.2	51 24.3 1.001 165.1	52 24.3 1.001 165.1	53 24.3 1.001 165.0	54 24.3 1.001 165.0	55 24.2 1.001 165.0	56 54.2 1.001 164.9	4
15	48 53.5 1.001 164.1	49 53.5 1.001 164.1	51 23.5 1.002 164.0	52 23.5 1.002 164.0	53 23.5 1.002 164.0	54 23.4 1.002 163.9	55 23.4 1.002 163.9	56 53.4 1.002 163.8	15
6	48 52.6 1.002 163.1	49 52.6 1.002 163.0	51 22.6 1.002 163.0	52 22.6 1.002 162.9	53 22.6 1.002 162.9	54 22.5 1.002 162.9	55 22.5 1.002 162.8	56 52.5 1.002 162.8	6
7	48 51.7 1.002 162.0	49 51.7 1.002 162.0	51 21.6 1.002 161.9	52 21.6 1.002 161.9	53 21.6 1.002 161.8	54 21.6 1.002 161.8	55 21.6 1.002 161.8	56 51.5 1.002 161.7	7
8	48 50.7 1.002 161.0	49 50.7 1.002 160.9	51 20.6 1.002 160.9	52 20.6 1.002 160.8	53 20.6 1.002 160.8	54 20.6 1.002 160.7	55 20.6 1.002 160.7	56 50.5 1.002 160.6	8
9	48 49.6 1.002 159.9	49 49.6 1.002 159.9	51 19.6 1.002 159.8	52 19.6 1.002 159.8	53 19.5 1.002 159.7	54 19.5 1.002 159.7	55 19.5 1.002 159.6	56 49.4 1.002 159.5	9
20	48 48.5 1.002 158.9	49 48.5 1.002 158.8	51 18.5 1.002 158.7	52 18.5 1.002 158.7	53 18.4 1.002 158.6	54 18.4 1.002 158.6	55 18.4 1.002 158.5	56 48.3 1.002 158.5	20
1	48 47.4 1.002 157.8	49 47.3 1.002 157.8	51 17.3 1.002 157.7	52 17.3 1.002 157.6	53 17.3 1.002 157.6	54 17.2 1.002 157.5	55 17.2 1.002 157.5	56 47.1 1.002 157.4	1
2	48 46.2 1.002 156.7	49 46.1 1.002 156.7	51 16.1 1.002 156.6	52 16.1 1.002 156.6	53 16.0 1.002 156.5	54 16.0 1.002 156.5	55 16.0 1.002 156.4	56 45.9 1.002 156.3	2
3	48 44.9 1.002 155.7	49 44.9 1.002 155.6	51 14.8 1.002 155.6	52 14.8 1.002 155.5	53 14.8 1.002 155.5	54 14.7 1.002 155.4	55 14.7 1.002 155.3	56 44.6 1.002 155.2	3
4	48 43.6 1.002 154.6	49 43.5 1.002 154.6	51 13.5 1.002 154.5	52 13.5 1.002 154.5	53 13.4 1.002 154.4	54 13.4 1.002 154.3	55 13.3 1.002 154.3	56 43.3 1.002 154.2	4
25	48 42.2 1.002 153.6	49 42.2 1.002 153.5	51 12.1 1.002 153.5	52 12.1 1.002 153.4	53 12.0 1.002 153.3	54 12.0 1.002 153.3	55 12.0 1.002 153.2	56 41.9 1.002 153.1	25
6	48 40.8 1.002 152.5	49 40.7 1.002 152.5	51 10.7 1.002 152.4	52 10.6 1.002 152.3	53 10.6 1.002 152.3	54 10.6 1.002 152.2	55 10.5 1.002 152.1	56 40.4 1.002 152.0	6
7	48 39.3 1.003 151.5	49 39.3 1.003 151.4	51 09.2 1.003 151.3	52 09.2 1.003 151.3	53 09.1 1.003 151.2	54 09.1 1.003 151.1	55 09.0 1.003 151.1	56 38.9 1.003 151.0	7
8	48 37.8 1.003 150.4	49 37.7 1.003 150.4	51 07.7 1.003 150.3	52 07.6 1.003 150.2	53 07.6 1.003 150.2	54 07.5 1.003 150.1	55 07.5 1.003 150.0	56 37.4 1.003 149.9	8
9	48 36.2 1.003 149.4	49 36.2 1.003 149.3	51 06.1 1.003 149.2	52 06.0 1.003 149.2	53 06.0 1.003 149.1	54 05.9 1.003 149.0	55 05.9 1.003 148.9	56 35.8 1.003 148.8	9
30	48 34.6 1.003 148.3	49 34.5 1.003 148.3	51 04.5 1.003 148.2	52 04.4 1.003 148.1	53 04.4 1.003 148.0	54 04.3 1.003 148.0	55 04.2 1.003 147.9	56 34.1 1.003 147.8	30
1	48 32.9 1.003 147.3	49 32.9 1.003 147.2	51 02.8 1.003 147.1	52 02.7 1.003 147.1	53 02.7 1.003 147.0	54 02.6 1.003 146.9	55 02.5 1.003 146.8	56 32.4 1.003 146.7	1
2	48 31.2 1.003 146.2	49 31.1 1.003 146.2	51 01.1 1.003 146.1	52 01.0 1.003 146.0	53 00.9 1.003 145.8	54 00.9 1.003 145.8	55 00.8 1.003 145.8	56 30.7 1.003 145.6	2
3	48 29.4 1.003 145.2	49 29.4 1.003 145.1	50 59.3 1.003 145.0	51 59.2 1.003 144.9	52 59.1 1.003 144.9	53 59.1 1.003 144.8	54 59.0 1.003 144.7	56 28.9 1.003 144.6	3
4	48 27.6 1.003 144.1	49 27.5 1.003 144.1	50 57.5 1.003 144.0	51 57.4 1.003 143.9	52 57.3 1.003 143.8	53 57.2 1.003 143.7	54 57.2 1.003 143.6	56 27.0 1.003 143.5	4
35	48 25.7 1.003 143.1	49 25.7 1.003 143.0	50 55.6 1.003 142.9	51 55.5 1.003 142.8	52 55.4 1.003 142.8	53 55.4 1.003 142.7	54 55.3 1.003 142.6	56 25.2 1.003 142.4	35
6	48 23.8 1.003 142.1	49 23.8 1.003 142.0	50 53.7 1.003 141.9	51 53.6 1.003 141.8	52 53.5 1.003 141.7	53 53.4 1.003 141.6	54 53.4 1.003 141.5	56 23.2 1.003 141.4	6
7	48 21.9 1.003 141.0	49 21.8 1.003 140.9	50 51.7 1.003 140.8	51 51.6 1.003 140.7	52 51.5 1.003 140.7	53 51.5 1.003 140.6	54 51.4 1.003 140.5	56 21.2 1.003 140.3	7
8	48 19.9 1.004 140.0	49 19.8 1.003 139.9	50 49.7 1.003 139.8	51 49.6 1.003 139.7	52 49.5 1.003 139.6	53 49.4 1.003 139.5	54 49.4 1.003 139.4	56 19.2 1.003 139.3	8
9	48 17.8 1.004 138.9	49 17.8 1.003 138.8	50 47.6 1.004 138.7	51 47.6 1.004 138.6	52 47.5 1.004 138.6	53 47.4 1.004 138.5	54 47.3 1.004 138.4	56 17.1 1.004 138.2	9
40	48 15.8 1.004 137.9	49 15.7 1.004 137.8	50 45.6 1.004 137.7	51 45.5 1.004 137.6	52 45.4 1.004 137.5	53 45.3 1.004 137.4	54 45.2 1.004 137.3	56 15.0 1.004 137.2	40
1	48 13.6 1.004 136.8	49 13.5 1.004 136.8	50 43.4 1.004 136.6	51 43.3 1.004 136.5	52 43.2 1.004 136.5	53 43.1 1.004 136.4	54 43.0 1.004 136.3	56 12.9 1.004 136.1	1
2	48 11.5 1.004 135.8	49 11.4 1.004 135.7	50 41.2 1.004 135.6	51 41.1 1.004 135.5	52 41.0 1.004 135.4	53 40.9 1.004 135.3	54 40.8 1.004 135.2	56 10.7 1.004 135.0	2
3	48 09.3 1.004 134.8	49 09.2 1.004 134.7	50 39.0 1.004 134.5	51 38.9 1.004 134.5	52 38.8 1.004 134.4	53 38.7 1.004 134.3	54 38.6 1.004 134.2	56 08.4 1.004 134.0	3
4	48 07.0 1.004 133.7	49 06.9 1.004 133.6	50 36.8 1.004 133.5	51 36.7 1.004 133.4	52 36.6 1.004 133.3	53 36.5 1.004 133.2	54 36.3 1.004 133.1	56 06.2 1.004 132.9	4
45	48 04.7 1.004 132.7	49 04.6 1.004 132.6	50 34.4 1.004 132.5	51 34.4 1.004 132.4	52 34.3 1.004 132.3	53 34.1 1.004 132.2	54 34.0 1.004 132.1	56 03.8 1.004 131.9	45
6	48 02.4 1.004 131.6	49 02.3 1.004 131.6	50 32.1 1.004 131.4	51 32.0 1.004 131.3	52 31.9 1.004 131.2	53 31.8 1.004 131.1	54 31.7 1.004 131.0	56 01.5 1.004 130.9	6
7	48 00.0 1.004 130.6	48 59.9 1.004 130.5	50 29.6 1.004 130.4	51 29.6 1.004 130.3	52 29.5 1.004 130.2	53 29.3 1.004 130.1	54 29.3 1.004 130.0	55 59.1 1.004 129.8	7
8	47 57.6 1.004 129.6	48 57.5 1.004 129.5	50 27.4 1.004 129.3	51 27.2 1.004 129.2	52 27.1 1.004 129.1	53 27.0 1.004 129.0	54 26.9 1.004 128.9	55 56.6 1.004 128.7	8
9	47 55.2 1.004 128.5	48 55.1 1.004 128.4	50 24.9 1.004 128.3	51 24.8 1.004 128.2	52 24.7 1.004 128.1	53 24.5 1.004 128.0	54 24.4 1.004 127.9	55 54.2 1.004 127.7	9
50	47 52.7 1.004 127.5	48 52.6 1.004 127.4	50 22.4 1.004 127.3	51 22.3 1.004 127.2	52 22.2 1.004 127.1	53 22.0 1.004 126.9	54 21.9 1.004 126.8	55 51.7 1.004 126.6	50
1	47 50.2 1.004 126.5	48 50.1 1.004 126.4	50 19.9 1.004 126.2	51 19.8 1.004 126.1	52 19.6 1.004 126.0	53 19.5 1.004 125.9	54 19.4 1.004 125.8	55 49.1 1.004 125.6	1
2	47 47.7 1.004 125.4	48 47.5 1.004 125.3	50 17.4 1.004 125.2	51 17.2 1.004 125.1	52 17.1 1.004 125.0	53 17.0 1.004 124.9	54 16.8 1.004 124.7	55 46.6 1.004 124.6	2
3	47 45.1 1.004 124.4	48 45.0 1.004 124.3	50 14.8 1.004 124.2	51 14.6 1.004 124.1	52 14.5 1.004 123.9	53 14.4 1.004 123.8	54 14.2 1.004 123.7	55 44.0 1.004 123.5	3
4	47 42.5 1.004 123.4	48 42.4 1.004 123.3	50 12.2 1.004 123.1	51 12.0 1.004 123.0	52 11.9 1.004 122.9	53 11.7 1.004 122.8	54 11.6 1.004 122.7	55 41.3 1.004 122.5	4
55	47 39.8 1.004 122.3	48 39.7 1.004 122.2	50 09.5 1.004 122.1	51 09.4 1.004 122.0	52 09.2 1.004 121.9	53 09.1 1.004 121.8	54 08.9 1.004 121.6	55 38.7 1.004 121.4	55
6	47 37.2 1.004 121.3	48 37.0 1.004 121.2	50 06.8 1.004 121.1	51 06.7 1.005 121.0	52 06.6 1.005 120.8	53 06.4 1.005 120.7	54 06.2 1.005 120.6	55 36.0 1.005 120.4	6
7	47 34.5 1.005 120.3	48 34.3 1.005 120.2	50 04.1 1.005 120.0	51 04.0 1.005 119.9	52 03.8 1.005 119.8	53 03.7 1.005 119.7	54 03.5 1.005 119.6	55 33.3 1.005 119.4	7
8	47 31.7 1.005 119.3	48 31.6 1.005 119.2	50 01.4 1.005 119.0	51 01.3 1.005 118.9	52 01.1 1.005 118.8	53 00.9 1.005 118.7	54 00.8 1.005 118.5	55 30.5 1.005 118.3	8
9	47 29.0 1.005 118.2	48 28.8 1.005 118.1	49 58.6 1.005 118.0	50 58.5 1.005 117.9	51 58.3 1.005 117.7	52 58.2 1.005 117.6	53 58.0 1.005 117.5	55 27.7 1.005 117.3	9
60	47 26.2 1.005 117.2	48 26.1 1.005 117.1	49 55.9 1.005 116.9	50 55.7 1.005 116.8	51 55.5 1.005 116.7	52 55.4 1.005 116.6	53 55.2 1.005 116.5	55 24.9 1.005 116.3	60
1	47 23.4 1.005 116.2	48 23.3 1.005 116.1	49 53.0 1.005 115.9	50 52.9 1.005 115.8	51 52.7 1.005 115.7	52 52.6 1.005 115.6	53 52.4 1.005 115.4	55 22.1 1.005 115.2	1
2	47 20.6 1.005 115.2	48 20.4 1.005 115.1	49 50.2 1.005 114.9	50 50.0 1.005 114.8	51 49.9 1.005 114.7	52 49.7 1.005 114.5	53 49.5 1.005 114.4	55 19.2 1.005 114.2	2
3	47 17.7 1.005 114.1	48 17.6 1.005 114.0	49 47.3 1.005 113.9	50 47.2 1.005 113.8	51 47.0 1.005 113.6	52 46.8 1.005 113.5	53 46.7 1.005 113.4	55 16.4 1.005 113.2	3
4	47 14.8 1.005 113.1	48 14.7 1.005 113.0	49 44.5 1.005 112.8	50 44.3 1.005 112.7	51 44.1 1.005 112.6	52 44.0 1.005 112.5	53 43.8 1.005 112.4	55 13.5 1.005 112.1	4
65	47 11.9 1.005 112.1	48 11.8 1.005 112.0	49 41.6 1.005 111.8	50 41.4 1.005 111.7	51 41.2 1.005 111.6	52 41.0 1.005 111.5	53 40.9 1.005 111.3	55 10.6 1.005 111.1	65
6	47 09.0 1.005 111.1	48 08.9 1.005 111.0	49 38.6 1.005 110.8	50 38.5 1.005 110.7	51 38.3 1.005 110.6	52 38.1 1.005 110.4	53 37.9 1.005 110.3	55 07.6 1.005 110.1	6
7	47 06.1 1.005 110.1	48 05.9 1.005 109.9	49 35.7 1.005 109.8	50 35.5 1.005 109.7	51 35.3 1.005 109.5	52 35.2 1.005 109.4	53 35.0 1.005 109.3	55 04.7 1.005 109.1	7
8	47 03.1 1.005 109.0	48 03.0 1.005 108.9	49 32.7 1.005 108.8	50 32.6 1.005 108.6	51 32.4 1.005 108.5	52 32.2 1.005 108.4	53 32.0 1.005 108.3	55 01.7 1.005 108.0	8
9	47 00.1 1.005 108.0	48 00.0 1.005 107.9	49 29.7 1.005 107.7	50 29.6 1.005 107.6	51 29.4 1.005 107.5	52 29.2 1.005 107.4	53 29.0 1.005 107.2	54 58.7 1.005 107.0	9
70	46 57.2 1.005 107.0	47 57.0 1.005 106.9	49 26.7 1.005 106.7	50 26.6 1.005 106.6	51 26.4 1.005 106.5	52 26.2 1.005 106.4	53 26.0 1.005 106.2	54 55.7 1.005 106.0	70
1	46 54.1 1.005 106.0	47 54.0 1.005 105.9	49 23.7 1.005 105.7	50 23.5 1.005 105.6	51 23.4 1.005 105.5	52 23.2 1.005 105.3	53 23.0 1.005 105.2	54 52.6 1.005 105.0	1
2	46 51.1 1.005 105.0	47 51.0 1.005 104.9	49 20.7 1.005 104.7	50 20.5 1.005 104.6	51 20.3 1.005 104.5	52 20.1 1.005 104.3	53 19.9 1.005 104.2	54 49.6 1.005 104.0	2
3	46 48.1 1.005 104.0	47 47.9 1.005 103.7	49 17.7 1.005 103.7	50 17.5 1.005 103.6	51 17.3 1.005 103.4	52 17.1 1.005 103.3	53 16.9 1.005 103.2	54 46.6 1.005 103.0	3
4	46 45.0 1.005 103.0	47 44.9 1.005 102.8	49 14.6 1.005 102.7	50 14.4 1.005 102.6	51 14.2 1.005 102.4	52 14.0 1.005 102.3	53 13.8 1.005 102.2	54 43.5 1.005 101.9	4
75	46 42.0 1.005 101.9	47 41.8 1.005 101.8	49 11.5 1.005 101.7	50 11.3 1.005 101.5	51 11.2 1.005 101.4	52 11.0 1.005 101.3	53 10.7 1.005 101.1	54 40.4 1.005 100.9	75
6	46 38.9 1.005 100.9	47 38.7 1.005 100.8	49 08.4 1.005 100.6	50 08.3 1.005 100.5	51 08.1 1.005 100.4	52 07.9 1.005 100.3	53 07.7 1.005 100.1	54 37.3 1.005 99.9	6
7	46 35.8 1.005 99.9	47 35.6 1.005 99.8	49 05.4 1.005 99.6	50 05.2 1.005 99.5	51 05.0 1.005 99.4	52 04.8 1.005 99.3	53 04.6 1.005 99.1	54 34.2 1.005 98.9	7
8	46 32.7 1.005 98.9	47 32.5 1.005 98.8	49 02.3 1.005 98.6	50 02.1 1.005 98.5	51 01.9 1.005 98.4	52 01.7 1.005 98.3	53 01.5 1.005 98.1	54 31.1 1.005 97.9	8
9	46 29.6 1.005 97.9	47 29.4 1.005 97.8	48 59.1 1.005 97.6	49 59.0 1.005 97.5	50 58.8 1.005 97.4	51 58.6 1.005 97.2	52 58.3 1.005 97.1	54 28.0 1.005 96.9	9
80	46 26.5 1.005 96.9	47 26.3 1.005 96.8	48 56.0 1.005 96.6	49 55.8 1.005 96.5	50 55.6 1.005 96.4	51 55.4 1.005 96.2	52 55.2 1.005 96.1	54 24.9 1.005 95.9	80
1	46 23.3 1.005 95.9	47 23.2 1.005 95.8	48 52.9 1.005 95.6	49 52.7 1.005 95.5	50 52.5 1.005 95.4	51 52.3 1.005 95.2	52 52.1 1.005 95.1	54 21.8 1.005 94.9	1
2	46 20.2 1.005 94.9	47 20.1 1.005 94.8	48 49.8 1.005 94.6	49 49.6 1.005 94.5	50 49.4 1.005 94.4	51 49.2 1.005 94.2	52 49.0 1.005 94.1	54 18.6 1.005 93.9	2
3	46 17.1 1.005 93.9	47 17.0 1.005 93.8	48 46.6 1.005 93.6	49 46.5 1.005 93.5	50 46.3 1.005 93.4	51 46.1 1.005 93.2	52 45.8 1.005 93.1	54 15.5 1.005 92.9	3
4	46 14.0 1.005 92.9	47 13.8 1.005 92.8	48 43.5 1.005 92.6	49 43.3 1.005 92.5	50 43.1 1.005 92.4	51 42.9 1.005 92.2	52 42.7 1.005 92.1	54 12.4 1.005 91.9	4
85	46 10.8 1.005 91.9	47 10.6 1.005 91.8	48 40.4 1.005 91.6	49 40.2 1.005 91.5	50 40.0 1.005 91.4	51 39.8 1.005 91.2	52 39.6 1.005 91.1	54 09.2 1.005 90.9	85
6	46 07.7 1.005 90.9	47 07.5 1.005 90.8	48 37.2 1.005 90.6	49 37.0 1.005 90.5	50 36.8 1.005 90.4	51 36.6 1.005 90.2	52 36.4 1.005 90.1	54 06.1 1.005 89.9	6
7	46 04.6 1.005 89.9	47 04.4 1.005 89.8	48 34.1 1.005 89.6	49 33.9 1.005 89.5	50 33.7 1.005 89.4	51 33.5 1.005 89.2	52 33.3 1.005 89.2	54 03.0 1.005 88.9	7
8	46 01.4 1.005 88.9	47 01.2 1.005 88.8	48 31.0 1.005 88.6	49 30.8 1.005 88.5	50 30.6 1.005 88.4	51 30.4 1.005 88.2	52 30.1 1.005 88.1	53 59.8 1.005 87.9	8
9	45 58.3 1.005 87.9	46 58.1 1.005 87.8	48 27.8 1.005 87.6	49 27.6 1.005 87.5	50 27.4 1.005 87.4	51 27.2 1.005 87.2	52 27.0 1.005 87.1	53 56.7 1.005 86.9	9
90	45 55.1 1.005 86.9	46 55.0 1.005 86.8	48 24.7 1.005 86.6	49 24.5 1.005 86.5	50 24.3 1.005 86.4	51 24.1 1.005 86.2	52 23.9 1.005 86.1	53 53.5 1.005 85.9	90

Lat. 87°

H.A.	46° 00' (Alt. / Δd Δt / Az.)	47° 00' (Alt. / Δd Δt / Az.)	48° 30' (Alt. / Δd Δt / Az.)	49° 30' (Alt. / Δd Δt / Az.)	50° 30' (Alt. / Δd Δt / Az.)	51° 30' (Alt. / Δd Δt / Az.)	52° 30' (Alt. / Δd Δt / Az.)	54° 00' (Alt. / Δd Δt / Az.)	H.A.
91	45 52.0 1.005 85.9	46 51.8 1.005 85.8	48 21.5 1.005 85.6	49 21.4 1.005 85.5	50 21.2 1.005 85.4	51 21.0 1.005 85.2	52 20.7 1.005 85.1	53 50.4 1.005 84.9	91
2	45 48.9 1.005 84.9	46 48.7 1.005 84.8	48 18.4 1.005 84.6	49 18.2 1.005 84.5	50 18.0 1.005 84.4	51 17.8 1.005 84.3	52 17.6 1.005 84.1	53 47.3 1.005 83.9	2
3	45 45.7 1.005 83.9	46 45.6 1.005 83.8	48 15.3 1.005 83.6	49 15.1 1.005 83.5	50 14.9 1.005 83.4	51 14.7 1.005 83.3	52 14.5 1.005 83.1	53 44.2 1.005 82.9	3
4	45 42.6 1.005 82.9	46 42.4 1.005 82.8	48 12.1 1.005 82.6	49 12.0 1.005 82.5	50 11.8 1.005 82.4	51 11.6 1.005 82.3	52 11.4 1.005 82.1	53 41.0 1.005 81.9	4
95	45 39.5 1.005 81.9	46 39.3 1.005 81.8	48 09.1 1.005 81.7	49 08.9 1.005 81.5	50 08.7 1.005 81.4	51 08.5 1.005 81.3	52 08.3 1.005 81.1	53 37.9 1.005 80.9	95
6	45 36.4 1.005 80.9	46 36.2 1.005 80.8	48 06.0 1.005 80.7	49 05.8 1.005 80.5	50 05.6 1.005 80.4	51 05.4 1.005 80.3	52 05.2 1.005 80.2	53 34.8 1.005 79.9	6
7	45 33.3 1.005 80.0	46 33.1 1.005 79.8	48 02.9 1.005 79.7	49 02.7 1.005 79.6	50 02.5 1.005 79.4	51 02.3 1.005 79.3	52 02.1 1.005 79.2	53 31.7 1.005 79.0	7
8	45 30.2 1.005 79.0	46 30.0 1.005 78.9	47 59.8 1.005 78.7	48 59.6 1.005 78.6	49 59.4 1.005 78.4	50 59.2 1.005 78.3	51 59.0 1.005 78.2	53 28.7 1.005 78.0	8
9	45 27.1 1.005 78.0	46 27.0 1.005 77.9	47 56.7 1.005 77.7	48 56.5 1.005 77.6	49 56.3 1.005 77.5	50 56.1 1.005 77.3	51 55.9 1.005 77.2	53 25.6 1.005 77.0	9
100	45 24.1 1.005 77.0	46 23.9 1.005 76.9	47 53.6 1.005 76.7	48 53.5 1.005 76.6	49 53.3 1.005 76.5	50 53.1 1.005 76.3	51 52.9 1.005 76.2	53 22.6 1.005 76.0	100
1	45 21.0 1.005 76.0	46 20.9 1.005 75.9	47 50.6 1.005 75.7	48 50.4 1.005 75.6	49 50.2 1.005 75.5	50 50.0 1.005 75.4	51 49.8 1.005 75.2	53 19.5 1.005 75.0	1
2	45 18.0 1.005 75.0	46 17.8 1.005 74.9	47 47.6 1.005 74.7	48 47.4 1.005 74.6	49 47.2 1.005 74.5	50 47.0 1.005 74.4	51 46.8 1.005 74.3	53 16.5 1.005 74.0	2
3	45 15.0 1.005 74.0	46 14.8 1.005 73.9	47 44.5 1.005 73.8	48 44.4 1.005 73.6	49 44.2 1.005 73.5	50 44.0 1.005 73.4	51 43.8 1.005 73.3	53 13.5 1.005 73.1	3
4	45 11.9 1.005 73.0	46 11.8 1.005 72.9	47 41.5 1.005 72.8	48 41.4 1.005 72.7	49 41.2 1.005 72.5	50 41.0 1.005 72.4	51 40.8 1.005 72.3	53 10.5 1.005 72.1	4
105	45 08.9 1.005 72.1	46 08.8 1.005 72.0	47 38.5 1.005 71.8	48 38.4 1.005 71.7	49 38.2 1.005 71.6	50 38.0 1.005 71.4	51 37.8 1.005 71.3	53 07.5 1.005 71.1	105
6	45 06.0 1.005 71.1	46 05.8 1.005 71.0	47 35.6 1.005 70.8	48 35.4 1.005 70.7	49 35.2 1.005 70.6	50 35.0 1.005 70.5	51 34.8 1.005 70.3	53 04.5 1.005 70.1	6
7	45 03.0 1.005 70.1	46 02.9 1.005 70.0	47 32.6 1.005 69.8	48 32.4 1.005 69.7	49 32.3 1.005 69.6	50 32.1 1.005 69.5	51 31.9 1.005 69.4	53 01.6 1.005 69.2	7
8	45 00.1 1.005 69.1	45 59.9 1.005 69.0	47 29.7 1.005 68.9	48 29.5 1.005 68.7	49 29.3 1.005 68.6	50 29.2 1.005 68.5	51 29.0 1.005 68.4	52 58.7 1.005 68.2	8
9	44 57.1 1.005 68.1	45 57.0 1.005 68.0	47 26.8 1.005 67.9	48 26.6 1.005 67.8	49 26.4 1.005 67.7	50 26.2 1.005 67.5	51 26.1 1.005 67.4	52 55.8 1.005 67.2	9
110	44 54.2 1.005 67.2	45 54.1 1.005 67.1	47 23.9 1.005 66.9	48 23.7 1.005 66.8	49 23.5 1.005 66.7	50 23.4 1.005 66.6	51 23.2 1.005 66.4	52 52.9 1.005 66.2	110
1	44 51.3 1.005 66.2	45 51.2 1.005 66.1	47 21.0 1.005 65.9	48 20.8 1.005 65.8	49 20.7 1.005 65.7	50 20.5 1.005 65.5	51 20.3 1.005 65.5	52 50.0 1.005 65.3	1
2	44 48.5 1.005 65.2	45 48.3 1.005 65.1	47 18.1 1.005 65.0	48 18.0 1.005 64.8	49 17.8 1.005 64.7	50 17.6 1.005 64.6	51 17.5 1.005 64.5	52 47.2 1.005 64.3	2
3	44 45.6 1.005 64.2	45 45.5 1.005 64.1	47 15.3 1.005 64.0	48 15.1 1.005 63.9	49 15.0 1.005 63.8	50 14.8 1.005 63.6	51 14.6 1.005 63.5	52 44.4 1.005 63.3	3
4	44 42.8 1.005 63.3	45 42.7 1.005 63.2	47 12.5 1.005 63.0	48 12.3 1.005 62.9	49 12.2 1.005 62.8	50 12.0 1.005 62.7	51 11.8 1.005 62.6	52 41.6 1.005 62.4	4
115	44 40.0 1.005 62.3	45 39.9 1.005 62.2	47 09.7 1.005 62.0	48 09.5 1.005 61.9	49 09.4 1.005 61.8	50 09.2 1.005 61.7	51 09.1 1.005 61.6	52 38.8 1.005 61.4	115
6	44 37.3 1.005 61.3	45 37.1 1.005 61.2	47 06.9 1.005 61.1	48 06.8 1.005 61.0	49 06.6 1.005 60.9	50 06.5 1.005 60.7	51 06.3 1.005 60.6	52 36.0 1.005 60.4	6
7	44 34.5 1.005 60.3	45 34.4 1.005 60.2	47 04.2 1.005 60.1	48 04.1 1.004 60.0	49 03.9 1.004 59.9	50 03.7 1.004 59.8	51 03.6 1.004 59.7	52 33.3 1.004 59.5	7
8	44 31.8 1.004 59.4	45 31.7 1.004 59.3	47 01.5 1.004 59.1	48 01.3 1.004 59.0	49 01.2 1.004 58.9	50 01.0 1.004 58.8	51 00.9 1.004 58.7	52 30.6 1.004 58.5	8
9	44 29.1 1.004 58.4	45 29.0 1.004 58.3	46 58.8 1.004 58.2	47 58.7 1.004 58.1	48 58.5 1.004 57.9	49 58.4 1.004 57.8	50 58.2 1.004 57.7	52 28.0 1.004 57.5	9
120	44 26.5 1.004 57.4	45 26.3 1.004 57.3	46 56.2 1.004 57.2	47 56.0 1.004 57.1	48 55.9 1.004 57.0	49 55.7 1.004 56.9	50 55.6 1.004 56.8	52 25.3 1.004 56.6	120
1	44 23.8 1.004 56.4	45 23.7 1.004 56.4	46 53.5 1.004 56.2	47 53.4 1.004 56.1	48 53.3 1.004 56.0	49 53.1 1.004 55.9	50 53.0 1.004 55.8	52 22.7 1.004 55.6	1
2	44 21.2 1.004 55.5	45 21.1 1.004 55.4	46 50.9 1.004 55.2	47 50.8 1.004 55.2	48 50.7 1.004 55.1	49 50.5 1.004 54.9	50 50.4 1.004 54.8	52 20.2 1.004 54.7	2
3	44 18.7 1.004 54.5	45 18.5 1.004 54.4	46 48.4 1.004 54.3	47 48.2 1.004 54.2	48 48.1 1.004 54.1	49 48.0 1.004 54.0	50 47.8 1.004 53.9	52 17.6 1.004 53.7	3
4	44 16.1 1.004 53.5	45 16.0 1.004 53.5	46 45.8 1.004 53.3	47 45.7 1.004 53.2	48 45.6 1.004 53.1	49 45.4 1.004 53.0	50 45.3 1.004 52.9	52 15.1 1.004 52.7	4
125	44 13.6 1.004 52.6	45 13.5 1.004 52.5	46 43.3 1.004 52.4	47 43.2 1.004 52.3	48 43.1 1.004 52.2	49 43.0 1.004 52.1	50 42.8 1.004 52.0	52 12.6 1.004 51.8	125
6	44 11.1 1.004 51.6	45 11.0 1.004 51.5	46 40.9 1.004 51.4	47 40.7 1.004 51.3	48 40.6 1.004 51.2	49 40.5 1.004 51.1	50 40.4 1.004 51.0	52 10.2 1.004 50.8	6
7	44 08.7 1.004 50.6	45 08.6 1.004 50.6	46 38.4 1.004 50.4	47 38.3 1.004 50.3	48 38.2 1.004 50.2	49 38.1 1.004 50.1	50 37.9 1.004 50.0	52 07.7 1.004 49.9	7
8	44 06.3 1.004 49.7	45 06.2 1.004 49.6	46 36.0 1.004 49.5	47 35.9 1.004 49.4	48 35.8 1.004 49.3	49 35.7 1.004 49.2	50 35.6 1.004 49.1	52 05.4 1.004 48.9	8
9	44 03.9 1.004 48.7	45 03.8 1.004 48.6	46 33.7 1.004 48.5	47 33.5 1.004 48.4	48 33.4 1.004 48.3	49 33.3 1.004 48.2	50 33.2 1.004 48.1	52 03.0 1.004 48.0	9
130	44 01.6 1.004 47.7	45 01.5 1.004 47.7	46 31.3 1.004 47.5	47 31.2 1.004 47.4	48 31.1 1.004 47.4	49 31.0 1.004 47.3	50 30.9 1.004 47.2	52 00.7 1.004 47.0	130
1	43 59.3 1.004 46.8	44 59.2 1.004 46.7	46 29.0 1.004 46.6	47 28.9 1.004 46.5	48 28.8 1.004 46.4	49 28.7 1.004 46.3	50 28.6 1.004 46.2	51 58.4 1.004 46.1	1
2	43 57.0 1.004 45.8	44 56.9 1.004 45.7	46 26.8 1.004 45.6	47 26.7 1.004 45.5	48 26.6 1.004 45.4	49 26.5 1.004 45.4	50 26.3 1.004 45.3	51 56.2 1.004 45.1	2
3	43 54.8 1.004 44.8	44 54.7 1.004 44.8	46 24.5 1.004 44.7	47 24.4 1.004 44.6	48 24.3 1.004 44.5	49 24.2 1.004 44.4	50 24.1 1.004 44.3	51 54.0 1.004 44.2	3
4	43 52.6 1.004 43.9	44 52.5 1.004 43.8	46 22.3 1.004 43.7	47 22.2 1.004 43.6	48 22.2 1.004 43.5	49 22.1 1.004 43.4	50 22.0 1.004 43.4	51 51.8 1.004 43.2	4
135	43 50.4 1.004 42.9	44 50.3 1.004 42.8	46 20.2 1.004 42.7	47 20.1 1.004 42.7	48 20.0 1.004 42.6	49 19.9 1.004 42.5	50 19.8 1.004 42.4	51 49.7 1.004 42.3	135
6	43 48.3 1.003 42.0	44 48.2 1.003 41.9	46 18.1 1.003 41.8	47 18.0 1.003 41.7	48 17.9 1.003 41.6	49 17.8 1.003 41.5	50 17.7 1.003 41.4	51 47.6 1.003 41.3	6
7	43 46.2 1.003 41.0	44 46.1 1.003 40.9	46 16.0 1.003 40.8	47 15.9 1.003 40.7	48 15.8 1.003 40.7	49 15.8 1.003 40.6	50 15.7 1.003 40.5	51 45.5 1.003 40.4	7
8	43 44.2 1.003 40.0	44 44.1 1.003 40.0	46 14.0 1.003 39.9	47 13.9 1.003 39.8	48 13.8 1.003 39.7	49 13.7 1.003 39.6	50 13.6 1.003 39.5	51 43.5 1.003 39.4	8
9	43 42.2 1.003 39.0	44 42.1 1.003 39.0	46 12.0 1.003 38.9	47 11.9 1.003 38.8	48 11.8 1.003 38.8	49 11.7 1.003 38.7	50 11.7 1.003 38.6	51 41.5 1.003 38.5	9
140	43 40.2 1.003 38.1	44 40.1 1.003 38.1	46 10.0 1.003 38.0	47 10.0 1.003 37.9	48 09.9 1.003 37.8	49 09.8 1.003 37.7	50 09.7 1.003 37.6	51 39.6 1.003 37.5	140
1	43 38.3 1.003 37.2	44 38.2 1.003 37.1	46 08.1 1.003 37.0	47 08.1 1.003 36.9	48 08.0 1.003 36.9	49 07.9 1.003 36.8	50 07.8 1.003 36.7	51 37.7 1.003 36.6	1
2	43 36.4 1.003 36.2	44 36.3 1.003 36.1	46 06.3 1.003 36.0	47 06.2 1.003 36.0	48 06.1 1.003 35.9	49 06.0 1.003 35.8	50 06.0 1.003 35.8	51 35.9 1.003 35.6	2
3	43 34.6 1.003 35.2	44 34.5 1.003 35.2	46 04.4 1.003 35.1	47 04.4 1.003 35.0	48 04.3 1.003 35.0	49 04.2 1.003 34.9	50 04.2 1.003 34.8	51 34.0 1.003 34.7	3
4	43 32.8 1.003 34.2	44 32.7 1.003 34.2	46 02.6 1.003 34.1	47 02.6 1.003 34.1	48 02.5 1.003 34.0	49 02.5 1.003 33.9	50 02.4 1.003 33.9	51 32.3 1.003 33.7	4
145	43 31.0 1.003 33.3	44 31.0 1.003 33.3	46 00.9 1.003 33.2	47 00.9 1.003 33.1	48 00.7 1.003 33.0	49 00.7 1.003 33.0	50 00.7 1.003 32.9	51 30.6 1.003 32.8	145
6	43 29.3 1.003 32.4	44 29.3 1.003 32.3	45 59.2 1.003 32.2	46 59.2 1.003 32.2	47 59.1 1.003 32.1	48 59.0 1.003 32.0	49 59.0 1.003 32.0	51 28.9 1.003 31.9	6
7	43 27.7 1.003 31.4	44 27.6 1.003 31.4	45 57.6 1.003 31.3	46 57.5 1.003 31.2	47 57.4 1.003 31.2	48 57.4 1.003 31.1	49 57.3 1.003 31.0	51 27.2 1.003 30.9	7
8	43 26.1 1.003 30.5	44 26.0 1.003 30.4	45 55.9 1.003 30.3	46 55.9 1.003 30.3	47 55.8 1.003 30.2	48 55.8 1.003 30.1	49 55.7 1.003 30.1	51 25.7 1.003 30.0	8
9	43 24.5 1.003 29.5	44 24.4 1.003 29.5	45 54.4 1.003 29.4	46 54.3 1.003 29.3	47 54.3 1.003 29.3	48 54.2 1.002 29.2	49 54.2 1.002 29.1	51 24.1 1.002 29.0	9
150	43 23.0 1.002 28.5	44 22.9 1.002 28.5	45 52.9 1.002 28.4	46 52.8 1.002 28.4	47 52.8 1.002 28.3	48 52.7 1.002 28.2	49 52.7 1.002 28.2	51 22.6 1.002 28.1	150
1	43 21.5 1.002 27.6	44 21.5 1.002 27.5	45 51.4 1.002 27.5	46 51.4 1.002 27.4	47 51.3 1.002 27.4	48 51.3 1.002 27.3	49 51.2 1.002 27.2	51 21.2 1.002 27.1	1
2	43 20.1 1.002 26.6	44 20.0 1.002 26.6	45 50.0 1.002 26.5	46 49.9 1.002 26.5	47 49.9 1.002 26.4	48 49.8 1.002 26.4	49 49.8 1.002 26.3	51 19.7 1.002 26.2	2
3	43 18.7 1.002 25.7	44 18.6 1.002 25.6	45 48.6 1.002 25.6	46 48.6 1.002 25.5	47 48.5 1.002 25.5	48 48.5 1.002 25.4	49 48.4 1.002 25.4	51 18.4 1.002 25.3	3
4	43 17.3 1.002 24.7	44 17.3 1.002 24.7	45 47.3 1.002 24.6	46 47.2 1.002 24.6	47 47.2 1.002 24.5	48 47.2 1.002 24.5	49 47.1 1.002 24.4	51 17.1 1.002 24.3	4
155	43 16.0 1.002 23.8	44 16.0 1.002 23.7	45 46.0 1.002 23.7	46 45.9 1.002 23.6	47 45.9 1.002 23.6	48 45.9 1.002 23.5	49 45.8 1.002 23.5	51 15.8 1.002 23.4	155
6	43 14.8 1.002 22.8	44 14.8 1.002 22.8	45 44.7 1.002 22.7	46 44.7 1.002 22.7	47 44.7 1.002 22.6	48 44.6 1.002 22.6	49 44.6 1.002 22.5	51 14.6 1.002 22.5	6
7	43 13.6 1.002 21.9	44 13.6 1.002 21.8	45 43.5 1.002 21.8	46 43.5 1.002 21.7	47 43.5 1.002 21.7	48 43.5 1.002 21.6	49 43.4 1.002 21.6	51 13.4 1.002 21.5	7
8	43 12.5 1.002 20.9	44 12.4 1.002 20.9	45 42.4 1.002 20.8	46 42.4 1.002 20.8	47 42.4 1.002 20.7	48 42.3 1.002 20.7	49 42.3 1.002 20.6	51 12.3 1.002 20.6	8
9	43 11.4 1.002 20.0	44 11.3 1.002 19.9	45 41.3 1.002 19.9	46 41.3 1.002 19.8	47 41.3 1.002 19.8	48 41.2 1.002 19.8	49 41.2 1.002 19.7	51 11.2 1.002 19.6	9
160	43 10.3 1.002 19.0	44 10.3 1.002 19.0	45 40.3 1.002 18.9	46 40.3 1.002 18.9	47 40.2 1.002 18.8	48 40.2 1.002 18.8	49 40.2 1.002 18.8	51 10.2 1.002 18.7	160
1	43 09.3 1.002 18.1	44 09.3 1.002 18.0	45 39.3 1.002 18.0	46 39.3 1.002 17.9	47 39.2 1.002 17.9	48 39.2 1.002 17.9	49 39.2 1.002 17.8	51 09.2 1.002 17.8	1
2	43 08.4 1.002 17.1	44 08.4 1.002 17.1	45 38.3 1.002 17.0	46 38.3 1.001 17.0	47 38.3 1.001 17.0	48 38.3 1.001 16.9	49 38.3 1.001 16.9	51 08.2 1.001 16.8	2
3	43 07.5 1.001 16.2	44 07.5 1.001 16.1	45 37.4 1.001 16.1	46 37.4 1.001 16.0	47 37.4 1.001 16.0	48 37.4 1.001 16.0	49 37.4 1.001 15.9	51 07.4 1.001 15.9	3
4	43 06.5 1.001 15.2	44 06.6 1.001 15.2	45 36.6 1.001 15.1	46 36.6 1.001 15.1	47 36.6 1.001 15.1	48 36.6 1.001 15.0	49 36.5 1.001 15.0	51 06.5 1.001 15.0	4
165	43 05.8 1.001 14.3	44 05.8 1.001 14.2	45 35.8 1.001 14.2	46 35.8 1.001 14.2	47 35.8 1.001 14.1	48 35.8 1.001 14.1	49 35.8 1.001 14.1	51 05.7 1.001 14.0	165
6	43 05.1 1.001 13.3	44 05.1 1.001 13.3	45 35.1 1.001 13.2	46 35.0 1.001 13.2	47 35.0 1.001 13.2	48 35.0 1.001 13.2	49 35.0 1.001 13.1	51 05.0 1.001 13.1	6
7	43 04.4 1.001 12.4	44 04.4 1.001 12.3	45 34.4 1.001 12.3	46 34.4 1.001 12.3	47 34.3 1.001 12.2	48 34.3 1.001 12.2	49 34.3 1.001 12.2	51 04.3 1.001 12.1	7
8	43 03.7 1.001 11.4	44 03.7 1.001 11.4	45 33.7 1.001 11.3	46 33.7 1.001 11.3	47 33.7 1.001 11.3	48 33.7 1.001 11.3	49 33.7 1.001 11.3	51 03.7 1.001 11.2	8
9	43 03.1 1.001 10.5	44 03.1 1.001 10.4	45 33.1 1.001 10.4	46 33.1 1.001 10.4	47 33.1 1.001 10.4	48 33.1 1.001 10.3	49 33.1 1.001 10.3	51 03.1 1.001 10.3	9
170	43 02.6 1.001 09.5	44 02.6 1.001 09.5	45 32.6 1.001 09.5	46 32.6 1.001 09.4	47 32.6 1.001 09.4	48 32.6 1.001 09.4	49 32.6 1.001 09.4	51 02.6 1.001 09.3	170
1	43 02.1 1.001 08.6	44 02.1 1.001 08.5	45 32.1 1.001 08.5	46 32.1 1.001 08.5	47 32.1 1.001 08.5	48 32.1 1.001 08.5	49 32.1 1.001 08.4	51 02.1 1.001 08.4	1
2	43 01.7 1.001 07.6	44 01.7 1.001 07.6	45 31.7 1.001 07.6	46 31.7 1.001 07.5	47 31.6 1.001 07.5	48 31.6 1.001 07.5	49 31.6 1.001 07.5	51 01.6 1.001 07.5	2
3	43 01.3 1.001 06.6	44 01.3 1.001 06.6	45 31.3 1.001 06.6	46 31.3 1.001 06.6	47 31.3 1.001 06.6	48 31.3 1.001 06.6	49 31.3 1.001 06.6	51 01.3 1.001 06.5	3
4	43 00.9 1.000 05.7	44 00.9 1.000 05.7	45 30.9 1.000 05.7	46 30.9 1.000 05.7	47 30.9 1.000 05.6	48 30.9 1.000 05.7	49 30.9 1.000 05.6	51 00.9 1.000 05.6	4
175	43 00.6 1.000 04.7	44 00.6 1.000 04.7	45 30.6 1.000 04.7	46 30.6 1.000 04.7	47 30.6 1.000 04.7	48 30.6 1.000 04.7	49 30.6 1.000 04.7	51 00.6 1.000 04.7	175
6	43 00.4 1.000 03.8	44 00.4 1.000 03.8	45 30.4 1.000 03.8	46 30.4 1.000 03.8	47 30.4 1.000 03.8	48 30.4 1.000 03.8	49 30.4 1.000 03.7	51 00.4 1.000 03.7	6
7	43 00.2 1.000 02.8	44 00.2 1.000 02.8	45 30.2 1.000 02.8	46 30.2 1.000 02.8	47 30.2 1.000 02.8	48 30.2 1.000 02.8	49 30.2 1.000 02.8	51 00.2 1.000 02.8	7
8	43 00.1 1.000 01.9	44 00.1 1.000 01.9	45 30.1 1.000 01.9	46 30.1 1.000 01.9	47 30.1 1.000 01.9	48 30.1 1.000 01.9	49 30.1 1.000 01.9	51 00.1 1.000 01.9	8
9	43 00.0 1.000 00.9	44 00.0 1.000 00.9	45 30.0 1.000 00.9	46 30.0 1.000 00.9	47 30.0 1.000 00.9	48 30.0 1.000 00.9	49 30.0 1.000 00.9	51 00.0 1.000 00.9	9
180	43 00.0 1.000 00.0	44 00.0 1.000 00.0	45 30.0 1.000 00.0	46 30.0 1.000 00.0	47 30.0 1.000 00.0	48 30.0 1.000 00.0	49 30.0 1.000 00.0	51 00.0 1.000 00.0	180

Lat. 88°

Lat. 89°

Lat. 87°

Each cell below lists: Alt. (° ′), Δd, Δt, Az. (°)

H.A.	54° 30′	55° 00′	56° 00′	56° 30′	57° 00′	57° 30′	59° 00′	59° 30′	H.A.
00	57 30.0 1.00 00 180.0	58 00.0 1.00 00 180.0	59 00.0 1.00 00 180.0	59 30.0 1.00 00 180.0	60 00.0 1.00 00 180.0	60 30.0 1.00 00 180.0	62 00.0 1.00 00 180.0	62 30.0 1.00 00 180.0	00
1	57 30.0 178.9	58 00.0 178.9	59 00.0 178.9	59 30.0 178.9	60 00.0 178.9	60 30.0 178.9	62 00.0 178.9	62 30.0 178.9	1
2	57 29.9 177.8	57 59.9 177.8	58 59.9 177.8	59 29.9 177.8	59 59.9 177.8	60 29.9 177.8	61 59.9 177.8	62 29.9 177.8	2
3	57 29.7 176.8	57 59.7 176.8	58 59.7 176.7	59 29.7 176.7	59 59.7 176.7	60 29.7 176.7	61 59.7 176.7	62 29.7 176.7	3
4	57 29.5 175.7	57 59.5 175.7	58 59.5 175.7	59 29.5 175.7	59 59.5 175.6	60 29.5 175.6	61 59.5 175.6	62 29.5 175.6	4
05	57 29.3 1.00 01 174.6	57 59.3 174.6	58 59.3 174.6	59 29.3 174.6	59 59.3 174.6	60 29.3 174.5	61 59.2 174.5	62 29.2 174.5	05
6	57 28.9 173.5	57 58.9 173.5	58 58.9 173.5	59 28.9 173.5	59 58.9 173.5	60 28.9 173.5	61 58.9 173.4	62 28.9 173.4	6
7	57 28.6 172.4	57 58.5 172.4	58 58.5 172.4	59 28.5 172.4	59 58.5 172.4	60 28.5 172.4	61 58.5 172.3	62 28.5 172.3	7
8	57 28.1 171.4	57 58.1 171.3	58 58.1 171.3	59 28.1 171.3	59 58.1 171.3	60 28.1 171.3	61 58.1 171.2	62 28.1 171.2	8
9	57 27.6 170.3	57 57.6 170.3	58 57.6 170.2	59 27.6 170.2	59 57.6 170.2	60 27.6 170.2	61 57.6 170.1	62 27.6 170.1	9
10	57 27.0 1.00 01 169.2	57 57.0 169.2	58 57.0 169.1	59 27.0 169.1	59 57.0 169.1	60 27.0 169.1	61 57.0 169.0	62 27.0 169.0	10
1	57 26.4 168.1	57 56.4 168.1	58 56.4 168.0	59 26.4 168.0	59 56.4 168.0	60 26.4 168.0	61 56.4 167.9	62 26.4 167.9	1
2	57 25.8 167.0	57 55.7 167.0	58 55.7 167.0	59 25.7 167.0	59 55.7 166.9	60 25.7 166.9	61 55.7 166.8	62 25.7 166.8	2
3	57 25.0 166.0	57 55.0 165.9	58 55.0 165.9	59 25.0 165.9	59 55.0 165.9	60 25.0 165.8	61 54.9 165.8	62 24.9 165.7	3
4	57 24.2 164.9	57 54.2 164.9	58 54.2 164.8	59 24.2 164.8	59 54.2 164.8	60 24.2 164.7	61 54.1 164.7	62 24.1 164.6	4
15	57 23.4 1.00 02 163.8	57 53.4 163.8	58 53.4 163.7	59 23.3 163.7	59 53.3 163.7	60 23.3 163.7	61 53.3 163.6	62 23.3 163.5	15
6	57 22.5 162.7	57 52.4 162.7	58 52.4 162.6	59 22.4 162.6	59 52.4 162.6	60 22.4 162.6	61 52.4 162.5	62 22.4 162.4	6
7	57 21.5 161.7	57 51.5 161.6	58 51.5 161.6	59 21.5 161.5	59 51.5 161.5	60 21.4 161.5	61 51.4 161.4	62 21.4 161.3	7
8	57 20.5 160.6	57 50.5 160.5	58 50.5 160.5	59 20.4 160.5	59 50.4 160.4	60 20.4 160.4	61 50.4 160.3	62 20.3 160.3	8
9	57 19.4 159.5	57 49.4 159.5	58 49.4 159.4	59 19.4 159.4	59 49.4 159.3	60 19.3 159.3	61 49.3 159.2	62 19.3 159.2	9
20	57 18.3 1.00 02 158.4	57 48.3 158.4	58 48.3 158.3	59 18.2 158.3	59 48.2 158.3	60 18.2 158.2	61 48.1 158.1	62 18.1 158.1	20
1	57 17.1 157.4	57 47.1 157.3	58 47.1 157.2	59 17.0 157.2	59 47.0 157.2	60 17.0 157.1	61 46.9 157.0	62 16.9 157.0	1
2	57 15.9 156.3	57 45.9 156.2	58 45.8 156.2	59 15.8 156.1	59 45.8 156.1	60 15.8 156.1	61 45.7 155.9	62 15.7 155.9	2
3	57 14.6 155.2	57 44.6 155.2	58 44.5 155.1	59 14.5 155.1	59 44.5 155.0	60 14.5 155.0	61 44.4 154.8	62 14.3 154.8	3
4	57 13.3 154.1	57 43.2 154.1	58 43.2 154.0	59 13.2 154.0	59 43.1 153.9	60 13.1 153.9	61 43.0 153.8	62 13.0 153.7	4
25	57 11.9 1.00 02 153.1	57 41.8 153.0	58 41.8 152.9	59 11.7 152.9	59 41.7 152.9	60 11.7 152.8	61 41.6 152.7	62 11.6 152.6	25
6	57 10.3 152.0	57 40.4 152.0	58 40.3 151.8	59 10.3 151.8	59 40.3 151.8	60 10.2 151.6	61 40.1 151.6	62 10.1 151.5	6
7	57 08.9 1.00 03 150.9	57 38.9 150.9	58 38.8 150.8	59 08.8 150.8	59 38.8 150.7	60 08.7 150.7	61 38.6 150.5	62 08.6 150.5	7
8	57 07.4 149.9	57 37.3 149.8	58 37.3 149.7	59 07.2 149.7	59 37.2 149.6	60 07.2 149.6	61 37.0 149.4	62 07.0 149.4	8
9	57 05.8 148.8	57 35.7 148.7	58 35.7 148.7	59 05.6 148.6	59 35.6 148.6	60 05.5 148.5	61 35.4 148.3	62 05.4 148.3	9
30	57 04.1 1.00 03 147.7	57 34.1 147.7	58 34.0 147.6	59 04.0 147.5	59 33.9 147.5	60 03.9 147.4	61 33.7 147.3	62 03.7 147.2	30
1	57 02.4 146.7	57 32.4 146.6	58 32.3 146.5	59 02.2 146.5	59 32.2 146.4	60 02.2 146.4	61 32.0 146.2	62 02.0 146.1	1
2	57 00.6 145.6	57 30.6 145.5	58 30.5 145.4	59 00.5 145.4	59 30.4 145.3	60 00.4 145.3	61 30.2 145.1	62 00.2 145.0	2
3	56 58.8 144.5	57 28.8 144.5	58 28.7 144.4	58 58.7 144.3	59 28.6 144.3	59 58.6 144.2	61 28.4 144.0	61 58.4 144.0	3
4	56 57.0 143.5	57 27.0 143.4	58 26.9 143.3	58 56.8 143.2	59 26.8 143.2	59 56.7 143.1	61 26.6 143.0	61 56.5 142.9	4
35	56 55.1 1.00 03 142.4	57 25.1 142.3	58 25.0 142.2	58 54.9 142.2	59 24.9 142.1	59 54.8 142.1	61 24.6 141.9	61 54.6 141.8	35
6	56 53.2 141.3	57 23.1 141.3	58 23.0 141.2	58 53.0 141.1	59 22.9 141.1	59 52.9 141.0	61 22.7 140.8	61 52.6 140.7	6
7	56 51.2 140.3	57 21.1 140.2	58 21.0 140.1	58 51.0 140.0	59 20.9 140.0	59 50.9 139.9	61 20.7 139.7	61 50.6 139.7	7
8	56 49.2 139.2	57 19.1 139.2	58 19.0 139.0	58 48.9 139.0	59 18.9 138.9	59 48.8 138.9	61 18.6 138.7	61 48.6 138.6	8
9	56 47.1 138.2	57 17.0 138.1	58 16.9 138.0	58 46.9 137.9	59 16.8 137.9	59 46.7 137.8	61 16.5 137.6	61 46.5 137.5	9
40	56 45.0 1.00 04 137.1	57 14.9 137.0	58 14.8 136.9	58 44.8 136.9	59 14.7 136.8	59 44.6 136.7	61 14.4 136.5	61 44.4 136.4	40
1	56 42.8 136.0	57 12.8 136.0	58 12.6 135.9	58 42.6 135.8	59 12.5 135.7	59 42.4 135.7	61 12.2 135.5	61 42.1 135.4	1
2	56 40.6 135.0	57 10.5 134.9	58 10.4 134.8	58 40.4 134.7	59 10.3 134.7	59 40.2 134.6	61 10.0 134.4	61 39.9 134.3	2
3	56 38.4 133.9	57 08.3 133.9	58 08.2 133.7	58 38.1 133.7	59 08.0 133.6	59 38.0 133.5	61 07.7 133.3	61 37.6 133.2	3
4	56 36.1 132.9	57 06.0 132.8	58 05.9 132.7	58 35.8 132.6	59 05.7 132.6	59 35.7 132.5	61 05.4 132.3	61 35.3 132.2	4
45	56 33.8 1.00 04 131.8	57 03.7 131.8	58 03.6 131.6	58 33.5 131.6	59 03.4 131.5	59 33.3 131.4	61 03.1 131.2	61 33.0 131.1	45
6	56 31.4 130.8	57 01.3 130.7	58 01.2 130.6	58 31.1 130.5	59 01.0 130.4	59 31.0 130.4	61 00.7 130.1	61 30.6 130.1	6
7	56 29.0 129.7	56 58.9 129.7	57 58.8 129.5	58 28.7 129.5	58 58.6 129.4	59 28.5 129.3	60 58.3 129.1	61 28.2 129.0	7
8	56 26.6 128.7	56 56.5 128.6	57 56.3 128.5	58 26.3 128.4	58 56.2 128.3	59 26.1 128.3	60 55.8 128.0	61 25.7 127.9	8
9	56 24.1 127.6	56 54.0 127.6	57 53.8 127.4	58 23.8 127.4	58 53.7 127.3	59 23.6 127.2	60 53.3 127.0	61 23.2 127.0	9
50	56 21.6 1.00 04 126.6	56 51.5 126.5	57 51.4 126.4	58 21.3 126.3	58 51.2 126.2	59 21.1 126.2	60 50.8 125.9	61 20.7 125.8	50
1	56 19.1 125.5	56 49.0 125.5	57 48.8 125.3	58 18.7 125.3	58 48.6 125.2	59 18.5 125.1	60 48.2 124.9	61 18.1 124.8	1
2	56 16.5 124.5	56 46.4 124.4	57 46.2 124.3	58 16.1 124.2	58 46.0 124.1	59 16.0 124.1	60 45.6 123.8	61 15.5 123.7	2
3	56 13.9 123.4	56 43.8 123.4	57 43.6 123.2	58 13.5 123.2	58 43.4 123.1	59 13.3 123.0	60 43.0 122.8	61 12.9 122.7	3
4	56 11.3 122.4	56 41.2 122.3	57 41.0 122.2	58 10.9 122.1	58 40.8 122.0	59 10.7 122.0	60 40.4 121.7	61 10.3 121.6	4
55	56 08.6 1.00 04 121.4	56 38.5 1.00 05 121.3	57 38.3 121.2	58 08.2 121.1	58 38.1 121.0	59 08.0 120.9	60 37.7 120.7	61 07.6 120.6	55
6	56 05.9 120.3	56 35.8 120.3	57 35.6 120.1	58 05.5 120.0	58 35.4 120.0	59 05.3 119.9	60 35.0 119.6	61 04.8 119.5	6
7	56 03.2 119.3	56 33.1 119.2	57 32.9 119.1	58 02.8 119.0	58 32.7 118.9	59 02.6 118.8	60 32.2 118.6	61 02.1 118.5	7
8	56 00.4 118.3	56 30.3 118.2	57 30.1 118.0	58 00.0 118.0	58 29.9 117.9	58 59.8 117.8	60 29.4 117.5	60 59.3 117.4	8
9	55 57.6 117.2	56 27.5 117.2	57 27.3 117.0	57 57.2 116.9	58 27.1 116.8	58 57.0 116.8	60 26.6 116.5	60 56.5 116.4	9
60	55 54.8 1.00 05 116.2	56 24.7 116.1	57 24.5 116.0	57 54.4 115.9	58 24.3 115.8	58 54.2 115.7	60 23.8 115.5	60 53.7 115.4	60
1	55 52.0 115.2	56 21.9 115.1	57 21.7 114.9	57 51.6 114.9	58 21.5 114.8	58 51.3 114.7	60 21.0 114.4	60 50.8 114.3	1
2	55 49.1 114.1	56 19.0 114.1	57 18.8 113.9	57 48.7 113.8	58 18.6 113.7	58 48.5 113.7	60 18.1 113.4	60 48.0 113.3	2
3	55 46.3 113.1	56 16.2 113.0	57 15.9 112.9	57 45.8 112.7	58 15.7 112.7	58 45.6 112.6	60 15.2 112.3	60 45.1 112.2	3
4	55 43.4 112.1	56 13.3 112.0	57 13.0 111.8	57 42.9 111.8	58 12.8 111.7	58 42.7 111.6	60 12.3 111.3	60 42.2 111.2	4
65	55 40.4 1.00 05 111.0	56 10.3 111.0	57 10.1 110.8	57 40.0 110.7	58 09.9 110.6	58 39.8 110.6	60 09.4 110.3	60 39.2 110.2	65
6	55 37.5 110.0	56 07.4 109.9	57 07.2 109.8	57 37.1 109.7	58 06.9 109.6	58 36.8 109.5	60 06.4 109.3	60 36.3 109.2	6
7	55 34.5 109.0	56 04.4 108.9	57 04.2 108.8	57 34.1 108.7	58 04.0 108.6	58 33.8 108.5	60 03.4 108.2	60 33.3 108.1	7
8	55 31.6 107.9	56 01.5 107.9	57 01.2 107.7	57 31.1 107.7	58 01.0 107.6	58 30.9 107.5	60 00.4 107.2	60 30.3 107.1	8
9	55 28.6 106.9	55 58.5 106.9	56 58.2 106.7	57 28.1 106.6	57 58.0 106.5	58 27.8 106.5	59 57.4 106.2	60 27.3 106.1	9
70	55 25.6 1.00 05 105.9	55 55.4 105.9	56 55.2 105.7	57 25.1 105.6	57 55.0 105.5	58 24.8 105.4	59 54.4 105.2	60 24.3 105.1	70
1	55 22.5 104.9	55 52.4 104.8	56 52.2 104.7	57 22.1 104.6	57 51.9 104.5	58 21.8 104.4	59 51.4 104.1	60 21.2 .99 05 104.0	1
2	55 19.5 103.9	55 49.4 103.8	56 49.1 103.7	57 19.0 103.6	57 48.9 103.4	58 18.7 103.4	59 48.3 .99 05 103.1	60 18.2 .99 05 103.0	2
3	55 16.4 102.9	55 46.3 102.8	56 46.1 102.6	57 16.0 102.6	57 45.8 102.5	58 15.6 102.4	59 45.3 102.1	60 15.2 102.1	3
4	55 13.4 101.9	55 43.3 101.8	56 43.0 101.6	57 12.9 101.5	57 42.7 101.4	58 12.6 101.4	59 42.2 101.1	60 12.0 101.0	4
75	55 10.3 1.00 05 100.8	55 40.2 100.8	56 39.9 100.6	57 09.8 100.5	57 39.7 100.4	58 09.5 100.3	59 39.1 .99 05 100.1	60 08.9 .99 05 100.0	75
6	55 07.2 99.8	55 37.1 99.8	56 36.8 99.6	57 06.7 99.5	57 36.6 99.4	58 06.4 99.3	59 36.0 99.0	60 05.8 98.9	6
7	55 04.1 98.8	55 34.0 98.8	56 33.7 98.6	57 03.6 98.5	57 33.5 98.4	58 03.3 98.3	59 32.9 98.0	60 02.7 97.9	7
8	55 01.0 97.8	55 30.9 97.7	56 30.6 97.6	57 00.5 97.5	57 30.4 97.4	58 00.2 97.3	59 29.8 97.0	59 59.6 97.0	8
9	54 57.9 96.8	55 27.8 96.7	56 27.5 96.6	56 57.4 96.5	57 27.2 96.4	57 57.1 96.3	59 26.7 96.0	59 56.5 95.9	9
80	54 54.8 1.00 05 95.8	55 24.6 95.7	56 24.4 95.6	56 54.3 95.5	57 24.1 95.4	57 54.0 95.3	59 23.5 .99 05 95.0	59 53.4 .99 05 94.9	80
1	54 51.6 94.8	55 21.5 94.7	56 21.3 94.6	56 51.1 94.5	57 21.0 94.4	57 50.8 94.3	59 20.4 94.0	59 50.2 93.9	1
2	54 48.5 93.8	55 18.4 93.7	56 18.1 93.5	56 48.0 93.5	57 17.9 93.5	57 47.7 93.3	59 17.3 93.0	59 47.1 93.0	2
3	54 45.4 92.8	55 15.2 92.7	56 15.0 92.5	56 44.9 92.5	57 14.7 92.4	57 44.6 92.3	59 14.1 92.0	59 44.0 91.9	3
4	54 42.2 91.8	55 12.1 91.7	56 11.9 91.5	56 41.7 91.5	57 11.6 91.4	57 41.4 91.3	59 11.0 91.0	59 40.8 90.9	4
85	54 39.1 1.00 05 90.8	55 09.0 90.7	56 08.7 90.5	56 38.6 90.5	57 08.4 90.4	57 38.3 90.3	59 07.9 .99 05 90.0	59 37.7 .99 05 89.9	85
6	54 36.0 89.8	55 05.8 89.7	56 05.6 89.5	56 35.4 89.5	57 05.3 89.4	57 35.2 89.3	59 04.7 89.0	59 34.6 88.9	6
7	54 32.8 88.8	55 02.7 88.7	56 02.4 88.5	56 32.3 88.5	57 02.2 88.4	57 32.0 88.3	59 01.6 88.0	59 31.4 87.9	7
8	54 29.7 87.8	54 59.6 87.7	55 59.3 87.6	56 29.2 87.5	56 59.0 87.4	57 28.9 87.3	58 58.4 87.0	59 28.3 86.9	8
9	54 26.5 86.8	54 56.4 86.7	55 56.2 86.6	56 26.0 86.5	56 55.9 86.4	57 25.8 86.3	58 55.3 86.0	59 25.1 85.9	9
90	54 23.4 1.00 05 85.8	54 53.3 85.7	55 53.0 85.6	56 22.9 85.5	56 52.8 85.4	57 22.6 85.3	58 52.2 85.0	59 22.0 84.9	90

H.A.	54° 30' Alt. Δd Δt	Az.	55° 00' Alt. Δd Δt	Az.	56° 00' Alt. Δd Δt	Az.	56° 30' Alt. Δd Δt	Az.	57° 00' Alt. Δd Δt	Az.	57° 30' Alt. Δd Δt	Az.	59° 00' Alt. Δd Δt	Az.	59° 30' Alt. Δd Δt	Az.	H.A.
91	54 20.3 1.005	84.8	54 50.2 1.005	84.7	55 49.9 1.005	84.6	56 19.9 1.005	84.5	56 49.6 1.005	84.4	57 19.5 1.005	84.3	58 49.0 99 05	84.0	59 18.9 99 05	83.9	91
2	54 17.1 1.005	83.8	54 47.0 1.005	83.7	55 46.8 1.005	83.6	56 16.6 1.005	83.5	56 46.5 1.005	83.4	57 16.4 1.005	83.3	58 45.9 99 05	83.0	59 15.8 99 05	82.9	2
3	54 14.0 1.005	82.8	54 43.9 1.005	82.8	55 43.7 1.005	82.6	56 13.5 1.005	82.5	56 43.4 1.005	82.4	57 13.3 1.005	82.3	58 42.8 99 05	82.1	59 12.7 99 05	82.0	3
4	54 10.9 1.005	81.8	54 40.8 1.005	81.8	55 40.5 1.005	81.6	56 10.4 1.005	81.5	56 40.3 1.005	81.4	57 10.1 1.005	81.3	58 39.7 99 05	81.1	59 09.6 99 05	81.0	4
95	54 07.8 1.005	80.9	54 37.7 1.005	80.8	55 37.4 1.005	80.6	56 07.3 1.005	80.5	56 37.2 1.005	80.4	57 07.0 1.005	80.4	58 36.6 99 05	80.1	59 06.5 99 05	80.0	95
6	54 04.7 1.005	79.9	54 34.6 1.005	79.8	55 34.4 1.005	79.6	56 04.2 1.005	79.5	56 34.1 1.005	79.5	57 04.0 1.005	79.4	58 33.5 1.005	79.1	59 03.4 99 05	79.0	6
7	54 01.6 1.005	78.9	54 31.5 1.005	78.8	55 31.3 1.005	78.6	56 01.1 1.005	78.6	56 31.0 1.005	78.5	57 00.9 1.005	78.4	58 30.4 1.005	78.1	59 00.3 99 05	78.0	7
8	53 58.6 1.005	77.9	54 28.4 1.005	77.8	55 28.2 1.005	77.7	55 58.1 1.005	77.6	56 27.9 1.005	77.5	56 57.8 1.005	77.4	58 27.4 1.005	77.1	58 57.2 99 05	77.0	8
9	53 55.5 1.005	76.9	54 25.4 1.005	76.8	55 25.1 1.005	76.7	55 55.0 1.005	76.6	56 24.9 1.005	76.5	56 54.7 1.005	76.4	58 24.3 1.005	76.2	58 54.2 99 05	76.1	9
100	53 52.4 1.005	75.9	54 22.3 1.005	75.9	55 22.1 1.005	75.7	55 52.0 1.005	75.6	56 21.8 1.005	75.5	56 51.7 1.005	75.5	58 21.3 1.005	75.2	58 51.1 1.005	75.1	100
1	53 49.4 1.005	75.0	54 19.3 1.005	74.9	55 19.0 1.005	74.7	55 48.9 1.005	74.6	56 18.8 1.005	74.6	56 48.7 1.005	74.5	58 18.2 1.005	74.2	58 48.1 1.005	74.1	1
2	53 46.4 1.005	74.0	54 16.3 1.005	73.9	55 16.0 1.005	73.7	55 45.9 1.005	73.7	56 15.8 1.005	73.6	56 45.6 1.005	73.5	58 15.2 1.005	73.2	58 45.1 1.005	73.1	2
3	53 43.4 1.005	73.0	54 13.3 1.005	72.9	55 13.0 1.005	72.8	55 42.9 1.005	72.7	56 12.8 1.005	72.6	56 42.6 1.005	72.5	58 12.2 1.005	72.3	58 42.1 1.005	72.2	3
4	53 40.4 1.005	72.0	54 10.3 1.005	71.9	55 10.0 1.005	71.8	55 39.9 1.005	71.7	56 09.8 1.005	71.6	56 39.7 1.005	71.5	58 09.3 1.005	71.3	58 39.1 1.005	71.2	4
105	53 37.4 1.005	71.0	54 07.3 1.005	71.0	55 07.1 1.005	70.8	55 36.9 1.005	70.7	56 06.8 1.005	70.7	56 36.7 1.005	70.6	58 06.3 1.005	70.3	58 36.2 1.005	70.2	105
6	53 34.4 1.005	70.1	54 04.3 1.005	70.0	55 04.1 1.005	69.8	55 34.0 1.005	69.8	56 03.9 1.005	69.7	56 33.7 1.005	69.6	58 03.3 1.005	69.3	58 33.2 1.005	69.3	6
7	53 31.5 1.005	69.1	54 01.4 1.005	69.0	55 01.2 1.005	68.9	55 31.0 1.005	68.8	56 00.9 1.005	68.7	56 30.8 1.005	68.6	58 00.4 1.005	68.4	58 30.3 1.005	68.3	7
8	53 28.6 1.005	68.1	53 58.5 1.005	68.0	54 58.2 1.005	67.9	55 28.1 1.005	67.8	55 58.0 1.005	67.7	56 27.9 1.005	67.7	57 57.5 1.005	67.4	58 27.4 1.005	67.3	8
9	53 25.7 1.005	67.1	53 55.6 1.005	67.1	54 55.3 1.005	66.9	55 25.2 1.005	66.9	55 55.1 1.005	66.8	56 25.0 1.005	66.7	57 54.6 1.005	66.4	58 24.5 1.005	66.4	9
110	53 22.8 1.005	66.2	53 52.7 1.005	66.1	54 52.5 1.005	66.0	55 22.3 1.005	65.9	55 52.2 1.005	65.8	56 22.1 1.005	65.7	57 51.7 1.005	65.5	58 21.6 1.005	65.4	110
1	53 19.9 1.005	65.2	53 49.8 1.005	65.1	54 49.6 1.005	65.0	55 19.5 1.005	64.9	55 49.4 1.005	64.9	56 19.3 1.005	64.8	57 48.9 1.005	64.5	58 18.8 1.005	64.4	1
2	53 17.1 1.005	64.2	53 47.0 1.005	64.2	54 46.8 1.005	64.0	55 16.7 1.005	64.0	55 46.5 1.005	63.9	56 16.4 1.005	63.8	57 46.1 1.005	63.6	58 16.0 1.005	63.5	2
3	53 14.3 1.005	63.3	53 44.2 1.005	63.2	54 44.0 1.005	63.1	55 13.8 1.005	63.0	55 43.7 1.005	62.9	56 13.6 1.005	62.8	57 43.3 1.005	62.6	58 13.2 1.005	62.5	3
4	53 11.5 1.005	62.3	53 41.4 1.005	62.2	54 41.2 1.005	62.1	55 11.1 1.005	62.0	55 41.0 1.005	62.0	56 10.8 1.005	61.9	57 40.5 1.005	61.6	58 10.4 1.005	61.5	4
115	53 08.7 1.005	61.3	53 38.6 1.005	61.3	54 38.4 1.005	61.1	55 08.3 1.005	61.1	55 38.1 1.005	61.0	56 08.1 1.005	60.9	57 37.8 1.005	60.7	58 07.6 1.005	60.6	115
6	53 05.9 1.005	60.4	53 35.9 1.005	60.3	54 35.7 1.005	60.2	55 05.6 1.005	60.1	55 35.5 1.004	60.0	56 05.4 1.005	60.0	57 35.0 1.004	59.7	58 04.9 1.004	59.6	6
7	53 03.2 1.004	59.4	53 33.1 1.004	59.3	54 33.0 1.004	59.2	55 02.9 1.004	59.1	55 32.8 1.004	59.1	56 02.7 1.004	59.0	57 32.3 1.004	58.8	58 02.2 1.004	58.7	7
8	53 00.6 1.004	58.4	53 30.5 1.004	58.4	54 30.3 1.004	58.2	55 00.2 1.004	58.2	55 30.1 1.004	58.1	56 00.0 1.004	58.0	57 29.7 1.004	57.8	57 59.5 1.004	57.7	8
9	52 57.9 1.004	57.5	53 27.8 1.004	57.4	54 27.6 1.004	57.3	54 57.5 1.004	57.2	55 27.4 1.004	57.2	55 57.3 1.004	57.1	57 27.0 1.004	56.8	57 56.9 1.004	56.8	9
120	52 55.3 1.004	56.5	53 25.2 1.004	56.5	54 25.0 1.004	56.3	54 54.9 1.004	56.3	55 24.8 1.004	56.2	55 54.7 1.004	56.1	57 24.4 1.004	55.9	57 54.3 1.004	55.8	120
1	52 52.6 1.004	55.6	53 22.6 1.004	55.5	54 22.4 1.004	55.4	54 52.3 1.004	55.3	55 22.2 1.004	55.2	55 52.1 1.004	55.2	57 21.8 1.004	54.9	57 51.7 1.004	54.9	1
2	52 50.1 1.004	54.6	53 20.0 1.004	54.5	54 19.8 1.004	54.4	54 49.7 1.004	54.3	55 19.6 1.004	54.3	55 49.6 1.004	54.2	57 19.3 1.004	54.0	57 49.2 1.004	53.9	2
3	52 47.5 1.004	53.6	53 17.4 1.004	53.6	54 17.3 1.004	53.5	54 47.2 1.004	53.4	55 17.1 1.004	53.3	55 47.0 1.004	53.3	57 16.7 1.004	53.0	57 46.6 1.004	53.0	3
4	52 45.0 1.004	52.7	53 14.9 1.004	52.6	54 14.8 1.004	52.5	54 44.7 1.004	52.4	55 14.6 1.004	52.4	55 44.5 1.004	52.3	57 14.2 1.004	52.1	57 44.1 1.004	52.0	4
125	52 42.5 1.004	51.7	53 12.5 1.004	51.7	54 12.3 1.004	51.6	54 42.2 1.004	51.5	55 12.1 1.004	51.4	55 42.1 1.004	51.4	57 11.8 1.004	51.1	57 41.7 1.004	51.1	125
6	52 40.1 1.004	50.8	53 10.0 1.004	50.7	54 09.9 1.004	50.6	54 39.8 1.004	50.5	55 09.7 1.004	50.5	55 39.6 1.004	50.4	57 09.4 1.004	50.2	57 39.3 1.004	50.1	6
7	52 37.7 1.004	49.8	53 07.6 1.004	49.8	54 07.4 1.004	49.6	54 37.4 1.004	49.6	55 07.3 1.004	49.5	55 37.2 1.004	49.5	57 07.0 1.004	49.3	57 36.9 1.004	49.2	7
8	52 35.3 1.004	48.9	53 05.2 1.004	48.8	54 05.1 1.004	48.7	54 35.0 1.004	48.6	55 04.9 1.004	48.6	55 34.8 1.004	48.5	57 04.6 1.004	48.3	57 34.5 1.004	48.2	8
9	52 32.9 1.004	47.9	53 02.9 1.004	47.9	54 02.7 1.004	47.7	54 32.7 1.004	47.7	55 02.6 1.004	47.6	55 32.5 1.004	47.6	57 02.3 1.004	47.4	57 32.2 1.004	47.3	9
130	52 30.6 1.004	47.0	53 00.6 1.004	46.9	54 00.4 1.004	46.8	54 30.4 1.004	46.7	55 00.3 1.004	46.7	55 30.2 1.004	46.6	57 00.0 1.004	46.4	57 29.9 1.004	46.4	130
1	52 28.4 1.004	46.0	52 58.3 1.004	46.0	53 58.1 1.004	45.8	54 28.1 1.004	45.8	54 58.0 1.004	45.7	55 27.9 1.004	45.7	56 57.7 1.004	45.5	57 27.6 1.004	45.4	1
2	52 26.1 1.004	45.1	52 56.0 1.004	45.0	53 55.9 1.004	44.9	54 25.9 1.004	44.8	54 55.8 1.004	44.8	55 25.7 1.004	44.7	56 55.5 1.004	44.5	57 25.4 1.004	44.5	2
3	52 23.9 1.004	44.1	52 53.8 1.004	44.1	53 53.7 1.004	43.9	54 23.7 1.004	43.9	54 53.6 1.004	43.8	55 23.5 1.004	43.8	56 53.3 1.004	43.6	57 23.2 1.004	43.5	3
4	52 21.7 1.004	43.2	52 51.7 1.004	43.1	53 51.6 1.004	43.0	54 21.5 1.004	42.9	54 51.4 1.004	42.9	55 21.4 1.004	42.8	56 51.2 1.004	42.7	57 21.1 1.004	42.6	4
135	52 19.6 1.003	42.2	52 49.6 1.003	42.2	53 49.4 1.003	42.1	54 19.4 1.003	42.0	54 49.3 1.003	41.9	55 19.3 1.003	41.9	56 49.1 1.003	41.7	57 19.0 1.003	41.7	135
6	52 17.5 1.003	41.3	52 47.5 1.003	41.2	53 47.4 1.003	41.1	54 17.3 1.003	41.1	54 47.2 1.003	41.0	55 17.2 1.003	41.0	56 47.0 1.003	40.8	57 16.9 1.003	40.7	6
7	52 15.5 1.003	40.3	52 45.4 1.003	40.3	53 45.3 1.003	40.2	54 15.3 1.003	40.1	54 45.2 1.003	40.1	55 15.1 1.003	40.0	56 45.0 1.003	39.8	57 14.9 1.003	39.8	7
8	52 13.5 1.003	39.4	52 43.4 1.003	39.3	53 43.3 1.003	39.2	54 13.2 1.003	39.2	54 43.2 1.003	39.1	55 13.1 1.003	39.1	56 43.0 1.003	38.9	57 12.9 1.003	38.8	8
9	52 11.5 1.003	38.4	52 41.4 1.003	38.4	53 41.3 1.003	38.3	54 11.3 1.003	38.2	54 41.2 1.003	38.2	55 11.2 1.003	38.1	56 41.0 1.003	38.0	57 11.0 1.003	37.9	9
140	52 09.6 1.003	37.5	52 39.5 1.003	37.4	53 39.4 1.003	37.3	54 09.4 1.003	37.3	54 39.3 1.003	37.2	55 09.3 1.003	37.2	56 39.1 1.003	37.0	57 09.1 1.003	37.0	140
1	52 07.7 1.003	36.5	52 37.6 1.003	36.5	53 37.5 1.003	36.4	54 07.5 1.003	36.4	54 37.4 1.003	36.3	55 07.4 1.003	36.3	56 37.2 1.003	36.1	57 07.2 1.003	36.0	1
2	52 05.8 1.003	35.6	52 35.8 1.003	35.5	53 35.7 1.003	35.5	54 05.6 1.003	35.4	54 35.6 1.003	35.4	55 05.5 1.003	35.3	56 35.4 1.003	35.2	57 05.3 1.003	35.1	2
3	52 04.0 1.003	34.6	52 34.0 1.003	34.6	53 33.9 1.003	34.5	54 03.8 1.003	34.5	54 33.8 1.003	34.4	55 03.8 1.003	34.4	56 33.6 1.003	34.2	57 03.6 1.003	34.2	3
4	52 02.2 1.003	33.7	52 32.2 1.003	33.7	53 32.1 1.003	33.6	54 02.1 1.003	33.5	54 32.0 1.003	33.5	55 02.0 1.003	33.4	56 31.9 1.003	33.3	57 01.8 1.003	33.2	4
145	52 00.5 1.003	32.8	52 30.4 1.003	32.8	53 30.4 1.003	32.6	54 00.4 1.003	32.6	54 30.3 1.003	32.5	55 00.3 1.003	32.5	56 30.2 1.003	32.4	57 00.1 1.003	32.3	145
6	51 58.8 1.003	31.8	52 28.8 1.003	31.8	53 28.7 1.003	31.7	53 58.7 1.003	31.7	54 28.7 1.003	31.6	54 58.6 1.003	31.6	56 28.5 1.003	31.4	56 58.5 1.003	31.4	6
7	51 57.2 1.003	30.9	52 27.2 1.003	30.8	53 27.1 1.003	30.8	53 57.1 1.003	30.7	54 27.0 1.003	30.7	54 57.0 1.003	30.6	56 26.9 1.003	30.5	56 56.8 1.003	30.5	7
8	51 55.6 1.003	29.9	52 25.6 1.003	29.9	53 25.5 1.003	29.8	53 55.5 1.003	29.8	54 25.5 1.003	29.7	54 55.4 1.003	29.7	56 25.3 1.003	29.6	56 55.3 1.003	29.5	8
9	51 54.1 1.002	29.0	52 24.1 1.002	29.0	53 24.0 1.002	28.8	53 54.0 1.002	28.8	54 23.9 1.002	28.8	54 53.9 1.002	28.8	56 23.8 1.002	28.6	56 53.8 1.002	28.6	9
150	51 52.5 1.002	28.1	52 22.6 1.002	28.0	53 22.5 1.002	27.9	53 52.5 1.002	27.9	54 22.4 1.002	27.9	54 52.4 1.002	27.8	56 22.3 1.002	27.7	56 52.3 1.002	27.7	150
1	51 51.1 1.002	27.1	52 21.1 1.002	27.1	53 21.0 1.002	27.0	53 51.0 1.002	27.0	54 21.0 1.002	26.9	54 51.0 1.002	26.9	56 20.9 1.002	26.8	56 50.8 1.002	26.7	1
2	51 49.7 1.002	26.2	52 19.7 1.002	26.1	53 19.6 1.002	26.1	53 49.6 1.002	26.0	54 19.6 1.002	26.0	54 49.6 1.002	26.0	56 19.5 1.002	25.9	56 49.4 1.002	25.8	2
3	51 48.4 1.002	25.2	52 18.3 1.002	25.2	53 18.3 1.002	25.1	53 48.3 1.002	25.1	54 18.2 1.002	25.1	54 48.2 1.002	25.0	56 18.1 1.002	24.9	56 48.1 1.002	24.9	3
4	51 47.0 1.002	24.3	52 17.0 1.002	24.3	53 17.0 1.002	24.2	53 47.0 1.002	24.2	54 16.9 1.002	24.1	54 46.9 1.002	24.1	56 16.8 1.002	24.0	56 46.8 1.002	24.0	4
155	51 45.8 1.002	23.4	52 15.8 1.002	23.3	53 15.7 1.002	23.3	53 45.7 1.002	23.2	54 15.7 1.002	23.2	54 45.6 1.002	23.2	56 15.6 1.002	23.1	56 45.6 1.002	23.0	155
6	51 44.5 1.002	22.4	52 14.5 1.002	22.4	53 14.5 1.002	22.3	53 44.5 1.002	22.3	54 14.5 1.002	22.3	54 44.4 1.002	22.2	56 14.4 1.002	22.1	56 44.3 1.002	22.1	6
7	51 43.4 1.002	21.5	52 13.4 1.002	21.5	53 13.3 1.002	21.4	53 43.3 1.002	21.4	54 13.3 1.002	21.3	54 43.3 1.002	21.3	56 13.2 1.002	21.2	56 43.2 1.002	21.2	7
8	51 42.2 1.002	20.5	52 12.2 1.002	20.5	53 12.2 1.002	20.5	53 42.2 1.002	20.4	54 12.2 1.002	20.4	54 42.2 1.002	20.4	56 12.1 1.002	20.3	56 42.1 1.002	20.3	8
9	51 41.2 1.002	19.6	52 11.2 1.002	19.6	53 11.1 1.002	19.5	53 41.1 1.002	19.5	54 11.1 1.002	19.5	54 41.1 1.002	19.5	56 11.0 1.002	19.4	56 41.0 1.002	19.3	9
160	51 40.1 1.002	18.7	52 10.1 1.002	18.7	53 10.1 1.002	18.6	53 40.1 1.002	18.6	54 10.1 1.002	18.6	54 40.1 1.002	18.5	56 10.0 1.002	18.5	56 40.0 1.002	18.4	160
1	51 39.2 1.002	17.7	52 09.1 1.002	17.7	53 09.1 1.002	17.7	53 39.1 1.002	17.6	54 09.1 1.002	17.6	54 39.1 1.002	17.6	56 09.0 1.002	17.5	56 39.0 1.002	17.5	1
2	51 38.2 1.001	16.8	52 08.2 1.001	16.8	53 08.2 1.001	16.7	53 38.2 1.001	16.7	54 08.2 1.001	16.7	54 38.2 1.001	16.7	56 08.1 1.001	16.6	56 38.1 1.001	16.6	2
3	51 37.3 1.001	15.9	52 07.3 1.001	15.9	53 07.3 1.001	15.8	53 37.3 1.001	15.8	54 07.3 1.001	15.8	54 37.3 1.001	15.7	56 07.3 1.001	15.7	56 37.2 1.001	15.6	3
4	51 36.5 1.001	14.9	52 06.5 1.001	14.9	53 06.5 1.001	14.9	53 36.5 1.001	14.9	54 06.5 1.001	14.8	54 36.5 1.001	14.8	56 06.4 1.001	14.7	56 36.4 1.001	14.7	4
165	51 35.7 1.001	14.0	52 05.7 1.001	14.0	53 05.7 1.001	13.9	53 35.7 1.001	13.9	54 05.7 1.001	13.9	54 35.7 1.001	13.9	56 05.7 1.001	13.8	56 35.6 1.001	13.8	165
6	51 35.0 1.001	13.1	52 05.0 1.001	13.0	53 05.0 1.001	13.0	53 35.0 1.001	13.0	54 05.0 1.001	13.0	54 34.9 1.001	13.0	56 04.9 1.001	12.9	56 34.9 1.001	12.9	6
7	51 34.3 1.001	12.1	52 04.3 1.001	12.1	53 04.3 1.001	12.1	53 34.3 1.001	12.1	54 04.3 1.001	12.1	54 34.3 1.001	12.0	56 04.2 1.001	12.0	56 34.2 1.001	12.0	7
8	51 33.7 1.001	11.2	52 03.7 1.001	11.2	53 03.7 1.001	11.2	53 33.7 1.001	11.1	54 03.6 1.001	11.1	54 33.6 1.001	11.1	56 03.6 1.001	11.1	56 33.6 1.001	11.0	8
9	51 33.1 1.001	10.3	52 03.1 1.001	10.3	53 03.1 1.001	10.3	53 33.1 1.001	10.2	54 03.1 1.001	10.2	54 33.1 1.001	10.2	56 03.0 1.001	10.1	56 33.0 1.001	10.1	9
170	51 32.6 1.001	09.3	52 02.5 1.001	09.3	53 02.5 1.001	09.3	53 32.5 1.001	09.3	54 02.5 1.001	09.3	54 32.5 1.001	09.2	56 02.5 1.001	09.2	56 32.5 1.001	09.2	170
1	51 32.1 1.001	08.4	52 02.1 1.001	08.4	53 02.1 1.001	08.4	53 32.1 1.001	08.4	54 02.1 1.001	08.3	54 32.0 1.001	08.3	56 02.0 1.001	08.3	56 32.0 1.001	08.3	1
2	51 31.6 1.001	07.5	52 01.6 1.001	07.5	53 01.6 1.001	07.4	53 31.6 1.001	07.4	54 01.6 1.001	07.4	54 31.6 1.001	07.4	56 01.6 1.001	07.4	56 31.6 1.001	07.4	2
3	51 31.3 1.001	06.5	52 01.2 1.001	06.5	53 01.2 1.001	06.5	53 31.2 1.001	06.5	54 01.2 1.001	06.5	54 31.2 1.001	06.5	56 01.2 1.001	06.4	56 31.2 1.001	06.4	3
4	51 30.9 1.000	05.6	52 00.9 1.000	05.6	53 00.9 1.000	05.6	53 30.9 1.000	05.6	54 00.9 1.000	05.6	54 30.9 1.000	05.6	56 00.9 1.000	05.5	56 30.9 1.000	05.5	4
175	51 30.6 1.000	04.7	52 00.6 1.000	04.7	53 00.6 1.000	04.6	53 30.6 1.000	04.6	54 00.6 1.000	04.6	54 30.6 1.000	04.6	56 00.6 1.000	04.6	56 30.6 1.000	04.6	175
6	51 30.4 1.000	03.7	52 00.4 1.000	03.7	53 00.4 1.000	03.7	53 30.4 1.000	03.7	54 00.4 1.000	03.7	54 30.4 1.000	03.7	56 00.4 1.000	03.7	56 30.4 1.000	03.7	6
7	51 30.2 1.000	02.8	52 00.2 1.000	02.8	53 00.2 1.000	02.8	53 30.2 1.000	02.8	54 00.2 1.000	02.8	54 30.2 1.000	02.8	56 00.2 1.000	02.8	56 30.2 1.000	02.8	7
8	51 30.1 1.000	01.9	52 00.1 1.000	01.9	53 00.1 1.000	01.9	53 30.1 1.000	01.9	54 00.1 1.000	01.9	54 30.1 1.000	01.9	56 00.1 1.000	01.8	56 30.1 1.000	01.8	8
9	51 30.0 1.000	00.9	52 00.0 1.000	00.9	53 00.0 1.000	00.9	53 30.0 1.000	00.9	54 00.0 1.000	00.9	54 30.0 1.000	00.9	56 00.0 1.000	00.9	56 30.0 1.000	00.9	9
180	51 30.0 1.000	00.0	52 00.0 1.000	00.0	53 00.0 1.000	00.0	53 30.0 1.000	00.0	54 00.0 1.000	00.0	54 30.0 1.000	00.0	56 00.0	00.0	56 30.0	00.0	180

Lat. 87°

H.A.	60° 00' Alt	Δd Δt	Az	60° 30' Alt	Δd Δt	Az	62° 00' Alt	Δd Δt	Az	62° 30' Alt	Δd Δt	Az	63° 00' Alt	Δd Δt	Az	69° 00' Alt	Δd Δt	Az	69° 30' Alt	Δd Δt	Az	74° 30' Alt	Δd Δt	Az	H.A.
00	63 00.0	1.0 00	180.0	63 30.0	1.0 00	180.0	65 00.0	1.0 00	180.0	65 30.0	1.0 00	180.0	66 00.0	1.0 00	180.0	72 00.0	1.0 00	180.0	72 30.0	1.0 00	180.0	77 30.0	1.0 00	180.0	00
1	63 00.0	1.0 00	178.9	63 30.0	1.0 00	178.9	65 00.0	1.0 00	178.9	65 30.0	1.0 00	178.9	66 00.0	1.0 00	178.9	72 00.0	1.0 00	178.8	72 30.0	1.0 00	178.8	77 30.0	1.0 00	178.8	1
2	62 59.9	1.0 00	177.8	63 29.9	1.0 00	177.8	64 59.9	1.0 00	177.8	65 29.9	1.0 00	177.8	65 59.9	1.0 00	177.7	71 59.9	1.0 00	177.7	72 29.9	1.0 00	177.6	77 29.9	1.0 00	177.5	2
3	62 59.7	1.0 00	176.7	63 29.7	1.0 00	176.7	64 59.7	1.0 00	176.7	65 29.7	1.0 00	176.7	65 59.7	1.0 00	176.6	71 59.7	1.0 00	176.5	72 29.7	1.0 00	176.5	77 29.7	1.0 00	176.3	3
4	62 59.5	1.0 00	175.6	63 29.5	1.0 00	175.6	64 59.5	1.0 00	175.6	65 29.5	1.0 00	175.5	65 59.5	1.0 00	175.5	71 59.5	1.0 00	175.4	72 29.5	1.0 00	175.3	77 29.5	1.0 01	175.1	4
05	62 59.2	1.0 01	174.5	63 29.2	1.0 01	174.5	64 59.2	1.0 01	174.4	65 29.2	1.0 01	174.4	65 59.2	1.0 01	174.4	71 59.2	1.0 01	174.2	72 29.2	1.0 01	174.2	77 29.2	1.0 01	173.8	05
6	62 58.9	1.0 01	173.4	63 28.9	1.0 01	173.4	64 58.9	1.0 01	173.3	65 28.9	1.0 01	173.3	65 58.9	1.0 01	173.3	71 58.9	1.0 01	173.0	72 28.8	1.0 01	173.0	77 28.8	1.0 01	172.6	6
7	62 58.5	1.0 01	172.3	63 28.5	1.0 01	172.3	64 58.5	1.0 01	172.2	65 28.5	1.0 01	172.2	65 58.5	1.0 01	172.2	71 58.4	1.0 01	171.9	72 28.4	1.0 01	171.9	77 28.3	1.0 01	171.4	7
8	62 58.1	1.0 01	171.2	63 28.1	1.0 01	171.2	64 58.1	1.0 01	171.1	65 28.1	1.0 01	171.1	65 58.0	1.0 01	171.1	71 58.0	1.0 01	170.7	72 28.0	1.0 01	170.7	77 27.8	1.0 01	170.1	8
9	62 57.6	1.0 01	170.1	63 27.6	1.0 01	170.1	64 57.5	1.0 01	170.0	65 27.5	1.0 01	170.0	65 57.5	1.0 01	170.0	71 57.4	1.0 01	169.6	72 27.4	1.0 01	169.5	77 27.3	1.0 01	168.9	9
10	62 57.0	1.0 01	169.0	63 27.0	1.0 01	169.0	64 57.0	1.0 01	168.9	65 27.0	1.0 01	168.9	65 57.0	1.0 01	168.8	71 56.8	1.0 01	168.4	72 26.8	1.0 01	168.4	77 26.6	1.0 01	167.7	10
1	62 56.4	1.0 01	167.9	63 26.4	1.0 01	167.9	64 56.3	1.0 01	167.8	65 26.3	1.0 01	167.8	65 56.3	1.0 01	167.7	71 56.2	1.0 01	167.3	72 26.2	1.0 01	167.2	77 25.9	1.0 01	166.4	1
2	62 55.7	1.0 01	166.8	63 25.7	1.0 01	166.8	64 55.6	1.0 01	166.7	65 25.6	1.0 01	166.7	65 55.6	1.0 01	166.6	71 55.4	1.0 01	166.1	72 25.4	1.0 01	166.0	77 25.2	1.0 01	165.2	2
3	62 54.9	1.0 01	165.7	63 24.9	1.0 01	165.7	64 54.9	1.0 01	165.6	65 24.9	1.0 01	165.5	65 54.9	1.0 01	165.5	71 54.7	1.0 01	165.0	72 24.6	1.0 01	164.9	77 24.3	1.0 02	164.0	3
4	62 54.1	1.0 01	164.6	63 24.1	1.0 01	164.6	64 54.1	1.0 01	164.5	65 24.1	1.0 01	164.4	65 54.0	1.0 01	164.4	71 53.8	1.0 02	163.8	72 23.8	1.0 02	163.7	77 23.4	1.0 02	162.8	4
15	62 53.3	1.0 02	163.5	63 23.2	1.0 02	163.5	64 53.2	1.0 02	163.4	65 23.2	1.0 02	163.3	65 53.2	1.0 02	163.3	71 52.9	1.0 02	162.6	72 22.9	1.0 02	162.6	77 22.5	1.0 02	161.6	15
6	62 52.3	1.0 02	162.4	63 22.3	1.0 02	162.4	64 52.3	1.0 02	162.2	65 22.3	1.0 02	162.2	65 52.2	1.0 02	162.2	71 51.9	1.0 02	161.5	72 21.9	1.0 02	161.4	77 21.4	1.0 02	160.3	6
7	62 51.4	1.0 02	161.3	63 21.3	1.0 02	161.3	64 51.3	1.0 02	161.2	65 21.3	1.0 02	161.1	65 51.3	1.0 02	161.1	71 50.9	1.0 02	160.3	72 20.9	1.0 02	160.3	77 20.4	1.0 02	159.1	7
8	62 50.3	1.0 02	160.2	63 20.3	1.0 02	160.2	64 50.2	1.0 02	160.1	65 20.2	1.0 02	160.0	65 50.2	1.0 02	160.0	71 49.8	1.0 02	159.2	72 19.8	1.0 02	159.1	77 19.2	1.0 02	157.9	8
9	62 49.2	1.0 02	159.1	63 19.2	1.0 02	159.1	64 49.1	1.0 02	158.9	65 19.1	1.0 02	158.9	65 49.1	1.0 02	158.8	71 48.7	1.0 02	158.1	72 18.6	1.0 02	158.0	77 18.0	1.0 02	156.7	9
20	62 48.1	1.0 02	158.0	63 18.1	1.0 02	158.0	64 48.0	1.0 02	157.8	65 18.0	1.0 02	157.8	65 47.9	1.0 02	157.7	71 47.5	1.0 02	156.9	72 17.4	1.0 02	156.8	77 16.7	1.0 02	155.5	20
1	62 46.9	1.0 02	156.9	63 16.9	1.0 02	156.9	64 46.8	1.0 02	156.7	65 16.8	1.0 02	156.7	65 46.7	1.0 02	156.6	71 46.2	1.0 02	155.8	72 16.2	1.0 02	155.7	77 15.4	1.0 03	154.3	1
2	62 45.6	1.0 02	155.8	63 15.6	1.0 02	155.8	64 45.5	1.0 02	155.6	65 15.5	1.0 02	155.6	65 45.4	1.0 02	155.5	71 44.9	1.0 02	154.6	72 14.8	1.0 02	154.5	77 14.0	1.0 02	153.1	2
3	62 44.3	1.0 02	154.8	63 14.3	1.0 02	154.7	64 44.2	1.0 02	154.5	65 14.2	1.0 02	154.5	65 44.1	1.0 02	154.4	71 43.5	1.0 02	153.5	72 13.5	1.0 02	153.4	77 12.5	1.0 02	151.9	3
4	62 43.0	1.0 02	153.7	63 12.9	1.0 02	153.6	64 42.8	1.0 02	153.4	65 12.8	1.0 02	153.4	65 42.7	1.0 02	153.3	71 42.1	1.0 02	152.3	72 12.0	1.0 02	152.2	77 11.0	1.0 03	150.7	4
25	62 41.5	1.0 02	152.6	63 11.5	1.0 02	152.5	64 41.4	1.0 02	152.3	65 11.3	1.0 02	152.3	65 41.3	1.0 02	152.2	71 40.6	1.0 03	151.2	72 10.5	1.0 03	151.1	77 09.5	1.0 03	149.5	25
6	62 40.0	1.0 03	151.5	63 10.0	1.0 03	151.4	64 39.9	1.0 03	151.3	65 09.9	1.0 03	151.2	65 39.8	1.0 03	151.1	71 39.1	1.0 03	150.1	72 09.0	1.0 03	149.9	77 07.8	99 03	148.3	6
7	62 38.5	1.0 03	150.4	63 08.5	1.0 03	150.3	64 38.4	1.0 03	150.2	65 08.3	1.0 03	150.1	65 38.3	1.0 03	150.0	71 37.5	1.0 03	148.9	72 07.4	1.0 03	148.8	77 06.2	99 03	147.1	7
8	62 37.0	1.0 03	149.3	63 06.9	1.0 03	149.3	64 36.8	1.0 03	149.1	65 06.7	1.0 03	149.0	65 36.7	1.0 03	148.9	71 35.8	1.0 03	147.8	72 05.7	1.0 03	147.7	77 04.4	99 03	145.9	8
9	62 35.3	1.0 03	148.2	63 05.3	1.0 03	148.2	64 35.1	1.0 03	148.0	65 05.1	1.0 03	147.9	65 35.0	1.0 03	147.8	71 34.1	1.0 03	146.7	72 04.0	1.0 03	146.5	77 02.6	99 03	144.7	9
30	62 33.6	1.0 03	147.1	63 03.6	1.0 03	147.1	64 33.4	1.0 03	146.9	65 03.4	1.0 03	146.8	65 33.3	1.0 03	146.7	71 32.4	1.0 03	145.5	72 02.3	1.0 03	145.4	77 00.8	99 03	143.5	30
1	62 31.9	1.0 03	146.1	63 01.9	1.0 03	146.0	64 31.7	1.0 03	145.7	65 01.6	1.0 03	145.7	65 31.6	1.0 03	145.6	71 30.6	1.0 03	144.3	72 00.5	1.0 03	144.3	76 58.9	99 03	142.3	1
2	62 30.1	1.0 03	145.0	63 00.1	1.0 03	144.9	64 29.9	1.0 03	144.7	64 59.8	1.0 03	144.6	65 29.8	1.0 03	144.5	71 28.7	1.0 03	143.3	71 58.6	1.0 03	143.1	76 57.0	99 03	141.2	2
3	62 28.3	1.0 03	143.9	62 58.3	1.0 03	143.8	64 28.1	1.0 03	143.6	64 58.0	1.0 03	143.5	65 27.9	1.0 03	143.5	71 26.8	1.0 03	142.2	71 56.7	1.0 03	142.0	76 55.0	99 03	140.0	3
4	62 26.4	1.0 03	142.8	62 56.4	1.0 03	142.8	64 26.2	1.0 03	142.5	64 56.1	1.0 03	142.4	65 26.0	1.0 03	142.4	71 24.9	1.0 03	141.0	71 54.7	1.0 03	140.9	76 52.9	99 03	138.8	4
35	62 24.5	1.0 03	141.7	62 54.5	1.0 03	141.7	64 24.3	1.0 03	141.4	64 54.2	1.0 03	141.4	65 24.1	1.0 03	141.3	71 22.9	1.0 03	139.9	71 52.7	1.0 03	139.8	76 50.8	99 04	137.7	35
6	62 22.6	1.0 03	140.7	62 52.5	1.0 03	140.6	64 22.3	1.0 03	140.3	64 52.2	1.0 03	140.3	65 22.1	1.0 03	140.2	71 20.8	1.0 04	138.8	71 50.7	1.0 04	138.7	76 48.7	99 04	136.5	6
7	62 20.5	1.0 03	139.6	62 50.5	1.0 03	139.5	64 20.3	1.0 03	139.3	64 50.2	1.0 03	139.2	65 20.1	1.0 03	139.1	71 18.7	1.0 04	137.7	71 48.6	99 04	137.5	76 46.5	99 04	135.3	7
8	62 18.5	1.0 04	138.5	62 48.4	1.0 04	138.4	64 18.2	1.0 04	138.2	64 48.1	1.0 04	138.1	65 18.0	1.0 04	138.0	71 16.6	99 04	136.6	71 46.5	99 04	136.4	76 44.3	99 04	134.2	8
9	62 16.4	1.0 04	137.4	62 46.3	1.0 04	137.4	64 16.1	1.0 04	137.1	64 46.0	1.0 04	137.0	65 15.9	1.0 04	136.9	71 14.4	99 04	135.5	71 44.3	99 04	135.3	76 42.0	99 04	133.0	9
40	62 14.2	1.0 04	136.4	62 44.2	1.0 04	136.3	64 13.9	1.0 04	136.0	64 43.8	1.0 04	135.9	65 13.7	1.0 04	135.9	71 12.2	99 04	134.4	71 42.0	99 04	134.2	76 39.7	99 04	131.9	40
1	62 12.0	1.0 04	135.3	62 42.0	1.0 04	135.2	64 11.7	1.0 04	135.0	64 41.6	1.0 04	134.8	65 11.5	1.0 04	134.8	71 09.9	99 04	133.3	71 39.8	99 04	133.1	76 37.3	99 04	130.7	1
2	62 09.8	1.0 04	134.2	62 39.7	1.0 04	134.2	64 09.5	1.0 04	133.9	64 39.4	1.0 04	133.8	65 09.3	1.0 04	133.7	71 07.6	99 04	132.2	71 37.4	99 04	132.0	76 34.9	99 04	129.6	2
3	62 07.6	1.0 04	133.2	62 37.5	1.0 04	133.1	64 07.2	1.0 04	132.8	64 37.1	1.0 04	132.7	65 07.0	1.0 04	132.6	71 05.3	99 04	131.1	71 35.1	99 04	130.9	76 32.5	99 04	128.5	3
4	62 05.2	1.0 04	132.1	62 35.1	1.0 04	132.0	64 04.9	1.0 04	131.7	64 34.7	1.0 04	131.6	65 04.6	1.0 04	131.5	71 02.9	99 04	130.0	71 32.7	99 04	129.8	76 30.0	99 04	127.3	4
45	62 02.9	1.0 04	131.0	62 32.8	1.0 04	131.0	64 02.5	1.0 04	130.7	64 32.4	1.0 04	130.6	65 02.2	1.0 04	130.5	71 00.5	99 04	128.9	71 30.3	99 04	128.7	76 27.5	99 04	126.2	45
6	62 00.5	1.0 04	130.0	62 30.4	1.0 04	129.9	64 00.1	1.0 04	129.6	63 59.9	1.0 04	129.5	64 59.9	1.0 04	129.4	70 58.0	99 04	127.8	71 27.8	99 04	127.6	76 24.9	99 04	125.1	6
7	61 58.1	1.0 04	128.9	62 28.0	1.0 04	128.8	63 57.7	1.0 04	128.5	64 27.5	1.0 04	128.4	64 57.4	1.0 04	128.3	70 55.5	99 04	126.7	71 25.3	99 04	126.5	76 22.4	99 04	123.9	7
8	61 55.6	1.0 04	127.9	62 25.5	1.0 04	127.8	63 55.2	1.0 04	127.5	64 25.1	1.0 04	127.4	64 54.9	1.0 04	127.3	70 53.0	99 04	125.6	71 22.8	99 04	125.4	76 19.7	99 04	122.8	8
9	61 53.1	1.0 04	126.8	62 23.0	1.0 04	126.7	63 52.7	1.0 04	126.4	64 22.5	1.0 04	126.3	64 52.3	1.0 04	126.2	70 50.4	99 04	124.5	71 20.2	99 04	124.3	76 17.1	99 04	121.7	9
50	61 50.6	1.0 04	125.7	62 20.5	1.0 04	125.6	63 50.1	1.0 04	125.4	64 20.0	1.0 04	125.2	64 49.9	1.0 04	125.1	70 47.8	99 04	123.4	71 17.6	99 04	123.2	76 14.4	99 05	120.6	50
1	61 48.0	1.0 04	124.7	62 17.9	1.0 04	124.6	63 47.5	1.0 04	124.3	64 17.4	1.0 04	124.2	64 47.3	1.0 04	124.1	70 45.2	99 04	122.3	71 14.9	99 04	122.2	76 11.7	99 05	119.5	1
2	61 45.4	1.0 04	123.6	62 15.3	1.0 04	123.5	63 44.9	1.0 04	123.2	64 14.8	1.0 04	123.1	64 44.7	1.0 04	123.0	70 42.5	99 05	121.3	71 12.2	99 04	121.1	76 08.9	99 05	118.4	2
3	61 42.8	1.0 04	122.6	62 12.7	1.0 04	122.5	63 42.3	1.0 04	122.2	64 12.2	1.0 04	122.1	64 42.0	1.0 04	122.0	70 39.8	99 05	120.2	71 09.5	99 05	120.0	76 06.2	99 05	117.3	3
4	61 40.1	1.0 04	121.5	62 10.0	1.0 04	121.4	63 39.6	1.0 04	121.1	64 09.5	1.0 04	121.0	64 39.3	1.0 04	121.0	70 37.1	99 05	119.1	71 06.8	99 05	118.9	76 03.3	99 05	116.2	4
55	61 37.4	1.0 05	120.5	62 07.3	1.0 05	120.4	63 36.9	1.0 05	120.1	64 06.8	1.0 05	120.0	64 36.6	1.0 05	119.9	70 34.3	99 05	118.0	71 04.0	99 05	117.8	76 00.5	99 05	115.1	55
6	61 34.7	1.0 05	119.4	62 04.6	1.0 05	119.3	63 34.2	1.0 05	119.0	64 04.0	1.0 05	118.9	64 33.9	1.0 05	118.8	70 31.5	99 05	117.0	71 01.3	99 05	116.8	75 57.7	99 05	114.0	6
7	61 32.0	1.0 05	118.4	62 01.8	1.0 05	118.3	63 31.4	1.0 05	118.0	64 01.3	1.0 05	117.9	64 31.1	1.0 05	117.7	70 28.7	99 05	115.9	70 58.4	99 05	115.7	75 54.8	99 05	113.0	7
8	61 29.2	1.0 05	117.3	61 59.1	1.0 05	117.2	63 28.6	1.0 05	116.9	63 58.5	1.0 05	116.8	64 28.3	1.0 05	116.7	70 25.9	99 05	114.9	70 55.6	99 05	114.7	75 51.9	99 05	111.9	8
9	61 26.4	1.0 05	116.3	61 56.3	1.0 05	116.2	63 25.8	99 05	115.8	63 55.7	99 05	115.8	64 25.5	99 05	115.7	70 23.0	99 05	113.8	70 52.7	99 05	113.6	75 49.0	99 05	110.8	9
60	61 23.6	1.0 05	115.3	61 53.4	1.0 05	115.2	63 23.0	99 05	114.8	63 52.8	99 05	114.7	64 22.7	99 05	114.6	70 20.1	99 05	112.7	70 49.8	99 05	112.5	75 46.0	99 05	109.7	60
1	61 20.7	1.0 05	114.2	61 50.6	1.0 05	114.1	63 20.1	99 05	113.8	63 50.0	99 05	113.7	64 19.8	99 05	113.6	70 17.2	99 05	111.7	70 46.9	99 05	111.5	75 43.0	99 05	108.7	1
2	61 17.8	1.0 05	113.2	61 47.7	1.0 05	113.1	63 17.2	99 05	112.8	63 47.1	99 05	112.6	64 16.9	99 05	112.5	70 14.3	99 05	110.6	70 44.0	99 05	110.4	75 40.1	98 05	107.6	2
3	61 14.9	1.0 05	112.2	61 44.8	1.0 05	112.0	63 14.3	99 05	111.7	63 44.2	99 05	111.6	64 14.0	99 05	111.5	70 11.3	99 05	109.6	70 41.0	99 05	109.4	75 37.1	98 05	106.5	3
4	61 12.0	1.0 05	111.1	61 41.9	1.0 05	111.0	63 11.4	99 05	110.7	63 41.2	99 05	110.6	64 11.1	99 05	110.4	70 08.4	99 05	108.5	70 38.1	99 05	108.3	75 34.0	98 05	105.5	4
65	61 09.1	1.0 05	110.1	61 38.9	99 05	110.0	63 08.5	99 05	109.6	63 38.3	99 05	109.5	64 08.1	99 05	109.4	70 05.4	99 05	107.5	70 35.1	99 05	107.3	75 31.0	98 05	104.4	65
6	61 06.1	1.0 05	109.1	61 36.0	99 05	109.0	63 05.5	99 05	108.6	63 35.3	99 05	108.5	64 05.1	99 05	108.4	70 02.4	99 05	106.5	70 32.1	99 05	106.2	75 28.0	98 05	103.4	6
7	61 03.1	1.0 05	108.0	61 33.0	99 05	107.9	63 02.5	99 05	107.6	63 32.3	99 05	107.5	64 02.2	99 05	107.3	69 59.4	99 05	105.4	70 29.0	99 05	105.2	75 24.9	98 05	102.3	7
8	61 00.0	1.0 05	107.0	61 30.0	99 05	106.9	62 59.5	99 05	106.6	63 29.3	99 05	106.4	63 59.2	99 05	106.3	69 56.3	99 05	104.4	70 26.0	99 05	104.2	75 21.8	98 05	101.3	8
9	60 57.1	99 05	106.0	61 27.0	99 05	105.9	62 56.5	99 05	105.5	63 26.3	99 05	105.4	63 56.1	99 05	105.3	69 53.3	99 05	103.4	70 23.0	99 05	103.1	75 18.7	98 05	100.3	9
70	60 54.1	99 05	104.9	61 24.0	99 05	104.8	62 53.5	99 05	104.5	63 23.3	99 05	104.4	63 53.1	99 05	104.3	69 50.2	99 05	102.3	70 19.9	99 05	102.1	75 15.6	98 05	99.2	70
1	60 51.1	99 05	103.9	61 20.9	99 05	103.8	62 50.4	99 05	103.5	63 20.2	99 05	103.4	63 50.0	99 05	103.2	69 47.1	99 05	101.3	70 16.8	99 05	101.1	75 12.5	98 05	98.2	1
2	60 48.0	99 05	102.9	61 17.9	99 05	102.8	62 47.4	99 05	102.5	63 17.2	99 05	102.3	63 47.0	99 05	102.2	69 44.1	99 05	100.3	70 13.7	99 05	100.1	75 09.4	98 05	97.2	2
3	60 45.0	99 05	101.9	61 14.8	99 05	101.8	62 44.3	99 05	101.4	63 14.1	99 05	101.3	63 43.9	99 05	101.2	69 41.0	99 05	99.2	70 10.6	99 05	99.0	75 06.3	98 05	96.2	3
4	60 41.9	99 05	100.9	61 11.7	99 05	100.8	62 41.2	99 05	100.4	63 11.0	99 05	100.3	63 40.8	99 05	100.2	69 37.9	99 05	98.2	70 07.5	99 05	98.0	75 03.2	98 05	95.1	4
75	60 38.8	99 05	99.9	61 08.6	99 05	99.8	62 38.1	99 05	99.4	63 07.9	99 05	99.3	63 37.7	99 05	99.2	69 34.8	99 05	97.2	70 04.4	99 05	97.0	75 00.1	98 05	94.1	75
6	60 35.7	99 05	98.8	61 05.5	99 05	98.7	62 35.0	99 05	98.4	63 04.8	99 05	98.3	63 34.6	99 05	98.1	69 31.6	99 05	96.2	70 01.3	99 05	96.0	74 56.9	98 05	93.1	6
7	60 32.6	99 05	97.8	61 02.4	99 05	97.7	62 31.9	99 05	97.4	63 01.7	99 05	97.3	63 31.5	99 05	97.1	69 28.5	99 05	95.2	69 58.2	99 05	95.0	74 53.8	98 05	92.1	7
8	60 29.5	99 05	96.8	60 59.3	99 05	96.7	62 28.8	99 05	96.4	62 58.6	99 05	96.3	63 28.4	99 05	96.1	69 25.4	99 05	94.2	69 55.0	99 05	94.0	74 50.6	98 05	91.1	8
9	60 26.3	99 05	95.8	60 56.2	99 05	95.7	62 25.6	99 05	95.4	62 55.5	99 05	95.2	63 25.3	99 05	95.1	69 22.2	99 05	93.2	69 51.9	99 05	93.0	74 47.5	98 05	90.1	9
80	60 23.2	99 05	94.8	60 53.1	99 05	94.7	62 22.5	99 05	94.4	62 52.3	99 05	94.2	63 22.1	99 05	94.1	69 19.1	99 05	92.2	69 48.8	99 05	91.9	74 44.4	98 05	89.1	80
1	60 20.1	99 05	93.8	60 49.9	99 05	93.7	62 19.4	99 05	93.3	62 49.2	99 05	93.2	63 19.0	99 05	93.1	69 16.0	99 05	91.2	69 45.6	99 05	90.9	74 41.2	98 05	88.1	1
2	60 17.0	99 05	92.8	60 46.8	99 05	92.7	62 16.3	99 05	92.3	62 46.1	99 05	92.2	63 15.9	99 05	92.0	69 12.8	99 05	90.2	69 42.5	99 05	89.9	74 38.1	98 05	87.1	2
3	60 13.8	99 05	91.8	60 43.6	99 05	91.7	62 13.1	99 05	91.3	62 43.0	99 05	91.2	63 12.7	99 05	91.1	69 09.7	99 05	89.2	69 39.4	99 05	88.9	74 35.0	98 05	86.1	3
4	60 10.7	99 05	90.8	60 40.5	99 05	90.7	62 10.0	99 05	90.3	62 39.8	99 05	90.2	63 09.6	99 05	90.1	69 06.5	99 05	88.2	69 36.2	99 05	88.0	74 31.8	98 05	85.2	4
85	60 07.5	99 05	89.8	60 37.4	99 05	89.7	62 06.8	99 05	89.3	62 36.6	99 05	89.2	63 06.4	99 05	89.1	69 03.4	99 05	87.2	69 33.1	99 05	87.0	74 28.7	98 05	84.2	85
6	60 04.4	99 05	88.8	60 34.2	99 05	88.7	62 03.7	99 05	88.3	62 33.5	99 05	88.2	63 03.3	99 05	88.1	69 00.3	99 05	86.2	69 30.0	99 05	86.0	74 25.6	98 05	83.2	6
7	60 01.3	99 05	87.8	60 31.1	99 05	87.7	62 00.6	99 05	87.3	62 30.4	99 05	87.2	63 00.2	99 05	87.1	68 57.1	99 05	85.2	69 26.8	99 05	85.0	74 22.5	98 05	82.2	7
8	59 58.1	99 05	86.8	60 28.0	99 05	86.7	61 57.4	99 05	86.4	62 27.2	99 05	86.2	62 57.0	99 05	86.1	68 54.0	99 05	84.2	69 23.7	99 05	84.0	74 19.4	98 05	81.2	8
9	59 55.0	99 05	85.8	60 24.8	99 05	85.7	61 54.3	99 05	85.4	62 24.1	99 05	85.2	62 53.9	99 05	85.1	68 50.9	99 05	83.2	69 20.6	99 05	83.0	74 16.3	98 05	80.3	9
90	59 51.9	99 05	84.8	60 21.7	99 05	84.7	61 51.2	99 05	84.4	62 21.0	99 05	84.3	62 50.8	99 05	84.1	68 47.8	99 05	82.2	69 17.5	99 05	82.0	74 13.2	98 05	79.3	90

Lat. 87°

H.A.	60° 00' Alt. Δd Δt	Az.	60° 30' Alt. Δd Δt	Az.	62° 00' Alt. Δd Δt	Az.	62° 30' Alt. Δd Δt	Az.	63° 00' Alt. Δd Δt	Az.	69° 00' Alt. Δd Δt	Az.	69° 30' Alt. Δd Δt	Az.	74° 30' Alt. Δd Δt	Az.	H.A.
91	59 48.7 99 05	83.8	60 18.6 99 05	83.7	61 48.0 99 05	83.4	62 17.8 99 05	83.3	62 47.7 99 05	83.1	68 44.7 99 05	81.3	69 14.4 99 05	81.1	74 10.1 98 05	78.4	91
2	59 45.6 99 05	82.8	60 15.4 99 05	82.7	61 44.9 99 05	82.4	62 14.7 99 05	82.3	62 44.5 99 05	82.2	68 41.6 99 05	80.3	69 11.3 99 05	80.1	74 07.0 98 05	77.4	2
3	59 42.5 99 05	81.9	60 12.3 99 05	81.8	61 41.8 99 05	81.4	62 11.6 99 05	81.3	62 41.4 99 05	81.2	68 38.5 99 05	79.3	69 08.2 99 05	79.1	74 04.0 98 05	76.4	3
4	59 39.4 99 05	80.9	60 09.2 99 05	80.8	61 38.7 99 05	80.4	62 08.5 99 05	80.3	62 38.3 99 05	80.2	68 35.4 99 05	78.3	69 05.1 99 05	78.1	74 00.9 98 05	75.5	4
95	59 36.3 99 05	79.9	60 06.1 99 05	79.8	61 35.6 99 05	79.5	62 05.4 99 05	79.3	62 35.2 99 05	79.2	68 32.3 99 05	77.4	69 02.0 99 05	77.2	73 57.9 98 05	74.5	95
6	59 33.2 99 05	78.9	60 03.1 99 05	78.8	61 32.5 99 05	78.5	62 02.4 99 05	78.4	62 32.2 99 05	78.2	68 29.3 99 05	76.4	68 59.0 99 05	76.2	73 54.9 98 05	73.6	6
7	59 30.1 99 05	77.9	60 00.0 99 05	77.8	61 29.5 99 05	77.5	61 59.3 99 05	77.4	62 29.1 99 05	77.3	68 26.2 99 05	75.4	68 55.9 99 05	75.2	73 51.8 98 05	72.6	7
8	59 27.1 99 05	76.9	59 56.9 99 05	76.8	61 26.4 99 05	76.5	61 56.2 99 05	76.4	62 26.0 99 05	76.3	68 23.2 99 05	74.5	68 52.9 99 05	74.3	73 48.8 98 05	71.7	8
9	59 24.0 99 05	76.0	59 53.9 99 05	75.9	61 23.4 99 05	75.5	61 53.2 99 05	75.4	62 23.0 99 05	75.3	68 20.2 99 05	73.5	68 49.9 99 05	73.3	73 45.9 98 05	70.7	9
100	59 21.0 99 05	75.0	59 50.8 99 05	74.9	61 20.3 99 05	74.6	61 50.2 99 05	74.5	62 20.0 99 05	74.3	68 17.2 99 05	72.5	68 46.9 99 05	72.3	73 42.9 98 05	69.8	100
1	59 18.0 99 05	74.0	59 47.8 99 05	73.9	61 17.3 99 05	73.6	61 47.1 99 05	73.5	62 17.0 99 05	73.4	68 14.2 99 05	71.6	68 43.9 99 05	71.4	73 40.0 98 05	68.9	1
2	59 14.9 99 05	73.0	59 44.8 99 05	72.9	61 14.3 99 05	72.6	61 44.1 99 05	72.5	62 14.0 99 05	72.4	68 11.2 99 05	70.6	68 40.9 99 05	70.4	73 37.1 98 05	67.9	2
3	59 11.9 1.0 05	72.1	59 41.8 99 05	72.0	61 11.3 99 05	71.7	61 41.1 99 05	71.5	62 11.0 99 05	71.4	68 08.3 99 05	69.7	68 38.0 99 05	69.5	73 34.2 98 05	67.0	3
4	59 09.0 1.0 05	71.1	59 38.8 99 05	71.0	61 08.3 99 05	70.7	61 38.2 99 05	70.6	62 08.0 99 05	70.5	68 05.3 99 05	68.7	68 35.0 99 05	68.5	73 31.3 98 05	66.1	4
105	59 06.0 1.0 05	70.1	59 35.9 99 05	70.0	61 05.4 99 05	69.7	61 35.2 99 05	69.6	62 05.0 99 05	69.5	68 02.4 99 05	67.8	68 32.1 99 05	67.6	73 28.4 98 05	65.2	105
6	59 03.1 1.0 05	69.2	59 32.9 1.0 05	69.1	61 02.4 99 05	68.8	61 32.3 99 05	68.6	62 02.1 99 05	68.5	67 59.5 99 05	66.8	68 29.2 99 05	66.6	73 25.6 98 05	64.2	6
7	59 00.1 1.0 05	68.2	59 30.0 1.0 05	68.1	60 59.5 99 05	67.8	61 29.4 99 05	67.7	61 59.2 99 05	67.6	67 56.6 99 05	65.9	68 26.4 99 05	65.7	73 22.8 98 05	63.3	7
8	58 57.2 1.0 05	67.2	59 27.1 1.0 05	67.1	60 56.6 99 05	66.8	61 26.5 99 05	66.7	61 56.3 99 05	66.6	67 53.8 99 05	64.9	68 23.5 99 05	64.7	73 20.0 98 05	62.4	8
9	58 54.3 1.0 05	66.3	59 24.2 1.0 05	66.2	60 53.8 99 05	65.9	61 23.6 99 05	65.8	61 53.4 99 05	65.7	67 51.0 99 05	64.0	68 20.7 99 05	63.8	73 17.2 98 05	61.5	9
110	58 51.5 1.0 05	65.3	59 21.3 1.0 05	65.2	60 50.9 99 05	64.9	61 20.8 99 05	64.8	61 50.6 99 05	64.7	67 48.1 99 05	63.0	68 17.9 99 05	62.9	73 14.5 98 04	60.6	110
1	58 48.6 1.0 05	64.3	59 18.5 1.0 05	64.2	60 48.1 99 05	64.0	61 17.9 99 05	63.8	61 47.8 99 05	63.7	67 45.4 99 05	62.1	68 15.1 99 05	61.9	73 11.7 99 04	59.7	1
2	58 45.8 1.0 05	63.4	59 15.7 1.0 05	63.3	60 45.3 1.0 05	63.0	61 15.1 99 05	62.9	61 45.0 99 05	62.8	67 42.6 99 05	61.2	68 12.3 99 05	61.0	73 09.0 99 04	58.7	2
3	58 43.0 1.0 05	62.4	59 12.9 1.0 05	62.3	60 42.5 1.0 05	62.0	61 12.3 99 05	61.9	61 42.2 99 05	61.8	67 39.9 99 05	60.2	68 09.6 99 04	60.1	73 06.4 99 04	57.8	3
4	58 40.3 1.0 05	61.5	59 10.1 1.0 05	61.4	60 39.7 1.0 05	61.1	61 09.6 99 05	61.0	61 39.4 99 05	60.9	67 37.1 99 04	59.3	68 06.9 99 04	59.1	73 03.7 99 04	56.9	4
115	58 37.5 1.0 05	60.5	59 07.4 1.0 05	60.4	60 37.0 1.0 05	60.1	61 06.8 1.0 04	60.0	61 36.7 1.0 04	59.9	67 34.5 99 04	58.4	68 04.2 99 04	58.2	73 01.1 99 04	56.0	115
6	58 34.8 1.0 04	59.5	59 04.7 1.0 04	59.5	60 34.3 1.0 04	59.2	61 04.1 1.0 04	59.1	61 34.0 1.0 04	59.0	67 31.8 99 04	57.4	68 01.6 99 04	57.3	72 58.5 99 04	55.1	6
7	58 32.1 1.0 04	58.6	59 02.0 1.0 04	58.5	60 31.6 1.0 04	58.2	61 01.4 1.0 04	58.1	61 31.3 1.0 04	58.0	67 29.2 99 04	56.5	67 58.9 99 04	56.3	72 56.0 99 04	54.2	7
8	58 29.4 1.0 04	57.6	58 59.3 1.0 04	57.6	60 28.9 1.0 04	57.3	60 58.8 1.0 04	57.2	61 28.7 1.0 04	57.1	67 26.6 99 04	55.6	67 56.3 99 04	55.4	72 53.4 99 04	53.3	8
9	58 26.8 1.0 04	56.7	58 56.7 1.0 04	56.6	60 26.3 1.0 04	56.4	60 56.2 1.0 04	56.2	61 26.0 1.0 04	56.1	67 24.0 99 04	54.7	67 53.8 99 04	54.5	72 50.9 99 04	52.4	9
120	58 24.2 1.0 04	55.7	58 54.1 1.0 04	55.7	60 23.7 1.0 04	55.4	60 53.6 1.0 04	55.3	61 23.4 1.0 04	55.2	67 21.4 99 04	53.7	67 51.2 99 04	53.6	72 48.4 99 04	51.5	120
1	58 21.6 1.0 04	54.8	58 51.5 1.0 04	54.7	60 21.1 1.0 04	54.4	60 51.0 1.0 04	54.3	61 20.9 1.0 04	54.3	67 18.9 99 04	52.8	67 48.7 99 04	52.6	72 46.0 99 04	50.6	1
2	58 19.0 1.0 04	53.8	58 48.9 1.0 04	53.8	60 18.6 1.0 04	53.5	60 48.5 1.0 04	53.4	61 18.3 1.0 04	53.3	67 16.4 99 04	51.9	67 46.2 99 04	51.7	72 43.6 99 04	49.8	2
3	58 16.5 1.0 04	52.9	58 46.4 1.0 04	52.8	60 16.1 1.0 04	52.6	60 46.0 1.0 04	52.5	61 15.8 1.0 04	52.4	67 14.0 99 04	51.0	67 43.8 99 04	50.8	72 41.2 99 04	48.9	3
4	58 14.0 1.0 04	51.9	58 43.9 1.0 04	51.9	60 13.6 1.0 04	51.6	60 43.5 1.0 04	51.5	61 13.4 1.0 04	51.4	67 11.6 99 04	50.0	67 41.4 99 04	49.9	72 38.9 99 04	48.0	4
125	58 11.6 1.0 04	51.0	58 41.5 1.0 04	50.9	60 11.2 1.0 04	50.7	60 41.1 1.0 04	50.6	61 10.9 1.0 04	50.5	67 09.2 99 04	49.1	67 39.0 99 04	49.0	72 36.5 99 04	47.1	125
6	58 09.2 1.0 04	50.1	58 39.1 1.0 04	50.0	60 08.8 1.0 04	49.7	60 38.6 1.0 04	49.6	61 08.5 1.0 04	49.6	67 06.8 99 04	48.2	67 36.6 99 04	48.1	72 34.3 99 04	46.2	6
7	58 06.8 1.0 04	49.1	58 36.7 1.0 04	49.0	60 06.4 1.0 04	48.8	60 36.3 1.0 04	48.7	61 06.2 1.0 04	48.6	67 04.5 99 04	47.3	67 34.3 99 04	47.1	72 32.0 99 04	45.3	7
8	58 04.4 1.0 04	48.2	58 34.3 1.0 04	48.1	60 04.0 1.0 04	47.9	60 33.9 1.0 04	47.8	61 03.8 1.0 04	47.7	67 02.2 99 04	46.4	67 32.0 99 04	46.2	72 29.8 99 04	44.4	8
9	58 02.1 1.0 04	47.2	58 32.0 1.0 04	47.1	60 01.7 1.0 04	46.9	60 31.6 1.0 04	46.8	61 01.5 1.0 04	46.7	66 59.9 99 04	45.4	67 29.8 99 04	45.3	72 27.6 99 04	43.6	9
130	57 59.8 1.0 04	46.3	58 29.7 1.0 04	46.2	59 59.4 1.0 04	46.0	60 29.3 1.0 04	45.9	60 59.2 1.0 04	45.8	66 57.7 99 04	44.5	67 27.6 99 04	44.4	72 25.5 99 04	42.7	130
1	57 57.6 1.0 04	45.3	58 27.5 1.0 04	45.3	59 57.2 1.0 04	45.0	60 27.1 1.0 04	45.0	60 57.0 1.0 04	44.9	66 55.5 99 04	43.6	67 25.4 99 04	43.5	72 23.4 99 03	41.8	1
2	57 55.3 1.0 04	44.4	58 25.3 1.0 04	44.3	59 55.0 1.0 04	44.1	60 24.9 1.0 04	44.0	60 54.8 1.0 04	43.9	66 53.4 1.0 04	42.7	67 23.2 99 04	42.6	72 21.3 99 03	40.9	2
3	57 53.2 1.0 04	43.4	58 23.1 1.0 04	43.4	59 52.8 1.0 04	43.2	60 22.7 1.0 04	43.1	60 52.6 1.0 04	43.0	66 51.3 1.0 04	41.8	67 21.1 1.0 03	41.7	72 19.2 99 03	40.1	3
4	57 51.0 1.0 04	42.5	58 20.9 1.0 04	42.5	59 50.7 1.0 04	42.2	60 20.6 1.0 03	42.2	60 50.5 1.0 04	42.1	66 49.2 1.0 03	40.9	67 19.1 1.0 03	40.8	72 17.2 99 03	39.2	4
135	57 48.9 1.0 03	41.6	58 18.8 1.0 03	41.5	59 48.6 1.0 03	41.3	60 18.5 1.0 03	41.2	60 48.4 1.0 03	41.2	66 47.2 1.0 03	40.0	67 17.0 1.0 03	39.9	72 15.3 99 03	38.3	135
6	57 46.8 1.0 03	40.7	58 16.8 1.0 03	40.6	59 46.6 1.0 03	40.4	60 16.5 1.0 03	40.3	60 46.4 1.0 03	40.2	66 45.2 1.0 03	39.1	67 15.0 1.0 03	39.0	72 13.3 99 03	37.4	6
7	57 44.8 1.0 03	39.7	58 14.8 1.0 03	39.7	59 44.5 1.0 03	39.5	60 14.5 1.0 03	39.4	60 44.4 1.0 03	39.3	66 43.2 1.0 03	38.2	67 13.1 1.0 03	38.1	72 11.5 99 03	36.6	7
8	57 42.8 1.0 03	38.8	58 12.8 1.0 03	38.7	59 42.5 1.0 03	38.5	60 12.5 1.0 03	38.5	60 42.4 1.0 03	38.4	66 41.3 1.0 03	37.2	67 11.2 1.0 03	37.2	72 09.6 99 03	35.7	8
9	57 40.9 1.0 03	37.8	58 10.8 1.0 03	37.8	59 40.6 1.0 03	37.6	60 10.6 1.0 03	37.5	60 40.5 1.0 03	37.5	66 39.4 1.0 03	36.4	67 09.3 1.0 03	36.3	72 07.8 99 03	34.8	9
140	57 39.0 1.0 03	36.9	58 08.9 1.0 03	36.9	59 38.7 1.0 03	36.7	60 08.7 1.0 03	36.6	60 38.6 1.0 03	36.5	66 37.5 99 03	35.5	67 07.4 1.0 03	35.4	72 06.0 99 03	34.0	140
1	57 37.1 1.0 03	36.0	58 07.1 1.0 03	35.9	59 36.9 1.0 03	35.7	60 06.8 1.0 03	35.7	60 36.7 1.0 03	35.6	66 35.7 1.0 03	34.6	67 05.6 1.0 03	34.5	72 04.3 99 03	33.1	1
2	57 35.3 1.0 03	35.1	58 05.2 1.0 03	35.0	59 35.1 1.0 03	34.8	60 05.0 1.0 03	34.8	60 34.9 1.0 03	34.7	66 34.0 1.0 03	33.7	67 03.9 1.0 03	33.6	72 02.6 99 03	32.3	2
3	57 33.5 1.0 03	34.1	58 03.5 1.0 03	34.1	59 33.3 1.0 03	33.9	60 03.3 1.0 03	33.8	60 33.2 1.0 03	33.8	66 32.3 1.0 03	32.8	67 02.2 1.0 03	32.7	72 00.9 99 03	31.4	3
4	57 31.8 1.0 03	33.2	58 01.7 1.0 03	33.1	59 31.6 1.0 03	33.0	60 01.5 1.0 03	32.9	60 31.4 1.0 03	32.8	66 30.6 1.0 03	31.9	67 00.5 1.0 03	31.8	71 59.3 1.0 03	30.5	4
145	57 30.1 1.0 03	32.3	58 00.0 1.0 03	32.2	59 29.9 1.0 03	32.0	59 59.8 1.0 03	32.0	60 29.8 1.0 03	31.9	66 28.9 1.0 03	31.0	66 58.9 1.0 03	30.9	71 57.7 1.0 03	29.7	145
6	57 28.4 1.0 03	31.3	57 58.4 1.0 03	31.3	59 28.2 1.0 03	31.1	59 58.2 1.0 03	31.1	60 28.1 1.0 03	31.0	66 27.3 1.0 03	30.1	66 57.3 1.0 03	30.0	71 56.2 1.0 02	28.8	6
7	57 26.8 1.0 03	30.4	57 56.8 1.0 03	30.4	59 26.6 1.0 03	30.2	59 56.6 1.0 03	30.1	60 26.5 1.0 03	30.1	66 25.8 1.0 02	29.2	66 55.7 1.0 03	29.1	71 54.7 1.0 02	28.0	7
8	57 25.2 1.0 03	29.5	57 55.2 1.0 03	29.4	59 25.1 1.0 02	29.3	59 55.0 1.0 03	29.2	60 25.0 1.0 03	29.2	66 24.2 1.0 02	28.3	66 54.2 1.0 02	28.2	71 53.3 1.0 02	27.1	8
9	57 23.7 1.0 02	28.5	57 53.7 1.0 02	28.5	59 23.6 1.0 02	28.4	59 53.5 1.0 02	28.3	60 23.5 1.0 02	28.2	66 22.8 1.0 02	27.4	66 52.7 1.0 02	27.3	71 51.9 1.0 02	26.2	9
150	57 22.2 1.0 02	27.6	57 52.2 1.0 02	27.6	59 22.1 1.0 02	27.4	59 52.1 1.0 02	27.4	60 22.0 1.0 02	27.3	66 21.4 1.0 02	26.5	66 51.3 1.0 02	26.5	71 50.5 1.0 02	25.4	150
1	57 20.8 1.0 02	26.7	57 50.8 1.0 02	26.7	59 20.7 1.0 02	26.5	59 50.6 1.0 02	26.5	60 20.6 1.0 02	26.4	66 20.0 1.0 02	25.6	66 49.9 1.0 02	25.6	71 49.2 1.0 02	24.5	1
2	57 19.4 1.0 02	25.8	57 49.4 1.0 02	25.7	59 19.3 1.0 02	25.6	59 49.3 1.0 02	25.5	60 19.2 1.0 02	25.5	66 18.7 1.0 02	24.8	66 48.6 1.0 02	24.7	71 47.9 1.0 02	23.7	2
3	57 18.1 1.0 02	24.8	57 48.0 1.0 02	24.8	59 18.0 1.0 02	24.7	59 48.0 1.0 02	24.6	60 17.9 1.0 02	24.6	66 17.3 1.0 02	23.9	66 47.3 1.0 02	23.8	71 46.6 1.0 02	22.8	3
4	57 16.8 1.0 02	23.9	57 46.8 1.0 02	23.9	59 16.7 1.0 02	23.8	59 46.6 1.0 02	23.7	60 16.6 1.0 02	23.7	66 16.1 1.0 02	22.9	66 46.1 1.0 02	22.9	71 45.4 1.0 02	21.9	4
155	57 15.5 1.0 02	23.0	57 45.5 1.0 02	23.0	59 15.4 1.0 02	22.8	59 45.4 1.0 02	22.8	60 15.4 1.0 02	22.8	66 14.9 1.0 02	22.1	66 44.9 1.0 02	22.0	71 44.3 1.0 02	21.1	155
6	57 14.3 1.0 02	22.1	57 44.3 1.0 02	22.0	59 14.2 1.0 02	21.9	59 44.2 1.0 02	21.9	60 14.2 1.0 02	21.8	66 13.8 1.0 02	21.2	66 43.7 1.0 02	21.1	71 43.2 1.0 02	20.3	6
7	57 13.2 1.0 02	21.2	57 43.1 1.0 02	21.1	59 13.1 1.0 02	21.0	59 43.1 1.0 02	21.0	60 13.0 1.0 02	20.9	66 12.7 1.0 02	20.3	66 42.6 1.0 02	20.2	71 42.1 1.0 02	19.4	7
8	57 12.1 1.0 02	20.2	57 42.0 1.0 02	20.2	59 12.0 1.0 02	20.1	59 42.0 1.0 02	20.0	60 11.9 1.0 02	20.0	66 11.6 1.0 02	19.4	66 41.6 1.0 02	19.4	71 41.1 1.0 02	18.5	8
9	57 11.0 1.0 02	19.3	57 41.0 1.0 02	19.3	59 10.9 1.0 02	19.2	59 40.9 1.0 02	19.1	60 10.9 1.0 02	19.1	66 10.6 1.0 02	18.5	66 40.5 1.0 02	18.5	71 40.1 1.0 02	17.7	9
160	57 10.0 1.0 02	18.4	57 40.0 1.0 02	18.4	59 09.9 1.0 02	18.3	59 39.9 1.0 02	18.2	60 09.9 1.0 02	18.2	66 09.6 1.0 02	17.7	66 39.6 1.0 02	17.6	71 39.2 1.0 01	16.9	160
1	57 09.0 1.0 02	17.5	57 39.0 1.0 02	17.4	59 09.0 1.0 02	17.3	59 38.9 1.0 02	17.3	60 08.9 1.0 02	17.3	66 08.7 1.0 01	16.8	66 38.6 1.0 01	16.7	71 38.3 1.0 01	16.0	1
2	57 08.1 1.0 01	16.5	57 38.1 1.0 01	16.5	59 08.0 1.0 01	16.4	59 38.0 1.0 01	16.4	60 08.0 1.0 01	16.4	66 07.8 1.0 01	15.9	66 37.8 1.0 01	15.8	71 37.4 1.0 01	15.2	2
3	57 07.1 1.0 01	15.6	57 37.2 1.0 01	15.6	59 07.2 1.0 01	15.5	59 37.1 1.0 01	15.5	60 07.2 1.0 01	15.5	66 06.9 1.0 01	15.0	66 36.9 1.0 01	15.0	71 36.6 1.0 01	14.3	3
4	57 06.4 1.0 01	14.7	57 36.4 1.0 01	14.7	59 06.4 1.0 01	14.6	59 36.4 1.0 01	14.6	60 06.3 1.0 01	14.5	66 06.2 1.0 01	14.1	66 36.1 1.0 01	14.1	71 35.9 1.0 01	13.5	4
165	57 05.6 1.0 01	13.8	57 35.6 1.0 01	13.8	59 05.6 1.0 01	13.7	59 35.6 1.0 01	13.7	60 05.6 1.0 01	13.6	66 05.4 1.0 01	13.2	66 35.4 1.0 01	13.2	71 35.2 1.0 01	12.6	165
6	57 04.9 1.0 01	12.9	57 34.9 1.0 01	12.8	59 04.9 1.0 01	12.8	59 34.9 1.0 01	12.7	60 04.9 1.0 01	12.7	66 04.7 1.0 01	12.3	66 34.7 1.0 01	12.3	71 34.5 1.0 01	11.8	6
7	57 04.2 1.0 01	11.9	57 34.2 1.0 01	11.9	59 04.2 1.0 01	11.9	59 34.2 1.0 01	11.8	60 04.2 1.0 01	11.8	66 04.1 1.0 01	11.5	66 34.1 1.0 01	11.4	71 33.9 1.0 01	11.0	7
8	57 03.6 1.0 01	11.0	57 33.6 1.0 01	11.0	59 03.6 1.0 01	10.9	59 33.6 1.0 01	10.9	60 03.6 1.0 01	10.9	66 03.5 1.0 01	10.5	66 33.5 1.0 01	10.5	71 33.3 1.0 01	10.1	8
9	57 03.0 1.0 01	10.1	57 33.0 1.0 01	10.1	59 03.0 1.0 01	10.0	59 33.0 1.0 01	10.0	60 03.0 1.0 01	10.0	66 02.9 1.0 01	09.7	66 32.9 1.0 01	09.7	71 32.8 1.0 01	09.3	9
170	57 02.5 1.0 01	09.2	57 32.5 1.0 01	09.2	59 02.5 1.0 01	09.1	59 32.5 1.0 01	09.1	60 02.5 1.0 01	09.1	66 02.4 1.0 01	08.8	66 32.4 1.0 01	08.8	71 32.3 1.0 01	08.4	170
1	57 02.0 1.0 01	08.3	57 32.0 1.0 01	08.3	59 02.0 1.0 01	08.2	59 32.0 1.0 01	08.2	60 02.0 1.0 01	08.2	66 02.0 1.0 01	07.9	66 31.9 1.0 01	07.9	71 31.9 1.0 01	07.6	1
2	57 01.6 1.0 01	07.3	57 31.6 1.0 01	07.3	59 01.6 1.0 01	07.3	59 31.6 1.0 01	07.3	60 01.6 1.0 01	07.3	66 01.5 1.0 01	07.1	66 31.5 1.0 01	07.0	71 31.5 1.0 01	06.7	2
3	57 01.2 1.0 01	06.4	57 31.2 1.0 01	06.4	59 01.2 1.0 01	06.4	59 31.2 1.0 01	06.4	60 01.2 1.0 01	06.4	66 01.2 1.0 01	06.2	66 31.2 1.0 01	06.1	71 31.1 1.0 00	05.9	3
4	57 00.9 1.0 01	05.5	57 30.9 1.0 01	05.5	59 00.9 1.0 00	05.5	59 30.9 1.0 00	05.5	60 00.9 1.0 00	05.5	66 00.9 1.0 00	05.3	66 30.9 1.0 00	05.3	71 30.8 1.0 00	05.1	4
175	57 00.6 1.0 00	04.6	57 30.6 1.0 00	04.6	59 00.6 1.0 00	04.6	59 30.6 1.0 00	04.5	60 00.6 1.0 00	04.5	66 00.6 1.0 00	04.4	66 30.6 1.0 00	04.4	71 30.6 1.0 00	04.2	175
6	57 00.4 1.0 00	03.7	57 30.4 1.0 00	03.7	59 00.4 1.0 00	03.6	59 30.4 1.0 00	03.6	60 00.4 1.0 00	03.6	66 00.4 1.0 00	03.5	66 30.4 1.0 00	03.5	71 30.4 1.0 00	03.4	6
7	57 00.2 1.0 00	02.8	57 30.2 1.0 00	02.7	59 00.2 1.0 00	02.7	59 30.2 1.0 00	02.7	60 00.2 1.0 00	02.7	66 00.2 1.0 00	02.6	66 30.2 1.0 00	02.6	71 30.2 1.0 00	02.5	7
8	57 00.1 1.0 00	01.8	57 30.1 1.0 00	01.8	59 00.1 1.0 00	01.8	59 30.1 1.0 00	01.8	60 00.1 1.0 00	01.8	66 00.1 1.0 00	01.8	66 30.1 1.0 00	01.8	71 30.1 1.0 00	01.7	8
9	57 00.0 1.0 00	00.9	57 30.0 1.0 00	00.9	59 00.0 1.0 00	00.9	59 30.0 1.0 00	00.9	60 00.0 1.0 00	00.9	66 00.0 1.0 00	00.9	66 30.0 1.0 00	00.9	71 30.0 1.0 00	00.8	9
180	57 00.0 1.0 00	00.0	57 30.0 1.0 00	00.0	59 00.0 1.0 00	00.0	59 30.0 1.0 00	00.0	60 00.0 1.0 00	00.0	66 00.0 1.0 00	00.0	66 30.0 1.0 00	00.0	71 30.0 1.0 00	00.0	180

Lat. 88°

Lat. 89°

STAR IDENTIFICATION TABLE

ALTITUDE

Lat. 87°

AZ.	4° Dec.	4° H.A.	8° Dec.	8° H.A.	12° Dec.	12° H.A.	16° Dec.	16° H.A.	20° Dec.	20° H.A.	24° Dec.	24° H.A.	28° Dec.	28° H.A.	32° Dec.	32° H.A.	36° Dec.	36° H.A.	40° Dec.	40° H.A.	44° Dec.	44° H.A.	AZ.
00	07	180	11	180	15	180	19	180	23	180	27	180	31	180	35	180	39	180	43	180	47	180	00
4	07	176	11	176	15	176	19	176	23	176	27	176	31	176	35	176	39	176	43	176	47	176	4
8	07	172	11	172	15	172	19	172	23	172	27	172	31	172	35	172	39	172	43	172	47	172	8
12	07	168	11	168	15	168	19	168	23	168	27	168	31	168	35	168	39	168	43	167	47	167	12
16	07	164	11	164	15	164	19	164	23	164	27	164	31	164	35	163	39	163	43	163	47	163	16
20	07	160	11	160	15	160	19	160	23	160	27	160	31	159	35	159	39	159	43	159	47	159	20
24	07	156	11	156	15	156	19	156	23	156	27	155	31	155	35	155	39	155	43	155	47	155	24
28	07	152	11	152	15	152	19	152	23	151	27	151	31	151	35	151	39	151	43	151	47	151	28
32	07	148	11	148	15	148	19	148	23	147	27	147	31	147	35	147	39	147	43	147	47	146	32
36	06	144	10	144	14	144	18	143	22	143	26	143	30	143	34	143	38	143	42	142	46	142	36
40	06	140	10	140	14	140	18	139	22	139	26	139	30	139	34	139	38	139	42	138	46	138	40
44	06	136	10	136	14	136	18	135	22	135	26	135	30	135	34	135	38	134	42	134	46	134	44
48	06	132	10	132	14	131	18	131	22	131	26	131	30	131	34	131	38	130	42	130	46	130	48
52	06	128	10	128	14	127	18	127	22	127	26	127	30	127	34	126	38	126	42	126	46	126	52
56	06	124	10	124	14	123	18	123	22	123	26	123	30	123	34	122	38	122	42	122	46	121	56
60	05	120	09	120	13	119	17	119	21	119	25	119	29	119	33	118	37	118	41	118	45	117	60
64	05	116	09	116	13	115	17	115	21	115	25	115	29	115	33	114	37	114	41	114	45	113	64
68	05	112	09	112	13	111	17	111	21	111	25	111	29	110	33	110	37	110	41	110	45	109	68
72	05	108	09	108	13	107	17	107	21	107	25	107	29	106	33	106	37	106	41	106	45	105	72
76	05	104	09	104	13	103	17	103	21	103	25	103	29	102	33	102	37	102	41	102	45	101	76
80	05	100	09	100	13	99	16	99	20	99	24	99	28	98	32	98	36	98	40	97	44	97	80
84	04	96	08	96	12	95	16	95	20	95	24	95	28	94	32	94	36	94	40	93	44	93	84
88	04	92	08	92	12	91	16	91	20	91	24	91	28	90	32	90	36	90	40	89	44	89	88
92	04	88	08	88	12	87	16	87	20	87	24	87	28	86	32	86	36	86	40	85	44	85	92
96	04	84	08	84	12	83	16	83	20	83	24	83	28	82	32	82	36	82	40	82	44	81	96
100	03	80	07	80	11	79	15	79	19	79	23	79	27	78	31	78	35	78	39	78	43	77	100
104	03	76	07	76	11	75	15	75	19	75	23	75	27	74	31	74	35	74	39	74	43	73	104
108	03	72	07	72	11	71	15	71	19	71	23	71	27	71	31	70	35	70	39	70	43	69	108
112	03	68	07	68	11	67	15	67	19	67	23	67	27	67	31	66	35	66	39	66	43	65	112
116	03	64	07	64	11	63	15	63	19	63	23	63	27	63	31	62	35	62	39	62	43	61	116
120	02	60	06	60	10	59	14	59	18	59	22	59	26	59	30	58	34	58	38	58	42	58	120
124	02	56	06	56	10	56	14	55	18	55	22	55	26	55	30	55	34	54	38	54	42	54	124
128	02	52	06	52	10	52	14	51	18	51	22	51	26	51	30	51	34	50	38	50	42	50	128
132	02	48	06	48	10	48	14	47	18	47	22	47	26	47	30	47	34	46	38	46	42	46	132
136	02	44	06	44	10	44	14	43	18	43	22	43	26	43	30	43	34	43	38	42	42	42	136
140	02	40	06	40	10	40	14	39	18	39	22	39	26	39	30	39	34	39	38	38	42	38	140
144	02	36	06	36	10	36	14	36	18	35	22	35	26	35	30	35	34	35	38	35	42	34	144
148	01	32	05	32	09	32	13	32	17	31	21	31	25	31	29	31	33	31	37	31	41	31	148
152	01	28	05	28	09	28	13	28	17	28	21	27	25	27	29	27	33	27	37	27	41	27	152
156	01	24	05	24	09	24	13	24	17	24	21	23	25	23	29	23	33	23	37	23	41	23	156
160	01	20	05	20	09	20	13	20	17	20	21	20	25	19	29	19	33	19	37	19	41	19	160
164	01	16	05	16	09	16	13	16	17	16	21	16	25	16	29	16	33	15	37	15	41	15	164
168	01	12	05	12	09	12	13	12	17	12	21	12	25	12	29	12	33	12	37	12	41	11	168
172	01	08	05	08	09	08	13	08	17	08	21	08	25	08	29	08	33	08	37	08	41	08	172
176	01	04	05	04	09	04	13	04	17	04	21	04	25	04	29	04	33	04	37	04	41	04	176
180	01	00	05	00	09	00	13	00	17	00	21	00	25	00	29	00	33	00	37	00	41	00	180

FIGURES IN ITALICS INDICATE THEAT DECLINATION IS OF CONTRARY NAME TO LATITUDE

Lat. 87°

AZ.	48°		52°		56°		60°		64°		68°		72°		76°		80°		84°		88°		AZ.
	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	Dec.	H.A.	
°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
00	51	180	55	180	59	180	63	180	67	180	71	180	75	180	79	180	83	180	87	180	89	00	00
4	51	176	55	176	59	176	63	176	67	176	71	175	75	175	79	175	83	174	87	172	89	08	4
8	51	171	55	171	59	171	63	171	67	171	71	171	75	170	79	170	83	169	87	164	89	15	8
12	51	167	55	167	59	167	63	167	67	167	71	166	75	166	79	165	83	163	87	157	89	22	12
16	51	163	55	163	59	163	63	162	67	162	71	162	75	161	79	160	83	157	87	149	89	27	16
20	51	159	55	159	59	158	63	158	67	158	71	157	75	156	79	155	83	152	87	142	89	31	20
24	51	155	55	154	59	154	63	154	67	153	71	153	75	152	79	150	83	147	86	136	89	35	24
28	51	150	55	150	59	150	63	149	67	149	71	148	75	147	79	145	83	141	86	129	88	37	28
32	51	146	55	146	59	145	63	145	66	144	70	144	74	142	78	140	82	136	86	123	88	39	32
36	50	142	54	142	58	141	62	141	66	140	70	139	74	138	78	135	82	131	86	118	88	40	36
40	50	138	54	137	58	137	62	136	66	136	70	135	74	133	78	131	82	126	86	113	88	41	40
44	50	134	54	133	58	133	62	132	66	131	70	130	74	129	78	126	82	121	86	108	88	42	44
48	50	129	54	129	58	128	62	128	66	127	70	126	74	124	78	122	82	117	85	103	88	42	48
52	50	125	54	125	58	124	62	124	66	123	70	122	74	120	78	117	82	112	85	98	88	42	52
56	50	121	54	121	58	120	62	119	66	119	70	117	73	116	77	113	81	108	85	94	88	41	56
60	49	117	53	117	57	116	61	115	65	114	69	113	73	111	77	108	81	103	85	90	87	41	60
64	49	113	53	112	57	112	61	111	65	110	69	109	73	107	77	104	81	99	85	86	87	40	64
68	49	109	53	108	57	108	61	107	65	106	69	105	73	103	77	100	81	95	84	82	87	40	68
72	49	105	53	104	57	104	61	103	65	102	69	101	73	99	77	96	80	91	84	79	87	39	72
76	49	101	53	100	57	100	61	99	65	98	69	97	72	95	76	92	80	87	84	75	87	38	76
80	48	97	52	96	56	96	60	95	64	94	68	93	72	91	76	88	80	83	84	72	87	37	80
84	48	93	52	92	56	92	60	91	64	90	68	89	72	87	76	84	80	79	84	68	87	35	84
88	48	89	52	88	56	88	60	87	64	86	68	85	72	83	76	80	80	75	83	65	86	34	88
92	48	85	52	84	56	84	60	83	64	82	68	81	72	79	76	76	79	72	83	62	86	33	92
96	48	81	52	80	56	80	60	79	64	78	67	77	71	75	75	72	79	68	83	59	86	32	96
100	47	77	51	76	55	76	59	75	63	74	67	73	71	71	75	69	79	64	83	56	86	30	100
104	47	73	51	72	55	72	59	71	63	70	67	69	71	67	75	65	79	61	83	53	86	29	104
108	47	69	51	68	55	68	59	67	63	66	67	65	71	64	75	61	79	58	83	50	86	28	108
112	47	65	51	65	55	64	59	63	63	63	67	61	71	60	75	58	79	54	82	47	86	26	112
116	47	61	51	61	55	60	59	60	63	59	67	58	71	56	74	54	78	51	82	44	86	25	116
120	46	57	50	57	54	56	58	56	62	55	66	54	70	53	74	51	78	47	82	41	86	23	120
124	46	53	50	53	54	53	58	52	62	51	66	50	70	49	74	47	78	44	82	38	86	22	124
128	46	50	50	49	54	49	58	48	62	47	66	47	70	45	74	44	78	41	82	35	85	20	128
132	46	46	50	45	54	45	58	44	62	44	66	43	70	42	74	40	78	38	82	33	85	19	132
136	46	42	50	41	54	41	58	41	62	40	66	39	70	38	74	37	78	34	82	30	85	17	136
140	46	38	50	38	54	37	58	37	62	36	66	36	70	35	74	33	78	31	81	27	85	16	140
144	46	34	50	34	54	34	58	33	62	33	66	32	69	31	73	30	77	28	81	24	85	14	144
148	45	30	49	30	53	30	57	29	61	29	65	28	69	28	73	27	77	25	81	22	85	13	148
152	45	27	49	26	53	26	57	26	61	25	65	25	69	24	73	23	77	22	81	19	85	11	152
156	45	23	49	23	53	22	57	22	61	22	65	21	69	21	73	20	77	19	81	16	85	10	156
160	45	19	49	19	53	19	57	18	61	18	65	18	69	17	73	17	77	15	81	13	85	08	160
164	45	15	49	15	53	15	57	15	61	14	65	14	69	14	73	13	77	12	81	11	85	06	164
168	45	11	49	11	53	11	57	11	61	11	65	11	69	10	73	10	77	09	81	08	85	05	168
172	45	08	49	08	53	07	57	07	61	07	65	07	69	07	73	07	77	06	81	05	85	03	172
176	45	04	49	04	53	04	57	04	61	04	65	04	69	03	73	03	77	03	81	03	85	02	176
180	45	00	49	00	53	00	57	00	61	00	65	00	69	00	73	00	77	00	81	00	85	00	180
	48°		52°		56°		60°		64°		68°		72°		76°		80°		84°		88°		

Lat. 88°

10—48722-1

FIGURES IN ITALICS INDICATE THAT DECLINATION IS OF CONTRARY NAME TO LATITUDE

Lat. 88° H.A.	0° 00' Alt. Az.	0° 30' Alt. Az.	1° 00' Alt. Az.	1° 30' Alt. Az.	2° 00' Alt. Az.	2° 30' Alt. Az.	3° 00' Alt. Az.	3° 30' Alt. Az.	H.A.
00							5 00.0 1.0 00 180.0	5 30.0 1.0 00 180.0	00
1								5 30.0 1.0 00 179.0	1
2								5 29.9 1.0 00 178.0	2
3								5 29.8 1.0 00 177.0	3
4								5 29.7 1.0 00 176.0	4
05								5 29.5 1.0 00 175.0	05
6								5 29.3 1.0 00 174.0	6
7								5 29.1 1.0 00 173.0	7
8								5 28.8 1.0 01 172.0	8
9								5 28.5 1.0 01 171.0	9
10								5 28.2 1.0 01 170.0	10
1								5 27.8 1.0 01 169.0	1
2								5 27.4 1.0 01 168.0	2
3								5 26.9 1.0 01 167.0	3
4								5 26.4 1.0 01 166.0	4
15								5 25.9 1.0 01 165.0	15
6								5 25.3 1.0 01 164.0	6
7								5 24.7 1.0 01 163.0	7
8								5 24.1 1.0 01 162.0	8
9								5 23.4 1.0 01 160.9	9
20								5 22.7 1.0 01 159.9	20
1								5 22.0 1.0 01 158.9	1
2								5 21.2 1.0 01 157.9	2
3								5 20.4 1.0 01 156.9	3
4								5 19.6 1.0 01 155.9	4
25								5 18.7 1.0 02 154.9	25
6								5 17.8 1.0 02 153.9	6
7								5 16.9 1.0 02 152.9	7
8								5 15.9 1.0 02 151.9	8
9								5 14.9 1.0 02 150.9	9
30								5 13.9 1.0 02 149.9	30
1								5 12.8 1.0 02 148.9	1
2								5 11.7 1.0 02 147.9	2
3								5 10.6 1.0 02 146.9	3
4								5 09.4 1.0 02 145.9	4
35								5 08.2 1.0 02 144.9	35
6								5 07.0 1.0 02 143.9	6
7								5 05.8 1.0 02 142.9	7
8								5 04.5 1.0 02 141.9	8
9								5 03.2 1.0 02 140.9	9
40								5 01.9 1.0 02 139.9	40
1								5 00.5 1.0 02 138.9	1

H.A.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	H.A.	Lat. 88°
°	°′ Δd Δt	°′ Δd Δt	°′ Δd Δt	°′ Δd Δt	°′ Δd Δt	°′ Δd Δt	°′ Δd Δt	°′ Δd Δt	°	
										Lat. 88°
H.A.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	Alt. Az.	H.A.	
										Lat. 89°

Lat. 88°

Each cell lists: Alt (° ′), Δd Δt, Az (°)

H.A.	4° 00′	4° 30′	5° 00′	5° 30′	6° 00′	6° 30′	7° 00′	7° 30′	H.A.
00	6 00.0 1.000 180.0	6 30.0 1.000 180.0	7 00.0 1.000 180.0	7 30.0 1.000 180.0	8 00.0 1.000 180.0	8 30.0 1.000 180.0	9 00.0 1.000 180.0	9 30.0 1.000 180.0	00
1	6 00.0 1.000 179.0	6 30.0 1.000 179.0	7 00.0 1.000 179.0	7 30.0 1.000 179.0	8 00.0 1.000 179.0	8 30.0 1.000 179.0	9 00.0 1.000 179.0	9 30.0 1.000 179.0	1
2	5 59.9 1.000 178.0	6 29.9 1.000 178.0	6 59.9 1.000 178.0	7 29.9 1.000 178.0	7 59.9 1.000 178.0	8 29.9 1.000 178.0	8 59.9 1.000 178.0	9 29.9 1.000 178.0	2
3	5 59.8 1.000 177.0	6 29.8 1.000 177.0	6 59.8 1.000 177.0	7 29.8 1.000 177.0	7 59.8 1.000 177.0	8 29.8 1.000 177.0	8 59.8 1.000 177.0	9 29.8 1.000 177.0	3
4	5 59.7 1.000 176.0	6 29.7 1.000 176.0	6 59.7 1.000 176.0	7 29.7 1.000 176.0	7 59.7 1.000 176.0	8 29.7 1.000 176.0	8 59.7 1.000 176.0	9 29.7 1.000 176.0	4
05	5 59.5 1.000 175.0	6 29.5 1.000 175.0	6 59.5 1.000 175.0	7 29.5 1.000 175.0	7 59.5 1.000 175.0	8 29.5 1.000 175.0	8 59.5 1.000 175.0	9 29.5 1.000 175.0	05
6	5 59.3 1.000 174.0	6 29.3 1.000 174.0	6 59.3 1.000 174.0	7 29.3 1.000 174.0	7 59.3 1.000 174.0	8 29.3 1.000 174.0	8 59.3 1.000 174.0	9 29.3 1.000 174.0	6
7	5 59.1 1.000 173.0	6 29.1 1.000 173.0	6 59.1 1.000 173.0	7 29.1 1.000 173.0	7 59.1 1.000 173.0	8 29.1 1.000 173.0	8 59.1 1.000 173.0	9 29.1 1.000 173.0	7
8	5 58.8 1.001 172.0	6 28.8 1.001 172.0	6 58.8 1.001 172.0	7 28.8 1.001 172.0	7 58.8 1.001 172.0	8 28.8 1.001 172.0	8 58.8 1.001 172.0	9 28.8 1.001 172.0	8
9	5 58.5 1.001 171.0	6 28.5 1.001 171.0	6 58.5 1.001 171.0	7 28.5 1.001 171.0	7 58.5 1.001 171.0	8 28.5 1.001 171.0	8 58.5 1.001 171.0	9 28.5 1.001 171.0	9
10	5 58.2 1.001 170.0	6 28.2 1.001 170.0	6 58.2 1.001 170.0	7 28.2 1.001 170.0	7 58.2 1.001 170.0	8 28.2 1.001 170.0	8 58.2 1.001 170.0	9 28.2 1.001 169.9	10
1	5 57.8 1.001 169.0	6 27.8 1.001 169.0	6 57.8 1.001 169.0	7 27.8 1.001 169.0	7 57.8 1.001 169.0	8 27.8 1.001 168.9	8 57.8 1.001 168.9	9 27.8 1.001 168.9	1
2	5 57.4 1.001 168.0	6 27.4 1.001 168.0	6 57.4 1.001 168.0	7 27.4 1.001 168.0	7 57.4 1.001 167.9	8 27.4 1.001 167.9	8 57.4 1.001 167.9	9 27.4 1.001 167.9	2
3	5 56.9 1.001 167.0	6 26.9 1.001 167.0	6 56.9 1.001 167.0	7 26.9 1.001 166.9	7 56.9 1.001 166.9	8 26.9 1.001 166.9	8 56.9 1.001 166.9	9 26.9 1.001 166.9	3
4	5 56.4 1.001 166.0	6 26.4 1.001 166.0	6 56.4 1.001 165.9	7 26.4 1.001 165.9	7 56.4 1.001 165.9	8 26.4 1.001 165.9	8 56.4 1.001 165.9	9 26.4 1.001 165.9	4
15	5 55.9 1.001 165.0	6 25.9 1.001 165.0	6 55.9 1.001 164.9	7 25.9 1.001 164.9	7 55.9 1.001 164.9	8 25.9 1.001 164.9	8 55.9 1.001 164.9	9 25.9 1.001 164.9	15
6	5 55.3 1.001 164.0	6 25.3 1.001 163.9	6 55.3 1.001 163.9	7 25.3 1.001 163.9	7 55.3 1.001 163.9	8 25.3 1.001 163.9	8 55.3 1.001 163.9	9 25.3 1.001 163.9	6
7	5 54.7 1.001 162.9	6 24.7 1.001 162.9	6 54.7 1.001 162.9	7 24.7 1.001 162.9	7 54.7 1.001 162.9	8 24.7 1.001 162.9	8 54.7 1.001 162.9	9 24.7 1.001 162.9	7
8	5 54.1 1.001 161.9	6 24.1 1.001 161.9	6 54.1 1.001 161.9	7 24.1 1.001 161.9	7 54.1 1.001 161.9	8 24.1 1.001 161.9	8 54.1 1.001 161.9	9 24.1 1.001 161.9	8
9	5 53.4 1.001 160.9	6 23.4 1.001 160.9	6 53.4 1.001 160.9	7 23.4 1.001 160.9	7 53.4 1.001 160.9	8 23.4 1.001 160.9	8 53.4 1.001 160.9	9 23.4 1.001 160.9	9
20	5 52.7 1.001 159.9	6 22.7 1.001 159.9	6 52.7 1.001 159.9	7 22.7 1.001 159.9	7 52.7 1.001 159.9	8 22.7 1.001 159.9	8 52.7 1.001 159.9	9 22.7 1.001 159.9	20
1	5 52.0 1.001 158.9	6 22.0 1.001 158.9	6 52.0 1.001 158.9	7 22.0 1.001 158.9	7 52.0 1.001 158.9	8 22.0 1.001 158.9	8 52.0 1.001 158.9	9 22.0 1.001 158.9	1
2	5 51.2 1.001 157.9	6 21.2 1.001 157.9	6 51.2 1.001 157.9	7 21.2 1.001 157.9	7 51.2 1.001 157.9	8 21.2 1.001 157.9	8 51.2 1.001 157.9	9 21.2 1.001 157.9	2
3	5 50.4 1.001 156.9	6 20.4 1.001 156.9	6 50.4 1.001 156.9	7 20.4 1.001 156.9	7 50.4 1.001 156.9	8 20.4 1.001 156.9	8 50.4 1.001 156.9	9 20.4 1.001 156.9	3
4	5 49.6 1.001 155.9	6 19.6 1.001 155.9	6 49.6 1.001 155.9	7 19.6 1.001 155.9	7 49.6 1.001 155.9	8 19.6 1.001 155.9	8 49.6 1.001 155.9	9 19.6 1.001 155.9	4
25	5 48.7 1.002 154.9	6 18.7 1.002 154.9	6 48.7 1.002 154.9	7 18.7 1.002 154.9	7 48.7 1.002 154.9	8 18.7 1.002 154.9	8 48.7 1.002 154.9	9 18.7 1.002 154.9	25
6	5 47.8 1.002 153.9	6 17.8 1.002 153.9	6 47.8 1.002 153.9	7 17.8 1.002 153.9	7 47.8 1.002 153.9	8 17.8 1.002 153.9	8 47.8 1.002 153.9	9 17.8 1.002 153.9	6
7	5 46.9 1.002 152.9	6 16.9 1.002 152.9	6 46.9 1.002 152.9	7 16.9 1.002 152.9	7 46.9 1.002 152.9	8 16.9 1.002 152.9	8 46.9 1.002 152.9	9 16.9 1.002 152.9	7
8	5 45.9 1.002 151.9	6 15.9 1.002 151.9	6 45.9 1.002 151.9	7 15.9 1.002 151.9	7 45.9 1.002 151.9	8 15.9 1.002 151.9	8 45.9 1.002 151.9	9 15.9 1.002 151.9	8
9	5 44.9 1.002 150.9	6 14.9 1.002 150.9	6 44.9 1.002 150.9	7 14.9 1.002 150.9	7 44.9 1.002 150.9	8 14.9 1.002 150.9	8 44.9 1.002 150.9	9 14.9 1.002 150.9	9
30	5 43.9 1.002 149.9	6 13.9 1.002 149.9	6 43.9 1.002 149.9	7 13.9 1.002 149.9	7 43.9 1.002 149.9	8 13.9 1.002 149.9	8 43.9 1.002 149.9	9 13.8 1.002 149.9	30
1	5 42.8 1.002 148.9	6 12.8 1.002 148.9	6 42.8 1.002 148.9	7 12.8 1.002 148.9	7 42.8 1.002 148.9	8 12.8 1.002 148.9	8 42.8 1.002 148.9	9 12.8 1.002 148.8	1
2	5 41.7 1.002 147.9	6 11.7 1.002 147.9	6 41.7 1.002 147.9	7 11.7 1.002 147.9	7 41.7 1.002 147.9	8 11.7 1.002 147.9	8 41.7 1.002 147.9	9 11.7 1.002 147.8	2
3	5 40.6 1.002 146.9	6 10.6 1.002 146.9	6 40.6 1.002 146.9	7 10.6 1.002 146.9	7 40.6 1.002 146.9	8 10.6 1.002 146.9	8 40.6 1.002 146.9	9 10.6 1.002 146.8	3
4	5 39.4 1.002 145.9	6 09.4 1.002 145.9	6 39.4 1.002 145.9	7 09.4 1.002 145.9	7 39.4 1.002 145.9	8 09.4 1.002 145.9	8 39.4 1.002 145.8	9 09.4 1.002 145.8	4
35	5 38.2 1.002 144.9	6 08.2 1.002 144.9	6 38.2 1.002 144.9	7 08.2 1.002 144.9	7 38.2 1.002 144.9	8 08.2 1.002 144.9	8 38.2 1.002 144.8	9 08.2 1.002 144.8	35
6	5 37.0 1.002 143.9	6 07.0 1.002 143.9	6 37.0 1.002 143.9	7 07.0 1.002 143.9	7 37.0 1.002 143.9	8 07.0 1.002 143.8	8 37.0 1.002 143.8	9 07.0 1.002 143.8	6
7	5 35.8 1.002 142.9	6 05.8 1.002 142.9	6 35.8 1.002 142.9	7 05.8 1.002 142.9	7 35.7 1.002 142.9	8 05.7 1.002 142.8	8 35.7 1.002 142.8	9 05.7 1.002 142.8	7
8	5 34.5 1.002 141.9	6 04.5 1.002 141.9	6 34.5 1.002 141.9	7 04.5 1.002 141.9	7 34.5 1.002 141.9	8 04.5 1.002 141.8	8 34.5 1.002 141.8	9 04.4 1.002 141.8	8
9	5 33.2 1.002 140.9	6 03.2 1.002 140.9	6 33.2 1.002 140.9	7 03.2 1.002 140.9	7 33.2 1.002 140.9	8 03.2 1.002 140.8	8 33.1 1.002 140.8	9 03.1 1.002 140.8	9
40	5 31.9 1.002 139.9	6 01.8 1.002 139.9	6 31.8 1.002 139.9	7 01.8 1.002 139.9	7 31.8 1.002 139.8	8 01.8 1.002 139.8	8 31.8 1.002 139.8	9 01.8 1.002 139.8	40
1	5 30.5 1.002 138.9	6 00.5 1.002 138.9	6 30.5 1.002 138.9	7 00.5 1.002 138.8	7 30.5 1.002 138.8	8 00.5 1.002 138.8	8 30.4 1.002 138.8	9 00.4 1.002 138.8	1
2	5 29.1 1.002 137.9	5 59.1 1.002 137.9	6 29.1 1.002 137.9	6 59.1 1.002 137.9	7 29.1 1.002 137.8	7 59.1 1.002 137.8	8 29.0 1.002 137.8	8 59.0 1.002 137.8	2
3	5 27.7 1.002 136.9	5 57.7 1.002 136.9	6 27.7 1.002 136.9	6 57.7 1.002 136.9	7 27.7 1.002 136.8	7 57.6 1.002 136.8	8 27.6 1.002 136.8	8 57.6 1.002 136.8	3
4	5 26.2 1.002 135.9	5 56.2 1.002 135.9	6 26.2 1.002 135.9	6 56.2 1.002 135.8	7 26.2 1.002 135.8	7 56.2 1.002 135.8	8 26.2 1.002 135.8	8 56.2 1.002 135.8	4
45	5 24.8 1.002 134.9	5 54.8 1.002 134.9	6 24.8 1.002 134.9	6 54.7 1.002 134.8	7 24.7 1.002 134.8	7 54.7 1.002 134.8	8 24.7 1.002 134.8	8 54.7 1.002 134.8	45
6	5 23.3 1.003 133.9	5 53.3 1.003 133.9	6 23.3 1.003 133.9	6 53.2 1.003 133.8	7 23.2 1.003 133.8	7 53.2 1.003 133.8	8 23.2 1.003 133.8	8 53.2 1.003 133.8	6
7	5 21.8 1.003 132.9	5 51.8 1.003 132.9	6 21.7 1.003 132.9	6 51.7 1.003 132.8	7 21.7 1.003 132.8	7 51.7 1.003 132.8	8 21.7 1.003 132.8	8 51.7 1.003 132.8	7
8	5 20.2 1.003 131.9	5 50.2 1.003 131.9	6 20.2 1.003 131.9	6 50.2 1.003 131.8	7 20.2 1.003 131.8	7 50.2 1.003 131.8	8 20.1 1.003 131.8	8 50.1 1.003 131.8	8
9	5 18.6 1.003 130.9	5 48.6 1.003 130.9	6 18.6 1.003 130.9	6 48.6 1.003 130.8	7 18.6 1.003 130.8	7 48.6 1.003 130.8	8 18.6 1.003 130.8	8 48.6 1.003 130.8	9
50	5 17.0 1.003 129.9	5 47.0 1.003 129.9	6 17.0 1.003 129.8	6 47.0 1.003 129.8	7 17.0 1.003 129.8	7 47.0 1.003 129.8	8 17.0 1.003 129.8	8 47.0 1.003 129.8	50
1	5 15.4 1.003 128.9	5 45.4 1.003 128.9	6 15.4 1.003 128.8	6 45.4 1.003 128.8	7 15.4 1.003 128.8	7 45.4 1.003 128.8	8 15.4 1.003 128.8	8 45.3 1.003 128.8	1
2	5 13.8 1.003 127.9	5 43.8 1.003 127.9	6 13.8 1.003 127.8	6 43.7 1.003 127.8	7 13.7 1.003 127.8	7 43.7 1.003 127.8	8 13.7 1.003 127.8	8 43.7 1.003 127.8	2
3	5 12.1 1.003 126.9	5 42.1 1.003 126.9	6 12.1 1.003 126.8	6 42.1 1.003 126.8	7 12.1 1.003 126.8	7 42.1 1.003 126.8	8 12.0 1.003 126.8	8 42.0 1.003 126.8	3
4	5 10.4 1.003 125.9	5 40.4 1.003 125.9	6 10.4 1.003 125.8	6 40.4 1.003 125.8	7 10.4 1.003 125.8	7 40.4 1.003 125.8	8 10.4 1.003 125.8	8 40.3 1.003 125.8	4
55	5 08.7 1.003 124.9	5 38.7 1.003 124.9	6 08.7 1.003 124.8	6 38.7 1.003 124.8	7 08.7 1.003 124.8	7 38.7 1.003 124.8	8 08.6 1.003 124.8	8 38.6 1.003 124.8	55
6	5 07.0 1.003 123.9	5 37.0 1.003 123.9	6 07.0 1.003 123.8	6 37.0 1.003 123.8	7 06.9 1.003 123.8	7 36.9 1.003 123.8	8 06.9 1.003 123.8	8 36.9 1.003 123.8	6
7	5 05.2 1.003 122.9	5 35.2 1.003 122.9	6 05.2 1.003 122.8	6 35.2 1.003 122.8	7 05.2 1.003 122.8	7 35.2 1.003 122.8	8 05.2 1.003 122.8	8 35.2 1.003 122.8	7
8	5 03.5 1.003 121.9	5 33.5 1.003 121.9	6 03.4 1.003 121.8	6 33.4 1.003 121.8	7 03.4 1.003 121.8	7 33.4 1.003 121.8	8 03.4 1.003 121.8	8 33.4 1.003 121.8	8
9	5 01.7 1.003 120.9	5 31.7 1.003 120.8	6 01.7 1.003 120.8	6 31.6 1.003 120.8	7 01.6 1.003 120.8	7 31.6 1.003 120.8	8 01.6 1.003 120.8	8 31.6 1.003 120.8	9
60		5 29.9 1.003 119.8	5 59.9 1.003 119.8	6 29.9 1.003 119.8	6 59.9 1.003 119.8	7 29.8 1.003 119.8	7 59.8 1.003 119.8	8 29.8 1.003 119.8	60
1		5 28.0 1.003 118.8	5 58.0 1.003 118.8	6 28.0 1.003 118.8	6 58.0 1.003 118.8	7 28.0 1.003 118.8	7 58.0 1.003 118.8	8 28.0 1.003 118.8	1
2		5 26.2 1.003 117.8	5 56.2 1.003 117.8	6 26.2 1.003 117.8	6 56.2 1.003 117.8	7 26.1 1.003 117.8	7 56.1 1.003 117.8	8 26.1 1.003 117.8	2
3		5 24.3 1.003 116.8	5 54.3 1.003 116.8	6 24.3 1.003 116.8	6 54.3 1.003 116.8	7 24.3 1.003 116.8	7 54.3 1.003 116.8	8 24.3 1.003 116.8	3
4		5 22.5 1.003 115.8	5 52.4 1.003 115.8	6 22.4 1.003 115.8	6 52.4 1.003 115.8	7 22.4 1.003 115.8	7 52.4 1.003 115.8	8 22.4 1.003 115.7	4
65		5 20.5 1.003 114.8	5 50.5 1.003 114.8	6 20.5 1.003 114.8	6 50.5 1.003 114.8	7 20.5 1.003 114.8	7 50.5 1.003 114.8	8 20.5 1.003 114.7	65
6		5 18.7 1.003 113.8	5 48.6 1.003 113.8	6 18.6 1.003 113.8	6 48.6 1.003 113.8	7 18.6 1.003 113.8	7 48.6 1.003 113.7	8 18.6 1.003 113.7	6
7		5 16.7 1.003 112.8	5 46.7 1.003 112.8	6 16.7 1.003 112.8	6 46.7 1.003 112.8	7 16.7 1.003 112.8	7 46.7 1.003 112.7	8 16.6 1.003 112.7	7
8		5 14.8 1.003 111.8	5 44.8 1.003 111.8	6 14.8 1.003 111.8	6 44.8 1.003 111.8	7 14.7 1.003 111.8	7 44.7 1.003 111.7	8 14.7 1.003 111.7	8
9		5 12.9 1.003 110.8	5 42.8 1.003 110.8	6 12.8 1.003 110.8	6 42.8 1.003 110.8	7 12.8 1.003 110.8	7 42.8 1.003 110.8	8 12.8 1.003 110.7	9
70		5 10.9 1.003 109.8	5 40.9 1.003 109.8	6 10.9 1.003 109.8	6 40.8 1.003 109.8	7 10.8 1.003 109.8	7 40.8 1.003 109.8	8 10.8 1.003 109.7	70
1		5 08.9 1.003 108.8	5 38.8 1.003 108.8	6 08.9 1.003 108.8	6 38.9 1.003 108.8	7 08.8 1.003 108.8	7 38.8 1.003 108.8	8 08.8 1.003 108.7	1
2		5 06.9 1.003 107.8	5 36.9 1.003 107.8	6 06.9 1.003 107.8	6 36.9 1.003 107.8	7 06.9 1.003 107.8	7 36.8 1.003 107.8	8 06.8 1.003 107.7	2
3		5 04.9 1.003 106.8	5 34.9 1.003 106.8	6 04.9 1.003 106.8	6 34.9 1.003 106.8	7 04.9 1.003 106.8	7 34.8 1.003 106.8	8 04.8 1.003 106.7	3
4		5 02.9 1.003 105.8	5 32.9 1.003 105.8	6 02.9 1.003 105.8	6 32.9 1.003 105.8	7 02.8 1.003 105.8	7 32.8 1.003 105.8	8 02.8 1.003 105.7	4
75		5 00.9 1.003 104.8	5 30.9 1.003 104.8	6 00.9 1.003 104.8	6 30.8 1.003 104.8	7 00.8 1.003 104.8	7 30.8 1.003 104.8	8 00.8 1.003 104.7	75
6			5 28.9 1.003 103.8	5 58.9 1.003 103.8	6 28.8 1.003 103.8	6 58.8 1.003 103.8	7 28.8 1.003 103.8	7 58.8 1.003 103.7	6
7			5 26.8 1.003 102.8	5 56.8 1.003 102.8	6 26.8 1.003 102.8	6 56.8 1.003 102.8	7 26.7 1.003 102.8	7 56.7 1.003 102.7	7
8			5 24.8 1.003 101.8	5 54.8 1.003 101.8	6 24.7 1.003 101.8	6 54.7 1.003 101.8	7 24.7 1.003 101.8	7 54.7 1.003 101.7	8
9			5 22.7 1.003 100.8	5 52.7 1.003 100.8	6 22.6 1.003 100.8	6 52.6 1.003 100.8	7 22.6 1.003 100.8	7 52.6 1.003 100.7	9
80			5 20.7 1.003 99.8	5 50.6 1.003 99.8	6 20.6 1.003 99.8	6 50.6 1.003 99.8	7 20.6 1.003 99.8	7 50.6 1.003 99.7	80
1			5 18.6 1.003 98.8	5 48.6 1.003 98.8	6 18.6 1.003 98.8	6 48.5 1.003 98.8	7 18.5 1.003 98.8	7 48.5 1.003 98.7	1
2			5 16.5 1.003 97.8	5 46.5 1.003 97.8	6 16.5 1.003 97.8	6 46.5 1.003 97.8	7 16.4 1.003 97.8	7 46.4 1.003 97.7	2
3			5 14.4 1.003 96.8	5 44.4 1.003 96.8	6 14.4 1.003 96.8	6 44.4 1.003 96.8	7 14.4 1.003 96.8	7 44.3 1.003 96.7	3
4			5 12.4 1.003 95.8	5 42.3 1.003 95.8	6 12.3 1.003 95.8	6 42.3 1.003 95.8	7 12.3 1.003 95.8	7 42.3 1.003 95.7	4
85			5 10.3 1.003 94.8	5 40.3 1.003 94.8	6 10.2 1.003 94.8	6 40.2 1.003 94.8	7 10.2 1.003 94.8	7 40.2 1.003 94.7	85
6			5 08.2 1.003 93.8	5 38.2 1.003 93.8	6 08.1 1.003 93.8	6 38.1 1.003 93.8	7 08.1 1.003 93.8	7 38.1 1.003 93.7	6
7			5 06.1 1.003 92.8	5 36.1 1.003 92.8	6 06.1 1.003 92.8	6 36.0 1.003 92.8	7 06.0 1.003 92.8	7 36.0 1.003 92.7	7
8			5 04.0 1.003 91.8	5 34.0 1.003 91.8	6 04.0 1.003 91.8	6 33.9 1.003 91.8	7 03.9 1.003 91.8	7 33.9 1.003 91.7	8
9			5 01.9 1.003 90.8	5 31.9 1.003 90.8	6 01.9 1.003 90.8	6 31.9 1.003 90.8	7 01.8 1.003 90.8	7 31.8 1.003 90.7	9
90				5 29.8 1.003 89.8	5 59.8 1.003 89.8	6 29.8 1.003 89.8	6 59.7 1.003 89.8	7 29.7 1.003 89.7	90

Lat. 88°

H.A.	4° 00' Alt.	Az.	4° 30' Alt.	Az.	5° 00' Alt.	Az.	5° 30' Alt.	Az.	6° 00' Alt.	Az.	6° 30' Alt.	Az.	7° 00' Alt.	Az.	7° 30' Alt.	Az.	H.A.
91							5 27.7 1.0 03	88.8	5 57.7 1.0 03	88.8	6 27.7 1.0 03	88.8	6 57.6 1.0 03	88.8	7 27.6 1.0 03	88.7	91
2							5 25.6 1.0 03	87.8	5 55.6 1.0 03	87.8	6 25.6 1.0 03	87.8	6 55.6 1.0 03	87.8	7 25.5 1.0 03	87.7	2
3							5 23.5 1.0 03	86.8	5 53.5 1.0 03	86.8	6 23.5 1.0 03	86.8	6 53.5 1.0 03	86.8	7 23.4 1.0 03	86.7	3
4							5 21.4 1.0 03	85.8	5 51.4 1.0 03	85.8	6 21.4 1.0 03	85.8	6 51.4 1.0 03	85.8	7 21.4 1.0 03	85.7	4
95							5 19.3 1.0 03	84.8	5 49.3 1.0 03	84.8	6 19.3 1.0 03	84.8	6 49.3 1.0 03	84.8	7 19.3 1.0 03	84.7	95
6							5 17.3 1.0 03	83.8	5 47.2 1.0 03	83.8	6 17.2 1.0 03	83.8	6 47.2 1.0 03	83.8	7 17.2 1.0 03	83.7	6
7							5 15.2 1.0 03	82.8	5 45.2 1.0 03	82.8	6 15.1 1.0 03	82.8	6 45.1 1.0 03	82.8	7 15.1 1.0 03	82.7	7
8							5 13.1 1.0 03	81.8	5 43.1 1.0 03	81.8	6 13.1 1.0 03	81.8	6 43.1 1.0 03	81.8	7 13.0 1.0 03	81.7	8
9							5 11.0 1.0 03	80.8	5 41.0 1.0 03	80.8	6 11.0 1.0 03	80.8	6 41.0 1.0 03	80.8	7 11.0 1.0 03	80.7	9
100							5 09.0 1.0 03	79.8	5 39.0 1.0 03	79.8	6 08.9 1.0 03	79.8	6 38.9 1.0 03	79.8	7 08.9 1.0 03	79.7	100
1							5 06.9 1.0 03	78.8	5 36.9 1.0 03	78.8	6 06.9 1.0 03	78.8	6 36.9 1.0 03	78.8	7 06.8 1.0 03	78.7	1
2							5 04.9 1.0 03	77.8	5 34.8 1.0 03	77.8	6 04.8 1.0 03	77.8	6 34.8 1.0 03	77.8	7 04.8 1.0 03	77.8	2
3							5 02.8 1.0 03	76.8	5 32.8 1.0 03	76.8	6 02.8 1.0 03	76.8	6 32.8 1.0 03	76.8	7 02.7 1.0 03	76.8	3
4							5 00.8 1.0 03	75.8	5 30.8 1.0 03	75.8	6 00.8 1.0 03	75.8	6 30.7 1.0 03	75.8	7 00.7 1.0 03	75.8	4
105									5 28.7 1.0 03	74.8	5 58.7 1.0 03	74.8	6 28.7 1.0 03	74.8	6 58.7 1.0 03	74.8	105
6									5 26.7 1.0 03	73.8	5 56.7 1.0 03	73.8	6 26.7 1.0 03	73.8	6 56.7 1.0 03	73.8	6
7									5 24.7 1.0 03	72.8	5 54.7 1.0 03	72.8	6 24.7 1.0 03	72.8	6 54.7 1.0 03	72.8	7
8									5 22.7 1.0 03	71.8	5 52.7 1.0 03	71.8	6 22.7 1.0 03	71.8	6 52.7 1.0 03	71.8	8
9									5 20.7 1.0 03	70.8	5 50.7 1.0 03	70.8	6 20.7 1.0 03	70.8	6 50.7 1.0 03	70.8	9
110									5 18.8 1.0 03	69.8	5 48.8 1.0 03	69.8	6 18.7 1.0 03	69.8	6 48.7 1.0 03	69.8	110
1									5 16.8 1.0 03	68.8	5 46.8 1.0 03	68.8	6 16.8 1.0 03	68.8	6 46.8 1.0 03	68.8	1
2									5 14.9 1.0 03	67.8	5 44.9 1.0 03	67.8	6 14.8 1.0 03	67.8	6 44.8 1.0 03	67.8	2
3									5 12.9 1.0 03	66.8	5 42.9 1.0 03	66.8	6 12.9 1.0 03	66.8	6 42.9 1.0 03	66.8	3
4									5 11.0 1.0 03	65.8	5 41.0 1.0 03	65.8	6 11.0 1.0 03	65.8	6 41.0 1.0 03	65.8	4
115									5 09.1 1.0 03	64.8	5 39.1 1.0 03	64.8	6 09.1 1.0 03	64.8	6 39.1 1.0 03	64.8	115
6									5 07.2 1.0 03	63.8	5 37.2 1.0 03	63.8	6 07.2 1.0 03	63.8	6 37.2 1.0 03	63.8	6
7									5 05.4 1.0 03	62.8	5 35.3 1.0 03	62.8	6 05.3 1.0 03	62.8	6 35.3 1.0 03	62.8	7
8									5 03.5 1.0 03	61.8	5 33.5 1.0 03	61.8	6 03.5 1.0 03	61.8	6 33.5 1.0 03	61.8	8
9									5 01.7 1.0 03	60.8	5 31.6 1.0 03	60.8	6 01.6 1.0 03	60.8	6 31.6 1.0 03	60.8	9
120											5 29.8 1.0 03	59.8	5 59.8 1.0 03	59.8	6 29.8 1.0 03	59.8	120
1											5 28.0 1.0 03	58.8	5 58.0 1.0 03	58.8	6 28.0 1.0 03	58.8	1
2											5 26.2 1.0 03	57.8	5 56.2 1.0 03	57.8	6 26.2 1.0 03	57.8	2
3											5 24.5 1.0 03	56.8	5 54.5 1.0 03	56.8	6 24.5 1.0 03	56.8	3
4											5 22.7 1.0 03	55.8	5 52.7 1.0 03	55.8	6 22.7 1.0 03	55.8	4
125											5 21.0 1.0 03	54.8	5 51.0 1.0 03	54.8	6 21.0 1.0 03	54.8	125
6											5 19.3 1.0 03	53.8	5 49.3 1.0 03	53.8	6 19.3 1.0 03	53.8	6
7											5 17.6 1.0 03	52.8	5 47.6 1.0 03	52.8	6 17.6 1.0 03	52.8	7
8											5 16.0 1.0 03	51.8	5 46.0 1.0 03	51.8	6 16.0 1.0 03	51.8	8
9											5 14.3 1.0 03	50.8	5 44.3 1.0 03	50.8	6 14.3 1.0 03	50.8	9
130											5 12.7 1.0 03	49.8	5 42.7 1.0 03	49.8	6 12.7 1.0 03	49.8	130
1											5 11.1 1.0 03	48.8	5 41.1 1.0 03	48.8	6 11.1 1.0 03	48.8	1
2											5 09.6 1.0 03	47.8	5 39.6 1.0 03	47.8	6 09.6 1.0 03	47.8	2
3											5 08.0 1.0 02	46.9	5 38.0 1.0 03	46.8	6 08.0 1.0 03	46.8	3
4											5 06.5 1.0 02	45.9	5 36.5 1.0 02	45.8	6 06.5 1.0 02	45.8	4
135											5 05.0 1.0 02	44.9	5 35.0 1.0 02	44.8	6 05.0 1.0 02	44.8	135
6											5 03.6 1.0 02	43.9	5 33.6 1.0 02	43.8	6 03.6 1.0 02	43.8	6
7											5 02.1 1.0 02	42.9	5 32.1 1.0 02	42.9	6 02.1 1.0 02	42.8	7
8											5 00.7 1.0 02	41.9	5 30.7 1.0 02	41.9	6 00.7 1.0 02	41.8	8
9													5 29.3 1.0 02	40.9	5 59.3 1.0 02	40.8	9
140													5 28.0 1.0 02	39.9	5 58.0 1.0 02	39.8	140
1													5 26.6 1.0 02	38.9	5 56.6 1.0 02	38.9	1
2													5 25.3 1.0 02	37.9	5 55.3 1.0 02	37.9	2
3													5 24.1 1.0 02	36.9	5 54.1 1.0 02	36.9	3
4													5 22.8 1.0 02	35.9	5 52.8 1.0 02	35.9	4
145													5 21.6 1.0 02	34.9	5 51.6 1.0 02	34.9	145
6													5 20.4 1.0 02	33.9	5 50.4 1.0 02	33.9	6
7													5 19.3 1.0 02	32.9	5 49.3 1.0 02	32.9	7
8													5 18.2 1.0 02	31.9	5 48.2 1.0 02	31.9	8
9													5 17.1 1.0 02	30.9	5 47.1 1.0 02	30.9	9
150													5 16.0 1.0 02	29.9	5 46.0 1.0 02	29.9	150
1													5 15.0 1.0 02	28.9	5 45.0 1.0 02	28.9	1
2													5 14.0 1.0 02	27.9	5 44.0 1.0 02	27.9	2
3													5 13.0 1.0 02	26.9	5 43.0 1.0 02	26.9	3
4													5 12.1 1.0 02	25.9	5 42.1 1.0 02	25.9	4
155													5 11.2 1.0 01	24.9	5 41.2 1.0 01	24.9	155
6													5 10.3 1.0 01	23.9	5 40.3 1.0 01	23.9	6
7													5 09.5 1.0 01	22.9	5 39.5 1.0 01	22.9	7
8													5 08.7 1.0 01	21.9	5 38.7 1.0 01	21.9	8
9													5 07.9 1.0 01	20.9	5 37.9 1.0 01	20.9	9
160													5 07.2 1.0 01	19.9	5 37.2 1.0 01	19.9	160
1													5 06.5 1.0 01	18.9	5 36.5 1.0 01	18.9	1
2													5 05.9 1.0 01	17.9	5 35.8 1.0 01	17.9	2
3													5 05.2 1.0 01	16.9	5 35.2 1.0 01	16.9	3
4													5 04.6 1.0 01	15.9	5 34.6 1.0 01	15.9	4
165													5 04.1 1.0 01	14.9	5 34.1 1.0 01	14.9	165
6													5 03.6 1.0 01	13.9	5 33.5 1.0 01	13.9	6
7													5 03.1 1.0 01	13.0	5 33.1 1.0 01	12.9	7
8													5 02.6 1.0 01	12.0	5 32.6 1.0 01	12.0	8
9													5 02.2 1.0 01	11.0	5 32.2 1.0 01	11.0	9
170													5 01.8 1.0 01	10.0	5 31.8 1.0 01	10.0	170
1													5 01.5 1.0 00	09.0	5 31.5 1.0 00	09.0	1
2													5 01.2 1.0 00	08.0	5 31.2 1.0 00	08.0	2
3													5 00.9 1.0 00	07.0	5 30.9 1.0 00	07.0	3
4													5 00.7 1.0 00	06.0	5 30.7 1.0 00	06.0	4
175													5 00.5 1.0 00	05.0	5 30.5 1.0 00	05.0	175
6													5 00.3 1.0 00	04.0	5 30.3 1.0 00	04.0	6
7													5 00.2 1.0 00	03.0	5 30.2 1.0 00	03.0	7
8													5 00.1 1.0 00	02.0	5 30.1 1.0 00	02.0	8
9													5 00.0 1.0 00	01.0	5 30.0 1.0 00	01.0	9
180													5 00.0 1.0 00	00.0	5 30.0 1.0 00	00.0	180

Lat. 88° — Declination Same Name as Latitude

H.A.	8° 00′ Alt. / Δd Δt / Az.	8° 30′	9° 00′	9° 30′	10° 00′	10° 30′	11° 00′	11° 30′	H.A.
00	10 00.0 1.0 00 180.0	10 30.0 1.0 00 180.0	11 00.0 1.0 00 180.0	11 30.0 1.0 00 180.0	12 00.0 1.0 00 180.0	12 30.0 1.0 00 180.0	13 00.0 1.0 00 180.0	13 30.0 1.0 00 180.0	00
1	10 00.0 1.0 00 179.0	10 30.0 1.0 00 179.0	11 00.0 1.0 00 179.0	11 30.0 1.0 00 179.0	11 59.9 1.0 00 179.0	12 30.0 1.0 00 179.0	13 00.0 1.0 00 179.0	13 30.0 1.0 00 179.0	1
2	9 59.9 1.0 00 178.0	10 29.9 1.0 00 178.0	10 59.9 1.0 00 178.0	11 29.9 1.0 00 178.0	11 59.9 1.0 00 178.0	12 29.9 1.0 00 178.0	12 59.9 1.0 00 178.0	13 29.9 1.0 00 178.0	2
3	9 59.8 1.0 00 177.0	10 29.8 1.0 00 177.0	10 59.8 1.0 00 177.0	11 29.8 1.0 00 177.0	11 59.8 1.0 00 177.0	12 29.8 1.0 00 177.0	12 59.8 1.0 00 177.0	13 29.8 1.0 00 177.0	3
4	9 59.7 1.0 00 176.0	10 29.7 1.0 00 176.0	10 59.7 1.0 00 176.0	11 29.7 1.0 00 176.0	11 59.7 1.0 00 176.0	12 29.7 1.0 00 176.0	12 59.7 1.0 00 176.0	13 29.7 1.0 00 176.0	4
05	9 59.5 1.0 00 175.0	10 29.5 1.0 00 175.0	10 59.5 1.0 00 175.0	11 29.5 1.0 00 175.0	11 59.5 1.0 00 175.0	12 29.5 1.0 00 175.0	12 59.5 1.0 00 175.0	13 29.5 1.0 00 175.0	05
6	9 59.3 1.0 00 174.0	10 29.3 1.0 00 174.0	10 59.3 1.0 00 174.0	11 29.3 1.0 00 174.0	11 59.3 1.0 00 174.0	12 29.3 1.0 00 174.0	12 59.3 1.0 00 174.0	13 29.3 1.0 00 174.0	6
7	9 59.1 1.0 00 173.0	10 29.1 1.0 00 173.0	10 59.1 1.0 00 173.0	11 29.1 1.0 00 173.0	11 59.1 1.0 00 173.0	12 29.1 1.0 00 173.0	12 59.1 1.0 00 172.9	13 29.1 1.0 00 172.9	7
8	9 58.8 1.0 01 172.0	10 28.8 1.0 01 172.0	10 58.8 1.0 01 172.0	11 28.8 1.0 01 171.9	11 58.8 1.0 00 171.9	12 28.8 1.0 00 171.9	12 58.8 1.0 00 171.9	13 28.8 1.0 00 171.9	8
9	9 58.5 1.0 01 171.0	10 28.5 1.0 01 170.9	10 58.5 1.0 01 170.9	11 28.5 1.0 01 170.9	11 58.5 1.0 01 170.9	12 28.5 1.0 01 170.9	12 58.5 1.0 01 170.9	13 28.5 1.0 01 170.9	9
10	9 58.2 1.0 01 169.9	10 28.2 1.0 01 169.9	10 58.2 1.0 01 169.9	11 28.2 1.0 01 169.9	11 58.2 1.0 01 169.9	12 28.2 1.0 01 169.9	12 58.2 1.0 01 169.9	13 28.2 1.0 01 169.9	10
1	9 57.8 1.0 01 168.9	10 27.8 1.0 01 168.9	10 57.8 1.0 01 168.9	11 27.8 1.0 01 168.9	11 57.8 1.0 01 168.9	12 27.8 1.0 01 168.9	12 57.8 1.0 01 168.9	13 27.8 1.0 01 168.9	1
2	9 57.4 1.0 01 167.9	10 27.4 1.0 01 167.9	10 57.4 1.0 01 167.9	11 27.4 1.0 01 167.9	11 57.4 1.0 01 167.9	12 27.4 1.0 01 167.9	12 57.4 1.0 01 167.9	13 27.4 1.0 01 167.9	2
3	9 56.9 1.0 01 166.9	10 26.9 1.0 01 166.9	10 56.9 1.0 01 166.9	11 26.9 1.0 01 166.9	11 56.9 1.0 01 166.9	12 26.9 1.0 01 166.9	12 56.9 1.0 01 166.9	13 26.9 1.0 01 166.9	3
4	9 56.4 1.0 01 165.9	10 26.4 1.0 01 165.9	10 56.4 1.0 01 165.9	11 26.4 1.0 01 165.9	11 56.4 1.0 01 165.9	12 26.4 1.0 01 165.9	12 56.4 1.0 01 165.9	13 26.4 1.0 01 165.9	4
15	9 55.9 1.0 01 164.9	10 25.9 1.0 01 164.9	10 55.9 1.0 01 164.9	11 25.9 1.0 01 164.9	11 55.9 1.0 01 164.9	12 25.9 1.0 01 164.9	12 55.9 1.0 01 164.9	13 25.9 1.0 01 164.9	15
6	9 55.3 1.0 01 163.9	10 25.3 1.0 01 163.9	10 55.3 1.0 01 163.9	11 25.3 1.0 01 163.9	11 55.3 1.0 01 163.9	12 25.3 1.0 01 163.9	12 55.3 1.0 01 163.9	13 25.3 1.0 01 163.9	6
7	9 54.7 1.0 01 162.9	10 24.7 1.0 01 162.9	10 54.7 1.0 01 162.9	11 24.7 1.0 01 162.9	11 54.7 1.0 01 162.9	12 24.7 1.0 01 162.9	12 54.7 1.0 01 162.9	13 24.7 1.0 01 162.9	7
8	9 54.1 1.0 01 161.9	10 24.1 1.0 01 161.9	10 54.1 1.0 01 161.9	11 24.1 1.0 01 161.9	11 54.1 1.0 01 161.9	12 24.1 1.0 01 161.9	12 54.1 1.0 01 161.9	13 24.1 1.0 01 161.9	8
9	9 53.4 1.0 01 160.9	10 23.4 1.0 01 160.9	10 53.4 1.0 01 160.9	11 23.4 1.0 01 160.9	11 53.4 1.0 01 160.9	12 23.4 1.0 01 160.9	12 53.4 1.0 01 160.9	13 23.4 1.0 01 160.9	9
20	9 52.7 1.0 01 159.9	10 22.7 1.0 01 159.9	10 52.7 1.0 01 159.9	11 22.7 1.0 01 159.9	11 52.7 1.0 01 159.9	12 22.7 1.0 01 159.9	12 52.7 1.0 01 159.9	13 22.7 1.0 01 159.8	20
1	9 52.0 1.0 01 158.9	10 22.0 1.0 01 158.9	10 52.0 1.0 01 158.8	11 22.0 1.0 01 158.9	11 52.0 1.0 01 158.8	12 22.0 1.0 01 158.8	12 52.0 1.0 01 158.8	13 22.0 1.0 01 158.8	1
2	9 51.2 1.0 01 157.9	10 21.2 1.0 01 157.9	10 51.2 1.0 01 157.9	11 21.2 1.0 01 157.9	11 51.2 1.0 01 157.9	12 21.2 1.0 01 157.8	12 51.2 1.0 01 157.8	13 21.2 1.0 01 157.8	2
3	9 50.4 1.0 01 156.9	10 20.4 1.0 01 156.9	10 50.4 1.0 01 156.9	11 20.4 1.0 01 156.9	11 50.4 1.0 01 156.8	12 20.4 1.0 01 156.8	12 50.4 1.0 01 156.8	13 20.4 1.0 01 156.8	3
4	9 49.6 1.0 01 155.9	10 19.6 1.0 01 155.9	10 49.6 1.0 01 155.9	11 19.6 1.0 01 155.8	11 49.6 1.0 01 155.8	12 19.6 1.0 01 155.8	12 49.6 1.0 01 155.8	13 19.6 1.0 01 155.8	4
25	9 48.7 1.0 02 154.9	10 18.7 1.0 02 154.9	10 48.7 1.0 02 154.9	11 18.7 1.0 02 154.8	11 48.7 1.0 02 154.8	12 18.7 1.0 02 154.8	12 48.7 1.0 02 154.8	13 18.7 1.0 02 154.8	25
6	9 47.8 1.0 02 153.9	10 17.8 1.0 02 153.9	10 47.8 1.0 02 153.9	11 17.8 1.0 02 153.8	11 47.8 1.0 02 153.8	12 17.8 1.0 02 153.8	12 47.8 1.0 02 153.8	13 17.8 1.0 02 153.8	6
7	9 46.9 1.0 02 152.9	10 16.9 1.0 02 152.9	10 46.9 1.0 02 152.8	11 16.9 1.0 02 152.8	11 46.9 1.0 02 152.8	12 16.9 1.0 02 152.8	12 46.9 1.0 02 152.8	13 16.9 1.0 02 152.8	7
8	9 45.9 1.0 02 151.9	10 15.9 1.0 02 151.8	10 45.9 1.0 02 151.8	11 15.9 1.0 02 151.8	11 45.9 1.0 02 151.8	12 15.9 1.0 02 151.8	12 45.9 1.0 02 151.8	13 15.9 1.0 02 151.8	8
9	9 44.9 1.0 02 150.8	10 14.9 1.0 02 150.8	10 44.9 1.0 02 150.8	11 14.9 1.0 02 150.8	11 44.9 1.0 02 150.8	12 14.9 1.0 02 150.8	12 44.9 1.0 02 150.8	13 14.8 1.0 02 150.8	9
30	9 43.8 1.0 02 149.8	10 13.8 1.0 02 149.8	10 43.8 1.0 02 149.8	11 13.8 1.0 02 149.8	11 43.8 1.0 02 149.8	12 13.8 1.0 02 149.8	12 43.8 1.0 02 149.8	13 13.8 1.0 02 149.8	30
1	9 42.8 1.0 02 148.8	10 12.8 1.0 02 148.8	10 42.8 1.0 02 148.8	11 12.8 1.0 02 148.8	11 42.8 1.0 02 148.8	12 12.8 1.0 02 148.8	12 42.7 1.0 02 148.8	13 12.7 1.0 02 148.8	1
2	9 41.7 1.0 02 147.8	10 11.7 1.0 02 147.8	10 41.7 1.0 02 147.8	11 11.7 1.0 02 147.8	11 41.7 1.0 02 147.8	12 11.6 1.0 02 147.8	12 41.6 1.0 02 147.8	13 11.6 1.0 02 147.8	2
3	9 40.5 1.0 02 146.8	10 10.5 1.0 02 146.8	10 40.5 1.0 02 146.8	11 10.5 1.0 02 146.8	11 40.5 1.0 02 146.8	12 10.5 1.0 02 146.8	12 40.5 1.0 02 146.8	13 10.5 1.0 02 146.8	3
4	9 39.4 1.0 02 145.8	10 09.4 1.0 02 145.8	10 39.4 1.0 02 145.8	11 09.4 1.0 02 145.8	11 39.4 1.0 02 145.8	12 09.4 1.0 02 145.8	12 39.3 1.0 02 145.8	13 09.3 1.0 02 145.8	4
35	9 38.2 1.0 02 144.8	10 08.2 1.0 02 144.8	10 38.2 1.0 02 144.8	11 08.2 1.0 02 144.8	11 38.2 1.0 02 144.8	12 08.2 1.0 02 144.8	12 38.2 1.0 02 144.7	13 08.2 1.0 02 144.7	35
6	9 37.0 1.0 02 143.8	10 07.0 1.0 02 143.8	10 37.0 1.0 02 143.8	11 07.0 1.0 02 143.8	11 36.9 1.0 02 143.8	12 06.9 1.0 02 143.8	12 36.9 1.0 02 143.7	13 06.9 1.0 02 143.7	6
7	9 35.7 1.0 02 142.8	10 05.7 1.0 02 142.8	10 35.7 1.0 02 142.8	11 05.7 1.0 02 142.8	11 35.7 1.0 02 142.8	12 05.7 1.0 02 142.7	12 35.7 1.0 02 142.7	13 05.7 1.0 02 142.7	7
8	9 34.4 1.0 02 141.8	10 04.4 1.0 02 141.8	10 34.4 1.0 02 141.8	11 04.4 1.0 02 141.8	11 34.4 1.0 02 141.8	12 04.4 1.0 02 141.8	12 34.4 1.0 02 141.7	13 04.4 1.0 02 141.7	8
9	9 33.1 1.0 02 140.8	10 03.1 1.0 02 140.8	10 33.1 1.0 02 140.8	11 03.1 1.0 02 140.8	11 33.1 1.0 02 140.8	12 03.1 1.0 02 140.7	12 33.1 1.0 02 140.7	13 03.1 1.0 02 140.7	9
40	9 31.8 1.0 02 139.8	10 01.8 1.0 02 139.8	10 31.8 1.0 02 139.8	11 01.8 1.0 02 139.8	11 31.8 1.0 02 139.8	12 01.8 1.0 02 139.7	12 31.7 1.0 02 139.7	13 01.7 1.0 02 139.7	40
1	9 30.4 1.0 02 138.8	10 00.4 1.0 02 138.8	10 30.4 1.0 02 138.8	11 00.4 1.0 02 138.8	11 30.4 1.0 02 138.8	12 00.4 1.0 02 138.7	12 30.4 1.0 02 138.7	13 00.4 1.0 02 138.7	1
2	9 29.0 1.0 02 137.8	9 59.0 1.0 02 137.8	10 29.0 1.0 02 137.8	10 59.0 1.0 02 137.8	11 29.0 1.0 02 137.8	11 59.0 1.0 02 137.7	12 29.0 1.0 02 137.7	12 59.0 1.0 02 137.7	2
3	9 27.6 1.0 02 136.8	9 57.6 1.0 02 136.8	10 27.6 1.0 02 136.8	10 57.6 1.0 02 136.8	11 27.6 1.0 02 136.8	11 57.6 1.0 02 136.7	12 27.6 1.0 02 136.7	12 57.6 1.0 02 136.7	3
4	9 26.2 1.0 02 135.8	9 56.2 1.0 02 135.8	10 26.2 1.0 02 135.8	10 56.1 1.0 02 135.7	11 26.1 1.0 02 135.7	11 56.1 1.0 02 135.7	12 26.1 1.0 02 135.7	12 56.1 1.0 02 135.7	4
45	9 24.7 1.0 02 134.8	9 54.7 1.0 02 134.8	10 24.7 1.0 03 134.8	10 54.7 1.0 03 134.7	11 24.7 1.0 03 134.7	11 54.6 1.0 03 134.7	12 24.6 1.0 02 134.7	12 54.6 1.0 03 134.7	45
6	9 23.2 1.0 03 133.8	9 53.2 1.0 03 133.8	10 23.2 1.0 03 133.8	10 53.2 1.0 03 133.7	11 23.1 1.0 03 133.7	11 53.1 1.0 03 133.7	12 23.1 1.0 03 133.7	12 53.1 1.0 03 133.7	6
7	9 21.7 1.0 03 132.8	9 51.7 1.0 03 132.8	10 21.7 1.0 03 132.8	10 51.6 1.0 03 132.7	11 21.6 1.0 03 132.7	11 51.6 1.0 03 132.7	12 21.6 1.0 03 132.7	12 51.6 1.0 03 132.7	7
8	9 20.1 1.0 03 131.8	9 50.1 1.0 03 131.8	10 20.1 1.0 03 131.7	10 50.1 1.0 03 131.7	11 20.1 1.0 03 131.7	11 50.1 1.0 03 131.7	12 20.1 1.0 03 131.7	12 50.0 1.0 03 131.7	8
9	9 18.5 1.0 03 130.8	9 48.5 1.0 03 130.8	10 18.5 1.0 03 130.7	10 48.5 1.0 03 130.7	11 18.5 1.0 03 130.7	11 48.5 1.0 03 130.7	12 18.5 1.0 03 130.7	12 48.5 1.0 03 130.7	9
50	9 17.0 1.0 03 129.8	9 46.9 1.0 03 129.8	10 16.9 1.0 03 129.7	10 46.9 1.0 03 129.7	11 16.9 1.0 03 129.7	11 46.9 1.0 03 129.7	12 16.9 1.0 03 129.7	12 46.9 1.0 03 129.7	50
1	9 15.3 1.0 03 128.8	9 45.3 1.0 03 128.7	10 15.3 1.0 03 128.7	10 45.3 1.0 03 128.7	11 15.3 1.0 03 128.7	11 45.3 1.0 03 128.7	12 15.3 1.0 03 128.7	12 45.3 1.0 03 128.7	1
2	9 13.7 1.0 03 127.8	9 43.7 1.0 03 127.7	10 13.7 1.0 03 127.7	10 43.7 1.0 03 127.7	11 13.6 1.0 03 127.7	11 43.6 1.0 03 127.7	12 13.6 1.0 03 127.7	12 43.6 1.0 03 127.7	2
3	9 12.0 1.0 03 126.8	9 42.0 1.0 03 126.7	10 12.0 1.0 03 126.7	10 42.0 1.0 03 126.7	11 12.0 1.0 03 126.7	11 42.0 1.0 03 126.7	12 11.9 1.0 03 126.7	12 41.9 1.0 03 126.7	3
4	9 10.3 1.0 03 125.8	9 40.3 1.0 03 125.7	10 10.3 1.0 03 125.7	10 40.3 1.0 03 125.7	11 10.3 1.0 03 125.7	11 40.3 1.0 03 125.7	12 10.3 1.0 03 125.7	12 40.2 1.0 03 125.7	4
55	9 08.6 1.0 03 124.8	9 38.6 1.0 03 124.7	10 08.6 1.0 03 124.7	10 38.6 1.0 03 124.7	11 08.6 1.0 03 124.7	11 38.6 1.0 03 124.7	12 08.5 1.0 03 124.7	12 38.5 1.0 03 124.6	55
6	9 06.9 1.0 03 123.8	9 36.9 1.0 03 123.7	10 06.9 1.0 03 123.7	10 36.9 1.0 03 123.7	11 06.8 1.0 03 123.7	11 36.8 1.0 03 123.7	12 06.8 1.0 03 123.7	12 36.8 1.0 03 123.6	6
7	9 05.1 1.0 03 122.7	9 35.1 1.0 03 122.7	10 05.1 1.0 03 122.7	10 35.1 1.0 03 122.7	11 05.1 1.0 03 122.7	11 35.1 1.0 03 122.7	12 05.1 1.0 03 122.7	12 35.0 1.0 03 122.6	7
8	9 03.4 1.0 03 121.7	9 33.4 1.0 03 121.7	10 03.4 1.0 03 121.7	10 33.3 1.0 03 121.7	11 03.3 1.0 03 121.7	11 33.3 1.0 03 121.7	12 03.3 1.0 03 121.7	12 33.3 1.0 03 121.6	8
9	9 01.6 1.0 03 120.7	9 31.6 1.0 03 120.7	10 01.6 1.0 03 120.7	10 31.5 1.0 03 120.7	11 01.5 1.0 03 120.7	11 31.5 1.0 03 120.7	12 01.5 1.0 03 120.7	12 31.5 1.0 03 120.6	9
60	8 59.8 1.0 03 119.7	9 29.8 1.0 03 119.7	9 59.7 1.0 03 119.7	10 29.7 1.0 03 119.7	10 59.7 1.0 03 119.7	11 29.7 1.0 03 119.7	11 59.7 1.0 03 119.6	12 29.7 1.0 03 119.6	60
1	8 57.9 1.0 03 118.7	9 27.9 1.0 03 118.7	9 57.9 1.0 03 118.7	10 27.9 1.0 03 118.7	10 57.9 1.0 03 118.7	11 27.9 1.0 03 118.7	11 57.9 1.0 03 118.6	12 27.8 1.0 03 118.6	1
2	8 56.1 1.0 03 117.7	9 26.1 1.0 03 117.7	9 56.1 1.0 03 117.7	10 26.1 1.0 03 117.7	10 56.0 1.0 03 117.7	11 26.0 1.0 03 117.7	11 56.0 1.0 03 117.6	12 26.0 1.0 03 117.6	2
3	8 54.2 1.0 03 116.7	9 24.2 1.0 03 116.7	9 54.2 1.0 03 116.7	10 24.2 1.0 03 116.7	10 54.2 1.0 03 116.7	11 24.2 1.0 03 116.7	11 54.1 1.0 03 116.6	12 24.1 1.0 03 116.6	3
4	8 52.4 1.0 03 115.7	9 22.3 1.0 03 115.7	9 52.3 1.0 03 115.7	10 22.3 1.0 03 115.7	10 52.3 1.0 03 115.7	11 22.3 1.0 03 115.7	11 52.3 1.0 03 115.6	12 22.3 1.0 03 115.6	4
65	8 50.5 1.0 03 114.7	9 20.4 1.0 03 114.7	9 50.4 1.0 03 114.7	10 20.4 1.0 03 114.7	10 50.4 1.0 03 114.7	11 20.4 1.0 03 114.6	11 50.4 1.0 03 114.6	12 20.4 1.0 03 114.6	65
6	8 48.6 1.0 03 113.7	9 18.5 1.0 03 113.7	9 48.5 1.0 03 113.7	10 18.5 1.0 03 113.7	10 48.5 1.0 03 113.7	11 18.5 1.0 03 113.6	11 48.5 1.0 03 113.6	12 18.4 1.0 03 113.6	6
7	8 46.6 1.0 03 112.7	9 16.6 1.0 03 112.7	9 46.6 1.0 03 112.7	10 16.6 1.0 03 112.7	10 46.6 1.0 03 112.7	11 16.5 1.0 03 112.6	11 46.5 1.0 03 112.6	12 16.5 1.0 03 112.6	7
8	8 44.7 1.0 03 111.7	9 14.7 1.0 03 111.7	9 44.7 1.0 03 111.7	10 14.6 1.0 03 111.7	10 44.6 1.0 03 111.7	11 14.6 1.0 03 111.6	11 44.6 1.0 03 111.6	12 14.6 1.0 03 111.6	8
9	8 42.7 1.0 03 110.7	9 12.7 1.0 03 110.7	9 42.7 1.0 03 110.7	10 12.7 1.0 03 110.7	10 42.7 1.0 03 110.7	11 12.7 1.0 03 110.6	11 42.6 1.0 03 110.6	12 12.6 1.0 03 110.6	9
70	8 40.8 1.0 03 109.7	9 10.8 1.0 03 109.7	9 40.7 1.0 03 109.7	10 10.7 1.0 03 109.7	10 40.7 1.0 03 109.7	11 10.7 1.0 03 109.6	11 40.7 1.0 03 109.6	12 10.7 1.0 03 109.6	70
1	8 38.8 1.0 03 108.7	9 08.8 1.0 03 108.7	9 38.8 1.0 03 108.7	10 08.7 1.0 03 108.7	10 38.7 1.0 03 108.7	11 08.7 1.0 03 108.6	11 38.7 1.0 03 108.6	12 08.7 1.0 03 108.6	1
2	8 36.8 1.0 03 107.7	9 06.8 1.0 03 107.7	9 36.8 1.0 03 107.7	10 06.8 1.0 03 107.7	10 36.7 1.0 03 107.7	11 06.7 1.0 03 107.6	11 36.7 1.0 03 107.6	12 06.7 1.0 03 107.6	2
3	8 34.8 1.0 03 106.7	9 04.8 1.0 03 106.7	9 34.8 1.0 03 106.7	10 04.8 1.0 03 106.7	10 34.7 1.0 03 106.7	11 04.7 1.0 03 106.6	11 34.7 1.0 03 106.6	12 04.7 1.0 03 106.6	3
4	8 32.8 1.0 03 105.7	9 02.8 1.0 03 105.7	9 32.8 1.0 03 105.7	10 02.8 1.0 03 105.7	10 32.7 1.0 03 105.7	11 02.7 1.0 03 105.6	11 32.7 1.0 03 105.6	12 02.7 1.0 03 105.6	4
75	8 30.8 1.0 03 104.7	9 00.8 1.0 03 104.7	9 30.7 1.0 03 104.7	10 00.7 1.0 03 104.7	10 30.7 1.0 03 104.6	11 00.7 1.0 03 104.6	11 30.7 1.0 03 104.6	12 00.7 1.0 03 104.6	75
6	8 28.7 1.0 03 103.7	8 58.7 1.0 03 103.7	9 28.7 1.0 03 103.7	9 58.7 1.0 03 103.7	10 28.7 1.0 03 103.6	10 58.7 1.0 03 103.6	11 28.6 1.0 03 103.6	11 58.6 1.0 03 103.6	6
7	8 26.7 1.0 03 102.7	8 56.7 1.0 03 102.7	9 26.7 1.0 03 102.7	9 56.7 1.0 03 102.7	10 26.6 1.0 03 102.6	10 56.6 1.0 03 102.6	11 26.6 1.0 03 102.6	11 56.6 1.0 03 102.6	7
8	8 24.7 1.0 03 101.7	8 54.6 1.0 03 101.7	9 24.6 1.0 03 101.7	9 54.6 1.0 03 101.7	10 24.6 1.0 03 101.6	10 54.6 1.0 03 101.6	11 24.6 1.0 03 101.6	11 54.5 1.0 03 101.6	8
9	8 22.6 1.0 03 100.7	8 52.6 1.0 03 100.7	9 22.6 1.0 03 100.7	9 52.6 1.0 03 100.7	10 22.5 1.0 03 100.6	10 52.5 1.0 03 100.6	11 22.5 1.0 03 100.6	11 52.5 1.0 03 100.6	9
80	8 20.5 1.0 03 99.7	8 50.5 1.0 03 99.7	9 20.5 1.0 03 99.7	9 50.5 1.0 03 99.7	10 20.5 1.0 03 99.6	10 50.5 1.0 03 99.6	11 20.4 1.0 03 99.6	11 50.4 1.0 03 99.6	80
1	8 18.5 1.0 03 98.7	8 48.5 1.0 03 98.7	9 18.4 1.0 03 98.7	9 48.4 1.0 03 98.7	10 18.4 1.0 03 98.7	10 48.4 1.0 03 98.6	11 18.4 1.0 03 98.6	11 48.4 1.0 03 98.6	1
2	8 16.4 1.0 03 97.7	8 46.4 1.0 03 97.7	9 16.4 1.0 03 97.7	9 46.4 1.0 03 97.7	10 16.3 1.0 03 97.7	10 46.3 1.0 03 97.6	11 16.3 1.0 03 97.6	11 46.3 1.0 03 97.6	2
3	8 14.3 1.0 03 96.7	8 44.3 1.0 03 96.7	9 14.3 1.0 03 96.7	9 44.3 1.0 03 96.7	10 14.3 1.0 03 96.6	10 44.2 1.0 03 96.6	11 14.2 1.0 03 96.6	11 44.2 1.0 03 96.6	3
4	8 12.2 1.0 03 95.7	8 42.2 1.0 03 95.7	9 12.2 1.0 03 95.7	9 42.2 1.0 03 95.7	10 12.2 1.0 03 95.6	10 42.2 1.0 03 95.6	11 12.1 1.0 03 95.6	11 42.1 1.0 03 95.6	4
85	8 10.2 1.0 03 94.7	8 40.1 1.0 03 94.7	9 10.1 1.0 03 94.7	9 40.1 1.0 03 94.7	10 10.1 1.0 03 94.6	10 40.1 1.0 03 94.6	11 10.1 1.0 03 94.6	11 40.0 1.0 03 94.6	85
6	8 08.1 1.0 03 93.7	8 38.1 1.0 03 93.7	9 08.0 1.0 03 93.7	9 38.0 1.0 03 93.7	10 08.0 1.0 03 93.6	10 38.0 1.0 03 93.6	11 08.0 1.0 03 93.6	11 37.9 1.0 03 93.6	6
7	8 06.0 1.0 03 92.7	8 36.0 1.0 03 92.7	9 05.9 1.0 03 92.7	9 35.9 1.0 03 92.7	10 05.9 1.0 03 92.6	10 35.9 1.0 03 92.6	11 05.9 1.0 03 92.6	11 35.9 1.0 03 92.6	7
8	8 03.9 1.0 03 91.7	8 33.9 1.0 03 91.7	9 03.9 1.0 03 91.7	9 33.8 1.0 03 91.7	10 03.8 1.0 03 91.6	10 33.8 1.0 03 91.6	11 03.8 1.0 03 91.6	11 33.8 1.0 03 91.6	8
9	8 01.8 1.0 03 90.7	8 31.8 1.0 03 90.7	9 01.8 1.0 03 90.7	9 31.7 1.0 03 90.7	10 01.7 1.0 03 90.6	10 31.7 1.0 03 90.6	11 01.7 1.0 03 90.6	11 31.7 1.0 03 90.6	9
90	7 59.7 1.0 03 89.7	8 29.7 1.0 03 89.7	8 59.7 1.0 03 89.7	9 29.6 1.0 03 89.7	9 59.6 1.0 03 89.6	10 29.6 1.0 03 89.6	10 59.6 1.0 03 89.6	11 29.6 1.0 03 89.6	90

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Lat. 88°

H.A.	8° 00′ (Alt / Δd Δt / Az)	8° 30′	9° 00′	9° 30′	10° 00′	10° 30′	11° 00′	11° 30′	H.A.
91	7 57.6 1.003 88.7	8 27.6 1.003 88.7	8 57.6 1.003 88.7	9 27.6 1.003 88.7	9 57.5 1.003 88.6	10 27.5 1.003 88.6	10 57.5 1.003 88.6	11 27.5 1.003 88.6	91
2	7 55.5 1.003 87.7	8 25.5 1.003 87.7	8 55.5 1.003 87.7	9 25.5 1.003 87.7	9 55.4 1.003 87.6	10 25.4 1.003 87.6	10 55.4 1.003 87.6	11 25.4 1.003 87.6	2
3	7 53.4 1.003 86.7	8 23.4 1.003 86.7	8 53.4 1.003 86.7	9 23.4 1.003 86.7	9 53.4 1.003 86.6	10 23.3 1.003 86.6	10 53.3 1.003 86.6	11 23.3 1.003 86.6	3
4	7 51.3 1.003 85.7	8 21.3 1.003 85.7	8 51.3 1.003 85.7	9 21.3 1.003 85.7	9 51.3 1.003 85.7	10 21.2 1.003 85.6	10 51.2 1.003 85.6	11 21.2 1.003 85.6	4
95	7 49.3 1.003 84.7	8 19.2 1.003 84.7	8 49.2 1.003 84.7	9 19.2 1.003 84.7	9 49.2 1.003 84.7	10 19.2 1.003 84.6	10 49.1 1.003 84.6	11 19.1 1.003 84.6	95
6	7 47.2 1.003 83.7	8 17.1 1.003 83.7	8 47.1 1.003 83.7	9 17.1 1.003 83.7	9 47.1 1.003 83.7	10 17.1 1.003 83.6	10 47.0 1.003 83.6	11 17.0 1.003 83.6	6
7	7 45.1 1.003 82.7	8 15.1 1.003 82.7	8 45.1 1.003 82.7	9 15.0 1.003 82.7	9 45.0 1.003 82.7	10 15.0 1.003 82.6	10 45.0 1.003 82.6	11 15.0 1.003 82.6	7
8	7 43.0 1.003 81.7	8 13.0 1.003 81.7	8 43.0 1.003 81.7	9 13.0 1.003 81.7	9 42.9 1.003 81.7	10 12.9 1.003 81.6	10 42.9 1.003 81.6	11 12.9 1.003 81.6	8
9	7 40.9 1.003 80.7	8 10.9 1.003 80.7	8 40.9 1.003 80.7	9 10.9 1.003 80.7	9 40.9 1.003 80.7	10 10.9 1.003 80.6	10 40.8 1.003 80.6	11 10.8 1.003 80.6	9
100	7 38.9 1.003 79.7	8 08.9 1.003 79.7	8 38.8 1.003 79.7	9 08.8 1.003 79.7	9 38.8 1.003 79.7	10 08.8 1.003 79.6	10 38.8 1.003 79.6	11 08.8 1.003 79.6	100
1	7 36.8 1.003 78.7	8 06.8 1.003 78.7	8 36.8 1.003 78.7	9 06.8 1.003 78.7	9 36.8 1.003 78.7	10 06.7 1.003 78.6	10 36.7 1.003 78.6	11 06.7 1.003 78.6	1
2	7 34.8 1.003 77.7	8 04.8 1.003 77.7	8 34.7 1.003 77.7	9 04.7 1.003 77.7	9 34.7 1.003 77.7	10 04.7 1.003 77.6	10 34.7 1.003 77.6	11 04.6 1.003 77.6	2
3	7 32.7 1.003 76.7	8 02.7 1.003 76.7	8 32.7 1.003 76.7	9 02.7 1.003 76.7	9 32.7 1.003 76.7	10 02.6 1.003 76.6	10 32.6 1.003 76.6	11 02.6 1.003 76.6	3
4	7 30.7 1.003 75.7	8 00.7 1.003 75.7	8 30.7 1.003 75.7	9 00.6 1.003 75.7	9 30.6 1.003 75.7	10 00.6 1.003 75.6	10 30.6 1.003 75.6	11 00.6 1.003 75.6	4
105	7 28.7 1.003 74.7	7 58.7 1.003 74.7	8 28.6 1.003 74.7	8 58.6 1.003 74.7	9 28.6 1.003 74.7	9 58.6 1.003 74.7	10 28.6 1.003 74.6	10 58.6 1.003 74.6	105
6	7 26.7 1.003 73.7	7 56.6 1.003 73.7	8 26.6 1.003 73.7	8 56.6 1.003 73.7	9 26.6 1.003 73.7	9 56.6 1.003 73.7	10 26.6 1.003 73.6	10 56.5 1.003 73.6	6
7	7 24.7 1.003 72.7	7 54.6 1.003 72.7	8 24.6 1.003 72.7	8 54.6 1.003 72.7	9 24.6 1.003 72.7	9 54.6 1.003 72.7	10 24.5 1.003 72.6	10 54.5 1.003 72.6	7
8	7 22.7 1.003 71.7	7 52.6 1.003 71.7	8 22.6 1.003 71.7	8 52.6 1.003 71.7	9 22.6 1.003 71.7	9 52.6 1.003 71.7	10 22.6 1.003 71.6	10 52.5 1.003 71.6	8
9	7 20.7 1.003 70.7	7 50.7 1.003 70.7	8 20.6 1.003 70.7	8 50.6 1.003 70.7	9 20.6 1.003 70.7	9 50.6 1.003 70.7	10 20.6 1.003 70.6	10 50.6 1.003 70.6	9
110	7 18.7 1.003 69.7	7 48.7 1.003 69.7	8 18.7 1.003 69.7	8 48.7 1.003 69.7	9 18.6 1.003 69.7	9 48.6 1.003 69.7	10 18.6 1.003 69.6	10 48.6 1.003 69.6	110
1	7 16.7 1.003 68.7	7 46.7 1.003 68.7	8 16.7 1.003 68.7	8 46.7 1.003 68.7	9 16.7 1.003 68.7	9 46.7 1.003 68.7	10 16.6 1.003 68.6	10 46.6 1.003 68.6	1
2	7 14.8 1.003 67.8	7 44.8 1.003 67.7	8 14.8 1.003 67.7	8 44.8 1.003 67.7	9 14.7 1.003 67.7	9 44.7 1.003 67.7	10 14.7 1.003 67.7	10 44.7 1.003 67.6	2
3	7 12.9 1.003 66.8	7 42.9 1.003 66.7	8 12.8 1.003 66.7	8 42.8 1.003 66.7	9 12.8 1.003 66.7	9 42.8 1.003 66.7	10 12.8 1.003 66.6	10 42.8 1.003 66.6	3
4	7 11.0 1.003 65.8	7 40.9 1.003 65.7	8 10.9 1.003 65.7	8 40.9 1.003 65.7	9 10.9 1.003 65.7	9 40.9 1.003 65.7	10 10.9 1.003 65.7	10 40.8 1.003 65.6	4
115	7 09.1 1.003 64.8	7 39.0 1.003 64.7	8 09.0 1.003 64.7	8 39.0 1.003 64.7	9 09.0 1.003 64.7	9 39.0 1.003 64.7	10 09.0 1.003 64.7	10 38.9 1.003 64.6	115
6	7 07.2 1.003 63.8	7 37.2 1.003 63.7	8 07.1 1.003 63.7	8 37.1 1.003 63.7	9 07.1 1.003 63.7	9 37.1 1.003 63.7	10 07.1 1.003 63.7	10 37.1 1.003 63.6	6
7	7 05.3 1.003 62.8	7 35.3 1.003 62.7	8 05.3 1.003 62.7	8 35.3 1.003 62.7	9 05.2 1.003 62.7	9 35.2 1.003 62.7	10 05.2 1.003 62.7	10 35.2 1.003 62.7	7
8	7 03.4 1.003 61.8	7 33.4 1.003 61.8	8 03.4 1.003 61.7	8 33.4 1.003 61.7	9 03.4 1.003 61.7	9 33.4 1.003 61.7	10 03.4 1.003 61.7	10 33.3 1.003 61.7	8
9	7 01.6 1.003 60.8	7 31.6 1.003 60.8	8 01.6 1.003 60.7	8 31.6 1.003 60.7	9 01.6 1.003 60.7	9 31.5 1.003 60.7	10 01.5 1.003 60.7	10 31.5 1.003 60.7	9
120	6 59.8 1.003 59.8	7 29.8 1.003 59.8	7 59.8 1.003 59.7	8 29.7 1.003 59.7	8 59.7 1.003 59.7	9 29.7 1.003 59.7	9 59.7 1.003 59.7	10 29.7 1.003 59.7	120
1	6 58.0 1.003 58.8	7 28.0 1.003 58.8	7 58.0 1.003 58.7	8 27.9 1.003 58.7	8 57.9 1.003 58.7	9 27.9 1.003 58.7	9 57.9 1.003 58.7	10 27.9 1.003 58.7	1
2	6 56.2 1.003 57.8	7 26.2 1.003 57.8	7 56.2 1.003 57.7	8 26.2 1.003 57.7	8 56.2 1.003 57.7	9 26.1 1.003 57.7	9 56.1 1.003 57.7	10 26.1 1.003 57.7	2
3	6 54.4 1.003 56.8	7 24.4 1.003 56.8	7 54.4 1.003 56.8	8 24.4 1.003 56.7	8 54.4 1.003 56.7	9 24.4 1.003 56.7	9 54.4 1.003 56.7	10 24.4 1.003 56.7	3
4	6 52.7 1.003 55.8	7 22.7 1.003 55.8	7 52.7 1.003 55.8	8 22.7 1.003 55.7	8 52.7 1.003 55.7	9 22.6 1.003 55.7	9 52.6 1.003 55.7	10 22.6 1.003 55.7	4
125	6 51.0 1.003 54.8	7 21.0 1.003 54.8	7 51.0 1.003 54.8	8 20.9 1.003 54.7	8 50.9 1.003 54.7	9 20.9 1.003 54.7	9 50.9 1.003 54.7	10 20.9 1.003 54.7	125
6	6 49.3 1.003 53.8	7 19.3 1.003 53.8	7 49.3 1.003 53.8	8 19.2 1.003 53.7	8 49.2 1.003 53.7	9 19.2 1.003 53.7	9 49.2 1.003 53.7	10 19.2 1.003 53.7	6
7	6 47.6 1.003 52.8	7 17.6 1.003 52.8	7 47.6 1.003 52.8	8 17.6 1.003 52.8	8 47.6 1.003 52.7	9 17.5 1.003 52.7	9 47.5 1.003 52.7	10 17.5 1.003 52.7	7
8	6 45.9 1.003 51.8	7 15.9 1.003 51.8	7 45.9 1.003 51.8	8 15.9 1.003 51.8	8 45.9 1.003 51.7	9 15.9 1.003 51.7	9 45.9 1.003 51.7	10 15.9 1.003 51.7	8
9	6 44.3 1.003 50.8	7 14.3 1.003 50.8	7 44.3 1.003 50.8	8 14.3 1.003 50.8	8 44.3 1.003 50.7	9 14.3 1.003 50.7	9 44.2 1.003 50.7	10 14.2 1.003 50.7	9
130	6 42.7 1.003 49.8	7 12.7 1.003 49.8	7 42.7 1.003 49.8	8 12.7 1.003 49.8	8 42.7 1.003 49.7	9 12.6 1.003 49.7	9 42.6 1.003 49.7	10 12.6 1.003 49.7	130
1	6 41.1 1.003 48.8	7 11.1 1.003 48.8	7 41.1 1.003 48.8	8 11.1 1.003 48.8	8 41.1 1.003 48.8	9 11.1 1.003 48.7	9 41.1 1.003 48.7	10 11.0 1.003 48.7	1
2	6 39.6 1.003 47.8	7 09.6 1.003 47.8	7 39.5 1.003 47.8	8 09.5 1.003 47.8	8 39.5 1.003 47.8	9 09.5 1.003 47.7	9 39.5 1.003 47.7	10 09.5 1.003 47.7	2
3	6 38.0 1.003 46.8	7 08.0 1.003 46.8	7 38.0 1.003 46.8	8 08.0 1.003 46.8	8 38.0 1.003 46.8	9 08.0 1.003 46.7	9 38.0 1.003 46.7	10 07.9 1.003 46.7	3
4	6 36.5 1.002 45.8	7 06.5 1.002 45.8	7 36.5 1.002 45.8	8 06.5 1.002 45.8	8 36.5 1.002 45.8	9 06.4 1.002 45.7	9 36.4 1.002 45.7	10 06.4 1.002 45.7	4
135	6 35.0 1.002 44.8	7 05.0 1.002 44.8	7 35.0 1.002 44.8	8 05.0 1.002 44.8	8 35.0 1.002 44.8	9 05.0 1.002 44.8	9 35.0 1.002 44.7	10 04.9 1.002 44.7	135
6	6 33.5 1.002 43.8	7 03.5 1.002 43.8	7 33.5 1.002 43.8	8 03.5 1.002 43.8	8 33.5 1.002 43.8	9 03.5 1.002 43.8	9 33.5 1.002 43.7	10 03.5 1.002 43.7	6
7	6 32.1 1.002 42.8	7 02.1 1.002 42.8	7 32.1 1.002 42.8	8 02.1 1.002 42.8	8 32.1 1.002 42.8	9 02.1 1.002 42.8	9 32.1 1.002 42.8	10 02.0 1.002 42.7	7
8	6 30.7 1.002 41.8	7 00.7 1.002 41.8	7 30.7 1.002 41.8	8 00.7 1.002 41.8	8 30.7 1.002 41.8	9 00.7 1.002 41.8	9 30.6 1.002 41.8	10 00.6 1.002 41.7	8
9	6 29.3 1.002 40.8	6 59.3 1.002 40.8	7 29.3 1.002 40.8	7 59.3 1.002 40.8	8 29.3 1.002 40.8	8 59.3 1.002 40.8	9 29.3 1.002 40.8	9 59.3 1.002 40.8	9
140	6 28.0 1.002 39.8	6 58.0 1.002 39.8	7 27.9 1.002 39.8	7 57.9 1.002 39.8	8 27.9 1.002 39.8	8 57.9 1.002 39.8	9 27.9 1.002 39.8	9 57.9 1.002 39.8	140
1	6 26.6 1.002 38.8	6 56.6 1.002 38.8	7 26.6 1.002 38.8	7 56.6 1.002 38.8	8 26.6 1.002 38.8	8 56.6 1.002 38.8	9 26.6 1.002 38.8	9 56.6 1.002 38.8	1
2	6 25.3 1.002 37.8	6 55.3 1.002 37.8	7 25.3 1.002 37.8	7 55.3 1.002 37.8	8 25.3 1.002 37.8	8 55.3 1.002 37.8	9 25.3 1.002 37.8	9 55.3 1.002 37.8	2
3	6 24.1 1.002 36.8	6 54.1 1.002 36.8	7 24.1 1.002 36.8	7 54.0 1.002 36.8	8 24.0 1.002 36.8	8 54.0 1.002 36.8	9 24.0 1.002 36.8	9 54.0 1.002 36.8	3
4	6 22.8 1.002 35.9	6 52.8 1.002 35.8	7 22.8 1.002 35.8	7 52.8 1.002 35.8	8 22.8 1.002 35.8	8 52.8 1.002 35.8	9 22.8 1.002 35.8	9 52.8 1.002 35.8	4
145	6 21.6 1.002 34.9	6 51.6 1.002 34.8	7 21.6 1.002 34.8	7 51.6 1.002 34.8	8 21.6 1.002 34.8	8 51.6 1.002 34.8	9 21.6 1.002 34.8	9 51.6 1.002 34.8	145
6	6 20.4 1.002 33.9	6 50.4 1.002 33.8	7 20.4 1.002 33.8	7 50.4 1.002 33.8	8 20.4 1.002 33.8	8 50.4 1.002 33.8	9 20.4 1.002 33.8	9 50.4 1.002 33.8	6
7	6 19.3 1.002 32.9	6 49.3 1.002 32.9	7 19.3 1.002 32.8	7 49.3 1.002 32.8	8 19.3 1.002 32.8	8 49.3 1.002 32.8	9 19.2 1.002 32.8	9 49.2 1.002 32.8	7
8	6 18.2 1.002 31.9	6 48.2 1.002 31.8	7 18.1 1.002 31.8	7 48.1 1.002 31.8	8 18.1 1.002 31.8	8 48.1 1.002 31.8	9 18.1 1.002 31.8	9 48.1 1.002 31.8	8
9	6 17.1 1.002 30.9	6 47.1 1.002 30.9	7 17.1 1.002 30.9	7 47.1 1.002 30.8	8 17.0 1.002 30.8	8 47.0 1.002 30.8	9 17.0 1.002 30.8	9 47.0 1.002 30.8	9
150	6 16.0 1.002 29.9	6 46.0 1.002 29.9	7 16.0 1.002 29.9	7 46.0 1.002 29.8	8 16.0 1.002 29.8	8 46.0 1.002 29.8	9 16.0 1.002 29.8	9 46.0 1.002 29.8	150
1	6 15.0 1.002 28.9	6 45.0 1.002 28.9	7 15.0 1.002 28.9	7 45.0 1.002 28.9	8 15.0 1.002 28.8	8 45.0 1.002 28.8	9 15.0 1.002 28.8	9 45.0 1.002 28.8	1
2	6 14.0 1.002 27.9	6 44.0 1.002 27.9	7 14.0 1.002 27.9	7 44.0 1.002 27.9	8 14.0 1.002 27.8	8 44.0 1.002 27.8	9 14.0 1.002 27.8	9 44.0 1.002 27.8	2
3	6 13.0 1.002 26.9	6 43.0 1.002 26.9	7 13.0 1.002 26.9	7 43.0 1.002 26.9	8 13.0 1.002 26.9	8 43.0 1.002 26.8	9 13.0 1.002 26.8	9 43.0 1.002 26.8	3
4	6 12.1 1.002 25.9	6 42.1 1.002 25.9	7 12.1 1.002 25.9	7 42.1 1.002 25.9	8 12.1 1.002 25.9	8 42.1 1.002 25.9	9 12.1 1.002 25.8	9 42.1 1.002 25.8	4
155	6 11.2 1.001 24.9	6 41.2 1.001 24.9	7 11.2 1.001 24.9	7 41.2 1.001 24.9	8 11.2 1.001 24.9	8 41.2 1.001 24.9	9 11.2 1.001 24.8	9 41.2 1.001 24.8	155
6	6 10.3 1.001 23.9	6 40.3 1.001 23.9	7 10.3 1.001 23.9	7 40.3 1.001 23.9	8 10.3 1.001 23.9	8 40.3 1.001 23.9	9 10.3 1.001 23.9	9 40.3 1.001 23.8	6
7	6 09.5 1.001 22.9	6 39.5 1.001 22.9	7 09.5 1.001 22.9	7 39.5 1.001 22.9	8 09.5 1.001 22.9	8 39.5 1.001 22.9	9 09.5 1.001 22.9	9 39.5 1.001 22.9	7
8	6 08.7 1.001 21.9	6 38.7 1.001 21.9	7 08.7 1.001 21.9	7 38.7 1.001 21.9	8 08.7 1.001 21.9	8 38.7 1.001 21.9	9 08.7 1.001 21.9	9 38.7 1.001 21.9	8
9	6 07.9 1.001 20.9	6 37.9 1.001 20.9	7 07.9 1.001 20.9	7 37.9 1.001 20.9	8 07.9 1.001 20.9	8 37.9 1.001 20.9	9 07.9 1.001 20.9	9 37.9 1.001 20.9	9
160	6 07.2 1.001 19.9	6 37.2 1.001 19.9	7 07.2 1.001 19.9	7 37.2 1.001 19.9	8 07.2 1.001 19.9	8 37.2 1.001 19.9	9 07.2 1.001 19.9	9 37.2 1.001 19.9	160
1	6 06.5 1.001 18.9	6 36.5 1.001 18.9	7 06.5 1.001 18.9	7 36.5 1.001 18.9	8 06.5 1.001 18.9	8 36.5 1.001 18.9	9 06.5 1.001 18.9	9 36.5 1.001 18.9	1
2	6 05.8 1.001 17.9	6 35.8 1.001 17.9	7 05.8 1.001 17.9	7 35.8 1.001 17.9	8 05.8 1.001 17.9	8 35.8 1.001 17.9	9 05.8 1.001 17.9	9 35.8 1.001 17.9	2
3	6 05.2 1.001 16.9	6 35.2 1.001 16.9	7 05.2 1.001 16.9	7 35.2 1.001 16.9	8 05.2 1.001 16.9	8 35.2 1.001 16.9	9 05.2 1.001 16.9	9 35.2 1.001 16.9	3
4	6 04.6 1.001 15.9	6 34.6 1.001 15.9	7 04.6 1.001 15.9	7 34.6 1.001 15.9	8 04.6 1.001 15.9	8 34.6 1.001 15.9	9 04.6 1.001 15.9	9 34.6 1.001 15.9	4
165	6 04.1 1.001 14.9	6 34.1 1.001 14.9	7 04.1 1.001 14.9	7 34.1 1.001 14.9	8 04.1 1.001 14.9	8 34.1 1.001 14.9	9 04.1 1.001 14.9	9 34.1 1.001 14.9	165
6	6 03.5 1.001 13.9	6 33.5 1.001 13.9	7 03.5 1.001 13.9	7 33.5 1.001 13.9	8 03.5 1.001 13.9	8 33.5 1.001 13.9	9 03.5 1.001 13.9	9 33.5 1.001 13.9	6
7	6 03.1 1.001 12.9	6 33.1 1.001 12.9	7 03.1 1.001 12.9	7 33.1 1.001 12.9	8 03.1 1.001 12.9	8 33.1 1.001 12.9	9 03.1 1.001 12.9	9 33.1 1.001 12.9	7
8	6 02.6 1.001 11.9	6 32.6 1.001 11.9	7 02.6 1.001 11.9	7 32.6 1.001 11.9	8 02.6 1.001 11.9	8 32.6 1.001 11.9	9 02.6 1.001 11.9	9 32.6 1.001 11.9	8
9	6 02.2 1.001 11.0	6 32.2 1.001 10.9	7 02.2 1.001 10.9	7 32.2 1.001 10.9	8 02.2 1.001 10.9	8 32.2 1.001 10.9	9 02.2 1.001 10.9	9 32.2 1.001 10.9	9
170	6 01.8 1.001 10.0	6 31.8 1.001 10.0	7 01.8 1.001 10.0	7 31.8 1.001 09.9	8 01.8 1.001 09.9	8 31.8 1.001 09.9	9 01.8 1.001 09.9	9 31.8 1.001 09.9	170
1	6 01.5 1.000 09.0	6 31.5 1.000 09.0	7 01.5 1.000 09.0	7 31.5 1.000 09.0	8 01.5 1.000 09.0	8 31.5 1.000 08.9	9 01.5 1.000 08.9	9 31.5 1.000 08.9	1
2	6 01.2 1.000 08.0	6 31.2 1.000 08.0	7 01.2 1.000 08.0	7 31.2 1.000 08.0	8 01.2 1.000 08.0	8 31.2 1.000 08.0	9 01.2 1.000 08.0	9 31.2 1.000 07.9	2
3	6 00.9 1.000 07.0	6 30.9 1.000 07.0	7 00.9 1.000 07.0	7 30.9 1.000 07.0	8 00.9 1.000 07.0	8 30.9 1.000 07.0	9 00.9 1.000 07.0	9 30.9 1.000 07.0	3
4	6 00.7 1.000 06.0	6 30.7 1.000 06.0	7 00.7 1.000 06.0	7 30.7 1.000 06.0	8 00.7 1.000 06.0	8 30.7 1.000 06.0	9 00.7 1.000 06.0	9 30.7 1.000 06.0	4
175	6 00.5 1.000 05.0	6 30.5 1.000 05.0	7 00.5 1.000 05.0	7 30.5 1.000 05.0	8 00.5 1.000 05.0	8 30.5 1.000 05.0	9 00.5 1.000 05.0	9 30.5 1.000 05.0	175
6	6 00.3 1.000 04.0	6 30.3 1.000 04.0	7 00.3 1.000 04.0	7 30.3 1.000 04.0	8 00.3 1.000 04.0	8 30.3 1.000 04.0	9 00.3 1.000 04.0	9 30.3 1.000 04.0	6
7	6 00.2 1.000 03.0	6 30.2 1.000 03.0	7 00.2 1.000 03.0	7 30.2 1.000 03.0	8 00.2 1.000 03.0	8 30.2 1.000 03.0	9 00.2 1.000 03.0	9 30.2 1.000 03.0	7
8	6 00.1 1.000 02.0	6 30.1 1.000 02.0	7 00.1 1.000 02.0	7 30.1 1.000 02.0	8 00.1 1.000 02.0	8 30.1 1.000 02.0	9 00.1 1.000 02.0	9 30.1 1.000 02.0	8
9	6 00.0 1.000 01.0	6 30.0 1.000 01.0	7 00.0 1.000 01.0	7 30.0 1.000 01.0	8 00.0 1.000 01.0	8 30.0 1.000 01.0	9 00.0 1.000 01.0	9 30.0 1.000 01.0	9
180	6 00.0 1.000 00.0	6 30.0 1.000 00.0	7 00.0 1.000 00.0	7 30.0 1.000 00.0	8 00.0 1.000 00.0	8 30.0 1.000 00.0	9 00.0 1.000 00.0	9 30.0 1.000 00.0	180

Lat. 88°

Each cell: Alt.   Δd   Δt   Az.

H.A.	12° 00′	12° 30′	18° 00′	13° 30′	14° 00′	14° 30′	15° 00′	15° 30′	H.A.
00	14 00.0 1.0 00 180.0	14 30.0 1.0 00 180.0	15 00.0 1.0 00 180.0	15 30.0 1.0 00 180.0	16 00.0 1.0 00 180.0	16 30.0 1.0 00 180.0	17 00.0 1.0 00 180.0	17 30.0 1.0 00 180.0	00
1	14 00.0 1.0 00 179.0	14 30.0 1.0 00 179.0	15 00.0 1.0 00 179.0	15 30.0 1.0 00 179.0	16 00.0 1.0 00 179.0	16 30.0 1.0 00 179.0	17 00.0 1.0 00 179.0	17 30.0 1.0 00 179.0	1
2	13 59.9 1.0 00 178.0	14 29.9 1.0 00 178.0	14 59.9 1.0 00 178.0	15 29.9 1.0 00 178.0	15 59.9 1.0 00 178.0	16 29.9 1.0 00 178.0	16 59.9 1.0 00 178.0	17 29.9 1.0 00 178.0	2
3	13 59.8 1.0 00 177.0	14 29.8 1.0 00 177.0	14 59.8 1.0 00 177.0	15 29.8 1.0 00 177.0	15 59.8 1.0 00 177.0	16 29.8 1.0 00 177.0	16 59.8 1.0 00 177.0	17 29.8 1.0 00 177.0	3
4	13 59.7 1.0 00 176.0	14 29.7 1.0 00 176.0	14 59.7 1.0 00 176.0	15 29.7 1.0 00 176.0	15 59.7 1.0 00 176.0	16 29.7 1.0 00 176.0	16 59.7 1.0 00 176.0	17 29.7 1.0 00 176.0	4
05	13 59.5 1.0 00 175.0	14 29.5 1.0 00 175.0	14 59.5 1.0 00 175.0	15 29.5 1.0 00 175.0	15 59.5 1.0 00 175.0	16 29.5 1.0 00 175.0	16 59.5 1.0 00 175.0	17 29.5 1.0 00 174.9	05
6	13 59.3 1.0 00 174.0	14 29.3 1.0 00 173.9	14 59.3 1.0 00 173.9	15 29.3 1.0 00 173.9	15 59.3 1.0 00 173.9	16 29.3 1.0 00 173.9	16 59.3 1.0 00 173.9	17 29.3 1.0 00 173.9	6
7	13 59.1 1.0 00 172.9	14 29.1 1.0 00 172.9	14 59.1 1.0 00 172.9	15 29.1 1.0 00 172.9	15 59.1 1.0 00 172.9	16 29.1 1.0 00 172.9	16 59.1 1.0 00 172.9	17 29.1 1.0 00 172.9	7
8	13 58.8 1.0 00 171.9	14 28.8 1.0 00 171.9	14 58.8 1.0 00 171.9	15 28.8 1.0 00 171.9	15 58.8 1.0 00 171.9	16 28.8 1.0 00 171.9	16 58.8 1.0 01 171.9	17 28.8 1.0 01 171.9	8
9	13 58.5 1.0 01 170.9	14 28.5 1.0 01 170.9	14 58.5 1.0 01 170.9	15 28.5 1.0 01 170.9	15 58.5 1.0 01 170.9	16 28.5 1.0 01 170.9	16 58.5 1.0 01 170.9	17 28.5 1.0 01 170.9	9
10	13 58.2 1.0 01 169.9	14 28.2 1.0 01 169.9	14 58.2 1.0 01 169.9	15 28.2 1.0 01 169.9	15 58.2 1.0 01 169.9	16 28.2 1.0 01 169.9	16 58.2 1.0 01 169.9	17 28.2 1.0 01 169.9	10
1	13 57.8 1.0 01 168.9	14 27.8 1.0 01 168.9	14 57.8 1.0 01 168.9	15 27.8 1.0 01 168.9	15 57.8 1.0 01 168.9	16 27.8 1.0 01 168.9	16 57.8 1.0 01 168.9	17 27.8 1.0 01 168.9	1
2	13 57.4 1.0 01 167.9	14 27.4 1.0 01 167.9	14 57.4 1.0 01 167.9	15 27.4 1.0 01 167.9	15 57.4 1.0 01 167.9	16 27.4 1.0 01 167.9	16 57.4 1.0 01 167.9	17 27.4 1.0 01 167.9	2
3	13 56.9 1.0 01 166.9	14 26.9 1.0 01 166.9	14 56.9 1.0 01 166.9	15 26.9 1.0 01 166.9	15 56.9 1.0 01 166.9	16 26.9 1.0 01 166.9	16 56.9 1.0 01 166.9	17 26.9 1.0 01 166.9	3
4	13 56.4 1.0 01 165.9	14 26.4 1.0 01 165.9	14 56.4 1.0 01 165.9	15 26.4 1.0 01 165.9	15 56.4 1.0 01 165.9	16 26.4 1.0 01 165.9	16 56.4 1.0 01 165.9	17 26.4 1.0 01 165.9	4
15	13 55.9 1.0 01 164.9	14 25.9 1.0 01 164.9	14 55.9 1.0 01 164.9	15 25.9 1.0 01 164.9	15 55.9 1.0 01 164.9	16 25.9 1.0 01 164.9	16 55.9 1.0 01 164.9	17 25.9 1.0 01 164.8	15
6	13 55.3 1.0 01 163.9	14 25.3 1.0 01 163.9	14 55.3 1.0 01 163.9	15 25.3 1.0 01 163.9	15 55.3 1.0 01 163.9	16 25.3 1.0 01 163.8	16 55.3 1.0 01 163.8	17 25.3 1.0 01 163.8	6
7	13 54.7 1.0 01 162.9	14 24.7 1.0 01 162.9	14 54.7 1.0 01 162.9	15 24.7 1.0 01 162.9	15 54.7 1.0 01 162.8	16 24.7 1.0 01 162.8	16 54.7 1.0 01 162.8	17 24.7 1.0 01 162.8	7
8	13 54.1 1.0 01 161.9	14 24.1 1.0 01 161.9	14 54.1 1.0 01 161.8	15 24.1 1.0 01 161.8	15 54.1 1.0 01 161.8	16 24.1 1.0 01 161.8	16 54.1 1.0 01 161.8	17 24.1 1.0 01 161.8	8
9	13 53.3 1.0 01 160.8	14 23.4 1.0 01 160.8	14 53.4 1.0 01 160.8	15 23.4 1.0 01 160.8	15 53.4 1.0 01 160.8	16 23.4 1.0 01 160.8	16 53.4 1.0 01 160.8	17 23.4 1.0 01 160.8	9
20	13 52.7 1.0 01 159.8	14 22.7 1.0 01 159.8	14 52.7 1.0 01 159.8	15 22.7 1.0 01 159.8	15 52.7 1.0 01 159.8	16 22.7 1.0 01 159.8	16 52.7 1.0 01 159.8	17 22.7 1.0 01 159.8	20
1	13 52.0 1.0 01 158.8	14 22.0 1.0 01 158.8	14 52.0 1.0 01 158.8	15 22.0 1.0 01 158.8	15 52.0 1.0 01 158.8	16 22.0 1.0 01 158.8	16 52.0 1.0 01 158.8	17 22.0 1.0 01 158.8	1
2	13 51.2 1.0 01 157.8	14 21.2 1.0 01 157.8	14 51.2 1.0 01 157.8	15 21.2 1.0 01 157.8	15 51.2 1.0 01 157.8	16 21.2 1.0 01 157.8	16 51.2 1.0 01 157.8	17 21.2 1.0 01 157.8	2
3	13 50.4 1.0 01 156.8	14 20.4 1.0 01 156.8	14 50.4 1.0 01 156.8	15 20.4 1.0 01 156.8	15 50.4 1.0 01 156.8	16 20.4 1.0 01 156.8	16 50.4 1.0 01 156.8	17 20.4 1.0 01 156.8	3
4	13 49.5 1.0 01 155.8	14 19.5 1.0 01 155.8	14 49.5 1.0 01 155.8	15 19.5 1.0 01 155.8	15 49.5 1.0 01 155.8	16 19.5 1.0 01 155.8	16 49.5 1.0 01 155.8	17 19.5 1.0 01 155.8	4
25	13 48.7 1.0 02 154.8	14 18.7 1.0 02 154.8	14 48.7 1.0 02 154.8	15 18.7 1.0 02 154.8	15 48.7 1.0 02 154.8	16 18.7 1.0 02 154.8	16 48.7 1.0 02 154.8	17 18.6 1.0 02 154.7	25
6	13 47.7 1.0 02 153.8	14 17.7 1.0 02 153.8	14 47.8 1.0 02 153.8	15 17.8 1.0 02 153.8	15 47.7 1.0 02 153.8	16 17.7 1.0 02 153.8	16 47.7 1.0 02 153.7	17 17.7 1.0 02 153.7	6
7	13 46.8 1.0 02 152.8	14 16.8 1.0 02 152.8	14 46.8 1.0 02 152.8	15 16.8 1.0 02 152.8	15 46.8 1.0 02 152.8	16 16.8 1.0 02 152.7	16 46.8 1.0 02 152.7	17 16.8 1.0 02 152.7	7
8	13 45.9 1.0 02 151.8	14 15.8 1.0 02 151.8	14 45.8 1.0 02 151.8	15 15.8 1.0 02 151.8	15 45.8 1.0 02 151.7	16 15.8 1.0 02 151.7	16 45.8 1.0 02 151.7	17 15.8 1.0 02 151.7	8
9	13 44.8 1.0 02 150.8	14 14.8 1.0 02 150.8	14 44.8 1.0 02 150.8	15 14.8 1.0 02 150.8	15 44.8 1.0 02 150.7	16 14.8 1.0 02 150.7	16 44.8 1.0 02 150.7	17 14.8 1.0 02 150.7	9
30	13 43.8 1.0 02 149.8	14 13.8 1.0 02 149.8	14 43.8 1.0 02 149.8	15 13.8 1.0 02 149.7	15 43.8 1.0 02 149.7	16 13.8 1.0 02 149.7	16 43.8 1.0 02 149.7	17 13.8 1.0 02 149.7	30
1	13 42.7 1.0 02 148.8	14 12.7 1.0 02 148.8	14 42.7 1.0 02 148.7	15 12.7 1.0 02 148.7	15 42.7 1.0 02 148.7	16 12.7 1.0 02 148.7	16 42.7 1.0 02 148.7	17 12.7 1.0 02 148.7	1
2	13 41.6 1.0 02 147.8	14 11.6 1.0 02 147.7	14 41.6 1.0 02 147.7	15 11.6 1.0 02 147.7	15 41.6 1.0 02 147.7	16 11.6 1.0 02 147.7	16 41.6 1.0 02 147.7	17 11.6 1.0 02 147.7	2
3	13 40.5 1.0 02 146.8	14 10.5 1.0 02 146.7	14 40.5 1.0 02 146.7	15 10.5 1.0 02 146.7	15 40.5 1.0 02 146.7	16 10.5 1.0 02 146.7	16 40.5 1.0 02 146.7	17 10.5 1.0 02 146.7	3
4	13 39.3 1.0 02 145.7	14 09.3 1.0 02 145.7	14 39.3 1.0 02 145.7	15 09.3 1.0 02 145.7	15 39.3 1.0 02 145.7	16 09.3 1.0 02 145.7	16 39.3 1.0 02 145.7	17 09.3 1.0 02 145.7	4
35	13 38.1 1.0 02 144.7	14 08.1 1.0 02 144.7	14 38.1 1.0 02 144.7	15 08.1 1.0 02 144.7	15 38.1 1.0 02 144.7	16 08.1 1.0 02 144.7	16 38.1 1.0 02 144.7	17 08.1 1.0 02 144.7	35
6	13 36.9 1.0 02 143.7	14 06.9 1.0 02 143.7	14 36.9 1.0 02 143.7	15 06.9 1.0 02 143.7	15 36.9 1.0 02 143.7	16 06.9 1.0 02 143.7	16 36.9 1.0 02 143.7	17 06.9 1.0 02 143.7	6
7	13 35.7 1.0 02 142.7	14 05.7 1.0 02 142.7	14 35.7 1.0 02 142.7	15 05.6 1.0 02 142.7	15 35.6 1.0 02 142.7	16 05.6 1.0 02 142.7	16 35.6 1.0 02 142.7	17 05.6 1.0 02 142.6	7
8	13 34.4 1.0 02 141.7	14 04.4 1.0 02 141.7	14 34.4 1.0 02 141.7	15 04.4 1.0 02 141.7	15 34.4 1.0 02 141.7	16 04.3 1.0 02 141.7	16 34.3 1.0 02 141.7	17 04.3 1.0 02 141.6	8
9	13 33.1 1.0 02 140.7	14 03.1 1.0 02 140.7	14 33.1 1.0 02 140.7	15 03.1 1.0 02 140.7	15 33.0 1.0 02 140.7	16 03.0 1.0 02 140.6	16 33.0 1.0 02 140.6	17 03.0 1.0 02 140.6	9
40	13 31.7 1.0 02 139.7	14 01.7 1.0 02 139.7	14 31.7 1.0 02 139.7	15 01.7 1.0 02 139.7	15 31.7 1.0 02 139.7	16 01.7 1.0 02 139.6	16 31.7 1.0 02 139.6	17 01.7 1.0 02 139.6	40
1	13 30.4 1.0 02 138.7	14 00.4 1.0 02 138.7	14 30.3 1.0 02 138.7	15 00.3 1.0 02 138.7	15 30.3 1.0 02 138.7	16 00.3 1.0 02 138.6	16 30.3 1.0 02 138.6	17 00.3 1.0 02 138.6	1
2	13 29.0 1.0 02 137.7	13 59.0 1.0 02 137.7	14 29.0 1.0 02 137.7	14 58.9 1.0 02 137.7	15 28.9 1.0 02 137.6	15 58.9 1.0 02 137.6	16 28.9 1.0 02 137.6	16 58.9 1.0 02 137.6	2
3	13 27.5 1.0 02 136.7	13 57.5 1.0 02 136.7	14 27.5 1.0 02 136.7	14 57.5 1.0 02 136.7	15 27.5 1.0 02 136.6	15 57.5 1.0 02 136.6	16 27.5 1.0 02 136.6	16 57.5 1.0 02 136.6	3
4	13 26.1 1.0 02 135.7	13 56.1 1.0 02 135.7	14 26.1 1.0 02 135.6	14 56.1 1.0 02 135.6	15 26.1 1.0 02 135.6	15 56.0 1.0 02 135.6	16 26.0 1.0 02 135.6	16 56.0 1.0 02 135.6	4
45	13 24.6 1.0 02 134.7	13 54.6 1.0 02 134.7	14 24.6 1.0 02 134.7	14 54.6 1.0 02 134.6	15 24.6 1.0 02 134.6	15 54.6 1.0 02 134.6	16 24.6 1.0 02 134.6	16 54.6 1.0 02 134.6	45
6	13 23.1 1.0 03 133.7	13 53.1 1.0 03 133.7	14 23.1 1.0 03 133.6	14 53.1 1.0 03 133.6	15 23.1 1.0 03 133.6	15 53.1 1.0 03 133.6	16 23.1 1.0 03 133.6	16 53.0 1.0 03 133.6	6
7	13 21.6 1.0 03 132.7	13 51.6 1.0 03 132.7	14 21.6 1.0 03 132.6	14 51.6 1.0 03 132.6	15 21.6 1.0 03 132.6	15 51.5 1.0 03 132.6	16 21.5 1.0 03 132.6	16 51.5 1.0 03 132.6	7
8	13 20.0 1.0 03 131.7	13 50.0 1.0 03 131.7	14 20.0 1.0 03 131.6	14 50.0 1.0 03 131.6	15 20.0 1.0 03 131.6	15 50.0 1.0 03 131.6	16 20.0 1.0 03 131.6	16 50.0 1.0 03 131.6	8
9	13 18.5 1.0 03 130.7	13 48.5 1.0 03 130.6	14 18.4 1.0 03 130.6	14 48.4 1.0 03 130.6	15 18.4 1.0 03 130.6	15 48.4 1.0 03 130.6	16 18.4 1.0 03 130.6	16 48.4 1.0 03 130.6	9
50	13 16.9 1.0 03 129.7	13 46.9 1.0 03 129.6	14 16.8 1.0 03 129.6	14 46.8 1.0 03 129.6	15 16.8 1.0 03 129.6	15 46.8 1.0 03 129.6	16 16.8 1.0 03 129.6	16 46.8 1.0 03 129.6	50
1	13 15.2 1.0 03 128.7	13 45.2 1.0 03 128.6	14 15.2 1.0 03 128.6	14 45.2 1.0 03 128.6	15 15.2 1.0 03 128.6	15 45.2 1.0 03 128.6	16 15.2 1.0 03 128.6	16 45.2 1.0 03 128.5	1
2	13 13.6 1.0 03 127.6	13 43.6 1.0 03 127.6	14 13.6 1.0 03 127.6	14 43.6 1.0 03 127.6	15 13.5 1.0 03 127.6	15 43.5 1.0 03 127.6	16 13.5 1.0 03 127.6	16 43.5 1.0 03 127.5	2
3	13 11.9 1.0 03 126.6	13 41.9 1.0 03 126.6	14 11.9 1.0 03 126.6	14 41.9 1.0 03 126.6	15 11.9 1.0 03 126.6	15 41.9 1.0 03 126.6	16 11.8 1.0 03 126.6	16 41.8 1.0 03 126.5	3
4	13 10.2 1.0 03 125.6	13 40.2 1.0 03 125.6	14 10.2 1.0 03 125.6	14 40.2 1.0 03 125.6	15 10.2 1.0 03 125.6	15 40.2 1.0 03 125.6	16 10.2 1.0 03 125.5	16 40.1 1.0 03 125.5	4
55	13 08.5 1.0 03 124.6	13 38.5 1.0 03 124.6	14 08.5 1.0 03 124.6	14 38.5 1.0 03 124.6	15 08.5 1.0 03 124.6	15 38.5 1.0 03 124.6	16 08.4 1.0 03 124.5	16 38.4 1.0 03 124.5	55
6	13 06.8 1.0 03 123.6	13 36.8 1.0 03 123.6	14 06.8 1.0 03 123.6	14 36.7 1.0 03 123.6	15 06.7 1.0 03 123.6	15 36.7 1.0 03 123.6	16 06.7 1.0 03 123.5	16 36.7 1.0 03 123.5	6
7	13 05.0 1.0 03 122.6	13 35.0 1.0 03 122.6	14 05.0 1.0 03 122.6	14 35.0 1.0 03 122.6	15 05.0 1.0 03 122.6	15 35.0 1.0 03 122.5	16 05.0 1.0 03 122.5	16 34.9 1.0 03 122.5	7
8	13 03.3 1.0 03 121.6	13 33.2 1.0 03 121.6	14 03.2 1.0 03 121.6	14 33.2 1.0 03 121.6	15 03.2 1.0 03 121.6	15 33.2 1.0 03 121.5	16 03.2 1.0 03 121.5	16 33.2 1.0 03 121.5	8
9	13 01.5 1.0 03 120.6	13 31.5 1.0 03 120.6	14 01.4 1.0 03 120.6	14 31.4 1.0 03 120.6	15 01.4 1.0 03 120.6	15 31.4 1.0 03 120.5	16 01.4 1.0 03 120.5	16 31.4 1.0 03 120.5	9
60	12 59.7 1.0 03 119.6	13 29.6 1.0 03 119.6	13 59.6 1.0 03 119.6	14 29.6 1.0 03 119.6	14 59.6 1.0 03 119.6	15 29.6 1.0 03 119.5	15 59.6 1.0 03 119.5	16 29.6 1.0 03 119.5	60
1	12 57.8 1.0 03 118.6	13 27.8 1.0 03 118.6	13 57.8 1.0 03 118.6	14 27.8 1.0 03 118.6	14 57.8 1.0 03 118.5	15 27.8 1.0 03 118.5	15 57.7 1.0 03 118.5	16 27.7 1.0 03 118.5	1
2	12 56.0 1.0 03 117.6	13 26.0 1.0 03 117.6	13 56.0 1.0 03 117.6	14 25.9 1.0 03 117.6	14 55.9 1.0 03 117.5	15 25.9 1.0 03 117.5	15 55.9 1.0 03 117.5	16 25.9 1.0 03 117.5	2
3	12 54.1 1.0 03 116.6	13 24.1 1.0 03 116.6	13 54.1 1.0 03 116.6	14 24.1 1.0 03 116.6	14 54.1 1.0 03 116.5	15 24.0 1.0 03 116.5	15 54.0 1.0 03 116.5	16 24.0 1.0 03 116.5	3
4	12 52.2 1.0 03 115.6	13 22.2 1.0 03 115.6	13 52.2 1.0 03 115.6	14 22.2 1.0 03 115.6	14 52.2 1.0 03 115.5	15 22.2 1.0 03 115.5	15 52.1 1.0 03 115.5	16 22.1 1.0 03 115.5	4
65	12 50.3 1.0 03 114.6	13 20.3 1.0 03 114.6	13 50.3 1.0 03 114.6	14 20.3 1.0 03 114.5	14 50.3 1.0 03 114.5	15 20.3 1.0 03 114.5	15 50.2 1.0 03 114.5	16 20.2 1.0 03 114.5	65
6	12 48.4 1.0 03 113.6	13 18.4 1.0 03 113.6	13 48.4 1.0 03 113.6	14 18.4 1.0 03 113.5	14 48.4 1.0 03 113.5	15 18.3 1.0 03 113.5	15 48.3 1.0 03 113.5	16 18.3 1.0 03 113.5	6
7	12 46.5 1.0 03 112.6	13 16.5 1.0 03 112.6	13 46.5 1.0 03 112.6	14 16.5 1.0 03 112.5	14 46.4 1.0 03 112.5	15 16.4 1.0 03 112.5	15 46.4 1.0 03 112.5	16 16.4 1.0 03 112.5	7
8	12 44.6 1.0 03 111.6	13 14.5 1.0 03 111.6	13 44.5 1.0 03 111.6	14 14.5 1.0 03 111.5	14 44.5 1.0 03 111.5	15 14.5 1.0 03 111.5	15 44.5 1.0 03 111.5	16 14.4 1.0 03 111.5	8
9	12 42.6 1.0 03 110.6	13 12.6 1.0 03 110.6	13 42.6 1.0 03 110.6	14 12.6 1.0 03 110.5	14 42.5 1.0 03 110.5	15 12.5 1.0 03 110.5	15 42.5 1.0 03 110.5	16 12.5 1.0 03 110.5	9
70	12 40.6 1.0 03 109.6	13 10.6 1.0 03 109.6	13 40.6 1.0 03 109.6	14 10.6 1.0 03 109.5	14 40.6 1.0 03 109.5	15 10.6 1.0 03 109.5	15 40.5 1.0 03 109.5	16 10.5 1.0 03 109.5	70
1	12 38.7 1.0 03 108.6	13 08.6 1.0 03 108.6	13 38.6 1.0 03 108.6	14 08.6 1.0 03 108.5	14 38.6 1.0 03 108.5	15 08.6 1.0 03 108.5	15 38.6 1.0 03 108.5	16 08.5 1.0 03 108.5	1
2	12 36.7 1.0 03 107.6	13 06.7 1.0 03 107.6	13 36.6 1.0 03 107.6	14 06.6 1.0 03 107.5	14 36.6 1.0 03 107.5	15 06.6 1.0 03 107.5	15 36.6 1.0 03 107.5	16 06.5 1.0 03 107.5	2
3	12 34.7 1.0 03 106.6	13 04.7 1.0 03 106.6	13 34.6 1.0 03 106.6	14 04.6 1.0 03 106.5	14 34.6 1.0 03 106.5	15 04.6 1.0 03 106.5	15 34.6 1.0 03 106.5	16 04.5 1.0 03 106.5	3
4	12 32.7 1.0 03 105.6	13 02.6 1.0 03 105.6	13 32.6 1.0 03 105.5	14 02.6 1.0 03 105.5	14 32.6 1.0 03 105.5	15 02.6 1.0 03 105.5	15 32.5 1.0 03 105.5	16 02.5 1.0 03 105.5	4
75	12 30.6 1.0 03 104.6	13 00.6 1.0 03 104.6	13 30.6 1.0 03 104.5	14 00.6 1.0 03 104.5	14 30.6 1.0 03 104.5	15 00.5 1.0 03 104.5	15 30.5 1.0 03 104.5	16 00.5 1.0 03 104.5	75
6	12 28.6 1.0 03 103.6	12 58.6 1.0 03 103.6	13 28.6 1.0 03 103.5	13 58.6 1.0 03 103.5	14 28.5 1.0 03 103.5	14 58.5 1.0 03 103.5	15 28.5 1.0 03 103.5	15 58.5 1.0 03 103.5	6
7	12 26.5 1.0 03 102.6	12 56.5 1.0 03 102.6	13 26.5 1.0 03 102.5	13 56.5 1.0 03 102.5	14 26.5 1.0 03 102.5	14 56.5 1.0 03 102.5	15 26.5 1.0 03 102.5	15 56.4 1.0 03 102.4	7
8	12 24.5 1.0 03 101.6	12 54.5 1.0 03 101.6	13 24.5 1.0 03 101.5	13 54.5 1.0 03 101.5	14 24.4 1.0 03 101.5	14 54.4 1.0 03 101.5	15 24.4 1.0 03 101.5	15 54.4 1.0 03 101.4	8
9	12 22.5 1.0 03 100.6	12 52.4 1.0 03 100.6	13 22.4 1.0 03 100.5	13 52.4 1.0 03 100.5	14 22.4 1.0 03 100.5	14 52.4 1.0 03 100.5	15 22.4 1.0 03 100.5	15 52.3 1.0 03 100.4	9
80	12 20.4 1.0 03 99.6	12 50.4 1.0 03 99.6	13 20.4 1.0 03 99.5	13 50.3 1.0 03 99.5	14 20.3 1.0 03 99.5	14 50.3 1.0 03 99.5	15 20.3 1.0 03 99.5	15 50.3 1.0 03 99.4	80
1	12 18.3 1.0 03 98.6	12 48.3 1.0 03 98.6	13 18.3 1.0 03 98.5	13 48.3 1.0 03 98.5	14 18.3 1.0 03 98.5	14 48.2 1.0 03 98.5	15 18.2 1.0 03 98.5	15 48.2 1.0 03 98.4	1
2	12 16.3 1.0 03 97.6	12 46.2 1.0 03 97.6	13 16.2 1.0 03 97.5	13 46.2 1.0 03 97.5	14 16.2 1.0 03 97.5	14 46.2 1.0 03 97.5	15 16.1 1.0 03 97.5	15 46.1 1.0 03 97.4	2
3	12 14.2 1.0 03 96.6	12 44.2 1.0 03 96.6	13 14.1 1.0 03 96.5	13 44.1 1.0 03 96.5	14 14.1 1.0 03 96.5	14 44.1 1.0 03 96.5	15 14.1 1.0 03 96.5	15 44.0 1.0 03 96.4	3
4	12 12.1 1.0 03 95.6	12 42.1 1.0 03 95.6	13 12.1 1.0 03 95.5	13 42.0 1.0 03 95.5	14 12.0 1.0 03 95.5	14 42.0 1.0 03 95.5	15 12.0 1.0 03 95.5	15 42.0 1.0 03 95.4	4
85	12 10.0 1.0 03 94.6	12 40.0 1.0 03 94.6	13 10.0 1.0 03 94.5	13 40.0 1.0 03 94.5	14 09.9 1.0 03 94.5	14 39.9 1.0 03 94.5	15 09.9 1.0 03 94.5	15 39.9 1.0 03 94.4	85
6	12 07.9 1.0 03 93.6	12 37.9 1.0 03 93.6	13 07.9 1.0 03 93.5	13 37.9 1.0 03 93.5	14 07.8 1.0 03 93.5	14 37.8 1.0 03 93.5	15 07.8 1.0 03 93.5	15 37.8 1.0 03 93.4	6
7	12 05.8 1.0 03 92.6	12 35.8 1.0 03 92.6	13 05.8 1.0 03 92.5	13 35.7 1.0 03 92.5	14 05.7 1.0 03 92.5	14 35.7 1.0 03 92.5	15 05.7 1.0 03 92.5	15 35.7 1.0 03 92.4	7
8	12 03.7 1.0 03 91.6	12 33.7 1.0 03 91.6	13 03.7 1.0 03 91.5	13 33.7 1.0 03 91.5	14 03.7 1.0 03 91.5	14 33.6 1.0 03 91.5	15 03.6 1.0 03 91.5	15 33.6 1.0 03 91.4	8
9	12 01.6 1.0 03 90.6	12 31.6 1.0 03 90.6	13 01.6 1.0 03 90.5	13 31.6 1.0 03 90.5	14 01.6 1.0 03 90.5	14 31.6 1.0 03 90.5	15 01.5 1.0 03 90.5	15 31.5 1.0 03 90.4	9
90	11 59.6 1.0 03 89.6	12 29.5 1.0 03 89.6	12 59.5 1.0 03 89.5	13 29.5 1.0 03 89.5	13 59.5 1.0 03 89.5	14 29.5 1.0 03 89.5	14 59.4 1.0 03 89.5	15 29.4 1.0 03 89.4	90

Lat. 88°

H.A.	12° 00' Alt.	Az.	12° 30' Alt.	Az.	13° 00' Alt.	Az.	13° 30' Alt.	Az.	14° 00' Alt.	Az.	14° 30' Alt.	Az.	15° 00' Alt.	Az.	15° 30' Alt.	Az.	H.A.
91	11 57.5 1.0 03	88.6	12 27.4 1.0 03	88.6	12 57.4 1.0 03	88.5	13 27.4 1.0 03	88.5	13 57.4 1.0 03	88.5	14 27.4 1.0 03	88.5	14 57.3 1.0 03	88.5	15 27.3 1.0 03	88.4	91
2	11 55.4 1.0 03	87.6	12 25.3 1.0 03	87.6	12 55.3 1.0 03	87.5	13 25.3 1.0 03	87.5	13 55.3 1.0 03	87.5	14 25.3 1.0 03	87.5	14 55.3 1.0 03	87.5	15 25.2 1.0 03	87.4	2
3	11 53.3 1.0 03	86.6	12 23.3 1.0 03	86.6	12 53.3 1.0 03	86.5	13 23.2 1.0 03	86.5	13 53.2 1.0 03	86.5	14 23.2 1.0 03	86.5	14 53.2 1.0 03	86.5	15 23.1 1.0 03	86.4	3
4	11 51.2 1.0 03	85.6	12 21.2 1.0 03	85.6	12 51.2 1.0 03	85.5	13 21.1 1.0 03	85.5	13 51.1 1.0 03	85.5	14 21.1 1.0 03	85.5	14 51.1 1.0 03	85.5	15 21.1 1.0 03	85.4	4
95	11 49.1 1.0 03	84.6	12 19.1 1.0 03	84.6	12 49.1 1.0 03	84.5	13 19.0 1.0 03	84.5	13 49.0 1.0 03	84.5	14 19.0 1.0 03	84.5	14 49.0 1.0 03	84.5	15 19.0 1.0 03	84.5	95
6	11 47.0 1.0 03	83.6	12 17.0 1.0 03	83.6	12 47.0 1.0 03	83.5	13 17.0 1.0 03	83.5	13 46.9 1.0 03	83.5	14 16.9 1.0 03	83.5	14 46.9 1.0 03	83.5	15 16.9 1.0 03	83.5	6
7	11 44.9 1.0 03	82.6	12 14.9 1.0 03	82.6	12 44.9 1.0 03	82.6	13 14.9 1.0 03	82.5	13 44.9 1.0 03	82.5	14 14.8 1.0 03	82.5	14 44.8 1.0 03	82.5	15 14.8 1.0 03	82.5	7
8	11 42.9 1.0 03	81.6	12 12.8 1.0 03	81.6	12 42.8 1.0 03	81.5	13 12.8 1.0 03	81.5	13 42.8 1.0 03	81.5	14 12.8 1.0 03	81.5	14 42.8 1.0 03	81.5	15 12.7 1.0 03	81.5	8
9	11 40.8 1.0 03	80.6	12 10.8 1.0 03	80.6	12 40.8 1.0 03	80.6	13 10.7 1.0 03	80.5	13 40.7 1.0 03	80.5	14 10.7 1.0 03	80.5	14 40.7 1.0 03	80.5	15 10.7 1.0 03	80.5	9
100	11 38.7 1.0 03	79.6	12 08.7 1.0 03	79.6	12 38.7 1.0 03	79.6	13 08.7 1.0 03	79.5	13 38.7 1.0 03	79.5	14 08.6 1.0 03	79.5	14 38.6 1.0 03	79.5	15 08.6 1.0 03	79.5	100
1	11 36.7 1.0 03	78.6	12 06.7 1.0 03	78.6	12 36.6 1.0 03	78.6	13 06.6 1.0 03	78.5	13 36.6 1.0 03	78.5	14 06.6 1.0 03	78.5	14 36.6 1.0 03	78.5	15 06.5 1.0 03	78.5	1
2	11 34.6 1.0 03	77.6	12 04.6 1.0 03	77.6	12 34.6 1.0 03	77.6	13 04.6 1.0 03	77.5	13 34.6 1.0 03	77.5	14 04.5 1.0 03	77.5	14 34.5 1.0 03	77.5	15 04.5 1.0 03	77.5	2
3	11 32.6 1.0 03	76.6	12 02.6 1.0 03	76.6	12 32.6 1.0 03	76.6	13 02.5 1.0 03	76.5	13 32.5 1.0 03	76.5	14 02.5 1.0 03	76.5	14 32.5 1.0 03	76.5	15 02.5 1.0 03	76.5	3
4	11 30.6 1.0 03	75.6	12 00.5 1.0 03	75.6	12 30.5 1.0 03	75.6	13 00.5 1.0 03	75.5	13 30.5 1.0 03	75.5	14 00.5 1.0 03	75.5	14 30.4 1.0 03	75.5	15 00.4 1.0 03	75.5	4
105	11 28.5 1.0 03	74.6	11 58.5 1.0 03	74.6	12 28.5 1.0 03	74.6	12 58.5 1.0 03	74.5	13 28.5 1.0 03	74.5	13 58.4 1.0 03	74.5	14 28.4 1.0 03	74.5	14 58.4 1.0 03	74.5	105
6	11 26.5 1.0 03	73.6	11 56.5 1.0 03	73.6	12 26.5 1.0 03	73.6	12 56.5 1.0 03	73.5	13 26.4 1.0 03	73.5	13 56.4 1.0 03	73.5	14 26.4 1.0 03	73.5	14 56.4 1.0 03	73.5	6
7	11 24.5 1.0 03	72.6	11 54.5 1.0 03	72.6	12 24.5 1.0 03	72.6	12 54.5 1.0 03	72.5	13 24.4 1.0 03	72.5	13 54.4 1.0 03	72.5	14 24.4 1.0 03	72.5	14 54.4 1.0 03	72.5	7
8	11 22.5 1.0 03	71.6	11 52.5 1.0 03	71.6	12 22.5 1.0 03	71.6	12 52.5 1.0 03	71.5	13 22.5 1.0 03	71.5	13 52.4 1.0 03	71.5	14 22.4 1.0 03	71.5	14 52.4 1.0 03	71.5	8
9	11 20.5 1.0 03	70.6	11 50.5 1.0 03	70.6	12 20.5 1.0 03	70.6	12 50.5 1.0 03	70.6	13 20.5 1.0 03	70.6	13 50.5 1.0 03	70.5	14 20.4 1.0 03	70.5	14 50.4 1.0 03	70.5	9
110	11 18.6 1.0 03	69.6	11 48.6 1.0 03	69.6	12 18.5 1.0 03	69.6	12 48.5 1.0 03	69.6	13 18.5 1.0 03	69.5	13 48.5 1.0 03	69.5	14 18.5 1.0 03	69.5	14 48.5 1.0 03	69.5	110
1	11 16.6 1.0 03	68.6	11 46.6 1.0 03	68.6	12 16.6 1.0 03	68.6	12 46.6 1.0 03	68.6	13 16.5 1.0 03	68.5	13 46.5 1.0 03	68.5	14 16.5 1.0 03	68.5	14 46.5 1.0 03	68.5	1
2	11 14.7 1.0 03	67.6	11 44.7 1.0 03	67.6	12 14.6 1.0 03	67.6	12 44.6 1.0 03	67.6	13 14.6 1.0 03	67.6	13 44.6 1.0 03	67.5	14 14.6 1.0 03	67.5	14 44.6 1.0 03	67.5	2
3	11 12.7 1.0 03	66.6	11 42.7 1.0 03	66.6	12 12.7 1.0 03	66.6	12 42.7 1.0 03	66.6	13 12.7 1.0 03	66.6	13 42.7 1.0 03	66.5	14 12.6 1.0 03	66.5	14 42.6 1.0 03	66.5	3
4	11 10.8 1.0 03	65.6	11 40.8 1.0 03	65.6	12 10.8 1.0 03	65.6	12 40.8 1.0 03	65.6	13 10.8 1.0 03	65.5	13 40.7 1.0 03	65.5	14 10.7 1.0 03	65.5	14 40.7 1.0 03	65.5	4
115	11 08.9 1.0 03	64.6	11 38.9 1.0 03	64.6	12 08.9 1.0 03	64.6	12 38.9 1.0 03	64.6	13 08.9 1.0 03	64.6	13 38.9 1.0 03	64.5	14 08.8 1.0 03	64.5	14 38.8 1.0 03	64.5	115
6	11 07.0 1.0 03	63.6	11 37.0 1.0 03	63.6	12 07.0 1.0 03	63.6	12 37.0 1.0 03	63.6	13 07.0 1.0 03	63.6	13 37.0 1.0 03	63.6	14 07.0 1.0 03	63.5	14 36.9 1.0 03	63.5	6
7	11 05.2 1.0 03	62.6	11 35.2 1.0 03	62.6	12 05.1 1.0 03	62.6	12 35.1 1.0 03	62.6	13 05.1 1.0 03	62.6	13 35.1 1.0 03	62.6	14 05.1 1.0 03	62.5	14 35.1 1.0 03	62.5	7
8	11 03.3 1.0 03	61.6	11 33.3 1.0 03	61.6	12 03.3 1.0 03	61.6	12 33.3 1.0 03	61.6	13 03.3 1.0 03	61.6	13 33.3 1.0 03	61.6	14 03.2 1.0 03	61.5	14 33.2 1.0 03	61.5	8
9	11 01.5 1.0 03	60.6	11 31.5 1.0 03	60.6	12 01.5 1.0 03	60.6	12 31.4 1.0 03	60.6	13 01.4 1.0 03	60.6	13 31.4 1.0 03	60.6	14 01.4 1.0 03	60.5	14 31.4 1.0 03	60.5	9
120	10 59.7 1.0 03	59.6	11 29.7 1.0 03	59.6	11 59.6 1.0 03	59.6	12 29.6 1.0 03	59.6	12 59.6 1.0 03	59.6	13 29.6 1.0 03	59.6	13 59.6 1.0 03	59.6	14 29.6 1.0 03	59.5	120
1	10 57.9 1.0 03	58.7	11 27.9 1.0 03	58.6	11 57.9 1.0 03	58.6	12 27.8 1.0 03	58.6	12 57.8 1.0 03	58.6	13 27.8 1.0 03	58.6	13 57.8 1.0 03	58.6	14 27.8 1.0 03	58.5	1
2	10 56.1 1.0 03	57.7	11 26.1 1.0 03	57.6	11 56.1 1.0 03	57.6	12 26.1 1.0 03	57.6	12 56.0 1.0 03	57.6	13 26.0 1.0 03	57.6	13 56.0 1.0 03	57.6	14 26.0 1.0 03	57.5	2
3	10 54.3 1.0 03	56.7	11 24.3 1.0 03	56.6	11 54.3 1.0 03	56.6	12 24.3 1.0 03	56.6	12 54.3 1.0 03	56.6	13 24.3 1.0 03	56.6	13 54.3 1.0 03	56.6	14 24.2 1.0 03	56.6	3
4	10 52.6 1.0 03	55.7	11 22.6 1.0 03	55.6	11 52.6 1.0 03	55.6	12 22.6 1.0 03	55.6	12 52.5 1.0 03	55.6	13 22.5 1.0 03	55.6	13 52.5 1.0 03	55.6	14 22.5 1.0 03	55.6	4
125	10 50.9 1.0 03	54.7	11 20.9 1.0 03	54.7	11 50.9 1.0 03	54.6	12 20.8 1.0 03	54.6	12 50.8 1.0 03	54.6	13 20.8 1.0 03	54.6	13 50.8 1.0 03	54.6	14 20.8 1.0 03	54.6	125
6	10 49.2 1.0 03	53.7	11 19.2 1.0 03	53.7	11 49.2 1.0 03	53.6	12 19.1 1.0 03	53.6	12 49.1 1.0 03	53.6	13 19.1 1.0 03	53.6	13 49.1 1.0 03	53.6	14 19.1 1.0 03	53.6	6
7	10 47.5 1.0 03	52.7	11 17.5 1.0 03	52.7	11 47.5 1.0 03	52.7	12 17.5 1.0 03	52.7	12 47.5 1.0 03	52.6	13 17.4 1.0 03	52.6	13 47.4 1.0 03	52.6	14 17.4 1.0 03	52.6	7
8	10 45.9 1.0 03	51.7	11 15.8 1.0 03	51.7	11 45.8 1.0 03	51.7	12 15.8 1.0 03	51.6	12 45.8 1.0 03	51.6	13 15.8 1.0 03	51.6	13 45.8 1.0 03	51.6	14 15.8 1.0 03	51.6	8
9	10 44.2 1.0 03	50.7	11 14.2 1.0 03	50.7	11 44.2 1.0 03	50.7	12 14.2 1.0 03	50.6	12 44.2 1.0 03	50.6	13 14.2 1.0 03	50.6	13 44.2 1.0 03	50.6	14 14.1 1.0 03	50.6	9
130	10 42.6 1.0 03	49.7	11 12.6 1.0 03	49.7	11 42.6 1.0 03	49.7	12 12.6 1.0 03	49.7	12 42.6 1.0 03	49.6	13 12.6 1.0 03	49.6	13 42.5 1.0 03	49.6	14 12.5 1.0 03	49.6	130
1	10 41.0 1.0 03	48.7	11 11.0 1.0 03	48.7	11 41.0 1.0 03	48.7	12 11.0 1.0 03	48.7	12 41.0 1.0 03	48.6	13 11.0 1.0 03	48.6	13 41.0 1.0 03	48.6	14 11.0 1.0 03	48.6	1
2	10 39.5 1.0 03	47.7	11 09.5 1.0 03	47.7	11 39.4 1.0 03	47.7	12 09.4 1.0 03	47.7	12 39.4 1.0 03	47.6	13 09.4 1.0 03	47.6	13 39.4 1.0 03	47.6	14 09.4 1.0 03	47.6	2
3	10 37.9 1.0 03	46.7	11 07.9 1.0 03	46.7	11 37.9 1.0 03	46.7	12 07.9 1.0 03	46.7	12 37.9 1.0 02	46.7	13 07.9 1.0 02	46.6	13 37.9 1.0 02	46.6	14 07.9 1.0 02	46.6	3
4	10 36.4 1.0 02	45.7	11 06.4 1.0 02	45.7	11 36.4 1.0 02	45.7	12 06.4 1.0 02	45.7	12 36.4 1.0 02	45.7	13 06.4 1.0 02	45.6	13 36.4 1.0 02	45.6	14 06.4 1.0 02	45.6	4
135	10 34.9 1.0 02	44.7	11 04.9 1.0 02	44.7	11 34.9 1.0 02	44.7	12 04.9 1.0 02	44.7	12 34.9 1.0 02	44.7	13 04.9 1.0 02	44.7	13 34.9 1.0 02	44.6	14 04.9 1.0 02	44.6	135
6	10 33.5 1.0 02	4.37	11 03.5 1.0 02	43.7	11 33.5 1.0 02	43.7	12 03.4 1.0 02	43.7	12 33.4 1.0 02	43.7	13 03.4 1.0 02	43.7	13 33.4 1.0 02	43.6	14 03.4 1.0 02	43.6	6
7	10 32.0 1.0 02	42.7	11 02.0 1.0 02	42.7	11 32.0 1.0 02	42.7	12 02.0 1.0 02	42.7	12 32.0 1.0 02	42.7	13 02.0 1.0 02	42.7	13 32.0 1.0 02	42.7	14 02.0 1.0 02	42.6	7
8	10 30.6 1.0 02	41.7	11 00.6 1.0 02	41.7	11 30.6 1.0 02	41.7	12 00.6 1.0 02	41.7	12 30.6 1.0 02	41.7	13 00.6 1.0 02	41.7	13 30.6 1.0 02	41.7	14 00.6 1.0 02	41.6	8
9	10 29.3 1.0 02	40.7	10 59.2 1.0 02	40.7	11 29.2 1.0 02	40.7	11 59.2 1.0 02	40.7	12 29.2 1.0 02	40.7	12 59.2 1.0 02	40.7	13 29.2 1.0 02	40.7	13 59.2 1.0 02	40.7	9
140	10 27.9 1.0 02	39.7	10 57.9 1.0 02	39.7	11 27.9 1.0 02	39.7	11 57.9 1.0 02	39.7	12 27.9 1.0 02	39.7	12 57.9 1.0 02	39.7	13 27.9 1.0 02	39.7	13 57.8 1.0 02	39.7	140
1	10 26.6 1.0 02	38.8	10 56.6 1.0 02	38.7	11 26.6 1.0 02	38.7	11 56.6 1.0 02	38.7	12 26.5 1.0 02	38.7	12 56.5 1.0 02	38.7	13 26.5 1.0 02	38.7	13 56.5 1.0 02	38.7	1
2	10 25.3 1.0 02	37.8	10 55.3 1.0 02	37.7	11 25.3 1.0 02	37.7	11 55.3 1.0 02	37.7	12 25.2 1.0 02	37.7	12 55.2 1.0 02	37.7	13 25.2 1.0 02	37.7	13 55.2 1.0 02	37.7	2
3	10 24.0 1.0 02	36.8	10 54.0 1.0 02	36.8	11 24.0 1.0 02	36.7	11 54.0 1.0 02	36.7	12 24.0 1.0 02	36.7	12 54.0 1.0 02	36.7	13 24.0 1.0 02	36.7	13 54.0 1.0 02	36.7	3
4	10 22.8 1.0 02	35.8	10 52.8 1.0 02	35.8	11 22.8 1.0 02	35.8	11 52.8 1.0 02	35.7	12 22.7 1.0 02	35.7	12 52.7 1.0 02	35.7	13 22.7 1.0 02	35.7	13 52.7 1.0 02	35.7	4
145	10 21.6 1.0 02	34.8	10 51.6 1.0 02	34.8	11 21.6 1.0 02	34.8	11 51.5 1.0 02	34.7	12 21.5 1.0 02	34.7	12 51.5 1.0 02	34.7	13 21.5 1.0 02	34.7	13 51.5 1.0 02	34.7	145
6	10 20.4 1.0 02	33.8	10 50.4 1.0 02	33.8	11 20.4 1.0 02	33.8	11 50.4 1.0 02	33.7	12 20.4 1.0 02	33.7	12 50.4 1.0 02	33.7	13 20.3 1.0 02	33.7	13 50.3 1.0 02	33.7	6
7	10 19.2 1.0 02	32.8	10 49.2 1.0 02	32.8	11 19.2 1.0 02	32.8	11 49.2 1.0 02	32.8	12 19.2 1.0 02	32.7	12 49.2 1.0 02	32.7	13 19.2 1.0 02	32.7	13 49.2 1.0 02	32.7	7
8	10 18.1 1.0 02	31.8	10 48.1 1.0 02	31.8	11 18.1 1.0 02	31.8	11 48.1 1.0 02	31.8	12 18.1 1.0 02	31.8	12 48.1 1.0 02	31.7	13 18.1 1.0 02	31.7	13 48.1 1.0 02	31.7	8
9	10 17.0 1.0 02	30.8	10 47.0 1.0 02	30.8	11 17.0 1.0 02	30.8	11 47.0 1.0 02	30.8	12 17.0 1.0 02	30.8	12 47.0 1.0 02	30.8	13 17.0 1.0 02	30.7	13 47.0 1.0 02	30.7	9
150	10 16.0 1.0 02	29.8	10 46.0 1.0 02	29.8	11 16.0 1.0 02	29.8	11 46.0 1.0 02	29.8	12 16.0 1.0 02	29.8	12 45.9 1.0 02	29.8	13 15.9 1.0 02	29.7	13 45.9 1.0 02	29.7	150
1	10 14.9 1.0 02	28.8	10 44.9 1.0 02	28.8	11 14.9 1.0 02	28.8	11 44.9 1.0 02	28.8	12 14.9 1.0 02	28.8	12 44.9 1.0 02	28.8	13 14.9 1.0 02	28.8	13 44.9 1.0 02	28.7	1
2	10 14.0 1.0 02	27.8	10 43.9 1.0 02	27.8	11 13.9 1.0 02	27.8	11 43.9 1.0 02	27.8	12 13.9 1.0 02	27.8	12 43.9 1.0 02	27.8	13 13.9 1.0 02	27.8	13 43.9 1.0 02	27.8	2
3	10 13.0 1.0 02	26.8	10 43.0 1.0 02	26.8	11 13.0 1.0 02	26.8	11 43.0 1.0 02	26.8	12 13.0 1.0 02	26.8	12 43.0 1.0 02	26.8	13 13.0 1.0 02	26.8	13 43.0 1.0 02	26.8	3
4	10 12.1 1.0 02	25.8	10 42.1 1.0 02	25.8	11 12.1 1.0 01	25.8	11 42.1 1.0 02	25.8	12 12.0 1.0 02	25.8	12 42.0 1.0 02	25.8	13 12.0 1.0 02	25.8	13 42.0 1.0 01	25.8	4
155	10 11.2 1.0 01	24.8	10 41.2 1.0 01	24.8	11 11.2 1.0 01	24.8	11 41.2 1.0 01	24.8	12 11.2 1.0 01	24.8	12 41.2 1.0 01	24.8	13 11.1 1.0 01	24.8	13 41.1 1.0 01	24.8	155
6	10 10.3 1.0 01	23.8	10 40.3 1.0 01	23.8	11 10.3 1.0 01	23.8	11 40.3 1.0 01	23.8	12 10.3 1.0 01	23.8	12 40.3 1.0 01	23.8	13 10.3 1.0 01	23.8	13 40.3 1.0 01	23.8	6
7	10 09.5 1.0 01	22.8	10 39.5 1.0 01	22.8	11 09.5 1.0 01	22.8	11 39.5 1.0 01	22.8	12 09.5 1.0 01	22.8	12 39.5 1.0 01	22.8	13 09.5 1.0 01	22.8	13 39.5 1.0 01	22.8	7
8	10 08.7 1.0 01	21.9	10 38.7 1.0 01	21.8	11 08.7 1.0 01	21.8	11 38.7 1.0 01	21.8	12 08.7 1.0 01	21.8	12 38.7 1.0 01	21.8	13 08.7 1.0 01	21.8	13 38.7 1.0 01	21.8	8
9	10 07.9 1.0 01	20.9	10 37.9 1.0 01	20.9	11 07.9 1.0 01	20.8	11 37.9 1.0 01	20.8	12 07.9 1.0 01	20.8	12 37.9 1.0 01	20.8	13 07.9 1.0 01	20.8	13 37.9 1.0 01	20.8	9
160	10 07.2 1.0 01	19.9	10 37.2 1.0 01	19.9	11 07.2 1.0 01	19.9	11 37.2 1.0 01	19.8	12 07.2 1.0 01	19.8	12 37.2 1.0 01	19.8	13 07.2 1.0 01	19.8	13 37.2 1.0 01	19.8	160
1	10 06.5 1.0 01	18.9	10 36.5 1.0 01	18.9	11 06.5 1.0 01	18.9	11 36.5 1.0 01	18.9	12 06.5 1.0 01	18.8	12 36.5 1.0 01	18.8	13 06.5 1.0 01	18.8	13 36.5 1.0 01	18.8	1
2	10 05.8 1.0 01	17.9	10 35.8 1.0 01	17.9	11 05.8 1.0 01	17.9	11 35.8 1.0 01	17.9	12 05.8 1.0 01	17.9	12 35.8 1.0 01	17.9	13 05.8 1.0 01	17.8	13 35.8 1.0 01	17.8	2
3	10 05.2 1.0 01	16.9	10 35.2 1.0 01	16.9	11 05.2 1.0 01	16.9	11 35.2 1.0 01	16.9	12 05.2 1.0 01	16.9	12 35.2 1.0 01	16.9	13 05.2 1.0 01	16.9	13 35.2 1.0 01	16.8	3
4	10 04.6 1.0 01	15.9	10 34.6 1.0 01	15.9	11 04.6 1.0 01	15.9	11 34.6 1.0 01	15.9	12 04.6 1.0 01	15.9	12 34.6 1.0 01	15.9	13 04.6 1.0 01	15.9	13 34.6 1.0 01	15.9	4
165	10 04.1 1.0 01	14.9	10 34.1 1.0 01	14.9	11 04.1 1.0 01	14.9	11 34.1 1.0 01	14.9	12 04.1 1.0 01	14.9	12 34.1 1.0 01	14.9	13 04.1 1.0 01	14.9	13 34.1 1.0 01	14.9	165
6	10 03.5 1.0 01	13.9	10 33.5 1.0 01	13.9	11 03.5 1.0 01	13.9	11 33.5 1.0 01	13.9	12 03.5 1.0 01	13.9	12 33.5 1.0 01	13.9	13 03.5 1.0 01	13.9	13 33.5 1.0 01	13.9	6
7	10 03.1 1.0 01	12.9	10 33.1 1.0 01	12.9	11 03.1 1.0 01	12.9	11 33.1 1.0 01	12.9	12 03.1 1.0 01	12.9	12 33.0 1.0 01	12.9	13 03.0 1.0 01	12.9	13 33.0 1.0 01	12.9	7
8	10 02.6 1.0 01	11.9	10 32.6 1.0 01	11.9	11 02.6 1.0 01	11.9	11 32.6 1.0 01	11.9	12 02.6 1.0 01	11.9	12 32.6 1.0 01	11.9	13 02.6 1.0 01	11.9	13 32.6 1.0 01	11.9	8
9	10 02.2 1.0 01	10.9	10 32.2 1.0 01	10.9	11 02.2 1.0 01	10.9	11 32.2 1.0 01	10.9	12 02.2 1.0 01	10.9	12 32.2 1.0 01	10.9	13 02.2 1.0 01	10.9	13 32.2 1.0 01	10.9	9
170	10 01.8 1.0 01	09.9	10 31.8 1.0 01	09.9	11 01.8 1.0 01	09.9	11 31.8 1.0 01	09.9	12 01.8 1.0 01	09.9	12 31.8 1.0 01	09.9	13 01.8 1.0 01	09.9	13 31.8 1.0 01	09.9	170
1	10 01.5 1.0 00	08.9	10 31.5 1.0 00	08.9	11 01.5 1.0 00	08.9	11 31.5 1.0 00	08.9	12 01.5 1.0 00	08.9	12 31.5 1.0 00	08.9	13 01.5 1.0 00	08.9	13 31.5 1.0 00	08.9	1
2	10 01.2 1.0 00	07.9	10 31.2 1.0 00	07.9	11 01.2 1.0 00	07.9	11 31.2 1.0 00	07.9	12 01.2 1.0 00	07.9	12 31.2 1.0 00	07.9	13 01.2 1.0 00	07.9	13 31.2 1.0 00	07.9	2
3	10 00.9 1.0 00	07.0	10 30.9 1.0 00	07.0	11 00.9 1.0 00	06.9	11 30.9 1.0 00	06.9	12 00.9 1.0 00	06.9	12 30.9 1.0 00	06.9	13 00.9 1.0 00	06.9	13 30.9 1.0 00	06.9	3
4	10 00.7 1.0 00	06.0	10 30.7 1.0 00	06.0	11 00.7 1.0 00	06.0	11 30.7 1.0 00	06.0	12 00.7 1.0 00	06.0	12 30.7 1.0 00	06.0	13 00.7 1.0 00	05.9	13 30.7 1.0 00	05.9	4
175	10 00.5 1.0 00	05.0	10 30.5 1.0 00	05.0	11 00.5 1.0 00	05.0	11 30.5 1.0 00	05.0	12 00.5 1.0 00	05.0	12 30.5 1.0 00	05.0	13 00.5 1.0 00	05.0	13 30.5 1.0 00	05.0	175
6	10 00.3 1.0 00	04.0	10 30.3 1.0 00	04.0	11 00.3 1.0 00	04.0	11 30.3 1.0 00	04.0	12 00.3 1.0 00	04.0	12 30.3 1.0 00	04.0	13 00.3 1.0 00	04.0	13 30.3 1.0 00	04.0	6
7	10 00.2 1.0 00	03.0	10 30.2 1.0 00	03.0	11 00.2 1.0 00	03.0	11 30.2 1.0 00	03.0	12 00.2 1.0 00	03.0	12 30.2 1.0 00	03.0	13 00.2 1.0 00	03.0	13 30.2 1.0 00	03.0	7
8	10 00.1 1.0 00	02.0	10 30.1 1.0 00	02.0	11 00.1 1.0 00	02.0	11 30.1 1.0 00	02.0	12 00.1 1.0 00	02.0	12 30.1 1.0 00	02.0	13 00.1 1.0 00	02.0	13 30.1 1.0 00	02.0	8
9	10 00.0 1.0 00	01.0	10 30.0 1.0 00	01.0	11 00.0 1.0 00	01.0	11 30.0 1.0 00	01.0	12 00.0 1.0 00	01.0	12 30.0 1.0 00	01.0	13 00.0 1.0 00	01.0	13 30.0 1.0 00	01.0	9
180	10 00.0 1.0 00	00.0	10 30.0 1.0 00	00.0	11 00.0 1.0 00	00.0	11 30.0 1.0 00	00.0	12 00.0 1.0 00	00.0	12 30.0 1.0 00	00.0	13 00.0 1.0 00	00.0	13 30.0 1.0 00	00.0	180

H.A.	16° 00′	16° 30′	17° 00′	17° 30′	18° 00′	18° 30′	19° 00′	19° 30′	H.A.
	Alt. Δd Δt Az.	Alt. Δd Δt Az.	Alt. Δd Δt Az.	Alt. Δd Δt Az.	Alt. Δd Δt Az.	Alt. Δd Δt Az.	Alt. Δd Δt Az.	Alt. Δd Δt Az.	
00	18 00.0 1.0 00 180.0	18 30.0 1.0 00 180.0	19 00.0 1.0 00 180.0	19 30.0 1.0 00 180.0	20 00.0 1.0 00 180.0	20 30.0 1.0 00 180.0	21 00.0 1.0 00 180.0	21 30.0 1.0 00 180.0	00
1	18 00.0 1.0 00 179.0	18 30.0 1.0 00 179.0	19 00.0 1.0 00 179.0	19 30.0 1.0 00 179.0	20 00.0 1.0 00 179.0	20 30.0 1.0 00 179.0	21 00.0 1.0 00 179.0	21 30.0 1.0 00 179.0	1
2	17 59.9 1.0 00 178.0	18 29.9 1.0 00 178.0	18 59.9 1.0 00 178.0	19 29.9 1.0 00 178.0	19 59.9 1.0 00 178.0	20 29.9 1.0 00 178.0	20 59.9 1.0 00 178.0	21 29.9 1.0 00 178.0	2
3	17 59.8 1.0 00 177.0	18 29.8 1.0 00 177.0	18 59.8 1.0 00 177.0	19 29.8 1.0 00 177.0	19 59.8 1.0 00 177.0	20 29.8 1.0 00 177.0	20 59.8 1.0 00 177.0	21 29.8 1.0 00 177.0	3
4	17 59.7 1.0 00 176.0	18 29.7 1.0 00 176.0	18 59.7 1.0 00 176.0	19 29.7 1.0 00 176.0	19 59.7 1.0 00 176.0	20 29.7 1.0 00 176.0	20 59.7 1.0 00 175.9	21 29.7 1.0 00 175.9	4
05	17 59.5 1.0 00 174.9	18 29.5 1.0 00 174.9	18 59.5 1.0 00 174.9	19 29.5 1.0 00 174.9	19 59.5 1.0 00 174.9	20 29.5 1.0 00 174.9	20 59.5 1.0 00 174.9	21 29.5 1.0 00 174.9	05
6	17 59.3 1.0 00 173.9	18 29.3 1.0 00 173.9	18 59.3 1.0 00 173.9	19 29.3 1.0 00 173.9	19 59.3 1.0 00 173.9	20 29.3 1.0 00 173.9	20 59.3 1.0 00 173.9	21 29.3 1.0 00 173.9	6
7	17 59.1 1.0 00 172.9	18 29.1 1.0 00 172.9	18 59.1 1.0 00 172.9	19 29.1 1.0 00 172.9	19 59.1 1.0 00 172.9	20 29.1 1.0 00 172.9	20 59.1 1.0 00 172.9	21 29.1 1.0 00 172.9	7
8	17 58.8 1.0 01 171.9	18 28.8 1.0 01 171.9	18 58.8 1.0 01 171.9	19 28.8 1.0 01 171.9	19 58.8 1.0 01 171.9	20 28.8 1.0 01 171.9	20 58.8 1.0 01 171.9	21 28.8 1.0 01 171.9	8
9	17 58.5 1.0 01 170.9	18 28.5 1.0 01 170.9	18 58.5 1.0 01 170.9	19 28.5 1.0 01 170.9	19 58.5 1.0 01 170.9	20 28.5 1.0 01 170.9	20 58.5 1.0 01 170.9	21 28.5 1.0 01 170.9	9
10	17 58.2 1.0 01 169.9	18 28.2 1.0 01 169.9	18 58.2 1.0 01 169.9	19 28.2 1.0 01 169.9	19 58.2 1.0 01 169.9	20 28.2 1.0 01 169.9	20 58.2 1.0 01 169.9	21 28.2 1.0 01 169.9	10
1	17 57.8 1.0 01 168.9	18 27.8 1.0 01 168.9	18 57.8 1.0 01 168.9	19 27.8 1.0 01 168.9	19 57.8 1.0 01 168.9	20 27.8 1.0 01 168.9	20 57.8 1.0 01 168.9	21 27.8 1.0 01 168.9	1
2	17 57.4 1.0 01 167.9	18 27.3 1.0 01 167.9	18 57.3 1.0 01 167.9	19 27.3 1.0 01 167.9	19 57.3 1.0 01 167.9	20 27.3 1.0 01 167.9	20 57.3 1.0 01 167.8	21 27.3 1.0 01 167.8	2
3	17 56.9 1.0 01 166.9	18 26.9 1.0 01 166.9	18 56.9 1.0 01 166.9	19 26.9 1.0 01 166.8	19 56.9 1.0 01 166.8	20 26.9 1.0 01 166.8	20 56.9 1.0 01 166.8	21 26.9 1.0 01 166.8	3
4	17 56.4 1.0 01 165.9	18 26.4 1.0 01 165.8	18 56.4 1.0 01 165.8	19 26.4 1.0 01 165.8	19 56.4 1.0 01 165.8	20 26.4 1.0 01 165.8	20 56.4 1.0 01 165.8	21 26.4 1.0 01 165.8	4
15	17 55.9 1.0 01 164.8	18 25.9 1.0 01 164.8	18 55.9 1.0 01 164.8	19 25.9 1.0 01 164.8	19 55.9 1.0 01 164.8	20 25.9 1.0 01 164.8	20 55.9 1.0 01 164.8	21 25.9 1.0 01 164.8	15
6	17 55.3 1.0 01 163.8	18 25.3 1.0 01 163.8	18 55.3 1.0 01 163.8	19 25.3 1.0 01 163.8	19 55.3 1.0 01 163.8	20 25.3 1.0 01 163.8	20 55.3 1.0 01 163.8	21 25.3 1.0 01 163.8	6
7	17 54.7 1.0 01 162.8	18 24.7 1.0 01 162.8	18 54.7 1.0 01 162.8	19 24.7 1.0 01 162.8	19 54.7 1.0 01 162.8	20 24.7 1.0 01 162.8	20 54.7 1.0 01 162.8	21 24.7 1.0 01 162.8	7
8	17 54.1 1.0 01 161.8	18 24.1 1.0 01 161.8	18 54.1 1.0 01 161.8	19 24.1 1.0 01 161.8	19 54.1 1.0 01 161.8	20 24.1 1.0 01 161.8	20 54.1 1.0 01 161.8	21 24.1 1.0 01 161.8	8
9	17 53.4 1.0 01 160.8	18 23.4 1.0 01 160.8	18 53.4 1.0 01 160.8	19 23.4 1.0 01 160.8	19 53.4 1.0 01 160.8	20 23.4 1.0 01 160.8	20 53.4 1.0 01 160.8	21 23.4 1.0 01 160.8	9
20	17 52.7 1.0 01 159.8	18 22.7 1.0 01 159.8	18 52.7 1.0 01 159.8	19 22.7 1.0 01 159.8	19 52.7 1.0 01 159.8	20 22.7 1.0 01 159.8	20 52.7 1.0 01 159.8	21 22.7 1.0 01 159.7	20
1	17 51.9 1.0 01 158.8	18 21.9 1.0 01 158.8	18 51.9 1.0 01 158.8	19 21.9 1.0 01 158.8	19 51.9 1.0 01 158.8	20 21.9 1.0 01 158.8	20 51.9 1.0 01 158.7	21 21.9 1.0 01 158.7	1
2	17 51.2 1.0 01 157.8	18 21.2 1.0 01 157.8	18 51.2 1.0 01 157.8	19 21.2 1.0 01 157.7	19 51.2 1.0 01 157.7	20 21.2 1.0 01 157.7	20 51.2 1.0 01 157.7	21 21.2 1.0 01 157.7	2
3	17 50.4 1.0 01 156.8	18 20.4 1.0 01 156.8	18 50.4 1.0 01 156.7	19 20.4 1.0 01 156.7	19 50.4 1.0 01 156.7	20 20.3 1.0 01 156.7	20 50.3 1.0 01 156.7	21 20.3 1.0 01 156.7	3
4	17 49.5 1.0 01 155.8	18 19.5 1.0 01 155.7	18 49.5 1.0 01 155.7	19 19.5 1.0 01 155.7	19 49.5 1.0 01 155.7	20 19.5 1.0 01 155.7	20 49.5 1.0 01 155.7	21 19.5 1.0 01 155.7	4
25	17 48.6 1.0 02 154.7	18 18.6 1.0 02 154.7	18 48.6 1.0 02 154.7	19 18.6 1.0 02 154.7	19 48.6 1.0 02 154.7	20 18.6 1.0 02 154.7	20 48.6 1.0 02 154.7	21 18.6 1.0 02 154.7	25
6	17 47.7 1.0 02 153.7	18 17.7 1.0 02 153.7	18 47.7 1.0 02 153.7	19 17.7 1.0 02 153.7	19 47.7 1.0 02 153.7	20 17.7 1.0 02 153.7	20 47.7 1.0 02 153.7	21 17.7 1.0 02 153.7	6
7	17 46.8 1.0 02 152.7	18 16.8 1.0 02 152.7	18 46.8 1.0 02 152.7	19 16.8 1.0 02 152.7	19 46.8 1.0 02 152.7	20 16.8 1.0 02 152.7	20 46.8 1.0 02 152.7	21 16.8 1.0 02 152.7	7
8	17 45.8 1.0 02 151.7	18 15.8 1.0 02 151.7	18 45.8 1.0 02 151.7	19 15.8 1.0 02 151.7	19 45.8 1.0 02 151.7	20 15.8 1.0 02 151.7	20 45.8 1.0 02 151.7	21 15.8 1.0 02 151.6	8
9	17 44.8 1.0 02 150.7	18 14.8 1.0 02 150.7	18 44.8 1.0 02 150.7	19 14.8 1.0 02 150.7	19 44.8 1.0 02 150.7	20 14.8 1.0 02 150.7	20 44.8 1.0 02 150.6	21 14.8 1.0 02 150.6	9
30	17 43.8 1.0 02 149.7	18 13.8 1.0 02 149.7	18 43.8 1.0 02 149.7	19 13.8 1.0 02 149.7	19 43.7 1.0 02 149.7	20 13.7 1.0 02 149.6	20 43.7 1.0 02 149.6	21 13.7 1.0 02 149.6	30
1	17 42.7 1.0 02 148.7	18 12.7 1.0 02 148.7	18 42.7 1.0 02 148.7	19 12.7 1.0 02 148.7	19 42.7 1.0 02 148.6	20 12.7 1.0 02 148.6	20 42.7 1.0 02 148.6	21 12.7 1.0 02 148.6	1
2	17 41.6 1.0 02 147.7	18 11.6 1.0 02 147.7	18 41.6 1.0 02 147.7	19 11.6 1.0 02 147.6	19 41.6 1.0 02 147.6	20 11.6 1.0 02 147.6	20 41.6 1.0 02 147.6	21 11.5 1.0 02 147.6	2
3	17 40.5 1.0 02 146.7	18 10.4 1.0 02 146.7	18 40.4 1.0 02 146.6	19 10.4 1.0 02 146.6	19 40.4 1.0 02 146.6	20 10.4 1.0 02 146.6	20 40.4 1.0 02 146.6	21 10.4 1.0 02 146.6	3
4	17 39.3 1.0 02 145.7	18 09.3 1.0 02 145.6	18 39.3 1.0 02 145.6	19 09.3 1.0 02 145.6	19 39.3 1.0 02 145.6	20 09.3 1.0 02 145.6	20 39.2 1.0 02 145.6	21 09.2 1.0 02 145.6	4
35	17 38.1 1.0 02 144.7	18 08.1 1.0 02 144.6	18 38.1 1.0 02 144.6	19 08.1 1.0 02 144.6	19 38.1 1.0 02 144.6	20 08.1 1.0 02 144.6	20 38.1 1.0 02 144.6	21 08.0 1.0 02 144.6	35
6	17 36.9 1.0 02 143.6	18 06.9 1.0 02 143.6	18 36.9 1.0 02 143.6	19 06.8 1.0 02 143.6	19 36.8 1.0 02 143.6	20 06.8 1.0 02 143.6	20 36.8 1.0 02 143.6	21 06.8 1.0 02 143.6	6
7	17 35.6 1.0 02 142.6	18 05.6 1.0 02 142.6	18 35.6 1.0 02 142.6	19 05.6 1.0 02 142.6	19 35.6 1.0 02 142.6	20 05.6 1.0 02 142.6	20 35.6 1.0 02 142.6	21 05.6 1.0 02 142.6	7
8	17 34.3 1.0 02 141.6	18 04.3 1.0 02 141.6	18 34.3 1.0 02 141.6	19 04.3 1.0 02 141.6	19 34.3 1.0 02 141.6	20 04.3 1.0 02 141.6	20 34.3 1.0 02 141.6	21 04.3 1.0 02 141.5	8
9	17 33.0 1.0 02 140.6	18 03.0 1.0 02 140.6	18 33.0 1.0 02 140.6	19 03.0 1.0 02 140.6	19 33.0 1.0 02 140.6	20 03.0 1.0 02 140.6	20 33.0 1.0 02 140.5	21 03.0 1.0 02 140.5	9
40	17 31.7 1.0 02 139.6	18 01.7 1.0 02 139.6	18 31.6 1.0 02 139.6	19 01.6 1.0 02 139.6	19 31.6 1.0 02 139.6	20 01.6 1.0 02 139.5	20 31.6 1.0 02 139.5	21 01.6 1.0 02 139.5	40
1	17 30.3 1.0 02 138.6	18 00.3 1.0 02 138.6	18 30.3 1.0 02 138.6	19 00.3 1.0 02 138.6	19 30.3 1.0 02 138.6	20 00.3 1.0 02 138.5	20 30.2 1.0 02 138.5	21 00.2 1.0 02 138.5	1
2	17 28.9 1.0 02 137.6	17 58.9 1.0 02 137.6	18 28.9 1.0 02 137.6	18 58.9 1.0 02 137.6	19 28.9 1.0 02 137.5	19 58.9 1.0 02 137.5	20 28.8 1.0 02 137.5	20 58.8 1.0 02 137.5	2
3	17 27.5 1.0 02 136.6	17 57.5 1.0 02 136.6	18 27.5 1.0 02 136.6	18 57.4 1.0 02 136.5	19 27.4 1.0 02 136.5	19 57.4 1.0 02 136.5	20 27.4 1.0 02 136.5	20 57.4 1.0 02 136.5	3
4	17 26.0 1.0 02 135.6	17 56.0 1.0 02 135.6	18 26.0 1.0 02 135.6	18 56.0 1.0 02 135.5	19 26.0 1.0 02 135.5	19 56.0 1.0 02 135.5	20 26.0 1.0 02 135.5	20 56.0 1.0 02 135.5	4
45	17 24.5 1.0 02 134.6	17 54.5 1.0 02 134.6	18 24.5 1.0 02 134.5	18 54.5 1.0 02 134.5	19 24.5 1.0 02 134.5	19 54.5 1.0 02 134.5	20 24.5 1.0 02 134.5	20 54.5 1.0 02 134.5	45
6	17 23.0 1.0 03 133.6	17 53.0 1.0 03 133.6	18 23.0 1.0 03 133.5	18 53.0 1.0 03 133.5	19 23.0 1.0 03 133.5	19 53.0 1.0 03 133.5	20 23.0 1.0 03 133.5	20 53.0 1.0 03 133.5	6
7	17 21.5 1.0 03 132.6	17 51.5 1.0 03 132.5	18 21.5 1.0 03 132.5	18 51.5 1.0 03 132.5	19 21.5 1.0 03 132.5	19 51.5 1.0 03 132.5	20 21.4 1.0 03 132.5	20 51.4 1.0 03 132.5	7
8	17 20.0 1.0 03 131.6	17 49.9 1.0 03 131.5	18 19.9 1.0 03 131.5	18 49.9 1.0 03 131.5	19 19.9 1.0 03 131.5	19 49.9 1.0 03 131.5	20 19.9 1.0 03 131.5	20 49.9 1.0 03 131.5	8
9	17 18.4 1.0 03 130.5	17 48.4 1.0 03 130.5	18 18.4 1.0 03 130.5	18 48.3 1.0 03 130.5	19 18.3 1.0 03 130.5	19 48.3 1.0 03 130.5	20 18.3 1.0 03 130.4	20 48.3 1.0 03 130.4	9
50	17 16.8 1.0 03 129.5	17 46.8 1.0 03 129.5	18 16.7 1.0 03 129.5	18 46.7 1.0 03 129.5	19 16.7 1.0 03 129.5	19 46.7 1.0 03 129.5	20 16.7 1.0 03 129.5	20 46.7 1.0 03 129.4	50
1	17 15.1 1.0 03 128.5	17 45.1 1.0 03 128.5	18 15.1 1.0 03 128.5	18 45.1 1.0 03 128.5	19 15.1 1.0 03 128.5	19 45.1 1.0 03 128.5	20 15.1 1.0 03 128.4	20 45.1 1.0 03 128.4	1
2	17 13.5 1.0 03 127.5	17 43.5 1.0 03 127.5	18 13.5 1.0 03 127.5	18 43.5 1.0 03 127.5	19 13.4 1.0 03 127.5	19 43.4 1.0 03 127.5	20 13.4 1.0 03 127.4	20 43.4 1.0 03 127.4	2
3	17 11.8 1.0 03 126.5	17 41.8 1.0 03 126.5	18 11.8 1.0 03 126.5	18 41.8 1.0 03 126.5	19 11.8 1.0 03 126.5	19 41.8 1.0 03 126.4	20 11.7 1.0 03 126.4	20 41.7 1.0 03 126.4	3
4	17 10.1 1.0 03 125.5	17 40.1 1.0 03 125.5	18 10.1 1.0 03 125.5	18 40.1 1.0 03 125.5	19 10.1 1.0 03 125.5	19 40.1 1.0 03 125.4	20 10.0 1.0 03 125.4	20 40.0 1.0 03 125.4	4
55	17 08.4 1.0 03 124.5	17 38.4 1.0 03 124.5	18 08.4 1.0 03 124.5	18 38.4 1.0 03 124.5	19 08.4 1.0 03 124.5	19 38.3 1.0 03 124.4	20 08.3 1.0 03 124.4	20 38.3 1.0 03 124.4	55
6	17 06.7 1.0 03 123.5	17 36.7 1.0 03 123.5	18 06.7 1.0 03 123.5	18 36.6 1.0 03 123.5	19 06.6 1.0 03 123.5	19 36.6 1.0 03 123.4	20 06.6 1.0 03 123.4	20 36.6 1.0 03 123.4	6
7	17 04.9 1.0 03 122.5	17 34.9 1.0 03 122.5	18 04.9 1.0 03 122.5	18 34.9 1.0 03 122.5	19 04.9 1.0 03 122.4	19 34.9 1.0 03 122.4	20 04.8 1.0 03 122.4	20 34.8 1.0 03 122.4	7
8	17 03.1 1.0 03 121.5	17 33.1 1.0 03 121.5	18 03.1 1.0 03 121.5	18 33.1 1.0 03 121.4	19 03.1 1.0 03 121.4	19 33.1 1.0 03 121.4	20 03.1 1.0 03 121.4	20 33.0 1.0 03 121.4	8
9	17 01.3 1.0 03 120.5	17 31.3 1.0 03 120.5	18 01.3 1.0 03 120.5	18 31.3 1.0 03 120.4	19 01.3 1.0 03 120.4	19 31.3 1.0 03 120.4	20 01.3 1.0 03 120.4	20 31.2 1.0 03 120.4	9
60	16 59.5 1.0 03 119.5	17 29.5 1.0 03 119.5	17 59.5 1.0 03 119.5	18 29.5 1.0 03 119.4	18 59.5 1.0 03 119.4	19 29.5 1.0 03 119.4	19 59.4 1.0 03 119.4	20 29.4 1.0 03 119.4	60
1	16 57.7 1.0 03 118.5	17 27.7 1.0 03 118.5	17 57.7 1.0 03 118.4	18 27.7 1.0 03 118.4	18 57.6 1.0 03 118.4	19 27.6 1.0 03 118.4	19 57.6 1.0 03 118.4	20 27.6 1.0 03 118.4	1
2	16 55.9 1.0 03 117.5	17 25.8 1.0 03 117.5	17 55.8 1.0 03 117.4	18 25.8 1.0 03 117.4	18 55.8 1.0 03 117.4	19 25.8 1.0 03 117.4	19 55.8 1.0 03 117.4	20 25.7 1.0 03 117.4	2
3	16 54.0 1.0 03 116.5	17 24.0 1.0 03 116.5	17 54.0 1.0 03 116.4	18 23.9 1.0 03 116.4	18 53.9 1.0 03 116.4	19 23.9 1.0 03 116.4	19 53.9 1.0 03 116.4	20 23.9 1.0 03 116.4	3
4	16 52.1 1.0 03 115.5	17 22.1 1.0 03 115.5	17 52.1 1.0 03 115.4	18 22.1 1.0 03 115.4	18 52.0 1.0 03 115.4	19 22.0 1.0 03 115.4	19 52.0 1.0 03 115.4	20 22.0 1.0 03 115.3	4
65	16 50.2 1.0 03 114.5	17 20.2 1.0 03 114.4	17 50.2 1.0 03 114.4	18 20.2 1.0 03 114.4	18 50.1 1.0 03 114.4	19 20.1 1.0 03 114.4	19 50.1 1.0 03 114.4	20 20.1 1.0 03 114.3	65
6	16 48.3 1.0 03 113.5	17 18.3 1.0 03 113.4	17 48.3 1.0 03 113.4	18 18.2 1.0 03 113.4	18 48.2 1.0 03 113.4	19 18.2 1.0 03 113.4	19 48.2 1.0 03 113.4	20 18.2 1.0 03 113.3	6
7	16 46.4 1.0 03 112.5	17 16.4 1.0 03 112.4	17 46.3 1.0 03 112.4	18 16.3 1.0 03 112.4	18 46.3 1.0 03 112.4	19 16.3 1.0 03 112.4	19 46.3 1.0 03 112.4	20 16.2 1.0 03 112.3	7
8	16 44.4 1.0 03 111.5	17 14.4 1.0 03 111.4	17 44.4 1.0 03 111.4	18 14.4 1.0 03 111.4	18 44.4 1.0 03 111.4	19 14.3 1.0 03 111.4	19 44.3 1.0 03 111.3	20 14.3 1.0 03 111.3	8
9	16 42.5 1.0 03 110.5	17 12.5 1.0 03 110.4	17 42.4 1.0 03 110.4	18 12.4 1.0 03 110.4	18 42.4 1.0 03 110.4	19 12.4 1.0 03 110.4	19 42.4 1.0 03 110.3	20 12.3 1.0 03 110.3	9
70	16 40.5 1.0 03 109.4	17 10.5 1.0 03 109.4	17 40.5 1.0 03 109.4	18 10.4 1.0 03 109.4	18 40.4 1.0 03 109.4	19 10.4 1.0 03 109.4	19 40.4 1.0 03 109.3	20 10.4 1.0 03 109.3	70
1	16 38.5 1.0 03 108.4	17 08.5 1.0 03 108.4	17 38.5 1.0 03 108.4	18 08.5 1.0 03 108.4	18 38.4 1.0 03 108.4	19 08.4 1.0 03 108.4	19 38.4 1.0 03 108.3	20 08.4 1.0 03 108.3	1
2	16 36.5 1.0 03 107.4	17 06.5 1.0 03 107.4	17 36.5 1.0 03 107.4	18 06.5 1.0 03 107.4	18 36.5 1.0 03 107.4	19 06.4 1.0 03 107.4	19 36.4 1.0 03 107.3	20 06.4 1.0 03 107.3	2
3	16 34.5 1.0 03 106.4	17 04.5 1.0 03 106.4	17 34.5 1.0 03 106.4	18 04.5 1.0 03 106.4	18 34.5 1.0 03 106.4	19 04.4 1.0 03 106.3	19 34.4 1.0 03 106.3	20 04.4 1.0 03 106.3	3
4	16 32.5 1.0 03 105.4	17 02.5 1.0 03 105.4	17 32.5 1.0 03 105.4	18 02.5 1.0 03 105.4	18 32.4 1.0 03 105.4	19 02.4 1.0 03 105.3	19 32.4 1.0 03 105.3	20 02.4 1.0 03 105.3	4
75	16 30.5 1.0 03 104.4	17 00.5 1.0 03 104.4	17 30.5 1.0 03 104.4	18 00.4 1.0 03 104.4	18 30.4 1.0 03 104.4	19 00.4 1.0 03 104.3	19 30.4 1.0 03 104.3	20 00.4 1.0 03 104.3	75
6	16 28.5 1.0 03 103.4	16 58.4 1.0 03 103.4	17 28.4 1.0 03 103.4	17 58.4 1.0 03 103.4	18 28.4 1.0 03 103.4	18 58.4 1.0 03 103.3	19 28.3 1.0 03 103.3	19 58.3 1.0 03 103.3	6
7	16 26.4 1.0 03 102.4	16 56.4 1.0 03 102.4	17 26.4 1.0 03 102.4	17 56.4 1.0 03 102.4	18 26.3 1.0 03 102.4	18 56.3 1.0 03 102.3	19 26.3 1.0 03 102.3	19 56.3 1.0 03 102.3	7
8	16 24.4 1.0 03 101.4	16 54.3 1.0 03 101.4	17 24.3 1.0 03 101.4	17 54.3 1.0 03 101.4	18 24.3 1.0 03 101.3	18 54.3 1.0 03 101.3	19 24.3 1.0 03 101.3	19 54.2 1.0 03 101.3	8
9	16 22.3 1.0 03 100.4	16 52.3 1.0 03 100.4	17 22.3 1.0 03 100.4	17 52.3 1.0 03 100.4	18 22.2 1.0 03 100.3	18 52.2 1.0 03 100.3	19 22.2 1.0 03 100.3	19 52.2 1.0 03 100.3	9
80	16 20.3 1.0 03 99.4	16 50.2 1.0 03 99.4	17 20.2 1.0 03 99.4	17 50.2 1.0 03 99.4	18 20.2 1.0 03 99.4	18 50.2 1.0 03 99.3	19 20.1 1.0 03 99.3	19 50.1 1.0 03 99.3	80
1	16 18.2 1.0 03 98.4	16 48.2 1.0 03 98.4	17 18.1 1.0 03 98.4	17 48.1 1.0 03 98.4	18 18.1 1.0 03 98.4	18 48.1 1.0 03 98.3	19 18.1 1.0 03 98.3	19 48.0 1.0 03 98.3	1
2	16 16.1 1.0 03 97.4	16 46.1 1.0 03 97.4	17 16.1 1.0 03 97.4	17 46.0 1.0 03 97.4	18 16.0 1.0 03 97.4	18 46.0 1.0 03 97.3	19 16.0 1.0 03 97.3	19 46.0 1.0 03 97.3	2
3	16 14.0 1.0 03 96.4	16 44.0 1.0 03 96.4	17 14.0 1.0 03 96.4	17 44.0 1.0 03 96.4	18 14.0 1.0 03 96.3	18 43.9 1.0 03 96.3	19 13.9 1.0 03 96.3	19 43.9 1.0 03 96.3	3
4	16 11.9 1.0 03 95.4	16 41.9 1.0 03 95.4	17 11.9 1.0 03 95.4	17 41.9 1.0 03 95.4	18 11.9 1.0 03 95.3	18 41.8 1.0 03 95.3	19 11.8 1.0 03 95.3	19 41.8 1.0 03 95.3	4
85	16 09.9 1.0 03 94.4	16 39.8 1.0 03 94.4	17 09.8 1.0 03 94.4	17 39.8 1.0 03 94.4	18 09.8 1.0 03 94.3	18 39.8 1.0 03 94.3	19 09.7 1.0 03 94.3	19 39.7 1.0 03 94.3	85
6	16 07.8 1.0 03 93.4	16 37.8 1.0 03 93.4	17 07.7 1.0 03 93.4	17 37.7 1.0 03 93.4	18 07.7 1.0 03 93.3	18 37.7 1.0 03 93.3	19 07.6 1.0 03 93.3	19 37.6 1.0 03 93.3	6
7	16 05.7 1.0 03 92.4	16 35.7 1.0 03 92.4	17 05.6 1.0 03 92.4	17 35.6 1.0 03 92.4	18 05.6 1.0 03 92.3	18 35.6 1.0 03 92.3	19 05.6 1.0 03 92.3	19 35.5 1.0 03 92.3	7
8	16 03.6 1.0 03 91.4	16 33.6 1.0 03 91.4	17 03.5 1.0 03 91.4	17 33.5 1.0 03 91.4	18 03.5 1.0 03 91.3	18 33.5 1.0 03 91.3	19 03.5 1.0 03 91.3	19 33.4 1.0 03 91.3	8
9	16 01.5 1.0 03 90.4	16 31.5 1.0 03 90.4	17 01.5 1.0 03 90.4	17 31.4 1.0 03 90.4	18 01.4 1.0 03 90.3	18 31.4 1.0 03 90.3	19 01.4 1.0 03 90.3	19 31.4 1.0 03 90.3	9
90	15 59.4 1.0 03 89.4	16 29.4 1.0 03 89.4	16 59.4 1.0 03 89.4	17 29.3 1.0 03 89.4	17 59.3 1.0 03 89.4	18 29.3 1.0 03 89.3	18 59.3 1.0 03 89.3	19 29.3 1.0 03 89.3	90

Lat. 88°

H.A.	16° 00′ Alt. Δd Δt	Az.	16° 30′ Alt. Δd Δt	Az.	17° 00′ Alt. Δd Δt	Az.	17° 30′ Alt. Δd Δt	Az.	18° 00′ Alt. Δd Δt	Az.	18° 30′ Alt. Δd Δt	Az.	19° 00′ Alt. Δd Δt	Az.	19° 30′ Alt. Δd Δt	Az.	H.A.
91	15 57.3 1.0 03	88.4	16 27.3 1.0 03	88.4	16 57.3 1.0 03	88.4	17 27.2 1.0 03	88.4	17 57.2 1.0 03	88.4	18 27.2 1.0 03	88.3	18 57.2 1.0 03	88.3	19 27.2 1.0 03	88.3	91
2	15 55.2 1.0 03	87.4	16 25.2 1.0 03	87.4	16 55.2 1.0 03	87.4	17 25.2 1.0 03	87.4	17 55.1 1.0 03	87.4	18 25.1 1.0 03	87.3	18 55.1 1.0 03	87.3	19 25.1 1.0 03	87.3	2
3	15 53.1 1.0 03	86.4	16 23.1 1.0 03	86.4	16 53.1 1.0 03	86.4	17 23.1 1.0 03	86.4	17 53.0 1.0 03	86.4	18 23.0 1.0 03	86.3	18 53.0 1.0 03	86.3	19 23.0 1.0 03	86.3	3
4	15 51.0 1.0 03	85.4	16 21.0 1.0 03	85.4	16 51.0 1.0 03	85.4	17 21.0 1.0 03	85.4	17 51.0 1.0 03	85.4	18 20.9 1.0 03	85.3	18 50.9 1.0 03	85.3	19 20.9 1.0 03	85.3	4
95	15 48.9 1.0 03	84.4	16 18.9 1.0 03	84.4	16 48.9 1.0 03	84.4	17 18.9 1.0 03	84.4	17 48.9 1.0 03	84.4	18 18.8 1.0 03	84.3	18 48.8 1.0 03	84.3	19 18.8 1.0 03	84.3	95
6	15 46.9 1.0 03	83.4	16 16.8 1.0 03	83.4	16 46.8 1.0 03	83.4	17 16.8 1.0 03	83.4	17 46.8 1.0 03	83.4	18 16.8 1.0 03	83.3	18 46.7 1.0 03	83.3	19 16.7 1.0 03	83.3	6
7	15 44.8 1.0 03	82.4	16 14.8 1.0 03	82.4	16 44.7 1.0 03	82.4	17 14.7 1.0 03	82.4	17 44.7 1.0 03	82.4	18 14.7 1.0 03	82.3	18 44.7 1.0 03	82.3	19 14.6 1.0 03	82.3	7
8	15 42.7 1.0 03	81.4	16 12.7 1.0 03	81.4	16 42.7 1.0 03	81.4	17 12.7 1.0 03	81.4	17 42.6 1.0 03	81.4	18 12.6 1.0 03	81.3	18 42.6 1.0 03	81.3	19 12.6 1.0 03	81.3	8
9	15 40.6 1.0 03	80.4	16 10.6 1.0 03	80.4	16 40.6 1.0 03	80.4	17 10.6 1.0 03	80.4	17 40.6 1.0 03	80.4	18 10.5 1.0 03	80.3	18 40.5 1.0 03	80.3	19 10.5 1.0 03	80.3	9
100	15 38.6 1.0 03	79.4	16 08.6 1.0 03	79.4	16 38.5 1.0 03	79.4	17 08.5 1.0 03	79.4	17 38.5 1.0 03	79.4	18 08.5 1.0 03	79.3	18 38.5 1.0 03	79.3	19 08.4 1.0 03	79.3	100
1	15 36.5 1.0 03	78.4	16 06.5 1.0 03	78.4	16 36.5 1.0 03	78.4	17 06.5 1.0 03	78.4	17 36.5 1.0 03	78.4	18 06.4 1.0 03	78.4	18 36.4 1.0 03	78.3	19 06.4 1.0 03	78.3	1
2	15 34.5 1.0 03	77.4	16 04.5 1.0 03	77.4	16 34.4 1.0 03	77.4	17 04.4 1.0 03	77.4	17 34.4 1.0 03	77.4	18 04.4 1.0 03	77.3	18 34.4 1.0 03	77.3	19 04.3 1.0 03	77.3	2
3	15 32.4 1.0 03	76.5	16 02.4 1.0 03	76.4	16 32.4 1.0 03	76.4	17 02.4 1.0 03	76.4	17 32.4 1.0 03	76.4	18 02.3 1.0 03	76.4	18 32.3 1.0 03	76.3	19 02.3 1.0 03	76.3	3
4	15 30.4 1.0 03	75.5	16 00.4 1.0 03	75.4	16 30.4 1.0 03	75.4	17 00.4 1.0 03	75.4	17 30.3 1.0 03	75.4	18 00.3 1.0 03	75.4	18 30.3 1.0 03	75.3	19 00.3 1.0 03	75.3	4
105	15 28.4 1.0 03	74.5	15 58.4 1.0 03	74.4	16 28.4 1.0 03	74.4	16 58.3 1.0 03	74.4	17 28.3 1.0 03	74.4	17 58.3 1.0 03	74.4	18 28.3 1.0 03	74.3	18 58.3 1.0 03	74.3	105
6	15 26.4 1.0 03	73.5	15 56.4 1.0 03	73.4	16 26.3 1.0 03	73.4	16 56.3 1.0 03	73.4	17 26.3 1.0 03	73.4	17 56.3 1.0 03	73.4	18 26.3 1.0 03	73.3	18 56.2 1.0 03	73.3	6
7	15 24.4 1.0 03	72.5	15 54.4 1.0 03	72.4	16 24.3 1.0 03	72.4	16 54.3 1.0 03	72.4	17 24.3 1.0 03	72.4	17 54.3 1.0 03	72.4	18 24.3 1.0 03	72.4	18 54.2 1.0 03	72.3	7
8	15 22.4 1.0 03	71.5	15 52.4 1.0 03	71.4	16 22.3 1.0 03	71.4	16 52.3 1.0 03	71.4	17 22.3 1.0 03	71.4	17 52.3 1.0 03	71.4	18 22.3 1.0 03	71.4	18 52.3 1.0 03	71.8	8
9	15 20.4 1.0 03	70.5	15 50.4 1.0 03	70.5	16 20.4 1.0 03	70.4	16 50.4 1.0 03	70.4	17 20.3 1.0 03	70.4	17 50.3 1.0 03	70.4	18 20.3 1.0 03	70.4	18 50.3 1.0 03	70.3	9
110	15 18.4 1.0 03	69.5	15 48.4 1.0 03	69.5	16 18.4 1.0 03	69.4	16 48.4 1.0 03	69.4	17 18.4 1.0 03	69.4	17 48.3 1.0 03	69.4	18 18.3 1.0 03	69.4	18 48.3 1.0 03	69.3	110
1	15 16.5 1.0 03	68.5	15 46.5 1.0 03	68.5	16 16.4 1.0 03	68.4	16 46.4 1.0 03	68.4	17 16.4 1.0 03	68.4	17 46.4 1.0 03	68.4	18 16.4 1.0 03	68.4	18 46.4 1.0 03	68.4	1
2	15 14.5 1.0 03	67.5	15 44.5 1.0 03	67.5	16 14.5 1.0 03	67.4	16 44.5 1.0 03	67.4	17 14.5 1.0 03	67.4	17 44.5 1.0 03	67.4	18 14.4 1.0 03	67.4	18 44.4 1.0 03	67.4	2
3	15 12.6 1.0 03	66.5	15 42.6 1.0 03	66.5	16 12.6 1.0 03	66.5	16 42.6 1.0 03	66.4	17 12.5 1.0 03	66.4	17 42.5 1.0 03	66.4	18 12.5 1.0 03	66.4	18 42.5 1.0 03	66.4	3
4	15 10.7 1.0 03	65.5	15 40.7 1.0 03	65.5	16 10.7 1.0 03	65.5	16 40.7 1.0 03	65.4	17 10.6 1.0 03	65.4	17 40.6 1.0 03	65.4	18 10.6 1.0 03	65.4	18 40.6 1.0 03	65.4	4
115	15 08.8 1.0 03	64.5	15 38.8 1.0 03	64.5	16 08.8 1.0 03	64.5	16 38.8 1.0 03	64.4	17 08.7 1.0 03	64.4	17 38.7 1.0 03	64.4	18 08.7 1.0 03	64.4	18 38.7 1.0 03	64.4	115
6	15 06.9 1.0 03	63.5	15 36.9 1.0 03	63.5	16 06.9 1.0 03	63.5	16 36.9 1.0 03	63.4	17 06.9 1.0 03	63.4	17 36.8 1.0 03	63.4	18 06.8 1.0 03	63.4	18 36.8 1.0 03	63.4	6
7	15 05.1 1.0 03	62.5	15 35.0 1.0 03	62.5	16 05.0 1.0 03	62.5	16 35.0 1.0 03	62.5	17 05.0 1.0 03	62.4	17 35.0 1.0 03	62.4	18 05.0 1.0 03	62.4	18 34.9 1.0 03	62.4	7
8	15 03.2 1.0 03	61.5	15 33.2 1.0 03	61.5	16 03.2 1.0 03	61.5	16 33.2 1.0 03	61.5	17 03.1 1.0 03	61.4	17 33.1 1.0 03	61.4	18 03.1 1.0 03	61.4	18 33.1 1.0 03	61.4	8
9	15 01.4 1.0 03	60.5	15 31.4 1.0 03	60.5	16 01.3 1.0 03	60.5	16 31.3 1.0 03	60.5	17 01.3 1.0 03	60.4	17 31.3 1.0 03	60.4	18 01.3 1.0 03	60.4	18 31.3 1.0 03	60.4	9
120	14 59.6 1.0 03	59.5	15 29.5 1.0 03	59.5	15 59.5 1.0 03	59.5	16 29.5 1.0 03	59.5	16 59.5 1.0 03	59.5	17 29.5 1.0 03	59.4	17 59.5 1.0 03	59.4	18 29.5 1.0 03	59.4	120
1	14 57.8 1.0 03	58.5	15 27.8 1.0 03	58.5	15 57.7 1.0 03	58.5	16 27.7 1.0 03	58.5	16 57.7 1.0 03	58.5	17 27.7 1.0 03	58.4	17 57.7 1.0 03	58.4	18 27.7 1.0 03	58.4	1
2	14 56.0 1.0 03	57.5	15 26.0 1.0 03	57.5	15 56.0 1.0 03	57.5	16 25.9 1.0 03	57.5	16 55.9 1.0 03	57.5	17 25.9 1.0 03	57.5	17 55.9 1.0 03	57.4	18 25.9 1.0 03	57.4	2
3	14 54.2 1.0 03	56.5	15 24.2 1.0 03	56.5	15 54.2 1.0 03	56.5	16 24.2 1.0 03	56.5	16 54.2 1.0 03	56.5	17 24.2 1.0 03	56.5	17 54.1 1.0 03	56.4	18 24.1 1.0 03	56.4	3
4	14 52.5 1.0 03	55.5	15 22.5 1.0 03	55.5	15 52.5 1.0 03	55.5	16 22.5 1.0 03	55.5	16 52.4 1.0 03	55.5	17 22.4 1.0 03	55.5	17 52.4 1.0 03	55.4	18 22.4 1.0 03	55.4	4
125	14 50.8 1.0 03	54.6	15 20.8 1.0 03	54.5	15 50.8 1.0 03	54.5	16 20.7 1.0 03	54.5	16 50.7 1.0 03	54.5	17 20.7 1.0 03	54.5	17 50.7 1.0 03	54.5	18 20.7 1.0 03	54.4	125
6	14 49.1 1.0 03	53.6	15 19.1 1.0 03	53.5	15 49.1 1.0 03	53.5	16 19.0 1.0 03	53.5	16 49.0 1.0 03	53.5	17 19.0 1.0 03	53.5	17 49.0 1.0 03	53.5	18 19.0 1.0 03	53.4	6
7	14 47.4 1.0 03	52.6	15 17.4 1.0 03	52.5	15 47.4 1.0 03	52.5	16 17.4 1.0 03	52.5	16 47.4 1.0 03	52.5	17 17.3 1.0 03	52.5	17 47.3 1.0 03	52.5	18 17.3 1.0 03	52.5	7
8	14 45.8 1.0 03	51.6	15 15.7 1.0 03	51.6	15 45.7 1.0 03	51.5	16 15.7 1.0 03	51.5	16 45.7 1.0 03	51.5	17 15.7 1.0 03	51.5	17 45.7 1.0 03	51.5	18 15.7 1.0 03	51.5	8
9	14 44.1 1.0 03	50.6	15 14.1 1.0 03	50.6	15 44.1 1.0 03	50.5	16 14.1 1.0 03	50.5	16 44.1 1.0 03	50.5	17 14.1 1.0 03	50.5	17 44.1 1.0 03	50.5	18 14.0 1.0 03	50.5	9
130	14 42.5 1.0 03	49.6	15 12.5 1.0 03	49.6	15 42.5 1.0 03	49.6	16 12.5 1.0 03	49.5	16 42.5 1.0 03	49.5	17 12.5 1.0 03	49.5	17 42.5 1.0 03	49.5	18 12.4 1.0 03	49.5	130
1	14 40.9 1.0 03	48.6	15 10.9 1.0 03	48.6	15 40.9 1.0 03	48.6	16 10.9 1.0 03	48.5	16 40.9 1.0 03	48.5	17 10.9 1.0 03	48.5	17 40.9 1.0 03	48.5	18 10.9 1.0 03	48.5	1
2	14 39.4 1.0 03	47.6	15 09.4 1.0 03	47.6	15 39.4 1.0 03	47.6	16 09.4 1.0 03	47.6	16 39.3 1.0 03	47.5	17 09.3 1.0 03	47.5	17 39.3 1.0 03	47.5	18 09.3 1.0 03	47.5	2
3	14 37.8 1.0 03	46.6	15 07.8 1.0 03	46.6	15 37.8 1.0 03	46.6	16 07.8 1.0 02	46.6	16 37.8 1.0 03	46.5	17 07.8 1.0 03	46.5	17 37.8 1.0 03	46.5	18 07.8 1.0 03	46.5	3
4	14 36.3 1.0 03	45.6	15 06.3 1.0 02	45.6	15 36.3 1.0 02	45.6	16 06.3 1.0 02	45.6	16 36.3 1.0 02	45.6	17 06.3 1.0 02	45.5	17 36.3 1.0 02	45.5	18 06.3 1.0 02	45.5	4
135	14 34.9 1.0 02	44.6	15 04.8 1.0 02	44.6	15 34.8 1.0 02	44.6	16 04.8 1.0 02	44.6	16 34.8 1.0 02	44.6	17 04.8 1.0 02	44.5	17 34.8 1.0 02	44.5	18 04.8 1.0 02	44.5	135
6	14 33.4 1.0 02	43.6	15 03.4 1.0 02	43.6	15 33.4 1.0 02	43.6	16 03.4 1.0 02	43.6	16 33.4 1.0 02	43.6	17 03.4 1.0 02	43.6	17 33.3 1.0 02	43.5	18 03.3 1.0 02	43.5	6
7	14 32.0 1.0 02	42.6	15 02.0 1.0 02	42.6	15 32.0 1.0 02	42.6	16 01.9 1.0 02	42.6	16 31.9 1.0 02	42.6	17 01.9 1.0 02	42.6	17 31.9 1.0 02	42.5	18 01.9 1.0 02	42.5	7
8	14 30.6 1.0 02	41.6	15 00.6 1.0 02	41.6	15 30.5 1.0 02	41.6	16 00.5 1.0 02	41.6	16 30.5 1.0 02	41.6	17 00.5 1.0 02	41.6	17 30.5 1.0 02	41.6	18 00.5 1.0 02	41.5	8
9	14 29.2 1.0 02	40.6	14 59.2 1.0 02	40.6	15 29.2 1.0 02	40.6	15 59.2 1.0 02	40.6	16 29.2 1.0 02	40.6	16 59.1 1.0 02	40.6	17 29.1 1.0 02	40.6	17 59.1 1.0 02	40.6	9
140	14 27.8 1.0 02	39.7	14 57.8 1.0 02	39.6	15 27.8 1.0 02	39.6	15 57.8 1.0 02	39.6	16 27.8 1.0 02	39.6	16 57.8 1.0 02	39.6	17 27.8 1.0 02	39.6	17 57.8 1.0 02	39.6	140
1	14 26.5 1.0 02	38.7	14 56.5 1.0 02	38.6	15 26.5 1.0 02	38.6	15 56.5 1.0 02	38.6	16 26.5 1.0 02	38.6	16 56.5 1.0 02	38.6	17 26.5 1.0 02	38.6	17 56.5 1.0 02	38.6	1
2	14 25.2 1.0 02	37.7	14 55.2 1.0 02	37.7	15 25.2 1.0 02	37.6	15 55.2 1.0 02	37.6	16 25.2 1.0 02	37.6	16 55.2 1.0 02	37.6	17 25.2 1.0 02	37.6	17 55.2 1.0 02	37.6	2
3	14 24.0 1.0 02	36.7	14 53.9 1.0 02	36.7	15 23.9 1.0 02	36.7	15 53.9 1.0 02	36.6	16 23.9 1.0 02	36.6	16 53.9 1.0 02	36.6	17 23.9 1.0 02	36.6	17 53.9 1.0 02	36.6	3
4	14 22.7 1.0 02	35.7	14 52.7 1.0 02	35.7	15 22.7 1.0 02	35.7	15 52.7 1.0 02	35.6	16 22.7 1.0 02	35.6	16 52.7 1.0 02	35.6	17 22.7 1.0 02	35.6	17 52.7 1.0 02	35.6	4
145	14 21.5 1.0 02	34.7	14 51.5 1.0 02	34.7	15 21.5 1.0 02	34.7	15 51.5 1.0 02	34.7	16 21.5 1.0 02	34.6	16 51.5 1.0 02	34.6	17 21.5 1.0 02	34.6	17 51.5 1.0 02	34.6	145
6	14 20.3 1.0 02	33.7	14 50.3 1.0 02	33.7	15 20.3 1.0 02	33.7	15 50.3 1.0 02	33.7	16 20.3 1.0 02	33.7	16 50.3 1.0 02	33.6	17 20.3 1.0 02	33.6	17 50.3 1.0 02	33.6	6
7	14 19.2 1.0 02	32.7	14 49.2 1.0 02	32.7	15 19.2 1.0 02	32.7	15 49.2 1.0 02	32.7	16 19.2 1.0 02	32.7	16 49.2 1.0 02	32.7	17 19.2 1.0 02	32.6	17 49.1 1.0 02	32.6	7
8	14 18.1 1.0 02	31.7	14 48.1 1.0 02	31.7	15 18.1 1.0 02	31.7	15 48.1 1.0 02	31.7	16 18.1 1.0 02	31.7	16 48.0 1.0 02	31.7	17 18.0 1.0 02	31.7	17 48.0 1.0 02	31.6	8
9	14 17.0 1.0 02	30.7	14 47.0 1.0 02	30.7	15 17.0 1.0 02	30.7	15 47.0 1.0 02	30.7	16 17.0 1.0 02	30.7	16 47.0 1.0 02	30.7	17 17.0 1.0 02	30.7	17 47.0 1.0 02	30.7	9
150	14 15.9 1.0 02	29.7	14 45.9 1.0 02	29.7	15 15.9 1.0 02	29.7	15 45.9 1.0 02	29.7	16 15.9 1.0 02	29.7	16 45.9 1.0 02	29.7	17 15.9 1.0 02	29.7	17 45.9 1.0 02	29.7	150
1	14 14.9 1.0 02	28.7	14 44.9 1.0 02	28.7	15 14.9 1.0 02	28.7	15 44.9 1.0 02	28.7	16 14.9 1.0 02	28.7	16 44.9 1.0 02	28.7	17 14.9 1.0 02	28.7	17 44.9 1.0 02	28.7	1
2	14 13.9 1.0 02	27.7	14 43.9 1.0 02	27.7	15 13.9 1.0 02	27.7	15 43.9 1.0 02	27.7	16 13.9 1.0 02	27.7	16 43.9 1.0 02	27.7	17 13.9 1.0 02	27.7	17 43.9 1.0 02	27.7	2
3	14 13.0 1.0 02	26.8	14 43.0 1.0 02	26.7	15 13.0 1.0 02	26.7	15 42.9 1.0 02	26.7	16 12.9 1.0 02	26.7	16 42.9 1.0 02	26.7	17 12.9 1.0 02	26.7	17 42.9 1.0 02	26.7	3
4	14 12.0 1.0 02	25.8	14 42.0 1.0 02	25.8	15 12.0 1.0 02	25.7	15 42.0 1.0 01	25.7	16 12.0 1.0 02	25.7	16 42.0 1.0 02	25.7	17 12.0 1.0 02	25.7	17 42.0 1.0 01	25.7	4
155	14 11.1 1.0 01	24.8	14 41.1 1.0 01	24.8	15 11.1 1.0 01	24.8	15 41.1 1.0 01	24.7	16 11.1 1.0 01	24.7	16 41.1 1.0 01	24.7	17 11.1 1.0 01	24.7	17 41.1 1.0 01	24.7	155
6	14 10.3 1.0 01	23.8	14 40.3 1.0 01	23.8	15 10.3 1.0 01	23.8	15 40.3 1.0 01	23.8	16 10.3 1.0 01	23.8	16 40.3 1.0 01	23.7	17 10.3 1.0 01	23.7	17 40.3 1.0 01	23.7	6
7	14 09.5 1.0 01	22.8	14 39.4 1.0 01	22.8	15 09.4 1.0 01	22.8	15 39.4 1.0 01	22.8	16 09.4 1.0 01	22.8	16 39.4 1.0 01	22.8	17 09.4 1.0 01	22.7	17 39.4 1.0 01	22.7	7
8	14 08.7 1.0 01	21.8	14 38.7 1.0 01	21.8	15 08.7 1.0 01	21.8	15 38.6 1.0 01	21.8	16 08.6 1.0 01	21.8	16 38.6 1.0 01	21.8	17 08.6 1.0 01	21.8	17 38.6 1.0 01	21.7	8
9	14 07.9 1.0 01	20.8	14 37.9 1.0 01	20.8	15 07.9 1.0 01	20.8	15 37.9 1.0 01	20.8	16 07.9 1.0 01	20.8	16 37.9 1.0 01	20.8	17 07.9 1.0 01	20.8	17 37.9 1.0 01	20.8	9
160	14 07.2 1.0 01	19.8	14 37.2 1.0 01	19.8	15 07.2 1.0 01	19.8	15 37.2 1.0 01	19.8	16 07.2 1.0 01	19.8	16 37.2 1.0 01	19.8	17 07.2 1.0 01	19.8	17 37.2 1.0 01	19.8	160
1	14 06.5 1.0 01	18.8	14 36.5 1.0 01	18.8	15 06.5 1.0 01	18.8	15 36.5 1.0 01	18.8	16 06.5 1.0 01	18.8	16 36.5 1.0 01	18.8	17 06.5 1.0 01	18.8	17 36.5 1.0 01	18.8	1
2	14 05.8 1.0 01	17.8	14 35.8 1.0 01	17.8	15 05.8 1.0 01	17.8	15 35.8 1.0 01	17.8	16 05.8 1.0 01	17.8	16 35.8 1.0 01	17.8	17 05.8 1.0 01	17.8	17 35.8 1.0 01	17.8	2
3	14 05.2 1.0 01	16.8	14 35.2 1.0 01	16.8	15 05.2 1.0 01	16.8	15 35.2 1.0 01	16.8	16 05.2 1.0 01	16.8	16 35.2 1.0 01	16.8	17 05.2 1.0 01	16.8	17 35.2 1.0 01	16.8	3
4	14 04.6 1.0 01	15.9	14 34.6 1.0 01	15.8	15 04.6 1.0 01	15.8	15 34.6 1.0 01	15.8	16 04.6 1.0 01	15.8	16 34.6 1.0 01	15.8	17 04.6 1.0 01	15.8	17 34.6 1.0 01	15.8	4
165	14 04.0 1.0 01	14.9	14 34.0 1.0 01	14.9	15 04.0 1.0 01	14.9	15 34.0 1.0 01	14.8	16 04.0 1.0 01	14.8	16 34.0 1.0 01	14.8	17 04.0 1.0 01	14.8	17 34.0 1.0 01	14.8	165
6	14 03.5 1.0 01	13.9	14 33.5 1.0 01	13.9	15 03.5 1.0 01	13.9	15 33.5 1.0 01	13.9	16 03.5 1.0 01	13.9	16 33.5 1.0 01	13.8	17 03.5 1.0 01	13.8	17 33.5 1.0 01	13.8	6
7	14 03.0 1.0 01	12.9	14 33.0 1.0 01	12.9	15 03.0 1.0 01	12.9	15 33.0 1.0 01	12.9	16 03.0 1.0 01	12.9	16 33.0 1.0 01	12.9	17 03.0 1.0 01	12.9	17 33.0 1.0 01	12.9	7
8	14 02.6 1.0 01	11.9	14 32.6 1.0 01	11.9	15 02.6 1.0 01	11.9	15 32.6 1.0 01	11.9	16 02.6 1.0 01	11.9	16 32.6 1.0 01	11.9	17 02.6 1.0 01	11.9	17 32.6 1.0 01	11.9	8
9	14 02.2 1.0 01	10.9	14 32.2 1.0 01	10.9	15 02.2 1.0 01	10.9	15 32.2 1.0 01	10.9	16 02.2 1.0 01	10.9	16 32.2 1.0 01	10.9	17 02.2 1.0 01	10.9	17 32.2 1.0 01	10.9	9
170	14 01.8 1.0 01	09.9	14 31.8 1.0 01	09.9	15 01.8 1.0 01	09.9	15 31.8 1.0 01	09.9	16 01.8 1.0 01	09.9	16 31.8 1.0 01	09.9	17 01.8 1.0 01	09.9	17 31.8 1.0 01	09.9	170
1	14 01.5 1.0 01	08.9	14 31.5 1.0 01	08.9	15 01.5 1.0 01	08.9	15 31.5 1.0 01	08.9	16 01.5 1.0 01	08.9	16 31.5 1.0 01	08.9	17 01.5 1.0 01	08.9	17 31.5 1.0 01	08.9	1
2	14 01.2 1.0 00	07.9	14 31.2 1.0 00	07.9	15 01.2 1.0 00	07.9	15 31.2 1.0 00	07.9	16 01.2 1.0 00	07.9	16 31.2 1.0 00	07.9	17 01.2 1.0 00	07.9	17 31.2 1.0 00	07.9	2
3	14 00.9 1.0 00	06.9	14 30.9 1.0 00	06.9	15 00.9 1.0 00	06.9	15 30.9 1.0 00	06.9	16 00.9 1.0 00	06.9	16 30.9 1.0 00	06.9	17 00.9 1.0 00	06.9	17 30.9 1.0 00	06.9	3
4	14 00.7 1.0 00	05.9	14 30.7 1.0 00	05.9	15 00.7 1.0 00	05.9	15 30.7 1.0 00	05.9	16 00.7 1.0 00	05.9	16 30.6 1.0 00	05.9	17 00.6 1.0 00	05.9	17 30.6 1.0 00	05.9	4
175	14 00.5 1.0 00	05.0	14 30.5 1.0 00	05.0	15 00.5 1.0 00	05.0	15 30.5 1.0 00	04.9	16 00.5 1.0 00	04.9	16 30.5 1.0 00	04.9	17 00.5 1.0 00	04.9	17 30.5 1.0 00	04.9	175
6	14 00.3 1.0 00	04.0	14 30.3 1.0 00	04.0	15 00.3 1.0 00	04.0	15 30.3 1.0 00	04.0	16 00.3 1.0 00	04.0	16 30.3 1.0 00	04.0	17 00.3 1.0 00	04.0	17 30.3 1.0 00	04.0	6
7	14 00.2 1.0 00	03.0	14 30.1 1.0 00	03.0	15 00.2 1.0 00	03.0	15 30.2 1.0 00	03.0	16 00.2 1.0 00	03.0	16 30.2 1.0 00	03.0	17 00.2 1.0 00	03.0	17 30.2 1.0 00	03.0	7
8	14 00.1 1.0 00	02.0	14 30.1 1.0 00	02.0	15 00.1 1.0 00	02.0	15 30.1 1.0 00	02.0	16 00.1 1.0 00	02.0	16 30.1 1.0 00	02.0	17 00.1 1.0 00	02.0	17 30.1 1.0 00	02.0	8
9	14 00.0 1.0 00	01.0	14 30.0 1.0 00	01.0	15 00.0 1.0 00	01.0	15 30.0 1.0 00	01.0	16 00.0 1.0 00	01.0	16 30.0 1.0 00	01.0	17 00.0 1.0 00	01.0	17 30.0 1.0 00	01.0	9
180	14 00.0 1.0 00	00.0	14 30.0 1.0 00	00.0	15 00.0 1.0 00	00.0	15 30.0 1.0 00	00.0	16 00.0 1.0 00	00.0	16 30.0 1.0 00	00.0	17 00.0 1.0 00	00.0	17 30.0 1.0 00	00.0	180

Lat. 89°

Lat. 88°

Each declination cell below shows **Alt. / Az.** Δd and Δt apply to all declination columns in a row.

H.A.	Δd	Δt	20° 00'	20° 30'	21° 00'	21° 30'	22° 00'	22° 30'	23° 00'	23° 30'	H.A.
00	1.0	00	22 00.0 / 180.0	22 30.0 / 180.0	23 00.0 / 180.0	23 30.0 / 180.0	24 00.0 / 180.0	24 30.0 / 180.0	25 00.0 / 180.0	25 30.0 / 180.0	00
1	1.0	00	22 00.0 / 179.0	22 30.0 / 179.0	23 00.0 / 179.0	23 30.0 / 179.0	24 00.0 / 179.0	24 30.0 / 179.0	25 00.0 / 179.0	25 30.0 / 179.0	1
2	1.0	00	21 59.9 / 178.0	22 29.9 / 178.0	22 59.9 / 178.0	23 29.9 / 178.0	23 59.9 / 178.0	24 29.9 / 178.0	24 59.9 / 178.0	25 29.9 / 178.0	2
3	1.0	00	21 59.8 / 177.0	22 29.8 / 177.0	22 59.8 / 177.0	23 29.8 / 177.0	23 59.8 / 177.0	24 29.8 / 177.0	24 59.8 / 177.0	25 29.8 / 177.0	3
4	1.0	00	21 59.7 / 175.9	22 29.7 / 175.9	22 59.7 / 175.9	23 29.7 / 175.9	23 59.7 / 175.9	24 29.7 / 175.9	24 59.7 / 175.9	25 29.7 / 175.9	4
05	1.0	00	21 59.5 / 174.9	22 29.5 / 174.9	22 59.5 / 174.9	23 29.5 / 174.9	23 59.5 / 174.9	24 29.5 / 174.9	24 59.5 / 174.9	25 29.5 / 174.9	05
6	1.0	00	21 59.3 / 173.9	22 29.3 / 173.9	22 59.3 / 173.9	23 29.3 / 173.9	23 59.3 / 173.9	24 29.3 / 173.9	24 59.3 / 173.9	25 29.3 / 173.9	6
7	1.0	00	21 59.1 / 172.9	22 29.1 / 172.9	22 59.1 / 172.9	23 29.1 / 172.9	23 59.1 / 172.9	24 29.1 / 172.9	24 59.1 / 172.9	25 29.1 / 172.9	7
8	1.0	01	21 58.8 / 171.9	22 28.8 / 171.9	22 58.8 / 171.9	23 28.8 / 171.9	23 58.8 / 171.9	24 28.8 / 171.9	24 58.8 / 171.9	25 28.8 / 171.9	8
9	1.0	01	21 58.5 / 170.9	22 28.5 / 170.9	22 58.5 / 170.9	23 28.5 / 170.9	23 58.5 / 170.9	24 28.5 / 170.9	24 58.5 / 170.9	25 28.5 / 170.9	9
10	1.0	01	21 58.2 / 169.9	22 28.2 / 169.9	22 58.2 / 169.9	23 28.2 / 169.9	23 58.2 / 169.9	24 28.1 / 169.9	24 58.1 / 169.8	25 28.1 / 169.8	10
1	1.0	01	21 57.8 / 168.9	22 27.8 / 168.9	22 57.8 / 168.9	23 27.8 / 168.9	23 57.8 / 168.9	24 27.8 / 168.9	24 57.8 / 168.8	25 27.8 / 168.8	1
2	1.0	01	21 57.3 / 167.8	22 27.3 / 167.8	22 57.3 / 167.8	23 27.3 / 167.8	23 57.3 / 167.8	24 27.3 / 167.8	24 57.3 / 167.8	25 27.3 / 167.8	2
3	1.0	01	21 56.9 / 166.8	22 26.9 / 166.8	22 56.9 / 166.8	23 26.9 / 166.8	23 56.9 / 166.8	24 26.9 / 166.8	24 56.9 / 166.8	25 26.9 / 166.8	3
4	1.0	01	21 56.4 / 165.8	22 26.4 / 165.8	22 56.4 / 165.8	23 26.4 / 165.8	23 56.4 / 165.8	24 26.4 / 165.8	24 56.4 / 165.8	25 26.4 / 165.8	4
15	1.0	01	21 55.9 / 164.8	22 25.9 / 164.8	22 55.9 / 164.8	23 25.9 / 164.8	23 55.9 / 164.8	24 25.9 / 164.8	24 55.8 / 164.8	25 25.8 / 164.8	15
6	1.0	01	21 55.3 / 163.8	22 25.3 / 163.8	22 55.3 / 163.8	23 25.3 / 163.8	23 55.3 / 163.8	24 25.3 / 163.8	24 55.3 / 163.8	25 25.3 / 163.7	6
7	1.0	01	21 54.7 / 162.8	22 24.7 / 162.8	22 54.7 / 162.8	23 24.7 / 162.8	23 54.7 / 162.8	24 24.7 / 162.7	24 54.7 / 162.7	25 24.7 / 162.7	7
8	1.0	01	21 54.1 / 161.8	22 24.1 / 161.8	22 54.1 / 161.8	23 24.1 / 161.7	23 54.0 / 161.7	24 24.0 / 161.7	24 54.0 / 161.7	25 24.0 / 161.7	8
9	1.0	01	21 53.4 / 160.7	22 23.4 / 160.7	22 53.4 / 160.7	23 23.4 / 160.7	23 53.4 / 160.7	24 23.4 / 160.7	24 53.4 / 160.7	25 23.4 / 160.7	9
20	1.0	01	21 52.7 / 159.7	22 22.7 / 159.7	22 52.7 / 159.7	23 22.7 / 159.7	23 52.7 / 159.7	24 22.7 / 159.7	24 52.7 / 159.7	25 22.7 / 159.7	20
1	1.0	01	21 51.9 / 158.7	22 21.9 / 158.7	22 51.9 / 158.7	23 21.9 / 158.7	23 51.9 / 158.7	24 21.9 / 158.7	24 51.9 / 158.7	25 21.9 / 158.7	1
2	1.0	01	21 51.2 / 157.7	22 21.1 / 157.7	22 51.1 / 157.7	23 21.1 / 157.7	23 51.1 / 157.7	24 21.1 / 157.7	24 51.1 / 157.7	25 21.1 / 157.7	2
3	1.0	01	21 50.3 / 156.7	22 20.3 / 156.7	22 50.3 / 156.7	23 20.3 / 156.7	23 50.3 / 156.7	24 20.3 / 156.7	24 50.3 / 156.6	25 20.3 / 156.6	3
4	1.0	01	21 49.5 / 155.7	22 19.5 / 155.7	22 49.5 / 155.7	23 19.5 / 155.7	23 49.5 / 155.7	24 19.5 / 155.6	24 49.5 / 155.6	25 19.5 / 155.6	4
25	1.0	02	21 48.6 / 154.7	22 18.6 / 154.7	22 48.6 / 154.7	23 18.6 / 154.6	23 48.6 / 154.6	24 18.6 / 154.6	24 48.6 / 154.6	25 18.6 / 154.6	25
6	1.0	02	21 47.7 / 153.7	22 17.7 / 153.7	22 47.7 / 153.7	23 17.7 / 153.6	23 47.7 / 153.6	24 17.7 / 153.6	24 47.7 / 153.6	25 17.7 / 153.6	6
7	1.0	02	21 46.8 / 152.7	22 16.8 / 152.7	22 46.7 / 152.6	23 16.7 / 152.6	23 46.7 / 152.6	24 16.7 / 152.6	24 46.7 / 152.6	25 16.7 / 152.6	7
8	1.0	02	21 45.8 / 151.6	22 15.8 / 151.6	22 45.8 / 151.6	23 15.8 / 151.6	23 45.8 / 151.6	24 15.8 / 151.6	24 45.8 / 151.6	25 15.7 / 151.6	8
9	1.0	02	21 44.8 / 150.6	22 14.8 / 150.6	22 44.8 / 150.6	23 14.8 / 150.6	23 44.8 / 150.6	24 14.7 / 150.6	24 44.7 / 150.6	25 14.7 / 150.6	9
30	1.0	02	21 43.7 / 149.6	22 13.7 / 149.6	22 43.7 / 149.6	23 13.7 / 149.6	23 43.7 / 149.6	24 13.7 / 149.6	24 43.7 / 149.6	25 13.7 / 149.5	30
1	1.0	02	21 42.7 / 148.6	22 12.6 / 148.6	22 42.6 / 148.6	23 12.6 / 148.6	23 42.6 / 148.6	24 12.6 / 148.6	24 42.6 / 148.6	25 12.6 / 148.5	1
2	1.0	02	21 41.5 / 147.6	22 11.5 / 147.6	22 41.5 / 147.6	23 11.5 / 147.6	23 41.5 / 147.6	24 11.5 / 147.6	24 41.5 / 147.5	25 11.5 / 147.5	2
3	1.0	02	21 40.4 / 146.6	22 10.4 / 146.6	22 40.4 / 146.6	23 10.4 / 146.6	23 40.4 / 146.6	24 10.4 / 146.5	24 40.4 / 146.5	25 10.4 / 146.5	3
4	1.0	02	21 39.2 / 145.6	22 09.2 / 145.6	22 39.2 / 145.6	23 09.2 / 145.6	23 39.2 / 145.5	24 09.2 / 145.5	24 39.2 / 145.5	25 09.2 / 145.5	4
35	1.0	02	21 38.0 / 144.6	22 08.0 / 144.6	22 38.0 / 144.5	23 08.0 / 144.5	23 38.0 / 144.5	24 08.0 / 144.5	24 38.0 / 144.5	25 08.0 / 144.5	35
6	1.0	02	21 36.8 / 143.6	22 06.8 / 143.6	22 36.8 / 143.5	23 06.8 / 143.5	23 36.8 / 143.5	24 06.8 / 143.5	24 36.8 / 143.5	25 06.8 / 143.5	6
7	1.0	02	21 35.5 / 142.5	22 05.5 / 142.5	22 35.5 / 142.5	23 05.5 / 142.5	23 35.5 / 142.5	24 05.5 / 142.5	24 35.5 / 142.5	25 05.5 / 142.5	7
8	1.0	02	21 34.3 / 141.5	22 04.3 / 141.5	22 34.3 / 141.5	23 04.3 / 141.5	23 34.2 / 141.5	24 04.2 / 141.5	24 34.2 / 141.5	25 04.2 / 141.4	8
9	1.0	02	21 32.9 / 140.5	22 02.9 / 140.5	22 32.9 / 140.5	23 02.9 / 140.5	23 32.9 / 140.5	24 02.9 / 140.5	24 32.9 / 140.5	25 02.9 / 140.4	9
40	1.0	02	21 31.6 / 139.5	22 01.6 / 139.5	22 31.6 / 139.5	23 01.6 / 139.5	23 31.6 / 139.5	24 01.6 / 139.4	24 31.5 / 139.4	25 01.5 / 139.4	40
1	1.0	02	21 30.2 / 138.5	22 00.2 / 138.5	22 30.2 / 138.5	23 00.2 / 138.5	23 30.2 / 138.4	24 00.2 / 138.4	24 30.2 / 138.4	25 00.2 / 138.4	1
2	1.0	02	21 28.8 / 137.5	21 58.8 / 137.5	22 28.8 / 137.5	22 58.8 / 137.5	23 28.8 / 137.4	23 58.8 / 137.4	24 28.8 / 137.4	24 58.8 / 137.4	2
3	1.0	02	21 27.4 / 136.5	21 57.4 / 136.5	22 27.4 / 136.5	22 57.4 / 136.4	23 27.4 / 136.4	23 57.4 / 136.4	24 27.3 / 136.4	24 57.3 / 136.4	3
4	1.0	02	21 25.9 / 135.5	21 55.9 / 135.5	22 25.9 / 135.4	22 55.9 / 135.4	23 25.9 / 135.4	23 55.9 / 135.4	24 25.9 / 135.4	24 55.9 / 135.4	4
45	1.0	03	21 24.5 / 134.5	21 54.4 / 134.4	22 24.4 / 134.4	22 54.4 / 134.4	23 24.4 / 134.4	23 54.4 / 134.4	24 24.4 / 134.4	24 54.4 / 134.4	45
6	1.0	03	21 23.0 / 133.5	21 52.9 / 133.4	22 22.9 / 133.4	22 52.9 / 133.4	23 22.9 / 133.4	23 52.9 / 133.4	24 22.9 / 133.4	24 52.9 / 133.4	6
7	1.0	03	21 21.4 / 132.4	21 51.4 / 132.4	22 21.4 / 132.4	22 51.4 / 132.4	23 21.4 / 132.4	23 51.3 / 132.4	24 21.4 / 132.4	24 51.3 / 132.3	7
8	1.0	03	21 19.9 / 131.4	21 49.8 / 131.4	22 19.8 / 131.4	22 49.8 / 131.4	23 19.8 / 131.4	23 49.8 / 131.4	24 19.8 / 131.3	24 49.8 / 131.3	8
9	1.0	03	21 18.3 / 130.4	21 48.3 / 130.4	22 18.3 / 130.4	22 48.2 / 130.4	23 18.2 / 130.4	23 48.2 / 130.4	24 18.2 / 130.3	24 48.2 / 130.3	9
50	1.0	03	21 16.7 / 129.4	21 46.7 / 129.4	22 16.6 / 129.4	22 46.6 / 129.4	23 16.6 / 129.4	23 46.6 / 129.3	24 16.6 / 129.3	24 46.6 / 129.3	50
1	1.0	03	21 15.0 / 128.4	21 45.0 / 128.4	22 15.0 / 128.4	22 45.0 / 128.4	23 15.0 / 128.3	23 45.0 / 128.3	24 15.0 / 128.3	24 45.0 / 128.3	1
2	1.0	03	21 13.4 / 127.4	21 43.4 / 127.4	22 13.4 / 127.4	22 43.4 / 127.4	23 13.3 / 127.3	23 43.3 / 127.3	24 13.3 / 127.3	24 43.3 / 127.3	2
3	1.0	03	21 11.7 / 126.4	21 41.7 / 126.4	22 11.7 / 126.4	22 41.7 / 126.3	23 11.7 / 126.3	23 41.7 / 126.3	24 11.6 / 126.3	24 41.6 / 126.3	3
4	1.0	03	21 10.0 / 125.4	21 40.0 / 125.4	22 10.0 / 125.3	22 40.0 / 125.3	23 10.0 / 125.3	23 40.0 / 125.3	24 09.9 / 125.3	24 39.9 / 125.3	4
55	1.0	03	21 08.3 / 124.4	21 38.3 / 124.4	22 08.3 / 124.3	22 38.3 / 124.3	23 08.2 / 124.3	23 38.2 / 124.3	24 08.2 / 124.3	24 38.2 / 124.3	55
6	1.0	03	21 06.6 / 123.4	21 36.6 / 123.4	22 06.5 / 123.3	22 36.5 / 123.3	23 06.5 / 123.3	23 36.5 / 123.3	24 06.5 / 123.3	24 36.5 / 123.3	6
7	1.0	03	21 04.8 / 122.4	21 34.8 / 122.4	22 04.8 / 122.3	22 34.8 / 122.3	23 04.7 / 122.3	23 34.7 / 122.3	24 04.7 / 122.2	24 34.7 / 122.2	7
8	1.0	03	21 03.0 / 121.4	21 33.0 / 121.4	22 03.0 / 121.3	22 33.0 / 121.3	23 03.0 / 121.3	23 33.0 / 121.3	24 02.9 / 121.2	24 32.9 / 121.2	8
9	1.0	03	21 01.2 / 120.4	21 31.2 / 120.3	22 01.2 / 120.3	22 31.2 / 120.3	23 01.2 / 120.3	23 31.2 / 120.3	24 01.1 / 120.2	24 31.1 / 120.2	9
60	1.0	03	20 59.4 / 119.4	21 29.4 / 119.3	21 59.4 / 119.3	22 29.4 / 119.3	22 59.4 / 119.3	23 29.3 / 119.3	23 59.3 / 119.2	24 29.3 / 119.2	60
1	1.0	03	20 57.6 / 118.3	21 27.6 / 118.3	21 57.6 / 118.3	22 27.5 / 118.3	22 57.5 / 118.3	23 27.5 / 118.3	23 57.5 / 118.2	24 27.5 / 118.2	1
2	1.0	03	20 55.7 / 117.3	21 25.7 / 117.3	21 55.7 / 117.3	22 25.7 / 117.3	22 55.7 / 117.3	23 25.6 / 117.2	23 55.6 / 117.2	24 25.6 / 117.2	2
3	1.0	03	20 53.9 / 116.3	21 23.8 / 116.3	21 53.8 / 116.3	22 23.8 / 116.3	22 53.8 / 116.2	23 23.8 / 116.2	23 53.8 / 116.2	24 23.7 / 116.2	3
4	1.0	03	20 52.0 / 115.3	21 22.0 / 115.3	21 51.9 / 115.3	22 21.9 / 115.3	22 51.9 / 115.2	23 21.9 / 115.2	23 51.9 / 115.2	24 21.9 / 115.2	4
65	1.0	03	20 50.1 / 114.3	21 20.1 / 114.3	21 50.0 / 114.3	22 20.0 / 114.2	22 50.0 / 114.2	23 20.0 / 114.2	23 50.0 / 114.2	24 20.0 / 114.2	65
6	1.0	03	20 48.2 / 113.3	21 18.1 / 113.3	21 48.1 / 113.3	22 18.1 / 113.2	22 48.1 / 113.2	23 18.1 / 113.2	23 48.1 / 113.2	24 18.0 / 113.2	6
7	1.0	03	20 46.2 / 112.3	21 16.2 / 112.3	21 46.2 / 112.3	22 16.1 / 112.2	22 46.1 / 112.2	23 16.1 / 112.2	23 46.1 / 112.2	24 16.1 / 112.2	7
8	1.0	03	20 44.3 / 111.3	21 14.3 / 111.3	21 44.2 / 111.2	22 14.2 / 111.2	22 44.2 / 111.2	23 14.2 / 111.2	23 44.2 / 111.2	24 14.2 / 111.2	8
9	1.0	03	20 42.3 / 110.3	21 12.3 / 110.3	21 42.3 / 110.2	22 12.3 / 110.2	22 42.3 / 110.2	23 12.2 / 110.2	23 42.2 / 110.2	24 12.2 / 110.2	9
70	1.0	03	20 40.4 / 109.3	21 10.3 / 109.3	21 40.3 / 109.3	22 10.3 / 109.2	22 40.3 / 109.2	23 10.3 / 109.2	23 40.2 / 109.2	24 10.2 / 109.2	70
1	1.0	03	20 38.4 / 108.3	21 08.4 / 108.3	21 38.3 / 108.3	22 08.3 / 108.2	22 38.3 / 108.2	23 08.3 / 108.2	23 38.3 / 108.2	24 08.2 / 108.2	1
2	1.0	03	20 36.4 / 107.3	21 06.4 / 107.3	21 36.3 / 107.3	22 06.3 / 107.2	22 36.3 / 107.2	23 06.3 / 107.2	23 36.3 / 107.2	24 06.2 / 107.2	2
3	1.0	03	20 34.4 / 106.3	21 04.4 / 106.3	21 34.3 / 106.2	22 04.3 / 106.2	22 34.3 / 106.2	23 04.3 / 106.2	23 34.3 / 106.2	24 04.2 / 106.2	3
4	1.0	03	20 32.4 / 105.3	21 02.3 / 105.3	21 32.3 / 105.2	22 02.3 / 105.2	22 32.3 / 105.2	23 02.3 / 105.2	23 32.2 / 105.2	24 02.2 / 105.2	4
75	1.0	03	20 30.3 / 104.3	21 00.3 / 104.3	21 30.3 / 104.2	22 00.3 / 104.2	22 30.3 / 104.2	23 00.3 / 104.2	23 30.2 / 104.2	24 00.2 / 104.1	75
6	1.0	03	20 28.3 / 103.3	20 58.3 / 103.3	21 28.3 / 103.2	21 58.2 / 103.2	22 28.2 / 103.2	22 58.2 / 103.2	23 28.2 / 103.2	23 58.1 / 103.1	6
7	1.0	03	20 26.3 / 102.3	20 56.3 / 102.3	21 26.2 / 102.2	21 56.2 / 102.2	22 26.2 / 102.2	22 56.2 / 102.2	23 26.1 / 102.1	23 56.1 / 102.1	7
8	1.0	03	20 24.2 / 101.3	20 54.2 / 101.3	21 24.2 / 101.2	21 54.2 / 101.2	22 24.1 / 101.2	22 54.1 / 101.2	23 24.1 / 101.1	23 54.1 / 101.1	8
9	1.0	03	20 22.2 / 100.3	20 52.1 / 100.3	21 22.1 / 100.2	21 52.1 / 100.2	22 22.1 / 100.2	22 52.1 / 100.2	23 22.0 / 100.1	23 52.0 / 100.1	9
80	1.0	03	20 20.1 / 99.3	20 50.1 / 99.3	21 20.1 / 99.2	21 50.0 / 99.2	22 20.0 / 99.2	22 50.0 / 99.2	23 20.0 / 99.2	23 49.9 / 99.1	80
1	1.0	03	20 18.0 / 98.3	20 48.0 / 98.3	21 18.0 / 98.2	21 48.0 / 98.2	22 17.9 / 98.2	22 47.9 / 98.2	23 17.9 / 98.2	23 47.9 / 98.1	1
2	1.0	03	20 15.9 / 97.3	20 45.9 / 97.3	21 15.9 / 97.2	21 45.9 / 97.2	22 15.9 / 97.2	22 45.8 / 97.2	23 15.8 / 97.2	23 45.8 / 97.1	2
3	1.0	03	20 13.9 / 96.3	20 43.8 / 96.3	21 13.8 / 96.2	21 43.8 / 96.2	22 13.8 / 96.2	22 43.8 / 96.2	23 13.7 / 96.2	23 43.7 / 96.1	3
4	1.0	03	20 11.8 / 95.3	20 41.8 / 95.3	21 11.7 / 95.2	21 41.7 / 95.2	22 11.7 / 95.2	22 41.7 / 95.2	23 11.7 / 95.2	23 41.6 / 95.1	4
85	1.0	03	20 09.7 / 94.3	20 39.7 / 94.3	21 09.7 / 94.2	21 39.6 / 94.2	22 09.6 / 94.2	22 39.6 / 94.2	23 09.6 / 94.2	23 39.6 / 94.1	85
6	1.0	03	20 07.6 / 93.3	20 37.6 / 93.3	21 07.6 / 93.2	21 37.5 / 93.2	22 07.5 / 93.2	22 37.5 / 93.2	23 07.5 / 93.2	23 37.5 / 93.1	6
7	1.0	03	20 05.5 / 92.3	20 35.5 / 92.3	21 05.5 / 92.2	21 35.5 / 92.2	22 05.4 / 92.2	22 35.4 / 92.2	23 05.4 / 92.2	23 35.4 / 92.1	7
8	1.0	03	20 03.4 / 91.3	20 33.4 / 91.3	21 03.4 / 91.2	21 33.4 / 91.2	22 03.3 / 91.2	22 33.3 / 91.2	23 03.3 / 91.2	23 33.3 / 91.1	8
9	1.0	03	20 01.3 / 90.3	20 31.3 / 90.3	21 01.3 / 90.2	21 31.3 / 90.2	22 01.2 / 90.2	22 31.2 / 90.2	23 01.2 / 90.2	23 31.2 / 90.1	9
90	1.0	03	19 59.2 / 89.3	20 29.2 / 89.3	20 59.2 / 89.2	21 29.2 / 89.2	21 59.1 / 89.2	22 29.1 / 89.2	22 59.1 / 89.2	23 29.1 / 89.1	90

H.A.	20° 00' Alt.	Δd Δt	Az.	20° 30' Alt.	Δd Δt	Az.	21° 00' Alt.	Δd Δt	Az.	21° 30' Alt.	Δd Δt	Az.	22° 00' Alt.	Δd Δt	Az.	22° 30' Alt.	Δd Δt	Az.	23° 00' Alt.	Δd Δt	Az.	23° 30' Alt.	Δd Δt	Az.	H.A.
91	19 57.1	1.003	88.3	20 27.1	1.003	88.3	20 57.1	1.003	88.2	21 27.1	1.003	88.2	21 57.1	1.003	88.2	22 27.0	1.003	88.2	22 57.0	1.003	88.2	23 27.0	1.003	88.1	91
2	19 55.1	1.003	87.3	20 25.0	1.003	87.3	20 55.0	1.003	87.2	21 25.0	1.003	87.2	21 55.0	1.003	87.2	22 24.9	1.003	87.2	22 54.9	1.003	87.2	23 24.9	1.003	87.1	2
3	19 53.0	1.003	86.3	20 22.9	1.003	86.3	20 52.9	1.003	86.2	21 22.9	1.003	86.2	21 52.9	1.003	86.2	22 22.9	1.003	86.2	22 52.8	1.003	86.2	23 22.8	1.003	86.1	3
4	19 50.9	1.003	85.3	20 20.9	1.003	85.3	20 50.8	1.003	85.2	21 20.8	1.003	85.2	21 50.8	1.003	85.2	22 20.8	1.003	85.2	22 50.7	1.003	85.2	23 20.7	1.003	85.1	4
95	19 48.8	1.003	84.3	20 18.8	1.003	84.3	20 48.7	1.003	84.2	21 18.7	1.003	84.2	21 48.7	1.003	84.2	22 18.7	1.003	84.2	22 48.7	1.003	84.2	23 18.6	1.003	84.1	95
6	19 46.7	1.003	83.3	20 16.7	1.003	83.3	20 46.7	1.003	83.2	21 16.6	1.003	83.2	21 46.6	1.003	83.2	22 16.6	1.003	83.2	22 46.6	1.003	83.2	23 16.6	1.003	83.1	6
7	19 44.6	1.003	82.3	20 14.6	1.003	82.3	20 44.6	1.003	82.2	21 14.6	1.003	82.2	21 44.5	1.003	82.2	22 14.5	1.003	82.2	22 44.5	1.003	82.2	23 14.5	1.003	82.1	7
8	19 42.6	1.003	81.3	20 12.5	1.003	81.3	20 42.5	1.003	81.2	21 12.5	1.003	81.2	21 42.5	1.003	81.2	22 12.5	1.003	81.2	22 42.4	1.003	81.2	23 12.4	1.003	81.1	8
9	19 40.5	1.003	80.3	20 10.5	1.003	80.3	20 40.4	1.003	80.2	21 10.4	1.003	80.2	21 40.4	1.003	80.2	22 10.4	1.003	80.2	22 40.4	1.003	80.2	23 10.3	1.003	80.1	9
100	19 38.4	1.003	79.3	20 08.4	1.003	79.3	20 38.4	1.003	79.3	21 08.4	1.003	79.2	21 38.3	1.003	79.2	22 08.3	1.003	79.2	22 38.3	1.003	79.2	23 08.3	1.003	79.2	100
1	19 36.4	1.003	78.3	20 06.4	1.003	78.3	20 36.3	1.003	78.3	21 06.3	1.003	78.2	21 36.3	1.003	78.2	22 06.3	1.003	78.2	22 36.3	1.003	78.2	23 06.2	1.003	78.2	1
2	19 34.3	1.003	77.3	20 04.3	1.003	77.3	20 34.3	1.003	77.3	21 04.3	1.003	77.2	21 34.2	1.003	77.2	22 04.2	1.003	77.2	22 34.2	1.003	77.2	23 04.2	1.003	77.2	2
3	19 32.3	1.003	76.3	20 02.3	1.003	76.3	20 32.2	1.003	76.3	21 02.2	1.003	76.2	21 32.2	1.003	76.2	22 02.2	1.003	76.2	22 32.2	1.003	76.2	23 02.1	1.003	76.2	3
4	19 30.3	1.003	75.3	20 00.2	1.003	75.3	20 30.2	1.003	75.3	21 00.2	1.003	75.2	21 30.2	1.003	75.2	22 00.2	1.003	75.2	22 30.1	1.003	75.2	23 00.1	1.003	75.2	4
105	19 28.2	1.003	74.3	19 58.2	1.003	74.3	20 28.2	1.003	74.3	20 58.2	1.003	74.2	21 28.2	1.003	74.2	21 58.1	1.003	74.2	22 28.1	1.003	74.2	22 58.1	1.003	74.2	105
6	19 26.2	1.003	73.3	19 56.2	1.003	73.3	20 26.2	1.003	73.3	20 56.2	1.003	73.3	21 26.2	1.003	73.2	21 56.1	1.003	73.2	22 26.1	1.003	73.2	22 56.1	1.003	73.2	6
7	19 24.2	1.003	72.3	19 54.2	1.003	72.3	20 24.2	1.003	72.3	20 54.2	1.003	72.3	21 24.2	1.003	72.2	21 54.1	1.003	72.2	22 24.1	1.003	72.2	22 54.1	1.003	72.2	7
8	19 22.2	1.003	71.3	19 52.2	1.003	71.3	20 22.2	1.003	71.3	20 52.2	1.003	71.3	21 22.2	1.003	71.2	21 52.1	1.003	71.2	22 22.1	1.003	71.2	22 52.1	1.003	71.2	8
9	19 20.3	1.003	70.3	19 50.2	1.003	70.3	20 20.2	1.003	70.3	20 50.2	1.003	70.3	21 20.2	1.003	70.3	21 50.2	1.003	70.2	22 20.1	1.003	70.2	22 50.1	1.003	70.2	9
110	19 18.3	1.003	69.3	19 48.3	1.003	69.3	20 18.3	1.003	69.3	20 48.2	1.003	69.3	21 18.2	1.003	69.3	21 48.2	1.003	69.2	22 18.2	1.003	69.2	22 48.2	1.003	69.2	110
1	19 16.3	1.003	68.3	19 46.3	1.003	68.3	20 16.3	1.003	68.3	20 46.3	1.003	68.3	21 16.3	1.003	68.2	21 46.3	1.003	68.2	22 16.2	1.003	68.2	22 46.2	1.003	68.2	1
2	19 14.4	1.003	67.3	19 44.4	1.003	67.3	20 14.4	1.003	67.3	20 44.3	1.003	67.3	21 14.3	1.003	67.3	21 44.3	1.003	67.2	22 14.3	1.003	67.2	22 44.3	1.003	67.2	2
3	19 12.5	1.003	66.3	19 42.5	1.003	66.3	20 12.4	1.003	66.3	20 42.4	1.003	66.3	21 12.4	1.003	66.3	21 42.4	1.003	66.3	22 12.4	1.003	66.2	22 42.4	1.003	66.2	3
4	19 10.6	1.003	65.4	19 40.5	1.003	65.3	20 10.5	1.003	65.3	20 40.5	1.003	65.3	21 10.5	1.003	65.3	21 40.5	1.003	65.3	22 10.5	1.003	65.2	22 40.4	1.003	65.2	4
115	19 08.7	1.003	64.4	19 38.7	1.003	64.3	20 08.6	1.003	64.3	20 38.6	1.003	64.3	21 08.6	1.003	64.3	21 38.6	1.003	64.3	22 08.6	1.003	64.2	22 38.6	1.003	64.2	115
6	19 06.8	1.003	63.4	19 36.8	1.003	63.3	20 06.8	1.003	63.3	20 36.7	1.003	63.3	21 06.7	1.003	63.3	21 36.7	1.003	63.3	22 06.7	1.003	63.3	22 36.7	1.003	63.2	6
7	19 04.9	1.003	62.4	19 34.9	1.003	62.4	20 04.9	1.003	62.3	20 34.9	1.003	62.3	21 04.9	1.003	62.3	21 34.8	1.003	62.3	22 04.8	1.003	62.3	22 34.8	1.003	62.2	7
8	19 03.1	1.003	61.4	19 33.1	1.003	61.4	20 03.0	1.003	61.3	20 33.0	1.003	61.3	21 03.0	1.003	61.3	21 33.0	1.003	61.3	22 03.0	1.003	61.3	22 33.0	1.003	61.3	8
9	19 01.3	1.003	60.4	19 31.2	1.003	60.4	20 01.2	1.003	60.3	20 31.2	1.003	60.3	21 01.2	1.003	60.3	21 31.2	1.003	60.3	22 01.2	1.003	60.3	22 31.1	1.003	60.3	9
120	18 59.4	1.003	59.4	19 29.4	1.003	59.4	19 59.4	1.003	59.4	20 29.4	1.003	59.3	20 59.4	1.003	59.3	21 29.4	1.003	59.3	21 59.3	1.003	59.3	22 29.3	1.003	59.3	120
1	18 57.6	1.003	58.4	19 27.6	1.003	58.4	19 57.6	1.003	58.4	20 27.6	1.003	58.3	20 57.6	1.003	58.3	21 27.6	1.003	58.3	21 57.6	1.003	58.3	22 27.5	1.003	58.3	1
2	18 55.9	1.003	57.4	19 25.9	1.003	57.4	19 55.8	1.003	57.4	20 25.8	1.003	57.4	20 55.8	1.003	57.3	21 25.8	1.003	57.3	21 55.8	1.003	57.3	22 25.8	1.003	57.3	2
3	18 54.1	1.003	56.4	19 24.1	1.003	56.4	19 54.1	1.003	56.4	20 24.1	1.003	56.4	20 54.1	1.003	56.3	21 24.0	1.003	56.3	21 54.0	1.003	56.3	22 24.0	1.003	56.3	3
4	18 52.4	1.003	55.4	19 22.4	1.003	55.4	19 52.4	1.003	55.4	20 22.3	1.003	55.4	20 52.3	1.003	55.4	21 22.3	1.003	55.3	21 52.3	1.003	55.3	22 22.3	1.003	55.3	4
125	18 50.7	1.003	54.4	19 20.7	1.003	54.4	19 50.6	1.003	54.4	20 20.6	1.003	54.4	20 50.6	1.003	54.4	21 20.6	1.003	54.3	21 50.6	1.003	54.3	22 20.6	1.003	54.3	125
6	18 49.0	1.003	53.4	19 19.0	1.003	53.4	19 49.0	1.003	53.4	20 18.9	1.003	53.4	20 48.9	1.003	53.4	21 18.9	1.003	53.4	21 48.9	1.003	53.3	22 18.9	1.003	53.3	6
7	18 47.3	1.003	52.4	19 17.3	1.003	52.4	19 47.3	1.003	52.4	20 17.3	1.003	52.4	20 47.3	1.003	52.4	21 17.2	1.003	52.4	21 47.2	1.003	52.3	22 17.2	1.003	52.3	7
8	18 45.7	1.003	51.4	19 15.6	1.003	51.4	19 45.6	1.003	51.4	20 15.6	1.003	51.4	20 45.6	1.003	51.4	21 15.6	1.003	51.4	21 45.6	1.003	51.4	22 15.6	1.003	51.3	8
9	18 44.0	1.003	50.5	19 14.0	1.003	50.4	19 44.0	1.003	50.4	20 14.0	1.003	50.4	20 44.0	1.003	50.4	21 14.0	1.003	50.4	21 44.0	1.003	50.4	22 13.9	1.003	50.3	9
130	18 42.4	1.003	49.5	19 12.4	1.003	49.4	19 42.4	1.003	49.4	20 12.4	1.003	49.4	20 42.4	1.003	49.4	21 12.4	1.003	49.4	21 42.4	1.003	49.4	22 12.3	1.003	49.4	130
1	18 40.9	1.003	48.5	19 10.8	1.003	48.5	19 40.8	1.003	48.4	20 10.8	1.003	48.4	20 40.8	1.003	48.4	21 10.8	1.003	48.4	21 40.8	1.003	48.4	22 10.8	1.003	48.4	1
2	18 39.3	1.003	47.5	19 09.3	1.003	47.5	19 39.3	1.003	47.5	20 09.3	1.003	47.4	20 39.3	1.003	47.4	21 09.2	1.003	47.4	21 39.2	1.003	47.4	22 09.2	1.003	47.4	2
3	18 37.8	1.002	46.5	19 07.8	1.002	46.5	19 37.7	1.003	46.5	20 07.7	1.002	46.4	20 37.7	1.002	46.4	21 07.7	1.003	46.4	21 37.7	1.002	46.4	22 07.7	1.002	46.4	3
4	18 36.3	1.002	45.5	19 06.2	1.002	45.5	19 36.2	1.002	45.5	20 06.2	1.002	45.5	20 36.2	1.002	45.4	21 06.2	1.002	45.4	21 36.2	1.002	45.4	22 06.2	1.002	45.4	4
135	18 34.8	1.002	44.5	19 04.8	1.002	44.5	19 34.8	1.002	44.5	20 04.7	1.002	44.5	20 34.7	1.002	44.5	21 04.7	1.002	44.4	21 34.7	1.002	44.4	22 04.7	1.002	44.4	135
6	18 33.3	1.002	43.5	19 03.3	1.002	43.5	19 33.3	1.002	43.5	20 03.3	1.002	43.5	20 33.3	1.002	43.5	21 03.3	1.002	43.4	21 33.3	1.002	43.4	22 03.3	1.002	43.4	6
7	18 31.9	1.002	42.5	19 01.9	1.002	42.5	19 31.9	1.002	42.5	20 01.9	1.002	42.5	20 31.9	1.002	42.5	21 01.8	1.002	42.5	21 31.8	1.002	42.4	22 01.8	1.002	42.4	7
8	18 30.5	1.002	41.5	19 00.5	1.002	41.5	19 30.5	1.002	41.5	20 00.5	1.002	41.5	20 30.5	1.002	41.5	21 00.4	1.002	41.5	21 30.4	1.002	41.5	22 00.4	1.002	41.4	8
9	18 29.1	1.002	40.5	18 59.1	1.002	40.5	19 29.1	1.002	40.5	19 59.1	1.002	40.5	20 29.1	1.002	40.5	20 59.1	1.002	40.5	21 29.1	1.002	40.5	21 59.1	1.002	40.5	9
140	18 27.8	1.002	39.6	18 57.8	1.002	39.5	19 27.8	1.002	39.5	19 57.7	1.002	39.5	20 27.7	1.002	39.5	20 57.7	1.002	39.5	21 27.7	1.002	39.5	21 57.7	1.002	39.5	140
1	18 26.4	1.002	38.6	18 56.4	1.002	38.6	19 26.4	1.002	38.5	19 56.4	1.002	38.5	20 26.4	1.002	38.5	20 56.4	1.002	38.5	21 26.4	1.002	38.5	21 56.4	1.002	38.5	1
2	18 25.2	1.002	37.6	18 55.2	1.002	37.6	19 25.1	1.002	37.5	19 55.1	1.002	37.5	20 25.1	1.002	37.5	20 55.1	1.002	37.5	21 25.1	1.002	37.5	21 55.1	1.002	37.5	2
3	18 23.9	1.002	36.6	18 53.9	1.002	36.6	19 23.9	1.002	36.6	19 53.9	1.002	36.5	20 23.9	1.002	36.5	20 53.9	1.002	36.5	21 23.9	1.002	36.5	21 53.8	1.002	36.5	3
4	18 22.7	1.002	35.6	18 52.7	1.002	35.6	19 22.7	1.002	35.6	19 52.6	1.002	35.6	20 22.6	1.002	35.5	20 52.6	1.002	35.5	21 22.6	1.002	35.5	21 52.6	1.002	35.5	4
145	18 21.5	1.002	34.6	18 51.5	1.002	34.6	19 21.4	1.002	34.6	19 51.4	1.002	34.6	20 21.4	1.002	34.6	20 51.4	1.002	34.5	21 21.4	1.002	34.5	21 51.4	1.002	34.5	145
6	18 20.3	1.002	33.6	18 50.3	1.002	33.6	19 20.3	1.002	33.6	19 50.3	1.002	33.6	20 20.3	1.002	33.6	20 50.3	1.002	33.6	21 20.2	1.002	33.5	21 50.2	1.002	33.5	6
7	18 19.1	1.002	32.6	18 49.1	1.002	32.6	19 19.1	1.002	32.6	19 49.1	1.002	32.6	20 19.1	1.002	32.6	20 49.1	1.002	32.6	21 19.1	1.002	32.6	21 49.1	1.002	32.5	7
8	18 18.0	1.002	31.6	18 48.0	1.002	31.6	19 18.0	1.002	31.6	19 48.0	1.002	31.6	20 18.0	1.002	31.6	20 48.0	1.002	31.6	21 18.0	1.002	31.6	21 48.0	1.002	31.6	8
9	18 16.9	1.002	30.6	18 46.9	1.002	30.6	19 16.9	1.002	30.6	19 46.9	1.002	30.6	20 16.9	1.002	30.6	20 46.9	1.002	30.6	21 16.9	1.002	30.6	21 46.9	1.002	30.6	9
150	18 15.9	1.002	29.7	18 45.9	1.002	29.6	19 15.9	1.002	29.6	19 45.9	1.002	29.6	20 15.9	1.002	29.6	20 45.9	1.002	29.6	21 15.9	1.002	29.6	21 45.9	1.002	29.6	150
1	18 14.9	1.002	28.7	18 44.9	1.002	28.7	19 14.9	1.002	28.6	19 44.9	1.002	28.6	20 14.9	1.002	28.6	20 44.8	1.002	28.6	21 14.8	1.002	28.6	21 44.8	1.002	28.6	1
2	18 13.9	1.002	27.7	18 43.9	1.002	27.7	19 13.9	1.002	27.7	19 43.9	1.002	27.6	20 13.9	1.002	27.6	20 43.9	1.002	27.6	21 13.9	1.002	27.6	21 43.9	1.002	27.6	2
3	18 12.9	1.002	26.7	18 42.9	1.002	26.7	19 12.9	1.002	26.7	19 42.9	1.002	26.7	20 12.9	1.002	26.7	20 42.9	1.002	26.6	21 12.9	1.002	26.6	21 42.9	1.002	26.6	3
4	18 12.0	1.001	25.7	18 42.0	1.001	25.7	19 12.0	1.002	25.7	19 42.0	1.002	25.7	20 12.0	1.001	25.7	20 42.0	1.001	25.7	21 12.0	1.001	25.6	21 42.0	1.002	25.6	4
155	18 11.1	1.001	24.7	18 41.1	1.001	24.7	19 11.1	1.001	24.7	19 41.1	1.001	24.7	20 11.1	1.001	24.7	20 41.1	1.001	24.7	21 11.1	1.001	24.7	21 41.1	1.001	24.7	155
6	18 10.3	1.001	23.7	18 40.2	1.001	23.7	19 10.2	1.001	23.7	19 40.2	1.001	23.7	20 10.2	1.001	23.7	20 40.2	1.001	23.7	21 10.2	1.001	23.7	21 40.2	1.001	23.7	6
7	18 09.4	1.001	22.7	18 39.4	1.001	22.7	19 09.4	1.001	22.7	19 39.4	1.001	22.7	20 09.4	1.001	22.7	20 39.4	1.001	22.7	21 09.4	1.001	22.7	21 39.4	1.001	22.7	7
8	18 08.6	1.001	21.7	18 38.6	1.001	21.7	19 08.6	1.001	21.7	19 38.6	1.001	21.7	20 08.6	1.001	21.7	20 38.6	1.001	21.7	21 08.6	1.001	21.7	21 38.6	1.001	21.7	8
9	18 07.9	1.001	20.8	18 37.9	1.001	20.7	19 07.9	1.001	20.7	19 37.9	1.001	20.7	20 07.9	1.001	20.7	20 37.9	1.001	20.7	21 07.9	1.001	20.7	21 37.9	1.001	20.7	9
160	18 07.2	1.001	19.8	18 37.1	1.001	19.8	19 07.1	1.001	19.8	19 37.1	1.001	19.7	20 07.1	1.001	19.7	20 37.1	1.001	19.7	21 07.1	1.001	19.7	21 37.1	1.001	19.7	160
1	18 06.5	1.001	18.8	18 36.5	1.001	18.8	19 06.5	1.001	18.8	19 36.5	1.001	18.8	20 06.5	1.001	18.8	20 36.4	1.001	18.7	21 06.4	1.001	18.7	21 36.4	1.001	18.7	1
2	18 05.8	1.001	17.8	18 35.8	1.001	17.8	19 05.8	1.001	17.8	19 35.8	1.001	17.8	20 05.8	1.001	17.8	20 35.8	1.001	17.8	21 05.8	1.001	17.8	21 35.8	1.001	17.7	2
3	18 05.2	1.001	16.8	18 35.2	1.001	16.8	19 05.2	1.001	16.8	19 35.2	1.001	16.8	20 05.2	1.001	16.8	20 35.2	1.001	16.8	21 05.2	1.001	16.8	21 35.2	1.001	16.8	3
4	18 04.6	1.001	15.8	18 34.6	1.001	15.8	19 04.6	1.001	15.8	19 34.6	1.001	15.8	20 04.6	1.001	15.8	20 34.6	1.001	15.8	21 04.6	1.001	15.8	21 34.6	1.001	15.8	4
165	18 04.0	1.001	14.8	18 34.0	1.001	14.8	19 04.0	1.001	14.8	19 34.0	1.001	14.8	20 04.0	1.001	14.8	20 34.0	1.001	14.8	21 04.0	1.001	14.8	21 34.0	1.001	14.8	165
6	18 03.5	1.001	13.8	18 33.5	1.001	13.8	19 03.5	1.001	13.8	19 33.5	1.001	13.8	20 03.5	1.001	13.8	20 33.5	1.001	13.8	21 03.5	1.001	13.8	21 33.5	1.001	13.8	6
7	18 03.0	1.001	12.8	18 33.0	1.001	12.8	19 03.0	1.001	12.8	19 33.0	1.001	12.8	20 03.0	1.001	12.8	20 33.0	1.001	12.8	21 03.0	1.001	12.8	21 33.0	1.001	12.8	7
8	18 02.6	1.001	11.9	18 32.6	1.001	11.9	19 02.6	1.001	11.8	19 32.6	1.001	11.8	20 02.6	1.001	11.8	20 32.6	1.001	11.8	21 02.6	1.001	11.8	21 32.6	1.001	11.8	8
9	18 02.2	1.001	10.9	18 32.2	1.001	10.9	19 02.2	1.001	10.9	19 32.2	1.001	10.9	20 02.2	1.001	10.9	20 32.2	1.001	10.9	21 02.2	1.001	10.8	21 32.2	1.001	10.8	9
170	18 01.8	1.001	09.9	18 31.8	1.001	09.9	19 01.8	1.001	09.9	19 31.8	1.001	09.9	20 01.8	1.001	09.9	20 31.8	1.001	09.9	21 01.8	1.001	09.9	21 31.8	1.001	09.9	170
1	18 01.5	1.001	08.9	18 31.5	1.001	08.9	19 01.5	1.001	08.9	19 31.5	1.001	08.9	20 01.5	1.001	08.9	20 31.5	1.001	08.9	21 01.5	1.001	08.9	21 31.5	1.001	08.9	1
2	18 01.2	1.000	07.9	18 31.2	1.000	07.9	19 01.2	1.000	07.9	19 31.2	1.000	07.9	20 01.2	1.000	07.9	20 31.2	1.000	07.9	21 01.2	1.000	07.9	21 31.2	1.000	07.9	2
3	18 00.9	1.000	06.9	18 30.9	1.000	06.9	19 00.9	1.000	06.9	19 30.9	1.000	06.9	20 00.9	1.000	06.9	20 30.9	1.000	06.9	21 00.9	1.000	06.9	21 30.9	1.000	06.9	3
4	18 00.6	1.000	05.9	18 30.6	1.000	05.9	19 00.6	1.000	05.9	19 30.6	1.000	05.9	20 00.6	1.000	05.9	20 30.6	1.000	05.9	21 00.6	1.000	05.9	21 30.6	1.000	05.9	4
175	18 00.5	1.000	04.9	18 30.5	1.000	04.9	19 00.5	1.000	04.9	19 30.5	1.000	04.9	20 00.5	1.000	04.9	20 30.5	1.000	04.9	21 00.5	1.000	04.9	21 30.5	1.000	04.9	175
6	18 00.3	1.000	04.0	18 30.3	1.000	04.0	19 00.3	1.000	03.9	19 30.3	1.000	03.9	20 00.3	1.000	03.9	20 30.3	1.000	03.9	21 00.3	1.000	03.9	21 30.3	1.000	03.9	6
7	18 00.2	1.000	03.0	18 30.2	1.000	03.0	19 00.2	1.000	03.0	19 30.2	1.000	03.0	20 00.2	1.000	03.0	20 30.2	1.000	03.0	21 00.2	1.000	03.0	21 30.2	1.000	03.0	7
8	18 00.1	1.000	02.0	18 30.1	1.000	02.0	19 00.1	1.000	02.0	19 30.1	1.000	02.0	20 00.1	1.000	02.0	20 30.1	1.000	02.0	21 00.1	1.000	02.0	21 30.1	1.000	02.0	8
9	18 00.0	1.000	01.0	18 30.0	1.000	01.0	19 00.0	1.000	01.0	19 30.0	1.000	01.0	20 00.0	1.000	01.0	20 30.0	1.000	01.0	21 00.0	1.000	01.0	21 30.0	1.000	01.0	9
180	18 00.0	1.000	00.0	18 30.0	1.000	00.0	19 00.0	1.000	00.0	19 30.0	1.000	00.0	20 00.0	1.000	00.0	20 30.0	1.000	00.0	21 00.0	1.000	00.0	21 30.0	1.000	00.0	180

Lat. 88°

H.A.	24° 00′ Alt.	Ad Δt	Az.	24° 30′ Alt.	Ad Δt	Az.	25° 00′ Alt.	Ad Δt	Az.	25° 30′ Alt.	Ad Δt	Az.	26° 00′ Alt.	Ad Δt	Az.	26° 30′ Alt.	Ad Δt	Az.	27° 00′ Alt.	Ad Δt	Az.	27° 30′ Alt.	Ad Δt	Az.	H.A.
00	26 00.0	1.000	180.0	26 30.0	1.000	180.0	27 00.0	1.000	180.0	27 30.0	1.000	180.0	28 00.0	1.000	180.0	28 30.0	1.000	180.0	29 00.0	1.000	180.0	29 30.0	1.000	180.0	00
1	26 00.0	1.000	179.0	26 30.0	1.000	179.0	27 00.0	1.000	179.0	27 30.0	1.000	179.0	28 00.0	1.000	179.0	28 30.0	1.000	179.0	29 00.0	1.000	179.0	29 30.0	1.000	179.0	1
2	25 59.9	1.000	178.0	26 29.9	1.000	178.0	26 59.9	1.000	178.0	27 29.9	1.000	178.0	27 59.9	1.000	178.0	28 29.9	1.000	178.0	28 59.9	1.000	178.0	29 29.9	1.000	178.0	2
3	25 59.8	1.000	177.0	26 29.8	1.000	176.9	26 59.8	1.000	176.9	27 29.8	1.000	176.9	27 59.8	1.000	176.9	28 29.8	1.000	176.9	28 59.8	1.000	176.9	29 29.8	1.000	176.9	3
4	25 59.7	1.000	175.9	26 29.7	1.000	175.9	26 59.7	1.000	175.9	27 29.7	1.000	175.9	27 59.7	1.000	175.9	28 29.7	1.000	175.9	28 59.7	1.000	175.9	29 29.7	1.000	175.9	4
05	25 59.5	1.000	174.9	26 29.5	1.000	174.9	26 59.5	1.000	174.9	27 29.5	1.000	174.9	27 59.5	1.000	174.9	28 29.5	1.000	174.9	28 59.5	1.000	174.9	29 29.5	1.000	174.9	05
6	25 59.3	1.000	173.9	26 29.3	1.000	173.9	26 59.3	1.000	173.9	27 29.3	1.000	173.9	27 59.3	1.000	173.9	28 29.3	1.000	173.9	28 59.3	1.000	173.9	29 29.3	1.000	173.9	6
7	25 59.1	1.000	172.9	26 29.1	1.000	172.9	26 59.1	1.000	172.9	27 29.1	1.000	172.9	27 59.1	1.000	172.9	28 29.1	1.000	172.9	28 59.1	1.000	172.9	29 29.1	1.000	172.9	7
8	25 58.8	1.001	171.9	26 28.8	1.001	171.9	26 58.8	1.001	171.9	27 28.8	1.001	171.9	27 58.8	1.001	171.9	28 28.8	1.001	171.9	28 58.8	1.001	171.9	29 28.8	1.001	171.8	8
9	25 58.5	1.001	170.9	26 28.5	1.001	170.8	26 58.5	1.001	170.8	27 28.5	1.001	170.8	27 58.5	1.001	170.8	28 28.5	1.001	170.8	28 58.5	1.001	170.8	29 28.5	1.001	170.8	9
10	25 58.1	1.001	169.8	26 28.1	1.001	169.8	26 58.1	1.001	169.8	27 28.1	1.001	169.8	27 58.1	1.001	169.8	28 28.1	1.001	169.8	28 58.1	1.001	169.8	29 28.1	1.001	169.8	10
1	25 57.8	1.001	168.8	26 27.8	1.001	168.8	26 57.8	1.001	168.8	27 27.8	1.001	168.8	27 57.8	1.001	168.8	28 27.8	1.001	168.8	28 57.8	1.001	168.8	29 27.8	1.001	168.8	1
2	25 57.3	1.001	167.8	26 27.3	1.001	167.8	26 57.3	1.001	167.8	27 27.3	1.001	167.8	27 57.3	1.001	167.8	28 27.3	1.001	167.8	28 57.3	1.001	167.8	29 27.3	1.001	167.8	2
3	25 56.9	1.001	166.8	26 26.9	1.001	166.8	26 56.9	1.001	166.8	27 26.9	1.001	166.8	27 56.9	1.001	166.8	28 26.9	1.001	166.8	28 56.9	1.001	166.8	29 26.9	1.001	166.8	3
4	25 56.4	1.001	165.8	26 26.4	1.001	165.8	26 56.4	1.001	165.8	27 26.4	1.001	165.8	27 56.4	1.001	165.8	28 26.4	1.001	165.7	28 56.4	1.001	165.7	29 26.4	1.001	165.7	4
15	25 55.8	1.001	164.8	26 25.8	1.001	164.7	26 55.8	1.001	164.7	27 25.8	1.001	164.7	27 55.8	1.001	164.7	28 25.8	1.001	164.7	28 55.8	1.001	164.7	29 25.8	1.001	164.7	15
6	25 55.3	1.001	163.7	26 25.3	1.001	163.7	26 55.3	1.001	163.7	27 25.3	1.001	163.7	27 55.3	1.001	163.7	28 25.3	1.001	163.7	28 55.3	1.001	163.7	29 25.3	1.001	163.7	6
7	25 54.7	1.001	162.7	26 24.7	1.001	162.7	26 54.7	1.001	162.7	27 24.7	1.001	162.7	27 54.7	1.001	162.7	28 24.7	1.001	162.7	28 54.7	1.001	162.7	29 24.7	1.001	162.7	7
8	25 54.0	1.001	161.7	26 24.0	1.001	161.7	26 54.0	1.001	161.7	27 24.0	1.001	161.7	27 54.0	1.001	161.7	28 24.0	1.001	161.7	28 54.0	1.001	161.7	29 24.0	1.001	161.7	8
9	25 53.4	1.001	160.7	26 23.4	1.001	160.7	26 53.4	1.001	160.7	27 23.4	1.001	160.7	27 53.3	1.001	160.7	28 23.3	1.001	160.7	28 53.3	1.001	160.7	29 23.3	1.001	160.6	9
20	25 52.6	1.001	159.7	26 22.6	1.001	159.7	26 52.6	1.001	159.7	27 22.6	1.001	159.7	27 52.6	1.001	159.6	28 22.6	1.001	159.6	28 52.6	1.001	159.6	29 22.6	1.001	159.6	20
1	25 51.9	1.001	158.7	26 21.9	1.001	158.7	26 51.9	1.001	158.6	27 21.9	1.001	158.6	27 51.9	1.001	158.6	28 21.9	1.001	158.6	28 51.9	1.001	158.6	29 21.9	1.001	158.6	1
2	25 51.1	1.001	157.6	26 21.1	1.001	157.6	26 51.1	1.001	157.6	27 21.1	1.001	157.6	27 51.1	1.001	157.6	28 21.1	1.001	157.6	28 51.1	1.001	157.6	29 21.1	1.001	157.6	2
3	25 50.3	1.001	156.6	26 20.3	1.001	156.6	26 50.3	1.001	156.6	27 20.3	1.001	156.6	27 50.3	1.001	156.6	28 20.3	1.001	156.6	28 50.3	1.001	156.6	29 20.3	1.001	156.6	3
4	25 49.5	1.001	155.6	26 19.5	1.001	155.6	26 49.5	1.001	155.6	27 19.5	1.001	155.6	27 49.4	1.001	155.6	28 19.4	1.001	155.6	28 49.4	1.001	155.6	29 19.4	1.001	155.6	4
25	25 48.6	1.002	154.6	26 18.6	1.002	154.6	26 48.6	1.002	154.6	27 18.6	1.002	154.6	27 48.6	1.002	154.6	28 18.6	1.002	154.6	28 48.6	1.002	154.5	29 18.6	1.002	154.5	25
6	25 47.7	1.002	153.6	26 17.7	1.002	153.6	26 47.7	1.002	153.6	27 17.7	1.002	153.6	27 47.7	1.002	153.6	28 17.6	1.002	153.5	28 47.6	1.002	153.5	29 17.6	1.002	153.5	6
7	25 46.7	1.002	152.6	26 16.7	1.002	152.6	26 46.7	1.002	152.6	27 16.7	1.002	152.5	27 46.7	1.002	152.5	28 16.7	1.002	152.5	28 46.7	1.002	152.5	29 16.7	1.002	152.5	7
8	25 45.7	1.002	151.6	26 15.7	1.002	151.6	26 45.7	1.002	151.5	27 15.7	1.002	151.5	27 45.7	1.002	151.5	28 15.7	1.002	151.5	28 45.7	1.002	151.5	29 15.7	1.002	151.5	8
9	25 44.7	1.002	150.5	26 14.7	1.002	150.5	26 44.7	1.002	150.5	27 14.7	1.002	150.5	27 44.7	1.002	150.5	28 14.7	1.002	150.5	28 44.7	1.002	150.5	29 14.7	1.002	150.5	9
30	25 43.7	1.002	149.5	26 13.7	1.002	149.5	26 43.7	1.002	149.5	27 13.7	1.002	149.5	27 43.7	1.002	149.5	28 13.6	1.002	149.5	28 43.6	1.002	149.5	29 13.6	1.002	149.5	30
1	25 42.6	1.002	148.5	26 12.6	1.002	148.5	26 42.6	1.002	148.5	27 12.6	1.002	148.5	27 42.6	1.002	148.5	28 12.6	1.002	148.5	28 42.6	1.002	148.5	29 12.6	1.002	148.4	1
2	25 41.5	1.002	147.5	26 11.5	1.002	147.5	26 41.5	1.002	147.5	27 11.5	1.002	147.5	27 41.5	1.002	147.5	28 11.5	1.002	147.4	28 41.5	1.002	147.4	29 11.4	1.002	147.4	2
3	25 40.4	1.002	146.5	26 10.3	1.002	146.5	26 40.3	1.002	146.5	27 10.3	1.002	146.5	27 40.3	1.002	146.4	28 10.3	1.002	146.4	28 40.3	1.002	146.4	29 10.3	1.002	146.4	3
4	25 39.2	1.002	145.5	26 09.2	1.002	145.5	26 39.2	1.002	145.5	27 09.2	1.002	145.4	27 39.2	1.002	145.4	28 09.1	1.002	145.4	28 39.1	1.002	145.4	29 09.1	1.002	145.4	4
35	25 38.0	1.002	144.5	26 08.0	1.002	144.4	26 38.0	1.002	144.4	27 08.0	1.002	144.4	27 38.0	1.002	144.4	28 07.9	1.002	144.4	28 37.9	1.002	144.4	29 07.9	1.002	144.4	35
6	25 36.7	1.002	143.4	26 06.7	1.002	143.4	26 36.7	1.002	143.4	27 06.7	1.002	143.4	27 36.7	1.002	143.4	28 06.7	1.002	143.4	28 36.7	1.002	143.4	29 06.7	1.002	143.4	6
7	25 35.5	1.002	142.4	26 05.5	1.002	142.4	26 35.5	1.002	142.4	27 05.5	1.002	142.4	27 35.5	1.002	142.4	28 05.4	1.002	142.4	28 35.4	1.002	142.4	29 05.4	1.002	142.3	7
8	25 34.2	1.002	141.4	26 04.2	1.002	141.4	26 34.2	1.002	141.4	27 04.2	1.002	141.4	27 34.2	1.002	141.4	28 04.2	1.002	141.4	28 34.1	1.002	141.3	29 04.1	1.002	141.3	8
9	25 32.9	1.002	140.4	26 02.9	1.002	140.4	26 32.9	1.002	140.4	27 02.8	1.002	140.4	27 32.8	1.002	140.4	28 02.8	1.002	140.3	28 32.8	1.002	140.3	29 02.8	1.002	140.3	9
40	25 31.5	1.002	139.4	26 01.5	1.002	139.4	26 31.5	1.002	139.4	27 01.5	1.002	139.4	27 31.5	1.002	139.3	28 01.5	1.002	139.3	28 31.5	1.002	139.3	29 01.5	1.002	139.3	40
1	25 30.1	1.002	138.4	26 00.1	1.002	138.4	26 30.1	1.002	138.4	27 00.1	1.002	138.3	27 30.1	1.002	138.3	28 00.1	1.002	138.3	28 30.1	1.002	138.3	29 00.1	1.002	138.3	1
2	25 28.7	1.002	137.4	25 58.7	1.002	137.4	26 28.7	1.002	137.4	26 58.7	1.002	137.3	27 28.7	1.002	137.3	27 58.7	1.002	137.3	28 28.7	1.002	137.3	28 58.7	1.002	137.3	2
3	25 27.3	1.002	136.4	25 57.3	1.002	136.4	26 27.3	1.002	136.3	26 57.3	1.002	136.3	27 27.3	1.002	136.3	27 57.3	1.002	136.3	28 27.3	1.002	136.3	28 57.2	1.002	136.3	3
4	25 25.9	1.002	135.4	25 55.8	1.002	135.3	26 25.8	1.002	135.3	26 55.8	1.002	135.3	27 25.8	1.002	135.3	27 55.8	1.002	135.3	28 25.8	1.002	135.3	28 55.8	1.002	135.2	4
45	25 24.4	1.002	134.3	25 54.4	1.002	134.3	26 24.3	1.002	134.3	26 54.3	1.002	134.3	27 24.3	1.003	134.3	27 54.3	1.003	134.3	28 24.3	1.003	134.3	28 54.3	1.003	134.2	45
6	25 22.9	1.002	133.3	25 52.9	1.002	133.3	26 22.8	1.003	133.3	26 52.8	1.003	133.3	27 22.8	1.003	133.3	27 52.8	1.003	133.3	28 22.8	1.003	133.2	28 52.8	1.003	133.2	6
7	25 21.3	1.003	132.3	25 51.3	1.003	132.3	26 21.3	1.003	132.3	26 51.3	1.003	132.3	27 21.3	1.003	132.3	27 51.3	1.003	132.2	28 21.3	1.003	132.2	28 51.2	1.003	132.2	7
8	25 19.8	1.003	131.3	25 49.8	1.003	131.3	26 19.7	1.003	131.3	26 49.7	1.003	131.3	27 19.7	1.003	131.2	27 49.7	1.003	131.2	28 19.7	1.003	131.2	28 49.7	1.003	131.2	8
9	25 18.2	1.003	130.3	25 48.2	1.003	130.3	26 18.2	1.003	130.3	26 48.1	1.003	130.2	27 18.1	1.003	130.2	27 48.1	1.003	130.2	28 18.1	1.003	130.2	28 48.1	1.003	130.2	9
50	25 16.6	1.003	129.3	25 46.6	1.003	129.3	26 16.5	1.003	129.3	26 46.5	1.003	129.2	27 16.5	1.003	129.2	27 46.5	1.003	129.2	28 16.5	1.003	129.2	28 46.5	1.003	129.2	50
1	25 14.9	1.003	128.3	25 44.9	1.003	128.3	26 14.9	1.003	128.3	26 44.9	1.003	128.2	27 14.9	1.003	128.2	27 44.9	1.003	128.2	28 14.9	1.003	128.2	28 44.8	1.003	128.2	1
2	25 13.3	1.003	127.3	25 43.3	1.003	127.3	26 13.3	1.003	127.2	26 43.2	1.003	127.2	27 13.2	1.003	127.2	27 43.2	1.003	127.2	28 13.2	1.003	127.2	28 43.2	1.003	127.2	2
3	25 11.6	1.003	126.3	25 41.6	1.003	126.2	26 11.6	1.003	126.2	26 41.6	1.003	126.2	27 11.6	1.003	126.2	27 41.5	1.003	126.2	28 11.5	1.003	126.2	28 41.5	1.003	126.1	3
4	25 09.9	1.003	125.2	25 39.9	1.003	125.2	26 09.9	1.003	125.2	26 39.8	1.003	125.2	27 09.8	1.003	125.2	27 39.8	1.003	125.2	28 09.8	1.003	125.1	28 39.8	1.003	125.1	4
55	25 08.2	1.003	124.2	25 38.2	1.003	124.2	26 08.2	1.003	124.2	26 38.1	1.003	124.2	27 08.1	1.003	124.2	27 38.1	1.003	124.2	28 08.1	1.003	124.1	28 38.1	1.003	124.1	55
6	25 06.4	1.003	123.2	25 36.4	1.003	123.2	26 06.4	1.003	123.2	26 36.4	1.003	123.2	27 06.4	1.003	123.2	27 36.4	1.003	123.1	28 06.4	1.003	123.1	28 36.3	1.003	123.1	6
7	25 04.7	1.003	122.2	25 34.7	1.003	122.2	26 04.7	1.003	122.2	26 34.6	1.003	122.2	27 04.6	1.003	122.2	27 34.6	1.003	122.1	28 04.6	1.003	122.1	28 34.6	1.003	122.1	7
8	25 02.9	1.003	121.2	25 32.9	1.003	121.2	26 02.9	1.003	121.2	26 32.9	1.003	121.2	27 02.8	1.003	121.2	27 32.8	1.003	121.1	28 02.8	1.003	121.1	28 32.8	1.003	121.1	8
9	25 01.1	1.003	120.2	25 31.1	1.003	120.2	26 01.1	1.003	120.2	26 31.1	1.003	120.2	27 01.0	1.003	120.1	27 31.0	1.003	120.1	28 01.0	1.003	120.1	28 31.0	1.003	120.1	9
60	24 59.3	1.003	119.2	25 29.3	1.003	119.2	25 59.3	1.003	119.2	26 29.3	1.003	119.2	26 59.2	1.003	119.1	27 29.2	1.003	119.1	27 59.2	1.003	119.1	28 29.2	1.003	119.1	60
1	24 57.4	1.003	118.2	25 27.4	1.003	118.2	25 57.4	1.003	118.2	26 27.4	1.003	118.1	26 57.4	1.003	118.1	27 27.4	1.003	118.1	27 57.3	1.003	118.1	28 27.3	1.003	118.1	1
2	24 55.6	1.003	117.2	25 25.6	1.003	117.2	25 55.6	1.003	117.2	26 25.5	1.003	117.1	26 55.5	1.003	117.1	27 25.5	1.003	117.1	27 55.5	1.003	117.1	28 25.5	1.003	117.1	2
3	24 53.7	1.003	116.2	25 23.7	1.003	116.2	25 53.7	1.003	116.1	26 23.7	1.003	116.1	26 53.7	1.003	116.1	27 23.6	1.003	116.1	27 53.6	1.003	116.1	28 23.6	1.003	116.1	3
4	24 51.8	1.003	115.2	25 21.8	1.003	115.2	25 51.8	1.003	115.1	26 21.8	1.003	115.1	26 51.8	1.003	115.1	27 21.7	1.003	115.1	27 51.7	1.003	115.1	28 21.7	1.003	115.0	4
65	24 49.9	1.003	114.2	25 19.9	1.003	114.2	25 49.9	1.003	114.1	26 19.9	1.003	114.1	26 49.9	1.003	114.1	27 19.8	1.003	114.1	27 49.8	1.003	114.0	28 19.8	1.003	114.0	65
6	24 48.0	1.003	113.2	25 18.0	1.003	113.1	25 48.0	1.003	113.1	26 18.0	1.003	113.1	26 47.9	1.003	113.1	27 17.9	1.003	113.1	27 47.9	1.003	113.0	28 17.9	1.003	113.0	6
7	24 46.1	1.003	112.2	25 16.1	1.003	112.1	25 46.0	1.003	112.1	26 16.0	1.003	112.1	26 46.0	1.003	112.1	27 16.0	1.003	112.1	27 46.0	1.003	112.0	28 15.9	1.003	112.0	7
8	24 44.1	1.003	111.2	25 14.1	1.003	111.1	25 44.1	1.003	111.1	26 14.1	1.003	111.1	26 44.1	1.003	111.1	27 14.0	1.003	111.1	27 44.0	1.003	111.0	28 14.0	1.003	111.0	8
9	24 42.2	1.003	110.1	25 12.1	1.003	110.1	25 42.1	1.003	110.1	26 12.1	1.003	110.1	26 42.1	1.003	110.1	27 12.1	1.003	110.1	27 42.1	1.003	110.0	28 12.0	1.003	110.0	9
70	24 40.2	1.003	109.1	25 10.2	1.003	109.1	25 40.2	1.003	109.1	26 10.1	1.003	109.1	26 40.1	1.003	109.1	27 10.1	1.003	109.0	27 40.1	1.003	109.0	28 10.1	1.003	109.0	70
1	24 38.2	1.003	108.1	25 08.2	1.003	108.1	25 38.2	1.003	108.1	26 08.2	1.003	108.1	26 38.1	1.003	108.1	27 08.1	1.003	108.0	27 38.1	1.003	108.0	28 08.1	1.003	108.0	1
2	24 36.2	1.003	107.1	25 06.2	1.003	107.1	25 36.2	1.003	107.1	26 06.2	1.003	107.1	26 36.1	1.003	107.1	27 06.1	1.003	107.0	27 36.1	1.003	107.0	28 06.1	1.003	107.0	2
3	24 34.2	1.003	106.1	25 04.2	1.003	106.1	25 34.2	1.003	106.1	26 04.2	1.003	106.1	26 34.1	1.003	106.1	27 04.1	1.003	106.0	27 34.1	1.003	106.0	28 04.1	1.003	106.0	3
4	24 32.2	1.003	105.1	25 02.2	1.003	105.1	25 32.2	1.003	105.1	26 02.1	1.003	105.1	26 32.1	1.003	105.0	27 02.1	1.003	105.0	27 32.1	1.003	105.0	28 02.1	1.003	105.0	4
75	24 30.2	1.003	104.1	25 00.2	1.003	104.1	25 30.1	1.003	104.1	26 00.1	1.003	104.1	26 30.1	1.003	104.0	27 00.1	1.003	104.0	27 30.1	1.003	104.0	28 00.0	1.003	104.0	75
6	24 28.1	1.003	103.1	24 58.1	1.003	103.1	25 28.1	1.003	103.1	25 58.1	1.003	103.1	26 28.1	1.003	103.0	26 58.0	1.003	103.0	27 28.0	1.003	103.0	27 58.0	1.003	103.0	6
7	24 26.1	1.003	102.1	24 56.1	1.003	102.1	25 26.1	1.003	102.1	25 56.0	1.003	102.1	26 26.0	1.003	102.0	26 56.0	1.003	102.0	27 26.0	1.003	102.0	27 56.0	1.003	102.0	7
8	24 24.1	1.003	101.1	24 54.0	1.003	101.1	25 24.0	1.003	101.1	25 54.0	1.003	101.0	26 24.0	1.003	101.0	26 54.0	1.003	101.0	27 24.0	1.003	101.0	27 53.9	1.003	101.0	8
9	24 22.0	1.003	100.1	24 52.0	1.003	100.1	25 21.9	1.003	100.1	25 51.9	1.003	100.1	26 21.9	1.003	100.0	26 51.9	1.003	100.0	27 21.9	1.003	100.0	27 51.9	1.003	100.0	9
80	24 19.9	1.003	99.1	24 49.9	1.003	99.1	25 19.9	1.003	99.1	25 49.9	1.003	99.1	26 19.8	1.003	99.0	26 49.8	1.003	99.0	27 19.8	1.003	99.0	27 49.8	1.003	99.0	80
1	24 17.9	1.003	98.1	24 47.8	1.003	98.1	25 17.8	1.003	98.1	25 47.8	1.003	98.1	26 17.8	1.003	98.0	26 47.7	1.003	98.0	27 17.7	1.003	98.0	27 47.7	1.003	98.0	1
2	24 15.8	1.003	97.1	24 45.8	1.003	97.1	25 15.7	1.003	97.1	25 45.7	1.003	97.0	26 15.7	1.003	97.0	26 45.7	1.003	97.0	27 15.6	1.003	97.0	27 45.6	1.003	97.0	2
3	24 13.7	1.003	96.1	24 43.7	1.003	96.1	25 13.7	1.003	96.1	25 43.6	1.003	96.0	26 13.6	1.003	96.0	26 43.6	1.003	96.0	27 13.6	1.003	96.0	27 43.6	1.003	96.0	3
4	24 11.6	1.003	95.1	24 41.6	1.003	95.1	25 11.6	1.003	95.1	25 41.6	1.003	95.0	26 11.5	1.003	95.0	26 41.5	1.003	95.0	27 11.5	1.003	95.0	27 41.5	1.003	95.0	4
85	24 09.5	1.003	94.1	24 39.5	1.003	94.1	25 09.5	1.003	94.1	25 39.5	1.003	94.0	26 09.4	1.003	94.0	26 39.4	1.003	94.0	27 09.4	1.003	94.0	27 39.4	1.003	94.0	85
6	24 07.4	1.003	93.1	24 37.4	1.003	93.1	25 07.4	1.003	93.1	25 37.4	1.003	93.0	26 07.4	1.003	93.0	26 37.3	1.003	93.0	27 07.3	1.003	93.0	27 37.3	1.003	93.0	6
7	24 05.3	1.003	92.1	24 35.3	1.003	92.1	25 05.3	1.003	92.1	25 35.3	1.003	92.0	26 05.3	1.003	92.0	26 35.2	1.003	92.0	27 05.2	1.003	92.0	27 35.2	1.003	92.0	7
8	24 03.2	1.003	91.1	24 33.2	1.003	91.1	25 03.2	1.003	91.1	25 33.1	1.003	91.0	26 03.1	1.003	91.0	26 33.1	1.003	91.0	27 03.1	1.003	91.0	27 33.1	1.003	91.0	8
9	24 01.2	1.003	90.1	24 31.1	1.003	90.1	25 01.1	1.003	90.0	25 31.1	1.003	90.0	26 01.1	1.003	90.0	26 31.0	1.003	90.0	27 01.0	1.003	90.0	27 31.0	1.003	90.0	9
90	23 59.1	1.003	89.1	24 29.0	1.003	89.1	24 59.0	1.003	89.0	25 29.0	1.003	89.0	25 59.0	1.003	89.0	26 29.0	1.003	89.0	26 58.9	1.003	89.0	27 28.9	1.003	89.0	90

Lat. 88°

H.A.	24° 00′ Alt (Δd Δt)	Az.	24° 30′ Alt (Δd Δt)	Az.	25° 00′ Alt (Δd Δt)	Az.	25° 30′ Alt (Δd Δt)	Az.	26° 00′ Alt (Δd Δt)	Az.	26° 30′ Alt (Δd Δt)	Az.	27° 00′ Alt (Δd Δt)	Az.	27° 30′ Alt (Δd Δt)	Az.	H.A.
91	23 57.0 1.003	88.1	24 27.0 1.003	88.1	24 56.9 1.003	88.1	25 26.9 1.003	88.0	25 56.9 1.003	88.0	26 26.9 1.003	88.0	26 56.8 1.003	88.0	27 26.8 1.003	88.0	91
2	23 54.9 1.003	87.1	24 24.9 1.003	87.1	24 54.8 1.003	87.1	25 24.8 1.003	87.0	25 54.8 1.003	87.0	26 24.8 1.003	87.0	26 54.7 1.003	87.0	27 24.7 1.003	87.0	2
3	23 52.8 1.003	86.1	24 22.8 1.003	86.1	24 52.7 1.003	86.1	25 22.7 1.003	86.1	25 52.7 1.003	86.0	26 22.7 1.003	86.0	26 52.7 1.003	86.0	27 22.6 1.003	86.0	3
4	23 50.7 1.003	85.1	24 20.7 1.003	85.1	24 50.7 1.003	85.1	25 20.6 1.003	85.1	25 50.6 1.003	85.0	26 20.6 1.003	85.0	26 50.6 1.003	85.0	27 20.5 1.003	85.0	4
95	23 48.6 1.003	84.1	24 18.6 1.003	84.1	24 48.6 1.003	84.1	25 18.6 1.003	84.1	25 48.5 1.003	84.0	26 18.5 1.003	84.0	26 48.5 1.003	84.0	27 18.5 1.003	84.0	95
6	23 46.5 1.003	83.1	24 16.5 1.003	83.1	24 46.5 1.003	83.1	25 16.5 1.003	83.1	25 46.5 1.003	83.0	26 16.4 1.003	83.0	26 46.4 1.003	83.0	27 16.4 1.003	83.0	6
7	23 44.4 1.003	82.1	24 14.4 1.003	82.1	24 44.4 1.003	82.1	25 14.4 1.003	82.1	25 44.4 1.003	82.0	26 14.4 1.003	82.0	26 44.3 1.003	82.0	27 14.3 1.003	82.0	7
8	23 42.4 1.003	81.1	24 12.4 1.003	81.1	24 42.3 1.003	81.1	25 12.3 1.003	81.1	25 42.3 1.003	81.0	26 12.3 1.003	81.0	26 42.3 1.003	81.0	27 12.2 1.003	81.0	8
9	23 40.3 1.003	80.1	24 10.3 1.003	80.1	24 40.3 1.003	80.1	25 10.3 1.003	80.1	25 40.2 1.003	80.0	26 10.2 1.003	80.0	26 40.2 1.003	80.0	27 10.2 1.003	80.0	9
100	23 38.3 1.003	79.1	24 08.2 1.003	79.1	24 38.2 1.003	79.1	25 08.2 1.003	79.1	25 38.2 1.003	79.0	26 08.2 1.003	79.0	26 38.1 1.003	79.0	27 08.1 1.003	79.0	100
1	23 36.2 1.003	78.1	24 06.2 1.003	78.1	24 36.2 1.003	78.1	25 06.1 1.003	78.1	25 36.1 1.003	78.1	26 06.1 1.003	78.0	26 36.1 1.003	78.0	27 06.1 1.003	78.0	1
2	23 34.2 1.003	77.1	24 04.1 1.003	77.1	24 34.1 1.003	77.1	25 04.1 1.003	77.1	25 34.1 1.003	77.1	26 04.1 1.003	77.0	26 34.0 1.003	77.0	27 04.0 1.003	77.0	2
3	23 32.1 1.003	76.1	24 02.1 1.003	76.1	24 32.1 1.003	76.1	25 02.1 1.003	76.1	25 32.0 1.003	76.1	26 02.0 1.003	76.0	26 32.0 1.003	76.0	27 02.0 1.003	76.0	3
4	23 30.1 1.003	75.1	24 00.1 1.003	75.1	24 30.1 1.003	75.1	25 00.0 1.003	75.1	25 30.0 1.003	75.1	26 00.0 1.003	75.0	26 30.0 1.003	75.0	27 00.0 1.003	75.0	4
105	23 28.1 1.003	74.2	23 58.1 1.003	74.1	24 28.0 1.003	74.1	24 58.0 1.003	74.1	25 28.0 1.003	74.1	25 58.0 1.003	74.0	26 28.0 1.003	74.0	26 57.9 1.003	74.0	105
6	23 26.1 1.003	73.2	23 56.1 1.003	73.1	24 26.0 1.003	73.1	24 56.0 1.003	73.1	25 26.0 1.003	73.1	25 56.0 1.003	73.1	26 25.9 1.003	73.0	26 55.9 1.003	73.0	6
7	23 24.1 1.003	72.2	23 54.1 1.003	72.1	24 24.0 1.003	72.1	24 54.0 1.003	72.1	25 24.0 1.003	72.1	25 54.0 1.003	72.1	26 24.0 1.003	72.0	26 53.9 1.003	72.0	7
8	23 22.1 1.003	71.2	23 52.1 1.003	71.1	24 22.0 1.003	71.1	24 52.0 1.003	71.1	25 22.0 1.003	71.1	25 52.0 1.003	71.1	26 22.0 1.003	71.0	26 51.9 1.003	71.0	8
9	23 20.1 1.003	70.2	23 50.1 1.003	70.2	24 20.1 1.003	70.1	24 50.1 1.003	70.1	25 20.0 1.003	70.1	25 50.0 1.003	70.1	26 20.0 1.003	70.1	26 50.0 1.003	70.0	9
110	23 18.1 1.003	69.2	23 48.1 1.003	69.2	24 18.1 1.003	69.1	24 48.1 1.003	69.1	25 18.1 1.003	69.1	25 48.0 1.003	69.1	26 18.0 1.003	69.1	26 48.0 1.003	69.0	110
1	23 16.2 1.003	68.2	23 46.2 1.003	68.2	24 16.2 1.003	68.1	24 46.1 1.003	68.1	25 16.1 1.003	68.1	25 46.1 1.003	68.1	26 16.1 1.003	68.1	26 46.1 1.003	68.0	1
2	23 14.3 1.003	67.2	23 44.2 1.003	67.2	24 14.2 1.003	67.2	24 44.2 1.003	67.1	25 14.2 1.003	67.1	25 44.2 1.003	67.1	26 14.1 1.003	67.1	26 44.1 1.003	67.1	2
3	23 12.3 1.003	66.2	23 42.3 1.003	66.2	24 12.3 1.003	66.2	24 42.3 1.003	66.1	25 12.3 1.003	66.1	25 42.2 1.003	66.1	26 12.2 1.003	66.1	26 42.2 1.003	66.1	3
4	23 10.4 1.003	65.2	23 40.4 1.003	65.2	24 10.4 1.003	65.2	24 40.4 1.003	65.1	25 10.4 1.003	65.1	25 40.3 1.003	65.1	26 10.3 1.003	65.1	26 40.3 1.003	65.1	4
115	23 08.5 1.003	64.2	23 38.5 1.003	64.2	24 08.5 1.003	64.2	24 38.5 1.003	64.2	25 08.5 1.003	64.1	25 38.4 1.003	64.1	26 08.4 1.003	64.1	26 38.4 1.003	64.1	115
6	23 06.7 1.003	63.2	23 36.6 1.003	63.2	24 06.6 1.003	63.2	24 36.6 1.003	63.2	25 06.6 1.003	63.1	25 36.6 1.003	63.1	26 06.5 1.003	63.1	26 36.5 1.003	63.1	6
7	23 04.8 1.003	62.2	23 34.8 1.003	62.2	24 04.8 1.003	62.2	24 34.7 1.003	62.2	25 04.7 1.003	62.2	25 34.7 1.003	62.1	26 04.7 1.003	62.1	26 34.7 1.003	62.1	7
8	23 03.0 1.003	61.2	23 32.9 1.003	61.2	24 02.9 1.003	61.2	24 32.9 1.003	61.2	25 02.9 1.003	61.2	25 32.9 1.003	61.1	26 02.8 1.003	61.1	26 32.8 1.003	61.1	8
9	23 01.1 1.003	60.2	23 31.1 1.003	60.2	24 01.1 1.003	60.2	24 31.1 1.003	60.2	25 01.1 1.003	60.2	25 31.0 1.003	60.2	26 01.0 1.003	60.1	26 31.0 1.003	60.1	9
120	22 59.3 1.003	59.3	23 29.3 1.003	59.2	23 59.3 1.003	59.2	24 29.3 1.003	59.2	24 59.2 1.003	59.2	25 29.2 1.003	59.2	25 59.2 1.003	59.1	26 29.2 1.003	59.1	120
1	22 57.5 1.003	58.3	23 27.5 1.003	58.2	23 57.5 1.003	58.2	24 27.5 1.003	58.2	24 57.5 1.003	58.2	25 27.4 1.003	58.2	25 57.4 1.003	58.1	26 27.4 1.003	58.1	1
2	22 55.8 1.003	57.3	23 25.7 1.003	57.2	23 55.7 1.003	57.2	24 25.7 1.003	57.2	24 55.7 1.003	57.2	25 25.7 1.003	57.2	25 55.7 1.003	57.2	26 25.6 1.003	57.1	2
3	22 54.0 1.003	56.3	23 24.0 1.003	56.3	23 54.0 1.003	56.2	24 24.0 1.003	56.2	24 53.9 1.003	56.2	25 23.9 1.003	56.2	25 53.9 1.003	56.2	26 23.9 1.003	56.2	3
4	22 52.3 1.003	55.3	23 22.3 1.003	55.3	23 52.2 1.003	55.2	24 22.2 1.003	55.2	24 52.2 1.003	55.2	25 22.2 1.003	55.2	25 52.2 1.003	55.2	26 22.2 1.003	55.2	4
125	22 50.6 1.003	54.3	23 20.5 1.003	54.3	23 50.5 1.003	54.3	24 20.5 1.003	54.2	24 50.5 1.003	54.2	25 20.5 1.003	54.2	25 50.5 1.003	54.2	26 20.5 1.003	54.2	125
6	22 48.9 1.003	53.3	23 18.9 1.003	53.3	23 48.8 1.003	53.3	24 18.8 1.003	53.3	24 48.8 1.003	53.2	25 18.8 1.003	53.2	25 48.8 1.003	53.2	26 18.8 1.003	53.2	6
7	22 47.2 1.003	52.3	23 17.2 1.003	52.3	23 47.2 1.003	52.3	24 17.2 1.003	52.2	24 47.1 1.003	52.2	25 17.1 1.003	52.2	25 47.1 1.003	52.2	26 17.1 1.003	52.2	7
8	22 45.6 1.003	51.3	23 15.5 1.003	51.3	23 45.5 1.003	51.3	24 15.5 1.003	51.3	24 45.5 1.003	51.3	25 15.5 1.003	51.2	25 45.5 1.003	51.2	26 15.5 1.003	51.2	8
9	22 43.9 1.003	50.3	23 13.9 1.003	50.3	23 43.9 1.003	50.3	24 13.9 1.003	50.3	24 43.9 1.003	50.3	25 13.9 1.003	50.3	25 43.9 1.003	50.2	26 13.8 1.003	50.2	9
130	22 42.3 1.003	49.3	23 12.3 1.003	49.3	23 42.3 1.003	49.3	24 12.3 1.003	49.3	24 42.3 1.003	49.3	25 12.3 1.003	49.3	25 42.3 1.003	49.2	26 12.2 1.003	49.2	130
1	22 40.8 1.003	48.4	23 10.7 1.003	48.3	23 40.7 1.003	48.3	24 10.7 1.003	48.3	24 40.7 1.003	48.3	25 10.7 1.003	48.3	25 40.7 1.003	48.3	26 10.7 1.003	48.2	1
2	22 39.2 1.003	47.4	23 09.2 1.003	47.3	23 39.2 1.003	47.3	24 09.2 1.003	47.3	24 39.2 1.003	47.3	25 09.1 1.003	47.3	25 39.1 1.003	47.3	26 09.1 1.003	47.3	2
3	22 37.7 1.002	46.4	23 07.7 1.002	46.4	23 37.7 1.002	46.3	24 07.6 1.002	46.3	24 37.6 1.002	46.3	25 07.6 1.002	46.3	25 37.6 1.002	46.3	26 07.6 1.002	46.3	3
4	22 36.2 1.002	45.4	23 06.2 1.002	45.4	23 36.1 1.002	45.4	24 06.1 1.002	45.3	24 36.1 1.002	45.3	25 06.1 1.002	45.3	25 36.1 1.002	45.3	26 06.1 1.002	45.3	4
135	22 34.7 1.002	44.4	23 04.7 1.002	44.4	23 34.7 1.002	44.4	24 04.7 1.002	44.4	24 34.7 1.002	44.3	25 04.6 1.002	44.3	25 34.6 1.002	44.3	26 04.6 1.002	44.3	135
6	22 33.2 1.002	43.4	23 03.2 1.002	43.4	23 33.2 1.002	43.4	24 03.2 1.002	43.4	24 33.2 1.002	43.3	25 03.2 1.002	43.3	25 33.2 1.002	43.3	26 03.2 1.002	43.3	6
7	22 31.8 1.002	42.4	23 01.8 1.002	42.4	23 31.8 1.002	42.4	24 01.8 1.002	42.4	24 31.8 1.002	42.4	25 01.8 1.002	42.3	25 31.8 1.002	42.3	26 01.7 1.002	42.3	7
8	22 30.4 1.002	41.4	23 00.4 1.002	41.4	23 30.4 1.002	41.4	24 00.4 1.002	41.4	24 30.4 1.002	41.4	25 00.4 1.002	41.4	25 30.4 1.002	41.3	26 00.3 1.002	41.3	8
9	22 29.0 1.002	40.4	22 59.0 1.002	40.4	23 29.0 1.002	40.4	23 59.0 1.002	40.4	24 29.0 1.002	40.4	24 59.0 1.002	40.4	25 29.0 1.002	40.4	25 59.0 1.002	40.3	9
140	22 27.7 1.002	39.5	22 57.7 1.002	39.4	23 27.7 1.002	39.4	23 57.7 1.002	39.4	24 27.7 1.002	39.4	24 57.7 1.002	39.4	25 27.6 1.002	39.4	25 57.6 1.002	39.4	140
1	22 26.4 1.002	38.5	22 56.4 1.002	38.4	23 26.4 1.002	38.4	23 56.4 1.002	38.4	24 26.3 1.002	38.4	24 56.3 1.002	38.4	25 26.3 1.002	38.4	25 56.3 1.002	38.4	1
2	22 25.1 1.002	37.5	22 55.1 1.002	37.5	23 25.1 1.002	37.4	23 55.1 1.002	37.4	24 25.1 1.002	37.4	24 55.1 1.002	37.4	25 25.0 1.002	37.4	25 55.0 1.002	37.4	2
3	22 23.8 1.002	36.5	22 53.8 1.002	36.5	23 23.8 1.002	36.5	23 53.8 1.002	36.5	24 23.8 1.002	36.4	24 53.8 1.002	36.4	25 23.8 1.002	36.4	25 53.8 1.002	36.4	3
4	22 22.6 1.002	35.5	22 52.6 1.002	35.5	23 22.6 1.002	35.5	23 52.6 1.002	35.5	24 22.6 1.002	35.5	24 52.6 1.002	35.4	25 22.6 1.002	35.4	25 52.6 1.002	35.4	4
145	22 21.4 1.002	34.5	22 51.4 1.002	34.5	23 21.4 1.002	34.5	23 51.4 1.002	34.5	24 21.4 1.002	34.5	24 51.4 1.002	34.5	25 21.4 1.002	34.4	25 51.4 1.002	34.4	145
6	22 20.2 1.002	33.5	22 50.2 1.002	33.5	23 20.2 1.002	33.5	23 50.2 1.002	33.5	24 20.2 1.002	33.5	24 50.2 1.002	33.5	25 20.2 1.002	33.5	25 50.2 1.002	33.4	6
7	22 19.1 1.002	32.5	22 49.1 1.002	32.5	23 19.1 1.002	32.5	23 49.1 1.002	32.5	24 19.1 1.002	32.5	24 49.1 1.002	32.5	25 19.1 1.002	32.5	25 49.0 1.002	32.5	7
8	22 18.0 1.002	31.6	22 48.0 1.002	31.5	23 18.0 1.002	31.5	23 48.0 1.002	31.5	24 18.0 1.002	31.5	24 48.0 1.002	31.5	25 17.9 1.002	31.5	25 47.9 1.002	31.5	8
9	22 16.9 1.002	30.6	22 46.9 1.002	30.6	23 16.9 1.002	30.5	23 46.9 1.002	30.5	24 16.9 1.002	30.5	24 46.9 1.002	30.5	25 16.9 1.002	30.5	25 46.9 1.002	30.5	9
150	22 15.9 1.002	29.6	22 45.8 1.002	29.6	23 15.8 1.002	29.6	23 45.8 1.002	29.5	24 15.8 1.002	29.5	24 45.8 1.002	29.5	25 15.8 1.002	29.5	25 45.8 1.002	29.5	150
1	22 14.8 1.002	28.6	22 44.8 1.002	28.6	23 14.8 1.002	28.6	23 44.8 1.002	28.6	24 14.8 1.002	28.5	24 44.8 1.002	28.5	25 14.8 1.002	28.5	25 44.8 1.002	28.5	1
2	22 13.8 1.002	27.6	22 43.8 1.002	27.6	23 13.8 1.002	27.6	23 43.8 1.002	27.6	24 13.8 1.002	27.6	24 43.8 1.002	27.5	25 13.8 1.002	27.5	25 43.8 1.002	27.5	2
3	22 12.9 1.002	26.6	22 42.9 1.002	26.6	23 12.9 1.002	26.6	23 42.9 1.002	26.6	24 12.9 1.002	26.6	24 42.9 1.002	26.6	25 12.9 1.002	26.5	25 42.9 1.002	26.5	3
4	22 12.0 1.001	25.6	22 42.0 1.001	25.6	23 12.0 1.001	25.6	23 42.0 1.001	25.6	24 12.0 1.001	25.6	24 42.0 1.001	25.6	25 11.9 1.001	25.6	25 41.9 1.001	25.6	4
155	22 11.1 1.001	24.6	22 41.1 1.001	24.6	23 11.1 1.001	24.6	23 41.1 1.001	24.6	24 11.1 1.001	24.6	24 41.1 1.001	24.6	25 11.1 1.001	24.6	25 41.1 1.001	24.6	155
6	22 10.2 1.001	23.7	22 40.2 1.001	23.6	23 10.2 1.001	23.6	23 40.2 1.001	23.6	24 10.2 1.001	23.6	24 40.2 1.001	23.6	25 10.2 1.001	23.6	25 40.2 1.001	23.6	6
7	22 09.4 1.001	22.7	22 39.4 1.001	22.7	23 09.4 1.001	22.7	23 39.4 1.001	22.6	24 09.4 1.001	22.6	24 39.4 1.001	22.6	25 09.4 1.001	22.6	25 39.4 1.001	22.6	7
8	22 08.6 1.001	21.7	22 38.6 1.001	21.7	23 08.6 1.001	21.7	23 38.6 1.001	21.7	24 08.6 1.001	21.7	24 38.6 1.001	21.6	25 08.6 1.001	21.6	25 38.6 1.001	21.6	8
9	22 07.9 1.001	20.7	22 37.9 1.001	20.7	23 07.8 1.001	20.7	23 37.8 1.001	20.7	24 07.8 1.001	20.7	24 37.8 1.001	20.7	25 07.8 1.001	20.7	25 37.8 1.001	20.6	9
160	22 07.1 1.001	19.7	22 37.1 1.001	19.7	23 07.1 1.001	19.7	23 37.1 1.001	19.7	24 07.1 1.001	19.7	24 37.1 1.001	19.7	25 07.1 1.001	19.7	25 37.1 1.001	19.7	160
1	22 06.4 1.001	18.7	22 36.4 1.001	18.7	23 06.4 1.001	18.7	23 36.4 1.001	18.7	24 06.4 1.001	18.7	24 36.4 1.001	18.7	25 06.4 1.001	18.7	25 36.4 1.001	18.7	1
2	22 05.8 1.001	17.7	22 35.8 1.001	17.7	23 05.8 1.001	17.7	23 35.8 1.001	17.7	24 05.8 1.001	17.7	24 35.8 1.001	17.7	25 05.8 1.001	17.7	25 35.8 1.001	17.7	2
3	22 05.2 1.001	16.8	22 35.2 1.001	16.7	23 05.2 1.001	16.7	23 35.2 1.001	16.7	24 05.2 1.001	16.7	24 35.2 1.001	16.7	25 05.2 1.001	16.7	25 35.2 1.001	16.7	3
4	22 04.6 1.001	15.8	22 34.6 1.001	15.8	23 04.6 1.001	15.8	23 34.6 1.001	15.8	24 04.6 1.001	15.7	24 34.6 1.001	15.7	25 04.6 1.001	15.7	25 34.6 1.001	15.7	4
165	22 04.0 1.001	14.8	22 34.0 1.001	14.8	23 04.0 1.001	14.8	23 34.0 1.001	14.8	24 04.0 1.001	14.8	24 34.0 1.001	14.8	25 04.0 1.001	14.7	25 34.0 1.001	14.7	165
6	22 03.5 1.001	13.8	22 33.5 1.001	13.8	23 03.5 1.001	13.8	23 33.5 1.001	13.8	24 03.5 1.001	13.8	24 33.5 1.001	13.8	25 03.5 1.001	13.8	25 33.5 1.001	13.8	6
7	22 03.0 1.001	12.8	22 33.0 1.001	12.8	23 03.0 1.001	12.8	23 33.0 1.001	12.8	24 03.0 1.001	12.8	24 33.0 1.001	12.8	25 03.0 1.001	12.8	25 33.0 1.001	12.8	7
8	22 02.6 1.001	11.8	22 32.6 1.001	11.8	23 02.6 1.001	11.8	23 32.6 1.001	11.8	24 02.6 1.001	11.8	24 32.6 1.001	11.8	25 02.6 1.001	11.8	25 32.6 1.001	11.8	8
9	22 02.2 1.001	10.8	22 32.2 1.001	10.8	23 02.2 1.001	10.8	23 32.2 1.001	10.8	24 02.2 1.001	10.8	24 32.2 1.001	10.8	25 02.2 1.001	10.8	25 32.2 1.001	10.8	9
170	22 01.8 1.001	09.9	22 31.8 1.001	09.8	23 01.8 1.001	09.8	23 31.8 1.001	09.8	24 01.8 1.001	09.8	24 31.8 1.001	09.8	25 01.8 1.001	09.8	25 31.8 1.001	09.8	170
1	22 01.5 1.000	08.9	22 31.5 1.000	08.9	23 01.5 1.000	08.9	23 31.5 1.000	08.9	24 01.5 1.000	08.9	24 31.5 1.000	08.9	25 01.5 1.000	08.8	25 31.5 1.000	08.8	1
2	22 01.2 1.000	07.9	22 31.2 1.000	07.9	23 01.2 1.000	07.9	23 31.2 1.000	07.9	24 01.1 1.000	07.9	24 31.1 1.000	07.9	25 01.1 1.000	07.9	25 31.1 1.000	07.9	2
3	22 00.9 1.000	06.9	22 30.9 1.000	06.9	23 00.9 1.000	06.9	23 30.9 1.000	06.9	24 00.9 1.000	06.9	24 30.9 1.000	06.9	25 00.9 1.000	06.9	25 30.9 1.000	06.9	3
4	22 00.6 1.000	05.9	22 30.6 1.000	05.9	23 00.6 1.000	05.9	23 30.6 1.000	05.9	24 00.6 1.000	05.9	24 30.6 1.000	05.9	25 00.6 1.000	05.9	25 30.6 1.000	05.9	4
175	22 00.5 1.000	04.9	22 30.4 1.000	04.9	23 00.4 1.000	04.9	23 30.4 1.000	04.9	24 00.4 1.000	04.9	24 30.4 1.000	04.9	25 00.4 1.000	04.9	25 30.4 1.000	04.9	175
6	22 00.3 1.000	03.9	22 30.3 1.000	03.9	23 00.3 1.000	03.9	23 30.3 1.000	03.9	24 00.3 1.000	03.9	24 30.3 1.000	03.9	25 00.3 1.000	03.9	25 30.3 1.000	03.9	6
7	22 00.2 1.000	03.0	22 30.2 1.000	03.0	23 00.2 1.000	03.0	23 30.2 1.000	03.0	24 00.2 1.000	03.0	24 30.2 1.000	03.0	25 00.2 1.000	02.9	25 30.2 1.000	02.9	7
8	22 00.1 1.000	02.0	22 30.1 1.000	02.0	23 00.1 1.000	02.0	23 30.1 1.000	02.0	24 00.1 1.000	02.0	24 30.1 1.000	02.0	25 00.1 1.000	02.0	25 30.1 1.000	02.0	8
9	22 00.0 1.000	01.0	22 30.0 1.000	01.0	23 00.0 1.000	01.0	23 30.0 1.000	01.0	24 00.0 1.000	01.0	24 30.0 1.000	01.0	25 00.0 1.000	01.0	25 30.0 1.000	01.0	9
180	22 00.0 1.000	00.0	22 30.0 1.000	00.0	23 00.0 1.000	00.0	23 30.0 1.000	00.0	24 00.0 1.000	00.0	24 30.0 1.000	00.0	25 00.0 1.000	00.0	25 30.0 1.000	00.0	180

Lat. 88°

H.A.	28° 00' Alt.	Δd Δt	Az.	28° 30' Alt.	Δd Δt	Az.	29° 00' Alt.	Δd Δt	Az.	30° 00' Alt.	Δd Δt	Az.	32° 00' Alt.	Δd Δt	Az.	84° 00' Alt.	Δd Δt	Az.	84° 30' Alt.	Δd Δt	Az.	85° 30' Alt.	Δd Δt	Az.	H.A.
00	30 00.0	1.000	180.0	30 30.0	1.000	180.0	31 00.0	1.000	180.0	32 00.0	1.000	180.0	34 00.0	1.000	180.0	36 00.0	1.000	180.0	36 30.0	1.000	180.0	37 30.0	1.000	180.0	00
1	30 00.0	1.000	179.0	30 30.0	1.000	179.0	31 00.0	1.000	179.0	32 00.0	1.000	179.0	34 00.0	1.000	179.0	36 00.0	1.000	179.0	36 30.0	1.000	179.0	37 30.0	1.000	179.0	1
2	29 59.9	1.000	178.0	30 29.9	1.000	178.0	30 59.9	1.000	178.0	31 59.9	1.000	178.0	33 59.9	1.000	178.0	35 59.9	1.000	178.0	36 29.9	1.000	177.9	37 29.9	1.000	177.9	2
3	29 59.8	1.000	176.9	30 29.8	1.000	176.9	30 59.8	1.000	176.9	31 59.8	1.000	176.9	33 59.8	1.000	176.9	35 59.8	1.000	176.9	36 29.8	1.000	176.9	37 29.8	1.000	176.9	3
4	29 59.7	1.000	175.9	30 29.7	1.000	175.9	30 59.7	1.000	175.9	31 59.7	1.000	175.9	33 59.7	1.000	175.9	35 59.7	1.000	175.9	36 29.7	1.000	175.9	37 29.7	1.000	175.9	4
05	29 59.5	1.000	174.9	30 29.5	1.000	174.9	30 59.5	1.000	174.9	31 59.5	1.000	174.9	33 59.5	1.000	174.9	35 59.5	1.000	174.9	36 29.5	1.000	174.9	37 29.5	1.000	174.9	05
6	29 59.3	1.000	173.9	30 29.3	1.000	173.9	30 59.3	1.000	173.9	31 59.3	1.000	173.9	33 59.3	1.000	173.9	35 59.3	1.000	173.9	36 29.3	1.000	173.8	37 29.3	1.000	173.8	6
7	29 59.1	1.000	172.9	30 29.1	1.000	172.9	30 59.1	1.000	172.9	31 59.1	1.000	172.9	33 59.1	1.000	172.8	35 59.1	1.000	172.8	36 29.1	1.000	172.8	37 29.1	1.000	172.8	7
8	29 58.8	1.001	171.8	30 28.8	1.001	171.8	30 58.8	1.001	171.8	31 58.8	1.001	171.8	33 58.8	1.001	171.8	35 58.8	1.001	171.8	36 28.8	1.001	171.8	37 28.8	1.001	171.8	8
9	29 58.5	1.001	170.8	30 28.5	1.001	170.8	30 58.5	1.001	170.8	31 58.5	1.001	170.8	33 58.5	1.001	170.8	35 58.5	1.001	170.8	36 28.5	1.001	170.8	37 28.5	1.001	170.8	9
10	29 58.1	1.001	169.8	30 28.1	1.001	169.8	30 58.1	1.001	169.8	31 58.1	1.001	169.8	33 58.1	1.001	169.8	35 58.1	1.001	169.8	36 28.1	1.001	169.7	37 28.1	1.001	169.7	10
1	29 57.8	1.001	168.8	30 27.8	1.001	168.8	30 57.8	1.001	168.8	31 57.7	1.001	168.8	33 57.7	1.001	168.7	35 57.7	1.001	168.7	36 27.7	1.001	168.7	37 27.7	1.001	168.7	1
2	29 57.3	1.001	167.8	30 27.3	1.001	167.8	30 57.3	1.001	167.8	31 57.3	1.001	167.7	33 57.3	1.001	167.7	35 57.3	1.001	167.7	36 27.3	1.001	167.7	37 27.3	1.001	167.7	2
3	29 56.9	1.001	166.7	30 26.9	1.001	166.7	30 56.9	1.001	166.7	31 56.9	1.001	166.7	33 56.9	1.001	166.7	35 56.9	1.001	166.7	36 26.8	1.001	166.7	37 26.8	1.001	166.7	3
4	29 56.4	1.001	165.7	30 26.4	1.001	165.7	30 56.4	1.001	165.7	31 56.4	1.001	165.7	33 56.4	1.001	165.7	35 56.3	1.001	165.7	36 26.3	1.001	165.7	37 26.3	1.001	165.6	4
15	29 55.8	1.001	164.7	30 25.8	1.001	164.7	30 55.8	1.001	164.7	31 55.8	1.001	164.7	33 55.8	1.001	164.7	35 55.8	1.001	164.6	36 25.8	1.001	164.6	37 25.8	1.001	164.6	15
6	29 55.3	1.001	163.7	30 25.3	1.001	163.7	30 55.3	1.001	163.7	31 55.3	1.001	163.7	33 55.2	1.001	163.6	35 55.2	1.001	163.6	36 25.2	1.001	163.6	37 25.2	1.001	163.6	6
7	29 54.7	1.001	162.7	30 24.7	1.001	162.7	30 54.7	1.001	162.7	31 54.6	1.001	162.6	33 54.6	1.001	162.6	35 54.6	1.001	162.6	36 24.6	1.001	162.6	37 24.6	1.001	162.6	7
8	29 54.0	1.001	161.7	30 24.0	1.001	161.6	30 54.0	1.001	161.6	31 54.0	1.001	161.6	33 54.0	1.001	161.6	35 54.0	1.001	161.6	36 24.0	1.001	161.6	37 24.0	1.001	161.5	8
9	29 53.3	1.001	160.6	30 23.3	1.001	160.6	30 53.3	1.001	160.6	31 53.3	1.001	160.6	33 53.3	1.001	160.6	35 53.3	1.001	160.5	36 23.3	1.001	160.5	37 23.3	1.001	160.5	9
20	29 52.6	1.001	159.6	30 22.6	1.001	159.6	30 52.6	1.001	159.6	31 52.6	1.001	159.6	33 52.6	1.001	159.6	35 52.6	1.001	159.5	36 22.6	1.001	159.5	37 22.6	1.001	159.5	20
1	29 51.9	1.001	158.6	30 21.9	1.001	158.6	30 51.9	1.001	158.6	31 51.9	1.001	158.6	33 51.9	1.001	158.5	35 51.8	1.001	158.5	36 21.8	1.001	158.5	37 21.8	1.001	158.5	1
2	29 51.1	1.001	157.6	30 21.1	1.001	157.6	30 51.1	1.001	157.6	31 51.1	1.001	157.5	33 51.1	1.001	157.5	35 51.0	1.001	157.5	36 21.1	1.001	157.5	37 21.0	1.001	157.4	2
3	29 50.3	1.001	156.6	30 20.3	1.001	156.6	30 50.3	1.001	156.5	31 50.3	1.001	156.5	33 50.3	1.001	156.5	35 50.2	1.001	156.4	36 20.2	1.001	156.4	37 20.2	1.001	156.4	3
4	29 49.4	1.001	155.5	30 19.4	1.001	155.5	30 49.4	1.001	155.5	31 49.4	1.001	155.5	33 49.4	1.001	155.5	35 49.4	1.001	155.4	36 19.4	1.002	155.4	37 19.4	1.001	155.4	4
25	29 48.6	1.002	154.5	30 18.5	1.002	154.5	30 48.5	1.002	154.5	31 48.5	1.002	154.5	33 48.5	1.002	154.4	35 48.5	1.002	154.4	36 18.5	1.002	154.4	37 18.5	1.002	154.4	25
6	29 47.6	1.002	153.5	30 17.6	1.002	153.5	30 47.6	1.002	153.5	31 47.6	1.002	153.5	33 47.6	1.002	153.4	35 47.6	1.002	153.4	36 17.6	1.002	153.4	37 17.6	1.002	153.3	6
7	29 46.7	1.002	152.5	30 16.7	1.002	152.5	30 46.7	1.002	152.5	31 46.7	1.002	152.5	33 46.6	1.002	152.4	35 46.6	1.002	152.4	36 16.6	1.002	152.3	37 16.6	1.002	152.3	7
8	29 45.7	1.002	151.5	30 15.7	1.002	151.5	30 45.7	1.002	151.5	31 45.7	1.002	151.4	33 45.7	1.002	151.4	35 45.6	1.002	151.3	36 15.6	1.002	151.3	37 15.6	1.002	151.3	8
9	29 44.7	1.002	150.5	30 14.7	1.002	150.4	30 44.7	1.002	150.4	31 44.7	1.002	150.4	33 44.6	1.002	150.4	35 44.6	1.002	150.3	36 14.6	1.002	150.3	37 14.6	1.002	150.3	9
30	29 43.6	1.002	149.4	30 13.6	1.002	149.4	30 43.6	1.002	149.4	31 43.6	1.002	149.4	33 43.6	1.002	149.3	35 43.6	1.002	149.3	36 13.6	1.002	149.3	37 13.5	1.002	149.3	30
1	29 42.6	1.002	148.4	30 12.5	1.002	148.4	30 42.5	1.002	148.4	31 42.5	1.002	148.4	33 42.5	1.002	148.3	35 42.5	1.002	148.3	36 12.5	1.002	148.3	37 12.4	1.002	148.2	1
2	29 41.4	1.002	147.4	30 11.4	1.002	147.4	30 41.4	1.002	147.4	31 41.4	1.002	147.4	33 41.4	1.002	147.3	35 41.4	1.002	147.3	36 11.3	1.002	147.2	37 11.3	1.002	147.2	2
3	29 40.3	1.002	146.4	30 10.3	1.002	146.4	30 40.3	1.002	146.4	31 40.3	1.002	146.3	33 40.2	1.002	146.3	35 40.2	1.002	146.2	36 10.2	1.002	146.2	37 10.2	1.002	146.2	3
4	29 39.1	1.002	145.4	30 09.1	1.002	145.4	30 39.1	1.002	145.4	31 39.1	1.002	145.3	33 39.1	1.002	145.3	35 39.0	1.002	145.2	36 09.0	1.002	145.2	37 09.0	1.002	145.2	4
35	29 37.9	1.002	144.4	30 07.9	1.002	144.4	30 37.9	1.002	144.3	31 37.9	1.002	144.3	33 37.9	1.002	144.3	35 37.8	1.002	144.2	36 07.8	1.002	144.2	37 07.8	1.002	144.1	35
6	29 36.7	1.002	143.3	30 06.7	1.002	143.3	30 36.7	1.002	143.3	31 36.6	1.002	143.3	33 36.6	1.002	143.2	35 36.6	1.002	143.2	36 06.6	1.002	143.2	37 06.5	1.002	143.1	6
7	29 35.4	1.002	142.3	30 05.4	1.002	142.3	30 35.4	1.002	142.3	31 35.4	1.002	142.3	33 35.3	1.002	142.2	35 35.3	1.002	142.2	36 05.3	1.002	142.1	37 05.3	1.002	142.1	7
8	29 34.1	1.002	141.3	30 04.1	1.002	141.3	30 34.1	1.002	141.3	31 34.1	1.002	141.3	33 34.0	1.002	141.2	35 34.0	1.002	141.1	36 04.0	1.002	141.1	37 04.0	1.002	141.1	8
9	29 32.8	1.002	140.3	30 02.8	1.002	140.3	30 32.8	1.002	140.3	31 32.8	1.002	140.2	33 32.7	1.002	140.2	35 32.7	1.002	140.1	36 02.7	1.002	140.1	37 02.6	1.002	140.1	9
40	29 31.4	1.002	139.3	30 01.4	1.002	139.3	30 31.4	1.002	139.3	31 31.4	1.002	139.2	33 31.4	1.002	139.2	35 31.3	1.002	139.1	36 01.3	1.002	139.1	37 01.3	1.002	139.0	40
1	29 30.1	1.002	138.3	30 00.1	1.002	138.3	30 30.0	1.002	138.3	31 30.0	1.002	138.2	33 30.0	1.002	138.1	35 29.9	1.002	138.1	35 59.9	1.002	138.0	36 59.9	1.002	138.0	1
2	29 28.7	1.002	137.3	29 58.7	1.002	137.2	30 28.6	1.002	137.2	31 28.6	1.002	137.2	33 28.6	1.002	137.1	35 28.5	1.002	137.1	35 58.5	1.002	137.0	36 58.5	1.002	137.0	2
3	29 27.2	1.002	136.2	29 57.2	1.002	136.2	30 27.2	1.002	136.2	31 27.2	1.002	136.2	33 27.1	1.002	136.1	35 27.1	1.002	136.0	35 57.1	1.002	136.0	36 57.0	1.002	136.0	3
4	29 25.8	1.002	135.2	29 55.8	1.002	135.2	30 25.7	1.002	135.2	31 25.7	1.002	135.2	33 25.7	1.002	135.1	35 25.6	1.002	135.0	35 55.6	1.002	135.0	36 55.6	1.002	135.0	4
45	29 24.3	1.003	134.2	29 54.3	1.003	134.2	30 24.3	1.003	134.2	31 24.2	1.003	134.2	33 24.2	1.003	134.1	35 24.1	1.003	134.0	35 54.1	1.003	134.0	36 54.1	1.003	134.0	45
6	29 22.8	1.003	133.2	29 52.8	1.003	133.2	30 22.7	1.003	133.2	31 22.7	1.003	133.1	33 22.7	1.003	133.1	35 22.6	1.003	133.0	35 52.6	1.003	132.9	36 52.6	1.003	132.9	6
7	29 21.2	1.003	132.2	29 51.2	1.003	132.2	30 21.2	1.003	132.2	31 21.1	1.003	132.1	33 21.1	1.003	132.1	35 21.0	1.003	132.0	35 51.0	1.003	132.0	36 51.0	1.003	131.9	7
8	29 19.7	1.003	131.2	29 49.7	1.003	131.2	30 19.6	1.003	131.1	31 19.6	1.003	131.1	33 19.6	1.003	131.0	35 19.5	1.003	131.0	35 49.5	1.003	130.9	36 49.4	1.003	130.9	8
9	29 18.1	1.003	130.2	29 48.1	1.003	130.2	30 18.0	1.003	130.1	31 18.0	1.003	130.1	33 18.0	1.003	130.0	35 17.9	1.003	129.9	35 47.9	1.003	129.9	36 47.9	1.003	129.9	9
50	29 16.5	1.003	129.2	29 46.4	1.003	129.1	30 16.4	1.003	129.1	31 16.4	1.003	129.1	33 16.3	1.003	129.0	35 16.3	1.003	128.9	35 46.3	1.003	128.9	36 46.2	1.003	128.9	50
1	29 14.8	1.003	128.1	29 44.8	1.003	128.1	30 14.8	1.003	128.1	31 14.7	1.003	128.0	33 14.7	1.003	128.0	35 14.6	1.003	127.9	35 44.6	1.003	127.9	36 44.6	1.003	127.9	1
2	29 13.2	1.003	127.1	29 43.2	1.003	127.1	30 13.1	1.003	127.1	31 13.1	1.003	127.0	33 13.0	1.003	127.0	35 13.0	1.003	126.9	35 43.0	1.003	126.9	36 42.9	1.003	126.8	2
3	29 11.5	1.003	126.1	29 41.5	1.003	126.1	30 11.5	1.003	126.1	31 11.4	1.003	126.0	33 11.4	1.003	126.0	35 11.3	1.003	125.9	35 41.3	1.003	125.9	36 41.2	1.003	125.8	3
4	29 09.8	1.003	125.1	29 39.8	1.003	125.1	30 09.8	1.003	125.1	31 09.7	1.003	125.0	33 09.7	1.003	125.0	35 09.6	1.003	124.9	35 39.6	1.003	124.9	36 39.5	1.003	124.8	4
55	29 08.1	1.003	124.1	29 38.0	1.003	124.1	30 08.0	1.003	124.1	31 08.0	1.003	124.1	33 07.9	1.003	123.9	35 07.9	1.003	123.9	35 37.8	1.003	123.8	36 37.8	1.003	123.8	55
6	29 06.3	1.003	123.1	29 36.3	1.003	123.1	30 06.3	1.003	123.1	31 06.3	1.003	123.0	33 06.2	1.003	122.9	35 06.1	1.003	122.9	35 36.1	1.003	122.8	36 36.1	1.003	122.8	6
7	29 04.6	1.003	122.1	29 34.5	1.003	122.1	30 04.5	1.003	122.0	31 04.5	1.003	122.0	33 04.4	1.003	121.9	35 04.3	1.003	121.8	35 34.3	1.003	121.8	36 34.3	1.003	121.8	7
8	29 02.8	1.003	121.1	29 32.8	1.003	121.1	30 02.7	1.003	121.0	31 02.7	1.003	121.0	33 02.6	1.003	120.9	35 02.6	1.003	120.8	35 32.5	1.003	120.8	36 32.5	1.003	120.8	8
9	29 01.0	1.003	120.1	29 31.0	1.003	120.0	30 00.9	1.003	120.0	31 00.9	1.003	120.0	33 00.8	1.003	119.9	35 00.7	1.003	119.8	35 30.7	1.003	119.8	36 30.7	1.003	119.7	9
60	28 59.1	1.003	119.1	29 29.1	1.003	119.0	29 59.1	1.003	119.0	30 59.1	1.003	119.0	32 59.0	1.003	118.9	34 58.9	1.003	118.8	35 28.9	1.003	118.8	36 28.9	1.003	118.7	60
1	28 57.3	1.003	118.1	29 27.3	1.003	118.0	29 57.3	1.003	118.0	30 57.2	1.003	118.0	32 57.2	1.003	117.9	34 57.1	1.003	117.8	35 27.1	1.003	117.8	36 27.0	1.003	117.7	1
2	28 55.5	1.003	117.0	29 25.4	1.003	117.0	29 55.4	1.003	117.0	30 55.4	1.003	117.0	32 55.3	1.003	116.9	34 55.2	1.003	116.8	35 25.2	1.003	116.8	36 25.2	1.003	116.7	2
3	28 53.6	1.003	116.0	29 23.6	1.003	116.0	29 53.5	1.003	116.0	30 53.5	1.003	115.9	32 53.4	1.003	115.9	34 53.3	1.003	115.8	35 23.3	1.003	115.7	36 23.3	1.003	115.7	3
4	28 51.7	1.003	115.0	29 21.7	1.003	115.0	29 51.6	1.003	115.0	30 51.6	1.003	114.9	32 51.5	1.003	114.9	34 51.4	1.003	114.8	35 21.4	1.003	114.7	36 21.4	1.003	114.7	4
65	28 49.8	1.003	114.0	29 19.8	1.003	114.0	29 49.7	1.003	114.0	30 49.7	1.003	113.9	32 49.6	1.003	113.8	34 49.5	1.003	113.8	35 19.5	1.003	113.7	36 19.5	1.003	113.7	65
6	28 47.9	1.003	113.0	29 17.8	1.003	113.0	29 47.8	1.003	113.0	30 47.8	1.003	112.9	32 47.7	1.003	112.8	34 47.6	1.003	112.7	35 17.6	1.003	112.7	36 17.6	1.003	112.7	6
7	28 45.9	1.003	112.0	29 15.9	1.003	112.0	29 45.8	1.003	112.0	30 45.8	1.003	111.9	32 45.8	1.003	111.8	34 45.7	1.003	111.7	35 15.6	1.003	111.7	36 15.6	1.003	111.7	7
8	28 44.0	1.003	111.0	29 14.0	1.003	111.0	29 43.9	1.003	111.0	30 43.9	1.003	110.9	32 43.8	1.003	110.8	34 43.7	1.003	110.7	35 13.7	1.003	110.7	36 13.6	1.003	110.7	8
9	28 42.0	1.003	110.0	29 12.0	1.003	110.0	29 42.0	1.003	109.9	30 41.9	1.003	109.9	32 41.8	1.003	109.8	34 41.8	1.003	109.7	35 11.7	1.003	109.7	36 11.7	1.003	109.6	9
70	28 40.0	1.003	109.0	29 10.0	1.003	109.0	29 40.0	1.003	108.9	30 40.0	1.003	108.9	32 39.9	1.003	108.8	34 39.8	1.003	108.7	35 09.8	1.003	108.7	36 09.7	1.003	108.6	70
1	28 38.1	1.003	108.0	29 08.0	1.003	108.0	29 38.0	1.003	107.9	30 38.0	1.003	107.9	32 37.9	1.003	107.8	34 37.8	1.003	107.7	35 07.8	1.003	107.7	36 07.7	1.003	107.6	1
2	28 36.1	1.003	107.0	29 06.0	1.003	107.0	29 36.0	1.003	106.9	30 36.0	1.003	106.9	32 35.9	1.003	106.8	34 35.8	1.003	106.7	35 05.8	1.003	106.6	36 05.7	1.003	106.6	2
3	28 34.1	1.003	106.0	29 04.0	1.003	105.9	29 34.0	1.003	105.9	30 34.0	1.003	105.9	32 33.9	1.003	105.8	34 33.8	1.003	105.7	35 03.8	1.003	105.7	36 03.7	1.003	105.6	3
4	28 32.0	1.003	105.0	29 02.0	1.003	104.9	29 32.0	1.003	104.9	30 31.9	1.003	104.9	32 31.9	1.003	104.8	34 31.8	1.003	104.7	35 01.7	1.003	104.7	36 01.7	1.003	104.6	4
75	28 30.0	1.003	104.0	29 00.0	1.003	103.9	29 29.9	1.003	103.9	30 29.9	1.003	103.9	32 29.8	1.003	103.8	34 29.7	1.003	103.7	34 59.7	1.003	103.7	35 59.6	1.003	103.6	75
6	28 28.0	1.003	103.0	28 57.9	1.003	102.9	29 27.9	1.003	102.9	30 27.9	1.003	102.9	32 27.8	1.003	102.8	34 27.7	1.003	102.7	34 57.7	1.003	102.7	35 57.6	1.003	102.6	6
7	28 25.9	1.003	102.0	28 55.9	1.003	101.9	29 25.9	1.003	101.9	30 25.8	1.003	101.9	32 25.7	1.003	101.8	34 25.6	1.003	101.7	34 55.6	1.003	101.6	35 55.6	1.003	101.6	7
8	28 23.9	1.003	100.9	28 53.9	1.003	100.9	29 23.8	1.003	100.9	30 23.8	1.003	100.9	32 23.7	1.003	100.8	34 23.6	1.003	100.7	34 53.6	1.003	100.6	35 53.5	1.003	100.6	8
9	28 21.8	1.003	99.9	28 51.8	1.003	99.9	29 21.8	1.003	99.9	30 21.7	1.003	99.9	32 21.7	1.003	99.8	34 21.5	1.003	99.7	34 51.5	1.003	99.6	35 51.4	1.003	99.6	9
80	28 19.7	1.003	98.9	28 49.7	1.003	98.9	29 19.7	1.003	98.9	30 19.6	1.003	98.8	32 19.6	1.003	98.8	34 19.5	1.003	98.7	34 49.4	1.003	98.6	35 49.4	1.003	98.6	80
1	28 17.7	1.003	97.9	28 47.7	1.003	97.9	29 17.6	1.003	97.9	30 17.6	1.003	97.8	32 17.5	1.003	97.8	34 17.4	1.003	97.7	34 47.4	1.003	97.6	35 47.3	1.003	97.6	1
2	28 15.6	1.003	96.9	28 45.6	1.003	96.9	29 15.6	1.003	96.9	30 15.5	1.003	96.8	32 15.4	1.003	96.8	34 15.3	1.003	96.7	34 45.3	1.003	96.6	35 45.2	1.003	96.6	2
3	28 13.5	1.003	95.9	28 43.5	1.003	95.9	29 13.5	1.003	95.9	30 13.4	1.003	95.8	32 13.3	1.003	95.8	34 13.2	1.003	95.7	34 43.2	1.003	95.6	35 43.1	1.003	95.6	3
4	28 11.4	1.003	94.9	28 41.4	1.003	94.9	29 11.4	1.003	94.9	30 11.3	1.003	94.8	32 11.2	1.003	94.8	34 11.1	1.003	94.7	34 41.1	1.003	94.6	35 41.1	1.003	94.6	4
85	28 09.4	1.003	93.9	28 39.3	1.003	93.9	29 09.3	1.003	93.9	30 09.3	1.003	93.8	32 09.2	1.003	93.8	34 09.1	1.003	93.7	34 39.0	1.003	93.6	35 39.0	1.003	93.6	85
6	28 07.3	1.003	92.9	28 37.2	1.003	92.9	29 07.2	1.003	92.9	30 07.2	1.003	92.8	32 07.1	1.003	92.7	34 07.0	1.003	92.6	34 36.9	1.003	92.6	35 36.9	1.003	92.6	6
7	28 05.2	1.003	91.9	28 35.1	1.003	91.9	29 05.1	1.003	91.9	30 05.1	1.003	91.8	32 05.0	1.003	91.7	34 04.9	1.003	91.6	34 34.8	1.003	91.6	35 34.8	1.003	91.6	7
8	28 03.1	1.003	90.9	28 33.1	1.003	90.9	29 03.0	1.003	90.9	30 03.0	1.003	90.8	32 02.9	1.003	90.7	34 02.8	1.003	90.6	34 32.7	1.003	90.6	35 32.7	1.003	90.6	8
9	28 01.0	1.003	89.9	28 31.0	1.003	89.9	29 00.9	1.003	89.9	30 00.9	1.003	89.8	32 00.8	1.003	89.7	34 00.7	1.003	89.7	34 30.7	1.003	89.6	35 30.6	1.003	89.6	9
90	27 58.9	1.003	88.9	28 28.9	1.003	88.9	28 58.8	1.003	88.9	29 58.8	1.003	88.8	31 58.7	1.003	88.8	33 58.6	1.003	88.7	34 28.6	1.003	88.7	35 28.5	1.003	88.6	90

Lat. 88°

H.A.	28° 00' Alt.	Az.	28° 30' Alt.	Az.	29° 00' Alt.	Az.	30° 00' Alt.	Az.	32° 00' Alt.	Az.	34° 00' Alt.	Az.	34° 30' Alt.	Az.	35° 30' Alt.	Az.	H.A.
91	27 56.8 1.0 03	87.9	28 26.8 1.0 03	87.9	28 56.7 1.0 03	87.9	29 56.7 1.0 03	87.8	31 56.6 1.0 03	87.7	33 56.5 1.0 03	87.7	34 26.5 1.0 03	87.6	35 26.4 1.0 03	87.6	91
2	27 54.7 1.0 03	86.9	28 24.7 1.0 03	86.9	28 54.7 1.0 03	86.9	29 54.6 1.0 03	86.8	31 54.5 1.0 03	86.8	33 54.4 1.0 03	86.7	34 24.4 1.0 03	86.6	35 24.3 1.0 03	86.6	2
3	27 52.6 1.0 03	85.9	28 22.6 1.0 03	85.9	28 52.6 1.0 03	85.9	29 52.5 1.0 03	85.9	31 52.4 1.0 03	85.8	33 52.3 1.0 03	85.7	34 22.3 1.0 03	85.6	35 22.2 1.0 03	85.6	3
4	27 50.5 1.0 03	84.9	28 20.5 1.0 03	84.9	28 50.5 1.0 03	84.9	29 50.4 1.0 03	84.9	31 50.3 1.0 03	84.8	33 50.2 1.0 03	84.7	34 20.2 1.0 03	84.6	35 20.1 1.0 03	84.6	4
95	27 48.4 1.0 03	83.9	28 18.4 1.0 03	83.9	28 48.4 1.0 03	83.9	29 48.3 1.0 03	83.9	31 48.2 1.0 03	83.8	33 48.1 1.0 03	83.7	34 18.1 1.0 03	83.6	35 18.1 1.0 03	83.6	95
6	27 46.4 1.0 03	82.9	28 16.3 1.0 03	82.9	28 46.3 1.0 03	82.9	29 46.3 1.0 03	82.9	31 46.2 1.0 03	82.8	33 46.1 1.0 03	82.7	34 16.0 1.0 03	82.6	35 16.0 1.0 03	82.6	6
7	27 44.3 1.0 03	82.0	28 14.3 1.0 03	81.9	28 44.2 1.0 03	81.9	29 44.2 1.0 03	81.9	31 44.1 1.0 03	81.8	33 44.0 1.0 03	81.7	34 14.0 1.0 03	81.6	35 13.9 1.0 03	81.6	7
8	27 42.2 1.0 03	81.0	28 12.2 1.0 03	80.9	28 42.2 1.0 03	80.9	29 42.1 1.0 03	80.9	31 42.0 1.0 03	80.8	33 41.9 1.0 03	80.7	34 11.9 1.0 03	80.6	35 11.8 1.0 03	80.6	8
9	27 40.1 1.0 03	80.0	28 10.1 1.0 03	79.9	28 40.1 1.0 03	79.9	29 40.1 1.0 03	79.9	31 40.0 1.0 03	79.8	33 39.9 1.0 03	79.7	34 09.8 1.0 03	79.7	35 09.8 1.0 03	79.6	9
100	27 38.1 1.0 03	79.0	28 08.1 1.0 03	78.9	28 38.0 1.0 03	78.9	29 38.0 1.0 03	78.9	31 37.9 1.0 03	78.8	33 37.8 1.0 03	78.7	34 07.8 1.0 03	78.7	35 07.7 1.0 03	78.6	100
1	27 36.0 1.0 03	78.0	28 06.0 1.0 03	77.9	28 36.0 1.0 03	77.9	29 35.9 1.0 03	77.9	31 35.9 1.0 03	77.8	33 35.8 1.0 03	77.7	34 05.7 1.0 03	77.7	35 05.7 1.0 03	77.6	1
2	27 34.0 1.0 03	77.0	28 04.0 1.0 03	76.9	28 34.0 1.0 03	76.9	29 33.9 1.0 03	76.9	31 33.8 1.0 03	76.8	33 33.7 1.0 03	76.7	34 03.7 1.0 03	76.7	35 03.6 1.0 03	76.6	2
3	27 32.0 1.0 03	76.0	28 01.9 1.0 03	76.0	28 31.9 1.0 03	75.9	29 31.9 1.0 03	75.9	31 31.8 1.0 03	75.8	33 31.7 1.0 03	75.7	34 01.7 1.0 03	75.7	35 01.6 1.0 03	75.6	3
4	27 29.9 1.0 03	75.0	27 59.9 1.0 03	75.0	28 29.9 1.0 03	74.9	29 29.8 1.0 03	74.9	31 29.7 1.0 03	74.8	33 29.7 1.0 03	74.7	33 59.6 1.0 03	74.7	34 59.6 1.0 03	74.6	4
105	27 27.9 1.0 03	74.0	27 57.9 1.0 03	74.0	28 27.9 1.0 03	73.9	29 27.8 1.0 03	73.9	31 27.7 1.0 03	73.8	33 27.6 1.0 03	73.7	33 57.6 1.0 03	73.7	34 57.6 1.0 03	73.6	105
6	27 25.9 1.0 03	73.0	27 55.9 1.0 03	73.0	28 25.9 1.0 03	72.9	29 25.8 1.0 03	72.9	31 25.7 1.0 03	72.8	33 25.6 1.0 03	72.7	33 55.6 1.0 03	72.7	34 55.6 1.0 03	72.6	6
7	27 23.9 1.0 03	72.0	27 53.9 1.0 03	72.0	28 23.9 1.0 03	72.0	29 23.8 1.0 03	71.9	31 23.7 1.0 03	71.8	33 23.6 1.0 03	71.7	33 53.6 1.0 03	71.7	34 53.6 1.0 03	71.7	7
8	27 21.9 1.0 03	71.0	27 51.9 1.0 03	71.0	28 21.9 1.0 03	71.0	29 21.8 1.0 03	70.9	31 21.8 1.0 03	70.8	33 21.7 1.0 03	70.7	33 51.6 1.0 03	70.7	34 51.6 1.0 03	70.7	8
9	27 20.0 1.0 03	70.0	27 49.9 1.0 03	70.0	28 19.9 1.0 03	70.0	29 19.9 1.0 03	69.9	31 19.8 1.0 03	69.8	33 19.7 1.0 03	69.7	33 49.7 1.0 03	69.7	34 49.6 1.0 03	69.7	9
110	27 18.0 1.0 03	69.0	27 48.0 1.0 03	69.0	28 17.9 1.0 03	69.0	29 17.9 1.0 03	68.9	31 17.8 1.0 03	68.8	33 17.7 1.0 03	68.8	33 47.7 1.0 03	68.7	34 47.7 1.0 03	68.7	110
1	27 16.0 1.0 03	68.0	27 46.0 1.0 03	68.0	28 16.0 1.0 03	68.0	29 16.0 1.0 03	67.9	31 15.9 1.0 03	67.9	33 15.8 1.0 03	67.8	33 45.8 1.0 03	67.7	34 45.7 1.0 03	67.7	1
2	27 14.1 1.0 03	67.0	27 44.1 1.0 03	67.0	28 14.1 1.0 03	67.0	29 14.0 1.0 03	66.9	31 13.9 1.0 03	66.9	33 13.9 1.0 03	66.8	33 43.8 1.0 03	66.7	34 43.8 1.0 03	66.7	2
3	27 12.2 1.0 03	66.0	27 42.2 1.0 03	66.0	28 12.1 1.0 03	66.0	29 12.1 1.0 03	66.0	31 12.0 1.0 03	65.9	33 11.9 1.0 03	65.8	33 41.9 1.0 03	65.8	34 41.9 1.0 03	65.7	3
4	27 10.3 1.0 03	65.0	27 40.3 1.0 03	65.0	28 10.2 1.0 03	65.0	29 10.2 1.0 03	65.0	31 10.1 1.0 03	64.9	33 10.0 1.0 03	64.8	33 40.0 1.0 03	64.8	34 40.0 1.0 03	64.7	4
115	27 08.4 1.0 03	64.1	27 38.4 1.0 03	64.0	28 08.3 1.0 03	64.0	29 08.3 1.0 03	64.0	31 08.2 1.0 03	63.9	33 08.1 1.0 03	63.8	33 38.1 1.0 03	63.8	34 38.1 1.0 03	63.7	115
6	27 06.5 1.0 03	63.1	27 36.5 1.0 03	63.0	28 06.5 1.0 03	63.0	29 06.4 1.0 03	63.0	31 06.4 1.0 03	62.9	33 06.3 1.0 03	62.8	33 36.3 1.0 03	62.8	34 36.2 1.0 03	62.7	6
7	27 04.7 1.0 03	62.1	27 34.6 1.0 03	62.1	28 04.6 1.0 03	62.0	29 04.6 1.0 03	62.0	31 04.5 1.0 03	61.9	33 04.4 1.0 03	61.8	33 34.4 1.0 03	61.8	34 34.4 1.0 03	61.8	7
8	27 02.8 1.0 03	61.1	27 32.8 1.0 03	61.1	28 02.8 1.0 03	61.0	29 02.7 1.0 03	61.0	31 02.7 1.0 03	60.9	33 02.6 1.0 03	60.8	33 32.6 1.0 03	60.8	34 32.5 1.0 03	60.8	8
9	27 01.0 1.0 03	60.1	27 31.0 1.0 03	60.1	28 01.0 1.0 03	60.1	29 00.9 1.0 03	60.0	31 00.8 1.0 03	59.9	33 00.8 1.0 03	59.8	33 30.7 1.0 03	59.8	34 30.7 1.0 03	59.8	9
120	26 59.2 1.0 03	59.1	27 29.2 1.0 03	59.1	27 59.1 1.0 03	59.1	28 59.1 1.0 03	59.0	30 59.0 1.0 03	58.9	32 59.0 1.0 03	58.9	33 28.9 1.0 03	58.8	34 28.9 1.0 03	58.8	120
1	26 57.4 1.0 03	58.1	27 27.4 1.0 03	58.1	27 57.4 1.0 03	58.1	28 57.3 1.0 03	58.0	30 57.3 1.0 03	58.0	32 57.2 1.0 03	57.9	33 27.2 1.0 03	57.9	34 27.1 1.0 03	57.8	1
2	26 55.6 1.0 03	57.1	27 25.6 1.0 03	57.1	27 55.6 1.0 03	57.1	28 55.6 1.0 03	57.0	30 55.5 1.0 03	57.0	32 55.4 1.0 03	56.9	33 25.4 1.0 03	56.8	34 25.4 1.0 03	56.8	2
3	26 53.9 1.0 03	56.1	27 23.9 1.0 03	56.1	27 53.9 1.0 03	56.1	28 53.8 1.0 03	56.1	30 53.7 1.0 03	56.0	32 53.7 1.0 03	55.9	33 23.7 1.0 03	55.9	34 23.6 1.0 03	55.8	3
4	26 52.1 1.0 03	55.1	27 22.1 1.0 03	55.1	27 52.1 1.0 03	55.1	28 52.1 1.0 03	55.1	30 52.0 1.0 03	55.0	32 51.9 1.0 03	54.9	33 21.9 1.0 03	54.9	34 21.9 1.0 03	54.8	4
125	26 50.4 1.0 03	54.2	27 20.4 1.0 03	54.1	27 50.4 1.0 03	54.1	28 50.4 1.0 03	54.1	30 50.3 1.0 03	54.0	32 50.2 1.0 03	53.9	33 20.2 1.0 03	53.9	34 20.2 1.0 03	53.9	125
6	26 48.8 1.0 03	53.2	27 18.7 1.0 03	53.1	27 48.7 1.0 03	53.1	28 48.7 1.0 03	53.1	30 48.6 1.0 03	53.0	32 48.6 1.0 03	52.9	33 18.5 1.0 03	52.9	34 18.5 1.0 03	52.9	6
7	26 47.1 1.0 03	52.2	27 17.1 1.0 03	52.2	27 47.1 1.0 03	52.1	28 47.0 1.0 03	52.1	30 47.0 1.0 03	52.0	32 46.9 1.0 03	52.0	33 16.9 1.0 03	51.9	34 16.9 1.0 03	51.9	7
8	26 45.4 1.0 03	51.2	27 15.4 1.0 03	51.2	27 45.4 1.0 03	51.2	28 45.4 1.0 03	51.1	30 45.3 1.0 03	51.0	32 45.3 1.0 03	51.0	33 15.2 1.0 03	51.0	34 15.2 1.0 03	50.9	8
9	26 43.8 1.0 03	50.2	27 13.8 1.0 03	50.2	27 43.8 1.0 03	50.2	28 43.8 1.0 03	50.1	30 43.7 1.0 03	50.1	32 43.6 1.0 03	50.0	33 13.6 1.0 03	50.0	34 13.6 1.0 03	49.9	9
130	26 42.2 1.0 03	49.2	27 12.2 1.0 03	49.2	27 42.2 1.0 03	49.2	28 42.2 1.0 03	49.1	30 42.1 1.0 03	49.1	32 42.1 1.0 03	49.0	33 12.0 1.0 03	49.0	34 12.0 1.0 03	48.9	130
1	26 40.7 1.0 03	48.2	27 10.6 1.0 03	48.2	27 40.6 1.0 03	48.2	28 40.6 1.0 03	48.2	30 40.5 1.0 03	48.1	32 40.5 1.0 03	48.0	33 10.5 1.0 03	48.0	34 10.4 1.0 03	48.0	1
2	26 39.1 1.0 03	47.2	27 09.1 1.0 03	47.2	27 39.1 1.0 03	47.2	28 39.1 1.0 03	47.2	30 39.0 1.0 03	47.1	32 38.9 1.0 03	47.0	33 08.9 1.0 03	47.0	34 08.9 1.0 03	47.0	2
3	26 37.6 1.0 02	46.2	27 07.6 1.0 02	46.2	27 37.6 1.0 02	46.2	28 37.5 1.0 02	46.2	30 37.5 1.0 02	46.1	32 37.4 1.0 02	46.0	33 07.4 1.0 02	46.0	34 07.4 1.0 02	46.0	3
4	26 36.1 1.0 02	45.3	27 06.1 1.0 02	45.2	27 36.1 1.0 02	45.2	28 36.0 1.0 02	45.2	30 36.0 1.0 02	45.1	32 35.9 1.0 02	45.1	33 05.9 1.0 02	45.0	34 05.9 1.0 02	45.0	4
135	26 34.6 1.0 02	44.3	27 04.6 1.0 02	44.3	27 34.6 1.0 02	44.2	28 34.6 1.0 02	44.2	30 34.5 1.0 02	44.1	32 34.5 1.0 02	44.1	33 04.4 1.0 02	44.1	34 04.4 1.0 02	44.0	135
6	26 33.2 1.0 02	43.3	27 03.1 1.0 02	43.3	27 33.1 1.0 02	43.3	28 33.1 1.0 02	43.2	30 33.1 1.0 02	43.2	32 33.0 1.0 02	43.1	33 03.0 1.0 02	43.1	34 03.0 1.0 02	43.0	6
7	26 31.7 1.0 02	42.3	27 01.7 1.0 02	42.3	27 31.7 1.0 02	42.3	28 31.7 1.0 02	42.2	30 31.6 1.0 02	42.2	32 31.6 1.0 02	42.1	33 01.6 1.0 02	42.1	34 01.6 1.0 02	42.1	7
8	26 30.3 1.0 02	41.3	27 00.3 1.0 02	41.3	27 30.3 1.0 02	41.3	28 30.3 1.0 02	41.3	30 30.3 1.0 02	41.2	32 30.2 1.0 02	41.1	33 00.2 1.0 02	41.1	34 00.2 1.0 02	41.1	8
9	26 29.0 1.0 02	40.3	26 59.0 1.0 02	40.3	27 28.9 1.0 02	40.3	28 28.9 1.0 02	40.3	30 28.9 1.0 02	40.2	32 28.8 1.0 02	40.1	32 58.8 1.0 02	40.1	33 58.8 1.0 02	40.1	9
140	26 27.6 1.0 02	39.3	26 57.6 1.0 02	39.3	27 27.6 1.0 02	39.3	28 27.6 1.0 02	39.3	30 27.6 1.0 02	39.2	32 27.5 1.0 02	39.2	32 57.5 1.0 02	39.2	33 57.5 1.0 02	39.1	140
1	26 26.3 1.0 02	38.3	26 56.3 1.0 02	38.3	27 26.3 1.0 02	38.3	28 26.3 1.0 02	38.3	30 26.2 1.0 02	38.2	32 26.2 1.0 02	38.2	32 56.2 1.0 02	38.2	33 56.2 1.0 02	38.1	1
2	26 25.0 1.0 02	37.4	26 55.0 1.0 02	37.4	27 25.0 1.0 02	37.3	28 25.0 1.0 02	37.3	30 25.0 1.0 02	37.3	32 24.9 1.0 02	37.2	32 54.9 1.0 02	37.2	33 54.9 1.0 02	37.2	2
3	26 23.8 1.0 02	36.4	26 53.8 1.0 02	36.4	27 23.8 1.0 02	36.4	28 23.7 1.0 02	36.3	30 23.7 1.0 02	36.3	32 23.7 1.0 02	36.2	32 53.7 1.0 02	36.2	33 53.6 1.0 02	36.2	3
4	26 22.5 1.0 02	35.4	26 52.5 1.0 02	35.4	27 22.5 1.0 02	35.4	28 22.5 1.0 02	35.3	30 22.5 1.0 02	35.3	32 22.4 1.0 02	35.2	32 52.4 1.0 02	35.2	33 52.4 1.0 02	35.2	4
145	26 21.3 1.0 02	34.4	26 51.3 1.0 02	34.4	27 21.3 1.0 02	34.4	28 21.3 1.0 02	34.4	30 21.3 1.0 02	34.3	32 21.3 1.0 02	34.3	32 51.2 1.0 02	34.2	33 51.2 1.0 02	34.2	145
6	26 20.2 1.0 02	33.4	26 50.2 1.0 02	33.4	27 20.2 1.0 02	33.4	28 20.2 1.0 02	33.4	30 20.1 1.0 02	33.3	32 20.1 1.0 02	33.3	32 50.1 1.0 02	33.3	33 50.1 1.0 02	33.2	6
7	26 19.0 1.0 02	32.4	26 49.0 1.0 02	32.4	27 19.0 1.0 02	32.4	28 19.0 1.0 02	32.4	30 19.0 1.0 02	32.3	32 19.0 1.0 02	32.3	32 48.9 1.0 02	32.3	33 48.9 1.0 02	32.3	7
8	26 17.9 1.0 02	31.5	26 47.9 1.0 02	31.4	27 17.9 1.0 02	31.4	28 17.9 1.0 02	31.4	30 17.9 1.0 02	31.4	32 17.9 1.0 02	31.3	32 47.8 1.0 02	31.3	33 47.8 1.0 02	31.3	8
9	26 16.9 1.0 02	30.5	26 46.8 1.0 02	30.5	27 16.8 1.0 02	30.5	28 16.8 1.0 02	30.4	30 16.8 1.0 02	30.4	32 16.8 1.0 02	30.3	32 46.8 1.0 02	30.3	33 46.8 1.0 02	30.3	9
150	26 15.8 1.0 02	29.5	26 45.8 1.0 02	29.5	27 15.8 1.0 02	29.5	28 15.8 1.0 02	29.4	30 15.8 1.0 02	29.4	32 15.7 1.0 02	29.4	32 45.7 1.0 02	29.3	33 45.7 1.0 02	29.3	150
1	26 14.8 1.0 02	28.5	26 44.8 1.0 02	28.5	27 14.8 1.0 02	28.5	28 14.8 1.0 02	28.4	30 14.7 1.0 02	28.4	32 14.7 1.0 02	28.4	32 44.7 1.0 02	28.4	33 44.7 1.0 02	28.3	1
2	26 13.8 1.0 02	27.5	26 43.8 1.0 02	27.5	27 13.8 1.0 02	27.5	28 13.8 1.0 02	27.5	30 13.8 1.0 02	27.4	32 13.7 1.0 02	27.4	32 43.7 1.0 02	27.4	33 43.7 1.0 02	27.4	2
3	26 12.9 1.0 02	26.5	26 42.9 1.0 02	26.5	27 12.8 1.0 02	26.5	28 12.8 1.0 02	26.5	30 12.8 1.0 02	26.5	32 12.8 1.0 02	26.4	32 42.8 1.0 02	26.4	33 42.8 1.0 02	26.4	3
4	26 11.9 1.0 01	25.6	26 41.9 1.0 01	25.5	27 11.9 1.0 01	25.5	28 11.9 1.0 01	25.5	30 11.9 1.0 01	25.5	32 11.9 1.0 01	25.4	32 41.9 1.0 01	25.4	33 41.9 1.0 01	25.4	4
155	26 11.1 1.0 01	24.6	26 41.0 1.0 01	24.6	27 11.0 1.0 01	24.6	28 11.0 1.0 01	24.5	30 11.0 1.0 01	24.5	32 11.0 1.0 01	24.5	32 41.0 1.0 01	24.4	33 41.0 1.0 01	24.4	155
6	26 10.2 1.0 01	23.6	26 40.2 1.0 01	23.6	27 10.2 1.0 01	23.6	28 10.2 1.0 01	23.6	30 10.2 1.0 01	23.5	32 10.1 1.0 01	23.5	32 40.1 1.0 01	23.5	33 40.1 1.0 01	23.4	6
7	26 09.4 1.0 01	22.6	26 39.4 1.0 01	22.6	27 09.4 1.0 01	22.6	28 09.4 1.0 01	22.6	30 09.3 1.0 01	22.5	32 09.3 1.0 01	22.5	32 39.3 1.0 01	22.5	33 39.3 1.0 01	22.5	7
8	26 08.6 1.0 01	21.6	26 38.6 1.0 01	21.6	27 08.6 1.0 01	21.6	28 08.6 1.0 01	21.6	30 08.6 1.0 01	21.6	32 08.5 1.0 01	21.5	32 38.5 1.0 01	21.5	33 38.5 1.0 01	21.5	8
9	26 07.8 1.0 01	20.6	26 37.8 1.0 01	20.6	27 07.8 1.0 01	20.6	28 07.8 1.0 01	20.6	30 07.8 1.0 01	20.6	32 07.8 1.0 01	20.5	32 37.8 1.0 01	20.5	33 37.8 1.0 01	20.5	9
160	26 07.1 1.0 01	19.7	26 37.1 1.0 01	19.6	27 07.1 1.0 01	19.6	28 07.1 1.0 01	19.6	30 07.1 1.0 01	19.6	32 07.1 1.0 01	19.6	32 37.1 1.0 01	19.5	33 37.1 1.0 01	19.5	160
1	26 06.4 1.0 01	18.7	26 36.4 1.0 01	18.7	27 06.4 1.0 01	18.7	28 06.4 1.0 01	18.6	30 06.4 1.0 01	18.6	32 06.4 1.0 01	18.6	32 36.4 1.0 01	18.6	33 36.4 1.0 01	18.6	1
2	26 05.8 1.0 01	17.7	26 35.8 1.0 01	17.7	27 05.8 1.0 01	17.7	28 05.8 1.0 01	17.7	30 05.8 1.0 01	17.6	32 05.7 1.0 01	17.6	32 35.7 1.0 01	17.6	33 35.7 1.0 01	17.6	2
3	26 05.2 1.0 01	16.7	26 35.2 1.0 01	16.7	27 05.1 1.0 01	16.7	28 05.1 1.0 01	16.7	30 05.1 1.0 01	16.7	32 05.1 1.0 01	16.6	32 35.1 1.0 01	16.6	33 35.1 1.0 01	16.6	3
4	26 04.6 1.0 01	15.7	26 34.6 1.0 01	15.7	27 04.6 1.0 01	15.7	28 04.6 1.0 01	15.7	30 04.6 1.0 01	15.7	32 04.5 1.0 01	15.6	32 34.5 1.0 01	15.6	33 34.5 1.0 01	15.6	4
165	26 04.0 1.0 01	14.7	26 34.0 1.0 01	14.7	27 04.0 1.0 01	14.7	28 04.0 1.0 01	14.7	30 04.0 1.0 01	14.7	32 04.0 1.0 01	14.7	32 34.0 1.0 01	14.7	33 34.0 1.0 01	14.6	165
6	26 03.5 1.0 01	13.8	26 33.5 1.0 01	13.7	27 03.5 1.0 01	13.7	28 03.5 1.0 01	13.7	30 03.5 1.0 01	13.7	32 03.5 1.0 01	13.7	32 33.5 1.0 01	13.7	33 33.5 1.0 01	13.7	6
7	26 03.0 1.0 01	12.8	26 33.0 1.0 01	12.8	27 03.0 1.0 01	12.8	28 03.0 1.0 01	12.8	30 03.0 1.0 01	12.7	32 03.0 1.0 01	12.7	32 33.0 1.0 01	12.7	33 33.0 1.0 01	12.7	7
8	26 02.6 1.0 01	11.8	26 32.6 1.0 01	11.8	27 02.6 1.0 01	11.8	28 02.6 1.0 01	11.8	30 02.6 1.0 01	11.8	32 02.6 1.0 01	11.7	32 32.6 1.0 01	11.7	33 32.6 1.0 01	11.7	8
9	26 02.2 1.0 01	10.8	26 32.2 1.0 01	10.8	27 02.2 1.0 01	10.8	28 02.2 1.0 01	10.8	30 02.2 1.0 01	10.8	32 02.2 1.0 01	10.8	32 32.2 1.0 01	10.8	33 32.2 1.0 01	10.7	9
170	26 01.8 1.0 00	09.8	26 31.8 1.0 00	09.8	27 01.8 1.0 00	09.8	28 01.8 1.0 00	09.8	30 01.8 1.0 00	09.8	32 01.8 1.0 01	09.8	32 31.8 1.0 01	09.8	33 31.8 1.0 01	09.8	170
1	26 01.5 1.0 00	08.8	26 31.5 1.0 00	08.8	27 01.5 1.0 00	08.8	28 01.5 1.0 00	08.8	30 01.4 1.0 00	08.8	32 01.4 1.0 00	08.8	32 31.4 1.0 00	08.8	33 31.4 1.0 01	08.8	1
2	26 01.1 1.0 00	07.9	26 31.1 1.0 00	07.9	27 01.1 1.0 00	07.9	28 01.1 1.0 00	07.8	30 01.1 1.0 00	07.8	32 01.1 1.0 00	07.8	32 31.1 1.0 00	07.8	33 31.1 1.0 00	07.8	2
3	26 00.9 1.0 00	06.9	26 30.9 1.0 00	06.9	27 00.9 1.0 00	06.9	28 00.9 1.0 00	06.9	30 00.9 1.0 00	06.9	32 00.9 1.0 00	06.8	32 30.9 1.0 00	06.8	33 30.9 1.0 00	06.8	3
4	26 00.6 1.0 00	05.9	26 30.6 1.0 00	05.9	27 00.6 1.0 00	05.9	28 00.6 1.0 00	05.9	30 00.6 1.0 00	05.9	32 00.6 1.0 00	05.9	32 30.6 1.0 00	05.9	33 30.6 1.0 00	05.9	4
175	26 00.4 1.0 00	04.9	26 30.4 1.0 00	04.9	27 00.4 1.0 00	04.9	28 00.4 1.0 00	04.9	30 00.4 1.0 00	04.9	32 00.4 1.0 00	04.9	32 30.4 1.0 00	04.9	33 30.4 1.0 00	04.9	175
6	26 00.3 1.0 00	03.9	26 30.3 1.0 00	03.9	27 00.3 1.0 00	03.9	28 00.3 1.0 00	03.9	30 00.3 1.0 00	03.9	32 00.3 1.0 00	03.9	32 30.3 1.0 00	03.9	33 30.3 1.0 00	03.9	6
7	26 00.2 1.0 00	02.9	26 30.2 1.0 00	02.9	27 00.2 1.0 00	02.9	28 00.2 1.0 00	02.9	30 00.2 1.0 00	02.9	32 00.2 1.0 00	02.9	32 30.2 1.0 00	02.9	33 30.2 1.0 00	02.9	7
8	26 00.1 1.0 00	02.0	26 30.1 1.0 00	02.0	27 00.1 1.0 00	02.0	28 00.1 1.0 00	02.0	30 00.1 1.0 00	02.0	32 00.1 1.0 00	02.0	32 30.1 1.0 00	02.0	33 30.1 1.0 00	02.0	8
9	26 00.0 1.0 00	01.0	26 30.0 1.0 00	01.0	27 00.0 1.0 00	01.0	28 00.0 1.0 00	01.0	30 00.0 1.0 00	01.0	32 00.0 1.0 00	01.0	32 30.0 1.0 00	01.0	33 30.0 1.0 00	01.0	9
180	26 00.0 1.0 00	00.0	26 30.0 1.0 00	00.0	27 00.0 1.0 00	00.0	28 00.0 1.0 00	00.0	30 00.0 1.0 00	00.0	32 00.0 1.0 00	00.0	32 30.0 1.0 00	00.0	33 30.0 1.0 00	00.0	180

Lat. 89°

Lat. 38°

Each declination column gives **Alt.** (° ′ Δd) and **Az.** (Δt °).

H.A.	36° 00′ Alt. Δd Δt	Az.	37° 00′ Alt. Δd Δt	Az.	38° 30′ Alt. Δd Δt	Az.	40° 00′ Alt. Δd Δt	Az.	42° 00′ Alt. Δd Δt	Az.	42° 30′ Alt. Δd Δt	Az.	43° 00′ Alt. Δd Δt	Az.	45° 00′ Alt. Δd Δt	Az.	H.A.
00	38 00.0 1.00 0	180.0	39 00.0 1.00 0	180.0	40 30.0 1.00 0	180.0	42 00.0 1.00 0	180.0	44 00.0 1.00 0	180.0	44 30.0 1.00 0	180.0	45 00.0 1.00 0	180.0	47 00.0 1.00 0	180.0	00
1	38 00.0 1.00 0	179.0	39 00.0 1.00 0	179.0	40 30.0 1.00 0	179.0	42 00.0 1.00 0	179.0	44 00.0 1.00 0	179.0	44 30.0 1.00 0	179.0	45 00.0 1.00 0	179.0	47 00.0 1.00 0	179.0	1
2	37 59.9 1.00 0	177.9	38 59.9 1.00 0	177.9	40 29.9 1.00 0	177.9	41 59.9 1.00 0	177.9	43 59.9 1.00 0	177.9	44 29.9 1.00 0	177.9	44 59.9 1.00 0	177.9	46 59.9 1.00 0	177.9	2
3	37 59.8 1.00 0	176.9	38 59.8 1.00 0	176.9	40 29.8 1.00 0	176.9	41 59.8 1.00 0	176.9	43 59.8 1.00 0	176.9	44 29.8 1.00 0	176.9	44 59.8 1.00 0	176.9	46 59.8 1.00 0	176.9	3
4	37 59.7 1.00 0	175.9	38 59.7 1.00 0	175.9	40 29.7 1.00 0	175.9	41 59.7 1.00 0	175.9	43 59.7 1.00 0	175.9	44 29.7 1.00 0	175.9	44 59.7 1.00 0	175.9	46 59.7 1.00 0	175.9	4
05	37 59.5 1.00 0	174.9	38 59.5 1.00 0	174.9	40 29.5 1.00 0	174.9	41 59.5 1.00 0	174.8	43 59.5 1.00 0	174.8	44 29.5 1.00 0	174.8	44 59.5 1.00 0	174.8	46 59.5 1.00 0	174.8	05
6	37 59.3 1.00 0	173.8	38 59.3 1.00 0	173.8	40 29.3 1.00 0	173.8	41 59.3 1.00 0	173.8	43 59.3 1.00 0	173.8	44 29.3 1.00 0	173.8	44 59.3 1.00 0	173.8	46 59.3 1.00 0	173.8	6
7	37 59.1 1.00 0	172.8	38 59.1 1.00 0	172.8	40 29.1 1.00 0	172.8	41 59.1 1.00 0	172.8	43 59.1 1.00 0	172.8	44 29.1 1.00 0	172.8	44 59.1 1.00 0	172.8	46 59.1 1.00 0	172.7	7
8	37 58.8 1.00 1	171.8	38 58.8 1.00 1	171.8	40 28.8 1.00 1	171.8	41 58.8 1.00 1	171.8	43 58.8 1.00 1	171.7	44 28.8 1.00 1	171.7	44 58.8 1.00 1	171.7	46 58.8 1.00 1	171.7	8
9	37 58.5 1.00 1	170.8	38 58.5 1.00 1	170.8	40 28.5 1.00 1	170.7	41 58.5 1.00 1	170.7	43 58.5 1.00 1	170.7	44 28.5 1.00 1	170.7	44 58.5 1.00 1	170.7	46 58.5 1.00 1	170.7	9
10	37 58.1 1.00 1	169.7	38 58.1 1.00 1	169.7	40 28.1 1.00 1	169.7	41 58.1 1.00 1	169.7	43 58.1 1.00 1	169.7	44 28.1 1.00 1	169.6	44 58.1 1.00 1	169.6	46 58.1 1.00 1	169.6	10
1	37 57.7 1.00 1	168.7	38 57.7 1.00 1	168.7	40 27.7 1.00 1	168.7	41 57.7 1.00 1	168.7	43 57.7 1.00 1	168.6	44 27.7 1.00 1	168.6	44 57.7 1.00 1	168.6	46 57.7 1.00 1	168.6	1
2	37 57.3 1.00 1	167.7	38 57.3 1.00 1	167.7	40 27.3 1.00 1	167.7	41 57.3 1.00 1	167.6	43 57.3 1.00 1	167.6	44 27.3 1.00 1	167.6	44 57.3 1.00 1	167.6	46 57.3 1.00 1	167.6	2
3	37 56.8 1.00 1	166.7	38 56.8 1.00 1	166.6	40 26.8 1.00 1	166.6	41 56.8 1.00 1	166.6	43 56.8 1.00 1	166.6	44 26.8 1.00 1	166.6	44 56.8 1.00 1	166.6	46 56.8 1.00 1	166.5	3
4	37 56.3 1.00 1	165.6	38 56.3 1.00 1	165.6	40 26.3 1.00 1	165.6	41 56.3 1.00 1	165.6	43 56.3 1.00 1	165.5	44 26.3 1.00 1	165.5	44 56.3 1.00 1	165.5	46 56.3 1.00 1	165.5	4
15	37 55.8 1.00 1	164.6	38 55.8 1.00 1	164.6	40 25.8 1.00 1	164.6	41 55.8 1.00 1	164.5	43 55.8 1.00 1	164.5	44 25.8 1.00 1	164.5	44 55.8 1.00 1	164.5	46 55.8 1.00 1	164.5	15
6	37 55.2 1.00 1	163.6	38 55.2 1.00 1	163.6	40 25.2 1.00 1	163.6	41 55.2 1.00 1	163.5	43 55.2 1.00 1	163.5	44 25.2 1.00 1	163.5	44 55.2 1.00 1	163.5	46 55.2 1.00 1	163.4	6
7	37 54.6 1.00 1	162.6	38 54.6 1.00 1	162.5	40 24.6 1.00 1	162.5	41 54.6 1.00 1	162.5	43 54.6 1.00 1	162.4	44 24.6 1.00 1	162.4	44 54.6 1.00 1	162.4	46 54.6 1.00 1	162.4	7
8	37 54.0 1.00 1	161.5	38 54.0 1.00 1	161.5	40 24.0 1.00 1	161.5	41 54.0 1.00 1	161.5	43 53.9 1.00 1	161.4	44 23.9 1.00 1	161.4	44 53.9 1.00 1	161.4	46 53.9 1.00 1	161.4	8
9	37 53.3 1.00 1	160.5	38 53.3 1.00 1	160.5	40 23.3 1.00 1	160.5	41 53.3 1.00 1	160.5	43 53.3 1.00 1	160.4	44 23.3 1.00 1	160.4	44 53.2 1.00 1	160.4	46 53.2 1.00 1	160.3	9
20	37 52.6 1.00 1	159.5	38 52.6 1.00 1	159.5	40 22.6 1.00 1	159.4	41 52.5 1.00 1	159.4	43 52.5 1.00 1	159.4	44 22.5 1.00 1	159.3	44 52.5 1.00 1	159.3	46 52.5 1.00 1	159.3	20
1	37 51.8 1.00 1	158.5	38 51.8 1.00 1	158.5	40 21.8 1.00 1	158.4	41 51.8 1.00 1	158.4	43 51.8 1.00 1	158.3	44 21.8 1.00 1	158.3	44 51.8 1.00 1	158.3	46 51.7 1.00 1	158.2	1
2	37 51.0 1.00 1	157.4	38 51.0 1.00 1	157.4	40 21.0 1.00 1	157.4	41 51.0 1.00 1	157.3	43 51.0 1.00 1	157.3	44 21.0 1.00 1	157.3	44 51.0 1.00 1	157.3	46 51.0 1.00 1	157.2	2
3	37 50.2 1.00 1	156.4	38 50.2 1.00 1	156.4	40 20.2 1.00 1	156.3	41 50.2 1.00 1	156.3	43 50.2 1.00 1	156.3	44 20.2 1.00 1	156.2	44 50.1 1.00 1	156.2	46 50.1 1.00 1	156.2	3
4	37 49.4 1.00 1	155.4	38 49.4 1.00 1	155.4	40 19.3 1.00 1	155.3	41 49.3 1.00 1	155.3	43 49.3 1.00 1	155.2	44 19.3 1.00 2	155.2	44 49.3 1.00 1	155.2	46 49.3 1.00 2	155.1	4
25	37 48.5 1.00 2	154.4	38 48.5 1.00 2	154.3	40 18.4 1.00 2	154.3	41 48.4 1.00 2	154.2	43 48.4 1.00 2	154.2	44 18.4 1.00 2	154.2	44 48.4 1.00 2	154.2	46 48.4 1.00 2	154.1	25
6	37 47.6 1.00 2	153.3	38 47.5 1.00 2	153.3	40 17.5 1.00 2	153.3	41 47.5 1.00 2	153.2	43 47.5 1.00 2	153.2	44 17.5 1.00 2	153.1	44 47.5 1.00 2	153.1	46 47.4 1.00 2	153.1	6
7	37 46.6 1.00 2	152.3	38 46.6 1.00 2	152.3	40 16.6 1.00 2	152.2	41 46.5 1.00 2	152.2	43 46.5 1.00 2	152.1	44 16.5 1.00 2	152.1	44 46.5 1.00 2	152.1	46 46.5 1.00 2	152.0	7
8	37 45.6 1.00 2	151.3	38 45.6 1.00 2	151.3	40 15.6 1.00 2	151.2	41 45.6 1.00 2	151.2	43 45.5 1.00 2	151.1	44 15.5 1.00 2	151.1	44 45.5 1.00 2	151.1	46 45.5 1.00 2	151.0	8
9	37 44.6 1.00 2	150.2	38 44.6 1.00 2	150.2	40 14.5 1.00 2	150.2	41 44.5 1.00 2	150.1	43 44.5 1.00 2	150.1	44 14.5 1.00 2	150.1	44 44.5 1.00 2	150.1	46 44.4 1.00 2	150.0	9
30	37 43.5 1.00 2	149.2	38 43.5 1.00 2	149.2	40 13.5 1.00 2	149.2	41 43.5 1.00 2	149.1	43 43.4 1.00 2	149.1	44 13.4 1.00 2	149.0	44 43.4 1.00 2	149.0	46 43.4 1.00 2	149.0	30
1	37 42.4 1.00 2	148.2	38 42.4 1.00 2	148.2	40 12.4 1.00 2	148.1	41 42.4 1.00 2	148.1	43 42.3 1.00 2	148.0	44 12.3 1.00 2	148.0	44 42.3 1.00 2	148.0	46 42.3 1.00 2	147.9	1
2	37 41.3 1.00 2	147.2	38 41.3 1.00 2	147.2	40 11.3 1.00 2	147.1	41 41.3 1.00 2	147.1	43 41.2 1.00 2	147.0	44 11.2 1.00 2	147.0	44 41.2 1.00 2	147.0	46 41.2 1.00 2	146.9	2
3	37 40.2 1.00 2	146.2	38 40.2 1.00 2	146.1	40 10.1 1.00 2	146.1	41 40.1 1.00 2	146.0	43 40.1 1.00 2	146.0	44 10.0 1.00 2	146.0	44 40.0 1.00 2	145.9	46 40.0 1.00 2	145.9	3
4	37 39.0 1.00 2	145.2	38 39.0 1.00 2	145.1	40 09.0 1.00 2	145.1	41 38.9 1.00 2	145.0	43 38.9 1.00 2	144.9	44 08.9 1.00 2	144.9	44 38.8 1.00 2	144.9	46 38.6 1.00 2	144.9	4
35	37 37.8 1.00 2	144.1	38 37.8 1.00 2	144.1	40 07.7 1.00 2	144.0	41 37.7 1.00 2	144.0	43 37.7 1.00 2	143.9	44 07.6 1.00 2	143.9	44 37.6 1.00 2	143.9	46 37.6 1.00 2	143.8	35
6	37 36.5 1.00 2	143.1	38 36.5 1.00 2	143.1	40 06.5 1.00 2	143.0	41 36.5 1.00 2	143.0	43 36.4 1.00 2	142.9	44 06.4 1.00 2	142.9	44 36.4 1.00 2	142.9	46 36.3 1.00 2	142.8	6
7	37 35.3 1.00 2	142.1	38 35.3 1.00 2	142.1	40 05.2 1.00 2	142.0	41 35.2 1.00 2	141.9	43 35.1 1.00 2	141.9	44 05.1 1.00 2	141.9	44 35.1 1.00 2	141.8	46 35.0 1.00 2	141.7	7
8	37 34.0 1.00 2	141.1	38 33.9 1.00 2	141.0	40 03.9 1.00 2	141.0	41 33.9 1.00 2	140.9	43 33.8 1.00 2	140.8	44 03.8 1.00 2	140.8	44 33.8 1.00 2	140.8	46 33.7 1.00 2	140.7	8
9	37 32.6 1.00 2	140.0	38 32.6 1.00 2	140.0	40 02.6 1.00 2	140.0	41 32.5 1.00 2	139.9	43 32.4 1.00 2	139.8	44 02.5 1.00 2	139.8	44 32.5 1.00 2	139.8	46 32.4 1.00 2	139.7	9
40	37 31.3 1.00 2	139.0	38 31.3 1.00 2	139.0	40 01.2 1.00 2	138.9	41 31.2 1.00 2	138.9	43 31.1 1.00 2	138.8	44 01.1 1.00 2	138.8	44 31.1 1.00 2	138.8	46 31.0 1.00 2	138.7	40
1	37 29.9 1.00 2	138.0	38 29.9 1.00 2	137.9	39 59.8 1.00 2	137.9	41 29.7 1.00 2	137.9	43 29.7 1.00 2	137.8	43 59.7 1.00 2	137.8	44 29.7 1.00 2	137.7	46 29.6 1.00 2	137.6	1
2	37 28.5 1.00 2	137.0	38 28.4 1.00 2	137.0	39 58.4 1.00 2	136.9	41 28.4 1.00 2	136.8	43 28.3 1.00 2	136.7	43 58.3 1.00 2	136.7	44 28.3 1.00 2	136.7	46 28.2 1.00 2	136.6	2
3	37 27.0 1.00 2	136.0	38 27.0 1.00 2	135.9	39 57.0 1.00 2	135.9	41 26.9 1.00 2	135.8	43 26.9 1.00 2	135.7	43 56.8 1.00 2	135.7	44 26.8 1.00 2	135.7	46 26.8 1.00 2	135.6	3
4	37 25.6 1.00 2	135.0	38 25.5 1.00 2	134.9	39 55.5 1.00 2	134.9	41 25.4 1.00 2	134.8	43 25.4 1.00 2	134.7	43 55.4 1.00 2	134.7	44 25.3 1.00 2	134.7	46 25.3 1.00 2	134.6	4
45	37 24.1 1.00 3	133.9	38 24.0 1.00 3	133.9	39 54.0 1.00 3	133.8	41 23.9 1.00 3	133.8	43 23.9 1.00 3	133.7	43 53.9 1.00 3	133.7	44 23.8 1.00 3	133.6	46 23.8 1.00 3	133.5	45
6	37 22.5 1.00 3	132.9	38 22.5 1.00 3	132.9	39 52.5 1.00 3	132.8	41 22.4 1.00 3	132.8	43 22.4 1.00 3	132.7	43 52.3 1.00 3	132.6	44 22.3 1.00 3	132.6	46 22.2 1.00 3	132.5	6
7	37 21.0 1.00 3	131.9	38 21.0 1.00 3	131.9	39 50.9 1.00 3	131.8	41 20.9 1.00 3	131.7	43 20.8 1.00 3	131.6	43 50.8 1.00 3	131.6	44 20.8 1.00 3	131.6	46 20.7 1.00 3	131.5	7
8	37 19.4 1.00 3	130.9	38 19.4 1.00 3	130.8	39 49.3 1.00 3	130.8	41 19.3 1.00 3	130.7	43 19.2 1.00 3	130.6	43 49.2 1.00 3	130.6	44 19.2 1.00 3	130.6	46 19.1 1.00 3	130.5	8
9	37 17.8 1.00 3	129.9	38 17.8 1.00 3	129.8	39 47.8 1.00 3	129.8	41 17.7 1.00 3	129.7	43 17.6 1.00 3	129.6	43 47.6 1.00 3	129.6	44 17.6 1.00 3	129.5	46 17.5 1.00 3	129.4	9
50	37 16.2 1.00 3	128.9	38 16.2 1.00 3	128.8	39 46.1 1.00 3	128.7	41 16.1 1.00 3	128.7	43 16.0 1.00 3	128.6	43 46.0 1.00 3	128.6	44 16.0 1.00 3	128.5	46 15.9 1.00 3	128.4	50
1	37 14.6 1.00 3	127.8	38 14.5 1.00 3	127.8	39 44.5 1.00 3	127.7	41 14.4 1.00 3	127.7	43 14.3 1.00 3	127.6	43 44.3 1.00 3	127.5	44 14.3 1.00 3	127.5	46 14.2 1.00 3	127.4	1
2	37 12.9 1.00 3	126.8	38 12.9 1.00 3	126.8	39 42.8 1.00 3	126.7	41 12.8 1.00 3	126.6	43 12.7 1.00 3	126.5	43 42.7 1.00 3	126.5	44 12.6 1.00 3	126.5	46 12.5 1.00 3	126.4	2
3	37 11.2 1.00 3	125.8	38 11.2 1.00 3	125.8	39 41.2 1.00 3	125.7	41 11.1 1.00 3	125.6	43 11.0 1.00 3	125.5	43 41.0 1.00 3	125.5	44 10.9 1.00 3	125.5	46 10.8 1.00 3	125.4	3
4	37 09.5 1.00 3	124.8	38 09.5 1.00 3	124.7	39 39.4 1.00 3	124.7	41 09.4 1.00 3	124.6	43 09.3 1.00 3	124.5	43 39.2 1.00 3	124.5	44 09.2 1.00 3	124.4	46 09.1 1.00 3	124.3	4
55	37 07.8 1.00 3	123.8	38 07.7 1.00 3	123.7	39 37.7 1.00 3	123.7	41 07.6 1.00 3	123.6	43 07.5 1.00 3	123.5	43 37.5 1.00 3	123.5	44 07.5 1.00 3	123.4	46 07.4 1.00 3	123.3	55
6	37 06.0 1.00 3	122.8	38 06.0 1.00 3	122.7	39 35.9 1.00 3	122.6	41 05.9 1.00 3	122.6	43 05.8 1.00 3	122.5	43 35.8 1.00 3	122.4	44 05.7 1.00 3	122.4	46 05.6 1.00 3	122.3	6
7	37 04.3 1.00 3	121.7	38 04.2 1.00 3	121.7	39 34.2 1.00 3	121.6	41 04.1 1.00 3	121.6	43 04.0 1.00 3	121.4	43 34.0 1.00 3	121.4	44 03.9 1.00 3	121.4	46 03.8 1.00 3	121.3	7
8	37 02.5 1.00 3	120.7	38 02.4 1.00 3	120.7	39 32.4 1.00 3	120.6	41 02.3 1.00 3	120.5	43 02.2 1.00 3	120.4	43 32.2 1.00 3	120.4	44 02.2 1.00 3	120.4	46 02.0 1.00 3	120.3	8
9	37 00.7 1.00 3	119.7	38 00.6 1.00 3	119.7	39 30.6 1.00 3	119.6	41 00.5 1.00 3	119.5	43 00.4 1.00 3	119.4	43 30.4 1.00 3	119.4	44 00.3 1.00 3	119.4	46 00.0 1.00 3	119.2	9
60	36 58.8 1.00 3	118.7	37 58.8 1.00 3	118.7	39 28.7 1.00 3	118.6	40 58.7 1.00 3	118.5	42 58.6 1.00 3	118.4	43 28.5 1.00 3	118.4	43 58.5 1.00 3	118.3	45 58.4 1.00 3	118.2	60
1	36 57.0 1.00 3	117.7	37 56.9 1.00 3	117.6	39 26.9 1.00 3	117.6	40 56.8 1.00 3	117.5	42 56.7 1.00 3	117.4	43 26.7 1.00 3	117.4	43 56.6 1.00 3	117.3	45 56.5 1.00 3	117.2	1
2	36 55.1 1.00 3	116.7	37 55.1 1.00 3	116.6	39 25.0 1.00 3	116.6	40 54.9 1.00 3	116.5	42 54.8 1.00 3	116.4	43 24.8 1.00 3	116.3	43 54.8 1.00 3	116.3	45 54.7 1.00 3	116.2	2
3	36 53.2 1.00 3	115.7	37 53.2 1.00 3	115.6	39 23.1 1.00 3	115.6	40 53.0 1.00 3	115.5	42 52.9 1.00 3	115.4	43 22.9 1.00 3	115.3	43 52.9 1.00 3	115.3	45 52.8 1.00 3	115.2	3
4	36 51.4 1.00 3	114.7	37 51.3 1.00 3	114.6	39 21.2 1.00 3	114.5	40 51.1 1.00 3	114.5	42 51.1 1.00 3	114.3	43 21.0 1.00 3	114.3	43 51.0 1.00 3	114.3	45 50.9 1.00 3	114.2	4
65	36 49.4 1.00 3	113.7	37 49.4 1.00 3	113.6	39 19.3 1.00 3	113.5	40 49.2 1.00 3	113.4	42 49.1 1.00 3	113.3	43 19.1 1.00 3	113.3	43 49.1 1.00 3	113.3	45 49.0 1.00 3	113.1	65
6	36 47.5 1.00 3	112.6	37 47.5 1.00 3	112.6	39 17.4 1.00 3	112.5	40 47.3 1.00 3	112.4	42 47.2 1.00 3	112.3	43 17.2 1.00 3	112.3	43 47.1 1.00 3	112.3	45 47.0 1.00 3	112.1	6
7	36 45.6 1.00 3	111.6	37 45.5 1.00 3	111.6	39 15.5 1.00 3	111.5	40 45.4 1.00 3	111.4	42 45.2 1.00 3	111.3	43 15.2 1.00 3	111.3	43 45.2 1.00 3	111.2	45 45.1 1.00 3	111.1	7
8	36 43.6 1.00 3	110.6	37 43.6 1.00 3	110.6	39 13.5 1.00 3	110.5	40 43.4 1.00 3	110.4	42 43.3 1.00 3	110.3	43 13.3 1.00 3	110.3	43 43.2 1.00 3	110.2	45 43.1 1.00 3	110.1	8
9	36 41.7 1.00 3	109.6	37 41.6 1.00 3	109.6	39 11.5 1.00 3	109.5	40 41.4 1.00 3	109.4	42 41.3 1.00 3	109.3	43 11.3 1.00 3	109.3	43 41.3 1.00 3	109.2	45 41.1 1.00 3	109.1	9
70	36 39.7 1.00 3	108.6	37 39.6 1.00 3	108.6	39 09.5 1.00 3	108.5	40 39.5 1.00 3	108.4	42 39.4 1.00 3	108.3	43 09.3 1.00 3	108.2	43 39.3 1.00 3	108.2	45 39.2 1.00 3	108.1	70
1	36 37.7 1.00 3	107.6	37 37.6 1.00 3	107.6	39 07.6 1.00 3	107.5	40 37.5 1.00 3	107.4	42 37.4 1.00 3	107.3	43 07.3 1.00 3	107.2	43 37.3 1.00 3	107.2	45 37.2 1.00 3	107.1	1
2	36 35.7 1.00 3	106.6	37 35.6 1.00 3	106.6	39 05.6 1.00 3	106.5	40 35.5 1.00 3	106.4	42 35.4 1.00 3	106.3	43 05.3 1.00 3	106.2	43 35.3 1.00 3	106.2	45 35.2 1.00 3	106.1	2
3	36 33.7 1.00 3	105.6	37 33.6 1.00 3	105.5	39 03.5 1.00 3	105.4	40 33.4 1.00 3	105.4	42 33.3 1.00 3	105.3	43 03.3 1.00 3	105.2	43 33.3 1.00 3	105.2	45 33.1 1.00 3	105.1	3
4	36 31.7 1.00 3	104.6	37 31.6 1.00 3	104.5	39 01.5 1.00 3	104.5	40 31.4 1.00 3	104.4	42 31.3 1.00 3	104.2	43 01.3 1.00 3	104.2	43 31.2 1.00 3	104.2	45 31.1 1.00 3	104.1	4
75	36 29.6 1.00 3	103.6	37 29.6 1.00 3	103.5	38 59.5 1.00 3	103.4	40 29.4 1.00 3	103.4	42 29.3 1.00 3	103.2	42 59.2 1.00 3	103.2	43 29.2 1.00 3	103.2	45 29.1 1.00 3	103.0	75
6	36 27.6 1.00 3	102.6	37 27.5 1.00 3	102.5	38 57.4 1.00 3	102.4	40 27.4 1.00 3	102.4	42 27.2 1.00 3	102.2	42 57.2 1.00 3	102.2	43 27.2 1.00 3	102.1	45 27.0 1.00 3	102.0	6
7	36 25.5 1.00 3	101.6	37 25.5 1.00 3	101.5	38 55.4 1.00 3	101.4	40 25.3 1.00 3	101.3	42 25.2 1.00 3	101.2	42 55.1 1.00 3	101.2	43 25.1 1.00 3	101.1	45 25.0 1.00 3	101.0	7
8	36 23.5 1.00 3	100.6	37 23.4 1.00 3	100.5	38 53.3 1.00 3	100.4	40 23.3 1.00 3	100.3	42 23.1 1.00 3	100.2	42 53.1 1.00 3	100.2	43 23.1 1.00 3	100.1	45 22.9 1.00 3	100.0	8
9	36 21.4 1.00 3	99.6	37 21.4 1.00 3	99.5	38 51.3 1.00 3	99.4	40 21.2 1.00 3	99.3	42 21.1 1.00 3	99.2	42 51.0 1.00 3	99.2	43 21.0 1.00 3	99.2	45 20.9 1.00 3	99.0	9
80	36 19.4 1.00 3	98.6	37 19.3 1.00 3	98.5	38 49.2 1.00 3	98.4	40 19.1 1.00 3	98.3	42 19.0 1.00 3	98.2	42 49.0 1.00 3	98.2	43 18.9 1.00 3	98.1	45 18.8 1.00 3	98.0	80
1	36 17.3 1.00 3	97.6	37 17.2 1.00 3	97.5	38 47.1 1.00 3	97.4	40 17.0 1.00 3	97.3	42 16.9 1.00 3	97.2	42 46.9 1.00 3	97.2	43 16.9 1.00 3	97.1	45 16.7 1.00 3	97.0	1
2	36 15.2 1.00 3	96.6	37 15.1 1.00 3	96.5	38 45.1 1.00 3	96.4	40 15.0 1.00 3	96.3	42 14.8 1.00 3	96.2	42 44.8 1.00 3	96.2	43 14.8 1.00 3	96.1	45 14.6 1.00 3	96.0	2
3	36 13.1 1.00 3	95.5	37 13.1 1.00 3	95.5	38 43.0 1.00 3	95.4	40 12.9 1.00 3	95.3	42 12.8 1.00 3	95.2	42 42.7 1.00 3	95.2	43 12.7 1.00 3	95.1	45 12.6 1.00 3	95.0	3
4	36 11.0 1.00 3	94.5	37 11.0 1.00 3	94.5	38 40.9 1.00 3	94.4	40 10.8 1.00 3	94.3	42 10.7 1.00 3	94.2	42 40.6 1.00 3	94.2	43 10.6 1.00 3	94.1	45 10.5 1.00 3	94.0	4
85	36 08.9 1.00 3	93.5	37 08.9 1.00 3	93.5	38 38.8 1.00 3	93.4	40 08.7 1.00 3	93.3	42 08.6 1.00 3	93.2	42 38.5 1.00 3	93.2	43 08.5 1.00 3	93.1	45 08.4 1.00 3	93.0	85
6	36 06.9 1.00 3	92.5	37 06.8 1.00 3	92.5	38 36.7 1.00 3	92.4	40 06.6 1.00 3	92.3	42 06.5 1.00 3	92.2	42 36.5 1.00 3	92.2	43 06.4 1.00 3	92.1	45 06.3 1.00 3	92.0	6
7	36 04.7 1.00 3	91.5	37 04.7 1.00 3	91.5	38 34.6 1.00 3	91.4	40 04.5 1.00 3	91.3	42 04.4 1.00 3	91.2	42 34.4 1.00 3	91.2	43 04.3 1.00 3	91.1	45 04.2 1.00 3	91.0	7
8	36 02.7 1.00 3	90.5	37 02.6 1.00 3	90.5	38 32.5 1.00 3	90.4	40 02.4 1.00 3	90.3	42 02.3 1.00 3	90.2	42 32.3 1.00 3	90.2	43 02.2 1.00 3	90.1	45 02.1 1.00 3	90.0	8
9	36 00.6 1.00 3	89.5	37 00.5 1.00 3	89.5	38 30.4 1.00 3	89.4	40 00.3 1.00 3	89.3	42 00.2 1.00 3	89.2	42 30.2 1.00 3	89.2	43 00.1 1.00 3	89.1	45 00.0 1.00 3	89.0	9
90	35 58.5 1.00 3	88.5	36 58.4 1.00 3	88.5	38 28.3 1.00 3	88.4	39 58.2 1.00 3	88.3	41 58.1 1.00 3	88.2	42 28.1 1.00 3	88.2	42 58.0 1.00 3	88.1	44 57.9 1.00 3	88.0	90

Lat. 36°

H.A.	36° 00' Alt.	Az.	37° 00' Alt.	Az.	38° 30' Alt.	Az.	40° 00' Alt.	Az.	42° 00' Alt.	Az.	42° 30' Alt.	Az.	43° 00' Alt.	Az.	45° 00' Alt.	Az.	H.A.
91	35 56.4 1.0 03	87.5	36 56.3 1.0 03	87.5	38 26.2 1.0 03	87.4	39 56.1 1.0 03	87.3	41 56.0 1.0 03	87.2	42 26.0 1.0 03	87.2	42 56.0 1.0 03	87.1	44 55.8 1.0 03	87.0	91
2	35 54.3 1.0 03	86.6	36 54.2 1.0 03	86.5	38 24.2 1.0 03	86.4	39 54.1 1.0 03	86.3	41 53.9 1.0 03	86.2	42 23.9 1.0 03	86.2	42 53.9 1.0 03	86.1	44 53.7 1.0 03	86.0	2
3	35 52.2 1.0 03	85.6	36 52.1 1.0 03	85.5	38 22.1 1.0 03	85.4	39 52.0 1.0 03	85.3	41 51.8 1.0 03	85.2	42 21.8 1.0 03	85.2	42 51.8 1.0 03	85.1	44 51.6 1.0 03	85.0	3
4	35 50.1 1.0 03	84.6	36 50.1 1.0 03	84.5	38 20.0 1.0 03	84.4	39 49.9 1.0 03	84.3	41 49.8 1.0 03	84.2	42 19.7 1.0 03	84.2	42 49.7 1.0 03	84.1	44 49.6 1.0 03	84.0	4
95	35 48.0 1.0 03	83.6	36 48.0 1.0 03	83.5	38 17.9 1.0 03	83.4	39 47.8 1.0 03	83.3	41 47.7 1.0 03	83.2	42 17.6 1.0 03	83.2	42 47.6 1.0 03	83.2	44 47.5 1.0 03	83.0	95
6	35 46.0 1.0 03	82.6	36 45.9 1.0 03	82.5	38 15.8 1.0 03	82.4	39 45.7 1.0 03	82.3	41 45.6 1.0 03	82.2	42 15.6 1.0 03	82.2	42 45.5 1.0 03	82.2	44 45.4 1.0 03	82.0	6
7	35 43.9 1.0 03	81.6	36 43.8 1.0 03	81.5	38 13.7 1.0 03	81.4	39 43.7 1.0 03	81.3	41 43.5 1.0 03	81.2	42 13.5 1.0 03	81.2	42 43.5 1.0 03	81.2	44 43.3 1.0 03	81.0	7
8	35 41.8 1.0 03	80.6	36 41.8 1.0 03	80.5	38 11.7 1.0 03	80.4	39 41.6 1.0 03	80.4	41 41.5 1.0 03	80.2	42 11.4 1.0 03	80.2	42 41.4 1.0 03	80.2	44 41.3 1.0 03	80.0	8
9	35 39.8 1.0 03	79.6	36 39.7 1.0 03	79.5	38 09.6 1.0 03	79.4	39 39.5 1.0 03	79.4	41 39.4 1.0 03	79.2	42 09.4 1.0 03	79.2	42 39.3 1.0 03	79.2	44 39.2 1.0 03	79.0	9
100	35 37.7 1.0 03	78.6	36 37.6 1.0 03	78.5	38 07.6 1.0 03	78.4	39 37.5 1.0 03	78.4	41 37.3 1.0 03	78.2	42 07.3 1.0 03	78.2	42 37.3 1.0 03	78.2	44 37.1 1.0 03	78.0	100
1	35 35.6 1.0 03	77.6	36 35.6 1.0 03	77.5	38 05.5 1.0 03	77.5	39 35.4 1.0 03	77.4	41 35.3 1.0 03	77.2	42 05.3 1.0 03	77.2	42 35.2 1.0 03	77.2	44 35.1 1.0 03	77.1	1
2	35 33.6 1.0 03	76.5	36 33.6 1.0 03	76.5	38 03.5 1.0 03	76.5	39 33.4 1.0 03	76.4	41 33.2 1.0 03	76.3	42 03.2 1.0 03	76.2	42 33.2 1.0 03	76.2	44 33.1 1.0 03	76.1	2
3	35 31.6 1.0 03	75.6	36 31.5 1.0 03	75.5	38 01.4 1.0 03	75.5	39 31.4 1.0 03	75.4	41 31.2 1.0 03	75.3	42 01.2 1.0 03	75.2	42 31.2 1.0 03	75.2	44 31.0 1.0 03	75.1	3
4	35 29.6 1.0 03	74.6	36 29.5 1.0 03	74.6	37 59.4 1.0 03	74.5	39 29.3 1.0 03	74.4	41 29.2 1.0 03	74.3	41 59.2 1.0 03	74.2	42 29.2 1.0 03	74.2	44 29.0 1.0 03	74.1	4
105	35 27.5 1.0 03	73.6	36 27.5 1.0 03	73.6	37 57.4 1.0 03	73.5	39 27.3 1.0 03	73.4	41 27.2 1.0 03	73.3	41 57.2 1.0 03	73.3	42 27.1 1.0 03	73.2	44 27.0 1.0 03	73.1	105
6	35 25.5 1.0 03	72.6	36 25.5 1.0 03	72.6	37 55.4 1.0 03	72.5	39 25.3 1.0 03	72.4	41 25.2 1.0 03	72.3	41 55.2 1.0 03	72.3	42 25.1 1.0 03	72.2	44 25.0 1.0 03	72.1	6
7	35 23.5 1.0 03	71.6	36 23.5 1.0 03	71.6	37 53.4 1.0 03	71.5	39 23.3 1.0 03	71.4	41 23.2 1.0 03	71.3	41 53.2 1.0 03	71.3	42 23.2 1.0 03	71.2	44 23.0 1.0 03	71.1	7
8	35 21.6 1.0 03	70.6	36 21.5 1.0 03	70.6	37 51.4 1.0 03	70.5	39 21.4 1.0 03	70.4	41 21.2 1.0 03	70.3	41 51.2 1.0 03	70.3	42 21.2 1.0 03	70.3	44 21.1 1.0 03	70.1	8
9	35 19.6 1.0 03	69.6	36 19.5 1.0 03	69.6	37 49.5 1.0 03	69.5	39 19.4 1.0 03	69.4	41 19.3 1.0 03	69.3	41 49.2 1.0 03	69.3	42 19.2 1.0 03	69.3	44 19.1 1.0 03	69.1	9
110	35 17.6 1.0 03	68.7	36 17.6 1.0 03	68.6	37 47.5 1.0 03	68.5	39 17.4 1.0 03	68.5	41 17.3 1.0 03	68.3	41 47.3 1.0 03	68.3	42 17.3 1.0 03	68.3	44 17.1 1.0 03	68.2	110
1	35 15.7 1.0 03	67.7	36 15.6 1.0 03	67.6	37 45.6 1.0 03	67.5	39 15.5 1.0 03	67.5	41 15.4 1.0 03	67.3	41 45.3 1.0 03	67.3	42 15.3 1.0 03	67.3	44 15.2 1.0 03	67.2	1
2	35 13.8 1.0 03	66.7	36 13.7 1.0 03	66.6	37 43.6 1.0 03	66.6	39 13.6 1.0 03	66.5	41 13.5 1.0 03	66.4	41 43.4 1.0 03	66.3	42 13.4 1.0 03	66.3	44 13.3 1.0 03	66.2	2
3	35 11.8 1.0 03	65.7	36 11.8 1.0 03	65.6	37 41.7 1.0 03	65.6	39 11.6 1.0 03	65.5	41 11.5 1.0 03	65.4	41 41.5 1.0 03	65.3	42 11.5 1.0 03	65.3	44 11.4 1.0 03	65.2	3
4	35 09.9 1.0 03	64.7	36 09.9 1.0 03	64.7	37 39.8 1.0 03	64.6	39 09.8 1.0 03	64.5	41 09.6 1.0 03	64.4	41 39.6 1.0 03	64.4	42 09.6 1.0 03	64.3	44 09.5 1.0 03	64.2	4
115	35 08.1 1.0 03	63.7	36 08.0 1.0 03	63.7	37 37.9 1.0 03	63.6	39 07.9 1.0 03	63.5	41 07.8 1.0 03	63.4	41 37.7 1.0 03	63.4	42 07.7 1.0 03	63.3	44 07.6 1.0 03	63.2	115
6	35 06.2 1.0 03	62.7	36 06.1 1.0 03	62.7	37 36.1 1.0 03	62.6	39 06.0 1.0 03	62.5	41 05.9 1.0 03	62.4	41 35.9 1.0 03	62.4	42 05.8 1.0 03	62.4	44 05.7 1.0 03	62.2	6
7	35 04.3 1.0 03	61.7	36 04.3 1.0 03	61.7	37 34.2 1.0 03	61.6	39 04.2 1.0 03	61.5	41 04.0 1.0 03	61.4	41 34.0 1.0 03	61.4	42 04.0 1.0 03	61.4	44 03.9 1.0 03	61.3	7
8	35 02.5 1.0 03	60.7	36 02.5 1.0 03	60.7	37 32.4 1.0 03	60.6	39 02.3 1.0 03	60.6	41 02.2 1.0 03	60.4	41 32.2 1.0 03	60.4	42 02.2 1.0 03	60.4	44 02.1 1.0 03	60.3	8
9	35 00.7 1.0 03	59.8	36 00.6 1.0 03	59.7	37 30.6 1.0 03	59.6	39 00.5 1.0 03	59.6	41 00.4 1.0 03	59.5	41 30.4 1.0 03	59.4	42 00.4 1.0 03	59.4	44 00.3 1.0 03	59.3	9
120	34 58.9 1.0 03	58.8	35 58.8 1.0 03	58.7	37 28.8 1.0 03	58.7	38 58.7 1.0 03	58.6	40 58.6 1.0 03	58.5	41 28.6 1.0 03	58.5	41 58.6 1.0 03	58.4	43 58.5 1.0 03	58.3	120
1	34 57.1 1.0 03	57.8	35 57.1 1.0 03	57.7	37 27.0 1.0 03	57.7	38 56.9 1.0 03	57.6	40 56.8 1.0 03	57.5	41 26.8 1.0 03	57.5	41 56.8 1.0 03	57.4	43 56.7 1.0 03	57.3	1
2	34 55.3 1.0 03	56.8	35 55.3 1.0 03	56.8	37 25.2 1.0 03	56.7	38 55.2 1.0 03	56.6	40 55.1 1.0 03	56.5	41 25.1 1.0 03	56.5	41 55.0 1.0 03	56.5	43 54.9 1.0 03	56.4	2
3	34 53.6 1.0 03	55.8	35 53.6 1.0 03	55.8	37 23.5 1.0 03	55.7	38 53.4 1.0 03	55.6	40 53.3 1.0 03	55.5	41 23.3 1.0 03	55.5	41 53.3 1.0 03	55.5	43 53.2 1.0 03	55.4	3
4	34 51.9 1.0 03	54.8	35 51.8 1.0 03	54.8	37 21.8 1.0 03	54.7	38 51.7 1.0 03	54.6	40 51.6 1.0 03	54.5	41 21.6 1.0 03	54.5	41 51.6 1.0 03	54.5	43 51.5 1.0 03	54.4	4
125	34 50.2 1.0 03	53.8	35 50.1 1.0 03	53.8	37 20.1 1.0 03	53.7	38 50.0 1.0 03	53.7	40 49.9 1.0 03	53.6	41 19.9 1.0 03	53.5	41 49.9 1.0 03	53.5	43 49.8 1.0 03	53.4	125
6	34 48.5 1.0 03	52.9	35 48.5 1.0 03	52.8	37 18.4 1.0 03	52.8	38 48.3 1.0 03	52.7	40 48.3 1.0 03	52.6	41 18.2 1.0 03	52.6	41 48.2 1.0 03	52.5	43 48.1 1.0 03	52.4	6
7	34 46.8 1.0 03	51.9	35 46.8 1.0 03	51.9	37 16.7 1.0 03	51.8	38 46.7 1.0 03	51.7	40 46.6 1.0 03	51.6	41 16.6 1.0 03	51.6	41 46.6 1.0 03	51.6	43 46.5 1.0 03	51.5	7
8	34 45.2 1.0 03	50.9	35 45.2 1.0 03	50.8	37 15.1 1.0 03	50.8	38 45.1 1.0 03	50.7	40 45.0 1.0 03	50.6	41 15.0 1.0 03	50.6	41 44.9 1.0 03	50.6	43 44.9 1.0 03	50.5	8
9	34 43.6 1.0 03	49.9	35 43.6 1.0 03	49.9	37 13.5 1.0 03	49.8	38 43.4 1.0 03	49.7	40 43.4 1.0 03	49.6	41 13.4 1.0 03	49.6	41 43.3 1.0 03	49.6	43 43.3 1.0 03	49.5	9
130	34 42.0 1.0 03	48.9	35 42.0 1.0 03	48.9	37 11.9 1.0 03	48.8	38 41.9 1.0 03	48.8	40 41.8 1.0 03	48.7	41 11.8 1.0 03	48.6	41 41.8 1.0 03	48.6	43 41.7 1.0 03	48.5	130
1	34 40.4 1.0 03	47.9	35 40.4 1.0 03	47.9	37 10.4 1.0 03	47.8	38 40.3 1.0 03	47.8	40 40.2 1.0 03	47.7	41 10.2 1.0 03	47.7	41 40.2 1.0 03	47.6	43 40.1 1.0 03	47.5	1
2	34 38.9 1.0 03	47.0	35 38.9 1.0 03	46.9	37 08.8 1.0 03	46.9	38 38.8 1.0 03	46.8	40 38.7 1.0 03	46.7	41 08.7 1.0 03	46.7	41 38.7 1.0 03	46.7	43 38.6 1.0 03	46.6	2
3	34 37.4 1.0 02	46.0	35 37.3 1.0 02	45.9	37 07.3 1.0 02	45.9	38 37.2 1.0 02	45.8	40 37.2 1.0 02	45.7	41 07.2 1.0 02	45.7	41 37.1 1.0 02	45.7	43 37.1 1.0 02	45.6	3
4	34 35.9 1.0 02	45.0	35 35.8 1.0 02	45.0	37 05.8 1.0 02	44.9	38 35.8 1.0 02	44.8	40 35.7 1.0 02	44.7	41 05.7 1.0 02	44.7	41 35.7 1.0 02	44.7	43 35.6 1.0 02	44.6	4
135	34 34.4 1.0 02	44.0	35 34.4 1.0 02	44.0	37 04.3 1.0 02	43.9	38 34.3 1.0 02	43.9	40 34.2 1.0 02	43.8	41 04.2 1.0 02	43.8	41 34.2 1.0 02	43.7	43 34.1 1.0 02	43.6	135
6	34 33.0 1.0 02	43.0	35 32.9 1.0 02	43.0	37 02.9 1.0 02	42.9	38 32.9 1.0 02	42.9	40 32.8 1.0 02	42.8	41 02.8 1.0 02	42.8	41 32.8 1.0 02	42.8	43 32.7 1.0 02	42.7	6
7	34 31.6 1.0 02	42.0	35 31.5 1.0 02	42.0	37 01.5 1.0 02	42.0	38 31.4 1.0 02	41.9	40 31.4 1.0 02	41.8	41 01.4 1.0 02	41.8	41 31.4 1.0 02	41.8	43 31.3 1.0 02	41.7	7
8	34 30.2 1.0 02	41.1	35 30.1 1.0 02	41.0	37 00.1 1.0 02	41.0	38 30.1 1.0 02	40.9	40 30.0 1.0 02	40.8	41 00.0 1.0 02	40.8	41 30.0 1.0 02	40.8	43 29.9 1.0 02	40.7	8
9	34 28.8 1.0 02	40.1	35 28.8 1.0 02	40.0	36 58.7 1.0 02	40.0	38 28.7 1.0 02	39.9	40 28.6 1.0 02	39.9	40 58.6 1.0 02	39.8	41 28.6 1.0 02	39.8	43 28.6 1.0 02	39.7	9
140	34 27.5 1.0 02	39.1	35 27.4 1.0 02	39.1	36 57.4 1.0 02	39.0	38 27.4 1.0 02	39.0	40 27.3 1.0 02	38.9	40 57.3 1.0 02	38.9	41 27.3 1.0 02	38.8	43 27.2 1.0 02	38.8	140
1	34 26.2 1.0 02	38.1	35 26.1 1.0 02	38.1	36 56.1 1.0 02	38.0	38 26.1 1.0 02	38.0	40 26.0 1.0 02	37.9	40 56.0 1.0 02	37.9	41 26.0 1.0 02	37.9	43 25.9 1.0 02	37.8	1
2	34 24.9 1.0 02	37.1	35 24.9 1.0 02	37.1	36 54.8 1.0 02	37.1	38 24.8 1.0 02	37.0	40 24.7 1.0 02	36.9	40 54.7 1.0 02	36.9	41 24.7 1.0 02	36.9	43 24.7 1.0 02	36.8	2
3	34 23.6 1.0 02	36.2	35 23.6 1.0 02	36.1	36 53.6 1.0 02	36.1	38 23.5 1.0 02	36.0	40 23.5 1.0 02	36.0	40 53.5 1.0 02	35.9	41 23.5 1.0 02	35.9	43 23.4 1.0 02	35.8	3
4	34 22.4 1.0 02	35.2	35 22.4 1.0 02	35.1	36 52.4 1.0 02	35.1	38 22.3 1.0 02	35.1	40 22.3 1.0 02	35.0	40 52.3 1.0 02	35.0	41 22.3 1.0 02	34.9	43 22.2 1.0 02	34.9	4
145	34 21.2 1.0 02	34.2	35 21.2 1.0 02	34.2	36 51.2 1.0 02	34.1	38 21.1 1.0 02	34.1	40 21.1 1.0 02	34.0	40 51.1 1.0 02	34.0	41 21.1 1.0 02	34.0	43 21.0 1.0 02	33.9	145
6	34 20.1 1.0 02	33.2	35 20.0 1.0 02	33.2	36 50.0 1.0 02	33.1	38 20.0 1.0 02	33.1	40 19.9 1.0 02	33.0	40 49.9 1.0 02	33.0	41 19.9 1.0 02	32.9	43 19.9 1.0 02	32.9	6
7	34 18.9 1.0 02	32.2	35 18.9 1.0 02	32.2	36 48.9 1.0 02	32.2	38 18.9 1.0 02	32.1	40 18.8 1.0 02	32.1	40 48.8 1.0 02	32.0	41 18.8 1.0 02	32.0	43 18.8 1.0 02	32.0	7
8	34 17.8 1.0 02	31.3	35 17.8 1.0 02	31.2	36 47.8 1.0 02	31.2	38 17.8 1.0 02	31.1	40 17.7 1.0 02	31.1	40 47.7 1.0 02	31.1	41 17.7 1.0 02	31.1	43 17.7 1.0 02	31.0	8
9	34 16.8 1.0 02	30.3	35 16.7 1.0 02	30.3	36 46.7 1.0 02	30.2	38 16.7 1.0 02	30.2	40 16.7 1.0 02	30.1	40 46.6 1.0 02	30.1	41 16.6 1.0 02	30.1	43 16.6 1.0 02	30.0	9
150	34 15.7 1.0 02	29.3	35 15.7 1.0 02	29.3	36 45.7 1.0 02	29.2	38 15.7 1.0 02	29.2	40 15.6 1.0 02	29.1	40 45.6 1.0 02	29.1	41 15.6 1.0 02	29.1	43 15.6 1.0 02	29.0	150
1	34 14.7 1.0 02	28.3	35 14.7 1.0 02	28.3	36 44.7 1.0 02	28.3	38 14.6 1.0 02	28.2	40 14.6 1.0 02	28.2	40 44.6 1.0 02	28.2	41 14.6 1.0 02	28.1	43 14.6 1.0 02	28.1	1
2	34 13.7 1.0 02	27.3	35 13.7 1.0 02	27.3	36 43.7 1.0 02	27.3	38 13.7 1.0 02	27.2	40 13.6 1.0 02	27.2	40 43.6 1.0 02	27.2	41 13.6 1.0 02	27.2	43 13.6 1.0 02	27.1	2
3	34 12.8 1.0 02	26.4	35 12.8 1.0 02	26.3	36 42.7 1.0 02	26.3	38 12.7 1.0 02	26.3	40 12.7 1.0 02	26.2	40 42.7 1.0 02	26.2	41 12.7 1.0 02	26.2	43 12.7 1.0 02	26.1	3
4	34 11.9 1.0 01	25.4	35 11.9 1.0 01	25.4	36 41.8 1.0 01	25.3	38 11.8 1.0 01	25.3	40 11.8 1.0 01	25.2	40 41.8 1.0 01	25.2	41 11.8 1.0 01	25.2	43 11.8 1.0 01	25.2	4
155	34 11.0 1.0 01	24.4	35 11.0 1.0 01	24.4	36 41.0 1.0 01	24.4	38 10.9 1.0 01	24.3	40 10.9 1.0 01	24.3	40 40.9 1.0 01	24.3	41 10.9 1.0 01	24.2	43 10.9 1.0 01	24.2	155
6	34 10.1 1.0 01	23.4	35 10.1 1.0 01	23.4	36 40.1 1.0 01	23.4	38 10.1 1.0 01	23.3	40 10.1 1.0 01	23.3	40 40.1 1.0 01	23.3	41 10.1 1.0 01	23.3	43 10.1 1.0 01	23.2	6
7	34 09.3 1.0 01	22.5	35 09.3 1.0 01	22.4	36 39.3 1.0 01	22.4	38 09.3 1.0 01	22.4	40 09.3 1.0 01	22.3	40 39.3 1.0 01	22.3	41 09.3 1.0 01	22.3	43 09.2 1.0 01	22.3	7
8	34 08.5 1.0 01	21.5	35 08.5 1.0 01	21.5	36 38.5 1.0 01	21.4	38 08.5 1.0 01	21.4	40 08.5 1.0 01	21.4	40 38.5 1.0 01	21.3	41 08.5 1.0 01	21.3	43 08.5 1.0 01	21.3	8
9	34 07.8 1.0 01	20.5	35 07.8 1.0 01	20.5	36 37.8 1.0 01	20.5	38 07.8 1.0 01	20.4	40 07.7 1.0 01	20.4	40 37.7 1.0 01	20.4	41 07.7 1.0 01	20.4	43 07.7 1.0 01	20.3	9
160	34 07.1 1.0 01	19.5	35 07.1 1.0 01	19.5	36 37.0 1.0 01	19.5	38 07.0 1.0 01	19.5	40 07.0 1.0 01	19.4	40 37.0 1.0 01	19.4	41 07.0 1.0 01	19.4	43 06.9 1.0 01	19.3	160
1	34 06.4 1.0 01	18.5	35 06.4 1.0 01	18.5	36 36.4 1.0 01	18.5	38 06.4 1.0 01	18.5	40 06.3 1.0 01	18.4	40 36.3 1.0 01	18.4	41 06.3 1.0 01	18.4	43 06.3 1.0 01	18.4	1
2	34 05.7 1.0 01	17.6	35 05.7 1.0 01	17.6	36 35.7 1.0 01	17.5	38 05.7 1.0 01	17.5	40 05.7 1.0 01	17.5	40 35.7 1.0 01	17.5	41 05.7 1.0 01	17.5	43 05.7 1.0 01	17.4	2
3	34 05.1 1.0 01	16.6	35 05.1 1.0 01	16.6	36 35.1 1.0 01	16.6	38 05.1 1.0 01	16.5	40 05.1 1.0 01	16.5	40 35.1 1.0 01	16.5	41 05.1 1.0 01	16.5	43 05.1 1.0 01	16.4	3
4	34 04.5 1.0 01	15.6	35 04.5 1.0 01	15.6	36 34.5 1.0 01	15.6	38 04.5 1.0 01	15.6	40 04.5 1.0 01	15.5	40 34.5 1.0 01	15.5	41 04.5 1.0 01	15.5	43 04.5 1.0 01	15.5	4
165	34 04.0 1.0 01	14.6	35 04.0 1.0 01	14.6	36 34.0 1.0 01	14.6	38 04.0 1.0 01	14.6	40 04.0 1.0 01	14.6	40 34.0 1.0 01	14.5	41 04.0 1.0 01	14.5	43 04.0 1.0 01	14.5	165
6	34 03.5 1.0 01	13.7	35 03.5 1.0 01	13.7	36 33.5 1.0 01	13.6	38 03.5 1.0 01	13.6	40 03.5 1.0 01	13.6	40 33.5 1.0 01	13.6	41 03.5 1.0 01	13.6	43 03.4 1.0 01	13.5	6
7	34 03.0 1.0 01	12.7	35 03.0 1.0 01	12.7	36 33.0 1.0 01	12.7	38 03.0 1.0 01	12.6	40 03.0 1.0 01	12.6	40 33.0 1.0 01	12.6	41 03.0 1.0 01	12.6	43 03.0 1.0 01	12.6	7
8	34 02.6 1.0 01	11.7	35 02.6 1.0 01	11.7	36 32.6 1.0 01	11.7	38 02.5 1.0 01	11.7	40 02.5 1.0 01	11.6	40 32.5 1.0 01	11.6	41 02.5 1.0 01	11.6	43 02.5 1.0 01	11.6	8
9	34 02.2 1.0 01	10.7	35 02.2 1.0 01	10.7	36 32.2 1.0 01	10.7	38 02.2 1.0 01	10.7	40 02.2 1.0 01	10.7	40 32.1 1.0 01	10.7	41 02.1 1.0 01	10.7	43 02.1 1.0 01	10.6	9
170	34 01.8 1.0 01	09.8	35 01.8 1.0 01	09.8	36 31.8 1.0 01	09.7	38 01.8 1.0 01	09.7	40 01.8 1.0 01	09.7	40 31.8 1.0 01	09.7	41 01.8 1.0 01	09.7	43 01.8 1.0 01	09.7	170
1	34 01.4 1.0 01	08.8	35 01.4 1.0 00	08.8	36 31.4 1.0 00	08.8	38 01.4 1.0 00	08.8	40 01.4 1.0 00	08.7	40 31.4 1.0 00	08.7	41 01.4 1.0 00	08.7	43 01.4 1.0 00	08.7	1
2	34 01.1 1.0 00	07.8	35 01.1 1.0 00	07.8	36 31.1 1.0 00	07.8	38 01.1 1.0 00	07.8	40 01.1 1.0 00	07.8	40 31.1 1.0 00	07.8	41 01.1 1.0 00	07.7	43 01.1 1.0 00	07.7	2
3	34 00.9 1.0 00	06.8	35 00.9 1.0 00	06.8	36 30.9 1.0 00	06.8	38 00.9 1.0 00	06.8	40 00.9 1.0 00	06.8	40 30.9 1.0 00	06.8	41 00.9 1.0 00	06.8	43 00.9 1.0 00	06.8	3
4	34 00.6 1.0 00	05.9	35 00.6 1.0 00	05.8	36 30.6 1.0 00	05.8	38 00.6 1.0 00	05.8	40 00.6 1.0 00	05.8	40 30.6 1.0 00	05.8	41 00.6 1.0 00	05.8	43 00.6 1.0 00	05.8	4
175	34 00.4 1.0 00	04.9	35 00.4 1.0 00	04.9	36 30.4 1.0 00	04.9	38 00.4 1.0 00	04.9	40 00.4 1.0 00	04.9	40 30.4 1.0 00	04.8	41 00.4 1.0 00	04.8	43 00.4 1.0 00	04.8	175
6	34 00.3 1.0 00	03.9	35 00.3 1.0 00	03.9	36 30.3 1.0 00	03.9	38 00.3 1.0 00	03.9	40 00.3 1.0 00	03.9	40 30.3 1.0 00	03.9	41 00.3 1.0 00	03.9	43 00.3 1.0 00	03.9	6
7	34 00.2 1.0 00	02.9	35 00.2 1.0 00	02.9	36 30.2 1.0 00	02.9	38 00.2 1.0 00	02.9	40 00.2 1.0 00	02.9	40 30.2 1.0 00	02.9	41 00.2 1.0 00	02.9	43 00.2 1.0 00	02.9	7
8	34 00.1 1.0 00	02.0	35 00.1 1.0 00	01.9	36 30.1 1.0 00	01.9	38 00.1 1.0 00	01.9	40 00.1 1.0 00	01.9	40 30.1 1.0 00	01.9	41 00.1 1.0 00	01.9	43 00.1 1.0 00	01.9	8
9	34 00.0 1.0 00	01.0	35 00.0 1.0 00	01.0	36 30.0 1.0 00	01.0	38 00.0 1.0 00	01.0	40 00.0 1.0 00	01.0	40 30.0 1.0 00	01.0	41 00.0 1.0 00	01.0	43 00.0 1.0 00	01.0	9
180	34 00.0 1.0 00	00.0	35 00.0 1.0 00	00.0	36 30.0 1.0 00	00.0	38 00.0 1.0 00	00.0	40 00.0 1.0 00	00.0	40 30.0 1.0 00	00.0	41 00.0 1.0 00	00.0	43 00.0 1.0 00	00.0	180

Lat. 88°

H.A.	Δd Δt	46°00' Alt	Az	47°00' Alt	Az	48°30' Alt	Az	49°30' Alt	Az	50°30' Alt	Az	51°30' Alt	Az	52°30' Alt	Az	54°00' Alt	Az	H.A.
00	1.0 00	48 00.0	180.0	49 00.0	180.0	50 30.0	180.0	51 30.0	180.0	52 30.0	180.0	53 30.0	180.0	54 30.0	180.0	56 00.0	180.0	00
1	1.0 00	48 00.0	179.0	49 00.0	179.0	50 30.0	179.0	51 30.0	179.0	52 30.0	179.0	53 30.0	179.0	54 30.0	179.0	56 00.0	178.9	1
2	1.0 00	47 59.9	177.9	48 59.9	177.9	50 29.9	177.9	51 29.9	177.9	52 29.9	177.9	53 29.9	177.9	54 29.9	177.9	55 59.9	177.9	2
3	1.0 00	47 59.8	176.9	48 59.8	176.9	50 29.8	176.9	51 29.8	176.9	52 29.8	176.9	53 29.8	176.9	54 29.8	176.9	55 59.8	176.8	3
4	1.0 00	47 59.7	175.8	48 59.7	175.8	50 29.7	175.8	51 29.7	175.8	52 29.7	175.8	53 29.7	175.8	54 29.7	175.8	55 59.7	175.8	4
05	1.0 00	47 59.5	174.8	48 59.5	174.8	50 29.5	174.8	51 29.5	174.8	52 29.5	174.8	53 29.5	174.8	54 29.5	174.8	55 59.5	174.7	05
6	1.0 00	47 59.3	173.8	48 59.3	173.8	50 29.3	173.8	51 29.3	173.7	52 29.3	173.7	53 29.3	173.7	54 29.3	173.7	55 59.3	173.7	6
7	1.0 00	47 59.1	172.7	48 59.1	172.7	50 29.1	172.7	51 29.1	172.7	52 29.1	172.7	53 29.1	172.7	54 29.1	172.7	55 59.1	172.6	7
8	1.0 01	47 58.8	171.7	48 58.8	171.7	50 28.8	171.7	51 28.8	171.7	52 28.8	171.6	53 28.8	171.6	54 28.8	171.6	55 58.8	171.6	8
9	1.0 01	47 58.5	170.7	48 58.5	170.6	50 28.5	170.6	51 28.5	170.6	52 28.5	170.6	53 28.5	170.6	54 28.5	170.6	55 58.4	170.5	9
10	1.0 01	47 58.1	169.6	48 58.1	169.6	50 28.1	169.6	51 28.1	169.6	52 28.1	169.6	53 28.1	169.5	54 28.1	169.5	55 58.1	169.5	10
1	1.0 01	47 57.7	168.6	48 57.7	168.6	50 27.7	168.5	51 27.7	168.5	52 27.7	168.5	53 27.7	168.5	54 27.7	168.5	55 57.7	168.4	1
2	1.0 01	47 57.3	167.5	48 57.3	167.5	50 27.3	167.5	51 27.3	167.5	52 27.3	167.5	53 27.3	167.4	54 27.3	167.4	55 57.2	167.4	2
3	1.0 01	47 56.8	166.5	48 56.8	166.5	50 26.8	166.5	51 26.8	166.4	52 26.8	166.4	53 26.8	166.4	54 26.8	166.4	55 56.8	166.3	3
4	1.0 01	47 56.3	165.5	48 56.3	165.5	50 26.3	165.5	51 26.3	165.4	52 26.3	165.4	53 26.3	165.4	54 26.3	165.3	55 56.3	165.3	4
15	1.0 01	47 55.8	164.4	48 55.8	164.4	50 25.7	164.4	51 25.7	164.4	52 25.7	164.3	53 25.7	164.3	54 25.7	164.3	55 55.7	164.2	15
6	1.0 01	47 55.2	163.4	48 55.2	163.4	50 25.2	163.3	51 25.1	163.3	52 25.1	163.3	53 25.1	163.3	54 25.1	163.2	55 55.1	163.2	6
7	1.0 01	47 54.6	162.4	48 54.6	162.3	50 24.5	162.3	51 24.5	162.3	52 24.5	162.3	53 24.5	162.2	54 24.5	162.2	55 54.5	162.1	7
8	1.0 01	47 53.9	161.3	48 53.9	161.3	50 23.9	161.3	51 23.9	161.2	52 23.9	161.2	53 23.9	161.2	54 23.9	161.1	55 53.8	161.1	8
9	1.0 01	47 53.2	160.8	48 53.2	160.3	50 23.2	160.2	51 23.2	160.2	52 23.2	160.2	53 23.2	160.1	54 23.2	160.1	55 53.1	160.0	9
20	1.0 01	47 52.5	159.2	48 52.5	159.2	50 22.5	159.2	51 22.5	159.2	52 22.5	159.1	53 22.5	159.1	54 22.4	159.1	55 52.4	159.0	20
1	1.0 01	47 51.7	158.2	48 51.7	158.2	50 21.7	158.1	51 21.7	158.1	52 21.7	158.1	53 21.7	158.0	54 21.7	158.0	55 51.6	158.0	1
2	1.0 01	47 50.9	157.2	48 50.9	157.2	50 20.9	157.1	51 20.9	157.1	52 20.9	157.0	53 20.9	157.0	54 20.9	157.0	55 50.9	156.9	2
3	1.0 01	47 50.1	156.1	48 50.1	156.1	50 20.1	156.1	51 20.1	156.0	52 20.1	156.0	53 20.0	156.0	54 20.0	155.9	55 50.0	155.9	3
4	1.0 02	47 49.3	155.1	48 49.2	155.1	50 19.2	155.0	51 19.2	155.0	52 19.2	155.0	53 19.2	154.9	54 19.2	154.9	55 49.1	154.8	4
25	1.0 02	47 48.4	154.1	48 48.3	154.0	50 18.3	154.0	51 18.3	154.0	52 18.3	153.9	53 18.3	153.9	54 18.2	153.8	55 48.2	153.8	25
6	1.0 02	47 47.4	153.0	48 47.4	153.0	50 17.4	153.0	51 17.4	152.9	52 17.3	152.9	53 17.3	152.8	54 17.3	152.8	55 47.3	152.7	6
7	1.0 02	47 46.5	152.0	48 46.4	152.0	50 16.4	151.9	51 16.4	151.9	52 16.4	151.8	53 16.4	151.8	54 16.3	151.8	55 46.3	151.7	7
8	1.0 02	47 45.5	151.0	48 45.4	150.9	50 15.4	150.9	51 15.4	150.8	52 15.3	150.8	53 15.3	150.8	54 15.3	150.7	55 45.3	150.6	8
9	1.0 02	47 44.4	149.9	48 44.4	149.9	50 14.4	149.8	51 14.4	149.8	52 14.3	149.8	53 14.3	149.7	54 14.3	149.7	55 44.2	149.6	9
30	1.0 02	47 43.4	148.9	48 43.3	148.9	50 13.3	148.8	51 13.3	148.7	52 13.3	148.7	53 13.2	148.7	54 13.2	148.6	55 43.2	148.5	30
1	1.0 02	47 42.3	147.9	48 42.2	147.8	50 12.2	147.8	51 12.2	147.7	52 12.2	147.7	53 12.1	147.6	54 12.1	147.6	55 42.1	147.5	1
2	1.0 02	47 41.1	146.9	48 41.1	146.8	50 11.1	146.7	51 11.0	146.7	52 11.0	146.7	53 11.0	146.6	54 11.0	146.5	55 40.9	146.5	2
3	1.0 02	47 40.0	145.8	48 39.9	145.8	50 09.9	145.7	51 09.9	145.7	52 09.9	145.6	53 09.8	145.6	54 09.8	145.5	55 39.7	145.4	3
4	1.0 02	47 38.8	144.8	48 38.8	144.7	50 08.7	144.7	51 08.7	144.6	52 08.7	144.6	53 08.6	144.5	54 08.6	144.5	55 38.5	144.4	4
35	1.0 02	47 37.6	143.8	48 37.5	143.7	50 07.5	143.6	51 07.5	143.6	52 07.4	143.5	53 07.4	143.5	54 07.4	143.4	55 37.3	143.3	35
6	1.0 02	47 36.3	142.7	48 36.3	142.7	50 06.2	142.6	51 06.2	142.6	52 06.2	142.5	53 06.1	142.5	54 06.1	142.4	55 36.0	142.3	6
7	1.0 02	47 35.0	141.7	48 35.0	141.7	50 04.9	141.6	51 04.9	141.5	52 04.9	141.5	53 04.8	141.4	54 04.8	141.4	55 34.7	141.3	7
8	1.0 02	47 33.7	140.7	48 33.7	140.6	50 03.6	140.5	51 03.6	140.5	52 03.6	140.4	53 03.5	140.4	54 03.5	140.3	55 33.4	140.2	8
9	1.0 02	47 32.4	139.6	48 32.3	139.6	50 02.3	139.5	51 02.2	139.5	52 02.2	139.4	53 02.2	139.3	54 02.1	139.3	55 32.1	139.2	9
40	1.0 02	47 31.0	138.6	48 31.0	138.6	50 00.9	138.5	51 00.9	138.4	52 00.8	138.4	53 00.8	138.3	54 00.7	138.2	55 30.7	138.1	40
1	1.0 02	47 29.6	137.6	48 29.6	137.5	49 59.5	137.5	50 59.5	137.4	51 59.4	137.3	52 59.4	137.3	53 59.3	137.2	55 29.3	137.1	1
2	1.0 02	47 28.2	136.6	48 28.1	136.5	49 58.1	136.4	50 58.0	136.4	51 58.0	136.3	52 58.0	136.2	53 57.9	136.2	55 27.8	136.1	2
3	1.0 02	47 26.7	135.5	48 26.7	135.5	49 56.6	135.4	50 56.6	135.3	51 56.5	135.3	52 56.5	135.2	53 56.4	135.1	55 26.4	135.0	3
4	1.0 03	47 25.2	134.5	48 25.2	134.4	49 55.1	134.4	50 55.1	134.3	51 55.0	134.2	52 55.0	134.2	53 55.0	134.1	55 24.9	134.0	4
45	1.0 03	47 23.7	133.4	48 23.7	133.4	49 53.6	133.3	50 53.6	133.3	51 53.5	133.2	52 53.5	133.1	53 53.4	133.1	55 23.4	133.0	45
6	1.0 03	47 22.2	132.5	48 22.2	132.4	49 52.1	132.3	50 52.0	132.2	51 52.0	132.2	52 51.9	132.1	53 51.9	132.0	55 21.8	131.9	6
7	1.0 03	47 20.6	131.4	48 20.6	131.4	49 50.5	131.3	50 50.5	131.2	51 50.4	131.2	52 50.4	131.1	53 50.3	131.0	55 20.2	130.9	7
8	1.0 03	47 19.1	130.4	48 19.0	130.3	49 48.9	130.3	50 48.9	130.2	51 48.8	130.1	52 48.8	130.1	53 48.7	130.0	55 18.6	129.9	8
9	1.0 03	47 17.5	129.3	48 17.4	129.3	49 47.3	129.2	50 47.3	129.2	51 47.2	129.1	52 47.2	129.0	53 47.1	129.0	55 17.0	128.8	9
50	1.0 03	47 15.8	128.4	48 15.8	128.3	49 45.7	128.2	50 45.6	128.1	51 45.6	128.1	52 45.5	128.0	53 45.5	127.9	55 15.4	127.8	50
1	1.0 03	47 14.2	127.3	48 14.1	127.3	49 44.0	127.2	50 44.0	127.1	51 43.9	127.0	52 43.9	127.0	53 43.8	126.9	55 13.7	126.8	1
2	1.0 03	47 12.5	126.3	48 12.4	126.3	49 42.4	126.2	50 42.3	126.1	51 42.2	126.0	52 42.2	125.9	53 42.1	125.9	55 12.0	125.7	2
3	1.0 03	47 10.8	125.3	48 10.7	125.2	49 40.7	125.1	50 40.6	125.1	51 40.5	125.0	52 40.5	124.9	53 40.4	124.8	55 10.3	124.7	3
4	1.0 03	47 09.1	124.3	48 09.0	124.2	49 38.9	124.1	50 38.9	124.0	51 38.8	124.0	52 38.7	123.9	53 38.7	123.8	55 08.6	123.7	4
55	1.0 03	47 07.3	123.3	48 07.3	123.2	49 37.2	123.1	50 37.1	123.0	51 37.1	122.9	52 37.0	122.9	53 36.9	122.8	55 06.8	122.7	55
6	1.0 03	47 05.6	122.2	48 05.5	122.2	49 35.4	122.1	50 35.4	122.0	51 35.3	121.9	52 35.2	121.8	53 35.2	121.8	55 05.1	121.6	6
7	1.0 03	47 03.8	121.2	48 03.7	121.1	49 33.6	121.0	50 33.6	121.0	51 33.5	120.9	52 33.4	120.8	53 33.4	120.7	55 03.3	120.6	7
8	1.0 03	47 02.0	120.2	48 01.9	120.1	49 31.8	120.0	50 31.8	120.0	51 31.7	119.9	52 31.6	119.8	53 31.6	119.7	55 01.5	119.6	8
9	1.0 03	47 00.2	119.2	48 00.1	119.1	49 30.0	119.0	50 30.0	118.9	51 29.9	118.9	52 29.8	118.8	53 29.8	118.7	54 59.6	118.6	9
60	1.0 03	46 58.3	118.2	47 58.3	118.1	49 28.2	118.0	50 28.1	117.9	51 28.0	117.8	52 28.0	117.8	53 27.9	117.7	54 57.8	117.5	60
1	1.0 03	46 56.5	117.1	47 56.4	117.1	49 26.3	117.0	50 26.3	116.9	51 26.2	116.8	52 26.1	116.7	53 26.0	116.7	54 55.9	116.5	1
2	1.0 03	46 54.6	116.1	47 54.5	116.1	49 24.4	116.0	50 24.4	115.9	51 24.3	115.8	52 24.2	115.7	53 24.2	115.6	54 54.0	115.5	2
3	1.0 03	46 52.7	115.1	47 52.7	115.0	49 22.6	114.9	50 22.6	114.9	51 22.4	114.8	52 22.3	114.7	53 22.3	114.6	54 52.1	114.5	3
4	1.0 03	46 50.8	114.1	47 50.8	114.0	49 20.6	113.9	50 20.6	113.8	51 20.5	113.8	52 20.4	113.7	53 20.3	113.6	54 50.2	113.5	4
65	1.0 03	46 48.9	113.1	47 48.8	113.0	49 18.7	112.9	50 18.7	112.8	51 18.6	112.7	52 18.5	112.7	53 18.4	112.6	54 48.3	112.4	65
6	1.0 03	46 47.0	112.1	47 46.9	112.0	49 16.8	111.9	50 16.7	111.8	51 16.6	111.7	52 16.6	111.6	53 16.5	111.6	54 46.3	111.4	6
7	1.0 03	46 45.0	111.1	47 44.9	111.0	49 14.8	110.9	50 14.8	110.8	51 14.7	110.7	52 14.6	110.6	53 14.5	110.5	54 44.4	110.4	7
8	1.0 03	46 43.1	110.0	47 43.0	110.0	49 12.9	109.9	50 12.8	109.8	51 12.7	109.7	52 12.6	109.6	53 12.6	109.5	54 42.4	109.4	8
9	1.0 03	46 41.1	109.0	47 41.0	109.0	49 10.9	108.9	50 10.8	108.8	51 10.8	108.7	52 10.7	108.6	53 10.6	108.5	54 40.5	108.4	9
70	1.0 03	46 39.1	108.0	47 39.0	107.9	49 08.9	107.8	50 08.8	107.8	51 08.8	107.7	52 08.7	107.6	53 08.6	107.5	54 38.4	107.4	70
1	1.0 03	46 37.1	107.0	47 37.0	106.9	49 06.9	106.8	50 06.8	106.7	51 06.8	106.7	52 06.7	106.6	53 06.6	106.5	54 36.4	106.3	1
2	1.0 03	46 35.1	106.0	47 35.0	105.9	49 04.9	105.8	50 04.8	105.7	51 04.7	105.7	52 04.7	105.6	53 04.6	105.5	54 34.4	105.3	2
3	1.0 03	46 33.1	105.0	47 33.0	104.9	49 02.9	104.8	50 02.8	104.8	51 02.7	104.6	52 02.6	104.6	53 02.6	104.5	54 32.4	104.3	3
4	1.0 03	46 31.0	104.0	47 31.0	103.9	49 00.9	103.8	50 00.8	103.7	51 00.7	103.6	52 00.6	103.6	53 00.5	103.5	54 30.4	103.3	4
75	1.0 03	46 29.0	103.0	47 28.9	102.9	48 58.8	102.8	49 58.7	102.7	50 58.7	102.6	51 58.6	102.5	52 58.5	102.4	54 28.3	102.3	75
6	1.0 03	46 27.0	102.0	47 26.9	101.9	48 56.8	101.8	49 56.7	101.7	50 56.6	101.6	51 56.5	101.5	52 56.4	101.4	54 26.3	101.3	6
7	1.0 03	46 24.9	101.0	47 24.8	100.9	48 54.7	100.8	49 54.6	100.7	50 54.6	100.6	51 54.5	100.5	52 54.4	100.4	54 24.2	100.3	7
8	1.0 03	46 22.9	100.0	47 22.8	99.9	48 52.7	99.8	49 52.6	99.6	50 52.5	99.6	51 52.4	99.5	52 52.3	99.4	54 22.2	99.3	8
9	1.0 03	46 20.8	98.9	47 20.7	98.9	48 50.6	98.8	49 50.5	98.7	50 50.4	98.6	51 50.3	98.5	52 50.2	98.4	54 20.1	98.3	9
80	1.0 03	46 18.7	97.9	47 18.6	97.9	48 48.5	97.8	49 48.4	97.7	50 48.4	97.6	51 48.3	97.5	52 48.2	97.4	54 18.0	97.3	80
1	1.0 03	46 16.6	96.9	47 16.6	96.9	48 46.4	96.7	49 46.4	96.7	50 46.3	96.6	51 46.2	96.5	52 46.1	96.4	54 15.9	96.3	1
2	1.0 03	46 14.6	95.9	47 14.5	95.9	48 44.4	95.7	49 44.3	95.7	50 44.2	95.6	51 44.1	95.5	52 44.0	95.4	54 13.9	95.3	2
3	1.0 03	46 12.5	94.9	47 12.4	94.9	48 42.3	94.7	49 42.3	94.7	50 42.1	94.6	51 42.0	94.5	52 41.9	94.4	54 11.8	94.3	3
4	1.0 03	46 10.4	93.9	47 10.3	93.9	48 40.2	93.7	49 40.1	93.7	50 40.0	93.6	51 39.9	93.5	52 39.8	93.4	54 09.7	93.2	4
85	1.0 03	46 08.3	92.9	47 08.2	92.9	48 38.1	92.7	49 38.0	92.7	50 37.9	92.6	51 37.8	92.5	52 37.7	92.4	54 07.6	92.2	85
6	1.0 03	46 06.2	91.9	47 06.1	91.9	48 36.0	91.7	49 35.9	91.7	50 35.8	91.6	51 35.7	91.5	52 35.6	91.4	54 05.5	91.2	6
7	1.0 03	46 04.1	90.9	47 04.0	90.9	48 33.9	90.7	49 33.7	90.7	50 33.7	90.6	51 33.6	90.5	52 33.5	90.4	54 03.4	90.2	7
8	1.0 03	46 02.0	89.9	47 01.9	89.9	48 31.8	89.7	49 31.7	89.7	50 31.6	89.6	51 31.6	89.5	52 31.5	89.4	54 01.3	89.2	8
9	1.0 03	45 59.9	88.9	46 59.8	88.9	48 29.7	88.7	49 29.6	88.7	50 29.6	88.6	51 29.5	88.5	52 29.4	88.4	53 59.2	88.2	9
90	1.0 03	45 57.8	87.9	46 57.8	87.9	48 27.6	87.7	49 27.5	87.7	50 27.5	87.6	51 27.4	87.5	52 27.3	87.4	53 57.1	87.3	90

Lat. 88°

H.A.	46° 00' Alt. / Ad Δt / Az.	47° 00' Alt. / Ad Δt / Az.	48° 80' Alt. / Ad Δt / Az.	49° 30' Alt. / Ad Δt / Az.	50° 30' Alt. / Ad Δt / Az.	51° 30' Alt. / Ad Δt / Az.	52° 80' Alt. / Ad Δt / Az.	54° 00' Alt. / Ad Δt / Az.	H.A.
91	45 55.7 1.003 86.9	46 55.7 1.003 86.9	48 25.5 1.003 86.7	49 25.5 1.003 86.7	50 25.4 1.003 86.6	51 25.3 1.003 86.5	52 25.2 1.003 86.4	53 55.0 1.003 86.3	91
2	45 53.6 1.003 85.9	46 53.6 1.003 85.9	48 23.5 1.003 85.7	49 23.4 1.003 85.7	50 23.3 1.003 85.6	51 23.2 1.003 85.5	52 23.1 1.003 85.4	53 52.9 1.003 85.3	2
3	45 51.5 1.003 84.9	46 51.5 1.003 84.9	48 21.4 1.003 84.8	49 21.3 1.003 84.6	50 21.2 1.003 84.6	51 21.1 1.003 84.5	52 21.0 1.003 84.4	53 50.9 1.003 84.3	3
4	45 49.5 1.003 83.9	46 49.4 1.003 83.9	48 19.3 1.003 83.8	49 19.2 1.003 83.7	50 19.1 1.003 83.6	51 19.0 1.003 83.5	52 18.9 1.003 83.4	53 48.8 1.003 83.3	4
95	45 47.4 1.003 82.9	46 47.3 1.003 82.9	48 17.2 1.003 82.8	49 17.1 1.003 82.7	50 17.0 1.003 82.6	51 16.9 1.003 82.5	52 16.8 1.003 82.4	53 46.7 1.003 82.3	95
6	45 45.3 1.003 82.0	46 45.2 1.003 81.9	48 15.1 1.003 81.8	49 15.0 1.003 81.7	50 15.0 1.003 81.6	51 14.9 1.003 81.5	52 14.8 1.003 81.4	53 44.6 1.003 81.3	6
7	45 43.3 1.003 81.0	46 43.2 1.003 80.9	48 13.1 1.003 80.8	49 13.0 1.003 80.7	50 12.9 1.003 80.6	51 12.8 1.003 80.5	52 12.7 1.003 80.4	53 42.6 1.003 80.3	7
8	45 41.2 1.003 80.0	46 41.1 1.003 79.9	48 11.0 1.003 79.8	49 10.9 1.003 79.8	50 10.8 1.003 79.6	51 10.7 1.003 79.5	52 10.6 1.003 79.4	53 40.5 1.003 79.3	8
9	45 39.1 1.003 79.0	46 39.1 1.003 78.9	48 08.9 1.003 78.8	49 08.9 1.003 78.7	50 08.8 1.003 78.6	51 08.7 1.003 78.5	52 08.6 1.003 78.5	53 38.4 1.003 78.3	9
100	45 37.1 1.003 78.0	46 37.0 1.003 77.9	48 06.9 1.003 77.8	49 06.8 1.003 77.7	50 06.7 1.003 77.6	51 06.6 1.003 77.6	52 06.5 1.003 77.5	53 36.4 1.003 77.3	100
1	45 35.0 1.003 77.0	46 35.0 1.003 76.9	48 04.8 1.003 76.8	49 04.8 1.003 76.7	50 04.7 1.003 76.6	51 04.6 1.003 76.6	52 04.5 1.003 76.5	53 34.4 1.003 76.3	1
2	45 33.0 1.003 76.0	46 32.9 1.003 75.9	48 02.8 1.003 75.8	49 02.7 1.003 75.7	50 02.6 1.003 75.7	51 02.6 1.003 75.6	52 02.5 1.003 75.5	53 32.3 1.003 75.3	2
3	45 31.0 1.003 75.0	46 30.9 1.003 74.9	48 00.8 1.003 74.8	49 00.7 1.003 74.7	50 00.6 1.003 74.7	51 00.5 1.003 74.6	52 00.4 1.003 74.5	53 30.3 1.003 74.4	3
4	45 29.0 1.003 74.0	46 28.9 1.003 73.9	47 58.8 1.003 73.8	48 58.7 1.003 73.8	49 58.6 1.003 73.7	50 58.5 1.003 73.6	51 58.4 1.003 73.5	53 28.3 1.003 73.4	4
105	45 26.9 1.003 73.0	46 26.9 1.003 73.0	47 56.8 1.003 72.8	48 56.7 1.003 72.8	49 56.6 1.003 72.7	50 56.5 1.003 72.6	51 56.4 1.003 72.5	53 26.3 1.003 72.4	105
6	45 24.9 1.003 72.0	46 24.9 1.003 72.0	47 54.8 1.003 71.9	48 54.7 1.003 71.8	49 54.6 1.003 71.7	50 54.5 1.003 71.6	51 54.4 1.003 71.5	53 24.3 1.003 71.4	6
7	45 23.0 1.003 71.1	46 22.9 1.003 71.0	47 52.8 1.003 70.9	48 52.7 1.003 70.8	49 52.6 1.003 70.7	50 52.5 1.003 70.6	51 52.5 1.003 70.6	53 22.3 1.003 70.4	7
8	45 21.0 1.003 70.1	46 20.9 1.003 70.0	47 50.8 1.003 69.9	48 50.7 1.003 69.8	49 50.7 1.003 69.7	50 50.6 1.003 69.7	51 50.5 1.003 69.6	53 20.4 1.003 69.4	8
9	45 19.0 1.003 69.1	46 19.0 1.003 69.0	47 48.9 1.003 68.9	48 48.8 1.003 68.8	49 48.7 1.003 68.8	50 48.6 1.003 68.7	51 48.5 1.003 68.6	53 18.4 1.003 68.5	9
110	45 17.1 1.003 68.1	46 17.0 1.003 68.0	47 46.9 1.003 67.9	48 46.8 1.003 67.8	49 46.8 1.003 67.8	50 46.7 1.003 67.7	51 46.6 1.003 67.6	53 16.5 1.003 67.5	110
1	45 15.1 1.003 67.1	46 15.1 1.003 67.0	47 45.0 1.003 66.9	48 44.9 1.003 66.9	49 44.8 1.003 66.8	50 44.7 1.003 66.7	51 44.7 1.003 66.6	53 14.5 1.003 66.5	1
2	45 13.2 1.003 66.1	46 13.2 1.003 66.1	47 43.0 1.003 65.9	48 43.0 1.003 65.9	49 42.9 1.003 65.8	50 42.8 1.003 65.7	51 42.7 1.003 65.6	53 12.6 1.003 65.5	2
3	45 11.3 1.003 65.1	46 11.2 1.003 65.1	47 41.1 1.003 65.0	48 41.1 1.003 64.9	49 41.0 1.003 64.8	50 40.9 1.003 64.7	51 40.8 1.003 64.7	53 10.7 1.003 64.5	3
4	45 09.4 1.003 64.1	46 09.4 1.003 64.1	47 39.3 1.003 64.0	48 39.2 1.003 63.9	49 39.1 1.003 63.8	50 39.0 1.003 63.8	51 39.0 1.003 63.7	53 08.8 1.003 63.5	4
115	45 07.5 1.003 63.2	46 07.5 1.003 63.1	47 37.4 1.003 63.0	48 37.3 1.003 62.9	49 37.2 1.003 62.9	50 37.2 1.003 62.8	51 37.1 1.003 62.7	53 07.0 1.003 62.6	115
6	45 05.7 1.003 62.2	46 05.6 1.003 62.1	47 35.5 1.003 62.0	48 35.5 1.003 61.9	49 35.4 1.003 61.9	50 35.3 1.003 61.8	51 35.2 1.003 61.7	53 05.1 1.003 61.6	6
7	45 03.8 1.003 61.2	46 03.8 1.003 61.1	47 33.7 1.003 61.0	48 33.6 1.003 61.0	49 33.6 1.003 60.9	50 33.5 1.003 60.8	51 33.4 1.003 60.7	53 03.3 1.003 60.6	7
8	45 02.0 1.003 60.2	46 02.0 1.003 60.2	47 31.9 1.003 60.1	48 31.8 1.003 60.0	49 31.7 1.003 59.9	50 31.7 1.003 59.8	51 31.6 1.003 59.8	53 01.5 1.003 59.6	8
9	45 00.2 1.003 59.2	46 00.1 1.003 59.2	47 30.1 1.003 59.1	48 30.0 1.003 59.0	49 29.9 1.003 58.9	50 29.9 1.003 58.9	51 29.8 1.003 58.8	52 59.7 1.003 58.7	9
120	44 58.4 1.003 58.3	45 58.4 1.003 58.2	47 28.3 1.003 58.1	48 28.2 1.003 58.0	49 28.1 1.003 58.0	50 28.1 1.003 57.9	51 28.0 1.003 57.8	52 57.9 1.003 57.7	120
1	44 56.6 1.003 57.3	45 56.6 1.003 57.2	47 26.5 1.003 57.1	48 26.4 1.003 57.0	49 26.4 1.003 57.0	50 26.3 1.003 56.9	51 26.2 1.003 56.8	52 56.1 1.003 56.7	1
2	44 54.9 1.003 56.3	45 54.8 1.003 56.2	47 24.8 1.003 56.1	48 24.7 1.003 56.1	49 24.6 1.003 56.0	50 24.6 1.003 55.9	51 24.5 1.003 55.9	52 54.4 1.003 55.7	2
3	44 53.2 1.003 55.3	45 53.1 1.003 55.3	47 23.0 1.003 55.2	48 23.0 1.003 55.1	49 22.9 1.003 55.0	50 22.8 1.003 55.0	51 22.8 1.003 54.9	52 52.7 1.003 54.8	3
4	44 51.4 1.003 54.3	45 51.4 1.003 54.3	47 21.3 1.003 54.2	48 21.3 1.003 54.1	49 21.2 1.003 54.1	50 21.1 1.003 54.0	51 21.1 1.003 53.9	52 51.0 1.003 53.8	4
125	44 49.8 1.003 53.4	45 49.7 1.003 53.3	47 19.6 1.003 53.2	48 19.6 1.003 53.1	49 19.5 1.003 53.1	50 19.5 1.003 53.0	51 19.4 1.003 52.9	52 49.3 1.003 52.8	125
6	44 48.1 1.003 52.4	45 48.0 1.003 52.3	47 18.0 1.003 52.2	48 17.9 1.003 52.2	49 17.9 1.003 52.1	50 17.8 1.003 52.0	51 17.7 1.003 52.0	52 47.6 1.003 51.9	6
7	44 46.4 1.003 51.4	45 46.4 1.003 51.8	47 16.3 1.003 51.3	48 16.3 1.003 51.2	49 16.2 1.003 51.1	50 16.2 1.003 51.1	51 16.1 1.003 51.0	52 46.0 1.003 50.9	7
8	44 44.8 1.003 50.4	45 44.7 1.003 50.4	47 14.7 1.003 50.3	48 14.6 1.003 50.2	49 14.6 1.003 50.2	50 14.5 1.003 50.1	51 14.4 1.003 50.0	52 44.4 1.003 49.9	8
9	44 43.2 1.003 49.4	45 43.2 1.003 49.4	47 13.1 1.003 49.3	48 13.0 1.003 49.2	49 13.0 1.003 49.2	50 12.9 1.003 49.1	51 12.9 1.003 49.0	52 42.8 1.003 48.9	9
130	44 41.6 1.003 48.5	45 41.6 1.003 48.4	47 11.5 1.003 48.3	48 11.5 1.003 48.3	49 11.4 1.003 48.2	50 11.4 1.003 48.1	51 11.3 1.003 48.1	52 41.2 1.003 48.0	130
1	44 40.1 1.003 47.5	45 40.0 1.003 47.4	47 10.0 1.003 47.4	48 09.9 1.003 47.3	49 09.9 1.003 47.2	50 09.8 1.003 47.2	51 09.8 1.003 47.1	52 39.7 1.003 47.0	1
2	44 38.5 1.003 46.5	45 38.5 1.003 46.5	47 08.4 1.002 46.4	48 08.4 1.002 46.3	49 08.3 1.002 46.3	50 08.3 1.002 46.2	51 08.3 1.002 46.1	52 38.2 1.002 46.0	2
3	44 37.0 1.002 45.5	45 37.0 1.002 45.5	47 06.9 1.002 45.4	48 06.9 1.002 45.4	49 06.8 1.002 45.3	50 06.8 1.002 45.2	51 06.8 1.002 45.2	52 36.7 1.002 45.1	3
4	44 35.5 1.002 44.6	45 35.5 1.002 44.5	47 05.5 1.002 44.4	48 05.4 1.002 44.4	49 05.4 1.002 44.3	50 05.3 1.002 44.3	51 05.3 1.002 44.2	52 35.2 1.002 44.1	4
135	44 34.1 1.002 43.6	45 34.1 1.002 43.5	47 04.0 1.002 43.5	48 04.0 1.002 43.4	49 03.9 1.002 43.4	50 03.9 1.002 43.3	51 03.8 1.002 43.2	52 33.8 1.002 43.1	135
6	44 32.7 1.002 42.6	45 32.6 1.002 42.6	47 02.6 1.002 42.5	48 02.5 1.002 42.4	49 02.5 1.002 42.4	50 02.5 1.002 42.3	51 02.4 1.002 42.3	52 32.3 1.002 42.2	6
7	44 31.3 1.002 41.6	45 31.2 1.002 41.6	47 01.2 1.002 41.5	48 01.1 1.002 41.5	49 01.1 1.002 41.4	50 01.1 1.002 41.4	51 01.0 1.002 41.3	52 31.0 1.002 41.2	7
8	44 29.9 1.002 40.7	45 29.9 1.002 40.6	46 59.8 1.002 40.5	47 59.8 1.002 40.5	48 59.8 1.002 40.4	49 59.7 1.002 40.4	50 59.6 1.002 40.3	52 29.6 1.002 40.2	8
9	44 28.5 1.002 39.7	45 28.5 1.002 39.6	46 58.5 1.002 39.6	47 58.4 1.002 39.5	48 58.4 1.002 39.5	49 58.3 1.002 39.4	50 58.3 1.002 39.4	52 28.3 1.002 39.3	9
140	44 27.2 1.002 38.7	45 27.2 1.002 38.7	46 57.1 1.002 38.6	47 57.1 1.002 38.6	48 57.1 1.002 38.5	49 57.0 1.002 38.5	50 57.0 1.002 38.4	52 26.9 1.002 38.3	140
1	44 25.9 1.002 37.7	45 25.9 1.002 37.7	46 55.8 1.002 37.6	47 55.8 1.002 37.6	48 55.8 1.002 37.5	49 55.7 1.002 37.5	50 55.7 1.002 37.4	52 25.6 1.002 37.3	1
2	44 24.6 1.002 36.8	45 24.6 1.002 36.7	46 54.6 1.002 36.7	47 54.5 1.002 36.6	48 54.5 1.002 36.6	49 54.5 1.002 36.5	50 54.4 1.002 36.5	52 24.4 1.002 36.4	2
3	44 23.4 1.002 35.8	45 23.4 1.002 35.8	46 53.3 1.002 35.7	47 53.3 1.002 35.7	48 53.3 1.002 35.6	49 53.2 1.002 35.6	50 53.2 1.002 35.5	52 23.2 1.002 35.4	3
4	44 22.2 1.002 34.8	45 22.2 1.002 34.8	46 52.1 1.002 34.7	47 52.1 1.002 34.7	48 52.1 1.002 34.6	49 52.0 1.002 34.6	50 52.0 1.002 34.5	52 22.0 1.002 34.5	4
145	44 21.0 1.002 33.9	45 21.0 1.002 33.8	46 51.0 1.002 33.8	47 50.9 1.002 33.7	48 50.9 1.002 33.7	49 50.9 1.002 33.6	50 50.8 1.002 33.6	52 20.8 1.002 33.5	145
6	44 19.9 1.002 32.9	45 19.8 1.002 32.9	46 49.8 1.002 32.8	47 49.8 1.002 32.7	48 49.8 1.002 32.7	49 49.7 1.002 32.7	50 49.7 1.002 32.6	52 19.7 1.002 32.5	6
7	44 18.7 1.002 31.9	45 18.7 1.002 31.9	46 48.7 1.002 31.8	47 48.7 1.002 31.8	48 48.6 1.002 31.7	49 48.6 1.002 31.7	50 48.6 1.002 31.6	52 18.5 1.002 31.6	7
8	44 17.6 1.002 31.0	45 17.6 1.002 30.9	46 47.6 1.002 30.9	47 47.6 1.002 30.8	48 47.6 1.002 30.8	49 47.5 1.002 30.7	50 47.5 1.002 30.7	52 17.5 1.002 30.6	8
9	44 16.6 1.002 30.0	45 16.6 1.002 29.9	46 46.5 1.002 29.9	47 46.5 1.002 29.8	48 46.5 1.002 29.8	49 46.5 1.002 29.8	50 46.4 1.002 29.7	52 16.4 1.002 29.7	9
150	44 15.6 1.002 29.0	45 15.5 1.002 29.0	46 45.5 1.002 28.9	47 45.5 1.002 28.9	48 45.5 1.002 28.8	49 45.4 1.002 28.8	50 45.4 1.002 28.8	52 15.4 1.002 28.7	150
1	44 14.6 1.002 28.0	45 14.5 1.002 28.0	46 44.5 1.002 28.0	47 44.5 1.002 27.9	48 44.5 1.002 27.9	49 44.5 1.002 27.8	50 44.4 1.002 27.8	52 14.4 1.002 27.7	1
2	44 13.6 1.002 27.0	45 13.6 1.002 27.0	46 43.5 1.002 27.0	47 43.5 1.002 26.9	48 43.5 1.002 26.9	49 43.5 1.002 26.9	50 43.5 1.002 26.8	52 13.4 1.002 26.8	2
3	44 12.6 1.002 26.1	45 12.6 1.002 26.1	46 42.6 1.002 26.0	47 42.6 1.002 26.0	48 42.6 1.002 26.0	49 42.5 1.002 25.9	50 42.5 1.002 25.9	52 12.5 1.002 25.8	3
4	44 11.7 1.001 25.1	45 11.7 1.001 25.1	46 41.7 1.001 25.1	47 41.7 1.001 25.0	48 41.7 1.001 25.0	49 41.7 1.001 25.0	50 41.6 1.001 24.9	52 11.6 1.001 24.9	4
155	44 10.9 1.001 24.2	45 10.9 1.001 24.1	46 40.8 1.001 24.1	47 40.8 1.001 24.1	48 40.8 1.001 24.0	49 40.8 1.001 24.0	50 40.8 1.001 24.0	52 10.8 1.001 23.9	155
6	44 10.0 1.001 23.2	45 10.0 1.001 23.2	46 40.0 1.001 23.1	47 40.0 1.001 23.1	48 40.0 1.001 23.1	49 40.0 1.001 23.0	50 39.9 1.001 23.0	52 09.9 1.001 22.9	6
7	44 09.2 1.001 22.2	45 09.2 1.001 22.2	46 39.2 1.001 22.2	47 39.2 1.001 22.1	48 39.2 1.001 22.1	49 39.2 1.001 22.1	50 39.1 1.001 22.0	52 09.1 1.001 22.0	7
8	44 08.4 1.001 21.3	45 08.4 1.001 21.2	46 38.4 1.001 21.2	47 38.4 1.001 21.2	48 38.4 1.001 21.1	49 38.4 1.001 21.1	50 38.4 1.001 21.1	52 08.4 1.001 21.0	8
9	44 07.7 1.001 20.3	45 07.7 1.001 20.3	46 37.7 1.001 20.2	47 37.7 1.001 20.2	48 37.7 1.001 20.2	49 37.6 1.001 20.1	50 37.6 1.001 20.1	52 07.6 1.001 20.1	9
160	44 07.0 1.001 19.3	45 07.0 1.001 19.3	46 37.0 1.001 19.3	47 37.0 1.001 19.2	48 37.0 1.001 19.2	49 36.9 1.001 19.2	50 36.9 1.001 19.2	52 06.9 1.001 19.1	160
1	44 06.3 1.001 18.4	45 06.3 1.001 18.3	46 36.3 1.001 18.3	47 36.3 1.001 18.3	48 36.3 1.001 18.3	49 36.3 1.001 18.2	50 36.3 1.001 18.2	52 06.2 1.001 18.2	1
2	44 05.6 1.001 17.4	45 05.7 1.001 17.4	46 35.7 1.001 17.3	47 35.6 1.001 17.3	48 35.6 1.001 17.3	49 35.6 1.001 17.3	50 35.6 1.001 17.2	52 05.6 1.001 17.2	2
3	44 05.1 1.001 16.4	45 05.1 1.001 16.4	46 35.1 1.001 16.4	47 35.0 1.001 16.4	48 35.0 1.001 16.3	49 35.0 1.001 16.3	50 35.0 1.001 16.3	52 05.0 1.001 16.2	3
4	44 04.5 1.001 15.5	45 04.5 1.001 15.4	46 34.5 1.001 15.4	47 34.5 1.001 15.4	48 34.5 1.001 15.4	49 34.5 1.001 15.3	50 34.5 1.001 15.3	52 04.4 1.001 15.3	4
165	44 03.9 1.001 14.5	45 03.9 1.001 14.5	46 33.9 1.001 14.4	47 33.9 1.001 14.4	48 33.9 1.001 14.4	49 33.9 1.001 14.4	50 33.9 1.001 14.4	52 03.9 1.001 14.3	165
6	44 03.4 1.001 13.5	45 03.4 1.001 13.5	46 33.4 1.001 13.5	47 33.4 1.001 13.5	48 33.4 1.001 13.4	49 33.4 1.001 13.4	50 33.4 1.001 13.4	52 03.4 1.001 13.4	6
7	44 03.0 1.001 12.6	45 03.0 1.001 12.5	46 33.0 1.001 12.5	47 33.0 1.001 12.5	48 33.0 1.001 12.5	49 32.9 1.001 12.5	50 32.9 1.001 12.5	52 02.9 1.001 12.4	7
8	44 02.5 1.001 11.6	45 02.5 1.001 11.6	46 32.5 1.001 11.6	47 32.5 1.001 11.5	48 32.5 1.001 11.5	49 32.5 1.001 11.5	50 32.5 1.001 11.5	52 02.5 1.001 11.5	8
9	44 02.1 1.001 10.6	45 02.1 1.001 10.6	46 32.1 1.001 10.6	47 32.1 1.001 10.6	48 32.1 1.001 10.6	49 32.1 1.001 10.5	50 32.1 1.001 10.5	52 02.1 1.001 10.5	9
170	44 01.8 1.001 09.7	45 01.8 1.001 09.6	46 31.8 1.001 09.6	47 31.8 1.001 09.6	48 31.8 1.001 09.6	49 31.7 1.001 09.6	50 31.7 1.001 09.6	52 01.7 1.001 09.5	170
1	44 01.4 1.000 08.7	45 01.4 1.000 08.7	46 31.4 1.000 08.7	47 31.4 1.000 08.7	48 31.4 1.000 08.6	49 31.4 1.000 08.6	50 31.4 1.000 08.6	52 01.4 1.000 08.6	1
2	44 01.1 1.000 07.7	45 01.1 1.000 07.7	46 31.1 1.000 07.7	47 31.1 1.000 07.7	48 31.1 1.000 07.7	49 31.1 1.000 07.7	50 31.1 1.000 07.7	52 01.1 1.000 07.6	2
3	44 00.9 1.000 06.8	45 00.9 1.000 06.8	46 30.9 1.000 06.7	47 30.9 1.000 06.7	48 30.9 1.000 06.7	49 30.9 1.000 06.7	50 30.9 1.000 06.7	52 00.9 1.000 06.7	3
4	44 00.6 1.000 05.8	45 00.6 1.000 05.8	46 30.6 1.000 05.8	47 30.6 1.000 05.8	48 30.6 1.000 05.8	49 30.6 1.000 05.8	50 30.6 1.000 05.7	52 00.6 1.000 05.7	4
175	44 00.4 1.000 04.8	45 00.4 1.000 04.8	46 30.4 1.000 04.8	47 30.4 1.000 04.8	48 30.4 1.000 04.8	49 30.4 1.000 04.8	50 30.4 1.000 04.8	52 00.4 1.000 04.8	175
6	44 00.3 1.000 03.9	45 00.3 1.000 03.9	46 30.3 1.000 03.9	47 30.3 1.000 03.8	48 30.3 1.000 03.8	49 30.3 1.000 03.8	50 30.3 1.000 03.8	52 00.3 1.000 03.8	6
7	44 00.2 1.000 02.9	45 00.2 1.000 02.9	46 30.2 1.000 02.9	47 30.2 1.000 02.9	48 30.2 1.000 02.9	49 30.2 1.000 02.9	50 30.2 1.000 02.9	52 00.2 1.000 02.9	7
8	44 00.1 1.000 01.9	45 00.1 1.000 01.9	46 30.1 1.000 01.9	47 30.1 1.000 01.9	48 30.1 1.000 01.9	49 30.1 1.000 01.9	50 30.1 1.000 01.9	52 00.1 1.000 01.9	8
9	44 00.0 1.000 01.0	45 00.0 1.000 01.0	46 30.0 1.000 01.0	47 30.0 1.000 01.0	48 30.0 1.000 01.0	49 30.0 1.000 01.0	50 30.0 1.000 01.0	52 00.0 1.000 01.0	9
180	44 00.0 1.000 00.0	45 00.0 1.000 00.0	46 30.0 1.000 00.0	47 30.0 1.000 00.0	48 30.0 1.000 00.0	49 30.0 1.000 00.0	50 30.0 1.000 00.0	52 00.0 1.000 00.0	180

La 89

16—43722-1

DECLINATION SAME NAME AS LATITUDE

Lat. 88°

H.A.	54° 30' Alt. / Δd Δt / Az.	55° 00' Alt. / Δd Δt / Az.	56° 00' Alt. / Δd Δt / Az.	56° 30' Alt. / Δd Δt / Az.	57° 00' Alt. / Δd Δt / Az.	57° 30' Alt. / Δd Δt / Az.	59° 00' Alt. / Δd Δt / Az.	59° 30' Alt. / Δd Δt / Az.	H.A.
00	56 30.0 1.00 180.0	57 00.0 1.00 180.0	58 00.0 1.00 180.0	58 30.0 1.00 180.0	59 00.0 1.00 180.0	59 30.0 1.00 180.0	61 00.0 1.00 180.0	61 30.0 1.00 180.0	00
1	56 30.0 1.00 178.9	57 00.0 1.00 178.9	58 00.0 1.00 178.9	58 30.0 1.00 178.9	59 00.0 1.00 178.9	59 30.0 1.00 178.9	61 00.0 1.00 178.9	61 30.0 1.00 178.9	1
2	56 29.9 1.00 177.9	56 59.9 1.00 177.9	57 59.9 1.00 177.9	58 29.9 1.00 177.9	58 59.9 1.00 177.9	59 29.9 1.00 177.9	60 59.9 1.00 177.9	61 29.9 1.00 177.9	2
3	56 29.8 1.00 176.8	56 59.8 1.00 176.8	57 59.8 1.00 176.8	58 29.8 1.00 176.8	58 59.8 1.00 176.8	59 29.8 1.00 176.8	60 59.8 1.00 176.8	61 29.8 1.00 176.8	3
4	56 29.7 1.00 175.8	56 59.7 1.00 175.8	57 59.7 1.00 175.8	58 29.7 1.00 175.8	58 59.7 1.00 175.8	59 29.7 1.00 175.8	60 59.7 1.00 175.8	61 29.7 1.00 175.7	4
05	56 29.5 1.00 174.7	56 59.5 1.00 174.7	57 59.5 1.00 174.7	58 29.5 1.00 174.7	58 59.5 1.00 174.7	59 29.5 1.00 174.7	60 59.5 1.00 174.7	61 29.5 1.00 174.7	05
6	56 29.3 1.00 173.7	56 59.3 1.00 173.7	57 59.3 1.00 173.7	58 29.3 1.00 173.7	58 59.3 1.00 173.7	59 29.3 1.00 173.6	60 59.3 1.00 173.6	61 29.3 1.00 173.6	6
7	56 29.1 1.00 172.6	56 59.1 1.00 172.6	57 59.1 1.00 172.6	58 29.1 1.00 172.6	58 59.1 1.00 172.6	59 29.1 1.00 172.6	60 59.1 1.00 172.6	61 29.1 1.00 172.6	7
8	56 28.8 1.001 171.6	56 58.8 1.001 171.6	57 58.8 1.001 171.6	58 28.8 1.001 171.6	58 58.8 1.001 171.5	59 28.8 1.001 171.5	60 58.8 1.001 171.5	61 28.8 1.001 171.5	8
9	56 28.4 1.001 170.5	56 58.4 1.001 170.5	57 58.4 1.001 170.5	58 28.4 1.001 170.5	58 58.4 1.001 170.5	59 28.4 1.001 170.5	60 58.4 1.001 170.4	61 28.4 1.001 170.4	9
10	56 28.1 1.001 169.5	56 58.1 1.001 169.5	57 58.1 1.001 169.5	58 28.1 1.001 169.4	58 58.1 1.001 169.4	59 28.1 1.001 169.4	60 58.1 1.001 169.4	61 28.1 1.001 169.4	10
1	56 27.7 1.001 168.4	56 57.7 1.001 168.4	57 57.7 1.001 168.4	58 27.7 1.001 168.4	58 57.7 1.001 168.4	59 27.7 1.001 168.4	60 57.7 1.001 168.3	61 27.7 1.001 168.3	1
2	56 27.2 1.001 167.4	56 57.2 1.001 167.4	57 57.2 1.001 167.3	58 27.2 1.001 167.3	58 57.2 1.001 167.3	59 27.2 1.001 167.3	60 57.2 1.001 167.3	61 27.2 1.001 167.2	2
3	56 26.8 1.001 166.3	56 56.8 1.001 166.3	57 56.8 1.001 166.3	58 26.8 1.001 166.3	58 56.8 1.001 166.3	59 26.7 1.001 166.2	60 56.7 1.001 166.2	61 26.7 1.001 166.2	3
4	56 26.3 1.001 165.3	56 56.2 1.001 165.3	57 56.2 1.001 165.2	58 26.2 1.001 165.2	58 56.2 1.001 165.2	59 26.2 1.001 165.2	60 56.2 1.001 165.1	61 26.2 1.001 165.1	4
15	56 25.7 1.001 164.2	56 55.7 1.001 164.2	57 55.7 1.001 164.2	58 25.7 1.001 164.2	58 55.7 1.001 164.2	59 25.7 1.001 164.1	60 55.7 1.001 164.1	61 25.7 1.001 164.1	15
6	56 25.1 1.001 163.2	56 55.1 1.001 163.2	57 55.1 1.001 163.1	58 25.1 1.001 163.1	58 55.1 1.001 163.1	59 25.1 1.001 163.1	60 55.1 1.001 163.0	61 25.1 1.001 163.0	6
7	56 24.5 1.001 162.1	56 54.5 1.001 162.1	57 54.5 1.001 162.1	58 24.5 1.001 162.1	58 54.5 1.001 162.1	59 24.5 1.001 162.0	60 54.4 1.001 162.0	61 24.4 1.001 161.9	7
8	56 23.8 1.001 161.1	56 53.8 1.001 161.1	57 53.8 1.001 161.0	58 23.8 1.001 161.0	58 53.8 1.001 161.0	59 23.8 1.001 161.0	60 53.8 1.001 160.9	61 23.8 1.001 160.9	8
9	56 23.1 1.001 160.0	56 53.1 1.001 160.0	57 53.1 1.001 160.0	58 23.1 1.001 160.0	58 53.1 1.001 159.9	59 23.1 1.001 159.9	60 53.1 1.001 159.8	61 23.1 1.001 159.8	9
20	56 22.4 1.001 159.0	56 52.4 1.001 159.0	57 52.4 1.001 158.9	58 22.4 1.001 158.9	58 52.4 1.001 158.9	59 22.4 1.001 158.9	60 52.3 1.001 158.8	61 22.3 1.001 158.8	20
1	56 21.6 1.001 157.9	56 51.6 1.001 157.9	57 51.6 1.001 157.9	58 21.6 1.001 157.8	58 51.6 1.001 157.8	59 21.6 1.001 157.8	60 51.6 1.001 157.7	61 21.5 1.001 157.7	1
2	56 20.8 1.001 156.9	56 50.8 1.001 156.9	57 50.8 1.001 156.8	58 20.8 1.001 156.8	58 50.8 1.001 156.8	59 20.8 1.001 156.7	60 50.7 1.001 156.7	61 20.7 1.001 156.6	2
3	56 20.0 1.001 155.8	56 50.0 1.001 155.8	57 50.0 1.001 155.8	58 19.9 1.001 155.7	58 49.9 1.001 155.7	59 19.9 1.001 155.7	60 49.9 1.001 155.6	61 19.9 1.001 155.6	3
4	56 19.1 1.002 154.8	56 49.1 1.002 154.8	57 49.1 1.002 154.7	58 19.1 1.002 154.7	58 49.1 1.002 154.7	59 19.0 1.002 154.6	60 49.0 1.002 154.6	61 19.0 1.002 154.5	4
25	56 18.2 1.002 153.7	56 48.2 1.002 153.7	57 48.2 1.002 153.7	58 18.2 1.002 153.6	58 48.1 1.002 153.6	59 18.1 1.002 153.6	60 48.1 1.002 153.5	61 18.1 1.002 153.5	25
6	56 17.3 1.002 152.7	56 47.2 1.002 152.7	57 47.2 1.002 152.6	58 17.2 1.002 152.6	58 47.2 1.002 152.6	59 17.2 1.002 152.5	60 47.1 1.002 152.4	61 17.1 1.002 152.4	6
7	56 16.3 1.002 151.7	56 46.3 1.002 151.6	57 46.2 1.002 151.6	58 16.2 1.002 151.5	58 46.2 1.002 151.5	59 16.2 1.002 151.5	60 46.1 1.002 151.4	61 16.1 1.002 151.4	7
8	56 15.3 1.002 150.6	56 45.3 1.002 150.6	57 45.2 1.002 150.5	58 15.2 1.002 150.5	58 45.2 1.002 150.5	59 15.2 1.002 150.4	60 45.1 1.002 150.3	61 15.1 1.002 150.3	8
9	56 14.2 1.002 149.6	56 44.2 1.002 149.5	57 44.2 1.002 149.5	58 14.2 1.002 149.4	58 44.2 1.002 149.4	59 14.1 1.002 149.4	60 44.1 1.002 149.3	61 14.1 1.002 149.2	9
30	56 13.2 1.002 148.5	56 43.1 1.002 148.5	57 43.1 1.002 148.4	58 13.1 1.002 148.4	58 43.1 1.002 148.4	59 13.1 1.002 148.3	60 43.0 1.002 148.2	61 13.0 1.002 148.2	30
1	56 12.0 1.002 147.5	56 42.0 1.002 147.4	57 42.0 1.002 147.4	58 12.0 1.002 147.4	58 42.0 1.002 147.3	59 11.9 1.002 147.3	60 41.9 1.002 147.2	61 11.9 1.002 147.1	1
2	56 10.9 1.002 146.4	56 40.9 1.002 146.4	57 40.8 1.002 146.3	58 10.8 1.002 146.3	58 40.8 1.002 146.2	59 10.8 1.002 146.2	60 40.7 1.002 146.1	61 10.7 1.002 146.1	2
3	56 09.7 1.002 145.4	56 39.7 1.002 145.4	57 39.7 1.002 145.3	58 09.7 1.002 145.3	58 39.6 1.002 145.2	59 09.6 1.002 145.2	60 39.5 1.002 145.1	61 09.5 1.002 145.0	3
4	56 08.5 1.002 144.3	56 38.5 1.002 144.3	57 38.5 1.002 144.3	58 08.4 1.002 144.2	58 38.4 1.002 144.2	59 08.4 1.002 144.1	60 38.3 1.002 144.0	61 08.3 1.002 144.0	4
35	56 07.3 1.002 143.3	56 37.3 1.002 143.3	57 37.2 1.002 143.2	58 07.2 1.002 143.2	58 37.2 1.002 143.1	59 07.2 1.002 143.1	60 37.1 1.002 143.0	61 07.1 1.002 142.9	35
6	56 06.0 1.002 142.3	56 36.0 1.002 142.2	57 36.0 1.002 142.2	58 05.9 1.002 142.1	58 35.9 1.002 142.1	59 05.9 1.002 142.1	60 35.8 1.002 141.9	61 05.8 1.002 141.9	6
7	56 04.7 1.002 141.2	56 34.7 1.002 141.2	57 34.7 1.002 141.1	58 04.6 1.002 141.1	58 34.6 1.002 141.0	59 04.6 1.002 141.0	60 34.5 1.002 140.9	61 04.5 1.002 140.8	7
8	56 03.4 1.002 140.2	56 33.4 1.002 140.2	57 33.3 1.002 140.1	58 03.3 1.002 140.0	58 33.3 1.002 140.0	59 03.3 1.002 140.0	60 33.2 1.002 139.8	61 03.1 1.002 139.8	8
9	56 02.0 1.002 139.1	56 32.0 1.002 139.1	57 32.0 1.002 139.0	58 01.9 1.002 139.0	58 31.9 1.002 139.0	59 01.9 1.002 138.9	60 31.8 1.002 138.8	61 01.8 1.002 138.7	9
40	56 00.7 1.002 138.1	56 30.6 1.002 138.1	57 30.6 1.002 138.0	58 00.6 1.002 138.0	58 30.5 1.002 137.9	59 00.5 1.002 137.9	60 30.4 1.002 137.7	61 00.4 1.002 137.7	40
1	55 59.2 1.002 137.1	56 29.2 1.002 137.0	57 29.2 1.002 137.0	57 59.1 1.002 136.9	58 29.1 1.002 136.9	58 59.1 1.002 136.8	60 29.0 1.002 136.7	60 59.0 1.002 136.7	1
2	55 57.8 1.002 136.0	56 27.8 1.002 136.0	57 27.7 1.002 135.9	57 57.7 1.002 135.9	58 27.7 1.002 135.8	58 57.6 1.002 135.8	60 27.5 1.002 135.6	60 57.5 1.002 135.6	2
3	55 56.3 1.002 135.0	56 26.3 1.002 135.0	57 26.3 1.002 134.9	57 56.2 1.002 134.8	58 26.2 1.002 134.8	58 56.2 1.002 134.8	60 26.1 1.002 134.6	60 56.0 1.002 134.6	3
4	55 54.8 1.003 134.0	56 24.8 1.003 133.9	57 24.8 1.003 133.8	57 54.7 1.003 133.8	58 24.7 1.003 133.8	58 54.7 1.003 133.7	60 24.6 1.003 133.6	60 54.5 1.003 133.5	4
45	55 53.3 1.003 132.9	56 23.3 1.003 132.9	57 23.2 1.003 132.8	57 53.2 1.003 132.8	58 23.2 1.003 132.7	58 53.1 1.003 132.7	60 23.0 1.003 132.5	60 53.0 1.003 132.5	45
6	55 51.8 1.003 131.9	56 21.7 1.003 131.8	57 21.7 1.003 131.8	57 51.7 1.003 131.7	58 21.6 1.003 131.7	58 51.6 1.003 131.6	60 21.5 1.003 131.5	60 51.4 1.003 131.4	6
7	55 50.2 1.003 130.9	56 20.2 1.003 130.8	57 20.1 1.003 130.7	57 50.1 1.003 130.7	58 20.0 1.003 130.6	58 50.0 1.003 130.6	60 19.9 1.003 130.4	60 49.8 1.003 130.4	7
8	55 48.6 1.003 129.8	56 18.6 1.003 129.8	57 18.5 1.003 129.7	57 48.5 1.003 129.7	58 18.4 1.003 129.6	58 48.4 1.003 129.6	60 18.3 1.003 129.4	60 48.2 1.003 129.4	8
9	55 47.0 1.003 128.8	56 17.0 1.003 128.8	57 16.9 1.003 128.7	57 46.9 1.003 128.6	58 16.8 1.003 128.6	58 46.8 1.003 128.5	60 16.7 1.003 128.4	60 46.6 1.003 128.3	9
50	55 45.3 1.003 127.8	56 15.3 1.003 127.7	57 15.2 1.003 127.6	57 45.2 1.003 127.6	58 15.2 1.003 127.5	58 45.1 1.003 127.5	60 15.0 1.003 127.3	60 45.0 1.003 127.3	50
1	55 43.7 1.003 126.7	56 13.6 1.003 126.7	57 13.6 1.003 126.6	57 43.5 1.003 126.6	58 13.5 1.003 126.5	58 43.5 1.003 126.5	60 13.3 1.003 126.3	60 43.3 1.003 126.2	1
2	55 42.0 1.003 125.7	56 12.0 1.003 125.7	57 11.9 1.003 125.6	57 41.8 1.003 125.5	58 11.8 1.003 125.5	58 41.8 1.003 125.4	60 11.6 1.003 125.3	60 41.6 1.003 125.2	2
3	55 40.3 1.003 124.7	56 10.2 1.003 124.6	57 10.2 1.003 124.5	57 40.1 1.003 124.5	58 10.1 1.003 124.4	58 40.0 1.003 124.4	60 09.9 1.003 124.2	60 39.9 1.003 124.2	3
4	55 38.5 1.003 123.6	56 08.5 1.003 123.6	57 08.4 1.003 123.5	57 38.4 1.003 123.5	58 08.3 1.003 123.4	58 38.3 1.003 123.4	60 08.2 1.003 123.2	60 38.1 1.003 123.1	4
55	55 36.8 1.003 122.6	56 06.8 1.003 122.6	57 06.7 1.003 122.5	57 36.6 1.003 122.4	58 06.6 1.003 122.4	58 36.5 1.003 122.3	60 06.4 1.003 122.2	60 36.4 1.003 122.1	55
6	55 35.0 1.003 121.6	56 05.0 1.003 121.5	57 04.9 1.003 121.4	57 34.9 1.003 121.4	58 04.8 1.003 121.3	58 34.8 1.003 121.3	60 04.6 1.003 121.1	60 34.6 1.003 121.1	6
7	55 33.2 1.003 120.6	56 03.2 1.003 120.5	57 03.1 1.003 120.4	57 33.1 1.003 120.4	58 03.0 1.003 120.3	58 33.0 1.003 120.3	60 02.8 1.003 120.1	60 32.8 1.003 120.0	7
8	55 31.4 1.003 119.5	56 01.4 1.003 119.5	57 01.3 1.003 119.4	57 31.2 1.003 119.3	58 01.2 1.003 119.3	58 31.1 1.003 119.2	60 01.0 1.003 119.1	60 30.9 1.003 119.0	8
9	55 29.6 1.003 118.5	55 59.5 1.003 118.5	56 59.5 1.003 118.4	57 29.4 1.003 118.3	57 59.4 1.003 118.3	58 29.3 1.003 118.2	59 59.2 1.003 118.0	60 29.1 1.003 118.0	9
60	55 27.7 1.003 117.5	55 57.7 1.003 117.4	56 57.6 1.003 117.4	57 27.6 1.003 117.3	57 57.5 1.003 117.2	58 27.5 1.003 117.2	59 57.3 1.003 117.0	60 27.2 1.003 117.0	60
1	55 25.9 1.003 116.5	55 55.8 1.003 116.4	56 55.8 1.003 116.3	57 25.7 1.003 116.3	57 55.6 1.003 116.2	58 25.6 1.003 116.2	59 55.4 1.003 116.0	60 25.4 1.003 115.9	1
2	55 24.0 1.003 115.5	55 53.9 1.003 115.4	56 53.8 1.003 115.3	57 23.8 1.003 115.3	57 53.8 1.003 115.2	58 23.7 1.003 115.1	59 53.5 1.003 115.0	60 23.5 1.003 114.9	2
3	55 22.1 1.003 114.4	55 52.0 1.003 114.4	56 51.9 1.003 114.3	57 21.9 1.003 114.2	57 51.8 1.003 114.2	58 21.8 1.003 114.1	59 51.6 1.003 113.9	60 21.6 1.003 113.9	3
4	55 20.2 1.003 113.4	55 50.1 1.003 113.4	56 50.0 1.003 113.3	57 20.0 1.003 113.2	57 49.9 1.003 113.2	58 19.9 1.003 113.1	59 49.7 1.003 112.9	60 19.6 1.003 112.9	4
65	55 18.2 1.003 112.4	55 48.2 1.003 112.3	56 48.1 1.003 112.2	57 18.0 1.003 112.2	57 48.0 1.003 112.1	58 17.9 1.003 112.1	59 47.8 1.003 111.9	60 17.7 1.003 111.8	65
6	55 16.3 1.003 111.4	55 46.3 1.003 111.3	56 46.2 1.003 111.2	57 16.1 1.003 111.2	57 46.0 1.003 111.1	58 16.0 1.003 111.1	59 45.8 1.003 110.9	60 15.8 1.003 110.8	6
7	55 14.3 1.003 110.4	55 44.3 1.003 110.3	56 44.2 1.003 110.2	57 14.1 1.003 110.1	57 44.1 1.003 110.1	58 14.0 1.003 110.0	59 43.9 1.003 109.9	60 13.8 1.003 109.8	7
8	55 12.4 1.003 109.3	55 42.3 1.003 109.3	56 42.2 1.003 109.2	57 12.2 1.003 109.1	57 42.1 1.003 109.1	58 12.1 1.003 109.0	59 41.9 1.003 108.8	60 11.8 1.003 108.8	8
9	55 10.4 1.003 108.3	55 40.3 1.003 108.3	56 40.2 1.003 108.2	57 10.2 1.003 108.1	57 40.1 1.003 108.1	58 10.1 1.003 108.0	59 39.9 1.003 107.8	60 09.8 1.003 107.8	9
70	55 08.4 1.003 107.3	55 38.3 1.003 107.3	56 38.2 1.003 107.2	57 08.2 1.003 107.1	57 38.1 1.003 107.0	58 08.1 1.003 107.0	59 37.9 1.003 106.8	60 07.8 1.003 106.7	70
1	55 06.4 1.003 106.3	55 36.3 1.003 106.2	56 36.2 1.003 106.1	57 06.2 1.003 106.1	57 36.1 1.003 106.0	58 06.1 1.003 106.0	59 35.9 1.003 105.8	60 05.8 1.003 105.7	1
2	55 04.4 1.003 105.3	55 34.3 1.003 105.2	56 34.2 1.003 105.1	57 04.2 1.003 105.1	57 34.1 1.003 105.0	58 04.1 1.003 105.0	59 33.9 1.003 104.8	60 03.8 1.003 104.7	2
3	55 02.4 1.003 104.3	55 32.3 1.003 104.2	56 32.2 1.003 104.1	57 02.1 1.003 104.1	57 32.1 1.003 104.0	58 02.0 1.003 103.9	59 31.8 1.003 103.8	60 01.8 1.003 103.7	3
4	55 00.3 1.003 103.3	55 30.2 1.003 103.2	56 30.2 1.003 103.1	57 00.1 1.003 103.1	57 30.0 1.003 103.0	58 00.0 1.003 102.9	59 29.8 1.003 102.7	59 59.7 1.003 102.7	4
75	54 58.3 1.003 102.3	55 28.2 1.003 102.2	56 28.1 1.003 102.1	56 58.1 1.003 102.0	57 28.0 1.003 102.0	57 57.9 1.003 101.9	59 27.8 1.003 101.7	59 57.7 1.003 101.7	75
6	54 56.2 1.003 101.2	55 26.2 1.003 101.2	56 26.1 1.003 101.1	56 56.0 1.003 101.0	57 26.0 1.003 101.0	57 55.9 1.003 100.9	59 25.7 1.003 100.7	59 55.6 1.003 100.7	6
7	54 54.2 1.003 100.2	55 24.1 1.003 100.2	56 24.0 1.003 100.1	56 54.0 1.003 100.0	57 23.9 1.003 100.0	57 53.8 1.003 99.9	59 23.6 1.003 99.7	59 53.6 1.003 99.6	7
8	54 52.1 1.003 99.2	55 22.1 1.003 99.2	56 21.9 1.003 99.1	56 51.9 1.003 99.0	57 21.8 1.003 99.0	57 51.8 1.003 98.9	59 21.6 1.003 98.7	59 51.5 1.003 98.6	8
9	54 50.0 1.003 98.2	55 20.0 1.003 98.2	56 19.9 1.003 98.1	56 49.8 1.003 98.0	57 19.8 1.003 97.9	57 49.7 1.003 97.9	59 19.5 1.003 97.7	59 49.4 1.003 97.6	9
80	54 48.0 1.003 97.2	55 17.9 1.003 97.2	56 17.8 1.003 97.1	56 47.7 1.003 97.0	57 17.7 1.003 96.9	57 47.6 1.003 96.9	59 17.4 1.003 96.7	59 47.4 1.003 96.6	80
1	54 45.9 1.003 96.2	55 15.8 1.003 96.2	56 15.7 1.003 96.0	56 45.7 1.003 96.0	57 15.6 1.003 95.9	57 45.5 1.003 95.9	59 15.3 1.003 95.7	59 45.3 1.003 95.6	1
2	54 43.8 1.003 95.2	55 13.7 1.003 95.1	56 13.6 1.003 95.0	56 43.6 1.003 95.0	57 13.5 1.003 94.9	57 43.5 1.003 94.9	59 13.3 1.003 94.7	59 43.2 1.003 94.6	2
3	54 41.7 1.003 94.2	55 11.7 1.003 94.1	56 11.5 1.003 94.0	56 41.5 1.003 94.0	57 11.4 1.003 93.9	57 41.4 1.003 93.9	59 11.2 1.003 93.7	59 41.1 1.003 93.6	3
4	54 39.6 1.003 93.2	55 09.6 1.003 93.1	56 09.5 1.003 93.0	56 39.4 1.003 93.0	57 09.3 1.003 92.9	57 39.3 1.003 92.9	59 09.1 1.003 92.7	59 39.0 1.003 92.6	4
85	54 37.5 1.003 92.2	55 07.5 1.003 92.1	56 07.4 1.003 92.0	56 37.3 1.003 92.0	57 07.2 1.003 91.9	57 37.2 1.003 91.9	59 07.0 1.003 91.7	59 36.9 1.003 91.6	85
6	54 35.4 1.003 91.2	55 05.4 1.003 91.1	56 05.3 1.003 91.0	56 35.2 1.003 91.0	57 05.1 1.003 90.9	57 35.1 1.003 90.9	59 04.9 1.003 90.7	59 34.8 1.003 90.6	6
7	54 33.3 1.003 90.2	55 03.3 1.003 90.1	56 03.2 1.003 90.0	56 33.1 1.003 90.0	57 03.1 1.003 89.9	57 33.0 1.003 89.9	59 02.8 1.003 89.7	59 32.7 1.003 89.6	7
8	54 31.3 1.003 89.2	55 01.2 1.003 89.1	56 01.1 1.003 89.0	56 31.0 1.003 89.0	57 01.0 1.003 88.9	57 30.9 1.003 88.9	59 00.6 1.003 88.7	59 30.6 1.003 88.6	8
9	54 29.2 1.003 88.2	54 59.1 1.003 88.1	55 59.0 1.003 88.0	56 28.9 1.003 88.0	56 58.9 1.003 87.9	57 28.8 1.003 87.9	58 58.6 1.003 87.7	59 28.5 1.003 87.6	9
90	54 27.1 1.003 87.2	54 57.0 1.003 87.1	55 56.9 1.003 87.0	56 26.8 1.003 87.0	56 56.8 1.003 86.9	57 26.7 1.003 86.9	58 56.5 1.003 86.7	59 26.4 1.003 86.6	90

Lat. 88°

H.A.	54° 30' Alt.	Δd Δt	Az.	55° 00' Alt.	Δd Δt	Az.	56° 00' Alt.	Δd Δt	Az.	56° 30' Alt.	Δd Δt	Az.	57° 00' Alt.	Δd Δt	Az.	57° 30' Alt.	Δd Δt	Az.	59° 00' Alt.	Δd Δt	Az.	59° 30' Alt.	Δd Δt	Az.	H.A.
91	54 25.0	1.003	86.2	54 54.9	1.003	86.1	55 54.8	1.003	86.0	56 24.7	1.003	86.0	56 54.7	1.003	85.9	57 24.6	1.003	85.9	58 54.4	1.003	85.7	59 24.4	1.003	85.6	91
2	54 22.9	1.003	85.2	54 52.8	1.003	85.2	55 52.7	1.003	85.0	56 22.7	1.003	85.0	56 52.5	1.003	84.9	57 22.5	1.003	84.9	58 52.3	1.003	84.7	59 22.3	1.003	84.6	2
3	54 20.8	1.003	84.2	54 50.7	1.003	84.2	55 50.6	1.003	84.1	56 20.6	1.003	84.0	56 50.5	1.003	83.9	57 20.5	1.003	83.9	58 50.3	1.003	83.7	59 20.2	1.003	83.6	3
4	54 18.7	1.003	83.2	54 48.7	1.003	83.2	55 48.6	1.003	83.1	56 18.5	1.003	83.0	56 48.4	1.003	82.9	57 18.4	1.003	82.9	58 48.2	1.003	82.7	59 18.1	1.003	82.6	4
95	54 16.6	1.003	82.2	54 46.6	1.003	82.2	55 46.5	1.003	82.1	56 16.4	1.003	82.0	56 46.4	1.003	82.0	57 16.3	1.003	81.9	58 46.1	1.003	81.7	59 16.0	1.003	81.6	95
6	54 14.6	1.003	81.2	54 44.5	1.003	81.2	55 44.4	1.003	81.1	56 14.3	1.003	81.0	56 44.3	1.003	81.0	57 14.2	1.003	80.9	58 44.0	1.003	80.7	59 14.0	1.003	80.7	6
7	54 12.5	1.003	80.2	54 42.5	1.003	80.2	55 42.3	1.003	80.1	56 12.2	1.003	80.0	56 42.2	1.003	80.0	57 12.2	1.003	79.9	58 42.0	1.003	79.7	59 11.9	1.003	79.7	7
8	54 10.4	1.003	79.2	54 40.4	1.003	79.2	55 40.3	1.003	79.1	56 10.2	1.003	79.0	56 40.2	1.003	79.0	57 10.1	1.003	78.9	58 39.9	1.003	78.7	59 09.8	1.003	78.7	8
9	54 08.4	1.003	78.3	54 38.3	1.003	78.2	55 38.2	1.003	78.1	56 08.2	1.003	78.0	56 38.1	1.003	78.0	57 08.1	1.003	77.9	58 37.9	1.003	77.8	59 07.8	1.003	77.7	9
100	54 06.3	1.003	77.3	54 36.3	1.003	77.2	55 36.2	1.003	77.1	56 06.1	1.003	77.1	56 36.1	1.003	77.0	57 06.0	1.003	76.9	58 35.8	1.003	76.8	59 05.8	1.003	76.7	100
1	54 04.3	1.003	76.3	54 34.3	1.003	76.2	55 34.1	1.003	76.1	56 04.1	1.003	76.1	56 34.0	1.003	76.0	57 04.0	1.003	76.0	58 33.8	1.003	75.8	59 03.7	1.003	75.7	1
2	54 02.3	1.003	75.3	54 32.2	1.003	75.2	55 32.1	1.003	75.1	56 02.1	1.003	75.1	56 32.0	1.003	75.0	57 01.9	1.003	75.0	58 31.8	1.003	74.8	59 01.7	1.003	74.7	2
3	54 00.3	1.003	74.3	54 30.2	1.003	74.3	55 30.1	1.003	74.2	56 00.0	1.003	74.1	56 30.0	1.003	74.0	56 59.9	1.003	74.0	58 29.7	1.003	73.8	58 59.7	1.003	73.7	3
4	53 58.2	1.003	73.3	54 28.2	1.003	73.3	55 28.1	1.003	73.2	55 58.0	1.003	73.1	56 28.0	1.003	73.1	56 57.9	1.003	73.0	58 27.7	1.003	72.8	58 57.7	1.003	72.8	4
105	53 56.2	1.003	72.3	54 26.2	1.003	72.3	55 26.1	1.003	72.2	55 56.0	1.003	72.1	56 26.0	1.003	72.1	56 55.9	1.003	72.0	58 25.7	1.003	71.8	58 55.7	1.003	71.8	105
6	53 54.3	1.003	71.4	54 24.2	1.003	71.3	55 24.1	1.003	71.2	55 54.0	1.003	71.1	56 24.0	1.003	71.1	56 53.9	1.003	71.0	58 23.8	1.003	70.9	58 53.7	1.003	70.8	6
7	53 52.3	1.003	70.4	54 22.2	1.003	70.3	55 22.1	1.003	70.2	55 52.1	1.003	70.2	56 22.0	1.003	70.1	56 52.0	1.003	70.1	58 21.8	1.003	69.9	58 51.7	1.003	69.8	7
8	53 50.3	1.003	69.4	54 20.3	1.003	69.3	55 20.1	1.003	69.2	55 50.1	1.003	69.2	56 20.1	1.003	69.1	56 50.0	1.003	69.1	58 19.8	1.003	68.9	58 49.8	1.003	68.8	8
9	53 48.4	1.003	68.4	54 18.3	1.003	68.4	55 18.2	1.003	68.3	55 48.2	1.003	68.2	56 18.1	1.003	68.2	56 48.1	1.003	68.1	58 17.9	1.003	67.9	58 47.8	1.003	67.9	9
110	53 46.4	1.003	67.4	54 16.4	1.003	67.4	55 16.3	1.003	67.3	55 46.2	1.003	67.2	56 16.2	1.003	67.2	56 46.1	1.003	67.1	58 16.0	1.003	66.9	58 45.9	1.003	66.9	110
1	53 44.5	1.003	66.4	54 14.4	1.003	66.4	55 14.3	1.003	66.3	55 44.3	1.003	66.2	56 14.2	1.003	66.2	56 44.2	1.003	66.1	58 14.0	1.003	66.0	58 44.0	1.003	65.9	1
2	53 42.6	1.003	65.5	54 12.5	1.003	65.4	55 12.4	1.003	65.3	55 42.4	1.003	65.3	56 12.3	1.003	65.2	56 42.3	1.003	65.2	58 12.1	1.003	65.0	58 42.1	1.003	64.9	2
3	53 40.7	1.003	64.5	54 10.6	1.003	64.4	55 10.5	1.003	64.3	55 40.5	1.003	64.3	56 10.4	1.003	64.2	56 40.4	1.003	64.2	58 10.2	1.003	64.0	58 40.2	1.003	64.0	3
4	53 38.8	1.003	63.5	54 08.8	1.003	63.5	55 08.7	1.003	63.4	55 38.6	1.003	63.3	56 08.6	1.003	63.3	56 38.5	1.003	63.2	58 08.4	1.003	63.0	58 38.3	1.003	63.0	4
115	53 36.9	1.003	62.5	54 06.9	1.003	62.5	55 06.8	1.003	62.4	55 36.8	1.003	62.3	56 06.7	1.003	62.3	56 36.7	1.003	62.2	58 06.5	1.003	62.1	58 36.4	1.003	62.0	115
6	53 35.1	1.003	61.5	54 05.0	1.003	61.5	55 05.0	1.003	61.4	55 34.9	1.003	61.4	56 04.9	1.003	61.3	56 34.8	1.003	61.3	58 04.7	1.003	61.1	58 34.6	1.003	61.0	6
7	53 33.2	1.003	60.6	54 03.2	1.003	60.5	55 03.1	1.003	60.4	55 33.1	1.003	60.4	56 03.0	1.003	60.3	56 33.0	1.003	60.3	58 02.8	1.003	60.1	58 32.8	1.003	60.1	7
8	53 31.4	1.003	59.6	54 01.4	1.003	59.6	55 01.3	1.003	59.5	55 31.3	1.003	59.4	56 01.2	1.003	59.4	56 31.2	1.003	59.3	58 01.0	1.003	59.2	58 31.0	1.003	59.1	8
9	53 29.6	1.003	58.6	53 59.6	1.003	58.6	54 59.5	1.003	58.5	55 29.5	1.003	58.4	55 59.4	1.003	58.4	56 29.4	1.003	58.3	57 59.2	1.003	58.2	58 29.2	1.003	58.1	9
120	53 27.9	1.003	57.6	53 57.8	1.003	57.6	54 57.7	1.003	57.5	55 27.7	1.003	57.5	55 57.7	1.003	57.4	56 27.6	1.003	57.4	57 57.5	1.003	57.2	58 27.4	1.003	57.2	120
1	53 26.1	1.003	56.7	53 56.1	1.003	56.6	54 56.0	1.003	56.5	55 25.9	1.003	56.5	55 55.9	1.003	56.4	56 25.9	1.003	56.4	57 55.7	1.003	56.2	58 25.7	1.003	56.2	1
2	53 24.4	1.003	55.7	53 54.3	1.003	55.7	54 54.2	1.003	55.6	55 24.2	1.003	55.5	55 54.2	1.003	55.5	56 24.1	1.003	55.4	57 54.0	1.003	55.3	58 23.9	1.003	55.2	2
3	53 22.6	1.003	54.7	53 52.6	1.003	54.7	54 52.5	1.003	54.6	55 22.5	1.003	54.6	55 52.4	1.003	54.5	56 22.4	1.003	54.5	57 52.3	1.003	54.3	58 22.2	1.003	54.3	3
4	53 20.9	1.003	53.8	53 50.9	1.003	53.7	54 50.8	1.003	53.6	55 20.8	1.003	53.6	55 50.8	1.003	53.5	56 20.7	1.003	53.5	57 50.6	1.003	53.3	58 20.5	1.003	53.3	4
125	53 19.3	1.003	52.8	53 49.2	1.003	52.7	54 49.2	1.003	52.7	55 19.1	1.003	52.6	55 49.1	1.003	52.6	56 19.0	1.003	52.5	57 48.9	1.003	52.4	58 18.9	1.003	52.3	125
6	53 17.6	1.003	51.8	53 47.6	1.003	51.8	54 47.5	1.003	51.7	55 17.5	1.003	51.6	55 47.4	1.003	51.6	56 17.4	1.003	51.6	57 47.3	1.003	51.4	58 17.2	1.003	51.4	6
7	53 16.0	1.003	50.8	53 45.9	1.003	50.8	54 45.9	1.003	50.7	55 15.8	1.003	50.7	55 45.8	1.003	50.6	56 15.8	1.003	50.6	57 45.6	1.003	50.4	58 15.6	1.003	50.4	7
8	53 14.4	1.003	49.9	53 44.3	1.003	49.8	54 44.3	1.003	49.8	55 14.2	1.003	49.7	55 44.2	1.003	49.7	56 14.2	1.003	49.6	57 44.0	1.003	49.5	58 14.0	1.003	49.4	8
9	53 12.8	1.003	48.9	53 42.7	1.003	48.9	54 42.7	1.003	48.8	55 12.6	1.003	48.7	55 42.6	1.003	48.7	56 12.6	1.003	48.7	57 42.5	1.003	48.5	58 12.4	1.003	48.5	9
130	53 11.2	1.003	47.9	53 41.2	1.003	47.9	54 41.1	1.003	47.8	55 11.1	1.002	47.8	55 41.0	1.002	47.7	56 11.0	1.002	47.7	57 40.9	1.002	47.6	58 10.9	1.002	47.5	130
1	53 09.7	1.003	47.0	53 39.6	1.003	46.9	54 39.6	1.003	46.9	55 09.5	1.002	46.8	55 39.5	1.002	46.8	56 09.5	1.002	46.7	57 39.4	1.002	46.6	58 09.3	1.002	46.6	1
2	53 08.1	1.002	46.0	53 38.1	1.002	46.0	54 38.1	1.002	45.9	55 08.0	1.002	45.8	55 38.0	1.002	45.8	56 08.0	1.002	45.8	57 37.9	1.002	45.6	58 07.8	1.002	45.6	2
3	53 06.6	1.002	45.0	53 36.6	1.002	45.0	54 36.6	1.002	44.9	55 06.5	1.002	44.9	55 36.5	1.002	44.8	56 06.5	1.002	44.8	57 36.4	1.002	44.7	58 06.3	1.002	44.6	3
4	53 05.2	1.002	44.1	53 35.2	1.002	44.0	54 35.1	1.002	44.0	55 05.1	1.002	43.9	55 35.0	1.002	43.9	56 05.0	1.002	43.8	57 34.9	1.002	43.7	58 04.9	1.002	43.7	4
135	53 03.7	1.002	43.1	53 33.7	1.002	43.1	54 33.7	1.002	43.0	55 03.6	1.002	43.0	55 33.6	1.002	42.9	56 03.6	1.002	42.9	57 33.5	1.002	42.8	58 03.4	1.002	42.7	135
6	53 02.3	1.002	42.1	53 32.3	1.002	42.1	54 32.2	1.002	42.0	55 02.2	1.002	42.0	55 32.2	1.002	42.0	56 02.2	1.002	41.9	57 32.1	1.002	41.8	58 02.0	1.002	41.8	6
7	53 00.9	1.002	41.2	53 30.9	1.002	41.1	54 30.9	1.002	41.1	55 00.8	1.002	41.0	55 30.8	1.002	41.0	56 00.8	1.002	41.0	57 30.7	1.002	40.8	58 00.7	1.002	40.8	7
8	52 59.6	1.002	40.2	53 29.5	1.002	40.2	54 29.5	1.002	40.1	54 59.5	1.002	40.1	55 29.4	1.002	40.0	55 59.4	1.002	40.0	57 29.3	1.002	39.9	57 59.3	1.002	39.8	8
9	52 58.2	1.002	39.2	53 28.2	1.002	39.2	54 28.2	1.002	39.1	54 58.1	1.002	39.1	55 28.1	1.002	39.1	55 58.1	1.002	39.0	57 28.0	1.002	38.9	57 58.0	1.002	38.9	9
140	52 56.9	1.002	38.3	53 26.9	1.902	38.2	54 26.8	1.002	38.2	54 56.8	1.002	38.2	55 26.8	1.002	38.1	55 56.8	1.002	38.1	57 26.7	1.002	38.0	57 56.7	1.002	37.9	140
1	52 55.6	1.002	37.3	53 25.6	1.002	37.3	54 25.6	1.002	37.2	54 55.5	1.002	37.2	55 25.5	1.002	37.2	55 55.5	1.002	37.1	57 25.4	1.002	37.0	57 55.4	1.002	37.0	1
2	52 54.4	1.002	36.4	53 24.4	1.002	36.3	54 24.3	1.002	36.3	54 54.3	1.002	36.2	55 24.3	1.002	36.2	55 54.2	1.002	36.2	57 24.2	1.002	36.1	57 54.2	1.002	36.0	2
3	52 53.1	1.002	35.4	53 23.1	1.002	35.4	54 23.1	1.002	35.3	54 53.1	1.002	35.3	55 23.1	1.002	35.2	55 53.0	1.002	35.2	57 23.0	1.002	35.1	57 52.9	1.002	35.1	3
4	52 52.0	1.002	34.4	53 21.9	1.002	34.4	54 21.9	1.002	34.3	54 51.9	1.002	34.3	55 21.9	1.002	34.3	55 51.8	1.002	34.2	57 21.8	1.002	34.1	57 51.8	1.002	34.1	4
145	52 50.8	1.002	33.5	53 20.8	1.002	33.4	54 20.7	1.002	33.4	54 50.7	1.002	33.4	55 20.7	1.002	33.3	55 50.7	1.002	33.3	57 20.6	1.002	33.2	57 50.6	1.002	33.2	145
6	52 49.6	1.002	32.5	53 19.6	1.002	32.5	54 19.6	1.002	32.4	54 49.6	1.002	32.4	55 19.6	1.002	32.4	55 49.5	1.002	32.3	57 19.5	1.002	32.2	57 49.5	1.002	32.2	6
7	52 48.5	1.002	31.5	53 18.5	1.002	31.5	54 18.5	1.002	31.5	54 48.5	1.002	31.4	55 18.4	1.002	31.4	55 48.4	1.002	31.4	57 18.4	1.002	31.3	57 48.3	1.002	31.3	7
8	52 47.4	1.002	30.6	53 17.4	1.002	30.6	54 17.4	1.002	30.5	54 47.4	1.002	30.5	55 17.4	1.002	30.5	55 47.4	1.002	30.4	57 17.3	1.002	30.3	57 47.3	1.002	30.3	8
9	52 46.4	1.002	29.6	53 16.4	1.002	29.6	54 16.4	1.002	29.6	54 46.3	1.002	29.5	55 16.3	1.002	29.5	55 46.3	1.002	29.5	57 16.3	1.002	29.4	57 46.2	1.002	29.4	9
150	52 45.4	1.002	28.7	53 15.4	1.002	28.6	54 15.3	1.002	28.6	54 45.3	1.002	28.6	55 15.3	1.002	28.5	55 45.3	1.002	28.5	57 15.3	1.002	28.4	57 45.2	1.002	28.4	150
1	52 44.4	1.002	27.7	53 14.4	1.002	27.7	54 14.4	1.002	27.6	54 44.3	1.002	27.6	55 14.3	1.002	27.6	55 44.3	1.002	27.6	57 14.3	1.002	27.5	57 44.3	1.002	27.4	1
2	52 43.4	1.002	26.8	53 13.4	1.002	26.7	54 13.4	1.002	26.7	54 43.4	1.002	26.7	55 13.4	1.002	26.6	55 43.4	1.002	26.6	57 13.3	1.002	26.5	57 43.3	1.002	26.5	2
3	52 42.5	1.002	25.8	53 12.5	1.002	25.8	54 12.5	1.002	25.7	54 42.5	1.002	25.7	55 12.4	1.001	25.7	55 42.4	1.001	25.7	57 12.4	1.001	25.6	57 42.4	1.001	25.5	3
4	52 41.6	1.001	24.8	53 11.6	1.001	24.8	54 11.6	1.001	24.8	54 41.6	1.001	24.7	55 11.6	1.001	24.7	55 41.5	1.001	24.7	57 11.5	1.001	24.6	57 41.5	1.001	24.6	4
155	52 40.7	1.001	23.9	53 10.7	1.001	23.9	54 10.7	1.001	23.8	54 40.7	1.001	23.8	55 10.7	1.001	23.8	55 40.7	1.001	23.7	57 10.7	1.001	23.7	57 40.6	1.001	23.7	155
6	52 39.9	1.001	22.9	53 09.9	1.001	22.9	54 09.9	1.001	22.9	54 39.9	1.001	22.8	55 09.9	1.001	22.8	55 39.9	1.001	22.8	57 09.8	1.001	22.7	57 39.8	1.001	22.7	6
7	52 39.1	1.001	22.0	53 09.1	1.001	21.9	54 09.1	1.001	21.9	54 39.1	1.001	21.9	55 09.1	1.001	21.9	55 39.1	1.001	21.8	57 09.0	1.001	21.8	57 39.0	1.001	21.8	7
8	52 38.3	1.001	21.0	53 08.3	1.001	21.0	54 08.3	1.001	21.0	54 38.3	1.001	20.9	55 08.3	1.001	20.9	55 38.3	1.001	20.9	57 08.3	1.001	20.8	57 38.3	1.001	20.8	8
9	52 37.6	1.001	20.0	53 07.6	1.001	20.0	54 07.6	1.001	20.0	54 37.6	1.001	20.0	55 07.6	1.001	20.0	55 37.6	1.001	19.9	57 07.5	1.001	19.9	57 37.5	1.001	19.9	9
160	52 36.9	1.001	19.1	53 06.9	1.001	19.1	54 06.9	1.001	19.0	54 36.9	1.001	19.0	55 06.9	1.001	19.0	55 36.9	1.001	19.0	57 06.9	1.001	18.9	57 36.8	1.001	18.9	160
1	52 36.2	1.001	18.1	53 06.2	1.001	18.1	54 06.2	1.001	18.1	54 36.2	1.001	18.1	55 06.2	1.001	18.1	55 36.2	1.001	18.0	57 06.2	1.001	18.0	57 36.2	1.001	18.0	1
2	52 35.6	1.001	17.2	53 05.6	1.001	17.2	54 05.6	1.001	17.1	54 35.6	1.001	17.1	55 05.6	1.001	17.1	55 35.6	1.001	17.1	57 05.6	1.001	17.0	57 35.6	1.001	17.0	2
3	52 35.0	1.001	16.2	53 05.0	1.001	16.2	54 05.0	1.001	16.2	54 35.0	1.001	16.2	55 05.0	1.001	16.2	55 35.0	1.001	16.1	57 05.0	1.001	16.1	57 35.0	1.001	16.1	3
4	52 34.4	1.001	15.3	53 04.4	1.001	15.3	54 04.4	1.001	15.2	54 34.4	1.001	15.2	55 04.4	1.001	15.2	55 34.4	1.001	15.2	57 04.4	1.001	15.1	57 34.4	1.001	15.1	4
165	52 33.9	1.001	14.3	53 03.9	1.001	14.3	54 03.9	1.001	14.3	54 33.9	1.001	14.3	55 03.9	1.001	14.3	55 33.9	1.001	14.2	57 03.9	1.001	14.2	57 33.9	1.001	14.2	165
6	52 33.4	1.001	13.4	53 03.4	1.001	13.3	54 03.4	1.001	13.3	54 33.4	1.001	13.3	55 03.4	1.001	13.3	55 33.4	1.001	13.3	57 03.4	1.001	13.2	57 33.4	1.001	13.2	6
7	52 32.9	1.001	12.4	53 02.9	1.001	12.4	54 02.9	1.001	12.4	54 32.9	1.001	12.4	55 02.9	1.001	12.3	55 32.9	1.001	12.3	57 02.9	1.001	12.3	57 32.9	1.001	12.3	7
8	52 32.5	1.001	11.5	53 02.5	1.001	11.4	54 02.5	1.001	11.4	54 32.5	1.001	11.4	55 02.5	1.001	11.4	55 32.5	1.001	11.4	57 02.5	1.001	11.3	57 32.5	1.001	11.3	8
9	52 32.1	1.001	10.5	53 02.1	1.001	10.5	54 02.1	1.001	10.5	54 32.1	1.001	10.5	55 02.1	1.001	10.4	55 32.1	1.001	10.4	57 02.1	1.001	10.4	57 32.1	1.001	10.4	9
170	52 31.7	1.001	09.5	53 01.7	1.001	09.5	54 01.7	1.001	09.5	54 31.7	1.001	09.5	55 01.7	1.001	09.5	55 31.7	1.001	09.5	57 01.7	1.001	09.5	57 31.7	1.001	09.4	170
1	52 31.4	1.000	08.6	53 01.4	1.000	08.6	54 01.4	1.000	08.6	54 31.4	1.000	08.6	55 01.4	1.000	08.5	55 31.4	1.000	08.5	57 01.4	1.000	08.5	57 31.4	1.000	08.5	1
2	52 31.1	1.000	07.6	53 01.1	1.000	07.6	54 01.1	1.000	07.6	54 31.1	1.000	07.6	55 01.1	1.000	07.6	55 31.1	1.000	07.6	57 01.1	1.000	07.6	57 31.1	1.000	07.6	2
3	52 30.9	1.000	06.7	53 00.9	1.000	06.7	54 00.9	1.000	06.7	54 30.8	1.000	06.7	55 00.8	1.000	06.6	55 30.8	1.000	06.6	57 00.8	1.000	06.6	57 30.8	1.000	06.6	3
4	52 30.6	1.000	05.7	53 00.6	1.000	05.7	54 00.6	1.000	05.7	54 30.6	1.000	05.7	55 00.6	1.000	05.7	55 30.6	1.000	05.7	57 00.6	1.000	05.7	57 30.6	1.000	05.7	4
175	52 30.4	1.000	04.8	53 00.4	1.000	04.8	54 00.4	1.000	04.8	54 30.4	1.000	04.8	55 00.4	1.000	04.7	55 30.4	1.000	04.7	57 00.4	1.000	04.7	57 30.4	1.000	04.7	175
6	52 30.3	1.000	03.8	53 00.3	1.000	03.8	54 00.3	1.000	03.8	54 30.3	1.000	03.8	55 00.3	1.000	03.8	55 30.3	1.000	03.8	57 00.3	1.000	03.8	57 30.3	1.000	03.8	6
7	52 30.2	1.000	02.9	53 00.2	1.000	02.9	54 00.2	1.000	02.9	54 30.2	1.000	02.9	55 00.2	1.000	02.8	55 30.2	1.000	02.8	57 00.2	1.000	02.8	57 30.2	1.000	02.8	7
8	52 30.1	1.000	01.9	53 00.1	1.000	01.9	54 00.1	1.000	01.9	54 30.1	1.000	01.9	55 00.1	1.000	01.9	55 30.1	1.000	01.9	57 00.1	1.000	01.9	57 30.1	1.000	01.9	8
9	52 30.0	1.000	01.0	53 00.0	1.000	01.0	54 00.0	1.000	01.0	54 30.0	1.000	01.0	55 00.0	1.000	00.9	55 30.0	1.000	00.9	57 00.0	1.000	00.9	57 30.0	1.000	00.9	9
180	52 30.0	1.000	00.0	53 00.0	1.000	00.0	54 00.0	1.000	00.0	54 30.0	1.000	00.0	55 00.0	1.000	00.0	55 30.0	1.000	00.0	57 00.0	1.000	00.0	57 30.0	1.000	00.0	180

Lat. 88°

Lat. 88°

H.A.	60° 00' Alt.	Δd Δt	Az.	60° 30' Alt.	Δd Δt	Az.	62° 00' Alt.	Δd Δt	Az.	62° 30' Alt.	Δd Δt	Az.	63° 00' Alt.	Δd Δt	Az.	69° 00' Alt.	Δd Δt	Az.	69° 30' Alt.	Δd Δt	Az.	74° 30' Alt.	Δd Δt	Az.	H.A.
00	62 00.0	1.0 00	180.0	62 30.0	1.0 00	180.0	64 00.0	1.0 00	180.0	64 30.0	1.0 00	180.0	65 00.0	1.0 00	180.0	71 00.0	1.0 00	180.0	71 30.0	1.0 00	180.0	76 30.0	1.0 00	180.0	00
1	62 00.0	1.0 00	178.9	62 30.0	1.0 00	178.9	64 00.0	1.0 00	178.9	64 30.0	1.0 00	178.9	65 00.0	1.0 00	178.9	71 00.0	1.0 00	178.9	71 30.0	1.0 00	178.9	76 30.0	1.0 00	178.9	1
2	61 59.9	1.0 00	177.9	62 29.9	1.0 00	177.9	63 59.9	1.0 00	177.9	64 29.9	1.0 00	177.9	64 59.9	1.0 00	177.9	70 59.9	1.0 00	177.8	71 29.9	1.0 00	177.8	76 29.9	1.0 00	177.7	2
3	61 59.7	1.0 00	176.8	62 29.8	1.0 00	176.8	63 59.8	1.0 00	176.8	64 29.8	1.0 00	176.8	64 59.8	1.0 00	176.8	70 59.8	1.0 00	176.7	71 29.8	1.0 00	176.7	76 29.8	1.0 00	176.6	3
4	61 59.7	1.0 00	175.7	62 29.7	1.0 00	175.7	63 59.7	1.0 00	175.7	64 29.7	1.0 00	175.7	64 59.7	1.0 00	175.7	70 59.7	1.0 00	175.6	71 29.7	1.0 00	175.6	76 29.7	1.0 00	175.4	4
05	61 59.5	1.0 00	174.7	62 29.5	1.0 00	174.7	63 59.5	1.0 00	174.6	64 29.5	1.0 00	174.6	64 59.5	1.0 00	174.6	70 59.5	1.0 00	174.5	71 29.5	1.0 00	174.5	76 29.5	1.0 00	174.3	05
6	61 59.3	1.0 00	173.6	62 29.3	1.0 00	173.6	63 59.3	1.0 00	173.6	64 29.3	1.0 00	173.6	64 59.3	1.0 00	173.6	70 59.3	1.0 00	173.4	71 29.3	1.0 00	173.4	76 29.2	1.0 00	173.1	6
7	61 59.0	1.0 00	172.5	62 29.0	1.0 00	172.5	63 59.0	1.0 00	172.5	64 29.0	1.0 00	172.5	64 59.0	1.0 00	172.5	70 59.0	1.0 00	172.3	71 29.0	1.0 00	172.3	76 29.0	1.0 01	172.0	7
8	61 58.8	1.0 01	171.5	62 28.8	1.0 01	171.5	63 58.8	1.0 01	171.4	64 28.7	1.0 01	171.4	64 58.7	1.0 01	171.4	70 58.7	1.0 01	171.2	71 28.7	1.0 01	171.2	76 28.7	1.0 01	170.8	8
9	61 58.4	1.0 01	170.4	62 28.4	1.0 01	170.4	63 58.4	1.0 01	170.4	64 28.4	1.0 01	170.4	64 58.4	1.0 01	170.3	70 58.4	1.0 01	170.1	71 28.4	1.0 01	170.1	76 28.3	1.0 01	169.7	9
10	61 58.1	1.0 01	169.4	62 28.1	1.0 01	169.3	63 58.0	1.0 01	169.3	64 28.0	1.0 01	169.3	64 58.0	1.0 01	169.3	70 58.0	1.0 01	169.0	71 28.0	1.0 01	169.0	76 27.9	1.0 01	168.6	10
1	61 57.7	1.0 01	168.3	62 27.7	1.0 01	168.3	63 57.6	1.0 01	168.2	64 27.6	1.0 01	168.2	64 57.6	1.0 01	168.2	70 57.6	1.0 01	167.9	71 27.6	1.0 01	167.9	76 27.5	1.0 01	167.4	1
2	61 57.2	1.0 01	167.2	62 27.2	1.0 01	167.2	63 57.2	1.0 01	167.2	64 27.2	1.0 01	167.1	64 57.1	1.0 01	167.1	70 57.1	1.0 01	166.8	71 27.1	1.0 01	166.8	76 27.0	1.0 01	166.3	2
3	61 56.7	1.0 01	166.2	62 26.7	1.0 01	166.1	63 56.7	1.0 01	166.1	64 26.7	1.0 01	166.1	64 56.7	1.0 01	166.0	70 56.6	1.0 01	165.7	71 26.6	1.0 01	165.7	76 26.5	1.0 01	165.1	3
4	61 56.2	1.0 01	165.1	62 26.2	1.0 01	165.1	63 56.2	1.0 01	165.0	64 26.2	1.0 01	165.0	64 56.2	1.0 01	165.0	70 56.1	1.0 01	164.6	71 26.1	1.0 01	164.6	76 25.9	1.0 01	164.0	4
15	61 55.7	1.0 01	164.0	62 25.6	1.0 01	164.0	63 55.6	1.0 01	164.0	64 25.6	1.0 01	163.9	64 55.6	1.0 01	163.9	70 55.5	1.0 01	163.5	71 25.5	1.0 01	163.5	76 25.3	1.0 01	162.9	15
6	61 55.1	1.0 01	163.0	62 25.0	1.0 01	163.0	63 55.0	1.0 01	162.9	64 25.0	1.0 01	162.9	64 55.0	1.0 01	162.8	70 54.9	1.0 01	162.4	71 24.9	1.0 01	162.4	76 24.7	1.0 01	161.7	6
7	61 54.4	1.0 01	161.9	62 24.4	1.0 01	161.9	63 54.4	1.0 01	161.8	64 24.4	1.0 01	161.8	64 54.4	1.0 01	161.8	70 54.2	1.0 01	161.3	71 24.2	1.0 01	161.3	76 24.0	1.0 01	160.6	7
8	61 53.8	1.0 01	160.9	62 23.7	1.0 01	160.8	63 53.7	1.0 01	160.7	64 23.7	1.0 01	160.7	64 53.7	1.0 01	160.7	70 53.6	1.0 01	160.2	71 23.5	1.0 01	160.2	76 23.3	1.0 01	159.5	8
9	61 53.1	1.0 01	159.8	62 23.0	1.0 01	159.8	63 53.0	1.0 01	159.7	64 23.0	1.0 01	159.7	64 53.0	1.0 01	159.6	70 52.8	1.0 01	159.1	71 22.8	1.0 01	159.1	76 22.6	1.0 01	158.3	9
20	61 52.3	1.0 01	158.7	62 22.3	1.0 01	158.7	63 52.3	1.0 01	158.6	64 22.3	1.0 01	158.6	64 52.2	1.0 01	158.6	70 52.1	1.0 01	158.0	71 22.0	1.0 01	158.0	76 21.8	1.0 01	157.2	20
1	61 51.5	1.0 01	157.7	62 21.5	1.0 01	157.6	63 51.5	1.0 01	157.6	64 21.5	1.0 01	157.5	64 51.5	1.0 01	157.5	70 51.3	1.0 01	156.9	71 21.2	1.0 01	156.9	76 20.9	1.0 01	156.1	1
2	61 50.7	1.0 01	156.6	62 20.7	1.0 01	156.6	63 50.7	1.0 01	156.5	64 20.7	1.0 01	156.5	64 50.6	1.0 01	156.4	70 50.4	1.0 01	155.8	71 20.4	1.0 01	155.8	76 20.1	1.0 02	154.9	2
3	61 49.8	1.0 01	155.5	62 19.9	1.0 01	155.5	63 49.8	1.0 01	155.4	64 19.8	1.0 01	155.4	64 49.8	1.0 01	155.4	70 49.5	1.0 02	154.8	71 19.5	1.0 02	154.7	76 19.2	1.0 02	153.8	3
4	61 49.0	1.0 02	154.5	62 19.0	1.0 02	154.5	63 48.9	1.0 02	154.4	64 18.9	1.0 02	154.3	64 48.9	1.0 02	154.3	70 48.6	1.0 02	153.7	71 18.6	1.0 02	153.6	76 18.2	1.0 02	152.7	4
25	61 48.1	1.0 02	153.4	62 18.1	1.0 02	153.4	63 48.0	1.0 02	153.3	64 18.0	1.0 02	153.2	64 48.0	1.0 02	153.2	70 47.7	1.0 02	152.6	71 17.7	1.0 02	152.5	76 17.2	1.0 02	151.5	25
6	61 47.1	1.0 02	152.4	62 17.1	1.0 02	152.3	63 47.0	1.0 02	152.2	64 17.0	1.0 02	152.2	64 47.0	1.0 02	152.2	70 46.7	1.0 02	151.5	71 16.7	1.0 02	151.4	76 16.2	1.0 02	150.4	6
7	61 46.1	1.0 02	151.3	62 16.1	1.0 02	151.3	63 46.1	1.0 02	151.2	64 16.0	1.0 02	151.1	64 46.0	1.0 02	151.1	70 45.7	1.0 02	150.4	71 15.7	1.0 02	150.3	76 15.2	1.0 02	149.3	7
8	61 45.1	1.0 02	150.3	62 15.1	1.0 02	150.2	63 45.0	1.0 02	150.1	64 15.0	1.0 02	150.1	64 45.0	1.0 02	150.0	70 44.6	1.0 02	149.3	71 14.6	1.0 02	149.2	76 14.1	1.0 02	148.2	8
9	61 44.0	1.0 02	149.2	62 14.0	1.0 02	149.2	63 44.0	1.0 02	149.0	64 13.9	1.0 02	149.0	64 43.9	1.0 02	149.0	70 43.6	1.0 02	148.2	71 13.5	1.0 02	148.2	76 13.0	1.0 02	147.1	9
30	61 43.0	1.0 02	148.2	62 12.9	1.0 02	148.1	63 42.9	1.0 02	148.0	64 12.8	1.0 02	147.9	64 42.8	1.0 02	147.9	70 42.4	1.0 02	147.2	71 12.4	1.0 02	147.1	76 11.8	1.0 02	145.9	30
1	61 41.8	1.0 02	147.1	62 11.8	1.0 02	147.1	63 41.7	1.0 02	146.9	64 11.7	1.0 02	146.9	64 41.7	1.0 02	146.8	70 41.3	1.0 02	146.1	71 11.2	1.0 02	146.0	76 10.6	1.0 02	144.8	1
2	61 40.7	1.0 02	146.0	62 10.7	1.0 02	146.0	63 40.6	1.0 02	145.9	64 10.5	1.0 02	145.8	64 40.5	1.0 02	145.8	70 40.1	1.0 02	145.0	71 10.0	1.0 02	144.9	76 09.4	1.0 02	143.7	2
3	61 39.5	1.0 02	145.0	62 09.5	1.0 02	145.0	63 39.4	1.0 02	144.8	64 09.4	1.0 02	144.8	64 39.3	1.0 02	144.7	70 38.9	1.0 02	143.9	71 08.8	1.0 02	143.8	76 08.1	1.0 02	142.6	3
4	61 38.3	1.0 02	143.9	62 08.3	1.0 02	143.9	63 38.2	1.0 02	143.8	64 08.1	1.0 02	143.7	64 38.1	1.0 02	143.7	70 37.6	1.0 02	142.8	71 07.6	1.0 02	142.7	76 06.8	1.0 02	141.5	4
35	61 37.0	1.0 02	142.9	62 07.0	1.0 02	142.8	63 36.9	1.0 02	142.7	64 06.9	1.0 02	142.7	64 36.9	1.0 02	142.6	70 36.4	1.0 02	141.8	71 06.3	1.0 02	141.7	76 05.5	1.0 02	140.4	35
6	61 35.8	1.0 02	141.8	62 05.7	1.0 02	141.8	63 35.6	1.0 02	141.6	64 05.6	1.0 02	141.6	64 35.6	1.0 02	141.5	70 35.0	1.0 02	140.7	71 05.0	1.0 02	140.6	76 04.2	1.0 02	139.3	6
7	61 34.4	1.0 02	140.8	62 04.4	1.0 02	140.7	63 34.3	1.0 02	140.6	64 04.3	1.0 02	140.5	64 34.3	1.0 02	140.5	70 33.7	1.0 02	139.6	71 03.6	1.0 02	139.5	76 02.8	1.0 02	138.2	7
8	61 33.1	1.0 02	139.7	62 03.1	1.0 02	139.7	63 33.0	1.0 02	139.5	64 02.9	1.0 02	139.5	64 32.9	1.0 02	139.4	70 32.3	1.0 02	138.5	71 02.3	1.0 02	138.4	76 01.4	1.0 02	137.1	8
9	61 31.7	1.0 02	138.7	62 01.7	1.0 02	138.6	63 31.6	1.0 02	138.5	64 01.6	1.0 02	138.4	64 31.5	1.0 02	138.4	70 30.9	1.0 02	137.5	71 00.9	1.0 02	137.4	75 59.9	1.0 02	136.0	9
40	61 30.3	1.0 02	137.6	62 00.3	1.0 02	137.6	63 30.2	1.0 02	137.4	64 00.2	1.0 02	137.4	64 30.1	1.0 02	137.3	70 29.5	1.0 02	136.4	70 59.4	1.0 02	136.3	75 58.5	1.0 02	134.9	40
1	61 28.9	1.0 02	136.6	61 58.9	1.0 02	136.6	63 28.8	1.0 02	136.4	63 58.7	1.0 02	136.3	64 28.7	1.0 02	136.3	70 28.0	1.0 02	135.3	70 58.0	1.0 02	135.2	75 57.0	1.0 03	133.8	1
2	61 27.5	1.0 02	135.6	61 57.4	1.0 02	135.5	63 27.3	1.0 02	135.3	63 57.3	1.0 02	135.3	64 27.2	1.0 02	135.2	70 26.6	1.0 02	134.2	70 56.5	1.0 02	134.1	75 55.4	1.0 03	132.7	2
3	61 26.0	1.0 02	134.5	61 56.0	1.0 02	134.5	63 25.8	1.0 02	134.3	63 55.8	1.0 02	134.2	64 25.7	1.0 02	134.2	70 25.0	1.0 02	133.2	70 55.0	1.0 02	133.1	75 53.9	1.0 03	131.6	3
4	61 24.5	1.0 03	133.5	61 54.4	1.0 02	133.4	63 24.3	1.0 02	133.2	63 54.3	1.0 03	133.2	64 24.2	1.0 03	133.1	70 23.5	1.0 02	132.1	70 53.4	1.0 03	132.0	75 52.3	1.0 03	130.5	4
45	61 23.0	1.0 03	132.4	61 52.9	1.0 03	132.4	63 22.8	1.0 03	132.2	63 52.7	1.0 03	132.1	64 22.7	1.0 03	132.1	70 21.9	1.0 03	131.0	70 51.8	1.0 03	130.9	75 50.7	99 03	129.4	45
6	61 21.4	1.0 03	131.4	61 51.4	1.0 03	131.3	63 21.2	1.0 03	131.1	63 51.2	1.0 03	131.1	64 21.1	1.0 03	131.0	70 20.3	1.0 03	130.0	70 50.3	1.0 03	129.9	75 49.1	99 03	128.3	6
7	61 19.8	1.0 03	130.3	61 49.8	1.0 03	130.3	63 19.6	1.0 03	130.1	63 49.6	1.0 03	130.0	64 19.5	1.0 03	130.0	70 18.7	1.0 03	128.9	70 48.6	1.0 03	128.8	75 47.4	99 03	127.2	7
8	61 18.2	1.0 03	129.3	61 48.2	1.0 03	129.2	63 18.0	1.0 03	129.1	63 48.0	1.0 03	129.0	64 17.9	1.0 03	128.9	70 17.1	1.0 03	127.9	70 47.0	1.0 03	127.7	75 45.7	99 03	126.1	8
9	61 16.6	1.0 03	128.3	61 46.5	1.0 03	128.2	63 16.4	1.0 03	128.0	63 46.3	1.0 03	128.0	64 16.3	1.0 03	127.9	70 15.4	1.0 03	126.8	70 45.3	1.0 03	126.7	75 44.0	99 03	125.1	9
50	61 14.9	1.0 03	127.2	61 44.9	1.0 03	127.2	63 14.7	1.0 03	127.0	63 44.7	1.0 03	126.9	64 14.6	1.0 03	126.8	70 13.7	1.0 03	125.8	70 43.6	1.0 03	125.6	75 42.3	99 03	124.0	50
1	61 13.2	1.0 03	126.2	61 43.2	1.0 03	126.1	63 13.0	1.0 03	125.9	63 43.0	1.0 03	125.9	64 12.9	1.0 03	125.8	70 12.0	1.0 03	124.7	70 41.9	1.0 03	124.6	75 40.6	99 03	122.9	1
2	61 11.5	1.0 03	125.1	61 41.5	1.0 03	125.1	63 11.3	1.0 03	124.9	63 41.3	1.0 03	124.8	64 11.2	1.0 03	124.8	70 10.3	1.0 03	123.6	70 40.2	1.0 03	123.5	75 38.8	99 03	121.8	2
3	61 09.8	1.0 03	124.1	61 39.8	1.0 03	124.1	63 09.6	1.0 03	123.9	63 39.5	1.0 03	123.8	64 09.5	1.0 03	123.7	70 08.5	1.0 03	122.6	70 38.4	1.0 03	122.5	75 37.0	99 03	120.8	3
4	61 08.1	1.0 03	123.1	61 38.0	1.0 03	123.0	63 07.8	1.0 03	122.8	63 37.8	1.0 03	122.8	64 07.7	1.0 03	122.7	70 06.8	1.0 03	121.5	70 36.7	1.0 03	121.4	75 35.2	99 03	119.7	4
55	61 06.3	1.0 03	122.0	61 36.2	1.0 03	122.0	63 06.1	1.0 03	121.8	63 36.0	1.0 03	121.7	64 06.0	1.0 03	121.6	70 05.0	1.0 03	120.5	70 34.9	1.0 03	120.4	75 33.4	99 03	118.6	55
6	61 04.5	1.0 03	121.0	61 34.5	1.0 03	121.0	63 04.3	1.0 03	120.7	63 34.2	1.0 03	120.7	64 04.2	1.0 03	120.6	70 03.1	1.0 03	119.4	70 33.0	1.0 03	119.3	75 31.5	99 03	117.6	6
7	61 02.7	1.0 03	120.0	61 32.7	1.0 03	119.9	63 02.5	1.0 03	119.7	63 32.4	1.0 03	119.6	64 02.3	1.0 03	119.6	70 01.3	1.0 03	118.4	70 31.2	1.0 03	118.3	75 29.7	99 03	116.5	7
8	61 00.9	1.0 03	119.0	61 30.8	1.0 03	118.9	63 00.6	1.0 03	118.7	63 30.6	1.0 03	118.6	64 00.5	1.0 03	118.5	69 59.5	1.0 03	117.4	70 29.3	1.0 03	117.2	75 27.8	99 03	115.5	8
9	60 59.0	1.0 03	117.9	61 29.0	1.0 03	117.9	62 58.8	1.0 03	117.7	63 28.7	1.0 03	117.6	63 58.7	1.0 03	117.5	69 57.6	1.0 03	116.3	70 27.5	1.0 03	116.2	75 25.9	99 03	114.4	9
60	60 57.2	1.0 03	116.9	61 27.1	1.0 03	116.8	62 56.9	1.0 03	116.6	63 26.9	1.0 03	116.5	63 56.8	1.0 03	116.5	69 55.7	1.0 03	115.3	70 25.6	1.0 03	115.1	75 24.0	99 03	113.3	60
1	60 55.3	1.0 03	115.9	61 25.2	1.0 03	115.8	62 55.1	1.0 03	115.6	63 25.0	1.0 03	115.5	63 54.9	1.0 03	115.4	69 53.8	1.0 03	114.2	70 23.7	1.0 03	114.1	75 22.0	99 03	112.3	1
2	60 53.4	1.0 03	114.8	61 23.4	1.0 03	114.8	62 53.2	1.0 03	114.6	63 23.1	1.0 03	114.5	63 53.0	1.0 03	114.4	69 51.9	1.0 03	113.2	70 21.8	1.0 03	113.1	75 20.1	99 03	111.2	2
3	60 51.5	1.0 03	113.8	61 21.4	1.0 03	113.7	62 51.2	1.0 03	113.5	63 21.2	1.0 03	113.5	63 51.1	1.0 03	113.4	69 50.0	1.0 03	112.2	70 19.8	1.0 03	112.0	75 18.1	99 03	110.2	3
4	60 49.6	1.0 03	112.8	61 19.5	1.0 03	112.7	62 49.3	1.0 03	112.5	63 19.2	1.0 03	112.4	63 49.2	1.0 03	112.4	69 48.0	1.0 03	111.1	70 17.9	1.0 03	111.0	75 16.2	99 03	109.2	4
65	60 47.6	1.0 03	111.8	61 17.6	1.0 03	111.7	62 47.4	1.0 03	111.5	63 17.3	1.0 03	111.4	63 47.2	1.0 03	111.3	69 46.1	1.0 03	110.1	70 15.9	1.0 03	110.0	75 14.2	99 03	108.1	65
6	60 45.7	1.0 03	110.7	61 15.6	1.0 03	110.7	62 45.4	1.0 03	110.5	63 15.4	1.0 03	110.4	63 45.3	1.0 03	110.3	69 44.1	1.0 03	109.1	70 14.0	1.0 03	108.9	75 12.2	99 03	107.1	6
7	60 43.7	1.0 03	109.7	61 13.7	1.0 03	109.7	62 43.5	1.0 03	109.4	63 13.4	1.0 03	109.4	63 43.3	1.0 03	109.3	69 42.1	1.0 03	108.0	70 12.0	1.0 03	107.9	75 10.2	99 03	106.0	7
8	60 41.8	1.0 03	108.7	61 11.7	1.0 03	108.6	62 41.5	1.0 03	108.4	63 11.4	1.0 03	108.3	63 41.3	1.0 03	108.3	69 40.1	1.0 03	107.0	70 10.0	1.0 03	106.9	75 08.2	99 03	105.0	8
9	60 39.8	1.0 03	107.7	61 09.7	1.0 03	107.6	62 39.5	1.0 03	107.4	63 09.4	1.0 03	107.3	63 39.3	1.0 03	107.2	69 38.1	1.0 03	106.0	70 08.0	1.0 03	105.8	75 06.1	99 03	104.0	9
70	60 37.8	1.0 03	106.7	61 07.7	1.0 03	106.6	62 37.5	1.0 03	106.4	63 07.4	1.0 03	106.3	63 37.3	1.0 03	106.2	69 36.1	1.0 03	104.9	70 05.9	1.0 03	104.8	75 04.1	99 03	102.9	70
1	60 35.8	1.0 03	105.7	61 05.7	1.0 03	105.6	62 35.5	1.0 03	105.4	63 05.4	1.0 03	105.3	63 35.3	1.0 03	105.2	69 34.0	1.0 03	103.9	70 03.9	1.0 03	103.8	75 02.0	99 03	101.9	1
2	60 33.7	1.0 03	104.6	61 03.7	1.0 03	104.6	62 33.4	1.0 03	104.3	63 03.4	1.0 03	104.3	63 33.3	1.0 03	104.2	69 32.0	1.0 03	102.9	70 01.9	1.0 03	102.8	75 00.0	99 03	100.9	2
3	60 31.7	1.0 03	103.6	61 01.6	1.0 03	103.6	62 31.4	1.0 03	103.3	63 01.3	1.0 03	103.2	63 31.2	1.0 03	103.2	69 30.0	1.0 03	101.9	69 59.8	1.0 03	101.7	74 57.9	99 03	99.9	3
4	60 29.7	1.0 03	102.6	60 59.6	1.0 03	102.5	62 29.4	1.0 03	102.3	62 59.3	1.0 03	102.2	63 29.2	1.0 03	102.2	69 27.9	1.0 03	100.9	69 57.8	1.0 03	100.7	74 55.9	99 03	98.8	4
75	60 27.6	1.0 03	101.6	60 57.5	1.0 03	101.5	62 27.3	1.0 03	101.3	62 57.2	1.0 03	101.2	63 27.2	1.0 03	101.1	69 25.9	1.0 03	99.9	69 55.7	1.0 03	99.7	74 53.8	99 03	97.8	75
6	60 25.6	1.0 03	100.6	60 55.5	1.0 03	100.5	62 25.3	1.0 03	100.3	62 55.2	1.0 03	100.2	63 25.1	1.0 03	100.1	69 23.8	1.0 03	98.8	69 53.7	1.0 03	98.7	74 51.7	99 03	96.8	6
7	60 23.5	1.0 03	99.6	60 53.4	1.0 03	99.5	62 23.2	1.0 03	99.3	62 53.1	1.0 03	99.2	63 23.0	1.0 03	99.1	69 21.7	1.0 03	97.8	69 51.6	1.0 03	97.7	74 49.6	99 03	95.8	7
8	60 21.4	1.0 03	98.6	60 51.4	1.0 03	98.5	62 21.1	1.0 03	98.3	62 51.0	1.0 03	98.2	63 21.0	1.0 03	98.1	69 19.6	1.0 03	96.8	69 49.5	1.0 03	96.7	74 47.6	99 03	94.8	8
9	60 19.4	1.0 03	97.6	60 49.3	1.0 03	97.5	62 19.1	1.0 03	97.3	62 49.0	1.0 03	97.2	63 18.9	1.0 03	97.1	69 17.6	1.0 03	95.8	69 47.4	1.0 03	95.7	74 45.5	99 03	93.8	9
80	60 17.3	1.0 03	96.6	60 47.2	1.0 03	96.5	62 17.0	1.0 03	96.3	62 46.9	1.0 03	96.2	63 16.8	1.0 03	96.1	69 15.5	1.0 03	94.8	69 45.3	1.0 03	94.7	74 43.4	99 03	92.8	80
1	60 15.2	1.0 03	95.5	60 45.1	1.0 03	95.5	62 14.9	1.0 03	95.2	62 44.8	1.0 03	95.2	63 14.7	1.0 03	95.1	69 13.4	1.0 03	93.8	69 43.2	1.0 03	93.6	74 41.3	99 03	91.8	1
2	60 13.1	1.0 03	94.5	60 43.0	1.0 03	94.5	62 12.8	1.0 03	94.2	62 42.7	1.0 03	94.2	63 12.6	1.0 03	94.1	69 11.3	1.0 03	92.8	69 41.1	1.0 03	92.6	74 39.2	99 03	90.8	2
3	60 11.0	1.0 03	93.5	60 41.0	1.0 03	93.5	62 10.7	1.0 03	93.2	62 40.6	1.0 03	93.2	63 10.5	1.0 03	93.1	69 09.2	1.0 03	91.8	69 39.0	1.0 03	91.6	74 37.1	99 03	89.8	3
4	60 08.9	1.0 03	92.5	60 38.9	1.0 03	92.5	62 08.6	1.0 03	92.2	62 38.5	1.0 03	92.2	63 08.5	1.0 03	92.1	69 07.1	1.0 03	90.8	69 37.0	1.0 03	90.6	74 35.0	99 03	88.8	4
85	60 06.8	1.0 03	91.5	60 36.8	1.0 03	91.5	62 06.5	1.0 03	91.2	62 36.4	1.0 03	91.2	63 06.4	1.0 03	91.1	69 05.0	1.0 03	89.8	69 34.9	1.0 03	89.6	74 32.9	99 03	87.8	85
6	60 04.7	1.0 03	90.5	60 34.7	1.0 03	90.5	62 04.4	1.0 03	90.2	62 34.3	1.0 03	90.2	63 04.3	1.0 03	90.1	69 02.9	1.0 03	88.8	69 32.8	1.0 03	88.6	74 30.8	99 03	86.8	6
7	60 02.7	1.0 03	89.5	60 32.6	1.0 03	89.5	62 02.3	1.0 03	89.2	62 32.3	1.0 03	89.2	63 02.2	1.0 03	89.1	69 00.8	1.0 03	87.8	69 30.7	1.0 03	87.6	74 28.7	99 03	85.8	7
8	60 00.6	1.0 03	88.5	60 30.5	1.0 03	88.5	62 00.2	1.0 03	88.2	62 30.2	1.0 03	88.2	63 00.1	1.0 03	88.1	68 58.7	1.0 03	86.8	69 28.6	1.0 03	86.7	74 26.6	99 03	84.8	8
9	59 58.5	1.0 03	87.5	60 28.4	1.0 03	87.5	61 58.2	1.0 03	87.2	62 28.1	1.0 03	87.2	62 58.0	1.0 03	87.1	68 56.6	1.0 03	85.8	69 26.5	1.0 03	85.7	74 24.5	99 03	83.8	9
90	59 56.4	1.0 03	86.5	60 26.3	1.0 03	86.5	61 56.1	1.0 03	86.2	62 26.0	1.0 03	86.2	62 55.9	1.0 03	86.1	68 54.6	1.0 03	84.8	69 24.4	1.0 03	84.7	74 22.5	99 03	82.8	90

Each degree-heading column gives **Alt.** (° ′ Δd Δt) and **Az.** (°). The left column is H.A.; the right column is H.A. with Lat. 88°.

H.A.	60° 00′ Alt	Az	60° 30′ Alt	Az	62° 00′ Alt	Az	62° 30′ Alt	Az	63° 00′ Alt	Az	69° 00′ Alt	Az	69° 30′ Alt	Az	74° 30′ Alt	Az	H.A.
91	59 54.3 1.0 03	85.5	60 24.2 1.0 03	85.5	61 54.0 1.0 03	85.3	62 23.9 1.0 03	85.2	62 53.8 1.0 03	85.1	68 52.5 1.0 03	83.8	69 22.3 1.0 03	83.7	74 20.4 99 03	81.8	91
92	59 52.2 1.0 03	84.6	60 22.1 1.0 03	84.5	61 51.9 1.0 03	84.3	62 21.8 1.0 03	84.2	62 51.7 1.0 03	84.1	68 50.4 1.0 03	82.8	69 20.2 1.0 03	82.7	74 18.3 99 03	80.9	2
93	59 50.1 1.0 03	83.6	60 20.0 1.0 03	83.5	61 49.8 1.0 03	83.3	62 19.7 1.0 03	83.2	62 49.6 1.0 03	83.1	68 48.3 1.0 03	81.8	69 18.2 1.0 03	81.7	74 16.3 99 03	79.9	3
94	59 48.0 1.0 03	82.6	60 18.0 1.0 03	82.5	61 47.7 1.0 03	82.3	62 17.7 1.0 03	82.2	62 47.6 1.0 03	82.1	68 46.2 1.0 03	80.9	69 16.1 1.0 03	80.7	74 14.2 99 03	78.9	4
95	59 46.0 1.0 03	81.6	60 15.9 1.0 03	81.5	61 45.7 1.0 03	81.3	62 15.6 1.0 03	81.2	62 45.5 1.0 03	81.1	68 44.2 1.0 03	79.9	69 14.0 1.0 03	79.7	74 12.2 99 03	77.9	95
96	59 43.9 1.0 03	80.6	60 13.8 1.0 03	80.5	61 43.6 1.0 03	80.3	62 13.5 1.0 03	80.2	62 43.4 1.0 03	80.1	68 42.1 1.0 03	78.9	69 12.0 1.0 03	78.8	74 10.3 99 03	77.0	6
97	59 41.8 1.0 03	79.6	60 11.8 1.0 03	79.5	61 41.5 1.0 03	79.3	62 11.5 1.0 03	79.2	62 41.4 1.0 03	79.1	68 40.1 1.0 03	77.9	69 09.9 1.0 03	77.8	74 08.1 99 03	76.0	7
98	59 39.8 1.0 03	78.6	60 09.7 1.0 03	78.5	61 39.5 1.0 03	78.3	62 09.4 1.0 03	78.2	62 39.3 1.0 03	78.2	68 38.0 1.0 03	76.9	69 07.9 1.0 03	76.8	74 06.1 99 03	75.0	8
99	59 37.7 1.0 03	77.6	60 07.7 1.0 03	77.6	61 37.4 1.0 03	77.3	62 07.4 1.0 03	77.3	62 37.3 1.0 03	77.2	68 36.0 1.0 03	75.9	69 05.9 1.0 03	75.8	74 04.0 99 03	74.1	9
100	59 35.7 1.0 03	76.6	60 05.6 1.0 03	76.6	61 35.4 1.0 03	76.3	62 05.3 1.0 03	76.3	62 35.2 1.0 03	76.2	68 34.0 1.0 03	75.0	69 03.8 1.0 03	74.8	74 02.0 99 03	73.1	100
101	59 33.7 1.0 03	75.6	60 03.6 1.0 03	75.6	61 33.4 1.0 03	75.4	62 03.3 1.0 03	75.3	62 33.2 1.0 03	75.2	68 31.9 1.0 03	74.0	69 01.8 1.0 03	73.9	74 00.0 99 03	72.1	1
102	59 31.6 1.0 03	74.7	60 01.6 1.0 03	74.6	61 31.3 1.0 03	74.4	62 01.3 1.0 03	74.3	62 31.2 1.0 03	74.2	68 29.9 1.0 03	73.0	68 59.8 1.0 03	72.9	73 58.0 99 03	71.2	2
103	59 29.6 1.0 03	73.7	59 59.5 1.0 03	73.6	61 29.3 1.0 03	73.4	61 59.3 1.0 03	73.3	62 29.2 1.0 03	73.2	68 27.9 1.0 03	72.0	68 57.8 1.0 03	71.9	73 56.1 99 03	70.2	3
104	59 27.6 1.0 03	72.7	59 57.5 1.0 03	72.6	61 27.3 1.0 03	72.4	61 57.3 1.0 03	72.3	62 27.2 1.0 03	72.3	68 26.0 1.0 03	71.1	68 55.8 1.0 03	70.9	73 54.1 99 03	69.2	4
105	59 25.6 1.0 03	71.7	59 55.6 1.0 03	71.7	61 25.3 1.0 03	71.4	61 55.3 1.0 03	71.4	62 25.2 1.0 03	71.3	68 24.0 1.0 03	70.1	68 53.9 1.0 03	70.0	73 52.2 99 03	68.3	105
106	59 23.6 1.0 03	70.7	59 53.6 1.0 03	70.7	61 23.4 1.0 03	70.5	61 53.3 1.0 03	70.4	62 23.2 1.0 03	70.3	68 22.0 1.0 03	69.1	68 51.9 1.0 03	69.0	73 50.2 99 03	67.3	6
107	59 21.7 1.0 03	69.8	59 51.6 1.0 03	69.7	61 21.4 1.0 03	69.5	61 51.3 1.0 03	69.4	62 21.2 1.0 03	69.3	68 20.1 1.0 03	68.2	68 49.9 1.0 03	68.0	73 48.3 99 03	66.4	7
108	59 19.7 1.0 03	68.8	59 49.6 1.0 03	68.7	61 19.4 1.0 03	68.5	61 49.4 1.0 03	68.4	62 19.3 1.0 03	68.4	68 18.1 1.0 03	67.2	68 48.0 1.0 03	67.1	73 46.4 99 03	65.4	8
109	59 17.8 1.0 03	67.8	59 47.7 1.0 03	67.7	61 17.5 1.0 03	67.5	61 47.4 1.0 03	67.5	62 17.3 1.0 03	67.4	68 16.2 1.0 03	66.2	68 46.1 1.0 03	66.1	73 44.5 99 03	64.5	9
110	59 15.8 1.0 03	66.8	59 45.8 1.0 03	66.8	61 15.6 1.0 03	66.6	61 45.5 1.0 03	66.5	62 15.4 1.0 03	66.4	68 14.3 1.0 03	65.3	68 44.2 1.0 03	65.2	73 42.6 99 03	63.5	110
111	59 13.9 1.0 03	65.8	59 43.8 1.0 03	65.8	61 13.7 1.0 03	65.6	61 43.6 1.0 03	65.5	62 13.5 1.0 03	65.4	68 12.4 1.0 03	64.3	68 42.3 1.0 03	64.2	73 40.7 99 03	62.6	1
112	59 12.0 1.0 03	64.9	59 41.9 1.0 03	64.8	61 11.7 1.0 03	64.6	61 41.7 1.0 03	64.5	62 11.6 1.0 03	64.5	68 10.5 1.0 03	63.4	68 40.4 1.0 03	63.2	73 38.8 99 03	61.7	2
113	59 10.1 1.0 03	63.9	59 40.1 1.0 03	63.8	61 09.9 1.0 03	63.6	61 39.8 1.0 03	63.6	62 09.7 1.0 03	63.5	68 08.7 1.0 03	62.4	68 38.6 1.0 03	62.3	73 37.0 99 03	60.7	3
114	59 08.2 1.0 03	62.9	59 38.2 1.0 03	62.9	61 08.0 1.0 03	62.7	61 37.9 1.0 03	62.6	62 07.9 1.0 03	62.5	68 06.8 1.0 03	61.4	68 36.7 1.0 03	61.3	73 35.2 99 03	59.8	4
115	59 06.4 1.0 03	62.0	59 36.3 1.0 03	61.9	61 06.1 1.0 03	61.7	61 36.1 1.0 03	61.6	62 06.0 1.0 03	61.6	68 05.0 1.0 03	60.5	68 34.9 1.0 03	60.4	73 33.4 99 03	58.8	115
116	59 04.6 1.0 03	61.0	59 34.5 1.0 03	60.9	61 04.3 1.0 03	60.7	61 34.2 1.0 03	60.7	62 04.2 1.0 03	60.6	68 03.2 1.0 03	59.5	68 33.1 1.0 03	59.4	73 31.6 99 03	57.9	6
117	59 02.7 1.0 03	60.0	59 32.7 1.0 03	60.0	61 02.5 1.0 03	59.8	61 32.4 1.0 03	59.7	62 02.4 1.0 03	59.6	68 01.4 1.0 03	58.6	68 31.3 1.0 03	58.5	73 29.9 99 03	57.0	7
118	59 00.9 1.0 03	59.0	59 30.9 1.0 03	59.0	61 00.7 1.0 03	58.8	61 30.6 1.0 03	58.7	62 00.6 1.0 03	58.7	67 59.6 1.0 03	57.6	68 29.5 1.0 03	57.5	73 28.1 99 03	56.0	8
119	58 59.1 1.0 03	58.1	59 29.1 1.0 03	58.0	60 58.9 1.0 03	57.8	61 28.9 1.0 03	57.8	61 58.8 1.0 03	57.7	67 57.8 1.0 03	56.7	68 27.7 1.0 03	56.5	73 26.4 99 03	55.1	9
120	58 57.4 1.0 03	57.1	59 27.3 1.0 03	57.0	60 57.2 1.0 03	56.9	61 27.1 1.0 03	56.8	61 57.0 1.0 03	56.7	67 56.1 1.0 03	55.7	68 26.0 1.0 03	55.6	73 24.7 99 03	54.2	120
121	58 55.6 1.0 03	56.1	59 25.6 1.0 03	56.1	60 55.4 1.0 03	55.9	61 25.4 1.0 03	55.8	61 55.3 1.0 03	55.8	67 54.4 1.0 03	54.8	68 24.3 1.0 03	54.6	73 23.0 99 03	53.2	1
122	58 53.9 1.0 03	55.2	59 23.8 1.0 03	55.1	60 53.7 1.0 03	54.9	61 23.6 1.0 03	54.9	61 53.6 1.0 03	54.8	67 52.7 1.0 03	53.8	68 22.6 1.0 03	53.7	73 21.3 99 03	52.3	2
123	58 52.2 1.0 03	54.2	59 22.1 1.0 03	54.1	60 52.0 1.0 03	54.0	61 21.9 1.0 03	53.9	61 51.9 1.0 03	53.8	67 51.0 1.0 03	52.9	68 20.9 1.0 03	52.8	73 19.7 99 03	51.4	3
124	58 50.5 1.0 03	53.2	59 20.4 1.0 03	53.2	60 50.3 1.0 03	53.0	61 20.2 1.0 03	52.9	61 50.2 1.0 03	52.9	67 49.3 1.0 03	51.9	68 19.2 1.0 03	51.8	73 18.1 99 03	50.4	4
125	58 48.8 1.0 03	52.3	59 18.8 1.0 03	52.2	60 48.6 1.0 03	52.0	61 18.6 1.0 03	52.0	61 48.5 1.0 03	51.9	67 47.7 1.0 03	51.0	68 17.6 1.0 03	50.9	73 16.5 1.0 03	49.5	125
126	58 47.2 1.0 03	51.3	59 17.1 1.0 03	51.3	60 47.0 1.0 03	51.1	61 16.9 1.0 03	51.0	61 46.9 1.0 03	51.0	67 46.1 1.0 03	50.0	68 16.0 1.0 03	49.9	73 14.9 1.0 03	48.6	6
127	58 45.6 1.0 03	50.3	59 15.5 1.0 03	50.3	60 45.4 1.0 03	50.1	61 15.3 1.0 03	50.1	61 45.3 1.0 03	50.0	67 44.5 1.0 03	49.1	68 14.4 1.0 03	49.0	73 13.3 1.0 03	47.7	7
128	58 44.0 1.0 03	49.4	59 13.9 1.0 03	49.3	60 43.8 1.0 03	49.2	61 13.7 1.0 03	49.1	61 43.7 1.0 03	49.1	67 42.9 1.0 03	48.1	68 12.8 1.0 03	48.0	73 11.8 1.0 03	46.8	8
129	58 42.4 1.0 03	48.4	59 12.3 1.0 03	48.4	60 42.2 1.0 03	48.2	61 12.2 1.0 03	48.2	61 42.1 1.0 03	48.1	67 41.4 1.0 02	47.2	68 11.3 1.0 03	47.1	73 10.3 1.0 02	45.8	9
130	58 40.8 1.0 03	47.5	59 10.8 1.0 03	47.4	60 40.7 1.0 03	47.3	61 10.6 1.0 03	47.2	61 40.6 1.0 02	47.1	67 39.8 1.0 02	46.3	68 09.8 1.0 02	46.2	73 08.8 1.0 02	44.9	130
131	58 39.3 1.0 03	46.5	59 09.3 1.0 02	46.5	60 39.1 1.0 02	46.3	61 09.1 1.0 02	46.2	61 39.0 1.0 02	46.2	67 38.4 1.0 02	45.3	68 08.3 1.0 02	45.2	73 07.4 1.0 02	44.0	1
132	58 37.8 1.0 02	45.5	59 07.8 1.0 02	45.5	60 37.6 1.0 02	45.3	61 07.6 1.0 02	45.3	61 37.5 1.0 02	45.2	67 36.9 1.0 02	44.4	68 06.6 1.0 02	44.3	73 05.9 1.0 02	43.1	2
133	58 36.3 1.0 02	44.6	59 06.3 1.0 02	44.5	60 36.2 1.0 02	44.4	61 06.1 1.0 02	44.3	61 36.1 1.0 02	44.3	67 35.4 1.0 02	43.4	68 05.4 1.0 02	43.3	73 04.5 1.0 02	42.2	3
134	58 34.8 1.0 02	43.6	59 04.8 1.0 02	43.6	60 34.7 1.0 02	43.4	61 04.7 1.0 02	43.4	61 34.6 1.0 02	43.3	67 34.0 1.0 02	42.5	68 03.9 1.0 02	42.4	73 03.1 1.0 02	41.3	4
135	58 33.4 1.0 02	42.7	59 03.4 1.0 02	42.6	60 33.3 1.0 02	42.5	61 03.2 1.0 02	42.4	61 33.2 1.0 02	42.4	67 32.6 1.0 02	41.6	68 02.5 1.0 02	41.5	73 01.7 1.0 02	40.3	135
136	58 32.0 1.0 02	41.7	59 02.0 1.0 02	41.7	60 31.9 1.0 02	41.5	61 01.8 1.0 02	41.5	61 31.8 1.0 02	41.5	67 31.2 1.0 02	40.6	68 01.2 1.0 02	40.5	73 00.4 1.0 02	39.4	6
137	58 30.6 1.0 02	40.8	59 00.6 1.0 02	40.7	60 30.5 1.0 02	40.6	61 00.5 1.0 02	40.5	61 30.4 1.0 02	40.5	67 29.9 1.0 02	39.7	67 59.8 1.0 02	39.6	72 59.0 1.0 02	38.5	7
138	58 29.3 1.0 02	39.8	58 59.2 1.0 02	39.8	60 29.2 1.0 02	39.6	60 59.1 1.0 02	39.6	61 29.1 1.0 02	39.5	67 28.5 1.0 02	38.8	67 58.5 1.0 02	38.7	72 57.7 1.0 02	37.6	8
139	58 27.9 1.0 02	38.8	58 57.9 1.0 02	38.8	60 27.8 1.0 02	38.7	60 57.8 1.0 02	38.6	61 27.8 1.0 02	38.6	67 27.2 1.0 02	37.8	67 57.2 1.0 02	37.7	72 56.5 1.0 02	36.7	9
140	58 26.6 1.0 02	37.9	58 56.6 1.0 02	37.8	60 26.5 1.0 02	37.7	60 56.5 1.0 02	37.7	61 26.5 1.0 02	37.6	67 26.0 1.0 02	36.9	67 55.9 1.0 02	36.8	72 55.2 1.0 02	35.8	140
141	58 25.3 1.0 02	36.9	58 55.4 1.0 02	36.9	60 25.3 1.0 02	36.8	60 55.2 1.0 02	36.7	61 25.2 1.0 02	36.7	67 24.7 1.0 02	36.0	67 54.7 1.0 02	35.9	72 54.0 1.0 02	34.9	1
142	58 24.1 1.0 02	36.0	58 54.1 1.0 02	35.9	60 24.0 1.0 02	35.8	60 54.0 1.0 02	35.8	61 24.0 1.0 02	35.7	67 23.5 1.0 02	35.0	67 53.5 1.0 02	35.0	72 52.8 1.0 02	34.0	2
143	58 22.9 1.0 02	35.0	58 52.9 1.0 02	35.0	60 22.8 1.0 02	34.9	60 52.8 1.0 02	34.8	61 22.8 1.0 02	34.8	67 22.3 1.0 02	34.1	67 52.3 1.0 02	34.0	72 51.7 1.0 02	33.1	3
144	58 21.7 1.0 02	34.1	58 51.7 1.0 02	34.0	60 21.6 1.0 02	33.9	60 51.6 1.0 02	33.9	61 21.6 1.0 02	33.8	67 21.2 1.0 02	33.2	67 51.1 1.0 02	33.1	72 50.6 1.0 02	32.2	4
145	58 20.6 1.0 02	33.1	58 50.6 1.0 02	33.1	60 20.5 1.0 02	33.0	60 50.5 1.0 02	32.9	61 20.4 1.0 02	32.9	67 20.0 1.0 02	32.2	67 50.0 1.0 02	32.2	72 49.5 1.0 02	31.3	145
146	58 19.4 1.0 02	32.2	58 49.4 1.0 02	32.0	60 19.4 1.0 02	32.0	60 49.3 1.0 02	32.0	61 19.3 1.0 02	31.9	67 18.9 1.0 02	31.3	67 48.9 1.0 02	31.2	72 48.4 1.0 02	30.4	6
147	58 18.3 1.0 02	31.2	58 48.3 1.0 02	31.2	60 18.3 1.0 02	31.1	60 48.2 1.0 02	31.0	61 18.2 1.0 02	31.0	67 17.9 1.0 02	30.4	67 47.8 1.0 02	30.3	72 47.3 1.0 02	29.5	7
148	58 17.3 1.0 02	30.3	58 47.3 1.0 02	30.2	60 17.2 1.0 02	30.1	60 47.2 1.0 02	30.1	61 17.1 1.0 02	30.0	67 16.8 1.0 02	29.5	67 46.8 1.0 02	29.4	72 46.3 1.0 02	28.6	8
149	58 16.2 1.0 02	29.3	58 46.2 1.0 02	29.3	60 16.2 1.0 02	29.2	60 46.1 1.0 02	29.1	61 16.1 1.0 02	29.1	67 15.8 1.0 02	28.5	67 45.8 1.0 02	28.5	72 45.3 1.0 02	27.7	9
150	58 15.2 1.0 02	28.4	58 45.2 1.0 02	28.3	60 15.2 1.0 02	28.2	60 45.1 1.0 02	28.2	61 15.1 1.0 02	28.2	67 14.8 1.0 02	27.6	67 44.8 1.0 02	27.5	72 44.4 1.0 02	26.8	150
151	58 14.2 1.0 02	27.4	58 44.2 1.0 02	27.4	60 14.2 1.0 02	27.3	60 44.2 1.0 02	27.3	61 14.1 1.0 02	27.2	67 13.9 1.0 02	26.7	67 43.8 1.0 02	26.6	72 43.4 1.0 02	25.9	1
152	58 13.2 1.0 02	26.5	58 43.2 1.0 02	26.4	60 13.2 1.0 02	26.3	60 43.2 1.0 02	26.3	61 13.2 1.0 02	26.3	67 12.9 1.0 01	25.7	67 42.9 1.0 01	25.7	72 42.6 1.0 01	25.0	2
153	58 12.4 1.0 01	25.5	58 42.4 1.0 01	25.5	60 12.3 1.0 01	25.4	60 42.3 1.0 01	25.4	61 12.3 1.0 01	25.3	67 12.0 1.0 01	24.8	67 42.0 1.0 01	24.8	72 41.7 1.0 01	24.1	3
154	58 11.5 1.0 01	24.6	58 41.5 1.0 01	24.5	60 11.4 1.0 01	24.5	60 41.4 1.0 01	24.4	61 11.4 1.0 01	24.4	67 11.2 1.0 01	23.9	67 41.2 1.0 01	23.8	72 40.8 1.0 01	23.2	4
155	58 10.6 1.0 01	23.6	58 40.6 1.0 01	23.6	60 10.6 1.0 01	23.5	60 40.6 1.0 01	23.5	61 10.6 1.0 01	23.5	67 10.3 1.0 01	23.0	67 40.3 1.0 01	22.9	72 40.0 1.0 01	22.3	155
156	58 09.8 1.0 01	22.7	58 39.8 1.0 01	22.7	60 09.8 1.0 01	22.6	60 39.7 1.0 01	22.5	61 09.7 1.0 01	22.5	67 09.5 1.0 01	22.1	67 39.5 1.0 01	22.0	72 39.3 1.0 01	21.4	6
157	58 09.0 1.0 01	21.7	58 39.0 1.0 01	21.7	60 09.0 1.0 01	21.6	60 39.0 1.0 01	21.6	61 09.0 1.0 01	21.6	67 08.6 1.0 01	21.1	67 38.6 1.0 01	21.1	72 38.5 1.0 01	20.5	7
158	58 08.3 1.0 01	20.8	58 38.3 1.0 01	20.8	60 08.2 1.0 01	20.7	60 38.2 1.0 01	20.7	61 08.2 1.0 01	20.6	67 08.0 1.0 01	20.2	67 38.0 1.0 01	20.2	72 37.8 1.0 01	19.6	8
159	58 07.5 1.0 01	19.8	58 37.5 1.0 01	19.8	60 07.5 1.0 01	19.7	60 37.5 1.0 01	19.7	61 07.5 1.0 01	19.7	67 07.3 1.0 01	19.3	67 37.3 1.0 01	19.2	72 37.1 1.0 01	18.7	9
160	58 06.8 1.0 01	18.9	58 36.8 1.0 01	18.9	60 06.8 1.0 01	18.8	60 36.8 1.0 01	18.8	61 06.8 1.0 01	18.7	67 06.7 1.0 01	18.4	67 36.6 1.0 01	18.3	72 36.4 1.0 01	17.8	160
161	58 06.2 1.0 01	17.9	58 36.2 1.0 01	17.9	60 06.1 1.0 01	17.9	60 36.1 1.0 01	17.8	61 06.1 1.0 01	17.8	67 06.0 1.0 01	17.4	67 36.0 1.0 01	17.4	72 35.8 1.0 01	16.9	1
162	58 05.5 1.0 01	17.0	58 35.5 1.0 01	17.0	60 05.5 1.0 01	16.9	60 35.5 1.0 01	16.9	61 05.5 1.0 01	16.9	67 05.4 1.0 01	16.5	67 35.4 1.0 01	16.5	72 35.2 1.0 01	16.0	2
163	58 05.0 1.0 01	16.1	58 34.9 1.0 01	16.0	60 04.9 1.0 01	16.0	60 34.9 1.0 01	16.0	61 04.9 1.0 01	15.9	67 04.8 1.0 01	15.6	67 34.8 1.0 01	15.6	72 34.7 1.0 01	15.1	3
164	58 04.4 1.0 01	15.1	58 34.4 1.0 01	15.1	60 04.4 1.0 01	15.0	60 34.4 1.0 01	15.0	61 04.4 1.0 01	15.0	67 04.3 1.0 01	14.7	67 34.3 1.0 01	14.7	72 34.1 1.0 01	14.2	4
165	58 03.9 1.0 01	14.2	58 33.9 1.0 01	14.1	60 03.8 1.0 01	14.1	60 33.8 1.0 01	14.1	61 03.8 1.0 01	14.1	67 03.8 1.0 01	13.8	67 33.7 1.0 01	13.7	72 33.6 1.0 01	13.3	165
166	58 03.4 1.0 01	13.2	58 33.4 1.0 01	13.2	60 03.3 1.0 01	13.2	60 33.3 1.0 01	13.1	61 03.3 1.0 01	13.1	67 03.3 1.0 01	12.8	67 33.3 1.0 01	12.8	72 33.1 1.0 01	12.5	6
167	58 02.9 1.0 01	12.3	58 32.9 1.0 01	12.3	60 02.9 1.0 01	12.2	60 32.9 1.0 01	12.2	61 02.9 1.0 01	12.2	67 02.8 1.0 01	11.9	67 32.8 1.0 01	11.9	72 32.7 1.0 01	11.6	7
168	58 02.5 1.0 01	11.3	58 32.5 1.0 01	11.3	60 02.5 1.0 01	11.3	60 32.5 1.0 01	11.3	61 02.5 1.0 01	11.2	67 02.4 1.0 01	11.0	67 32.4 1.0 01	11.0	72 32.3 1.0 01	10.7	8
169	58 02.1 1.0 01	10.4	58 32.1 1.0 01	10.4	60 02.1 1.0 01	10.3	60 32.1 1.0 01	10.3	61 02.1 1.0 01	10.3	67 02.0 1.0 01	10.1	67 32.0 1.0 01	10.1	72 32.0 1.0 01	09.8	233
170	58 01.7 1.0 01	09.4	58 31.7 1.0 01	09.4	60 01.7 1.0 01	09.4	60 31.7 1.0 01	09.4	61 01.7 1.0 01	09.4	67 01.7 1.0 01	09.2	67 31.7 1.0 01	09.2	72 31.6 1.0 00	08.9	170
171	58 01.3 1.0 00	08.5	58 31.3 1.0 01	08.5	60 01.4 1.0 00	08.5	60 31.4 1.0 00	08.4	61 01.4 1.0 00	08.5	67 01.4 1.0 00	08.3	67 31.4 1.0 00	08.2	72 31.3 1.0 00	08.2	1
172	58 01.1 1.0 00	07.5	58 31.1 1.0 00	07.5	60 01.1 1.0 00	07.5	60 31.1 1.0 00	07.5	61 01.1 1.0 00	07.5	67 01.1 1.0 00	07.3	67 31.1 1.0 00	07.3	72 31.0 1.0 00	07.1	2
173	58 00.8 1.0 00	06.6	58 30.8 1.0 00	06.6	60 00.8 1.0 00	06.6	60 30.8 1.0 00	06.6	61 00.8 1.0 00	06.6	67 00.8 1.0 00	06.4	67 30.8 1.0 00	06.4	72 30.8 1.0 00	06.2	3
174	58 00.6 1.0 00	05.7	58 30.6 1.0 00	05.7	60 00.6 1.0 00	05.6	60 30.6 1.0 00	05.6	61 00.6 1.0 00	05.6	67 00.6 1.0 00	05.5	67 30.6 1.0 00	05.5	72 30.6 1.0 00	05.3	4
175	58 00.4 1.0 00	04.7	58 30.4 1.0 00	04.7	60 00.4 1.0 00	04.7	60 30.4 1.0 00	04.7	61 00.4 1.0 00	04.7	67 00.4 1.0 00	04.6	67 30.4 1.0 00	04.6	72 30.4 1.0 00	04.4	175
176	58 00.3 1.0 00	03.8	58 30.3 1.0 00	03.8	60 00.3 1.0 00	03.8	60 30.3 1.0 00	03.8	61 00.3 1.0 00	03.8	67 00.3 1.0 00	03.7	67 30.3 1.0 00	03.7	72 30.3 1.0 00	03.6	6
177	58 00.2 1.0 00	02.8	58 30.2 1.0 00	02.8	60 00.2 1.0 00	02.8	60 30.2 1.0 00	02.8	61 00.2 1.0 00	02.8	67 00.2 1.0 00	02.7	67 30.2 1.0 00	02.7	72 30.1 1.0 00	02.7	7
178	58 00.1 1.0 00	01.9	58 30.1 1.0 00	01.9	60 00.1 1.0 00	01.9	60 30.1 1.0 00	01.9	61 00.1 1.0 00	01.9	67 00.1 1.0 00	01.8	67 30.1 1.0 00	01.8	72 30.1 1.0 00	01.8	8
179	58 00.0 1.0 00	00.9	58 30.0 1.0 00	00.9	60 00.0 1.0 00	00.9	60 30.0 1.0 00	00.9	61 00.0 1.0 00	00.9	67 00.0 1.0 00	00.9	67 30.0 1.0 00	00.9	72 30.0 1.0 00	00.9	9
180	58 00.0 1.0 00	00.0	58 30.0 1.0 00	00.0	60 00.0 1.0 00	00.0	60 30.0 1.0 00	00.0	61 00.0 1.0 00	00.0	67 00.0 1.0 00	00.0	67 30.0 1.0 00	00.0	72 30.0 1.0 00	00.0	180

STAR IDENTIFICATION TABLE

ALTITUDE

Lat. 88°

AZ.	4° Dec.	4° H.A.	8° Dec.	8° H.A.	12° Dec.	12° H.A.	16° Dec.	16° H.A.	20° Dec.	20° H.A.	24° Dec.	24° H.A.	28° Dec.	28° H.A.	32° Dec.	32° H.A.	36° Dec.	36° H.A.	40° Dec.	40° H.A.	44° Dec.	44° H.A.	AZ.
00	06	180	10	180	14	180	18	180	22	180	26	180	30	180	34	180	38	180	42	180	46	180	00
4	06	176	10	176	14	176	18	176	22	176	26	176	30	176	34	176	38	176	42	176	46	176	4
8	06	172	10	172	14	172	18	172	22	172	26	172	30	172	34	172	38	172	42	172	46	172	8
12	06	168	10	168	14	168	18	168	22	168	26	168	30	168	34	168	38	168	42	168	46	168	12
16	06	164	10	164	14	164	18	164	22	164	26	164	30	164	34	164	38	164	42	164	46	163	16
20	06	160	10	160	14	160	18	160	22	160	26	160	30	160	34	160	38	159	42	159	46	159	20
24	06	156	10	156	14	156	18	156	22	156	26	156	30	156	34	155	38	155	42	155	46	155	24
28	06	152	10	152	14	152	18	152	22	152	26	152	30	151	34	151	38	151	42	151	46	151	28
32	06	148	10	148	14	148	18	148	22	148	26	148	30	147	34	147	38	147	42	147	46	147	32
36	06	144	10	144	14	144	18	144	22	144	26	143	30	143	34	143	38	143	42	143	46	143	36
40	06	140	10	140	14	140	18	140	22	140	26	139	30	139	34	139	38	139	42	139	46	139	40
44	05	136	09	136	13	136	17	136	21	135	25	135	29	135	33	135	37	135	41	135	45	135	44
48	05	132	09	132	13	132	17	132	21	131	25	131	29	131	33	131	37	131	41	131	45	131	48
52	05	128	09	128	13	128	17	128	21	127	25	127	29	127	33	127	37	127	41	127	45	126	52
56	05	124	09	124	13	124	17	124	21	123	25	123	29	123	33	123	37	123	41	123	45	122	56
60	05	120	09	120	13	120	17	119	21	119	25	119	29	119	33	119	37	119	41	119	45	118	60
64	05	116	09	116	13	116	17	115	21	115	25	115	29	115	33	115	37	115	41	114	45	114	64
68	05	112	09	112	13	112	17	111	21	111	25	111	29	111	33	111	37	111	41	110	45	110	68
72	05	108	09	108	13	108	17	107	21	107	25	107	29	107	33	107	37	107	41	106	45	106	72
76	04	104	08	104	12	104	16	103	20	103	24	103	28	103	32	103	36	103	40	102	44	102	76
80	04	100	08	100	12	100	16	99	20	99	24	99	28	99	32	99	36	99	40	98	44	98	80
84	04	96	08	96	12	96	16	95	20	95	24	95	28	95	32	95	36	95	40	94	44	94	84
88	04	92	08	92	12	92	16	91	20	91	24	91	28	91	32	91	36	91	40	90	44	90	88
92	04	88	08	88	12	88	16	87	20	87	24	87	28	87	32	87	36	87	40	86	44	86	92
96	04	84	08	84	12	84	16	83	20	83	24	83	28	83	32	83	36	83	40	82	44	82	96
100	04	80	08	80	12	80	16	79	20	79	24	79	28	79	32	79	36	79	40	78	44	78	100
104	04	76	08	76	12	76	16	75	20	75	24	75	27	75	31	75	35	75	39	74	43	74	104
108	03	72	07	72	11	72	15	71	19	71	23	71	27	71	31	71	35	71	39	70	43	70	108
112	03	68	07	68	11	68	15	67	19	67	23	67	27	67	31	67	35	67	39	66	43	66	112
116	03	64	07	64	11	64	15	64	19	63	23	63	27	63	31	63	35	63	39	63	43	62	116
120	03	60	07	60	11	60	15	60	19	59	23	59	27	59	31	59	35	59	39	59	43	58	120
124	03	56	07	56	11	56	15	56	19	55	23	55	27	55	31	55	35	55	39	55	43	54	124
128	03	52	07	52	11	52	15	52	19	51	23	51	27	51	31	51	35	51	39	51	43	51	128
132	03	48	07	48	11	48	15	48	19	47	23	47	27	47	31	47	35	47	39	47	43	47	132
136	03	44	07	44	11	44	15	44	19	44	23	43	27	43	31	43	35	43	39	43	43	43	136
140	02	40	06	40	10	40	14	40	18	40	22	39	26	39	30	39	34	39	38	39	42	39	140
144	02	36	06	36	10	36	14	36	18	36	22	36	26	35	30	35	34	35	38	35	42	35	144
148	02	32	06	32	10	32	14	32	18	32	22	32	26	31	30	31	34	31	38	31	42	31	148
152	02	28	06	28	10	28	14	28	18	28	22	28	26	28	30	27	34	27	38	27	42	27	152
156	02	24	06	24	10	24	14	24	18	24	22	24	26	24	30	24	34	23	38	23	42	23	156
160	02	20	06	20	10	20	14	20	18	20	22	20	26	20	30	20	34	20	38	19	42	19	160
164	02	16	06	16	10	16	14	16	18	16	22	16	26	16	30	16	34	16	38	16	42	15	164
168	02	12	06	12	10	12	14	12	18	12	22	12	26	12	30	12	34	12	38	12	42	12	168
172	02	08	06	08	10	08	14	08	18	08	22	08	26	08	30	08	34	08	38	08	42	08	172
176	02	04	06	04	10	04	14	04	18	04	22	04	26	04	30	04	34	04	38	04	42	04	176
180	02	00	06	00	10	00	14	00	18	00	22	00	26	00	30	00	34	00	38	00	42	00	180
	4°		8°		12°		16°		20°		24°		28°		32°		36°		40°		44°		

FIGURES IN ITALICS INDICATE THAT DECLINATION IS OF CONTRARY NAME TO LATITUDE

AZ.	48° Dec.	H.A.	52° Dec.	H.A.	56° Dec.	H.A.	60° Dec.	H.A.	64° Dec.	H.A.	68° Dec.	H.A.	72° Dec.	H.A.	76° Dec.	H.A.	80° Dec.	H.A.	84° Dec.	H.A.	88° Dec.	H.A.	AZ.
00	50	180	54	180	58	180	62	180	66	180	70	180	74	180	78	180	82	180	86	180	90	...	00
4	50	176	54	176	58	176	62	176	66	176	70	176	74	176	78	175	82	175	86	174	90	88	4
8	50	172	54	172	58	172	62	171	66	171	70	171	74	171	78	171	82	170	86	168	90	86	8
12	50	168	54	167	58	167	62	167	66	167	70	167	74	167	78	166	82	165	86	162	90	84	12
16	50	163	54	163	58	163	62	163	66	163	70	163	74	162	78	161	82	160	86	156	90	82	16
20	50	159	54	159	58	159	62	159	66	158	70	158	74	158	78	157	82	155	86	151	89	80	20
24	50	155	54	155	58	155	62	154	66	154	70	154	74	153	78	152	82	150	86	145	89	78	24
28	50	151	54	151	58	151	62	150	66	150	70	149	74	149	78	148	82	146	86	140	89	76	28
32	50	147	54	147	58	146	62	146	66	146	70	145	74	144	78	143	82	141	86	134	89	74	32
36	50	143	54	142	58	142	62	142	66	141	70	141	74	140	78	139	82	136	85	129	89	72	36
40	50	139	54	138	58	138	62	138	66	137	69	137	73	136	77	134	81	131	85	124	89	70	40
44	49	134	53	134	57	134	61	133	65	133	69	132	73	131	77	130	81	127	85	119	88	68	44
48	49	130	53	130	57	130	61	129	65	129	69	128	73	127	77	125	81	122	85	114	88	66	48
52	49	126	53	126	57	126	61	125	65	125	69	124	73	123	77	121	81	118	85	110	88	64	52
56	49	122	53	122	57	121	61	121	65	120	69	120	73	119	77	117	81	114	85	105	88	62	56
60	49	118	53	118	57	117	61	117	65	116	69	116	73	114	77	113	81	109	85	101	88	60	60
64	49	114	53	114	57	113	61	113	65	112	69	111	73	110	77	108	81	105	85	97	88	58	64
68	49	110	53	110	57	109	61	109	65	108	69	107	73	106	77	104	81	101	84	93	88	56	68
72	49	106	53	106	57	105	61	105	65	104	69	103	73	102	76	100	80	97	84	89	88	54	72
76	48	102	52	101	56	101	60	101	64	100	68	99	72	98	76	96	80	93	84	85	88	52	76
80	48	98	52	97	56	97	60	97	64	96	68	95	72	94	76	92	80	89	84	81	87	50	80
84	48	94	52	93	56	93	60	93	64	92	68	91	72	90	76	88	80	85	84	77	87	48	84
88	48	90	52	89	56	89	60	89	64	88	68	87	72	86	76	84	80	81	84	73	87	46	88
92	48	86	52	85	56	85	60	85	64	84	68	83	72	82	76	80	80	77	84	70	87	44	92
96	48	82	52	81	56	81	60	81	64	80	68	79	72	78	76	76	80	73	83	66	87	42	96
100	48	78	52	78	56	77	60	77	64	76	68	75	72	74	76	72	79	69	83	63	87	40	100
104	47	74	51	74	55	73	59	73	63	72	67	71	71	70	75	69	79	66	83	59	87	38	104
108	47	70	51	70	55	69	59	69	63	68	67	67	71	66	75	65	79	62	83	56	87	36	108
112	47	66	51	66	55	65	59	65	63	64	67	64	71	63	75	61	79	58	83	53	87	34	112
116	47	62	51	62	55	61	59	61	63	60	67	60	71	59	75	57	79	55	83	49	87	32	116
120	47	58	51	58	55	58	59	57	63	57	67	56	71	55	75	54	79	51	83	46	87	30	120
124	47	54	51	54	55	54	59	53	63	53	67	52	71	51	75	50	79	48	83	43	86	28	124
128	47	50	51	50	55	50	59	49	63	49	67	48	71	47	75	46	79	44	83	40	86	26	128
132	47	46	51	46	55	46	59	46	63	45	67	45	71	44	75	43	79	41	83	37	86	24	132
136	47	43	51	42	55	42	59	42	63	41	67	41	71	40	74	39	78	37	82	33	86	22	136
140	46	39	50	38	54	38	58	38	62	38	66	37	70	36	74	35	78	34	82	30	86	20	140
144	46	35	50	35	54	34	58	34	62	34	66	33	70	33	74	32	78	30	82	27	86	18	144
148	46	31	50	31	54	31	58	30	62	30	66	30	70	29	74	28	78	27	82	24	86	16	148
152	46	27	50	27	54	27	58	26	62	26	66	26	70	25	74	25	78	23	82	21	86	14	152
156	46	23	50	23	54	23	58	23	62	22	66	22	70	22	74	21	78	20	82	18	86	12	156
160	46	19	50	19	54	19	58	19	62	19	66	18	70	18	74	18	78	17	82	15	86	10	160
164	46	15	50	15	54	15	58	15	62	15	66	15	70	14	74	14	78	13	82	12	86	08	164
168	46	12	50	11	54	11	58	11	62	11	66	11	70	11	74	11	78	10	82	09	86	06	168
172	46	08	50	08	54	08	58	08	62	07	66	07	70	07	74	07	78	07	82	06	86	04	172
176	46	04	50	04	54	04	58	04	62	04	66	04	70	04	74	04	78	03	82	03	86	02	176
180	46	00	50	00	54	00	58	00	62	00	66	00	70	00	74	00	78	00	82	00	86	00	180
	48°		52°		56°		60°		64°		68°		72°		76°		80°		84°		88°		

FIGURES IN ITALICS INDICATE THAT DECLINATION IS OF CONTRARY NAME TO LATITUDE

10—43722-1

Lat. 89°

H.A.	4° 00' Alt.	Δd Δt	Az.	4° 30' Alt.	Δd Δt	Az.	5° 00' Alt.	Δd Δt	Az.	5° 30' Alt.	Δd Δt	Az.	6° 00' Alt.	Δd Δt	Az.	6° 30' Alt.	Δd Δt	Az.	7° 00' Alt.	Δd Δt	Az.	7° 30' Alt.	Δd Δt	Az.	H.A.
00	5 00.0	1.0 00	180.0	5 30.0	1.0 00	180.0	6 00.0	1.0 00	180.0	6 30.0	1.0 00	180.0	7 00.0	1.0 00	180.0	7 30.0	1.0 00	180.0	8 00.0	1.0 00	180.0	8 30.0	1.0 00	180.0	00
1				5 30.0	1.0 00	179.0	6 00.0	1.0 00	179.0	6 30.0	1.0 00	179.0	7 00.0	1.0 00	179.0	7 30.0	1.0 00	179.0	8 00.0	1.0 00	179.0	8 30.0	1.0 00	179.0	1
2				5 30.0	1.0 00	178.0	6 00.0	1.0 00	178.0	6 30.0	1.0 00	178.0	7 00.0	1.0 00	178.0	7 30.0	1.0 00	178.0	8 00.0	1.0 00	178.0	8 30.0	1.0 00	178.0	2
3				5 29.9	1.0 00	177.0	5 59.9	1.0 00	177.0	6 29.9	1.0 00	177.0	6 59.9	1.0 00	177.0	7 29.9	1.0 00	177.0	7 59.9	1.0 00	177.0	8 29.9	1.0 00	177.0	3
4				5 29.9	1.0 00	176.0	5 59.9	1.0 00	176.0	6 29.9	1.0 00	176.0	6 59.9	1.0 00	176.0	7 29.9	1.0 00	176.0	7 59.9	1.0 00	176.0	8 29.9	1.0 00	176.0	4
05				5 29.8	1.0 00	175.0	5 59.8	1.0 00	175.0	6 29.8	1.0 00	175.0	6 59.8	1.0 00	175.0	7 29.8	1.0 00	175.0	7 59.8	1.0 00	175.0	8 29.8	1.0 00	175.0	05
6				5 29.7	1.0 00	174.0	5 59.7	1.0 00	174.0	6 29.7	1.0 00	174.0	6 59.7	1.0 00	174.0	7 29.7	1.0 00	174.0	7 59.7	1.0 00	174.0	8 29.7	1.0 00	174.0	6
7				5 29.6	1.0 00	173.0	5 59.6	1.0 00	173.0	6 29.6	1.0 00	173.0	6 59.6	1.0 00	173.0	7 29.6	1.0 00	173.0	7 59.6	1.0 00	173.0	8 29.6	1.0 00	173.0	7
8				5 29.4	1.0 00	172.0	5 59.4	1.0 00	172.0	6 29.4	1.0 00	172.0	6 59.4	1.0 00	172.0	7 29.4	1.0 00	172.0	7 59.4	1.0 00	172.0	8 29.4	1.0 00	172.0	8
9				5 29.3	1.0 00	171.0	5 59.3	1.0 00	171.0	6 29.3	1.0 00	171.0	6 59.3	1.0 00	171.0	7 29.3	1.0 00	171.0	7 59.3	1.0 00	171.0	8 29.3	1.0 00	171.0	9
10				5 29.1	1.0 00	170.0	5 59.1	1.0 00	170.0	6 29.1	1.0 00	170.0	6 59.1	1.0 00	170.0	7 29.1	1.0 00	170.0	7 59.1	1.0 00	170.0	8 29.1	1.0 00	170.0	10
1				5 28.9	1.0 00	169.0	5 58.9	1.0 00	169.0	6 28.9	1.0 00	169.0	6 58.9	1.0 00	169.0	7 28.9	1.0 00	169.0	7 58.9	1.0 00	169.0	8 28.9	1.0 00	169.0	1
2				5 28.7	1.0 00	168.0	5 58.7	1.0 00	168.0	6 28.7	1.0 00	168.0	6 58.7	1.0 00	168.0	7 28.7	1.0 00	168.0	7 58.7	1.0 00	168.0	8 28.7	1.0 00	168.0	2
3				5 28.5	1.0 00	167.0	5 58.5	1.0 00	167.0	6 28.5	1.0 00	167.0	6 58.5	1.0 00	167.0	7 28.5	1.0 00	167.0	7 58.5	1.0 00	167.0	8 28.5	1.0 00	167.0	3
4				5 28.2	1.0 00	166.0	5 58.2	1.0 00	166.0	6 28.2	1.0 00	166.0	6 58.2	1.0 00	166.0	7 28.2	1.0 00	166.0	7 58.2	1.0 00	166.0	8 28.2	1.0 00	166.0	4
15				5 28.0	1.0 00	165.0	5 58.0	1.0 00	165.0	6 28.0	1.0 00	165.0	6 58.0	1.0 00	165.0	7 28.0	1.0 00	165.0	7 58.0	1.0 00	165.0	8 28.0	1.0 00	165.0	15
6				5 27.7	1.0 00	164.0	5 57.7	1.0 00	164.0	6 27.7	1.0 00	164.0	6 57.7	1.0 00	164.0	7 27.7	1.0 00	164.0	7 57.7	1.0 00	164.0	8 27.7	1.0 00	164.0	6
7				5 27.4	1.0 00	163.0	5 57.4	1.0 01	163.0	6 27.4	1.0 01	163.0	6 57.4	1.0 01	163.0	7 27.4	1.0 01	163.0	7 57.4	1.0 01	163.0	8 27.4	1.0 01	163.0	7
8				5 27.1	1.0 01	162.0	5 57.1	1.0 01	162.0	6 27.1	1.0 01	162.0	6 57.1	1.0 01	162.0	7 27.1	1.0 01	162.0	7 57.1	1.0 01	162.0	8 27.1	1.0 01	162.0	8
9				5 26.7	1.0 01	161.0	5 56.7	1.0 01	161.0	6 26.7	1.0 01	161.0	6 56.7	1.0 01	161.0	7 26.7	1.0 01	161.0	7 56.7	1.0 01	161.0	8 26.7	1.0 01	161.0	9
20				5 26.4	1.0 01	160.0	5 56.4	1.0 01	160.0	6 26.4	1.0 01	160.0	6 56.4	1.0 01	160.0	7 26.4	1.0 01	160.0	7 56.4	1.0 01	160.0	8 26.4	1.0 01	160.0	20
1				5 26.0	1.0 01	159.0	5 56.0	1.0 01	159.0	6 26.0	1.0 01	159.0	6 56.0	1.0 01	159.0	7 26.0	1.0 01	159.0	7 56.0	1.0 01	159.0	8 26.0	1.0 01	158.9	1
2				5 25.6	1.0 01	158.0	5 55.6	1.0 01	158.0	6 25.6	1.0 01	158.0	6 55.6	1.0 01	158.0	7 25.6	1.0 01	158.0	7 55.6	1.0 01	158.0	8 25.6	1.0 01	157.9	2
3				5 25.2	1.0 01	157.0	5 55.2	1.0 01	157.0	6 25.2	1.0 01	157.0	6 55.2	1.0 01	157.0	7 25.2	1.0 01	157.0	7 55.2	1.0 01	156.9	8 25.2	1.0 01	156.9	3
4				5 24.8	1.0 01	156.0	5 54.8	1.0 01	156.0	6 24.8	1.0 01	156.0	6 54.8	1.0 01	156.0	7 24.8	1.0 01	156.0	7 54.8	1.0 01	155.9	8 24.8	1.0 01	155.9	4
25				5 24.4	1.0 01	155.0	5 54.4	1.0 01	155.0	6 24.4	1.0 01	155.0	6 54.4	1.0 01	155.0	7 24.4	1.0 01	154.9	7 54.4	1.0 01	154.9	8 24.4	1.0 01	154.9	25
6				5 23.9	1.0 01	154.0	5 53.9	1.0 01	154.0	6 23.9	1.0 01	154.0	6 53.9	1.0 01	154.0	7 23.9	1.0 01	153.9	7 53.9	1.0 01	153.9	8 23.9	1.0 01	153.9	6
7				5 23.5	1.0 01	153.0	5 53.5	1.0 01	153.0	6 23.4	1.0 01	153.0	6 53.4	1.0 01	152.9	7 23.4	1.0 01	152.9	7 53.4	1.0 01	152.9	8 23.4	1.0 01	152.9	7
8				5 23.0	1.0 01	152.0	5 53.0	1.0 01	152.0	6 23.0	1.0 01	152.0	6 53.0	1.0 01	151.9	7 23.0	1.0 01	151.9	7 53.0	1.0 01	151.9	8 23.0	1.0 01	151.9	8
9				5 22.5	1.0 01	151.0	5 52.5	1.0 01	151.0	6 22.5	1.0 01	150.9	6 52.5	1.0 01	150.9	7 22.5	1.0 01	150.9	7 52.5	1.0 01	150.9	8 22.5	1.0 01	150.9	9
30				5 22.0	1.0 01	150.0	5 51.9	1.0 01	150.0	6 21.9	1.0 01	149.9	6 51.9	1.0 01	149.9	7 21.9	1.0 01	149.9	7 51.9	1.0 01	149.9	8 21.9	1.0 01	149.9	30
1				5 21.4	1.0 01	149.0	5 51.4	1.0 01	149.0	6 21.4	1.0 01	148.9	6 51.4	1.0 01	148.9	7 21.4	1.0 01	148.9	7 51.4	1.0 01	148.9	8 21.4	1.0 01	148.9	1
2				5 20.9	1.0 01	148.0	5 50.9	1.0 01	147.9	6 20.9	1.0 01	147.9	6 50.9	1.0 01	147.9	7 20.9	1.0 01	147.9	7 50.9	1.0 01	147.9	8 20.9	1.0 01	147.9	2
3				5 20.3	1.0 01	147.0	5 50.3	1.0 01	146.9	6 20.3	1.0 01	146.9	6 50.3	1.0 01	146.9	7 20.3	1.0 01	146.9	7 50.3	1.0 01	146.9	8 20.3	1.0 01	146.9	3
4				5 19.7	1.0 01	146.0	5 49.7	1.0 01	145.9	6 19.7	1.0 01	145.9	6 49.7	1.0 01	145.9	7 19.7	1.0 01	145.9	7 49.7	1.0 01	145.9	8 19.7	1.0 01	145.9	4
35				5 19.1	1.0 01	145.0	5 49.1	1.0 01	144.9	6 19.1	1.0 01	144.9	6 49.1	1.0 01	144.9	7 19.1	1.0 01	144.9	7 49.1	1.0 01	144.9	8 19.1	1.0 01	144.9	35
6				5 18.5	1.0 01	143.9	5 48.5	1.0 01	143.9	6 18.5	1.0 01	143.9	6 48.5	1.0 01	143.9	7 18.5	1.0 01	143.9	7 48.5	1.0 01	143.9	8 18.5	1.0 01	143.9	6
7				5 17.9	1.0 01	142.9	5 47.9	1.0 01	142.9	6 17.9	1.0 01	142.9	6 47.9	1.0 01	142.9	7 17.9	1.0 01	142.9	7 47.9	1.0 01	142.9	8 17.9	1.0 01	142.9	7
8				5 17.3	1.0 01	141.9	5 47.3	1.0 01	141.9	6 17.3	1.0 01	141.9	6 47.3	1.0 01	141.9	7 17.3	1.0 01	141.9	7 47.3	1.0 01	141.9	8 17.3	1.0 01	141.9	8
9				5 16.6	1.0 01	140.9	5 46.6	1.0 01	140.9	6 16.6	1.0 01	140.9	6 46.6	1.0 01	140.9	7 16.6	1.0 01	140.9	7 46.6	1.0 01	140.9	8 16.6	1.0 01	140.9	9
40				5 15.9	1.0 01	139.9	5 45.9	1.0 01	139.9	6 15.9	1.0 01	139.9	6 45.9	1.0 01	139.9	7 15.9	1.0 01	139.9	7 45.9	1.0 01	139.9	8 15.9	1.0 01	139.9	40
1				5 15.3	1.0 01	138.9	5 45.3	1.0 01	138.9	6 15.3	1.0 01	138.9	6 45.3	1.0 01	138.9	7 15.3	1.0 01	138.9	7 45.3	1.0 01	138.9	8 15.3	1.0 01	138.9	1
2				5 14.6	1.0 01	137.9	5 44.6	1.0 01	137.9	6 14.6	1.0 01	137.9	6 44.6	1.0 01	137.9	7 14.6	1.0 01	137.9	7 44.6	1.0 01	137.9	8 14.6	1.0 01	137.9	2
3				5 13.9	1.0 01	136.9	5 43.9	1.0 01	136.9	6 13.9	1.0 01	136.9	6 43.9	1.0 01	136.9	7 13.9	1.0 01	136.9	7 43.9	1.0 01	136.9	8 13.8	1.0 01	136.9	3
4				5 13.1	1.0 01	135.9	5 43.1	1.0 01	135.9	6 13.1	1.0 01	135.9	6 43.1	1.0 01	135.9	7 13.1	1.0 01	135.9	7 43.1	1.0 01	135.9	8 13.1	1.0 01	135.9	4
45				5 12.4	1.0 01	134.9	5 42.4	1.0 01	134.9	6 12.4	1.0 01	134.9	6 42.4	1.0 01	134.9	7 12.4	1.0 01	134.9	7 42.4	1.0 01	134.9	8 12.4	1.0 01	134.9	45
6				5 11.7	1.0 01	133.9	5 41.7	1.0 01	133.9	6 11.7	1.0 01	133.9	6 41.6	1.0 01	133.9	7 11.6	1.0 01	133.9	7 41.6	1.0 01	133.9	8 11.6	1.0 01	133.9	6
7				5 10.9	1.0 01	132.9	5 40.9	1.0 01	132.9	6 10.9	1.0 01	132.9	6 40.9	1.0 01	132.9	7 10.9	1.0 01	132.9	7 40.9	1.0 01	132.9	8 10.9	1.0 01	132.9	7
8				5 10.1	1.0 01	131.9	5 40.1	1.0 01	131.9	6 10.1	1.0 01	131.9	6 40.1	1.0 01	131.9	7 10.1	1.0 01	131.9	7 40.1	1.0 01	131.9	8 10.1	1.0 01	131.9	8
9				5 09.3	1.0 01	130.9	5 39.3	1.0 01	130.9	6 09.3	1.0 01	130.9	6 39.3	1.0 01	130.9	7 09.3	1.0 01	130.9	7 39.3	1.0 01	130.9	8 09.3	1.0 01	130.9	9
50				5 08.5	1.0 01	129.9	5 38.5	1.0 01	129.9	6 08.5	1.0 01	129.9	6 38.5	1.0 01	129.9	7 08.5	1.0 01	129.9	7 38.5	1.0 01	129.9	8 08.5	1.0 01	129.9	50
1				5 07.7	1.0 01	128.9	5 37.7	1.0 01	128.9	6 07.7	1.0 01	128.9	6 37.7	1.0 01	128.9	7 07.7	1.0 01	128.9	7 37.7	1.0 01	128.9	8 07.7	1.0 01	128.9	1
2				5 06.9	1.0 01	127.9	5 36.9	1.0 01	127.9	6 06.9	1.0 01	127.9	6 36.9	1.0 01	127.9	7 06.9	1.0 01	127.9	7 36.9	1.0 01	127.9	8 06.9	1.0 01	127.9	2
3				5 06.1	1.0 01	126.9	5 36.1	1.0 01	126.9	6 06.1	1.0 01	126.9	6 36.1	1.0 01	126.9	7 06.1	1.0 01	126.9	7 36.1	1.0 01	126.9	8 06.1	1.0 01	126.9	3
4				5 05.2	1.0 01	125.9	5 35.2	1.0 01	125.9	6 05.2	1.0 01	125.9	6 35.2	1.0 01	125.9	7 05.2	1.0 01	125.9	7 35.2	1.0 01	125.9	8 05.2	1.0 01	125.9	4
55				5 04.4	1.0 01	124.9	5 34.4	1.0 01	124.9	6 04.4	1.0 01	124.9	6 34.4	1.0 01	124.9	7 04.4	1.0 01	124.9	7 34.4	1.0 01	124.9	8 04.4	1.0 01	124.9	55
6				5 03.5	1.0 01	123.9	5 33.5	1.0 01	123.9	6 03.5	1.0 01	123.9	6 33.5	1.0 01	123.9	7 03.5	1.0 01	123.9	7 33.5	1.0 01	123.9	8 03.5	1.0 01	123.9	6
7				5 02.6	1.0 01	122.9	5 32.6	1.0 01	122.9	6 02.6	1.0 01	122.9	6 32.6	1.0 01	122.9	7 02.6	1.0 01	122.9	7 32.6	1.0 01	122.9	8 02.6	1.0 01	122.9	7
8				5 01.8	1.0 02	121.9	5 31.8	1.0 02	121.9	6 01.8	1.0 01	121.9	6 31.8	1.0 01	121.9	7 01.8	1.0 01	121.9	7 31.7	1.0 01	121.9	8 01.7	1.0 02	121.9	8
9				5 00.9	1.0 02	120.9	5 30.9	1.0 02	120.9	6 00.9	1.0 02	120.9	6 30.9	1.0 02	120.9	7 00.9	1.0 02	120.9	7 30.9	1.0 02	120.9	8 00.9	1.0 02	120.9	9
60							5 30.0	1.0 02	119.9	6 00.0	1.0 02	119.9	6 30.0	1.0 02	119.9	7 00.0	1.0 02	119.9	7 30.0	1.0 02	119.9	7 59.9	1.0 02	119.9	60
1							5 29.1	1.0 02	118.9	5 59.1	1.0 02	118.9	6 29.1	1.0 02	118.9	6 59.1	1.0 02	118.9	7 29.1	1.0 02	118.9	7 59.0	1.0 02	118.9	1
2							5 28.1	1.0 02	117.9	5 58.1	1.0 02	117.9	6 28.1	1.0 02	117.9	6 58.1	1.0 02	117.9	7 28.1	1.0 02	117.9	7 58.1	1.0 02	117.9	2
3							5 27.2	1.0 02	116.9	5 57.2	1.0 02	116.9	6 27.2	1.0 02	116.9	6 57.1	1.0 02	116.9	7 27.2	1.0 02	116.9	7 57.2	1.0 02	116.9	3
4							5 26.3	1.0 02	115.9	5 56.3	1.0 02	115.9	6 26.3	1.0 02	115.9	6 56.2	1.0 02	115.9	7 26.2	1.0 02	115.9	7 56.2	1.0 02	115.9	4
65							5 25.3	1.0 02	114.9	5 55.3	1.0 02	114.9	6 25.3	1.0 02	114.9	6 55.3	1.0 02	114.9	7 25.3	1.0 02	114.9	7 55.3	1.0 02	114.9	65
6							5 24.4	1.0 02	113.9	5 54.4	1.0 02	113.9	6 24.4	1.0 02	113.9	6 54.4	1.0 02	113.9	7 24.3	1.0 02	113.9	7 54.3	1.0 02	113.9	6
7							5 23.4	1.0 02	112.9	5 53.4	1.0 02	112.9	6 23.4	1.0 02	112.9	6 53.4	1.0 02	112.9	7 23.4	1.0 02	112.9	7 53.4	1.0 02	112.9	7
8							5 22.4	1.0 02	111.9	5 52.4	1.0 02	111.9	6 22.4	1.0 02	111.9	6 52.4	1.0 02	111.9	7 22.4	1.0 02	111.9	7 52.4	1.0 02	111.9	8
9							5 21.5	1.0 02	110.9	5 51.5	1.0 02	110.9	6 21.5	1.0 02	110.9	6 51.4	1.0 02	110.9	7 21.4	1.0 02	110.9	7 51.4	1.0 02	110.9	9
70							5 20.5	1.0 02	109.9	5 50.5	1.0 02	109.9	6 20.5	1.0 02	109.9	6 50.5	1.0 02	109.9	7 20.5	1.0 02	109.9	7 50.5	1.0 02	109.9	70
1							5 19.5	1.0 02	108.9	5 49.5	1.0 02	108.9	6 19.5	1.0 02	108.9	6 49.5	1.0 02	108.9	7 19.5	1.0 02	108.9	7 49.5	1.0 02	108.9	1
2							5 18.5	1.0 02	107.9	5 48.5	1.0 02	107.9	6 18.5	1.0 02	107.9	6 48.5	1.0 02	107.9	7 18.5	1.0 02	107.9	7 48.5	1.0 02	107.9	2
3							5 17.5	1.0 02	106.9	5 47.5	1.0 02	106.9	6 17.5	1.0 02	106.9	6 47.5	1.0 02	106.9	7 17.5	1.0 02	106.9	7 47.5	1.0 02	106.9	3
4							5 16.5	1.0 02	105.9	5 46.5	1.0 02	105.9	6 16.5	1.0 02	105.9	6 46.5	1.0 02	105.9	7 16.5	1.0 02	105.9	7 46.5	1.0 02	105.9	4
75							5 15.5	1.0 02	104.9	5 45.5	1.0 02	104.9	6 15.5	1.0 02	104.9	6 45.5	1.0 02	104.9	7 15.5	1.0 02	104.9	7 45.5	1.0 02	104.9	75
6							5 14.5	1.0 02	103.9	5 44.5	1.0 02	103.9	6 14.5	1.0 02	103.9	6 44.5	1.0 02	103.9	7 14.5	1.0 02	103.9	7 44.4	1.0 02	103.9	6
7							5 13.5	1.0 02	102.9	5 43.4	1.0 02	102.9	6 13.4	1.0 02	102.9	6 43.4	1.0 02	102.9	7 13.4	1.0 02	102.9	7 43.4	1.0 02	102.9	7
8							5 12.4	1.0 02	101.9	5 42.4	1.0 02	101.9	6 12.4	1.0 02	101.9	6 42.4	1.0 02	101.9	7 12.4	1.0 02	101.9	7 42.4	1.0 02	101.9	8
9							5 11.4	1.0 02	100.9	5 41.4	1.0 02	100.9	6 11.4	1.0 02	100.9	6 41.4	1.0 02	100.9	7 11.4	1.0 02	100.9	7 41.4	1.0 02	100.9	9
80							5 10.4	1.0 02	99.9	5 40.4	1.0 02	99.9	6 10.4	1.0 02	99.9	6 40.4	1.0 02	99.9	7 10.4	1.0 02	99.9	7 40.4	1.0 02	99.9	80
1							5 09.3	1.0 02	98.9	5 39.3	1.0 02	98.9	6 09.3	1.0 02	98.9	6 39.3	1.0 02	98.9	7 09.3	1.0 02	98.9	7 39.3	1.0 02	98.9	1
2							5 08.3	1.0 02	97.9	5 38.3	1.0 02	97.9	6 08.3	1.0 02	97.9	6 38.3	1.0 02	97.9	7 08.3	1.0 02	97.9	7 38.3	1.0 02	97.9	2
3							5 07.3	1.0 02	96.9	5 37.3	1.0 02	96.9	6 07.3	1.0 02	96.9	6 37.3	1.0 02	96.9	7 07.2	1.0 02	96.9	7 37.2	1.0 02	96.9	3
4							5 06.2	1.0 02	95.9	5 36.2	1.0 02	95.9	6 06.2	1.0 02	95.9	6 36.2	1.0 02	95.9	7 06.2	1.0 02	95.9	7 36.2	1.0 02	95.9	4
85							5 05.2	1.0 02	94.9	5 35.2	1.0 02	94.9	6 05.2	1.0 02	94.9	6 35.2	1.0 02	94.9	7 05.2	1.0 02	94.9	7 35.2	1.0 02	94.9	85
6							5 04.1	1.0 02	93.9	5 34.1	1.0 02	93.9	6 04.1	1.0 02	93.9	6 34.1	1.0 02	93.9	7 04.1	1.0 02	93.9	7 34.1	1.0 02	93.9	6
7							5 03.1	1.0 02	92.9	5 33.1	1.0 02	92.9	6 03.1	1.0 02	92.9	6 33.1	1.0 02	92.9	7 03.1	1.0 02	92.9	7 33.1	1.0 02	92.9	7
8							5 02.0	1.0 02	91.9	5 32.0	1.0 02	91.9	6 02.0	1.0 02	91.9	6 32.0	1.0 02	91.9	7 02.0	1.0 02	91.9	7 32.0	1.0 02	91.9	8
9							5 01.0	1.0 02	90.9	5 31.0	1.0 02	90.9	6 01.0	1.0 02	90.9	6 31.0	1.0 02	90.9	7 01.0	1.0 02	90.9	7 31.0	1.0 02	90.9	9
90										5 29.9	1.0 02	89.9	5 59.9	1.0 02	89.9	6 29.9	1.0 02	89.9	6 59.9	1.0 02	89.9	7 29.9	1.0 02	89.9	90

Lat. 89°

H.A.	4°00' Alt. Δd	Az.	4°30' Alt. Δd	Az.	5°00' Alt. Δd	Az.	5°30' Alt. Δd	Az.	6°00' Alt. Δd	Az.	6°30' Alt. Δd	Az.	7°00' Alt. Δd	Az.	7°30' Alt. Δd	Az.	H.A.
91							5 28.9 1.002	88.9	5 58.9 1.002	88.9	6 28.9 1.002	88.9	6 58.9 1.002	88.9	7 28.9 1.002	88.9	91
2							5 27.9 1.002	87.9	5 57.9 1.002	87.9	6 27.8 1.002	87.9	6 57.8 1.002	87.9	7 27.8 1.002	87.9	2
3							5 26.8 1.002	86.9	5 56.8 1.002	86.9	6 26.8 1.002	86.9	6 56.8 1.002	86.9	7 26.8 1.002	86.9	3
4							5 25.8 1.002	85.9	5 55.8 1.002	85.9	6 25.8 1.002	85.9	6 55.8 1.002	85.9	7 25.7 1.002	85.9	4
95							5 24.7 1.002	84.9	5 54.7 1.002	84.9	6 24.7 1.002	84.9	6 54.7 1.002	84.9	7 24.7 1.002	84.9	95
6							5 23.7 1.002	83.9	5 53.7 1.002	83.9	6 23.7 1.002	83.9	6 53.7 1.002	83.9	7 23.7 1.002	83.9	6
7							5 22.6 1.002	82.9	5 52.6 1.002	82.9	6 22.6 1.002	82.9	6 52.6 1.002	82.9	7 22.6 1.002	82.9	7
8							5 21.6 1.002	81.9	5 51.6 1.002	81.9	6 21.6 1.002	81.9	6 51.6 1.002	81.9	7 21.6 1.002	81.9	8
9							5 20.6 1.002	80.9	5 50.6 1.002	80.9	6 20.6 1.002	80.9	6 50.6 1.002	80.9	7 20.5 1.002	80.9	9
100							5 19.5 1.002	79.9	5 49.5 1.002	79.9	6 19.5 1.002	79.9	6 49.5 1.002	79.9	7 19.5 1.002	79.9	100
1							5 18.5 1.002	78.9	5 48.5 1.002	78.9	6 18.5 1.002	78.9	6 48.5 1.002	78.9	7 18.5 1.002	78.9	1
2							5 17.5 1.002	77.9	5 47.5 1.002	77.9	6 17.5 1.002	77.9	6 47.5 1.002	77.9	7 17.5 1.002	77.9	2
3							5 16.5 1.002	76.9	5 46.5 1.002	76.9	6 16.4 1.002	76.9	6 46.4 1.002	76.9	7 16.4 1.002	76.9	3
4							5 15.4 1.002	75.9	5 45.4 1.002	75.9	6 15.4 1.002	75.9	6 45.4 1.002	75.9	7 15.4 1.002	75.9	4
105							5 14.4 1.002	74.9	5 44.4 1.002	74.9	6 14.4 1.002	74.9	6 44.4 1.002	74.9	7 14.4 1.002	74.9	105
6							5 13.4 1.002	73.9	5 43.4 1.002	73.9	6 13.4 1.002	73.9	6 43.4 1.002	73.9	7 13.4 1.002	73.9	6
7							5 12.4 1.002	72.9	5 42.4 1.002	72.9	6 12.4 1.002	72.9	6 42.4 1.002	72.9	7 12.4 1.002	72.9	7
8							5 11.4 1.002	71.9	5 41.4 1.002	71.9	6 11.4 1.002	71.9	6 41.4 1.002	71.9	7 11.4 1.002	71.9	8
9							5 10.4 1.002	70.9	5 40.4 1.002	70.9	6 10.4 1.002	70.9	6 40.4 1.002	70.9	7 10.4 1.002	70.9	9
110							5 09.4 1.002	69.9	5 39.4 1.002	69.9	6 09.4 1.002	69.9	6 39.4 1.002	69.9	7 09.4 1.002	69.9	110
1							5 08.5 1.002	68.9	5 38.5 1.002	68.9	6 08.4 1.002	68.9	6 38.4 1.002	68.9	7 08.4 1.002	68.9	1
2							5 07.5 1.002	67.9	5 37.5 1.002	67.9	6 07.5 1.002	67.9	6 37.5 1.002	67.9	7 07.5 1.002	67.9	2
3							5 06.5 1.002	66.9	5 36.5 1.002	66.9	6 06.5 1.002	66.9	6 36.5 1.002	66.9	7 06.5 1.002	66.9	3
4							5 05.6 1.002	65.9	5 35.6 1.002	65.9	6 05.5 1.002	65.9	6 35.5 1.002	65.9	7 05.5 1.002	65.9	4
115							5 04.6 1.002	64.9	5 34.6 1.002	64.9	6 04.6 1.002	64.9	6 34.6 1.002	64.9	7 04.6 1.002	64.9	115
6							5 03.7 1.002	63.9	5 33.7 1.002	63.9	6 03.7 1.002	63.9	6 33.6 1.002	63.9	7 03.6 1.002	63.9	6
7							5 02.7 1.002	62.9	5 32.7 1.002	62.9	6 02.7 1.002	62.9	6 32.7 1.002	62.9	7 02.7 1.002	62.9	7
8							5 01.8 1.002	61.9	5 31.8 1.002	61.9	6 01.8 1.002	61.9	6 31.8 1.002	61.9	7 01.8 1.002	61.9	8
9							5 00.9 1.002	60.9	5 30.9 1.002	60.9	6 00.9 1.002	60.9	6 30.9 1.002	60.9	7 00.9 1.002	60.9	9
120									5 30.0 1.002	59.9	6 00.0 1.002	59.9	6 30.0 1.002	59.9	7 00.0 1.002	59.9	120
1									5 29.1 1.001	58.9	5 59.1 1.001	58.9	6 29.1 1.001	58.9	6 59.0 1.002	58.9	1
2									5 28.2 1.001	57.9	5 58.2 1.001	57.9	6 28.2 1.001	57.9	6 58.2 1.001	57.9	2
3									5 27.3 1.001	56.9	5 57.3 1.001	56.9	6 27.3 1.001	56.9	6 57.3 1.001	56.9	3
4									5 26.4 1.001	55.9	5 56.4 1.001	55.9	6 26.4 1.001	55.9	6 56.4 1.001	55.9	4
125									5 25.5 1.001	54.9	5 55.5 1.001	54.9	6 25.5 1.001	54.9	6 55.5 1.001	54.9	125
6									5 24.7 1.001	53.9	5 54.7 1.001	53.9	6 24.7 1.001	53.9	6 54.7 1.001	53.9	6
7									5 23.9 1.001	52.9	5 53.9 1.001	52.9	6 23.9 1.001	52.9	6 53.8 1.001	52.9	7
8									5 23.0 1.001	51.9	5 53.0 1.001	51.9	6 23.0 1.001	51.9	6 53.0 1.001	51.9	8
9									5 22.2 1.001	50.9	5 52.2 1.001	50.9	6 22.2 1.001	50.9	6 52.2 1.001	50.9	9
130									5 21.4 1.001	49.9	5 51.4 1.001	49.9	6 21.4 1.001	49.9	6 51.4 1.001	49.9	130
1									5 20.6 1.001	48.9	5 50.6 1.001	48.9	6 20.6 1.001	48.9	6 50.6 1.001	48.9	1
2									5 19.8 1.001	47.9	5 49.8 1.001	47.9	6 19.8 1.001	47.9	6 49.8 1.001	47.9	2
3									5 19.1 1.001	46.9	5 49.0 1.001	46.9	6 19.0 1.001	46.9	6 49.0 1.001	46.9	3
4									5 18.3 1.001	45.9	5 48.3 1.001	45.9	6 18.3 1.001	45.9	6 48.3 1.001	45.9	4
135									5 17.5 1.001	44.9	5 47.5 1.001	44.9	6 17.5 1.001	44.9	6 47.5 1.001	44.9	135
6									5 16.8 1.001	43.9	5 46.8 1.001	43.9	6 16.8 1.001	43.9	6 46.8 1.001	43.9	6
7									5 16.1 1.001	42.9	5 46.1 1.001	42.9	6 16.1 1.001	42.9	6 46.1 1.001	42.9	7
8									5 15.4 1.001	41.9	5 45.4 1.001	41.9	6 15.4 1.001	41.9	6 45.4 1.001	41.9	8
9									5 14.7 1.001	40.9	5 44.7 1.001	40.9	6 14.7 1.001	40.9	6 44.7 1.001	40.9	9
140									5 14.0 1.001	39.9	5 44.0 1.001	39.9	6 14.0 1.001	39.9	6 44.0 1.001	39.9	140
1									5 13.4 1.001	38.9	5 43.3 1.001	38.9	6 13.3 1.001	38.9	6 43.3 1.001	38.9	1
2									5 12.7 1.001	37.9	5 42.7 1.001	37.9	6 12.7 1.001	37.9	6 42.7 1.001	37.9	2
3									5 12.1 1.001	36.9	5 42.1 1.001	36.9	6 12.1 1.001	36.9	6 42.1 1.001	36.9	3
4									5 11.4 1.001	35.9	5 41.4 1.001	35.9	6 11.4 1.001	35.9	6 41.4 1.001	35.9	4
145									5 10.8 1.001	34.9	5 40.8 1.001	34.9	6 10.8 1.001	34.9	6 40.8 1.001	34.9	145
6									5 10.2 1.001	33.9	5 40.2 1.001	33.9	6 10.2 1.001	33.9	6 40.2 1.001	33.9	6
7									5 09.7 1.001	32.9	5 39.7 1.001	32.9	6 09.7 1.001	32.9	6 39.7 1.001	32.9	7
8									5 09.1 1.001	31.9	5 39.1 1.001	31.9	6 09.1 1.001	31.9	6 39.1 1.001	31.9	8
9									5 08.6 1.001	31.0	5 38.6 1.001	30.9	6 08.6 1.001	30.9	6 38.6 1.001	30.9	9
150									5 08.0 1.001	30.0	5 38.0 1.001	29.9	6 08.0 1.001	29.9	6 38.0 1.001	29.9	150
1									5 07.5 1.001	29.0	5 37.5 1.001	28.9	6 07.5 1.001	28.9	6 37.5 1.001	28.9	1
2									5 07.0 1.001	28.0	5 37.0 1.001	28.0	6 07.0 1.001	27.9	6 37.0 1.001	27.9	2
3									5 06.5 1.001	27.0	5 36.5 1.001	27.0	6 06.5 1.001	26.9	6 36.5 1.001	26.9	3
4									5 06.1 1.001	26.0	5 36.1 1.001	26.0	6 06.1 1.001	25.9	6 36.1 1.001	25.9	4
155									5 05.6 1.001	25.0	5 35.6 1.001	25.0	6 05.6 1.001	25.0	6 35.6 1.001	24.9	155
6									5 05.2 1.001	24.0	5 35.2 1.001	24.0	6 05.2 1.001	24.0	6 35.2 1.001	23.9	6
7									5 04.8 1.001	23.0	5 34.8 1.001	23.0	6 04.8 1.001	23.0	6 34.8 1.001	23.0	7
8									5 04.4 1.001	22.0	5 34.4 1.001	22.0	6 04.4 1.001	22.0	6 34.4 1.001	22.0	8
9									5 04.0 1.001	21.0	5 34.0 1.001	21.0	6 04.0 1.001	21.0	6 34.0 1.001	21.0	9
160									5 03.6 1.001	20.0	5 33.6 1.001	20.0	6 03.6 1.001	20.0	6 33.6 1.001	20.0	160
1									5 03.3 1.001	19.0	5 33.3 1.001	19.0	6 03.3 1.001	19.0	6 33.3 1.001	19.0	1
2									5 02.9 1.001	18.0	5 32.9 1.001	18.0	6 02.9 1.001	18.0	6 32.9 1.001	18.0	2
3									5 02.6 1.000	17.0	5 32.6 1.000	17.0	6 02.6 1.000	17.0	6 32.6 1.000	17.0	3
4									5 02.3 1.000	16.0	5 32.3 1.000	16.0	6 02.3 1.000	16.0	6 32.3 1.000	16.0	4
165									5 02.0 1.000	15.0	5 32.0 1.000	15.0	6 02.0 1.000	15.0	6 32.0 1.000	15.0	165
6									5 01.8 1.000	14.0	5 31.8 1.000	14.0	6 01.8 1.000	14.0	6 31.8 1.000	14.0	6
7									5 01.5 1.000	13.0	5 31.5 1.000	13.0	6 01.5 1.000	13.0	6 31.5 1.000	13.0	7
8									5 01.3 1.000	12.0	5 31.3 1.000	12.0	6 01.3 1.000	12.0	6 31.3 1.000	12.0	8
9									5 01.1 1.000	11.0	5 31.1 1.000	11.0	6 01.1 1.000	11.0	6 31.1 1.000	11.0	9
170									5 00.9 1.000	10.0	5 30.9 1.000	10.0	6 00.9 1.000	10.0	6 30.9 1.000	10.0	170
1									5 00.7 1.000	09.0	5 30.7 1.000	09.0	6 00.7 1.000	09.0	6 30.7 1.000	09.0	1
2									5 00.6 1.000	08.0	5 30.6 1.000	08.0	6 00.6 1.000	08.0	6 30.6 1.000	08.0	2
3									5 00.4 1.000	07.0	5 30.4 1.000	07.0	6 00.4 1.000	07.0	6 30.4 1.000	07.0	3
4									5 00.3 1.000	06.0	5 30.3 1.000	06.0	6 00.3 1.000	06.0	6 30.3 1.000	06.0	4
175									5 00.2 1.000	05.0	5 30.2 1.000	05.0	6 00.2 1.000	05.0	6 30.2 1.000	05.0	175
6									5 00.1 1.000	04.0	5 30.1 1.000	04.0	6 00.1 1.000	04.0	6 30.1 1.000	04.0	6
7									5 00.1 1.000	03.0	5 30.1 1.000	03.0	6 00.1 1.000	03.0	6 30.1 1.000	03.0	7
8									5 00.0 1.000	02.0	5 30.0 1.000	02.0	6 00.0 1.000	02.0	6 30.0 1.000	02.0	8
9									5 00.0 1.000	01.0	5 30.0 1.000	01.0	6 00.0 1.000	01.0	6 30.0 1.000	01.0	9
180									5 00.0 1.000	00.0	5 30.0 1.000	00.0	6 00.0 1.000	00.0	6 30.0 1.000	00.0	180

Lat. 89°

Lat. 89°

Each declination column gives: **Alt.** | **Δd Δt** | **Az.**

H.A.	8° 00′	8° 30′	9° 00′	9° 30′	10° 00′	10° 30′	11° 00′	11° 30′	H.A.
00	9 00.0 1.000 180.0	9 30.0 1.000 180.0	10 00.0 1.000 180.0	10 30.0 1.000 180.0	11 00.0 1.000 180.0	11 30.0 1.000 180.0	12 00.0 1.000 180.0	12 30.0 1.000 180.0	00
1	9 00.0 1.000 179.0	9 30.0 1.000 179.0	10 00.0 1.000 179.0	10 30.0 1.000 179.0	11 00.0 1.000 179.0	11 30.0 1.000 179.0	12 00.0 1.000 179.0	12 30.0 1.000 179.0	1
2	9 00.0 1.000 178.0	9 30.0 1.000 178.0	10 00.0 1.000 178.0	10 30.0 1.000 178.0	11 00.0 1.000 178.0	11 30.0 1.000 178.0	12 00.0 1.000 178.0	12 30.0 1.000 178.0	2
3	8 59.9 1.000 177.0	9 29.9 1.000 177.0	9 59.9 1.000 177.0	10 29.9 1.000 177.0	10 59.9 1.000 177.0	11 29.9 1.000 177.0	11 59.9 1.000 177.0	12 29.9 1.000 177.0	3
4	8 59.9 1.000 176.0	9 29.9 1.000 176.0	9 59.9 1.000 176.0	10 29.9 1.000 176.0	10 59.9 1.000 176.0	11 29.9 1.000 176.0	11 59.9 1.000 176.0	12 29.9 1.000 176.0	4
05	8 59.8 1.000 175.0	9 29.8 1.000 175.0	9 59.8 1.000 175.0	10 29.8 1.000 175.0	10 59.8 1.000 175.0	11 29.8 1.000 175.0	11 59.8 1.000 175.0	12 29.8 1.000 175.0	05
6	8 59.7 1.000 174.0	9 29.7 1.000 174.0	9 59.7 1.000 174.0	10 29.7 1.000 174.0	10 59.7 1.000 174.0	11 29.7 1.000 174.0	11 59.7 1.000 174.0	12 29.7 1.000 174.0	6
7	8 59.6 1.000 173.0	9 29.6 1.000 173.0	9 59.6 1.000 173.0	10 29.6 1.000 173.0	10 59.6 1.000 173.0	11 29.6 1.000 173.0	11 59.6 1.000 173.0	12 29.6 1.000 173.0	7
8	8 59.4 1.000 172.0	9 29.4 1.000 172.0	9 59.4 1.000 172.0	10 29.4 1.000 172.0	10 59.4 1.000 172.0	11 29.4 1.000 172.0	11 59.4 1.000 172.0	12 29.4 1.000 172.0	8
9	8 59.3 1.000 171.0	9 29.3 1.000 171.0	9 59.3 1.000 171.0	10 29.3 1.000 171.0	10 59.3 1.000 171.0	11 29.3 1.000 171.0	11 59.3 1.000 171.0	12 29.3 1.000 171.0	9
10	8 59.1 1.000 170.0	9 29.1 1.000 170.0	9 59.1 1.000 170.0	10 29.1 1.000 170.0	10 59.1 1.000 170.0	11 29.1 1.000 170.0	11 59.1 1.000 170.0	12 29.1 1.000 170.0	10
1	8 58.9 1.000 169.0	9 28.9 1.000 169.0	9 58.9 1.000 169.0	10 28.9 1.000 169.0	10 58.9 1.000 169.0	11 28.9 1.000 169.0	11 58.9 1.000 169.0	12 28.9 1.000 169.0	1
2	8 58.7 1.000 168.0	9 28.7 1.000 168.0	9 58.7 1.000 168.0	10 28.7 1.000 168.0	10 58.7 1.000 168.0	11 28.7 1.000 168.0	11 58.7 1.000 168.0	12 28.7 1.000 168.0	2
3	8 58.5 1.000 167.0	9 28.5 1.000 167.0	9 58.5 1.000 167.0	10 28.5 1.000 167.0	10 58.5 1.000 167.0	11 28.5 1.000 167.0	11 58.5 1.000 167.0	12 28.5 1.000 167.0	3
4	8 58.2 1.000 166.0	9 28.2 1.000 166.0	9 58.2 1.000 166.0	10 28.2 1.000 166.0	10 58.2 1.000 166.0	11 28.2 1.000 166.0	11 58.2 1.000 166.0	12 28.2 1.000 165.9	4
15	8 58.0 1.000 165.0	9 28.0 1.000 165.0	9 58.0 1.000 165.0	10 28.0 1.000 165.0	10 58.0 1.000 165.0	11 27.9 1.000 164.9	11 57.9 1.000 164.9	12 27.9 1.000 164.9	15
6	8 57.7 1.000 164.0	9 27.7 1.000 164.0	9 57.7 1.000 164.0	10 27.7 1.000 164.0	10 57.7 1.000 163.9	11 27.7 1.000 163.9	11 57.7 1.000 163.9	12 27.7 1.000 163.9	6
7	8 57.4 1.001 163.0	9 27.4 1.001 163.0	9 57.4 1.001 163.0	10 27.4 1.001 162.9	10 57.4 1.001 162.9	11 27.4 1.001 162.9	11 57.4 1.001 162.9	12 27.4 1.001 162.9	7
8	8 57.1 1.001 162.0	9 27.1 1.001 162.0	9 57.1 1.001 161.9	10 27.1 1.001 161.9	10 57.1 1.001 161.9	11 27.1 1.001 161.9	11 57.1 1.001 161.9	12 27.1 1.001 161.9	8
9	8 56.7 1.001 161.0	9 26.7 1.001 160.9	9 56.7 1.001 160.9	10 26.7 1.001 160.9	10 56.7 1.001 160.9	11 26.7 1.001 160.9	11 56.7 1.001 160.9	12 26.7 1.001 160.9	9
20	8 56.4 1.001 159.9	9 26.4 1.001 159.9	9 56.4 1.001 159.9	10 26.4 1.001 159.9	10 56.4 1.001 159.9	11 26.4 1.001 159.9	11 56.4 1.001 159.9	12 26.4 1.001 159.9	20
1	8 56.0 1.001 158.9	9 26.0 1.001 158.9	9 56.0 1.001 158.9	10 26.0 1.001 158.9	10 56.0 1.001 158.9	11 26.0 1.001 158.9	11 56.0 1.001 158.9	12 26.0 1.001 158.9	1
2	8 55.6 1.001 157.9	9 25.6 1.001 157.9	9 55.6 1.001 157.9	10 25.6 1.001 157.9	10 55.6 1.001 157.9	11 25.6 1.001 157.9	11 55.6 1.001 157.9	12 25.6 1.001 157.9	2
3	8 55.2 1.001 156.9	9 25.2 1.001 156.9	9 55.2 1.001 156.9	10 25.2 1.001 156.9	10 55.2 1.001 156.9	11 25.2 1.001 156.9	11 55.2 1.001 156.9	12 25.2 1.001 156.9	3
4	8 54.8 1.001 155.9	9 24.8 1.001 155.9	9 54.8 1.001 155.9	10 24.8 1.001 155.9	10 54.8 1.001 155.9	11 24.8 1.001 155.9	11 54.8 1.001 155.9	12 24.8 1.001 155.9	4
25	8 54.4 1.001 154.9	9 24.4 1.001 154.9	9 54.4 1.001 154.9	10 24.4 1.001 154.9	10 54.4 1.001 154.9	11 24.4 1.001 154.9	11 54.4 1.001 154.9	12 24.4 1.001 154.9	25
6	8 53.9 1.001 153.9	9 23.9 1.001 153.9	9 53.9 1.001 153.9	10 23.9 1.001 153.9	10 53.9 1.001 153.9	11 23.9 1.001 153.9	11 53.9 1.001 153.9	12 23.9 1.001 153.9	6
7	8 53.4 1.001 152.9	9 23.4 1.001 152.9	9 53.4 1.001 152.9	10 23.4 1.001 152.9	10 53.4 1.001 152.9	11 23.4 1.001 152.9	11 53.4 1.001 152.9	12 23.4 1.001 152.9	7
8	8 53.0 1.001 151.9	9 23.0 1.001 151.9	9 53.0 1.001 151.9	10 23.0 1.001 151.9	10 53.0 1.001 151.9	11 23.0 1.001 151.9	11 53.0 1.001 151.9	12 23.0 1.001 151.9	8
9	8 52.5 1.001 150.9	9 22.5 1.001 150.9	9 52.5 1.001 150.9	10 22.5 1.001 150.9	10 52.5 1.001 150.9	11 22.5 1.001 150.9	11 52.5 1.001 150.9	12 22.5 1.001 150.9	9
30	8 51.9 1.001 149.9	9 21.9 1.001 149.9	9 51.9 1.001 149.9	10 21.9 1.001 149.9	10 51.9 1.001 149.9	11 21.9 1.001 149.9	11 51.9 1.001 149.9	12 21.9 1.001 149.9	30
1	8 51.4 1.001 148.9	9 21.4 1.001 148.9	9 51.4 1.001 148.9	10 21.4 1.001 148.9	10 51.4 1.001 148.9	11 21.4 1.001 148.9	11 51.4 1.001 148.9	12 21.4 1.001 148.9	1
2	8 50.9 1.001 147.9	9 20.9 1.001 147.9	9 50.9 1.001 147.9	10 20.9 1.001 147.9	10 50.9 1.001 147.9	11 20.9 1.001 147.9	11 50.9 1.001 147.9	12 20.9 1.001 147.9	2
3	8 50.3 1.001 146.9	9 20.3 1.001 146.9	9 50.3 1.001 146.9	10 20.3 1.001 146.9	10 50.3 1.001 146.9	11 20.3 1.001 146.9	11 50.3 1.001 146.9	12 20.3 1.001 146.9	3
4	8 49.7 1.001 145.9	9 19.7 1.001 145.9	9 49.7 1.001 145.9	10 19.7 1.001 145.9	10 49.7 1.001 145.9	11 19.7 1.001 145.9	11 49.7 1.001 145.9	12 19.7 1.001 145.9	4
35	8 49.1 1.001 144.9	9 19.1 1.001 144.9	9 49.1 1.001 144.9	10 19.1 1.001 144.9	10 49.1 1.001 144.9	11 19.1 1.001 144.9	11 49.1 1.001 144.9	12 19.1 1.001 144.9	35
6	8 48.5 1.001 143.9	9 18.5 1.001 143.9	9 48.5 1.001 143.9	10 18.5 1.001 143.9	10 48.5 1.001 143.9	11 18.5 1.001 143.9	11 48.5 1.001 143.9	12 18.5 1.001 143.9	6
7	8 47.9 1.001 142.9	9 17.9 1.001 142.9	9 47.9 1.001 142.9	10 17.9 1.001 142.9	10 47.9 1.001 142.9	11 17.9 1.001 142.9	11 47.9 1.001 142.9	12 17.9 1.001 142.9	7
8	8 47.3 1.001 141.9	9 17.2 1.001 141.9	9 47.2 1.001 141.9	10 17.2 1.001 141.9	10 47.2 1.001 141.9	11 17.2 1.001 141.9	11 47.2 1.001 141.9	12 17.2 1.001 141.9	8
9	8 46.6 1.001 140.9	9 16.6 1.001 140.9	9 46.6 1.001 140.9	10 16.6 1.001 140.9	10 46.6 1.001 140.9	11 16.6 1.001 140.9	11 46.6 1.001 140.9	12 16.6 1.001 140.9	9
40	8 45.9 1.001 139.9	9 15.9 1.001 139.9	9 45.9 1.001 139.9	10 15.9 1.001 139.9	10 45.9 1.001 139.9	11 15.9 1.001 139.9	11 45.9 1.001 139.9	12 15.9 1.001 139.9	40
1	8 45.3 1.001 138.9	9 15.2 1.001 138.9	9 45.2 1.001 138.9	10 15.2 1.001 138.9	10 45.2 1.001 138.9	11 15.2 1.001 138.9	11 45.2 1.001 138.9	12 15.2 1.001 138.9	1
2	8 44.6 1.001 137.9	9 14.6 1.001 137.9	9 44.5 1.001 137.9	10 14.5 1.001 137.9	10 44.5 1.001 137.9	11 14.5 1.001 137.9	11 44.5 1.001 137.9	12 14.5 1.001 137.9	2
3	8 43.8 1.001 136.9	9 13.8 1.001 136.9	9 43.8 1.001 136.9	10 13.8 1.001 136.9	10 43.8 1.001 136.9	11 13.8 1.001 136.9	11 43.8 1.001 136.9	12 13.8 1.001 136.9	3
4	8 43.1 1.001 135.9	9 13.1 1.001 135.9	9 43.1 1.001 135.9	10 13.1 1.001 135.9	10 43.1 1.001 135.9	11 13.1 1.001 135.9	11 43.1 1.001 135.9	12 13.1 1.001 135.9	4
45	8 42.4 1.001 134.9	9 12.4 1.001 134.9	9 42.4 1.001 134.9	10 12.4 1.001 134.9	10 42.4 1.001 134.9	11 12.4 1.001 134.9	11 42.4 1.001 134.9	12 12.4 1.001 134.9	45
6	8 41.6 1.001 133.9	9 11.6 1.001 133.9	9 41.6 1.001 133.9	10 11.6 1.001 133.9	10 41.6 1.001 133.9	11 11.6 1.001 133.9	11 41.6 1.001 133.9	12 11.6 1.001 133.8	6
7	8 40.9 1.001 132.9	9 10.9 1.001 132.9	9 40.9 1.001 132.9	10 10.9 1.001 132.9	10 40.9 1.001 132.9	11 10.9 1.001 132.9	11 40.9 1.001 132.9	12 10.9 1.001 132.8	7
8	8 40.1 1.001 131.9	9 10.1 1.001 131.9	9 40.1 1.001 131.9	10 10.1 1.001 131.9	10 40.1 1.001 131.9	11 10.1 1.001 131.9	11 40.1 1.001 131.9	12 10.1 1.001 131.8	8
9	8 39.3 1.001 130.9	9 09.3 1.001 130.9	9 39.3 1.001 130.9	10 09.3 1.001 130.9	10 39.3 1.001 130.9	11 09.3 1.001 130.9	11 39.3 1.001 130.9	12 09.3 1.001 130.8	9
50	8 38.5 1.001 129.9	9 08.5 1.001 129.9	9 38.5 1.001 129.9	10 08.5 1.001 129.9	10 38.5 1.001 129.9	11 08.5 1.001 129.9	11 38.5 1.001 129.8	12 08.5 1.001 129.8	50
1	8 37.7 1.001 128.9	9 07.7 1.001 128.9	9 37.7 1.001 128.9	10 07.7 1.001 128.9	10 37.7 1.001 128.9	11 07.7 1.001 128.9	11 37.7 1.001 128.8	12 07.7 1.001 128.8	1
2	8 36.9 1.001 127.9	9 06.9 1.001 127.9	9 36.9 1.001 127.9	10 06.9 1.001 127.9	10 36.9 1.001 127.9	11 06.9 1.001 127.9	11 36.9 1.001 127.8	12 06.9 1.001 127.8	2
3	8 36.1 1.001 126.9	9 06.1 1.001 126.9	9 36.1 1.001 126.9	10 06.1 1.001 126.9	10 36.1 1.001 126.9	11 06.1 1.001 126.8	11 36.1 1.001 126.8	12 06.1 1.001 126.8	3
4	8 35.2 1.001 125.9	9 05.2 1.001 125.9	9 35.2 1.001 125.9	10 05.2 1.001 125.9	10 35.2 1.001 125.9	11 05.2 1.001 125.8	11 35.2 1.001 125.8	12 05.2 1.001 125.8	4
55	8 34.4 1.001 124.9	9 04.4 1.001 124.9	9 34.4 1.001 124.9	10 04.4 1.001 124.9	10 34.4 1.001 124.9	11 04.3 1.001 124.8	11 34.3 1.001 124.8	12 04.3 1.001 124.8	55
6	8 33.5 1.001 123.9	9 03.5 1.001 123.9	9 33.5 1.001 123.9	10 03.5 1.001 123.9	10 33.5 1.001 123.9	11 03.5 1.001 123.8	11 33.5 1.001 123.8	12 03.5 1.001 123.8	6
7	8 32.6 1.001 122.9	9 02.6 1.001 122.9	9 32.6 1.001 122.9	10 02.6 1.001 122.9	10 32.6 1.001 122.8	11 02.6 1.001 122.8	11 32.6 1.001 122.8	12 02.6 1.001 122.8	7
8	8 31.7 1.001 121.9	9 01.7 1.001 121.9	9 31.7 1.002 121.9	10 01.7 1.002 121.9	10 31.7 1.001 121.8	11 01.7 1.001 121.8	11 31.7 1.001 121.8	12 01.7 1.002 121.8	8
9	8 30.8 1.002 120.9	9 00.8 1.002 120.9	9 30.8 1.002 120.9	10 00.8 1.002 120.9	10 30.8 1.002 120.8	11 00.8 1.002 120.8	11 30.8 1.002 120.8	12 00.8 1.002 120.8	9
60	8 29.9 1.002 119.9	8 59.9 1.002 119.9	9 29.9 1.002 119.9	9 59.9 1.002 119.9	10 29.9 1.002 119.8	10 59.9 1.002 119.8	11 29.9 1.002 119.8	11 59.9 1.002 119.8	60
1	8 29.0 1.002 118.9	8 59.0 1.002 118.9	9 29.0 1.002 118.9	9 59.0 1.002 118.9	10 29.0 1.002 118.8	10 59.0 1.002 118.8	11 29.0 1.002 118.8	11 59.0 1.002 118.8	1
2	8 28.1 1.002 117.9	8 58.1 1.002 117.9	9 28.1 1.002 117.9	9 58.1 1.002 117.8	10 28.1 1.002 117.8	10 58.1 1.002 117.8	11 28.1 1.002 117.8	11 58.1 1.002 117.8	2
3	8 27.2 1.002 116.9	8 57.2 1.002 116.9	9 27.2 1.002 116.9	9 57.2 1.002 116.8	10 27.2 1.002 116.8	10 57.2 1.002 116.8	11 27.2 1.002 116.8	11 57.2 1.002 116.8	3
4	8 26.2 1.002 115.9	8 56.2 1.002 115.9	9 26.2 1.002 115.9	9 56.2 1.002 115.8	10 26.2 1.002 115.8	10 56.2 1.002 115.8	11 26.2 1.002 115.8	11 56.2 1.002 115.8	4
65	8 25.3 1.002 114.9	8 55.3 1.002 114.9	9 25.3 1.002 114.8	9 55.3 1.002 114.8	10 25.3 1.002 114.8	10 55.3 1.002 114.8	11 25.3 1.002 114.8	11 55.3 1.002 114.8	65
6	8 24.3 1.002 113.9	8 54.3 1.002 113.9	9 24.3 1.002 113.8	9 54.3 1.002 113.8	10 24.3 1.002 113.8	10 54.3 1.002 113.8	11 24.3 1.002 113.8	11 54.3 1.002 113.8	6
7	8 23.4 1.002 112.9	8 53.4 1.002 112.9	9 23.4 1.002 112.8	9 53.4 1.002 112.8	10 23.4 1.002 112.8	10 53.4 1.002 112.8	11 23.4 1.002 112.8	11 53.4 1.002 112.8	7
8	8 22.4 1.002 111.9	8 52.4 1.002 111.9	9 22.4 1.002 111.8	9 52.4 1.002 111.8	10 22.4 1.002 111.8	10 52.4 1.002 111.8	11 22.4 1.002 111.8	11 52.4 1.002 111.8	8
9	8 21.4 1.002 110.9	8 51.4 1.002 110.9	9 21.4 1.002 110.8	9 51.4 1.002 110.8	10 21.4 1.002 110.8	10 51.4 1.002 110.8	11 21.4 1.002 110.8	11 51.4 1.002 110.8	9
70	8 20.5 1.002 109.9	8 50.5 1.002 109.9	9 20.4 1.002 109.8	9 50.4 1.002 109.8	10 20.4 1.002 109.8	10 50.4 1.002 109.8	11 20.4 1.002 109.8	11 50.4 1.002 109.8	70
1	8 19.5 1.002 108.9	8 49.5 1.002 108.9	9 19.5 1.002 108.8	9 49.5 1.002 108.8	10 19.5 1.002 108.8	10 49.5 1.002 108.8	11 19.4 1.002 108.8	11 49.4 1.002 108.8	1
2	8 18.5 1.002 107.9	8 48.5 1.002 107.9	9 18.5 1.002 107.8	9 48.5 1.002 107.8	10 18.5 1.002 107.8	10 48.5 1.002 107.8	11 18.4 1.002 107.8	11 48.4 1.002 107.8	2
3	8 17.5 1.002 106.9	8 47.5 1.002 106.9	9 17.5 1.002 106.8	9 47.5 1.002 106.8	10 17.5 1.002 106.8	10 47.5 1.002 106.8	11 17.4 1.002 106.8	11 47.4 1.002 106.8	3
4	8 16.5 1.002 105.9	8 46.5 1.002 105.9	9 16.5 1.002 105.8	9 46.5 1.002 105.8	10 16.5 1.002 105.8	10 46.4 1.002 105.8	11 16.4 1.002 105.8	11 46.4 1.002 105.8	4
75	8 15.5 1.002 104.9	8 45.5 1.002 104.9	9 15.5 1.002 104.8	9 45.4 1.002 104.8	10 15.4 1.002 104.8	10 45.4 1.002 104.8	11 15.4 1.002 104.8	11 45.4 1.002 104.8	75
6	8 14.4 1.002 103.9	8 44.4 1.002 103.9	9 14.4 1.002 103.8	9 44.4 1.002 103.8	10 14.4 1.002 103.8	10 44.4 1.002 103.8	11 14.4 1.002 103.8	11 44.4 1.002 103.8	6
7	8 13.4 1.002 102.9	8 43.4 1.002 102.9	9 13.4 1.002 102.8	9 43.4 1.002 102.8	10 13.4 1.002 102.8	10 43.4 1.002 102.8	11 13.4 1.002 102.8	11 43.4 1.002 102.8	7
8	8 12.4 1.002 101.9	8 42.4 1.002 101.9	9 12.4 1.002 101.8	9 42.4 1.002 101.8	10 12.4 1.002 101.8	10 42.4 1.002 101.8	11 12.4 1.002 101.8	11 42.4 1.002 101.8	8
9	8 11.4 1.002 100.9	8 41.4 1.002 100.9	9 11.4 1.002 100.8	9 41.4 1.002 100.8	10 11.4 1.002 100.8	10 41.4 1.002 100.8	11 11.4 1.002 100.8	11 41.3 1.002 100.8	9
80	8 10.3 1.002 99.9	8 40.3 1.002 99.9	9 10.3 1.002 99.8	9 40.3 1.002 99.8	10 10.3 1.002 99.8	10 40.3 1.002 99.8	11 10.3 1.002 99.8	11 40.3 1.002 99.8	80
1	8 09.3 1.002 98.9	8 39.3 1.002 98.9	9 09.3 1.002 98.8	9 39.3 1.002 98.8	10 09.3 1.002 98.8	10 39.3 1.002 98.8	11 09.3 1.002 98.8	11 39.3 1.002 98.8	1
2	8 08.3 1.002 97.9	8 38.3 1.002 97.9	9 08.3 1.002 97.8	9 38.3 1.002 97.8	10 08.3 1.002 97.8	10 38.3 1.002 97.8	11 08.3 1.002 97.8	11 38.2 1.002 97.8	2
3	8 07.2 1.002 96.9	8 37.2 1.002 96.9	9 07.2 1.002 96.8	9 37.2 1.002 96.8	10 07.2 1.002 96.8	10 37.2 1.002 96.8	11 07.2 1.002 96.8	11 37.2 1.002 96.8	3
4	8 06.2 1.002 95.9	8 36.2 1.002 95.9	9 06.2 1.002 95.8	9 36.2 1.002 95.8	10 06.2 1.002 95.8	10 36.2 1.002 95.8	11 06.2 1.002 95.8	11 36.2 1.002 95.8	4
85	8 05.2 1.002 94.9	8 35.2 1.002 94.9	9 05.1 1.002 94.8	9 35.1 1.002 94.8	10 05.1 1.002 94.8	10 35.1 1.002 94.8	11 05.1 1.002 94.8	11 35.1 1.002 94.8	85
6	8 04.1 1.002 93.9	8 34.1 1.002 93.9	9 04.1 1.002 93.8	9 34.1 1.002 93.8	10 04.1 1.002 93.8	10 34.1 1.002 93.8	11 04.1 1.002 93.8	11 34.1 1.002 93.8	6
7	8 03.1 1.002 92.9	8 33.1 1.002 92.9	9 03.1 1.002 92.8	9 33.1 1.002 92.8	10 03.0 1.002 92.8	10 33.0 1.002 92.8	11 03.0 1.002 92.8	11 33.0 1.002 92.8	7
8	8 02.0 1.002 91.9	8 32.0 1.002 91.9	9 02.0 1.002 91.8	9 32.0 1.002 91.8	10 02.0 1.002 91.8	10 32.0 1.002 91.8	11 02.0 1.002 91.8	11 32.0 1.002 91.8	8
9	8 01.0 1.002 90.9	8 31.0 1.002 90.9	9 01.0 1.002 90.8	9 31.0 1.002 90.8	10 01.0 1.002 90.8	10 31.0 1.002 90.8	11 00.9 1.002 90.8	11 30.9 1.002 90.8	9
90	7 59.9 1.002 89.9	8 29.9 1.002 89.9	8 59.9 1.002 89.8	9 29.9 1.002 89.8	9 59.9 1.002 89.8	10 29.9 1.002 89.8	10 59.9 1.002 89.8	11 29.9 1.002 89.8	90

Lat. 89°

H.A.	8° 00' Alt.	Δd Δt	Az.	8° 30' Alt.	Δd Δt	Az.	9° 00' Alt.	Δd Δt	Az.	9° 30' Alt.	Δd Δt	Az.	10° 00' Alt.	Δd Δt	Az.	10° 30' Alt.	Δd Δt	Az.	11° 00' Alt.	Δd Δt	Az.	11° 30' Alt.	Δd Δt	Az.	H.A.
91	7 58.9	1.0 02	88.9	8 28.9	1.0 02	88.9	8 58.9	1.0 02	88.8	9 28.9	1.0 02	88.8	9 58.9	1.0 02	88.8	10 28.9	1.0 02	88.8	10 58.9	1.0 02	88.8	11 28.9	1.0 02	88.8	91
2	7 57.8	1.0 02	87.9	8 27.8	1.0 02	87.9	8 57.8	1.0 02	87.8	9 27.8	1.0 02	87.8	9 57.8	1.0 02	87.8	10 27.8	1.0 02	87.8	10 57.8	1.0 02	87.8	11 27.8	1.0 02	87.8	2
3	7 56.8	1.0 02	86.9	8 26.8	1.0 02	86.9	8 56.8	1.0 02	86.8	9 26.8	1.0 02	86.8	9 56.8	1.0 02	86.8	10 26.8	1.0 02	86.8	10 56.8	1.0 02	86.8	11 26.8	1.0 02	86.8	3
4	7 55.7	1.0 02	85.9	8 25.7	1.0 02	85.9	8 55.7	1.0 02	85.8	9 25.7	1.0 02	85.8	9 55.7	1.0 02	85.8	10 25.7	1.0 02	85.8	10 55.7	1.0 02	85.8	11 25.7	1.0 02	85.8	4
95	7 54.7	1.0 02	84.9	8 24.7	1.0 02	84.9	8 54.7	1.0 02	84.8	9 24.7	1.0 02	84.8	9 54.7	1.0 02	84.8	10 24.7	1.0 02	84.8	10 54.7	1.0 02	84.8	11 24.7	1.0 02	84.8	95
6	7 53.7	1.0 02	83.9	8 23.7	1.0 02	83.9	8 53.6	1.0 02	83.8	9 23.6	1.0 02	83.8	9 53.6	1.0 02	83.8	10 23.6	1.0 02	83.8	10 53.6	1.0 02	83.8	11 23.6	1.0 02	83.8	6
7	7 52.6	1.0 02	82.9	8 22.6	1.0 02	82.9	8 52.6	1.0 02	82.8	9 22.6	1.0 02	82.8	9 52.6	1.0 02	82.8	10 22.6	1.0 02	82.8	10 52.6	1.0 02	82.8	11 22.6	1.0 02	82.8	7
8	7 51.6	1.0 02	81.9	8 21.6	1.0 02	81.9	8 51.6	1.0 02	81.8	9 21.6	1.0 02	81.8	9 51.6	1.0 02	81.8	10 21.6	1.0 02	81.8	10 51.5	1.0 02	81.8	11 21.5	1.0 02	81.8	8
9	7 50.5	1.0 02	80.9	8 20.5	1.0 02	80.9	8 50.5	1.0 02	80.8	9 20.5	1.0 02	80.8	9 50.5	1.0 02	80.8	10 20.5	1.0 02	80.8	10 50.5	1.0 02	80.8	11 20.5	1.0 02	80.8	9
100	7 49.5	1.0 02	79.9	8 19.5	1.0 02	79.9	8 49.5	1.0 02	79.8	9 19.5	1.0 02	79.8	9 49.5	1.0 02	79.8	10 19.5	1.0 02	79.8	10 49.5	1.0 02	79.8	11 19.5	1.0 02	79.8	100
1	7 48.5	1.0 02	78.9	8 18.5	1.0 02	78.9	8 48.5	1.0 02	78.8	9 18.5	1.0 02	78.8	9 48.5	1.0 02	78.8	10 18.5	1.0 02	78.8	10 48.5	1.0 02	78.8	11 18.4	1.0 02	78.8	1
2	7 47.5	1.0 02	77.9	8 17.5	1.0 02	77.9	8 47.4	1.0 02	77.8	9 17.4	1.0 02	77.8	9 47.4	1.0 02	77.8	10 17.4	1.0 02	77.8	10 47.4	1.0 02	77.8	11 17.4	1.0 02	77.8	2
3	7 46.4	1.0 02	76.9	8 16.4	1.0 02	76.9	8 46.4	1.0 02	76.8	9 16.4	1.0 02	76.8	9 46.4	1.0 02	76.8	10 16.4	1.0 02	76.8	10 46.4	1.0 02	76.8	11 16.4	1.0 02	76.8	3
4	7 45.4	1.0 02	75.9	8 15.4	1.0 02	75.9	8 45.4	1.0 02	75.8	9 15.4	1.0 02	75.8	9 45.4	1.0 02	75.8	10 15.4	1.0 02	75.8	10 45.4	1.0 02	75.8	11 15.4	1.0 02	75.8	4
105	7 44.4	1.0 02	74.9	8 14.4	1.0 02	74.9	8 44.4	1.0 02	74.8	9 14.4	1.0 02	74.8	9 44.4	1.0 02	74.8	10 14.4	1.0 02	74.8	10 44.4	1.0 02	74.8	11 14.4	1.0 02	74.8	105
6	7 43.4	1.0 02	73.9	8 13.4	1.0 02	73.9	8 43.4	1.0 02	73.8	9 13.4	1.0 02	73.8	9 43.4	1.0 02	73.8	10 13.4	1.0 02	73.8	10 43.4	1.0 02	73.8	11 13.4	1.0 02	73.8	6
7	7 42.4	1.0 02	72.9	8 12.4	1.0 02	72.9	8 42.4	1.0 02	72.8	9 12.4	1.0 02	72.8	9 42.4	1.0 02	72.8	10 12.4	1.0 02	72.8	10 42.4	1.0 02	72.8	11 12.4	1.0 02	72.8	7
8	7 41.4	1.0 02	71.9	8 11.4	1.0 02	71.9	8 41.4	1.0 02	71.9	9 11.4	1.0 02	71.8	9 41.4	1.0 02	71.8	10 11.4	1.0 02	71.8	10 41.4	1.0 02	71.8	11 11.4	1.0 02	71.8	8
9	7 40.4	1.0 02	70.9	8 10.4	1.0 02	70.9	8 40.4	1.0 02	70.8	9 10.4	1.0 02	70.8	9 40.4	1.0 02	70.8	10 10.4	1.0 02	70.8	10 40.4	1.0 02	70.8	11 10.4	1.0 02	70.8	9
110	7 39.4	1.0 02	69.9	8 09.4	1.0 02	69.9	8 39.4	1.0 02	69.8	9 09.4	1.0 02	69.8	9 39.4	1.0 02	69.8	10 09.4	1.0 02	69.8	10 39.4	1.0 02	69.8	11 09.4	1.0 02	69.8	110
1	7 38.4	1.0 02	68.9	8 08.4	1.0 02	68.9	8 38.4	1.0 02	68.9	9 08.4	1.0 02	68.9	9 38.4	1.0 02	68.8	10 08.4	1.0 02	68.8	10 38.4	1.0 02	68.8	11 08.4	1.0 02	68.8	1
2	7 37.5	1.0 02	67.9	8 07.5	1.0 02	67.9	8 37.5	1.0 02	67.9	9 07.4	1.0 02	67.8	9 37.4	1.0 02	67.8	10 07.4	1.0 02	67.8	10 37.4	1.0 02	67.8	11 07.4	1.0 02	67.8	2
3	7 36.5	1.0 02	66.9	8 06.5	1.0 02	66.9	8 36.5	1.0 02	66.9	9 06.5	1.0 02	66.8	9 36.5	1.0 02	66.8	10 06.5	1.0 02	66.8	10 36.5	1.0 02	66.8	11 06.5	1.0 02	66.8	3
4	7 35.5	1.0 02	65.9	8 05.5	1.0 02	65.9	8 35.5	1.0 02	65.9	9 05.5	1.0 02	65.9	9 35.5	1.0 02	65.8	10 05.5	1.0 02	65.8	10 35.5	1.0 02	65.8	11 05.5	1.0 02	65.8	4
115	7 34.6	1.0 02	64.9	8 04.6	1.0 02	64.9	8 34.6	1.0 02	64.9	9 04.6	1.0 02	64.9	9 34.6	1.0 02	64.8	10 04.6	1.0 02	64.8	10 34.6	1.0 02	64.8	11 04.6	1.0 02	64.8	115
6	7 33.6	1.0 02	63.9	8 03.6	1.0 02	63.9	8 33.6	1.0 02	63.9	9 03.6	1.0 02	63.9	9 33.6	1.0 02	63.8	10 03.6	1.0 02	63.8	10 33.6	1.0 02	63.8	11 03.6	1.0 02	63.8	6
7	7 32.7	1.0 02	62.9	8 02.7	1.0 02	62.9	8 32.7	1.0 02	62.9	9 02.7	1.0 02	62.9	9 32.7	1.0 02	62.8	10 02.7	1.0 02	62.8	10 32.7	1.0 02	62.8	11 02.7	1.0 02	62.8	7
8	7 31.8	1.0 02	61.9	8 01.8	1.0 02	61.9	8 31.8	1.0 02	61.9	9 01.8	1.0 02	61.9	9 31.8	1.0 02	61.8	10 01.8	1.0 02	61.8	10 31.8	1.0 02	61.8	11 01.8	1.0 02	61.8	8
9	7 30.9	1.0 02	60.9	8 00.9	1.0 02	60.9	8 30.8	1.0 02	60.9	9 00.8	1.0 02	60.9	9 30.8	1.0 02	60.8	10 00.8	1.0 02	60.8	10 30.8	1.0 02	60.8	11 00.8	1.0 02	60.8	9
120	7 29.9	1.0 02	59.9	7 59.9	1.0 02	59.9	8 29.9	1.0 02	59.9	8 59.9	1.0 02	59.9	9 29.9	1.0 02	59.9	9 59.9	1.0 02	59.8	10 29.9	1.0 02	59.8	10 59.9	1.0 01	59.8	120
1	7 29.0	1.0 02	58.9	7 59.0	1.0 01	58.9	8 29.0	1.0 01	58.9	8 59.0	1.0 01	58.9	9 29.0	1.0 02	58.9	9 59.0	1.0 02	58.8	10 29.0	1.0 01	58.8	10 59.0	1.0 01	58.8	1
2	7 28.2	1.0 01	57.9	7 58.2	1.0 01	57.9	8 28.1	1.0 01	57.9	8 58.1	1.0 01	57.9	9 28.1	1.0 01	57.9	9 58.1	1.0 01	57.8	10 28.1	1.0 01	57.8	10 58.1	1.0 01	57.8	2
3	7 27.3	1.0 01	56.9	7 57.3	1.0 01	56.9	8 27.3	1.0 01	56.9	8 57.3	1.0 01	56.9	9 27.3	1.0 01	56.9	9 57.3	1.0 01	56.8	10 27.3	1.0 01	56.8	10 57.2	1.0 01	56.8	3
4	7 26.4	1.0 01	55.9	7 56.4	1.0 01	55.9	8 26.4	1.0 01	55.9	8 56.4	1.0 01	55.9	9 26.4	1.0 01	55.9	9 56.4	1.0 01	55.8	10 26.4	1.0 01	55.8	10 56.4	1.0 01	55.8	4
125	7 25.5	1.0 01	54.9	7 55.5	1.0 01	54.9	8 25.5	1.0 01	54.9	8 55.5	1.0 01	54.9	9 25.5	1.0 01	54.9	9 55.5	1.0 01	54.9	10 25.5	1.0 01	54.8	10 55.5	1.0 01	54.8	125
6	7 24.7	1.0 01	53.9	7 54.7	1.0 01	53.9	8 24.7	1.0 01	53.9	8 54.7	1.0 01	53.9	9 24.7	1.0 01	53.9	9 54.7	1.0 01	53.9	10 24.7	1.0 01	53.8	10 54.7	1.0 01	53.8	6
7	7 23.8	1.0 01	52.9	7 53.8	1.0 01	52.9	8 23.8	1.0 01	52.9	8 53.8	1.0 01	52.9	9 23.8	1.0 01	52.9	9 53.8	1.0 01	52.9	10 23.8	1.0 01	52.8	10 53.8	1.0 01	52.8	7
8	7 23.0	1.0 01	51.9	7 53.0	1.0 01	51.9	8 23.0	1.0 01	51.9	8 53.0	1.0 01	51.9	9 23.0	1.0 01	51.9	9 53.0	1.0 01	51.9	10 23.0	1.0 01	51.8	10 53.0	1.0 01	51.8	8
9	7 22.2	1.0 01	50.9	7 52.2	1.0 01	50.9	8 22.2	1.0 01	50.9	8 52.2	1.0 01	50.9	9 22.2	1.0 01	50.9	9 52.2	1.0 01	50.9	10 22.2	1.0 01	50.8	10 52.2	1.0 01	50.8	9
130	7 21.4	1.0 01	49.9	7 51.4	1.0 01	49.9	8 21.4	1.0 01	49.9	8 51.4	1.0 01	49.9	9 21.4	1.0 01	49.9	9 51.4	1.0 01	49.9	10 21.4	1.0 01	49.9	10 51.4	1.0 01	49.8	130
1	7 20.6	1.0 01	48.9	7 50.6	1.0 01	48.9	8 20.6	1.0 01	48.9	8 50.6	1.0 01	48.9	9 20.6	1.0 01	48.9	9 50.6	1.0 01	48.9	10 20.6	1.0 01	48.9	10 50.6	1.0 01	48.9	1
2	7 19.8	1.0 01	47.9	7 49.8	1.0 01	47.9	8 19.8	1.0 01	47.9	8 49.8	1.0 01	47.9	9 19.8	1.0 01	47.9	9 49.8	1.0 01	47.9	10 19.8	1.0 01	47.9	10 49.8	1.0 01	47.9	2
3	7 19.0	1.0 01	46.9	7 49.0	1.0 01	46.9	8 19.0	1.0 01	46.9	8 49.0	1.0 01	46.9	9 19.0	1.0 01	46.9	9 49.0	1.0 01	46.9	10 19.0	1.0 01	46.9	10 49.0	1.0 01	46.9	3
4	7 18.3	1.0 01	45.9	7 48.3	1.0 01	45.9	8 18.3	1.0 01	45.0	8 48.3	1.0 01	45.9	9 18.3	1.0 01	45.9	9 48.3	1.0 01	45.9	10 18.3	1.0 01	45.9	10 48.3	1.0 01	45.9	4
135	7 17.5	1.0 01	44.9	7 47.5	1.0 01	44.9	8 17.5	1.0 01	44.9	8 47.5	1.0 01	44.9	9 17.5	1.0 01	44.9	9 47.5	1.0 01	44.9	10 17.5	1.0 01	44.9	10 47.5	1.0 01	44.9	135
6	7 16.8	1.0 01	43.9	7 46.8	1.0 01	43.9	8 16.8	1.0 01	43.9	8 46.8	1.0 01	43.9	9 16.8	1.0 01	43.9	9 46.8	1.0 01	43.9	10 16.8	1.0 01	43.9	10 46.8	1.0 01	43.9	6
7	7 16.1	1.0 01	42.9	7 46.1	1.0 01	42.9	8 16.1	1.0 01	42.9	8 46.1	1.0 01	42.9	9 16.1	1.0 01	42.9	9 46.1	1.0 01	42.9	10 16.1	1.0 01	42.9	10 46.1	1.0 01	42.9	7
8	7 15.4	1.0 01	41.9	7 45.4	1.0 01	41.9	8 15.4	1.0 01	41.9	8 45.4	1.0 01	41.9	9 15.4	1.0 01	41.9	9 45.4	1.0 01	41.9	10 15.4	1.0 01	41.9	10 45.4	1.0 01	41.9	8
9	7 14.7	1.0 01	40.9	7 44.7	1.0 01	40.9	8 14.7	1.0 01	40.9	8 44.7	1.0 01	40.9	9 14.7	1.0 01	40.9	9 44.7	1.0 01	40.9	10 14.7	1.0 01	40.9	10 44.7	1.0 01	40.9	9
140	7 14.0	1.0 01	39.9	7 44.0	1.0 01	39.9	8 14.0	1.0 01	39.9	8 44.0	1.0 01	39.9	9 14.0	1.0 01	39.9	9 44.0	1.0 01	39.9	10 14.0	1.0 01	39.9	10 44.0	1.0 01	39.9	140
1	7 13.3	1.0 01	38.9	7 43.3	1.0 01	38.9	8 13.3	1.0 01	38.9	8 43.3	1.0 01	38.9	9 13.3	1.0 01	38.9	9 43.3	1.0 01	38.9	10 13.3	1.0 01	38.9	10 43.3	1.0 01	38.9	1
2	7 12.7	1.0 01	37.9	7 42.7	1.0 01	37.9	8 12.7	1.0 01	37.9	8 42.7	1.0 01	37.9	9 12.7	1.0 01	37.9	9 42.7	1.0 01	37.9	10 12.7	1.0 01	37.9	10 42.7	1.0 01	37.9	2
3	7 12.1	1.0 01	36.9	7 42.1	1.0 01	36.9	8 12.1	1.0 01	36.9	8 42.1	1.0 01	36.9	9 12.0	1.0 01	36.9	9 42.0	1.0 01	36.9	10 12.0	1.0 01	36.9	10 42.0	1.0 01	36.9	3
4	7 11.4	1.0 01	35.9	7 41.4	1.0 01	35.9	8 11.4	1.0 01	35.9	8 41.4	1.0 01	35.9	9 11.4	1.0 01	35.9	9 41.4	1.0 01	35.9	10 11.4	1.0 01	35.9	10 41.4	1.0 01	35.9	4
145	7 10.8	1.0 01	34.9	7 40.8	1.0 01	34.9	8 10.8	1.0 01	34.9	8 40.8	1.0 01	34.9	9 10.8	1.0 01	34.9	9 40.8	1.0 01	34.9	10 10.8	1.0 01	34.9	10 40.8	1.0 01	34.9	145
6	7 10.2	1.0 01	33.9	7 40.2	1.0 01	33.9	8 10.2	1.0 01	33.9	8 40.2	1.0 01	33.9	9 10.2	1.0 01	33.9	9 40.2	1.0 01	33.9	10 10.2	1.0 01	33.9	10 40.2	1.0 01	33.9	6
7	7 09.7	1.0 01	32.9	7 39.7	1.0 01	32.9	8 09.7	1.0 01	32.9	8 39.7	1.0 01	32.9	9 09.7	1.0 01	32.9	9 39.7	1.0 01	32.9	10 09.7	1.0 01	32.9	10 39.6	1.0 01	32.9	7
8	7 09.1	1.0 01	31.9	7 39.1	1.0 01	31.9	8 09.1	1.0 01	31.9	8 39.1	1.0 01	31.9	9 09.1	1.0 01	31.9	9 39.1	1.0 01	31.9	10 09.1	1.0 01	31.9	10 39.1	1.0 01	31.9	8
9	7 08.6	1.0 01	30.9	7 38.5	1.0 01	30.9	8 08.5	1.0 01	30.9	8 38.5	1.0 01	30.9	9 08.5	1.0 01	30.9	9 38.5	1.0 01	30.9	10 08.5	1.0 01	30.9	10 38.5	1.0 01	30.9	9
150	7 08.0	1.0 01	29.9	7 38.0	1.0 01	29.9	8 08.0	1.0 01	29.9	8 38.0	1.0 01	29.9	9 08.0	1.0 01	29.9	9 38.0	1.0 01	29.9	10 08.0	1.0 01	29.9	10 38.0	1.0 01	29.9	150
1	7 07.5	1.0 01	28.9	7 37.5	1.0 01	28.9	8 07.5	1.0 01	28.9	8 37.5	1.0 01	28.9	9 07.5	1.0 01	28.9	9 37.5	1.0 01	28.9	10 07.5	1.0 01	28.9	10 37.5	1.0 01	28.9	1
2	7 07.0	1.0 01	27.9	7 37.0	1.0 01	27.9	8 07.0	1.0 01	27.9	8 37.0	1.0 01	27.9	9 07.0	1.0 01	27.9	9 37.0	1.0 01	27.9	10 07.0	1.0 01	27.9	10 37.0	1.0 01	27.9	2
3	7 06.5	1.0 01	26.9	7 36.5	1.0 01	26.9	8 06.5	1.0 01	26.9	8 36.5	1.0 01	26.9	9 06.5	1.0 01	26.9	9 36.5	1.0 01	26.9	10 06.5	1.0 01	26.9	10 36.5	1.0 01	26.9	3
4	7 06.1	1.0 01	25.9	7 36.1	1.0 01	25.9	8 06.1	1.0 01	25.9	8 36.1	1.0 01	25.9	9 06.1	1.0 01	25.9	9 36.1	1.0 01	25.9	10 06.1	1.0 01	25.9	10 36.1	1.0 01	25.0	4
155	7 05.6	1.0 01	24.9	7 35.6	1.0 01	24.9	8 05.6	1.0 01	24.9	8 35.6	1.0 01	24.9	9 05.6	1.0 01	24.9	9 35.6	1.0 01	24.9	10 05.6	1.0 01	24.9	10 35.6	1.0 01	24.9	155
6	7 05.2	1.0 01	23.9	7 35.2	1.0 01	23.9	8 05.2	1.0 01	23.9	8 35.2	1.0 01	23.9	9 05.2	1.0 01	23.9	9 35.2	1.0 01	23.9	10 05.2	1.0 01	23.9	10 35.2	1.0 01	23.9	6
7	7 04.8	1.0 01	22.9	7 34.8	1.0 01	22.9	8 04.8	1.0 01	22.9	8 34.8	1.0 01	22.9	9 04.8	1.0 01	22.9	9 34.8	1.0 01	22.9	10 04.8	1.0 01	22.9	10 34.8	1.0 01	22.9	7
8	7 04.4	1.0 01	22.0	7 34.4	1.0 01	21.9	8 04.4	1.0 01	21.9	8 34.4	1.0 01	21.9	9 04.4	1.0 01	21.9	9 34.4	1.0 01	21.9	10 04.4	1.0 01	21.9	10 34.4	1.0 01	21.9	8
9	7 04.1	1.0 01	21.0	7 34.0	1.0 01	20.9	8 04.0	1.0 01	20.9	8 34.0	1.0 01	20.9	9 04.0	1.0 01	20.9	9 34.0	1.0 01	20.9	10 04.0	1.0 01	20.9	10 34.0	1.0 01	20.9	9
160	7 03.6	1.0 01	20.0	7 33.6	1.0 01	19.9	8 03.6	1.0 01	19.9	8 33.6	1.0 01	19.9	9 03.6	1.0 01	19.9	9 33.6	1.0 01	19.9	10 03.6	1.0 01	19.9	10 33.6	1.0 01	19.9	160
1	7 03.3	1.0 01	19.0	7 33.3	1.0 01	19.0	8 03.3	1.0 01	19.0	8 33.3	1.0 01	18.9	9 03.3	1.0 01	18.9	9 33.3	1.0 01	18.9	10 03.3	1.0 01	18.9	10 33.3	1.0 01	18.9	1
2	7 02.9	1.0 01	18.0	7 32.9	1.0 01	18.0	8 02.9	1.0 01	18.0	8 32.9	1.0 01	18.0	9 02.9	1.0 01	17.9	9 32.9	1.0 01	17.9	10 02.9	1.0 01	17.9	10 32.9	1.0 01	17.9	2
3	7 02.6	1.0 00	17.0	7 32.6	1.0 00	17.0	8 02.6	1.0 00	17.0	8 32.6	1.0 00	17.0	9 02.6	1.0 00	17.0	9 32.6	1.0 00	16.9	10 02.6	1.0 00	16.9	10 32.6	1.0 00	16.9	3
4	7 02.3	1.0 00	16.0	7 32.3	1.0 00	16.0	8 02.3	1.0 00	16.0	8 32.3	1.0 00	16.0	9 02.3	1.0 00	16.0	9 32.3	1.0 00	16.0	10 02.3	1.0 00	15.9	10 32.3	1.0 00	15.9	4
165	7 02.0	1.0 00	15.0	7 32.0	1.0 00	15.0	8 02.0	1.0 00	15.0	8 32.0	1.0 00	15.0	9 02.0	1.0 00	15.0	9 32.0	1.0 00	15.0	10 02.0	1.0 00	15.0	10 32.0	1.0 00	14.9	165
6	7 01.8	1.0 00	14.0	7 31.8	1.0 00	14.0	8 01.8	1.0 00	14.0	8 31.8	1.0 00	14.0	9 01.8	1.0 00	14.0	9 31.8	1.0 00	14.0	10 01.8	1.0 00	14.0	10 31.8	1.0 00	14.0	6
7	7 01.5	1.0 00	13.0	7 31.5	1.0 00	13.0	8 01.5	1.0 00	13.0	8 31.5	1.0 00	13.0	9 01.5	1.0 00	13.0	9 31.5	1.0 00	13.0	10 01.5	1.0 00	13.0	10 31.5	1.0 00	13.0	7
8	7 01.3	1.0 00	12.0	7 31.3	1.0 00	12.0	8 01.3	1.0 00	12.0	8 31.3	1.0 00	12.0	9 01.3	1.0 00	12.0	9 31.3	1.0 00	12.0	10 01.3	1.0 00	12.0	10 31.3	1.0 00	12.0	8
9	7 01.1	1.0 00	11.0	7 31.1	1.0 00	11.0	8 01.1	1.0 00	11.0	8 31.1	1.0 00	11.0	9 01.1	1.0 00	11.0	9 31.1	1.0 00	11.0	10 01.1	1.0 00	11.0	10 31.1	1.0 00	11.0	9
170	7 00.9	1.0 00	10.0	7 30.9	1.0 00	10.0	8 00.9	1.0 00	10.0	8 30.9	1.0 00	10.0	9 00.9	1.0 00	10.0	9 30.9	1.0 00	10.0	10 00.9	1.0 00	10.0	10 30.9	1.0 00	10.0	170
1	7 00.7	1.0 00	09.0	7 30.7	1.0 00	09.0	8 00.7	1.0 00	09.0	8 30.7	1.0 00	09.0	9 00.7	1.0 00	09.0	9 30.7	1.0 00	09.0	10 00.7	1.0 00	09.0	10 30.7	1.0 00	09.0	1
2	7 00.6	1.0 00	08.0	7 30.6	1.0 00	08.0	8 00.6	1.0 00	08.0	8 30.6	1.0 00	08.0	9 00.6	1.0 00	08.0	9 30.6	1.0 00	08.0	10 00.6	1.0 00	08.0	10 30.6	1.0 00	08.0	2
3	7 00.4	1.0 00	07.0	7 30.4	1.0 00	07.0	8 00.4	1.0 00	07.0	8 30.4	1.0 00	07.0	9 00.4	1.0 00	07.0	9 30.4	1.0 00	07.0	10 00.4	1.0 00	07.0	10 30.4	1.0 00	07.0	3
4	7 00.3	1.0 00	06.0	7 30.3	1.0 00	06.0	8 00.3	1.0 00	06.0	8 30.3	1.0 00	06.0	9 00.3	1.0 00	06.0	9 30.3	1.0 00	06.0	10 00.3	1.0 00	06.0	10 30.3	1.0 00	06.0	4
175	7 00.2	1.0 00	05.0	7 30.2	1.0 00	05.0	8 00.2	1.0 00	05.0	8 30.2	1.0 00	05.0	9 00.2	1.0 00	05.0	9 30.2	1.0 00	05.0	10 00.2	1.0 00	05.0	10 30.2	1.0 00	05.0	175
6	7 00.1	1.0 00	04.0	7 30.1	1.0 00	04.0	8 00.1	1.0 00	04.0	8 30.1	1.0 00	04.0	9 00.1	1.0 00	04.0	9 30.1	1.0 00	04.0	10 00.1	1.0 00	04.0	10 30.1	1.0 00	04.0	6
7	7 00.1	1.0 00	03.0	7 30.1	1.0 00	03.0	8 00.1	1.0 00	03.0	8 30.1	1.0 00	03.0	9 00.1	1.0 00	03.0	9 30.1	1.0 00	03.0	10 00.1	1.0 00	03.0	10 30.1	1.0 00	03.0	7
8	7 00.0	1.0 00	02.0	7 30.0	1.0 00	02.0	8 00.0	1.0 00	02.0	8 30.0	1.0 00	02.0	9 00.0	1.0 00	02.0	9 30.0	1.0 00	02.0	10 00.0	1.0 00	02.0	10 30.0	1.0 00	02.0	8
9	7 00.0	1.0 00	01.0	7 30.0	1.0 00	01.0	8 00.0	1.0 00	01.0	8 30.0	1.0 00	01.0	9 00.0	1.0 00	01.0	9 30.0	1.0 00	01.0	10 00.0	1.0 00	01.0	10 30.0	1.0 00	01.0	9
180	7 00.0	1.0 00	00.0	7 30.0	1.0 00	00.0	8 00.0	1.0 00	00.0	8 30.0	1.0 00	00.0	9 00.0	1.0 00	00.0	9 30.0	1.0 00	00.0	10 00.0	1.0 00	00.0	10 30.0	1.0 00	00.0	180

Lat. 89°

Each cell below lists: Alt. (° ′) — Δd Δt — Az.

H.A.	12° 00′	12° 30′	13° 00′	13° 30′	14° 00′	14° 30′	15° 00′	15° 30′	H.A.
00	13 00.0 1.000 180.0	13 30.0 1.000 180.0	14 00.0 1.000 180.0	14 30.0 1.000 180.0	15 00.0 1.000 180.0	15 30.0 1.000 180.0	16 00.0 1.000 180.0	16 30.0 1.000 180.0	00
1	13 00.0 1.000 179.0	13 30.0 1.000 179.0	14 00.0 1.000 179.0	14 30.0 1.000 179.0	15 00.0 1.000 179.0	15 30.0 1.000 179.0	16 00.0 1.000 179.0	16 30.0 1.000 179.0	1
2	13 00.0 1.000 178.0	13 30.0 1.000 178.0	14 00.0 1.000 178.0	14 30.0 1.000 178.0	15 00.0 1.000 178.0	15 30.0 1.000 178.0	16 00.0 1.000 178.0	16 30.0 1.000 178.0	2
3	12 59.9 1.000 177.0	13 29.9 1.000 177.0	13 59.9 1.000 177.0	14 29.9 1.000 177.0	14 59.9 1.000 177.0	15 29.9 1.000 177.0	15 59.9 1.000 177.0	16 29.9 1.000 177.0	3
4	12 59.9 1.000 176.0	13 29.9 1.000 176.0	13 59.9 1.000 176.0	14 29.9 1.000 176.0	14 59.9 1.000 176.0	15 29.9 1.000 176.0	15 59.9 1.000 176.0	16 29.9 1.000 176.0	4
05	12 59.8 1.000 175.0	13 29.8 1.000 175.0	13 59.8 1.000 175.0	14 29.8 1.000 175.0	14 59.8 1.000 175.0	15 29.8 1.000 175.0	15 59.8 1.000 175.0	16 29.8 1.000 175.0	05
6	12 59.7 1.000 174.0	13 29.7 1.000 174.0	13 59.7 1.000 174.0	14 29.7 1.000 174.0	14 59.7 1.000 174.0	15 29.7 1.000 174.0	15 59.7 1.000 174.0	16 29.7 1.000 174.0	6
7	12 59.6 1.000 173.0	13 29.6 1.000 173.0	13 59.6 1.000 173.0	14 29.6 1.000 173.0	14 59.6 1.000 173.0	15 29.6 1.000 173.0	15 59.6 1.000 173.0	16 29.6 1.000 173.0	7
8	12 59.4 1.000 172.0	13 29.4 1.000 172.0	13 59.4 1.000 172.0	14 29.4 1.000 172.0	14 59.4 1.000 172.0	15 29.4 1.000 172.0	15 59.4 1.000 172.0	16 29.4 1.000 172.0	8
9	12 59.3 1.000 171.0	13 29.3 1.000 171.0	13 59.3 1.000 171.0	14 29.3 1.000 171.0	14 59.3 1.000 171.0	15 29.3 1.000 171.0	15 59.3 1.000 171.0	16 29.3 1.000 171.0	9
10	12 59.1 1.000 170.0	13 29.1 1.000 170.0	13 59.1 1.000 170.0	14 29.1 1.000 170.0	14 59.1 1.000 170.0	15 29.1 1.000 170.0	15 59.1 1.000 170.0	16 29.1 1.000 170.0	10
1	12 58.9 1.000 169.0	13 28.9 1.000 169.0	13 58.9 1.000 169.0	14 28.9 1.000 169.0	14 58.9 1.000 169.0	15 28.9 1.000 168.9	15 58.9 1.000 168.9	16 28.9 1.000 168.9	1
2	12 58.7 1.000 168.0	13 28.7 1.000 168.0	13 58.7 1.000 168.0	14 28.7 1.000 167.9	14 58.7 1.000 167.9	15 28.7 1.000 167.9	15 58.7 1.000 167.9	16 28.7 1.000 167.9	2
3	12 58.5 1.000 167.0	13 28.5 1.000 166.9	13 58.5 1.000 166.9	14 28.5 1.000 166.9	14 58.5 1.000 166.9	15 28.5 1.000 166.9	15 58.5 1.000 166.9	16 28.5 1.000 166.9	3
4	12 58.2 1.000 165.9	13 28.2 1.000 165.9	13 58.2 1.000 165.9	14 28.2 1.000 165.9	14 58.2 1.000 165.9	15 28.2 1.000 165.9	15 58.2 1.000 165.9	16 28.2 1.000 165.9	4
15	12 57.9 1.000 164.9	13 27.9 1.000 164.9	13 57.9 1.000 164.9	14 27.9 1.000 164.9	14 57.9 1.000 164.9	15 27.9 1.000 164.9	15 57.9 1.000 164.9	16 27.9 1.000 164.9	15
6	12 57.7 1.000 163.9	13 27.7 1.000 163.9	13 57.7 1.000 163.9	14 27.7 1.000 163.9	14 57.7 1.000 163.9	15 27.7 1.000 163.9	15 57.7 1.000 163.9	16 27.7 1.000 163.9	6
7	12 57.4 1.001 162.9	13 27.4 1.001 162.9	13 57.4 1.001 162.9	14 27.4 1.001 162.9	14 57.4 1.001 162.9	15 27.4 1.001 162.9	15 57.4 1.001 162.9	16 27.4 1.001 162.9	7
8	12 57.1 1.001 161.9	13 27.1 1.001 161.9	13 57.1 1.001 161.9	14 27.1 1.001 161.9	14 57.0 1.001 161.9	15 27.0 1.001 161.9	15 57.0 1.001 161.9	16 27.0 1.001 161.9	8
9	12 56.7 1.001 160.9	13 26.7 1.001 160.9	13 56.7 1.001 160.9	14 26.7 1.001 160.9	14 56.7 1.001 160.9	15 26.7 1.001 160.9	15 56.7 1.001 160.9	16 26.7 1.001 160.9	9
20	12 56.4 1.001 159.9	13 26.4 1.001 159.9	13 56.4 1.001 159.9	14 26.4 1.001 159.9	14 56.4 1.001 159.9	15 26.4 1.001 159.9	15 56.4 1.001 159.9	16 26.4 1.001 159.9	20
1	12 56.0 1.001 158.9	13 26.0 1.001 158.9	13 56.0 1.001 158.9	14 26.0 1.001 158.9	14 56.0 1.001 158.9	15 26.0 1.001 158.9	15 56.0 1.001 158.9	16 26.0 1.001 158.9	1
2	12 55.6 1.001 157.9	13 25.6 1.001 157.9	13 55.6 1.001 157.9	14 25.6 1.001 157.9	14 55.6 1.001 157.9	15 25.6 1.001 157.9	15 55.6 1.001 157.9	16 25.6 1.001 157.9	2
3	12 55.2 1.001 156.9	13 25.2 1.001 156.9	13 55.2 1.001 156.9	14 25.2 1.001 156.9	14 55.2 1.001 156.9	15 25.2 1.001 156.9	15 55.2 1.001 156.9	16 25.2 1.001 156.9	3
4	12 54.8 1.001 155.9	13 24.8 1.001 155.9	13 54.8 1.001 155.9	14 24.8 1.001 155.9	14 54.8 1.001 155.9	15 24.8 1.001 155.9	15 54.8 1.001 155.9	16 24.8 1.001 155.9	4
25	12 54.4 1.001 154.9	13 24.4 1.001 154.9	13 54.4 1.001 154.9	14 24.4 1.001 154.9	14 54.4 1.001 154.9	15 24.4 1.001 154.9	15 54.4 1.001 154.9	16 24.4 1.001 154.9	25
6	12 53.9 1.001 153.9	13 23.9 1.001 153.9	13 53.9 1.001 153.9	14 23.9 1.001 153.9	14 53.9 1.001 153.9	15 23.9 1.001 153.9	15 53.9 1.001 153.9	16 23.9 1.001 153.9	6
7	12 53.4 1.001 152.9	13 23.4 1.001 152.9	13 53.4 1.001 152.9	14 23.4 1.001 152.9	14 53.4 1.001 152.9	15 23.4 1.001 152.9	15 53.4 1.001 152.9	16 23.4 1.001 152.9	7
8	12 53.0 1.001 151.9	13 23.0 1.001 151.9	13 53.0 1.001 151.9	14 22.9 1.001 151.9	14 52.9 1.001 151.9	15 22.9 1.001 151.9	15 52.9 1.001 151.9	16 22.9 1.001 151.9	8
9	12 52.5 1.001 150.9	13 22.4 1.001 150.9	13 52.4 1.001 150.9	14 22.4 1.001 150.9	14 52.4 1.001 150.9	15 22.4 1.001 150.9	15 52.4 1.001 150.9	16 22.4 1.001 150.9	9
30	12 51.9 1.001 149.9	13 21.9 1.001 149.9	13 51.9 1.001 149.9	14 21.9 1.001 149.9	14 51.9 1.001 149.9	15 21.9 1.001 149.9	15 51.9 1.001 149.9	16 21.9 1.001 149.9	30
1	12 51.4 1.001 148.9	13 21.4 1.001 148.9	13 51.4 1.001 148.9	14 21.4 1.001 148.9	14 51.4 1.001 148.9	15 21.4 1.001 148.9	15 51.4 1.001 148.9	16 21.4 1.001 148.9	1
2	12 50.9 1.001 147.9	13 20.9 1.001 147.9	13 50.8 1.001 147.9	14 20.8 1.001 147.9	14 50.8 1.001 147.9	15 20.8 1.001 147.9	15 50.8 1.001 147.9	16 20.8 1.001 147.8	2
3	12 50.3 1.001 146.9	13 20.3 1.001 146.9	13 50.3 1.001 146.9	14 20.3 1.001 146.9	14 50.3 1.001 146.9	15 20.3 1.001 146.9	15 50.3 1.001 146.9	16 20.3 1.001 146.8	3
4	12 49.7 1.001 145.9	13 19.7 1.001 145.9	13 49.7 1.001 145.9	14 19.7 1.001 145.9	14 49.7 1.001 145.9	15 19.7 1.001 145.9	15 49.7 1.001 145.8	16 19.7 1.001 145.8	4
35	12 49.1 1.001 144.9	13 19.1 1.001 144.9	13 49.1 1.001 144.9	14 19.1 1.001 144.9	14 49.1 1.001 144.9	15 19.1 1.001 144.8	15 49.1 1.001 144.8	16 19.1 1.001 144.8	35
6	12 48.5 1.001 143.9	13 18.5 1.001 143.9	13 48.5 1.001 143.9	14 18.5 1.001 143.9	14 48.5 1.001 143.8	15 18.5 1.001 143.8	15 48.5 1.001 143.8	16 18.5 1.001 143.8	6
7	12 47.9 1.001 142.9	13 17.9 1.001 142.9	13 47.9 1.001 142.9	14 17.9 1.001 142.9	14 47.9 1.001 142.8	15 17.9 1.001 142.8	15 47.9 1.001 142.8	16 17.9 1.001 142.8	7
8	12 47.2 1.001 141.9	13 17.2 1.001 141.9	13 47.2 1.001 141.9	14 17.2 1.001 141.8	14 47.2 1.001 141.8	15 17.2 1.001 141.8	15 47.2 1.001 141.8	16 17.2 1.001 141.8	8
9	12 46.6 1.001 140.9	13 16.6 1.001 140.8	13 46.6 1.001 140.8	14 16.6 1.001 140.8	14 46.6 1.001 140.8	15 16.6 1.001 140.8	15 46.6 1.001 140.8	16 16.6 1.001 140.8	9
40	12 45.9 1.001 139.9	13 15.9 1.001 139.9	13 45.9 1.001 139.9	14 15.9 1.001 139.9	14 45.9 1.001 139.9	15 15.9 1.001 139.9	15 45.9 1.001 139.9	16 15.9 1.001 139.9	40
1	12 45.2 1.001 138.9	13 15.2 1.001 138.8	13 45.2 1.001 138.8	14 15.2 1.001 138.8	14 45.2 1.001 138.8	15 15.2 1.001 138.8	15 45.2 1.001 138.8	16 15.2 1.001 138.8	1
2	12 44.5 1.001 137.9	13 14.5 1.001 137.8	13 44.5 1.001 137.8	14 14.5 1.001 137.8	14 44.5 1.001 137.8	15 14.5 1.001 137.8	15 44.5 1.001 137.8	16 14.5 1.001 137.8	2
3	12 43.8 1.001 136.8	13 13.8 1.001 136.8	13 43.8 1.001 136.8	14 13.8 1.001 136.8	14 43.8 1.001 136.8	15 13.8 1.001 136.8	15 43.8 1.001 136.8	16 13.8 1.001 136.8	3
4	12 43.1 1.001 135.8	13 13.1 1.001 135.8	13 43.1 1.001 135.8	14 13.1 1.001 135.8	14 43.1 1.001 135.8	15 13.1 1.001 135.8	15 43.1 1.001 135.8	16 13.1 1.001 135.8	4
45	12 42.4 1.001 134.8	13 12.4 1.001 134.8	13 42.4 1.001 134.8	14 12.4 1.001 134.8	14 42.4 1.001 134.8	15 12.4 1.001 134.8	15 42.4 1.001 134.8	16 12.4 1.001 134.8	45
6	12 41.6 1.001 133.8	13 11.6 1.001 133.8	13 41.6 1.001 133.8	14 11.6 1.001 133.8	14 41.6 1.001 133.8	15 11.6 1.001 133.8	15 41.6 1.001 133.8	16 11.6 1.001 133.8	6
7	12 40.9 1.001 132.8	13 10.9 1.001 132.8	13 40.9 1.001 132.8	14 10.9 1.001 132.8	14 40.8 1.001 132.8	15 10.8 1.001 132.8	15 40.8 1.001 132.8	16 10.8 1.001 132.8	7
8	12 40.1 1.001 131.8	13 10.1 1.001 131.8	13 40.1 1.001 131.8	14 10.1 1.001 131.8	14 40.1 1.001 131.8	15 10.1 1.001 131.8	15 40.1 1.001 131.8	16 10.1 1.001 131.8	8
9	12 39.3 1.001 130.8	13 09.3 1.001 130.8	13 39.3 1.001 130.8	14 09.3 1.001 130.8	14 39.3 1.001 130.8	15 09.3 1.001 130.8	15 39.3 1.001 130.8	16 09.3 1.001 130.8	9
50	12 38.5 1.001 129.8	13 08.5 1.001 129.8	13 38.5 1.001 129.8	14 08.5 1.001 129.8	14 38.5 1.001 129.8	15 08.5 1.001 129.8	15 38.5 1.001 129.8	16 08.5 1.001 129.8	50
1	12 37.7 1.001 128.8	13 07.7 1.001 128.8	13 37.7 1.001 128.8	14 07.7 1.001 128.8	14 37.7 1.001 128.8	15 07.7 1.001 128.8	15 37.7 1.001 128.8	16 07.7 1.001 128.8	1
2	12 36.9 1.001 127.8	13 06.9 1.001 127.8	13 36.9 1.001 127.8	14 06.9 1.001 127.8	14 36.9 1.001 127.8	15 06.9 1.001 127.8	15 36.9 1.001 127.8	16 06.8 1.001 127.8	2
3	12 36.0 1.001 126.8	13 06.0 1.001 126.8	13 36.0 1.001 126.8	14 06.0 1.001 126.8	14 36.0 1.001 126.8	15 06.0 1.001 126.8	15 36.0 1.001 126.8	16 06.0 1.001 126.8	3
4	12 35.2 1.001 125.8	13 05.2 1.001 125.8	13 35.2 1.001 125.8	14 05.2 1.001 125.8	14 35.2 1.001 125.8	15 05.2 1.001 125.8	15 35.2 1.001 125.8	16 05.2 1.001 125.8	4
55	12 34.3 1.001 124.8	13 04.3 1.001 124.8	13 34.3 1.001 124.8	14 04.3 1.001 124.8	14 34.3 1.001 124.8	15 04.3 1.001 124.8	15 34.3 1.001 124.8	16 04.3 1.001 124.8	55
6	12 33.5 1.001 123.8	13 03.5 1.001 123.8	13 33.5 1.001 123.8	14 03.5 1.001 123.8	14 33.5 1.001 123.8	15 03.5 1.001 123.8	15 33.5 1.001 123.8	16 03.4 1.001 123.8	6
7	12 32.6 1.001 122.8	13 02.6 1.001 122.8	13 32.6 1.001 122.8	14 02.6 1.001 122.8	14 32.6 1.001 122.8	15 02.6 1.001 122.8	15 32.6 1.001 122.8	16 02.6 1.001 122.8	7
8	12 31.7 1.002 121.8	13 01.7 1.002 121.8	13 31.7 1.002 121.8	14 01.7 1.002 121.8	14 31.7 1.002 121.8	15 01.7 1.002 121.8	15 31.7 1.002 121.8	16 01.7 1.002 121.8	8
9	12 30.8 1.002 120.8	13 00.8 1.002 120.8	13 30.8 1.002 120.8	14 00.8 1.002 120.8	14 30.8 1.002 120.8	15 00.8 1.002 120.8	15 30.8 1.002 120.8	16 00.8 1.002 120.8	9
60	12 29.9 1.002 119.8	12 59.9 1.002 119.8	13 29.9 1.002 119.8	13 59.9 1.002 119.8	14 29.9 1.002 119.8	14 59.9 1.002 119.8	15 29.9 1.002 119.8	15 59.9 1.002 119.8	60
1	12 29.0 1.002 118.8	12 59.0 1.002 118.8	13 29.0 1.002 118.8	13 59.0 1.002 118.8	14 29.0 1.002 118.8	14 59.0 1.002 118.8	15 29.0 1.002 118.8	15 59.0 1.002 118.8	1
2	12 28.1 1.002 117.8	12 58.1 1.002 117.8	13 28.1 1.002 117.8	13 58.1 1.002 117.8	14 28.1 1.002 117.8	14 58.1 1.002 117.8	15 28.1 1.002 117.8	15 58.1 1.002 117.8	2
3	12 27.2 1.002 116.8	12 57.1 1.002 116.8	13 27.1 1.002 116.8	13 57.1 1.002 116.8	14 27.1 1.002 116.8	14 57.1 1.002 116.8	15 27.1 1.002 116.8	15 57.1 1.002 116.7	3
4	12 26.2 1.002 115.8	12 56.2 1.002 115.8	13 26.2 1.002 115.8	13 56.2 1.002 115.8	14 26.2 1.002 115.8	14 56.2 1.002 115.8	15 26.2 1.002 115.8	15 56.2 1.002 115.7	4
65	12 25.3 1.002 114.8	12 55.3 1.002 114.8	13 25.3 1.002 114.8	13 55.3 1.002 114.8	14 25.2 1.002 114.8	14 55.2 1.002 114.8	15 25.2 1.002 114.8	15 55.2 1.002 114.7	65
6	12 24.3 1.002 113.8	12 54.3 1.002 113.8	13 24.3 1.002 113.8	13 54.3 1.002 113.8	14 24.3 1.002 113.8	14 54.3 1.002 113.8	15 24.3 1.002 113.8	15 54.3 1.002 113.7	6
7	12 23.3 1.002 112.8	12 53.3 1.002 112.8	13 23.3 1.002 112.8	13 53.3 1.002 112.8	14 23.3 1.002 112.8	14 53.3 1.002 112.8	15 23.3 1.002 112.8	15 53.3 1.002 112.7	7
8	12 22.4 1.002 111.8	12 52.4 1.002 111.8	13 22.4 1.002 111.8	13 52.4 1.002 111.8	14 22.4 1.002 111.8	14 52.4 1.002 111.8	15 22.4 1.002 111.7	15 52.4 1.002 111.7	8
9	12 21.4 1.002 110.8	12 51.4 1.002 110.8	13 21.4 1.002 110.8	13 51.4 1.002 110.8	14 21.4 1.002 110.8	14 51.4 1.002 110.8	15 21.4 1.002 110.7	15 51.4 1.002 110.7	9
70	12 20.4 1.002 109.8	12 50.4 1.002 109.8	13 20.4 1.002 109.8	13 50.4 1.002 109.8	14 20.4 1.002 109.8	14 50.4 1.002 109.8	15 20.4 1.002 109.7	15 50.4 1.002 109.7	70
1	12 19.4 1.002 108.8	12 49.4 1.002 108.8	13 19.4 1.002 108.8	13 49.4 1.002 108.8	14 19.4 1.002 108.8	14 49.4 1.002 108.8	15 19.4 1.002 108.7	15 49.4 1.002 108.7	1
2	12 18.4 1.002 107.8	12 48.4 1.002 107.8	13 18.4 1.002 107.8	13 48.4 1.002 107.8	14 18.4 1.002 107.8	14 48.4 1.002 107.8	15 18.4 1.002 107.7	15 48.4 1.002 107.7	2
3	12 17.4 1.002 106.8	12 47.4 1.002 106.8	13 17.4 1.002 106.8	13 47.4 1.002 106.8	14 17.4 1.002 106.8	14 47.4 1.002 106.8	15 17.4 1.002 106.7	15 47.4 1.002 106.7	3
4	12 16.4 1.002 105.8	12 46.4 1.002 105.8	13 16.4 1.002 105.8	13 46.4 1.002 105.8	14 16.4 1.002 105.8	14 46.4 1.002 105.7	15 16.4 1.002 105.7	15 46.4 1.002 105.7	4
75	12 15.4 1.002 104.8	12 45.4 1.002 104.8	13 15.4 1.002 104.8	13 45.4 1.002 104.8	14 15.4 1.002 104.8	14 45.4 1.002 104.7	15 15.4 1.002 104.7	15 45.4 1.002 104.7	75
6	12 14.4 1.002 103.8	12 44.4 1.002 103.8	13 14.4 1.002 103.8	13 44.4 1.002 103.8	14 14.4 1.002 103.8	14 44.4 1.002 103.7	15 14.4 1.002 103.7	15 44.4 1.002 103.7	6
7	12 13.4 1.002 102.8	12 43.4 1.002 102.8	13 13.4 1.002 102.8	13 43.4 1.002 102.8	14 13.4 1.002 102.8	14 43.4 1.002 102.7	15 13.4 1.002 102.7	15 43.4 1.002 102.7	7
8	12 12.4 1.002 101.8	12 42.4 1.002 101.8	13 12.4 1.002 101.8	13 42.4 1.002 101.8	14 12.3 1.002 101.8	14 42.3 1.002 101.7	15 12.3 1.002 101.7	15 42.3 1.002 101.7	8
9	12 11.3 1.002 100.8	12 41.3 1.002 100.8	13 11.3 1.002 100.8	13 41.3 1.002 100.8	14 11.3 1.002 100.8	14 41.3 1.002 100.7	15 11.3 1.002 100.7	15 41.3 1.002 100.7	9
80	12 10.3 1.002 99.8	12 40.3 1.002 99.8	13 10.3 1.002 99.8	13 40.3 1.002 99.8	14 10.3 1.002 99.8	14 40.3 1.002 99.7	15 10.3 1.002 99.7	15 40.2 1.002 99.7	80
1	12 09.3 1.002 98.8	12 39.3 1.002 98.8	13 09.3 1.002 98.8	13 39.3 1.002 98.8	14 09.3 1.002 98.8	14 39.3 1.002 98.7	15 09.2 1.002 98.7	15 39.2 1.002 98.7	1
2	12 08.2 1.002 97.8	12 38.2 1.002 97.8	13 08.2 1.002 97.8	13 38.2 1.002 97.8	14 08.2 1.002 97.8	14 38.2 1.002 97.7	15 08.2 1.002 97.7	15 38.2 1.002 97.7	2
3	12 07.2 1.002 96.8	12 37.2 1.002 96.8	13 07.2 1.002 96.8	13 37.2 1.002 96.8	14 07.2 1.002 96.8	14 37.2 1.002 96.7	15 07.2 1.002 96.7	15 37.2 1.002 96.7	3
4	12 06.2 1.002 95.8	12 36.2 1.002 95.8	13 06.2 1.002 95.8	13 36.1 1.002 95.8	14 06.1 1.002 95.8	14 36.1 1.002 95.7	15 06.1 1.002 95.7	15 36.1 1.002 95.7	4
85	12 05.1 1.002 94.8	12 35.1 1.002 94.8	13 05.1 1.002 94.8	13 35.1 1.002 94.8	14 05.1 1.002 94.8	14 35.1 1.002 94.7	15 04.1 1.002 94.7	15 35.1 1.002 94.7	85
6	12 04.1 1.002 93.8	12 34.1 1.002 93.8	13 04.1 1.002 93.8	13 34.1 1.002 93.8	14 04.1 1.002 93.8	14 34.0 1.002 93.7	15 04.0 1.002 93.7	15 34.0 1.002 93.7	6
7	12 03.0 1.002 92.8	12 33.0 1.002 92.8	13 03.0 1.002 92.8	13 33.0 1.002 92.8	14 03.0 1.002 92.8	14 33.0 1.002 92.7	15 03.0 1.002 92.7	15 33.0 1.002 92.7	7
8	12 02.0 1.002 91.8	12 32.0 1.002 91.8	13 02.0 1.002 91.8	13 32.0 1.002 91.8	14 02.0 1.002 91.8	14 32.0 1.002 91.7	15 02.0 1.002 91.7	15 31.9 1.002 91.7	8
9	12 01.0 1.002 90.8	12 31.0 1.002 90.8	13 01.0 1.002 90.8	13 31.0 1.002 90.8	14 00.9 1.002 90.8	14 30.9 1.002 90.7	15 00.9 1.002 90.7	15 30.9 1.002 90.7	9
90	11 59.9 1.002 89.8	12 29.9 1.002 89.8	12 59.9 1.002 89.8	13 29.9 1.002 89.8	13 59.9 1.002 89.8	14 29.9 1.002 89.7	14 59.9 1.002 89.7	15 29.9 1.002 89.7	90

Lat. 89°

H.A.	12° 00′ Alt	Az	12° 30′ Alt	Az	13° 00′ Alt	Az	13° 30′ Alt	Az	14° 00′ Alt	Az	14° 30′ Alt	Az	15° 00′ Alt	Az	15° 30′ Alt	Az	H.A.
91	11 58.8 1.002	88.8	12 28.8 1.002	88.8	12 58.8 1.002	88.8	13 28.8 1.002	88.8	13 58.8 1.002	88.8	14 28.8 1.002	88.7	14 58.8 1.002	88.7	15 28.8 1.002	88.7	91
2	11 57.8 1.002	87.8	12 27.8 1.002	87.8	12 57.8 1.002	87.8	13 27.8 1.002	87.8	13 57.8 1.002	87.8	14 27.8 1.002	87.7	14 57.8 1.002	87.7	15 27.8 1.002	87.7	2
3	11 56.7 1.002	86.8	12 26.7 1.002	86.8	12 56.7 1.002	86.8	13 26.7 1.002	86.8	13 56.7 1.002	86.8	14 26.7 1.002	86.7	14 56.7 1.002	86.7	15 26.7 1.002	86.7	3
4	11 55.7 1.002	85.8	12 25.7 1.002	85.8	12 55.7 1.002	85.8	13 25.7 1.002	85.8	13 55.7 1.002	85.8	14 25.7 1.002	85.7	14 55.7 1.002	85.7	15 25.7 1.002	85.7	4
95	11 54.7 1.002	84.8	12 24.7 1.002	84.8	12 54.7 1.002	84.8	13 24.6 1.002	84.8	13 54.6 1.002	84.8	14 24.6 1.002	84.7	14 54.6 1.002	84.7	15 24.6 1.002	84.7	95
6	11 53.6 1.002	83.8	12 23.6 1.002	83.8	12 53.6 1.002	83.8	13 23.6 1.002	83.8	13 53.6 1.002	83.8	14 23.6 1.002	83.7	14 53.6 1.002	83.7	15 23.6 1.002	83.7	6
7	11 52.6 1.002	82.8	12 22.6 1.002	82.8	12 52.6 1.002	82.8	13 22.6 1.002	82.8	13 52.6 1.002	82.8	14 22.6 1.002	82.7	14 52.5 1.002	82.7	15 22.5 1.002	82.7	7
8	11 51.5 1.002	81.8	12 21.5 1.002	81.8	12 51.5 1.002	81.8	13 21.5 1.002	81.8	13 51.5 1.002	81.8	14 21.5 1.002	81.7	14 51.5 1.002	81.7	15 21.5 1.002	81.7	8
9	11 50.5 1.002	80.8	12 20.5 1.002	80.8	12 50.5 1.002	80.8	13 20.5 1.002	80.8	13 50.5 1.002	80.8	14 20.5 1.002	80.7	14 50.5 1.002	80.7	15 20.5 1.002	80.7	9
100	11 49.5 1.002	79.8	12 19.5 1.002	79.8	12 49.5 1.002	79.8	13 19.5 1.002	79.8	13 49.5 1.002	79.8	14 19.5 1.002	79.7	14 49.4 1.002	79.7	15 19.4 1.002	79.7	100
1	11 48.4 1.002	78.8	12 18.4 1.002	78.8	12 48.4 1.002	78.8	13 18.4 1.002	78.8	13 48.4 1.002	78.8	14 18.4 1.002	78.7	14 48.4 1.002	78.7	15 18.4 1.002	78.7	1
2	11 47.4 1.002	77.8	12 17.4 1.002	77.8	12 47.4 1.002	77.8	13 17.4 1.002	77.8	13 47.4 1.002	77.8	14 17.4 1.002	77.7	14 47.4 1.002	77.7	15 17.4 1.002	77.7	2
3	11 46.4 1.002	76.8	12 16.4 1.002	76.8	12 46.4 1.002	76.8	13 16.4 1.002	76.8	13 46.4 1.002	76.8	14 16.4 1.002	76.7	14 46.4 1.002	76.7	15 16.4 1.002	76.7	3
4	11 45.4 1.002	75.8	12 15.4 1.002	75.8	12 45.4 1.002	75.8	13 15.4 1.002	75.8	13 45.4 1.002	75.8	14 15.4 1.002	75.7	14 45.4 1.002	75.7	15 15.3 1.002	75.7	4
105	11 44.4 1.002	74.8	12 14.4 1.002	74.8	12 44.4 1.002	74.8	13 14.4 1.002	74.8	13 44.4 1.002	74.8	14 14.3 1.002	74.7	14 44.3 1.002	74.7	15 14.3 1.002	74.7	105
6	11 43.4 1.002	73.8	12 13.4 1.002	73.8	12 43.4 1.002	73.8	13 13.3 1.002	73.8	13 43.3 1.002	73.8	14 13.3 1.002	73.7	14 43.3 1.002	73.7	15 13.3 1.002	73.7	6
7	11 42.4 1.002	72.8	12 12.4 1.002	72.8	12 42.3 1.002	72.8	13 12.3 1.002	72.8	13 42.3 1.002	72.8	14 12.3 1.002	72.7	14 42.3 1.002	72.7	15 12.3 1.002	72.7	7
8	11 41.4 1.002	71.8	12 11.4 1.002	71.8	12 41.4 1.002	71.8	13 11.3 1.002	71.8	13 41.3 1.002	71.8	14 11.3 1.002	71.7	14 41.3 1.002	71.7	15 11.3 1.002	71.7	8
9	11 40.4 1.002	70.8	12 10.4 1.002	70.8	12 40.4 1.002	70.8	13 10.4 1.002	70.8	13 40.3 1.002	70.8	14 10.3 1.002	70.7	14 40.3 1.002	70.7	15 10.3 1.002	70.7	9
110	11 39.4 1.002	69.8	12 09.4 1.002	69.8	12 39.4 1.002	69.8	13 09.4 1.002	69.8	13 39.4 1.002	69.8	14 09.4 1.002	69.8	14 39.4 1.002	69.8	15 09.4 1.002	69.7	110
1	11 38.4 1.002	68.8	12 08.4 1.002	68.8	12 38.4 1.002	68.8	13 08.4 1.002	68.8	13 38.4 1.002	68.8	14 08.4 1.002	68.8	14 38.4 1.002	68.8	15 08.4 1.002	68.7	1
2	11 37.4 1.002	67.8	12 07.4 1.002	67.8	12 37.4 1.002	67.8	13 07.4 1.002	67.8	13 37.4 1.002	67.8	14 07.4 1.002	67.8	14 37.4 1.002	67.8	15 07.4 1.002	67.7	2
3	11 36.5 1.002	66.8	12 06.5 1.002	66.8	12 36.5 1.002	66.8	13 06.4 1.002	66.8	13 36.4 1.002	66.8	14 06.4 1.002	66.8	14 36.4 1.002	66.8	15 06.4 1.002	66.7	3
4	11 35.5 1.002	65.8	12 05.5 1.002	65.8	12 35.5 1.002	65.8	13 05.5 1.002	65.8	13 35.5 1.002	65.8	14 05.5 1.002	65.8	14 35.5 1.002	65.8	15 05.5 1.002	65.8	4
115	11 34.6 1.002	64.8	12 04.5 1.002	64.8	12 34.5 1.002	64.8	13 04.5 1.002	64.8	13 34.5 1.002	64.8	14 04.5 1.002	64.8	14 34.5 1.002	64.8	15 04.5 1.002	64.8	115
6	11 33.6 1.002	63.8	12 03.6 1.002	63.8	12 33.6 1.002	63.8	13 03.6 1.002	63.8	13 33.6 1.002	63.8	14 03.6 1.002	63.8	14 33.6 1.002	63.8	15 03.6 1.002	63.8	6
7	11 32.7 1.002	62.8	12 02.7 1.002	62.8	12 32.7 1.002	62.8	13 02.7 1.002	62.8	13 32.7 1.002	62.8	14 02.7 1.002	62.8	14 32.7 1.002	62.8	15 02.6 1.002	62.8	7
8	11 31.7 1.002	61.8	12 01.7 1.002	61.8	12 31.7 1.002	61.8	13 01.7 1.002	61.8	13 31.7 1.002	61.8	14 01.7 1.002	61.8	14 31.7 1.002	61.8	15 01.7 1.002	61.8	8
9	11 30.8 1.002	60.8	12 00.8 1.002	60.8	12 30.8 1.002	60.8	13 00.8 1.002	60.8	13 30.8 1.002	60.8	14 00.8 1.002	60.8	14 30.8 1.002	60.8	15 00.8 1.002	60.8	9
120	11 29.9 1.002	59.8	11 59.9 1.002	59.8	12 29.9 1.002	59.8	12 59.9 1.002	59.8	13 29.9 1.002	59.8	13 59.9 1.002	59.8	14 29.9 1.002	59.8	14 59.9 1.002	59.8	120
1	11 29.0 1.001	58.8	11 59.0 1.001	58.8	12 29.0 1.001	58.8	12 59.0 1.001	58.8	13 29.0 1.001	58.8	13 59.0 1.001	58.8	14 29.0 1.001	58.8	14 59.0 1.001	58.8	1
2	11 28.1 1.001	57.8	11 58.1 1.001	57.8	12 28.1 1.001	57.8	12 58.1 1.001	57.8	13 28.1 1.001	57.8	13 58.1 1.001	57.8	14 28.1 1.001	57.8	14 58.1 1.001	57.8	2
3	11 27.2 1.001	56.8	11 57.2 1.001	56.8	12 27.2 1.001	56.8	12 57.2 1.001	56.8	13 27.2 1.001	56.8	13 57.2 1.001	56.8	14 27.2 1.001	56.8	14 57.2 1.001	56.8	3
4	11 26.4 1.001	55.8	11 56.4 1.001	55.8	12 26.4 1.001	55.8	12 56.4 1.001	55.8	13 26.4 1.001	55.8	13 56.4 1.001	55.8	14 26.4 1.001	55.8	14 56.4 1.001	55.8	4
125	11 25.5 1.001	54.8	11 55.5 1.001	54.8	12 25.5 1.001	54.8	12 55.5 1.001	54.8	13 25.5 1.001	54.8	13 55.5 1.001	54.8	14 25.5 1.001	54.8	14 55.5 1.001	54.8	125
6	11 24.7 1.001	53.8	11 54.7 1.001	53.8	12 24.7 1.001	53.8	12 54.7 1.001	53.8	13 24.6 1.001	53.8	13 54.6 1.001	53.8	14 24.6 1.001	53.8	14 54.6 1.001	53.8	6
7	11 23.8 1.001	52.8	11 53.8 1.001	52.8	12 23.8 1.001	52.8	12 53.8 1.001	52.8	13 23.8 1.001	52.8	13 53.8 1.001	52.8	14 23.8 1.001	52.8	14 53.8 1.001	52.8	7
8	11 23.0 1.001	51.8	11 53.0 1.001	51.8	12 23.0 1.001	51.8	12 53.0 1.001	51.8	13 23.0 1.001	51.8	13 53.0 1.001	51.8	14 23.0 1.001	51.8	14 53.0 1.001	51.8	8
9	11 22.2 1.001	50.8	11 52.2 1.001	50.8	12 22.2 1.001	50.8	12 52.2 1.001	50.8	13 22.2 1.001	50.8	13 52.2 1.001	50.8	14 22.2 1.001	50.8	14 52.2 1.001	50.8	9
130	11 21.4 1.001	49.8	11 51.4 1.001	49.8	12 21.4 1.001	49.8	12 51.4 1.001	49.8	13 21.4 1.001	49.8	13 51.4 1.001	49.8	14 21.4 1.001	49.8	14 51.3 1.001	49.8	130
1	11 20.6 1.001	48.8	11 50.6 1.001	48.8	12 20.6 1.001	48.8	12 50.6 1.001	48.8	13 20.6 1.001	48.8	13 50.6 1.001	48.8	14 20.6 1.001	48.8	14 50.6 1.001	48.8	1
2	11 19.8 1.001	47.8	11 49.8 1.001	47.8	12 19.8 1.001	47.8	12 49.8 1.001	47.8	13 19.8 1.001	47.8	13 49.8 1.001	47.8	14 19.8 1.001	47.8	14 49.8 1.001	47.8	2
3	11 19.0 1.001	46.8	11 49.0 1.001	46.8	12 19.0 1.001	46.8	12 49.0 1.001	46.8	13 19.0 1.001	46.8	13 49.0 1.001	46.8	14 19.0 1.001	46.8	14 49.0 1.001	46.8	3
4	11 18.3 1.001	45.9	11 48.3 1.001	45.8	12 18.3 1.001	45.8	12 48.3 1.001	45.8	13 18.3 1.001	45.8	13 48.3 1.001	45.8	14 18.2 1.001	45.8	14 48.2 1.001	45.8	4
135	11 17.5 1.001	44.9	11 47.5 1.001	44.8	12 17.5 1.001	44.8	12 47.5 1.001	44.8	13 17.5 1.001	44.8	13 47.5 1.001	44.8	14 17.5 1.001	44.8	14 47.5 1.001	44.8	135
6	11 16.8 1.001	43.9	11 46.8 1.001	43.8	12 16.8 1.001	43.8	12 46.8 1.001	43.8	13 16.8 1.001	43.8	13 46.8 1.001	43.8	14 16.8 1.001	43.8	14 46.8 1.001	43.8	6
7	11 16.1 1.001	42.9	11 46.1 1.001	42.9	12 16.1 1.001	42.8	12 46.1 1.001	42.8	13 16.1 1.001	42.8	13 46.1 1.001	42.8	14 16.1 1.001	42.8	14 46.1 1.001	42.8	7
8	11 15.4 1.001	41.9	11 45.4 1.001	41.9	12 15.4 1.001	41.9	12 45.4 1.001	41.8	13 15.4 1.001	41.8	13 45.4 1.001	41.8	14 15.4 1.001	41.8	14 45.3 1.001	41.8	8
9	11 14.7 1.001	40.9	11 44.7 1.001	40.9	12 14.7 1.001	40.9	12 44.7 1.001	40.8	13 14.7 1.001	40.8	13 44.7 1.001	40.8	14 14.7 1.001	40.8	14 44.7 1.001	40.8	9
140	11 14.0 1.001	39.9	11 44.0 1.001	39.9	12 14.0 1.001	39.9	12 44.0 1.001	39.9	13 14.0 1.001	39.8	13 44.0 1.001	39.8	14 14.0 1.001	39.8	14 44.0 1.001	39.8	140
1	11 13.3 1.001	38.9	11 43.3 1.001	38.9	12 13.3 1.001	38.9	12 43.3 1.001	38.9	13 13.3 1.001	38.8	13 43.3 1.001	38.8	14 13.3 1.001	38.8	14 43.3 1.001	38.8	1
2	11 12.7 1.001	37.9	11 42.7 1.001	37.9	12 12.7 1.001	37.9	12 42.7 1.001	37.9	13 12.7 1.001	37.9	13 42.7 1.001	37.8	14 12.7 1.001	37.8	14 42.7 1.001	37.8	2
3	11 12.0 1.001	36.9	11 42.0 1.001	36.9	12 12.0 1.001	36.9	12 42.0 1.001	36.9	13 12.0 1.001	36.9	13 42.0 1.001	36.8	14 12.0 1.001	36.8	14 42.0 1.001	36.8	3
4	11 11.4 1.001	35.9	11 41.4 1.001	35.9	12 11.4 1.001	35.9	12 41.4 1.001	35.9	13 11.4 1.001	35.9	13 41.4 1.001	35.9	14 11.4 1.001	35.8	14 41.4 1.001	35.8	4
145	11 10.8 1.001	34.9	11 40.8 1.001	34.9	12 10.8 1.001	34.9	12 40.8 1.001	34.9	13 10.8 1.001	34.9	13 40.8 1.001	34.9	14 10.8 1.001	34.9	14 40.8 1.001	34.8	145
6	11 10.2 1.001	33.9	11 40.2 1.001	33.9	12 10.2 1.001	33.9	12 40.2 1.001	33.9	13 10.2 1.001	33.9	13 40.2 1.001	33.9	14 10.2 1.001	33.9	14 40.2 1.001	33.8	6
7	11 09.6 1.001	32.9	11 39.6 1.001	32.9	12 09.6 1.001	32.9	12 39.6 1.001	32.9	13 09.6 1.001	32.9	13 39.6 1.001	32.9	14 09.6 1.001	32.9	14 39.6 1.001	32.9	7
8	11 09.1 1.001	31.9	11 39.1 1.001	31.9	12 09.1 1.001	31.9	12 39.1 1.001	31.9	13 09.1 1.001	31.9	13 39.1 1.001	31.9	14 09.1 1.001	31.9	14 39.1 1.001	31.9	8
9	11 08.5 1.001	30.9	11 38.5 1.001	30.9	12 08.5 1.001	30.9	12 38.5 1.001	30.9	13 08.5 1.001	30.9	13 38.5 1.001	30.9	14 08.5 1.001	30.9	14 38.5 1.001	30.9	9
150	11 08.0 1.001	29.9	11 38.0 1.001	29.9	12 08.0 1.001	29.9	12 38.0 1.001	29.9	13 08.0 1.001	29.9	13 38.0 1.001	29.9	14 08.0 1.001	29.9	14 38.0 1.001	29.9	150
1	11 07.5 1.001	28.9	11 37.5 1.001	28.9	12 07.5 1.001	28.9	12 37.5 1.001	28.9	13 07.5 1.001	28.9	13 37.5 1.001	28.9	14 07.5 1.001	28.9	14 37.5 1.001	28.9	1
2	11 07.0 1.001	27.9	11 37.0 1.001	27.9	12 07.0 1.001	27.9	12 37.0 1.001	27.9	13 07.0 1.001	27.9	13 37.0 1.001	27.9	14 07.0 1.001	27.9	14 37.0 1.001	27.9	2
3	11 06.5 1.001	26.9	11 36.5 1.001	26.9	12 06.5 1.001	26.9	12 36.5 1.001	26.9	13 06.5 1.001	26.9	13 36.5 1.001	26.9	14 06.5 1.001	26.9	14 36.5 1.001	26.9	3
4	11 06.1 1.001	25.9	11 36.1 1.001	25.9	12 06.0 1.001	25.9	12 36.0 1.001	25.9	13 06.0 1.001	25.9	13 36.0 1.001	25.9	14 06.0 1.001	25.9	14 36.0 1.001	25.9	4
155	11 05.6 1.001	24.9	11 35.6 1.001	24.9	12 05.6 1.001	24.9	12 35.6 1.001	24.9	13 05.6 1.001	24.9	13 35.6 1.001	24.9	14 05.6 1.001	24.9	14 35.6 1.001	24.9	155
6	11 05.2 1.001	23.9	11 35.2 1.001	23.9	12 05.2 1.001	23.9	12 35.2 1.001	23.9	13 05.2 1.001	23.9	13 35.2 1.001	23.9	14 05.2 1.001	23.9	14 35.2 1.001	23.9	6
7	11 04.8 1.001	22.9	11 34.8 1.001	22.9	12 04.8 1.001	22.9	12 34.8 1.001	22.9	13 04.7 1.001	22.9	13 34.7 1.001	22.9	14 04.7 1.001	22.9	14 34.7 1.001	22.9	7
8	11 04.4 1.001	21.9	11 34.4 1.001	21.9	12 04.4 1.001	21.9	12 34.4 1.001	21.9	13 04.4 1.001	21.9	13 34.4 1.001	21.9	14 04.3 1.001	21.9	14 34.3 1.001	21.9	8
9	11 04.0 1.001	20.9	11 34.0 1.001	20.9	12 04.0 1.001	20.9	12 34.0 1.001	20.9	13 04.0 1.001	20.9	13 34.0 1.001	20.9	14 04.0 1.001	20.9	14 34.0 1.001	20.9	9
160	11 03.6 1.001	19.9	11 33.6 1.001	19.9	12 03.6 1.001	19.9	12 33.6 1.001	19.9	13 03.6 1.001	19.9	13 33.6 1.001	19.9	14 03.6 1.001	19.9	14 33.6 1.001	19.9	160
1	11 03.3 1.001	18.9	11 33.3 1.001	18.9	12 03.3 1.001	18.9	12 33.3 1.001	18.9	13 03.3 1.001	18.9	13 33.3 1.001	18.9	14 03.3 1.001	18.9	14 33.3 1.001	18.9	1
2	11 02.9 1.001	17.9	11 32.9 1.001	17.9	12 02.9 1.001	17.9	12 32.9 1.001	17.9	13 02.9 1.001	17.9	13 32.9 1.000	17.9	14 02.9 1.000	17.9	14 32.9 1.000	17.9	2
3	11 02.6 1.000	16.9	11 32.6 1.000	16.9	12 02.6 1.000	16.9	12 32.6 1.000	16.9	13 02.6 1.000	16.9	13 32.6 1.000	16.9	14 02.6 1.000	16.9	14 32.6 1.000	16.9	3
4	11 02.3 1.000	15.9	11 32.3 1.000	15.9	12 02.3 1.000	15.9	12 32.3 1.000	15.9	13 02.3 1.000	15.9	13 32.3 1.000	15.9	14 02.3 1.000	15.9	14 32.3 1.000	15.9	4
165	11 02.0 1.000	14.9	11 32.0 1.000	14.9	12 02.0 1.000	14.9	12 32.0 1.000	14.9	13 02.0 1.000	14.9	13 32.0 1.000	14.9	14 02.0 1.000	14.9	14 32.0 1.000	14.9	165
6	11 01.8 1.000	14.0	11 31.8 1.000	13.9	12 01.8 1.000	13.9	12 31.8 1.000	13.9	13 01.8 1.000	13.9	13 31.8 1.000	13.9	14 01.8 1.000	13.9	14 31.8 1.000	13.9	6
7	11 01.5 1.000	13.0	11 31.5 1.000	13.0	12 01.5 1.000	13.0	12 31.5 1.000	12.9	13 01.5 1.000	12.9	13 31.5 1.000	12.9	14 01.5 1.000	12.9	14 31.5 1.000	12.9	7
8	11 01.3 1.000	12.0	11 31.3 1.000	12.0	12 01.3 1.000	12.0	12 31.3 1.000	11.9	13 01.3 1.000	11.9	13 31.3 1.000	11.9	14 01.3 1.000	11.9	14 31.3 1.000	11.9	8
9	11 01.1 1.000	11.0	11 31.1 1.000	11.0	12 01.1 1.000	11.0	12 31.1 1.000	11.0	13 01.1 1.000	11.0	13 31.1 1.000	11.0	14 01.1 1.000	11.0	14 31.1 1.000	10.9	9
170	11 00.9 1.000	10.0	11 30.9 1.000	10.0	12 00.9 1.000	10.0	12 30.9 1.000	10.0	13 00.9 1.000	10.0	13 30.9 1.000	10.0	14 00.9 1.000	10.0	14 30.9 1.000	10.0	170
1	11 00.7 1.000	09.0	11 30.7 1.000	09.0	12 00.7 1.000	09.0	12 30.7 1.000	09.0	13 00.7 1.000	09.0	13 30.7 1.000	09.0	14 00.7 1.000	09.0	14 30.7 1.000	09.0	1
2	11 00.6 1.000	08.0	11 30.6 1.000	08.0	12 00.6 1.000	08.0	12 30.6 1.000	08.0	13 00.6 1.000	08.0	13 30.6 1.000	08.0	14 00.6 1.000	08.0	14 30.6 1.000	08.0	2
3	11 00.4 1.000	07.0	11 30.4 1.000	07.0	12 00.4 1.000	07.0	12 30.4 1.000	07.0	13 00.4 1.000	07.0	13 30.4 1.000	07.0	14 00.4 1.000	07.0	14 30.4 1.000	07.0	3
4	11 00.3 1.000	06.0	11 30.3 1.000	06.0	12 00.3 1.000	06.0	12 30.3 1.000	06.0	13 00.3 1.000	06.0	13 30.3 1.000	06.0	14 00.3 1.000	06.0	14 30.3 1.000	06.0	4
175	11 00.2 1.000	05.0	11 30.2 1.000	05.0	12 00.2 1.000	05.0	12 30.2 1.000	05.0	13 00.2 1.000	05.0	13 30.2 1.000	05.0	14 00.2 1.000	05.0	14 30.2 1.000	05.0	175
6	11 00.1 1.000	04.0	11 30.1 1.000	04.0	12 00.1 1.000	04.0	12 30.1 1.000	04.0	13 00.1 1.000	04.0	13 30.1 1.000	04.0	14 00.1 1.000	04.0	14 30.1 1.000	04.0	6
7	11 00.1 1.000	03.0	11 30.1 1.000	03.0	12 00.1 1.000	03.0	12 30.1 1.000	03.0	13 00.1 1.000	03.0	13 30.1 1.000	03.0	14 00.1 1.000	03.0	14 30.1 1.000	03.0	7
8	11 00.0 1.000	02.0	11 30.0 1.000	02.0	12 00.0 1.000	02.0	12 30.0 1.000	02.0	13 00.0 1.000	02.0	13 30.0 1.000	02.0	14 00.0 1.000	02.0	14 30.0 1.000	02.0	8
9	11 00.0 1.000	01.0	11 30.0 1.000	01.0	12 00.0 1.000	01.0	12 30.0 1.000	01.0	13 00.0 1.000	01.0	13 30.0 1.000	01.0	14 00.0 1.000	01.0	14 30.0 1.000	01.0	9
180	11 00.0 1.000	00.0	11 30.0 1.000	00.0	12 00.0 1.000	00.0	12 30.0 1.000	00.0	13 00.0 1.000	00.0	13 30.0 1.000	00.0	14 00.0 1.000	00.0	14 30.0 1.000	00.0	180

DECLINATION SAME NAME AS LATITUDE

Lat. 89°

Each cell lists: Altitude (° ′), Δd Δt, Azimuth (°).

H.A.	16° 00′	16° 30′	17° 00′	17° 30′	18° 00′	18° 30′	19° 00′	19° 30′	H.A.
00	17 00.0 1.00 180.0	17 30.0 1.00 180.0	18 00.0 1.00 180.0	18 30.0 1.00 180.0	19 00.0 1.00 180.0	19 30.0 1.00 180.0	20 00.0 1.00 180.0	20 30.0 1.00 180.0	00
1	17 00.0 1.00 179.0	17 30.0 1.00 179.0	18 00.0 1.00 179.0	18 30.0 1.00 179.0	19 00.0 1.00 179.0	19 30.0 1.00 179.0	20 00.0 1.00 179.0	20 30.0 1.00 179.0	1
2	17 00.0 1.00 178.0	17 30.0 1.00 178.0	18 00.0 1.00 178.0	18 30.0 1.00 178.0	19 00.0 1.00 178.0	19 30.0 1.00 178.0	20 00.0 1.00 178.0	20 30.0 1.00 178.0	2
3	16 59.9 1.00 177.0	17 29.9 1.00 177.0	17 59.9 1.00 177.0	18 29.9 1.00 177.0	18 59.9 1.00 177.0	19 29.9 1.00 177.0	19 59.9 1.00 177.0	20 29.9 1.00 177.0	3
4	16 59.9 1.00 176.0	17 29.9 1.00 176.0	17 59.9 1.00 176.0	18 29.9 1.00 176.0	18 59.9 1.00 176.0	19 29.9 1.00 176.0	19 59.9 1.00 176.0	20 29.9 1.00 176.0	4
05	16 59.8 1.00 175.0	17 29.8 1.00 175.0	17 59.8 1.00 175.0	18 29.8 1.00 175.0	18 59.8 1.00 175.0	19 29.8 1.00 175.0	19 59.8 1.00 175.0	20 29.8 1.00 175.0	05
6	16 59.7 1.00 174.0	17 29.7 1.00 174.0	17 59.7 1.00 174.0	18 29.7 1.00 174.0	18 59.7 1.00 174.0	19 29.7 1.00 174.0	19 59.7 1.00 174.0	20 29.7 1.00 174.0	6
7	16 59.6 1.00 173.0	17 29.6 1.00 173.0	17 59.6 1.00 173.0	18 29.6 1.00 173.0	18 59.6 1.00 173.0	19 29.6 1.00 173.0	19 59.6 1.00 173.0	20 29.6 1.00 173.0	7
8	16 59.4 1.00 172.0	17 29.4 1.00 172.0	17 59.4 1.00 172.0	18 29.4 1.00 172.0	18 59.4 1.00 172.0	19 29.4 1.00 172.0	19 59.4 1.00 172.0	20 29.4 1.00 171.9	8
9	16 59.3 1.00 171.0	17 29.3 1.00 171.0	17 59.3 1.00 171.0	18 29.3 1.00 171.0	18 59.3 1.00 170.9	19 29.3 1.00 170.9	19 59.3 1.00 170.9	20 29.3 1.00 170.9	9
10	16 59.1 1.00 169.9	17 29.1 1.00 169.9	17 59.1 1.00 169.9	18 29.1 1.00 169.9	18 59.1 1.00 169.9	19 29.1 1.00 169.9	19 59.1 1.00 169.9	20 29.1 1.00 169.9	10
1	16 58.9 1.00 168.9	17 28.9 1.00 168.9	17 58.9 1.00 168.9	18 28.9 1.00 168.9	18 58.9 1.00 168.9	19 28.9 1.00 168.9	19 58.9 1.00 168.9	20 28.9 1.00 168.9	1
2	16 58.7 1.00 167.9	17 28.7 1.00 167.9	17 58.7 1.00 167.9	18 28.7 1.00 167.9	18 58.7 1.00 167.9	19 28.7 1.00 167.9	19 58.7 1.00 167.9	20 28.7 1.00 167.9	2
3	16 58.5 1.00 166.9	17 28.5 1.00 166.9	17 58.5 1.00 166.9	18 28.5 1.00 166.9	18 58.5 1.00 166.9	19 28.5 1.00 166.9	19 58.5 1.00 166.9	20 28.5 1.00 166.9	3
4	16 58.2 1.00 165.9	17 28.2 1.00 165.9	17 58.2 1.00 165.9	18 28.2 1.00 165.9	18 58.2 1.00 165.9	19 28.2 1.00 165.9	19 58.2 1.00 165.9	20 28.2 1.00 165.9	4
15	16 57.9 1.00 164.9	17 27.9 1.00 164.9	17 57.9 1.00 164.9	18 27.9 1.00 164.9	18 57.9 1.00 164.9	19 27.9 1.00 164.9	19 57.9 1.00 164.9	20 27.9 1.00 164.9	15
6	16 57.7 1.00 163.9	17 27.7 1.00 163.9	17 57.7 1.00 163.9	18 27.7 1.00 163.9	18 57.7 1.00 163.9	19 27.7 1.00 163.9	19 57.7 1.00 163.9	20 27.7 1.00 163.9	6
7	16 57.4 1.001 162.9	17 27.4 1.001 162.9	17 57.4 1.001 162.9	18 27.4 1.001 162.9	18 57.4 1.001 162.9	19 27.4 1.001 162.9	19 57.4 1.001 162.9	20 27.4 1.001 162.9	7
8	16 57.0 1.001 161.9	17 27.0 1.001 161.9	17 57.0 1.001 161.9	18 27.0 1.001 161.9	18 57.0 1.001 161.9	19 27.0 1.001 161.9	19 57.0 1.001 161.9	20 27.0 1.001 161.9	8
9	16 56.7 1.001 160.9	17 26.7 1.001 160.9	17 56.7 1.001 160.9	18 26.7 1.001 160.9	18 56.7 1.001 160.9	19 26.7 1.001 160.9	19 56.7 1.001 160.9	20 26.7 1.001 160.9	9
20	16 56.4 1.001 159.9	17 26.4 1.001 159.9	17 56.4 1.001 159.9	18 26.4 1.001 159.9	18 56.4 1.001 159.9	19 26.4 1.001 159.9	19 56.4 1.001 159.9	20 26.4 1.001 159.9	20
1	16 56.0 1.001 158.9	17 26.0 1.001 158.9	17 56.0 1.001 158.9	18 26.0 1.001 158.9	18 56.0 1.001 158.9	19 26.0 1.001 158.9	19 56.0 1.001 158.9	20 26.0 1.001 158.9	1
2	16 55.6 1.001 157.9	17 25.6 1.001 157.9	17 55.6 1.001 157.9	18 25.6 1.001 157.9	18 55.6 1.001 157.9	19 25.6 1.001 157.9	19 55.6 1.001 157.9	20 25.6 1.001 157.9	2
3	16 55.2 1.001 156.9	17 25.2 1.001 156.9	17 55.2 1.001 156.9	18 25.2 1.001 156.9	18 55.2 1.001 156.9	19 25.2 1.001 156.9	19 55.2 1.001 156.9	20 25.2 1.001 156.9	3
4	16 54.8 1.001 155.9	17 24.8 1.001 155.9	17 54.8 1.001 155.9	18 24.8 1.001 155.9	18 54.8 1.001 155.9	19 24.8 1.001 155.9	19 54.8 1.001 155.9	20 24.8 1.001 155.9	4
25	16 54.4 1.001 154.9	17 24.4 1.001 154.9	17 54.4 1.001 154.9	18 24.3 1.001 154.9	18 54.3 1.001 154.9	19 24.3 1.001 154.9	19 54.3 1.001 154.8	20 24.3 1.001 154.8	25
6	16 53.9 1.001 153.9	17 23.9 1.001 153.9	17 53.9 1.001 153.9	18 23.9 1.001 153.9	18 53.9 1.001 153.9	19 23.9 1.001 153.9	19 53.9 1.001 153.8	20 23.9 1.001 153.8	6
7	16 53.4 1.001 152.9	17 23.4 1.001 152.9	17 53.4 1.001 152.9	18 23.4 1.001 152.9	18 53.4 1.001 152.9	19 23.4 1.001 152.9	19 53.4 1.001 152.8	20 23.4 1.001 152.8	7
8	16 52.9 1.001 151.9	17 22.9 1.001 151.9	17 52.9 1.001 151.9	18 22.9 1.001 151.8	18 52.9 1.001 151.8	19 22.9 1.001 151.8	19 52.9 1.001 151.8	20 22.9 1.001 151.8	8
9	16 52.4 1.001 150.9	17 22.4 1.001 150.9	17 52.4 1.001 150.9	18 22.4 1.001 150.8	18 52.4 1.001 150.8	19 22.4 1.001 150.8	19 52.4 1.001 150.8	20 22.4 1.001 150.8	9
30	16 51.9 1.001 149.9	17 21.9 1.001 149.8	17 51.9 1.001 149.8	18 21.9 1.001 149.8	18 51.9 1.001 149.8	19 21.9 1.001 149.8	19 51.9 1.001 149.8	20 21.9 1.001 149.8	30
1	16 51.4 1.001 148.9	17 21.4 1.001 148.8	17 51.4 1.001 148.8	18 21.4 1.001 148.8	18 51.4 1.001 148.8	19 21.4 1.001 148.8	19 51.4 1.001 148.8	20 21.4 1.001 148.8	1
2	16 50.8 1.001 147.8	17 20.8 1.001 147.8	17 50.8 1.001 147.8	18 20.8 1.001 147.8	18 50.8 1.001 147.8	19 20.8 1.001 147.8	19 50.8 1.001 147.8	20 20.8 1.001 147.8	2
3	16 50.3 1.001 146.8	17 20.3 1.001 146.8	17 50.3 1.001 146.8	18 20.3 1.001 146.8	18 50.3 1.001 146.8	19 20.3 1.001 146.8	19 50.3 1.001 146.8	20 20.3 1.001 146.8	3
4	16 49.7 1.001 145.8	17 19.7 1.001 145.8	17 49.7 1.001 145.8	18 19.7 1.001 145.8	18 49.7 1.001 145.8	19 19.7 1.001 145.8	19 49.7 1.001 145.8	20 19.7 1.001 145.8	4
35	16 49.1 1.001 144.8	17 19.1 1.001 144.8	17 49.1 1.001 144.8	18 19.1 1.001 144.8	18 49.1 1.001 144.8	19 19.1 1.001 144.8	19 49.1 1.001 144.8	20 19.1 1.001 144.8	35
6	16 48.5 1.001 143.8	17 18.5 1.001 143.8	17 48.5 1.001 143.8	18 18.5 1.001 143.8	18 48.5 1.001 143.8	19 18.5 1.001 143.8	19 48.5 1.001 143.8	20 18.5 1.001 143.8	6
7	16 47.9 1.001 142.8	17 17.9 1.001 142.8	17 47.9 1.001 142.8	18 17.9 1.001 142.8	18 47.9 1.001 142.8	19 17.9 1.001 142.8	19 47.9 1.001 142.8	20 17.8 1.001 142.8	7
8	16 47.2 1.001 141.8	17 17.2 1.001 141.8	17 47.2 1.001 141.8	18 17.2 1.001 141.8	18 47.2 1.001 141.8	19 17.2 1.001 141.8	19 47.2 1.001 141.8	20 17.2 1.001 141.8	8
9	16 46.6 1.001 140.8	17 16.6 1.001 140.8	17 46.6 1.001 140.8	18 16.6 1.001 140.8	18 46.6 1.001 140.8	19 16.6 1.001 140.8	19 46.6 1.001 140.8	20 16.6 1.001 140.8	9
40	16 45.9 1.001 139.8	17 15.9 1.001 139.8	17 45.9 1.001 139.8	18 15.9 1.001 139.8	18 45.9 1.001 139.8	19 15.9 1.001 139.8	19 45.9 1.001 139.8	20 15.9 1.001 139.8	40
1	16 45.2 1.001 138.8	17 15.2 1.001 138.8	17 45.2 1.001 138.8	18 15.2 1.001 138.8	18 45.2 1.001 138.8	19 15.2 1.001 138.8	19 45.2 1.001 138.8	20 15.2 1.001 138.8	1
2	16 44.5 1.001 137.8	17 14.5 1.001 137.8	17 44.5 1.001 137.8	18 14.5 1.001 137.8	18 44.5 1.001 137.8	19 14.5 1.001 137.8	19 44.5 1.001 137.8	20 14.5 1.001 137.8	2
3	16 43.8 1.001 136.8	17 13.8 1.001 136.8	17 43.8 1.001 136.8	18 13.8 1.001 136.8	18 43.8 1.001 136.8	19 13.8 1.001 136.8	19 43.8 1.001 136.8	20 13.8 1.001 136.8	3
4	16 43.1 1.001 135.8	17 13.1 1.001 135.8	17 43.1 1.001 135.8	18 13.1 1.001 135.8	18 43.1 1.001 135.8	19 13.1 1.001 135.8	19 43.1 1.001 135.8	20 13.1 1.001 135.7	4
45	16 42.3 1.001 134.8	17 12.3 1.001 134.8	17 42.3 1.001 134.8	18 12.3 1.001 134.8	18 42.3 1.001 134.8	19 12.3 1.001 134.8	19 42.3 1.001 134.8	20 12.3 1.001 134.7	45
6	16 41.6 1.001 133.8	17 11.6 1.001 133.8	17 41.6 1.001 133.8	18 11.6 1.001 133.8	18 41.6 1.001 133.8	19 11.6 1.001 133.8	19 41.6 1.001 133.8	20 11.6 1.001 133.7	6
7	16 40.8 1.001 132.8	17 10.8 1.001 132.8	17 40.8 1.001 132.8	18 10.8 1.001 132.8	18 40.8 1.001 132.8	19 10.8 1.001 132.8	19 40.8 1.001 132.7	20 10.8 1.001 132.7	7
8	16 40.1 1.001 131.8	17 10.1 1.001 131.8	17 40.1 1.001 131.8	18 10.1 1.001 131.8	18 40.1 1.001 131.8	19 10.0 1.001 131.7	19 40.0 1.001 131.7	20 10.0 1.001 131.7	8
9	16 39.3 1.001 130.8	17 09.3 1.001 130.8	17 39.3 1.001 130.8	18 09.3 1.001 130.8	18 39.3 1.001 130.7	19 09.3 1.001 130.7	19 39.3 1.001 130.7	20 09.3 1.001 130.7	9
50	16 38.5 1.001 129.8	17 08.5 1.001 129.8	17 38.5 1.001 129.8	18 08.5 1.001 129.8	18 38.5 1.001 129.7	18 59.0 1.001 129.7	19 38.5 1.001 129.7	20 08.5 1.001 129.7	50
1	16 37.7 1.001 128.8	17 07.7 1.001 128.8	17 37.7 1.001 128.8	18 07.7 1.001 128.7	18 37.7 1.001 128.7	19 07.7 1.001 128.7	19 37.6 1.001 128.7	20 07.6 1.001 128.7	1
2	16 36.8 1.001 127.8	17 06.8 1.001 127.8	17 36.8 1.001 127.7	18 06.8 1.001 127.7	18 36.8 1.001 127.7	19 06.8 1.001 127.7	19 36.8 1.001 127.7	20 06.8 1.001 127.7	2
3	16 36.0 1.001 126.8	17 06.0 1.001 126.8	17 36.0 1.001 126.8	18 06.0 1.001 126.7	18 36.0 1.001 126.7	19 06.0 1.001 126.7	19 36.0 1.001 126.7	20 06.0 1.001 126.7	3
4	16 35.2 1.001 125.8	17 05.2 1.001 125.8	17 35.2 1.001 125.7	18 05.2 1.001 125.7	18 35.2 1.001 125.7	19 05.2 1.001 125.7	19 35.1 1.001 125.7	20 05.1 1.001 125.7	4
55	16 34.3 1.001 124.8	17 04.3 1.001 124.8	17 34.3 1.001 124.7	18 04.3 1.001 124.7	18 34.3 1.001 124.7	19 04.3 1.001 124.7	19 34.3 1.001 124.7	20 04.3 1.001 124.7	55
6	16 33.4 1.001 123.8	17 03.4 1.001 123.7	17 33.4 1.001 123.7	18 03.4 1.001 123.7	18 33.4 1.001 123.7	19 03.4 1.001 123.7	19 33.4 1.001 123.7	20 03.4 1.001 123.7	6
7	16 32.6 1.001 122.8	17 02.6 1.001 122.7	17 32.6 1.001 122.7	18 02.6 1.001 122.7	18 32.6 1.001 122.7	19 02.6 1.001 122.7	19 32.5 1.001 122.7	20 02.5 1.001 122.7	7
8	16 31.7 1.002 121.8	17 01.7 1.002 121.7	17 31.7 1.001 121.7	18 01.7 1.001 121.7	18 31.7 1.001 121.7	19 01.7 1.001 121.7	19 31.7 1.002 121.7	20 01.7 1.002 121.7	8
9	16 30.8 1.002 120.8	17 00.8 1.002 120.7	17 30.8 1.002 120.7	18 00.8 1.002 120.7	18 30.8 1.002 120.7	19 00.8 1.002 120.7	19 30.8 1.002 120.7	20 00.8 1.002 120.7	9
60	16 29.9 1.002 119.7	16 59.9 1.002 119.7	17 29.9 1.002 119.7	17 59.9 1.002 119.7	18 29.9 1.002 119.7	18 59.9 1.002 119.7	19 29.9 1.002 119.7	19 59.9 1.002 119.7	60
1	16 29.0 1.002 118.7	16 59.0 1.002 118.7	17 29.0 1.002 118.7	17 59.0 1.002 118.7	18 29.0 1.002 118.7	18 59.0 1.002 118.7	19 29.0 1.002 118.7	19 58.9 1.002 118.7	1
2	16 28.0 1.002 117.7	16 58.0 1.002 117.7	17 28.0 1.002 117.7	17 58.0 1.002 117.7	18 28.0 1.002 117.7	18 58.0 1.002 117.7	19 28.0 1.002 117.7	19 58.0 1.002 117.7	2
3	16 27.1 1.002 116.7	16 57.1 1.002 116.7	17 27.1 1.002 116.7	17 57.1 1.002 116.7	18 27.1 1.002 116.7	18 57.1 1.002 116.7	19 27.1 1.002 116.7	19 57.1 1.002 116.7	3
4	16 26.2 1.002 115.7	16 56.2 1.002 115.7	17 26.2 1.002 115.7	17 56.2 1.002 115.7	18 26.2 1.002 115.7	18 56.2 1.002 115.7	19 26.2 1.002 115.7	19 56.2 1.002 115.7	4
65	16 25.2 1.002 114.7	16 55.2 1.002 114.7	17 25.2 1.002 114.7	17 55.2 1.002 114.7	18 25.2 1.002 114.7	18 55.2 1.002 114.7	19 25.2 1.002 114.7	19 55.2 1.002 114.7	65
6	16 24.3 1.002 113.7	16 54.3 1.002 113.7	17 24.3 1.002 113.7	17 54.3 1.002 113.7	18 24.3 1.002 113.7	18 54.3 1.002 113.7	19 24.3 1.002 113.7	19 54.2 1.002 113.7	6
7	16 23.3 1.002 112.7	16 53.3 1.002 112.7	17 23.3 1.002 112.7	17 53.3 1.002 112.7	18 23.3 1.002 112.7	18 53.3 1.002 112.7	19 23.3 1.002 112.7	19 53.3 1.002 112.7	7
8	16 22.3 1.002 111.7	16 52.3 1.002 111.7	17 22.3 1.002 111.7	17 52.3 1.002 111.7	18 22.3 1.002 111.7	18 52.3 1.002 111.7	19 22.3 1.002 111.7	19 52.3 1.002 111.7	8
9	16 21.4 1.002 110.7	16 51.4 1.002 110.7	17 21.4 1.002 110.7	17 51.4 1.002 110.7	18 21.4 1.002 110.7	18 51.3 1.002 110.7	19 21.3 1.002 110.7	19 51.3 1.002 110.7	9
70	16 20.4 1.002 109.7	16 50.4 1.002 109.7	17 20.4 1.002 109.7	17 50.4 1.002 109.7	18 20.4 1.002 109.7	18 50.4 1.002 109.7	19 20.4 1.002 109.7	19 50.4 1.002 109.7	70
1	16 19.4 1.002 108.7	16 49.4 1.002 108.7	17 19.4 1.002 108.7	17 49.4 1.002 108.7	18 19.4 1.002 108.7	18 49.4 1.002 108.7	19 19.4 1.002 108.7	19 49.4 1.002 108.7	1
2	16 18.4 1.002 107.7	16 48.4 1.002 107.7	17 18.4 1.002 107.7	17 48.4 1.002 107.7	18 18.4 1.002 107.7	18 48.4 1.002 107.7	19 18.4 1.002 107.7	19 48.4 1.002 107.7	2
3	16 17.4 1.002 106.7	16 47.4 1.002 106.7	17 17.4 1.002 106.7	17 47.4 1.002 106.7	18 17.4 1.002 106.7	18 47.4 1.002 106.7	19 17.4 1.002 106.7	19 47.4 1.002 106.7	3
4	16 16.4 1.002 105.7	16 46.4 1.002 105.7	17 16.4 1.002 105.7	17 46.4 1.002 105.7	18 16.4 1.002 105.7	18 46.4 1.002 105.7	19 16.4 1.002 105.7	19 46.4 1.002 105.7	4
75	16 15.4 1.002 104.7	16 45.4 1.002 104.7	17 15.4 1.002 104.7	17 45.4 1.002 104.7	18 15.4 1.002 104.7	18 45.4 1.002 104.7	19 15.4 1.002 104.7	19 45.4 1.002 104.7	75
6	16 14.4 1.002 103.7	16 44.4 1.002 103.7	17 14.4 1.002 103.7	17 44.4 1.002 103.7	18 14.4 1.002 103.7	18 44.3 1.002 103.7	19 14.3 1.002 103.7	19 44.3 1.002 103.7	6
7	16 13.4 1.002 102.7	16 43.3 1.002 102.7	17 13.3 1.002 102.7	17 43.3 1.002 102.7	18 13.3 1.002 102.7	18 43.3 1.002 102.7	19 13.3 1.002 102.7	19 43.3 1.002 102.7	7
8	16 12.3 1.002 101.7	16 42.3 1.002 101.7	17 12.3 1.002 101.7	17 42.3 1.002 101.7	18 12.3 1.002 101.7	18 42.3 1.002 101.7	19 12.3 1.002 101.7	19 42.3 1.002 101.7	8
9	16 11.3 1.002 100.7	16 41.3 1.002 100.7	17 11.3 1.002 100.7	17 41.3 1.002 100.7	18 11.3 1.002 100.7	18 41.3 1.002 100.7	19 11.3 1.002 100.7	19 41.3 1.002 100.7	9
80	16 10.3 1.002 99.7	16 40.3 1.002 99.7	17 10.3 1.002 99.7	17 40.3 1.002 99.7	18 10.3 1.002 99.7	18 40.2 1.002 99.7	19 10.2 1.002 99.7	19 40.2 1.002 99.6	80
1	16 09.2 1.002 98.7	16 39.2 1.002 98.7	17 09.2 1.002 98.7	17 39.2 1.002 98.7	18 09.2 1.002 98.7	18 39.2 1.002 98.7	19 09.2 1.002 98.7	19 39.2 1.002 98.6	1
2	16 08.2 1.002 97.7	16 38.2 1.002 97.7	17 08.2 1.002 97.7	17 38.2 1.002 97.7	18 08.2 1.002 97.7	18 38.2 1.002 97.7	19 08.2 1.002 97.7	19 38.2 1.002 97.6	2
3	16 07.2 1.002 96.7	16 37.2 1.002 96.7	17 07.2 1.002 96.7	17 37.1 1.002 96.7	18 07.1 1.002 96.7	18 37.1 1.002 96.7	19 07.1 1.002 96.7	19 37.1 1.002 96.6	3
4	16 06.1 1.002 95.7	16 36.1 1.002 95.7	17 06.1 1.002 95.7	17 36.1 1.002 95.7	18 06.1 1.002 95.7	18 36.1 1.002 95.7	19 06.1 1.002 95.7	19 36.1 1.002 95.6	4
85	16 05.1 1.002 94.7	16 35.1 1.002 94.7	17 05.1 1.002 94.7	17 35.1 1.002 94.7	18 05.1 1.002 94.7	18 35.1 1.002 94.7	19 05.1 1.002 94.7	19 35.0 1.002 94.6	85
6	16 04.0 1.002 93.7	16 34.0 1.002 93.7	17 04.0 1.002 93.7	17 34.0 1.002 93.7	18 04.0 1.002 93.7	18 34.0 1.002 93.7	19 04.0 1.002 93.7	19 34.0 1.002 93.6	6
7	16 03.0 1.002 92.7	16 33.0 1.002 92.7	17 03.0 1.002 92.7	17 33.0 1.002 92.7	18 03.0 1.002 92.7	18 33.0 1.002 92.7	19 03.0 1.002 92.7	19 33.0 1.002 92.6	7
8	16 01.9 1.002 91.7	16 31.9 1.002 91.7	17 01.9 1.002 91.7	17 31.9 1.002 91.7	18 01.9 1.002 91.7	18 31.9 1.002 91.7	19 01.9 1.002 91.7	19 31.9 1.002 91.6	8
9	16 00.9 1.002 90.7	16 30.9 1.002 90.7	17 00.9 1.002 90.7	17 30.9 1.002 90.7	18 00.9 1.002 90.7	18 30.9 1.002 90.7	19 00.9 1.002 90.7	19 30.9 1.002 90.6	9
90	15 59.8 1.002 89.7	16 29.8 1.002 89.7	16 59.8 1.002 89.7	17 29.8 1.002 89.7	17 59.8 1.002 89.7	18 29.8 1.002 89.7	18 59.8 1.002 89.7	19 29.8 1.002 89.6	90

Each declination cell lists: Alt (° ′), Δd Δt, Az (°).

H.A.	16° 00′	16° 30′	17° 00′	17° 30′	18° 00′	18° 30′	19° 00′	19° 30′	H.A.
91	15 58.8 1.002 88.7	16 28.8 1.002 88.7	16 58.8 1.002 88.7	17 28.8 1.002 88.7	17 58.8 1.002 88.7	18 28.8 1.002 88.7	18 58.8 1.002 88.7	19 28.8 1.002 88.6	91
2	15 57.8 1.002 87.7	16 27.8 1.002 87.7	16 57.7 1.002 87.7	17 27.7 1.002 87.7	17 57.7 1.002 87.7	18 27.7 1.002 87.7	18 57.7 1.002 87.7	19 27.7 1.002 87.6	2
3	15 56.7 1.002 86.7	16 26.7 1.002 86.7	16 56.7 1.002 86.7	17 26.7 1.002 86.7	17 56.7 1.002 86.7	18 26.7 1.002 86.7	18 56.7 1.002 86.7	19 26.7 1.002 86.6	3
4	15 55.7 1.002 85.7	16 25.7 1.002 85.7	16 55.7 1.002 85.7	17 25.7 1.002 85.7	17 55.6 1.002 85.7	18 25.6 1.002 85.7	18 55.6 1.002 85.7	19 25.6 1.002 85.6	4
95	15 54.6 1.002 84.7	16 24.6 1.002 84.7	16 54.6 1.002 84.7	17 24.6 1.002 84.7	17 54.6 1.002 84.7	18 24.6 1.002 84.7	18 54.6 1.002 84.7	19 24.6 1.002 84.6	95
6	15 53.6 1.002 83.7	16 23.6 1.002 83.7	16 53.6 1.002 83.7	17 23.6 1.002 83.7	17 53.6 1.002 83.7	18 23.6 1.002 83.7	18 53.6 1.002 83.7	19 23.5 1.002 83.6	6
7	15 52.5 1.002 82.7	16 22.5 1.002 82.7	16 52.5 1.002 82.7	17 22.5 1.002 82.7	17 52.5 1.002 82.7	18 22.5 1.002 82.7	18 52.5 1.002 82.7	19 22.5 1.002 82.6	7
8	15 51.5 1.002 81.7	16 21.5 1.002 81.7	16 51.5 1.002 81.7	17 21.5 1.002 81.7	17 51.5 1.002 81.7	18 21.5 1.002 81.7	18 51.5 1.002 81.7	19 21.5 1.002 81.7	8
9	15 50.5 1.002 80.7	16 20.5 1.002 80.7	16 50.5 1.002 80.7	17 20.5 1.002 80.7	17 50.4 1.002 80.7	18 20.4 1.002 80.7	18 50.4 1.002 80.7	19 20.4 1.002 80.7	9
100	15 49.4 1.002 79.7	16 19.4 1.002 79.7	16 49.4 1.002 79.7	17 19.4 1.002 79.7	17 49.4 1.002 79.7	18 19.4 1.002 79.7	18 49.4 1.002 79.7	19 19.4 1.002 79.7	100
1	15 48.4 1.002 78.7	16 18.4 1.002 78.7	16 48.4 1.002 78.7	17 18.4 1.002 78.7	17 48.4 1.002 78.7	18 18.4 1.002 78.7	18 48.4 1.002 78.7	19 18.4 1.002 78.7	1
2	15 47.4 1.002 77.7	16 17.4 1.002 77.7	16 47.4 1.002 77.7	17 17.4 1.002 77.7	17 47.4 1.002 77.7	18 17.4 1.002 77.7	18 47.4 1.002 77.7	19 17.3 1.002 77.7	2
3	15 46.4 1.002 76.7	16 16.4 1.002 76.7	16 46.4 1.002 76.7	17 16.3 1.002 76.7	17 46.3 1.002 76.7	18 16.3 1.002 76.7	18 46.3 1.002 76.7	19 16.3 1.002 76.7	3
4	15 45.3 1.002 75.7	16 15.3 1.002 75.7	16 45.3 1.002 75.7	17 15.3 1.002 75.7	17 45.3 1.002 75.7	18 15.3 1.002 75.7	18 45.3 1.002 75.7	19 15.3 1.002 75.7	4
105	15 44.3 1.002 74.7	16 14.3 1.002 74.7	16 44.3 1.002 74.7	17 14.3 1.002 74.7	17 44.3 1.002 74.7	18 14.3 1.002 74.7	18 44.3 1.002 74.7	19 14.3 1.002 74.7	105
6	15 43.3 1.002 73.7	16 13.3 1.002 73.7	16 43.3 1.002 73.7	17 13.3 1.002 73.7	17 43.3 1.002 73.7	18 13.3 1.002 73.7	18 43.3 1.002 73.7	19 13.3 1.002 73.7	6
7	15 42.3 1.002 72.7	16 12.3 1.002 72.7	16 42.3 1.002 72.7	17 12.3 1.002 72.7	17 42.3 1.002 72.7	18 12.3 1.002 72.7	18 42.3 1.002 72.7	19 12.3 1.002 72.7	7
8	15 41.3 1.002 71.7	16 11.3 1.002 71.7	16 41.3 1.002 71.7	17 11.3 1.002 71.7	17 41.3 1.002 71.7	18 11.3 1.002 71.7	18 41.3 1.002 71.7	19 11.3 1.002 71.7	8
9	15 40.3 1.002 70.7	16 10.3 1.002 70.7	16 40.3 1.002 70.7	17 10.3 1.002 70.7	17 40.3 1.002 70.7	18 10.3 1.002 70.7	18 40.3 1.002 70.7	19 10.3 1.002 70.7	9
110	15 39.3 1.002 69.7	16 09.3 1.002 69.7	16 39.3 1.002 69.7	17 09.3 1.002 69.7	17 39.3 1.002 69.7	18 09.3 1.002 69.7	18 39.3 1.002 69.7	19 09.3 1.002 69.7	110
1	15 38.4 1.002 68.7	16 08.4 1.002 68.7	16 38.4 1.002 68.7	17 08.4 1.002 68.7	17 38.4 1.002 68.7	18 08.3 1.002 68.7	18 38.3 1.002 68.7	19 08.3 1.002 68.7	1
2	15 37.4 1.002 67.7	16 07.4 1.002 67.7	16 37.4 1.002 67.7	17 07.4 1.002 67.7	17 37.4 1.002 67.7	18 07.4 1.002 67.7	18 37.4 1.002 67.7	19 07.4 1.002 67.7	2
3	15 36.4 1.002 66.7	16 06.4 1.002 66.7	16 36.4 1.002 66.7	17 06.4 1.002 66.7	17 36.4 1.002 66.7	18 06.4 1.002 66.7	18 36.4 1.002 66.7	19 06.4 1.002 66.7	3
4	15 35.5 1.002 65.7	16 05.5 1.002 65.7	16 35.5 1.002 65.7	17 05.5 1.002 65.7	17 35.5 1.002 65.7	18 05.5 1.002 65.7	18 35.4 1.002 65.7	19 05.4 1.002 65.7	4
115	15 34.5 1.002 64.7	16 04.5 1.002 64.7	16 34.5 1.002 64.7	17 04.5 1.002 64.7	17 34.5 1.002 64.7	18 04.5 1.002 64.7	18 34.5 1.002 64.7	19 04.5 1.002 64.7	115
6	15 33.6 1.002 63.7	16 03.6 1.002 63.7	16 33.6 1.002 63.7	17 03.6 1.002 63.7	17 33.6 1.002 63.7	18 03.6 1.002 63.7	18 33.6 1.002 63.7	19 03.5 1.002 63.7	6
7	15 32.6 1.002 62.7	16 02.6 1.002 62.7	16 32.6 1.002 62.7	17 02.6 1.002 62.7	17 32.6 1.002 62.7	18 02.6 1.002 62.7	18 32.6 1.002 62.7	19 02.6 1.002 62.7	7
8	15 31.7 1.002 61.8	16 01.7 1.002 61.7	16 31.7 1.002 61.7	17 01.7 1.002 61.7	17 31.7 1.002 61.7	18 01.7 1.002 61.7	18 31.7 1.002 61.7	19 01.7 1.002 61.7	8
9	15 30.8 1.002 60.8	16 00.8 1.002 60.7	16 30.8 1.002 60.7	17 00.8 1.002 60.7	17 30.8 1.002 60.7	18 00.8 1.002 60.7	18 30.8 1.002 60.7	19 00.8 1.002 60.7	9
120	15 29.9 1.002 59.8	15 59.9 1.002 59.7	16 29.9 1.002 59.7	16 59.9 1.002 59.7	17 29.9 1.002 59.7	17 59.9 1.002 59.7	18 29.9 1.002 59.7	18 59.9 1.002 59.7	120
1	15 29.0 1.001 58.8	15 59.0 1.001 58.8	16 29.0 1.001 58.7	16 59.0 1.001 58.7	17 29.0 1.001 58.7	17 59.0 1.001 58.7	18 29.0 1.001 58.7	18 59.0 1.001 58.7	1
2	15 28.1 1.001 57.8	15 58.1 1.001 57.8	16 28.1 1.001 57.7	16 58.1 1.001 57.7	17 28.1 1.001 57.7	17 58.1 1.001 57.7	18 28.1 1.001 57.7	18 58.1 1.001 57.7	2
3	15 27.2 1.001 56.8	15 57.2 1.001 56.8	16 27.2 1.001 56.7	16 57.2 1.001 56.7	17 27.2 1.001 56.7	17 57.2 1.001 56.7	18 27.2 1.001 56.7	18 57.2 1.001 56.7	3
4	15 26.3 1.001 55.8	15 56.3 1.001 55.8	16 26.3 1.001 55.8	16 56.3 1.001 55.7	17 26.3 1.001 55.7	17 56.3 1.001 55.7	18 26.3 1.001 55.7	18 56.3 1.001 55.7	4
125	15 25.5 1.001 54.8	15 55.5 1.001 54.8	16 25.5 1.001 54.8	16 55.5 1.001 54.7	17 25.5 1.001 54.7	17 55.5 1.001 54.7	18 25.5 1.001 54.7	18 55.5 1.001 54.7	125
6	15 24.6 1.001 53.8	15 54.6 1.001 53.8	16 24.6 1.001 53.8	16 54.6 1.001 53.8	17 24.6 1.001 53.7	17 54.6 1.001 53.7	18 24.6 1.001 53.7	18 54.6 1.001 53.7	6
7	15 23.8 1.001 52.8	15 53.8 1.001 52.8	16 23.8 1.001 52.8	16 53.8 1.001 52.8	17 23.8 1.001 52.7	17 53.8 1.001 52.7	18 23.8 1.001 52.7	18 53.8 1.001 52.7	7
8	15 23.0 1.001 51.8	15 53.0 1.001 51.8	16 23.0 1.001 51.8	16 53.0 1.001 51.8	17 23.0 1.001 51.7	17 53.0 1.001 51.7	18 23.0 1.001 51.7	18 52.9 1.001 51.7	8
9	15 22.2 1.001 50.8	15 52.1 1.001 50.8	16 22.1 1.001 50.8	16 52.1 1.001 50.8	17 22.1 1.001 50.8	17 52.1 1.001 50.7	18 22.1 1.001 50.7	18 52.1 1.001 50.7	9
130	15 21.3 1.001 49.8	15 51.3 1.001 49.8	16 21.3 1.001 49.8	16 51.3 1.001 49.8	17 21.3 1.001 49.8	17 51.3 1.001 49.7	18 21.3 1.001 49.7	18 51.3 1.001 49.7	130
1	15 20.6 1.001 48.8	15 50.6 1.001 48.8	16 20.5 1.001 48.8	16 50.5 1.001 48.8	17 20.5 1.001 48.8	17 50.5 1.001 48.8	18 20.5 1.001 48.7	18 50.5 1.001 48.7	1
2	15 19.8 1.001 47.8	15 49.8 1.001 47.8	16 19.8 1.001 47.8	16 49.8 1.001 47.8	17 19.8 1.001 47.8	17 49.8 1.001 47.8	18 19.8 1.001 47.7	18 49.8 1.001 47.7	2
3	15 19.0 1.001 46.8	15 49.0 1.001 46.8	16 19.0 1.001 46.8	16 49.0 1.001 46.8	17 19.0 1.001 46.8	17 49.0 1.001 46.8	18 19.0 1.001 46.8	18 49.0 1.001 46.7	3
4	15 18.2 1.001 45.8	15 48.2 1.001 45.8	16 18.2 1.001 45.8	16 48.2 1.001 45.8	17 18.2 1.001 45.8	17 48.2 1.001 45.8	18 18.2 1.001 45.8	18 48.2 1.001 45.8	4
135	15 17.5 1.001 44.8	15 47.5 1.001 44.8	16 17.5 1.001 44.8	16 47.5 1.001 44.8	17 17.5 1.001 44.8	17 47.5 1.001 44.8	18 17.5 1.001 44.8	18 47.5 1.001 44.8	135
6	15 16.8 1.001 43.8	15 46.8 1.001 43.8	16 16.8 1.001 43.8	16 46.8 1.001 43.8	17 16.8 1.001 43.8	17 46.8 1.001 43.8	18 16.8 1.001 43.8	18 46.8 1.001 43.8	6
7	15 16.1 1.001 42.8	15 46.0 1.001 42.8	16 16.0 1.001 42.8	16 46.0 1.001 42.8	17 16.0 1.001 42.8	17 46.0 1.001 42.8	18 16.0 1.001 42.8	18 46.0 1.001 42.8	7
8	15 15.3 1.001 41.8	15 45.3 1.001 41.8	16 15.3 1.001 41.8	16 45.3 1.001 41.8	17 15.3 1.001 41.8	17 45.3 1.001 41.8	18 15.3 1.001 41.8	18 45.3 1.001 41.8	8
9	15 14.7 1.001 40.8	15 44.7 1.001 40.8	16 14.6 1.001 40.8	16 44.6 1.001 40.8	17 14.6 1.001 40.8	17 44.6 1.001 40.8	18 14.6 1.001 40.8	18 44.6 1.001 40.8	9
140	15 14.0 1.001 39.8	15 44.0 1.001 39.8	16 14.0 1.001 39.8	16 44.0 1.001 39.8	17 14.0 1.001 39.8	17 44.0 1.001 39.8	18 14.0 1.001 39.8	18 44.0 1.001 39.8	140
1	15 13.3 1.001 38.8	15 43.3 1.001 38.8	16 13.3 1.001 38.8	16 43.3 1.001 38.8	17 13.3 1.001 38.8	17 43.3 1.001 38.8	18 13.3 1.001 38.8	18 43.3 1.001 38.8	1
2	15 12.7 1.001 37.8	15 42.7 1.001 37.8	16 12.7 1.001 37.8	16 42.7 1.001 37.8	17 12.7 1.001 37.8	17 42.7 1.001 37.8	18 12.7 1.001 37.8	18 42.7 1.001 37.8	2
3	15 12.0 1.001 36.8	15 42.0 1.001 36.8	16 12.0 1.001 36.8	16 42.0 1.001 36.8	17 12.0 1.001 36.8	17 42.0 1.001 36.8	18 12.0 1.001 36.8	18 42.0 1.001 36.8	3
4	15 11.4 1.001 35.8	15 41.4 1.001 35.8	16 11.4 1.001 35.8	16 41.4 1.001 35.8	17 11.4 1.001 35.8	17 41.4 1.001 35.8	18 11.4 1.001 35.8	18 41.4 1.001 35.8	4
145	15 10.8 1.001 34.8	15 40.8 1.001 34.8	16 10.8 1.001 34.8	16 40.8 1.001 34.8	17 10.8 1.001 34.8	17 40.8 1.001 34.8	18 10.8 1.001 34.8	18 40.8 1.001 34.8	145
6	15 10.2 1.001 33.8	15 40.2 1.001 33.8	16 10.2 1.001 33.8	16 40.2 1.001 33.8	17 10.2 1.001 33.8	17 40.2 1.001 33.8	18 10.2 1.001 33.8	18 40.2 1.001 33.8	6
7	15 09.6 1.001 32.8	15 39.6 1.001 32.8	16 09.6 1.001 32.8	16 39.6 1.001 32.8	17 09.6 1.001 32.8	17 39.6 1.001 32.8	18 09.6 1.001 32.8	18 39.6 1.001 32.8	7
8	15 09.1 1.001 31.9	15 39.1 1.001 31.8	16 09.1 1.001 31.8	16 39.1 1.001 31.8	17 09.1 1.001 31.8	17 39.1 1.001 31.8	18 09.1 1.001 31.8	18 39.1 1.001 31.8	8
9	15 08.5 1.001 30.9	15 38.5 1.001 30.9	16 08.5 1.001 30.8	16 38.5 1.001 30.8	17 08.5 1.001 30.8	17 38.5 1.001 30.8	18 08.5 1.001 30.8	18 38.5 1.001 30.8	9
150	15 08.0 1.001 29.9	15 38.0 1.001 29.9	16 08.0 1.001 29.9	16 38.0 1.001 29.8	17 08.0 1.001 29.8	17 38.0 1.001 29.8	18 08.0 1.001 29.8	18 38.0 1.001 29.8	150
1	15 07.5 1.001 28.9	15 37.5 1.001 28.9	16 07.5 1.001 28.9	16 37.5 1.001 28.9	17 07.5 1.001 28.8	17 37.5 1.001 28.8	18 07.5 1.001 28.8	18 37.5 1.001 28.8	1
2	15 07.0 1.001 27.9	15 37.0 1.001 27.9	16 07.0 1.001 27.9	16 37.0 1.001 27.9	17 07.0 1.001 27.9	17 37.0 1.001 27.8	18 07.0 1.001 27.8	18 37.0 1.001 27.8	2
3	15 06.5 1.001 26.9	15 36.5 1.001 26.9	16 06.5 1.001 26.9	16 36.5 1.001 26.9	17 06.5 1.001 26.9	17 36.5 1.001 26.9	18 06.5 1.001 26.8	18 36.5 1.001 26.8	3
4	15 06.0 1.001 25.9	15 36.0 1.001 25.9	16 06.0 1.001 25.9	16 36.0 1.001 25.9	17 06.0 1.001 25.9	17 36.0 1.001 25.9	18 06.0 1.001 25.9	18 36.0 1.001 25.8	4
155	15 05.6 1.001 24.9	15 35.6 1.001 24.9	16 05.6 1.001 24.9	16 35.6 1.001 24.9	17 05.6 1.001 24.9	17 35.6 1.001 24.9	18 05.6 1.001 24.9	18 35.6 1.001 24.9	155
6	15 05.2 1.001 23.9	15 35.2 1.001 23.9	16 05.2 1.001 23.9	16 35.2 1.001 23.9	17 05.2 1.001 23.9	17 35.2 1.001 23.9	18 05.2 1.001 23.9	18 35.2 1.001 23.9	6
7	15 04.7 1.001 22.9	15 34.7 1.001 22.9	16 04.7 1.001 22.9	16 34.7 1.001 22.9	17 04.7 1.001 22.9	17 34.7 1.001 22.9	18 04.7 1.001 22.9	18 34.7 1.001 22.9	7
8	15 04.3 1.001 21.9	15 34.3 1.001 21.9	16 04.3 1.001 21.9	16 34.3 1.001 21.9	17 04.3 1.001 21.9	17 34.3 1.001 21.9	18 04.3 1.001 21.9	18 34.3 1.001 21.9	8
9	15 04.0 1.001 20.9	15 34.0 1.001 20.9	16 04.0 1.001 20.9	16 34.0 1.001 20.9	17 04.0 1.001 20.9	17 34.0 1.001 20.9	18 04.0 1.001 20.9	18 34.0 1.001 20.9	9
160	15 03.6 1.001 19.9	15 33.6 1.001 19.9	16 03.6 1.001 19.9	16 33.6 1.001 19.9	17 03.6 1.001 19.9	17 33.6 1.001 19.9	18 03.6 1.001 19.9	18 33.6 1.001 19.9	160
1	15 03.3 1.001 18.9	15 33.3 1.001 18.9	16 03.3 1.001 18.9	16 33.3 1.001 18.9	17 03.3 1.001 18.9	17 33.3 1.001 18.9	18 03.2 1.001 18.9	18 33.2 1.001 18.9	1
2	15 02.9 1.000 17.9	15 32.9 1.000 17.9	16 02.9 1.000 17.9	16 32.9 1.001 17.9	17 02.9 1.001 17.9	17 32.9 1.001 17.9	18 02.9 1.001 17.9	18 32.9 1.001 17.9	2
3	15 02.6 1.000 16.9	15 32.6 1.000 16.9	16 02.6 1.000 16.9	16 32.6 1.000 16.9	17 02.6 1.000 16.9	17 32.6 1.000 16.9	18 02.6 1.000 16.9	18 32.6 1.000 16.9	3
4	15 02.3 1.000 15.9	15 32.3 1.000 15.9	16 02.3 1.000 15.9	16 32.3 1.000 15.9	17 02.3 1.000 15.9	17 32.3 1.000 15.9	18 02.3 1.000 15.9	18 32.3 1.000 15.9	4
165	15 02.0 1.000 14.9	15 32.0 1.000 14.9	16 02.0 1.000 14.9	16 32.0 1.000 14.9	17 02.0 1.000 14.9	17 32.0 1.000 14.9	18 02.0 1.000 14.9	18 32.0 1.000 14.9	165
6	15 01.8 1.000 13.9	15 31.8 1.000 13.9	16 01.8 1.000 13.9	16 31.8 1.000 13.9	17 01.8 1.000 13.9	17 31.8 1.000 13.9	18 01.8 1.000 13.9	18 31.8 1.000 13.9	6
7	15 01.5 1.000 12.9	15 31.5 1.000 12.9	16 01.5 1.000 12.9	16 31.5 1.000 12.9	17 01.5 1.000 12.9	17 31.5 1.000 12.9	18 01.5 1.000 12.9	18 31.5 1.000 12.9	7
8	15 01.3 1.000 11.9	15 31.3 1.000 11.9	16 01.3 1.000 11.9	16 31.3 1.000 11.9	17 01.3 1.000 11.9	17 31.3 1.000 11.9	18 01.3 1.000 11.9	18 31.3 1.000 11.9	8
9	15 01.1 1.000 10.9	15 31.1 1.000 10.9	16 01.1 1.000 10.9	16 31.1 1.000 10.9	17 01.1 1.000 10.9	17 31.1 1.000 10.9	18 01.1 1.000 10.9	18 31.1 1.000 10.9	9
170	15 00.9 1.000 10.0	15 30.9 1.000 10.0	16 00.9 1.000 09.9	16 30.9 1.000 09.9	17 00.9 1.000 09.9	17 30.9 1.000 09.9	18 00.9 1.000 09.9	18 30.9 1.000 09.9	170
1	15 00.7 1.000 09.0	15 30.7 1.000 09.0	16 00.7 1.000 09.0	16 30.7 1.000 09.0	17 00.7 1.000 09.0	17 30.7 1.000 08.9	18 00.7 1.000 08.9	18 30.7 1.000 08.9	1
2	15 00.6 1.000 08.0	15 30.6 1.000 08.0	16 00.6 1.000 08.0	16 30.6 1.000 08.0	17 00.6 1.000 08.0	17 30.6 1.000 08.0	18 00.6 1.000 08.0	18 30.6 1.000 08.0	2
3	15 00.4 1.000 07.0	15 30.4 1.000 07.0	16 00.4 1.000 07.0	16 30.4 1.000 07.0	17 00.4 1.000 07.0	17 30.4 1.000 07.0	18 00.4 1.000 07.0	18 30.4 1.000 07.0	3
4	15 00.3 1.000 06.0	15 30.3 1.000 06.0	16 00.3 1.000 06.0	16 30.3 1.000 06.0	17 00.3 1.000 06.0	17 30.3 1.000 06.0	18 00.3 1.000 06.0	18 30.3 1.000 06.0	4
175	15 00.2 1.000 05.0	15 30.2 1.000 05.0	16 00.2 1.000 05.0	16 30.2 1.000 05.0	17 00.2 1.000 05.0	17 30.2 1.000 05.0	18 00.2 1.000 05.0	18 30.2 1.000 05.0	175
6	15 00.1 1.000 04.0	15 30.1 1.000 04.0	16 00.1 1.000 04.0	16 30.1 1.000 04.0	17 00.1 1.000 04.0	17 30.1 1.000 04.0	18 00.1 1.000 04.0	18 30.1 1.000 04.0	6
7	15 00.1 1.000 03.0	15 30.1 1.000 03.0	16 00.1 1.000 03.0	16 30.1 1.000 03.0	17 00.1 1.000 03.0	17 30.1 1.000 03.0	18 00.1 1.000 03.0	18 30.1 1.000 03.0	7
8	15 00.0 1.000 02.0	15 30.0 1.000 02.0	16 00.0 1.000 02.0	16 30.0 1.000 02.0	17 00.0 1.000 02.0	17 30.0 1.000 02.0	18 00.0 1.000 02.0	18 30.0 1.000 02.0	8
9	15 00.0 1.000 01.0	15 30.0 1.000 01.0	16 00.0 1.000 01.0	16 30.0 1.000 01.0	17 00.0 1.000 01.0	17 30.0 1.000 01.0	18 00.0 1.000 01.0	18 30.0 1.000 01.0	9
180	15 00.0 1.000 00.0	15 30.0 1.000 00.0	16 00.0 1.000 00.0	16 30.0 1.000 00.0	17 00.0 1.000 00.0	17 30.0 1.000 00.0	18 00.0 1.000 00.0	18 30.0 1.000 00.0	180

Lat. 69° H.A.	20° 00' Alt.	Ad Δt	Az.	20° 30' Alt.	Ad Δt	Az.	21° 00' Alt.	Ad Δt	Az.	21° 30' Alt.	Ad Δt	Az.	22° 00' Alt.	Ad Δt	Az.	22° 30' Alt.	Ad Δt	Az.	23° 00' Alt.	Ad Δt	Az.	23° 30' Alt.	Ad Δt	Az.	Ht.
00	21 00.0	1.0 00	180.0	21 30.0	1.0 00	180.0	22 00.0	1.0 00	180.0	22 30.0	1.0 00	180.0	23 00.0	1.0 00	180.0	23 30.0	1.0 00	180.0	24 00.0	1.0 00	180.0	24 30.0	1.0 00	180.0	00
1	21 00.0	1.0 00	179.0	21 30.0	1.0 00	179.0	22 00.0	1.0 00	179.0	22 30.0	1.0 00	179.0	23 00.0	1.0 00	179.0	23 30.0	1.0 00	179.0	24 00.0	1.0 00	179.0	24 30.0	1.0 00	179.0	1
2	21 00.0	1.0 00	178.0	21 30.0	1.0 00	178.0	22 00.0	1.0 00	178.0	22 30.0	1.0 00	178.0	23 00.0	1.0 00	178.0	23 30.0	1.0 00	178.0	24 00.0	1.0 00	178.0	24 30.0	1.0 00	178.0	2
3	20 59.9	1.0 00	177.0	21 29.9	1.0 00	177.0	21 59.9	1.0 00	177.0	22 29.9	1.0 00	177.0	22 59.9	1.0 00	177.0	23 29.9	1.0 00	177.0	23 59.9	1.0 00	177.0	24 29.9	1.0 00	177.0	3
4	20 59.9	1.0 00	176.0	21 29.9	1.0 00	176.0	21 59.9	1.0 00	176.0	22 29.9	1.0 00	176.0	22 59.9	1.0 00	176.0	23 29.9	1.0 00	176.0	23 59.9	1.0 00	176.0	24 29.9	1.0 00	176.0	4
05	20 59.8	1.0 00	175.0	21 29.8	1.0 00	175.0	21 59.8	1.0 00	175.0	22 29.8	1.0 00	175.0	22 59.8	1.0 00	175.0	23 29.8	1.0 00	175.0	23 59.8	1.0 00	175.0	24 29.8	1.0 00	175.0	05
6	20 59.7	1.0 00	174.0	21 29.7	1.0 00	174.0	21 59.7	1.0 00	174.0	22 29.7	1.0 00	174.0	22 59.7	1.0 00	174.0	23 29.7	1.0 00	174.0	23 59.7	1.0 00	174.0	24 29.7	1.0 00	174.0	6
7	20 59.6	1.0 00	173.0	21 29.6	1.0 00	173.0	21 59.6	1.0 00	173.0	22 29.6	1.0 00	173.0	22 59.6	1.0 00	172.9	23 59.5	1.0 00	172.9	23 59.5	1.0 00	172.9	24 29.5	1.0 00	172.9	7
8	20 59.4	1.0 00	171.9	21 29.4	1.0 00	171.9	21 59.4	1.0 00	171.9	22 29.4	1.0 00	171.9	22 59.4	1.0 00	171.9	23 29.4	1.0 00	171.9	23 59.4	1.0 00	171.9	24 29.4	1.0 00	171.9	8
9	20 59.3	1.0 00	170.9	21 29.3	1.0 00	170.9	21 59.3	1.0 00	170.9	22 29.3	1.0 00	170.9	22 59.3	1.0 00	170.9	23 29.3	1.0 00	170.9	23 59.3	1.0 00	170.9	24 29.3	1.0 00	170.9	9
10	20 59.1	1.0 00	169.9	21 29.1	1.0 00	169.9	21 59.1	1.0 00	169.9	22 29.1	1.0 00	169.9	22 59.1	1.0 00	169.9	23 29.1	1.0 00	169.9	23 59.1	1.0 00	169.9	24 29.1	1.0 00	169.9	10
1	20 58.9	1.0 00	168.9	21 28.9	1.0 00	168.9	21 58.9	1.0 00	168.9	22 28.9	1.0 00	168.9	22 58.9	1.0 00	168.9	23 28.9	1.0 00	168.9	23 58.9	1.0 00	168.9	24 28.9	1.0 00	168.9	1
2	20 58.7	1.0 00	167.9	21 28.7	1.0 00	167.9	21 58.7	1.0 00	167.9	22 28.7	1.0 00	167.9	22 58.7	1.0 00	167.9	23 28.7	1.0 00	167.9	23 58.7	1.0 00	167.9	24 28.7	1.0 00	167.9	2
3	20 58.5	1.0 00	166.9	21 28.5	1.0 00	166.9	21 58.5	1.0 00	166.9	22 28.5	1.0 00	166.9	22 58.5	1.0 00	166.9	23 28.5	1.0 00	166.9	23 58.5	1.0 00	166.9	24 28.5	1.0 00	166.9	3
4	20 58.2	1.0 00	165.9	21 28.2	1.0 00	165.9	21 58.2	1.0 00	165.9	22 28.2	1.0 00	165.9	22 58.2	1.0 00	165.9	23 28.2	1.0 00	165.9	23 58.2	1.0 00	165.9	24 28.2	1.0 00	165.9	4
15	20 57.9	1.0 00	164.9	21 27.9	1.0 00	164.9	21 57.9	1.0 00	164.9	22 27.9	1.0 00	164.9	22 57.9	1.0 00	164.9	23 27.9	1.0 00	164.9	23 57.9	1.0 00	164.9	24 27.9	1.0 00	164.9	15
6	20 57.7	1.0 00	163.9	21 27.7	1.0 00	163.9	21 57.7	1.0 00	163.9	22 27.7	1.0 00	163.9	22 57.7	1.0 00	163.9	23 27.7	1.0 00	163.9	23 57.7	1.0 00	163.9	24 27.7	1.0 00	163.9	6
7	20 57.4	1.0 01	162.9	21 27.4	1.0 01	162.9	21 57.4	1.0 01	162.9	22 27.4	1.0 01	162.9	22 57.4	1.0 01	162.9	23 27.4	1.0 01	162.9	23 57.4	1.0 01	162.9	24 27.4	1.0 01	162.9	7
8	20 57.0	1.0 01	161.9	21 27.0	1.0 01	161.9	21 57.0	1.0 01	161.9	22 27.0	1.0 01	161.9	22 57.0	1.0 01	161.9	23 27.0	1.0 01	161.9	23 57.0	1.0 01	161.9	24 27.0	1.0 01	161.9	8
9	20 56.7	1.0 01	160.9	21 26.7	1.0 01	160.9	21 56.7	1.0 01	160.9	22 26.7	1.0 01	160.9	22 56.7	1.0 01	160.9	23 26.7	1.0 01	160.9	23 56.7	1.0 01	160.9	24 26.7	1.0 01	160.9	9
20	20 56.4	1.0 01	159.9	21 26.4	1.0 01	159.9	21 56.4	1.0 01	159.9	22 26.4	1.0 01	159.9	22 56.4	1.0 01	159.9	23 26.4	1.0 01	159.9	23 56.4	1.0 01	159.9	24 26.4	1.0 01	159.8	20
1	20 56.0	1.0 01	158.9	21 26.0	1.0 01	158.9	21 56.0	1.0 01	158.9	22 26.0	1.0 01	158.9	22 56.0	1.0 01	158.9	23 26.0	1.0 01	158.8	23 56.0	1.0 01	158.8	24 26.0	1.0 01	158.8	1
2	20 55.6	1.0 01	157.9	21 25.6	1.0 01	157.9	21 55.6	1.0 01	157.9	22 25.6	1.0 01	157.8	22 55.6	1.0 01	157.8	23 25.6	1.0 01	157.8	23 55.6	1.0 01	157.8	24 25.6	1.0 01	157.8	2
3	20 55.2	1.0 01	156.9	21 25.2	1.0 01	156.8	21 55.2	1.0 01	156.8	22 25.2	1.0 01	156.8	22 55.2	1.0 01	156.8	23 25.2	1.0 01	156.8	23 55.2	1.0 01	156.8	24 25.2	1.0 01	156.8	3
4	20 54.8	1.0 01	155.8	21 24.8	1.0 01	155.8	21 54.8	1.0 01	155.8	22 24.8	1.0 01	155.8	22 54.8	1.0 01	155.8	23 24.8	1.0 01	155.8	23 54.8	1.0 01	155.8	24 24.8	1.0 01	155.8	4
25	20 54.3	1.0 01	154.8	21 24.3	1.0 01	154.8	21 54.3	1.0 01	154.8	22 24.3	1.0 01	154.8	22 54.3	1.0 01	154.8	23 24.3	1.0 01	154.8	23 54.3	1.0 01	154.8	24 24.3	1.0 01	154.8	25
6	20 53.9	1.0 01	153.8	21 23.9	1.0 01	153.8	21 53.9	1.0 01	153.8	22 23.9	1.0 01	153.8	22 53.9	1.0 01	153.8	23 23.9	1.0 01	153.8	23 53.9	1.0 01	153.8	24 23.9	1.0 01	153.8	6
7	20 53.4	1.0 01	152.8	21 23.4	1.0 01	152.8	21 53.4	1.0 01	152.8	22 23.4	1.0 01	152.8	22 53.4	1.0 01	152.8	23 23.4	1.0 01	152.8	23 53.4	1.0 01	152.8	24 23.4	1.0 01	152.8	7
8	20 52.9	1.0 01	151.8	21 22.9	1.0 01	151.8	21 52.9	1.0 01	151.8	22 22.9	1.0 01	151.8	22 52.9	1.0 01	151.8	23 22.9	1.0 01	151.8	23 52.9	1.0 01	151.8	24 22.9	1.0 01	151.8	8
9	20 52.4	1.0 01	150.8	21 22.4	1.0 01	150.8	21 52.4	1.0 01	150.8	22 22.4	1.0 01	150.8	22 52.4	1.0 01	150.8	23 22.4	1.0 01	150.8	23 52.4	1.0 01	150.8	24 22.4	1.0 01	150.8	9
30	20 51.9	1.0 01	149.8	21 21.9	1.0 01	149.8	21 51.9	1.0 01	149.8	22 21.9	1.0 01	149.8	22 51.9	1.0 01	149.8	23 21.9	1.0 01	149.8	23 51.9	1.0 01	149.8	24 21.9	1.0 01	149.8	30
1	20 51.4	1.0 01	148.8	21 21.4	1.0 01	148.8	21 51.4	1.0 01	148.8	22 21.4	1.0 01	148.8	22 51.4	1.0 01	148.8	23 21.4	1.0 01	148.8	23 51.4	1.0 01	148.8	24 21.4	1.0 01	148.8	1
2	20 50.8	1.0 01	147.8	21 20.8	1.0 01	147.8	21 50.8	1.0 01	147.8	22 20.8	1.0 01	147.8	22 50.8	1.0 01	147.8	23 20.8	1.0 01	147.8	23 50.8	1.0 01	147.8	24 20.8	1.0 01	147.8	2
3	20 50.3	1.0 01	146.8	21 20.3	1.0 01	146.8	21 50.3	1.0 01	146.8	22 20.3	1.0 01	146.8	22 50.3	1.0 01	146.8	23 20.3	1.0 01	146.8	23 50.3	1.0 01	146.8	24 20.3	1.0 01	146.8	3
4	20 49.7	1.0 01	145.8	21 19.7	1.0 01	145.8	21 49.7	1.0 01	145.8	22 19.7	1.0 01	145.8	22 49.7	1.0 01	145.8	23 19.7	1.0 01	145.8	23 49.7	1.0 01	145.8	24 19.7	1.0 01	145.8	4
35	20 49.1	1.0 01	144.8	21 19.1	1.0 01	144.8	21 49.1	1.0 01	144.8	22 19.1	1.0 01	144.8	22 49.1	1.0 01	144.8	23 19.1	1.0 01	144.8	23 49.1	1.0 01	144.8	24 19.1	1.0 01	144.7	35
6	20 48.5	1.0 01	143.8	21 18.5	1.0 01	143.8	21 48.5	1.0 01	143.8	22 18.5	1.0 01	143.8	22 48.5	1.0 01	143.8	23 18.5	1.0 01	143.8	23 48.5	1.0 01	143.7	24 18.5	1.0 01	143.7	6
7	20 47.8	1.0 01	142.8	21 17.8	1.0 01	142.8	21 47.8	1.0 01	142.8	22 17.8	1.0 01	142.8	22 47.8	1.0 01	142.8	23 17.8	1.0 01	142.7	23 47.8	1.0 01	142.7	24 17.8	1.0 01	142.7	7
8	20 47.2	1.0 01	141.8	21 17.2	1.0 01	141.8	21 47.2	1.0 01	141.8	22 17.2	1.0 01	141.8	22 47.2	1.0 01	141.7	23 17.2	1.0 01	141.7	23 47.2	1.0 01	141.7	24 17.2	1.0 01	141.7	8
9	20 46.5	1.0 01	140.8	21 16.5	1.0 01	140.8	21 46.5	1.0 01	140.8	22 16.5	1.0 01	140.7	22 46.5	1.0 01	140.7	23 16.5	1.0 01	140.7	23 46.5	1.0 01	140.7	24 16.5	1.0 01	140.7	9
40	20 45.9	1.0 01	139.8	21 15.9	1.0 01	139.8	21 45.9	1.0 01	139.7	22 15.9	1.0 01	139.7	22 45.9	1.0 01	139.7	23 15.9	1.0 01	139.7	23 45.9	1.0 01	139.7	24 15.9	1.0 01	139.7	40
1	20 45.2	1.0 01	138.8	21 15.2	1.0 01	138.7	21 45.2	1.0 01	138.7	22 15.2	1.0 01	138.7	22 45.2	1.0 01	138.7	23 15.2	1.0 01	138.7	23 45.2	1.0 01	138.7	24 15.2	1.0 01	138.7	1
2	20 44.5	1.0 01	137.8	21 14.5	1.0 01	137.7	21 44.5	1.0 01	137.7	22 14.5	1.0 01	137.7	22 44.5	1.0 01	137.7	23 14.5	1.0 01	137.7	23 44.5	1.0 01	137.7	24 14.5	1.0 01	137.7	2
3	20 43.8	1.0 01	136.7	21 13.8	1.0 01	136.7	21 43.8	1.0 01	136.7	22 13.8	1.0 01	136.7	22 43.8	1.0 01	136.7	23 13.8	1.0 01	136.7	23 43.8	1.0 01	136.7	24 13.8	1.0 01	136.7	3
4	20 43.1	1.0 01	135.7	21 13.1	1.0 01	135.7	21 43.1	1.0 01	135.7	22 13.1	1.0 01	135.7	22 43.1	1.0 01	135.7	23 13.1	1.0 01	135.7	23 43.1	1.0 01	135.7	24 13.0	1.0 01	135.7	4
45	20 42.3	1.0 01	134.7	21 12.3	1.0 01	134.7	21 42.3	1.0 01	134.7	22 12.3	1.0 01	134.7	22 42.3	1.0 01	134.7	23 12.3	1.0 01	134.7	23 42.3	1.0 01	134.7	24 12.3	1.0 01	134.7	45
6	20 41.6	1.0 01	133.7	21 11.6	1.0 01	133.7	21 41.6	1.0 01	133.7	22 11.6	1.0 01	133.7	22 41.6	1.0 01	133.7	23 11.6	1.0 01	133.7	23 41.6	1.0 01	133.7	24 11.6	1.0 01	133.7	6
7	20 40.8	1.0 01	132.7	21 10.8	1.0 01	132.7	21 40.8	1.0 01	132.7	22 10.8	1.0 01	132.7	22 40.8	1.0 01	132.7	23 10.8	1.0 01	132.7	23 40.8	1.0 01	132.7	24 10.8	1.0 01	132.7	7
8	20 40.0	1.0 01	131.7	21 10.0	1.0 01	131.7	21 40.0	1.0 01	131.7	22 10.0	1.0 01	131.7	22 40.0	1.0 01	131.7	23 10.0	1.0 01	131.7	23 40.0	1.0 01	131.7	24 10.0	1.0 01	131.7	8
9	20 39.3	1.0 01	130.7	21 09.2	1.0 01	130.7	21 39.2	1.0 01	130.7	22 09.2	1.0 01	130.7	22 39.2	1.0 01	130.7	23 09.2	1.0 01	130.7	23 39.2	1.0 01	130.7	24 09.2	1.0 01	130.7	9
50	20 38.5	1.0 01	129.7	21 08.5	1.0 01	129.7	21 38.4	1.0 01	129.7	22 08.4	1.0 01	129.7	22 38.4	1.0 01	129.7	23 08.4	1.0 01	129.7	23 38.4	1.0 01	129.7	24 08.4	1.0 01	129.7	50
1	20 37.6	1.0 01	128.7	21 07.6	1.0 01	128.7	21 37.6	1.0 01	128.7	22 07.6	1.0 01	128.7	22 37.6	1.0 01	128.7	23 07.6	1.0 01	128.7	23 37.6	1.0 01	128.7	24 07.6	1.0 01	128.7	1
2	20 36.8	1.0 01	127.7	21 06.8	1.0 01	127.7	21 36.8	1.0 01	127.7	22 06.8	1.0 01	127.7	22 36.8	1.0 01	127.7	23 06.8	1.0 01	127.7	23 36.8	1.0 01	127.7	24 06.8	1.0 01	127.7	2
3	20 36.0	1.0 01	126.7	21 06.0	1.0 01	126.7	21 36.0	1.0 01	126.7	22 06.0	1.0 01	126.7	22 36.0	1.0 01	126.7	23 06.0	1.0 01	126.7	23 36.0	1.0 01	126.7	24 06.0	1.0 01	126.6	3
4	20 35.1	1.0 01	125.7	21 05.1	1.0 01	125.7	21 35.1	1.0 01	125.7	22 05.1	1.0 01	125.7	22 35.1	1.0 01	125.7	23 05.1	1.0 01	125.7	23 35.1	1.0 01	125.6	24 05.1	1.0 01	125.6	4
55	20 34.3	1.0 01	124.7	21 04.3	1.0 01	124.7	21 34.3	1.0 01	124.7	22 04.3	1.0 01	124.7	22 34.3	1.0 01	124.7	23 04.3	1.0 01	124.7	23 34.3	1.0 01	124.6	24 04.3	1.0 01	124.6	55
6	20 33.4	1.0 01	123.7	21 03.4	1.0 01	123.7	21 33.4	1.0 01	123.7	22 03.4	1.0 01	123.7	22 33.4	1.0 01	123.7	23 03.4	1.0 01	123.7	23 33.4	1.0 01	123.6	24 03.4	1.0 01	123.6	6
7	20 32.5	1.0 01	122.7	21 02.5	1.0 01	122.7	21 32.5	1.0 01	122.7	22 02.5	1.0 01	122.7	22 32.5	1.0 01	122.7	23 02.5	1.0 01	122.6	23 32.5	1.0 01	122.6	24 02.5	1.0 01	122.6	7
8	20 31.7	1.0 01	121.7	21 01.7	1.0 02	121.7	21 31.6	1.0 02	121.7	22 01.6	1.0 01	121.7	22 31.6	1.0 01	121.7	23 01.6	1.0 02	121.6	23 31.6	1.0 02	121.6	24 01.6	1.0 02	121.6	8
9	20 30.8	1.0 02	120.7	21 00.8	1.0 02	120.7	21 30.8	1.0 02	120.7	22 00.7	1.0 02	120.7	22 30.7	1.0 02	120.6	23 00.7	1.0 02	120.6	23 30.7	1.0 02	120.6	24 00.7	1.0 02	120.6	9
60	20 29.9	1.0 02	119.7	20 59.9	1.0 02	119.7	21 29.8	1.0 02	119.7	21 59.8	1.0 02	119.7	22 29.8	1.0 02	119.6	22 59.8	1.0 02	119.6	23 29.8	1.0 02	119.6	23 59.8	1.0 02	119.6	60
1	20 28.9	1.0 02	118.7	20 58.9	1.0 02	118.7	21 28.9	1.0 02	118.7	21 58.9	1.0 02	118.7	22 28.9	1.0 02	118.6	22 58.9	1.0 02	118.6	23 28.9	1.0 02	118.6	23 58.9	1.0 02	118.6	1
2	20 28.0	1.0 02	117.7	20 58.0	1.0 02	117.7	21 28.0	1.0 02	117.7	21 58.0	1.0 02	117.6	22 28.0	1.0 02	117.6	22 58.0	1.0 02	117.6	23 28.0	1.0 02	117.6	23 58.0	1.0 02	117.6	2
3	20 26.1	1.0 02	116.7	20 57.1	1.0 02	116.7	21 27.1	1.0 02	116.7	21 57.1	1.0 02	116.6	22 27.1	1.0 02	116.6	22 57.1	1.0 02	116.6	23 27.1	1.0 02	116.6	23 57.1	1.0 02	116.6	3
4	20 26.1	1.0 02	115.7	20 56.1	1.0 02	115.7	21 26.1	1.0 02	115.7	21 56.1	1.0 02	115.6	22 26.1	1.0 02	115.6	22 56.1	1.0 02	115.6	23 26.1	1.0 02	115.6	23 56.1	1.0 02	115.6	4
65	20 25.2	1.0 02	114.7	20 55.2	1.0 02	114.7	21 25.2	1.0 02	114.6	21 55.2	1.0 02	114.6	22 25.2	1.0 02	114.6	22 55.2	1.0 02	114.6	23 25.2	1.0 02	114.6	23 55.2	1.0 02	114.6	65
6	20 24.2	1.0 02	113.7	20 54.2	1.0 02	113.7	21 24.2	1.0 02	113.6	21 54.2	1.0 02	113.6	22 24.2	1.0 02	113.6	22 54.2	1.0 02	113.6	23 24.2	1.0 02	113.6	23 54.2	1.0 02	113.6	6
7	20 23.3	1.0 02	112.7	20 53.3	1.0 02	112.7	21 23.3	1.0 02	112.6	21 53.3	1.0 02	112.6	22 23.3	1.0 02	112.6	22 53.3	1.0 02	112.6	23 23.3	1.0 02	112.6	23 53.2	1.0 02	112.6	7
8	20 22.3	1.0 02	111.7	20 52.3	1.0 02	111.6	21 22.3	1.0 02	111.6	21 52.3	1.0 02	111.6	22 22.3	1.0 02	111.6	22 52.3	1.0 02	111.6	23 22.3	1.0 02	111.6	23 52.3	1.0 02	111.6	8
9	20 21.3	1.0 02	110.7	20 51.3	1.0 02	110.6	21 21.3	1.0 02	110.6	21 51.3	1.0 02	110.6	22 21.3	1.0 02	110.6	22 51.3	1.0 02	110.6	23 21.3	1.0 02	110.6	23 51.3	1.0 02	110.6	9
70	20 20.4	1.0 02	109.7	20 50.3	1.0 02	109.6	21 20.3	1.0 02	109.6	21 50.3	1.0 02	109.6	22 20.3	1.0 02	109.6	22 50.3	1.0 02	109.6	23 20.3	1.0 02	109.6	23 50.3	1.0 02	109.6	70
1	20 19.4	1.0 02	108.7	20 49.4	1.0 02	108.6	21 19.4	1.0 02	108.6	21 49.3	1.0 02	108.6	22 19.3	1.0 02	108.6	22 49.3	1.0 02	108.6	23 19.3	1.0 02	108.6	23 49.3	1.0 02	108.6	1
2	20 18.4	1.0 02	107.7	20 48.4	1.0 02	107.6	21 18.4	1.0 02	107.6	21 48.4	1.0 02	107.6	22 18.3	1.0 02	107.6	22 48.3	1.0 02	107.6	23 18.3	1.0 02	107.6	23 48.3	1.0 02	107.6	2
3	20 17.4	1.0 02	106.7	20 47.4	1.0 02	106.6	21 17.4	1.0 02	106.6	21 47.4	1.0 02	106.6	22 17.3	1.0 02	106.6	22 47.3	1.0 02	106.6	23 17.3	1.0 02	106.6	23 47.3	1.0 02	106.6	3
4	20 16.4	1.0 02	105.6	20 46.4	1.0 02	105.6	21 16.4	1.0 02	105.6	21 46.3	1.0 02	105.6	22 16.3	1.0 02	105.6	22 46.3	1.0 02	105.6	23 16.3	1.0 02	105.6	23 46.3	1.0 02	105.6	4
75	20 15.4	1.0 02	104.6	20 45.3	1.0 02	104.6	21 15.3	1.0 02	104.6	21 45.3	1.0 02	104.6	22 15.3	1.0 02	104.6	22 45.3	1.0 02	104.6	23 15.3	1.0 02	104.6	23 45.3	1.0 02	104.6	75
6	20 14.3	1.0 02	103.6	20 44.3	1.0 02	103.6	21 14.3	1.0 02	103.6	21 44.3	1.0 02	103.6	22 14.3	1.0 02	103.6	22 44.3	1.0 02	103.6	23 14.3	1.0 02	103.6	23 44.3	1.0 02	103.6	6
7	20 13.3	1.0 02	102.6	20 43.3	1.0 02	102.6	21 13.3	1.0 02	102.6	21 43.3	1.0 02	102.6	22 13.3	1.0 02	102.6	22 43.3	1.0 02	102.6	23 13.3	1.0 02	102.6	23 43.3	1.0 02	102.6	7
8	20 12.3	1.0 02	101.6	20 42.3	1.0 02	101.6	21 12.3	1.0 02	101.6	21 42.3	1.0 02	101.6	22 12.3	1.0 02	101.6	22 42.3	1.0 02	101.6	23 12.3	1.0 02	101.6	23 42.3	1.0 02	101.6	8
9	20 11.3	1.0 02	100.6	20 41.3	1.0 02	100.6	21 11.3	1.0 02	100.6	21 41.2	1.0 02	100.6	22 11.2	1.0 02	100.6	22 41.2	1.0 02	100.6	23 11.2	1.0 02	100.6	23 41.2	1.0 02	100.6	9
80	20 10.2	1.0 02	99.6	20 40.2	1.0 02	99.6	21 10.2	1.0 02	99.6	21 40.2	1.0 02	99.6	22 10.2	1.0 02	99.6	22 40.2	1.0 02	99.6	23 10.2	1.0 02	99.6	23 40.2	1.0 02	99.6	80
1	20 09.2	1.0 02	98.6	20 39.2	1.0 02	98.6	21 09.2	1.0 02	98.6	21 39.2	1.0 02	98.6	22 09.2	1.0 02	98.6	22 39.2	1.0 02	98.6	23 09.2	1.0 02	98.6	23 39.2	1.0 02	98.6	1
2	20 08.2	1.0 02	97.6	20 38.2	1.0 02	97.6	21 08.2	1.0 02	97.6	21 38.1	1.0 02	97.6	22 08.1	1.0 02	97.6	22 38.1	1.0 02	97.6	23 08.1	1.0 02	97.6	23 38.1	1.0 02	97.6	2
3	20 07.1	1.0 02	96.6	20 37.1	1.0 02	96.6	21 07.1	1.0 02	96.6	21 37.1	1.0 02	96.6	22 07.1	1.0 02	96.6	22 37.1	1.0 02	96.6	23 07.1	1.0 02	96.6	23 37.1	1.0 02	96.6	3
4	20 06.1	1.0 02	95.6	20 36.1	1.0 02	95.6	21 06.1	1.0 02	95.6	21 36.1	1.0 02	95.6	22 06.1	1.0 02	95.6	22 36.1	1.0 02	95.6	23 06.1	1.0 02	95.6	23 36.0	1.0 02	95.6	4
85	20 05.0	1.0 02	94.6	20 35.0	1.0 02	94.6	21 05.0	1.0 02	94.6	21 35.0	1.0 02	94.6	22 05.0	1.0 02	94.6	22 35.0	1.0 02	94.6	23 05.0	1.0 02	94.6	23 35.0	1.0 02	94.6	85
6	20 04.0	1.0 02	93.6	20 34.0	1.0 02	93.6	21 04.0	1.0 02	93.6	21 34.0	1.0 02	93.6	22 04.0	1.0 02	93.6	22 34.0	1.0 02	93.6	23 04.0	1.0 02	93.6	23 34.0	1.0 02	93.6	6
7	20 02.9	1.0 02	92.6	20 32.9	1.0 02	92.6	21 02.9	1.0 02	92.6	21 32.9	1.0 02	92.6	22 02.9	1.0 02	92.6	22 32.9	1.0 02	92.6	23 02.9	1.0 02	92.6	23 32.9	1.0 02	92.6	7
8	20 01.9	1.0 02	91.6	20 31.9	1.0 02	91.6	21 01.9	1.0 02	91.6	21 31.9	1.0 02	91.6	22 01.9	1.0 02	91.6	22 31.9	1.0 02	91.6	23 01.9	1.0 02	91.6	23 31.9	1.0 02	91.6	8
9	20 00.9	1.0 02	90.6	20 30.9	1.0 02	90.6	21 00.8	1.0 02	90.6	21 30.8	1.0 02	90.6	22 00.8	1.0 02	90.6	22 30.8	1.0 02	90.6	23 00.8	1.0 02	90.6	23 30.8	1.0 02	90.6	9
90	19 59.8	1.0 02	89.6	20 29.8	1.0 02	89.6	20 59.8	1.0 02	89.6	21 29.8	1.0 02	89.6	21 59.8	1.0 02	89.6	22 29.8	1.0 02	89.6	22 59.8	1.0 02	89.6	23 29.8	1.0 02	89.6	90

Lat. 89°

H.A.	20° 00' Alt. (Δd Δt)	Az.	20° 30' Alt. (Δd Δt)	Az.	21° 00' Alt. (Δd Δt)	Az.	21° 30' Alt. (Δd Δt)	Az.	22° 00' Alt. (Δd Δt)	Az.	22° 30' Alt. (Δd Δt)	Az.	23° 00' Alt. (Δd Δt)	Az.	23° 30' Alt. (Δd Δt)	Az.	H.A.
91	19 58.8 1.0 02	88.6	20 28.8 1.0 02	88.6	20 58.8 1.0 02	88.6	21 28.7 1.0 02	88.6	21 58.7 1.0 02	88.6	22 28.7 1.0 02	88.6	22 58.7 1.0 02	88.6	23 28.7 1.0 02	88.6	91
2	19 57.7 1.0 02	87.6	20 27.7 1.0 02	87.6	20 57.7 1.0 02	87.6	21 27.7 1.0 02	87.6	21 57.7 1.0 02	87.6	22 27.7 1.0 02	87.6	22 57.7 1.0 02	87.6	23 27.7 1.0 02	87.6	2
3	19 56.7 1.0 02	86.6	20 26.7 1.0 02	86.6	20 56.7 1.0 02	86.6	21 26.7 1.0 02	86.6	21 56.6 1.0 02	86.6	22 26.6 1.0 02	86.6	22 56.6 1.0 02	86.6	23 26.6 1.0 02	86.6	3
4	19 55.6 1.0 02	85.6	20 25.6 1.0 02	85.6	20 55.6 1.0 02	85.6	21 25.6 1.0 02	85.6	21 55.6 1.0 02	85.6	22 25.6 1.0 02	85.6	22 55.6 1.0 02	85.6	23 25.6 1.0 02	85.6	4
95	19 54.6 1.0 02	84.6	20 24.6 1.0 02	84.6	20 54.6 1.0 02	84.6	21 24.6 1.0 02	84.6	21 54.6 1.0 02	84.6	22 24.6 1.0 02	84.6	22 54.6 1.0 02	84.6	23 24.5 1.0 02	84.6	95
6	19 53.5 1.0 02	83.6	20 23.5 1.0 02	83.6	20 53.5 1.0 02	83.6	21 23.5 1.0 02	83.6	21 53.5 1.0 02	83.6	22 23.5 1.0 02	83.6	22 53.5 1.0 02	83.6	23 23.5 1.0 02	83.6	6
7	19 52.5 1.0 02	82.6	20 22.5 1.0 02	82.6	20 52.5 1.0 02	82.6	21 22.5 1.0 02	82.6	21 52.5 1.0 02	82.6	22 22.5 1.0 02	82.6	22 52.5 1.0 02	82.6	23 22.5 1.0 02	82.6	7
8	19 51.5 1.0 02	81.6	20 21.5 1.0 02	81.6	20 51.5 1.0 02	81.6	21 21.4 1.0 02	81.6	21 51.4 1.0 02	81.6	22 21.4 1.0 02	81.6	22 51.4 1.0 02	81.6	23 21.4 1.0 02	81.6	8
9	19 50.4 1.0 02	80.6	20 20.4 1.0 02	80.6	20 50.4 1.0 02	80.6	21 20.4 1.0 02	80.6	21 50.4 1.0 02	80.6	22 20.4 1.0 02	80.6	22 50.4 1.0 02	80.6	23 20.4 1.0 02	80.6	9
100	19 49.4 1.0 02	79.6	20 19.4 1.0 02	79.6	20 49.4 1.0 02	79.6	21 19.4 1.0 02	79.6	21 49.4 1.0 02	79.6	22 19.4 1.0 02	79.6	22 49.4 1.0 02	79.6	23 19.4 1.0 02	79.6	100
1	19 48.4 1.0 02	78.6	20 18.4 1.0 02	78.6	20 48.4 1.0 02	78.6	21 18.4 1.0 02	78.6	21 48.3 1.0 02	78.6	22 18.3 1.0 02	78.6	22 48.3 1.0 02	78.6	23 18.3 1.0 02	78.6	1
2	19 47.3 1.0 02	77.6	20 17.3 1.0 02	77.6	20 47.3 1.0 02	77.6	21 17.3 1.0 02	77.6	21 47.3 1.0 02	77.6	22 17.3 1.0 02	77.6	22 47.3 1.0 02	77.6	23 17.3 1.0 02	77.6	2
3	19 46.3 1.0 02	76.6	20 16.3 1.0 02	76.6	20 46.3 1.0 02	76.6	21 16.3 1.0 02	76.6	21 46.3 1.0 02	76.6	22 16.3 1.0 02	76.6	22 46.3 1.0 02	76.6	23 16.3 1.0 02	76.6	3
4	19 45.3 1.0 02	75.6	20 15.3 1.0 02	75.6	20 45.3 1.0 02	75.6	21 15.3 1.0 02	75.6	21 45.3 1.0 02	75.6	22 15.3 1.0 02	75.6	22 45.3 1.0 02	75.6	23 15.3 1.0 02	75.6	4
105	19 44.3 1.0 02	74.7	20 14.3 1.0 02	74.6	20 44.3 1.0 02	74.6	21 14.3 1.0 02	74.6	21 44.3 1.0 02	74.6	22 14.3 1.0 02	74.6	22 44.3 1.0 02	74.6	23 14.3 1.0 02	74.6	105
6	19 43.3 1.0 02	73.7	20 13.3 1.0 02	73.6	20 43.3 1.0 02	73.6	21 13.3 1.0 02	73.6	21 43.3 1.0 02	73.6	22 13.3 1.0 02	73.6	22 43.3 1.0 02	73.6	23 13.3 1.0 02	73.6	6
7	19 42.3 1.0 02	72.7	20 12.3 1.0 02	72.6	20 42.3 1.0 02	72.6	21 12.3 1.0 02	72.6	21 42.3 1.0 02	72.6	22 12.3 1.0 02	72.6	22 42.3 1.0 02	72.6	23 12.3 1.0 02	72.6	7
8	19 41.3 1.0 02	71.7	20 11.3 1.0 02	71.6	20 41.3 1.0 02	71.6	21 11.3 1.0 02	71.6	21 41.3 1.0 02	71.6	22 11.3 1.0 02	71.6	22 41.3 1.0 02	71.6	23 11.3 1.0 02	71.6	8
9	19 40.3 1.0 02	70.7	20 10.3 1.0 02	70.7	20 40.3 1.0 02	70.6	21 10.3 1.0 02	70.6	21 40.3 1.0 02	70.6	22 10.3 1.0 02	70.6	22 40.3 1.0 02	70.6	23 10.3 1.0 02	70.6	9
110	19 39.3 1.0 02	69.7	20 09.3 1.0 02	69.7	20 39.3 1.0 02	69.6	21 09.3 1.0 02	69.6	21 39.3 1.0 02	69.6	22 09.3 1.0 02	69.6	22 39.3 1.0 02	69.6	23 09.3 1.0 02	69.6	110
1	19 38.3 1.0 02	68.7	20 08.3 1.0 02	68.7	20 38.3 1.0 02	68.6	21 08.3 1.0 02	68.6	21 38.3 1.0 02	68.6	22 08.3 1.0 02	68.6	22 38.3 1.0 02	68.6	23 08.3 1.0 02	68.6	1
2	19 37.4 1.0 02	67.7	20 07.4 1.0 02	67.7	20 37.4 1.0 02	67.6	21 07.3 1.0 02	67.6	21 37.3 1.0 02	67.6	22 07.3 1.0 02	67.6	22 37.3 1.0 02	67.6	23 07.3 1.0 02	67.6	2
3	19 36.4 1.0 02	66.7	20 06.4 1.0 02	66.7	20 36.4 1.0 02	66.7	21 06.4 1.0 02	66.6	21 36.4 1.0 02	66.6	22 06.4 1.0 02	66.6	22 36.4 1.0 02	66.6	23 06.4 1.0 02	66.6	3
4	19 35.4 1.0 02	65.7	20 05.4 1.0 02	65.7	20 35.4 1.0 02	65.7	21 05.4 1.0 02	65.6	21 35.4 1.0 02	65.6	22 05.4 1.0 02	65.6	22 35.4 1.0 02	65.6	23 05.4 1.0 02	65.6	4
115	19 34.5 1.0 02	64.7	20 04.5 1.0 02	64.7	20 34.5 1.0 02	64.7	21 04.5 1.0 02	64.6	21 34.5 1.0 02	64.6	22 04.5 1.0 02	64.6	22 34.5 1.0 02	64.6	23 04.5 1.0 02	64.6	115
6	19 33.5 1.0 02	63.7	20 03.5 1.0 02	63.7	20 33.5 1.0 02	63.7	21 03.5 1.0 02	63.7	21 33.5 1.0 02	63.6	22 03.5 1.0 02	63.6	22 33.5 1.0 02	63.6	23 03.5 1.0 02	63.6	6
7	19 32.6 1.0 02	62.7	20 02.6 1.0 02	62.7	20 32.6 1.0 02	62.7	21 02.6 1.0 02	62.7	21 32.6 1.0 02	62.6	22 02.6 1.0 02	62.6	22 32.6 1.0 02	62.6	23 02.6 1.0 02	62.6	7
8	19 31.7 1.0 02	61.7	20 01.7 1.0 02	61.7	20 31.7 1.0 02	61.7	21 01.7 1.0 02	61.7	21 31.7 1.0 02	61.6	22 01.7 1.0 02	61.6	22 31.7 1.0 02	61.6	23 01.7 1.0 02	61.6	8
9	19 30.8 1.0 02	60.7	20 00.8 1.0 02	60.7	20 30.8 1.0 02	60.7	21 00.8 1.0 02	60.7	21 30.8 1.0 02	60.7	22 00.7 1.0 02	60.6	22 30.7 1.0 02	60.6	23 00.7 1.0 02	60.6	9
120	19 29.9 1.0 02	59.7	19 59.9 1.0 02	59.7	20 29.9 1.0 02	59.7	20 59.8 1.0 02	59.7	21 29.8 1.0 02	59.7	21 59.8 1.0 02	59.6	22 29.8 1.0 02	59.6	22 59.8 1.0 02	59.6	120
1	19 29.0 1.0 02	58.7	19 59.0 1.0 01	58.7	20 29.0 1.0 02	58.7	20 58.9 1.0 01	58.7	21 28.9 1.0 02	58.7	21 58.9 1.0 01	58.6	22 28.9 1.0 01	58.6	22 58.9 1.0 01	58.6	1
2	19 28.1 1.0 01	57.7	19 58.1 1.0 01	57.7	20 28.1 1.0 01	57.7	20 58.1 1.0 01	57.7	21 28.1 1.0 01	57.7	21 58.1 1.0 01	57.7	22 28.0 1.0 01	57.6	22 58.0 1.0 01	57.6	2
3	19 27.2 1.0 01	56.7	19 57.2 1.0 01	56.7	20 27.2 1.0 01	56.7	20 57.2 1.0 01	56.7	21 27.2 1.0 01	56.7	21 57.2 1.0 01	56.7	22 27.2 1.0 01	56.6	22 57.2 1.0 01	56.6	3
4	19 26.3 1.0 01	55.7	19 56.3 1.0 01	55.7	20 26.3 1.0 01	55.7	20 56.3 1.0 01	55.7	21 26.3 1.0 01	55.7	21 56.3 1.0 01	55.7	22 26.3 1.0 01	55.7	22 56.3 1.0 01	55.6	4
125	19 25.5 1.0 01	54.7	19 55.5 1.0 01	54.7	20 25.5 1.0 01	54.7	20 55.4 1.0 01	54.7	21 25.4 1.0 01	54.7	21 55.4 1.0 01	54.7	22 25.4 1.0 01	54.7	22 55.4 1.0 01	54.6	125
6	19 24.6 1.0 01	53.7	19 54.6 1.0 01	53.7	20 24.6 1.0 01	53.7	20 54.6 1.0 01	53.7	21 24.6 1.0 01	53.7	21 54.6 1.0 01	53.7	22 24.6 1.0 01	53.7	22 54.6 1.0 01	53.7	6
7	19 23.8 1.0 01	52.7	19 53.8 1.0 01	52.7	20 23.8 1.0 01	52.7	20 53.8 1.0 01	52.7	21 23.8 1.0 01	52.7	21 53.8 1.0 01	52.7	22 23.8 1.0 01	52.7	22 53.7 1.0 01	52.7	7
8	19 22.9 1.0 01	51.7	19 52.9 1.0 01	51.7	20 22.9 1.0 01	51.7	20 52.9 1.0 01	51.7	21 22.9 1.0 01	51.7	21 52.9 1.0 01	51.7	22 22.9 1.0 01	51.7	22 52.9 1.0 01	51.7	8
9	19 22.1 1.0 01	50.7	19 52.1 1.0 01	50.7	20 22.1 1.0 01	50.7	20 52.1 1.0 01	50.7	21 22.1 1.0 01	50.7	21 52.1 1.0 01	50.7	22 22.1 1.0 01	50.7	22 52.1 1.0 01	50.7	9
130	19 21.3 1.0 01	49.7	19 51.3 1.0 01	49.7	20 21.3 1.0 01	49.7	20 51.3 1.0 01	49.7	21 21.3 1.0 01	49.7	21 51.3 1.0 01	49.7	22 21.3 1.0 01	49.7	22 51.3 1.0 01	49.7	130
1	19 20.5 1.0 01	48.7	19 50.5 1.0 01	48.7	20 20.5 1.0 01	48.7	20 50.5 1.0 01	48.7	21 20.5 1.0 01	48.7	21 50.5 1.0 01	48.7	22 20.5 1.0 01	48.7	22 50.5 1.0 01	48.7	1
2	19 19.7 1.0 01	47.7	19 49.7 1.0 01	47.7	20 19.7 1.0 01	47.7	20 49.7 1.0 01	47.7	21 19.7 1.0 01	47.7	21 49.7 1.0 01	47.7	22 19.7 1.0 01	47.7	22 49.7 1.0 01	47.7	2
3	19 19.0 1.0 01	46.7	19 49.0 1.0 01	46.7	20 19.0 1.0 01	46.7	20 49.0 1.0 01	46.7	21 19.0 1.0 01	46.7	21 49.0 1.0 01	46.7	22 19.0 1.0 01	46.7	22 49.0 1.0 01	46.7	3
4	19 18.2 1.0 01	45.7	19 48.2 1.0 01	45.7	20 18.2 1.0 01	45.7	20 48.2 1.0 01	45.7	21 18.2 1.0 01	45.7	21 48.2 1.0 01	45.7	22 18.2 1.0 01	45.7	22 48.2 1.0 01	45.7	4
135	19 17.5 1.0 01	44.7	19 47.5 1.0 01	44.7	20 17.5 1.0 01	44.7	20 47.5 1.0 01	44.7	21 17.5 1.0 01	44.7	21 47.5 1.0 01	44.7	22 17.5 1.0 01	44.7	22 47.5 1.0 01	44.7	135
6	19 16.7 1.0 01	43.8	19 46.7 1.0 01	43.7	20 16.7 1.0 01	43.7	20 46.7 1.0 01	43.7	21 16.7 1.0 01	43.7	21 46.7 1.0 01	43.7	22 16.7 1.0 01	43.7	22 46.7 1.0 01	43.7	6
7	19 16.0 1.0 01	42.8	19 46.0 1.0 01	42.8	20 16.0 1.0 01	42.7	20 46.0 1.0 01	42.7	21 16.0 1.0 01	42.7	21 46.0 1.0 01	42.7	22 16.0 1.0 01	42.7	22 46.0 1.0 01	42.7	7
8	19 15.3 1.0 01	41.8	19 45.3 1.0 01	41.8	20 15.3 1.0 01	41.7	20 45.3 1.0 01	41.7	21 15.3 1.0 01	41.7	21 45.3 1.0 01	41.7	22 15.3 1.0 01	41.7	22 45.3 1.0 01	41.7	8
9	19 14.6 1.0 01	40.8	19 44.6 1.0 01	40.8	20 14.6 1.0 01	40.8	20 44.6 1.0 01	40.7	21 14.6 1.0 01	40.7	21 44.6 1.0 01	40.7	22 14.6 1.0 01	40.7	22 44.6 1.0 01	40.7	9
140	19 14.0 1.0 01	39.8	19 44.0 1.0 01	39.8	20 14.0 1.0 01	39.8	20 44.0 1.0 01	39.8	21 14.0 1.0 01	39.7	21 43.9 1.0 01	39.7	22 13.9 1.0 01	39.7	22 43.9 1.0 01	39.7	140
1	19 13.3 1.0 01	38.8	19 43.3 1.0 01	38.8	20 13.3 1.0 01	38.8	20 43.3 1.0 01	38.8	21 13.3 1.0 01	38.8	21 43.3 1.0 01	38.7	22 13.3 1.0 01	38.7	22 43.3 1.0 01	38.7	1
2	19 12.6 1.0 01	37.8	19 42.6 1.0 01	37.8	20 12.6 1.0 01	37.8	20 42.6 1.0 01	37.8	21 12.6 1.0 01	37.8	21 42.6 1.0 01	37.8	22 12.6 1.0 01	37.7	22 42.6 1.0 01	37.7	2
3	19 12.0 1.0 01	36.8	19 42.0 1.0 01	36.8	20 12.0 1.0 01	36.8	20 42.0 1.0 01	36.8	21 12.0 1.0 01	36.8	21 42.0 1.0 01	36.8	22 12.0 1.0 01	36.8	22 42.0 1.0 01	36.7	3
4	19 11.4 1.0 01	35.8	19 41.4 1.0 01	35.8	20 11.4 1.0 01	35.8	20 41.4 1.0 01	35.8	21 11.4 1.0 01	35.8	21 41.4 1.0 01	35.8	22 11.4 1.0 01	35.8	22 41.4 1.0 01	35.8	4
145	19 10.8 1.0 01	34.8	19 40.8 1.0 01	34.8	20 10.8 1.0 01	34.8	20 40.8 1.0 01	34.8	21 10.8 1.0 01	34.8	21 40.8 1.0 01	34.8	22 10.8 1.0 01	34.8	22 40.8 1.0 01	34.8	145
6	19 10.2 1.0 01	33.8	19 40.2 1.0 01	33.8	20 10.2 1.0 01	33.8	20 40.2 1.0 01	33.8	21 10.2 1.0 01	33.8	21 40.2 1.0 01	33.8	22 10.2 1.0 01	33.8	22 40.2 1.0 01	33.8	6
7	19 09.6 1.0 01	32.8	19 39.6 1.0 01	32.8	20 09.6 1.0 01	32.8	20 39.6 1.0 01	32.8	21 09.6 1.0 01	32.8	21 39.6 1.0 01	32.8	22 09.6 1.0 01	32.8	22 39.6 1.0 01	32.8	7
8	19 09.1 1.0 01	31.8	19 39.1 1.0 01	31.8	20 09.1 1.0 01	31.8	20 39.1 1.0 01	31.8	21 09.1 1.0 01	31.8	21 39.1 1.0 01	31.8	22 09.1 1.0 01	31.8	22 39.1 1.0 01	31.8	8
9	19 08.5 1.0 01	30.8	19 38.5 1.0 01	30.8	20 08.5 1.0 01	30.8	20 38.5 1.0 01	30.8	21 08.5 1.0 01	30.8	21 38.5 1.0 01	30.8	22 08.5 1.0 01	30.8	22 38.5 1.0 01	30.8	9
150	19 08.0 1.0 01	29.8	19 38.0 1.0 01	29.8	20 08.0 1.0 01	29.8	20 38.0 1.0 01	29.8	21 08.0 1.0 01	29.8	21 38.0 1.0 01	29.8	22 08.0 1.0 01	29.8	22 38.0 1.0 01	29.8	150
1	19 07.5 1.0 01	28.8	19 37.5 1.0 01	28.8	20 07.5 1.0 01	28.8	20 37.5 1.0 01	28.8	21 07.5 1.0 01	28.8	21 37.5 1.0 01	28.8	22 07.5 1.0 01	28.8	22 37.5 1.0 01	28.8	1
2	19 07.0 1.0 01	27.8	19 37.0 1.0 01	27.8	20 07.0 1.0 01	27.8	20 37.0 1.0 01	27.8	21 07.0 1.0 01	27.8	21 37.0 1.0 01	27.8	22 07.0 1.0 01	27.8	22 37.0 1.0 01	27.8	2
3	19 06.5 1.0 01	26.8	19 36.5 1.0 01	26.8	20 06.5 1.0 01	26.8	20 36.5 1.0 01	26.8	21 06.5 1.0 01	26.8	21 36.5 1.0 01	26.8	22 06.5 1.0 01	26.8	22 36.5 1.0 01	26.8	3
4	19 06.0 1.0 01	25.8	19 36.0 1.0 01	25.8	20 06.0 1.0 01	25.8	20 36.0 1.0 01	25.8	21 06.0 1.0 01	25.8	21 36.0 1.0 01	25.8	22 06.0 1.0 01	25.8	22 36.0 1.0 01	25.8	4
155	19 05.6 1.0 01	24.9	19 35.6 1.0 01	24.8	20 05.6 1.0 01	24.8	20 35.6 1.0 01	24.8	21 05.6 1.0 01	24.8	21 35.6 1.0 01	24.8	22 05.6 1.0 01	24.8	22 35.6 1.0 01	24.8	155
6	19 05.2 1.0 01	23.9	19 35.2 1.0 01	23.9	20 05.2 1.0 01	23.8	20 35.2 1.0 01	23.8	21 05.2 1.0 01	23.8	21 35.2 1.0 01	23.8	22 05.2 1.0 01	23.8	22 35.2 1.0 01	23.8	6
7	19 04.7 1.0 01	22.9	19 34.7 1.0 01	22.9	20 04.7 1.0 01	22.9	20 34.7 1.0 01	22.9	21 04.7 1.0 01	22.8	21 34.7 1.0 01	22.8	22 04.7 1.0 01	22.8	22 34.7 1.0 01	22.8	7
8	19 04.3 1.0 01	21.9	19 34.3 1.0 01	21.9	20 04.3 1.0 01	21.9	20 34.3 1.0 01	21.9	21 04.3 1.0 01	21.9	21 34.3 1.0 01	21.8	22 04.3 1.0 01	21.8	22 34.3 1.0 01	21.8	8
9	19 04.0 1.0 01	20.9	19 34.0 1.0 01	20.9	20 04.0 1.0 01	20.9	20 34.0 1.0 01	20.9	21 04.0 1.0 01	20.9	21 34.0 1.0 01	20.9	22 04.0 1.0 01	20.9	22 34.0 1.0 01	20.8	9
160	19 03.6 1.0 01	19.9	19 33.6 1.0 01	19.9	20 03.6 1.0 01	19.9	20 33.6 1.0 01	19.9	21 03.6 1.0 01	19.9	21 33.6 1.0 01	19.9	22 03.6 1.0 01	19.9	22 33.6 1.0 01	19.9	160
1	19 03.2 1.0 01	18.9	19 33.2 1.0 01	18.9	20 03.2 1.0 01	18.9	20 33.2 1.0 01	18.9	21 03.2 1.0 01	18.9	21 33.2 1.0 01	18.9	22 03.2 1.0 01	18.9	22 33.2 1.0 01	18.9	1
2	19 02.9 1.0 01	17.9	19 32.9 1.0 01	17.9	20 02.9 1.0 01	17.9	20 32.9 1.0 01	17.9	21 02.9 1.0 01	17.9	21 32.9 1.0 01	17.9	22 02.9 1.0 01	17.9	22 32.9 1.0 01	17.9	2
3	19 02.6 1.0 01	16.9	19 32.6 1.0 00	16.9	20 02.6 1.0 00	16.9	20 32.6 1.0 00	16.9	21 02.6 1.0 00	16.9	21 32.6 1.0 00	16.9	22 02.6 1.0 00	16.9	22 32.6 1.0 00	16.9	3
4	19 02.3 1.0 00	15.9	19 32.3 1.0 00	15.9	20 02.3 1.0 00	15.9	20 32.3 1.0 00	15.9	21 02.3 1.0 00	15.9	21 32.3 1.0 00	15.9	22 02.3 1.0 00	15.9	22 32.3 1.0 00	15.9	4
165	19 02.0 1.0 00	14.9	19 32.0 1.0 00	14.9	20 02.0 1.0 00	14.9	20 32.0 1.0 00	14.9	21 02.0 1.0 00	14.9	21 32.0 1.0 00	14.9	22 02.0 1.0 00	14.9	22 32.0 1.0 00	14.9	165
6	19 01.8 1.0 00	13.9	19 31.8 1.0 00	13.9	20 01.8 1.0 00	13.9	20 31.8 1.0 00	13.9	21 01.8 1.0 00	13.9	21 31.8 1.0 00	13.9	22 01.8 1.0 00	13.9	22 31.8 1.0 00	13.9	6
7	19 01.5 1.0 00	12.9	19 31.5 1.0 00	12.9	20 01.5 1.0 00	12.9	20 31.5 1.0 00	12.9	21 01.5 1.0 00	12.9	21 31.5 1.0 00	12.9	22 01.5 1.0 00	12.9	22 31.5 1.0 00	12.9	7
8	19 01.3 1.0 00	11.9	19 31.3 1.0 00	11.9	20 01.3 1.0 00	11.9	20 31.3 1.0 00	11.9	21 01.3 1.0 00	11.9	21 31.3 1.0 00	11.9	22 01.3 1.0 00	11.9	22 31.3 1.0 00	11.9	8
9	19 01.1 1.0 00	10.9	19 31.1 1.0 00	10.9	20 01.1 1.0 00	10.9	20 31.1 1.0 00	10.9	21 01.1 1.0 00	10.9	21 31.1 1.0 00	10.9	22 01.1 1.0 00	10.9	22 31.1 1.0 00	10.9	9
170	19 00.9 1.0 00	09.9	19 30.9 1.0 00	09.9	20 00.9 1.0 00	09.9	20 30.9 1.0 00	09.9	21 00.9 1.0 00	09.9	21 30.9 1.0 00	09.9	22 00.9 1.0 00	09.9	22 30.9 1.0 00	09.9	170
1	19 00.7 1.0 00	08.9	19 30.7 1.0 00	08.9	20 00.7 1.0 00	08.9	20 30.7 1.0 00	08.9	21 00.7 1.0 00	08.9	21 30.7 1.0 00	08.9	22 00.7 1.0 00	08.9	22 30.7 1.0 00	08.9	1
2	19 00.6 1.0 00	08.0	19 30.6 1.0 00	07.9	20 00.6 1.0 00	07.9	20 30.6 1.0 00	07.9	21 00.6 1.0 00	07.9	21 30.6 1.0 00	07.9	22 00.6 1.0 00	07.9	22 30.6 1.0 00	07.9	2
3	19 00.4 1.0 00	07.0	19 30.3 1.0 00	07.0	20 00.4 1.0 00	07.0	20 30.4 1.0 00	07.0	21 00.4 1.0 00	07.0	21 30.4 1.0 00	07.0	22 00.4 1.0 00	06.9	22 30.4 1.0 00	06.9	3
4	19 00.3 1.0 00	06.0	19 30.3 1.0 00	06.0	20 00.3 1.0 00	06.0	20 30.3 1.0 00	06.0	21 00.3 1.0 00	06.0	21 30.3 1.0 00	06.0	22 00.3 1.0 00	06.0	22 30.3 1.0 00	06.0	4
175	19 00.2 1.0 00	05.0	19 30.2 1.0 00	05.0	20 00.2 1.0 00	05.0	20 30.2 1.0 00	05.0	21 00.2 1.0 00	05.0	21 30.2 1.0 00	05.0	22 00.2 1.0 00	05.0	22 30.2 1.0 00	05.0	175
6	19 00.1 1.0 00	04.0	19 30.1 1.0 00	04.0	20 00.1 1.0 00	04.0	20 30.1 1.0 00	04.0	21 00.1 1.0 00	04.0	21 30.1 1.0 00	04.0	22 00.1 1.0 00	04.0	22 30.1 1.0 00	04.0	6
7	19 00.1 1.0 00	03.0	19 30.1 1.0 00	03.0	20 00.1 1.0 00	03.0	20 30.1 1.0 00	03.0	21 00.1 1.0 00	03.0	21 30.1 1.0 00	03.0	22 00.1 1.0 00	03.0	22 30.1 1.0 00	03.0	7
8	19 00.0 1.0 00	02.0	19 30.0 1.0 00	02.0	20 00.0 1.0 00	02.0	20 30.0 1.0 00	02.0	21 00.0 1.0 00	02.0	21 30.0 1.0 00	02.0	22 00.0 1.0 00	02.0	22 30.0 1.0 00	02.0	8
9	19 00.0 1.0 00	01.0	19 30.0 1.0 00	01.0	20 00.0 1.0 00	01.0	20 30.0 1.0 00	01.0	21 00.0 1.0 00	01.0	21 30.0 1.0 00	01.0	22 00.0 1.0 00	01.0	22 30.0 1.0 00	01.0	9
180	19 00.0 1.0 00	00.0	19 30.0 1.0 00	00.0	20 00.0 1.0 00	00.0	20 30.0 1.0 00	00.0	21 00.0 1.0 00	00.0	21 30.0 1.0 00	00.0	22 00.0 1.0 00	00.0	22 30.0 1.0 00	00.0	180

Lat. 39°

Each cell lists: Alt. (° ′)   Δd Δt   Az.

H.A.	24° 00′	24° 30′	25° 00′	25° 30′	26° 00′	26° 30′	27° 00′	27° 30′	H.A.
00	25 00.0 1.0 00 180.0	25 30.0 1.0 00 180.0	26 00.0 1.0 00 180.0	26 30.0 1.0 00 180.0	27 00.0 1.0 00 180.0	27 30.0 1.0 00 180.0	28 00.0 1.0 00 180.0	28 30.0 1.0 00 180.0	00
1	25 00.0 1.0 00 179.0	25 30.0 1.0 00 179.0	26 00.0 1.0 00 179.0	26 30.0 1.0 00 179.0	27 00.0 1.0 00 179.0	27 30.0 1.0 00 179.0	28 00.0 1.0 00 179.0	28 30.0 1.0 00 179.0	1
2	25 00.0 1.0 00 178.0	25 30.0 1.0 00 178.0	26 00.0 1.0 00 178.0	26 30.0 1.0 00 178.0	27 00.0 1.0 00 178.0	27 30.0 1.0 00 178.0	28 00.0 1.0 00 178.0	28 30.0 1.0 00 178.0	2
3	24 59.9 1.0 00 177.0	25 29.9 1.0 00 177.0	25 59.9 1.0 00 177.0	26 29.9 1.0 00 177.0	26 59.9 1.0 00 177.0	27 29.9 1.0 00 177.0	27 59.9 1.0 00 177.0	28 29.9 1.0 00 177.0	3
4	24 59.8 1.0 00 176.0	25 29.9 1.0 00 176.0	25 59.9 1.0 00 176.0	26 29.9 1.0 00 176.0	26 59.9 1.0 00 176.0	27 29.9 1.0 00 176.0	27 59.9 1.0 00 176.0	28 29.9 1.0 00 176.0	4
05	24 59.8 1.0 00 175.0	25 29.8 1.0 00 175.0	25 59.8 1.0 00 175.0	26 29.8 1.0 00 175.0	26 59.8 1.0 00 175.0	27 29.8 1.0 00 175.0	27 59.8 1.0 00 175.0	28 29.8 1.0 00 175.0	05
6	24 59.7 1.0 00 174.0	25 29.7 1.0 00 174.0	25 59.7 1.0 00 173.9	26 29.7 1.0 00 173.9	26 59.7 1.0 00 173.9	27 29.7 1.0 00 173.9	27 59.7 1.0 00 173.9	28 29.7 1.0 00 173.9	6
7	24 59.5 1.0 00 172.9	25 29.5 1.0 00 172.9	25 59.5 1.0 00 172.9	26 29.5 1.0 00 172.9	26 59.5 1.0 00 172.9	27 29.5 1.0 00 172.9	27 59.5 1.0 00 172.9	28 29.5 1.0 00 172.9	7
8	24 59.4 1.0 00 171.9	25 29.4 1.0 00 171.9	25 59.4 1.0 00 171.9	26 29.4 1.0 00 171.9	26 59.4 1.0 00 171.9	27 29.4 1.0 00 171.9	27 59.4 1.0 00 171.9	28 29.4 1.0 00 171.9	8
9	24 59.3 1.0 00 170.9	25 29.3 1.0 00 170.9	25 59.3 1.0 00 170.9	26 29.3 1.0 00 170.9	26 59.3 1.0 00 170.9	27 29.3 1.0 00 170.9	27 59.3 1.0 00 170.9	28 29.3 1.0 00 170.9	9
10	24 59.1 1.0 00 169.9	25 29.1 1.0 00 169.9	25 59.1 1.0 00 169.9	26 29.1 1.0 00 169.9	26 59.1 1.0 00 169.9	27 29.1 1.0 00 169.9	27 59.1 1.0 00 169.9	28 29.1 1.0 00 169.9	10
1	24 58.9 1.0 00 168.9	25 28.9 1.0 00 168.9	25 58.9 1.0 00 168.9	26 28.9 1.0 00 168.9	26 58.9 1.0 00 168.9	27 28.9 1.0 00 168.9	27 58.9 1.0 00 168.9	28 28.9 1.0 00 168.9	1
2	24 58.7 1.0 00 167.9	25 28.7 1.0 00 167.9	25 58.7 1.0 00 167.9	26 28.7 1.0 00 167.9	26 58.7 1.0 00 167.9	27 28.7 1.0 00 167.9	27 58.7 1.0 00 167.9	28 28.7 1.0 00 167.9	2
3	24 58.5 1.0 00 166.9	25 28.5 1.0 00 166.9	25 58.5 1.0 00 166.9	26 28.5 1.0 00 166.9	26 58.5 1.0 00 166.9	27 28.4 1.0 00 166.9	27 58.4 1.0 00 166.9	28 28.4 1.0 00 166.9	3
4	24 58.2 1.0 00 165.9	25 28.2 1.0 00 165.9	25 58.2 1.0 00 165.9	26 28.2 1.0 00 165.9	26 58.2 1.0 00 165.9	27 28.2 1.0 00 165.9	27 58.2 1.0 00 165.9	28 28.2 1.0 00 165.9	4
15	24 57.9 1.0 00 164.9	25 27.9 1.0 00 164.9	25 57.9 1.0 00 164.9	26 27.9 1.0 00 164.9	26 57.9 1.0 00 164.9	27 27.9 1.0 00 164.9	27 57.9 1.0 00 164.9	28 27.9 1.0 00 164.9	15
6	24 57.7 1.0 01 163.9	25 27.7 1.0 00 163.9	25 57.7 1.0 00 163.9	26 27.7 1.0 00 163.9	26 57.7 1.0 00 163.9	27 27.7 1.0 00 163.9	27 57.7 1.0 00 163.9	28 27.7 1.0 00 163.9	6
7	24 57.4 1.0 01 162.9	25 27.4 1.0 01 162.9	25 57.4 1.0 01 162.9	26 27.4 1.0 01 162.9	26 57.4 1.0 01 162.9	27 27.4 1.0 01 162.9	27 57.4 1.0 01 162.8	28 27.4 1.0 01 162.8	7
8	24 57.0 1.0 01 161.9	25 27.0 1.0 01 161.9	25 57.0 1.0 01 161.9	26 27.0 1.0 01 161.8	26 57.0 1.0 01 161.8	27 27.0 1.0 01 161.8	27 57.0 1.0 01 161.8	28 27.0 1.0 01 161.8	8
9	24 56.7 1.0 01 160.9	25 26.7 1.0 01 160.9	25 56.7 1.0 01 160.8	26 26.7 1.0 01 160.8	26 56.7 1.0 01 160.8	27 26.7 1.0 01 160.8	27 56.7 1.0 01 160.8	28 26.7 1.0 01 160.8	9
20	24 56.4 1.0 01 159.8	25 26.4 1.0 01 159.8	25 56.4 1.0 01 159.8	26 26.4 1.0 01 159.8	26 56.4 1.0 01 159.8	27 26.4 1.0 01 159.8	27 56.4 1.0 01 159.8	28 26.3 1.0 01 159.8	20
1	24 56.0 1.0 01 158.8	25 26.0 1.0 01 158.8	25 56.0 1.0 01 158.8	26 26.0 1.0 01 158.8	26 56.0 1.0 01 158.8	27 26.0 1.0 01 158.8	27 56.0 1.0 01 158.8	28 26.0 1.0 01 158.8	1
2	24 55.6 1.0 01 157.8	25 25.6 1.0 01 157.8	25 55.6 1.0 01 157.8	26 25.6 1.0 01 157.8	26 55.6 1.0 01 157.8	27 25.6 1.0 01 157.8	27 55.6 1.0 01 157.8	28 25.6 1.0 01 157.8	2
3	24 55.2 1.0 01 156.8	25 25.2 1.0 01 156.8	25 55.2 1.0 01 156.8	26 25.2 1.0 01 156.8	26 55.2 1.0 01 156.8	27 25.2 1.0 01 156.8	27 55.2 1.0 01 156.8	28 25.2 1.0 01 156.8	3
4	24 54.8 1.0 01 155.8	25 24.8 1.0 01 155.8	25 54.8 1.0 01 155.8	26 24.8 1.0 01 155.8	26 54.8 1.0 01 155.8	27 24.8 1.0 01 155.8	27 54.8 1.0 01 155.8	28 24.8 1.0 01 155.8	4
25	24 54.3 1.0 01 154.8	25 24.3 1.0 01 154.8	25 54.3 1.0 01 154.8	26 24.3 1.0 01 154.8	26 54.3 1.0 01 154.8	27 24.3 1.0 01 154.8	27 54.3 1.0 01 154.8	28 24.3 1.0 01 154.8	25
6	24 53.9 1.0 01 153.8	25 23.9 1.0 01 153.8	25 53.9 1.0 01 153.8	26 23.9 1.0 01 153.8	26 53.9 1.0 01 153.8	27 23.9 1.0 01 153.8	27 53.9 1.0 01 153.8	28 23.9 1.0 01 153.8	6
7	24 53.4 1.0 01 152.8	25 23.4 1.0 01 152.8	25 53.4 1.0 01 152.8	26 23.4 1.0 01 152.8	26 53.4 1.0 01 152.8	27 23.4 1.0 01 152.8	27 53.4 1.0 01 152.8	28 23.4 1.0 01 152.8	7
8	24 52.9 1.0 01 151.8	25 22.9 1.0 01 151.8	25 52.9 1.0 01 151.8	26 22.9 1.0 01 151.8	26 52.9 1.0 01 151.8	27 22.9 1.0 01 151.8	27 52.9 1.0 01 151.8	28 22.9 1.0 01 151.8	8
9	24 52.4 1.0 01 150.8	25 22.4 1.0 01 150.8	25 52.4 1.0 01 150.8	26 22.4 1.0 01 150.8	26 52.4 1.0 01 150.8	27 22.4 1.0 01 150.8	27 52.4 1.0 01 150.7	28 22.4 1.0 01 150.7	9
30	24 51.9 1.0 01 149.8	25 21.9 1.0 01 149.8	25 51.9 1.0 01 149.8	26 21.9 1.0 01 149.8	26 51.9 1.0 01 149.8	27 21.9 1.0 01 149.7	27 51.9 1.0 01 149.7	28 21.9 1.0 01 149.7	30
1	24 51.4 1.0 01 148.8	25 21.4 1.0 01 148.8	25 51.4 1.0 01 148.8	26 21.4 1.0 01 148.7	26 51.4 1.0 01 148.7	27 21.4 1.0 01 148.7	27 51.4 1.0 01 148.7	28 21.4 1.0 01 148.7	1
2	24 50.8 1.0 01 147.8	25 20.8 1.0 01 147.8	25 50.8 1.0 01 147.7	26 20.8 1.0 01 147.7	26 50.8 1.0 01 147.7	27 20.8 1.0 01 147.7	27 50.8 1.0 01 147.7	28 20.8 1.0 01 147.7	2
3	24 50.2 1.0 01 146.8	25 20.2 1.0 01 146.7	25 50.2 1.0 01 146.7	26 20.2 1.0 01 146.7	26 50.2 1.0 01 146.7	27 20.2 1.0 01 146.7	27 50.2 1.0 01 146.7	28 20.2 1.0 01 146.7	3
4	24 49.7 1.0 01 145.7	25 19.7 1.0 01 145.7	25 49.7 1.0 01 145.7	26 19.7 1.0 01 145.7	26 49.7 1.0 01 145.7	27 19.7 1.0 01 145.7	27 49.7 1.0 01 145.7	28 19.7 1.0 01 145.7	4
35	24 49.1 1.0 01 144.7	25 19.1 1.0 01 144.7	25 49.1 1.0 01 144.7	26 19.1 1.0 01 144.7	26 49.1 1.0 01 144.7	27 19.1 1.0 01 144.7	27 49.1 1.0 01 144.7	28 19.1 1.0 01 144.7	35
6	24 48.5 1.0 01 143.7	25 18.5 1.0 01 143.7	25 48.5 1.0 01 143.7	26 18.5 1.0 01 143.7	26 48.5 1.0 01 143.7	27 18.5 1.0 01 143.7	27 48.4 1.0 01 143.7	28 18.4 1.0 01 143.7	6
7	24 47.8 1.0 01 142.7	25 17.8 1.0 01 142.7	25 47.8 1.0 01 142.7	26 17.8 1.0 01 142.7	26 47.8 1.0 01 142.7	27 17.8 1.0 01 142.7	27 47.8 1.0 01 142.7	28 17.7 1.0 01 142.7	7
8	24 47.2 1.0 01 141.7	25 17.2 1.0 01 141.7	25 47.2 1.0 01 141.7	26 17.2 1.0 01 141.7	26 47.2 1.0 01 141.7	27 17.2 1.0 01 141.7	27 47.2 1.0 01 141.7	28 17.2 1.0 01 141.7	8
9	24 46.5 1.0 01 140.7	25 16.5 1.0 01 140.7	25 46.5 1.0 01 140.7	26 16.5 1.0 01 140.7	26 46.5 1.0 01 140.7	27 16.5 1.0 01 140.7	27 46.5 1.0 01 140.7	28 16.5 1.0 01 140.7	9
40	24 45.9 1.0 01 139.7	25 15.9 1.0 01 139.7	25 45.9 1.0 01 139.7	26 15.9 1.0 01 139.7	26 45.9 1.0 01 139.7	27 15.9 1.0 01 139.7	27 45.9 1.0 01 139.7	28 15.8 1.0 01 139.7	40
1	24 45.2 1.0 01 138.7	25 15.2 1.0 01 138.7	25 45.2 1.0 01 138.7	26 15.2 1.0 01 138.7	26 45.2 1.0 01 138.7	27 15.2 1.0 01 138.7	27 45.2 1.0 01 138.7	28 15.2 1.0 01 138.7	1
2	24 44.5 1.0 01 137.7	25 14.5 1.0 01 137.7	25 44.5 1.0 01 137.7	26 14.5 1.0 01 137.7	26 44.5 1.0 01 137.7	27 14.5 1.0 01 137.7	27 44.5 1.0 01 137.7	28 14.5 1.0 01 137.6	2
3	24 43.8 1.0 01 136.7	25 13.8 1.0 01 136.7	25 43.8 1.0 01 136.7	26 13.8 1.0 01 136.7	26 43.8 1.0 01 136.7	27 13.8 1.0 01 136.7	27 43.8 1.0 01 136.6	28 13.8 1.0 01 136.6	3
4	24 43.0 1.0 01 135.7	25 13.0 1.0 01 135.7	25 43.0 1.0 01 135.7	26 13.0 1.0 01 135.7	26 43.0 1.0 01 135.7	27 13.0 1.0 01 135.6	27 43.0 1.0 01 135.6	28 13.0 1.0 01 135.6	4
45	24 42.3 1.0 01 134.7	25 12.3 1.0 01 134.7	25 42.3 1.0 01 134.7	26 12.3 1.0 01 134.7	26 42.3 1.0 01 134.6	27 12.3 1.0 01 134.6	27 42.3 1.0 01 134.6	28 12.3 1.0 01 134.6	45
6	24 41.6 1.0 01 133.7	25 11.6 1.0 01 133.7	25 41.6 1.0 01 133.7	26 11.5 1.0 01 133.7	26 41.5 1.0 01 133.6	27 11.5 1.0 01 133.6	27 41.5 1.0 01 133.6	28 11.5 1.0 01 133.6	6
7	24 40.8 1.0 01 132.7	25 10.8 1.0 01 132.7	25 40.8 1.0 01 132.7	26 10.8 1.0 01 132.6	26 40.8 1.0 01 132.6	27 10.8 1.0 01 132.6	27 40.8 1.0 01 132.6	28 10.8 1.0 01 132.6	7
8	24 40.0 1.0 01 131.7	25 10.0 1.0 01 131.7	25 40.0 1.0 01 131.6	26 10.0 1.0 01 131.6	26 40.0 1.0 01 131.6	27 10.0 1.0 01 131.6	27 40.0 1.0 01 131.6	28 10.0 1.0 01 131.6	8
9	24 39.2 1.0 01 130.7	25 09.2 1.0 01 130.7	25 39.2 1.0 01 130.6	26 09.2 1.0 01 130.6	26 39.2 1.0 01 130.6	27 09.2 1.0 01 130.6	27 39.2 1.0 01 130.6	28 09.2 1.0 01 130.6	9
50	24 38.4 1.0 01 129.7	25 08.4 1.0 01 129.6	25 38.4 1.0 01 129.6	26 08.4 1.0 01 129.6	26 38.4 1.0 01 129.6	27 08.4 1.0 01 129.6	27 38.4 1.0 01 129.6	28 08.4 1.0 01 129.6	50
1	24 37.6 1.0 01 128.7	25 07.6 1.0 01 128.6	25 37.6 1.0 01 128.6	26 07.6 1.0 01 128.6	26 37.6 1.0 01 128.6	27 07.6 1.0 01 128.6	27 37.6 1.0 01 128.6	28 07.6 1.0 01 128.6	1
2	24 36.8 1.0 01 127.6	25 06.8 1.0 01 127.6	25 36.8 1.0 01 127.6	26 06.8 1.0 01 127.6	26 36.8 1.0 01 127.6	27 06.8 1.0 01 127.6	27 36.8 1.0 01 127.6	28 06.8 1.0 01 127.6	2
3	24 36.0 1.0 01 126.6	25 06.0 1.0 01 126.6	25 36.0 1.0 01 126.6	26 05.9 1.0 01 126.6	26 35.9 1.0 01 126.6	27 05.9 1.0 01 126.6	27 35.9 1.0 01 126.6	28 05.9 1.0 01 126.6	3
4	24 35.1 1.0 01 125.6	25 05.1 1.0 01 125.6	25 35.1 1.0 01 125.6	26 05.1 1.0 01 125.6	26 35.1 1.0 01 125.6	27 05.1 1.0 01 125.6	27 35.1 1.0 01 125.6	28 05.1 1.0 01 125.6	4
55	24 34.3 1.0 01 124.6	25 04.3 1.0 01 124.6	25 34.2 1.0 01 124.6	26 04.2 1.0 01 124.6	26 34.2 1.0 01 124.6	27 04.2 1.0 01 124.6	27 34.2 1.0 01 124.6	28 04.2 1.0 01 124.6	55
6	24 33.4 1.0 01 123.6	25 03.4 1.0 01 123.6	25 33.4 1.0 01 123.6	26 03.4 1.0 01 123.6	26 33.4 1.0 01 123.6	27 03.4 1.0 01 123.6	27 33.4 1.0 01 123.6	28 03.4 1.0 01 123.6	6
7	24 32.5 1.0 01 122.6	25 02.5 1.0 01 122.6	25 32.5 1.0 01 122.6	26 02.5 1.0 01 122.6	26 32.5 1.0 01 122.6	27 02.5 1.0 01 122.6	27 32.5 1.0 01 122.6	28 02.5 1.0 01 122.6	7
8	24 31.6 1.0 02 121.6	25 01.6 1.0 02 121.6	25 31.6 1.0 02 121.6	26 01.6 1.0 02 121.6	26 31.6 1.0 02 121.6	27 01.6 1.0 02 121.6	27 31.6 1.0 02 121.6	28 01.6 1.0 02 121.6	8
9	24 30.7 1.0 02 120.6	25 00.7 1.0 02 120.6	25 30.7 1.0 02 120.6	26 00.7 1.0 02 120.6	26 30.7 1.0 02 120.6	27 00.7 1.0 02 120.6	27 30.7 1.0 02 120.6	28 00.7 1.0 02 120.5	9
60	24 29.8 1.0 02 119.6	24 59.8 1.0 02 119.6	25 29.8 1.0 02 119.6	25 59.8 1.0 02 119.6	26 29.8 1.0 02 119.6	26 59.8 1.0 02 119.6	27 29.8 1.0 02 119.6	27 59.8 1.0 02 119.5	60
1	24 28.9 1.0 02 118.6	24 58.9 1.0 02 118.6	25 28.9 1.0 02 118.6	25 58.9 1.0 02 118.6	26 28.9 1.0 02 118.6	26 58.9 1.0 02 118.6	27 28.9 1.0 02 118.5	27 58.9 1.0 02 118.5	1
2	24 28.0 1.0 02 117.6	24 58.0 1.0 02 117.6	25 28.0 1.0 02 117.6	25 58.0 1.0 02 117.6	26 28.0 1.0 02 117.6	26 58.0 1.0 02 117.5	27 28.0 1.0 02 117.5	27 58.0 1.0 02 117.5	2
3	24 27.1 1.0 02 116.6	24 57.0 1.0 02 116.6	25 27.0 1.0 02 116.6	25 57.0 1.0 02 116.6	26 27.0 1.0 02 116.6	26 57.0 1.0 02 116.6	27 27.0 1.0 02 116.5	27 57.0 1.0 02 116.5	3
4	24 26.1 1.0 02 115.6	24 56.1 1.0 02 115.6	25 26.1 1.0 02 115.6	25 56.1 1.0 02 115.6	26 26.1 1.0 02 115.6	26 56.1 1.0 02 115.5	27 26.1 1.0 02 115.5	27 56.1 1.0 02 115.5	4
65	24 25.2 1.0 02 114.6	24 55.2 1.0 02 114.6	25 25.2 1.0 02 114.6	25 55.2 1.0 02 114.6	26 25.1 1.0 02 114.6	26 55.1 1.0 02 114.5	27 25.1 1.0 02 114.5	27 55.1 1.0 02 114.5	65
6	24 24.2 1.0 02 113.6	24 54.2 1.0 02 113.6	25 24.2 1.0 02 113.6	25 54.2 1.0 02 113.6	26 24.2 1.0 02 113.6	26 54.2 1.0 02 113.5	27 24.2 1.0 02 113.5	27 54.2 1.0 02 113.5	6
7	24 23.2 1.0 02 112.6	24 53.2 1.0 02 112.6	25 23.2 1.0 02 112.6	25 53.2 1.0 02 112.6	26 23.2 1.0 02 112.5	26 53.2 1.0 02 112.5	27 23.2 1.0 02 112.5	27 53.2 1.0 02 112.5	7
8	24 22.3 1.0 02 111.6	24 52.3 1.0 02 111.6	25 22.3 1.0 02 111.6	25 52.3 1.0 02 111.6	26 22.3 1.0 02 111.5	26 52.2 1.0 02 111.5	27 22.2 1.0 02 111.5	27 52.2 1.0 02 111.5	8
9	24 21.3 1.0 02 110.6	24 51.3 1.0 02 110.6	25 21.3 1.0 02 110.6	25 51.3 1.0 02 110.6	26 21.3 1.0 02 110.5	26 51.3 1.0 02 110.5	27 21.3 1.0 02 110.5	27 51.3 1.0 02 110.5	9
70	24 20.3 1.0 02 109.6	24 50.3 1.0 02 109.6	25 20.3 1.0 02 109.6	25 50.3 1.0 02 109.5	26 20.3 1.0 02 109.5	26 50.3 1.0 02 109.5	27 20.3 1.0 02 109.5	27 50.3 1.0 02 109.5	70
1	24 19.3 1.0 02 108.6	24 49.3 1.0 02 108.6	25 19.3 1.0 02 108.6	25 49.3 1.0 02 108.5	26 19.3 1.0 02 108.5	26 49.3 1.0 02 108.5	27 19.3 1.0 02 108.5	27 49.3 1.0 02 108.5	1
2	24 18.3 1.0 02 107.6	24 48.3 1.0 02 107.6	25 18.3 1.0 02 107.6	25 48.3 1.0 02 107.5	26 18.3 1.0 02 107.5	26 48.3 1.0 02 107.5	27 18.3 1.0 02 107.5	27 48.3 1.0 02 107.5	2
3	24 17.3 1.0 02 106.6	24 47.3 1.0 02 106.6	25 17.3 1.0 02 106.6	25 47.3 1.0 02 106.5	26 17.3 1.0 02 106.5	26 47.3 1.0 02 106.5	27 17.3 1.0 02 106.5	27 47.3 1.0 02 106.5	3
4	24 16.3 1.0 02 105.6	24 46.3 1.0 02 105.6	25 16.3 1.0 02 105.5	25 46.3 1.0 02 105.5	26 16.3 1.0 02 105.5	26 46.3 1.0 02 105.5	27 16.3 1.0 02 105.5	27 46.3 1.0 02 105.5	4
75	24 15.3 1.0 02 104.6	24 45.3 1.0 02 104.6	25 15.3 1.0 02 104.5	25 45.3 1.0 02 104.5	26 15.3 1.0 02 104.5	26 45.3 1.0 02 104.5	27 15.3 1.0 02 104.5	27 45.3 1.0 02 104.5	75
6	24 14.3 1.0 02 103.6	24 44.3 1.0 02 103.6	25 14.3 1.0 02 103.5	25 44.3 1.0 02 103.5	26 14.3 1.0 02 103.5	26 44.3 1.0 02 103.5	27 14.3 1.0 02 103.5	27 44.3 1.0 02 103.5	6
7	24 13.3 1.0 02 102.6	24 43.3 1.0 02 102.6	25 13.3 1.0 02 102.5	25 43.3 1.0 02 102.5	26 13.3 1.0 02 102.5	26 43.2 1.0 02 102.5	27 13.2 1.0 02 102.5	27 43.2 1.0 02 102.5	7
8	24 12.2 1.0 02 101.6	24 42.2 1.0 02 101.6	25 12.2 1.0 02 101.5	25 42.2 1.0 02 101.5	26 12.2 1.0 02 101.5	26 42.2 1.0 02 101.5	27 12.2 1.0 02 101.5	27 42.2 1.0 02 101.5	8
9	24 11.2 1.0 02 100.6	24 41.2 1.0 02 100.6	25 11.2 1.0 02 100.5	25 41.2 1.0 02 100.5	26 11.2 1.0 02 100.5	26 41.2 1.0 02 100.5	27 11.2 1.0 02 100.5	27 41.2 1.0 02 100.5	9
80	24 10.2 1.0 02 99.6	24 40.2 1.0 02 99.6	25 10.2 1.0 02 99.5	25 40.2 1.0 02 99.5	26 10.2 1.0 02 99.5	26 40.2 1.0 02 99.5	27 10.2 1.0 02 99.5	27 40.2 1.0 02 99.5	80
1	24 09.2 1.0 02 98.6	24 39.2 1.0 02 98.5	25 09.1 1.0 02 98.5	25 39.1 1.0 02 98.5	26 09.1 1.0 02 98.5	26 39.1 1.0 02 98.5	27 09.1 1.0 02 98.5	27 39.1 1.0 02 98.5	1
2	24 08.1 1.0 02 97.6	24 38.1 1.0 02 97.5	25 08.1 1.0 02 97.5	25 38.1 1.0 02 97.5	26 08.1 1.0 02 97.5	26 38.1 1.0 02 97.5	27 08.1 1.0 02 97.5	27 38.1 1.0 02 97.5	2
3	24 07.1 1.0 02 96.6	24 37.1 1.0 02 96.5	25 07.1 1.0 02 96.5	25 37.1 1.0 02 96.5	26 07.1 1.0 02 96.5	26 37.1 1.0 02 96.5	27 07.0 1.0 02 96.5	27 37.0 1.0 02 96.5	3
4	24 06.0 1.0 02 95.6	24 36.0 1.0 02 95.5	25 06.0 1.0 02 95.5	25 36.0 1.0 02 95.5	26 06.0 1.0 02 95.5	26 36.0 1.0 02 95.5	27 06.0 1.0 02 95.5	27 36.0 1.0 02 95.5	4
85	24 05.0 1.0 02 94.6	24 35.0 1.0 02 94.5	25 05.0 1.0 02 94.5	25 35.0 1.0 02 94.5	26 05.0 1.0 02 94.5	26 35.0 1.0 02 94.5	27 05.0 1.0 02 94.5	27 35.0 1.0 02 94.5	85
6	24 04.0 1.0 02 93.6	24 33.9 1.0 02 93.5	25 03.9 1.0 02 93.5	25 33.9 1.0 02 93.5	26 03.9 1.0 02 93.5	26 33.9 1.0 02 93.5	27 03.9 1.0 02 93.5	27 33.9 1.0 02 93.5	6
7	24 02.9 1.0 02 92.6	24 32.9 1.0 02 92.5	25 02.9 1.0 02 92.5	25 32.9 1.0 02 92.5	26 02.9 1.0 02 92.5	26 32.9 1.0 02 92.5	27 02.9 1.0 02 92.5	27 32.9 1.0 02 92.5	7
8	24 01.9 1.0 02 91.6	24 31.8 1.0 02 91.5	25 01.8 1.0 02 91.5	25 31.8 1.0 02 91.5	26 01.8 1.0 02 91.5	26 31.8 1.0 02 91.5	27 01.8 1.0 02 91.5	27 31.8 1.0 02 91.5	8
9	24 00.8 1.0 02 90.6	24 30.8 1.0 02 90.5	25 00.8 1.0 02 90.5	25 30.8 1.0 02 90.5	26 00.8 1.0 02 90.5	26 30.8 1.0 02 90.5	27 00.8 1.0 02 90.5	27 30.8 1.0 02 90.5	9
90	23 59.8 1.0 02 89.6	24 29.8 1.0 02 89.5	24 59.8 1.0 02 89.5	25 29.8 1.0 02 89.5	25 59.7 1.0 02 89.5	26 29.7 1.0 02 89.5	26 59.7 1.0 02 89.5	27 29.7 1.0 02 89.5	90

Lat. 89°

H.A.	24° 00' (Alt. / Δd Δt / Az.)	24° 30'	25° 00'	25° 30'	26° 00'	26° 30'	27° 00'	27° 30'	H.A.
91	23 58.7 1.002 88.6	24 28.7 1.002 88.5	24 58.7 1.002 88.5	25 28.7 1.002 88.5	25 58.7 1.002 88.5	26 28.7 1.002 88.5	26 58.7 1.002 88.5	27 28.7 1.002 88.5	91
2	23 57.7 1.002 87.6	24 27.7 1.002 87.5	24 57.7 1.002 87.5	25 27.7 1.002 87.5	25 57.6 1.002 87.5	26 27.6 1.002 87.5	26 57.6 1.002 87.5	27 27.6 1.002 87.5	2
3	23 56.6 1.002 86.6	24 26.6 1.002 86.5	24 56.6 1.002 86.5	25 26.6 1.002 86.5	25 56.6 1.002 86.5	26 26.6 1.002 86.5	26 56.6 1.002 86.5	27 26.6 1.002 86.5	8
4	23 55.6 1.002 85.6	24 25.6 1.002 85.5	24 55.6 1.002 85.5	25 25.6 1.002 85.5	25 55.6 1.002 85.5	26 25.6 1.002 85.5	26 55.6 1.002 85.5	27 25.5 1.002 85.5	4
95	23 54.5 1.002 84.6	24 24.5 1.002 84.5	24 54.5 1.002 84.5	25 24.5 1.002 84.5	25 54.5 1.002 84.5	26 24.5 1.002 84.5	26 54.5 1.002 84.5	27 24.5 1.002 84.5	95
6	23 53.5 1.002 83.6	24 23.5 1.002 83.5	24 53.5 1.002 83.5	25 23.5 1.002 83.5	25 53.5 1.002 83.5	26 23.5 1.002 83.5	26 53.5 1.002 83.5	27 23.5 1.002 83.5	6
7	23 52.5 1.002 82.6	24 22.5 1.002 82.6	24 52.4 1.002 82.5	25 22.4 1.002 82.5	25 52.4 1.002 82.5	26 22.4 1.002 82.5	26 52.4 1.002 82.5	27 22.4 1.002 82.5	7
8	23 51.4 1.002 81.6	24 21.4 1.002 81.6	24 51.4 1.002 81.5	25 21.4 1.002 81.5	25 51.4 1.002 81.5	26 21.4 1.002 81.5	26 51.4 1.002 81.5	27 21.4 1.002 81.5	8
9	23 50.4 1.002 80.6	24 20.4 1.002 80.6	24 50.4 1.002 80.5	25 20.4 1.002 80.5	25 50.4 1.002 80.5	26 20.4 1.002 80.5	26 50.4 1.002 80.5	27 20.3 1.002 80.5	9
100	23 49.4 1.002 79.6	24 19.4 1.002 79.6	24 49.3 1.002 79.5	25 19.3 1.002 79.5	25 49.3 1.002 79.5	26 19.3 1.002 79.5	26 49.3 1.002 79.5	27 19.3 1.002 79.5	100
1	23 48.3 1.002 78.6	24 18.3 1.002 78.6	24 48.3 1.002 78.5	25 18.3 1.002 78.5	25 48.3 1.002 78.5	26 18.3 1.002 78.5	26 48.3 1.002 78.5	27 18.3 1.002 78.5	1
2	23 47.3 1.002 77.6	24 17.3 1.002 77.6	24 47.3 1.002 77.5	25 17.3 1.002 77.5	25 47.3 1.002 77.5	26 17.3 1.002 77.5	26 47.3 1.002 77.5	27 17.3 1.002 77.5	2
3	23 46.3 1.002 76.6	24 16.3 1.002 76.6	24 46.3 1.002 76.6	25 16.3 1.002 76.5	25 46.3 1.002 76.5	26 16.3 1.002 76.5	26 46.3 1.002 76.5	27 16.2 1.002 76.5	8
4	23 45.3 1.002 75.6	24 15.3 1.002 75.6	24 45.3 1.002 75.6	25 15.3 1.002 75.5	25 45.2 1.002 75.5	26 15.2 1.002 75.5	26 45.2 1.002 75.5	27 15.2 1.002 75.5	4
105	23 44.3 1.002 74.6	24 14.2 1.002 74.6	24 44.2 1.002 74.6	25 14.2 1.002 74.5	25 44.2 1.002 74.5	26 14.2 1.002 74.5	26 44.2 1.002 74.5	27 14.2 1.002 74.5	105
6	23 43.2 1.002 73.6	24 13.2 1.002 73.6	24 43.2 1.002 73.6	25 13.2 1.002 73.5	25 43.2 1.002 73.5	26 13.2 1.002 73.5	26 43.2 1.002 73.5	27 13.2 1.002 73.5	6
7	23 42.2 1.002 72.6	24 12.2 1.002 72.6	24 42.2 1.002 72.6	25 12.2 1.002 72.5	25 42.2 1.002 72.5	26 12.2 1.002 72.5	26 42.2 1.002 72.5	27 12.2 1.002 72.5	7
8	23 41.2 1.002 71.6	24 11.2 1.002 71.6	24 41.2 1.002 71.6	25 11.2 1.002 71.5	25 41.2 1.002 71.5	26 11.2 1.002 71.5	26 41.2 1.002 71.5	27 11.2 1.002 71.5	8
9	23 40.3 1.002 70.6	24 10.3 1.002 70.6	24 40.2 1.002 70.6	25 10.2 1.002 70.6	25 40.2 1.002 70.5	26 10.2 1.002 70.5	26 40.2 1.002 70.5	27 10.2 1.002 70.5	9
110	23 39.3 1.002 69.6	24 09.3 1.002 69.6	24 39.3 1.002 69.6	25 09.3 1.002 69.6	25 39.3 1.002 69.5	26 09.2 1.002 69.5	26 39.3 1.002 69.5	27 09.2 1.002 69.5	110
1	23 38.3 1.002 68.6	24 08.3 1.002 68.6	24 38.3 1.002 68.6	25 08.3 1.002 68.6	25 38.3 1.002 68.5	26 08.3 1.002 68.5	26 38.3 1.002 68.5	27 08.3 1.002 68.5	1
2	23 37.3 1.002 67.6	24 07.3 1.002 67.6	24 37.3 1.002 67.6	25 07.3 1.002 67.6	25 37.3 1.002 67.5	26 07.3 1.002 67.5	26 37.3 1.002 67.5	27 07.3 1.002 67.5	2
3	23 36.4 1.002 66.6	24 06.4 1.002 66.6	24 36.4 1.002 66.6	25 06.3 1.002 66.6	25 36.3 1.002 66.6	26 06.3 1.002 66.5	26 36.3 1.002 66.5	27 06.3 1.002 66.5	8
4	23 35.4 1.002 65.6	24 05.4 1.002 65.6	24 35.4 1.002 65.6	25 05.4 1.002 65.6	25 35.4 1.002 65.6	26 05.4 1.002 65.5	26 35.4 1.002 65.5	27 05.4 1.002 65.5	4
115	23 34.5 1.002 64.6	24 04.4 1.002 64.6	24 34.4 1.002 64.6	25 04.4 1.002 64.6	25 34.4 1.002 64.6	26 04.4 1.002 64.6	26 34.4 1.002 64.5	27 04.4 1.002 64.5	115
6	23 33.5 1.002 63.6	24 03.5 1.002 63.6	24 33.5 1.002 63.6	25 03.5 1.002 63.6	25 33.5 1.002 63.6	26 03.5 1.002 63.6	26 33.5 1.002 63.5	27 03.5 1.002 63.5	6
7	23 32.6 1.002 62.6	24 02.6 1.002 62.6	24 32.6 1.002 62.6	25 02.6 1.002 62.6	25 32.6 1.002 62.6	26 02.6 1.002 62.6	26 32.6 1.002 62.6	27 02.5 1.002 62.5	7
8	23 31.7 1.002 61.6	24 01.6 1.002 61.6	24 31.6 1.002 61.6	25 01.6 1.002 61.6	25 31.6 1.002 61.6	26 01.6 1.002 61.6	26 31.6 1.002 61.6	27 01.6 1.002 61.5	8
9	23 30.7 1.002 60.6	24 00.7 1.002 60.6	24 30.7 1.002 60.6	25 00.7 1.002 60.6	25 30.7 1.002 60.6	26 00.7 1.002 60.6	26 30.7 1.002 60.6	27 00.7 1.002 60.6	9
120	23 29.8 1.002 59.6	23 59.8 1.002 59.6	24 29.8 1.002 59.6	24 59.8 1.002 59.6	25 29.8 1.002 59.6	25 59.8 1.002 59.6	26 29.8 1.002 59.6	26 59.8 1.001 59.6	120
1	23 28.9 1.002 58.6	23 58.9 1.001 58.6	24 28.9 1.001 58.6	24 58.9 1.001 58.6	25 28.9 1.001 58.6	25 58.9 1.001 58.6	26 28.9 1.001 58.6	26 58.9 1.001 58.6	1
2	23 28.0 1.001 57.6	23 58.0 1.001 57.6	24 28.0 1.001 57.6	24 58.0 1.001 57.6	25 28.0 1.001 57.6	25 58.0 1.001 57.6	26 28.0 1.001 57.6	26 58.0 1.001 57.6	2
3	23 27.2 1.001 56.6	23 57.2 1.001 56.6	24 27.2 1.001 56.6	24 57.1 1.001 56.6	25 27.1 1.001 56.6	25 57.1 1.001 56.6	26 27.1 1.001 56.6	26 57.1 1.001 56.6	8
4	23 26.3 1.001 55.6	23 56.3 1.001 55.6	24 26.3 1.001 55.6	24 56.3 1.001 55.6	25 26.3 1.001 55.6	25 56.3 1.001 55.6	26 26.3 1.001 55.6	26 56.3 1.001 55.6	4
125	23 25.4 1.001 54.6	23 55.4 1.001 54.6	24 25.4 1.001 54.6	24 55.4 1.001 54.6	25 25.4 1.001 54.6	25 55.4 1.001 54.6	26 25.4 1.001 54.6	26 55.4 1.001 54.6	125
6	23 24.6 1.001 53.6	23 54.6 1.001 53.6	24 24.6 1.001 53.6	24 54.6 1.001 53.6	25 24.6 1.001 53.6	25 54.6 1.001 53.6	26 24.6 1.001 53.6	26 54.6 1.001 53.6	6
7	23 23.7 1.001 52.7	23 53.7 1.001 52.6	24 23.7 1.001 52.6	24 53.7 1.001 52.6	25 23.7 1.001 52.6	25 53.7 1.001 52.6	26 23.7 1.001 52.6	26 53.7 1.001 52.6	7
8	23 22.9 1.001 51.7	23 52.9 1.001 51.6	24 22.9 1.001 51.6	24 52.9 1.001 51.6	25 22.9 1.001 51.6	25 52.9 1.001 51.6	26 22.9 1.001 51.6	26 52.9 1.001 51.6	8
9	23 22.1 1.001 50.7	23 52.1 1.001 50.7	24 22.1 1.001 50.6	24 52.1 1.001 50.6	25 22.1 1.001 50.6	25 52.1 1.001 50.6	26 22.1 1.001 50.6	26 52.1 1.001 50.6	9
130	23 21.3 1.001 49.7	23 51.3 1.001 49.7	24 21.3 1.001 49.6	24 51.3 1.001 49.6	25 21.3 1.001 49.6	25 51.3 1.001 49.6	26 21.3 1.001 49.6	26 51.3 1.001 49.6	130
1	23 20.5 1.001 48.7	23 50.5 1.001 48.7	24 20.5 1.001 48.7	24 50.5 1.001 48.6	25 20.5 1.001 48.6	25 50.5 1.001 48.6	26 20.5 1.001 48.6	26 50.5 1.001 48.6	1
2	23 19.7 1.001 47.7	23 49.7 1.001 47.7	24 19.7 1.001 47.7	24 49.7 1.001 47.7	25 19.7 1.001 47.6	25 49.7 1.001 47.6	26 19.7 1.001 47.6	26 49.7 1.001 47.6	2
3	23 19.0 1.001 46.7	23 49.0 1.001 46.7	24 19.0 1.001 46.7	24 48.9 1.001 46.7	25 18.9 1.001 46.6	25 48.9 1.001 46.6	26 18.9 1.001 46.6	26 48.9 1.001 46.6	8
4	23 18.2 1.001 45.7	23 48.2 1.001 45.7	24 18.2 1.001 45.7	24 48.2 1.001 45.7	25 18.2 1.001 45.7	25 48.2 1.001 45.6	26 18.2 1.001 45.6	26 48.2 1.001 45.6	4
135	23 17.5 1.001 44.7	23 47.5 1.001 44.7	24 17.5 1.001 44.7	24 47.5 1.001 44.7	25 17.4 1.001 44.7	25 47.4 1.001 44.7	26 17.4 1.001 44.6	26 47.4 1.001 44.6	135
6	23 16.7 1.001 43.7	23 46.7 1.001 43.7	24 16.7 1.001 43.7	24 46.7 1.001 43.7	25 16.7 1.001 43.7	25 46.7 1.001 43.7	26 16.7 1.001 43.7	26 46.7 1.001 43.6	6
7	23 16.0 1.001 42.7	23 46.0 1.001 42.7	24 16.0 1.001 42.7	24 46.0 1.001 42.7	25 16.0 1.001 42.7	25 46.0 1.001 42.7	26 16.0 1.001 42.7	26 46.0 1.001 42.7	7
8	23 15.3 1.001 41.7	23 45.3 1.001 41.7	24 15.3 1.001 41.7	24 45.3 1.001 41.7	25 15.3 1.001 41.7	25 45.3 1.001 41.7	26 15.3 1.001 41.7	26 45.3 1.001 41.7	8
9	23 14.6 1.001 40.7	23 44.6 1.001 40.7	24 14.6 1.001 40.7	24 44.6 1.001 40.7	25 14.6 1.001 40.7	25 44.6 1.001 40.7	26 14.6 1.001 40.7	26 44.6 1.001 40.7	9
140	23 13.9 1.001 39.7	23 43.9 1.001 39.7	24 13.9 1.001 39.7	24 43.9 1.001 39.7	25 13.9 1.001 39.7	25 43.9 1.001 39.7	26 13.9 1.001 39.7	26 43.9 1.001 39.7	140
1	23 13.3 1.001 38.7	23 43.3 1.001 38.7	24 13.3 1.001 38.7	24 43.3 1.001 38.7	25 13.3 1.001 38.7	25 43.3 1.001 38.7	26 13.3 1.001 38.7	26 43.3 1.001 38.7	1
2	23 12.6 1.001 37.7	23 42.6 1.001 37.7	24 12.6 1.001 37.7	24 42.6 1.001 37.7	25 12.6 1.001 37.7	25 42.6 1.001 37.7	26 12.6 1.001 37.7	26 42.6 1.001 37.7	2
3	23 12.0 1.001 36.7	23 42.0 1.001 36.7	24 12.0 1.001 36.7	24 42.0 1.001 36.7	25 12.0 1.001 36.7	25 42.0 1.001 36.7	26 12.0 1.001 36.7	26 42.0 1.001 36.7	8
4	23 11.4 1.001 35.7	23 41.4 1.001 35.7	24 11.4 1.001 35.7	24 41.4 1.001 35.7	25 11.4 1.001 35.7	25 41.4 1.001 35.7	26 11.4 1.001 35.7	26 41.4 1.001 35.7	4
145	23 10.8 1.001 34.8	23 40.8 1.001 34.7	24 10.8 1.001 34.7	24 40.8 1.001 34.7	25 10.8 1.001 34.7	25 40.8 1.001 34.7	26 10.8 1.001 34.7	26 40.8 1.001 34.7	145
6	23 10.2 1.001 33.8	23 40.2 1.001 33.8	24 10.2 1.001 33.7	24 40.2 1.001 33.7	25 10.2 1.001 33.7	25 40.2 1.001 33.7	26 10.2 1.001 33.7	26 40.2 1.001 33.7	6
7	23 09.6 1.001 32.8	23 39.6 1.001 32.8	24 09.6 1.001 32.8	24 39.6 1.001 32.7	25 09.6 1.001 32.7	25 39.6 1.001 32.7	26 09.6 1.001 32.7	26 39.6 1.001 32.7	7
8	23 09.1 1.001 31.8	23 39.1 1.001 31.8	24 09.0 1.001 31.8	24 39.0 1.001 31.8	25 09.0 1.001 31.8	25 39.0 1.001 31.7	26 09.0 1.001 31.7	26 39.0 1.001 31.7	8
9	23 08.5 1.001 30.8	23 38.5 1.001 30.8	24 08.5 1.001 30.8	24 38.5 1.001 30.8	25 08.5 1.001 30.8	25 38.5 1.001 30.7	26 08.5 1.001 30.7	26 38.5 1.001 30.7	9
150	23 08.0 1.001 29.8	23 38.0 1.001 29.8	24 08.0 1.001 29.8	24 38.0 1.001 29.8	25 08.0 1.001 29.8	25 38.0 1.001 29.8	26 08.0 1.001 29.8	26 38.0 1.001 29.7	150
1	23 07.5 1.001 28.8	23 37.5 1.001 28.8	24 07.5 1.001 28.8	24 37.5 1.001 28.8	25 07.5 1.001 28.8	25 37.5 1.001 28.8	26 07.5 1.001 28.8	26 37.5 1.001 28.8	1
2	23 07.0 1.001 27.8	23 37.0 1.001 27.8	24 07.0 1.001 27.8	24 37.0 1.001 27.8	25 07.0 1.001 27.8	25 37.0 1.001 27.8	26 07.0 1.001 27.8	26 37.0 1.001 27.8	2
3	23 06.5 1.001 26.8	23 36.5 1.001 26.8	24 06.5 1.001 26.8	24 36.5 1.001 26.8	25 06.5 1.001 26.8	25 36.5 1.001 26.8	26 06.5 1.001 26.8	26 36.5 1.001 26.8	8
4	23 06.0 1.001 25.8	23 36.0 1.001 25.8	24 06.0 1.001 25.8	24 36.0 1.001 25.8	25 06.0 1.001 25.8	25 36.0 1.001 25.8	26 06.0 1.001 25.8	26 36.0 1.001 25.8	4
155	23 05.6 1.001 24.8	23 35.6 1.001 24.8	24 05.6 1.001 24.8	24 35.6 1.001 24.8	25 05.6 1.001 24.8	25 35.6 1.001 24.8	26 05.6 1.001 24.8	26 35.6 1.001 24.8	155
6	23 05.1 1.001 23.8	23 35.1 1.001 23.8	24 05.1 1.001 23.8	24 35.1 1.001 23.8	25 05.1 1.001 23.8	25 35.1 1.001 23.8	26 05.1 1.001 23.8	26 35.1 1.001 23.8	6
7	23 04.7 1.001 22.8	23 34.7 1.001 22.8	24 04.7 1.001 22.8	24 34.7 1.001 22.8	25 04.7 1.001 22.8	25 34.7 1.001 22.8	26 04.7 1.001 22.8	26 34.7 1.001 22.8	7
8	23 04.3 1.001 21.8	23 34.3 1.001 21.8	24 04.3 1.001 21.8	24 34.3 1.001 21.8	25 04.3 1.001 21.8	25 34.3 1.001 21.8	26 04.3 1.001 21.8	26 34.3 1.001 21.8	8
9	23 04.0 1.001 20.8	23 34.0 1.001 20.8	24 04.0 1.001 20.8	24 34.0 1.001 20.8	25 04.0 1.001 20.8	25 34.0 1.001 20.8	26 04.0 1.001 20.8	26 34.0 1.001 20.8	9
160	23 03.6 1.001 19.9	23 33.6 1.001 19.8	24 03.6 1.001 19.8	24 33.6 1.001 19.8	25 03.6 1.001 19.8	25 33.6 1.001 19.8	26 03.6 1.001 19.8	26 33.6 1.001 19.8	160
1	23 03.2 1.001 18.9	23 33.2 1.001 18.9	24 03.2 1.001 18.8	24 33.2 1.001 18.8	25 03.2 1.001 18.8	25 33.2 1.001 18.8	26 03.2 1.001 18.8	26 33.2 1.001 18.8	1
2	23 02.9 1.001 17.9	23 32.9 1.001 17.9	24 02.9 1.001 17.9	24 32.9 1.001 17.9	25 02.9 1.001 17.9	25 32.9 1.001 17.8	26 02.9 1.001 17.8	26 32.9 1.001 17.8	2
3	23 02.6 1.000 16.9	23 32.6 1.000 16.9	24 02.6 1.000 16.9	24 32.6 1.000 16.9	25 02.6 1.000 16.9	25 32.6 1.000 16.9	26 02.6 1.000 16.9	26 32.6 1.000 16.9	8
4	23 02.3 1.000 15.9	23 32.3 1.000 15.9	24 02.3 1.000 15.9	24 32.3 1.000 15.9	25 02.3 1.000 15.9	25 32.3 1.000 15.9	26 02.3 1.000 15.9	26 32.3 1.000 15.9	4
165	23 02.0 1.000 14.9	23 32.0 1.000 14.9	24 02.0 1.000 14.9	24 32.0 1.000 14.9	25 02.0 1.000 14.9	25 32.0 1.000 14.9	26 02.0 1.000 14.9	26 32.0 1.000 14.9	165
6	23 01.8 1.000 13.9	23 31.8 1.000 13.9	24 01.8 1.000 13.9	24 31.8 1.000 13.9	25 01.8 1.000 13.9	25 31.8 1.000 13.9	26 01.8 1.000 13.9	26 31.8 1.000 13.9	6
7	23 01.5 1.000 12.9	23 31.5 1.000 12.9	24 01.5 1.000 12.9	24 31.5 1.000 12.9	25 01.5 1.000 12.9	25 31.5 1.000 12.9	26 01.5 1.000 12.9	26 31.5 1.000 12.9	7
8	23 01.3 1.000 11.9	23 31.3 1.000 11.9	24 01.3 1.000 11.9	24 31.3 1.000 11.9	25 01.3 1.000 11.9	25 31.3 1.000 11.9	26 01.3 1.000 11.9	26 31.3 1.000 11.9	8
9	23 01.1 1.000 10.9	23 31.1 1.000 10.9	24 01.1 1.000 10.9	24 31.1 1.000 10.9	25 01.1 1.000 10.9	25 31.1 1.000 10.9	26 01.1 1.000 10.9	26 31.1 1.000 10.9	9
170	23 00.9 1.000 09.9	23 30.9 1.000 09.9	24 00.9 1.000 09.9	24 30.9 1.000 09.9	25 00.9 1.000 09.9	25 30.9 1.000 09.9	26 00.9 1.000 09.9	26 30.9 1.000 09.9	170
1	23 00.7 1.000 08.9	23 30.7 1.000 08.9	24 00.7 1.000 08.9	24 30.7 1.000 08.9	25 00.7 1.000 08.9	25 30.7 1.000 08.9	26 00.7 1.000 08.9	26 30.7 1.000 08.9	1
2	23 00.6 1.000 07.9	23 30.6 1.000 07.9	24 00.6 1.000 07.9	24 30.6 1.000 07.9	25 00.6 1.000 07.9	25 30.6 1.000 07.9	26 00.6 1.000 07.9	26 30.6 1.000 07.9	2
3	23 00.4 1.000 06.9	23 30.4 1.000 06.9	24 00.4 1.000 06.9	24 30.4 1.000 06.9	25 00.4 1.000 06.9	25 30.4 1.000 06.9	26 00.4 1.000 06.9	26 30.4 1.000 06.9	8
4	23 00.3 1.000 06.0	23 30.3 1.000 06.0	24 00.3 1.000 06.0	24 30.3 1.000 06.0	25 00.3 1.000 06.0	25 30.3 1.000 05.9	26 00.3 1.000 05.9	26 30.3 1.000 05.9	4
175	23 00.2 1.000 05.0	23 30.2 1.000 05.0	24 00.2 1.000 05.0	24 30.2 1.000 05.0	25 00.2 1.000 05.0	25 30.2 1.000 05.0	26 00.2 1.000 05.0	26 30.2 1.000 05.0	175
6	23 00.1 1.000 04.0	23 30.1 1.000 04.0	24 00.1 1.000 04.0	24 30.1 1.000 04.0	25 00.1 1.000 04.0	25 30.1 1.000 04.0	26 00.1 1.000 04.0	26 30.1 1.000 04.0	6
7	23 00.1 1.000 03.0	23 30.1 1.000 03.0	24 00.1 1.000 03.0	24 30.1 1.000 03.0	25 00.1 1.000 03.0	25 30.1 1.000 03.0	26 00.1 1.000 03.0	26 30.1 1.000 03.0	7
8	23 00.0 1.000 02.0	23 30.0 1.000 02.0	24 00.0 1.000 02.0	24 30.0 1.000 02.0	25 00.0 1.000 02.0	25 30.0 1.000 02.0	26 00.0 1.000 02.0	26 30.0 1.000 02.0	8
9	23 00.0 1.000 01.0	23 30.0 1.000 01.0	24 00.0 1.000 01.0	24 30.0 1.000 01.0	25 00.0 1.000 01.0	25 30.0 1.000 01.0	26 00.0 1.000 01.0	26 30.0 1.000 01.0	9
180	23 00.0 1.000 00.0	23 30.0 1.000 00.0	24 00.0 1.000 00.0	24 30.0 1.000 00.0	25 00.0 1.000 00.0	25 30.0 1.000 00.0	26 00.0 1.000 00.0	26 30.0 1.000 00.0	180

DECLINATION SAME NAME AS LATITUDE

H.A.	28°00' Alt	Δd Δt	Az.	28°30' Alt	Δd Δt	Az.	29°00' Alt	Δd Δt	Az.	30°00' Alt	Δd Δt	Az.	32°00' Alt	Δd Δt	Az.	34°00' Alt	Δd Δt	Az.	34°30' Alt	Δd Δt	Az.	35°30' Alt	Δd Δt	Az.	H.A.
00	29 09.6	1.0 00	180.0	29 39.6	1.0 00	180.0	30 06.0	1.0 00	180.0	31 06.0	1.0 00	180.0	33 00.0	1.0 00	180.0	35 00.0	1.0 00	180.0	35 30.0	1.0 00	180.0	36 30.0	1.0 00	180.0	00
1	29 00.0	1.0 00	179.0	29 30.0	1.0 00	179.0	30 00.0	1.0 00	179.0	31 00.0	1.0 00	179.0	33 00.0	1.0 00	179.0	35 00.0	1.0 00	179.0	35 30.0	1.0 00	179.0	36 30.0	1.0 00	179.0	1
2	29 00.0	1.0 00	178.0	29 30.0	1.0 00	178.0	30 00.0	1.0 00	178.0	31 00.0	1.0 00	178.0	33 00.0	1.0 00	178.0	35 00.0	1.0 00	178.0	35 30.0	1.0 00	178.0	36 30.0	1.0 00	178.0	2
3	28 59.9	1.0 00	177.0	29 29.9	1.0 00	177.0	29 59.9	1.0 00	177.0	30 59.9	1.0 00	177.0	32 59.9	1.0 00	177.0	34 59.9	1.0 00	177.0	35 29.9	1.0 00	177.0	36 29.9	1.0 00	177.0	3
4	28 59.9	1.0 00	176.0	29 29.9	1.0 00	176.0	29 59.9	1.0 00	176.0	30 59.9	1.0 00	176.0	32 59.9	1.0 00	177.0	34 59.9	1.0 00	177.0	35 29.9	1.0 00	177.0	36 29.9	1.0 00	178.0	4
05	28 59.8	1.0 00	175.0	29 29.8	1.0 00	175.0	29 59.8	1.0 00	175.0	30 59.8	1.0 00	176.0	32 59.8	1.0 00	176.0	34 59.8	1.0 00	176.0	35 29.8	1.0 00	176.0	36 29.8	1.0 00	177.0	05
6	28 59.7	1.0 00	173.9	29 29.7	1.0 00	173.9	29 59.7	1.0 00	174.9	30 59.7	1.0 00	174.9	32 59.7	1.0 00	174.9	34 59.7	1.0 00	174.9	35 29.7	1.0 00	174.9	36 29.8	1.0 00	175.9	6
7	28 59.5	1.0 00	172.9	29 29.5	1.0 00	172.9	29 59.5	1.0 00	173.9	30 59.5	1.0 00	173.9	32 59.5	1.0 00	173.9	34 59.5	1.0 00	174.9	35 29.5	1.0 00	174.9	36 29.5	1.0 00	174.9	7
8	28 59.4	1.0 00	171.9	29 29.4	1.0 00	171.9	29 59.5	1.0 00	172.9	30 59.5	1.0 00	172.9	32 59.4	1.0 00	172.9	34 59.5	1.0 00	173.9	35 29.5	1.0 00	173.9	36 29.5	1.0 00	173.9	8
9	28 59.3	1.0 00	170.9	29 29.3	1.0 00	170.9	29 59.3	1.0 00	171.9	30 59.3	1.0 00	171.9	32 59.4	1.0 00	172.9	34 59.5	1.0 00	172.9	35 29.5	1.0 00	172.9	36 29.5	1.0 00	172.9	9
10	28 59.1	1.0 00	169.9	29 29.1	1.0 00	169.9	29 59.1	1.0 00	169.9	30 59.1	1.0 00	170.9	32 59.1	1.0 00	169.9	34 59.1	1.0 00	170.9	35 29.4	1.0 00	171.9	36 29.4	1.0 00	171.9	10
1	28 58.9	1.0 00	168.9	29 28.9	1.0 00	168.9	29 58.9	1.0 00	169.9	30 59.1	1.0 00	169.9	32 59.1	1.0 00	169.9	34 59.1	1.0 00	169.9	35 29.1	1.0 00	170.9	36 29.3	1.0 00	170.9	1
2	28 58.7	1.0 00	167.9	29 28.7	1.0 00	167.9	29 58.9	1.0 00	168.9	30 58.7	1.0 00	168.9	32 58.7	1.0 00	168.9	34 58.9	1.0 00	168.9	35 28.9	1.0 00	168.9	36 29.1	1.0 00	169.9	2
3	28 58.4	1.0 00	166.9	29 28.4	1.0 00	166.9	29 58.7	1.0 00	167.9	30 58.7	1.0 00	167.9	32 58.7	1.0 00	167.9	34 58.7	1.0 00	167.9	35 28.9	1.0 00	168.9	36 28.9	1.0 00	168.9	3
4	28 58.2	1.0 00	165.9	29 28.2	1.0 00	165.9	29 58.2	1.0 00	166.9	30 58.4	1.0 00	166.9	32 58.4	1.0 00	166.9	34 58.4	1.0 00	166.8	35 28.7	1.0 00	167.9	36 28.7	1.0 00	167.8	4
15	28 57.9	1.0 00	164.9	29 27.9	1.0 00	164.9	29 57.9	1.0 00	164.8	30 57.9	1.0 00	164.8	32 57.9	1.0 00	164.8	34 58.1	1.0 00	165.8	35 28.4	1.0 00	166.8	36 28.4	1.0 00	166.8	15
6	28 57.6	1.0 00	163.8	29 27.6	1.0 00	163.8	29 57.7	1.0 00	163.8	30 57.7	1.0 00	163.8	32 57.7	1.0 00	163.8	34 57.6	1.0 00	163.8	35 27.9	1.0 00	165.8	36 28.2	1.0 00	165.8	6
7	28 57.4	1.0 01	162.8	29 27.4	1.0 01	162.8	29 57.4	1.0 01	162.8	30 57.4	1.0 01	162.8	32 57.7	1.0 00	163.8	34 57.6	1.0 00	164.8	35 27.9	1.0 01	164.8	36 27.9	1.0 00	164.8	7
8	28 57.0	1.0 01	161.8	29 27.0	1.0 01	161.8	29 57.0	1.0 01	161.8	30 57.0	1.0 01	161.8	32 57.0	1.0 01	161.8	34 57.3	1.0 01	162.8	35 27.6	1.0 01	163.8	36 27.3	1.0 01	163.8	8
9	28 56.7	1.0 01	160.8	29 26.7	1.0 01	160.8	29 56.7	1.0 01	161.8	30 57.0	1.0 01	160.8	32 57.0	1.0 01	160.8	34 57.0	1.0 01	161.8	35 27.3	1.0 01	162.8	36 27.3	1.0 01	162.8	9
20	28 56.3	1.0 01	159.8	29 26.3	1.0 01	159.8	29 56.3	1.0 01	159.8	30 56.3	1.0 01	159.8	32 56.7	1.0 01	159.8	34 57.0	1.0 01	160.8	35 27.0	1.0 01	160.8	36 27.0	1.0 01	161.8	20
1	28 56.0	1.0 01	158.8	29 26.0	1.0 01	158.8	29 56.0	1.0 01	158.8	30 56.0	1.0 01	158.8	32 56.3	1.0 01	159.8	34 56.3	1.0 01	159.8	35 26.3	1.0 01	159.8	36 26.3	1.0 01	159.8	1
2	28 55.6	1.0 01	157.8	29 25.6	1.0 01	157.8	29 55.6	1.0 01	157.8	30 55.6	1.0 01	157.8	32 56.0	1.0 01	158.8	34 56.0	1.0 01	158.8	35 26.0	1.0 01	158.7	36 26.0	1.0 01	158.7	2
3	28 55.2	1.0 01	156.8	29 25.2	1.0 01	156.8	29 55.2	1.0 01	156.8	30 55.2	1.0 01	156.8	32 55.2	1.0 01	156.8	34 55.6	1.0 01	157.7	35 26.0	1.0 01	157.7	36 25.6	1.0 01	157.7	3
4	28 54.8	1.0 01	155.8	29 24.8	1.0 01	155.8	29 54.8	1.0 01	156.8	30 54.8	1.0 01	155.8	32 55.2	1.0 01	156.7	34 55.2	1.0 01	156.7	35 25.2	1.0 01	156.7	36 25.2	1.0 01	156.7	4
25	28 54.3	1.0 01	154.8	29 24.3	1.0 01	154.8	29 54.3	1.0 01	154.8	30 54.3	1.0 01	154.8	32 54.3	1.0 01	154.7	34 54.8	1.0 01	155.7	35 25.2	1.0 01	155.7	36 24.8	1.0 01	155.7	25
6	28 53.9	1.0 01	153.8	29 23.9	1.0 01	153.8	29 53.9	1.0 01	153.8	30 54.3	1.0 01	154.8	32 54.3	1.0 01	154.7	34 54.3	1.0 01	154.7	35 24.3	1.0 01	154.7	36 24.3	1.0 01	154.7	6
7	28 53.4	1.0 01	152.8	29 23.9	1.0 01	152.7	29 53.9	1.0 01	153.8	30 53.9	1.0 01	153.7	32 53.9	1.0 01	153.7	34 53.9	1.0 01	153.7	35 23.9	1.0 01	153.7	36 23.9	1.0 01	153.7	7
8	28 52.9	1.0 01	151.7	29 22.9	1.0 01	151.7	29 52.9	1.0 01	152.7	30 53.4	1.0 01	152.7	32 53.4	1.0 01	152.7	34 53.4	1.0 01	152.7	35 23.4	1.0 01	152.7	36 23.9	1.0 01	153.7	8
9	28 52.4	1.0 01	150.7	29 22.4	1.0 01	150.7	29 52.4	1.0 01	151.7	30 52.4	1.0 01	151.7	32 52.4	1.0 01	151.7	34 52.9	1.0 01	151.7	35 22.9	1.0 01	151.7	36 22.9	1.0 01	151.7	9
30	28 51.9	1.0 01	149.7	29 21.9	1.0 01	149.7	29 51.9	1.0 01	149.7	30 51.9	1.0 01	150.7	32 51.9	1.0 01	149.7	34 51.9	1.0 01	149.7	35 22.4	1.0 01	150.7	36 22.4	1.0 01	150.6	30
1	28 51.4	1.0 01	148.7	29 21.4	1.0 01	148.7	29 51.4	1.0 01	148.7	30 51.4	1.0 01	148.7	32 51.3	1.0 01	148.7	34 51.3	1.0 01	148.6	35 21.9	1.0 01	149.6	36 21.9	1.0 01	149.6	1
2	28 50.8	1.0 01	147.7	29 20.8	1.0 01	147.7	29 50.8	1.0 01	147.7	30 50.8	1.0 01	147.7	32 50.8	1.0 01	147.7	34 51.3	1.0 01	147.6	35 21.3	1.0 01	148.6	36 21.3	1.0 01	148.6	2
3	28 50.2	1.0 01	146.7	29 20.2	1.0 01	146.7	29 50.2	1.0 01	146.7	30 50.2	1.0 01	146.7	32 50.2	1.0 01	146.7	34 50.8	1.0 01	146.6	35 20.8	1.0 01	147.6	36 20.8	1.0 01	147.6	3
4	28 49.7	1.0 01	145.7	29 19.7	1.0 01	145.7	29 49.6	1.0 01	145.7	30 49.6	1.0 01	145.7	32 49.6	1.0 01	145.6	34 50.2	1.0 01	146.6	35 20.2	1.0 01	146.6	36 20.2	1.0 01	146.6	4
35	28 49.1	1.0 01	144.7	29 19.1	1.0 01	144.7	29 49.1	1.0 01	144.7	30 49.1	1.0 01	144.7	32 49.0	1.0 01	144.6	34 49.6	1.0 01	145.6	35 19.6	1.0 01	145.6	36 19.6	1.0 01	145.6	35
6	28 48.4	1.0 01	143.7	29 18.4	1.0 01	143.7	29 48.4	1.0 01	143.7	30 48.4	1.0 01	143.7	32 48.4	1.0 01	144.6	34 48.4	1.0 01	143.6	35 19.0	1.0 01	144.6	36 19.6	1.0 01	145.6	6
7	28 47.8	1.0 01	142.7	29 18.4	1.0 01	143.7	29 48.4	1.0 01	143.7	30 47.8	1.0 01	142.7	32 48.4	1.0 01	143.6	34 48.4	1.0 01	143.6	35 19.0	1.0 01	144.6	36 19.0	1.0 01	144.6	7
8	28 47.2	1.0 01	141.7	29 17.2	1.0 01	141.7	29 47.2	1.0 01	142.7	30 47.2	1.0 01	142.6	32 47.8	1.0 01	142.6	34 47.8	1.0 01	142.6	35 18.4	1.0 01	143.6	36 18.4	1.0 01	143.6	8
9	28 46.5	1.0 01	140.7	29 16.5	1.0 01	140.7	29 46.5	1.0 01	141.7	30 47.2	1.0 01	141.6	32 47.2	1.0 01	141.6	34 47.1	1.0 01	141.6	35 17.8	1.0 01	142.6	36 18.4	1.0 01	143.6	9
40	28 45.8	1.0 01	139.7	29 15.8	1.0 01	139.6	29 45.8	1.0 01	139.6	30 45.8	1.0 01	139.6	32 46.5	1.0 01	140.6	34 46.5	1.0 01	140.6	35 17.1	1.0 01	141.6	36 17.1	1.0 01	141.6	40
1	28 45.2	1.0 01	138.6	29 15.2	1.0 01	138.6	29 45.2	1.0 01	138.6	30 45.2	1.0 01	138.6	32 45.1	1.0 01	139.6	34 45.8	1.0 01	139.6	35 16.5	1.0 01	140.6	36 16.5	1.0 01	140.5	1
2	28 44.5	1.0 01	137.6	29 14.5	1.0 01	137.6	29 44.5	1.0 01	138.6	30 44.5	1.0 01	137.6	32 45.1	1.0 01	138.6	34 45.1	1.0 01	138.5	35 15.8	1.0 01	139.5	36 15.8	1.0 01	139.5	2
3	28 43.7	1.0 01	136.6	29 13.7	1.0 01	136.6	29 43.7	1.0 01	136.6	30 43.7	1.0 01	136.6	32 44.4	1.0 01	137.6	34 44.4	1.0 01	137.5	35 15.1	1.0 01	138.5	36 15.1	1.0 01	138.5	3
4	28 43.0	1.0 01	135.6	29 13.0	1.0 01	135.6	29 43.0	1.0 01	135.6	30 43.7	1.0 01	136.6	32 43.7	1.0 01	136.6	34 43.7	1.0 01	136.5	35 13.7	1.0 01	136.5	36 14.4	1.0 01	137.5	4
45	28 42.3	1.0 01	134.6	29 12.3	1.0 01	134.6	29 42.3	1.0 01	134.6	30 42.3	1.0 01	134.6	32 43.0	1.0 01	134.6	34 43.0	1.0 01	135.5	35 13.0	1.0 01	135.5	36 13.7	1.0 01	136.5	45
6	28 41.5	1.0 01	133.6	29 11.5	1.0 01	133.6	29 41.5	1.0 01	133.6	30 41.5	1.0 01	133.6	32 41.5	1.0 01	134.6	34 42.2	1.0 01	134.5	35 12.2	1.0 01	134.5	36 12.2	1.0 01	134.5	6
7	28 40.8	1.0 01	132.6	29 10.8	1.0 01	132.6	29 40.8	1.0 01	132.6	30 40.8	1.0 01	132.6	32 41.5	1.0 01	133.5	34 41.5	1.0 01	133.5	35 11.5	1.0 01	133.5	36 11.5	1.0 01	133.5	7
8	28 40.0	1.0 01	131.6	29 10.0	1.0 01	131.6	29 40.0	1.0 01	131.6	30 40.0	1.0 01	131.6	32 40.7	1.0 01	132.5	34 40.7	1.0 01	131.5	35 10.7	1.0 01	132.5	36 10.7	1.0 01	132.5	8
9	28 39.2	1.0 01	130.6	29 09.2	1.0 01	130.6	29 39.2	1.0 01	131.6	30 40.0	1.0 01	130.6	32 39.9	1.0 01	130.5	34 40.0	1.0 01	131.5	35 09.9	1.0 01	131.5	36 09.9	1.0 01	131.5	9
50	28 38.4	1.0 02	129.6	29 08.4	1.0 01	129.6	29 38.4	1.0 01	129.6	30 39.2	1.0 01	130.6	32 38.4	1.0 01	129.5	34 39.2	1.0 01	130.5	35 09.2	1.0 01	131.5	36 09.9	1.0 01	131.5	50
1	28 37.6	1.0 01	128.6	29 07.6	1.0 01	128.6	29 38.4	1.0 01	129.6	30 38.4	1.0 01	129.6	32 38.4	1.0 01	128.5	34 38.4	1.0 01	129.5	35 08.4	1.0 01	129.5	36 09.1	1.0 01	130.5	1
2	28 36.8	1.0 01	127.6	29 06.8	1.0 01	127.6	29 36.7	1.0 01	127.5	30 36.7	1.0 01	128.5	32 37.6	1.0 01	127.5	34 36.7	1.0 01	127.5	35 06.7	1.0 01	128.5	36 08.3	1.0 01	129.4	2
3	28 35.9	1.0 01	126.6	29 05.9	1.0 01	126.6	29 35.9	1.0 01	126.6	30 35.9	1.0 01	126.5	32 35.9	1.0 01	126.5	34 36.7	1.0 01	127.5	35 06.7	1.0 01	127.5	36 07.5	1.0 01	128.4	3
4	28 35.1	1.0 01	125.6	29 05.1	1.0 01	125.6	29 35.1	1.0 01	125.5	30 35.1	1.0 01	125.5	32 35.9	1.0 01	125.5	34 35.9	1.0 01	126.5	35 06.7	1.0 01	127.5	36 07.5	1.0 01	127.4	4
55	28 34.2	1.0 01	124.6	29 04.2	1.0 01	124.5	29 34.2	1.0 01	124.5	30 34.2	1.0 01	124.5	32 34.2	1.0 01	124.4	34 34.2	1.0 01	124.4	35 05.0	1.0 01	125.4	36 05.9	1.0 01	126.4	55
6	28 33.4	1.0 01	123.6	29 03.4	1.0 01	123.5	29 33.3	1.0 01	123.5	30 33.3	1.0 01	123.5	32 33.3	1.0 01	123.5	34 33.3	1.0 01	123.4	35 03.3	1.0 01	123.4	36 05.0	1.0 01	125.4	6
7	28 32.5	1.0 01	122.5	29 02.5	1.0 01	122.5	29 32.5	1.0 01	122.5	30 32.4	1.0 01	122.5	32 32.4	1.0 01	122.5	34 32.4	1.0 02	122.4	35 03.3	1.0 01	123.4	36 04.2	1.0 01	124.4	7
8	28 31.6	1.0 02	121.5	29 01.6	1.0 02	121.5	29 31.6	1.0 02	121.5	30 31.6	1.0 01	121.5	32 31.6	1.0 01	121.5	34 31.5	1.0 02	121.4	35 01.5	1.0 02	121.4	36 03.3	1.0 01	123.4	8
9	28 30.7	1.0 02	120.5	29 00.7	1.0 02	120.5	29 30.7	1.0 02	120.5	30 30.7	1.0 02	120.5	32 30.7	1.0 01	120.5	34 30.6	1.0 02	120.4	35 00.6	1.0 02	120.4	36 02.4	1.0 01	122.4	9
60	28 29.8	1.0 02	119.5	28 59.8	1.0 02	119.5	29 29.8	1.0 02	119.5	30 29.8	1.0 02	119.5	32 29.8	1.0 02	119.5	34 29.7	1.0 02	119.4	34 59.7	1.0 02	119.4	36 00.4	1.0 02	120.4	60
1	28 28.9	1.0 02	118.5	28 58.9	1.0 02	118.5	29 28.9	1.0 02	118.5	30 28.9	1.0 02	118.5	32 28.8	1.0 02	118.4	34 28.8	1.0 02	118.4	34 58.8	1.0 02	118.4	35 59.7	1.0 02	119.4	1
2	28 27.9	1.0 02	117.5	28 57.9	1.0 02	117.5	29 27.9	1.0 02	117.5	30 28.9	1.0 02	117.5	32 27.9	1.0 02	117.4	34 27.9	1.0 02	117.4	34 58.8	1.0 02	118.4	35 58.8	1.0 02	118.4	2
3	28 27.0	1.0 02	116.5	28 57.0	1.0 02	116.5	29 27.0	1.0 02	116.5	30 27.0	1.0 02	116.4	32 27.0	1.0 02	116.4	34 27.0	1.0 02	116.4	34 57.9	1.0 02	117.4	35 57.9	1.0 02	117.4	3
4	28 26.1	1.0 02	115.5	28 56.1	1.0 02	115.5	29 26.1	1.0 02	115.5	30 26.1	1.0 02	115.5	32 26.0	1.0 02	115.4	34 26.0	1.0 02	115.4	34 57.0	1.0 02	116.4	35 56.9	1.0 02	116.4	4
65	28 25.1	1.0 02	114.5	28 55.1	1.0 02	114.5	29 25.1	1.0 02	114.5	30 25.1	1.0 02	114.5	32 25.1	1.0 02	114.4	34 26.0	1.0 02	115.4	34 55.1	1.0 02	114.4	35 56.0	1.0 02	115.4	65
6	28 24.2	1.0 02	113.5	28 54.2	1.0 02	113.5	29 24.2	1.0 02	113.5	30 24.2	1.0 02	113.5	32 24.1	1.0 02	113.4	34 24.1	1.0 02	113.4	34 54.1	1.0 02	113.4	35 54.1	1.0 02	113.3	6
7	28 23.2	1.0 02	112.5	28 53.2	1.0 02	112.5	29 23.2	1.0 02	112.5	30 23.2	1.0 02	112.4	32 23.2	1.0 02	112.4	34 23.1	1.0 02	112.4	34 53.1	1.0 02	112.4	35 54.1	1.0 02	113.3	7
8	28 22.2	1.0 02	111.5	28 52.2	1.0 02	111.5	29 22.2	1.0 02	111.5	30 22.2	1.0 02	111.5	32 22.2	1.0 02	111.4	34 22.2	1.0 02	111.4	34 52.2	1.0 02	111.4	35 52.1	1.0 02	112.3	8
9	28 21.3	1.0 02	110.5	28 51.3	1.0 02	110.5	29 21.3	1.0 02	110.5	30 21.3	1.0 02	110.5	32 21.2	1.0 02	110.4	34 21.2	1.0 02	110.4	34 51.2	1.0 02	110.4	35 51.2	1.0 02	110.3	9
70	28 20.3	1.0 02	109.5	28 50.3	1.0 02	109.5	29 20.3	1.0 02	109.5	30 20.3	1.0 02	109.5	32 20.2	1.0 02	109.4	34 20.2	1.0 02	109.4	34 50.2	1.0 02	109.3	35 50.2	1.0 02	109.3	70
1	28 19.3	1.0 02	108.5	28 49.3	1.0 02	108.5	29 19.3	1.0 02	108.5	30 19.3	1.0 02	108.4	32 19.2	1.0 02	108.4	34 19.2	1.0 02	108.3	34 49.2	1.0 02	108.3	35 49.2	1.0 02	108.3	1
2	28 18.3	1.0 02	107.5	28 48.3	1.0 02	107.5	29 18.3	1.0 02	107.5	30 18.3	1.0 02	107.4	32 18.2	1.0 02	107.4	34 18.2	1.0 02	107.4	34 48.2	1.0 02	108.3	35 48.2	1.0 02	107.3	2
3	28 17.3	1.0 02	106.5	28 47.3	1.0 02	106.5	29 17.3	1.0 02	106.5	30 17.3	1.0 02	106.4	32 17.2	1.0 02	106.4	34 17.2	1.0 02	106.4	34 47.2	1.0 02	106.3	35 48.2	1.0 02	107.3	3
4	28 16.3	1.0 02	105.5	28 46.3	1.0 02	105.5	29 16.3	1.0 02	105.5	30 16.3	1.0 02	105.4	32 16.2	1.0 02	105.4	34 16.2	1.0 02	105.3	34 46.2	1.0 02	105.3	35 46.2	1.0 02	105.3	4
75	28 15.3	1.0 02	104.5	28 45.3	1.0 02	104.5	29 15.3	1.0 02	104.5	30 15.2	1.0 02	104.4	32 15.2	1.0 02	104.4	34 15.2	1.0 02	104.3	34 45.2	1.0 02	104.3	35 45.2	1.0 02	104.3	75
6	28 14.3	1.0 02	103.5	28 44.2	1.0 02	103.5	29 14.2	1.0 02	103.5	30 14.2	1.0 02	103.4	32 14.2	1.0 02	103.4	34 14.2	1.0 02	103.3	34 44.2	1.0 02	103.3	35 44.2	1.0 02	103.3	6
7	28 13.2	1.0 02	102.5	28 43.2	1.0 02	102.5	29 13.2	1.0 02	102.5	30 13.2	1.0 02	102.4	32 13.2	1.0 02	102.4	34 13.2	1.0 02	102.3	34 43.2	1.0 02	102.3	35 44.2	1.0 02	103.3	7
8	28 12.2	1.0 02	101.5	28 42.2	1.0 02	101.5	29 12.2	1.0 02	101.5	30 12.2	1.0 02	101.4	32 12.2	1.0 02	101.4	34 12.2	1.0 02	101.3	34 42.2	1.0 02	101.3	35 42.2	1.0 02	101.3	8
9	28 11.2	1.0 02	100.5	28 41.2	1.0 02	100.5	29 11.2	1.0 02	100.5	30 11.2	1.0 02	100.4	32 11.1	1.0 02	100.4	34 11.1	1.0 02	100.3	34 41.1	1.0 02	100.3	35 41.1	1.0 02	100.3	9
80	28 10.1	1.0 02	99.5	28 40.1	1.0 02	99.5	29 10.1	1.0 02	99.5	30 10.1	1.0 02	99.4	32 10.1	1.0 02	99.4	34 10.1	1.0 02	99.3	34 40.1	1.0 02	99.3	35 41.1	1.0 02	100.3	80
1	28 09.1	1.0 02	98.5	28 39.1	1.0 02	98.5	29 09.1	1.0 02	98.4	30 09.1	1.0 02	98.4	32 09.1	1.0 02	98.4	34 09.1	1.0 02	98.3	34 39.1	1.0 02	98.3	35 40.1	1.0 02	99.3	1
2	28 08.1	1.0 02	97.5	28 38.1	1.0 02	97.5	29 08.1	1.0 02	97.4	30 07.1	1.0 02	97.4	32 09.1	1.0 02	98.4	34 09.1	1.0 02	98.3	34 39.1	1.0 02	98.3	35 40.1	1.0 02	99.3	2
3	28 07.0	1.0 02	96.5	28 37.6	1.0 02	96.5	29 06.1	1.0 02	96.4	30 07.1	1.0 02	97.4	32 07.1	1.0 02	97.4	34 08.1	1.0 02	97.3	34 38.1	1.0 02	97.3	35 39.1	1.0 02	98.3	3
4	28 06.0	1.0 02	95.5	28 36.0	1.0 02	95.5	29 06.0	1.0 02	95.4	30 07.0	1.0 02	96.4	32 07.0	1.0 02	96.4	34 07.0	1.0 02	96.3	34 38.0	1.0 02	97.3	35 36.9	1.0 02	96.3	4
85	28 05.0	1.0 02	94.5	28 34.9	1.0 02	94.5	29 04.9	1.0 02	94.4	30 04.9	1.0 02	94.4	32 04.9	1.0 02	94.4	34 04.9	1.0 02	94.3	34 34.9	1.0 02	94.3	35 35.9	1.0 02	95.3	85
6	28 03.9	1.0 02	93.5	28 33.9	1.0 02	93.5	29 03.9	1.0 02	93.4	30 03.9	1.0 02	93.4	32 03.9	1.0 02	93.4	34 03.9	1.0 02	93.3	34 33.9	1.0 02	94.3	35 34.9	1.0 02	94.3	6
7	28 02.9	1.0 02	92.5	28 32.9	1.0 02	92.5	29 02.8	1.0 02	92.4	30 02.8	1.0 02	92.4	32 02.8	1.0 02	92.4	34 02.8	1.0 02	92.3	34 32.8	1.0 02	92.3	35 33.8	1.0 02	93.3	7
8	28 01.8	1.0 02	91.5	28 31.8	1.0 02	91.5	29 01.8	1.0 02	91.4	30 01.8	1.0 02	91.4	32 01.8	1.0 02	91.4	34 01.7	1.0 02	91.3	34 32.8	1.0 02	92.3	35 31.7	1.0 02	92.3	8
9	28 00.8	1.0 02	90.5	28 30.8	1.0 02	90.5	29 00.7	1.0 02	90.4	30 00.7	1.0 02	90.4	32 00.7	1.0 02	90.4	34 01.7	1.0 02	91.3	34 31.7	1.0 02	91.3	35 31.7	1.0 02	91.3	9
90	27 59.7	1.0 02	89.5	28 29.7	1.0 02	89.5	28 59.7	1.0 02	89.4	29 59.7	1.0 02	89.4	31 59.7	1.0 02	89.4	33 59.6	1.0 02	89.3	34 29.6	1.0 02	89.3	35 29.6	1.0 02	89.3	90

H.A.	28° 00' Alt.	Δd Δt	Az.	28° 30' Alt.	Δd Δt	Az.	29° 00' Alt.	Δd Δt	Az.	30° 00' Alt.	Δd Δt	Az.	32° 00' Alt.	Δd Δt	Az.	34° 00' Alt.	Δd Δt	Az.	34° 30' Alt.	Δd Δt	Az.	35° 30' Alt.	Δd Δt	Az.	H.A.
91	27 58.7	1.002	88.5	28 28.7	1.002	88.5	28 58.7	1.002	88.4	29 58.7	1.002	88.4	31 58.6	1.002	88.4	33 58.6	1.002	88.3	34 28.6	1.002	88.3	35 28.6	1.002	88.3	91
2	27 57.6	1.002	87.5	28 27.6	1.002	87.5	28 57.6	1.002	87.4	29 57.6	1.002	87.4	31 57.6	1.002	87.4	33 57.6	1.002	87.3	34 27.5	1.002	87.3	35 27.5	1.002	87.3	2
3	27 56.6	1.002	86.5	28 26.6	1.002	86.5	28 56.6	1.002	86.4	29 56.6	1.002	86.4	31 56.5	1.002	86.4	33 56.5	1.002	86.3	34 26.5	1.002	86.3	35 26.5	1.002	86.3	3
4	27 55.5	1.002	85.5	28 25.5	1.002	85.5	28 55.5	1.002	85.4	29 55.5	1.002	85.4	31 55.5	1.002	85.4	33 55.5	1.002	85.3	34 25.5	1.002	85.3	35 25.4	1.002	85.3	4
95	27 54.5	1.002	84.5	28 24.5	1.002	84.5	28 54.5	1.002	84.4	29 54.5	1.002	84.4	31 54.4	1.002	84.4	33 54.4	1.002	84.3	34 24.4	1.002	84.3	35 24.4	1.002	84.3	95
6	27 53.5	1.002	83.5	28 23.4	1.002	83.5	28 53.4	1.002	83.4	29 53.4	1.002	83.4	31 53.4	1.002	83.4	33 53.4	1.002	83.3	34 23.4	1.002	83.3	35 23.4	1.002	83.3	6
7	27 52.4	1.002	82.5	28 22.4	1.002	82.5	28 52.4	1.002	82.4	29 52.4	1.002	82.4	31 52.4	1.002	82.4	33 52.3	1.002	82.3	34 22.3	1.002	82.3	35 22.3	1.002	82.3	7
8	27 51.4	1.002	81.5	28 21.4	1.002	81.5	28 51.4	1.002	81.5	29 51.4	1.002	81.4	31 51.3	1.002	81.4	33 51.3	1.002	81.3	34 21.3	1.002	81.3	35 21.3	1.002	81.3	8
9	27 50.3	1.002	80.5	28 20.3	1.002	80.5	28 50.3	1.002	80.5	29 50.3	1.002	80.4	31 50.3	1.002	80.4	33 50.3	1.002	80.3	34 20.3	1.002	80.3	35 20.3	1.002	80.3	9
100	27 49.3	1.002	79.5	28 19.3	1.002	79.5	28 49.3	1.002	79.5	29 49.3	1.002	79.4	31 49.3	1.002	79.4	33 49.2	1.002	79.3	34 19.2	1.002	79.3	35 19.2	1.002	79.3	100
1	27 48.3	1.002	78.5	28 18.3	1.002	78.5	28 48.3	1.002	78.5	29 48.3	1.002	78.4	31 48.2	1.002	78.4	33 48.2	1.002	78.3	34 18.2	1.002	78.3	35 18.2	1.002	78.3	1
2	27 47.3	1.002	77.5	28 17.3	1.002	77.5	28 47.2	1.002	77.5	29 47.2	1.002	77.4	31 47.2	1.002	77.4	33 47.2	1.002	77.3	34 17.2	1.002	77.3	35 17.2	1.002	77.3	2
3	27 46.2	1.002	76.5	28 16.2	1.002	76.5	28 46.2	1.002	76.5	29 46.2	1.002	76.4	31 46.2	1.002	76.4	33 46.2	1.002	76.3	34 16.2	1.002	76.3	35 16.2	1.002	76.3	3
4	27 45.2	1.002	75.5	28 15.2	1.002	75.5	28 45.2	1.002	75.5	29 45.2	1.002	75.4	31 45.2	1.002	75.4	33 45.2	1.002	75.4	34 15.1	1.002	75.3	35 15.1	1.002	75.3	4
105	27 44.2	1.002	74.5	28 14.2	1.002	74.5	28 44.2	1.002	74.5	29 44.2	1.002	74.4	31 44.2	1.002	74.4	33 44.1	1.002	74.4	34 14.1	1.002	74.3	35 14.1	1.002	74.3	105
6	27 43.2	1.002	73.5	28 13.2	1.002	73.5	28 43.2	1.002	73.5	29 43.2	1.002	73.4	31 43.2	1.002	73.4	33 43.1	1.002	73.4	34 13.1	1.002	73.3	35 13.1	1.002	73.3	6
7	27 42.2	1.002	72.5	28 12.2	1.002	72.5	28 42.2	1.002	72.5	29 42.2	1.002	72.4	31 42.1	1.002	72.4	33 42.1	1.002	72.4	34 12.1	1.002	72.3	35 12.1	1.002	72.3	7
8	27 41.2	1.002	71.5	28 11.2	1.002	71.5	28 41.2	1.002	71.5	29 41.2	1.002	71.5	31 41.2	1.002	71.4	33 41.1	1.002	71.4	34 11.1	1.002	71.4	35 11.1	1.002	71.3	8
9	27 40.2	1.002	70.5	28 10.2	1.002	70.5	28 40.2	1.002	70.5	29 40.2	1.002	70.5	31 40.2	1.002	70.4	33 40.2	1.002	70.4	34 10.1	1.002	70.4	35 10.1	1.002	70.3	9
110	27 39.2	1.002	69.5	28 09.2	1.002	69.5	28 39.2	1.002	69.5	29 39.2	1.002	69.5	31 39.2	1.002	69.4	33 39.2	1.002	69.4	34 09.2	1.002	69.4	35 09.2	1.002	69.3	110
1	27 38.3	1.002	68.5	28 08.3	1.002	68.5	28 38.2	1.002	68.5	29 38.2	1.002	68.5	31 38.2	1.002	68.4	33 38.2	1.002	68.4	34 08.2	1.002	68.4	35 08.2	1.002	68.3	1
2	27 37.3	1.002	67.5	28 07.3	1.002	67.5	28 37.3	1.002	67.5	29 37.3	1.002	67.5	31 37.2	1.002	67.4	33 37.2	1.002	67.4	34 07.2	1.002	67.4	35 07.2	1.002	67.3	2
3	27 36.3	1.002	66.5	28 06.3	1.002	66.5	28 36.3	1.002	66.5	29 36.3	1.002	66.5	31 36.3	1.002	66.4	33 36.3	1.002	66.4	34 06.3	1.002	66.4	35 06.2	1.002	66.3	3
4	27 35.4	1.002	65.5	28 05.4	1.002	65.5	28 35.4	1.002	65.5	29 35.3	1.002	65.5	31 35.3	1.002	65.4	33 35.3	1.002	65.4	34 05.3	1.002	65.4	35 05.3	1.002	65.4	4
115	27 34.4	1.002	64.5	28 04.4	1.002	64.5	28 34.4	1.002	64.5	29 34.4	1.002	64.5	31 34.4	1.002	64.4	33 34.4	1.002	64.4	34 04.3	1.002	64.4	35 04.3	1.002	64.4	115
6	27 33.5	1.002	63.5	28 03.5	1.002	63.5	28 33.5	1.002	63.5	29 33.5	1.002	63.5	31 33.4	1.002	63.4	33 33.4	1.002	63.4	34 03.4	1.002	63.4	35 03.4	1.002	63.4	6
7	27 32.5	1.002	62.5	28 02.5	1.002	62.5	28 32.5	1.002	62.5	29 32.5	1.002	62.5	31 32.5	1.002	62.4	33 32.5	1.002	62.4	34 02.5	1.002	62.4	35 02.5	1.002	62.4	7
8	27 31.6	1.002	61.5	28 01.6	1.002	61.5	28 31.6	1.002	61.5	29 31.6	1.002	61.5	31 31.6	1.002	61.5	33 31.6	1.002	61.4	34 01.6	1.002	61.4	35 01.5	1.002	61.4	8
9	27 30.7	1.002	60.5	28 00.7	1.002	60.5	28 30.7	1.002	60.5	29 30.7	1.002	60.5	31 30.7	1.002	60.5	33 30.6	1.002	60.4	34 00.6	1.002	60.4	35 00.6	1.002	60.4	9
120	27 29.8	1.002	59.5	27 59.8	1.002	59.5	28 29.8	1.002	59.5	29 29.8	1.002	59.5	31 29.8	1.001	59.5	33 29.7	1.002	59.4	33 59.7	1.001	59.4	34 59.7	1.001	59.4	120
1	27 28.9	1.002	58.5	27 58.9	1.001	58.5	28 28.9	1.002	58.5	29 28.9	1.002	58.5	31 28.9	1.001	58.5	33 28.8	1.001	58.4	33 58.8	1.001	58.4	34 58.8	1.001	58.4	1
2	27 28.0	1.001	57.6	27 58.0	1.001	57.5	28 28.0	1.001	57.5	29 28.0	1.001	57.5	31 28.0	1.001	57.5	33 28.0	1.001	57.4	33 57.9	1.001	57.4	34 57.9	1.001	57.4	2
3	27 27.1	1.001	56.6	27 57.1	1.001	56.6	28 27.1	1.001	56.5	29 27.1	1.001	56.5	31 27.1	1.001	56.5	33 27.1	1.001	56.4	33 57.1	1.001	56.4	34 57.1	1.001	56.4	3
4	27 26.3	1.001	55.6	27 56.3	1.001	55.6	28 26.3	1.001	55.5	29 26.2	1.001	55.5	31 26.2	1.001	55.5	33 26.2	1.001	55.4	33 56.2	1.001	55.4	34 56.2	1.001	55.4	4
125	27 25.4	1.001	54.6	27 55.4	1.001	54.6	28 25.4	1.001	54.5	29 25.4	1.001	54.5	31 25.4	1.001	54.5	33 25.4	1.001	54.5	33 55.3	1.001	54.4	34 55.3	1.001	54.4	125
6	27 24.6	1.001	53.6	27 54.5	1.001	53.6	28 24.5	1.001	53.6	29 24.5	1.001	53.5	31 24.5	1.001	53.5	33 24.5	1.001	53.5	33 54.5	1.001	53.5	34 54.5	1.001	53.4	6
7	27 23.7	1.001	52.6	27 53.7	1.001	52.6	28 23.7	1.001	52.6	29 23.7	1.001	52.5	31 23.7	1.001	52.5	33 23.7	1.001	52.5	33 53.7	1.001	52.5	34 53.7	1.001	52.4	7
8	27 22.9	1.001	51.6	27 52.9	1.001	51.6	28 22.9	1.001	51.6	29 22.9	1.001	51.6	31 22.9	1.001	51.5	33 22.8	1.001	51.5	33 52.8	1.001	51.5	34 52.8	1.001	51.4	8
9	27 22.1	1.001	50.6	27 52.1	1.001	50.6	28 22.1	1.001	50.6	29 22.1	1.001	50.6	31 22.0	1.001	50.5	33 22.0	1.001	50.5	33 52.0	1.001	50.5	34 52.0	1.001	50.5	9
130	27 21.3	1.001	49.6	27 51.3	1.001	49.6	28 21.3	1.001	49.6	29 21.3	1.001	49.6	31 21.2	1.001	49.5	33 21.2	1.001	49.5	33 51.2	1.001	49.5	34 51.2	1.001	49.5	130
1	27 20.5	1.001	48.6	27 50.5	1.001	48.6	28 20.5	1.001	48.6	29 20.5	1.001	48.6	31 20.5	1.001	48.5	33 20.4	1.001	48.5	33 50.4	1.001	48.5	34 50.4	1.001	48.5	1
2	27 19.7	1.001	47.6	27 49.7	1.001	47.6	28 19.7	1.001	47.6	29 19.7	1.001	47.6	31 19.7	1.001	47.5	33 19.7	1.001	47.5	33 49.7	1.001	47.5	34 49.6	1.001	47.5	2
3	27 18.9	1.001	46.6	27 48.9	1.001	46.6	28 18.9	1.001	46.6	29 18.9	1.001	46.6	31 18.9	1.001	46.6	33 18.9	1.001	46.5	33 48.9	1.001	46.5	34 48.9	1.001	46.5	3
4	27 18.2	1.001	45.6	27 48.2	1.001	45.6	28 18.2	1.001	45.6	29 18.2	1.001	45.6	31 18.2	1.001	45.6	33 18.1	1.001	45.5	33 48.1	1.001	45.5	34 48.1	1.001	45.5	4
135	27 17.4	1.001	44.6	27 47.4	1.001	44.6	28 17.4	1.001	44.6	29 17.4	1.001	44.6	31 17.4	1.001	44.6	33 17.4	1.001	44.5	33 47.4	1.001	44.5	34 47.4	1.001	44.5	135
6	27 16.7	1.001	43.6	27 46.7	1.001	43.6	28 16.7	1.001	43.6	29 16.7	1.001	43.6	31 16.7	1.001	43.6	33 16.7	1.001	43.5	33 46.7	1.001	43.5	34 46.7	1.001	43.5	6
7	27 16.0	1.001	42.6	27 46.0	1.001	42.6	28 16.0	1.001	42.6	29 16.0	1.001	42.6	31 16.0	1.001	42.6	33 16.0	1.001	42.5	33 46.0	1.001	42.5	34 45.9	1.001	42.5	7
8	27 15.3	1.001	41.7	27 45.3	1.001	41.6	28 15.3	1.001	41.6	29 15.3	1.001	41.6	31 15.3	1.001	41.6	33 15.3	1.001	41.6	33 45.3	1.001	41.5	34 45.3	1.001	41.5	8
9	27 14.6	1.001	40.7	27 44.6	1.001	40.7	28 14.6	1.001	40.6	29 14.6	1.001	40.6	31 14.6	1.001	40.6	33 14.6	1.001	40.6	33 44.6	1.001	40.6	34 44.6	1.001	40.5	9
140	27 13.9	1.001	39.7	27 43.9	1.001	39.7	28 13.9	1.001	39.7	29 13.9	1.001	39.6	31 13.9	1.001	39.6	33 13.9	1.001	39.6	33 43.9	1.001	39.6	34 43.9	1.001	39.6	140
1	27 13.3	1.001	38.7	27 43.3	1.001	38.7	28 13.3	1.001	38.7	29 13.3	1.001	38.6	31 13.2	1.001	38.6	33 13.2	1.001	38.6	33 43.2	1.001	38.6	34 43.2	1.001	38.6	1
2	27 12.6	1.001	37.7	27 42.6	1.001	37.7	28 12.6	1.001	37.7	29 12.6	1.001	37.7	31 12.6	1.001	37.6	33 12.6	1.001	37.6	33 42.6	1.001	37.6	34 42.6	1.001	37.6	2
3	27 12.0	1.001	36.7	27 42.0	1.001	36.7	28 12.0	1.001	36.7	29 12.0	1.001	36.7	31 12.0	1.001	36.6	33 12.0	1.001	36.6	33 42.0	1.001	36.6	34 41.9	1.001	36.6	3
4	27 11.4	1.001	35.7	27 41.4	1.001	35.7	28 11.4	1.001	35.7	29 11.4	1.001	35.7	31 11.4	1.001	35.6	33 11.3	1.001	35.6	33 41.3	1.001	35.6	34 41.3	1.001	35.6	4
145	27 10.8	1.001	34.7	27 40.8	1.001	34.7	28 10.8	1.001	34.7	29 10.8	1.001	34.7	31 10.7	1.001	34.6	33 10.7	1.001	34.6	33 40.7	1.001	34.6	34 40.7	1.001	34.6	145
6	27 10.2	1.001	33.7	27 40.2	1.001	33.7	28 10.2	1.001	33.7	29 10.2	1.001	33.7	31 10.2	1.001	33.7	33 10.1	1.001	33.6	33 40.1	1.001	33.6	34 40.1	1.001	33.6	6
7	27 09.6	1.001	32.7	27 39.6	1.001	32.7	28 09.6	1.001	32.7	29 09.6	1.001	32.7	31 09.6	1.001	32.7	33 09.6	1.001	32.6	33 39.6	1.001	32.6	34 39.6	1.001	32.6	7
8	27 09.0	1.001	31.7	27 39.0	1.001	31.7	28 09.0	1.001	31.7	29 09.0	1.001	31.7	31 09.0	1.001	31.7	33 09.0	1.001	31.6	33 39.0	1.001	31.6	34 39.0	1.001	31.6	8
9	27 08.5	1.001	30.7	27 38.5	1.001	30.7	28 08.5	1.001	30.7	29 08.5	1.001	30.7	31 08.5	1.001	30.7	33 08.5	1.001	30.7	33 38.5	1.001	30.7	34 38.5	1.001	30.6	9
150	27 08.0	1.001	29.7	27 38.0	1.001	29.7	28 08.0	1.001	29.7	29 08.0	1.001	29.7	31 08.0	1.001	29.7	33 08.0	1.001	29.7	33 37.9	1.001	29.7	34 37.9	1.001	29.7	150
1	27 07.5	1.001	28.7	27 37.5	1.001	28.7	28 07.5	1.001	28.7	29 07.5	1.001	28.7	31 07.4	1.001	28.7	33 07.4	1.001	28.7	33 37.4	1.001	28.7	34 37.4	1.001	28.7	1
2	27 07.0	1.001	27.8	27 37.0	1.001	27.8	28 07.0	1.001	27.7	29 07.0	1.001	27.7	31 07.0	1.001	27.7	33 06.9	1.001	27.7	33 36.9	1.001	27.7	34 36.9	1.001	27.7	2
3	27 06.5	1.001	26.8	27 36.5	1.001	26.8	28 06.5	1.001	26.8	29 06.5	1.001	26.7	31 06.5	1.001	26.7	33 06.5	1.001	26.7	33 36.5	1.001	26.7	34 36.5	1.001	26.7	3
4	27 06.0	1.001	25.8	27 36.0	1.001	25.8	28 06.0	1.001	25.8	29 06.0	1.001	25.8	31 06.0	1.001	25.7	33 06.0	1.001	25.7	33 36.0	1.001	25.7	34 36.0	1.001	25.7	4
155	27 05.6	1.001	24.8	27 35.6	1.001	24.8	28 05.6	1.001	24.8	29 05.6	1.001	24.8	31 05.6	1.001	24.7	33 05.6	1.001	24.7	33 35.6	1.001	24.7	34 35.6	1.001	24.7	155
6	27 05.1	1.001	23.8	27 35.1	1.001	23.8	28 05.1	1.001	23.8	29 05.1	1.001	23.8	31 05.1	1.001	23.8	33 05.1	1.001	23.7	33 35.1	1.001	23.7	34 35.1	1.001	23.7	6
7	27 04.7	1.001	22.8	27 34.7	1.001	22.8	28 04.7	1.001	22.8	29 04.7	1.001	22.8	31 04.7	1.001	22.8	33 04.7	1.001	22.7	33 34.7	1.001	22.7	34 34.7	1.001	22.7	7
8	27 04.3	1.001	21.8	27 34.3	1.001	21.8	28 04.3	1.001	21.8	29 04.3	1.001	21.8	31 04.3	1.001	21.8	33 04.3	1.001	21.8	33 34.3	1.001	21.7	34 34.3	1.001	21.7	8
9	27 04.0	1.001	20.8	27 34.0	1.001	20.8	28 03.9	1.001	20.8	29 03.9	1.001	20.8	31 03.9	1.001	20.8	33 03.9	1.001	20.8	33 33.9	1.001	20.8	34 33.9	1.001	20.8	9
160	27 03.6	1.001	19.8	27 33.6	1.001	19.8	28 03.6	1.001	19.8	29 03.6	1.001	19.8	31 03.6	1.001	19.8	33 03.6	1.001	19.8	33 33.6	1.001	19.8	34 33.6	1.001	19.8	160
1	27 03.2	1.001	18.8	27 33.2	1.001	18.8	28 03.2	1.001	18.8	29 03.2	1.001	18.8	31 03.2	1.001	18.8	33 03.2	1.001	18.8	33 33.2	1.001	18.8	34 33.2	1.001	18.8	1
2	27 02.9	1.001	17.8	27 32.9	1.001	17.8	28 02.9	1.001	17.8	29 02.9	1.001	17.8	31 02.9	1.000	17.8	33 02.9	1.000	17.8	33 32.9	1.001	17.8	34 32.9	1.001	17.8	2
3	27 02.6	1.000	16.8	27 32.6	1.000	16.8	28 02.6	1.000	16.8	29 02.6	1.000	16.8	31 02.6	1.000	16.8	33 02.6	1.000	16.8	33 32.6	1.000	16.8	34 32.6	1.000	16.8	3
4	27 02.3	1.000	15.9	27 32.3	1.000	15.9	28 02.3	1.000	15.9	29 02.3	1.000	15.8	31 02.3	1.000	15.8	33 02.3	1.000	15.8	33 32.3	1.000	15.8	34 32.3	1.000	15.8	4
165	27 02.0	1.000	14.9	27 32.0	1.000	14.9	28 02.0	1.000	14.9	29 02.0	1.000	14.9	31 02.0	1.000	14.8	33 02.0	1.000	14.8	33 32.0	1.000	14.8	34 32.0	1.000	14.8	165
6	27 01.8	1.000	13.9	27 31.8	1.000	13.9	28 01.8	1.000	13.9	29 01.8	1.000	13.9	31 01.8	1.000	13.9	33 01.8	1.000	13.8	33 31.8	1.000	13.8	34 31.8	1.000	13.8	6
7	27 01.5	1.000	12.9	27 31.5	1.000	12.9	28 01.5	1.000	12.9	29 01.5	1.000	12.9	31 01.5	1.000	12.9	33 01.5	1.000	12.9	33 31.5	1.000	12.8	34 31.5	1.000	12.8	7
8	27 01.3	1.000	11.9	27 31.3	1.000	11.9	28 01.3	1.000	11.9	29 01.3	1.000	11.9	31 01.3	1.000	11.9	33 01.3	1.000	11.9	33 31.3	1.000	11.9	34 31.3	1.000	11.9	8
9	27 01.1	1.000	10.9	27 31.1	1.000	10.9	28 01.1	1.000	10.9	29 01.1	1.000	10.9	31 01.1	1.000	10.9	33 01.1	1.000	10.9	33 31.1	1.000	10.9	34 31.1	1.000	10.9	9
170	27 00.9	1.000	09.9	27 30.9	1.000	09.9	28 00.9	1.000	09.9	29 00.9	1.000	09.9	31 00.9	1.000	09.9	33 00.9	1.000	09.9	33 30.9	1.000	09.9	34 30.9	1.000	09.9	170
1	27 00.7	1.000	08.9	27 30.7	1.000	08.9	28 00.7	1.000	08.9	29 00.7	1.000	08.9	31 00.7	1.000	08.9	33 00.7	1.000	08.9	33 30.7	1.000	08.9	34 30.7	1.000	08.9	1
2	27 00.6	1.000	07.9	27 30.6	1.000	07.9	28 00.6	1.000	07.9	29 00.6	1.000	07.9	31 00.6	1.000	07.9	33 00.6	1.000	07.9	33 30.6	1.000	07.9	34 30.6	1.000	07.9	2
3	27 00.4	1.000	06.9	27 30.4	1.000	06.9	28 00.4	1.000	06.9	29 00.4	1.000	06.9	31 00.4	1.000	06.9	33 00.4	1.000	06.9	33 30.4	1.000	06.9	34 30.4	1.000	06.9	3
4	27 00.3	1.000	05.9	27 30.3	1.000	05.9	28 00.3	1.000	05.9	29 00.3	1.000	05.9	31 00.3	1.000	05.9	33 00.3	1.000	05.9	33 30.3	1.000	05.9	34 30.3	1.000	05.9	4
175	27 00.2	1.000	05.0	27 30.2	1.000	05.0	28 00.2	1.000	05.0	29 00.2	1.000	05.0	31 00.2	1.000	04.9	33 00.2	1.000	04.9	33 30.2	1.000	04.9	34 30.2	1.000	04.9	175
6	27 00.1	1.000	04.0	27 30.1	1.000	04.0	28 00.1	1.000	04.0	29 00.1	1.000	04.0	31 00.1	1.000	04.0	33 00.1	1.000	04.0	33 30.1	1.000	04.0	34 30.1	1.000	04.0	6
7	27 00.1	1.000	03.0	27 30.1	1.000	03.0	28 00.1	1.000	03.0	29 00.1	1.000	03.0	31 00.1	1.000	03.0	33 00.1	1.000	03.0	33 30.1	1.000	03.0	34 30.1	1.000	03.0	7
8	27 00.0	1.000	02.0	27 30.0	1.000	02.0	28 00.0	1.000	02.0	29 00.0	1.000	02.0	31 00.0	1.000	02.0	33 00.0	1.000	02.0	33 30.0	1.000	02.0	34 30.0	1.000	02.0	8
9	27 00.0	1.000	01.0	27 30.0	1.000	01.0	28 00.0	1.000	01.0	29 00.0	1.000	01.0	31 00.0	1.000	01.0	33 00.0	1.000	01.0	33 30.0	1.000	01.0	34 30.0	1.000	01.0	9
180	27 00.0	1.000	00.0	27 30.0	1.000	00.0	28 00.0	1.000	00.0	29 00.0	1.000	00.0	31 00.0	1.000	00.0	33 00.0	1.000	00.0	33 30.0	1.000	00.0	34 30.0	1.000	00.0	180

Lat. 89°

H.A.	36° 00′ Alt.	Δd Δt	Az.	37° 00′ Alt.	Δd Δt	Az.	38° 30′ Alt.	Δd Δt	Az.	40° 00′ Alt.	Δd Δt	Az.	42° 00′ Alt.	Δd Δt	Az.	42° 30′ Alt.	Δd Δt	Az.	43° 00′ Alt.	Δd Δt	Az.	45° 00′ Alt.	Δd Δt	Az.	H.A.
00	37 00.0	1.000	180.0	38 00.0	1.000	180.0	39 30.0	1.000	180.0	41 00.0	1.000	180.0	43 00.0	1.000	180.0	43 30.0	1.000	180.0	44 00.0	1.000	180.0	46 00.0	1.000	180.0	00
1	37 00.0	1.000	179.0	38 00.0	1.000	179.0	39 30.0	1.000	179.0	41 00.0	1.000	179.0	43 00.0	1.000	179.0	43 30.0	1.000	179.0	44 00.0	1.000	179.0	46 00.0	1.000	179.0	1
2	37 00.0	1.000	178.0	38 00.0	1.000	178.0	39 30.0	1.000	178.0	41 00.0	1.000	178.0	43 00.0	1.000	178.0	43 30.0	1.000	178.0	44 00.0	1.000	178.0	46 00.0	1.000	178.0	2
3	36 59.9	1.000	177.0	37 59.9	1.000	177.0	39 29.9	1.000	177.0	40 59.9	1.000	177.0	42 59.9	1.000	177.0	43 29.9	1.000	177.0	43 59.9	1.000	177.0	45 59.9	1.000	176.9	3
4	36 59.9	1.000	175.9	37 59.9	1.000	175.9	39 29.9	1.000	175.9	40 59.9	1.000	175.9	42 59.9	1.000	175.9	43 29.9	1.000	175.9	43 59.9	1.000	175.9	45 59.9	1.000	175.9	4
05	36 59.8	1.000	174.9	37 59.8	1.000	174.9	39 29.8	1.000	174.9	40 59.8	1.000	174.9	42 59.8	1.000	174.9	43 29.8	1.000	174.9	43 59.8	1.000	174.9	45 59.8	1.000	174.9	05
6	36 59.7	1.000	173.9	37 59.7	1.000	173.9	39 29.7	1.000	173.9	40 59.7	1.000	173.9	42 59.7	1.000	173.9	43 29.7	1.000	173.9	43 59.7	1.000	173.9	45 59.7	1.000	173.9	6
7	36 59.5	1.000	172.9	37 59.5	1.000	172.9	39 29.5	1.000	172.9	40 59.5	1.000	172.9	42 59.5	1.000	172.9	43 29.5	1.000	172.9	43 59.5	1.000	172.9	45 59.5	1.000	172.9	7
8	36 59.4	1.000	171.9	37 59.4	1.000	171.9	39 29.4	1.000	171.9	40 59.4	1.000	171.9	42 59.4	1.000	171.9	43 29.4	1.000	171.9	43 59.4	1.000	171.9	45 59.4	1.000	171.9	8
9	36 59.3	1.000	170.9	37 59.3	1.000	170.9	39 29.3	1.000	170.9	40 59.3	1.000	170.9	42 59.2	1.000	170.9	43 29.2	1.000	170.9	43 59.2	1.000	170.9	45 59.2	1.000	170.8	9
10	36 59.1	1.000	169.9	37 59.1	1.000	169.9	39 29.1	1.000	169.9	40 59.1	1.000	169.9	42 59.1	1.000	169.8	43 29.1	1.000	169.8	43 59.1	1.000	169.8	45 59.1	1.000	169.8	10
1	36 58.9	1.000	168.9	37 58.9	1.000	168.9	39 28.9	1.000	168.8	40 58.9	1.000	168.8	42 58.9	1.000	168.8	43 28.9	1.000	168.8	43 58.9	1.000	168.8	45 58.9	1.000	168.8	1
2	36 58.7	1.000	167.8	37 58.7	1.000	167.8	39 28.7	1.000	167.8	40 58.7	1.000	167.8	42 58.7	1.000	167.8	43 28.7	1.000	167.8	43 58.7	1.000	167.8	45 58.7	1.000	167.8	2
3	36 58.4	1.000	166.8	37 58.4	1.000	166.8	39 28.4	1.000	166.8	40 58.4	1.000	166.8	42 58.4	1.000	166.8	43 28.4	1.000	166.8	43 58.4	1.000	166.8	45 58.4	1.000	166.8	3
4	36 58.2	1.000	165.8	37 58.2	1.000	165.8	39 28.2	1.000	165.8	40 58.2	1.000	165.8	42 58.2	1.000	165.8	43 28.2	1.000	165.8	43 58.2	1.000	165.8	45 58.2	1.000	165.8	4
15	36 57.9	1.000	164.8	37 57.9	1.000	164.8	39 27.9	1.000	164.8	40 57.9	1.000	164.8	42 57.9	1.000	164.8	43 27.9	1.000	164.8	43 57.9	1.000	164.8	45 57.9	1.000	164.7	15
6	36 57.6	1.000	163.8	37 57.6	1.000	163.8	39 27.6	1.001	163.8	40 57.6	1.001	163.8	42 57.6	1.000	163.7	43 27.6	1.000	163.7	43 57.6	1.000	163.7	45 57.6	1.000	163.7	6
7	36 57.3	1.001	162.8	37 57.3	1.001	162.8	39 27.3	1.001	162.8	40 57.3	1.001	162.7	42 57.3	1.001	162.7	43 27.3	1.001	162.7	43 57.3	1.001	162.7	45 57.3	1.001	162.7	7
8	36 57.0	1.001	161.8	37 57.0	1.001	161.8	39 27.0	1.001	161.7	40 57.0	1.001	161.7	42 57.0	1.001	161.7	43 27.0	1.001	161.7	43 57.0	1.001	161.7	45 57.0	1.001	161.7	8
9	36 56.7	1.001	160.8	37 56.7	1.001	160.7	39 26.7	1.001	160.7	40 56.7	1.001	160.7	42 56.7	1.001	160.7	43 26.7	1.001	160.7	43 56.7	1.001	160.7	45 56.7	1.001	160.7	9
20	36 56.3	1.001	159.7	37 56.3	1.001	159.7	39 26.3	1.001	159.7	40 56.3	1.001	159.7	42 56.3	1.001	159.7	43 26.3	1.001	159.7	43 56.3	1.001	159.7	45 56.3	1.001	159.6	20
1	36 56.0	1.001	158.7	37 56.0	1.001	158.7	39 26.0	1.001	158.7	40 56.0	1.001	158.7	42 56.0	1.001	158.7	43 26.0	1.001	158.7	43 56.0	1.001	158.7	45 55.9	1.001	158.6	1
2	36 55.6	1.001	157.7	37 55.6	1.001	157.7	39 25.6	1.001	157.7	40 55.6	1.001	157.7	42 55.6	1.001	157.7	43 25.6	1.001	157.6	43 55.6	1.001	157.6	45 55.6	1.001	157.6	2
3	36 55.2	1.001	156.7	37 55.2	1.001	156.7	39 25.2	1.001	156.7	40 55.2	1.001	156.7	42 55.2	1.001	156.6	43 25.2	1.001	156.6	43 55.2	1.001	156.6	45 55.1	1.001	156.6	3
4	36 54.7	1.001	155.7	37 54.7	1.001	155.7	39 24.7	1.001	155.7	40 54.7	1.001	155.7	42 54.7	1.001	155.6	43 24.7	1.001	155.6	43 54.7	1.001	155.6	45 54.7	1.001	155.6	4
25	36 54.3	1.001	154.7	37 54.3	1.001	154.7	39 24.3	1.001	154.7	40 54.3	1.001	154.6	42 54.3	1.001	154.6	43 24.3	1.001	154.6	43 54.3	1.001	154.6	45 54.3	1.001	154.6	25
6	36 53.8	1.001	153.7	37 53.8	1.001	153.7	39 23.8	1.001	153.6	40 53.8	1.001	153.6	42 53.8	1.001	153.6	43 23.8	1.001	153.6	43 53.8	1.001	153.6	45 53.8	1.001	153.6	6
7	36 53.4	1.001	152.7	37 53.4	1.001	152.7	39 23.4	1.001	152.6	40 53.4	1.001	152.6	42 53.4	1.001	152.6	43 23.4	1.001	152.6	43 53.4	1.001	152.6	45 53.4	1.001	152.5	7
8	36 52.9	1.001	151.7	37 52.9	1.001	151.6	39 22.9	1.001	151.6	40 52.9	1.001	151.6	42 52.9	1.001	151.6	43 22.9	1.001	151.6	43 52.9	1.001	151.6	45 52.9	1.001	151.5	8
9	36 52.4	1.001	150.6	37 52.4	1.001	150.6	39 22.4	1.001	150.6	40 52.4	1.001	150.6	42 52.4	1.001	150.6	43 22.4	1.001	150.5	43 52.4	1.001	150.5	45 52.4	1.001	150.5	9
30	36 51.9	1.001	149.6	37 51.9	1.001	149.6	39 21.9	1.001	149.6	40 51.8	1.001	149.6	42 51.8	1.001	149.5	43 21.8	1.001	149.5	43 51.8	1.001	149.5	45 51.8	1.001	149.5	30
1	36 51.3	1.001	148.6	37 51.3	1.001	148.6	39 21.3	1.001	148.6	40 51.3	1.001	148.5	42 51.3	1.001	148.5	43 21.3	1.001	148.5	43 51.3	1.001	148.5	45 51.3	1.001	148.5	1
2	36 50.8	1.001	147.6	37 50.8	1.001	147.6	39 20.8	1.001	147.6	40 50.8	1.001	147.5	42 50.7	1.001	147.5	43 20.7	1.001	147.5	43 50.7	1.001	147.5	45 50.7	1.001	147.5	2
3	36 50.2	1.001	146.6	37 50.2	1.001	146.6	39 20.2	1.001	146.6	40 50.2	1.001	146.5	42 50.2	1.001	146.5	43 20.2	1.001	146.5	43 50.2	1.001	146.5	45 50.2	1.001	146.4	3
4	36 49.6	1.001	145.6	37 49.6	1.001	145.6	39 19.6	1.001	145.5	40 49.6	1.001	145.5	42 49.6	1.001	145.5	43 19.6	1.001	145.5	43 49.6	1.001	145.5	45 49.6	1.001	145.4	4
35	36 49.0	1.001	144.6	37 49.0	1.001	144.6	39 19.0	1.001	144.5	40 49.0	1.001	144.5	42 49.0	1.001	144.5	43 19.0	1.001	144.5	43 49.0	1.001	144.5	45 49.0	1.001	144.4	35
6	36 48.4	1.001	143.6	37 48.4	1.001	143.5	39 18.4	1.001	143.5	40 48.4	1.001	143.5	42 48.4	1.001	143.5	43 18.4	1.001	143.4	43 48.4	1.001	143.4	45 48.4	1.001	143.4	6
7	36 47.8	1.001	142.6	37 47.8	1.001	142.5	39 17.8	1.001	142.5	40 47.8	1.001	142.5	42 47.7	1.001	142.4	43 17.7	1.001	142.4	43 47.7	1.001	142.4	45 47.7	1.001	142.4	7
8	36 47.1	1.001	141.5	37 47.1	1.001	141.5	39 17.1	1.001	141.5	40 47.1	1.001	141.5	42 47.1	1.001	141.4	43 17.1	1.001	141.4	43 47.1	1.001	141.4	45 47.1	1.001	141.4	8
9	36 46.5	1.001	140.5	37 46.5	1.001	140.5	39 16.5	1.001	140.5	40 46.5	1.001	140.5	42 46.4	1.001	140.4	43 16.4	1.001	140.4	43 46.4	1.001	140.4	45 46.4	1.001	140.4	9
40	36 45.8	1.001	139.5	37 45.8	1.001	139.5	39 15.8	1.001	139.5	40 45.8	1.001	139.4	42 45.8	1.001	139.4	43 15.8	1.001	139.4	43 45.8	1.001	139.4	45 45.7	1.001	139.3	40
1	36 45.1	1.001	138.5	37 45.1	1.001	138.5	39 15.1	1.001	138.5	40 45.1	1.001	138.4	42 45.1	1.001	138.4	43 15.1	1.001	138.4	43 45.1	1.001	138.4	45 45.1	1.001	138.3	1
2	36 44.4	1.001	137.5	37 44.4	1.001	137.5	39 14.4	1.001	137.5	40 44.4	1.001	137.4	42 44.4	1.001	137.4	43 14.4	1.001	137.4	43 44.4	1.001	137.4	45 44.3	1.001	137.3	2
3	36 43.7	1.001	136.5	37 43.7	1.001	136.5	39 13.7	1.001	136.4	40 43.7	1.001	136.4	42 43.7	1.001	136.4	43 13.7	1.001	136.4	43 43.6	1.001	136.4	45 43.6	1.001	136.3	3
4	36 43.0	1.001	135.5	37 43.0	1.001	135.5	39 13.0	1.001	135.4	40 42.9	1.001	135.4	42 42.9	1.001	135.4	43 12.9	1.001	135.4	43 42.9	1.001	135.3	45 42.9	1.001	135.3	4
45	36 42.2	1.001	134.5	37 42.2	1.001	134.4	39 12.2	1.001	134.4	40 42.2	1.001	134.4	42 42.2	1.001	134.4	43 12.2	1.001	134.3	43 42.2	1.001	134.3	45 42.2	1.001	134.3	45
6	36 41.5	1.001	133.5	37 41.5	1.001	133.4	39 11.5	1.001	133.4	40 41.4	1.001	133.4	42 41.4	1.001	133.3	43 11.4	1.001	133.3	43 41.4	1.001	133.3	45 41.4	1.001	133.3	6
7	36 40.7	1.001	132.5	37 40.7	1.001	132.4	39 10.7	1.001	132.4	40 40.7	1.001	132.4	42 40.7	1.001	132.3	43 10.7	1.001	132.3	43 40.7	1.001	132.3	45 40.6	1.001	132.3	7
8	36 39.9	1.001	131.5	37 39.9	1.001	131.4	39 09.9	1.001	131.4	40 39.9	1.001	131.4	42 39.9	1.001	131.3	43 09.9	1.001	131.3	43 39.9	1.001	131.3	45 39.9	1.001	131.2	8
9	36 39.1	1.001	130.4	37 39.1	1.001	130.4	39 09.1	1.001	130.4	40 39.1	1.001	130.4	42 39.1	1.001	130.3	43 09.1	1.001	130.3	43 39.1	1.001	130.3	45 39.1	1.001	130.2	9
50	36 38.3	1.001	129.4	37 38.3	1.001	129.4	39 08.3	1.001	129.4	40 38.3	1.001	129.3	42 38.3	1.001	129.3	43 08.3	1.001	129.3	43 38.3	1.001	129.3	45 38.3	1.001	129.2	50
1	36 37.5	1.001	128.4	37 37.5	1.001	128.4	39 07.5	1.001	128.4	40 37.5	1.001	128.3	42 37.5	1.001	128.3	43 07.5	1.001	128.3	43 37.5	1.001	128.3	45 37.4	1.001	128.2	1
2	36 36.7	1.001	127.4	37 36.7	1.001	127.4	39 06.7	1.001	127.4	40 36.7	1.001	127.3	42 36.6	1.001	127.3	43 06.6	1.001	127.3	43 36.6	1.001	127.3	45 36.6	1.001	127.2	2
3	36 35.9	1.001	126.4	37 35.9	1.001	126.4	39 05.8	1.001	126.4	40 35.8	1.001	126.3	42 35.8	1.001	126.3	43 05.8	1.001	126.3	43 35.8	1.001	126.2	45 35.8	1.001	126.2	3
4	36 35.0	1.001	125.4	37 35.0	1.001	125.4	39 05.0	1.001	125.3	40 35.0	1.001	125.3	42 35.0	1.001	125.3	43 04.9	1.001	125.3	43 34.9	1.001	125.2	45 34.9	1.001	125.2	4
55	36 34.2	1.001	124.4	37 34.1	1.001	124.4	39 04.1	1.001	124.3	40 34.1	1.001	124.3	42 34.1	1.001	124.3	43 04.1	1.001	124.2	43 34.1	1.001	124.2	45 34.1	1.001	124.2	55
6	36 33.3	1.001	123.4	37 33.3	1.001	123.4	39 03.3	1.001	123.3	40 33.2	1.001	123.3	42 33.2	1.001	123.2	43 03.2	1.001	123.2	43 33.2	1.001	123.2	45 33.2	1.001	123.2	6
7	36 32.4	1.001	122.4	37 32.4	1.001	122.4	39 02.4	1.001	122.3	40 32.4	1.001	122.3	42 32.3	1.001	122.2	43 02.3	1.001	122.2	43 32.3	1.002	122.2	45 32.3	1.001	122.2	7
8	36 31.5	1.001	121.4	37 31.5	1.001	121.4	39 01.5	1.002	121.3	40 31.5	1.002	121.3	42 31.5	1.002	121.2	43 01.4	1.002	121.2	43 31.4	1.002	121.2	45 31.4	1.002	121.1	8
9	36 30.6	1.002	120.4	37 30.6	1.002	120.3	39 00.6	1.002	120.3	40 30.6	1.002	120.3	42 30.6	1.002	120.2	43 00.5	1.002	120.2	43 30.5	1.002	120.2	45 30.5	1.002	120.1	9
60	36 29.7	1.002	119.4	37 29.7	1.002	119.3	38 59.7	1.002	119.3	40 29.7	1.002	119.3	42 29.6	1.002	119.2	42 59.6	1.002	119.2	43 29.6	1.002	119.2	45 29.6	1.002	119.1	60
1	36 28.8	1.002	118.4	37 28.8	1.002	118.3	38 58.8	1.002	118.3	40 28.7	1.002	118.3	42 28.7	1.002	118.2	42 58.7	1.002	118.2	43 28.7	1.002	118.2	45 28.7	1.002	118.1	1
2	36 27.9	1.002	117.4	37 27.9	1.002	117.3	38 57.8	1.002	117.3	40 27.8	1.002	117.3	42 27.8	1.002	117.2	42 57.8	1.002	117.2	43 27.8	1.002	117.2	45 27.8	1.002	117.1	2
3	36 26.9	1.002	116.3	37 26.9	1.002	116.3	38 56.9	1.002	116.3	40 26.9	1.002	116.2	42 26.9	1.002	116.2	42 56.9	1.002	116.2	43 26.8	1.002	116.2	45 26.8	1.002	116.1	3
4	36 26.0	1.002	115.3	37 26.0	1.002	115.3	38 56.0	1.002	115.3	40 25.9	1.002	115.2	42 25.9	1.002	115.2	42 55.9	1.002	115.2	43 25.9	1.002	115.2	45 25.9	1.002	115.1	4
65	36 25.0	1.002	114.3	37 25.0	1.002	114.3	38 55.0	1.002	114.3	40 25.0	1.002	114.2	42 25.0	1.002	114.2	42 54.9	1.002	114.2	43 25.0	1.002	114.1	45 24.9	1.002	114.1	65
6	36 24.1	1.002	113.3	37 24.1	1.002	113.3	38 54.1	1.002	113.3	40 24.0	1.002	113.2	42 24.0	1.002	113.2	42 54.0	1.002	113.2	43 24.0	1.002	113.1	45 24.0	1.002	113.1	6
7	36 23.1	1.002	112.3	37 23.1	1.002	112.3	38 53.1	1.002	112.3	40 23.1	1.002	112.2	42 23.0	1.002	112.2	42 53.0	1.002	112.1	43 23.0	1.002	112.1	45 23.0	1.002	112.1	7
8	36 22.1	1.002	111.3	37 22.1	1.002	111.3	38 52.1	1.002	111.3	40 22.1	1.002	111.2	42 22.1	1.002	111.2	42 52.1	1.002	111.1	43 22.0	1.002	111.1	45 22.0	1.002	111.1	8
9	36 21.2	1.002	110.3	37 21.2	1.002	110.3	38 51.1	1.002	110.3	40 21.1	1.002	110.2	42 21.1	1.002	110.2	42 51.1	1.002	110.1	43 21.1	1.002	110.1	45 21.0	1.002	110.1	9
70	36 20.2	1.002	109.3	37 20.2	1.002	109.3	38 50.2	1.002	109.2	40 20.1	1.002	109.2	42 20.1	1.002	109.1	42 50.1	1.002	109.1	43 20.1	1.002	109.1	45 20.1	1.002	109.1	70
1	36 19.2	1.002	108.3	37 19.2	1.002	108.3	38 49.2	1.002	108.2	40 19.1	1.002	108.2	42 19.1	1.002	108.1	42 49.1	1.002	108.1	43 19.1	1.002	108.1	45 19.1	1.002	108.0	1
2	36 18.2	1.002	107.3	37 18.2	1.002	107.3	38 48.2	1.002	107.2	40 18.1	1.002	107.2	42 18.1	1.002	107.1	42 48.1	1.002	107.1	43 18.1	1.002	107.1	45 18.1	1.002	107.0	2
3	36 17.2	1.002	106.3	37 17.2	1.002	106.3	38 47.1	1.002	106.2	40 17.1	1.002	106.2	42 17.1	1.002	106.1	42 47.1	1.002	106.1	43 17.1	1.002	106.1	45 17.0	1.002	106.0	3
4	36 16.2	1.002	105.3	37 16.2	1.002	105.3	38 46.2	1.002	105.2	40 16.1	1.002	105.2	42 16.1	1.002	105.1	42 46.1	1.002	105.1	43 16.1	1.002	105.1	45 16.1	1.002	105.0	4
75	36 15.2	1.002	104.3	37 15.2	1.002	104.3	38 45.1	1.002	104.2	40 15.1	1.002	104.2	42 15.1	1.002	104.1	42 45.1	1.002	104.1	43 15.1	1.002	104.1	45 15.0	1.002	104.0	75
6	36 14.2	1.002	103.3	37 14.1	1.002	103.3	38 44.1	1.002	103.2	40 14.1	1.002	103.2	42 14.1	1.002	103.1	42 44.1	1.002	103.1	43 14.1	1.002	103.1	45 14.0	1.002	103.0	6
7	36 13.1	1.002	102.3	37 13.1	1.002	102.3	38 43.1	1.002	102.2	40 13.1	1.002	102.2	42 13.0	1.002	102.1	42 43.0	1.002	102.1	43 13.0	1.002	102.1	45 13.0	1.002	102.0	7
8	36 12.1	1.002	101.3	37 12.1	1.002	101.3	38 42.1	1.002	101.2	40 12.1	1.002	101.2	42 12.0	1.002	101.1	42 42.0	1.002	101.1	43 12.0	1.002	101.1	45 12.0	1.002	101.0	8
9	36 11.1	1.002	100.3	37 11.1	1.002	100.3	38 41.1	1.002	100.2	40 11.0	1.002	100.2	42 11.0	1.002	100.1	42 41.0	1.002	100.1	43 11.0	1.002	100.1	45 10.9	1.002	100.0	9
80	36 10.0	1.002	99.3	37 10.0	1.002	99.3	38 40.0	1.002	99.2	40 10.0	1.002	99.2	42 10.0	1.002	99.1	42 40.0	1.002	99.1	43 09.9	1.002	99.1	45 09.9	1.002	99.0	80
1	36 09.0	1.002	98.3	37 09.0	1.002	98.3	38 39.0	1.002	98.2	40 09.0	1.002	98.2	42 08.9	1.002	98.1	42 38.9	1.002	98.1	43 08.9	1.002	98.1	45 08.9	1.002	98.0	1
2	36 08.0	1.002	97.3	37 08.0	1.002	97.3	38 37.9	1.002	97.2	40 07.9	1.002	97.2	42 07.9	1.002	97.1	42 37.9	1.002	97.1	43 07.9	1.002	97.1	45 07.8	1.002	97.0	2
3	36 06.9	1.002	96.3	37 06.9	1.002	96.2	38 36.9	1.002	96.2	40 06.9	1.002	96.2	42 06.8	1.002	96.1	42 36.8	1.002	96.1	43 06.8	1.002	96.1	45 06.8	1.002	96.0	3
4	36 05.9	1.002	95.3	37 05.9	1.002	95.2	38 35.9	1.002	95.2	40 05.8	1.002	95.2	42 05.8	1.002	95.1	42 35.8	1.002	95.1	43 05.8	1.002	95.1	45 05.8	1.002	95.0	4
85	36 04.9	1.002	94.3	37 04.8	1.002	94.2	38 34.8	1.002	94.2	40 04.8	1.002	94.2	42 04.8	1.002	94.1	42 34.8	1.002	94.1	43 04.7	1.002	94.1	45 04.7	1.002	94.0	85
6	36 03.8	1.002	93.3	37 03.8	1.002	93.2	38 33.8	1.002	93.2	40 03.7	1.002	93.2	42 03.7	1.002	93.1	42 33.7	1.002	93.1	43 03.7	1.002	93.1	45 03.6	1.002	93.0	6
7	36 02.8	1.002	92.3	37 02.7	1.002	92.2	38 32.7	1.002	92.2	40 02.7	1.002	92.2	42 02.7	1.002	92.1	42 32.7	1.002	92.1	43 02.7	1.002	92.1	45 02.6	1.002	92.0	7
8	36 01.7	1.002	91.3	37 01.7	1.002	91.2	38 31.7	1.002	91.2	40 01.7	1.002	91.2	42 01.6	1.002	91.1	42 31.6	1.002	91.1	43 01.6	1.002	91.1	45 01.6	1.002	91.0	8
9	36 00.7	1.002	90.3	37 00.7	1.002	90.2	38 30.6	1.002	90.2	40 00.6	1.002	90.2	42 00.6	1.002	90.1	42 30.6	1.002	90.1	43 00.6	1.002	90.1	45 00.6	1.002	90.0	9
90	35 59.6	1.002	89.3	36 59.6	1.002	89.2	38 29.6	1.002	89.2	39 59.6	1.002	89.2	41 59.5	1.002	89.1	42 29.5	1.002	89.1	42 59.5	1.002	89.1	44 59.5	1.002	89.0	90

Lat 89°

H.A.	36° 00' Alt.	Az.	37° 30' Alt.	Az.	38° 30' Alt.	Az.	40° 00' Alt.	Az.	42° 00' Alt.	Az.	42° 30' Alt.	Az.	43° 00' Alt.	Az.	45° 00' Alt.	Az.	H.A.
	° ' Δd Δt	°	° ' Δd Δt	°	° ' Δd Δt	°	° ' Δd Δt	°	° ' Δd Δt	°	° ' Δd Δt	°	° ' Δd Δt	°	° ' Δd Δt	°	
91	35 58.6 1.0 02	88.3	36 58.6 1.0 02	88.2	38 28.5 1.0 02	88.2	39 58.5 1.0 02	88.2	41 58.5 1.0 02	88.1	42 28.5 1.0 02	88.1	42 58.5 1.0 02	88.1	44 58.4 1.0 02	88.0	91
2	35 57.5 1.0 02	87.3	36 57.5 1.0 02	87.2	38 27.5 1.0 02	87.2	39 57.5 1.0 02	87.2	41 57.4 1.0 02	87.1	42 27.4 1.0 02	87.1	42 57.4 1.0 02	87.1	44 57.4 1.0 02	87.0	2
3	35 56.5 1.0 02	86.3	36 56.5 1.0 02	86.2	38 26.4 1.0 02	86.2	39 56.4 1.0 02	86.2	41 56.4 1.0 02	86.1	42 26.4 1.0 02	86.1	42 56.4 1.0 02	86.1	44 56.3 1.0 02	86.0	3
4	35 55.4 1.0 02	85.3	36 55.4 1.0 02	85.2	38 25.4 1.0 02	85.2	39 55.4 1.0 02	85.2	41 55.3 1.0 02	85.1	42 25.3 1.0 02	85.1	42 55.3 1.0 02	85.1	44 55.3 1.0 02	85.0	4
95	35 54.4 1.0 02	84.3	36 54.4 1.0 02	84.3	38 24.4 1.0 02	84.2	39 54.3 1.0 02	84.2	41 54.3 1.0 02	84.1	42 24.3 1.0 02	84.1	42 54.3 1.0 02	84.1	44 54.3 1.0 02	84.0	95
6	35 53.4 1.0 02	83.3	36 53.3 1.0 02	83.3	38 23.3 1.0 02	83.2	39 53.3 1.0 02	83.2	41 53.3 1.0 02	83.1	42 23.3 1.0 02	83.1	42 53.3 1.0 02	83.1	44 53.2 1.0 02	83.0	6
7	35 52.3 1.0 02	82.3	36 52.3 1.0 02	82.2	38 22.3 1.0 02	82.2	39 52.3 1.0 02	82.2	41 52.2 1.0 02	82.1	42 22.2 1.0 02	82.1	42 52.2 1.0 02	82.1	44 52.2 1.0 02	82.0	7
8	35 51.3 1.0 02	81.3	36 51.2 1.0 02	81.3	38 21.2 1.0 02	81.2	39 51.2 1.0 02	81.2	41 51.2 1.0 02	81.1	42 21.2 1.0 02	81.1	42 51.2 1.0 02	81.1	44 51.1 1.0 02	81.0	8
9	35 50.2 1.0 02	80.3	36 50.2 1.0 02	80.3	38 20.2 1.0 02	80.2	39 50.2 1.0 02	80.2	41 50.2 1.0 02	80.1	42 20.1 1.0 02	80.1	42 50.1 1.0 02	80.1	44 50.1 1.0 02	80.0	9
100	35 49.2 1.0 02	79.3	36 49.2 1.0 02	79.3	38 19.2 1.0 02	79.2	39 49.2 1.0 02	79.2	41 49.1 1.0 02	79.1	42 19.1 1.0 02	79.1	42 49.1 1.0 02	79.1	44 49.1 1.0 02	79.0	100
1	35 48.2 1.0 02	78.3	36 48.2 1.0 02	78.3	38 18.2 1.0 02	78.2	39 48.1 1.0 02	78.2	41 48.1 1.0 02	78.1	42 18.1 1.0 02	78.1	42 48.1 1.0 02	78.1	44 48.0 1.0 02	78.0	1
2	35 47.2 1.0 02	77.3	36 47.1 1.0 02	77.3	38 17.1 1.0 02	77.2	39 47.1 1.0 02	77.2	41 47.1 1.0 02	77.1	42 17.1 1.0 02	77.1	42 47.1 1.0 02	77.1	44 47.0 1.0 02	77.0	2
3	35 46.1 1.0 02	76.3	36 46.1 1.0 02	76.3	38 16.1 1.0 02	76.2	39 46.1 1.0 02	76.2	41 46.1 1.0 02	76.1	42 16.0 1.0 02	76.1	42 46.0 1.0 02	76.1	44 46.0 1.0 02	76.0	3
4	35 45.1 1.0 02	75.3	36 45.1 1.0 02	75.3	38 15.1 1.0 02	75.2	39 45.1 1.0 02	75.2	41 45.0 1.0 02	75.1	42 15.0 1.0 02	75.1	42 45.0 1.0 02	75.1	44 45.0 1.0 02	75.0	4
105	35 44.1 1.0 02	74.3	36 44.1 1.0 02	74.3	38 14.1 1.0 02	74.2	39 44.1 1.0 02	74.2	41 44.0 1.0 02	74.1	42 14.0 1.0 02	74.1	42 44.0 1.0 02	74.1	44 44.0 1.0 02	74.0	105
6	35 43.1 1.0 02	73.3	36 43.1 1.0 02	73.3	38 13.1 1.0 02	73.2	39 43.1 1.0 02	73.2	41 43.0 1.0 02	73.1	42 13.0 1.0 02	73.1	42 43.0 1.0 02	73.1	44 43.0 1.0 02	73.0	6
7	35 42.1 1.0 02	72.3	36 42.1 1.0 02	72.3	38 12.1 1.0 02	72.2	39 42.1 1.0 02	72.2	41 42.0 1.0 02	72.1	42 12.0 1.0 02	72.1	42 42.0 1.0 02	72.1	44 42.0 1.0 02	72.1	7
8	35 41.1 1.0 02	71.3	36 41.1 1.0 02	71.3	38 11.1 1.0 02	71.2	39 41.1 1.0 02	71.2	41 41.0 1.0 02	71.2	42 11.0 1.0 02	71.1	42 41.0 1.0 02	71.1	44 41.0 1.0 02	71.1	8
9	35 40.1 1.0 02	70.3	36 40.1 1.0 02	70.3	38 10.1 1.0 02	70.3	39 40.1 1.0 02	70.2	41 40.0 1.0 02	70.2	42 10.0 1.0 02	70.1	42 40.0 1.0 02	70.1	44 40.0 1.0 02	70.1	9
110	35 39.1 1.0 02	69.3	36 39.1 1.0 02	69.3	38 09.1 1.0 02	69.3	39 39.1 1.0 02	69.2	41 39.1 1.0 02	69.2	42 09.1 1.0 02	69.1	42 39.1 1.0 02	69.1	44 39.0 1.0 02	69.1	110
1	35 38.2 1.0 02	68.3	36 38.2 1.0 02	68.3	38 08.1 1.0 02	68.3	39 38.1 1.0 02	68.2	41 38.1 1.0 02	68.2	42 08.1 1.0 02	68.2	42 38.1 1.0 02	68.1	44 38.0 1.0 02	68.1	1
2	35 37.2 1.0 02	67.3	36 37.2 1.0 02	67.3	38 07.2 1.0 02	67.3	39 37.1 1.0 02	67.2	41 37.1 1.0 02	67.2	42 07.1 1.0 02	67.2	42 37.1 1.0 02	67.1	44 37.1 1.0 02	67.1	2
3	35 36.2 1.0 02	66.3	36 36.2 1.0 02	66.3	38 06.2 1.0 02	66.3	39 36.2 1.0 02	66.2	41 36.2 1.0 02	66.2	42 06.1 1.0 02	66.2	42 36.1 1.0 02	66.2	44 36.1 1.0 02	66.1	3
4	35 35.3 1.0 02	65.3	36 35.3 1.0 02	65.3	38 05.3 1.0 02	65.3	39 35.2 1.0 02	65.2	41 35.2 1.0 02	65.2	42 05.2 1.0 02	65.2	42 35.2 1.0 02	65.2	44 35.2 1.0 02	65.1	4
115	35 34.3 1.0 02	64.3	36 34.3 1.0 02	64.3	38 04.3 1.0 02	64.3	39 34.3 1.0 02	64.2	41 34.3 1.0 02	64.2	42 04.3 1.0 02	64.2	42 34.2 1.0 02	64.2	44 34.2 1.0 02	64.1	115
6	35 33.4 1.0 02	63.4	36 33.4 1.0 02	63.3	38 03.4 1.0 02	63.3	39 33.3 1.0 02	63.3	41 33.3 1.0 02	63.2	42 03.3 1.0 02	63.2	42 33.3 1.0 02	63.2	44 33.3 1.0 02	63.1	6
7	35 32.5 1.0 02	62.4	36 32.4 1.0 02	62.3	38 02.4 1.0 02	62.3	39 32.4 1.0 02	62.3	41 32.4 1.0 02	62.2	42 02.4 1.0 02	62.2	42 32.4 1.0 02	62.2	44 32.3 1.0 02	62.1	7
8	35 31.5 1.0 02	61.4	36 31.5 1.0 02	61.3	38 01.5 1.0 02	61.3	39 31.5 1.0 02	61.3	41 31.5 1.0 02	61.2	42 01.5 1.0 02	61.2	42 31.5 1.0 02	61.2	44 31.4 1.0 02	61.1	8
9	35 30.6 1.0 02	60.4	36 30.6 1.0 02	60.3	38 00.6 1.0 02	60.3	39 30.6 1.0 02	60.3	41 30.6 1.0 02	60.2	42 00.5 1.0 02	60.2	42 30.5 1.0 02	60.2	44 30.5 1.0 02	60.1	9
120	35 29.7 1.0 02	59.4	36 29.7 1.0 01	59.4	37 59.7 1.0 01	59.3	39 29.7 1.0 01	59.3	41 29.7 1.0 01	59.2	41 59.6 1.0 01	59.2	42 29.6 1.0 01	59.2	44 29.6 1.0 02	59.1	120
1	35 28.8 1.0 01	58.4	36 28.8 1.0 01	58.4	37 58.8 1.0 01	58.3	39 28.8 1.0 01	58.3	41 28.8 1.0 01	58.2	41 58.7 1.0 01	58.2	42 28.7 1.0 01	58.2	44 28.7 1.0 01	58.2	1
2	35 27.9 1.0 01	57.4	36 27.9 1.0 01	57.4	37 57.9 1.0 01	57.3	39 27.9 1.0 01	57.3	41 27.9 1.0 01	57.2	41 57.9 1.0 01	57.2	42 27.9 1.0 01	57.2	44 27.8 1.0 01	57.2	2
3	35 27.1 1.0 01	56.4	36 27.0 1.0 01	56.4	37 57.0 1.0 01	56.3	39 27.0 1.0 01	56.3	41 27.0 1.0 01	56.3	41 57.0 1.0 01	56.2	42 27.0 1.0 01	56.2	44 27.0 1.0 01	56.2	3
4	35 26.2 1.0 01	55.4	36 26.2 1.0 01	55.4	37 56.2 1.0 01	55.3	39 26.2 1.0 01	55.3	41 26.1 1.0 01	55.3	41 56.1 1.0 01	55.3	42 26.1 1.0 01	55.2	44 26.1 1.0 01	55.2	4
125	35 25.3 1.0 01	54.4	36 25.3 1.0 01	54.4	37 55.3 1.0 01	54.4	39 25.3 1.0 01	54.3	41 25.3 1.0 01	54.3	41 55.3 1.0 01	54.3	42 25.3 1.0 01	54.2	44 25.2 1.0 01	54.2	125
6	35 24.5 1.0 01	53.4	36 24.5 1.0 01	53.4	37 54.5 1.0 01	53.4	39 24.4 1.0 01	53.3	41 24.4 1.0 01	53.3	41 54.4 1.0 01	53.3	42 24.4 1.0 01	53.3	44 24.4 1.0 01	53.2	6
7	35 23.7 1.0 01	52.4	36 23.6 1.0 01	52.4	37 53.6 1.0 01	52.4	39 23.6 1.0 01	52.3	41 23.6 1.0 01	52.3	41 53.6 1.0 01	52.3	42 23.6 1.0 01	52.3	44 23.6 1.0 01	52.2	7
8	35 22.8 1.0 01	51.4	36 22.8 1.0 01	51.4	37 52.8 1.0 01	51.4	39 22.8 1.0 01	51.3	41 22.8 1.0 01	51.3	41 52.8 1.0 01	51.3	42 22.8 1.0 01	51.3	44 22.7 1.0 01	51.2	8
9	35 22.0 1.0 01	50.4	36 22.0 1.0 01	50.4	37 52.0 1.0 01	50.4	39 22.0 1.0 01	50.4	41 22.0 1.0 01	50.3	41 52.0 1.0 01	50.3	42 22.0 1.0 01	50.3	44 21.9 1.0 01	50.2	9
130	35 21.2 1.0 01	49.5	36 21.2 1.0 01	49.4	37 51.2 1.0 01	49.4	39 21.2 1.0 01	49.4	41 21.2 1.0 01	49.3	41 51.2 1.0 01	49.3	42 21.1 1.0 01	49.3	44 21.1 1.0 01	49.2	130
1	35 20.4 1.0 01	48.5	36 20.4 1.0 01	48.4	37 50.4 1.0 01	48.4	39 20.4 1.0 01	48.4	41 20.4 1.0 01	48.3	41 50.4 1.0 01	48.3	42 20.4 1.0 01	48.3	44 20.3 1.0 01	48.3	1
2	35 19.6 1.0 01	47.5	36 19.6 1.0 01	47.4	37 49.6 1.0 01	47.4	39 19.6 1.0 01	47.4	41 19.6 1.0 01	47.3	41 49.6 1.0 01	47.3	42 19.6 1.0 01	47.3	44 19.6 1.0 01	47.3	2
3	35 18.9 1.0 01	46.5	36 18.9 1.0 01	46.5	37 48.9 1.0 01	46.4	39 18.8 1.0 01	46.4	41 18.8 1.0 01	46.4	41 48.8 1.0 01	46.3	42 18.8 1.0 01	46.3	44 18.8 1.0 01	46.3	3
4	35 18.1 1.0 01	45.5	36 18.1 1.0 01	45.5	37 48.1 1.0 01	45.4	39 18.1 1.0 01	45.4	41 18.1 1.0 01	45.4	41 48.1 1.0 01	45.4	42 18.1 1.0 01	45.3	44 18.1 1.0 01	45.3	4
135	35 17.4 1.0 01	44.5	36 17.4 1.0 01	44.5	37 47.4 1.0 01	44.4	39 17.4 1.0 01	44.4	41 17.3 1.0 01	44.4	41 47.3 1.0 01	44.4	42 17.3 1.0 01	44.4	44 17.3 1.0 01	44.3	135
6	35 16.7 1.0 01	43.5	36 16.7 1.0 01	43.5	37 46.6 1.0 01	43.5	39 16.6 1.0 01	43.4	41 16.6 1.0 01	43.4	41 46.6 1.0 01	43.4	42 16.6 1.0 01	43.4	44 16.6 1.0 01	43.3	6
7	35 15.9 1.0 01	42.5	36 15.9 1.0 01	42.5	37 45.9 1.0 01	42.5	39 15.9 1.0 01	42.4	41 15.9 1.0 01	42.4	41 45.9 1.0 01	42.4	42 15.9 1.0 01	42.4	44 15.9 1.0 01	42.3	7
8	35 15.2 1.0 01	41.5	36 15.2 1.0 01	41.5	37 45.2 1.0 01	41.5	39 15.2 1.0 01	41.4	41 15.2 1.0 01	41.4	41 45.2 1.0 01	41.4	42 15.2 1.0 01	41.4	44 15.2 1.0 01	41.3	8
9	35 14.6 1.0 01	40.5	36 14.5 1.0 01	40.5	37 44.5 1.0 01	40.5	39 14.5 1.0 01	40.5	41 14.5 1.0 01	40.4	41 44.5 1.0 01	40.4	42 14.5 1.0 01	40.4	44 14.5 1.0 01	40.4	9
140	35 13.9 1.0 01	39.5	36 13.9 1.0 01	39.5	37 43.9 1.0 01	39.5	39 13.9 1.0 01	39.5	41 13.8 1.0 01	39.4	41 43.8 1.0 01	39.4	42 13.8 1.0 01	39.4	44 13.9 1.0 01	39.4	140
1	35 13.2 1.0 01	38.6	36 13.2 1.0 01	38.5	37 43.2 1.0 01	38.5	39 13.2 1.0 01	38.5	41 13.2 1.0 01	38.4	41 43.2 1.0 01	38.4	42 13.2 1.0 01	38.4	44 13.2 1.0 01	38.4	1
2	35 12.6 1.0 01	37.6	36 12.6 1.0 01	37.5	37 42.6 1.0 01	37.5	39 12.6 1.0 01	37.5	41 12.5 1.0 01	37.5	41 42.5 1.0 01	37.4	42 12.5 1.0 01	37.4	44 12.5 1.0 01	37.4	2
3	35 11.9 1.0 01	36.6	36 11.9 1.0 01	36.6	37 41.9 1.0 01	36.5	39 11.9 1.0 01	36.5	41 11.9 1.0 01	36.5	41 41.9 1.0 01	36.5	42 11.9 1.0 01	36.5	44 11.9 1.0 01	36.4	3
4	35 11.3 1.0 01	35.6	36 11.3 1.0 01	35.6	37 41.3 1.0 01	35.5	39 11.3 1.0 01	35.5	41 11.3 1.0 01	35.5	41 41.3 1.0 01	35.5	42 11.3 1.0 01	35.5	44 11.3 1.0 01	35.4	4
145	35 10.7 1.0 01	34.6	36 10.7 1.0 01	34.6	37 40.7 1.0 01	34.6	39 10.7 1.0 01	34.5	41 10.7 1.0 01	34.5	41 40.7 1.0 01	34.5	42 10.7 1.0 01	34.5	44 10.7 1.0 01	34.4	145
6	35 10.1 1.0 01	33.6	36 10.1 1.0 01	33.6	37 40.1 1.0 01	33.6	39 10.1 1.0 01	33.5	41 10.1 1.0 01	33.5	41 40.1 1.0 01	33.5	42 10.1 1.0 01	33.5	44 10.1 1.0 01	33.5	6
7	35 09.6 1.0 01	32.6	36 09.6 1.0 01	32.6	37 39.6 1.0 01	32.6	39 09.6 1.0 01	32.6	41 09.5 1.0 01	32.5	41 39.5 1.0 01	32.5	42 09.5 1.0 01	32.5	44 09.5 1.0 01	32.5	7
8	35 09.0 1.0 01	31.6	36 09.0 1.0 01	31.6	37 39.0 1.0 01	31.6	39 09.0 1.0 01	31.6	41 09.0 1.0 01	31.5	41 39.0 1.0 01	31.5	42 09.0 1.0 01	31.5	44 09.0 1.0 01	31.5	8
9	35 08.5 1.0 01	30.6	36 08.5 1.0 01	30.6	37 38.5 1.0 01	30.6	39 08.5 1.0 01	30.6	41 08.4 1.0 01	30.5	41 38.4 1.0 01	30.5	42 08.4 1.0 01	30.5	44 08.4 1.0 01	30.5	9
150	35 07.9 1.0 01	29.6	36 07.9 1.0 01	29.6	37 37.9 1.0 01	29.6	39 07.9 1.0 01	29.6	41 07.9 1.0 01	29.6	41 37.9 1.0 01	29.6	42 07.9 1.0 01	29.5	44 07.9 1.0 01	29.5	150
1	35 07.4 1.0 01	28.7	36 07.4 1.0 01	28.6	37 37.4 1.0 01	28.6	39 07.4 1.0 01	28.6	41 07.4 1.0 01	28.6	41 37.4 1.0 01	28.6	42 07.4 1.0 01	28.6	44 07.4 1.0 01	28.5	1
2	35 06.9 1.0 01	27.7	36 06.9 1.0 01	27.7	37 36.9 1.0 01	27.6	39 06.9 1.0 01	27.6	41 06.9 1.0 01	27.6	41 36.9 1.0 01	27.6	42 06.9 1.0 01	27.6	44 06.9 1.0 01	27.5	2
3	35 06.5 1.0 01	26.7	36 06.5 1.0 01	26.7	37 36.5 1.0 01	26.6	39 06.5 1.0 01	26.6	41 06.4 1.0 01	26.6	41 36.4 1.0 01	26.6	42 06.4 1.0 01	26.6	44 06.4 1.0 01	26.6	3
4	35 06.0 1.0 01	25.7	36 06.0 1.0 01	25.7	37 36.0 1.0 01	25.7	39 06.0 1.0 01	25.6	41 06.0 1.0 01	25.6	41 36.0 1.0 01	25.6	42 06.0 1.0 01	25.6	44 06.0 1.0 01	25.6	4
155	35 05.6 1.0 01	24.7	36 05.6 1.0 01	24.7	37 35.5 1.0 01	24.7	39 05.5 1.0 01	24.7	41 05.5 1.0 01	24.6	41 35.5 1.0 01	24.6	42 05.5 1.0 01	24.6	44 05.5 1.0 01	24.6	155
6	35 05.1 1.0 01	23.7	36 05.1 1.0 01	23.7	37 35.1 1.0 01	23.7	39 05.1 1.0 01	23.7	41 05.1 1.0 01	23.6	41 35.1 1.0 01	23.6	42 05.1 1.0 01	23.6	44 05.1 1.0 01	23.6	6
7	35 04.7 1.0 01	22.7	36 04.7 1.0 01	22.7	37 34.7 1.0 01	22.7	39 04.7 1.0 01	22.7	41 04.7 1.0 01	22.7	41 34.7 1.0 01	22.7	42 04.7 1.0 01	22.6	44 04.7 1.0 01	22.6	7
8	35 04.3 1.0 01	21.7	36 04.3 1.0 01	21.7	37 34.3 1.0 01	21.7	39 04.3 1.0 01	21.7	41 04.3 1.0 01	21.7	41 34.3 1.0 01	21.7	42 04.3 1.0 01	21.7	44 04.3 1.0 01	21.6	8
9	35 03.9 1.0 01	20.7	36 03.9 1.0 01	20.7	37 33.9 1.0 01	20.7	39 03.9 1.0 01	20.7	41 03.9 1.0 01	20.7	41 33.9 1.0 01	20.7	42 03.9 1.0 01	20.7	44 03.9 1.0 01	20.7	9
160	35 03.6 1.0 01	19.8	36 03.6 1.0 01	19.7	37 33.6 1.0 01	19.7	39 03.6 1.0 01	19.7	41 03.6 1.0 01	19.7	41 33.6 1.0 01	19.7	42 03.6 1.0 01	19.7	44 03.6 1.0 01	19.7	160
1	35 03.2 1.0 01	18.8	36 03.2 1.0 01	18.8	37 33.2 1.0 01	18.7	39 03.2 1.0 01	18.7	41 03.2 1.0 01	18.7	41 33.2 1.0 01	18.7	42 03.2 1.0 01	18.7	44 03.2 1.0 01	18.7	1
2	35 02.9 1.0 01	17.8	36 02.9 1.0 01	17.8	37 32.9 1.0 01	17.8	39 02.9 1.0 01	17.7	41 02.9 1.0 01	17.7	41 32.9 1.0 01	17.7	42 02.9 1.0 01	17.7	44 02.9 1.0 00	17.7	2
3	35 02.6 1.0 01	16.8	36 02.6 1.0 00	16.8	37 32.6 1.0 00	16.8	39 02.6 1.0 00	16.8	41 02.6 1.0 00	16.7	41 32.6 1.0 00	16.7	42 02.6 1.0 00	16.7	44 02.6 1.0 00	16.7	3
4	35 02.3 1.0 01	15.8	36 02.3 1.0 00	15.8	37 32.3 1.0 00	15.8	39 02.3 1.0 00	15.8	41 02.3 1.0 00	15.8	41 32.3 1.0 00	15.8	42 02.3 1.0 00	15.7	44 02.3 1.0 00	15.7	4
165	35 02.0 1.0 00	14.8	36 02.0 1.0 00	14.8	37 32.0 1.0 00	14.8	39 02.0 1.0 00	14.8	41 02.0 1.0 00	14.8	41 32.0 1.0 00	14.8	42 02.0 1.0 00	14.8	44 02.0 1.0 00	14.7	165
6	35 01.8 1.0 00	13.8	36 01.8 1.0 00	13.8	37 31.8 1.0 00	13.8	39 01.8 1.0 00	13.8	41 01.8 1.0 00	13.8	41 31.8 1.0 00	13.8	42 01.8 1.0 00	13.8	44 01.8 1.0 00	13.8	6
7	35 01.5 1.0 00	12.8	36 01.5 1.0 00	12.8	37 31.5 1.0 00	12.8	39 01.5 1.0 00	12.8	41 01.5 1.0 00	12.8	41 31.5 1.0 00	12.8	42 01.5 1.0 00	12.8	44 01.5 1.0 00	12.8	7
8	35 01.3 1.0 00	11.9	36 01.3 1.0 00	11.8	37 31.3 1.0 00	11.8	39 01.3 1.0 00	11.8	41 01.3 1.0 00	11.8	41 31.3 1.0 00	11.8	42 01.3 1.0 00	11.8	44 01.3 1.0 00	11.8	8
9	35 01.1 1.0 00	10.9	36 01.1 1.0 00	10.9	37 31.1 1.0 00	10.9	39 01.1 1.0 00	10.9	41 01.1 1.0 00	10.8	41 31.1 1.0 00	10.8	42 01.1 1.0 00	10.8	44 01.1 1.0 00	10.8	9
170	35 00.9 1.0 00	09.9	36 00.9 1.0 00	09.9	37 30.9 1.0 00	09.9	39 00.9 1.0 00	09.9	41 00.9 1.0 00	09.9	41 30.9 1.0 00	09.8	42 00.9 1.0 00	09.8	44 00.9 1.0 00	09.8	170
1	35 00.7 1.0 00	08.9	36 00.7 1.0 00	08.9	37 30.7 1.0 00	08.9	39 00.7 1.0 00	08.9	41 00.7 1.0 00	08.9	41 30.7 1.0 00	08.9	42 00.7 1.0 00	08.9	44 00.7 1.0 00	08.8	1
2	35 00.6 1.0 00	07.9	36 00.6 1.0 00	07.9	37 30.6 1.0 00	07.9	39 00.6 1.0 00	07.9	41 00.6 1.0 00	07.9	41 30.6 1.0 00	07.9	42 00.6 1.0 00	07.9	44 00.6 1.0 00	07.9	2
3	35 00.4 1.0 00	06.9	36 00.4 1.0 00	06.9	37 30.4 1.0 00	06.9	39 00.4 1.0 00	06.9	41 00.4 1.0 00	06.9	41 30.4 1.0 00	06.9	42 00.4 1.0 00	06.9	44 00.4 1.0 00	06.9	3
4	35 00.3 1.0 00	05.9	36 00.3 1.0 00	05.9	37 30.3 1.0 00	05.9	39 00.3 1.0 00	05.9	41 00.3 1.0 00	05.9	41 30.3 1.0 00	05.9	42 00.3 1.0 00	05.9	44 00.3 1.0 00	05.9	4
175	35 00.2 1.0 00	04.9	36 00.2 1.0 00	04.9	37 30.2 1.0 00	04.9	39 00.2 1.0 00	04.9	41 00.2 1.0 00	04.9	41 30.2 1.0 00	04.9	42 00.2 1.0 00	04.9	44 00.2 1.0 00	04.9	175
6	35 00.1 1.0 00	04.0	36 00.1 1.0 00	03.9	37 30.1 1.0 00	03.9	39 00.1 1.0 00	03.9	41 00.1 1.0 00	03.9	41 30.1 1.0 00	03.9	42 00.1 1.0 00	03.9	44 00.1 1.0 00	03.9	6
7	35 00.1 1.0 00	03.0	36 00.1 1.0 00	03.0	37 30.1 1.0 00	03.0	39 00.1 1.0 00	03.0	41 00.1 1.0 00	03.0	41 30.1 1.0 00	03.0	42 00.1 1.0 00	03.0	44 00.1 1.0 00	02.9	7
8	35 00.0 1.0 00	02.0	36 00.0 1.0 00	02.0	37 30.0 1.0 00	02.0	39 00.0 1.0 00	02.0	41 00.0 1.0 00	02.0	41 30.0 1.0 00	02.0	42 00.0 1.0 00	02.0	44 00.0 1.0 00	02.0	8
9	35 00.0 1.0 00	01.0	36 00.0 1.0 00	01.0	37 30.0 1.0 00	01.0	39 00.0 1.0 00	01.0	41 00.0 1.0 00	01.0	41 30.0 1.0 00	01.0	42 00.0 1.0 00	01.0	44 00.0 1.0 00	01.0	9
180	35 00.0 1.0 00	00.0	36 00.0 1.0 00	00.0	37 30.0 1.0 00	00.0	39 00.0 1.0 00	00.0	41 00.0 1.0 00	00.0	41 30.0 1.0 00	00.0	42 00.0 1.0 00	00.0	44 00.0 1.0 00	00.0	180

Lat. 38° / Lat. 89°	H.A.	46° 00' Alt.	Δd Δt	Az.	47° 00' Alt.	Δd Δt	Az.	48° 30' Alt.	Δd Δt	Az.	49° 30' Alt.	Δd Δt	Az.	50° 30' Alt.	Δd Δt	Az.	51° 30' Alt.	Δd Δt	Az.	52° 30' Alt.	Δd Δt	Az.	54° 00' Alt.	Δd Δt	Az.	H.A.
	00	47 00.0	1.00	180.0	48 00.0	1.00	180.0																			00
	1	47 00.0	1.00	179.0	48 00.0	1.00	179.0	49 30.0	1.00	180.0	50 30.0	1.00	180.0	51 30.0	1.00	180.0	52 30.0	1.00	180.0							1
	2	47 00.0	1.00	178.0	48 00.0	1.00	178.0	49 30.0	1.00	179.0	50 30.0	1.00	179.0	51 30.0	1.00	179.0	52 30.0	1.00	179.0	53 30.0	1.00	180.0				2
	3	46 59.9	1.00	176.9	48 00.0	1.00	178.0	49 30.0	1.00	178.0	50 30.0	1.00	178.0	51 30.0	1.00	178.0	52 30.0	1.00	178.0	53 30.0	1.00	179.0				3
	4	46 59.9	1.00	175.9	47 59.9	1.00	176.9	49 29.9	1.00	176.9	50 30.0	1.00	178.0	51 30.0	1.00	178.0	52 30.0	1.00	178.0	53 30.0	1.00	178.0	55 00.0	1.00	180.0	4
	05	46 59.8	1.00	174.9	47 59.8	1.00	174.9	49 29.9	1.00	175.9	50 29.9	1.00	176.9	51 29.9	1.00	176.9	52 29.9	1.00	176.9	53 30.0	1.00	178.0	55 00.0	1.00	179.0	05
	6	46 59.7	1.00	173.9	47 59.7	1.00	174.9	49 29.8	1.00	174.9	50 29.8	1.00	175.9	51 29.8	1.00	175.9	52 29.9	1.00	175.9	53 29.9	1.00	176.9	55 00.0	1.00	178.0	6
	7	46 59.5	1.00	172.9	47 59.5	1.00	173.9	49 29.7	1.00	173.9	50 29.7	1.00	174.9	51 29.8	1.00	174.9	52 29.8	1.00	174.9	53 29.8	1.00	175.9	54 59.9	1.00	176.9	7
	8	46 59.4	1.00	171.9	47 59.4	1.00	172.9	49 29.5	1.00	172.9	50 29.5	1.00	173.9	51 29.7	1.00	173.9	52 29.7	1.00	173.9	53 29.8	1.00	174.9	54 59.8	1.00	174.9	8
	9	46 59.2	1.00	170.8	47 59.2	1.00	171.8	49 29.4	1.00	171.8	50 29.5	1.00	172.9	51 29.5	1.00	172.8	52 29.5	1.00	172.9	53 29.7	1.00	173.9	54 59.8	1.00	174.9	9
	10	46 59.1	1.00	169.8	47 59.1	1.00	170.8	49 29.2	1.00	170.8	50 29.2	1.00	171.8	51 29.4	1.00	171.8	52 29.4	1.00	171.8	53 29.5	1.00	172.8	54 59.7	1.00	173.9	10
	1	46 58.9	1.00	168.8	47 58.9	1.00	168.8	49 29.1	1.00	169.8	50 29.1	1.00	169.8	51 29.1	1.00	170.8	52 29.2	1.00	171.8	53 29.4	1.00	171.8	54 59.5	1.00	172.8	1
	2	46 58.7	1.00	167.8	47 58.7	1.00	167.8	49 28.7	1.00	168.8	50 28.9	1.00	168.8	51 28.9	1.00	168.8	52 29.1	1.00	169.8	53 29.2	1.00	170.8	54 59.4	1.00	171.8	2
	3	46 58.4	1.00	166.8	47 58.4	1.00	166.8	49 28.7	1.00	167.8	50 28.7	1.00	167.8	51 28.9	1.00	168.8	52 28.9	1.00	168.8	53 29.1	1.00	169.8	54 59.2	1.00	170.8	3
	4	46 58.2	1.00	165.7	47 58.2	1.00	165.7	49 28.4	1.00	166.7	50 28.4	1.00	166.7	51 28.7	1.00	167.7	52 28.9	1.00	168.8	53 28.9	1.00	168.8	54 59.1	1.00	169.8	4
	15	46 57.9	1.00	164.7	47 57.9	1.00	164.7	49 28.2	1.00	165.7	50 28.2	1.00	165.7	51 28.4	1.00	166.7	52 28.4	1.00	167.7	53 28.7	1.00	167.7	54 58.9	1.00	168.7	15
	6	46 57.6	1.00	163.7	47 57.6	1.00	163.7	49 27.9	1.00	164.7	50 27.9	1.00	164.7	51 28.2	1.00	165.7	52 28.2	1.00	165.7	53 28.4	1.00	166.7	54 58.4	1.00	167.7	6
	7	46 57.3	1.01	162.7	47 57.6	1.00	163.7	49 27.6	1.00	163.7	50 27.6	1.01	163.7	51 27.9	1.00	164.7	52 28.1	1.00	165.7	53 28.2	1.00	165.7	54 58.4	1.00	165.7	7
	8	46 57.0	1.01	161.7	47 57.0	1.01	161.7	49 27.3	1.01	162.7	50 27.3	1.01	162.6	51 27.6	1.01	163.7	52 27.9	1.00	164.7	53 27.9	1.00	164.7	54 58.2	1.00	165.7	8
	9	46 56.7	1.01	160.7	47 57.0	1.01	160.7	49 27.0	1.01	161.6	50 27.0	1.01	161.6	51 27.3	1.01	162.6	52 27.6	1.01	163.6	53 27.6	1.00	163.6	54 57.9	1.00	164.6	9
	20	46 56.3	1.01	159.6	47 56.3	1.01	159.6	49 26.3	1.01	160.6	50 26.7	1.01	160.6	51 27.0	1.01	161.6	52 27.3	1.01	162.6	53 27.3	1.00	162.6	54 57.6	1.01	163.6	15
	1	46 55.9	1.01	158.6	47 55.9	1.01	158.6	49 26.3	1.01	159.6	50 26.3	1.01	159.6	51 26.3	1.01	160.6	52 27.0	1.01	161.6	53 27.0	1.00	161.6	54 57.0	1.01	162.6	6
	2	46 55.6	1.01	157.6	47 55.9	1.01	157.6	49 25.9	1.01	158.6	50 25.9	1.01	158.6	51 25.9	1.01	159.6	52 26.7	1.01	160.6	53 26.7	1.01	160.6	54 57.0	1.01	161.6	7
	3	46 55.1	1.01	156.6	47 55.1	1.01	157.6	49 25.5	1.01	157.6	50 25.5	1.01	157.6	51 25.5	1.01	158.6	52 25.9	1.01	159.6	53 26.3	1.01	159.5	54 56.7	1.01	160.5	8
	4	46 54.7	1.01	155.6	47 54.7	1.01	156.6	49 25.1	1.01	156.5	50 25.1	1.01	157.6	51 25.5	1.01	157.6	52 25.5	1.01	158.5	53 25.9	1.01	158.5	54 56.3	1.01	159.5	9
	25	46 54.3	1.01	154.6	47 54.3	1.01	154.5	49 24.7	1.01	155.5	50 24.7	1.01	155.5	51 25.1	1.01	156.5	52 25.1	1.01	157.5	53 25.5	1.01	157.5	54 55.9	1.01	158.5	20
	6	46 53.8	1.01	153.5	47 53.8	1.01	153.5	49 24.3	1.01	154.5	50 24.3	1.01	154.5	51 24.7	1.01	155.5	52 24.7	1.01	155.5	53 25.1	1.01	156.5	54 55.5	1.01	157.5	1
	7	46 53.3	1.01	152.5	47 53.8	1.01	152.5	49 23.8	1.01	153.5	50 23.8	1.01	153.5	51 24.3	1.01	154.5	52 24.7	1.01	155.5	53 25.1	1.01	155.5	54 55.1	1.01	156.4	2
	8	46 52.9	1.01	151.5	47 52.9	1.01	151.5	49 23.3	1.01	152.5	50 23.3	1.01	152.5	51 23.8	1.01	153.5	52 24.3	1.01	154.5	53 24.3	1.01	154.4	54 54.7	1.01	155.4	3
	9	46 52.3	1.01	150.5	47 52.3	1.01	150.5	49 22.8	1.01	151.5	50 22.8	1.01	152.5	51 23.3	1.01	152.4	52 23.8	1.01	153.4	53 23.8	1.01	153.4	54 54.2	1.01	154.4	4
	30	46 51.8	1.01	149.5	47 51.8	1.01	149.5	49 22.3	1.01	150.4	50 22.8	1.01	151.4	51 22.8	1.01	151.4	52 23.3	1.01	152.4	53 23.8	1.01	152.4	54 53.8	1.01	153.4	25
	1	46 51.3	1.01	148.5	47 51.3	1.01	148.4	49 21.8	1.01	149.4	50 22.3	1.01	150.4	51 22.3	1.01	150.4	52 22.8	1.01	151.4	53 23.3	1.01	152.4	54 53.3	1.01	152.4	6
	2	46 50.7	1.01	147.4	47 50.7	1.01	147.4	49 21.3	1.01	148.4	50 21.8	1.01	149.4	51 21.8	1.01	149.4	52 22.3	1.01	150.4	53 22.8	1.01	151.4	54 52.8	1.01	151.3	7
	3	46 50.2	1.01	146.4	47 50.2	1.01	146.4	49 20.7	1.01	147.4	50 20.7	1.01	148.4	51 21.3	1.01	148.4	52 21.8	1.01	149.4	53 21.8	1.01	149.3	54 52.3	1.01	150.3	8
	4	46 49.6	1.01	145.4	47 49.6	1.01	145.4	49 19.6	1.01	146.4	50 20.1	1.01	146.3	51 20.7	1.01	147.3	52 20.7	1.01	148.3	53 21.2	1.01	148.3	54 51.8	1.01	149.3	9
	35	46 49.0	1.01	144.4	47 49.0	1.01	144.4	49 19.6	1.01	145.4	50 19.5	1.01	145.3	51 20.1	1.01	146.3	52 20.7	1.01	147.3	53 20.7	1.01	147.3	54 50.7	1.01	148.3	30
	6	46 48.4	1.01	143.4	47 49.0	1.01	143.4	49 18.9	1.01	144.3	50 18.9	1.01	144.3	51 19.5	1.01	145.3	52 20.1	1.01	146.3	53 20.1	1.01	146.3	54 50.7	1.01	147.3	1
	7	46 47.7	1.01	142.4	47 47.7	1.01	143.4	49 18.3	1.01	143.3	50 18.3	1.01	144.3	51 18.9	1.01	144.3	52 19.5	1.01	145.3	53 19.5	1.01	145.3	54 50.1	1.01	146.2	2
	8	46 47.1	1.01	141.3	47 47.1	1.01	141.3	49 17.1	1.01	142.3	50 17.7	1.01	143.3	51 18.3	1.01	143.3	52 18.3	1.01	143.2	53 18.9	1.01	144.2	54 49.5	1.01	145.2	3
	9	46 46.4	1.01	140.3	47 46.4	1.01	140.3	49 17.1	1.01	141.3	50 17.0	1.01	141.3	51 17.7	1.01	142.3	52 18.3	1.01	143.2	53 18.3	1.01	144.2	54 48.9	1.01	144.2	4
	40	46 45.7	1.01	139.3	47 45.7	1.01	139.3	49 15.7	1.01	139.3	50 16.4	1.01	140.2	51 17.0	1.01	141.2	52 17.0	1.01	142.2	53 17.7	1.01	142.2	54 48.3	1.01	143.2	35
	1	46 45.0	1.01	138.3	47 45.0	1.01	138.3	49 15.7	1.01	139.3	50 15.7	1.01	139.2	51 16.4	1.01	140.2	52 17.0	1.01	141.2	53 17.0	1.01	141.2	54 47.6	1.01	142.2	6
	2	46 44.3	1.01	137.3	47 44.3	1.01	138.3	49 15.0	1.01	138.2	50 15.0	1.01	138.2	51 15.7	1.01	139.2	52 16.4	1.01	140.2	53 16.4	1.01	140.2	54 47.0	1.01	141.1	7
	3	46 43.6	1.01	136.3	47 43.6	1.01	137.3	49 14.3	1.01	137.2	50 14.3	1.01	137.2	51 15.0	1.01	138.2	52 15.0	1.01	139.2	53 15.7	1.01	139.1	54 46.3	1.01	140.1	8
	4	46 42.9	1.01	135.3	47 42.9	1.01	136.3	49 13.6	1.01	136.2	50 13.6	1.01	136.2	51 14.3	1.01	137.2	52 15.0	1.01	137.1	53 15.0	1.01	138.1	54 45.7	1.01	139.1	9
	45	46 42.1	1.01	134.3	47 42.1	1.01	134.2	49 12.9	1.01	135.2	50 12.9	1.01	135.2	51 13.6	1.01	136.2	52 14.3	1.01	137.1	53 13.6	1.01	136.1	54 45.0	1.01	138.1	40
	6	46 41.4	1.01	133.2	47 41.4	1.01	134.2	49 12.1	1.01	134.2	50 12.1	1.01	134.2	51 12.8	1.01	135.1	52 13.6	1.01	136.1	53 13.6	1.01	136.1	54 44.3	1.01	137.1	1
	7	46 40.6	1.01	132.2	47 40.6	1.01	132.2	49 11.3	1.01	133.2	50 11.4	1.01	133.1	51 12.1	1.01	134.1	52 12.8	1.01	135.1	53 12.8	1.01	135.1	54 43.5	1.01	136.0	2
	8	46 39.8	1.01	131.2	47 40.6	1.01	132.2	49 10.6	1.01	132.1	50 10.6	1.01	132.1	51 11.3	1.01	133.1	52 11.3	1.01	133.1	53 12.1	1.01	134.1	54 42.8	1.01	135.0	3
	9	46 39.0	1.01	130.2	47 39.8	1.01	130.2	49 09.8	1.01	131.1	50 09.8	1.01	132.1	51 10.6	1.01	132.1	52 10.6	1.01	132.1	53 11.3	1.01	133.0	54 42.1	1.01	134.0	4
	50	46 38.2	1.01	129.2	47 38.2	1.01	129.2	49 09.0	1.01	130.1	50 09.8	1.01	131.1	51 09.8	1.01	131.0	52 09.0	1.01	131.0	53 10.5	1.01	132.0	54 41.3	1.01	133.0	45
	1	46 37.4	1.01	128.2	47 37.4	1.01	128.2	49 08.2	1.01	129.1	50 08.2	1.01	129.1	51 09.0	1.01	130.1	52 09.0	1.01	131.0	53 09.8	1.01	131.0	54 40.5	1.01	132.0	6
	2	46 36.6	1.01	127.2	47 36.6	1.01	128.2	49 07.4	1.01	128.1	50 07.4	1.01	128.1	51 08.2	1.01	129.1	52 08.2	1.01	129.0	53 09.0	1.01	130.0	54 39.7	1.01	131.0	7
	3	46 35.8	1.01	126.2	47 35.7	1.01	127.1	49 06.6	1.01	127.1	50 06.6	1.01	127.1	51 06.5	1.01	127.0	52 07.4	1.01	128.0	53 09.0	1.01	130.0	54 38.9	1.01	129.9	8
	4	46 34.9	1.01	125.1	47 34.9	1.01	125.1	49 05.7	1.01	126.1	50 05.7	1.01	126.0	51 06.5	1.01	127.0	52 07.4	1.01	128.0	53 08.2	1.01	129.0	54 38.1	1.01	128.9	9
	55	46 34.0	1.01	124.1	47 34.0	1.01	124.1	49 04.9	1.01	125.1	50 04.9	1.01	125.0	51 05.7	1.01	126.0	52 05.7	1.01	127.0	53 06.5	1.01	127.0	54 37.3	1.01	127.9	50
	6	46 33.0	1.01	123.1	47 33.2	1.01	123.1	49 04.0	1.01	124.1	50 04.0	1.01	124.0	51 04.8	1.01	125.0	52 05.7	1.01	126.0	53 06.5	1.01	125.9	54 35.6	1.01	126.9	1
	7	46 32.3	1.01	122.1	47 33.2	1.01	123.1	49 03.1	1.01	123.0	50 03.1	1.01	123.0	51 03.1	1.01	124.0	52 04.8	1.01	125.0	53 04.8	1.01	124.9	54 35.6	1.01	125.9	2
	8	46 31.4	1.02	121.1	47 31.4	1.02	122.1	49 02.3	1.01	122.0	50 02.2	1.01	122.0	51 02.2	1.01	122.0	52 03.1	1.01	123.9	53 03.9	1.01	123.9	54 34.8	1.01	124.9	3
	9	46 30.5	1.02	120.1	47 30.5	1.02	120.1	49 01.4	1.02	121.0	50 01.4	1.02	122.0	51 01.3	1.02	121.0	52 02.2	1.02	121.9	53 03.1	1.01	122.9	54 33.9	1.01	123.9	4
	60	46 29.6	1.02	119.1	47 29.6	1.02	119.1	48 59.5	1.02	119.0	50 00.5	1.02	120.0	51 00.4	1.02	121.0	52 01.3	1.02	121.0	53 02.2	1.02	121.9	54 33.0	1.01	122.8	55
	1	46 28.6	1.02	118.1	47 28.7	1.02	118.0	48 59.5	1.02	119.0	49 59.5	1.02	119.9	51 00.4	1.02	120.0	52 00.4	1.02	119.9	53 01.3	1.02	120.9	54 32.2	1.01	121.8	6
	2	46 27.7	1.02	117.1	47 27.7	1.02	117.0	48 58.6	1.02	118.0	49 58.6	1.02	118.0	50 59.5	1.02	118.9	52 00.4	1.02	119.9	52 59.5	1.02	119.9	54 31.3	1.02	120.8	7
	3	46 26.8	1.02	116.1	47 26.8	1.02	117.0	48 57.7	1.02	117.0	49 57.7	1.02	118.0	50 58.6	1.02	117.9	51 59.5	1.02	118.9	52 58.6	1.02	118.8	54 30.4	1.02	119.8	8
	4	46 25.9	1.02	115.1	47 25.8	1.02	116.0	48 55.8	1.02	116.0	49 56.7	1.02	117.0	50 57.7	1.02	117.0	51 59.5	1.02	117.9	52 58.6	1.02	117.8	54 29.5	1.02	118.8	9
	65	46 24.9	1.02	114.1	47 24.9	1.02	114.0	48 55.8	1.02	115.0	49 55.8	1.02	115.9	50 56.7	1.02	116.9	51 57.6	1.02	116.9	52 57.6	1.02	116.8	54 28.5	1.02	117.8	60
	6	46 23.9	1.02	113.0	47 24.9	1.02	114.0	48 54.9	1.02	114.0	49 55.8	1.02	114.9	50 55.8	1.02	115.9	51 56.7	1.02	115.9	52 57.6	1.02	116.8	54 27.6	1.02	116.8	1
	7	46 23.0	1.02	112.0	47 23.0	1.02	113.0	48 53.9	1.02	113.0	49 54.8	1.02	113.9	50 54.8	1.02	114.9	51 55.8	1.02	114.9	52 55.7	1.02	114.8	54 26.7	1.02	115.8	2
	8	46 22.0	1.02	111.0	47 22.0	1.02	112.0	48 52.9	1.02	111.9	49 52.9	1.02	112.9	50 53.9	1.02	112.9	51 54.8	1.02	113.8	52 54.8	1.02	113.8	54 25.7	1.02	114.7	3
	9	46 21.0	1.02	110.0	47 22.0	1.02	111.0	48 52.0	1.02	111.9	49 52.9	1.02	111.9	50 52.9	1.02	111.9	51 53.9	1.02	112.8	52 53.8	1.02	112.8	54 24.8	1.02	113.7	4
	70	46 20.0	1.02	109.0	47 20.0	1.02	109.0	48 50.0	1.02	109.9	49 51.0	1.02	110.9	50 50.0	1.02	110.9	51 51.9	1.02	110.8	52 51.9	1.02	111.8	54 23.8	1.02	112.7	65
	1	46 19.0	1.02	108.0	47 19.0	1.02	108.0	48 50.0	1.02	108.9	49 51.0	1.02	109.9	50 50.9	1.02	109.8	51 51.9	1.02	110.8	52 51.9	1.02	110.8	54 22.8	1.02	111.7	6
	2	46 18.0	1.02	107.0	47 18.0	1.02	108.0	48 49.0	1.02	107.9	49 49.0	1.02	108.9	50 50.0	1.02	108.8	51 50.9	1.02	109.8	52 50.9	1.02	109.8	54 21.8	1.02	110.7	7
	3	46 17.0	1.02	106.0	47 17.0	1.02	107.0	48 48.0	1.02	106.9	49 48.0	1.02	107.9	50 49.0	1.02	107.8	51 49.9	1.02	108.8	52 49.9	1.02	108.7	54 20.9	1.02	109.7	8
	4	46 16.0	1.02	105.0	47 16.0	1.02	105.9	48 47.0	1.02	105.9	49 48.0	1.02	106.9	50 48.0	1.02	107.8	51 48.9	1.02	107.8	52 49.9	1.02	107.7	54 19.9	1.02	108.7	9
	75	46 15.0	1.02	104.0	47 15.0	1.02	104.0	48 45.0	1.02	103.9	49 46.0	1.02	104.9	50 47.0	1.02	105.8	51 46.9	1.02	106.8	52 47.9	1.02	106.7	54 18.9	1.02	107.7	70
	6	46 14.0	1.02	103.0	47 14.0	1.02	104.0	48 45.0	1.02	103.9	49 45.0	1.02	103.9	50 45.9	1.02	104.8	51 46.9	1.02	105.8	52 46.9	1.02	105.7	54 17.9	1.02	106.7	1
	7	46 13.0	1.02	102.0	47 13.0	1.02	103.0	48 44.0	1.02	102.9	49 44.0	1.02	102.9	50 44.9	1.02	103.8	51 45.9	1.02	104.8	52 45.9	1.02	104.7	54 15.9	1.02	105.7	2
	8	46 12.0	1.02	101.0	47 11.9	1.02	101.9	48 42.0	1.02	101.9	49 43.9	1.02	102.9	50 43.9	1.02	102.8	51 44.9	1.02	103.8	52 44.9	1.02	103.7	54 15.9	1.02	104.7	3
	9	46 10.9	1.02	100.0	47 11.9	1.02	100.9	48 41.9	1.02	100.9	49 42.9	1.02	101.9	50 42.9	1.02	101.8	51 43.9	1.02	102.8	52 44.9	1.02	102.7	54 14.9	1.02	103.7	4
	80	46 09.9	1.02	99.0	47 09.9	1.02	99.9	48 40.9	1.02	99.9	49 40.9	1.02	99.8	50 41.9	1.02	100.8	51 42.9	1.02	101.8	52 42.8	1.02	101.7	54 13.8	1.02	102.7	75
	1	46 08.9	1.02	98.0	47 08.8	1.02	98.9	48 39.8	1.02	98.9	49 39.8	1.02	99.8	50 40.8	1.02	99.8	51 40.8	1.02	100.8	52 41.8	1.02	100.7	54 12.8	1.02	101.6	6
	2	46 07.8	1.02	97.0	47 07.8	1.02	97.9	48 37.8	1.02	97.9	49 38.8	1.02	98.8	50 39.8	1.02	98.8	51 39.8	1.02	99.8	52 40.8	1.02	99.7	54 11.7	1.02	100.6	7
	3	46 06.8	1.02	96.0	47 07.8	1.02	96.9	48 37.8	1.02	96.9	49 37.8	1.02	97.8	50 37.8	1.02	97.8	51 39.8	1.02	98.8	52 40.8	1.02	99.7	54 10.8	1.02	99.6	8
	4	46 05.7	1.02	95.0	47 05.7	1.02	95.9	48 36.7	1.02	95.9	49 37.7	1.02	96.8	50 37.7	1.02	96.8	51 38.7	1.02	97.8	52 38.7	1.02	98.7	54 09.7	1.02	98.6	9
85		46 04.7	1.02	94.0	47 04.7	1.02	94.9	48 35.7	1.02	94.9	49 35.7	1.02	95.8	50 36.7	1.02	95.8	51 37.7	1.02	96.7	52 37.7	1.02	97.7	54 08.7	1.02	97.6	80
6		46 03.6	1.02	93.0	47 03.6	1.02	93.9	48 34.6	1.02	93.9	49 34.6	1.02	94.8	50 35.6	1.02	94.8	51 36.6	1.02	95.7	52 36.6	1.02	95.7	54 07.6	1.02	96.6	1
7		46 02.6	1.02	92.0	47 02.6	1.02	92.9	48 33.6	1.02	92.9	49 34.6	1.02	93.8	50 34.6	1.02	93.8	51 35.6	1.02	94.7	52 35.6	1.02	94.7	54 06.6	1.02	95.6	2
8		46 01.6	1.02	91.0	47 01.5	1.02	91.9	48 32.5	1.02	91.9	49 33.6	1.02	92.8	50 34.6	1.02	92.8	51 34.6	1.02	93.7	52 34.6	1.02	93.7	54 05.6	1.02	94.6	3
90		46 00.5	1.02	90.0	47 00.5	1.02	90.9	48 31.5	1.02	90.9	49 31.5	1.02	91.8	50 32.5	1.02	91.8	51 33.5	1.02	92.7	52 33.5	1.02	92.7	54 04.5	1.02	93.6	4
		45 59.5	1.02	89.0	46 59.4	1.02	88.9	48 30.5	1.02	89.9	49 31.5	1.02	90.8	50 31.5	1.02	90.8	51 31.4	1.02	90.7	52 32.5	1.02	91.7	54 03.4	1.02	92.6	5
								48 29.4	1.02	88.9	49 30.4	1.02	89.8	50 30.4	1.02	89.8	51 30.4	1.02	89.7	52 31.4	1.02	90.7	54 02.4	1.02	91.6	6
								48 29.4	1.02	88.9	49 29.4	1.02	88.8	50 29.4	1.02	88.8	51 30.4	1.02	88.7	52 30.4	1.02	89.7	54 01.4	1.02	90.6	7
																	51 29.3	1.02	88.7	52 30.4	1.02	89.7	54 00.3	1.02	89.6	8
																				52 29.3	1.02	88.7	53 59.3	1.02	88.6	9

H.A.	46° 00' Alt. ° '	Δd Δt	Az. °	47° 00' Alt. ° '	Δd Δt	Az. °	48° 30' Alt. ° '	Δd Δt	Az. °	49° 30' Alt. ° '	Δd Δt	Az. °	50° 30' Alt. ° '	Δd Δt	Az. °	51° 30' Alt. ° '	Δd Δt	Az. °	52° 30' Alt. ° '	Δd Δt	Az. °	54° 00' Alt. ° '	Δd Δt	Az. °	H.A.
91	45 58.4	1.0 02	88.0	46 58.4	1.0 02	87.9	48 28.4	1.0 02	87.9	49 28.3	1.0 02	87.8	50 28.3	1.0 02	87.8	51 28.3	1.0 02	87.7	52 28.3	1.0 02	87.7	53 58.2	1.0 02	87.6	91
2	45 57.4	1.0 02	87.0	46 57.3	1.0 02	86.9	48 27.3	1.0 02	86.9	49 27.3	1.0 02	86.8	50 27.3	1.0 02	86.8	51 27.2	1.0 02	86.7	52 27.2	1.0 02	86.7	53 57.2	1.0 02	86.6	2
3	45 56.3	1.0 02	86.0	46 56.3	1.0 02	85.9	48 26.2	1.0 02	85.8	49 26.2	1.0 02	85.8	50 26.2	1.0 02	85.8	51 26.2	1.0 02	85.7	52 26.2	1.0 02	85.7	53 56.3	1.0 02	85.6	3
4	45 55.3	1.0 02	85.0	46 55.3	1.0 02	84.9	48 25.2	1.0 02	84.9	49 25.2	1.0 02	84.8	50 25.2	1.0 02	84.8	51 25.2	1.0 02	84.7	52 25.1	1.0 02	84.7	53 55.1	1.0 02	84.6	4
95	45 54.2	1.0 02	84.0	46 54.2	1.0 02	83.9	48 24.2	1.0 02	83.9	49 24.2	1.0 02	83.8	50 24.1	1.0 02	83.8	51 24.1	1.0 02	83.8	52 24.1	1.0 02	83.7	53 54.1	1.0 02	83.6	95
6	45 53.2	1.0 02	83.0	46 53.2	1.0 02	82.9	48 23.1	1.0 02	82.9	49 23.1	1.0 02	82.8	50 23.1	1.0 02	82.8	51 23.1	1.0 02	82.8	52 23.1	1.0 02	82.7	53 53.0	1.0 02	82.6	6
7	45 52.2	1.0 02	82.0	46 52.1	1.0 02	81.9	48 22.1	1.0 02	81.9	49 22.1	1.0 02	81.8	50 22.1	1.0 02	81.8	51 22.0	1.0 02	81.8	52 22.0	1.0 02	81.7	53 52.0	1.0 02	81.6	7
8	45 51.1	1.0 02	81.0	46 51.1	1.0 02	80.9	48 21.1	1.0 02	80.9	49 21.0	1.0 02	80.8	50 21.0	1.0 02	80.8	51 21.0	1.0 02	80.8	52 21.0	1.0 02	80.7	53 50.9	1.0 02	80.6	8
9	45 50.1	1.0 02	80.0	46 50.1	1.0 02	79.9	48 20.0	1.0 02	79.9	49 20.0	1.0 02	79.8	50 20.0	1.0 02	79.8	51 20.0	1.0 02	79.8	52 20.0	1.0 02	79.7	53 49.9	1.0 02	79.6	9
100	45 49.1	1.0 02	79.0	46 49.0	1.0 02	78.9	48 19.0	1.0 02	78.9	49 19.0	1.0 02	78.9	50 19.0	1.0 02	78.8	51 18.9	1.0 02	78.8	52 18.9	1.0 02	78.7	53 48.9	1.0 02	78.7	100
1	45 48.0	1.0 02	78.0	46 48.0	1.0 02	78.0	48 18.0	1.0 02	77.9	49 18.0	1.0 02	77.9	50 17.9	1.0 02	77.8	51 17.9	1.0 02	77.8	52 17.9	1.0 02	77.7	53 47.9	1.0 02	77.7	1
2	45 47.0	1.0 02	77.0	46 47.0	1.0 02	77.0	48 17.0	1.0 02	76.9	49 16.9	1.0 02	76.9	50 16.9	1.0 02	76.8	51 16.9	1.0 02	76.8	52 16.9	1.0 02	76.7	53 46.8	1.0 02	76.7	2
3	45 46.0	1.0 02	76.0	46 46.0	1.0 02	76.0	48 15.9	1.0 02	75.9	49 15.9	1.0 02	75.9	50 15.9	1.0 02	75.8	51 15.9	1.0 02	75.8	52 15.9	1.0 02	75.7	53 45.8	1.0 02	75.7	3
4	45 45.0	1.0 02	75.0	46 45.0	1.0 02	75.0	48 14.9	1.0 02	74.9	49 14.9	1.0 02	74.9	50 14.9	1.0 02	74.8	51 14.9	1.0 02	74.8	52 14.8	1.0 02	74.7	53 44.8	1.0 02	74.7	4
105	45 44.0	1.0 02	74.0	46 44.0	1.0 02	74.0	48 13.9	1.0 02	73.9	49 13.9	1.0 02	73.9	50 13.9	1.0 02	73.8	51 13.9	1.0 02	73.8	52 13.8	1.0 02	73.7	53 43.8	1.0 02	73.7	105
6	45 43.0	1.0 02	73.0	46 42.9	1.0 02	73.0	48 12.9	1.0 02	72.9	49 12.9	1.0 02	72.9	50 12.9	1.0 02	72.8	51 12.9	1.0 02	72.8	52 12.8	1.0 02	72.8	53 42.8	1.0 02	72.7	6
7	45 42.0	1.0 02	72.0	46 41.9	1.0 02	72.0	48 11.9	1.0 02	71.9	49 11.9	1.0 02	71.9	50 11.9	1.0 02	71.9	51 11.9	1.0 02	71.8	52 11.8	1.0 02	71.8	53 41.8	1.0 02	71.7	7
8	45 41.0	1.0 02	71.0	46 41.0	1.0 02	71.0	48 10.9	1.0 02	70.9	49 10.9	1.0 02	70.9	50 10.9	1.0 02	70.9	51 10.9	1.0 02	70.8	52 10.8	1.0 02	70.8	53 40.8	1.0 02	70.7	8
9	45 40.0	1.0 02	70.0	46 40.0	1.0 02	70.0	48 09.9	1.0 02	69.9	49 09.9	1.0 02	69.9	50 09.9	1.0 02	69.9	51 09.9	1.0 02	69.8	52 09.9	1.0 02	69.8	53 39.8	1.0 02	69.7	9
110	45 39.0	1.0 02	69.0	46 39.0	1.0 02	69.0	48 09.0	1.0 02	68.9	49 08.9	1.0 02	68.9	50 08.9	1.0 02	68.9	51 08.9	1.0 02	68.8	52 08.9	1.0 02	68.8	53 38.8	1.0 02	68.7	110
1	45 38.0	1.0 02	68.0	46 38.0	1.0 02	68.0	48 08.0	1.0 02	68.0	49 08.0	1.0 02	67.9	50 08.0	1.0 02	67.9	51 07.9	1.0 02	67.8	52 07.9	1.0 02	67.8	53 37.9	1.0 02	67.7	1
2	45 37.1	1.0 02	67.0	46 37.0	1.0 02	67.0	48 07.0	1.0 02	67.0	49 07.0	1.0 02	66.9	50 07.0	1.0 02	66.9	51 07.0	1.0 02	66.8	52 06.9	1.0 02	66.8	53 36.9	1.0 02	66.7	2
3	45 36.1	1.0 02	66.1	46 36.1	1.0 02	66.0	48 06.1	1.0 02	66.0	49 06.0	1.0 02	65.9	50 06.0	1.0 02	65.9	51 06.0	1.0 02	65.9	52 06.0	1.0 02	65.8	53 36.0	1.0 02	65.7	3
4	45 35.1	1.0 02	65.1	46 35.1	1.0 02	65.0	48 05.1	1.0 02	65.0	49 05.1	1.0 02	64.9	50 05.1	1.0 02	64.9	51 05.1	1.0 02	64.9	52 05.0	1.0 02	64.8	53 35.0	1.0 02	64.8	4
115	45 34.2	1.0 02	64.1	46 34.2	1.0 02	64.0	48 04.2	1.0 02	64.0	49 04.1	1.0 02	64.0	50 04.1	1.0 02	63.9	51 04.1	1.0 02	63.9	52 04.1	1.0 02	63.8	53 34.1	1.0 02	63.8	115
6	45 33.3	1.0 02	63.1	46 33.2	1.0 02	63.0	48 03.2	1.0 02	63.0	49 03.2	1.0 02	63.0	50 03.2	1.0 02	62.9	51 03.2	1.0 02	62.9	52 03.2	1.0 02	62.8	53 33.1	1.0 02	62.8	6
7	45 32.3	1.0 02	62.1	46 32.3	1.0 02	62.1	48 02.3	1.0 02	62.0	49 02.3	1.0 02	62.0	50 02.3	1.0 02	61.9	51 02.2	1.0 02	61.9	52 02.2	1.0 02	61.9	53 32.2	1.0 02	61.8	7
8	45 31.4	1.0 02	61.1	46 31.4	1.0 02	61.1	48 01.4	1.0 02	61.0	49 01.4	1.0 02	61.0	50 01.3	1.0 02	60.9	51 01.3	1.0 02	60.9	52 01.3	1.0 02	60.9	53 31.3	1.0 02	60.8	8
9	45 30.5	1.0 02	60.1	46 30.5	1.0 02	60.1	48 00.5	1.0 02	60.0	49 00.5	1.0 02	60.0	50 00.4	1.0 02	59.9	51 00.4	1.0 02	59.9	52 00.4	1.0 02	59.9	53 30.4	1.0 02	59.8	9
120	45 29.6	1.0 02	59.1	46 29.6	1.0 02	59.1	47 59.6	1.0 02	59.0	48 59.5	1.0 02	59.0	49 59.5	1.0 02	59.0	50 59.5	1.0 02	58.9	51 59.5	1.0 02	58.9	53 29.5	1.0 01	58.8	120
1	45 28.7	1.0 01	58.1	46 28.7	1.0 01	58.1	47 58.7	1.0 01	58.0	48 58.7	1.0 01	58.0	49 58.6	1.0 01	58.0	50 58.6	1.0 01	57.9	51 58.6	1.0 01	57.9	53 28.6	1.0 01	57.8	1
2	45 27.8	1.0 01	57.1	46 27.8	1.0 01	57.1	47 57.8	1.0 01	57.1	48 57.8	1.0 01	57.0	49 57.8	1.0 01	57.0	50 57.7	1.0 01	57.0	51 57.7	1.0 01	56.9	53 27.7	1.0 01	56.9	2
3	45 26.9	1.0 01	56.1	46 26.9	1.0 01	56.1	47 56.9	1.0 01	56.1	48 56.9	1.0 01	56.0	49 56.9	1.0 01	56.0	50 56.9	1.0 01	56.0	51 56.8	1.0 01	55.9	53 26.8	1.0 01	55.9	3
4	45 26.1	1.0 01	55.2	46 26.1	1.0 01	55.1	47 56.0	1.0 01	55.1	48 56.0	1.0 01	55.0	49 56.0	1.0 01	55.0	50 56.0	1.0 01	55.0	51 56.0	1.0 01	54.9	53 26.0	1.0 01	54.9	4
125	45 25.2	1.0 01	54.2	46 25.2	1.0 01	54.1	47 55.2	1.0 01	54.1	48 55.2	1.0 01	54.1	49 55.2	1.0 01	54.0	50 55.2	1.0 01	54.0	51 55.1	1.0 01	54.0	53 25.1	1.0 01	53.9	125
6	45 24.4	1.0 01	53.2	46 24.4	1.0 01	53.1	47 54.4	1.0 01	53.1	48 54.3	1.0 01	53.1	49 54.3	1.0 01	53.0	50 54.3	1.0 01	53.0	51 54.3	1.0 01	53.0	53 24.3	1.0 01	52.9	6
7	45 23.5	1.0 01	52.2	46 23.5	1.0 01	52.2	47 53.5	1.0 01	52.1	48 53.5	1.0 01	52.1	49 53.5	1.0 01	52.0	50 53.5	1.0 01	52.0	51 53.5	1.0 01	51.9	53 23.4	1.0 01	51.9	7
8	45 22.7	1.0 01	51.2	46 22.7	1.0 01	51.2	47 52.7	1.0 01	51.1	48 52.7	1.0 01	51.1	49 52.7	1.0 01	51.1	50 52.6	1.0 01	51.0	51 52.6	1.0 01	51.0	53 22.6	1.0 01	50.9	8
9	45 21.9	1.0 01	50.2	46 21.9	1.0 01	50.2	47 51.9	1.0 01	50.1	48 51.9	1.0 01	50.1	49 51.9	1.0 01	50.1	50 51.8	1.0 01	50.0	51 51.8	1.0 01	50.0	53 21.8	1.0 01	50.0	9
130	45 21.1	1.0 01	49.2	46 21.1	1.0 01	49.2	47 51.1	1.0 01	49.1	48 51.1	1.0 01	49.1	49 51.1	1.0 01	49.1	50 51.1	1.0 01	49.1	51 51.0	1.0 01	49.0	53 21.0	1.0 01	49.0	130
1	45 20.3	1.0 01	48.2	46 20.3	1.0 01	48.2	47 50.3	1.0 01	48.2	48 50.3	1.0 01	48.1	49 50.3	1.0 01	48.1	50 50.3	1.0 01	48.1	51 50.3	1.0 01	48.0	53 20.2	1.0 01	48.0	1
2	45 19.6	1.0 01	47.2	46 19.5	1.0 01	47.2	47 49.5	1.0 01	47.2	48 49.5	1.0 01	47.1	49 49.5	1.0 01	47.1	50 49.5	1.0 01	47.1	51 49.5	1.0 01	47.1	53 19.5	1.0 01	47.0	2
3	45 18.8	1.0 01	46.3	46 18.8	1.0 01	46.2	47 48.8	1.0 01	46.2	48 48.8	1.0 01	46.2	49 48.7	1.0 01	46.1	50 48.7	1.0 01	46.1	51 48.7	1.0 01	46.1	53 18.7	1.0 01	46.0	3
4	45 18.0	1.0 01	45.3	46 18.0	1.0 01	45.2	47 48.0	1.0 01	45.2	48 48.0	1.0 01	45.2	49 48.0	1.0 01	45.1	50 48.0	1.0 01	45.1	51 48.0	1.0 01	45.1	53 18.0	1.0 01	45.0	4
135	45 17.3	1.0 01	44.3	46 17.3	1.0 01	44.3	47 47.3	1.0 01	44.2	48 47.3	1.0 01	44.2	49 47.3	1.0 01	44.2	50 47.2	1.0 01	44.1	51 47.2	1.0 01	44.1	53 17.2	1.0 01	44.0	135
6	45 16.6	1.0 01	43.3	46 16.6	1.0 01	43.3	47 46.6	1.0 01	43.2	48 46.5	1.0 01	43.2	49 46.5	1.0 01	43.2	50 46.5	1.0 01	43.1	51 46.5	1.0 01	43.1	53 16.5	1.0 01	43.1	6
7	45 15.9	1.0 01	42.3	46 15.9	1.0 01	42.3	47 45.9	1.0 01	42.2	48 45.8	1.0 01	42.2	49 45.8	1.0 01	42.2	50 45.8	1.0 01	42.2	51 45.8	1.0 01	42.1	53 15.8	1.0 01	42.1	7
8	45 15.2	1.0 01	41.3	46 15.2	1.0 01	41.3	47 45.2	1.0 01	41.3	48 45.1	1.0 01	41.2	49 45.1	1.0 01	41.2	50 45.1	1.0 01	41.2	51 45.1	1.0 01	41.1	53 15.1	1.0 01	41.1	8
9	45 14.5	1.0 01	40.3	46 14.5	1.0 01	40.3	47 44.5	1.0 01	40.3	48 44.5	1.0 01	40.2	49 44.4	1.0 01	40.2	50 44.4	1.0 01	40.2	51 44.4	1.0 01	40.2	53 14.4	1.0 01	40.1	9
140	45 13.8	1.0 01	39.3	46 13.8	1.0 01	39.3	47 43.8	1.0 01	39.3	48 43.8	1.0 01	39.3	49 43.8	1.0 01	39.2	50 43.8	1.0 01	39.2	51 43.8	1.0 01	39.2	53 13.7	1.0 01	39.1	140
1	45 13.2	1.0 01	38.4	46 13.2	1.0 01	38.3	47 43.1	1.0 01	38.3	48 43.1	1.0 01	38.3	49 43.1	1.0 01	38.3	50 43.1	1.0 01	38.2	51 43.1	1.0 01	38.2	53 13.1	1.0 01	38.2	1
2	45 12.5	1.0 01	37.4	46 12.5	1.0 01	37.4	47 42.5	1.0 01	37.3	48 42.5	1.0 01	37.3	49 42.5	1.0 01	37.3	50 42.5	1.0 01	37.2	51 42.5	1.0 01	37.2	53 12.5	1.0 01	37.2	2
3	45 11.9	1.0 01	36.4	46 11.9	1.0 01	36.4	47 41.9	1.0 01	36.3	48 41.9	1.0 01	36.3	49 41.9	1.0 01	36.3	50 41.8	1.0 01	36.3	51 41.8	1.0 01	36.2	53 11.8	1.0 01	36.2	3
4	45 11.3	1.0 01	35.4	46 11.3	1.0 01	35.4	47 41.3	1.0 01	35.4	48 41.3	1.0 01	35.3	49 41.3	1.0 01	35.3	50 41.2	1.0 01	35.3	51 41.2	1.0 01	35.3	53 11.2	1.0 01	35.2	4
145	45 10.7	1.0 01	34.4	46 10.7	1.0 01	34.4	47 40.7	1.0 01	34.4	48 40.7	1.0 01	34.3	49 40.6	1.0 01	34.3	50 40.6	1.0 01	34.3	51 40.6	1.0 01	34.3	53 10.6	1.0 01	34.2	145
6	45 10.1	1.0 01	33.4	46 10.1	1.0 01	33.4	47 40.1	1.0 01	33.4	48 40.1	1.0 01	33.4	49 40.1	1.0 01	33.3	50 40.1	1.0 01	33.3	51 40.0	1.0 01	33.3	53 10.0	1.0 01	33.2	6
7	45 09.5	1.0 01	32.4	46 09.5	1.0 01	32.4	47 39.5	1.0 01	32.4	48 39.5	1.0 01	32.4	49 39.5	1.0 01	32.3	50 39.5	1.0 01	32.3	51 39.5	1.0 01	32.3	53 09.5	1.0 01	32.3	7
8	45 09.0	1.0 01	31.5	46 09.0	1.0 01	31.4	47 39.0	1.0 01	31.4	48 38.9	1.0 01	31.4	49 38.9	1.0 01	31.4	50 38.9	1.0 01	31.4	51 38.9	1.0 01	31.3	53 08.9	1.0 01	31.3	8
9	45 08.4	1.0 01	30.5	46 08.4	1.0 01	30.5	47 38.4	1.0 01	30.4	48 38.4	1.0 01	30.4	49 38.4	1.0 01	30.4	50 38.4	1.0 01	30.4	51 38.4	1.0 01	30.3	53 08.4	1.0 01	30.3	9
150	45 07.9	1.0 01	29.5	46 07.9	1.0 01	29.5	47 37.9	1.0 01	29.4	48 37.9	1.0 01	29.4	49 37.9	1.0 01	29.4	50 37.9	1.0 01	29.4	51 37.9	1.0 01	29.4	53 07.9	1.0 01	29.3	150
1	45 07.4	1.0 01	28.5	46 07.4	1.0 01	28.5	47 37.4	1.0 01	28.5	48 37.4	1.0 01	28.4	49 37.4	1.0 01	28.4	50 37.4	1.0 01	28.4	51 37.4	1.0 01	28.4	53 07.4	1.0 01	28.4	1
2	45 06.9	1.0 01	27.5	46 06.9	1.0 01	27.5	47 36.9	1.0 01	27.5	48 36.9	1.0 01	27.5	49 36.9	1.0 01	27.4	50 36.9	1.0 01	27.4	51 36.9	1.0 01	27.4	53 06.9	1.0 01	27.4	2
3	45 06.4	1.0 01	26.5	46 06.4	1.0 01	26.5	47 36.4	1.0 01	26.5	48 36.4	1.0 01	26.5	49 36.4	1.0 01	26.5	50 36.4	1.0 01	26.4	51 36.4	1.0 01	26.4	53 06.4	1.0 01	26.4	3
4	45 06.0	1.0 01	25.6	46 06.0	1.0 01	25.5	47 36.0	1.0 01	25.5	48 36.0	1.0 01	25.5	49 36.0	1.0 01	25.5	50 35.9	1.0 01	25.5	51 35.9	1.0 01	25.4	53 05.9	1.0 01	25.4	4
155	45 05.5	1.0 01	24.6	46 05.5	1.0 01	24.6	47 35.5	1.0 01	24.5	48 35.5	1.0 01	24.5	49 35.5	1.0 01	24.5	50 35.5	1.0 01	24.5	51 35.5	1.0 01	24.5	53 05.5	1.0 01	24.4	155
6	45 05.1	1.0 01	23.6	46 05.1	1.0 01	23.6	47 35.1	1.0 01	23.6	48 35.1	1.0 01	23.5	49 35.0	1.0 01	23.5	50 35.0	1.0 01	23.5	51 35.0	1.0 01	23.5	53 05.0	1.0 01	23.5	6
7	45 04.7	1.0 01	22.6	46 04.7	1.0 01	22.6	47 34.7	1.0 01	22.6	48 34.7	1.0 01	22.6	49 34.7	1.0 01	22.5	50 34.7	1.0 01	22.5	51 34.7	1.0 01	22.5	53 04.7	1.0 01	22.5	7
8	45 04.3	1.0 01	21.6	46 04.3	1.0 01	21.6	47 34.3	1.0 01	21.6	48 34.3	1.0 01	21.6	49 34.3	1.0 01	21.6	50 34.3	1.0 01	21.5	51 34.3	1.0 01	21.5	53 04.3	1.0 01	21.5	8
9	45 03.9	1.0 01	20.6	46 03.9	1.0 01	20.6	47 33.9	1.0 01	20.6	48 33.9	1.0 01	20.6	49 33.9	1.0 01	20.6	50 33.9	1.0 01	20.6	51 33.9	1.0 01	20.5	53 03.9	1.0 01	20.5	9
160	45 03.6	1.0 01	19.7	46 03.6	1.0 01	19.6	47 33.6	1.0 01	19.6	48 33.5	1.0 01	19.6	49 33.5	1.0 01	19.6	50 33.5	1.0 01	19.6	51 33.5	1.0 01	19.6	53 03.5	1.0 01	19.5	160
1	45 03.2	1.0 01	18.7	46 03.2	1.0 01	18.6	47 33.2	1.0 01	18.6	48 33.2	1.0 01	18.6	49 33.2	1.0 01	18.6	50 33.2	1.0 01	18.6	51 33.2	1.0 01	18.6	53 03.2	1.0 01	18.6	1
2	45 02.9	1.0 01	17.7	46 02.9	1.0 01	17.7	47 32.9	1.0 01	17.7	48 32.9	1.0 01	17.6	49 32.9	1.0 01	17.6	50 32.9	1.0 01	17.6	51 32.9	1.0 01	17.6	53 02.9	1.0 00	17.6	2
3	45 02.6	1.0 00	16.7	46 02.6	1.0 00	16.7	47 32.6	1.0 00	16.7	48 32.6	1.0 00	16.7	49 32.6	1.0 00	16.7	50 32.6	1.0 00	16.6	51 32.6	1.0 00	16.6	53 02.6	1.0 00	16.6	3
4	45 02.3	1.0 00	15.7	46 02.3	1.0 00	15.7	47 32.3	1.0 00	15.7	48 32.3	1.0 00	15.7	49 32.3	1.0 00	15.7	50 32.3	1.0 00	15.7	51 32.3	1.0 00	15.7	53 02.3	1.0 00	15.6	4
165	45 02.0	1.0 00	14.7	46 02.0	1.0 00	14.7	47 32.0	1.0 00	14.7	48 32.0	1.0 00	14.7	49 32.0	1.0 00	14.7	50 32.0	1.0 00	14.7	51 32.0	1.0 00	14.7	53 02.0	1.0 00	14.7	165
6	45 01.8	1.0 00	13.8	46 01.7	1.0 00	13.7	47 31.7	1.0 00	13.7	48 31.7	1.0 00	13.7	49 31.7	1.0 00	13.7	50 31.7	1.0 00	13.7	51 31.7	1.0 00	13.7	53 01.7	1.0 00	13.7	6
7	45 01.5	1.0 00	12.8	46 01.5	1.0 00	12.8	47 31.5	1.0 00	12.8	48 31.5	1.0 00	12.7	49 31.5	1.0 00	12.7	50 31.5	1.0 00	12.7	51 31.5	1.0 00	12.7	53 01.5	1.0 00	12.7	7
8	45 01.3	1.0 00	11.8	46 01.3	1.0 00	11.8	47 31.3	1.0 00	11.8	48 31.3	1.0 00	11.8	49 31.3	1.0 00	11.8	50 31.3	1.0 00	11.7	51 31.3	1.0 00	11.7	53 01.3	1.0 00	11.7	8
9	45 01.1	1.0 00	10.8	46 01.1	1.0 00	10.8	47 31.1	1.0 00	10.8	48 31.1	1.0 00	10.8	49 31.1	1.0 00	10.8	50 31.1	1.0 00	10.8	51 31.1	1.0 00	10.8	53 01.1	1.0 00	10.7	9
170	45 00.9	1.0 00	09.8	46 00.9	1.0 00	09.8	47 30.9	1.0 00	09.8	48 30.9	1.0 00	09.8	49 30.9	1.0 00	09.8	50 30.9	1.0 00	09.8	51 30.9	1.0 00	09.8	53 00.9	1.0 00	09.8	170
1	45 00.7	1.0 00	08.8	46 00.7	1.0 00	08.8	47 30.7	1.0 00	08.8	48 30.7	1.0 00	08.8	49 30.7	1.0 00	08.8	50 30.7	1.0 00	08.8	51 30.7	1.0 00	08.8	53 00.7	1.0 00	08.8	1
2	45 00.6	1.0 00	07.9	46 00.6	1.0 00	07.9	47 30.6	1.0 00	07.8	48 30.6	1.0 00	07.8	49 30.6	1.0 00	07.8	50 30.6	1.0 00	07.8	51 30.6	1.0 00	07.8	53 00.6	1.0 00	07.8	2
3	45 00.4	1.0 00	06.9	46 00.4	1.0 00	06.9	47 30.4	1.0 00	06.9	48 30.4	1.0 00	06.9	49 30.4	1.0 00	06.9	50 30.4	1.0 00	06.9	51 30.4	1.0 00	06.8	53 00.4	1.0 00	06.8	3
4	45 00.3	1.0 00	05.9	46 00.3	1.0 00	05.9	47 30.3	1.0 00	05.9	48 30.3	1.0 00	05.9	49 30.3	1.0 00	05.9	50 30.3	1.0 00	05.9	51 30.3	1.0 00	05.9	53 00.3	1.0 00	05.9	4
175	45 00.2	1.0 00	04.9	46 00.2	1.0 00	04.9	47 30.2	1.0 00	04.9	48 30.2	1.0 00	04.9	49 30.2	1.0 00	04.9	50 30.2	1.0 00	04.9	51 30.2	1.0 00	04.9	53 00.2	1.0 00	04.9	175
6	45 00.1	1.0 00	03.9	46 00.1	1.0 00	03.9	47 30.1	1.0 00	03.9	48 30.1	1.0 00	03.9	49 30.1	1.0 00	03.9	50 30.1	1.0 00	03.9	51 30.1	1.0 00	03.9	53 00.1	1.0 00	03.9	6
7	45 00.1	1.0 00	02.9	46 00.1	1.0 00	02.9	47 30.1	1.0 00	02.9	48 30.1	1.0 00	02.9	49 30.1	1.0 00	02.9	50 30.1	1.0 00	02.9	51 30.1	1.0 00	02.9	53 00.1	1.0 00	02.9	7
8	45 00.0	1.0 00	02.0	46 00.0	1.0 00	02.0	47 30.0	1.0 00	02.0	48 30.0	1.0 00	02.0	49 30.0	1.0 00	02.0	50 30.0	1.0 00	02.0	51 30.0	1.0 00	02.0	53 00.0	1.0 00	02.0	8
9	45 00.0	1.0 00	01.0	46 00.0	1.0 00	01.0	47 30.0	1.0 00	01.0	48 30.0	1.0 00	01.0	49 30.0	1.0 00	01.0	50 30.0	1.0 00	01.0	51 30.0	1.0 00	01.0	53 00.0	1.0 00	01.0	9
180	45 00.0	1.0 00	00.0	46 00.0	1.0 00	00.0	47 30.0	1.0 00	00.0	48 30.0	1.0 00	00.0	49 30.0	1.0 00	00.0	50 30.0	1.0 00	00.0	51 30.0	1.0 00	00.0	53 00.0	1.0 00	00.0	180

Lat. 89°

H.A.	54° 30'	55° 00'	56° 00'	56° 30'	57° 00'	57° 30'	59° 00'	59° 30'	H.A.
	Alt. / Δd Δt / Az.	Alt. / Δd Δt / Az.	Alt. / Δd Δt / Az.	Alt. / Δd Δt / Az.	Alt. / Δd Δt / Az.	Alt. / Δd Δt / Az.	Alt. / Δd Δt / Az.	Alt. / Δd Δt / Az.	
00	55 30.0 1.0 00 180.0	56 00.0 1.0 00 180.0	57 00.0 1.0 00 180.0	57 30.0 1.0 00 180.0	58 00.0 1.0 00 180.0	58 30.0 1.0 00 180.0	60 00.0 1.0 00 180.0	60 30.0 1.0 00 180.0	00
1	55 30.0 1.0 00 179.0	56 00.0 1.0 00 179.0	57 00.0 1.0 00 179.0	57 30.0 1.0 00 179.0	58 00.0 1.0 00 179.0	58 30.0 1.0 00 179.0	60 00.0 1.0 00 179.0	60 30.0 1.0 00 179.0	1
2	55 30.0 1.0 00 177.9	56 00.0 1.0 00 177.9	57 00.0 1.0 00 177.9	57 30.0 1.0 00 177.9	58 00.0 1.0 00 177.9	58 30.0 1.0 00 177.9	60 00.0 1.0 00 177.9	60 30.0 1.0 00 177.9	2
3	55 29.9 1.0 00 176.9	55 59.9 1.0 00 176.9	56 59.9 1.0 00 176.9	57 29.9 1.0 00 176.9	57 59.9 1.0 00 176.9	58 29.9 1.0 00 176.9	59 59.9 1.0 00 176.9	60 29.9 1.0 00 176.9	3
4	55 29.8 1.0 00 175.9	55 59.8 1.0 00 175.9	56 59.8 1.0 00 175.9	57 29.8 1.0 00 175.9	57 59.8 1.0 00 175.9	58 29.8 1.0 00 175.9	59 59.8 1.0 00 175.9	60 29.8 1.0 00 175.9	4
05	55 29.8 1.0 00 174.9	55 59.8 1.0 00 174.9	56 59.8 1.0 00 174.9	57 29.8 1.0 00 174.9	57 59.8 1.0 00 174.9	58 29.8 1.0 00 174.9	59 59.8 1.0 00 174.8	60 29.8 1.0 00 174.8	05
6	55 29.7 1.0 00 173.8	55 59.7 1.0 00 173.8	56 59.7 1.0 00 173.8	57 29.7 1.0 00 173.8	57 59.7 1.0 00 173.8	58 29.7 1.0 00 173.8	59 59.7 1.0 00 173.8	60 29.7 1.0 00 173.8	6
7	55 29.5 1.0 00 172.8	55 59.5 1.0 00 172.8	56 59.5 1.0 00 172.8	57 29.5 1.0 00 172.8	57 59.5 1.0 00 172.8	58 29.5 1.0 00 172.8	59 59.5 1.0 00 172.8	60 29.5 1.0 00 172.8	7
8	55 29.4 1.0 00 171.8	55 59.4 1.0 00 171.8	56 59.4 1.0 00 171.8	57 29.4 1.0 00 171.8	57 59.4 1.0 00 171.8	58 29.4 1.0 00 171.8	59 59.4 1.0 00 171.8	60 29.4 1.0 00 171.8	8
9	55 29.2 1.0 00 170.8	55 59.2 1.0 00 170.8	56 59.2 1.0 00 170.8	57 29.2 1.0 00 170.8	57 59.2 1.0 00 170.8	58 29.2 1.0 00 170.8	59 59.2 1.0 00 170.7	60 29.2 1.0 00 170.7	9
10	55 29.1 1.0 00 169.7	55 59.1 1.0 00 169.7	56 59.1 1.0 00 169.7	57 29.1 1.0 00 169.7	57 59.1 1.0 00 169.7	58 29.1 1.0 00 169.7	59 59.1 1.0 00 169.7	60 29.1 1.0 00 169.7	10
1	55 28.9 1.0 00 168.7	55 58.9 1.0 00 168.7	56 58.9 1.0 00 168.7	57 28.9 1.0 00 168.7	57 58.9 1.0 00 168.7	58 28.9 1.0 00 168.7	59 58.9 1.0 00 168.7	60 28.9 1.0 00 168.7	1
2	55 28.7 1.0 00 167.7	55 58.7 1.0 00 167.7	56 58.7 1.0 00 167.7	57 28.7 1.0 00 167.7	57 58.7 1.0 00 167.7	58 28.7 1.0 00 167.7	59 58.6 1.0 00 167.6	60 28.6 1.0 00 167.6	2
3	55 28.4 1.0 00 166.7	55 58.4 1.0 00 166.7	56 58.4 1.0 00 166.7	57 28.4 1.0 00 166.7	57 58.4 1.0 00 166.7	58 28.4 1.0 00 166.6	59 58.4 1.0 00 166.6	60 28.4 1.0 00 166.6	3
4	55 28.2 1.0 00 165.7	55 58.2 1.0 00 165.6	56 58.2 1.0 00 165.6	57 28.2 1.0 00 165.6	57 58.2 1.0 00 165.6	58 28.2 1.0 00 165.6	59 58.2 1.0 00 165.6	60 28.2 1.0 00 165.6	4
15	55 27.9 1.0 00 164.6	55 57.9 1.0 00 164.6	56 57.9 1.0 00 164.6	57 27.9 1.0 00 164.6	57 57.9 1.0 00 164.6	58 27.9 1.0 00 164.6	59 57.9 1.0 00 164.5	60 27.9 1.0 00 164.5	15
6	55 27.6 1.0 00 163.6	55 57.6 1.0 00 163.6	56 57.6 1.0 00 163.6	57 27.6 1.0 00 163.6	57 57.6 1.0 01 163.6	58 27.6 1.0 01 163.6	59 57.6 1.0 00 163.5	60 27.6 1.0 00 163.5	6
7	55 27.3 1.0 01 162.6	55 57.3 1.0 01 162.6	56 57.3 1.0 01 162.6	57 27.3 1.0 01 162.5	57 57.3 1.0 01 162.5	58 27.3 1.0 01 162.5	59 57.3 1.0 01 162.5	60 27.3 1.0 01 162.5	7
8	55 27.0 1.0 01 161.6	55 57.0 1.0 01 161.6	56 57.0 1.0 01 161.6	57 27.0 1.0 01 161.5	57 57.0 1.0 01 161.5	58 27.0 1.0 01 161.5	59 57.0 1.0 01 161.5	60 27.0 1.0 01 161.5	8
9	55 26.7 1.0 01 160.5	55 56.7 1.0 01 160.5	56 56.6 1.0 01 160.5	57 26.6 1.0 01 160.5	57 56.6 1.0 01 160.5	58 26.6 1.0 01 160.5	59 56.6 1.0 01 160.4	60 26.6 1.0 01 160.4	9
20	55 26.3 1.0 01 159.5	55 56.3 1.0 01 159.5	56 56.3 1.0 01 159.5	57 26.3 1.0 01 159.5	57 56.3 1.0 01 159.5	58 26.3 1.0 01 159.4	59 56.3 1.0 01 159.4	60 26.3 1.0 01 159.4	20
1	55 25.9 1.0 01 158.5	55 55.9 1.0 01 158.5	56 55.9 1.0 01 158.5	57 25.9 1.0 01 158.5	57 55.9 1.0 01 158.4	58 25.9 1.0 01 158.4	59 55.9 1.0 01 158.4	60 25.9 1.0 01 158.4	1
2	55 25.5 1.0 01 157.5	55 55.5 1.0 01 157.4	56 55.5 1.0 01 157.4	57 25.5 1.0 01 157.4	57 55.5 1.0 01 157.4	58 25.5 1.0 01 157.4	59 55.5 1.0 01 157.4	60 25.5 1.0 01 157.3	2
3	55 25.1 1.0 01 156.4	55 55.1 1.0 01 156.4	56 55.1 1.0 01 156.4	57 25.1 1.0 01 156.4	57 55.1 1.0 01 156.4	58 25.1 1.0 01 156.4	59 55.1 1.0 01 156.3	00 25.1 1.0 01 156.3	3
4	55 24.7 1.0 01 155.4	55 54.7 1.0 01 155.4	56 54.7 1.0 01 155.4	57 24.7 1.0 01 155.4	57 54.7 1.0 01 155.4	58 24.7 1.0 01 155.3	59 54.7 1.0 01 155.3	60 24.7 1.0 01 155.3	4
25	55 24.2 1.0 01 154.4	55 54.2 1.0 01 154.4	56 54.2 1.0 01 154.4	57 24.2 1.0 01 154.3	57 54.2 1.0 01 154.3	58 24.2 1.0 01 154.3	59 54.2 1.0 01 154.3	60 24.2 1.0 01 154.3	25
6	55 23.8 1.0 01 153.4	55 53.8 1.0 01 153.4	56 53.8 1.0 01 153.3	57 23.8 1.0 01 153.3	57 53.8 1.0 01 153.3	58 23.8 1.0 01 153.3	59 53.8 1.0 01 153.2	60 23.8 1.0 01 153.2	6
7	55 23.3 1.0 01 152.3	55 53.3 1.0 01 152.3	56 53.3 1.0 01 152.3	57 23.3 1.0 01 152.3	57 53.3 1.0 01 152.3	58 23.3 1.0 01 152.3	59 53.3 1.0 01 152.2	60 23.3 1.0 01 152.2	7
8	55 22.8 1.0 01 151.3	55 52.8 1.0 01 151.3	56 52.8 1.0 01 151.3	57 22.8 1.0 01 151.3	57 52.8 1.0 01 151.3	58 22.8 1.0 01 151.2	59 52.8 1.0 01 151.2	60 22.8 1.0 01 151.2	8
9	55 22.3 1.0 01 150.3	55 52.3 1.0 01 150.3	56 52.3 1.0 01 150.3	57 22.3 1.0 01 150.3	57 52.3 1.0 01 150.2	58 22.3 1.0 01 150.2	59 52.3 1.0 01 150.2	60 22.3 1.0 01 150.2	9
30	55 21.8 1.0 01 149.3	55 51.8 1.0 01 149.3	56 51.8 1.0 01 149.2	57 21.8 1.0 01 149.2	57 51.8 1.0 01 149.2	58 21.8 1.0 01 149.2	59 51.7 1.0 01 149.1	60 21.7 1.0 01 149.1	30
1	55 21.2 1.0 01 148.3	55 51.2 1.0 01 148.2	56 51.2 1.0 01 148.2	57 21.2 1.0 01 148.2	57 51.2 1.0 01 148.2	58 21.2 1.0 01 148.2	59 51.2 1.0 01 148.1	60 21.2 1.0 01 148.1	1
2	55 20.7 1.0 01 147.2	55 50.7 1.0 01 147.2	56 50.7 1.0 01 147.2	57 20.7 1.0 01 147.2	57 50.6 1.0 01 147.2	58 20.6 1.0 01 147.1	59 50.6 1.0 01 147.1	60 20.6 1.0 01 147.1	2
3	55 20.1 1.0 01 146.2	55 50.1 1.0 01 146.2	56 50.1 1.0 01 146.2	57 20.1 1.0 01 146.2	57 50.1 1.0 01 146.1	58 20.1 1.0 01 146.1	59 50.1 1.0 01 146.0	60 20.0 1.0 01 146.0	3
4	55 19.5 1.0 01 145.2	55 49.5 1.0 01 145.2	56 49.5 1.0 01 145.1	57 19.5 1.0 01 145.1	57 49.5 1.0 01 145.1	58 19.5 1.0 01 145.1	59 49.5 1.0 01 145.0	60 19.5 1.0 01 145.0	4
35	55 18.9 1.0 01 144.2	55 48.9 1.0 01 144.2	56 48.9 1.0 01 144.1	57 18.9 1.0 01 144.1	57 48.9 1.0 01 144.1	58 18.9 1.0 01 144.1	59 48.9 1.0 01 144.0	60 18.8 1.0 01 144.0	35
6	55 18.3 1.0 01 143.2	55 48.3 1.0 01 143.1	56 48.3 1.0 01 143.1	57 18.3 1.0 01 143.1	57 48.3 1.0 01 143.1	58 18.3 1.0 01 143.1	59 48.2 1.0 01 143.0	60 18.2 1.0 01 143.0	6
7	55 17.6 1.0 01 142.1	55 47.6 1.0 01 142.1	56 47.6 1.0 01 142.1	57 17.6 1.0 01 142.1	57 47.6 1.0 01 142.0	58 17.6 1.0 01 142.0	59 47.6 1.0 01 141.9	60 17.6 1.0 01 141.9	7
8	55 17.0 1.0 01 141.1	55 47.0 1.0 01 141.1	56 47.0 1.0 01 141.1	57 17.0 1.0 01 141.0	57 47.0 1.0 01 141.0	58 17.0 1.0 01 141.0	59 46.9 1.0 01 140.9	60 16.9 1.0 01 140.9	8
9	55 16.3 1.0 01 140.1	55 46.3 1.0 01 140.1	56 46.3 1.0 01 140.0	57 16.3 1.0 01 140.0	57 46.3 1.0 01 140.0	58 16.3 1.0 01 140.0	59 46.3 1.0 01 139.9	60 16.3 1.0 01 139.9	9
40	55 15.7 1.0 01 139.1	55 45.6 1.0 01 139.1	56 45.6 1.0 01 139.0	57 15.6 1.0 01 139.0	57 45.6 1.0 01 139.0	58 15.6 1.0 01 139.0	59 45.6 1.0 01 138.9	60 15.6 1.0 01 138.9	40
1	55 15.0 1.0 01 138.1	55 45.0 1.0 01 138.0	56 44.9 1.0 01 138.0	57 14.9 1.0 01 138.0	57 44.9 1.0 01 138.0	58 14.9 1.0 01 137.9	59 44.9 1.0 01 137.9	60 14.9 1.0 01 137.9	1
2	55 14.3 1.0 01 137.0	55 44.2 1.0 01 137.0	56 44.2 1.0 01 136.9	57 14.2 1.0 01 136.9	57 44.2 1.0 01 136.9	58 14.2 1.0 01 136.9	59 44.2 1.0 01 136.8	60 14.2 1.0 01 136.8	2
3	55 13.5 1.0 01 136.0	55 43.5 1.0 01 136.0	56 43.5 1.0 01 136.0	57 13.5 1.0 01 136.0	57 43.5 1.0 01 135.9	58 13.5 1.0 01 135.9	59 43.5 1.0 01 135.8	60 13.5 1.0 01 135.8	3
4	55 12.8 1.0 01 135.0	55 42.8 1.0 01 135.0	56 42.8 1.0 01 134.9	57 12.8 1.0 01 134.9	57 42.8 1.0 01 134.9	58 12.8 1.0 01 134.9	59 42.7 1.0 01 134.8	60 12.7 1.0 01 134.8	4
45	55 12.1 1.0 01 134.0	55 42.0 1.0 01 134.0	56 42.0 1.0 01 133.9	57 12.0 1.0 01 133.9	57 42.0 1.0 01 133.9	58 12.0 1.0 01 133.9	59 42.0 1.0 01 133.8	60 12.0 1.0 01 133.8	45
6	55 11.3 1.0 01 133.0	55 41.3 1.0 01 133.0	56 41.3 1.0 01 132.9	57 11.3 1.0 01 132.9	57 41.3 1.0 01 132.9	58 11.2 1.0 01 132.8	59 41.2 1.0 01 132.7	60 11.2 1.0 01 132.7	6
7	55 10.5 1.0 01 132.0	55 40.5 1.0 01 132.0	56 40.5 1.0 01 131.9	57 10.5 1.0 01 131.9	57 40.5 1.0 01 131.8	58 10.5 1.0 01 131.8	59 40.4 1.0 01 131.7	60 10.4 1.0 01 131.7	7
8	55 09.7 1.0 01 130.9	55 39.7 1.0 01 130.9	56 39.7 1.0 01 130.9	57 09.7 1.0 01 130.9	57 39.7 1.0 01 130.8	58 09.7 1.0 01 130.8	59 39.7 1.0 01 130.7	60 09.7 1.0 01 130.7	8
9	55 08.9 1.0 01 129.9	55 38.9 1.0 01 129.9	56 38.9 1.0 01 129.9	57 08.9 1.0 01 129.8	57 38.9 1.0 01 129.8	58 08.9 1.0 01 129.8	59 38.9 1.0 01 129.7	60 08.8 1.0 01 129.7	9
50	55 08.1 1.0 01 128.9	55 38.1 1.0 01 128.9	56 38.1 1.0 01 128.8	57 08.1 1.0 01 128.8	57 38.1 1.0 01 128.8	58 08.1 1.0 01 128.8	59 38.0 1.0 01 128.7	60 08.0 1.0 01 128.7	50
1	55 07.3 1.0 01 127.9	55 37.3 1.0 01 127.9	56 37.3 1.0 01 127.8	57 07.3 1.0 01 127.8	57 37.3 1.0 01 127.8	58 07.3 1.0 01 127.8	59 37.2 1.0 01 127.7	60 07.2 1.0 01 127.7	1
2	55 06.5 1.0 01 126.9	55 36.5 1.0 01 126.9	56 36.4 1.0 01 126.8	57 06.4 1.0 01 126.8	57 36.4 1.0 01 126.8	58 06.5 1.0 01 126.8	59 36.4 1.0 01 126.7	60 06.4 1.0 01 126.7	2
3	55 05.6 1.0 01 125.9	55 35.6 1.0 01 125.9	56 35.6 1.0 01 125.8	57 05.6 1.0 01 125.8	57 35.6 1.0 01 125.7	58 05.6 1.0 01 125.7	59 35.5 1.0 01 125.6	60 05.5 1.0 01 125.6	3
4	55 04.8 1.0 01 124.8	55 34.8 1.0 01 124.8	56 34.8 1.0 01 124.8	57 04.7 1.0 01 124.8	57 34.7 1.0 01 124.7	58 04.7 1.0 01 124.7	59 34.7 1.0 01 124.6	60 04.7 1.0 01 124.6	4
55	55 03.9 1.0 01 123.8	55 33.9 1.0 01 123.8	56 33.9 1.0 01 123.8	57 03.9 1.0 01 123.7	57 33.9 1.0 01 123.7	58 03.9 1.0 01 123.7	59 33.8 1.0 01 123.6	60 03.8 1.0 01 123.6	55
6	55 03.0 1.0 01 122.8	55 33.0 1.0 01 122.8	56 33.0 1.0 01 122.7	57 03.0 1.0 01 122.7	57 33.0 1.0 01 122.7	58 03.0 1.0 01 122.7	59 32.9 1.0 01 122.6	60 02.9 1.0 01 122.6	6
7	55 02.2 1.0 01 121.8	55 32.1 1.0 01 121.8	56 32.1 1.0 01 121.7	57 02.1 1.0 02 121.7	57 32.1 1.0 01 121.7	58 02.1 1.0 01 121.7	59 32.1 1.0 01 121.6	60 02.0 1.0 01 121.6	7
8	55 01.3 1.0 02 120.8	55 31.2 1.0 02 120.8	56 31.2 1.0 02 120.7	57 01.2 1.0 02 120.7	57 31.2 1.0 02 120.7	58 01.2 1.0 02 120.6	59 31.2 1.0 02 120.6	60 01.1 1.0 02 120.5	8
9	55 00.4 1.0 02 119.8	55 30.3 1.0 02 119.8	56 30.3 1.0 02 119.7	57 00.3 1.0 02 119.7	57 30.3 1.0 02 119.7	58 00.3 1.0 02 119.6	59 30.3 1.0 02 119.5	60 00.2 1.0 02 119.5	9
60	54 59.4 1.0 02 118.8	55 29.4 1.0 02 118.7	56 29.4 1.0 02 118.7	56 59.4 1.0 02 118.7	57 29.4 1.0 02 118.6	57 59.4 1.0 02 118.6	59 29.3 1.0 02 118.5	59 59.3 1.0 02 118.5	60
1	54 58.5 1.0 02 117.8	55 28.5 1.0 02 117.7	56 27.6 1.0 02 117.7	56 58.5 1.0 02 117.7	57 28.5 1.0 02 117.6	57 58.4 1.0 02 117.6	59 28.4 1.0 02 117.5	59 58.4 1.0 02 117.5	1
2	54 57.6 1.0 02 116.7	55 27.6 1.0 02 116.7	56 27.6 1.0 02 116.7	56 57.6 1.0 02 116.7	57 27.5 1.0 02 116.6	57 57.5 1.0 02 116.6	59 27.5 1.0 02 116.5	59 57.5 1.0 02 116.5	2
3	54 56.6 1.0 02 115.7	55 26.6 1.0 02 115.7	56 26.6 1.0 02 115.7	56 56.6 1.0 02 115.6	57 26.6 1.0 02 115.6	57 56.6 1.0 02 115.6	59 26.5 1.0 02 115.5	59 56.5 1.0 02 115.5	3
4	54 55.7 1.0 02 114.7	55 25.7 1.0 02 114.7	56 25.7 1.0 02 114.6	56 55.7 1.0 02 114.6	57 25.6 1.0 02 114.6	57 55.6 1.0 02 114.6	59 25.6 1.0 02 114.5	59 55.6 1.0 02 114.5	4
65	54 54.7 1.0 02 113.7	55 24.7 1.0 02 113.7	56 24.7 1.0 02 113.6	56 54.7 1.0 02 113.6	57 24.7 1.0 02 113.6	57 54.7 1.0 02 113.6	59 24.6 1.0 02 113.5	59 54.6 1.0 02 113.4	65
6	54 53.7 1.0 02 112.7	55 23.8 1.0 02 112.7	56 23.7 1.0 02 112.6	56 53.7 1.0 02 112.6	57 23.7 1.0 02 112.6	57 53.7 1.0 02 112.5	59 23.7 1.0 02 112.5	59 53.7 1.0 02 112.4	6
7	54 52.8 1.0 02 111.7	55 22.8 1.0 02 111.7	56 22.8 1.0 02 111.7	56 52.8 1.0 02 111.6	57 22.8 1.0 02 111.6	57 52.7 1.0 02 111.5	59 22.7 1.0 02 111.4	59 52.7 1.0 02 111.4	7
8	54 51.8 1.0 02 110.7	55 21.8 1.0 02 110.7	56 21.8 1.0 02 110.6	56 51.8 1.0 02 110.6	57 21.8 1.0 02 110.6	57 51.8 1.0 02 110.5	59 21.7 1.0 02 110.4	59 51.7 1.0 02 110.4	8
9	54 50.9 1.0 02 109.7	55 20.8 1.0 02 109.7	56 20.8 1.0 02 109.6	56 50.8 1.0 02 109.6	57 20.8 1.0 02 109.6	57 50.8 1.0 02 109.5	59 20.7 1.0 02 109.4	59 50.7 1.0 02 109.4	9
70	54 49.9 1.0 02 108.7	55 19.9 1.0 02 108.6	56 19.8 1.0 02 108.6	56 49.8 1.0 02 108.6	57 19.8 1.0 02 108.5	57 49.8 1.0 02 108.5	59 19.7 1.0 02 108.4	59 49.7 1.0 02 108.4	70
1	54 48.9 1.0 02 107.7	55 18.9 1.0 02 107.6	56 18.8 1.0 02 107.6	56 48.8 1.0 02 107.6	57 18.8 1.0 02 107.5	57 48.8 1.0 02 107.5	59 18.7 1.0 02 107.4	59 48.7 1.0 02 107.4	1
2	54 47.9 1.0 02 106.7	55 17.9 1.0 02 106.6	56 17.9 1.0 02 106.6	56 47.9 1.0 02 106.5	57 17.8 1.0 02 106.5	57 47.8 1.0 02 106.5	59 17.7 1.0 02 106.4	59 47.7 1.0 02 106.4	2
3	54 46.9 1.0 02 105.6	55 16.9 1.0 02 105.6	56 16.8 1.0 02 105.6	56 46.8 1.0 02 105.6	57 16.8 1.0 02 105.5	57 46.8 1.0 02 105.5	59 16.7 1.0 02 105.4	59 46.7 1.0 02 105.4	3
4	54 45.9 1.0 02 104.6	55 15.8 1.0 02 104.6	56 15.8 1.0 02 104.6	56 45.8 1.0 02 104.5	57 15.8 1.0 02 104.5	57 45.8 1.0 02 104.5	59 15.7 1.0 02 104.4	59 45.7 1.0 02 104.4	4
75	54 44.8 1.0 02 103.6	55 14.8 1.0 02 103.6	56 14.8 1.0 02 103.6	56 44.8 1.0 02 103.5	57 14.8 1.0 02 103.5	57 44.8 1.0 02 103.5	59 14.7 1.0 02 103.4	59 44.7 1.0 02 103.3	75
6	54 43.8 1.0 02 102.6	55 13.8 1.0 02 102.6	56 13.8 1.0 02 102.6	56 43.7 1.0 02 102.5	57 13.8 1.0 02 102.5	57 43.7 1.0 02 102.5	59 13.7 1.0 02 102.4	59 43.7 1.0 02 102.3	6
7	54 42.8 1.0 02 101.6	55 12.8 1.0 02 101.6	56 12.8 1.0 02 101.5	56 42.7 1.0 02 101.5	57 12.7 1.0 02 101.5	57 42.7 1.0 02 101.5	59 12.7 1.0 02 101.4	59 42.6 1.0 02 101.3	7
8	54 41.8 1.0 02 100.6	55 11.8 1.0 02 100.6	56 11.7 1.0 02 100.5	56 41.7 1.0 02 100.5	57 11.7 1.0 02 100.5	57 41.7 1.0 02 100.5	59 11.6 1.0 02 100.4	59 41.6 1.0 02 100.3	8
9	54 40.7 1.0 02 99.6	55 10.7 1.0 02 99.6	56 10.7 1.0 02 99.5	56 40.7 1.0 02 99.5	57 10.7 1.0 02 99.4	57 40.7 1.0 02 99.4	59 10.6 1.0 02 99.4	59 40.6 1.0 02 99.3	9
80	54 39.7 1.0 02 98.6	55 09.7 1.0 02 98.6	56 08.6 1.0 02 98.5	56 39.6 1.0 02 98.5	57 09.6 1.0 02 98.5	57 38.6 1.0 02 98.4	59 09.6 1.0 02 98.4	59 39.6 1.0 02 98.3	80
1	54 38.7 1.0 02 97.6	55 08.7 1.0 02 97.6	56 08.6 1.0 02 97.5	56 38.6 1.0 02 97.5	57 08.6 1.0 02 97.4	57 38.6 1.0 02 97.4	59 08.5 1.0 02 97.3	59 38.5 1.0 02 97.3	1
2	54 37.6 1.0 02 96.6	55 07.6 1.0 02 96.6	56 07.6 1.0 02 96.5	56 37.6 1.0 02 96.5	57 07.6 1.0 02 96.4	57 37.5 1.0 02 96.4	59 07.5 1.0 02 96.3	59 37.5 1.0 02 96.3	2
3	54 36.6 1.0 02 95.6	55 06.6 1.0 02 95.6	56 06.5 1.0 02 95.5	56 36.5 1.0 02 95.5	57 06.5 1.0 02 95.4	57 36.5 1.0 02 95.4	59 06.4 1.0 02 95.3	59 36.4 1.0 02 95.3	3
4	54 35.5 1.0 02 94.6	55 05.5 1.0 02 94.6	56 05.5 1.0 02 94.5	56 35.5 1.0 02 94.5	57 05.5 1.0 02 94.4	57 35.5 1.0 02 94.4	59 05.4 1.0 02 94.3	59 35.4 1.0 02 94.3	4
85	54 34.5 1.0 02 93.6	55 04.5 1.0 02 93.6	56 04.5 1.0 02 93.5	56 34.4 1.0 02 93.5	57 04.4 1.0 02 93.4	57 34.4 1.0 02 93.4	59 04.4 1.0 02 93.3	59 34.3 1.0 02 93.3	85
6	54 33.5 1.0 02 92.6	55 03.5 1.0 02 92.6	56 03.4 1.0 02 92.5	56 33.4 1.0 02 92.5	57 03.4 1.0 02 92.4	57 33.4 1.0 02 92.4	59 03.3 1.0 02 92.3	59 33.3 1.0 02 92.3	6
7	54 32.4 1.0 02 91.6	55 02.4 1.0 02 91.6	56 02.4 1.0 02 91.5	56 32.4 1.0 02 91.5	57 02.3 1.0 02 91.4	57 32.3 1.0 02 91.4	59 02.3 1.0 02 91.3	59 32.3 1.0 02 91.3	7
8	54 31.4 1.0 02 90.6	55 01.3 1.0 02 90.6	56 01.3 1.0 02 90.5	56 31.3 1.0 02 90.5	57 01.3 1.0 02 90.4	57 31.3 1.0 02 90.4	59 01.2 1.0 02 90.3	59 31.2 1.0 02 90.3	8
9	54 30.3 1.0 02 89.6	55 00.3 1.0 02 89.6	56 00.3 1.0 02 89.5	56 30.3 1.0 02 89.5	57 00.2 1.0 02 89.4	57 30.2 1.0 02 89.4	59 00.2 1.0 02 89.3	59 30.2 1.0 02 89.3	9
90	54 29.3 1.0 02 88.6	54 59.3 1.0 02 88.6	55 59.2 1.0 02 88.5	56 29.2 1.0 02 88.5	56 59.2 1.0 02 88.4	57 29.2 1.0 02 88.4	58 59.1 1.0 02 88.3	59 29.1 1.0 02 88.3	90

H.A.	54° 30' Alt.	Δd Δt	Az.	55° 00' Alt.	Δd Δt	Az.	56° 00' Alt.	Δd Δt	Az.	56° 30' Alt.	Δd Δt	Az.	57° 00' Alt.	Δd Δt	Az.	57° 30' Alt.	Δd Δt	Az.	59° 00' Alt.	Δd Δt	Az.	59° 30' Alt.	Δd Δt	Az.	H.A.
91	54 28.2	1.002	87.6	54 58.2	1.002	87.6	55 58.2	1.002	87.5	56 28.2	1.002	87.5	56 58.1	1.002	87.5	57 28.1	1.002	87.4	58 58.1	1.002	87.3	59 28.1	1.002	87.3	91
2	54 27.2	1.002	86.6	54 57.2	1.002	86.6	55 57.1	1.002	86.5	56 27.1	1.002	86.5	56 57.1	1.002	86.5	57 27.1	1.002	86.4	58 57.0	1.002	86.3	59 27.0	1.002	86.3	2
3	54 26.1	1.002	85.6	54 56.1	1.002	85.6	55 56.1	1.002	85.5	56 26.1	1.002	85.5	56 56.1	1.002	85.5	57 26.0	1.002	85.4	58 56.0	1.002	85.3	59 26.0	1.002	85.3	3
4	54 25.1	1.002	84.6	54 55.1	1.002	84.6	55 55.0	1.002	84.5	56 25.0	1.002	84.5	56 55.0	1.002	84.5	57 25.0	1.002	84.4	58 55.0	1.002	84.3	59 24.9	1.003	84.3	4
95	54 24.0	1.002	83.6	54 54.0	1.002	83.6	55 54.0	1.002	83.5	56 24.0	1.003	83.5	56 54.0	1.002	83.5	57 24.0	1.002	83.4	58 53.9	1.002	83.3	59 23.9	1.002	83.3	95
6	54 23.0	1.002	82.6	54 53.0	1.002	82.6	55 53.0	1.002	82.5	56 23.0	1.002	82.5	56 52.9	1.002	82.5	57 22.9	1.002	82.4	58 52.9	1.002	82.4	59 22.9	1.002	82.3	6
7	54 22.0	1.002	81.6	54 52.0	1.002	81.6	55 51.9	1.002	81.5	56 21.9	1.002	81.5	56 51.9	1.002	81.5	57 21.9	1.002	81.4	58 51.8	1.002	81.4	59 21.8	1.002	81.3	7
8	54 20.9	1.002	80.6	54 50.9	1.002	80.6	55 50.9	1.002	80.5	56 20.9	1.002	80.5	56 50.9	1.002	80.5	57 20.8	1.002	80.5	58 50.8	1.002	80.4	59 20.8	1.002	80.3	8
9	54 19.9	1.002	79.6	54 49.9	1.002	79.6	55 49.9	1.002	79.5	56 19.8	1.002	79.5	56 49.8	1.002	79.5	57 19.8	1.002	79.5	58 49.8	1.002	79.4	59 19.8	1.002	79.3	9
100	54 18.9	1.002	78.6	54 48.9	1.002	78.6	55 48.8	1.002	78.5	56 18.8	1.002	78.5	56 48.8	1.002	78.5	57 18.8	1.002	78.5	58 48.7	1.002	78.4	59 18.7	1.002	78.3	100
1	54 17.8	1.002	77.6	54 47.8	1.002	77.6	55 47.8	1.002	77.6	56 17.8	1.002	77.5	56 47.8	1.002	77.5	57 17.8	1.002	77.5	58 47.7	1.002	77.4	59 17.7	1.002	77.3	1
2	54 16.8	1.002	76.6	54 46.8	1.002	76.6	55 46.8	1.002	76.6	56 16.8	1.002	76.5	56 46.8	1.002	76.5	57 16.7	1.002	76.5	58 46.7	1.002	76.4	59 16.7	1.002	76.4	2
3	54 15.8	1.002	75.6	54 45.8	1.002	75.6	55 45.8	1.002	75.6	56 15.8	1.002	75.5	56 45.7	1.002	75.5	57 15.7	1.002	75.5	58 45.7	1.002	75.4	59 15.7	1.002	75.4	3
4	54 14.8	1.002	74.6	54 44.8	1.002	74.6	55 44.8	1.002	74.6	56 14.7	1.002	74.5	56 44.7	1.002	74.5	57 14.7	1.002	74.5	58 44.7	1.002	74.4	59 14.7	1.002	74.4	4
105	54 13.8	1.002	73.7	54 43.8	1.002	73.6	55 43.8	1.002	73.6	56 13.7	1.002	73.6	56 43.7	1.002	73.5	57 13.7	1.002	73.5	58 43.7	1.002	73.4	59 13.6	1.002	73.4	105
6	54 12.8	1.002	72.7	54 42.8	1.002	72.6	55 42.8	1.002	72.6	56 12.7	1.002	72.6	56 42.7	1.002	72.5	57 12.7	1.002	72.5	58 42.7	1.002	72.4	59 12.6	1.002	72.4	6
7	54 11.8	1.002	71.7	54 41.8	1.002	71.6	55 41.8	1.002	71.6	56 11.7	1.002	71.6	56 41.7	1.002	71.5	57 11.7	1.002	71.5	58 41.7	1.002	71.4	59 11.7	1.002	71.4	7
8	54 10.8	1.002	70.7	54 40.8	1.002	70.7	55 40.8	1.002	70.6	56 10.8	1.002	70.6	56 40.7	1.002	70.5	57 10.7	1.002	70.5	58 40.7	1.002	70.4	59 10.7	1.002	70.4	8
9	54 09.8	1.002	69.7	54 39.8	1.002	69.7	55 39.8	1.002	69.6	56 09.8	1.002	69.6	56 39.8	1.002	69.6	57 09.7	1.002	69.5	58 39.7	1.002	69.4	59 09.7	1.002	69.4	9
110	54 08.8	1.002	68.7	54 38.8	1.002	68.7	55 38.8	1.002	68.6	56 08.8	1.002	68.6	56 38.8	1.002	68.6	57 08.8	1.002	68.5	58 38.7	1.002	68.5	59 08.7	1.002	68.4	110
1	54 07.9	1.002	67.7	54 37.9	1.002	67.7	55 37.9	1.002	67.6	56 07.8	1.002	67.6	56 37.8	1.002	67.6	57 07.8	1.002	67.6	58 37.7	1.002	67.5	59 07.7	1.002	67.4	1
2	54 06.9	1.002	66.7	54 36.9	1.002	66.7	55 36.9	1.002	66.6	56 06.8	1.002	66.6	56 36.8	1.002	66.6	57 06.8	1.002	66.6	58 36.8	1.002	66.5	59 06.8	1.002	66.4	2
3	54 05.9	1.002	65.7	54 35.9	1.002	65.7	55 35.9	1.002	65.7	56 05.9	1.002	65.6	56 35.9	1.002	65.6	57 05.9	1.002	65.6	58 35.8	1.002	65.5	59 05.8	1.002	65.5	3
4	54 05.0	1.002	64.7	54 35.0	1.002	64.7	55 35.0	1.002	64.7	56 04.9	1.002	64.6	56 34.9	1.002	64.6	57 04.9	1.002	64.6	58 34.9	1.002	64.5	59 04.9	1.002	64.5	4
115	54 04.0	1.002	63.7	54 34.0	1.002	63.7	55 34.0	1.002	63.7	56 04.0	1.002	63.6	56 34.0	1.002	63.6	57 04.0	1.002	63.6	58 33.9	1.002	63.5	59 03.9	1.002	63.5	115
6	54 03.1	1.002	62.8	54 33.1	1.002	62.7	55 33.1	1.002	62.7	56 03.1	1.002	62.7	56 33.0	1.002	62.6	57 03.0	1.002	62.6	58 33.0	1.002	62.5	59 03.0	1.002	62.5	6
7	54 02.2	1.002	61.8	54 32.2	1.002	61.7	55 32.2	1.002	61.7	56 02.1	1.002	61.7	56 32.1	1.002	61.6	57 02.1	1.002	61.6	58 32.1	1.002	61.5	59 02.1	1.002	61.5	7
8	54 01.3	1.002	60.8	54 31.3	1.002	60.8	55 31.2	1.002	60.7	56 01.2	1.002	60.7	56 31.2	1.002	60.7	57 01.2	1.002	60.6	58 31.2	1.002	60.6	59 01.1	1.002	60.5	8
9	54 00.4	1.002	59.8	54 30.4	1.002	59.8	55 30.4	1.002	59.8	56 00.3	1.002	59.7	56 30.3	1.002	59.7	57 00.3	1.002	59.6	58 30.3	1.002	59.6	59 00.2	1.002	59.5	9
120	53 59.5	1.001	58.8	54 29.4	1.001	58.8	55 29.4	1.001	58.7	55 59.4	1.001	58.7	56 29.4	1.001	58.7	56 59.4	1.001	58.7	58 29.4	1.001	58.6	58 59.3	1.001	58.6	120
1	53 58.6	1.001	57.8	54 28.6	1.001	57.8	55 28.5	1.001	57.7	55 58.5	1.001	57.7	56 28.5	1.001	57.7	56 58.5	1.001	57.7	58 28.5	1.001	57.6	58 58.5	1.001	57.6	1
2	53 57.7	1.001	56.8	54 27.7	1.001	56.8	55 27.7	1.001	56.8	55 57.6	1.001	56.7	56 27.6	1.001	56.7	56 57.6	1.001	56.7	58 27.6	1.001	56.6	58 57.6	1.001	56.6	2
3	53 56.9	1.001	55.8	54 26.8	1.001	55.8	55 26.8	1.001	55.8	55 56.8	1.001	55.8	56 26.8	1.001	55.7	56 56.8	1.001	55.7	58 26.7	1.001	55.6	58 56.7	1.001	55.6	3
4	53 56.0	1.001	54.9	54 25.9	1.001	54.8	55 25.9	1.001	54.8	55 55.9	1.001	54.8	56 25.9	1.001	54.7	56 55.9	1.001	54.7	58 25.9	1.001	54.6	58 55.8	1.001	54.6	4
125	53 55.1	1.001	53.9	54 25.1	1.001	53.9	55 25.1	1.001	53.8	55 55.1	1.001	53.8	56 25.1	1.001	53.8	56 55.0	1.001	53.7	58 25.0	1.001	53.7	58 55.0	1.001	53.6	125
6	53 54.3	1.001	52.9	54 24.3	1.001	52.9	55 24.2	1.001	52.8	55 54.2	1.001	52.8	56 24.2	1.001	52.8	56 54.2	1.001	52.8	58 24.2	1.001	52.7	58 54.2	1.001	52.7	6
7	53 53.4	1.001	51.9	54 23.4	1.001	51.9	55 23.4	1.001	51.8	55 53.4	1.001	51.8	56 23.4	1.001	51.8	56 53.4	1.001	51.8	58 23.3	1.001	51.7	58 53.3	1.001	51.7	7
8	53 52.6	1.001	50.9	54 22.6	1.001	50.9	55 22.6	1.001	50.9	55 52.6	1.001	50.8	56 22.6	1.001	50.8	56 52.5	1.001	50.8	58 22.5	1.001	50.7	58 52.5	1.001	50.7	8
9	53 51.8	1.001	49.9	54 21.8	1.001	49.9	55 21.8	1.001	49.9	55 51.8	1.001	49.8	56 21.8	1.001	49.8	56 51.8	1.001	49.8	58 21.7	1.001	49.7	58 51.7	1.001	49.7	9
130	53 51.0	1.001	48.9	54 21.0	1.001	48.9	55 21.0	1.001	48.9	55 51.0	1.001	48.9	56 21.0	1.001	48.8	56 51.0	1.001	48.8	58 20.9	1.001	48.8	58 50.9	1.001	48.7	130
1	53 50.2	1.001	48.0	54 20.2	1.001	47.9	55 20.2	1.001	47.9	55 50.2	1.001	47.9	56 20.2	1.001	47.9	56 50.2	1.001	47.8	58 20.2	1.001	47.8	58 50.1	1.001	47.7	1
2	53 49.5	1.001	47.0	54 19.4	1.001	47.0	55 19.4	1.001	46.9	55 49.4	1.001	46.9	56 19.4	1.001	46.9	56 49.4	1.001	46.9	58 19.4	1.001	46.8	58 49.4	1.001	46.8	2
3	53 48.7	1.001	46.0	54 18.7	1.001	46.0	55 18.7	1.001	45.9	55 48.7	1.001	45.9	56 18.7	1.001	45.9	56 48.6	1.001	45.9	58 18.6	1.001	45.8	58 48.6	1.001	45.8	3
4	53 47.9	1.001	45.0	54 17.9	1.001	45.0	55 17.9	1.001	45.0	55 47.9	1.001	45.0	56 17.9	1.001	44.9	56 47.9	1.001	44.9	58 17.9	1.001	44.8	58 47.9	1.001	44.8	4
135	53 47.2	1.001	44.0	54 17.2	1.001	44.0	55 17.2	1.001	44.0	55 47.2	1.001	44.0	56 17.2	1.001	43.9	56 47.2	1.001	43.9	58 17.1	1.001	43.9	58 47.1	1.001	43.8	135
6	53 46.5	1.001	43.0	54 16.5	1.001	43.0	55 16.5	1.001	43.0	55 46.5	1.001	43.0	56 16.5	1.001	43.0	56 46.5	1.001	42.9	58 16.4	1.001	42.9	58 46.4	1.001	42.8	6
7	53 45.8	1.001	42.1	54 15.8	1.001	42.0	55 15.8	1.001	42.0	55 45.8	1.001	42.0	56 15.8	1.001	42.0	56 45.7	1.001	42.0	58 15.7	1.001	41.9	58 45.7	1.001	41.9	7
8	53 45.1	1.001	41.1	54 15.1	1.001	41.0	55 15.1	1.001	41.0	55 45.1	1.001	41.0	56 15.1	1.001	41.0	56 45.1	1.001	41.0	58 15.1	1.001	40.9	58 45.1	1.001	40.9	8
9	53 44.4	1.001	40.1	54 14.4	1.001	40.1	55 14.4	1.001	40.1	55 44.4	1.001	40.0	56 14.4	1.001	40.0	56 44.4	1.001	40.0	58 14.4	1.001	39.9	58 44.3	1.001	39.9	9
140	53 43.7	1.001	39.1	54 13.7	1.001	39.1	55 13.7	1.001	39.1	55 43.7	1.001	39.1	56 13.7	1.001	39.0	56 43.7	1.001	39.0	58 13.7	1.001	39.0	58 43.7	1.001	38.9	140
1	53 43.1	1.001	38.1	54 13.1	1.001	38.1	55 13.1	1.001	38.1	55 43.1	1.001	38.1	56 13.1	1.001	38.0	56 43.1	1.001	38.0	58 13.0	1.001	38.0	58 43.0	1.001	38.0	1
2	53 42.4	1.001	37.2	54 12.4	1.001	37.1	55 12.4	1.001	37.1	55 42.4	1.001	37.1	56 12.4	1.001	37.1	56 42.4	1.001	37.1	58 12.4	1.001	37.0	58 42.4	1.001	37.0	2
3	53 41.8	1.001	36.2	54 11.8	1.001	36.2	55 11.8	1.001	36.1	55 41.8	1.001	36.1	56 11.8	1.001	36.1	56 41.8	1.001	36.1	58 11.8	1.001	36.0	58 41.8	1.001	36.0	3
4	53 41.2	1.001	35.2	54 11.2	1.001	35.2	55 11.2	1.001	35.2	55 41.2	1.001	35.1	56 11.2	1.001	35.1	56 41.2	1.001	35.1	58 11.2	1.001	35.0	58 41.2	1.001	35.0	4
145	53 40.6	1.001	34.2	54 10.6	1.001	34.2	55 10.6	1.001	34.2	55 40.6	1.001	34.2	56 10.6	1.001	34.1	56 40.6	1.001	34.1	58 10.6	1.001	34.1	58 40.6	1.001	34.1	145
6	53 40.0	1.001	33.2	54 10.0	1.001	33.2	55 10.0	1.001	33.2	55 40.0	1.001	33.2	56 10.0	1.001	33.2	56 40.0	1.001	33.1	58 10.0	1.001	33.1	58 40.0	1.001	33.1	6
7	53 39.5	1.001	32.3	54 09.5	1.001	32.2	55 09.5	1.001	32.2	55 39.5	1.001	32.2	56 09.4	1.001	32.2	56 39.4	1.001	32.2	58 09.4	1.001	32.1	58 39.4	1.001	32.1	7
8	53 38.9	1.001	31.3	54 08.9	1.001	31.3	55 08.9	1.001	31.2	55 38.9	1.001	31.2	56 08.9	1.001	31.2	56 38.9	1.001	31.2	58 08.9	1.001	31.1	58 38.9	1.001	31.1	8
9	53 38.4	1.001	30.3	54 08.4	1.001	30.3	55 08.4	1.001	30.3	55 38.4	1.001	30.2	56 08.4	1.001	30.2	56 38.4	1.001	30.2	58 08.3	1.001	30.2	58 38.3	1.001	30.2	9
150	53 37.9	1.001	29.3	54 07.9	1.001	29.3	55 07.8	1.001	29.3	55 37.8	1.001	29.3	56 07.8	1.001	29.3	56 37.8	1.001	29.2	58 07.8	1.001	29.2	58 37.8	1.001	29.2	150
1	53 37.4	1.001	28.3	54 07.4	1.001	28.3	55 07.3	1.001	28.3	55 37.3	1.001	28.3	56 07.3	1.001	28.3	56 37.3	1.001	28.3	58 07.3	1.001	28.2	58 37.3	1.001	28.2	1
2	53 36.9	1.001	27.4	54 06.9	1.001	27.3	55 06.9	1.001	27.3	55 36.9	1.001	27.3	56 06.8	1.001	27.3	56 36.8	1.001	27.2	58 06.8	1.001	27.2	58 36.8	1.001	27.2	2
3	53 36.4	1.001	26.4	54 06.4	1.001	26.4	55 06.4	1.001	26.3	55 36.4	1.001	26.3	56 06.4	1.001	26.3	56 36.4	1.001	26.3	58 06.4	1.001	26.3	58 36.4	1.001	26.3	3
4	53 35.9	1.001	25.4	54 05.9	1.001	25.4	55 05.9	1.001	25.4	55 35.9	1.001	25.4	56 05.9	1.001	25.3	56 35.9	1.001	25.3	58 05.9	1.001	25.3	58 35.9	1.001	25.3	4
155	53 35.5	1.001	24.4	54 05.5	1.001	24.4	55 05.5	1.001	24.4	55 35.5	1.001	24.4	56 05.5	1.001	24.4	56 35.5	1.001	24.4	58 05.5	1.001	24.3	58 35.5	1.001	24.3	155
6	53 35.1	1.001	23.4	54 05.1	1.001	23.4	55 05.1	1.001	23.4	55 35.1	1.001	23.4	56 05.1	1.001	23.4	56 35.1	1.001	23.4	58 05.0	1.001	23.3	58 35.0	1.001	23.3	6
7	53 34.7	1.001	22.5	54 04.7	1.001	22.5	55 04.7	1.001	22.4	55 34.7	1.001	22.4	56 04.6	1.001	22.4	56 34.6	1.001	22.4	58 04.6	1.001	22.4	58 34.6	1.001	22.4	7
8	53 34.3	1.001	21.5	54 04.3	1.001	21.5	55 04.3	1.001	21.5	55 34.3	1.001	21.5	56 04.3	1.001	21.5	56 34.3	1.001	21.4	58 04.2	1.001	21.4	58 34.2	1.001	21.4	8
9	53 33.9	1.001	20.5	54 03.9	1.001	20.5	55 03.9	1.001	20.5	55 33.9	1.001	20.5	56 03.9	1.001	20.5	56 33.9	1.001	20.5	58 03.9	1.001	20.4	58 33.9	1.001	20.4	9
160	53 33.5	1.001	19.5	54 03.5	1.001	19.5	55 03.5	1.001	19.5	55 33.5	1.001	19.5	56 03.5	1.001	19.5	56 33.5	1.001	19.5	58 03.5	1.001	19.4	58 33.5	1.001	19.4	160
1	53 33.2	1.001	18.6	54 03.2	1.001	18.5	55 03.2	1.001	18.5	55 33.2	1.001	18.5	56 03.2	1.001	18.5	56 33.2	1.001	18.5	58 03.2	1.001	18.5	58 33.2	1.001	18.5	1
2	53 32.9	1.000	17.6	54 02.9	1.000	17.6	55 02.9	1.001	17.6	55 32.9	1.000	17.5	56 02.9	1.001	17.5	56 32.9	1.000	17.5	58 02.9	1.000	17.5	58 32.9	1.000	17.5	2
3	53 32.6	1.000	16.6	54 02.6	1.000	16.6	55 02.6	1.000	16.6	55 32.6	1.000	16.6	56 02.6	1.000	16.6	56 32.6	1.000	16.6	58 02.6	1.000	16.5	58 32.5	1.000	16.5	3
4	53 32.3	1.000	15.6	54 02.3	1.000	15.6	55 02.3	1.000	15.6	55 32.3	1.000	15.6	56 02.3	1.000	15.6	56 32.3	1.000	15.6	58 02.3	1.000	15.6	58 32.3	1.000	15.5	4
165	53 32.0	1.000	14.6	54 02.0	1.000	14.6	55 02.0	1.000	14.6	55 32.0	1.000	14.6	56 02.0	1.000	14.6	56 32.0	1.000	14.6	58 02.0	1.000	14.6	58 32.0	1.000	14.6	165
6	53 31.7	1.000	13.7	54 01.7	1.000	13.7	55 01.7	1.000	13.7	55 31.7	1.000	13.6	56 01.7	1.000	13.6	56 31.7	1.000	13.6	58 01.7	1.000	13.6	58 31.7	1.000	13.6	6
7	53 31.5	1.000	12.7	54 01.5	1.000	12.7	55 01.5	1.000	12.7	55 31.5	1.000	12.7	56 01.5	1.000	12.7	56 31.5	1.000	12.7	58 01.5	1.000	12.6	58 31.5	1.000	12.6	7
8	53 31.3	1.000	11.7	54 01.3	1.000	11.7	55 01.3	1.000	11.7	55 31.3	1.000	11.7	56 01.3	1.000	11.7	56 31.3	1.000	11.7	58 01.3	1.000	11.7	58 31.3	1.000	11.7	8
9	53 31.1	1.000	10.7	54 01.1	1.000	10.7	55 01.1	1.000	10.7	55 31.1	1.000	10.7	56 01.1	1.000	10.7	56 31.1	1.000	10.7	58 01.1	1.000	10.7	58 31.1	1.000	10.7	9
170	53 30.9	1.000	09.8	54 00.9	1.000	09.8	55 00.9	1.000	09.8	55 30.9	1.000	09.7	56 00.9	1.000	09.7	56 30.9	1.000	09.7	58 00.9	1.000	09.7	58 30.9	1.000	09.7	170
1	53 30.7	1.000	08.8	54 00.7	1.000	08.8	55 30.7	1.000	08.8	55 30.7	1.000	08.8	56 00.7	1.000	08.8	56 30.7	1.000	08.8	58 00.7	1.000	08.7	58 30.7	1.000	08.7	1
2	53 30.6	1.000	07.8	54 00.6	1.000	07.8	55 00.6	1.000	07.8	55 30.6	1.000	07.8	56 00.6	1.000	07.8	56 30.6	1.000	07.8	58 00.6	1.000	07.8	58 30.6	1.000	07.8	2
3	53 30.4	1.000	06.8	54 00.4	1.000	06.8	55 00.4	1.000	06.8	55 30.4	1.000	06.8	56 00.4	1.000	06.8	56 30.4	1.000	06.8	58 00.4	1.000	06.8	58 30.4	1.000	06.8	3
4	53 30.3	1.000	05.9	54 00.3	1.000	05.9	55 00.3	1.000	05.8	55 30.3	1.000	05.8	56 00.3	1.000	05.8	56 30.3	1.000	05.8	58 00.3	1.000	05.8	58 30.3	1.000	05.8	4
175	53 30.2	1.000	04.9	54 00.2	1.000	04.9	55 00.2	1.000	04.9	55 30.2	1.000	04.9	56 00.2	1.000	04.9	56 30.2	1.000	04.9	58 00.2	1.000	04.9	58 30.2	1.000	04.9	175
6	53 30.1	1.000	03.9	54 00.1	1.000	03.9	55 00.1	1.000	03.9	55 30.1	1.000	03.9	56 00.1	1.000	03.9	56 30.1	1.000	03.9	58 00.1	1.000	03.9	58 30.1	1.000	03.9	6
7	53 30.1	1.000	02.9	54 00.1	1.000	02.9	55 00.1	1.000	02.9	55 30.1	1.000	02.9	56 00.1	1.000	02.9	56 30.1	1.000	02.9	58 00.1	1.000	02.9	58 30.1	1.000	02.9	7
8	53 30.0	1.000	02.0	54 00.0	1.000	02.0	55 00.0	1.000	01.9	55 30.0	1.000	01.9	56 00.0	1.000	01.9	56 30.0	1.000	01.9	58 00.0	1.000	01.9	58 30.0	1.000	01.9	8
9	53 30.0	1.000	01.0	54 00.0	1.000	01.0	55 00.0	1.000	01.0	55 30.0	1.000	01.0	56 00.0	1.000	01.0	56 30.0	1.000	01.0	58 00.0	1.000	01.0	58 30.0	1.000	01.0	9
180	53 30.0	1.000	00.0	54 00.0	1.000	00.0	55 00.0	1.000	00.0	55 30.0	1.000	00.0	56 00.0	1.000	00.0	56 30.0	1.000	00.0	58 00.0	1.000	00.0	58 30.0	1.000	00.0	180

Lat. 89°

H.A.	60° 00′ — Alt. Δd Δt Az.	60° 30′ — Alt. Δd Δt Az.	62° 00′ — Alt. Δd Δt Az.	62° 30′ — Alt. Δd Δt Az.	63° 00′ — Alt. Δd Δt Az.	69° 00′ — Alt. Δd Δt Az.	69° 30′ — Alt. Δd Δt Az.	74° 30′ — Alt. Δd Δt Az.	H.A.
00	61 00.0 1.00 180.0	61 30.0 1.00 180.0	63 00.0 1.00 180.0	63 30.0 1.00 180.0	64 00.0 1.00 180.0	70 00.0 1.00 180.0	70 30.0 1.00 180.0	75 30.0 1.00 180.0	00
1	61 00.0 1.00 179.0	61 30.0 1.00 179.0	63 00.0 1.00 179.0	63 30.0 1.00 179.0	64 00.0 1.00 179.0	70 00.0 1.00 179.0	70 30.0 1.00 179.0	75 30.0 1.00 178.9	1
2	61 00.0 1.00 177.9	61 30.0 1.00 177.9	63 00.0 1.00 177.9	63 30.0 1.00 177.9	64 00.0 1.00 177.9	70 00.0 1.00 177.9	70 30.0 1.00 177.9	75 30.0 1.00 177.9	2
3	60 59.9 1.00 176.9	61 29.9 1.00 176.9	62 59.9 1.00 176.9	63 29.9 1.00 176.9	63 59.9 1.00 176.9	69 59.9 1.00 176.9	70 29.9 1.00 176.8	75 29.9 1.00 176.8	3
4	60 59.8 1.00 175.9	61 29.8 1.00 175.9	62 59.8 1.00 175.9	63 29.8 1.00 175.9	63 59.8 1.00 175.9	69 59.8 1.00 175.8	70 29.8 1.00 175.8	75 29.8 1.00 175.7	4
05	60 59.8 1.00 174.8	61 29.8 1.00 174.8	62 59.8 1.00 174.8	63 29.8 1.00 174.8	63 59.8 1.00 174.8	69 59.8 1.00 174.8	70 29.8 1.00 174.8	75 29.8 1.00 174.7	05
6	60 59.7 1.00 173.8	61 29.7 1.00 173.8	62 59.7 1.00 173.8	63 29.7 1.00 173.8	63 59.7 1.00 173.7	69 59.7 1.00 173.7	70 29.7 1.00 173.6	75 29.6 1.00 173.6	6
7	60 59.5 1.00 172.8	61 29.5 1.00 172.8	62 59.5 1.00 172.8	63 29.5 1.00 172.8	63 59.5 1.00 172.8	69 59.5 1.00 172.7	70 29.5 1.00 172.7	75 29.5 1.00 172.5	7
8	60 59.4 1.00 171.8	61 29.4 1.00 171.7	62 59.4 1.00 171.7	63 29.4 1.00 171.7	63 59.4 1.00 171.7	69 59.4 1.00 171.6	70 29.4 1.00 171.6	75 29.4 1.00 171.5	8
9	60 59.2 1.00 170.7	61 29.2 1.00 170.7	62 59.2 1.00 170.7	63 29.2 1.00 170.7	63 59.2 1.00 170.7	69 59.2 1.00 170.6	70 29.2 1.00 170.6	75 29.2 1.00 170.4	9
10	60 59.1 1.00 169.7	61 29.1 1.00 169.7	62 59.1 1.00 169.7	63 29.1 1.00 169.7	63 59.1 1.00 169.6	69 59.0 1.00 169.5	70 29.0 1.00 169.5	75 29.0 1.00 169.3	10
1	60 58.9 1.00 168.7	61 28.9 1.00 168.7	62 58.9 1.00 168.6	63 28.9 1.00 168.6	63 58.9 1.00 168.6	69 58.9 1.00 168.5	70 28.8 1.00 168.5	75 28.8 1.00 168.3	1
2	60 58.6 1.00 167.6	61 28.6 1.00 167.6	62 58.6 1.00 167.6	63 28.6 1.00 167.6	63 58.6 1.00 167.6	69 58.6 1.00 167.4	70 28.6 1.00 167.4	75 28.6 1.00 167.2	2
3	60 58.4 1.00 166.6	61 28.4 1.00 166.6	62 58.4 1.00 166.6	63 28.4 1.00 166.6	63 58.4 1.00 166.5	69 58.4 1.00 166.4	70 28.4 1.00 166.4	75 28.4 1.00 166.1	3
4	60 58.2 1.00 165.6	61 28.2 1.00 165.6	62 58.2 1.00 165.5	63 28.2 1.00 165.5	63 58.2 1.00 165.5	69 58.1 1.00 165.3	70 28.1 1.00 165.3	75 28.1 1.00 165.1	4
15	60 57.9 1.00 164.5	61 27.9 1.00 164.5	62 57.9 1.00 164.5	63 27.9 1.00 164.5	63 57.9 1.00 164.4	69 57.9 1.00 164.3	70 27.9 1.00 164.3	75 27.8 1.00 164.0	15
6	60 57.6 1.00 163.5	61 27.6 1.00 163.5	62 57.6 1.00 163.5	63 27.6 1.00 163.5	63 57.6 1.001 163.4	69 57.6 1.001 163.2	70 27.6 1.001 163.2	75 27.5 1.001 162.9	6
7	60 57.3 1.001 162.5	61 27.3 1.001 162.5	62 57.3 1.001 162.4	63 27.3 1.001 162.4	63 57.3 1.001 162.4	69 57.3 1.001 162.2	70 27.3 1.001 162.2	75 27.2 1.001 161.9	7
8	60 57.0 1.001 161.4	61 27.0 1.001 161.4	62 57.0 1.001 161.4	63 27.0 1.001 161.4	63 57.0 1.001 161.4	69 56.9 1.001 161.2	70 26.9 1.001 161.1	75 26.9 1.001 160.8	8
9	60 56.6 1.001 160.4	61 26.6 1.001 160.4	62 56.6 1.001 160.4	63 26.6 1.001 160.4	63 56.6 1.001 160.3	69 56.6 1.001 160.1	70 26.6 1.001 160.1	75 26.5 1.001 159.7	9
20	60 56.3 1.001 159.4	61 26.3 1.001 159.3	62 56.3 1.001 159.3	63 26.3 1.001 159.3	63 56.3 1.001 159.3	69 56.2 1.001 159.1	70 26.2 1.001 159.0	75 26.1 1.001 158.7	20
1	60 55.9 1.001 158.4	61 25.9 1.001 158.3	62 55.9 1.001 158.3	63 25.9 1.001 158.3	63 55.9 1.001 158.3	69 55.8 1.001 158.0	70 25.8 1.001 158.0	75 25.8 1.001 157.6	1
2	60 55.5 1.001 157.3	61 25.5 1.001 157.3	62 55.5 1.001 157.3	63 25.5 1.001 157.3	63 55.5 1.001 157.2	69 55.4 1.001 157.0	70 25.4 1.001 156.9	75 25.4 1.001 156.6	2
3	60 55.1 1.001 156.3	61 25.1 1.001 156.3	62 55.1 1.001 156.2	63 25.1 1.001 156.2	63 55.1 1.001 156.2	69 55.0 1.001 155.9	70 25.0 1.001 155.9	75 24.9 1.001 155.5	3
4	60 54.7 1.001 155.3	61 24.7 1.001 155.2	62 54.6 1.001 155.2	63 24.6 1.001 155.2	63 54.6 1.001 155.2	69 54.6 1.001 154.9	70 24.6 1.001 154.9	75 24.5 1.001 154.4	4
25	60 54.2 1.001 154.2	61 24.2 1.001 154.2	62 54.2 1.001 154.2	63 24.2 1.001 154.1	63 54.2 1.001 154.1	69 54.1 1.001 153.8	70 24.1 1.001 153.8	75 24.0 1.001 153.3	25
6	60 53.7 1.001 153.2	61 23.7 1.001 153.2	62 53.7 1.001 153.1	63 23.7 1.001 153.1	63 53.7 1.001 153.1	69 53.7 1.001 152.8	70 23.6 1.001 152.8	75 23.5 1.001 152.3	6
7	60 53.3 1.001 152.2	61 23.3 1.001 152.2	62 53.3 1.001 152.1	63 23.2 1.001 152.1	63 53.2 1.001 152.1	69 53.2 1.001 151.8	70 23.2 1.001 151.7	75 23.0 1.001 151.3	7
8	60 52.8 1.001 151.2	61 22.8 1.001 151.1	62 52.8 1.001 151.1	63 22.8 1.001 151.1	63 52.7 1.001 151.0	69 52.7 1.001 150.7	70 22.7 1.001 150.7	75 22.5 1.001 150.2	8
9	60 52.3 1.001 150.1	61 22.3 1.001 150.1	62 52.3 1.001 150.1	63 22.2 1.001 150.0	63 52.2 1.001 150.0	69 52.2 1.001 149.7	70 22.1 1.001 149.6	75 22.0 1.001 149.1	9
30	60 51.7 1.001 149.1	61 21.7 1.001 149.1	62 51.7 1.001 149.0	63 21.7 1.001 149.0	63 51.7 1.001 149.0	69 51.6 1.001 148.6	70 21.6 1.001 148.6	75 21.5 1.001 148.1	30
1	60 51.2 1.001 148.1	61 21.2 1.001 148.1	62 51.1 1.001 148.0	63 21.2 1.001 148.0	63 51.2 1.001 148.0	69 51.1 1.001 147.6	70 21.0 1.001 147.6	75 20.9 1.001 147.0	1
2	60 50.6 1.001 147.1	61 20.6 1.001 147.0	62 50.6 1.001 147.0	63 20.6 1.001 146.9	63 50.6 1.001 146.9	69 50.5 1.001 146.6	70 20.5 1.001 146.5	75 20.3 1.001 146.0	2
3	60 50.0 1.001 146.0	61 20.0 1.001 146.0	62 50.0 1.001 145.9	63 20.0 1.001 145.9	63 50.0 1.001 145.9	69 49.9 1.001 145.5	70 19.9 1.001 145.5	75 19.7 1.001 144.9	3
4	60 49.4 1.001 145.0	61 19.4 1.001 145.0	62 49.4 1.001 144.9	63 19.4 1.001 144.9	63 49.4 1.001 144.9	69 49.3 1.001 144.5	70 19.3 1.001 144.4	75 19.1 1.001 143.9	4
35	60 48.8 1.001 144.0	61 18.8 1.001 144.0	62 48.8 1.001 143.9	63 18.8 1.001 143.9	63 48.8 1.001 143.8	69 48.7 1.001 143.4	70 18.7 1.001 143.4	75 18.5 1.001 142.8	35
6	60 48.2 1.001 143.0	61 18.2 1.001 142.9	62 48.2 1.001 142.9	63 18.2 1.001 142.8	63 48.2 1.001 142.8	69 48.1 1.001 142.4	70 18.0 1.001 142.4	75 17.9 1.001 141.8	6
7	60 47.6 1.001 141.9	61 17.6 1.001 141.9	62 47.6 1.001 141.8	63 17.5 1.001 141.8	63 47.5 1.001 141.8	69 47.4 1.001 141.4	70 17.4 1.001 141.3	75 17.2 1.001 140.7	7
8	60 46.9 1.001 140.9	61 16.9 1.001 140.9	62 46.9 1.001 140.8	63 16.9 1.001 140.8	63 46.9 1.001 140.7	69 46.9 1.001 140.3	70 16.7 1.001 140.3	75 16.5 1.001 139.7	8
9	60 46.3 1.001 139.9	61 16.3 1.001 139.9	62 46.2 1.001 139.8	63 16.2 1.001 139.8	63 46.2 1.001 139.7	69 46.1 1.001 139.3	70 16.0 1.001 139.2	75 15.8 1.001 138.6	9
40	60 45.6 1.001 138.9	61 15.6 1.001 138.8	62 45.5 1.001 138.8	63 15.5 1.001 138.7	63 45.5 1.001 138.7	69 45.4 1.001 138.3	70 15.4 1.001 138.2	75 15.1 1.001 137.6	40
1	60 44.9 1.001 137.8	61 14.9 1.001 137.8	62 44.8 1.001 137.7	63 14.8 1.001 137.7	63 44.8 1.001 137.7	69 44.7 1.001 137.2	70 14.7 1.001 137.2	75 14.4 1.001 136.5	1
2	60 44.2 1.001 136.8	61 14.2 1.001 136.8	62 44.1 1.001 136.7	63 14.1 1.001 136.7	63 44.1 1.001 136.6	69 44.0 1.001 136.2	70 13.9 1.001 136.1	75 13.7 1.001 135.5	2
3	60 43.4 1.001 135.8	61 13.4 1.001 135.8	62 43.4 1.001 135.7	63 13.4 1.001 135.7	63 43.4 1.001 135.6	69 43.2 1.001 135.2	70 13.2 1.001 135.1	75 13.0 1.001 134.4	3
4	60 42.7 1.001 134.8	61 12.7 1.001 134.7	62 42.7 1.001 134.7	63 12.7 1.001 134.6	63 42.7 1.001 134.6	69 42.5 1.001 134.1	70 12.5 1.001 134.1	75 12.2 1.001 133.4	4
45	60 42.0 1.001 133.7	61 12.0 1.001 133.7	62 41.9 1.001 133.6	63 11.9 1.001 133.6	63 41.9 1.001 133.6	69 41.7 1.001 133.1	70 11.7 1.001 133.0	75 11.4 1.001 132.3	45
6	60 41.2 1.001 132.7	61 11.2 1.001 132.7	62 41.2 1.001 132.6	63 11.1 1.001 132.6	63 41.1 1.001 132.5	69 41.0 1.001 132.1	70 10.9 1.001 132.0	75 10.7 1.001 131.3	6
7	60 40.4 1.001 131.7	61 10.4 1.001 131.6	62 40.4 1.001 131.6	63 10.4 1.001 131.6	63 40.4 1.001 131.5	69 40.2 1.001 131.0	70 10.1 1.001 131.0	75 09.9 1.001 130.2	7
8	60 39.6 1.001 130.7	61 09.6 1.001 130.7	62 39.6 1.001 130.6	63 09.6 1.001 130.5	63 39.6 1.001 130.5	69 39.4 1.001 130.0	70 09.4 1.001 129.9	75 09.1 1.001 129.2	8
9	60 38.8 1.001 129.7	61 08.8 1.001 129.6	62 38.8 1.001 129.5	63 08.8 1.001 129.5	63 38.8 1.001 129.5	69 38.6 1.001 129.0	70 08.5 1.001 128.9	75 08.2 1.001 128.2	9
50	60 38.0 1.001 128.6	61 08.0 1.001 128.6	62 38.0 1.001 128.5	63 08.0 1.001 128.5	63 38.0 1.001 128.5	69 37.7 1.001 127.9	70 07.7 1.001 127.9	75 07.4 1.001 127.1	50
1	60 37.2 1.001 127.6	61 07.2 1.001 127.6	62 37.2 1.001 127.5	63 07.1 1.001 127.5	63 37.1 1.001 127.4	69 36.9 1.001 126.9	70 06.9 1.001 126.9	75 06.6 1.001 126.1	1
2	60 36.4 1.001 126.6	61 06.4 1.001 126.6	62 36.3 1.001 126.5	63 06.3 1.001 126.5	63 36.3 1.001 126.4	69 36.1 1.001 125.9	70 06.0 1.001 125.8	75 05.7 1.001 125.1	2
3	60 35.5 1.001 125.6	61 05.5 1.001 125.6	62 35.5 1.001 125.5	63 05.5 1.001 125.4	63 35.4 1.001 125.4	69 35.2 1.001 124.9	70 05.2 1.001 124.8	75 04.9 1.001 124.0	3
4	60 34.7 1.001 124.6	61 04.6 1.001 124.5	62 34.6 1.001 124.4	63 04.6 1.001 124.4	63 34.6 1.001 124.4	69 34.4 1.001 123.8	70 04.3 1.001 123.8	75 04.0 1.001 123.0	4
55	60 33.8 1.001 123.6	61 03.8 1.001 123.5	62 33.7 1.001 123.4	63 03.7 1.001 123.4	63 33.7 1.001 123.4	69 33.5 1.001 122.8	70 03.4 1.001 122.7	75 03.1 1.002 121.9	55
6	60 32.9 1.001 122.5	61 02.9 1.002 122.4	62 32.9 1.002 122.4	63 02.8 1.002 122.3	63 32.8 1.002 122.3	69 32.6 1.001 121.8	70 02.6 1.002 121.7	75 02.2 1.002 120.9	6
7	60 32.0 1.002 121.5	61 02.0 1.002 121.5	62 32.0 1.002 121.4	63 02.0 1.002 121.4	63 31.9 1.002 121.3	69 31.7 1.002 120.8	70 01.7 1.002 120.7	75 01.3 1.002 119.9	7
8	60 31.1 1.002 120.5	61 01.1 1.002 120.5	62 31.1 1.002 120.4	63 01.1 1.002 120.3	63 31.0 1.002 120.3	69 30.8 1.002 119.7	70 00.8 1.002 119.7	75 00.4 1.002 118.8	8
9	60 30.2 1.002 119.5	61 00.2 1.002 119.5	62 30.2 1.002 119.4	63 00.2 1.002 119.3	63 30.1 1.002 119.3	69 29.9 1.002 118.7	69 59.8 1.002 118.6	74 59.5 1.002 117.8	9
60	60 29.3 1.002 118.5	60 59.3 1.002 118.4	62 29.2 1.002 118.3	62 59.2 1.002 118.3	63 29.2 1.002 118.3	69 29.0 1.002 117.7	69 58.9 1.002 117.6	74 58.5 1.002 116.8	60
1	60 28.4 1.002 117.5	60 58.3 1.002 117.3	62 28.3 1.002 117.3	62 58.3 1.002 117.3	63 28.3 1.002 117.3	69 28.0 1.002 116.7	69 58.0 1.002 116.6	74 57.6 1.002 115.7	1
2	60 27.4 1.002 116.4	60 57.4 1.002 116.4	62 27.4 1.002 116.3	62 57.4 1.002 116.3	63 27.4 1.002 116.2	69 27.1 1.002 115.6	69 57.0 1.002 115.6	74 56.6 1.002 114.7	2
3	60 26.5 1.002 115.4	60 56.5 1.002 115.4	62 26.4 1.002 115.3	62 56.4 1.002 115.3	63 26.4 1.002 115.2	69 26.1 1.002 114.6	69 56.1 1.002 114.6	74 55.7 1.002 113.7	3
4	60 25.6 1.002 114.4	60 55.5 1.002 114.4	62 25.5 1.002 114.3	62 55.5 1.002 114.2	63 25.5 1.002 114.2	69 25.2 1.002 113.6	69 55.1 1.002 113.5	74 54.7 1.002 112.7	4
65	60 24.6 1.002 113.4	60 54.6 1.002 113.4	62 24.5 1.002 113.3	62 54.5 1.002 113.2	63 24.5 1.002 113.2	69 24.2 1.002 112.6	69 54.2 1.002 112.5	74 53.8 1.002 111.6	65
6	60 23.6 1.002 112.4	60 53.6 1.002 112.4	62 23.6 1.002 112.3	62 53.6 1.002 112.2	63 23.5 1.002 112.2	69 23.2 1.002 111.6	69 53.2 1.002 111.5	74 52.8 1.002 110.6	6
7	60 22.7 1.002 111.4	60 52.6 1.002 111.4	62 22.6 1.002 111.2	62 52.6 1.002 111.2	63 22.6 1.002 111.1	69 22.3 1.002 110.6	69 52.2 1.002 110.5	74 51.8 1.002 109.6	7
8	60 21.7 1.002 110.4	60 51.7 1.002 110.3	62 21.6 1.002 110.2	62 51.6 1.002 110.2	63 21.6 1.002 110.2	69 21.3 1.002 109.5	69 51.2 1.002 109.5	74 50.8 1.002 108.6	8
9	60 20.7 1.002 109.4	60 50.7 1.002 109.3	62 20.6 1.002 109.2	62 50.6 1.002 109.2	63 20.6 1.002 109.1	69 20.3 1.002 108.5	69 50.3 1.002 108.5	74 49.8 1.002 107.6	9
70	60 19.7 1.002 108.4	60 49.7 1.002 108.3	62 19.6 1.002 108.2	62 49.6 1.002 108.2	63 19.6 1.002 108.1	69 19.3 1.002 107.5	69 49.3 1.002 107.4	74 48.8 1.002 106.5	70
1	60 18.7 1.002 107.3	60 48.7 1.002 107.3	62 18.6 1.002 107.2	62 48.6 1.002 107.2	63 18.6 1.002 107.1	69 18.3 1.002 106.5	69 48.3 1.002 106.4	74 47.8 1.002 105.5	1
2	60 17.7 1.002 106.3	60 47.7 1.002 106.3	62 17.6 1.002 106.2	62 47.6 1.002 106.2	63 17.6 1.002 106.1	69 17.3 1.002 105.5	69 47.3 1.002 105.4	74 46.8 1.002 104.5	2
3	60 16.7 1.002 105.3	60 46.7 1.002 105.3	62 16.6 1.002 105.2	62 46.6 1.002 105.1	63 16.6 1.002 105.1	69 16.3 1.002 104.5	69 46.2 1.002 104.4	74 45.8 1.002 103.5	3
4	60 15.7 1.002 104.3	60 45.7 1.002 104.3	62 15.6 1.002 104.2	62 45.6 1.002 104.1	63 15.6 1.002 104.1	69 15.2 1.002 103.5	69 45.2 1.002 103.4	74 44.8 1.002 102.5	4
75	60 14.7 1.002 103.3	60 44.7 1.002 103.3	62 14.6 1.002 103.2	62 44.6 1.002 103.1	63 14.6 1.002 103.1	69 14.2 1.002 102.5	69 44.2 1.002 102.4	74 43.7 1.002 101.5	75
6	60 13.7 1.002 102.3	60 43.6 1.002 102.3	62 13.6 1.002 102.2	62 43.6 1.002 102.1	63 13.5 1.002 102.1	69 13.2 1.002 101.4	69 43.2 1.002 101.4	74 42.7 1.002 100.4	6
7	60 12.6 1.002 101.3	60 42.6 1.002 101.3	62 12.6 1.002 101.2	62 42.5 1.002 101.1	63 12.5 1.002 101.1	69 12.2 1.002 100.4	69 42.2 1.002 100.4	74 41.7 1.002 99.4	7
8	60 11.6 1.002 100.3	60 41.6 1.002 100.3	62 11.5 1.002 100.1	62 41.5 1.002 100.1	63 11.5 1.002 100.1	69 11.2 1.002 99.4	69 41.1 1.002 99.4	74 40.6 1.002 98.4	8
9	60 10.6 1.002 99.3	60 40.6 1.002 99.3	62 10.5 1.002 99.1	62 40.5 1.002 99.1	63 10.5 1.002 99.1	69 10.1 1.002 98.4	69 40.1 1.002 98.4	74 39.6 1.002 97.4	9
80	60 09.5 1.002 98.3	60 39.5 1.002 98.2	62 09.5 1.002 98.1	62 39.4 1.002 98.1	63 09.4 1.002 98.1	69 09.1 1.002 97.4	69 39.0 1.002 97.3	74 38.6 1.002 96.4	80
1	60 08.5 1.002 97.3	60 38.5 1.002 97.2	62 08.4 1.002 97.1	62 38.4 1.002 97.1	63 08.4 1.002 97.1	69 08.0 1.002 96.4	69 38.0 1.002 96.3	74 37.5 1.002 95.4	1
2	60 07.5 1.002 96.3	60 37.4 1.002 96.2	62 07.4 1.002 96.1	62 37.4 1.002 96.1	63 07.3 1.002 96.0	69 07.0 1.002 95.4	69 37.0 1.002 95.3	74 36.5 1.002 94.4	2
3	60 06.4 1.002 95.2	60 36.4 1.002 95.2	62 06.3 1.002 95.1	62 36.3 1.002 95.1	63 06.3 1.002 95.0	69 06.0 1.002 94.4	69 35.9 1.002 94.3	74 35.4 1.002 93.4	3
4	60 05.4 1.002 94.3	60 35.4 1.002 94.2	62 05.3 1.002 94.1	62 35.3 1.002 94.1	63 05.3 1.002 94.0	69 04.9 1.002 93.4	69 34.9 1.002 93.3	74 34.4 1.002 92.4	4
85	60 04.3 1.002 93.3	60 34.3 1.002 93.2	62 04.2 1.002 93.1	62 34.2 1.002 93.1	63 04.2 1.002 93.0	69 03.9 1.002 92.4	69 33.8 1.002 92.3	74 33.3 1.002 91.4	85
6	60 03.3 1.002 92.3	60 33.3 1.002 92.2	62 03.2 1.002 92.1	62 33.2 1.002 92.1	63 03.2 1.002 92.0	69 02.8 1.002 91.4	69 32.8 1.002 91.3	74 32.3 1.002 90.4	6
7	60 02.2 1.002 91.3	60 32.2 1.002 91.2	62 02.2 1.002 91.1	62 32.1 1.002 91.1	63 02.1 1.002 91.0	69 01.8 1.002 90.4	69 31.7 1.002 90.3	74 31.2 1.002 89.4	7
8	60 01.2 1.002 90.3	60 31.2 1.002 90.2	62 01.1 1.002 90.1	62 31.1 1.002 90.1	63 01.1 1.002 90.0	69 00.7 1.002 89.4	69 30.7 1.002 89.3	74 30.2 1.002 88.4	8
9	60 00.1 1.002 89.3	60 30.1 1.002 89.2	62 00.1 1.002 89.1	62 30.0 1.002 89.1	63 00.0 1.002 89.0	68 59.7 1.002 88.4	69 29.6 1.002 88.3	74 29.2 1.002 87.4	9
90	59 59.1 1.002 88.3	60 29.1 1.002 88.2	61 59.0 1.002 88.1	62 29.0 1.002 88.1	62 59.0 1.002 88.0	68 58.6 1.002 87.4	69 28.6 1.002 87.3	74 28.1 1.002 86.4	90

Lat. 89°

H.A.	60° 00' Alt / Δd Δt	Az.	60° 30' Alt / Δd Δt	Az.	62° 00' Alt / Δd Δt	Az.	62° 30' Alt / Δd Δt	Az.	63° 00' Alt / Δd Δt	Az.	69° 00' Alt / Δd Δt	Az.	69° 30' Alt / Δd Δt	Az.	74° 30' Alt / Δd Δt	Az.	H.A.
91	59 58.0 1.0 02	87.3	60 28.0 1.0 02	87.2	61 58.0 1.0 02	87.1	62 27.9 1.0 02	87.1	62 57.9 1.0 02	87.0	68 57.6 1.0 02	86.4	69 27.6 1.0 02	86.3	74 27.1 1.0 02	85.4	91
2	59 57.0 1.0 02	86.3	60 27.0 1.0 02	86.2	61 56.9 1.0 02	86.1	62 26.9 1.0 02	86.1	62 56.9 1.0 02	86.0	68 56.5 1.0 02	85.4	69 26.5 1.0 02	85.3	74 26.0 1.0 02	84.4	2
3	59 56.0 1.0 02	85.3	60 25.9 1.0 02	85.2	61 55.9 1.0 02	85.1	62 25.9 1.0 02	85.1	62 55.9 1.0 02	85.0	68 55.5 1.0 02	84.4	69 25.5 1.0 02	84.3	74 25.0 1.0 02	83.4	3
4	59 54.9 1.0 02	84.3	60 24.9 1.0 02	84.2	61 54.9 1.0 02	84.1	62 24.8 1.0 02	84.1	62 54.8 1.0 02	84.0	68 54.5 1.0 02	83.4	69 24.4 1.0 02	83.3	74 23.9 1.0 02	82.4	4
95	59 53.9 1.0 02	83.3	60 23.9 1.0 02	83.2	61 53.8 1.0 02	83.1	62 23.8 1.0 02	83.1	62 53.8 1.0 02	83.0	68 53.4 1.0 02	82.4	69 23.4 1.0 02	82.3	74 22.9 1.0 02	81.4	95
6	59 52.8 1.0 02	82.3	60 22.8 1.0 02	82.2	61 52.8 1.0 02	82.1	62 22.7 1.0 02	82.1	62 52.7 1.0 02	82.1	68 52.4 1.0 02	81.4	69 22.4 1.0 02	81.4	74 21.9 1.0 02	80.4	6
7	59 51.8 1.0 02	81.3	60 21.8 1.0 02	81.3	61 51.7 1.0 02	81.1	62 21.7 1.0 02	81.1	62 51.7 1.0 02	81.1	68 51.4 1.0 02	80.4	69 21.3 1.0 02	80.4	74 20.8 1.0 02	79.5	7
8	59 50.8 1.0 02	80.3	60 20.7 1.0 02	80.3	61 50.7 1.0 02	80.1	62 20.7 1.0 02	80.1	62 50.6 1.0 02	80.1	68 50.3 1.0 02	79.4	69 20.3 1.0 02	79.4	74 19.8 1.0 02	78.5	8
9	59 49.7 1.0 02	79.3	60 19.7 1.0 02	79.3	61 49.7 1.0 02	79.2	62 19.6 1.0 02	79.1	62 49.6 1.0 02	79.1	68 49.3 1.0 02	78.4	69 19.3 1.0 02	78.4	74 18.8 1.0 02	77.5	9
100	59 48.7 1.0 02	78.3	60 18.7 1.0 02	78.3	61 48.6 1.0 02	78.2	62 18.6 1.0 02	78.1	62 48.6 1.0 02	78.1	68 48.3 1.0 02	77.5	69 18.2 1.0 02	77.4	74 17.8 1.0 02	76.5	100
1	59 47.7 1.0 02	77.3	60 17.7 1.0 02	77.3	61 47.6 1.0 02	77.2	62 17.6 1.0 02	77.1	62 47.6 1.0 02	77.1	68 47.2 1.0 02	76.5	69 17.2 1.0 02	76.4	74 16.8 1.0 02	75.5	1
2	59 46.7 1.0 02	76.3	60 16.6 1.0 02	76.3	61 46.6 1.0 02	76.2	62 16.6 1.0 02	76.1	62 46.5 1.0 02	76.1	68 46.2 1.0 02	75.5	69 16.2 1.0 02	75.4	74 15.7 1.0 02	74.5	2
3	59 45.6 1.0 02	75.3	60 15.6 1.0 02	75.3	61 45.6 1.0 02	75.2	62 15.6 1.0 02	75.1	62 45.5 1.0 02	75.1	68 45.2 1.0 02	74.5	69 15.2 1.0 02	74.4	74 14.7 1.0 02	73.5	3
4	59 44.6 1.0 02	74.3	60 14.6 1.0 02	74.3	61 44.6 1.0 02	74.2	62 14.5 1.0 02	74.2	62 44.5 1.0 02	74.1	68 44.2 1.0 02	73.5	69 14.2 1.0 02	73.4	74 13.7 1.0 02	72.6	4
105	59 43.6 1.0 02	73.3	60 13.6 1.0 02	73.3	61 43.6 1.0 02	73.2	62 13.5 1.0 02	73.2	62 43.5 1.0 02	73.1	68 43.2 1.0 02	72.5	69 13.2 1.0 02	72.5	74 12.7 1.0 02	71.6	105
6	59 42.6 1.0 02	72.4	60 12.6 1.0 02	72.3	61 42.6 1.0 02	72.2	62 12.5 1.0 02	72.2	62 42.5 1.0 02	72.1	68 42.2 1.0 02	71.5	69 12.2 1.0 02	71.5	74 11.8 1.0 02	70.6	6
7	59 41.6 1.0 02	71.4	60 11.6 1.0 02	71.3	61 41.6 1.0 02	71.2	62 11.5 1.0 02	71.2	62 41.5 1.0 02	71.1	68 41.2 1.0 02	70.5	69 11.2 1.0 02	70.5	74 10.8 1.0 02	69.6	7
8	59 40.6 1.0 02	70.4	60 10.6 1.0 02	70.3	61 40.6 1.0 02	70.2	62 10.5 1.0 02	70.2	62 40.5 1.0 02	70.2	68 40.2 1.0 02	69.6	69 10.2 1.0 02	69.5	74 09.8 1.0 02	68.6	8
9	59 39.7 1.0 02	69.4	60 09.6 1.0 02	69.3	61 39.6 1.0 02	69.2	62 09.6 1.0 02	69.2	62 39.6 1.0 02	69.2	68 39.3 1.0 02	68.6	69 09.2 1.0 02	68.5	74 08.8 1.0 02	67.7	9
110	59 38.7 1.0 02	68.4	60 08.7 1.0 02	68.4	61 38.6 1.0 02	68.3	62 08.6 1.0 02	68.2	62 38.6 1.0 02	68.2	68 38.3 1.0 02	67.6	69 08.3 1.0 02	67.5	74 07.8 1.0 02	66.7	110
1	59 37.7 1.0 02	67.4	60 07.7 1.0 02	67.4	61 37.7 1.0 02	67.3	62 07.6 1.0 02	67.2	62 37.6 1.0 02	67.2	68 37.3 1.0 02	66.6	69 07.3 1.0 02	66.5	74 06.9 1.0 02	65.7	1
2	59 36.8 1.0 02	66.4	60 06.7 1.0 02	66.4	61 36.7 1.0 02	66.3	62 06.7 1.0 02	66.2	62 36.7 1.0 02	66.2	68 36.4 1.0 02	65.6	69 06.3 1.0 02	65.6	74 05.9 1.0 02	64.7	2
3	59 35.8 1.0 02	65.4	60 05.8 1.0 02	65.4	61 35.7 1.0 02	65.3	62 05.7 1.0 02	65.3	62 35.7 1.0 02	65.2	68 35.4 1.0 02	64.6	69 05.4 1.0 02	64.6	74 05.0 1.0 02	63.8	3
4	59 34.8 1.0 02	64.4	60 04.8 1.0 02	64.4	61 34.8 1.0 02	64.3	62 04.8 1.0 02	64.3	62 34.8 1.0 02	64.2	68 34.5 1.0 02	63.7	69 04.4 1.0 02	63.6	74 04.1 1.0 02	62.8	4
115	59 33.9 1.0 02	63.5	60 03.9 1.0 02	63.4	61 33.8 1.0 02	63.3	62 03.8 1.0 02	63.3	62 33.8 1.0 02	63.3	68 33.5 1.0 02	62.7	69 03.5 1.0 02	62.6	74 03.1 1.0 02	61.8	115
6	59 33.0 1.0 02	62.5	60 03.0 1.0 02	62.4	61 32.9 1.0 02	62.3	62 02.9 1.0 02	62.3	62 32.9 1.0 02	62.3	68 32.6 1.0 02	61.7	69 02.6 1.0 02	61.6	74 02.2 1.0 02	60.9	6
7	59 32.1 1.0 02	61.5	60 02.0 1.0 02	61.5	61 32.0 1.0 02	61.4	62 02.0 1.0 02	61.3	62 32.0 1.0 02	61.3	68 31.7 1.0 02	60.7	69 01.7 1.0 02	60.7	74 01.3 1.0 02	59.9	7
8	59 31.1 1.0 02	60.5	60 01.1 1.0 02	60.5	61 31.1 1.0 02	60.4	62 01.1 1.0 02	60.4	62 31.0 1.0 02	60.3	68 30.8 1.0 02	59.8	69 00.8 1.0 01	59.7	74 00.4 1.0 01	58.9	8
9	59 30.2 1.0 02	59.5	60 00.2 1.0 02	59.5	61 30.2 1.0 01	59.4	62 00.2 1.0 01	59.4	62 30.1 1.0 01	59.3	68 29.9 1.0 01	58.8	68 59.9 1.0 01	58.7	73 59.5 1.0 01	57.9	9
120	59 29.3 1.0 01	58.5	59 59.3 1.0 01	58.5	61 29.3 1.0 01	58.4	61 59.3 1.0 01	58.4	62 29.2 1.0 01	58.3	68 29.0 1.0 01	57.8	68 59.0 1.0 01	57.7	73 58.6 1.0 01	57.0	120
1	59 28.4 1.0 01	57.5	59 58.4 1.0 01	57.5	61 28.4 1.0 01	57.4	61 58.4 1.0 01	57.4	62 28.4 1.0 01	57.4	68 28.1 1.0 01	56.8	68 58.1 1.0 01	56.8	73 57.8 1.0 01	56.0	1
2	59 27.6 1.0 01	56.6	59 57.6 1.0 01	56.5	61 27.5 1.0 01	56.4	61 57.5 1.0 01	56.4	62 27.5 1.0 01	56.4	68 27.2 1.0 01	55.8	68 57.2 1.0 01	55.8	73 56.9 1.0 01	55.0	2
3	59 26.7 1.0 01	55.6	59 56.7 1.0 01	55.5	61 26.6 1.0 01	55.5	61 56.6 1.0 01	55.4	62 26.6 1.0 01	55.4	68 26.4 1.0 01	54.9	68 56.4 1.0 01	54.8	73 56.0 1.0 01	54.1	3
4	59 25.8 1.0 01	54.6	59 55.8 1.0 01	54.6	61 25.8 1.0 01	54.5	61 55.8 1.0 01	54.5	62 25.8 1.0 01	54.4	68 25.5 1.0 01	53.9	68 55.5 1.0 01	53.8	73 55.2 1.0 01	53.1	4
125	59 25.0 1.0 01	53.6	59 55.0 1.0 01	53.6	61 24.9 1.0 01	53.5	61 54.9 1.0 01	53.5	62 24.9 1.0 01	53.4	68 24.7 1.0 01	52.9	68 54.7 1.0 01	52.9	73 54.4 1.0 01	52.2	125
6	59 24.2 1.0 01	52.6	59 54.1 1.0 01	52.6	61 24.1 1.0 01	52.5	61 54.1 1.0 01	52.5	62 24.1 1.0 01	52.4	68 23.9 1.0 01	52.0	68 53.8 1.0 01	51.9	73 53.5 1.0 01	51.2	6
7	59 23.3 1.0 01	51.6	59 53.3 1.0 01	51.6	61 23.3 1.0 01	51.5	61 53.3 1.0 01	51.5	62 23.2 1.0 01	51.5	68 23.0 1.0 01	51.0	68 53.0 1.0 01	50.9	73 52.7 1.0 01	50.2	7
8	59 22.5 1.0 01	50.6	59 52.5 1.0 01	50.6	61 22.5 1.0 01	50.6	61 52.4 1.0 01	50.5	62 22.4 1.0 01	50.5	68 22.2 1.0 01	50.0	68 52.2 1.0 01	50.0	73 51.9 1.0 01	49.3	8
9	59 21.7 1.0 01	49.7	59 51.7 1.0 01	49.7	61 21.7 1.0 01	49.6	61 51.6 1.0 01	49.5	62 21.6 1.0 01	49.5	68 21.4 1.0 01	49.0	68 51.4 1.0 01	49.0	73 51.1 1.0 01	48.3	9
130	59 20.9 1.0 01	48.7	59 50.9 1.0 01	48.7	61 20.9 1.0 01	48.6	61 50.9 1.0 01	48.6	62 20.8 1.0 01	48.5	68 20.7 1.0 01	48.1	68 50.6 1.0 01	48.0	73 50.4 1.0 01	47.4	130
1	59 20.1 1.0 01	47.7	59 50.1 1.0 01	47.7	61 20.1 1.0 01	47.6	61 50.1 1.0 01	47.6	62 20.1 1.0 01	47.6	68 19.9 1.0 01	47.1	68 49.9 1.0 01	47.0	73 49.6 1.0 01	46.4	1
2	59 19.4 1.0 01	46.7	59 49.4 1.0 01	46.7	61 19.3 1.0 01	46.6	61 49.3 1.0 01	46.6	62 19.3 1.0 01	46.6	68 19.1 1.0 01	46.1	68 49.1 1.0 01	46.1	73 48.9 1.0 01	45.4	2
3	59 18.6 1.0 01	45.7	59 48.6 1.0 01	45.7	61 18.6 1.0 01	45.7	61 48.6 1.0 01	45.6	62 18.5 1.0 01	45.6	68 18.4 1.0 01	45.2	68 48.4 1.0 01	45.1	73 48.1 1.0 01	44.5	3
4	59 17.9 1.0 01	44.8	59 47.9 1.0 01	44.8	61 17.8 1.0 01	44.7	61 47.8 1.0 01	44.7	62 17.8 1.0 01	44.6	68 17.6 1.0 01	44.2	68 47.6 1.0 01	44.1	73 47.4 1.0 01	43.5	4
135	59 17.1 1.0 01	43.8	59 47.1 1.0 01	43.8	61 17.1 1.0 01	43.7	61 47.1 1.0 01	43.7	62 17.1 1.0 01	43.6	68 16.9 1.0 01	43.2	68 46.9 1.0 01	43.2	73 46.7 1.0 01	42.6	135
6	59 16.4 1.0 01	42.8	59 46.4 1.0 01	42.8	61 16.4 1.0 01	42.7	61 46.4 1.0 01	42.7	62 16.4 1.0 01	42.7	68 16.2 1.0 01	42.3	68 46.2 1.0 01	42.2	73 46.0 1.0 01	41.6	6
7	59 15.7 1.0 01	41.8	59 45.7 1.0 01	41.8	61 15.7 1.0 01	41.8	61 45.7 1.0 01	41.7	62 15.7 1.0 01	41.7	68 15.5 1.0 01	41.3	68 45.5 1.0 01	41.2	73 45.3 1.0 01	40.7	7
8	59 15.0 1.0 01	40.9	59 45.0 1.0 01	40.8	61 15.0 1.0 01	40.8	61 45.0 1.0 01	40.8	62 15.0 1.0 01	40.7	68 14.8 1.0 01	40.3	68 44.8 1.0 01	40.3	73 44.6 1.0 01	39.7	8
9	59 14.3 1.0 01	39.9	59 44.3 1.0 01	39.9	61 14.3 1.0 01	39.8	61 44.3 1.0 01	39.8	62 14.3 1.0 01	39.7	68 14.2 1.0 01	39.4	68 44.1 1.0 01	39.3	73 43.9 1.0 01	38.7	9
140	59 13.7 1.0 01	38.9	59 43.7 1.0 01	38.9	61 13.6 1.0 01	38.8	61 43.6 1.0 01	38.8	62 13.6 1.0 01	38.8	68 13.5 1.0 01	38.4	68 43.5 1.0 01	38.3	73 43.3 1.0 01	37.8	140
1	59 13.0 1.0 01	37.9	59 43.0 1.0 01	37.9	61 13.0 1.0 01	37.9	61 43.0 1.0 01	37.8	62 13.0 1.0 01	37.8	68 12.9 1.0 01	37.4	68 42.8 1.0 01	37.4	73 42.7 1.0 01	36.8	1
2	59 12.4 1.0 01	37.0	59 42.4 1.0 01	36.9	61 12.4 1.0 01	36.9	61 42.4 1.0 01	36.9	62 12.4 1.0 01	36.8	68 12.2 1.0 01	36.5	68 42.2 1.0 01	36.4	73 42.0 1.0 01	35.9	2
3	59 11.8 1.0 01	36.0	59 41.8 1.0 01	36.0	61 11.7 1.0 01	35.9	61 41.7 1.0 01	35.9	62 11.7 1.0 01	35.9	68 11.6 1.0 01	35.5	68 41.6 1.0 01	35.5	73 41.4 1.0 01	34.9	3
4	59 11.2 1.0 01	35.0	59 41.1 1.0 01	35.0	61 11.1 1.0 01	34.9	61 41.1 1.0 01	34.9	62 11.1 1.0 01	34.9	68 11.0 1.0 01	34.5	68 41.0 1.0 01	34.5	73 40.8 1.0 01	34.0	4
145	59 10.6 1.0 01	34.0	59 40.6 1.0 01	34.0	61 10.5 1.0 01	34.0	61 40.5 1.0 01	33.9	62 10.5 1.0 01	33.9	68 10.4 1.0 01	33.6	68 40.4 1.0 01	33.5	73 40.3 1.0 01	33.0	145
6	59 10.0 1.0 01	33.1	59 40.0 1.0 01	33.0	61 10.0 1.0 01	33.0	61 40.0 1.0 01	33.0	62 09.9 1.0 01	32.9	68 09.8 1.0 01	32.6	68 39.8 1.0 01	32.6	73 39.7 1.0 01	32.1	6
7	59 09.4 1.0 01	32.1	59 39.4 1.0 01	32.1	61 09.4 1.0 01	32.0	61 39.4 1.0 01	32.0	62 09.4 1.0 01	32.0	68 09.3 1.0 01	31.6	68 39.3 1.0 01	31.6	73 39.2 1.0 01	31.1	7
8	59 08.9 1.0 01	31.1	59 38.9 1.0 01	31.1	61 08.8 1.0 01	31.0	61 38.8 1.0 01	31.0	62 08.8 1.0 01	31.0	68 08.7 1.0 01	30.7	68 38.7 1.0 01	30.6	73 38.6 1.0 01	30.2	8
9	59 08.3 1.0 01	30.1	59 38.3 1.0 01	30.1	61 08.3 1.0 01	30.1	61 38.3 1.0 01	30.0	62 08.3 1.0 01	30.0	68 08.2 1.0 01	29.7	68 38.2 1.0 01	29.7	73 38.1 1.0 01	29.2	9
150	59 07.8 1.0 01	29.2	59 37.8 1.0 01	29.1	61 07.8 1.0 01	29.1	61 37.8 1.0 01	29.1	62 07.8 1.0 01	29.1	68 07.7 1.0 01	28.8	68 37.7 1.0 01	28.7	73 37.6 1.0 01	28.3	150
1	59 07.3 1.0 01	28.2	59 37.3 1.0 01	28.2	61 07.3 1.0 01	28.1	61 37.3 1.0 01	28.1	62 07.3 1.0 01	28.1	68 07.2 1.0 01	27.8	68 37.2 1.0 01	27.8	73 37.1 1.0 01	27.3	1
2	59 06.8 1.0 01	27.2	59 36.8 1.0 01	27.2	61 06.8 1.0 01	27.1	61 36.8 1.0 01	27.1	62 06.8 1.0 01	27.1	68 06.7 1.0 01	26.8	68 36.7 1.0 01	26.8	73 36.6 1.0 01	26.4	2
3	59 06.4 1.0 01	26.2	59 36.4 1.0 01	26.2	61 06.3 1.0 01	26.2	61 36.3 1.0 01	26.2	62 06.3 1.0 01	26.1	68 06.3 1.0 01	25.9	68 36.3 1.0 01	25.8	73 36.2 1.0 01	25.5	3
4	59 05.9 1.0 01	25.3	59 35.9 1.0 01	25.2	61 05.9 1.0 01	25.2	61 35.9 1.0 01	25.2	62 05.9 1.0 01	25.2	68 05.8 1.0 01	24.9	68 35.8 1.0 01	24.9	73 35.7 1.0 01	24.5	4
155	59 05.5 1.0 01	24.3	59 35.5 1.0 01	24.3	61 05.4 1.0 01	24.2	61 35.4 1.0 01	24.2	62 05.4 1.0 01	24.2	68 05.4 1.0 01	23.9	68 35.4 1.0 01	23.9	73 35.3 1.0 01	23.6	155
6	59 05.0 1.0 01	23.3	59 35.0 1.0 01	23.3	61 05.0 1.0 01	23.2	61 35.0 1.0 01	23.2	62 05.0 1.0 01	23.2	68 05.0 1.0 01	23.0	68 35.0 1.0 01	23.0	73 34.9 1.0 01	22.6	6
7	59 04.6 1.0 01	22.3	59 34.6 1.0 01	22.3	61 04.6 1.0 01	22.3	61 34.6 1.0 01	22.3	62 04.6 1.0 01	22.3	68 04.6 1.0 01	22.0	68 34.6 1.0 01	22.0	73 34.5 1.0 01	21.7	7
8	59 04.2 1.0 01	21.4	59 34.2 1.0 01	21.4	61 04.2 1.0 01	21.3	61 34.2 1.0 01	21.3	62 04.2 1.0 01	21.3	68 04.2 1.0 01	21.1	68 34.2 1.0 01	21.0	73 34.1 1.0 01	20.7	8
9	59 03.9 1.0 01	20.4	59 33.9 1.0 01	20.4	61 03.9 1.0 01	20.3	61 33.9 1.0 01	20.3	62 03.9 1.0 01	20.3	68 03.8 1.0 01	20.1	68 33.8 1.0 01	20.1	73 33.8 1.0 01	19.8	9
160	59 03.5 1.0 01	19.4	59 33.5 1.0 01	19.4	61 03.5 1.0 01	19.4	61 33.5 1.0 01	19.4	62 03.5 1.0 01	19.4	68 03.5 1.0 01	19.1	68 33.5 1.0 01	19.1	73 33.4 1.0 01	18.8	160
1	59 03.2 1.0 01	18.4	59 33.2 1.0 01	18.4	61 03.2 1.0 01	18.4	61 33.2 1.0 01	18.4	62 03.2 1.0 01	18.4	68 03.1 1.0 01	18.2	68 33.1 1.0 01	18.2	73 33.1 1.0 01	17.9	1
2	59 02.9 1.0 01	17.5	59 32.9 1.0 00	17.5	61 02.8 1.0 01	17.4	61 32.8 1.0 01	17.4	62 02.8 1.0 01	17.4	68 02.8 1.0 00	17.2	68 32.8 1.0 01	17.2	73 32.8 1.0 00	17.0	2
3	59 02.5 1.0 01	16.5	59 32.5 1.0 00	16.5	61 02.5 1.0 01	16.5	61 32.5 1.0 00	16.5	62 02.5 1.0 00	16.4	68 02.5 1.0 00	16.3	68 32.5 1.0 00	16.3	73 32.5 1.0 00	16.0	3
4	59 02.3 1.0 00	15.5	59 32.3 1.0 00	15.5	61 02.3 1.0 00	15.5	61 32.2 1.0 00	15.5	62 02.2 1.0 00	15.5	68 02.2 1.0 00	15.3	68 32.2 1.0 00	15.3	73 32.2 1.0 00	15.1	4
165	59 02.0 1.0 00	14.6	59 32.0 1.0 00	14.6	61 02.0 1.0 00	14.5	61 32.0 1.0 00	14.5	62 02.0 1.0 00	14.5	68 02.0 1.0 00	14.4	68 32.0 1.0 00	14.3	73 31.9 1.0 00	14.1	165
6	59 01.7 1.0 00	13.6	59 31.7 1.0 00	13.6	61 01.7 1.0 00	13.6	61 31.7 1.0 00	13.6	62 01.7 1.0 00	13.5	68 01.7 1.0 00	13.4	68 31.7 1.0 00	13.4	73 31.7 1.0 00	13.2	6
7	59 01.5 1.0 00	12.6	59 31.5 1.0 00	12.6	61 01.5 1.0 00	12.6	61 31.5 1.0 00	12.6	62 01.5 1.0 00	12.6	68 01.5 1.0 00	12.4	68 31.5 1.0 00	12.4	73 31.4 1.0 00	12.2	7
8	59 01.3 1.0 00	11.7	59 31.3 1.0 00	11.6	61 01.3 1.0 00	11.6	61 31.3 1.0 00	11.6	62 01.3 1.0 00	11.6	68 01.3 1.0 00	11.5	68 31.3 1.0 00	11.5	73 31.2 1.0 00	11.3	8
9	59 01.1 1.0 00	10.7	59 31.1 1.0 00	10.7	61 01.1 1.0 00	10.7	61 31.1 1.0 00	10.6	62 01.1 1.0 00	10.6	68 01.1 1.0 00	10.5	68 31.1 1.0 00	10.5	73 31.0 1.0 00	10.4	9
170	59 00.9 1.0 00	09.7	59 30.9 1.0 00	09.7	61 00.9 1.0 00	09.7	61 30.9 1.0 00	09.7	62 00.9 1.0 00	09.7	68 00.9 1.0 00	09.6	68 30.9 1.0 00	09.6	73 30.9 1.0 00	09.4	170
1	59 00.7 1.0 00	08.7	59 30.7 1.0 00	08.7	61 00.7 1.0 00	08.7	61 30.7 1.0 00	08.7	62 00.7 1.0 00	08.7	68 00.7 1.0 00	08.6	68 30.7 1.0 00	08.6	73 30.7 1.0 00	08.5	1
2	59 00.6 1.0 00	07.8	59 30.6 1.0 00	07.8	61 00.6 1.0 00	07.7	61 30.6 1.0 00	07.7	62 00.6 1.0 00	07.7	68 00.6 1.0 00	07.7	68 30.6 1.0 00	07.7	73 30.6 1.0 00	07.5	2
3	59 00.4 1.0 00	06.8	59 30.4 1.0 00	06.8	61 00.4 1.0 00	06.8	61 30.4 1.0 00	06.8	62 00.4 1.0 00	06.8	68 00.4 1.0 00	06.7	68 30.4 1.0 00	06.7	73 30.4 1.0 00	06.6	3
4	59 00.3 1.0 00	05.8	59 30.3 1.0 00	05.8	61 00.3 1.0 00	05.8	61 30.3 1.0 00	05.8	62 00.3 1.0 00	05.8	68 00.3 1.0 00	05.7	68 30.3 1.0 00	05.7	73 30.3 1.0 00	05.6	4
175	59 00.2 1.0 00	04.9	59 30.2 1.0 00	04.9	61 00.2 1.0 00	04.8	61 30.2 1.0 00	04.8	62 00.2 1.0 00	04.8	68 00.2 1.0 00	04.8	68 30.2 1.0 00	04.8	73 30.2 1.0 00	04.7	175
6	59 00.1 1.0 00	03.9	59 30.1 1.0 00	03.9	61 00.1 1.0 00	03.9	61 30.1 1.0 00	03.9	62 00.1 1.0 00	03.9	68 00.1 1.0 00	03.8	68 30.1 1.0 00	03.8	73 30.1 1.0 00	03.8	6
7	59 00.1 1.0 00	02.9	59 30.1 1.0 00	02.9	61 00.1 1.0 00	02.9	61 30.1 1.0 00	02.9	62 00.1 1.0 00	02.9	68 00.1 1.0 00	02.9	68 30.1 1.0 00	02.9	73 30.1 1.0 00	02.8	7
8	59 00.0 1.0 00	01.9	59 30.0 1.0 00	01.9	61 00.0 1.0 00	01.9	61 30.0 1.0 00	01.9	62 00.0 1.0 00	01.9	68 00.0 1.0 00	01.9	68 30.0 1.0 00	01.9	73 30.0 1.0 00	01.9	8
9	59 00.0 1.0 00	01.0	59 30.0 1.0 00	01.0	61 00.0 1.0 00	01.0	61 30.0 1.0 00	01.0	62 00.0 1.0 00	01.0	68 00.0 1.0 00	01.0	68 30.0 1.0 00	01.0	73 30.0 1.0 00	00.9	9
180	59 00.0	00.0	59 30.0	00.0	61 00.0	00.0	61 30.0	00.0	62 00.0	00.0	68 00.0	00.0	68 30.0	00.0	73 30.0	00.0	180

STAR IDENTIFICATION TABLE

ALTITUDE

Lat. 89°

AZ.	4° Dec.	4° H.A.	8° Dec.	8° H.A.	12° Dec.	12° H.A.	16° Dec.	16° H.A.	20° Dec.	20° H.A.	24° Dec.	24° H.A.	28° Dec.	28° H.A.	32° Dec.	32° H.A.	36° Dec.	36° H.A.	40° Dec.	40° H.A.	44° Dec.	44° H.A.	AZ.
00	05	180	09	180	13	180	17	180	21	180	25	180	29	180	33	180	37	180	41	180	45	180	00
4	05	176	09	176	13	176	17	176	21	176	25	176	29	176	33	176	37	176	41	176	45	176	4
8	05	172	09	172	13	172	17	172	21	172	25	172	29	172	33	172	37	172	41	172	45	172	8
12	05	168	09	168	13	168	17	168	21	168	25	168	29	168	33	168	37	168	41	168	45	168	12
16	05	164	09	164	13	164	17	164	21	164	25	164	29	164	33	164	37	164	41	164	45	164	16
20	05	160	09	160	13	160	17	160	21	160	25	160	29	160	33	160	37	160	41	160	45	160	20
24	05	156	09	156	13	156	17	156	21	156	25	156	29	156	33	156	37	156	41	156	45	156	24
28	05	152	09	152	13	152	17	152	21	152	25	152	29	152	33	152	37	152	41	152	45	152	28
32	05	148	09	148	13	148	17	148	21	148	25	148	29	148	33	148	37	148	41	148	45	147	32
36	05	144	09	144	13	144	17	144	21	144	25	144	29	144	33	144	37	144	41	143	45	143	36
40	05	140	09	140	13	140	17	140	21	140	25	140	29	140	33	140	37	140	41	139	45	139	40
44	05	136	09	136	13	136	17	136	21	136	25	136	29	136	33	136	37	135	41	135	45	135	44
48	05	132	09	132	13	132	17	132	21	132	25	132	29	132	33	132	37	131	41	131	45	131	48
52	05	128	09	128	13	128	17	128	21	128	25	128	29	128	33	128	37	127	41	127	45	127	52
56	05	124	09	124	13	124	17	124	21	124	25	124	29	124	33	123	37	123	41	123	45	123	56
60	04	120	08	120	12	120	16	120	20	120	24	120	28	120	32	119	36	119	40	119	44	119	60
64	04	116	08	116	12	116	16	116	20	116	24	116	28	116	32	115	36	115	40	115	44	115	64
68	04	112	08	112	12	112	16	112	20	112	24	112	28	112	32	111	36	111	40	111	44	111	68
72	04	108	08	108	12	108	16	108	20	108	24	108	28	107	32	107	36	107	40	107	44	107	72
76	04	104	08	104	12	104	16	104	20	104	24	104	28	103	32	103	36	103	40	103	44	103	76
80	04	100	08	100	12	100	16	100	20	100	24	100	28	99	32	99	36	99	40	99	44	99	80
84	04	96	08	96	12	96	16	96	20	96	24	96	28	95	32	95	36	95	40	95	44	95	84
88	04	92	08	92	12	92	16	92	20	92	24	92	28	91	32	91	36	91	40	91	44	91	88
92	04	88	08	88	12	88	16	88	20	88	24	88	28	87	32	87	36	87	40	87	44	87	92
96	04	84	08	84	12	84	16	84	20	84	24	84	28	83	32	83	36	83	40	83	44	83	96
100	04	80	08	80	12	80	16	80	20	80	24	80	28	79	32	79	36	79	40	79	44	79	100
104	04	76	08	76	12	76	16	76	20	76	24	76	28	75	32	75	36	75	40	75	44	75	104
108	04	72	08	72	12	72	16	72	20	72	24	72	28	71	32	71	36	71	40	71	44	71	108
112	04	68	08	68	12	68	16	68	20	68	24	68	28	68	32	67	36	67	40	67	44	67	112
116	04	64	08	64	12	64	16	64	20	64	24	64	28	64	32	63	36	63	40	63	44	63	116
120	04	60	07	60	11	60	15	60	19	60	23	60	27	60	31	59	35	59	39	59	43	59	120
124	03	56	07	56	11	56	15	56	19	56	23	56	27	56	31	55	35	55	39	55	43	55	124
128	03	52	07	52	11	52	15	52	19	52	23	52	27	52	31	52	35	51	39	51	43	51	128
132	03	48	07	48	11	48	15	48	19	48	23	48	27	48	31	48	35	47	39	47	43	47	132
136	03	44	07	44	11	44	15	44	19	44	23	44	27	44	31	44	35	44	39	43	43	43	136
140	03	40	07	40	11	40	15	40	19	40	23	40	27	40	31	40	35	40	39	39	43	39	140
144	03	36	07	36	11	36	15	36	19	36	23	36	27	36	31	36	35	36	39	36	43	35	144
148	03	32	07	32	11	32	15	32	19	32	23	32	27	32	31	32	35	32	39	32	43	31	148
152	03	28	07	28	11	28	15	28	19	28	23	28	27	28	31	28	35	28	39	28	43	28	152
156	03	24	07	24	11	24	15	24	19	24	23	24	27	24	31	24	35	24	39	24	43	24	156
160	03	20	07	20	11	20	15	20	19	20	23	20	27	20	31	20	35	20	39	20	43	20	160
164	03	16	07	16	11	16	15	16	19	16	23	16	27	16	31	16	35	16	39	16	43	16	164
168	03	12	07	12	11	12	15	12	19	12	23	12	27	12	31	12	35	12	39	12	43	12	168
172	03	08	07	08	11	08	15	08	19	08	23	08	27	08	31	08	35	08	39	08	43	08	172
176	03	04	07	04	11	04	15	04	19	04	23	04	27	04	31	04	35	04	39	04	43	04	176
180	03	00	07	00	11	00	15	00	19	00	23	00	27	00	31	00	35	00	39	00	43	00	180
	4°		8°		12°		16°		20°		24°		28°		32°		36°		40°		44°		

FIGURES IN ITALICS INDICATE THAT DECLINATION IS OF CONTRARY NAME TO LATITUDE

16—46723-1

AZ.	48° Dec.	48° H.A.	52° Dec.	52° H.A.	56° Dec.	56° H.A.	60° Dec.	60° H.A.	64° Dec.	64° H.A.	68° Dec.	68° H.A.	72° Dec.	72° H.A.	76° Dec.	76° H.A.	80° Dec.	80° H.A.	84° Dec.	84° H.A.	88° Dec.	88° H.A.	AZ.
00	49	180	53	180	57	180	61	180	65	180	69	180	73	180	77	180	81	180	85	180	89	180	00
4	49	176	53	176	57	176	61	176	65	176	69	176	73	176	77	176	81	176	85	175	89	172	4
8	49	172	53	172	57	172	61	172	65	172	69	172	73	172	77	171	81	171	85	170	89	164	8
12	49	168	53	168	57	168	61	168	65	168	69	167	73	167	77	167	81	167	85	166	89	157	12
16	49	164	53	164	57	164	61	164	65	163	69	163	73	163	77	163	81	162	85	161	89	149	16
20	49	160	53	160	57	159	61	159	65	159	69	159	73	159	77	159	81	158	85	156	89	142	20
24	49	156	53	155	57	155	61	155	65	155	69	155	73	155	77	154	81	153	85	151	89	135	24
28	49	151	53	151	57	151	61	151	65	151	69	151	73	150	77	150	81	149	85	147	89	129	28
32	49	147	53	147	57	147	61	147	65	147	69	147	73	146	77	146	81	145	85	142	89	123	32
36	49	143	53	143	57	143	61	143	65	143	69	142	73	142	77	141	81	140	85	138	89	118	36
40	49	139	53	139	57	139	61	139	65	139	69	138	73	138	77	137	81	136	85	133	89	112	40
44	49	135	53	135	57	135	61	135	65	135	69	134	73	134	77	133	81	132	85	129	88	108	44
48	49	131	53	131	57	131	61	131	65	130	69	130	73	130	77	129	81	127	85	124	88	103	48
52	49	127	53	127	57	127	61	127	65	126	69	126	73	125	77	125	81	123	85	120	88	98	52
56	49	123	53	123	57	123	61	123	65	122	69	122	73	121	77	121	81	119	84	115	88	94	56
60	48	119	52	119	56	119	60	118	64	118	68	118	72	117	76	116	80	115	84	111	88	90	60
64	48	115	52	115	56	115	60	114	64	114	68	114	72	113	76	112	80	111	84	107	88	86	64
68	48	111	52	111	56	111	60	110	64	110	68	110	72	109	76	108	80	107	84	103	88	82	68
72	48	107	52	107	56	107	60	106	64	106	68	106	72	105	76	104	80	102	84	99	88	79	72
76	48	103	52	103	56	103	60	102	64	102	68	102	72	101	76	100	80	98	84	94	88	75	76
80	48	99	52	99	56	99	60	98	64	98	68	98	72	97	76	96	80	94	84	90	88	72	80
84	48	95	52	95	56	95	60	94	64	94	68	94	72	93	76	92	80	90	84	86	88	68	84
88	48	91	52	91	56	91	60	90	64	90	68	90	72	89	76	88	80	86	84	83	88	65	88
92	48	87	52	87	56	87	60	86	64	86	68	86	72	85	76	84	80	82	84	79	88	62	92
96	48	83	52	83	56	83	60	82	64	82	68	82	72	81	76	80	80	78	84	75	88	59	96
100	48	79	52	79	56	79	60	78	64	78	68	78	72	77	76	76	80	75	84	71	88	56	100
104	48	75	52	75	56	75	60	74	64	74	68	74	72	73	76	72	80	71	84	67	88	53	104
108	48	71	52	71	56	71	60	70	64	70	68	70	72	69	76	68	80	67	84	63	88	50	108
112	48	67	52	67	56	67	60	66	64	66	68	66	72	65	76	64	80	63	84	60	87	47	112
116	48	63	52	63	56	63	60	62	64	62	68	62	72	61	76	61	80	59	84	56	87	44	116
120	47	59	51	59	55	59	59	59	63	58	67	58	71	57	75	57	79	55	83	52	87	41	120
124	47	55	51	55	55	55	59	55	63	54	67	54	71	54	75	53	79	52	83	49	87	38	124
128	47	51	51	51	55	51	59	51	63	50	67	50	71	50	75	49	79	48	83	45	87	35	128
132	47	47	51	47	55	47	59	47	63	47	67	46	71	46	75	45	79	44	83	42	87	32	132
136	47	43	51	43	55	43	59	43	63	43	67	42	71	42	75	41	79	40	83	38	87	30	136
140	47	39	51	39	55	39	59	39	63	39	67	38	71	38	75	38	79	37	83	35	87	27	140
144	47	35	51	35	55	35	59	35	63	35	67	35	71	34	75	34	79	33	83	31	87	24	144
148	47	31	51	31	55	31	59	31	63	31	67	31	71	30	75	30	79	29	83	28	87	21	148
152	47	27	51	27	55	27	59	27	63	27	67	27	71	27	75	26	79	26	83	24	87	19	152
156	47	24	51	23	55	23	59	23	63	23	67	23	71	23	75	22	79	22	83	21	87	16	156
160	47	20	51	20	55	20	59	19	63	19	67	19	71	19	75	19	79	18	83	17	87	13	160
164	47	16	51	16	55	16	59	16	63	15	67	15	71	15	75	15	79	15	83	14	87	11	164
168	47	12	51	12	55	12	59	12	63	12	67	12	71	11	75	11	79	11	83	10	87	08	168
172	47	08	51	08	55	08	59	08	63	08	67	08	71	08	75	07	79	07	83	07	87	05	172
176	47	04	51	04	55	04	59	04	63	04	67	04	71	04	75	04	79	04	83	03	87	03	176
180	47	00	51	00	55	00	59	00	63	00	67	00	71	00	75	00	79	00	83	00	87	00	180
	48°		52°		56°		60°		64°		68°		72°		76°		80°		84°		88°		

10—43722-4

FIGURES IN ITALICS INDICATE THAT DECLINATION IS OF CONTRARY NAME TO LATITUDE

LATITUDE DIFFERENCE (minutes of arc)

Az.		1'	2'	3'	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'	Az.	
0	180	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	0	180
1	179	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	1	179
2	178	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	2	178
3	177	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	3	177
4	176	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	4	176
5	175	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	13.9	14.9	5	175
6	174	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	9.9	10.9	11.9	12.9	13.9	14.9	6	174
7	173	1.0	2.0	3.0	4.0	5.0	6.0	6.9	7.9	8.9	9.9	10.9	11.9	12.9	13.9	14.9	7	173
8	172	1.0	2.0	3.0	4.0	5.0	5.9	6.9	7.9	8.9	9.9	10.9	11.9	12.9	13.9	14.9	8	172
9	171	1.0	2.0	3.0	4.0	4.9	5.9	6.9	7.9	8.9	9.9	10.9	11.9	12.8	13.8	14.8	9	171
10	170	1.0	2.0	3.0	3.9	4.9	5.9	6.9	7.9	8.9	9.8	10.8	11.8	12.8	13.8	14.8	10	170
11	169	1.0	2.0	2.9	3.9	4.9	5.9	6.9	7.9	8.8	9.8	10.8	11.8	12.7	13.7	14.7	11	169
12	168	1.0	2.0	2.9	3.9	4.9	5.9	6.8	7.8	8.8	9.8	10.8	11.7	12.7	13.7	14.7	12	168
13	167	1.0	1.9	2.9	3.9	4.9	5.8	6.8	7.8	8.8	9.7	10.7	11.7	12.6	13.6	14.6	13	167
14	166	1.0	1.9	2.9	3.9	4.9	5.8	6.8	7.8	8.7	9.7	10.7	11.6	12.6	13.6	14.6	14	166
15	165	1.0	1.9	2.9	3.9	4.8	5.8	6.8	7.7	8.7	9.7	10.6	11.6	12.6	13.5	14.5	15	165
16	164	1.0	1.9	2.9	3.8	4.8	5.8	6.7	7.7	8.7	9.6	10.6	11.5	12.5	13.5	14.4	16	164
17	163	1.0	1.9	2.9	3.8	4.8	5.7	6.7	7.7	8.6	9.6	10.5	11.5	12.4	13.4	14.3	17	163
18	162	1.0	1.9	2.9	3.8	4.8	5.7	6.7	7.6	8.6	9.5	10.5	11.4	12.4	13.3	14.3	18	162
19	161	1.0	1.9	2.8	3.8	4.7	5.7	6.6	7.6	8.5	9.5	10.4	11.3	12.3	13.2	14.2	19	161
20	160	0.9	1.9	2.8	3.8	4.7	5.6	6.6	7.5	8.5	9.4	10.3	11.3	12.2	13.2	14.1	20	160
21	159	0.9	1.9	2.8	3.7	4.7	5.6	6.5	7.5	8.4	9.3	10.3	11.2	12.1	13.1	14.0	21	159
22	158	0.9	1.9	2.8	3.7	4.6	5.6	6.5	7.4	8.3	9.3	10.2	11.1	12.1	13.0	13.9	22	158
23	157	0.9	1.8	2.8	3.7	4.6	5.5	6.4	7.4	8.3	9.2	10.1	11.0	12.0	12.9	13.8	23	157
24	156	0.9	1.8	2.7	3.7	4.6	5.5	6.4	7.3	8.2	9.1	10.0	11.0	11.9	12.8	13.7	24	156
25	155	0.9	1.8	2.7	3.6	4.5	5.4	6.3	7.3	8.2	9.1	10.0	10.9	11.8	12.7	13.6	25	155
26	154	0.9	1.8	2.7	3.6	4.5	5.4	6.3	7.2	8.1	9.0	9.9	10.8	11.7	12.6	13.5	26	154
27	153	0.9	1.8	2.7	3.6	4.5	5.3	6.2	7.1	8.0	8.9	9.8	10.7	11.6	12.5	13.4	27	153
28	152	0.9	1.8	2.6	3.5	4.4	5.3	6.2	7.1	7.9	8.8	9.7	10.6	11.5	12.4	13.2	28	152
29	151	0.9	1.7	2.6	3.5	4.4	5.2	6.1	7.0	7.9	8.7	9.6	10.5	11.4	12.2	13.1	29	151
30	150	0.9	1.7	2.6	3.5	4.3	5.2	6.1	7.0	7.8	8.7	9.5	10.4	11.3	12.1	13.0	30	150
31	149	0.9	1.7	2.6	3.4	4.3	5.1	6.0	6.9	7.7	8.6	9.4	10.3	11.1	12.0	12.9	31	149
32	148	0.8	1.7	2.5	3.4	4.2	5.1	5.9	6.8	7.6	8.5	9.3	10.2	11.0	11.8	12.7	32	148
33	147	0.8	1.7	2.5	3.4	4.2	5.0	5.9	6.7	7.5	8.4	9.2	10.1	10.9	11.7	12.6	33	147
34	146	0.8	1.7	2.5	3.3	4.1	5.0	5.8	6.6	7.5	8.3	9.1	9.9	10.8	11.6	12.4	34	146
35	145	0.8	1.6	2.5	3.3	4.1	4.9	5.7	6.6	7.4	8.2	9.0	9.8	10.6	11.5	12.3	35	145
36	144	0.8	1.6	2.4	3.2	4.0	4.9	5.7	6.5	7.3	8.1	8.9	9.7	10.5	11.3	12.1	36	144
37	143	0.8	1.6	2.4	3.2	4.0	4.8	5.6	6.4	7.2	8.0	8.8	9.6	10.4	11.2	12.0	37	143
38	142	0.8	1.6	2.4	3.2	3.9	4.7	5.5	6.3	7.1	7.9	8.7	9.5	10.2	11.0	11.8	38	142
39	141	0.8	1.6	2.3	3.1	3.9	4.7	5.4	6.2	7.0	7.8	8.5	9.3	10.1	10.9	11.7	39	141
40	140	0.8	1.5	2.3	3.1	3.8	4.6	5.4	6.1	6.9	7.7	8.4	9.2	10.0	10.7	11.5	40	140
41	139	0.8	1.5	2.3	3.0	3.8	4.5	5.3	6.0	6.8	7.5	8.3	9.1	9.8	10.6	11.3	41	139
42	138	0.7	1.5	2.2	3.0	3.7	4.5	5.2	5.9	6.7	7.4	8.2	8.9	9.7	10.4	11.1	42	138
43	137	0.7	1.5	2.2	2.9	3.7	4.4	5.1	5.9	6.6	7.3	8.0	8.8	9.5	10.2	11.0	43	137
44	136	0.7	1.4	2.2	2.9	3.6	4.3	5.0	5.8	6.5	7.2	7.9	8.6	9.4	10.1	10.8	44	136
45	135	0.7	1.4	2.1	2.8	3.5	4.2	4.9	5.7	6.4	7.1	7.8	8.5	9.2	9.9	10.6	45	135
46	134	0.7	1.4	2.1	2.8	3.5	4.2	4.9	5.6	6.3	6.9	7.6	8.3	9.0	9.7	10.4	46	134
47	133	0.7	1.4	2.0	2.7	3.4	4.1	4.8	5.5	6.1	6.8	7.5	8.2	8.9	9.5	10.2	47	133
48	132	0.7	1.3	2.0	2.7	3.3	4.0	4.7	5.4	6.0	6.7	7.4	8.0	8.7	9.4	10.0	48	132
49	131	0.7	1.3	2.0	2.6	3.3	3.9	4.6	5.2	5.9	6.6	7.2	7.9	8.5	9.2	9.8	49	131
50	130	0.6	1.3	1.9	2.6	3.2	3.9	4.5	5.1	5.8	6.4	7.1	7.7	8.4	9.0	9.6	50	130
51	129	0.6	1.3	1.9	2.5	3.1	3.8	4.4	5.0	5.7	6.3	6.9	7.6	8.2	8.8	9.4	51	129
52	128	0.6	1.2	1.8	2.5	3.1	3.7	4.3	4.9	5.5	6.2	6.8	7.4	8.0	8.6	9.2	52	128
53	127	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.6	7.2	7.8	8.4	9.0	53	127
54	126	0.6	1.2	1.8	2.4	2.9	3.5	4.1	4.7	5.3	5.9	6.5	7.1	7.6	8.2	8.8	54	126
55	125	0.6	1.1	1.7	2.3	2.9	3.4	4.0	4.6	5.2	5.7	6.3	6.9	7.5	8.0	8.6	55	125
56	124	0.6	1.1	1.7	2.2	2.8	3.4	3.9	4.5	5.0	5.6	6.2	6.7	7.3	7.8	8.4	56	124
57	123	0.5	1.1	1.6	2.2	2.7	3.3	3.8	4.4	4.9	5.4	6.0	6.5	7.1	7.6	8.2	57	123
58	122	0.5	1.1	1.6	2.1	2.6	3.2	3.7	4.2	4.8	5.3	5.8	6.4	6.9	7.4	7.9	58	122
59	121	0.5	1.0	1.5	2.1	2.6	3.1	3.6	4.1	4.6	5.2	5.7	6.2	6.7	7.2	7.7	59	121
60	120	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	60	120
61	119	0.5	1.0	1.5	1.9	2.4	2.9	3.4	3.9	4.4	4.8	5.3	5.8	6.3	6.8	7.3	61	119
62	118	0.5	0.9	1.4	1.9	2.3	2.8	3.3	3.8	4.2	4.7	5.2	5.6	6.1	6.6	7.0	62	118
63	117	0.5	0.9	1.4	1.8	2.3	2.7	3.2	3.6	4.1	4.5	5.0	5.4	5.9	6.4	6.8	63	117
64	116	0.4	0.9	1.3	1.8	2.2	2.6	3.1	3.5	3.9	4.4	4.8	5.3	5.7	6.1	6.6	64	116
65	115	0.4	0.8	1.3	1.7	2.1	2.5	3.0	3.4	3.8	4.2	4.6	5.1	5.5	5.9	6.3	65	115
66	114	0.4	0.8	1.2	1.6	2.0	2.4	2.8	3.3	3.7	4.1	4.5	4.9	5.3	5.7	6.1	66	114
67	113	0.4	0.8	1.2	1.6	2.0	2.3	2.7	3.1	3.5	3.9	4.3	4.7	5.1	5.5	5.9	67	113
68	112	0.4	0.7	1.1	1.5	1.9	2.2	2.6	3.0	3.4	3.7	4.1	4.5	4.9	5.2	5.6	68	112
69	111	0.4	0.7	1.1	1.4	1.8	2.2	2.5	2.9	3.2	3.6	3.9	4.3	4.7	5.0	5.4	69	111
70	110	0.3	0.7	1.0	1.4	1.7	2.1	2.4	2.7	3.1	3.4	3.8	4.1	4.4	4.8	5.1	70	110
71	109	0.3	0.7	1.0	1.3	1.6	2.0	2.3	2.6	2.9	3.3	3.6	3.9	4.2	4.6	4.9	71	109
72	108	0.3	0.6	0.9	1.2	1.5	1.9	2.2	2.5	2.8	3.1	3.4	3.7	4.0	4.3	4.6	72	108
73	107	0.3	0.6	0.9	1.2	1.5	1.8	2.0	2.3	2.6	2.9	3.2	3.5	3.8	4.1	4.4	73	107
74	106	0.3	0.6	0.8	1.1	1.4	1.7	1.9	2.2	2.5	2.8	3.0	3.3	3.6	3.9	4.1	74	106
75	105	0.3	0.5	0.8	1.0	1.3	1.6	1.8	2.1	2.3	2.6	2.8	3.1	3.4	3.6	3.9	75	105
76	104	0.2	0.5	0.7	1.0	1.2	1.5	1.7	1.9	2.2	2.4	2.7	2.9	3.1	3.4	3.6	76	104
77	103	0.2	0.4	0.7	0.9	1.1	1.3	1.6	1.8	2.0	2.2	2.5	2.7	2.9	3.1	3.4	77	103
78	102	0.2	0.4	0.6	0.8	1.0	1.2	1.5	1.7	1.9	2.1	2.3	2.5	2.7	2.9	3.1	78	102
79	101	0.2	0.4	0.6	0.8	1.0	1.1	1.3	1.5	1.7	1.9	2.1	2.3	2.5	2.7	2.9	79	101
80	100	0.2	0.3	0.5	0.7	0.9	1.0	1.2	1.4	1.6	1.7	1.9	2.1	2.3	2.4	2.6	80	100
81	99	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.3	1.4	1.6	1.7	1.9	2.0	2.2	2.3	81	99
82	98	0.1	0.3	0.4	0.6	0.7	0.8	1.0	1.1	1.3	1.4	1.5	1.7	1.8	1.9	2.1	82	98
83	97	0.1	0.2	0.4	0.5	0.6	0.7	0.9	1.0	1.1	1.2	1.3	1.5	1.6	1.7	1.8	83	97
84	96	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.3	1.4	1.5	1.6	84	96
85	95	0.1	0.2	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.0	1.1	1.2	1.3	85	95
86	94	0.1	0.1	0.2	0.3	0.3	0.4	0.5	0.6	0.6	0.7	0.8	0.8	0.9	1.0	1.0	86	94
87	93	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.8	87	93
88	92	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.5	88	92
89	91	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	89	91
90	90	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	90	90
Az.		1'	2'	3'	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'	Az.	

LAT. DIFF. (tenths of minutes of arc)

Az.		0.1'	0.2'	0.3'	0.4'	0.5'	0.6'	0.7'	0.8'	0.9'	Az.	
0	180	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0	180
5	175	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	5	175
10	170	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	10	170
15	165	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	15	165
19	161									0.9	19	161
20	160	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8		20	160
21	159							0.7	0.7		21	159
22	158							0.6			22	158
23	157						0.6				23	157
24	156						0.5				24	156
25	155	0.1	0.2	0.3	0.4	0.5	0.5	0.6	0.7	0.8	25	155
26	154					0.4					26	154
28	152				0.4						28	152
29	151				0.3						29	151
30	150	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8		30	150
33	147			0.3						0.8	33	147
34	146			0.2						0.7	34	146
35	145	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.7	0.7	35	145
36	144								0.6		36	144
38	142							0.6			38	142
39	141							0.5			39	141
40	140	0.1	0.2	0.2	0.3	0.4	0.5	0.5	0.6	0.7	40	140
41	139		0.2				0.5				41	139
42	138		0.1				0.4				42	138
43	137								0.7		43	137
44	136								0.6		44	136
45	135	0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.6	0.6	45	135
46	134					0.3			0.6		46	134
47	133								0.5		47	133
49	131						0.5				49	131
50	130	0.1	0.1	0.2	0.3	0.3	0.4	0.4	0.5	0.6	50	130
51	129				0.3						51	129
52	128				0.2				0.6		52	128
53	127									0.5	53	127
54	126					0.4					54	126
55	125	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.5		55	125
56	124						0.4				56	124
59	121	0.1			0.3					0.5	59	121
60	120	0.0	0.1	0.2	0.2	0.2	0.3	0.4	0.4	0.4	60	120
61	119			0.1				0.3			61	119
63	117								0.4		63	117
65	115	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.4	65	115
66	114							0.2		0.4	66	114
67	113				0.2					0.4	67	113
68	112				0.1					0.3	68	112
69	111						0.3			0.3	69	111
70	110	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	70	110
71	109								0.3		71	109
72	108				0.2			0.2			72	108
73	107				0.1				0.3		73	107
74	106								0.2		74	106
75	105	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	75	105
76	104		0.0			0.1					76	104
77	103							0.2			77	103
78	102							0.1			78	102
79	101								0.2		79	101
80	100	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	80	100
81	99			0.0						0.1	81	99
82	98				0.1						82	98
83	97				0.0						83	97
84	96					0.1					84	96
85	95	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	85	95
86	94							0.0	0.1	0.1	86	94
87	93								0.0		87	93
90	90	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	90	90
Az.		0.1'	0.2'	0.3'	0.4'	0.5'	0.6'	0.7'	0.8'	0.9'	Az.	

Azimuth angle greater than 90°:
 If DR latitude is greater than selected tabulated latitude, ΔL correction is *minus;* but for DR latitude less than selected tabulated latitude, the correction is *plus.*
Azimuth angle less than 90°:
 If DR latitude is greater than selected tabulated latitude, ΔL correction is *plus;* but for DR latitude less than selected tabulated latitude, the correction is *minus.*

ALTITUDE CORRECTION FOR D. R. LATITUDE

LATITUDE DIFFERENCE (minutes of arc)

Az.		16'	17'	18'	19'	20'	21'	22'	23'	24'	25'	26'	27'	28'	29'	30'
0	180	16.0	17.0	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0	27.0	28.0	29.0	30.0
1	179	16.0	17.0	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0	27.0	28.0	29.0	30.0
2	178	16.0	17.0	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0	27.0	28.0	29.0	30.0
3	177	16.0	17.0	18.0	19.0	20.0	21.0	22.0	23.0	24.0	25.0	26.0	27.0	28.0	29.0	30.0
4	176	16.0	17.0	18.0	19.0	20.0	20.9	21.9	22.9	23.9	24.9	25.9	26.9	27.9	28.9	29.9
5	175	15.9	16.9	17.9	18.9	19.9	20.9	21.9	22.9	23.9	24.9	25.9	26.9	27.9	28.9	29.8
6	174	15.9	16.9	17.9	18.9	19.9	20.9	21.9	22.9	23.9	24.9	25.9	26.9	27.8	28.8	29.8
7	173	15.9	16.9	17.9	18.9	19.9	20.8	21.8	22.8	23.8	24.8	25.8	26.8	27.8	28.8	29.8
8	172	15.8	16.8	17.8	18.8	19.8	20.8	21.8	22.8	23.8	24.8	25.7	26.7	27.7	28.7	29.7
9	171	15.8	16.8	17.8	18.8	19.8	20.7	21.7	22.7	23.7	24.7	25.7	26.7	27.7	28.6	29.6
10	170	15.8	16.7	17.7	18.7	19.7	20.7	21.7	22.7	23.6	24.6	25.6	26.6	27.6	28.6	29.5
11	169	15.7	16.7	17.7	18.7	19.6	20.6	21.6	22.6	23.6	24.5	25.5	26.5	27.5	28.5	29.4
12	168	15.7	16.6	17.6	18.6	19.6	20.5	21.5	22.5	23.5	24.5	25.4	26.4	27.4	28.4	29.3
13	167	15.6	16.6	17.5	18.5	19.5	20.5	21.4	22.4	23.4	24.4	25.3	26.3	27.3	28.3	29.2
14	166	15.5	16.5	17.5	18.4	19.4	20.4	21.3	22.3	23.3	24.3	25.2	26.2	27.2	28.1	29.1
15	165	15.5	16.4	17.4	18.4	19.3	20.3	21.3	22.2	23.2	24.1	25.1	26.1	27.0	28.0	29.0
16	164	15.4	16.3	17.3	18.3	19.2	20.2	21.1	22.1	23.1	24.0	25.0	26.0	26.9	27.9	28.8
17	163	15.3	16.3	17.2	18.2	19.1	20.1	21.0	22.0	23.0	23.9	24.9	25.8	26.8	27.7	28.7
18	162	15.2	16.2	17.1	18.1	19.0	20.0	20.9	21.8	22.8	23.8	24.7	25.7	26.6	27.5	28.5
19	161	15.1	16.1	17.0	18.0	18.9	19.9	20.8	21.7	22.7	23.6	24.6	25.5	26.5	27.4	28.4
20	160	15.0	16.0	16.9	17.9	18.8	19.7	20.7	21.6	22.6	23.5	24.4	25.4	26.3	27.3	28.2
21	159	14.9	15.9	16.8	17.7	18.7	19.6	20.5	21.5	22.4	23.3	24.3	25.2	26.1	27.1	28.0
22	158	14.8	15.8	16.7	17.6	18.5	19.5	20.4	21.3	22.3	23.2	24.1	25.0	26.0	26.9	27.8
23	157	14.7	15.6	16.6	17.5	18.4	19.3	20.3	21.2	22.1	23.0	23.9	24.9	25.8	26.7	27.6
24	156	14.6	15.5	16.4	17.4	18.3	19.2	20.1	21.0	21.9	22.8	23.8	24.7	25.6	26.5	27.4
25	155	14.5	15.4	16.3	17.2	18.1	19.0	19.9	20.8	21.8	22.7	23.6	24.5	25.4	26.3	27.2
26	154	14.4	15.3	16.2	17.1	18.0	18.9	19.8	20.7	21.6	22.5	23.4	24.3	25.2	26.1	27.0
27	153	14.3	15.1	16.0	16.9	17.8	18.7	19.6	20.5	21.4	22.3	23.2	24.1	24.9	25.8	26.7
28	152	14.1	15.0	15.9	16.8	17.7	18.5	19.4	20.3	21.2	22.1	23.0	23.8	24.7	25.6	26.5
29	151	14.0	14.9	15.7	16.6	17.5	18.4	19.2	20.1	21.0	21.9	22.7	23.6	24.5	25.4	26.2
30	150	13.9	14.7	15.6	16.5	17.3	18.2	19.1	19.9	20.8	21.7	22.5	23.4	24.2	25.1	26.0
31	149	13.7	14.6	15.4	16.3	17.1	18.0	18.9	19.7	20.6	21.4	22.3	23.1	24.0	24.9	25.7
32	148	13.6	14.4	15.3	16.1	17.0	17.8	18.7	19.5	20.4	21.2	22.0	22.9	23.7	24.6	25.4
33	147	13.4	14.3	15.1	15.9	16.8	17.6	18.5	19.3	20.1	21.0	21.8	22.6	23.5	24.3	25.2
34	146	13.3	14.1	14.9	15.8	16.6	17.4	18.2	19.1	19.9	20.7	21.6	22.4	23.2	24.0	24.9
35	145	13.1	13.9	14.7	15.6	16.4	17.2	18.0	18.8	19.7	20.5	21.3	22.1	22.9	23.8	24.6
36	144	12.9	13.8	14.6	15.4	16.2	17.0	17.8	18.6	19.4	20.2	21.0	21.8	22.7	23.5	24.3
37	143	12.8	13.6	14.4	15.2	16.0	16.8	17.6	18.4	19.2	20.0	20.8	21.6	22.4	23.2	24.0
38	142	12.6	13.4	14.2	15.0	15.8	16.5	17.3	18.1	18.9	19.7	20.5	21.3	22.1	22.9	23.6
39	141	12.4	13.2	14.0	14.8	15.5	16.3	17.1	17.9	18.7	19.4	20.2	21.0	21.8	22.5	23.3
40	140	12.3	13.0	13.8	14.6	15.3	16.1	16.9	17.6	18.4	19.2	19.9	20.7	21.4	22.2	23.0
41	139	12.1	12.8	13.6	14.3	15.1	15.8	16.6	17.4	18.1	18.9	19.6	20.4	21.1	21.9	22.6
42	138	11.9	12.6	13.4	14.1	14.9	15.6	16.3	17.1	17.8	18.6	19.3	20.1	20.8	21.6	22.3
43	137	11.7	12.4	13.2	13.9	14.6	15.4	16.1	16.8	17.6	18.3	19.0	19.7	20.5	21.2	21.9
44	136	11.5	12.2	13.0	13.7	14.4	15.1	15.8	16.5	17.3	18.0	18.7	19.4	20.1	20.9	21.6
45	135	11.3	12.0	12.7	13.4	14.1	14.8	15.6	16.3	17.0	17.7	18.4	19.1	19.8	20.5	21.2
46	134	11.1	11.8	12.5	13.2	13.9	14.6	15.3	16.0	16.7	17.4	18.1	18.8	19.5	20.1	20.8
47	133	10.9	11.6	12.3	13.0	13.6	14.3	15.0	15.7	16.4	17.1	17.7	18.4	19.1	19.8	20.5
48	132	10.7	11.4	12.0	12.7	13.4	14.1	14.7	15.4	16.1	16.7	17.4	18.1	18.7	19.4	20.1
49	131	10.5	11.2	11.8	12.5	13.1	13.8	14.4	15.1	15.7	16.4	17.1	17.7	18.4	19.0	19.7
50	130	10.3	10.9	11.6	12.2	12.9	13.5	14.1	14.8	15.4	16.1	16.7	17.4	18.0	18.6	19.3
51	129	10.1	10.7	11.3	12.0	12.6	13.2	13.8	14.5	15.1	15.7	16.4	17.0	17.6	18.3	18.9
52	128	9.9	10.5	11.1	11.7	12.3	12.9	13.5	14.2	14.8	15.4	16.0	16.6	17.2	17.9	18.5
53	127	9.6	10.2	10.8	11.4	12.0	12.6	13.2	13.8	14.4	15.0	15.6	16.2	16.9	17.5	18.1
54	126	9.4	10.0	10.6	11.2	11.8	12.3	12.9	13.5	14.1	14.7	15.3	15.9	16.5	17.0	17.6
55	125	9.2	9.8	10.3	10.9	11.5	12.0	12.6	13.2	13.8	14.3	14.9	15.5	16.1	16.6	17.2
56	124	8.9	9.5	10.1	10.6	11.2	11.7	12.3	12.9	13.4	14.0	14.5	15.1	15.7	16.2	16.8
57	123	8.7	9.3	9.8	10.3	10.9	11.4	12.0	12.5	13.1	13.6	14.2	14.7	15.2	15.8	16.3
58	122	8.5	9.0	9.5	10.1	10.6	11.1	11.7	12.2	12.7	13.2	13.8	14.3	14.8	15.4	15.9
59	121	8.2	8.8	9.3	9.8	10.3	10.8	11.3	11.8	12.4	12.9	13.4	13.9	14.4	14.9	15.5
60	120	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0
61	119	7.8	8.2	8.7	9.2	9.7	10.2	10.7	11.2	11.6	12.1	12.6	13.1	13.6	14.1	14.5
62	118	7.5	8.0	8.5	8.9	9.4	9.9	10.3	10.8	11.3	11.7	12.2	12.7	13.1	13.6	14.1
63	117	7.3	7.7	8.2	8.6	9.1	9.5	10.0	10.4	10.9	11.3	11.8	12.3	12.7	13.2	13.6
64	116	7.0	7.5	7.9	8.3	8.8	9.2	9.6	10.1	10.5	11.0	11.4	11.8	12.3	12.7	13.2
65	115	6.8	7.2	7.6	8.0	8.5	8.9	9.3	9.7	10.1	10.6	11.0	11.4	11.8	12.3	12.7
66	114	6.5	6.9	7.3	7.7	8.1	8.5	8.9	9.4	9.8	10.2	10.6	11.0	11.4	11.8	12.2
67	113	6.3	6.6	7.0	7.4	7.8	8.2	8.6	9.0	9.4	9.8	10.2	10.5	10.9	11.3	11.7
68	112	6.0	6.4	6.7	7.1	7.5	7.9	8.2	8.6	9.0	9.4	9.7	10.1	10.5	10.9	11.2
69	111	5.7	6.1	6.5	6.8	7.2	7.5	7.9	8.2	8.6	9.0	9.3	9.7	10.0	10.4	10.8
70	110	5.5	5.8	6.2	6.5	6.8	7.2	7.5	7.9	8.2	8.6	9.0	9.2	9.6	9.9	10.3
71	109	5.2	5.5	5.9	6.2	6.5	6.8	7.2	7.5	7.8	8.1	8.5	8.8	9.1	9.4	9.8
72	108	4.9	5.3	5.6	5.9	6.2	6.5	6.8	7.1	7.4	7.7	8.0	8.3	8.7	9.0	9.3
73	107	4.7	5.0	5.3	5.6	5.8	6.1	6.4	6.7	7.0	7.3	7.6	7.9	8.2	8.5	8.8
74	106	4.4	4.7	5.0	5.2	5.5	5.8	6.1	6.3	6.6	6.9	7.2	7.4	7.7	8.0	8.3
75	105	4.1	4.4	4.7	4.9	5.2	5.4	5.7	6.0	6.2	6.5	6.7	7.0	7.2	7.5	7.8
76	104	3.9	4.1	4.4	4.6	4.8	5.1	5.3	5.6	5.8	6.0	6.3	6.5	6.8	7.0	7.3
77	103	3.6	3.8	4.0	4.3	4.5	4.7	5.0	5.2	5.4	5.6	5.8	6.1	6.3	6.5	6.7
78	102	3.3	3.5	3.7	4.0	4.2	4.4	4.6	4.8	5.0	5.2	5.4	5.6	5.8	6.0	6.2
79	101	3.0	3.2	3.4	3.6	3.8	4.0	4.2	4.4	4.6	4.8	5.0	5.2	5.3	5.5	5.7
80	100	2.8	3.0	3.1	3.3	3.5	3.6	3.8	4.0	4.2	4.3	4.5	4.7	4.9	5.0	5.2
81	99	2.5	2.7	2.8	3.0	3.1	3.3	3.4	3.6	3.8	3.9	4.1	4.2	4.4	4.5	4.7
82	98	2.2	2.4	2.5	2.6	2.8	2.9	3.1	3.2	3.3	3.5	3.6	3.8	3.9	4.0	4.2
83	97	1.9	2.1	2.2	2.3	2.4	2.6	2.7	2.8	2.9	3.0	3.2	3.3	3.4	3.5	3.7
84	96	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.1
85	95	1.4	1.5	1.6	1.7	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.4	2.5	2.6
86	94	1.1	1.2	1.3	1.3	1.4	1.5	1.5	1.6	1.7	1.7	1.8	1.9	2.0	2.0	2.1
87	93	0.8	0.9	0.9	1.0	1.0	1.1	1.2	1.2	1.3	1.3	1.4	1.4	1.5	1.5	1.6
88	92	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.0
89	91	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5
90	90	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Az.		16'	17'	18'	19'	20'	21'	22'	23'	24'	25'	26'	27'	28'	29'	30'

LAT. DIFF. (tenths of minutes of arc)

Az.		0.1'	0.2'	0.3'	0.4'	0.5'	0.6'	0.7'	0.8'	0.9'
0	180	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
5	175	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
10	170	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
15	165	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
19	161									0.9
20	160	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.8
21	159							0.7	0.7	
22	158						0.6	0.6		
23	157						0.6			
24	156						0.5			
25	155	0.1	0.2	0.3	0.4	0.5	0.5	0.6	0.7	0.8
26	154					0.4				
28	152				0.4					
29	151				0.3					
30	150	0.1	0.2	0.3	0.3	0.4	0.5	0.6	0.7	0.8
32	148			0.3						
33	147			0.2						0.8
34	146			0.2						0.7
35	145	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.7	0.7
36	144							0.6		
38	142						0.6			
39	141						0.5			
40	140	0.1	0.2	0.2	0.3	0.4	0.5	0.5	0.6	0.7
41	139		0.2				0.5			
42	138		0.1				0.4			
43	137									0.7
44	136									0.6
45	135	0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.6	0.6
46	134					0.3			0.6	
47	133								0.5	
49	131							0.5		
50	130	0.1	0.1	0.2	0.3	0.3	0.4	0.4	0.5	0.6
51	129					0.3				
52	128					0.2				0.6
53	127									0.5
54	126						0.4			
55	125	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.5	0.5
56	124								0.4	
59	121	0.1				0.3				0.5
60	120	0.0	0.1	0.2	0.2	0.2	0.3	0.4	0.4	0.4
61	119				0.1			0.3		
64	116						0.4			
65	115	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.4
66	114						0.2			
67	113				0.2					0.4
68	112				0.1					0.3
69	111						0.3			
70	110	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3
71	109								0.3	
72	108						0.2		0.2	
73	107						0.1			0.3
74	106									0.2
75	105	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
76	104		0.0					0.1		
77	103							0.2		
78	102							0.1		
79	101								0.2	
80	100	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2
81	99		0.0							0.1
82	98			0.1						
83	97			0.0						
84	96				0.1					
85	95	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
86	94						0.0	0.0	0.1	0.1
87	93								0.0	0.0
90	90	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Az.		0.1'	0.2'	0.3'	0.4'	0.5'	0.6'	0.7'	0.8'	0.9'

Azimuth angle greater than 90°:
   If DR latitude is greater than selected tabulated latitude, ΔL correction is *minus*; but for DR latitude less than selected tabulated latitude, the correction is *plus*.
Azimuth angle less than 90°:
   If DR latitude is greater than selected tabulated latitude, ΔL correction is *plus*; but for DR latitude less than selected tabulated latitude, the correction is *minus*.

MULTIPLICATION TABLE

DEC. DIFF. OR H. A. DIFF. (minutes of arc)

Δ	1'	2'	3'	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'
01	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2
2	.0	.0	.1	.1	.1	.1	.1	.2	.2	.2	.2	.2	.3	.3	.3
3	.0	.1	.1	.1	.2	.2	.2	.2	.3	.3	.3	.4	.4	.4	.5
4	.0	.1	.1	.2	.2	.2	.3	.3	.3	.4	.4	.5	.5	.6	.6
05	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.8
6	.1	.1	.2	.2	.3	.4	.4	.5	.5	.6	.7	.7	.8	.8	.9
7	.1	.1	.2	.3	.4	.4	.5	.6	.6	.7	.8	.9	1.0	1.0	1.1
8	.1	.2	.2	.3	.4	.5	.6	.6	.7	.8	.9	1.0	1.1	1.1	1.2
9	.1	.2	.3	.4	.5	.5	.6	.7	.8	.9	1.0	1.1	1.2	1.3	1.4
10	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5
1	.1	.2	.3	.4	.6	.7	.8	.9	1.0	1.1	1.2	1.3	1.4	1.5	1.7
2	.1	.2	.4	.5	.6	.7	.8	1.0	1.1	1.2	1.3	1.4	1.6	1.7	1.8
3	.1	.3	.4	.5	.7	.8	.9	1.0	1.2	1.3	1.4	1.6	1.7	1.8	2.0
4	.1	.3	.4	.6	.7	.8	1.0	1.1	1.3	1.4	1.5	1.7	1.8	2.0	2.1
15	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4	1.5	1.7	1.8	2.0	2.1	2.3
6	.2	.3	.5	.6	.8	1.0	1.1	1.3	1.4	1.6	1.8	1.9	2.1	2.2	2.4
7	.2	.3	.5	.7	.9	1.0	1.2	1.4	1.5	1.7	1.9	2.0	2.2	2.4	2.6
8	.2	.4	.5	.7	.9	1.1	1.3	1.4	1.6	1.8	2.0	2.2	2.3	2.5	2.7
9	.2	.4	.6	.8	1.0	1.1	1.3	1.5	1.7	1.9	2.1	2.3	2.5	2.7	2.9
20	0.2	0.4	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6	2.8	3.0
1	.2	.4	.6	.8	1.1	1.3	1.5	1.7	1.9	2.1	2.3	2.5	2.7	2.9	3.2
2	.2	.4	.7	.9	1.1	1.3	1.5	1.8	2.0	2.2	2.4	2.6	2.9	3.1	3.3
3	.2	.5	.7	.9	1.2	1.4	1.6	1.8	2.1	2.3	2.5	2.8	3.0	3.2	3.5
4	.2	.5	.7	1.0	1.2	1.4	1.7	1.9	2.2	2.4	2.6	2.9	3.1	3.4	3.6
25	0.3	0.5	0.8	1.0	1.3	1.5	1.8	2.0	2.3	2.5	2.8	3.0	3.3	3.5	3.8
6	.3	.5	.8	1.0	1.3	1.6	1.8	2.1	2.3	2.6	2.9	3.1	3.4	3.6	3.9
7	.3	.5	.8	1.1	1.4	1.6	1.9	2.2	2.4	2.7	3.0	3.2	3.5	3.8	4.1
8	.3	.6	.8	1.1	1.4	1.7	2.0	2.2	2.5	2.8	3.1	3.4	3.6	3.9	4.2
9	.3	.6	.9	1.2	1.5	1.7	2.0	2.3	2.6	2.9	3.2	3.5	3.8	4.1	4.4
30	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7	3.0	3.3	3.6	3.9	4.2	4.5
1	.3	.6	.9	1.2	1.6	1.9	2.2	2.5	2.8	3.1	3.4	3.7	4.0	4.3	4.7
2	.3	.6	1.0	1.3	1.6	1.9	2.2	2.6	2.9	3.2	3.5	3.8	4.2	4.5	4.8
3	.3	.7	1.0	1.3	1.7	2.0	2.3	2.6	3.0	3.3	3.6	4.0	4.3	4.6	5.0
4	.3	.7	1.0	1.4	1.7	2.0	2.4	2.7	3.1	3.4	3.7	4.1	4.4	4.8	5.1
35	0.4	0.7	1.1	1.4	1.8	2.1	2.5	2.8	3.2	3.5	3.9	4.2	4.6	4.9	5.3
6	.4	.7	1.1	1.4	1.8	2.2	2.5	2.9	3.2	3.6	4.0	4.3	4.7	5.0	5.4
7	.4	.7	1.1	1.5	1.9	2.2	2.6	3.0	3.3	3.7	4.1	4.4	4.8	5.2	5.6
8	.4	.8	1.1	1.5	1.9	2.3	2.7	3.0	3.4	3.8	4.2	4.6	4.9	5.3	5.7
9	.4	.8	1.2	1.6	2.0	2.3	2.7	3.1	3.5	3.9	4.3	4.7	5.1	5.5	5.9
40	0.4	0.8	1.2	1.6	2.0	2.4	2.8	3.2	3.6	4.0	4.4	4.8	5.2	5.6	6.0
1	.4	.8	1.2	1.6	2.1	2.5	2.9	3.3	3.7	4.1	4.5	5.0	5.3	5.7	6.2
2	.4	.8	1.3	1.7	2.1	2.5	2.9	3.4	3.8	4.2	4.6	5.0	5.5	5.9	6.3
3	.4	.9	1.3	1.7	2.2	2.6	3.0	3.4	3.9	4.3	4.7	5.2	5.6	6.0	6.5
4	.4	.9	1.3	1.8	2.2	2.6	3.1	3.5	4.0	4.4	4.8	5.3	5.7	6.2	6.6
45	0.5	0.9	1.4	1.8	2.3	2.7	3.2	3.6	4.1	4.5	5.0	5.4	5.9	6.3	6.8
6	.5	.9	1.4	1.8	2.3	2.8	3.3	3.7	4.1	4.6	5.1	5.5	6.0	6.4	6.9
7	.5	1.0	1.4	1.9	2.4	2.8	3.3	3.8	4.2	4.7	5.2	5.6	6.1	6.6	7.1
8	.5	1.0	1.4	1.9	2.4	2.9	3.4	3.8	4.3	4.8	5.3	5.8	6.2	6.7	7.2
9	.5	1.0	1.5	2.0	2.5	2.9	3.4	3.9	4.4	4.9	5.4	5.9	6.4	6.9	7.4
50	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5
1	.5	1.0	1.5	2.0	2.6	3.1	3.6	4.1	4.6	5.1	5.6	6.1	6.6	7.1	7.7
2	.5	1.0	1.6	2.1	2.6	3.1	3.6	4.2	4.7	5.2	5.7	6.2	6.8	7.3	7.8
3	.5	1.1	1.6	2.1	2.7	3.2	3.7	4.2	4.8	5.3	5.8	6.4	6.9	7.4	8.0
4	.5	1.1	1.6	2.2	2.7	3.2	3.8	4.3	4.9	5.4	5.9	6.5	7.0	7.6	8.1
55	0.6	1.1	1.7	2.2	2.8	3.3	3.9	4.4	5.0	5.5	6.1	6.6	7.2	7.7	8.3
6	.6	1.1	1.7	2.2	2.8	3.4	3.9	4.5	5.0	5.6	6.2	6.7	7.3	7.8	8.4
7	.6	1.1	1.7	2.3	2.9	3.4	4.0	4.6	5.1	5.7	6.3	6.8	7.4	8.0	8.6
8	.6	1.2	1.7	2.3	2.9	3.5	4.1	4.6	5.2	5.8	6.4	7.0	7.5	8.1	8.7
9	.6	1.2	1.8	2.4	3.0	3.5	4.1	4.7	5.3	5.9	6.5	7.1	7.7	8.3	8.9
60	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8	5.4	6.0	6.6	7.2	7.8	8.4	9.0
1	.6	1.2	1.8	2.4	3.1	3.7	4.3	4.9	5.5	6.1	6.7	7.3	7.9	8.5	9.2
2	.6	1.2	1.9	2.5	3.1	3.7	4.3	5.0	5.6	6.2	6.8	7.4	8.1	8.7	9.3
3	.6	1.3	1.9	2.5	3.2	3.8	4.4	5.0	5.7	6.3	6.9	7.6	8.2	8.8	9.5
4	.6	1.3	1.9	2.6	3.2	3.8	4.5	5.1	5.8	6.4	7.0	7.7	8.3	9.0	9.6
65	0.7	1.3	2.0	2.6	3.3	3.9	4.6	5.2	5.9	6.5	7.2	7.8	8.5	9.1	9.8
6	.7	1.3	2.0	2.6	3.3	4.0	4.6	5.3	5.9	6.6	7.3	7.9	8.6	9.2	9.9
7	.7	1.3	2.0	2.7	3.4	4.0	4.7	5.4	6.0	6.7	7.4	8.0	8.7	9.4	10.1
8	.7	1.4	2.0	2.7	3.4	4.1	4.8	5.4	6.1	6.8	7.5	8.2	8.8	9.5	10.2
9	.7	1.4	2.1	2.8	3.5	4.1	4.8	5.5	6.2	6.9	7.6	8.3	9.0	9.7	10.4
70	0.7	1.4	2.1	2.8	3.5	4.2	4.9	5.6	6.3	7.0	7.7	8.4	9.1	9.8	10.5
1	.7	1.4	2.1	2.8	3.6	4.3	5.0	5.7	6.4	7.1	7.8	8.5	9.2	9.9	10.7
2	.7	1.4	2.2	2.9	3.6	4.3	5.0	5.8	6.5	7.2	7.9	8.6	9.4	10.1	10.8
3	.7	1.5	2.2	2.9	3.7	4.4	5.1	5.8	6.6	7.3	8.0	8.8	9.5	10.2	11.0
4	.7	1.5	2.2	3.0	3.7	4.4	5.2	5.9	6.7	7.4	8.1	8.9	9.6	10.4	11.1
75	0.8	1.5	2.3	3.0	3.8	4.5	5.3	6.0	6.8	7.5	8.3	9.0	9.8	10.5	11.3
6	.8	1.5	2.3	3.0	3.8	4.6	5.3	6.1	6.8	7.6	8.4	9.1	9.9	10.6	11.4
7	.8	1.5	2.3	3.1	3.9	4.6	5.4	6.2	6.9	7.7	8.5	9.2	10.0	10.8	11.6
8	.8	1.6	2.3	3.1	3.9	4.7	5.5	6.2	7.0	7.8	8.6	9.4	10.1	10.9	11.7
9	.8	1.6	2.4	3.2	4.0	4.7	5.5	6.3	7.1	7.9	8.7	9.5	10.3	11.1	11.9
80	0.8	1.6	2.4	3.2	4.0	4.8	5.6	6.4	7.2	8.0	8.8	9.6	10.4	11.2	12.0
1	.8	1.6	2.4	3.2	4.1	4.9	5.7	6.5	7.3	8.1	8.9	9.7	10.5	11.3	12.2
2	.8	1.6	2.5	3.3	4.1	4.9	5.7	6.6	7.4	8.2	9.0	9.8	10.7	11.5	12.3
3	.8	1.7	2.5	3.3	4.2	5.0	5.8	6.6	7.5	8.3	9.1	10.0	10.8	11.6	12.5
4	.8	1.7	2.5	3.4	4.2	5.0	5.9	6.7	7.6	8.4	9.2	10.1	10.9	11.8	12.6
85	0.9	1.7	2.6	3.4	4.3	5.1	6.0	6.8	7.7	8.5	9.4	10.2	11.1	11.9	12.8
6	.9	1.7	2.6	3.4	4.3	5.2	6.0	6.9	7.7	8.6	9.5	10.3	11.2	12.0	12.9
7	.9	1.7	2.6	3.5	4.4	5.2	6.1	7.0	7.8	8.7	9.6	10.4	11.3	12.2	13.1
8	.9	1.8	2.6	3.5	4.4	5.3	6.2	7.0	7.9	8.8	9.7	10.6	11.4	12.3	13.2
9	.9	1.8	2.7	3.6	4.5	5.3	6.2	7.1	8.0	8.9	9.8	10.7	11.6	12.5	13.4
90	0.9	1.8	2.7	3.6	4.5	5.4	6.3	7.2	8.1	9.0	9.9	10.8	11.7	12.6	13.5
1	.9	1.8	2.7	3.6	4.6	5.5	6.4	7.3	8.2	9.1	10.0	10.9	11.8	12.7	13.6
2	.9	1.8	2.8	3.7	4.6	5.5	6.4	7.4	8.3	9.2	10.1	11.0	12.0	12.9	13.8
3	.9	1.9	2.8	3.7	4.7	5.6	6.5	7.4	8.4	9.3	10.2	11.2	12.1	13.0	14.0
4	.9	1.9	2.8	3.8	4.7	5.6	6.6	7.5	8.5	9.4	10.3	11.3	12.2	13.2	14.1
95	1.0	1.9	2.9	3.8	4.8	5.7	6.7	7.6	8.6	9.5	10.5	11.4	12.4	13.3	14.3
6	1.0	1.9	2.9	3.8	4.8	5.8	6.7	7.7	8.6	9.6	10.6	11.5	12.5	13.4	14.4
7	1.0	1.9	2.9	3.9	4.8	5.8	6.8	7.7	8.7	9.7	10.7	11.6	12.6	13.6	14.6
8	1.0	2.0	2.9	3.9	4.9	5.9	6.9	7.8	8.8	9.8	10.8	11.8	12.7	13.7	14.7
99	1.0	2.0	3.0	4.0	5.0	5.9	6.9	7.9	8.9	9.9	10.9	11.9	12.9	13.9	14.9
Δ	1'	2'	3'	4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'

DEC. DIFF. OR H. A. DIFF. (tenths of minutes)

Δ	0.1'	0.2'	0.3'	0.4'	0.5'	0.6'	0.7'	0.8'	0.9'
01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
05	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
15	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
20	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2
25	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
30	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3
35	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3
40	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4
45	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4
50	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5
55	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5
60	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.5
65	0.1	0.1	0.2	0.3	0.3	0.4	0.5	0.5	0.6
70	0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.6	0.6
75	0.1	0.2	0.2	0.3	0.4	0.5	0.5	0.6	0.7
80	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.6	0.7
85	0.1	0.2	0.3	0.3	0.4	0.5	0.6	0.7	0.8
90	0.1	0.2	0.3	0.4	0.5	0.6	0.6	0.7	0.8
95	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Δ	0.1'	0.2'	0.3'	0.4'	0.5'	0.6'	0.7'	0.8'	0.9'

Δd or Δt

MULTIPLICATION TABLE

Δ	16'	17'	18'	19'	20'	21'	22'	23'	24'	25'	26'	27'	28'	29'	30'	Δ	0.1'	0.2'	0.3'	0.4'	0.5'	0.6'	0.7'	0.8'	0.9'	Δ
						DEC. DIFF. OR H. A. DIFF. (minutes of arc)												DEC. DIFF. OR H. A. DIFF. (tenths of minutes)								
01	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	01
2	.3	.3	.4	.4	.4	.4	.4	.5	.5	.5	.5	.6	.6	.6	.6	2										2
3	.5	.5	.5	.6	.6	.6	.7	.7	.7	.8	.8	.8	.8	.9	.9	3										3
4	.6	.7	.7	.8	.8	.8	.9	.9	1.0	1.0	1.0	1.1	1.1	1.2	1.2	4										4
05	0.8	0.9	0.9	1.0	1.0	1.1	1.1	1.2	1.2	1.3	1.3	1.4	1.4	1.5	1.5	05	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	05
6	1.0	1.0	1.1	1.1	1.2	1.3	1.3	1.4	1.4	1.5	1.6	1.6	1.7	1.7	1.8	6								0.0	0.1	6
7	1.1	1.2	1.3	1.3	1.4	1.5	1.5	1.6	1.6	1.8	1.8	1.9	2.0	2.0	2.1	7							0.0	0.1		7
8	1.3	1.4	1.4	1.5	1.6	1.7	1.8	1.8	1.9	2.0	2.1	2.2	2.2	2.3	2.4	8						0.0	0.1			8
9	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.3	2.4	2.5	2.6	2.7	9						0.1				9
10	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0	10	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	10
1	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.8	2.9	3.0	3.1	3.2	3.3	1										1
2	1.9	2.0	2.2	2.3	2.4	2.5	2.6	2.8	2.9	3.0	3.1	3.2	3.4	3.5	3.6	2				0.0						2
3	2.1	2.2	2.3	2.5	2.6	2.7	2.9	3.0	3.1	3.3	3.4	3.5	3.6	3.9	3.9	3				0.1						3
4	2.2	2.4	2.5	2.7	2.8	2.9	3.1	3.2	3.4	3.5	3.6	3.8	3.9	4.1	4.2	4										4
15	2.4	2.6	2.7	2.9	3.0	3.2	3.3	3.5	3.6	3.8	3.9	4.1	4.2	4.4	4.5	15	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	15
6	2.6	2.7	2.9	3.0	3.2	3.4	3.5	3.7	3.8	4.0	4.2	4.3	4.5	4.6	4.8	6			0.0						0.1	6
7	2.7	2.9	3.1	3.2	3.4	3.6	3.7	3.9	4.1	4.3	4.4	4.6	4.8	4.9	5.1	7			0.1						0.2	7
8	2.9	3.1	3.2	3.4	3.6	3.8	4.0	4.1	4.3	4.5	4.7	4.9	5.0	5.2	5.4	8								0.1		8
9	3.0	3.2	3.4	3.6	3.8	4.0	4.2	4.4	4.6	4.8	4.9	5.1	5.3	5.5	5.7	9								0.2		9
20	3.2	3.4	3.6	3.8	4.0	4.2	4.4	4.6	4.8	5.0	5.2	5.4	5.6	5.8	6.0	20	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	20
1	3.4	3.6	3.8	4.0	4.2	4.4	4.6	4.8	5.0	5.3	5.5	5.7	5.9	6.1	6.3	1							0.1			1
2	3.5	3.7	4.0	4.2	4.4	4.6	4.8	5.1	5.3	5.5	5.7	5.9	6.2	6.4	6.6	2							0.2			2
3	3.7	3.9	4.1	4.3	4.6	4.8	5.1	5.3	5.5	5.7	6.0	6.2	6.4	6.7	6.9	3						0.1				3
4	3.8	4.1	4.3	4.6	4.8	5.0	5.3	5.5	5.8	6.0	6.2	6.5	6.7	7.0	7.2	4										4
25	4.0	4.3	4.5	4.8	5.0	5.3	5.5	5.8	6.0	6.3	6.5	6.8	7.0	7.3	7.5	25	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	25
6	4.2	4.4	4.7	4.9	5.2	5.5	5.7	6.0	6.2	6.5	6.8	7.0	7.3	7.5	7.8	6										6
7	4.3	4.6	4.9	5.1	5.4	5.7	5.9	6.2	6.5	6.8	7.0	7.3	7.6	7.8	8.1	7									0.2	7
8	4.5	4.8	5.0	5.3	5.6	5.9	6.2	6.4	6.7	7.0	7.3	7.6	7.8	8.1	8.4	8				0.1					0.3	8
9	4.6	4.9	5.2	5.5	5.8	6.1	6.4	6.7	7.0	7.3	7.5	7.8	8.1	8.4	8.7	9										9
30	4.8	5.1	5.4	5.7	6.0	6.3	6.6	6.9	7.2	7.5	7.8	8.1	8.4	8.7	9.0	30	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	30
1	5.0	5.3	5.6	5.9	6.2	6.5	6.8	7.1	7.4	7.8	8.0	8.4	8.7	9.0	9.3	1								0.2		1
2	5.1	5.4	5.8	6.1	6.4	6.7	7.0	7.4	7.7	8.0	8.3	8.6	9.0	9.3	9.6	2								0.3		2
3	5.3	5.6	5.9	6.3	6.6	6.9	7.3	7.6	7.9	8.3	8.6	8.9	9.2	9.6	9.9	3										3
4	5.4	5.8	6.1	6.5	6.8	7.1	7.5	7.8	8.2	8.5	8.8	9.2	9.5	9.9	10.2	4										4
35	5.6	6.0	6.3	6.7	7.0	7.4	7.7	8.1	8.4	8.8	9.1	9.5	9.8	10.2	10.5	35	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	35
6	5.8	6.1	6.5	6.8	7.2	7.6	7.9	8.3	8.6	9.0	9.4	9.7	10.1	10.4	10.8	6							0.3			6
7	5.9	6.3	6.7	7.0	7.4	7.8	8.1	8.5	8.9	9.3	9.6	10.0	10.4	10.7	11.1	7					0.1					7
8	6.1	6.5	6.8	7.2	7.6	8.0	8.4	8.7	9.1	9.5	9.9	10.3	10.6	11.0	11.4	8					0.2			0.3		8
9	6.2	6.6	7.0	7.4	7.8	8.2	8.6	9.0	9.4	9.8	10.1	10.5	10.9	11.3	11.7	9								0.4		9
40	6.4	6.8	7.2	7.6	8.0	8.4	8.8	9.2	9.6	10.0	10.4	10.8	11.2	11.6	12.0	40	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	40
1	6.6	7.0	7.4	7.8	8.2	8.6	9.0	9.4	9.8	10.3	10.7	11.1	11.5	11.9	12.3	1						0.2				1
2	6.7	7.1	7.6	8.0	8.4	8.8	9.2	9.7	10.1	10.5	10.9	11.3	11.8	12.2	12.6	2						0.3		0.3		2
3	6.8	7.3	7.7	8.1	8.6	9.0	9.5	9.9	10.3	10.8	11.1	11.6	12.0	12.5	12.9	3								0.4		3
4	7.0	7.5	7.9	8.4	8.8	9.2	9.7	10.1	10.6	11.0	11.4	11.9	12.3	12.8	13.2	4										4
45	7.2	7.7	8.1	8.6	9.0	9.5	9.9	10.4	10.8	11.3	11.7	12.2	12.6	13.1	13.5	45	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	45
6	7.4	7.8	8.3	8.7	9.2	9.7	10.1	10.6	11.0	11.5	12.0	12.4	12.9	13.3	13.8	6										6
7	7.5	8.0	8.5	8.9	9.4	9.9	10.3	10.8	11.3	11.8	12.2	12.7	13.2	13.6	14.1	7										7
8	7.7	8.2	8.6	9.1	9.6	10.1	10.6	11.0	11.5	12.0	12.5	13.0	13.4	13.9	14.4	8										8
9	7.8	8.3	8.8	9.3	9.8	10.3	10.8	11.3	11.8	12.3	12.7	13.2	13.7	14.2	14.7	9			0.1		0.2				0.4	9
50	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	50	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	50
1	8.2	8.7	9.2	9.7	10.2	10.7	11.2	11.7	12.2	12.8	13.3	13.8	14.3	14.8	15.3	1										1
2	8.3	8.8	9.4	9.9	10.4	10.9	11.4	12.0	12.5	13.0	13.5	14.0	14.6	15.1	15.6	2										2
3	8.5	9.0	9.5	10.1	10.6	11.1	11.7	12.2	12.7	13.3	13.8	14.3	14.8	15.4	15.9	3										3
4	8.6	9.2	9.7	10.3	10.8	11.3	11.9	12.4	13.0	13.5	14.0	14.6	15.1	15.7	16.2	4										4
55	8.8	9.4	9.9	10.5	11.0	11.6	12.1	12.7	13.2	13.8	14.3	14.9	15.4	16.0	16.5	55	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	55
6	9.0	9.5	10.1	10.6	11.2	11.8	12.3	12.9	13.4	14.0	14.6	15.1	15.7	16.2	16.8	6								0.4		6
7	9.1	9.7	10.3	10.8	11.4	12.0	12.5	13.1	13.7	14.3	14.8	15.4	16.0	16.5	17.1	7								0.5		7
8	9.3	9.9	10.4	11.0	11.6	12.2	12.8	13.3	13.9	14.5	15.1	15.7	16.2	16.8	17.4	8					0.3					8
9	9.4	10.0	10.6	11.2	11.8	12.4	13.0	13.6	14.2	14.8	15.3	15.9	16.5	17.1	17.7	9					0.4					9
60	9.6	10.2	10.8	11.4	12.0	12.6	13.2	13.8	14.4	15.0	15.6	16.2	16.8	17.4	18.0	60	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.5	60
1	9.8	10.4	11.0	11.6	12.2	12.8	13.4	14.0	14.6	15.3	15.9	16.5	17.1	17.7	18.3	1									0.5	1
2	9.9	10.5	11.2	11.8	12.4	13.0	13.6	14.3	14.9	15.5	16.1	16.7	17.4	18.0	18.6	2				0.2					0.6	2
3	10.1	10.7	11.3	12.0	12.6	13.2	13.9	14.5	15.1	15.8	16.4	17.0	17.6	18.3	18.9	3				0.3						3
4	10.2	10.9	11.5	12.2	12.8	13.4	14.1	14.7	15.4	16.0	16.6	17.3	17.9	18.6	19.2	4							0.4			4
65	10.4	11.1	11.7	12.4	13.0	13.7	14.3	15.0	15.6	16.3	16.9	17.6	18.2	18.9	19.5	65	0.1	0.1	0.2	0.3	0.3	0.4	0.5	0.5	0.6	65
6	10.6	11.2	11.9	12.5	13.2	13.9	14.5	15.2	15.8	16.5	17.2	17.8	18.5	19.1	19.8	6										6
7	10.7	11.4	12.1	12.7	13.4	14.1	14.7	15.4	16.1	16.8	17.4	18.1	18.8	19.4	20.1	7								0.5		7
8	10.9	11.6	12.2	12.9	13.6	14.3	15.0	15.6	16.3	17.0	17.7	18.4	19.0	19.7	20.4	8					0.3			0.6		8
9	11.0	11.7	12.4	13.1	13.8	14.5	15.2	15.9	16.6	17.3	17.9	18.6	19.3	20.0	20.7	9										9
70	11.2	11.9	12.6	13.3	14.0	14.7	15.4	16.1	16.8	17.5	18.2	18.9	19.6	20.3	21.0	70	0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.6	0.6	70
1	11.4	12.1	12.8	13.5	14.2	14.9	15.6	16.3	17.0	17.8	18.5	19.2	19.9	20.6	21.3	1										1
2	11.5	12.2	13.0	13.7	14.4	15.1	15.8	16.6	17.3	18.0	18.7	19.4	20.2	20.9	21.6	2									0.6	2
3	11.7	12.4	13.1	13.9	14.6	15.3	16.1	16.8	17.5	18.3	19.0	19.7	20.4	21.2	21.9	3									0.7	3
4	11.8	12.6	13.3	14.1	14.8	15.5	16.3	17.0	17.8	18.5	19.2	20.0	20.7	21.5	22.2	4		0.1				0.4				4
75	12.0	12.8	13.5	14.3	15.0	15.8	16.5	17.3	18.0	18.8	19.5	20.3	21.0	21.8	22.5	75	0.1	0.2	0.2	0.3	0.4	0.5	0.5	0.6	0.7	75
6	12.2	12.9	13.7	14.4	15.2	16.0	16.7	17.5	18.2	19.0	19.8	20.5	21.3	22.0	22.8	6										6
7	12.3	13.1	13.9	14.6	15.4	16.2	16.9	17.7	18.5	19.3	20.0	20.8	21.6	22.3	23.1	7										7
8	12.5	13.3	14.0	14.8	15.6	16.4	17.2	17.9	18.7	19.5	20.3	21.1	21.8	22.6	23.4	8							0.5			8
9	12.6	13.4	14.2	15.0	15.8	16.6	17.4	18.2	19.0	19.8	20.5	21.3	22.1	22.9	23.7	9							0.6			9
80	12.8	13.6	14.4	15.2	16.0	16.8	17.6	18.4	19.2	20.0	20.8	21.6	22.4	23.2	24.0	80	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.6	0.7	80
1	13.0	13.8	14.6	15.4	16.2	17.0	17.8	18.6	19.4	20.3	21.1	21.9	22.7	23.5	24.3	1								0.6		1
2	13.1	13.9	14.8	15.6	16.4	17.2	18.0	18.9	19.7	20.5	21.3	22.1	23.0	23.8	24.6	2								0.7		2
3	13.3	14.1	14.9	15.8	16.6	17.4	18.3	19.1	19.9	20.8	21.6	22.4	23.2	24.1	24.9	3			0.2						0.7	3
4	13.4	14.3	15.1	16.0	16.8	17.6	18.5	19.3	20.2	21.0	21.8	22.7	23.5	24.4	25.2	4			0.3						0.8	4
85	13.6	14.5	15.3	16.2	17.0	17.9	18.7	19.6	20.4	21.3	22.1	23.0	23.8	24.7	25.5	85	0.1	0.2	0.3	0.3	0.4	0.5	0.6	0.7	0.8	85
6	13.8	14.6	15.5	16.3	17.2	18.1	18.9	19.8	20.6	21.5	22.4	23.2	24.1	24.9	25.8	6										6
7	13.9	14.8	15.7	16.5	17.4	18.3	19.1	20.0	20.9	21.8	22.6	23.5	24.4	25.2	26.1	7			0.3							7
8	14.1	15.0	15.8	16.7	17.6	18.5	19.4	20.2	21.1	22.0	22.9	23.8	24.6	25.5	26.4	8			0.4							8
9	14.2	15.1	16.0	16.9	17.8	18.7	19.6	20.5	21.4	22.3	23.1	24.0	24.9	25.8	26.7	9				0.4						9
90	14.4	15.3	16.2	17.1	18.0	18.9	19.8	20.7	21.6	22.5	23.4	24.3	25.2	26.1	27.0	90	0.1	0.2	0.3	0.4	0.5	0.5	0.6	0.7	0.8	90
1	14.6	15.5	16.4	17.3	18.2	19.1	20.0	20.9	21.8	22.8	23.7	24.6	25.5	26.4	27.3	1						0.5				1
2	14.7	15.6	16.6	17.5	18.4	19.3	20.2	21.2	22.1	23.0	23.9	24.8	25.8	26.7	27.6	2						0.6	0.6			2
3	14.9	15.8	16.7	17.7	18.6	19.5	20.5	21.4	22.3	23.3	24.2	25.1	26.0	27.0	27.9	3							0.7	0.7		3
4	15.0	16.0	16.9	17.9	18.8	19.7	20.7	21.6	22.6	23.5	24.4	25.4	26.3	27.3	28.2	4									0.8	4
95	15.2	16.2	17.1	18.1	19.0	20.0	20.9	21.9	22.8	23.8	24.7	25.7	26.6	27.6	28.5	95	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	95
6	15.4	16.3	17.3	18.2	19.2	20.2	21.1	22.1	23.0	24.0	25.0	25.9	26.9	27.8	28.8	6										6
7	15.5	16.5	17.5	18.4	19.4	20.4	21.3	22.3	23.3	24.2	25.2	26.2	27.2	28.1	29.1	7										7
8	15.7	16.7	17.6	18.6	19.6	20.6	21.6	22.5	23.5	24.5	25.5	26.4	27.4	28.4	29.4	8										8
99	15.8	16.8	17.8	18.8	19.8	20.8	21.8	22.8	23.8	24.8	25.7	26.7	27.7	28.7	29.7	99										99
Δ	16'	17'	18'	19'	20'	21'	22'	23'	24'	25'	26'	27'	28'	29'	30'	Δ	0.1'	0.2'	0.3'	0.4'	0.5'	0.6'	0.7'	0.8'	0.9'	Δ

Δd or Δt — Δt or Δt

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