

Perpetual Almanac Sun and Stars

DRAFT
5 March 2021

2020–2050

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DO NOT use this material in any situation where there is any possibility of risk to property or safety of life.

Version notes:

* Star positions were calculated using the Skyfield library in Python.

* Solar data was obtained from JPL Horizons on 16 Sep 2020. Calculated for Greenwich, UK. With the following configuration:

```
Reference frame      = ICRF
Time zone correction = UT+00:00
Time format         = BOTH
Time digits output  = FRACSEC
R.A. format        = DEG
RA/DEC extra precision = YES
Apparent coord. type = AIRLESS
Range units        = AU
Suppress range-rate = NO
Minimum elevation  = -90.0
Maximum airmass    = 38.0000
Rise-Transit-Set only = NO
Skip daylight      = NO
Solar elong. cut-off = 0,180
Hour angle cut-off = 0.000000000
RA/DEC rate cut-off = 0.0
CSV spreadsheet output = YES
Table quantities    = 2, 7,34,42,41
  2 - R.A.__(a-app), DEC__(a-app)
  7 - L_Ap_Sid_Time
 42 - L_Ap_SOL_Time
 41 - L_Ap_Hour_Ang
```

* All angle calculations were made using decimal degrees rounded at 16 places. When converted to DMS for display seconds were rounded 0.5 up.

Reference Tables

Initial Values on 01 January 00:00 UT for Year

Daily Solar Increments

Year	GHA Aries	E	Declination	EoT	Year	GHA Aries	E	Declination	EoT	Nr	Hour	Minute	Second
2020	100° 7' 1.0"	4° 13' 41.5"	-23° 3' 36.0"	3 ^m 5.2 ^s	2036	100° 14' 32.1"	4° 13' 35.9"	-23° 2' 49.0"	3 ^m 5.6 ^s	0	175°		0"
2021	100° 51' 50.4"	4° 8' 26.8"	-23° 0' 1.5"	3 ^m 26.2 ^s	2037	100° 59' 16.8"	4° 8' 4.3"	-22° 59' 11.8"	3 ^m 27.7 ^s	1	190°	15	15"
2022	100° 37' 32.7"	4° 10' 26.7"	-23° 1' 16.6"	3 ^m 18.2 ^s	2038	100° 44' 54.8"	4° 10' 6.4"	-23° 0' 26.9"	3 ^m 19.6 ^s	2	205°	30	30"
2023	100° 23' 16.8"	4° 12' 6.4"	-23° 2' 27.2"	3 ^m 11.6 ^s	2039	100° 30' 34.9"	4° 11' 44.7"	-23° 1' 40.7"	3 ^m 13.0 ^s	3	220°	45	45"
2024	100° 9' 2.2"	4° 13' 47.1"	-23° 3' 34.7"	3 ^m 4.9 ^s	2040	100° 16' 16.5"	4° 13' 20.8"	-23° 2' 49.8"	3 ^m 6.6 ^s	4	235°	1° 0'	1° 0'
2025	100° 53' 56.3"	4° 8' 20.2"	-22° 59' 57.8"	3 ^m 26.7 ^s	2041	101° 1' 7.8"	4° 8' 0.2"	-22° 59' 12.8"	3 ^m 28.0 ^s	5	250°	1° 15'	1° 15'
2026	100° 39' 41.7"	4° 10' 1.1"	-23° 1' 6.3"	3 ^m 19.9 ^s	2042	100° 46' 52.3"	4° 9' 30.5"	-23° 0' 24.6"	3 ^m 22.0 ^s	6	265°	1° 30'	1° 30'
2027	100° 25' 27.1"	4° 11' 54.6"	-23° 2' 15.6"	3 ^m 12.4 ^s	2043	100° 32' 38.1"	4° 11' 28.2"	-23° 1' 35.9"	3 ^m 14.1 ^s	7	280°	1° 45'	1° 45'
2028	100° 11' 11.6"	4° 13' 28.4"	-23° 3' 19.4"	3 ^m 6.1 ^s	2044	100° 18' 23.9"	4° 13' 18.9"	-23° 2' 45.5"	3 ^m 6.7 ^s	8	295°	2° 0'	1° 60"
2029	100° 56' 2.8"	4° 7' 56.8"	-22° 59' 37.3"	3 ^m 28.2 ^s	2045	101° 3' 17.5"	4° 7' 52.7"	-22° 59' 2.2"	3 ^m 28.5 ^s	9	310°	2° 15'	2° 15'
2030	100° 41' 43.7"	4° 9' 52.3"	-23° 0' 46.5"	3 ^m 20.5 ^s	2046	100° 49' 2.6"	4° 10' 1.6"	-23° 0' 15.2"	3 ^m 19.9 ^s	10	325°	2° 30'	2° 30'
2031	100° 27' 23.2"	4° 11' 36.2"	-23° 1' 52.5"	3 ^m 13.6 ^s	2047	100° 34' 46.7"	4° 11' 38.5"	-23° 1' 21.1"	3 ^m 13.4 ^s	11	340°	2° 45'	2° 45'
2032	100° 13' 1.1"	4° 13' 29.6"	-23° 2' 59.7"	3 ^m 6.0 ^s	2048	100° 20' 28.8"	4° 13' 12.8"	-23° 2' 26.1"	3 ^m 7.1 ^s	12	355°	3° 0'	3° 0'
2033	100° 57' 45.7"	4° 8' 20.2"	-22° 59' 19.1"	3 ^m 26.7 ^s	2049	101° 5' 17.4"	4° 8' 4.7"	-22° 58' 43.0"	3 ^m 27.7 ^s	13	10°	3° 15'	3° 15'
2034	100° 43' 20.9"	4° 10' 5.7"	-23° 0' 30.4"	3 ^m 19.6 ^s	2050	100° 50' 56.2"	4° 9' 36.7"	-22° 59' 50.8"	3 ^m 21.6 ^s	14	25°	3° 30'	3° 30'
2035	100° 28' 56.4"	4° 11' 58.2"	-23° 1' 40.1"	3 ^m 12.1 ^s						15	40°	3° 45'	3° 45'
										16	55°	4° 0'	4° 0'
										17	70°	4° 15'	4° 15'
										18	85°	4° 30'	4° 30'
										19	100°	4° 45'	4° 45'
										20	115°	5° 0'	4° 60"
										21	130°	5° 15'	5° 15"
										22	145°	5° 30'	5° 30"
										23	160°	5° 45'	5° 45"
										24	175°	6° 0'	6° 0"
										25	---	6° 15'	6° 15"
										26	---	6° 30'	6° 30"
										27	---	6° 45'	6° 45"
										28	---	7° 0'	7° 0"
										29	---	7° 15'	7° 15"
										30	---	7° 30'	7° 30"
										31	---	7° 45'	7° 45"
										32	---	8° 0'	7° 60"
										33	---	8° 15'	8° 15"
										34	---	8° 30'	8° 30"
										35	---	8° 45'	8° 45"
										36	---	9° 0'	9° 0"
										37	---	9° 15'	9° 15"
										38	---	9° 30'	9° 30"
										39	---	9° 45'	9° 45"
										40	---	10° 0'	10° 0"
										41	---	10° 15'	10° 15"
										42	---	10° 30'	10° 30"
										43	---	10° 45'	10° 45"
										44	---	11° 0'	10° 60"
										45	---	11° 15'	11° 15"
										46	---	11° 30'	11° 30"
										47	---	11° 45'	11° 45"
										48	---	12° 0'	12° 0"
										49	---	12° 15'	12° 15"
										50	---	12° 30'	12° 30"
										51	---	12° 45'	12° 45"
										52	---	13° 0'	13° 0"
										53	---	13° 15'	13° 15"
										54	---	13° 30'	13° 30"
										55	---	13° 45'	13° 45"
										56	---	14° 0'	13° 60"
										57	---	14° 15'	14° 15"
										58	---	14° 30'	14° 30"
										59	---	14° 45'	14° 45"
										60	---	15° 0'	15° 0"

Interpolation Table for Declination and E. Arc / 10 Minutes

	1"	2.5"	3"	5"	10"	15"	30"	45"	1'	1'15"	1'30"	1'45"	2'	3'
0:00	0.0"	0.0"	0.0"	0.0"	0.0"	0.0"	0.0"	0.0"	0"	0.0"	0.0"	0.0"	0"	0"
0:10	0.1"	0.2"	0.2"	0.4"	0.8"	1.2"	2.5"	3.8"	5"	6.2"	7.5"	8.8"	10"	15"
0:20	0.2"	0.4"	0.5"	0.8"	1.7"	2.5"	5.0"	7.5"	10"	12.5"	15.0"	17.5"	20"	30"
0:30	0.2"	0.6"	0.8"	1.3"	2.5"	3.8"	7.5"	11.2"	15"	18.8"	22.5"	26.2"	30"	45"
0:40	0.3"	0.8"	1.0"	1.7"	3.3"	5.0"	10.0"	15.0"	20"	25.0"	30.0"	35.0"	40"	1' 0"
0:50	0.4"	1.0"	1.2"	2.1"	4.2"	6.2"	12.5"	18.8"	25"	31.2"	37.5"	43.8"	50"	1' 15"
1:00	0.5"	1.2"	1.5"	2.5"	5.0"	7.5"	15.0"	22.5"	30"	37.5"	45.0"	52.5"	1' 0"	1' 30"
1:10	0.6"	1.5"	1.8"	2.9"	5.8"	8.8"	17.5"	26.2"	35"	43.8"	52.5"	1' 1.2"	1' 10"	1' 45"
1:20	0.7"	1.7"	2.0"	3.3"	6.7"	10.0"	20.0"	30.0"	40"	50.0"	1' 0.0"	1' 10.0"	1' 20"	2' 0"
1:30	0.7"	1.9"	2.2"	3.8"	7.5"	11.2"	22.5"	33.8"	45"	56.2"	1' 7.5"	1' 18.8"	1' 30"	2' 15"
1:40	0.8"	2.1"	2.5"	4.2"	8.3"	12.5"	25.0"	37.5"	50"	1' 2.5"	1' 15.0"	1' 27.5"	1' 40"	2' 30"
1:50	0.9"	2.3"	2.8"	4.6"	9.2"	13.8"	27.5"	41.2"	55"	1' 8.8"	1' 22.5"	1' 36.2"	1' 50"	2' 45"

Interpolation Table Equation of Time (seconds / 10 minutes)

	0.1	0.25	0.5	1	2	3	4	5	6	7	8	9	10
0:10	0.01	0.02	0.04	0.08	0.17	0.25	0.33	0.42	0.5	0.58	0.67	0.75	0.83
0:20	0.02	0.04	0.08	0.17	0.33	0.5	0.67	0.83	1.0	1.17	1.33	1.5	1.67
0:30	0.02	0.06	0.13	0.25	0.5	0.75	1.0	1.25	1.5	1.75	2.0	2.25	2.5
0:40	0.03	0.08	0.17	0.33	0.67	1.0	1.33	1.67	2.0	2.33	2.67	3.0	3.33
0:50	0.04	0.1	0.21	0.42	0.83	1.25	1.67	2.08	2.5	2.92	3.33	3.75	4.17
1:00	0.05	0.12	0.25	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
1:10	0.06	0.15	0.29	0.58	1.17	1.75	2.33	2.92	3.5	4.08	4.67	5.25	5.83
1:20	0.07	0.17	0.33	0.67	1.33	2.0	2.67	3.33	4.0	4.67	5.33	6.0	6.67
1:30	0.07	0.19	0.38	0.75	1.5	2.25	3.0	3.75	4.5	5.25	6.0	6.75	7.5
1:40	0.08	0.21	0.42	0.83	1.67	2.5	3.33	4.17	5.0	5.83	6.67	7.5	8.33
1:50	0.09	0.23	0.46	0.92	1.83	2.75	3.67	4.58	5.5	6.42	7.33	8.25	9.17

Day Number	
Mon	Mi
Jan	-1
Feb	30
Mar	58/59
Apr	89/90
May	119/120
Jun	150/151
Jul	180/181
Aug	211/212
Sep	242/243
Oct	272/273
Nov	303/303
Dec	333/334

One's Complement

Digit	0	1	2	3	4	5	6	7	8	9
Compl.	9	8	7	6	5	4	3	2	1	0

For rightmost digit only

Digit	0	1	2	3	4	5	6	7	8	9
Compl.	0	9	8	7	6	5	4	3	2	1

Δ Orbit Time / Year

Arc to Time / Time to Arc

2020	LY0 +00 ^m	2021	LY1 +00 ^m
2022	LY2 +00 ^m	2023	LY3 +00 ^m
2024	LY0 +40 ^m	2025	LY1 -40 ^m
2026	LY2 -40 ^m	2027	LY3 -40 ^m
2028	LY0 +00 ^m	2029	LY1 +00 ^m
2030	LY2 +00 ^m	2031	LY3 +00 ^m
2032	LY0 +40 ^m	2033	LY1 -40 ^m
2034	LY2 -40 ^m	2035	LY3 -40 ^m
2036	LY0 +00 ^m	2037	LY1 +00 ^m
2038	LY2 +00 ^m	2039	LY3 +00 ^m
2040	LY0 +40 ^m	2041	LY1 -40 ^m
2042	LY2 -40 ^m	2043	LY3 -40 ^m
2044	LY0 +00 ^m	2045	LY1 +00 ^m
2046	LY2 +00 ^m	2047	LY3 +00 ^m
2048	LY0 +40 ^m	2049	LY1 -40 ^m
2050	LY2 -40 ^m	2051	LY3 -40 ^m

	100°	10°	1°	10'	1'	10"	1"
1	6°40'	0°40'	0°04'	40"	4"	0.67"	0.07"
2	13°20'	1°20'	0°08'				

GHA Aries for Day of Year

Dn	GHA	Dn	GHA	Dn	GHA	Dn	GHA
0	0.0"	92	90°40' 34.8"	184	181°21' 9.6"	276	272° 1' 44.4"
1	59' 8.2"	93	91°39' 43.0"	185	182°20' 17.8"	277	273° 0' 52.6"
2	1°58' 16.4"	94	92°38' 51.2"	186	183°19' 26.0"	278	274° 0' 0.8"
3	2°57' 24.6"	95	93°37' 59.4"	187	184°18' 34.2"	279	274°59' 9.0"
4	3°56' 32.8"	96	94°37' 7.6"	188	185°17' 42.4"	280	275°58' 17.2"
5	4°55' 41.0"	97	95°36' 15.8"	189	186°16' 50.6"	281	276°57' 25.4"
6	5°54' 49.2"	98	96°35' 24.0"	190	187°15' 58.8"	282	277°56' 33.6"
7	6°53' 57.4"	99	97°34' 32.2"	191	188°15' 7.0"	283	278°55' 41.8"
8	7°53' 5.6"	100	98°33' 40.4"	192	189°14' 15.2"	284	279°54' 50.0"
9	8°52' 13.8"	101	99°32' 48.6"	193	190°13' 23.4"	285	280°53' 58.2"
10	9°51' 22.0"	102	100°31' 56.8"	194	191°12' 31.6"	286	281°53' 6.4"
11	10°50' 30.2"	103	101°31' 5.0"	195	192°11' 39.8"	287	282°52' 14.6"
12	11°49' 38.5"	104	102°30' 13.2"	196	193°10' 48.0"	288	283°51' 22.8"
13	12°48' 46.7"	105	103°29' 21.4"	197	194° 9' 56.2"	289	284°50' 31.0"
14	13°47' 54.9"	106	104°28' 29.6"	198	195° 8' 4.4"	290	285°49' 39.2"
15	14°47' 3.1"	107	105°27' 37.9"	199	196° 8' 12.6"	291	286°48' 47.4"
16	15°46' 11.3"	108	106°26' 46.1"	200	197° 7' 20.8"	292	287°47' 55.6"
17	16°45' 19.5"	109	107°25' 54.3"	201	198° 6' 29.0"	293	288°47' 3.8"
18	17°44' 27.7"	110	108°25' 2.5"	202	199° 5' 37.3"	294	289°46' 12.0"
19	18°43' 35.9"	111	109°24' 10.7"	203	200° 4' 45.5"	295	290°45' 20.2"
20	19°42' 44.1"	112	110°23' 18.9"	204	201° 3' 53.7"	296	291°44' 28.5"
21	20°41' 52.3"	113	111°22' 27.1"	205	202° 3' 1.9"	297	292°43' 36.7"
22	21°41' 0.5"	114	112°21' 35.3"	206	203° 2' 10.1"	298	293°42' 44.9"
23	22°40' 8.7"	115	113°20' 43.5"	207	204° 1' 18.3"	299	294°41' 53.1"
24	23°39' 16.9"	116	114°19' 51.7"	208	205° 0' 26.5"	300	295°41' 1.3"
25	24°38' 25.1"	117	115°18' 59.9"	209	205°59' 34.7"	301	296°40' 9.5"
26	25°37' 33.3"	118	116°18' 8.1"	210	206°58' 42.9"	302	297°39' 17.7"
27	26°36' 41.5"	119	117°17' 16.3"	211	207°57' 51.1"	303	298°38' 25.9"
28	27°35' 49.7"	120	118°16' 24.5"	212	208°56' 59.3"	304	299°37' 34.1"
29	28°34' 57.9"	121	119°15' 32.7"	213	209°56' 7.5"	305	300°36' 42.3"
30	29°34' 6.1"	122	120°14' 40.9"	214	210°55' 15.7"	306	301°35' 50.5"
31	30°33' 14.3"	123	121°13' 49.1"	215	211°54' 23.9"	307	302°34' 58.7"
32	31°32' 22.5"	124	122°12' 57.3"	216	212°53' 32.1"	308	303°34' 6.9"
33	32°31' 30.7"	125	123°12' 5.5"	217	213°52' 40.3"	309	304°33' 15.1"
34	33°30' 38.9"	126	124°11' 13.7"	218	214°51' 48.5"	310	305°32' 23.3"
35	34°29' 47.1"	127	125°10' 21.9"	219	215°50' 56.7"	311	306°31' 31.5"
36	35°28' 55.4"	128	126° 9' 30.1"	220	216°50' 4.9"	312	307°30' 39.7"
37	36°28' 3.6"	129	127° 8' 38.3"	221	217°49' 13.1"	313	308°29' 47.9"
38	37°27' 11.8"	130	128° 7' 46.6"	222	218°48' 21.3"	314	309°28' 56.1"
39	38°26' 20.0"	131	129° 6' 54.8"	223	219°47' 29.5"	315	310°28' 4.3"
40	39°25' 28.2"	132	130° 6' 3.0"	224	220°46' 37.7"	316	311°27' 12.5"
41	40°24' 36.4"	133	131° 5' 11.2"	225	221°45' 46.0"	317	312°26' 20.7"
42	41°23' 44.6"	134	132° 4' 19.4"	226	222°44' 54.2"	318	313°25' 28.9"
43	42°22' 52.8"	135	133° 3' 27.6"	227	223°44' 2.4"	319	314°24' 37.2"
44	43°22' 1.0"	136	134° 2' 35.8"	228	224°43' 10.6"	320	315°23' 45.4"
45	44°21' 9.2"	137	135° 1' 44.0"	229	225°42' 18.8"	321	316°22' 53.6"
46	45°20' 17.4"	138	136° 0' 52.2"	230	226°41' 27.0"	322	317°22' 1.8"
47	46°19' 25.6"	139	137° 0' 0.4"	231	227°40' 35.2"	323	318°21' 10.0"
48	47°18' 33.8"	140	137°59' 8.6"	232	228°39' 43.4"	324	319°20' 18.2"
49	48°17' 42.0"	141	138°58' 16.8"	233	229°38' 51.6"	325	320°19' 26.4"
50	49°16' 50.2"	142	139°57' 25.0"	234	230°37' 59.8"	326	321°18' 34.6"
51	50°15' 58.4"	143	140°56' 33.2"	235	231°37' 8.0"	327	322°17' 42.8"
52	51°15' 6.6"	144	141°55' 41.4"	236	232°36' 16.2"	328	323°16' 51.0"
53	52°14' 14.8"	145	142°54' 49.6"	237	233°35' 24.4"	329	324°15' 59.2"
54	53°13' 23.0"	146	143°53' 57.8"	238	234°34' 32.6"	330	325°15' 7.4"
55	54°12' 31.2"	147	144°53' 6.0"	239	235°33' 40.8"	331	326°14' 15.6"
56	55°11' 39.4"	148	145°52' 14.2"	240	236°32' 49.0"	332	327°13' 23.8"
57	56°10' 47.6"	149	146°51' 22.4"	241	237°31' 57.2"	333	328°12' 32.0"
58	57° 9' 55.8"	150	147°50' 30.6"	242	238°31' 5.4"	334	329°11' 40.2"
59	58° 9' 4.0"	151	148°49' 38.8"	243	239°30' 13.6"	335	330°10' 48.4"
60	59° 8' 12.3"	152	149°48' 47.0"	244	240°29' 21.8"	336	331° 9' 56.6"
61	60° 7' 20.5"	153	150°47' 55.2"	245	241°28' 30.0"	337	332° 9' 4.8"
62	61° 6' 28.7"	154	151°47' 3.5"	246	242°27' 38.2"	338	333° 8' 13.0"
63	62° 5' 36.9"	155	152°46' 11.7"	247	243°26' 46.4"	339	334° 7' 21.2"
64	63° 4' 45.1"	156	153°45' 19.9"	248	244°25' 54.7"	340	335° 6' 29.4"
65	64° 3' 53.3"	157	154°44' 28.1"	249	245°25' 2.9"	341	336° 5' 37.6"
66	65° 3' 1.5"	158	155°43' 36.3"	250	246°24' 11.1"	342	337° 4' 45.8"
67	66° 2' 9.7"	159	156°42' 44.5"	251	247°23' 19.3"	343	338° 3' 54.0"
68	67° 1' 17.9"	160	157°41' 52.7"	252	248°22' 27.5"	344	339° 3' 2.2"
69	68° 0' 26.1"	161	158°41' 0.9"	253	249°21' 35.7"	345	340° 2' 10.5"
70	68°59' 34.3"	162	159°40' 9.1"	254	250°20' 43.9"	346	341° 1' 18.7"
71	69°58' 42.5"	163	160°39' 17.3"	255	251°19' 52.1"	347	342° 0' 26.9"
72	70°57' 50.7"	164	161°38' 25.5"	256	252°19' 0.3"	348	342°59' 35.1"
73	71°56' 58.9"	165	162°37' 33.7"	257	253°18' 8.5"	349	343°58' 43.3"
74	72°56' 7.1"	166	163°36' 41.9"	258	254°17' 16.7"	350	344°57' 51.5"
75	73°55' 15.3"	167	164°35' 50.1"	259	255°16' 24.9"	351	345°56' 59.7"
76	74°54' 23.5"	168	165°34' 58.3"	260	256°15' 33.1"	352	346°56' 7.9"
77	75°53' 31.7"	169	166°34' 6.5"	261	257°14' 41.3"	353	347°55' 16.1"
78	76°52' 39.9"	170	167°33' 14.7"	262	258°13' 49.5"	354	348°54' 24.3"
79	77°51' 48.1"	171	168°32' 22.9"	263	259°12' 57.7"	355	349°53' 32.5"
80	78°50' 56.3"	172	169°31' 31.1"	264	260°12' 5.9"	356	350°52' 40.7"
81	79°50' 4.5"	173	170°30' 39.3"	265	261°11' 14.1"	357	351°51' 48.9"
82	80°49' 12.7"	174	171°29' 47.5"	266	262°10' 22.3"	358	352°50' 57.1"
83	81°48' 21.0"	175	172°28' 55.7"	267	263° 9' 30.5"	359	353°50' 5.3"
84	82°47' 29.2"	176	173°28' 3.9"	268	264° 8' 38.7"	360	354°49' 13.5"
85	83°46' 37.4"	177	174°27' 12.2"	269	265° 7' 46.9"	361	355°48' 21.7"
86	84°45' 45.6"	178	175°26' 20.4"	270	266° 6' 55.1"	362	356°47' 29.9"
87	85°44' 53.8"	179	176°25' 28.6"	271	267° 6' 3.3"	363	357°46' 38.1"
88	86°44' 2.0"	180	177°24' 36.8"	272	268° 5' 11.6"	364	358°45' 46.3"
89	87°43' 10.2"	181	178°23' 45.0"	273	269° 4' 19.8"	365	359°44' 54.5"
90	88°42' 18.4"	182	179°22' 53.2"	274	270° 3' 28.0"	366	44' 2.8"
91	89°41' 26.6"	183	180°22' 1.4"	275	271° 2' 36.2"	-----	-----

Increments for Time of Day

Nr.	Hours	Minutes	Seconds
0	0.0"	0.0"	0.0"
1	15° 2' 27.8"	15' 2.5"	15.04"
2	30° 4' 55.7"	30' 4.9"	30.08"
3	45° 7' 23.5"	45' 7.4"	45.12"
4	60° 9' 51.4"	1° 0' 9.9"	1' 0.16"
5	75° 12' 19.2"	1° 15' 12.3"	1' 15.21"
6	90° 14' 47.1"	1° 30' 14.8"	1' 30.25"
7	105° 17' 14.9"	1° 45' 17.2"	1' 45.29"
8	120° 19' 42.7"	2° 0' 19.7"	2' 0.33"
9	135° 22' 10.6"	2° 15' 22.2"	2' 15.37"
10	150° 24' 38.4"	2° 30' 24.6"	2' 30.41"
11	165° 27' 6.3"	2° 45' 27.1"	2' 45.45"
12	180° 29' 34.1"	3° 0' 29.6"	3' 0.49"
13	195° 32' 1.9"	3° 15' 32.0"	3' 15.53"
14	210° 34' 29.8"	3° 30' 34.5"	3' 30.57"
15	225° 36' 57.6"	3° 45' 37.0"	3' 45.62"
16	240° 39' 25.5"	4° 0' 39.4"	4' 0.66"
17	255° 41' 53.3"	4° 15' 41.9"	4' 15.70"
18	270° 44' 21.2"	4° 30' 44.4"	4' 30.74"
19	285° 46' 49.0"	4° 45' 46.8"	4' 45.78"
20	300° 49' 16.8"	5° 0' 49.3"	5' 0.82"
21	315° 51' 44.7"	5° 15' 51.7"	5' 15.86"
22	330° 54' 12.5"	5° 30' 54.2"	5' 30.90"
23	345° 56' 40.4"	5° 45' 56.7"	5' 45.95"
24	59' 8.2"	6° 0' 59.1"	6' 0.99"
25	-----	6° 16' 1.6"	6' 16.03"
26	-----	6° 31' 4.1"	6' 31.07"
27	-----	6° 46' 6.5"	6' 46.11"
28	-----	7° 1' 9.0"	7' 1.15"
29	-----	7° 16' 11.5"	7' 16.19"
30	-----	7° 31' 13.9"	7' 31.23"
31	-----	7° 46' 16.4"	7' 46.27"
32	-----	8° 1' 18.8"	8' 1.31"
33	-----	8° 16' 21.3"	8' 16.36"
34	-----	8° 31' 23.8"	8' 31.40"
35	-----	8° 46' 26.2"	8' 46.44"
36	-----	9° 1' 28.7"	9' 1.48"
37	-----	9° 16' 31.2"	9' 16.52"
38	-----	9° 31' 33.6"	9' 31.56"
39	-----	9° 46' 36.1"	9' 46.60"
40	-----	10° 1' 38.6"	10' 1.64"
41	-----	10° 16' 41.0"	10' 16.68"
42	-----	10° 31' 43.5"	10' 31.73"
43	-----	10° 46' 46.0"	10' 46.77"
44	-----	11° 1' 48.4"	11' 1.81"
45	-----	11° 16' 50.9"	11' 16.85"
46	-----	11° 31' 53.3"	11' 31.89"
47	-----	11° 46' 55.8"	11' 46.93"
48	-----	12° 1' 58.3"	12' 1.97"
49	-----	12° 17' 0.7"	12' 17.01"
50	-----	12° 32' 3.2"	12' 32.05"
51	-----	12° 47' 5.7"	12' 47.09"
52	-----	13° 2' 8.1"	13' 2.13"
53	-----	13° 17' 10.6"	13' 17.18"

Star Position Average Corrections (2020-2050)

Star	SHA/Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Δ/Year	Δ2025	Δ2030	Δ2035	Δ2040	Δ2045	Δ2050
Acamar	315°14'38.9"	9	10	9	3	5	11	16	16	-13	-8	-1	5	-34.8	-3.7.9	-6.4.4	-8.36.2	-11.25.5	-14.34.7	-17.22.9
Achernar	335°23'12.8"	15	12	7	-2	-11	-18	-22	-19	-12	-3	6	13	-33.5	-3.11.8	-5.56.3	-8.16.1	-11.13.4	-14.22.2	-16.55.9
Acrux	173°4'18.5"	-26	-16	-8	-2	10	15	16	12	2	-10	-22	-28	-53.6	-4.11.8	-9.3.0	-13.13.0	-16.51.6	-21.20.8	-26.9.8
Adhara	255°8'36.7"	-7	-9	-11	-9	-6	-2	2	6	8	7	3	-2	-20.6	-1.47.5	-3.32.6	-5.2.9	-6.38.9	-8.28.2	-10.9.0
Al Na'ir	27°38'22.6"	-8	-5	-2	2	5	7	8	6	2	-3	-7	-9	-5.9	-17.8	-54.8	-1.26.4	-1.39.5	-2.3.1	-2.42.5
Aldebaran	290°43'54.6"	3	7	8	4	-2	-8	-13	-14	-13	-12	-8	-3	-53.3	-4.34.9	-9.12.5	-13.11.2	-17.16.0	-21.58.1	-26.26.4
Alioth	166°16'44.8"	-23	-16	-8	1	8	12	12	10	4	-5	-14	-21	-39.6	-3.44.6	-7.0.2	-9.48.7	-13.12.1	-16.54.1	-19.57.5
Alkaid	152°55'29.0"	-20	-16	-11	-3	4	8	11	10	7	-9	-9	-17	-35.8	-3.19.6	-6.18.2	-8.51.9	-11.51.9	-15.10.7	-17.59.4
Alnilam	275°41'28.6"	1	6	8	6	1	-5	-10	-13	-13	-10	-5	-4	-47.1	-4.3.8	-8.0.8	-11.37.9	-15.15.2	-19.24.8	-23.20.4
Alphard	217°51'25.8"	-3	-2	4	6	6	3	-0	-4	-8	-12	-14	-14	-45.6	-3.54.8	-7.52.2	-11.16.1	-14.44.6	-18.45.6	-22.35.0
Alphecca	126°7'27.6"	-5	-14	-13	-8	-4	1	6	8	8	4	-3	-10	-39.1	-3.26.6	-6.47.4	-9.40.0	-12.44.7	-16.14.7	-19.27.4
Alpheratz	357°38'54.6"	6	3	2	-8	-14	-16	-15	-10	-4	1	4	6	-48.4	-4.3.3	-8.18.8	-11.58.3	-15.34.1	-19.43.5	-23.55.0
Altair	62°4'11.3"	-5	-8	-12	-13	-13	-10	-5	-2	6	8	5	1	-45.2	-3.53.1	-7.48.2	-11.10.5	-14.38.7	-18.37.2	-22.24.2
Ankaa	353°11'15.2"	8	5	0	-7	-14	-17	-17	-13	-6	1	6	8	-45.0	-4.4.9	-7.52.6	-11.8.5	-14.49.6	-18.55.2	-22.31.4
Antares	112°21'4.3"	-15	-15	-15	-12	-8	-3	2	7	8	5	-2	-10	-57.1	-4.53.5	-9.51.0	-14.6.7	-18.27.6	-23.29.2	-28.17.0
Arcturus	145°51'46.9"	-25	-13	-10	-5	-0	3	6	7	5	0	-7	-13	-42.2	-3.42.7	-7.19.7	-10.25.4	-13.43.6	-17.30.3	-20.58.5
Atria	107°19'22.7"	-31	-33	-36	-29	-19	-5	9	20	23	16	1	-17	-1.39.5	-8.25.5	-17.7.2	-24.35.6	-32.4.3	-40.47.1	-49.13.9
Avior	234°15'37.2"	-4	7	16	18	17	10	2	-8	-16	-22	-22	-16	-19.5	-1.28.1	-3.16.0	-4.48.4	-6.3.5	-7.38.8	-9.26.2
Bellatrix	278°56'51.5"	1	6	8	5	0	6	11	-13	-13	-10	-5	-5	-49.8	-4.17.5	-8.36.0	-12.18.0	-16.7.5	-20.31.3	-24.40.7
Betelgeuse	270°56'5.7"	-0	5	8	6	1	-4	-10	-12	-13	-13	-11	-7	-50.2	-4.20.0	-8.40.6	-12.24.4	-16.16.1	-20.42.3	-24.53.7
Canopus	263°53'35.5"	4	12	17	15	9	1	-8	-14	-18	-19	-14	-6	-20.7	-1.45.2	-3.33.4	-5.6.4	-6.37.9	-8.28.1	-10.13.0
Capella	280°27'20.4"	2	9	12	7	0	-8	-15	-19	-19	-18	-13	-7	-1.8	-7.5	-5.53.5	-11.51.5	-16.59.2	-22.13.9	-28.19.9
Deneb	49°28'51.5"	0	-6	-13	-16	-17	-13	-6	2	8	12	11	7	-32.0	-2.36.9	-5.27.6	-7.54.0	-10.12.1	-12.56.2	-15.45.1
Denebola	142°29'0.7"	-14	-8	-3	2	4	5	4	2	-2	-8	-13	-16	-47.1	-4.7.5	-8.9.9	-11.37.8	-15.18.3	-19.30.3	-23.23.1
Diphda	348°51'21.5"	6	4	0	-5	-11	-14	-15	-11	-6	1	3	5	-46.2	-4.3.6	-8.1.5	-11.26.2	-15.4.5	-19.12.0	-23.0.4
Dubhe	193°45'53.2"	-23	-11	1	10	15	14	9	2	-6	-16	-23	-27	-55.2	-5.10.3	-9.44.1	-13.39.4	-18.19.4	-23.26.5	-27.43.3
Elnath	278°6'33.9"	1	6	9	6	0	-6	-12	-15	-15	-15	-11	-6	-58.7	-5.3.0	-10.8.3	-14.30.6	-19.0.5	-24.11.3	-29.6.0
Eltanin	90°44'35.7"	-10	-15	-19	-16	-11	-3	5	12	15	14	8	-1	-21.5	-1.52.0	-3.43.6	-5.19.6	-6.59.2	-8.53.7	-10.41.5
Enif	33°42'57.2"	0	-3	-8	-12	-14	-13	-10	-3	2	6	6	4	-45.6	-3.54.1	-7.51.8	-11.16.0	-14.44.3	-18.44.7	-22.34.5
Fomalhaut	15°19'10.8"	3	-1	-6	11	-15	-16	-14	-8	-1	4	6	6	-50.6	-4.29.2	-8.48.2	-12.31.0	-16.32.7	-21.5.0	-25.12.6
Gacrux	171°55'54.5"	-23	-14	-7	1	7	11	12	9	2	-9	-19	-25	-53.0	-4.14.5	-8.59.8	-13.4.9	-16.47.2	-21.16.6	-25.58.2
Genah	175°47'39.1"	-15	-9	-4	0	3	5	5	3	1	-7	-12	-16	-48.0	-4.4.7	-8.15.9	-11.51.6	-15.28.4	-19.40.8	-23.44.4
Hadar	148°41'47.2"	-27	-22	-17	-8	1	8	14	15	9	-1	-14	-24	-1.7	-3.5	-29.9	-11.28.4	-16.37.2	-21.26.2	-27.13.3
Hamal	327°55'32.3"	6	6	4	-2	-9	-14	-16	-14	-10	-6	-1	3	-52.7	-4.27.9	-9.4.0	-13.1.4	-16.59.6	-21.36.0	-26.4.0
Kaus Aust.	83°38'16.1"	-11	-14	-17	-16	-14	-9	-2	5	9	8	3	-4	-1.4	-5.19.3	-10.37.4	-15.10.8	-19.55.4	-25.21.7	-30.28.3
Kochab	137°20'45.2"	-38	-36	-29	-10	8	23	33	35	28	15	-4	-24	-3.0	-18.9	-14.5	-42.2	-18.2	-10.8	-5.0
Markab	74°4'14.3"	5	1	6	9	9	6	2	-3	-7	-11	-12	-10	-15.0	-1.25.6	-2.37.5	-3.39.5	-4.57.5	-6.21.6	-7.28.7
Menkar	314°10'8.5"	5	6	5	0	-6	-11	-14	-14	-11	-8	-3	1	-48.6	-4.10.9	-8.23.5	-12.0.6	-15.44.2	-20.1.4	-24.5.4
Menkent	148°2'26.9"	-18	-14	-11	-6	-1	3	7	8	5	-2	-10	-16	-55.3	-4.38.6	-9.29.9	-13.39.8	-17.45.7	-22.34.8	-27.18.4
Miaplacidus	221°38'2.7"	-10	5	19	25	27	20	10	-4	-18	-29	-31	-26	-10.9	-30.4	-1.40.9	-2.40.5	-3.0.4	-3.41.5	-4.56.0
Mirfak	308°33'33.4"	12	-11	-9	-5	0	5	8	10	7	3	-4	-9	-15.8	-1.12.8	-2.38.7	-3.52.3	-4.55.0	-6.13.0	-7.38.2
Nunki	75°53'7.8"	-9	-12	-15	-15	-14	-9	-4	3	8	8	4	-3	-57.3	-4.58.5	-9.55.0	-14.9.8	-18.36.1	-23.40.9	-28.26.3
Peacock	53°12'42.9"	5	-12	-19	-23	-24	-19	-11	0	10	14	12	5	-12.0	-6.25.3	-12.32.9	-17.48.8	-23.34.3	-30.2.9	-35.53.3
Pollux	243°21'52.9"	-6	2	7	8	5	0	-6	-10	-13	-12	-15	-13	-56.4	-4.55.7	-9.47.0	-13.56.7	-18.20.2	-23.21.6	-28.1.3
Procyon	244°54'42.7"	-4	-2	7	7	4	0	-5	-9	-12	-14	-13	-11	-48.4	-4.11.6	-8.22.8	-11.58.1	-15.41.8	-19.59.2	-24.1.1
Rasalhague	96°2'37.2"	-10	-12	-14	-12	-9	-4	1	6	8	7	2	-5	-40.4	-3.43.3	-7.26.3	-10.38.1	-13.57.1	-17.45.5	-21.20.7
Regulus	207°38'31.9"	-11	-4	2	3	6	4	5	3	0	-2	-5	-7	-1.9	-22.6	-24.9	-27.3	-29.9	-31.7	-33.5
Rigel	281°7'24.6"	2	6	8	5	0	-6	-10	-13	-13	-12	-9	-4	-44.6	-3.51.2	-7.42.3	-11.0.9	-14.27.0	-18.23.6	-22.6.5
Rigel Kent.	139°45'59.4"	-27	-23	-19	-10	-1	7	14	16	12	2	-11	-23	-1.4	-8.5	-18.9	-11.5.6	-15.58.1	-20.34.3	-26.10.1
Sabik	102°7'43.0"	-12	-13	-14	-12	-9	-4	1	6	8	6	0	-7	-53.3	-4.35.2	-9.12.0	-13.9.8	-17.14.8	-21.56.9	-26.24.1
Scheat	13°49'10.7"	4	1	-5	-10	-15	-13	-7	-1	4	6	6	6	-45.4	-3.47.9	-7.47.0	-11.12.5	-14.34.6	-18.30.7	-22.23.5
Schedar	349°35'24.4"	13	9	2	-9	-18	-22	-22	-16	-8	-1	6	12	-54.2	-4.26.3	-9.11.9	-13.22.3	-17.11.1	-21.46.2	-26.33.7
Shaula	96°16'13.8"	-14	-15	-17	-15	-12	-6	0	7	9	8	1	-7	-1.3	-5.25.7	-10.53.4	-15.35.0	-20.24.8	-25.58.7	-31.15.1
Sirius	258°29'24.7"	1	5	9	8	4	-2	-7	-11	-13	-14	-12	-8	-40.9	-3.31.0	-7.3.6	-10.5.9	-13.13.3	-16.49.7	-20.14.9
Spica	158°26'35.5"	-7	-4	-1	2	4	6	6	4	1	-3	-6	-8	-5.9	-17.7	-54.9	-1.27.5	-1.41.2	-2.4.6	-2.44.5
Suhail	222°48'47.6"	-8	1	7	10	10	7	2	-4	-10	-16	-17	-15	-34.6	-2.50.0	-5.54.0	-8.32.0	-11.1.1	-13.58.9	-16.58.9
Vega	80°36'21.7"	-8	-12	-15	-12	-6	1	7	11	11	7	0	-9	-31.5	-2.41.2	-5.25.3	-7.46.5	-10.9.8	-12.55.4	-15.34.3
Zuben'ubi	137°0'38.5"	-16	-13	-11	-7	-3	1	5	7	5	0	-6	-13	-51.6	-4.24.7	-8.53.7	-12.44.9	-16.39.8	-21.12.1	-25.32.6

The monthly values are the 30 year average of the movement which occurs from the start of the month to its end. The one year delta is the sum of the average change for one year. The 5 year deltas are the difference between the calculated 2020 values and the calculated values for the year in question. They are NOT additive. If one applies the 2030 value, one does not use 2025's.

Star	SHA/Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
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Example #1 – Worksheet for Star SHA and Declination

Star Suhail Observation Month Aug Day 19 Year 2029

Sidereal Hour Angle

Declination

SHA 2020	222	°	48	'	47.6	"
Δ20xx 30 +/-		°	-5	'	54	"
Δ 1 yr +/-		°		'	-34.6	"
Δ 1 yr +/-		°		'		"
Result =	222	°	43	'	28	" (SR)

Decl. 2020	-43	°	30	'	39.2	"
Δ20xx 30 +/-		°	-2	'	36.8	"
Δ 1 yr +/-		°		'	-16.7	"
Δ 1 yr +/-		°		'		"
Result =	-43	°	32	'	59	" (DR)

SHA Monthly Corrections

Decl. Monthly Corrections

Better results are obtained if, for the last 2 years in a 5 year cycle, one subtracts the one year deltas from the next higher 5 year delta. For example: For the years 2026 and 2027 the 0 January values are obtained by adding the one year deltas to the 2025 value, while for 2028 and 2029 one would subtract them from the 2030 value.

Jan +/-	-8	"
Feb +/-	1	"
Mar +/-	7	"
Apr +/-	10	"
May +/-	10	"
Jun +/-	7	"
Jul +/-	2	"
Aug +/-	-3	" 2/3 of -4"
Sep +/-		"
Oct +/-		"
Nov +/-		"
Dec +/-		"
Total =	26	" (SM)

Jan +/-	-11	"
Feb +/-	-9	"
Mar +/-	-7	"
Apr +/-	-3	"
May +/-	1	"
Jun +/-	5	"
Jul +/-	8	"
Aug +/-	5	" 2/3 of 8"
Sep +/-		"
Oct +/-		"
Nov +/-		"
Dec +/-		"
Total =	-11	" (DM)

(SR)	222	°	43	'	28	"
(SM) +		°		'	26	"
SHA =	222	°	43	'	54	" (SHA)

(DR)	-43	°	32	'	59	"
(DM) +		°		'	-11	"
Decl. =	-43	°	33	'	10	" (DEC)

EzAlmanac reports 222 43.9'

EzAlmanac reports -43 33.2'

Star Observation Month Day Year

Sidereal Hour Angle

Declination

SHA 2020		°		'		"
Δ20xx +/-		°		'		"
Δ 1 yr +/-		°		'		"
Δ 1 yr +/-		°		'		"
Result =		°		'		" (SR)

Decl. 2020		°		'		"
Δ20xx +/-		°		'		"
Δ 1 yr +/-		°		'		"
Δ 1 yr +/-		°		'		"
Result =		°		'		" (DR)

SHA Monthly Corrections

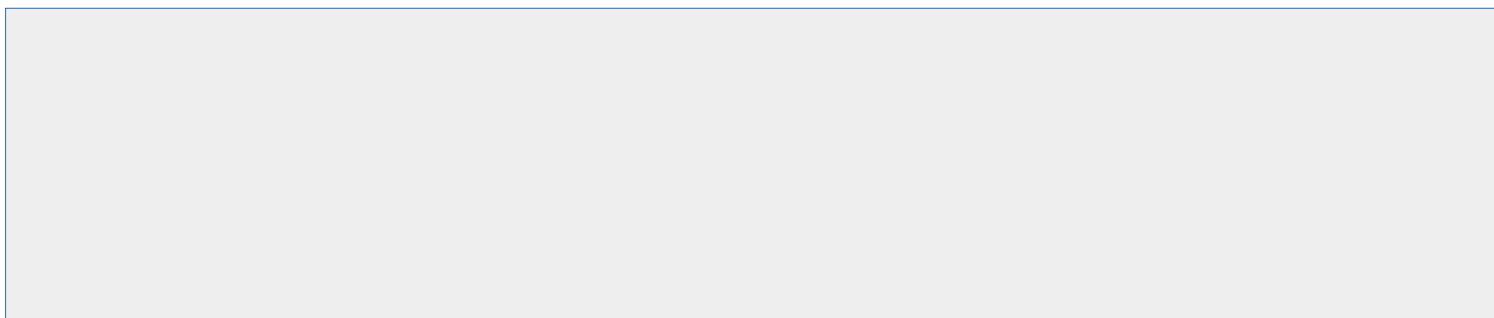
Decl. Monthly Corrections

Jan +/-		"
Feb +/-		"
Mar +/-		"
Apr +/-		"
May +/-		"
Jun +/-		"
Jul +/-		"
Aug +/-		"
Sep +/-		"
Oct +/-		"
Nov +/-		"
Dec +/-		"
Total =		" (SM)

Jan +/-		"
Feb +/-		"
Mar +/-		"
Apr +/-		"
May +/-		"
Jun +/-		"
Jul +/-		"
Aug +/-		"
Sep +/-		"
Oct +/-		"
Nov +/-		"
Dec +/-		"
Total =		" (DM)

(SR)		°		'		"
(SM) +		°		'		"
SHA =		°		'		" (SHA)

(DR)		°		'		"
(DM) +		°		'		"
Decl =		°		'		" (DEC)



Example #2 – Perpetual Almanac Worksheet

Date: Month Aug (M) Day 19 (D) Year 2024 (Y) UT Time: 17 (hh) 45 (mm) 25 (ss)
 Day Number: 212 (Mn) + D = 231 (Dn) Orbit Time: +/- (OT) +40m → 18 (ho) 25 (mo) 25 (so)

Determine table series and cycle from year: LY0/LY1/LY2/LY3 (S) 0/1/2/3/4/5/6/7 (C)

Orbit Time (ho) 18 (mo) 25 (OT)
 Early Time - 18 00 (ET) *ET and LT are the times bracketing OT in the tables.*
 Increment Time (Nearest 10 min) = 0 30 (IT)

Calculate GHA Aries

GHA 1 Jan 0000UT 2024 → 100 ° 9 ' 2.2 "
 (Dn) 231 → + 227 ° 40 ' 35.3 "
 (hh) 17 → + 255 ° 41 ' 53.3 "
 (mm) 45 → + 11 ° 16 ' 50.9 "
 (ss) 25 → + 234 ° 54 ' 38 " (GHAA)

Dn = Mn + D

Leap Year

Mon	Mn	Mon	Mn	Mon	Mn
Jan	-1	May	119/120	Sep	242/243
Feb	30	Jun	150/151	Oct	272/273
Mar	58/59	Jul	180/181	Nov	303/303
Apr	89/90	Aug	211/212	Dec	333/334

Calculate Solar Declination

EzAlmanac reports 234 54.2

Declination 1 Jan 0000UT 2024 -----> -23 ° 3 ' 34.7 " (DB)
 Decl diff for Dn ET 1800 → 35 ° 30 ' 2 " (DE) ---> + 35 ° 30 ' 2 " (DE)
 Decl diff for Dn LT 2000 → - 35 ° 28 ' 22 " (DL) **Positive if increasing from ET to LT, negative if decreasing.**
 Difference = 0 ° -1 ' 40 " (DF)

Look up Increment in Interpolation Table using DF and IT -----> + 0 ° 0 ' -26 " (DI)

Quadrennial correction for series -52 " * 1 (C) = -52 " --> + 0 ° 0 ' -52 " (DQ)

Solar Declination for observation -----> = 12 ° 26 ' 59.7 " (DEC)

EzAlmanac reports 12 26.7'

Calculate GHA Sun

Solar E 1 Jan 0000UT 2024 -----> 4 ° 13 ' 47 " (EB)
 E diff for Dn ET 1800 → 0 ° -5 ' 27 " (EE) -----> + 0 ° -5 ' 27 " (EE)
 E diff for Dn LT 2000 → - 0 ° -5 ' 10 " (EL) **Positive if increasing from ET to LT, negative if decreasing.**
 Difference = 0 ° 0 ' 17 " (EF)

Look up Increment in Interpolation Table using EF and IT -----> + 0 ° 0 ' 4 " (EI)

E for observation -----> = 4 ° 8 ' 21 " (EO)

Solar Increment

Hour 17 (hh) → + 70 ° 0 ' 0 "
 Minutes 45 (mm) → + 11 ° 15 ' 0 "
 Seconds 25 (ss) → + 0 ° 0 ' 15 "
 Solar Increment = 81 ° 21 ' 15 " (SI) -----> + 81 ° 21 ' 15 " (SI)
GHA Sun = 85 ° 29 ' 39 " (GHAS)

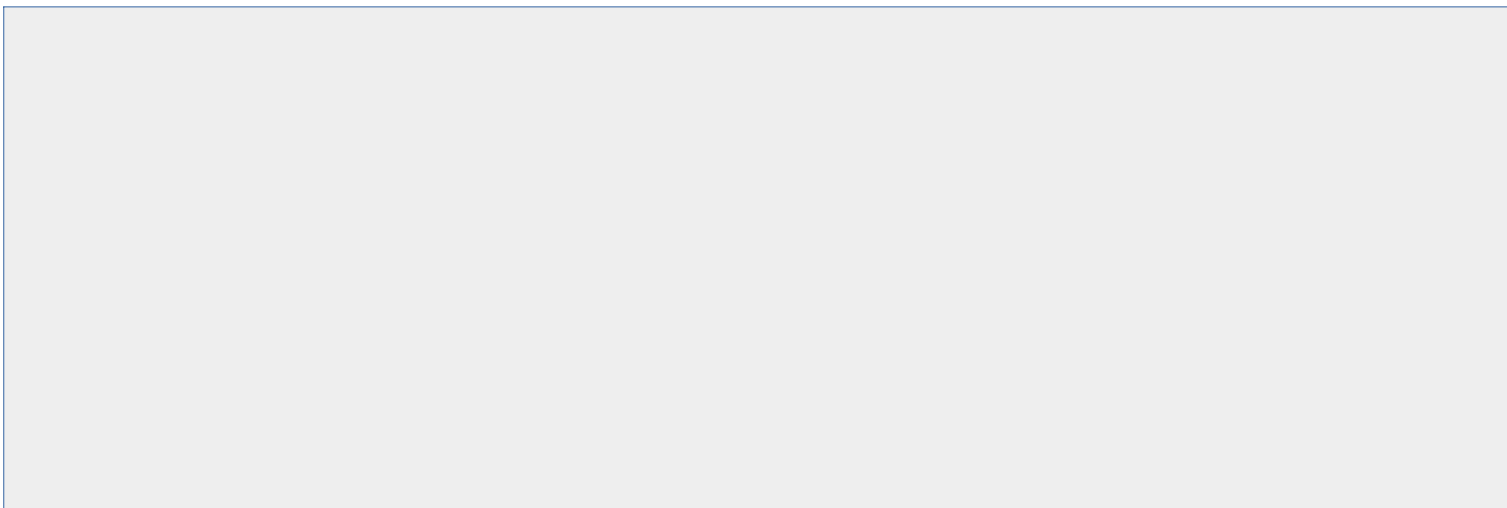
EzAlmanac reports 85 29.3'

Calculate Equation of Time

EoT for 1 Jan 0000UT 2024 -----> 3 m 4.9 s (EB)
 Arc-to-Time (EE) 0 ° -5 ' 27 " -----> - 0 m -21.8 s (TE)
 Arc-to-Time (EF) 0 ° 0 ' 17 " → 0 m 1.1 s (TF)

Look up Increment in Interpolation Table using TF and IT -----> - 0 m 0.3 s (TI)

Equation of Time for observation -----> = 3 m 26 s (T0)



Quaddrenial Correcton Table for Solar Declination

Dn	LY0	LY1	LY2	LY3	Dn	LY0	LY1	LY2	LY3	Dn	LY0	LY1	LY2	LY3	Dn	LY0	LY1	LY2	LY3	Dn	LY0	LY1	LY2	LY3
0	0	0	0	0	92	32	32	30	31	184	-22	-25	-26	-27	276	-55	-57	-56	-56	2	2	2	2	2
1	1	1	1	1	93	32	32	30	31	185	-23	-26	-27	-28	277	-55	-57	-56	-56	3	3	3	3	3
2	2	2	2	2	94	32	32	30	31	186	-24	-27	-28	-28	278	-54	-57	-56	-56	4	4	4	4	4
3	3	3	3	3	95	32	32	29	30	187	-25	-28	-28	-29	279	-54	-56	-55	-56	5	5	5	5	5
4	4	4	4	4	96	32	31	29	30	188	-25	-29	-29	-30	280	-54	-56	-55	-56	6	6	6	6	6
5	5	5	5	5	97	32	31	29	30	189	-26	-29	-30	-31	281	-54	-55	-55	-56	7	7	7	7	7
6	6	6	6	6	98	32	31	28	30	190	-27	-30	-31	-32	282	-54	-55	-55	-55	8	8	8	8	8
7	7	7	7	7	99	32	31	28	30	191	-28	-31	-31	-32	283	-54	-55	-55	-55	9	9	9	9	9
8	8	8	8	8	100	31	30	28	30	192	-29	-32	-32	-33	284	-54	-54	-55	-55	10	10	10	10	10
9	9	9	9	9	101	31	30	28	30	193	-30	-32	-33	-34	285	-53	-54	-54	-54	11	11	11	11	11
10	10	10	10	10	102	31	29	27	29	194	-30	-33	-34	-35	286	-53	-53	-54	-54	12	12	12	12	12
11	11	11	11	11	103	31	29	27	29	195	-31	-34	-35	-35	287	-53	-53	-54	-53	13	13	13	13	13
12	12	12	12	12	104	31	29	27	29	196	-32	-34	-35	-36	288	-52	-53	-54	-53	14	14	14	14	14
13	13	13	13	13	105	31	28	27	28	197	-33	-35	-36	-37	289	-52	-52	-53	-52	15	15	15	15	15
14	14	14	14	14	106	30	28	26	28	198	-34	-36	-37	-37	290	-51	-52	-53	-52	16	16	16	16	16
15	15	15	15	15	107	30	27	26	28	199	-34	-36	-38	-38	291	-51	-52	-53	-51	17	17	17	17	17
16	16	16	16	16	108	30	27	26	27	200	-35	-37	-38	-39	292	-50	-51	-52	-51	18	18	18	18	18
17	17	17	17	17	109	30	26	26	27	201	-36	-38	-39	-39	293	-50	-51	-52	-50	19	19	19	19	19
18	18	18	18	18	110	29	26	25	26	202	-36	-39	-40	-40	294	-49	-51	-52	-50	20	20	20	20	20
19	19	19	19	19	111	29	26	25	26	203	-37	-39	-41	-40	295	-49	-51	-51	-49	21	21	21	21	21
20	20	20	20	20	112	28	25	25	25	204	-37	-40	-41	-41	296	-48	-50	-51	-49	22	22	22	22	22
21	21	21	21	21	113	28	25	24	24	205	-38	-41	-42	-41	297	-48	-50	-50	-49	23	23	23	23	23
22	22	22	22	22	114	27	25	24	24	206	-39	-41	-42	-42	298	-47	-49	-49	-48	24	24	24	24	24
23	23	23	23	23	115	27	24	24	23	207	-39	-42	-43	-43	299	-47	-49	-49	-48	25	25	25	25	25
24	24	24	24	24	116	26	24	23	23	208	-40	-43	-44	-43	300	-46	-49	-48	-47	26	26	26	26	26
25	25	25	25	25	117	26	24	23	22	209	-40	-44	-44	-44	301	-46	-48	-48	-47	27	27	27	27	27
26	26	26	26	26	118	25	23	22	22	210	-41	-44	-45	-44	302	-46	-48	-47	-47	28	28	28	28	28
27	27	27	27	27	119	25	23	21	21	211	-41	-45	-45	-45	303	-45	-47	-46	-46	29	29	29	29	29
28	28	28	28	28	120	24	23	21	21	212	-42	-46	-46	-45	304	-45	-47	-46	-46	30	30	30	30	30
29	29	29	29	29	121	24	22	20	20	213	-43	-46	-46	-46	305	-44	-46	-45	-45	31	31	31	31	31
30	30	30	30	30	122	23	22	20	20	214	-43	-47	-46	-46	306	-44	-45	-45	-45	32	32	32	32	32
31	31	31	31	31	123	23	21	19	19	215	-44	-47	-47	-47	307	-44	-45	-44	-44	33	33	33	33	33
32	32	32	32	32	124	22	21	18	18	216	-44	-48	-47	-48	308	-43	-44	-44	-44	34	34	34	34	34
33	33	33	33	33	125	22	20	18	18	217	-45	-48	-48	-49	309	-43	-43	-43	-43	35	35	35	35	35
34	34	34	34	34	126	21	20	17	17	218	-46	-49	-48	-49	310	-42	-43	-43	-43	36	36	36	36	36
35	35	35	35	35	127	21	19	17	17	219	-46	-49	-49	-50	311	-42	-42	-42	-42	37	37	37	37	37
36	36	36	36	36	128	20	19	16	16	220	-47	-50	-49	-50	312	-41	-41	-42	-41	38	38	38	38	38
37	37	37	37	37	129	20	18	15	16	221	-47	-50	-50	-51	313	-41	-41	-41	-41	39	39	39	39	39
38	38	38	38	38	130	20	17	15	16	222	-48	-50	-50	-51	314	-40	-40	-41	-40	40	40	40	40	40
39	39	39	39	39	131	19	17	14	15	223	-48	-51	-51	-52	315	-39	-39	-40	-39	41	41	41	41	41
40	40	40	40	40	132	19	16	14	15	224	-49	-51	-51	-52	316	-39	-38	-39	-39	42	42	42	42	42
41	41	41	41	41	133	18	15	13	14	225	-49	-51	-52	-52	317	-38	-38	-39	-38	43	43	43	43	43
42	42	42	42	42	134	17	15	13	13	226	-50	-52	-52	-53	318	-37	-37	-38	-37	44	44	44	44	44
43	43	43	43	43	135	17	14	12	13	227	-50	-52	-53	-53	319	-37	-37	-37	-37	45	45	45	45	45
44	44	44	44	44	136	16	13	11	12	228	-51	-52	-53	-53	320	-36	-36	-37	-36	46	46	46	46	46
45	45	45	45	45	137	16	12	11	11	229	-51	-53	-54	-54	321	-35	-35	-36	-35	47	47	47	47	47
46	46	46	46	46	138	15	12	10	10	230	-51	-53	-54	-54	322	-34	-35	-35	-34	48	48	48	48	48
47	47	47	47	47	139	14	11	10	10	231	-52	-53	-55	-54	323	-33	-34	-35	-33	49	49	49	49	49
48	48	48	48	48	140	14	10	9	9	232	-52	-54	-55	-54	324	-33	-33	-34	-33	50	50	50	50	50
49	49	49	49	49	141	13	10	8	8	233	-52	-54	-55	-54	325	-32	-33	-33	-32	51	51	51	51	51
50	50	50	50	50	142	12	9	8	7	234	-52	-55	-56	-54	326	-31	-32	-32	-31	52	52	52	52	52
51	51	51	51	51	143	11	8	7	6	235	-52	-55	-56	-55	327	-30	-31	-31	-31	53	53	53	53	53
52	52	52	52	52	144	11	8	6	6	236	-53	-56	-56	-55	328	-30	-30	-31	-30	54	54	54	54	54
53	53	53	53	53	145	10	7	5	5	237	-53	-56	-56	-55	329	-29	-30	-30	-29	55	55	55	55	55
54	54	54	54	54	146	9	6	5	4	238	-53	-56	-56	-55	330	-28	-29	-29	-29	56	56	56	56	56
55	55	55	55	55	147	8	6	4	3	239	-53	-57	-57	-56	331	-27	-28	-28	-28	57	57	57	57	57
56	56	56	56	56	148	7	5	3	3	240	-53	-57	-57	-56	332	-27	-27	-27	-27	58	58	58	58	58
57	57	57	57	57	149	7	4	2	2	241	-54	-57	-57	-56	333	-26	-27	-26	-26	59	59	59	59	59
58	58	58	58	58	150	6	4	1	1	242	-54	-58	-57	-56	334	-25	-26	-26	-26	60	60	60	60	60
59	59	59	59	59	151	5	3	1	0	243	-54	-58	-57	-57	335	-25	-25	-25	-25	61	61	61	61	61
60	60	60	60	60	152	4	2	0	0	244	-54	-58	-57	-57	336	-24	-24	-24	-24	62	62	62	62	62
61	61	61	61	61	153	3	1	-1	-1	245	-55	-58	-57	-57	337	-23	-23	-23	-23	63	63	63	63	63
62	62	62	62	62	154	3	0	-2	-2	246	-55	-58	-57	-58	338	-22	-22	-23	-22	64	64	64	64	64
63	63	63	63	63	155	2	0	-3	-3	247	-55	-58	-57	-58	339	-22	-21	-22	-22	65	65	65	65	65
64	64	64	64	64	156	1	-1	-3	-4	248	-55	-58	-57	-58	340	-21	-20	-21	-21	66	66	66	66	66
65	65	65	65	65	157	0	-2	-4	-4	249	-56	-58	-57	-58	341	-20	-20	-20	-20	67	67	67	67	67
66	66	66	66	66	158	0	-3	-5	-5	250	-56	-58	-58	-58	342	-19	-19	-19	-19	68	68	68	68	68
67	67																							

Solar Declination Differentials -- Epoch 2020 -- Leap Years (LY0)

Dn	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
0	0° 23'	0° 45'	1° 08'	1° 30'	1° 53'	2° 17'	2° 41'	3° 07'	3° 32'	3° 58'	4° 24'	
1	4° 49'	5° 15'	5° 39'	6° 04'	6° 29'	6° 54'	7° 20'	7° 47'	8° 14'	8° 42'	9° 11'	9° 39'
2	10° 06'	10° 34'	11° 01'	11° 28'	11° 55'	12° 23'	12° 51'	13° 20'	13° 50'	14° 20'	14° 50'	15° 21'
3	15° 51'	16° 20'	16° 50'	17° 19'	17° 48'	18° 18'	18° 49'	19° 20'	19° 52'	20° 25'	20° 57'	21° 30'
4	22° 02'	22° 34'	23° 06'	23° 37'	24° 09'	24° 41'	25° 14'	25° 47'	26° 22'	26° 56'	27° 31'	28° 06'
5	28° 41'	29° 15'	29° 49'	30° 23'	30° 57'	31° 31'	32° 06'	32° 42'	33° 18'	33° 55'	34° 32'	35° 09'
6	35° 46'	36° 23'	36° 59'	37° 35'	38° 11'	38° 47'	39° 25'	40° 03'	40° 41'	41° 20'	41° 60'	42° 39'
7	43° 18'	43° 57'	44° 35'	45° 13'	45° 51'	46° 30'	47° 10'	47° 50'	48° 31'	49° 12'	49° 54'	50° 35'
8	51° 16'	51° 57'	52° 38'	53° 18'	53° 58'	54° 39'	55° 21'	56° 03'	56° 46'	57° 30'	58° 14'	58° 57'
9	59° 41'	1° 02' 24"	1° 01' 06"	1° 01' 49"	1° 02' 31"	1° 03' 15"	1° 03' 58"	1° 04' 43"	1° 05' 28"	1° 06' 14"	1° 06' 59"	1° 07' 45"
10	1° 8' 31"	1° 9' 16"	1° 10' 01"	1° 10' 45"	1° 11' 30"	1° 12' 15"	1° 13' 01"	1° 13' 48"	1° 14' 35"	1° 15' 23"	1° 16' 11"	1° 16' 59"
11	1° 17' 47"	1° 18' 34"	1° 19' 21"	1° 20' 08"	1° 20' 54"	1° 21' 42"	1° 22' 30"	1° 23' 19"	1° 24' 08"	1° 24' 58"	1° 25' 48"	1° 26' 38"
12	1° 27' 28"	1° 28' 17"	1° 29' 06"	1° 29' 55"	1° 30' 44"	1° 31' 33"	1° 32' 24"	1° 33' 14"	1° 34' 06"	1° 34' 58"	1° 35' 50"	1° 36' 42"
13	1° 37' 34"	1° 38' 25"	1° 39' 16"	1° 40' 07"	1° 40' 59"	1° 41' 50"	1° 42' 42"	1° 43' 35"	1° 44' 29"	1° 45' 23"	1° 46' 17"	1° 47' 11"
14	1° 48' 05"	1° 48' 58"	1° 49' 52"	1° 50' 45"	1° 51' 38"	1° 52' 31"	1° 53' 26"	1° 54' 20"	1° 55' 16"	1° 56' 12"	1° 57' 08"	1° 58' 04"
15	1° 59' 00"	1° 59' 56"	2° 0' 51"	2° 0' 46"	2° 0' 41"	2° 0' 37"	2° 0' 33"	2° 0' 30"	2° 0' 28"	2° 0' 26"	2° 0' 24"	2° 0' 22"
16	2° 10' 20"	2° 11' 18"	2° 12' 15"	2° 13' 12"	2° 14' 09"	2° 15' 07"	2° 16' 05"	2° 17' 04"	2° 18' 04"	2° 19' 04"	2° 20' 04"	2° 21' 04"
17	2° 22' 04"	2° 23' 03"	2° 24' 03"	2° 25' 02"	2° 26' 01"	2° 27' 00"	2° 28' 01"	2° 29' 02"	2° 30' 03"	2° 31' 05"	2° 32' 07"	2° 33' 09"
18	2° 34' 11"	2° 35' 13"	2° 36' 14"	2° 37' 15"	2° 38' 16"	2° 39' 18"	2° 40' 20"	2° 41' 22"	2° 42' 26"	2° 43' 30"	2° 44' 34"	2° 45' 38"
19	2° 46' 42"	2° 47' 45"	2° 48' 48"	2° 49' 51"	2° 50' 54"	2° 51' 58"	2° 53' 02"	2° 54' 07"	2° 55' 12"	2° 56' 18"	2° 57' 24"	2° 58' 30"
20	2° 59' 35"	3° 0' 41"	3° 0' 46"	3° 0' 50"	3° 0' 55"	3° 0' 5' 1"	3° 0' 6' 7"	3° 0' 7' 13"	3° 0' 8' 21"	3° 0' 9' 28"	3° 0' 10' 36"	3° 0' 11' 44"
21	3° 12' 51"	3° 13' 59"	3° 15' 06"	3° 16' 12"	3° 17' 19"	3° 18' 26"	3° 19' 34"	3° 20' 43"	3° 21' 52"	3° 23' 01"	3° 24' 11"	3° 25' 20"
22	3° 26' 30"	3° 27' 39"	3° 28' 48"	3° 29' 56"	3° 31' 05"	3° 32' 14"	3° 33' 24"	3° 34' 34"	3° 35' 45"	3° 36' 56"	3° 38' 07"	3° 39' 19"
23	3° 40' 30"	3° 41' 41"	3° 42' 51"	3° 44' 02"	3° 45' 12"	3° 46' 23"	3° 47' 35"	3° 48' 47"	3° 49' 59"	3° 51' 12"	3° 52' 26"	3° 53' 39"
24	3° 54' 52"	3° 56' 04"	3° 57' 17"	3° 58' 29"	3° 59' 41"	4° 0' 54"	4° 0' 2' 7"	4° 0' 3' 21"	4° 0' 4' 35"	4° 0' 5' 50"	4° 0' 7' 5"	4° 0' 8' 20"
25	4° 0' 35"	4° 10' 49"	4° 12' 03"	4° 13' 17"	4° 14' 31"	4° 15' 45"	4° 17' 00"	4° 18' 16"	4° 19' 32"	4° 20' 48"	4° 22' 5"	4° 23' 22"
26	4° 24' 38"	4° 25' 54"	4° 27' 10"	4° 28' 26"	4° 29' 41"	4° 30' 57"	4° 32' 14"	4° 33' 31"	4° 34' 49"	4° 36' 7"	4° 37' 26"	4° 38' 44"
27	4° 40' 22"	4° 41' 20"	4° 42' 37"	4° 43' 55"	4° 45' 12"	4° 46' 30"	4° 47' 48"	4° 49' 7"	4° 50' 26"	4° 51' 46"	4° 53' 6"	4° 54' 26"
28	4° 55' 46"	4° 57' 05"	4° 58' 24"	4° 59' 43"	5° 0' 12"	5° 0' 22"	5° 0' 32"	5° 0' 42"	5° 0' 52"	5° 0' 6' 23"	5° 0' 7' 45"	5° 0' 9' 6"
29	5° 11' 49"	5° 13' 10"	5° 14' 31"	5° 15' 52"	5° 17' 12"	5° 18' 33"	5° 19' 55"	5° 21' 17"	5° 22' 40"	5° 24' 3"	5° 25' 26"	5° 26' 49"
30	5° 28' 12"	5° 29' 34"	5° 30' 57"	5° 32' 19"	5° 33' 41"	5° 35' 04"	5° 36' 27"	5° 37' 51"	5° 39' 15"	5° 40' 39"	5° 42' 4"	5° 43' 29"
31	5° 44' 53"	5° 46' 17"	5° 47' 41"	5° 49' 5"	5° 50' 29"	5° 51' 53"	5° 53' 18"	5° 54' 43"	5° 56' 8"	5° 57' 34"	5° 59' 1"	6° 0' 27"
32	6° 0' 53"	6° 0' 39"	6° 0' 44"	6° 0' 9"	6° 0' 7' 34"	6° 0' 9"	6° 0' 10' 26"	6° 0' 11' 53"	6° 0' 13' 20"	6° 0' 14' 48"	6° 0' 16' 15"	6° 0' 17' 43"
33	6° 19' 10"	6° 20' 38"	6° 22' 04"	6° 23' 31"	6° 24' 58"	6° 26' 25"	6° 27' 53"	6° 29' 21"	6° 30' 49"	6° 32' 18"	6° 33' 48"	6° 35' 17"
34	6° 36' 46"	6° 38' 14"	6° 39' 42"	6° 41' 11"	6° 42' 39"	6° 44' 7"	6° 45' 36"	6° 47' 6"	6° 48' 36"	6° 50' 6"	6° 51' 37"	6° 53' 7"
35	6° 54' 38"	6° 56' 8"	6° 57' 37"	6° 59' 7"	7° 0' 37"	7° 0' 2' 7"	7° 0' 3' 37"	7° 0' 5' 8"	7° 0' 6' 39"	7° 0' 8' 11"	7° 0' 9' 43"	7° 0' 11' 15"
36	7° 12' 46"	7° 14' 18"	7° 15' 49"	7° 17' 20"	7° 18' 51"	7° 20' 22"	7° 21' 54"	7° 23' 26"	7° 24' 59"	7° 26' 32"	7° 28' 5"	7° 29' 39"
37	7° 31' 12"	7° 32' 44"	7° 34' 17"	7° 35' 49"	7° 37' 21"	7° 38' 54"	7° 40' 27"	7° 42' 1"	7° 43' 35"	7° 45' 9"	7° 46' 44"	7° 48' 18"
38	7° 49' 52"	7° 51' 26"	7° 53' 0"	7° 54' 34"	7° 56' 7"	7° 57' 41"	7° 59' 16"	8° 0' 51"	8° 0' 2' 26"	8° 0' 4' 2"	8° 0' 5' 37"	8° 0' 7' 13"
39	8° 0' 8' 49"	8° 0' 10' 24"	8° 0' 11' 59"	8° 0' 13' 34"	8° 0' 15' 9"	8° 0' 16' 44"	8° 0' 18' 20"	8° 0' 19' 56"	8° 0' 21' 32"	8° 0' 23' 9"	8° 0' 24' 46"	8° 0' 26' 23"
40	8° 27' 60"	8° 29' 36"	8° 31' 13"	8° 32' 49"	8° 34' 25"	8° 36' 2"	8° 37' 38"	8° 39' 16"	8° 40' 53"	8° 42' 32"	8° 44' 10"	8° 45' 48"
41	8° 47' 26"	8° 49' 4"	8° 50' 41"	8° 52' 18"	8° 53' 56"	8° 55' 33"	8° 57' 12"	8° 58' 50"	9° 0' 29"	9° 0' 2' 8"	9° 0' 3' 48"	9° 0' 5' 27"
42	9° 7' 6"	9° 8' 45"	9° 10' 24"	9° 12' 2"	9° 13' 41"	9° 15' 20"	9° 16' 59"	9° 18' 38"	9° 20' 18"	9° 21' 59"	9° 23' 39"	9° 25' 20"
43	9° 27' 0"	9° 28' 40"	9° 30' 20"	9° 31' 60"	9° 33' 39"	9° 35' 19"	9° 36' 60"	9° 38' 40"	9° 40' 22"	9° 42' 3"	9° 43' 45"	9° 45' 26"
44	9° 47' 8"	9° 48' 49"	9° 50' 30"	9° 52' 10"	9° 53' 51"	9° 55' 32"	9° 57' 14"	9° 58' 56"	10° 0' 38"	10° 0' 2' 20"	10° 0' 4' 3"	10° 0' 5' 46"
45	10° 7' 28"	10° 9' 10"	10° 10' 52"	10° 12' 34"	10° 14' 16"	10° 15' 58"	10° 17' 41"	10° 19' 24"	10° 21' 7"	10° 22' 51"	10° 24' 34"	10° 26' 18"
46	10° 28' 1"	10° 29' 45"	10° 31' 28"	10° 33' 11"	10° 34' 54"	10° 36' 37"	10° 38' 20"	10° 40' 4"	10° 41' 49"	10° 43' 33"	10° 45' 18"	10° 47' 2"
47	10° 48' 47"	10° 50' 31"	10° 52' 15"	10° 53' 59"	10° 55' 43"	10° 57' 27"	10° 59' 12"	11° 0' 57"	11° 0' 42"	11° 0' 4' 28"	11° 0' 6' 13"	11° 0' 7' 59"
48	11° 9' 44"	11° 11' 30"	11° 13' 15"	11° 14' 59"	11° 16' 44"	11° 18' 30"	11° 20' 15"	11° 22' 1"	11° 23' 47"	11° 25' 34"	11° 27' 20"	11° 29' 7"
49	11° 30' 53"	11° 32' 39"	11° 34' 25"	11° 36' 11"	11° 37' 57"	11° 39' 43"	11° 41' 29"	11° 43' 16"	11° 45' 3"	11° 46' 51"	11° 48' 38"	11° 50' 26"
50	11° 52' 13"	11° 53' 60"	11° 55' 47"	11° 57' 33"	11° 59' 20"	12° 0' 7"	12° 0' 2' 55"	12° 0' 4' 42"	12° 0' 6' 30"	12° 0' 8' 18"	12° 0' 10' 7"	12° 0' 11' 55"
51	12° 13' 43"	12° 15' 31"	12° 17' 19"	12° 19' 6"	12° 20' 54"	12° 22' 42"	12° 24' 30"	12° 26' 19"	12° 28' 7"	12° 29' 56"	12° 31' 46"	12° 33' 35"
52	12° 35' 24"	12° 37' 12"	12° 39' 1"	12° 40' 49"	12° 42' 38"	12° 44' 27"	12° 46' 16"	12° 48' 5"	12° 49' 54"	12° 51' 44"	12° 53' 34"	12° 55' 24"
53	12° 57' 14"	12° 59' 3"	13° 0' 53"	13° 0' 42"	13° 0' 41"	13° 0' 6' 21"	13° 0' 8' 10"	13° 0' 10' 1"	13° 0' 11' 51"	13° 0' 13' 42"	13° 0' 15' 32"	13° 0' 17' 23"
54	13° 19' 13"	13° 21' 4"	13° 22' 54"	13° 24' 44"	13° 26' 34"	13° 28' 24"	13° 30' 15"	13° 32' 5"	13° 33' 56"	13° 35' 48"	13° 37' 39"	13° 39' 30"
55	13° 41' 22"	13° 43' 13"	13° 45' 3"	13° 46' 54"	13° 48' 45"	13° 50' 36"	13° 52' 27"	13° 54' 19"	13° 56' 11"	13° 58' 3"	13° 59' 55"	14° 0' 1' 47"
56	14° 3' 38"	14° 5' 30"	14° 7' 22"	14° 9' 13"	14° 11' 5"	14° 12' 56"	14° 14' 48"	14° 16' 40"	14° 18' 33"	14° 20' 25"	14° 22' 18"	14° 24' 11"
57	14° 26' 3"	14° 27' 56"	14° 29' 48"	14° 31' 40"	14° 33' 32"	14° 35' 24"	14° 37' 17"	14° 39' 10"	14° 41' 3"	14° 42' 56"	14° 44' 49"	14° 46' 43"
58	14° 48' 36"	14° 50' 29"	14° 52' 22"	14° 54' 14"	14° 56' 7"	14° 58' 0"	14° 59' 53"	15° 0' 1' 47"	15° 0' 3' 40"	15° 0' 5' 34"	15° 0' 7' 28"	15° 0' 9' 22"
59	15° 11' 54"	15° 13' 9"	15° 15' 3"	15° 16' 56"	15° 18' 49"	15° 20' 43"	15° 22' 37"	15° 24' 31"	15° 26' 25"	15° 28' 19"	15° 30' 13"	15° 32' 8"
60	15° 34' 2"	15° 35' 56"	15° 37' 50"	15° 39' 44"	15° 41' 38"	15° 43' 32"	15° 45' 26"	15° 47' 21"	15° 49' 16"	15° 51' 10"	15° 53' 5"	15° 55' 0"
61	15° 56' 55"	15° 58' 50"	16° 0' 44"	16° 0' 39"	16° 0' 33"	16° 0' 28"	16° 0' 22"	16° 0' 17"	16° 0' 12' 13"	16° 0' 14' 8"	16° 0' 16' 3"	16° 0' 17' 59"
62	16° 19' 54"	16° 21' 49"	16° 23' 44"	16° 25' 39"	16° 27' 34"	16° 29' 29"	16° 31' 24"	16° 33' 20"	16° 35' 15"	16° 37' 11"	16° 39' 7"	16° 41' 3"
63	16° 42' 58"	16° 44' 54"	16° 46' 50"	16° 48' 45"	16° 50' 40"	16° 52' 36"	16° 54' 32"	16° 56' 27"	16° 58' 23"	17° 0' 20"	17° 0' 16"	17° 0' 12' 12"
64	17° 6' 8"	17° 8' 4"	17° 10' 0"	17° 11' 56"	17° 13' 52"	17° 15' 48"	17° 17' 44"	17° 19' 40"	17° 21' 36"	17° 23' 33"	17° 25' 30"	17° 27' 26"
65	17° 29' 23"	17° 31' 19"	17° 33' 15"	17° 35' 11"	17° 37' 8"	17° 39' 4"	17° 41' 0"	17° 42' 57"	17° 44' 54"	17° 46' 51"	17° 48' 48"	17° 50' 45"
66	17° 52' 41"	17° 54' 38"	17° 56' 35"	17° 58' 31"	18° 0' 28"	18° 0' 25"	18° 0' 21"	18° 0' 18"	18° 0' 15"	18° 0' 12"	18° 0' 9"	18° 0' 7"
67	18° 16' 4"	18° 18' 1"	18° 19' 58"	18° 21' 55"	18° 23' 52"	18° 25' 49"	18° 27' 46"	18° 29' 43				

Solar Declination Differentials -- Epoch 2020 -- Leap Years (LY0)

Dn	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
92	28° 4' 50"	28° 6' 45"	28° 8' 40"	28° 10' 36"	28° 12' 31"	28° 14' 26"	28° 16' 21"	28° 18' 16"	28° 20' 11"	28° 22' 6"	28° 24' 0"	28° 25' 55"
93	28° 27' 50"	28° 29' 45"	28° 31' 39"	28° 33' 34"	28° 35' 29"	28° 37' 24"	28° 39' 19"	28° 41' 13"	28° 43' 8"	28° 45' 2"	28° 46' 56"	28° 48' 50"
94	28° 50' 44"	28° 52' 38"	28° 54' 33"	28° 56' 27"	28° 58' 22"	29° 0' 16"	29° 2' 10"	29° 4' 4"	29° 5' 58"	29° 7' 51"	29° 9' 45"	29° 11' 39"
95	29° 13' 32"	29° 15' 26"	29° 17' 20"	29° 19' 14"	29° 21' 8"	29° 23' 2"	29° 24' 55"	29° 26' 49"	29° 28' 42"	29° 30' 35"	29° 32' 28"	29° 34' 21"
96	29° 36' 14"	29° 38' 7"	29° 40' 1"	29° 41' 54"	29° 43' 47"	29° 45' 41"	29° 47' 34"	29° 49' 26"	29° 51' 19"	29° 53' 11"	29° 55' 4"	29° 56' 56"
97	29° 58' 49"	30° 0' 41"	30° 0' 24"	30° 4' 27"	30° 6' 20"	30° 8' 12"	30° 10' 5"	30° 11' 57"	30° 13' 49"	30° 15' 41"	30° 17' 33"	30° 19' 25"
98	30° 21' 16"	30° 23' 9"	30° 25' 1"	30° 26' 53"	30° 28' 45"	30° 30' 37"	30° 32' 29"	30° 34' 21"	30° 36' 12"	30° 38' 3"	30° 39' 54"	30° 41' 45"
99	30° 43' 37"	30° 45' 28"	30° 47' 20"	30° 49' 11"	30° 51' 3"	30° 52' 54"	30° 54' 45"	30° 56' 36"	30° 58' 27"	31° 0' 18"	31° 2' 8"	31° 3' 59"
100	31° 5' 49"	31° 7' 40"	31° 9' 31"	31° 11' 22"	31° 13' 13"	31° 15' 3"	31° 16' 54"	31° 18' 44"	31° 20' 34"	31° 22' 24"	31° 24' 14"	31° 26' 4"
101	31° 27' 54"	31° 29' 44"	31° 31' 34"	31° 33' 24"	31° 35' 14"	31° 37' 5"	31° 38' 54"	31° 40' 44"	31° 42' 33"	31° 44' 22"	31° 46' 11"	31° 48' 0"
102	31° 49' 50"	31° 51' 39"	31° 53' 29"	31° 55' 18"	31° 57' 8"	31° 58' 57"	32° 0' 46"	32° 2' 35"	32° 4' 24"	32° 6' 12"	32° 8' 0"	32° 9' 49"
103	32° 11' 37"	32° 13' 26"	32° 15' 15"	32° 17' 3"	32° 18' 52"	32° 20' 41"	32° 22' 29"	32° 24' 17"	32° 26' 5"	32° 27' 53"	32° 29' 40"	32° 31' 28"
104	32° 33' 16"	32° 35' 3"	32° 36' 51"	32° 38' 40"	32° 40' 28"	32° 42' 15"	32° 44' 3"	32° 45' 50"	32° 47' 37"	32° 49' 24"	32° 51' 11"	32° 52' 58"
105	32° 54' 45"	32° 56' 32"	32° 58' 19"	33° 0' 6"	33° 1' 54"	33° 3' 41"	33° 5' 27"	33° 7' 14"	33° 9' 0"	33° 10' 46"	33° 12' 32"	33° 14' 18"
106	33° 16' 4"	33° 17' 50"	33° 19' 37"	33° 21' 23"	33° 23' 10"	33° 24' 56"	33° 26' 42"	33° 28' 27"	33° 30' 13"	33° 31' 58"	33° 33' 43"	33° 35' 28"
107	33° 37' 13"	33° 38' 59"	33° 40' 44"	33° 42' 30"	33° 44' 16"	33° 46' 1"	33° 47' 46"	33° 49' 31"	33° 51' 15"	33° 52' 60"	33° 54' 44"	33° 56' 28"
108	33° 58' 12"	33° 59' 57"	34° 1' 42"	34° 3' 26"	34° 5' 11"	34° 6' 56"	34° 8' 40"	34° 10' 24"	34° 12' 7"	34° 13' 51"	34° 15' 34"	34° 17' 17"
109	34° 19' 1"	34° 20' 44"	34° 22' 28"	34° 24' 12"	34° 25' 56"	34° 27' 39"	34° 29' 23"	34° 31' 6"	34° 32' 48"	34° 34' 31"	34° 36' 13"	34° 37' 55"
110	34° 39' 38"	34° 41' 20"	34° 43' 3"	34° 44' 46"	34° 46' 29"	34° 48' 12"	34° 49' 54"	34° 51' 36"	34° 53' 18"	34° 54' 59"	34° 56' 41"	34° 58' 22"
111	35° 0' 3"	35° 1' 45"	35° 3' 27"	35° 5' 9"	35° 6' 51"	35° 8' 33"	35° 10' 14"	35° 11' 55"	35° 13' 36"	35° 15' 16"	35° 16' 57"	35° 18' 37"
112	35° 20' 18"	35° 21' 58"	35° 23' 39"	35° 25' 20"	35° 27' 1"	35° 28' 42"	35° 30' 22"	35° 32' 2"	35° 33' 42"	35° 35' 21"	35° 37' 1"	35° 38' 40"
113	35° 40' 19"	35° 41' 59"	35° 43' 39"	35° 45' 19"	35° 46' 59"	35° 48' 39"	35° 50' 18"	35° 51' 57"	35° 53' 36"	35° 55' 14"	35° 56' 52"	35° 58' 31"
114	36° 0' 9"	36° 1' 48"	36° 3' 27"	36° 5' 6"	36° 6' 44"	36° 8' 23"	36° 10' 1"	36° 11' 39"	36° 13' 17"	36° 14' 54"	36° 16' 31"	36° 18' 8"
115	36° 19' 46"	36° 21' 23"	36° 23' 1"	36° 24' 39"	36° 26' 17"	36° 27' 55"	36° 29' 32"	36° 31' 9"	36° 32' 45"	36° 34' 21"	36° 35' 57"	36° 37' 33"
116	36° 39' 9"	36° 40' 46"	36° 42' 23"	36° 43' 59"	36° 45' 36"	36° 47' 13"	36° 48' 49"	36° 50' 24"	36° 51' 60"	36° 53' 35"	36° 55' 9"	36° 56' 44"
117	36° 58' 20"	36° 59' 55"	37° 1' 31"	37° 3' 6"	37° 4' 42"	37° 6' 17"	37° 7' 52"	37° 9' 27"	37° 11' 1"	37° 12' 34"	37° 14' 8"	37° 15' 42"
118	37° 17' 16"	37° 18' 50"	37° 20' 25"	37° 21' 59"	37° 23' 34"	37° 25' 8"	37° 26' 41"	37° 28' 15"	37° 29' 48"	37° 31' 20"	37° 32' 53"	37° 34' 25"
119	37° 35' 58"	37° 37' 31"	37° 39' 4"	37° 40' 38"	37° 42' 11"	37° 43' 44"	37° 45' 17"	37° 46' 49"	37° 48' 20"	37° 49' 52"	37° 51' 23"	37° 52' 54"
120	37° 54' 26"	37° 55' 58"	37° 57' 30"	37° 59' 2"	38° 0' 34"	38° 2' 6"	38° 3' 37"	38° 5' 8"	38° 6' 38"	38° 8' 8"	38° 9' 38"	38° 11' 8"
121	38° 12' 39"	38° 14' 9"	38° 15' 40"	38° 17' 11"	38° 18' 42"	38° 20' 12"	38° 21' 42"	38° 23' 12"	38° 24' 41"	38° 26' 10"	38° 27' 39"	38° 29' 7"
122	38° 30' 36"	38° 32' 6"	38° 33' 35"	38° 35' 5"	38° 36' 34"	38° 38' 4"	38° 39' 32"	38° 41' 1"	38° 42' 29"	38° 43' 56"	38° 45' 24"	38° 46' 51"
123	38° 48' 19"	38° 49' 47"	38° 51' 15"	38° 52' 43"	38° 54' 12"	38° 55' 39"	38° 57' 7"	38° 58' 34"	39° 0' 0"	39° 1' 27"	39° 2' 53"	39° 4' 19"
124	39° 5' 45"	39° 7' 12"	39° 8' 39"	39° 10' 6"	39° 11' 33"	39° 12' 59"	39° 14' 25"	39° 15' 51"	39° 17' 16"	39° 18' 41"	39° 20' 6"	39° 21' 31"
125	39° 22' 56"	39° 24' 21"	39° 25' 46"	39° 27' 12"	39° 28' 38"	39° 30' 3"	39° 31' 28"	39° 32' 52"	39° 34' 16"	39° 35' 39"	39° 37' 3"	39° 38' 26"
126	39° 39' 50"	39° 41' 14"	39° 42' 38"	39° 44' 2"	39° 45' 26"	39° 46' 50"	39° 48' 13"	39° 49' 36"	39° 50' 59"	39° 52' 21"	39° 53' 43"	39° 55' 5"
127	39° 56' 27"	39° 57' 49"	39° 59' 12"	40° 0' 35"	40° 1' 58"	40° 3' 20"	40° 4' 42"	40° 6' 4"	40° 7' 25"	40° 8' 46"	40° 10' 6"	40° 11' 27"
128	40° 12' 47"	40° 14' 9"	40° 15' 30"	40° 16' 51"	40° 18' 13"	40° 19' 34"	40° 20' 54"	40° 22' 14"	40° 23' 34"	40° 24' 53"	40° 26' 12"	40° 27' 31"
129	40° 28' 51"	40° 30' 10"	40° 31' 30"	40° 32' 50"	40° 34' 10"	40° 35' 30"	40° 36' 49"	40° 38' 8"	40° 39' 26"	40° 40' 43"	40° 42' 1"	40° 43' 19"
130	40° 44' 37"	40° 45' 55"	40° 47' 13"	40° 48' 32"	40° 49' 50"	40° 51' 9"	40° 52' 26"	40° 53' 43"	40° 54' 60"	40° 55' 16"	40° 56' 32"	40° 57' 48"
131	41° 0' 5"	41° 1' 21"	41° 2' 38"	41° 3' 56"	41° 5' 13"	41° 6' 29"	41° 7' 45"	41° 9' 1"	41° 10' 16"	41° 11' 31"	41° 12' 45"	41° 13' 60"
132	41° 15' 15"	41° 16' 30"	41° 17' 46"	41° 19' 1"	41° 20' 17"	41° 21' 32"	41° 22' 47"	41° 24' 1"	41° 25' 14"	41° 26' 27"	41° 27' 40"	41° 28' 53"
133	41° 30' 7"	41° 31' 20"	41° 32' 34"	41° 33' 49"	41° 35' 2"	41° 36' 16"	41° 37' 29"	41° 38' 42"	41° 39' 54"	41° 41' 5"	41° 42' 17"	41° 43' 28"
134	41° 44' 40"	41° 45' 52"	41° 47' 5"	41° 48' 17"	41° 49' 30"	41° 50' 42"	41° 51' 53"	41° 53' 4"	41° 54' 14"	41° 55' 24"	41° 56' 34"	41° 57' 44"
135	41° 58' 55"	42° 0' 5"	42° 1' 16"	42° 2' 27"	42° 3' 38"	42° 4' 48"	42° 5' 58"	42° 7' 7"	42° 8' 16"	42° 9' 25"	42° 10' 33"	42° 11' 41"
136	42° 12' 50"	42° 13' 59"	42° 15' 8"	42° 16' 17"	42° 17' 27"	42° 18' 36"	42° 19' 44"	42° 20' 52"	42° 21' 59"	42° 23' 5"	42° 24' 12"	42° 25' 19"
137	42° 26' 26"	42° 27' 33"	42° 28' 41"	42° 29' 48"	42° 30' 56"	42° 32' 3"	42° 33' 10"	42° 34' 16"	42° 35' 22"	42° 36' 27"	42° 37' 32"	42° 38' 37"
138	42° 39' 42"	42° 40' 48"	42° 41' 54"	42° 42' 60"	42° 44' 6"	42° 45' 11"	42° 46' 16"	42° 47' 21"	42° 48' 25"	42° 49' 28"	42° 50' 31"	42° 51' 35"
139	42° 52' 38"	42° 53' 42"	42° 54' 47"	42° 55' 51"	42° 56' 55"	42° 57' 59"	42° 59' 3"	43° 0' 5"	43° 1' 7"	43° 2' 9"	43° 3' 11"	43° 4' 12"
140	43° 5' 14"	43° 6' 17"	43° 7' 19"	43° 8' 22"	43° 9' 25"	43° 10' 27"	43° 11' 28"	43° 12' 29"	43° 13' 30"	43° 14' 30"	43° 15' 30"	43° 16' 30"
141	43° 17' 30"	43° 18' 30"	43° 19' 31"	43° 20' 32"	43° 21' 33"	43° 22' 34"	43° 23' 34"	43° 24' 33"	43° 25' 32"	43° 26' 30"	43° 27' 28"	43° 28' 26"
142	43° 29' 25"	43° 30' 24"	43° 31' 23"	43° 32' 22"	43° 33' 21"	43° 34' 20"	43° 35' 18"	43° 36' 16"	43° 37' 13"	43° 38' 9"	43° 39' 5"	43° 40' 2"
143	43° 40' 59"	43° 41' 56"	43° 42' 53"	43° 43' 51"	43° 44' 48"	43° 45' 45"	43° 46' 41"	43° 47' 37"	43° 48' 32"	43° 49' 27"	43° 50' 21"	43° 51' 16"
144	43° 52' 11"	43° 53' 6"	43° 54' 2"	43° 54' 58"	43° 55' 53"	43° 56' 49"	43° 57' 43"	43° 58' 37"	43° 59' 30"	44° 0' 23"	44° 1' 16"	44° 2' 9"
145	44° 3' 2"	44° 3' 56"	44° 4' 50"	44° 5' 43"	44° 6' 37"	44° 7' 31"	44° 8' 23"	44° 9' 16"	44° 10' 7"	44° 10' 58"	44° 11' 49"	44° 12' 40"
146	44° 13' 32"	44° 14' 23"	44° 15' 15"	44° 16' 7"	44° 16' 59"	44° 17' 51"	44° 18' 42"	44° 19' 32"	44° 20' 22"	44° 21' 11"	44° 22' 0"	44° 22' 49"
147	44° 23' 39"	44° 24' 29"	44° 25' 19"	44° 26' 9"	44° 26' 59"	44° 27' 49"	44° 28' 38"	44° 29' 27"	44° 30' 14"	44° 31' 2"	44° 31' 49"	44° 32' 36"
148	44° 33' 24"	44° 34' 12"	44° 35' 0"	44° 35' 49"	44° 36' 37"	44° 37' 25"	44° 38' 12"	44° 38' 59"	44° 39' 45"	44° 40' 30"	44° 41' 16"	44° 42' 1"
149	44° 42' 47"	44° 43' 33"	44° 44' 19"	44° 45' 6"	44° 45' 52"	44° 46' 38"	44° 47' 24"	44° 48' 8"	44° 48' 52"	44° 49' 36"	44° 50' 20"	44° 51' 3"
150	44° 51' 47"	44° 52' 31"	44° 53' 16"	44° 54' 0"	44° 54' 45"	44° 55' 29"	44° 56' 12"	44° 56' 55"	44° 57' 37"	44° 58' 19"	44° 59' 1"	44° 59' 42"
151	45° 0' 24"	45° 1' 7"	45° 1' 49"	45° 2' 32"	45° 3' 15"	45° 3' 57"	45° 4' 38"	45° 5' 19"	45° 5' 59"	45° 6' 39"	45° 7' 19"	45° 7' 58"
152	45° 8' 38"	45° 9' 19"	45° 9' 60"	45° 10' 40"	45° 11' 21"	45° 12' 1"	45° 12' 41"	45° 13' 20"	45° 13' 58"	45° 14' 36"	45° 15' 14"	45° 15' 51"
153	45° 16' 30"	45° 17' 8"	45° 17' 47"	45° 18' 26"	45° 19' 4"	45° 19' 43"	45° 20' 20"	45° 20' 57"	45° 21' 34"	45° 22' 10"	45° 22' 45"	45° 23' 21"
154	45° 23' 57"	45° 24' 34"	45° 25' 11"	45° 25' 48"	45° 26' 24"	45° 27' 1"	45° 27' 36"	45° 28' 12"	45° 28' 46"	45° 29' 20"	45° 29' 54"	45° 30' 27"
155	45° 31' 2"	45° 31' 36"	45° 32' 11"	45° 32' 46"	45° 33' 21"	45° 33' 55"	45° 34' 29"	45° 35' 2"	45° 35' 34"	45° 36' 6"	45° 36' 38"	45° 37' 10"
156	45° 37' 42"	45° 38' 15"										

Solar Declination Differentials -- Epoch 2020 -- Leap Years (LY0)

Dn	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
184	45°59' 37"	45°59' 12"	45°58' 48"	45°58' 24"	45°57' 60"	45°57' 35"	45°57' 10"	45°56' 44"	45°56' 17"	45°55' 50"	45°55' 22"	45°54' 55"
185	45°54' 28"	45°54' 2"	45°53' 35"	45°53' 9"	45°52' 43"	45°52' 16"	45°51' 49"	45°51' 21"	45°50' 53"	45°50' 23"	45°49' 54"	45°49' 25"
186	45°48' 56"	45°48' 27"	45°47' 59"	45°47' 31"	45°47' 3"	45°46' 34"	45°46' 5"	45°45' 35"	45°45' 5"	45°44' 33"	45°44' 2"	45°43' 31"
187	45°43' 0"	45°42' 30"	45°41' 59"	45°41' 29"	45°40' 59"	45°40' 29"	45°39' 57"	45°39' 25"	45°38' 53"	45°38' 20"	45°37' 47"	45°37' 13"
188	45°36' 41"	45°36' 8"	45°35' 36"	45°35' 4"	45°34' 32"	45°33' 59"	45°33' 26"	45°32' 52"	45°32' 18"	45°31' 43"	45°31' 8"	45°30' 33"
189	45°29' 58"	45°29' 23"	45°28' 49"	45°28' 15"	45°27' 41"	45°27' 7"	45°26' 32"	45°25' 56"	45°25' 20"	45°24' 43"	45°24' 5"	45°23' 28"
190	45°22' 52"	45°22' 15"	45°21' 39"	45°21' 4"	45°20' 28"	45°19' 51"	45°19' 14"	45°18' 36"	45°17' 58"	45°17' 19"	45°16' 40"	45°16' 1"
191	45°15' 23"	45°14' 44"	45°14' 6"	45°13' 29"	45°12' 51"	45°12' 12"	45°11' 34"	45°10' 54"	45°10' 14"	45° 9' 33"	45° 8' 52"	45° 8' 11"
192	45° 7' 31"	45° 6' 50"	45° 6' 11"	45° 5' 31"	45° 4' 51"	45° 4' 11"	45° 3' 30"	45° 2' 49"	45° 2' 6"	45° 1' 24"	45° 0' 41"	44°59' 58"
193	44°59' 16"	44°58' 34"	44°57' 52"	44°57' 10"	44°56' 29"	44°55' 47"	44°55' 4"	44°54' 21"	44°53' 37"	44°52' 52"	44°52' 7"	44°51' 23"
194	44°50' 38"	44°49' 55"	44°49' 11"	44°48' 27"	44°47' 44"	44°46' 60"	44°46' 15"	44°45' 30"	44°44' 44"	44°43' 58"	44°43' 11"	44°42' 25"
195	44°41' 39"	44°40' 53"	44°40' 8"	44°39' 22"	44°38' 37"	44°37' 51"	44°37' 5"	44°36' 17"	44°35' 30"	44°34' 41"	44°33' 53"	44°33' 5"
196	44°32' 17"	44°31' 29"	44°30' 42"	44°29' 55"	44°29' 8"	44°28' 20"	44°27' 32"	44°26' 43"	44°25' 53"	44°25' 3"	44°24' 13"	44°23' 23"
197	44°22' 33"	44°21' 44"	44°20' 54"	44°20' 5"	44°19' 16"	44°18' 27"	44°17' 37"	44°16' 46"	44°15' 55"	44°15' 3"	44°14' 11"	44°13' 19"
198	44°12' 27"	44°11' 36"	44°10' 45"	44° 9' 54"	44° 9' 4"	44° 8' 12"	44° 7' 20"	44° 6' 28"	44° 5' 35"	44° 4' 41"	44° 3' 47"	44° 2' 54"
199	44° 2' 0"	44° 1' 7"	44° 0' 15"	43°59' 22"	43°58' 29"	43°57' 36"	43°56' 43"	43°55' 48"	43°54' 53"	43°53' 58"	43°53' 3"	43°52' 7"
200	43°51' 12"	43°50' 17"	43°49' 23"	43°48' 28"	43°47' 34"	43°46' 39"	43°45' 44"	43°44' 48"	43°43' 51"	43°42' 54"	43°41' 57"	43°40' 59"
201	43°40' 3"	43°39' 6"	43°38' 10"	43°37' 14"	43°36' 17"	43°35' 21"	43°34' 24"	43°33' 26"	43°32' 28"	43°31' 29"	43°30' 30"	43°29' 31"
202	43°28' 32"	43°27' 34"	43°26' 36"	43°25' 38"	43°24' 40"	43°23' 42"	43°22' 43"	43°21' 44"	43°20' 44"	43°19' 43"	43°18' 42"	43°17' 42"
203	43°16' 42"	43°15' 42"	43°14' 42"	43°13' 42"	43°12' 43"	43°11' 43"	43°10' 42"	43° 9' 41"	43° 8' 39"	43° 7' 37"	43° 6' 35"	43° 5' 32"
204	43° 4' 31"	43° 3' 29"	43° 2' 28"	43° 1' 26"	43° 0' 25"	42°59' 23"	42°58' 21"	42°57' 18"	42°56' 15"	42°55' 11"	42°54' 7"	42°53' 3"
205	42°51' 59"	42°50' 56"	42°49' 53"	42°48' 50"	42°47' 47"	42°46' 44"	42°45' 40"	42°44' 36"	42°43' 31"	42°42' 25"	42°41' 19"	42°40' 14"
206	42°39' 9"	42°38' 4"	42°36' 59"	42°35' 55"	42°34' 50"	42°33' 45"	42°32' 39"	42°31' 33"	42°30' 27"	42°29' 20"	42°28' 12"	42°27' 5"
207	42°25' 58"	42°24' 52"	42°23' 45"	42°22' 39"	42°21' 33"	42°20' 27"	42°19' 19"	42°18' 12"	42°17' 3"	42°15' 55"	42°14' 46"	42°13' 37"
208	42°12' 29"	42°11' 21"	42°10' 13"	42° 9' 5"	42° 7' 57"	42° 6' 49"	42° 5' 40"	42° 4' 31"	42° 3' 21"	42° 2' 11"	42° 1' 1"	41°59' 50"
209	41°58' 40"	41°57' 30"	41°56' 21"	41°55' 12"	41°54' 2"	41°52' 53"	41°51' 42"	41°50' 32"	41°49' 20"	41°48' 8"	41°46' 56"	41°45' 45"
210	41°44' 33"	41°43' 22"	41°42' 11"	41°40' 60"	41°39' 49"	41°38' 38"	41°37' 26"	41°36' 14"	41°35' 1"	41°33' 47"	41°32' 34"	41°31' 21"
211	41°30' 8"	41°28' 55"	41°27' 42"	41°26' 30"	41°25' 17"	41°24' 5"	41°22' 51"	41°21' 37"	41°20' 23"	41°19' 8"	41°17' 53"	41°16' 39"
212	41°15' 24"	41°14' 10"	41°12' 56"	41°11' 42"	41°10' 28"	41° 9' 14"	41° 7' 59"	41° 6' 43"	41° 5' 28"	41° 4' 11"	41° 2' 55"	41° 1' 39"
213	41° 0' 23"	40°59' 7"	40°57' 51"	40°56' 36"	40°55' 21"	40°54' 5"	40°52' 49"	40°51' 32"	40°50' 15"	40°48' 57"	40°47' 39"	40°46' 21"
214	40°45' 4"	40°43' 47"	40°42' 30"	40°41' 13"	40°39' 56"	40°38' 39"	40°37' 21"	40°36' 3"	40°34' 44"	40°33' 25"	40°32' 6"	40°30' 47"
215	40°29' 28"	40°28' 9"	40°26' 51"	40°25' 33"	40°24' 14"	40°22' 56"	40°21' 37"	40°20' 17"	40°18' 57"	40°17' 36"	40°16' 16"	40°14' 55"
216	40°13' 35"	40°12' 15"	40°10' 55"	40° 9' 36"	40° 8' 16"	40° 6' 56"	40° 5' 35"	40° 4' 14"	40° 2' 53"	40° 1' 31"	40° 0' 9"	39°58' 47"
217	39°57' 25"	39°56' 4"	39°54' 43"	39°53' 22"	39°52' 1"	39°50' 39"	39°49' 18"	39°47' 55"	39°46' 32"	39°45' 9"	39°43' 46"	39°42' 23"
218	39°40' 59"	39°39' 37"	39°38' 14"	39°36' 52"	39°35' 29"	39°34' 7"	39°32' 44"	39°31' 20"	39°29' 56"	39°28' 31"	39°27' 6"	39°25' 42"
219	39°24' 18"	39°22' 53"	39°21' 30"	39°20' 6"	39°18' 42"	39°17' 18"	39°15' 54"	39°14' 29"	39°13' 3"	39°11' 37"	39°10' 11"	39° 8' 45"
220	39° 7' 20"	39° 5' 54"	39° 4' 29"	39° 3' 4"	39° 1' 39"	39° 0' 14"	38°58' 48"	38°57' 22"	38°55' 55"	38°54' 28"	38°53' 1"	38°51' 33"
221	38°50' 7"	38°48' 40"	38°47' 13"	38°45' 47"	38°44' 21"	38°42' 54"	38°41' 27"	38°39' 60"	38°38' 31"	38°37' 3"	38°35' 35"	38°34' 6"
222	38°32' 38"	38°31' 10"	38°29' 43"	38°28' 15"	38°26' 47"	38°25' 19"	38°23' 51"	38°22' 22"	38°20' 53"	38°19' 23"	38°17' 54"	38°16' 24"
223	38°14' 55"	38°13' 26"	38°11' 57"	38°10' 28"	38° 8' 59"	38° 7' 30"	38° 6' 0"	38° 4' 30"	38° 2' 60"	38° 1' 29"	37°59' 58"	37°58' 27"
224	37°56' 57"	37°55' 26"	37°53' 56"	37°52' 26"	37°50' 56"	37°49' 26"	37°47' 55"	37°46' 24"	37°44' 52"	37°43' 20"	37°41' 48"	37°40' 16"
225	37°38' 44"	37°37' 13"	37°35' 42"	37°34' 10"	37°32' 39"	37°31' 8"	37°29' 36"	37°28' 3"	37°26' 30"	37°24' 57"	37°23' 24"	37°21' 51"
226	37°20' 18"	37°18' 45"	37°17' 13"	37°15' 41"	37°14' 8"	37°12' 35"	37°11' 2"	37° 9' 29"	37° 7' 55"	37° 6' 21"	37° 4' 46"	37° 3' 12"
227	37° 1' 38"	37° 0' 4"	36°58' 31"	36°56' 57"	36°55' 24"	36°53' 50"	36°52' 16"	36°50' 41"	36°49' 6"	36°47' 31"	36°45' 55"	36°44' 20"
228	36°42' 45"	36°41' 10"	36°39' 35"	36°38' 0"	36°36' 26"	36°34' 51"	36°33' 16"	36°31' 40"	36°30' 4"	36°28' 27"	36°26' 51"	36°25' 14"
229	36°23' 38"	36°22' 2"	36°20' 26"	36°18' 51"	36°17' 15"	36°15' 39"	36°14' 3"	36°12' 26"	36°10' 49"	36° 9' 11"	36° 7' 34"	36° 5' 56"
230	36° 4' 19"	36° 2' 42"	36° 1' 5"	35°59' 28"	35°57' 52"	35°56' 15"	35°54' 37"	35°52' 59"	35°51' 21"	35°49' 43"	35°48' 4"	35°46' 26"
231	35°44' 47"	35°43' 9"	35°41' 31"	35°39' 54"	35°38' 16"	35°36' 38"	35°34' 59"	35°33' 21"	35°31' 41"	35°30' 2"	35°28' 22"	35°26' 43"
232	35°25' 4"	35°23' 25"	35°21' 46"	35°20' 7"	35°18' 28"	35°16' 49"	35°15' 10"	35°13' 30"	35°11' 50"	35°10' 9"	35° 8' 29"	35° 6' 49"
233	35° 5' 8"	35° 3' 28"	35° 1' 49"	35° 0' 9"	34°58' 29"	34°56' 49"	34°55' 9"	34°53' 28"	34°51' 47"	34°50' 5"	34°48' 24"	34°46' 43"
234	34°45' 2"	34°43' 21"	34°41' 40"	34°39' 59"	34°38' 18"	34°36' 37"	34°34' 56"	34°33' 15"	34°31' 33"	34°29' 50"	34°28' 8"	34°26' 26"
235	34°24' 44"	34°23' 2"	34°21' 20"	34°19' 39"	34°17' 57"	34°16' 15"	34°14' 33"	34°12' 50"	34°11' 7"	34° 9' 24"	34° 7' 41"	34° 5' 58"
236	34° 4' 15"	34° 2' 32"	34° 0' 50"	33°59' 7"	33°57' 25"	33°55' 42"	33°53' 59"	33°52' 16"	33°50' 32"	33°48' 48"	33°47' 4"	33°45' 20"
237	33°43' 36"	33°41' 53"	33°40' 9"	33°38' 26"	33°36' 42"	33°34' 59"	33°33' 15"	33°31' 31"	33°29' 46"	33°28' 1"	33°26' 17"	33°24' 32"
238	33°22' 47"	33°21' 3"	33°19' 18"	33°17' 34"	33°15' 50"	33°14' 6"	33°12' 21"	33°10' 36"	33° 8' 50"	33° 7' 5"	33° 5' 19"	33° 3' 34"
239	33° 1' 48"	33° 0' 3"	32°58' 18"	32°56' 33"	32°54' 48"	32°53' 3"	32°51' 17"	32°49' 31"	32°47' 45"	32°45' 59"	32°44' 13"	32°42' 26"
240	32°40' 40"	32°38' 54"	32°37' 8"	32°35' 23"	32°33' 37"	32°31' 51"	32°30' 5"	32°28' 18"	32°26' 31"	32°24' 44"	32°22' 57"	32°21' 10"
241	32°19' 23"	32°17' 36"	32°15' 50"	32°14' 3"	32°12' 17"	32°10' 30"	32° 8' 43"	32° 6' 56"	32° 5' 8"	32° 3' 20"	32° 1' 32"	31°59' 45"
242	31°57' 57"	31°56' 10"	31°54' 22"	31°52' 35"	31°50' 48"	31°49' 0"	31°47' 13"	31°45' 25"	31°43' 36"	31°41' 48"	31°39' 59"	31°38' 11"
243	31°36' 23"	31°34' 35"	31°32' 47"	31°30' 59"	31°29' 11"	31°27' 22"	31°25' 34"	31°23' 45"	31°21' 56"	31°20' 7"	31°18' 18"	31°16' 29"
244	31°14' 40"	31°12' 51"	31°11' 3"	31° 9' 14"	31° 7' 25"	31° 5' 37"	31° 3' 48"	31° 1' 58"	31° 0' 9"	30°58' 19"	30°56' 29"	30°54' 40"
245	30°52' 50"	30°51' 0"	30°49' 11"	30°47' 22"	30°45' 33"	30°43' 43"	30°41' 53"	30°40' 3"	30°38' 13"	30°36' 23"	30°34' 33"	30°32' 42"
246	30°30' 52"	30°29' 2"	30°27' 12"	30°25' 22"	30°23' 32"	30°21' 42"	30°19' 52"	30°18' 1"	30°16' 11"	30°14' 20"	30°12' 29"	30°10' 38"
247	30° 8' 47"	30° 6' 56"	30° 5' 6"	30° 3' 15"	30° 1' 25"	29°59' 34"	29°57' 43"	29°55' 52"	29°54' 1"	29°52' 9"	29°50' 18"	29°48' 26"
248	29°46' 35"	29°44' 44"	29°42' 53"	29°41' 2"	29°39' 10"	29°37' 19"	29°35' 28"	29°33' 36"	29°31' 44"	29°29' 52"	29°28' 0"	29°26' 8"
249	29°24' 16"	29°22' 25"	29°20' 33"	29°18' 41"	29°16' 50"	29°14' 58"	29°13' 6"	29°11' 14"	29° 9' 21"	29° 7' 29"	29° 5' 36"	29° 3' 44"
250	29° 1' 51"	28°59' 59"	28°58' 7"	28°56' 15"	28°54' 23"	28°52' 30"	28°50' 38"	28°48' 45"	28°46' 52"	28°44' 59"	28°43' 5"	28°41' 13"
251	28°39' 21"	28°37' 28"	28°35' 35"	28°33' 42"	28°31' 50"	28°29' 57"	28°28' 4"	28°26' 11"	28°2			

Solar Declination Differentials -- Epoch 2020 -- Leap Years (LY0)

Dn	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
276	19° 0' 11"	18° 58' 16"	18° 56' 20"	18° 54' 24"	18° 52' 28"	18° 50' 32"	18° 48' 36"	18° 46' 40"	18° 44' 45"	18° 42' 50"	18° 40' 54"	18° 38' 59"
277	18° 37' 3"	18° 35' 8"	18° 33' 12"	18° 31' 16"	18° 29' 20"	18° 27' 25"	18° 25' 29"	18° 23' 34"	18° 21' 39"	18° 19' 44"	18° 17' 48"	18° 15' 53"
278	18° 13' 58"	18° 12' 3"	18° 10' 7"	18° 8' 12"	18° 6' 16"	18° 4' 21"	18° 2' 26"	18° 0' 31"	17° 58' 36"	17° 56' 41"	17° 54' 46"	17° 52' 51"
279	17° 50' 56"	17° 49' 1"	17° 47' 6"	17° 45' 11"	17° 43' 16"	17° 41' 21"	17° 39' 26"	17° 37' 31"	17° 35' 37"	17° 33' 42"	17° 31' 48"	17° 29' 53"
280	17° 27' 59"	17° 26' 4"	17° 24' 9"	17° 22' 14"	17° 20' 20"	17° 18' 25"	17° 16' 30"	17° 14' 36"	17° 12' 42"	17° 10' 48"	17° 8' 53"	17° 6' 59"
281	17° 5' 5"	17° 3' 11"	17° 1' 16"	16° 59' 22"	16° 57' 27"	16° 55' 33"	16° 53' 39"	16° 51' 45"	16° 49' 51"	16° 47' 57"	16° 46' 0"	16° 44' 10"
282	16° 42' 16"	16° 40' 22"	16° 38' 28"	16° 36' 34"	16° 34' 40"	16° 32' 46"	16° 30' 52"	16° 28' 59"	16° 27' 5"	16° 25' 12"	16° 23' 19"	16° 21' 25"
283	16° 19' 32"	16° 17' 39"	16° 15' 45"	16° 13' 51"	16° 11' 58"	16° 10' 4"	16° 8' 11"	16° 6' 18"	16° 4' 25"	16° 2' 32"	16° 0' 39"	15° 58' 46"
284	15° 56' 53"	15° 55' 0"	15° 53' 7"	15° 51' 14"	15° 49' 21"	15° 47' 27"	15° 45' 35"	15° 43' 42"	15° 41' 49"	15° 39' 57"	15° 38' 5"	15° 36' 13"
285	15° 34' 20"	15° 32' 28"	15° 30' 35"	15° 28' 42"	15° 26' 49"	15° 24' 57"	15° 23' 4"	15° 21' 12"	15° 19' 20"	15° 17' 28"	15° 15' 37"	15° 13' 45"
286	15° 11' 53"	15° 10' 1"	15° 8' 9"	15° 6' 16"	15° 4' 24"	15° 2' 32"	15° 0' 40"	14° 58' 49"	14° 56' 57"	14° 55' 6"	14° 53' 15"	14° 51' 24"
287	14° 49' 32"	14° 47' 41"	14° 45' 49"	14° 43' 57"	14° 42' 6"	14° 40' 14"	14° 38' 23"	14° 36' 32"	14° 34' 41"	14° 32' 50"	14° 30' 60"	14° 29' 9"
288	14° 27' 18"	14° 25' 28"	14° 23' 36"	14° 21' 45"	14° 19' 54"	14° 18' 3"	14° 16' 13"	14° 14' 22"	14° 12' 32"	14° 10' 42"	14° 8' 52"	14° 7' 2"
289	14° 5' 12"	14° 3' 21"	14° 1' 31"	13° 59' 40"	13° 57' 50"	13° 55' 60"	13° 54' 10"	13° 52' 20"	13° 50' 30"	13° 48' 41"	13° 46' 52"	13° 45' 2"
290	13° 43' 13"	13° 41' 23"	13° 39' 33"	13° 37' 43"	13° 35' 53"	13° 34' 4"	13° 32' 14"	13° 30' 25"	13° 28' 36"	13° 26' 48"	13° 24' 59"	13° 23' 11"
291	13° 21' 22"	13° 19' 33"	13° 17' 44"	13° 15' 54"	13° 14' 5"	13° 12' 16"	13° 10' 28"	13° 8' 39"	13° 6' 51"	13° 5' 3"	13° 3' 15"	13° 1' 27"
292	12° 59' 39"	12° 57' 51"	12° 56' 2"	12° 54' 14"	12° 52' 25"	12° 50' 37"	12° 48' 49"	12° 47' 2"	12° 45' 14"	12° 43' 27"	12° 41' 40"	12° 39' 53"
293	12° 38' 5"	12° 36' 18"	12° 34' 30"	12° 32' 42"	12° 30' 55"	12° 29' 7"	12° 27' 20"	12° 25' 33"	12° 23' 47"	12° 22' 0"	12° 20' 14"	12° 18' 28"
294	12° 16' 41"	12° 14' 54"	12° 13' 7"	12° 11' 20"	12° 9' 33"	12° 7' 47"	12° 6' 0"	12° 4' 14"	12° 2' 29"	12° 0' 43"	11° 58' 58"	11° 57' 12"
295	11° 55' 26"	11° 53' 40"	11° 51' 54"	11° 50' 8"	11° 48' 22"	11° 46' 36"	11° 44' 51"	11° 43' 5"	11° 41' 20"	11° 39' 36"	11° 37' 51"	11° 36' 7"
296	11° 34' 22"	11° 32' 37"	11° 30' 51"	11° 29' 6"	11° 27' 21"	11° 25' 36"	11° 23' 51"	11° 22' 7"	11° 20' 23"	11° 18' 39"	11° 16' 55"	11° 15' 12"
297	11° 13' 28"	11° 11' 43"	11° 9' 59"	11° 8' 15"	11° 6' 30"	11° 4' 46"	11° 3' 2"	11° 1' 19"	10° 59' 36"	10° 57' 53"	10° 56' 10"	10° 54' 27"
298	10° 52' 44"	10° 51' 1"	10° 49' 18"	10° 47' 34"	10° 45' 51"	10° 44' 8"	10° 42' 25"	10° 40' 42"	10° 39' 0"	10° 37' 18"	10° 35' 36"	10° 33' 55"
299	10° 32' 13"	10° 30' 30"	10° 28' 48"	10° 27' 5"	10° 25' 23"	10° 23' 40"	10° 21' 59"	10° 20' 17"	10° 18' 36"	10° 16' 55"	10° 15' 14"	10° 13' 33"
300	10° 11' 52"	10° 10' 11"	10° 8' 30"	10° 6' 48"	10° 5' 6"	10° 3' 25"	10° 1' 44"	10° 0' 4"	9° 58' 24"	9° 56' 44"	9° 55' 4"	9° 53' 24"
301	9° 51' 44"	9° 50' 4"	9° 48' 24"	9° 46' 43"	9° 45' 2"	9° 43' 22"	9° 41' 42"	9° 40' 3"	9° 38' 24"	9° 36' 45"	9° 35' 7"	9° 33' 28"
302	9° 31' 49"	9° 30' 9"	9° 28' 30"	9° 26' 50"	9° 25' 11"	9° 23' 32"	9° 21' 53"	9° 20' 15"	9° 18' 37"	9° 16' 59"	9° 15' 22"	9° 13' 44"
303	9° 12' 6"	9° 10' 28"	9° 8' 49"	9° 7' 11"	9° 5' 33"	9° 3' 55"	9° 2' 17"	9° 0' 40"	8° 59' 3"	8° 57' 26"	8° 55' 50"	8° 54' 13"
304	8° 52' 37"	8° 50' 59"	8° 49' 22"	8° 47' 45"	8° 46' 8"	8° 44' 31"	8° 42' 54"	8° 41' 18"	8° 39' 42"	8° 38' 7"	8° 36' 32"	8° 34' 56"
305	8° 33' 21"	8° 31' 45"	8° 30' 9"	8° 28' 32"	8° 26' 56"	8° 25' 21"	8° 23' 45"	8° 22' 10"	8° 20' 36"	8° 19' 2"	8° 17' 27"	8° 15' 53"
306	8° 14' 19"	8° 12' 44"	8° 11' 9"	8° 9' 34"	8° 7' 59"	8° 6' 25"	8° 4' 50"	8° 3' 17"	8° 1' 43"	8° 0' 10"	7° 58' 38"	7° 57' 5"
307	7° 55' 31"	7° 53' 58"	7° 52' 24"	7° 50' 50"	7° 49' 17"	7° 47' 43"	7° 46' 10"	7° 44' 38"	7° 43' 6"	7° 41' 34"	7° 40' 2"	7° 38' 31"
308	7° 36' 59"	7° 35' 26"	7° 33' 54"	7° 32' 21"	7° 30' 49"	7° 29' 17"	7° 27' 45"	7° 26' 14"	7° 24' 43"	7° 23' 13"	7° 21' 42"	7° 20' 12"
309	7° 18' 41"	7° 17' 10"	7° 15' 39"	7° 14' 8"	7° 12' 36"	7° 11' 5"	7° 9' 35"	7° 8' 5"	7° 6' 36"	7° 5' 7"	7° 3' 38"	7° 2' 8"
310	7° 0' 39"	6° 59' 9"	6° 57' 39"	6° 56' 9"	6° 54' 40"	6° 53' 10"	6° 51' 41"	6° 50' 12"	6° 48' 44"	6° 47' 16"	6° 45' 49"	6° 44' 21"
311	6° 42' 53"	6° 41' 25"	6° 39' 56"	6° 38' 27"	6° 36' 59"	6° 35' 31"	6° 34' 3"	6° 32' 36"	6° 31' 9"	6° 29' 43"	6° 28' 16"	6° 26' 50"
312	6° 25' 23"	6° 23' 56"	6° 22' 29"	6° 21' 2"	6° 19' 35"	6° 18' 8"	6° 16' 41"	6° 15' 16"	6° 13' 50"	6° 12' 25"	6° 11' 0"	6° 9' 35"
313	6° 8' 10"	6° 6' 45"	6° 5' 19"	6° 3' 53"	6° 2' 27"	6° 1' 2"	5° 59' 37"	5° 58' 13"	5° 56' 49"	5° 55' 25"	5° 54' 2"	5° 52' 38"
314	5° 51' 14"	5° 49' 50"	5° 48' 26"	5° 47' 1"	5° 45' 37"	5° 44' 13"	5° 42' 50"	5° 41' 27"	5° 40' 4"	5° 38' 42"	5° 37' 20"	5° 35' 58"
315	5° 34' 36"	5° 33' 13"	5° 31' 51"	5° 30' 28"	5° 29' 5"	5° 27' 42"	5° 26' 20"	5° 24' 59"	5° 23' 38"	5° 22' 17"	5° 20' 57"	5° 19' 37"
316	5° 18' 16"	5° 16' 55"	5° 15' 33"	5° 14' 12"	5° 12' 50"	5° 11' 29"	5° 10' 9"	5° 8' 49"	5° 7' 30"	5° 6' 11"	5° 4' 52"	5° 3' 33"
317	5° 2' 14"	5° 0' 54"	4° 59' 34"	4° 58' 14"	4° 56' 55"	4° 55' 35"	4° 54' 16"	4° 52' 58"	4° 51' 40"	4° 50' 23"	4° 49' 6"	4° 47' 48"
318	4° 46' 31"	4° 45' 13"	4° 43' 54"	4° 42' 36"	4° 41' 18"	4° 39' 60"	4° 38' 43"	4° 37' 26"	4° 36' 10"	4° 34' 54"	4° 33' 38"	4° 32' 23"
319	4° 31' 7"	4° 29' 50"	4° 28' 34"	4° 27' 17"	4° 26' 0"	4° 24' 44"	4° 23' 28"	4° 22' 13"	4° 20' 59"	4° 19' 45"	4° 18' 31"	4° 17' 17"
320	4° 16' 2"	4° 14' 47"	4° 13' 32"	4° 12' 17"	4° 11' 2"	4° 9' 48"	4° 8' 34"	4° 7' 20"	4° 6' 8"	4° 4' 55"	4° 3' 43"	4° 2' 30"
321	4° 1' 18"	4° 0' 5"	3° 58' 51"	3° 57' 38"	3° 56' 25"	3° 55' 12"	3° 53' 59"	3° 52' 48"	3° 51' 37"	3° 50' 26"	3° 49' 15"	3° 48' 5"
322	3° 46' 54"	3° 45' 42"	3° 44' 31"	3° 43' 19"	3° 42' 8"	3° 40' 56"	3° 39' 46"	3° 38' 36"	3° 37' 27"	3° 36' 18"	3° 35' 9"	3° 33' 60"
323	3° 32' 50"	3° 31' 41"	3° 30' 31"	3° 29' 21"	3° 28' 11"	3° 27' 2"	3° 25' 53"	3° 24' 45"	3° 23' 37"	3° 22' 30"	3° 21' 23"	3° 20' 16"
324	3° 19' 8"	3° 18' 1"	3° 16' 53"	3° 15' 44"	3° 14' 36"	3° 13' 29"	3° 12' 22"	3° 11' 15"	3° 10' 10"	3° 9' 4"	3° 7' 59"	3° 6' 54"
325	3° 5' 48"	3° 4' 42"	3° 3' 36"	3° 2' 29"	3° 1' 23"	3° 0' 17"	2° 59' 12"	2° 58' 8"	2° 57' 4"	2° 56' 0"	2° 54' 57"	2° 53' 53"
326	2° 52' 50"	2° 51' 45"	2° 50' 41"	2° 49' 36"	2° 48' 32"	2° 47' 28"	2° 46' 25"	2° 45' 22"	2° 44' 20"	2° 43' 18"	2° 42' 17"	2° 41' 15"
327	2° 40' 13"	2° 39' 11"	2° 38' 9"	2° 37' 6"	2° 36' 3"	2° 35' 1"	2° 33' 60"	2° 32' 59"	2° 31' 59"	2° 30' 59"	2° 29' 60"	2° 28' 60"
328	2° 27' 60"	2° 26' 60"	2° 25' 59"	2° 24' 58"	2° 23' 58"	2° 22' 57"	2° 21' 58"	2° 20' 59"	2° 20' 1"	2° 19' 3"	2° 18' 5"	2° 17' 8"
329	2° 16' 9"	2° 15' 11"	2° 14' 12"	2° 13' 13"	2° 12' 15"	2° 11' 17"	2° 10' 19"	2° 9' 22"	2° 8' 26"	2° 7' 30"	2° 6' 34"	2° 5' 38"
330	2° 4' 42"	2° 3' 46"	2° 2' 49"	2° 1' 52"	2° 0' 55"	1° 59' 59"	1° 59' 3"	1° 58' 9"	1° 57' 14"	1° 56' 20"	1° 55' 27"	1° 54' 33"
331	1° 53' 39"	1° 52' 44"	1° 51' 49"	1° 50' 54"	1° 49' 60"	1° 49' 5"	1° 48' 12"	1° 47' 19"	1° 46' 27"	1° 45' 35"	1° 44' 43"	1° 43' 51"
332	1° 42' 59"	1° 42' 7"	1° 41' 14"	1° 40' 21"	1° 39' 28"	1° 38' 36"	1° 37' 44"	1° 36' 53"	1° 36' 3"	1° 35' 13"	1° 34' 24"	1° 33' 34"
333	1° 32' 44"	1° 31' 53"	1° 31' 2"	1° 30' 12"	1° 29' 21"	1° 28' 31"	1° 27' 41"	1° 26' 52"	1° 26' 4"	1° 25' 16"	1° 24' 28"	1° 23' 41"
334	1° 22' 53"	1° 22' 4"	1° 21' 16"	1° 20' 27"	1° 19' 38"	1° 18' 50"	1° 18' 2"	1° 17' 16"	1° 16' 29"	1° 15' 44"	1° 14' 58"	1° 14' 13"
335	1° 13' 27"	1° 12' 40"	1° 11' 54"	1° 11' 7"	1° 10' 20"	1° 9' 34"	1° 8' 49"	1° 8' 4"	1° 7' 20"	1° 6' 36"	1° 5' 53"	1° 5' 9"
336	1° 4' 26"	1° 3' 41"	1° 2' 57"	1° 2' 12"	1° 1' 28"	1° 0' 44"	1° 0' 0"	59' 18"	58' 36"	57' 54"	57' 13"	56' 31"
337	55' 50"	55' 8"	54' 25"	53' 43"	53' 0"	52' 18"	51' 37"	50' 57"	50' 17"	49' 38"	48' 58"	48' 19"
338	47' 40"	46' 60"	46' 19"	45' 39"	44' 59"	44' 19"	43' 40"	43' 2"	42' 24"	41' 47"	41' 10"	40' 33"
339	39' 55"	39' 17"	38' 39"	38' 1"	37' 23"	36' 45"	36' 8"	35' 32"	34' 57"	34' 22"	33' 47"	33' 12"
340	32' 37"	32' 1"	31' 25"	30' 49"	30' 13"	29' 38"	29' 3"	28' 29"	27' 56"	27' 23"	26' 51"	26' 18"
341	25' 45"	25' 11"	24' 38"	24' 4"	23' 30"	22' 57"	22' 24"	21' 53"	21' 22"	20' 51"	20' 21"	19' 50"
342	19' 19"	18' 48"	18' 16"	17' 45"	17' 13"	16' 42"	16' 12"	15' 43"	15' 14"	14' 45"	14' 17"	13' 49"
343	13' 20"	12' 51"	12' 22"	11' 53"	11' 24"	10' 55"	10' 27"	9' 59"	9' 33"	9' 7"	8' 41"	8' 15"
344	7' 49"	7' 22"	6' 55"	6' 28"	6'							

Solar E Differentials -- Epoch 2020 -- Leap Years (LY0)

Dn	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
0	0°	-39'	-1'17"	-1'54"	-2'28"	-3'2"	-3'	-4'7"	-4'40"	-5'15"	-5'51"	-6'28"
1	-7'7"	-7'45"	-8'23"	-8'59"	-9'34"	-10'7"	-10'39"	-11'11"	-11'44"	-12'18"	-12'53"	-13'30"
2	-14'8"	-14'46"	-15'23"	-15'59"	-16'33"	-17'6"	-17'38"	-18'9"	-18'42"	-19'15"	-19'50"	-20'27"
3	-21'4"	-21'42"	-22'18"	-22'54"	-23'27"	-23'60"	-24'31"	-25'2"	-25'34"	-26'7"	-26'41"	-27'17"
4	-27'54"	-28'31"	-29'7"	-29'42"	-30'15"	-30'47"	-31'18"	-31'48"	-32'19"	-32'52"	-33'26"	-34'1"
5	-34'38"	-35'14"	-35'50"	-36'24"	-36'56"	-37'27"	-37'58"	-38'28"	-38'58"	-39'30"	-40'4"	-40'39"
6	-41'14"	-41'50"	-42'25"	-42'59"	-43'31"	-44'1"	-44'31"	-44'60"	-45'30"	-46'1"	-46'34"	-47'8"
7	-47'44"	-48'19"	-48'53"	-49'26"	-49'57"	-50'27"	-50'56"	-51'25"	-51'54"	-52'25"	-52'57"	-53'31"
8	-54'5"	-54'40"	-55'13"	-55'46"	-56'16"	-56'46"	-57'14"	-57'42"	-58'11"	-58'41"	-59'12"	-59'45"
9	-1° 0'19"	-1° 0'53"	-1° 1'26"	-1° 1'57"	-1° 2'27"	-1° 2'56"	-1° 3'24"	-1° 3'51"	-1° 4'19"	-1° 4'48"	-1° 5'19"	-1° 5'51"
10	-1° 6'24"	-1° 6'57"	-1° 7'30"	-1° 8'1"	-1° 8'30"	-1° 8'58"	-1° 9'25"	-1° 9'51"	-1° 10'19"	-1° 10'47"	-1° 11'17"	-1° 11'49"
11	-1°12'21"	-1°12'54"	-1°13'25"	-1°13'56"	-1°14'24"	-1°14'51"	-1°15'17"	-1°15'43"	-1°16'10"	-1°16'38"	-1°17'7"	-1°17'38"
12	-1°18'9"	-1°18'41"	-1°19'12"	-1°19'41"	-1°20'9"	-1°20'36"	-1°21'1"	-1°21'26"	-1°21'52"	-1°22'19"	-1°22'48"	-1°23'18"
13	-1°23'48"	-1°24'19"	-1°24'49"	-1°25'18"	-1°25'45"	-1°26'11"	-1°26'35"	-1°26'60"	-1°27'25"	-1°27'51"	-1°28'19"	-1°28'48"
14	-1°29'18"	-1°29'48"	-1°30'18"	-1°30'46"	-1°31'12"	-1°31'37"	-1°32'0"	-1°32'24"	-1°32'48"	-1°33'14"	-1°33'41"	-1°34'9"
15	-1°34'38"	-1°35'8"	-1°35'36"	-1°36'3"	-1°36'29"	-1°36'53"	-1°37'16"	-1°37'39"	-1°38'2"	-1°38'27"	-1°38'53"	-1°39'20"
16	-1°39'49"	-1°40'17"	-1°40'45"	-1°41'11"	-1°41'36"	-1°41'59"	-1°42'21"	-1°42'43"	-1°43'6"	-1°43'30"	-1°43'55"	-1°44'22"
17	-1°44'49"	-1°45'17"	-1°45'44"	-1°46'9"	-1°46'33"	-1°46'55"	-1°47'16"	-1°47'38"	-1°47'59"	-1°48'22"	-1°48'47"	-1°49'13"
18	-1°49'39"	-1°50'6"	-1°50'32"	-1°50'57"	-1°51'19"	-1°51'41"	-1°52'1"	-1°52'22"	-1°52'42"	-1°53'4"	-1°53'28"	-1°53'53"
19	-1°54'19"	-1°54'45"	-1°55'10"	-1°55'33"	-1°55'55"	-1°56'16"	-1°56'36"	-1°56'55"	-1°57'15"	-1°57'36"	-1°57'59"	-1°58'23"
20	-1°58'48"	-1°59'13"	-1°59'37"	-1°59'59"	-2° 0'21"	-2° 0'40"	-2° 0'59"	-2° 1'17"	-2° 1'36"	-2° 1'57"	-2° 2'18"	-2° 2'41"
21	-2° 3'5"	-2° 3'29"	-2° 3'53"	-2° 4'14"	-2° 4'35"	-2° 4'53"	-2° 5'11"	-2° 5'29"	-2° 5'47"	-2° 6'6"	-2° 6'27"	-2° 6'49"
22	-2° 7'12"	-2° 7'35"	-2° 7'57"	-2° 8'18"	-2° 8'37"	-2° 8'55"	-2° 9'12"	-2° 9'28"	-2° 9'46"	-2° 10'4"	-2° 10'24"	-2° 10'45"
23	-2°11'7"	-2°11'29"	-2°11'50"	-2°12'10"	-2°12'29"	-2°12'45"	-2°13'1"	-2°13'17"	-2°13'33"	-2°13'50"	-2°14'9"	-2°14'29"
24	-2°14'50"	-2°15'11"	-2°15'32"	-2°15'51"	-2°16'8"	-2°16'24"	-2°16'39"	-2°16'53"	-2°17'8"	-2°17'25"	-2°17'43"	-2°18'2"
25	-2°18'18"	-2°18'42"	-2°19'1"	-2°19'19"	-2°19'35"	-2°19'50"	-2°20'4"	-2°20'18"	-2°20'32"	-2°20'47"	-2°21'4"	-2°21'22"
26	-2°21'41"	-2°22'0"	-2°22'19"	-2°22'36"	-2°22'51"	-2°23'5"	-2°23'17"	-2°23'30"	-2°23'43"	-2°23'58"	-2°24'13"	-2°24'31"
27	-2°24'49"	-2°25'7"	-2°25'24"	-2°25'40"	-2°25'54"	-2°26'7"	-2°26'19"	-2°26'30"	-2°26'42"	-2°26'56"	-2°27'10"	-2°27'27"
28	-2°27'44"	-2°28'1"	-2°28'17"	-2°28'32"	-2°28'45"	-2°28'57"	-2°29'7"	-2°29'18"	-2°29'29"	-2°29'41"	-2°29'55"	-2°30'10"
29	-2°30'26"	-2°30'42"	-2°30'57"	-2°31'11"	-2°31'23"	-2°31'34"	-2°31'44"	-2°31'53"	-2°32'3"	-2°32'15"	-2°32'27"	-2°32'41"
30	-2°32'56"	-2°33'11"	-2°33'25"	-2°33'38"	-2°33'49"	-2°33'59"	-2°34'8"	-2°34'16"	-2°34'25"	-2°34'35"	-2°34'47"	-2°35'0"
31	-2°35'14"	-2°35'28"	-2°35'41"	-2°35'53"	-2°36'3"	-2°36'12"	-2°36'19"	-2°36'27"	-2°36'35"	-2°36'44"	-2°36'54"	-2°37'6"
32	-2°37'19"	-2°37'32"	-2°37'44"	-2°37'55"	-2°38'4"	-2°38'11"	-2°38'18"	-2°38'24"	-2°38'31"	-2°38'39"	-2°38'49"	-2°38'60"
33	-2°39'12"	-2°39'23"	-2°39'35"	-2°39'44"	-2°39'52"	-2°39'59"	-2°40'4"	-2°40'10"	-2°40'16"	-2°40'23"	-2°40'31"	-2°40'41"
34	-2°40'52"	-2°41'3"	-2°41'13"	-2°41'21"	-2°41'28"	-2°41'34"	-2°41'38"	-2°41'43"	-2°41'47"	-2°41'53"	-2°42'1"	-2°42'10"
35	-2°42'19"	-2°42'29"	-2°42'38"	-2°42'46"	-2°42'52"	-2°42'56"	-2°42'60"	-2°43'3"	-2°43'7"	-2°43'12"	-2°43'18"	-2°43'26"
36	-2°43'35"	-2°43'43"	-2°43'51"	-2°43'58"	-2°44'3"	-2°44'6"	-2°44'9"	-2°44'11"	-2°44'14"	-2°44'18"	-2°44'23"	-2°44'30"
37	-2°44'38"	-2°44'45"	-2°44'52"	-2°44'58"	-2°45'2"	-2°45'4"	-2°45'6"	-2°45'7"	-2°45'9"	-2°45'12"	-2°45'16"	-2°45'22"
38	-2°45'28"	-2°45'35"	-2°45'41"	-2°45'45"	-2°45'48"	-2°45'50"	-2°45'50"	-2°45'51"	-2°45'51"	-2°45'53"	-2°45'57"	-2°46'2"
39	-2°46'7"	-2°46'13"	-2°46'18"	-2°46'21"	-2°46'23"	-2°46'24"	-2°46'23"	-2°46'22"	-2°46'22"	-2°46'23"	-2°46'26"	-2°46'29"
40	-2°46'34"	-2°46'39"	-2°46'43"	-2°46'45"	-2°46'46"	-2°46'46"	-2°46'44"	-2°46'42"	-2°46'41"	-2°46'41"	-2°46'43"	-2°46'46"
41	-2°46'49"	-2°46'53"	-2°46'56"	-2°46'58"	-2°46'58"	-2°46'56"	-2°46'54"	-2°46'51"	-2°46'49"	-2°46'48"	-2°46'49"	-2°46'50"
42	-2°46'53"	-2°46'56"	-2°46'58"	-2°46'59"	-2°46'58"	-2°46'55"	-2°46'52"	-2°46'48"	-2°46'45"	-2°46'43"	-2°46'43"	-2°46'44"
43	-2°46'46"	-2°46'47"	-2°46'49"	-2°46'48"	-2°46'47"	-2°46'43"	-2°46'39"	-2°46'34"	-2°46'30"	-2°46'28"	-2°46'26"	-2°46'26"
44	-2°46'27"	-2°46'28"	-2°46'28"	-2°46'27"	-2°46'24"	-2°46'20"	-2°46'15"	-2°46'10"	-2°46'5"	-2°46'1"	-2°45'59"	-2°45'58"
45	-2°45'58"	-2°45'58"	-2°45'57"	-2°45'55"	-2°45'51"	-2°45'46"	-2°45'40"	-2°45'34"	-2°45'28"	-2°45'24"	-2°45'21"	-2°45'19"
46	-2°45'18"	-2°45'17"	-2°45'15"	-2°45'12"	-2°45'8"	-2°45'2"	-2°44'55"	-2°44'48"	-2°44'41"	-2°44'36"	-2°44'32"	-2°44'29"
47	-2°44'27"	-2°44'26"	-2°44'23"	-2°44'19"	-2°44'14"	-2°44'7"	-2°44'59"	-2°43'51"	-2°43'44"	-2°43'38"	-2°43'33"	-2°43'29"
48	-2°43'27"	-2°43'24"	-2°43'21"	-2°43'16"	-2°43'10"	-2°43'2"	-2°42'53"	-2°42'45"	-2°42'36"	-2°42'29"	-2°42'23"	-2°42'19"
49	-2°42'15"	-2°42'12"	-2°42'8"	-2°42'2"	-2°41'55"	-2°41'47"	-2°41'37"	-2°41'28"	-2°41'19"	-2°41'11"	-2°41'4"	-2°40'59"
50	-2°40'54"	-2°40'50"	-2°40'45"	-2°40'39"	-2°40'31"	-2°40'22"	-2°40'11"	-2°40'1"	-2°39'51"	-2°39'42"	-2°39'35"	-2°39'29"
51	-2°39'24"	-2°39'18"	-2°39'13"	-2°39'6"	-2°38'57"	-2°38'47"	-2°38'36"	-2°38'24"	-2°38'14"	-2°38'4"	-2°37'56"	-2°37'49"
52	-2°37'43"	-2°37'37"	-2°37'30"	-2°37'23"	-2°37'13"	-2°37'2"	-2°36'50"	-2°36'38"	-2°36'27"	-2°36'16"	-2°36'7"	-2°35'60"
53	-2°35'53"	-2°35'46"	-2°35'39"	-2°35'30"	-2°35'20"	-2°35'8"	-2°34'55"	-2°34'43"	-2°34'30"	-2°34'19"	-2°34'10"	-2°34'1"
54	-2°33'54"	-2°33'46"	-2°33'38"	-2°33'28"	-2°33'17"	-2°33'5"	-2°32'51"	-2°32'38"	-2°32'25"	-2°32'13"	-2°32'3"	-2°31'53"
55	-2°31'45"	-2°31'37"	-2°31'28"	-2°31'18"	-2°31'6"	-2°30'53"	-2°30'38"	-2°30'24"	-2°30'10"	-2°29'58"	-2°29'47"	-2°29'37"
56	-2°29'28"	-2°29'19"	-2°29'9"	-2°28'58"	-2°28'45"	-2°28'31"	-2°28'17"	-2°28'2"	-2°27'47"	-2°27'34"	-2°27'22"	-2°27'11"
57	-2°27'1"	-2°26'52"	-2°26'41"	-2°26'30"	-2°26'16"	-2°26'2"	-2°25'46"	-2°25'30"	-2°25'15"	-2°25'1"	-2°24'48"	-2°24'37"
58	-2°24'27"	-2°24'16"	-2°24'5"	-2°23'53"	-2°23'39"	-2°23'24"	-2°23'7"	-2°22'51"	-2°22'35"	-2°22'20"	-2°22'7"	-2°21'55"
59	-2°21'44"	-2°21'33"	-2°21'21"	-2°21'8"	-2°20'53"	-2°20'37"	-2°20'20"	-2°20'3"	-2°19'47"	-2°19'31"	-2°19'17"	-2°19'5"
60	-2°18'53"	-2°18'41"	-2°18'29"	-2°18'15"	-2°17'60"	-2°17'43"	-2°17'25"	-2°17'7"	-2°16'50"	-2°16'34"	-2°16'20"	-2°16'6"
61	-2°15'54"	-2°15'41"	-2°15'28"	-2°15'14"	-2°14'58"	-2°14'41"	-2°14'23"	-2°14'4"	-2°13'46"	-2°13'30"	-2°13'15"	-2°13'1"
62	-2°12'48"	-2°12'35"	-2°12'21"	-2°12'6"	-2°11'49"	-2°11'31"	-2°11'13"	-2°10'54"	-2°10'35"	-2°10'18"	-2°10'2"	-2°9'48"
63	-2° 9'34"	-2° 9'20"	-2° 9'6"	-2° 8'50"	-2° 8'33"	-2° 8'15"	-2° 7'55"	-2° 7'36"	-2° 7'17"	-2° 6'59"	-2° 6'43"	-2° 6'28"
64	-2° 6'13"	-2° 5'59"	-2° 5'44"	-2° 5'28"	-2° 5'11"	-2° 4'51"	-2° 4'32"	-2° 4'11"	-2° 3'52"	-2° 3'33"	-2° 3'17"	-2° 3'1"
65	-2° 2'46"	-2° 2'31"	-2° 2'16"	-2° 1'59"	-2° 1'41"	-2° 1'22"	-2° 1'1"	-2° 0'40"	-2° 0'20"	-2° 0'1"	-1°59'44"	-1°59'28"
66	-1°59'13"	-1°58'57"	-1°58'41"	-1°58'24"	-1°58'5"	-1°57'45"	-1°57'24"	-1°57'3"	-1°56'43"	-1°56'23"	-1°56'5"	-1°55'49"
67	-1°55'33"	-1°55'17"	-1°55'1"	-1°54'43"	-1°54'24"	-1°54'3"	-1°53'42"	-1°53'20"	-1°52'59"	-1°52'39"	-1°52'21"	-1°52'4"
68	-1°51'48"	-1°51'31"	-1°51'15"	-1°50'56"	-1°50'37"	-1°50'16"	-1°49'54"	-1°49'32"	-1°49'10"	-1°48'50"	-1°48'31"	-1°48'14"
69	-1°47'57"	-1°47'40"	-1°47'23"	-1°47'5"	-1°46'45"	-1°46'23"	-1°46'1"	-1°45'38"	-1°45'16"	-1°44'56"	-1°44'37"	-1°44'19"
70	-1°44'2"	-1°43'45"	-1°43'27"	-1°43'8"	-1°42'48"	-1°42'26"	-1°42'3"	-1°41'40"	-1°41'18"	-1°40'57"	-1°40'37"	-1°40'19"
71	-1°40'2"	-1°39'44"	-1°39'26"	-1°39'7"	-1°38'46"	-1°38'24"	-1°38'1"	-1°37'38"	-1°37'15"	-1°36'54"	-1°36'34"	-1°36'15"
72	-1°35'57"	-1°35'40"	-1°35'21"	-1°35'2"	-1°34'41"	-1°34'18"	-1°33'55"	-1°33'31"	-1°33'8"	-1°32'47"	-1°32'26"	-1°32'7"
73	-1°31'49"	-1°31'31"	-1°31'13"	-1°30'53"	-1°30'31"	-1°30'9"	-1°29'45"	-1°29'21"	-1°28'58"	-1°28'36"	-1°28'16"	-1°27'56"
74	-1°27'38"	-1°27'20"	-1°27'1"	-1°26'40"	-1°26'19"	-1°25'56"	-1°25'32"	-1°25'8"	-1°24'44"	-1°24'22"	-1°24'1"	-1°23'42"
75	-1°23'23"	-1°23'5"	-1°22'46"	-1°22'25"	-1°22'3"	-1°21'40"	-1°21'16"	-1°20'51"	-1°20'28"	-1°20'5"	-1°19'44"	-1°19'23"
76	-1°19'6"	-1°18'47"	-1°18'28"	-1°18'7"	-1°17'45"	-1°17'21"	-1°16'57"	-1°16'32"	-1°16'9"	-1°15'46"	-1°15'25"	-1°15'5"
77	-1°14'46"	-1°14'27"	-1°14'7"	-1°13'46"	-1°13'24"	-1°13'0"	-1°12'36"	-1°12'11"	-1°11'47"	-1°11'24"	-1°11'3"	-1°10'43"
78	-1°10'24"	-1°10'4"	-1°9'45"	-1°9'24"	-1°9'1"	-1°8'37"	-1°8'12"	-1°7'48"	-1°7'23"	-1°7'0"	-1°6'39"	-1°6'19"
79	-1°5'59"	-1°5'40"	-1°5'20"	-1°4'59"	-1°4'36"	-1°4'12"	-1°3'47"	-1°3'22"	-1°2'58"	-1°2'35"	-1°2'13"	-1°1'53"
80	-1° 1'33"	-1° 1'14"	-1° 0'54"	-1° 0'32"	-1° 0'1							

Solar E Differentials -- Epoch 2020 -- Leap Years (LY0)

Dn	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
92	-7'42"	-7'23"	-7'3"	-6'42"	-6'19"	-5'55"	-5'30"	-5'6"	-4'41"	-4'19"	-3'57"	-3'37"
93	-3'18"	-2'59"	-2'39"	-2'18"	-1'57"	-1'31"	-1'7"	-42"	-18"	5"	26"	46"
94	1'5"	1'24"	1'43"	2'4"	2'27"	2'50"	3'15"	3'39"	4'3"	4'25"	4'46"	5'6"
95	5'25"	5'44"	6'3"	6'24"	6'46"	7'9"	7'34"	7'58"	8'22"	8'44"	9'5"	9'24"
96	9'43"	10'1"	10'20"	10'41"	11'3"	11'26"	11'50"	12'14"	12'37"	12'59"	13'20"	13'39"
97	13'57"	14'16"	14'35"	14'55"	15'16"	15'39"	16'3"	16'27"	16'50"	17'12"	17'32"	17'51"
98	18'9"	18'27"	18'45"	19'5"	19'27"	19'49"	20'13"	20'36"	20'59"	21'20"	21'40"	21'59"
99	22'17"	22'34"	22'53"	23'12"	23'33"	23'56"	24'19"	24'42"	25'4"	25'25"	25'45"	26'3"
100	26'20"	26'38"	26'56"	27'15"	27'36"	27'58"	28'20"	28'43"	29'5"	29'26"	29'45"	30'3"
101	30'20"	30'37"	30'55"	31'13"	31'34"	31'55"	32'18"	32'40"	33'2"	33'22"	33'41"	33'58"
102	34'15"	34'32"	34'49"	35'7"	35'27"	35'48"	36'10"	36'32"	36'53"	37'13"	37'32"	37'49"
103	38'5"	38'21"	38'38"	38'56"	39'16"	39'36"	39'58"	40'19"	40'40"	40'60"	41'18"	41'34"
104	41'50"	42'6"	42'22"	42'40"	42'59"	43'19"	43'40"	44'1"	44'22"	44'41"	44'58"	45'14"
105	45'30"	45'45"	46'1"	46'18"	46'37"	46'57"	47'17"	47'38"	47'58"	48'16"	48'33"	48'49"
106	49'4"	49'19"	49'34"	49'51"	50'9"	50'28"	50'48"	51'8"	51'28"	51'46"	52'3"	52'18"
107	52'32"	52'46"	53'1"	53'17"	53'35"	53'54"	54'14"	54'33"	54'52"	55'10"	55'26"	55'40"
108	55'54"	56'8"	56'22"	56'38"	56'55"	57'14"	57'33"	57'52"	58'10"	58'27"	58'43"	58'57"
109	59'10"	59'24"	59'37"	59'53"	1'0'9"	1'0'27"	1'0'46"	1'1'4"	1'1'22"	1'1'39"	1'1'54"	1'2'7"
110	1'2'20"	1'2'33"	1'2'46"	1'3'1"	1'3'17"	1'3'34"	1'3'52"	1'4'10"	1'4'27"	1'4'43"	1'4'58"	1'5'11"
111	1'5'23"	1'5'35"	1'5'48"	1'6'2"	1'6'18"	1'6'34"	1'6'52"	1'7'9"	1'7'26"	1'7'42"	1'7'55"	1'8'8"
112	1'8'20"	1'8'31"	1'8'43"	1'8'57"	1'9'12"	1'9'28"	1'9'45"	1'10'2"	1'10'18"	1'10'33"	1'10'46"	1'10'58"
113	1'11'9"	1'11'20"	1'11'32"	1'11'45"	1'11'59"	1'12'15"	1'12'31"	1'12'47"	1'13'3"	1'13'17"	1'13'30"	1'13'41"
114	1'13'52"	1'14'2"	1'14'13"	1'14'26"	1'14'39"	1'14'54"	1'15'10"	1'15'26"	1'15'41"	1'15'55"	1'16'7"	1'16'18"
115	1'16'27"	1'16'37"	1'16'48"	1'16'59"	1'17'13"	1'17'27"	1'17'42"	1'17'57"	1'18'12"	1'18'25"	1'18'36"	1'18'47"
116	1'18'56"	1'19'5"	1'19'15"	1'19'26"	1'19'39"	1'19'52"	1'20'7"	1'20'22"	1'20'35"	1'20'48"	1'20'59"	1'21'8"
117	1'21'17"	1'21'26"	1'21'35"	1'21'45"	1'21'57"	1'22'10"	1'22'24"	1'22'38"	1'22'52"	1'23'3"	1'23'14"	1'23'23"
118	1'23'31"	1'23'39"	1'23'47"	1'23'57"	1'24'8"	1'24'21"	1'24'34"	1'24'48"	1'25'0"	1'25'12"	1'25'21"	1'25'29"
119	1'25'37"	1'25'44"	1'25'52"	1'26'1"	1'26'12"	1'26'24"	1'26'37"	1'26'50"	1'27'1"	1'27'12"	1'27'21"	1'27'29"
120	1'27'36"	1'27'42"	1'27'50"	1'27'58"	1'28'8"	1'28'20"	1'28'32"	1'28'44"	1'28'55"	1'29'5"	1'29'13"	1'29'20"
121	1'29'26"	1'29'33"	1'29'39"	1'29'47"	1'29'57"	1'30'7"	1'30'19"	1'30'30"	1'30'41"	1'30'50"	1'30'58"	1'31'4"
122	1'31'10"	1'31'15"	1'31'21"	1'31'28"	1'31'37"	1'31'47"	1'31'58"	1'32'9"	1'32'19"	1'32'27"	1'32'34"	1'32'40"
123	1'32'45"	1'32'50"	1'32'55"	1'33'2"	1'33'10"	1'33'19"	1'33'29"	1'33'39"	1'33'49"	1'33'57"	1'34'3"	1'34'8"
124	1'34'12"	1'34'16"	1'34'21"	1'34'27"	1'34'35"	1'34'43"	1'34'53"	1'35'2"	1'35'11"	1'35'18"	1'35'24"	1'35'28"
125	1'35'32"	1'35'35"	1'35'39"	1'35'44"	1'35'51"	1'35'59"	1'36'8"	1'36'17"	1'36'25"	1'36'31"	1'36'36"	1'36'40"
126	1'36'43"	1'36'45"	1'36'49"	1'36'53"	1'36'59"	1'37'7"	1'37'15"	1'37'23"	1'37'30"	1'37'36"	1'37'40"	1'37'43"
127	1'37'45"	1'37'47"	1'37'50"	1'37'54"	1'37'59"	1'38'6"	1'38'13"	1'38'20"	1'38'27"	1'38'32"	1'38'36"	1'38'38"
128	1'38'39"	1'38'41"	1'38'43"	1'38'46"	1'38'50"	1'38'56"	1'39'3"	1'39'10"	1'39'15"	1'39'20"	1'39'23"	1'39'24"
129	1'39'25"	1'39'25"	1'39'27"	1'39'29"	1'39'33"	1'39'38"	1'39'44"	1'39'50"	1'39'55"	1'39'59"	1'40'1"	1'40'2"
130	1'40'2"	1'40'2"	1'40'2"	1'40'4"	1'40'7"	1'40'12"	1'40'17"	1'40'22"	1'40'26"	1'40'29"	1'40'31"	1'40'31"
131	1'40'30"	1'40'29"	1'40'29"	1'40'30"	1'40'32"	1'40'36"	1'40'41"	1'40'45"	1'40'49"	1'40'51"	1'40'52"	1'40'51"
132	1'40'49"	1'40'48"	1'40'47"	1'40'47"	1'40'49"	1'40'52"	1'40'56"	1'40'59"	1'41'2"	1'41'4"	1'41'4"	1'41'2"
133	1'40'60"	1'40'58"	1'40'56"	1'40'55"	1'40'56"	1'40'59"	1'41'2"	1'41'5"	1'41'7"	1'41'8"	1'41'7"	1'41'5"
134	1'41'2"	1'40'58"	1'40'56"	1'40'55"	1'40'55"	1'40'57"	1'40'59"	1'41'1"	1'41'3"	1'41'3"	1'41'1"	1'40'58"
135	1'40'55"	1'40'51"	1'40'48"	1'40'46"	1'40'45"	1'40'46"	1'40'48"	1'40'49"	1'40'50"	1'40'49"	1'40'47"	1'40'43"
136	1'40'39"	1'40'34"	1'40'30"	1'40'28"	1'40'26"	1'40'27"	1'40'27"	1'40'28"	1'40'28"	1'40'27"	1'40'24"	1'40'20"
137	1'40'14"	1'40'9"	1'40'4"	1'40'1"	1'39'59"	1'39'58"	1'39'59"	1'39'59"	1'39'58"	1'39'56"	1'39'52"	1'39'47"
138	1'39'41"	1'39'35"	1'39'30"	1'39'26"	1'39'23"	1'39'22"	1'39'21"	1'39'21"	1'39'19"	1'39'16"	1'39'12"	1'39'6"
139	1'38'60"	1'38'53"	1'38'47"	1'38'42"	1'38'39"	1'38'37"	1'38'35"	1'38'34"	1'38'32"	1'38'29"	1'38'24"	1'38'17"
140	1'38'10"	1'38'2"	1'37'56"	1'37'50"	1'37'46"	1'37'43"	1'37'41"	1'37'39"	1'37'37"	1'37'33"	1'37'27"	1'37'20"
141	1'37'12"	1'37'3"	1'36'56"	1'36'50"	1'36'45"	1'36'42"	1'36'39"	1'36'37"	1'36'33"	1'36'28"	1'36'22"	1'36'14"
142	1'36'5"	1'35'57"	1'35'49"	1'35'42"	1'35'36"	1'35'32"	1'35'29"	1'35'26"	1'35'22"	1'35'16"	1'35'9"	1'35'1"
143	1'34'51"	1'34'42"	1'34'33"	1'34'26"	1'34'20"	1'34'15"	1'34'11"	1'34'7"	1'34'3"	1'33'56"	1'33'49"	1'33'40"
144	1'33'30"	1'33'20"	1'33'10"	1'33'2"	1'32'55"	1'32'50"	1'32'46"	1'32'41"	1'32'36"	1'32'29"	1'32'21"	1'32'11"
145	1'32'0"	1'31'50"	1'31'40"	1'31'31"	1'31'24"	1'31'18"	1'31'13"	1'31'8"	1'31'2"	1'30'54"	1'30'45"	1'30'35"
146	1'30'24"	1'30'13"	1'30'2"	1'29'53"	1'29'45"	1'29'39"	1'29'33"	1'29'27"	1'29'21"	1'29'13"	1'29'3"	1'28'52"
147	1'28'40"	1'28'29"	1'28'17"	1'28'8"	1'27'59"	1'27'52"	1'27'46"	1'27'40"	1'27'33"	1'27'24"	1'27'14"	1'27'3"
148	1'26'50"	1'26'38"	1'26'26"	1'26'16"	1'26'7"	1'25'59"	1'25'52"	1'25'46"	1'25'38"	1'25'29"	1'25'18"	1'25'6"
149	1'24'54"	1'24'41"	1'24'28"	1'24'17"	1'24'8"	1'23'60"	1'23'53"	1'23'45"	1'23'37"	1'23'28"	1'23'16"	1'23'4"
150	1'22'51"	1'22'37"	1'22'24"	1'22'13"	1'22'3"	1'21'54"	1'21'46"	1'21'39"	1'21'30"	1'21'20"	1'21'8"	1'20'55"
151	1'20'41"	1'20'28"	1'20'14"	1'20'2"	1'19'52"	1'19'43"	1'19'34"	1'19'26"	1'19'17"	1'19'7"	1'18'54"	1'18'41"
152	1'18'27"	1'18'12"	1'17'58"	1'17'46"	1'17'35"	1'17'26"	1'17'17"	1'17'8"	1'16'58"	1'16'47"	1'16'35"	1'16'21"
153	1'16'6"	1'15'51"	1'15'37"	1'15'24"	1'15'13"	1'15'3"	1'14'54"	1'14'44"	1'14'34"	1'14'23"	1'14'10"	1'13'56"
154	1'13'40"	1'13'25"	1'13'10"	1'12'57"	1'12'45"	1'12'35"	1'12'25"	1'12'16"	1'12'5"	1'11'53"	1'11'40"	1'11'25"
155	1'11'9"	1'10'54"	1'10'39"	1'10'25"	1'10'13"	1'10'2"	1'9'52"	1'9'42"	1'9'31"	1'9'19"	1'9'5"	1'8'50"
156	1'8'33"	1'8'17"	1'8'2"	1'7'48"	1'7'35"	1'7'24"	1'7'13"	1'7'3"	1'6'52"	1'6'39"	1'6'25"	1'6'9"
157	1'5'53"	1'5'36"	1'5'20"	1'5'6"	1'4'53"	1'4'41"	1'4'30"	1'4'20"	1'4'8"	1'3'55"	1'3'40"	1'3'24"
158	1'3'8"	1'2'51"	1'2'34"	1'2'20"	1'2'6"	1'1'54"	1'1'43"	1'1'32"	1'1'20"	1'1'6"	1'0'52"	1'0'35"
159	1'0'18"	1'0'1"	59'44"	59'29"	59'15"	59'3"	58'51"	58'40"	58'28"	58'14"	57'59"	57'42"
160	57'24"	57'7"	56'50"	56'34"	56'20"	56'8"	55'56"	55'44"	55'31"	55'17"	55'2"	54'45"
161	54'27"	54'9"	53'52"	53'36"	53'22"	53'9"	52'57"	52'44"	52'32"	52'17"	52'2"	51'44"
162	51'26"	51'8"	50'50"	50'34"	50'20"	50'6"	49'54"	49'42"	49'29"	49'14"	48'58"	48'40"
163	48'22"	48'4"	47'46"	47'29"	47'15"	47'1"	46'48"	46'36"	46'22"	46'8"	45'51"	45'34"
164	45'15"	44'56"	44'38"	44'22"	44'7"	43'53"	43'40"	43'27"	43'14"	42'59"	42'42"	42'24"
165	42'5"	41'47"	41'28"	41'12"	40'56"	40'42"	40'29"	40'16"	40'2"	39'47"	39'31"	39'13"
166	38'54"	38'35"	38'16"	37'59"	37'44"	37'30"	37'16"	37'3"	36'49"	36'34"	36'17"	35'59"
167	35'40"	35'21"	35'2"	34'45"	34'30"	34'15"	34'2"	33'49"	33'35"	33'19"	33'2"	32'44"
168	32'25"	32'5"	31'47"	31'30"	31'14"	30'60"	30'46"	30'33"	30'19"	30'3"	29'46"	29'28"
169	29'8"	28'49"	28'30"	28'13"	27'57"	27'43"	27'29"	27'16"	27'2"	26'46"	26'29"	26'11"
170	25'51"	25'32"	25'13"	24'56"	24'40"	24'26"	24'12"	23'59"	23'44"	23'29"	23'12"	22'53"
171	22'34"	22'14"	21'56"	21'38"	21'23"	21'8"	20'55"	20'41"	20'27"	20'11"	19'54"	19'36"
172	19'17"	18'57"	18'38"	18'21"	18'5"	17'51"	17'37"	17'24"	17'10"	16'54"	16'37"	16'19"
173	15'60"	15'40"	15'22"	15'4"	14'49"	14'34"	14'21"	14'8"	13'54"	13'38"	13'21"	13'3"
174	12'44"	12'25"	12'6"	11'49"	11'33"	11'19"	11'6"	10'53"	10'39"	10'23"	10'6"	9'48"
175	9'29"	9'10"	8'52"	8'35"	8'19"	8'5"	7'52"	7'39"	7'25"	7'10"	6'53"	6'35"
176	6'16"	5'57"	5'39"	5'22"	5'7"	4'53"	4'40"	4'27"	4'14"			

Solar E Differentials -- Epoch 2020 -- Leap Years (LY0)

Dn	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
184	-17'37"	-17'54"	-18'10"	-18'24"	-18'37"	-18'48"	-18'59"	-19' 9"	-19'20"	-19'33"	-19'47"	-20' 2"
185	-20'18"	-20'34"	-20'50"	-21' 4"	-21'16"	-21'27"	-21'37"	-21'47"	-21'58"	-22'10"	-22'23"	-22'38"
186	-22'54"	-23'10"	-23'25"	-23'38"	-23'50"	-24' 1"	-24'11"	-24'20"	-24'30"	-24'42"	-24'55"	-25' 9"
187	-25'25"	-25'40"	-25'54"	-26' 8"	-26'19"	-26'29"	-26'39"	-26'48"	-26'58"	-27' 9"	-27'21"	-27'35"
188	-27'50"	-28' 5"	-28'19"	-28'32"	-28'43"	-28'52"	-29' 1"	-29'10"	-29'19"	-29'30"	-29'42"	-29'55"
189	-30'10"	-30'24"	-30'38"	-30'50"	-31' 0"	-31' 0"	-31'18"	-31'26"	-31'35"	-31'45"	-31'57"	-32'10"
190	-32'23"	-32'37"	-32'50"	-33' 2"	-33'12"	-33'21"	-33'29"	-33'36"	-33'45"	-33'54"	-34' 5"	-34'18"
191	-34'31"	-34'44"	-34'57"	-35' 8"	-35'18"	-35'26"	-35'33"	-35'41"	-35'48"	-35'57"	-36' 8"	-36'20"
192	-36'33"	-36'45"	-36'57"	-37' 8"	-37'17"	-37'25"	-37'32"	-37'38"	-37'46"	-37'54"	-38' 4"	-38'15"
193	-38'28"	-38'40"	-38'51"	-39' 1"	-39'10"	-39'17"	-39'23"	-39'29"	-39'36"	-39'44"	-39'53"	-40' 4"
194	-40'16"	-40'28"	-40'38"	-40'48"	-40'56"	-41' 3"	-41' 8"	-41'14"	-41'20"	-41'27"	-41'36"	-41'46"
195	-41'57"	-42' 8"	-42'19"	-42'28"	-42'35"	-42'41"	-42'46"	-42'51"	-42'56"	-43' 3"	-43'11"	-43'21"
196	-43'31"	-43'42"	-43'52"	-44' 0"	-44' 7"	-44'12"	-44'17"	-44'21"	-44'26"	-44'32"	-44'40"	-44'49"
197	-44'58"	-45' 8"	-45'17"	-45'25"	-45'31"	-45'36"	-45'40"	-45'43"	-45'46"	-45'53"	-46' 0"	-46' 9"
198	-46'18"	-46'27"	-46'35"	-46'43"	-46'48"	-46'52"	-46'55"	-46'58"	-47' 2"	-47' 7"	-47'13"	-47'21"
199	-47'29"	-47'38"	-47'46"	-47'52"	-47'57"	-48' 0"	-48' 3"	-48' 5"	-48' 8"	-48'12"	-48'18"	-48'25"
200	-48'33"	-48'41"	-48'48"	-48'54"	-48'58"	-49' 1"	-49' 3"	-49' 4"	-49' 6"	-49'10"	-49'15"	-49'21"
201	-49'28"	-49'36"	-49'42"	-49'47"	-49'51"	-49'53"	-49'54"	-49'55"	-49'56"	-49'59"	-50' 4"	-50' 9"
202	-50'16"	-50'22"	-50'28"	-50'32"	-50'35"	-50'36"	-50'37"	-50'37"	-50'38"	-50'40"	-50'44"	-50'49"
203	-50'54"	-50'60"	-51' 5"	-51' 9"	-51'11"	-51'11"	-51'11"	-51'11"	-51'11"	-51'12"	-51'15"	-51'19"
204	-51'24"	-51'29"	-51'33"	-51'36"	-51'38"	-51'37"	-51'36"	-51'35"	-51'35"	-51'35"	-51'37"	-51'41"
205	-51'45"	-51'49"	-51'53"	-51'55"	-51'55"	-51'55"	-51'53"	-51'51"	-51'49"	-51'49"	-51'51"	-51'53"
206	-51'57"	-52' 0"	-52' 3"	-52' 4"	-52' 4"	-52' 3"	-52' 0"	-51'57"	-51'55"	-51'54"	-51'55"	-51'57"
207	-51'59"	-52' 2"	-52' 4"	-52' 5"	-52' 4"	-52' 1"	-51'58"	-51'55"	-51'52"	-51'50"	-51'50"	-51'51"
208	-51'53"	-51'55"	-51'56"	-51'56"	-51'54"	-51'51"	-51'47"	-51'42"	-51'39"	-51'36"	-51'35"	-51'36"
209	-51'37"	-51'38"	-51'38"	-51'37"	-51'35"	-51'31"	-51'26"	-51'21"	-51'16"	-51'13"	-51'11"	-51'11"
210	-51'11"	-51'12"	-51'11"	-51'10"	-51' 6"	-51' 2"	-50'56"	-50'50"	-50'45"	-50'41"	-50'38"	-50'37"
211	-50'37"	-50'36"	-50'35"	-50'32"	-50'28"	-50'23"	-50'16"	-50'10"	-50' 4"	-49'59"	-49'56"	-49'54"
212	-49'52"	-49'51"	-49'49"	-49'46"	-49'41"	-49'35"	-49'28"	-49'20"	-49'13"	-49' 8"	-49' 4"	-49' 1"
213	-48'59"	-48'57"	-48'54"	-48'50"	-48'44"	-48'37"	-48'29"	-48'21"	-48'14"	-48' 7"	-48' 2"	-47'59"
214	-47'56"	-47'53"	-47'50"	-47'45"	-47'39"	-47'31"	-47'22"	-47'13"	-47' 5"	-46'58"	-46'52"	-46'48"
215	-46'44"	-46'41"	-46'36"	-46'31"	-46'24"	-46'15"	-46' 5"	-45'56"	-45'47"	-45'39"	-45'32"	-45'27"
216	-45'23"	-45'19"	-45'14"	-45' 7"	-44'59"	-44'50"	-44'42"	-44'29"	-44'20"	-44'11"	-44' 4"	-43'58"
217	-43'53"	-43'48"	-43'42"	-43'35"	-43'26"	-43'16"	-43' 5"	-42'54"	-42'44"	-42'34"	-42'26"	-42'20"
218	-42'14"	-42' 8"	-42' 2"	-41'54"	-41'44"	-41'34"	-41'22"	-41'10"	-40'59"	-40'49"	-40'40"	-40'33"
219	-40'26"	-40'20"	-40'13"	-40' 4"	-39'54"	-39'42"	-39'30"	-39'17"	-39' 5"	-38'54"	-38'45"	-38'37"
220	-38'30"	-38'23"	-38'15"	-38' 5"	-37'55"	-37'42"	-37'29"	-37'16"	-37' 3"	-36'52"	-36'42"	-36'33"
221	-36'25"	-36'17"	-36' 8"	-35'58"	-35'47"	-35'34"	-35'20"	-35' 6"	-34'52"	-34'40"	-34'30"	-34'20"
222	-34'11"	-34' 3"	-33'53"	-33'43"	-33'30"	-33'17"	-33' 2"	-32'48"	-32'33"	-32'21"	-32' 9"	-31'59"
223	-31'50"	-31'40"	-31'30"	-31'19"	-31' 6"	-30'52"	-30'36"	-30'21"	-30' 6"	-29'53"	-29'41"	-29'30"
224	-29'20"	-29'10"	-28'59"	-28'47"	-28'33"	-28'18"	-28' 2"	-27'46"	-27'31"	-27'17"	-27' 4"	-26'52"
225	-26'42"	-26'31"	-26'20"	-26' 7"	-25'53"	-25'37"	-25'20"	-25' 4"	-24'47"	-24'33"	-24'19"	-24' 7"
226	-23'56"	-23'44"	-23'32"	-23'19"	-23' 4"	-22'48"	-22'30"	-22'13"	-21'56"	-21'41"	-21'27"	-21'14"
227	-21' 2"	-20'50"	-20'37"	-20'23"	-20' 7"	-19'50"	-19'33"	-19'15"	-18'57"	-18'41"	-18'26"	-18'13"
228	-18' 0"	-17'48"	-17'34"	-17'19"	-17' 3"	-16'46"	-16'27"	-16' 9"	-15'51"	-15'34"	-15'18"	-15' 4"
229	-14'51"	-14'38"	-14'24"	-14' 8"	-13'52"	-13'33"	-13'14"	-12'55"	-12'36"	-12'19"	-12' 3"	-11'48"
230	-11'34"	-11'20"	-11' 6"	-10'50"	-10'32"	-10'14"	-9'54"	-9'34"	-9'15"	-8'57"	-8'40"	-8'25"
231	-8'10"	-7'56"	-7'40"	-7'24"	-7' 6"	-6'46"	-6'26"	-6' 6"	-5'46"	-5'27"	-5'10"	-4'54"
232	-4'39"	-4'24"	-4' 8"	-3'51"	-3'32"	-3'12"	-2'51"	-2'30"	-2'10"	-1'53"	-1'36"	-1'16"
233	-1' 0"	-45'	-28"	-10"	9"	30"	51"	1'13"	1'34"	1'54"	2'12"	2'29"
234	2'45"	3' 2"	3'19"	3'37"	3'57"	4'18"	4'40"	5' 2"	5'24"	5'44"	6' 3"	6'21"
235	6'38"	6'55"	7'12"	7'31"	7'52"	8'13"	8'36"	8'59"	9'21"	9'42"	10' 1"	10'20"
236	10'37"	10'55"	11'13"	11'32"	11'53"	12'16"	12'39"	13' 2"	13'25"	13'46"	14' 6"	14'25"
237	14'43"	15' 1"	15'20"	15'40"	16' 1"	16'24"	16'48"	17'12"	17'35"	17'57"	18'18"	18'37"
238	18'55"	19'14"	19'33"	19'54"	20'16"	20'39"	21' 3"	21'28"	21'51"	22'14"	22'35"	22'55"
239	23'14"	23'33"	23'53"	24'14"	24'36"	25' 0"	25'25"	25'50"	26'14"	26'37"	26'58"	27'19"
240	27'38"	27'58"	28'18"	28'39"	29' 2"	29'27"	29'52"	30'17"	30'42"	31' 5"	31'48"	32'18"
241	32' 8"	32'28"	32'49"	33'11"	33'34"	33'59"	34'25"	34'50"	35'16"	35'39"	36' 2"	36'23"
242	36'44"	37' 4"	37'25"	37'47"	38'11"	38'37"	39' 3"	39'29"	39'54"	40'19"	40'42"	41' 3"
243	41'24"	41'45"	42' 6"	42'29"	42'53"	43'19"	43'46"	44'12"	44'38"	45' 3"	45'26"	45'48"
244	46' 9"	46'30"	46'52"	47'15"	47'40"	48' 6"	48'33"	48'60"	49'26"	49'51"	50'15"	50'37"
245	50'59"	51'20"	51'43"	52' 6"	52'31"	52'58"	53'25"	53'52"	54'19"	54'44"	55' 8"	55'31"
246	55'53"	56'14"	56'37"	57' 1"	57'26"	57'53"	58'21"	58'48"	59'15"	59'41"	1' 0' 5"	1' 0'28"
247	1' 0'50"	1' 1'12"	1' 1'35"	1' 1'59"	1' 2'25"	1' 2'52"	1' 3'20"	1' 3'48"	1' 4'15"	1' 4'41"	1' 5' 6"	1' 5'29"
248	1' 5'51"	1' 6'14"	1' 6'37"	1' 7' 1"	1' 7'27"	1' 7'55"	1' 8'23"	1' 8'51"	1' 9'18"	1' 9'45"	1'10' 9"	1'10'33"
249	1'10'56"	1'11'18"	1'11'42"	1'12' 7"	1'12'33"	1'13' 0"	1'13'29"	1'13'57"	1'14'25"	1'14'51"	1'15'16"	1'15'40"
250	1'16' 3"	1'16'26"	1'16'50"	1'17'15"	1'17'41"	1'18' 9"	1'18'37"	1'19' 6"	1'19'34"	1'20' 1"	1'20'26"	1'20'50"
251	1'21'13"	1'21'36"	1'21'60"	1'22'25"	1'22'52"	1'23'20"	1'23'48"	1'24'17"	1'24'45"	1'25'12"	1'25'38"	1'26' 2"
252	1'26'25"	1'26'48"	1'27'13"	1'27'38"	1'28' 5"	1'28'33"	1'29' 2"	1'29'31"	1'29'59"	1'30'26"	1'30'51"	1'31'16"
253	1'31'39"	1'32' 3"	1'32'27"	1'32'53"	1'33'20"	1'33'48"	1'34'17"	1'34'46"	1'35'14"	1'35'41"	1'36' 7"	1'36'32"
254	1'36'55"	1'37'19"	1'37'43"	1'38' 9"	1'38'36"	1'39' 4"	1'39'33"	1'40' 3"	1'40'31"	1'40'58"	1'41'24"	1'41'49"
255	1'42'13"	1'42'36"	1'43' 1"	1'43'26"	1'43'54"	1'44'22"	1'44'51"	1'45'21"	1'45'49"	1'46'17"	1'46'43"	1'47' 7"
256	1'47'31"	1'47'55"	1'48'19"	1'48'45"	1'49'12"	1'49'41"	1'50'10"	1'50'40"	1'51' 8"	1'51'36"	1'52' 2"	1'52'26"
257	1'52'50"	1'53'14"	1'53'39"	1'54' 5"	1'54'32"	1'55' 1"	1'55'30"	1'55'59"	1'56'28"	1'56'56"	1'57'22"	1'57'46"
258	1'58'10"	1'58'34"	1'58'59"	1'59'25"	1'59'52"	2' 0'21"	2' 0'50"	2' 1'20"	2' 1'48"	2' 2'16"	2' 2'42"	2' 3' 6"
259	2' 3'30"	2' 3'54"	2' 4'19"	2' 4'45"	2' 5'12"	2' 5'41"	2' 6'10"	2' 6'40"	2' 7' 9"	2' 7'36"	2' 8' 2"	2' 8'27"
260	2' 8'51"	2' 9'15"	2' 9'39"	2'10' 5"	2'10'33"	2'11' 1"	2'11'31"	2'12' 0"	2'12'29"	2'12'56"	2'13'22"	2'13'47"
261	2'14'11"	2'14'35"	2'14'60"	2'15'25"	2'15'53"	2'16'22"	2'16'51"	2'17'20"	2'17'49"	2'18'16"	2'18'42"	2'19' 7"
262	2'19'31"	2'19'55"	2'20'19"	2'20'45"	2'21'13"	2'21'41"	2'22'10"	2'22'40"	2'23' 8"	2'23'36"	2'24' 2"	2'24'26"
263	2'24'50"	2'25'14"	2'25'39"	2'26' 4"	2'26'32"	2'27' 0"	2'27'29"	2'27'59"	2'28'27"	2'28'54"	2'29'20"	2'29'45"
264	2'30' 9"	2'30'32"	2'30'57"	2'31'23"	2'31'50"	2'32'18"	2'32'47"	2'33'17"	2'33'45"	2'34'12"	2'34'38"	2'35' 2"
265	2'35'26"	2'35'50"	2'36'14"	2'36'40"	2'37' 7"	2'37'35"	2'38' 4"	2'38'33"	2'39' 1"	2'39'29"	2'39'54"	2'40'18"
266	2'40'42"	2'41' 5"	2'41'30"	2'41'55"	2'42'22"	2'42'50"	2'43'19"	2'43'48"	2'44'16"	2'44'43"	2'45' 9"	2'45'33"
267	2'45'56"	2'46'20"	2'46'44"	2'47' 9"	2'47'36"	2'48' 4"	2'48'33"	2'49' 2"	2'49'30"	2'49'56"	2'50'22"	2'50'45"
268	2'51' 9"	2'51'32"	2'51'56"	2'52'21"	2'52'48"	2'53'15"	2'53'44"	2'54'13"	2'54'40"	2'55' 7"	2'55'32"	2'55'56"
269	2'56'19"	2'56'42"	2'57' 5"	2'57'30"	2'57'57"	2'58'25"	2'58'53"	2'59'21"	2'59'49"	3' 0'15"	3' 0'40"	3' 1' 4"
270	3' 1'26"	3' 1'49"	3' 2'13"	3' 2'37"	3' 3' 3"	3' 3'31"	3' 3'59"	3' 4'27"	3' 4'54"	3' 5'20"	3' 5'45"	3' 6' 8"
271	3' 6'31"	3' 6'53"	3' 7'16"	3' 7'41"								

Solar E Differentials -- Epoch 2020 -- Leap Years (LY0)

Dn	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
276	3°30' 57"	3°31' 17"	3°31' 39"	3°32' 2"	3°32' 26"	3°32' 51"	3°33' 17"	3°33' 43"	3°34' 8"	3°34' 32"	3°34' 55"	3°35' 16"
277	3°35' 36"	3°35' 56"	3°36' 17"	3°36' 40"	3°37' 3"	3°37' 28"	3°37' 54"	3°38' 20"	3°38' 44"	3°39' 8"	3°39' 30"	3°39' 50"
278	3°40' 10"	3°40' 30"	3°40' 51"	3°41' 12"	3°41' 36"	3°42' 0"	3°42' 25"	3°42' 50"	3°43' 15"	3°43' 37"	3°43' 59"	3°44' 19"
279	3°44' 38"	3°44' 58"	3°45' 18"	3°45' 39"	3°46' 2"	3°46' 26"	3°46' 50"	3°47' 15"	3°47' 39"	3°48' 1"	3°48' 22"	3°48' 42"
280	3°49' 1"	3°49' 19"	3°49' 39"	3°49' 60"	3°50' 22"	3°50' 45"	3°51' 10"	3°51' 34"	3°51' 57"	3°52' 19"	3°52' 39"	3°52' 58"
281	3°53' 16"	3°53' 35"	3°53' 54"	3°54' 14"	3°54' 36"	3°54' 58"	3°55' 22"	3°55' 46"	3°56' 8"	3°56' 30"	3°56' 49"	3°57' 8"
282	3°57' 26"	3°57' 43"	3°58' 2"	3°58' 21"	3°58' 42"	3°59' 5"	3°59' 28"	3°59' 51"	4° 0' 13"	4° 0' 33"	4° 0' 53"	4° 1' 10"
283	4° 1' 28"	4° 1' 45"	4° 2' 3"	4° 2' 22"	4° 2' 42"	4° 3' 4"	4° 3' 26"	4° 3' 48"	4° 4' 10"	4° 4' 30"	4° 4' 49"	4° 5' 6"
284	4° 5' 22"	4° 5' 39"	4° 5' 56"	4° 6' 14"	4° 6' 34"	4° 6' 55"	4° 7' 17"	4° 7' 39"	4° 7' 60"	4° 8' 19"	4° 8' 37"	4° 8' 54"
285	4° 9' 10"	4° 9' 25"	4° 9' 42"	4° 9' 60"	4° 10' 19"	4° 10' 39"	4° 11' 0"	4° 11' 21"	4° 11' 42"	4° 12' 0"	4° 12' 18"	4° 12' 34"
286	4° 12' 49"	4° 13' 4"	4° 13' 20"	4° 13' 37"	4° 13' 55"	4° 14' 15"	4° 14' 36"	4° 14' 56"	4° 15' 16"	4° 15' 34"	4° 15' 50"	4° 16' 5"
287	4° 16' 20"	4° 16' 34"	4° 16' 50"	4° 17' 6"	4° 17' 24"	4° 17' 43"	4° 18' 3"	4° 18' 22"	4° 18' 41"	4° 18' 59"	4° 19' 14"	4° 19' 29"
288	4° 19' 43"	4° 19' 56"	4° 20' 11"	4° 20' 27"	4° 20' 44"	4° 21' 2"	4° 21' 21"	4° 21' 40"	4° 21' 58"	4° 22' 15"	4° 22' 30"	4° 22' 44"
289	4° 22' 57"	4° 23' 10"	4° 23' 24"	4° 23' 39"	4° 23' 55"	4° 24' 13"	4° 24' 31"	4° 24' 49"	4° 25' 7"	4° 25' 23"	4° 25' 37"	4° 25' 50"
290	4° 26' 2"	4° 26' 15"	4° 26' 28"	4° 26' 42"	4° 26' 58"	4° 27' 14"	4° 27' 32"	4° 27' 49"	4° 28' 6"	4° 28' 21"	4° 28' 35"	4° 28' 47"
291	4° 28' 59"	4° 29' 10"	4° 29' 23"	4° 29' 36"	4° 29' 51"	4° 30' 7"	4° 30' 24"	4° 30' 41"	4° 30' 57"	4° 31' 11"	4° 31' 24"	4° 31' 35"
292	4° 31' 46"	4° 31' 57"	4° 32' 8"	4° 32' 21"	4° 32' 35"	4° 32' 51"	4° 33' 7"	4° 33' 23"	4° 33' 38"	4° 33' 51"	4° 34' 4"	4° 34' 14"
293	4° 34' 24"	4° 34' 34"	4° 34' 45"	4° 34' 57"	4° 35' 10"	4° 35' 25"	4° 35' 40"	4° 35' 55"	4° 36' 10"	4° 36' 22"	4° 36' 34"	4° 36' 44"
294	4° 36' 53"	4° 37' 2"	4° 37' 12"	4° 37' 23"	4° 37' 36"	4° 37' 49"	4° 38' 4"	4° 38' 18"	4° 38' 32"	4° 38' 44"	4° 38' 54"	4° 39' 3"
295	4° 39' 12"	4° 39' 20"	4° 39' 29"	4° 39' 39"	4° 39' 51"	4° 40' 4"	4° 40' 18"	4° 40' 31"	4° 40' 44"	4° 40' 55"	4° 41' 5"	4° 41' 13"
296	4° 41' 21"	4° 41' 28"	4° 41' 36"	4° 41' 46"	4° 41' 57"	4° 42' 9"	4° 42' 22"	4° 42' 35"	4° 42' 46"	4° 42' 57"	4° 43' 6"	4° 43' 13"
297	4° 43' 20"	4° 43' 26"	4° 43' 34"	4° 43' 42"	4° 43' 52"	4° 44' 4"	4° 44' 16"	4° 44' 27"	4° 44' 38"	4° 44' 48"	4° 44' 56"	4° 45' 2"
298	4° 45' 8"	4° 45' 14"	4° 45' 20"	4° 45' 28"	4° 45' 37"	4° 45' 48"	4° 45' 59"	4° 46' 10"	4° 46' 20"	4° 46' 29"	4° 46' 36"	4° 46' 41"
299	4° 46' 46"	4° 46' 51"	4° 46' 57"	4° 47' 4"	4° 47' 12"	4° 47' 21"	4° 47' 32"	4° 47' 42"	4° 47' 51"	4° 47' 58"	4° 48' 5"	4° 48' 9"
300	4° 48' 13"	4° 48' 17"	4° 48' 22"	4° 48' 28"	4° 48' 35"	4° 48' 44"	4° 48' 53"	4° 49' 2"	4° 49' 11"	4° 49' 17"	4° 49' 23"	4° 49' 27"
301	4° 49' 30"	4° 49' 33"	4° 49' 36"	4° 49' 41"	4° 49' 48"	4° 49' 56"	4° 50' 4"	4° 50' 12"	4° 50' 19"	4° 50' 25"	4° 50' 30"	4° 50' 33"
302	4° 50' 35"	4° 50' 37"	4° 50' 40"	4° 50' 44"	4° 50' 49"	4° 50' 56"	4° 51' 3"	4° 51' 10"	4° 51' 17"	4° 51' 22"	4° 51' 25"	4° 51' 27"
303	4° 51' 28"	4° 51' 29"	4° 51' 31"	4° 51' 34"	4° 51' 39"	4° 51' 45"	4° 51' 51"	4° 51' 57"	4° 52' 3"	4° 52' 7"	4° 52' 9"	4° 52' 10"
304	4° 52' 10"	4° 52' 10"	4° 52' 11"	4° 52' 13"	4° 52' 17"	4° 52' 22"	4° 52' 27"	4° 52' 32"	4° 52' 37"	4° 52' 40"	4° 52' 41"	4° 52' 41"
305	4° 52' 40"	4° 52' 39"	4° 52' 39"	4° 52' 40"	4° 52' 43"	4° 52' 47"	4° 52' 51"	4° 52' 55"	4° 52' 59"	4° 53' 1"	4° 53' 1"	4° 53' 0"
306	4° 52' 58"	4° 52' 56"	4° 52' 55"	4° 52' 55"	4° 52' 57"	4° 52' 60"	4° 53' 3"	4° 53' 6"	4° 53' 9"	4° 53' 10"	4° 53' 9"	4° 53' 7"
307	4° 53' 4"	4° 53' 1"	4° 52' 59"	4° 52' 58"	4° 52' 59"	4° 53' 0"	4° 53' 3"	4° 53' 5"	4° 53' 6"	4° 53' 6"	4° 53' 5"	4° 53' 1"
308	4° 52' 58"	4° 52' 54"	4° 52' 50"	4° 52' 48"	4° 52' 48"	4° 52' 49"	4° 52' 50"	4° 52' 51"	4° 52' 52"	4° 52' 50"	4° 52' 48"	4° 52' 44"
309	4° 52' 39"	4° 52' 34"	4° 52' 29"	4° 52' 26"	4° 52' 25"	4° 52' 24"	4° 52' 25"	4° 52' 25"	4° 52' 24"	4° 52' 22"	4° 52' 18"	4° 52' 13"
310	4° 52' 7"	4° 52' 1"	4° 51' 55"	4° 51' 51"	4° 51' 49"	4° 51' 47"	4° 51' 47"	4° 51' 46"	4° 51' 44"	4° 51' 41"	4° 51' 36"	4° 51' 30"
311	4° 51' 22"	4° 51' 15"	4° 51' 9"	4° 51' 4"	4° 51' 0"	4° 50' 58"	4° 50' 56"	4° 50' 54"	4° 50' 51"	4° 50' 47"	4° 50' 41"	4° 50' 33"
312	4° 50' 25"	4° 50' 17"	4° 50' 9"	4° 50' 3"	4° 49' 59"	4° 49' 55"	4° 49' 52"	4° 49' 49"	4° 49' 45"	4° 49' 40"	4° 49' 33"	4° 49' 24"
313	4° 49' 15"	4° 49' 6"	4° 48' 57"	4° 48' 50"	4° 48' 44"	4° 48' 39"	4° 48' 35"	4° 48' 31"	4° 48' 26"	4° 48' 20"	4° 48' 12"	4° 48' 2"
314	4° 47' 52"	4° 47' 41"	4° 47' 32"	4° 47' 23"	4° 47' 16"	4° 47' 11"	4° 47' 6"	4° 47' 0"	4° 46' 54"	4° 46' 47"	4° 46' 38"	4° 46' 27"
315	4° 46' 15"	4° 46' 4"	4° 45' 53"	4° 45' 44"	4° 45' 36"	4° 45' 29"	4° 45' 23"	4° 45' 17"	4° 45' 9"	4° 45' 1"	4° 44' 50"	4° 44' 39"
316	4° 44' 26"	4° 44' 14"	4° 44' 2"	4° 43' 51"	4° 43' 42"	4° 43' 34"	4° 43' 27"	4° 43' 20"	4° 43' 11"	4° 43' 2"	4° 42' 50"	4° 42' 38"
317	4° 42' 24"	4° 42' 10"	4° 41' 57"	4° 41' 46"	4° 41' 36"	4° 41' 27"	4° 41' 18"	4° 41' 10"	4° 41' 1"	4° 40' 50"	4° 40' 37"	4° 40' 23"
318	4° 40' 9"	4° 39' 54"	4° 39' 40"	4° 39' 27"	4° 39' 16"	4° 39' 6"	4° 38' 57"	4° 38' 47"	4° 38' 37"	4° 38' 25"	4° 38' 11"	4° 37' 56"
319	4° 37' 41"	4° 37' 25"	4° 37' 10"	4° 36' 56"	4° 36' 44"	4° 36' 33"	4° 36' 22"	4° 36' 12"	4° 36' 0"	4° 35' 47"	4° 35' 33"	4° 35' 17"
320	4° 35' 0"	4° 34' 43"	4° 34' 27"	4° 34' 12"	4° 33' 59"	4° 33' 47"	4° 33' 35"	4° 33' 24"	4° 33' 11"	4° 32' 57"	4° 32' 42"	4° 32' 25"
321	4° 32' 7"	4° 31' 49"	4° 31' 32"	4° 31' 16"	4° 31' 1"	4° 30' 48"	4° 30' 36"	4° 30' 23"	4° 30' 10"	4° 29' 55"	4° 29' 38"	4° 29' 20"
322	4° 29' 1"	4° 28' 42"	4° 28' 24"	4° 28' 7"	4° 27' 52"	4° 27' 38"	4° 27' 24"	4° 27' 11"	4° 26' 56"	4° 26' 40"	4° 26' 22"	4° 26' 3"
323	4° 25' 43"	4° 25' 23"	4° 25' 4"	4° 24' 46"	4° 24' 30"	4° 24' 15"	4° 24' 0"	4° 23' 46"	4° 23' 30"	4° 23' 13"	4° 22' 55"	4° 22' 34"
324	4° 22' 14"	4° 21' 53"	4° 21' 32"	4° 21' 13"	4° 20' 56"	4° 20' 40"	4° 20' 24"	4° 20' 9"	4° 19' 52"	4° 19' 34"	4° 19' 15"	4° 18' 54"
325	4° 18' 32"	4° 18' 10"	4° 17' 49"	4° 17' 29"	4° 17' 10"	4° 16' 53"	4° 16' 37"	4° 16' 20"	4° 16' 3"	4° 15' 44"	4° 15' 23"	4° 15' 1"
326	4° 14' 38"	4° 14' 15"	4° 13' 53"	4° 13' 32"	4° 13' 13"	4° 12' 55"	4° 12' 37"	4° 12' 20"	4° 12' 2"	4° 11' 42"	4° 11' 20"	4° 10' 57"
327	4° 10' 33"	4° 10' 9"	4° 9' 46"	4° 9' 24"	4° 9' 4"	4° 8' 45"	4° 8' 27"	4° 8' 8"	4° 7' 49"	4° 7' 28"	4° 7' 6"	4° 6' 42"
328	4° 6' 17"	4° 5' 52"	4° 5' 28"	4° 5' 5"	4° 4' 44"	4° 4' 24"	4° 4' 5"	4° 3' 45"	4° 3' 25"	4° 3' 3"	4° 2' 40"	4° 2' 15"
329	4° 1' 49"	4° 1' 23"	4° 0' 58"	4° 0' 35"	4° 0' 12"	3° 59' 52"	3° 59' 31"	3° 59' 11"	3° 58' 50"	3° 58' 27"	3° 58' 3"	3° 57' 37"
330	3° 57' 10"	3° 56' 44"	3° 56' 18"	3° 55' 53"	3° 55' 30"	3° 55' 8"	3° 54' 47"	3° 54' 26"	3° 54' 4"	3° 53' 40"	3° 53' 15"	3° 52' 48"
331	3° 52' 21"	3° 51' 53"	3° 51' 26"	3° 51' 1"	3° 50' 37"	3° 50' 14"	3° 49' 52"	3° 49' 30"	3° 49' 7"	3° 48' 43"	3° 48' 17"	3° 47' 49"
332	3° 47' 21"	3° 46' 52"	3° 46' 24"	3° 45' 58"	3° 45' 33"	3° 45' 10"	3° 44' 47"	3° 44' 24"	3° 43' 60"	3° 43' 35"	3° 43' 8"	3° 42' 39"
333	3° 42' 10"	3° 41' 41"	3° 41' 12"	3° 40' 45"	3° 40' 19"	3° 39' 55"	3° 39' 31"	3° 39' 7"	3° 38' 43"	3° 38' 16"	3° 37' 49"	3° 37' 19"
334	3° 36' 49"	3° 36' 19"	3° 35' 50"	3° 35' 22"	3° 34' 55"	3° 34' 30"	3° 34' 5"	3° 33' 41"	3° 33' 15"	3° 32' 48"	3° 32' 20"	3° 31' 49"
335	3° 31' 18"	3° 30' 48"	3° 30' 17"	3° 29' 48"	3° 29' 21"	3° 28' 55"	3° 28' 30"	3° 28' 4"	3° 27' 38"	3° 27' 10"	3° 26' 41"	3° 26' 10"
336	3° 25' 38"	3° 25' 6"	3° 24' 35"	3° 24' 6"	3° 23' 37"	3° 23' 11"	3° 22' 45"	3° 22' 18"	3° 21' 51"	3° 21' 23"	3° 20' 53"	3° 20' 21"
337	3° 19' 48"	3° 19' 16"	3° 18' 44"	3° 18' 14"	3° 17' 45"	3° 17' 17"	3° 16' 50"	3° 16' 23"	3° 15' 55"	3° 15' 26"	3° 14' 55"	3° 14' 23"
338	3° 13' 50"	3° 13' 16"	3° 12' 44"	3° 12' 13"	3° 11' 43"	3° 11' 15"	3° 10' 47"	3° 10' 19"	3° 9' 51"	3° 9' 21"	3° 8' 49"	3° 8' 16"
339	3° 7' 42"	3° 7' 8"	3° 6' 35"	3° 6' 3"	3° 5' 32"	3° 5' 3"	3° 4' 35"	3° 4' 7"	3° 3' 38"	3° 3' 7"	3° 2' 34"	3° 2' 1"
340	3° 1' 26"	3° 0' 51"	3° 0' 17"	2° 59' 45"	2° 59' 14"	2° 58' 44"	2° 58' 15"	2° 57' 46"	2° 57' 16"	2° 56' 45"	2° 56' 12"	2° 55' 37"
341	2° 55' 2"	2° 54' 26"	2° 53' 52"	2° 53' 19"	2° 52' 47"	2° 52' 16"	2° 51' 47"	2° 51' 17"	2° 50' 47"	2° 50' 15"	2° 49' 41"	2° 49' 6"
342	2° 48' 30"	2° 47' 54"	2° 47' 19"	2° 46' 45"	2° 46' 12"	2° 45' 41"	2° 45' 11"	2° 44' 41"	2° 44' 10"	2° 43' 37"	2° 43' 3"	2° 42' 27"
343	2° 41' 51"	2° 41' 14"	2° 40' 38"	2° 40' 4"	2° 39' 31"	2° 38' 59"	2° 38' 28"	2° 37' 58"	2° 37' 26"	2° 36' 53"	2° 36' 18"	2° 35' 42"
344	2° 35' 5"	2° 34' 27"	2° 33' 51"	2° 33' 16"	2° 32' 42"	2° 32' 10"	2° 31'					

Solar Declination Differentials -- Epoch 2020 -- Leap Years +1 (LY1)

Dn	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
0	0°	25'	49"	1' 13"	1' 37"	2' 2"	2' 27"	2' 54"	3' 20"	3' 48"	4' 15"	4' 43"
1	5' 10"	5' 37"	6' 4"	6' 30"	6' 57"	7' 24"	7' 51"	8' 20"	8' 49"	9' 19"	9' 48"	10' 18"
2	10' 48"	11' 17"	11' 46"	12' 14"	12' 43"	13' 12"	13' 42"	14' 13"	14' 45"	15' 17"	15' 49"	16' 21"
3	16' 53"	17' 24"	17' 55"	18' 26"	18' 57"	19' 29"	20' 1"	20' 34"	21' 7"	21' 42"	22' 16"	22' 50"
4	23' 24"	23' 58"	24' 31"	25' 4"	25' 38"	26' 12"	26' 46"	27' 21"	27' 57"	28' 33"	29' 10"	29' 47"
5	30' 23"	30' 59"	31' 34"	32' 10"	32' 45"	33' 21"	33' 58"	34' 35"	35' 14"	35' 52"	36' 31"	37' 10"
6	37' 48"	38' 26"	39' 4"	39' 42"	40' 19"	40' 58"	41' 37"	42' 16"	42' 57"	43' 37"	44' 18"	44' 59"
7	45' 40"	46' 20"	47' 0"	47' 40"	48' 20"	49' 0"	49' 42"	50' 23"	51' 6"	51' 49"	52' 32"	53' 15"
8	53' 58"	54' 40"	55' 23"	56' 5"	56' 47"	57' 29"	58' 13"	58' 57"	59' 41"	1° 0' 26"	1° 1' 12"	1° 1' 57"
9	1° 2' 42"	1° 3' 27"	1° 4' 11"	1° 4' 55"	1° 5' 39"	1° 6' 24"	1° 7' 10"	1° 7' 56"	1° 8' 42"	1° 9' 30"	1° 10' 17"	1° 11' 5"
10	1° 11' 52"	1° 12' 39"	1° 13' 25"	1° 14' 11"	1° 14' 58"	1° 15' 45"	1° 16' 32"	1° 17' 20"	1° 18' 9"	1° 18' 59"	1° 19' 48"	1° 20' 38"
11	1° 21' 27"	1° 22' 16"	1° 23' 4"	1° 23' 53"	1° 24' 41"	1° 25' 30"	1° 26' 20"	1° 27' 10"	1° 28' 1"	1° 28' 53"	1° 29' 44"	1° 30' 36"
12	1° 31' 27"	1° 32' 18"	1° 33' 9"	1° 33' 59"	1° 34' 50"	1° 35' 41"	1° 36' 33"	1° 37' 25"	1° 38' 18"	1° 39' 12"	1° 40' 6"	1° 40' 59"
13	1° 41' 53"	1° 42' 46"	1° 43' 38"	1° 44' 31"	1° 45' 24"	1° 46' 17"	1° 47' 10"	1° 48' 5"	1° 49' 0"	1° 49' 56"	1° 50' 51"	1° 51' 47"
14	1° 52' 43"	1° 53' 38"	1° 54' 32"	1° 55' 27"	1° 56' 22"	1° 57' 17"	1° 58' 13"	1° 59' 9"	2° 0' 6"	2° 1' 4"	2° 2' 2"	2° 2' 59"
15	2° 3' 57"	2° 4' 54"	2° 5' 51"	2° 6' 47"	2° 7' 44"	2° 8' 41"	2° 9' 39"	2° 10' 37"	2° 11' 36"	2° 12' 36"	2° 13' 36"	2° 14' 35"
16	2° 15' 35"	2° 16' 34"	2° 17' 33"	2° 18' 31"	2° 19' 30"	2° 20' 29"	2° 21' 29"	2° 22' 29"	2° 23' 30"	2° 24' 32"	2° 25' 34"	2° 26' 35"
17	2° 27' 37"	2° 28' 38"	2° 29' 38"	2° 30' 39"	2° 31' 40"	2° 32' 41"	2° 33' 42"	2° 34' 45"	2° 35' 48"	2° 36' 51"	2° 37' 55"	2° 38' 58"
18	2° 40' 2"	2° 41' 5"	2° 42' 7"	2° 43' 10"	2° 44' 13"	2° 45' 16"	2° 46' 19"	2° 47' 23"	2° 48' 28"	2° 49' 34"	2° 50' 39"	2° 51' 45"
19	2° 52' 50"	2° 53' 55"	2° 54' 59"	2° 56' 4"	2° 57' 8"	2° 58' 13"	2° 59' 19"	3° 0' 25"	3° 1' 32"	3° 2' 39"	3° 3' 46"	3° 4' 54"
20	3° 6' 1"	3° 7' 7"	3° 8' 14"	3° 9' 20"	3° 10' 27"	3° 11' 33"	3° 12' 41"	3° 13' 49"	3° 14' 57"	3° 16' 6"	3° 17' 16"	3° 18' 25"
21	3° 19' 34"	3° 20' 42"	3° 21' 50"	3° 22' 59"	3° 24' 7"	3° 25' 15"	3° 26' 25"	3° 27' 34"	3° 28' 45"	3° 29' 56"	3° 31' 7"	3° 32' 18"
22	3° 33' 29"	3° 34' 39"	3° 35' 49"	3° 36' 59"	3° 38' 9"	3° 39' 19"	3° 40' 30"	3° 41' 42"	3° 42' 54"	3° 44' 7"	3° 45' 20"	3° 46' 32"
23	3° 47' 45"	3° 48' 57"	3° 50' 9"	3° 51' 21"	3° 52' 32"	3° 53' 45"	3° 54' 57"	3° 56' 11"	3° 57' 25"	3° 58' 39"	3° 59' 54"	4° 1' 8"
24	4° 2' 22"	4° 3' 36"	4° 4' 50"	4° 6' 3"	4° 7' 17"	4° 8' 31"	4° 9' 45"	4° 11' 0"	4° 12' 16"	4° 13' 32"	4° 14' 49"	4° 16' 5"
25	4° 17' 21"	4° 18' 36"	4° 19' 52"	4° 21' 7"	4° 22' 22"	4° 23' 38"	4° 24' 54"	4° 26' 11"	4° 27' 28"	4° 28' 46"	4° 30' 4"	4° 31' 22"
26	4° 32' 39"	4° 33' 57"	4° 35' 14"	4° 36' 31"	4° 37' 48"	4° 39' 5"	4° 40' 23"	4° 41' 41"	4° 43' 0"	4° 44' 20"	4° 45' 39"	4° 46' 59"
27	4° 48' 18"	4° 49' 37"	4° 50' 56"	4° 52' 14"	4° 53' 33"	4° 54' 52"	4° 56' 11"	4° 57' 31"	4° 58' 52"	5° 0' 13"	5° 1' 34"	5° 2' 55"
28	5° 4' 16"	5° 5' 37"	5° 6' 57"	5° 8' 17"	5° 9' 37"	5° 10' 58"	5° 12' 19"	5° 13' 41"	5° 15' 3"	5° 16' 26"	5° 17' 48"	5° 19' 11"
29	5° 20' 34"	5° 21' 56"	5° 23' 18"	5° 24' 39"	5° 26' 1"	5° 27' 23"	5° 28' 46"	5° 30' 9"	5° 31' 33"	5° 32' 57"	5° 34' 21"	5° 35' 46"
30	5° 37' 10"	5° 38' 33"	5° 39' 57"	5° 41' 20"	5° 42' 44"	5° 44' 7"	5° 45' 32"	5° 46' 56"	5° 48' 22"	5° 49' 47"	5° 51' 13"	5° 52' 39"
31	5° 54' 4"	5° 55' 30"	5° 56' 55"	5° 58' 19"	5° 59' 44"	6° 1' 10"	6° 2' 35"	6° 4' 2"	6° 5' 28"	6° 6' 56"	6° 8' 23"	6° 9' 50"
32	6° 11' 17"	6° 12' 44"	6° 14' 10"	6° 15' 37"	6° 17' 3"	6° 18' 30"	6° 19' 57"	6° 21' 25"	6° 22' 53"	6° 24' 22"	6° 25' 50"	6° 27' 19"
33	6° 28' 48"	6° 30' 16"	6° 31' 44"	6° 33' 12"	6° 34' 39"	6° 36' 8"	6° 37' 36"	6° 39' 5"	6° 40' 35"	6° 42' 5"	6° 43' 35"	6° 45' 6"
34	6° 46' 35"	6° 48' 5"	6° 49' 34"	6° 51' 4"	6° 52' 33"	6° 54' 3"	6° 55' 33"	6° 57' 3"	6° 58' 34"	7° 0' 6"	7° 1' 37"	7° 3' 9"
35	7° 4' 40"	7° 6' 11"	7° 7' 42"	7° 9' 13"	7° 10' 43"	7° 12' 14"	7° 13' 46"	7° 15' 18"	7° 16' 50"	7° 18' 23"	7° 19' 56"	7° 21' 29"
36	7° 23' 1"	7° 24' 34"	7° 26' 6"	7° 27' 38"	7° 29' 10"	7° 30' 42"	7° 32' 15"	7° 33' 48"	7° 35' 22"	7° 36' 56"	7° 38' 31"	7° 40' 5"
37	7° 41' 39"	7° 43' 13"	7° 44' 46"	7° 46' 19"	7° 47' 53"	7° 49' 26"	7° 51' 1"	7° 52' 35"	7° 54' 10"	7° 55' 46"	7° 57' 21"	7° 58' 57"
38	8° 0' 32"	8° 2' 7"	8° 3' 42"	8° 5' 16"	8° 6' 51"	8° 8' 26"	8° 10' 1"	8° 11' 37"	8° 13' 13"	8° 14' 50"	8° 16' 27"	8° 18' 4"
39	8° 19' 40"	8° 21' 16"	8° 22' 52"	8° 24' 28"	8° 26' 4"	8° 27' 40"	8° 29' 17"	8° 30' 54"	8° 32' 32"	8° 34' 10"	8° 35' 48"	8° 37' 26"
40	8° 39' 3"	8° 40' 41"	8° 42' 18"	8° 43' 55"	8° 45' 32"	8° 47' 10"	8° 48' 48"	8° 50' 26"	8° 52' 5"	8° 53' 44"	8° 55' 23"	8° 57' 2"
41	8° 58' 41"	9° 0' 19"	9° 1' 58"	9° 3' 36"	9° 5' 14"	9° 6' 53"	9° 8' 32"	9° 10' 12"	9° 11' 51"	9° 13' 32"	9° 15' 12"	9° 16' 52"
42	9° 18' 32"	9° 20' 12"	9° 21' 52"	9° 23' 31"	9° 25' 11"	9° 26' 50"	9° 28' 30"	9° 30' 11"	9° 31' 52"	9° 33' 33"	9° 35' 15"	9° 36' 56"
43	9° 38' 37"	9° 40' 18"	9° 41' 59"	9° 43' 39"	9° 45' 20"	9° 47' 1"	9° 48' 42"	9° 50' 24"	9° 52' 6"	9° 53' 48"	9° 55' 31"	9° 57' 13"
44	9° 58' 55"	10° 0' 37"	10° 2' 19"	10° 4' 1"	10° 5' 42"	10° 7' 24"	10° 9' 7"	10° 10' 49"	10° 12' 32"	10° 14' 16"	10° 15' 59"	10° 17' 43"
45	10° 19' 26"	10° 21' 9"	10° 22' 52"	10° 24' 35"	10° 26' 17"	10° 28' 0"	10° 29' 44"	10° 31' 27"	10° 33' 12"	10° 34' 56"	10° 36' 40"	10° 38' 25"
46	10° 40' 9"	10° 41' 53"	10° 43' 37"	10° 45' 21"	10° 47' 4"	10° 48' 48"	10° 50' 33"	10° 52' 17"	10° 54' 3"	10° 55' 48"	10° 57' 33"	10° 59' 19"
47	11° 1' 4"	11° 2' 49"	11° 4' 34"	11° 6' 18"	11° 8' 3"	11° 9' 48"	11° 11' 33"	11° 13' 19"	11° 15' 5"	11° 16' 51"	11° 18' 38"	11° 20' 24"
48	11° 22' 10"	11° 23' 56"	11° 25' 42"	11° 27' 27"	11° 29' 13"	11° 30' 59"	11° 32' 45"	11° 34' 32"	11° 36' 19"	11° 38' 6"	11° 39' 53"	11° 41' 40"
49	11° 43' 27"	11° 45' 14"	11° 47' 1"	11° 48' 47"	11° 50' 34"	11° 52' 21"	11° 54' 8"	11° 55' 55"	11° 57' 43"	11° 59' 31"	12° 1' 19"	12° 3' 7"
50	12° 4' 55"	12° 6' 43"	12° 8' 30"	12° 10' 18"	12° 12' 5"	12° 13' 53"	12° 15' 41"	12° 17' 29"	12° 19' 18"	12° 21' 6"	12° 22' 55"	12° 24' 44"
51	12° 26' 33"	12° 28' 21"	12° 30' 10"	12° 31' 58"	12° 33' 46"	12° 35' 35"	12° 37' 23"	12° 39' 12"	12° 41' 2"	12° 42' 51"	12° 44' 41"	12° 46' 31"
52	12° 48' 20"	12° 50' 10"	12° 51' 59"	12° 53' 48"	12° 55' 37"	12° 57' 26"	12° 59' 16"	13° 1' 6"	13° 2' 56"	13° 4' 46"	13° 6' 36"	13° 8' 27"
53	13° 10' 17"	13° 12' 7"	13° 13' 57"	13° 15' 47"	13° 17' 37"	13° 19' 27"	13° 21' 17"	13° 23' 8"	13° 24' 58"	13° 26' 50"	13° 28' 41"	13° 30' 32"
54	13° 32' 23"	13° 34' 14"	13° 36' 4"	13° 37' 55"	13° 39' 45"	13° 41' 36"	13° 43' 27"	13° 45' 18"	13° 47' 10"	13° 49' 2"	13° 50' 53"	13° 52' 45"
55	13° 54' 37"	13° 56' 28"	13° 58' 20"	14° 0' 11"	14° 2' 2"	14° 3' 54"	14° 5' 45"	14° 7' 37"	14° 9' 29"	14° 11' 22"	14° 13' 14"	14° 15' 7"
56	14° 16' 59"	14° 18' 51"	14° 20' 43"	14° 22' 35"	14° 24' 27"	14° 26' 19"	14° 28' 11"	14° 30' 4"	14° 31' 57"	14° 33' 50"	14° 35' 43"	14° 37' 36"
57	14° 39' 29"	14° 41' 22"	14° 43' 14"	14° 45' 7"	14° 46' 59"	14° 48' 52"	14° 50' 45"	14° 52' 38"	14° 54' 32"	14° 56' 25"	14° 58' 19"	15° 0' 12"
58	15° 2' 6"	15° 3' 59"	15° 5' 52"	15° 7' 46"	15° 9' 39"	15° 11' 32"	15° 13' 26"	15° 15' 19"	15° 17' 13"	15° 19' 7"	15° 21' 2"	15° 22' 56"
59	15° 24' 50"	15° 26' 44"	15° 28' 38"	15° 30' 31"	15° 32' 25"	15° 34' 19"	15° 36' 13"	15° 38' 7"	15° 40' 2"	15° 41' 57"	15° 43' 51"	15° 45' 46"
60	15° 47' 41"	15° 49' 35"	15° 51' 29"	15° 53' 24"	15° 55' 18"	15° 57' 12"	15° 59' 7"	16° 1' 2"	16° 2' 57"	16° 4' 52"	16° 6' 47"	16° 8' 42"
61	16° 10' 37"	16° 12' 32"	16° 14' 27"	16° 16' 22"	16° 18' 17"	16° 20' 12"	16° 22' 7"	16° 24' 2"	16° 25' 58"	16° 27' 53"	16° 29' 49"	16° 31' 44"
62	16° 33' 40"	16° 35' 35"	16° 37' 31"	16° 39' 26"	16° 41' 21"	16° 43' 17"	16° 45' 12"	16° 47' 8"	16° 49' 4"	16° 51' 0"	16° 52' 56"	16° 54' 52"
63	16° 56' 48"	16° 58' 44"	17° 0' 40"	17° 2' 36"	17° 4' 31"	17° 6' 27"	17° 8' 23"	17° 10' 19"	17° 12' 16"	17° 14' 12"	17° 16' 9"	17° 18' 5"
64	17° 20' 2"	17° 21' 58"	17° 23' 54"	17° 25' 50"	17° 27' 46"	17° 29' 42"	17° 31' 39"	17° 33' 35"	17° 35' 32"	17° 37' 29"	17° 39' 26"	17° 41' 23"
65	17° 43' 20"	17° 45' 16"	17° 47' 13"	17° 49' 9"	17° 51' 6"	17° 53' 2"	17° 54' 59"	17° 56' 56"	17° 58' 53"	18° 0' 50"	18° 2' 48"	18° 4' 45"
66	18° 6' 42"	18° 8' 39"	18° 10' 36"	18° 12' 33"	18° 14' 30"	18° 16' 27"	18° 18' 24"	18° 20' 21"	18° 22' 18"	18° 24' 16"	18° 26' 13"	18° 28' 11"
67	18° 30' 8"	18° 32' 5"	18° 34' 3"	18° 35' 60"	18° 37' 57"	18° 39' 54"	18° 41' 52"	18° 43' 49"	18° 45' 47"	18° 47' 45"	18° 49' 43"	18° 51' 40"
68	18° 53' 38"	18° 55' 36"	18° 57' 33"	18° 59' 31"	19° 1' 28"	19° 3' 26"	19° 5' 23"	19° 7' 21"	19° 9' 19"	19° 11' 17"	19° 13' 15"	19° 15' 13"
69	19° 17'											

Solar Declination Differentials -- Epoch 2020 -- Leap Years +1 (LY1)

Dn	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
92	28°18'34"	28°20'28"	28°22'23"	28°24'19"	28°26'14"	28°28'8"	28°30'3"	28°31'58"	28°33'52"	28°35'46"	28°37'41"	28°39'35"
93	28°41'29"	28°43'24"	28°45'18"	28°47'13"	28°49'7"	28°51'1"	28°52'56"	28°54'50"	28°56'44"	28°58'38"	29°0'32"	29°2'25"
94	29°4'19"	29°6'13"	29°8'7"	29°10'1"	29°11'56"	29°13'49"	29°15'43"	29°17'37"	29°19'30"	29°21'23"	29°23'17"	29°25'10"
95	29°27'3"	29°28'57"	29°30'50"	29°32'44"	29°34'37"	29°36'31"	29°38'24"	29°40'17"	29°42'10"	29°44'2"	29°45'55"	29°47'48"
96	29°49'40"	29°51'33"	29°53'26"	29°55'19"	29°57'12"	29°59'5"	30°0'58"	30°2'50"	30°4'42"	30°6'35"	30°8'27"	30°10'19"
97	30°12'11"	30°14'3"	30°15'55"	30°17'48"	30°19'40"	30°21'33"	30°23'25"	30°25'16"	30°27'8"	30°28'60"	30°30'51"	30°32'42"
98	30°34'34"	30°36'26"	30°38'17"	30°40'9"	30°42'1"	30°43'53"	30°45'44"	30°47'35"	30°49'26"	30°51'17"	30°53'8"	30°54'58"
99	30°56'49"	30°58'40"	31°0'32"	31°2'23"	31°4'14"	31°6'5"	31°7'56"	31°9'46"	31°11'36"	31°13'27"	31°15'17"	31°17'7"
100	31°18'57"	31°20'47"	31°22'38"	31°24'28"	31°26'19"	31°28'9"	31°29'59"	31°31'49"	31°33'39"	31°35'28"	31°37'17"	31°39'7"
101	31°40'56"	31°42'46"	31°44'35"	31°46'25"	31°48'15"	31°50'5"	31°51'54"	31°53'43"	31°55'32"	31°57'21"	31°59'9"	32°0'58"
102	32°2'47"	32°4'36"	32°6'25"	32°8'14"	32°10'3"	32°11'52"	32°13'40"	32°15'29"	32°17'17"	32°19'4"	32°20'52"	32°22'40"
103	32°24'28"	32°26'16"	32°28'5"	32°29'53"	32°31'41"	32°33'29"	32°35'17"	32°37'5"	32°38'52"	32°40'39"	32°42'26"	32°44'13"
104	32°46'0"	32°47'48"	32°49'35"	32°51'23"	32°53'10"	32°54'57"	32°56'44"	32°58'31"	33°0'18"	33°0'18"	33°2'50"	33°5'36"
105	33°7'23"	33°9'9"	33°10'56"	33°12'42"	33°14'29"	33°16'16"	33°18'2"	33°19'48"	33°21'33"	33°23'19"	33°25'4"	33°26'49"
106	33°28'35"	33°30'20"	33°32'6"	33°33'52"	33°35'38"	33°37'24"	33°39'9"	33°40'54"	33°42'39"	33°44'23"	33°46'8"	33°47'52"
107	33°49'37"	33°51'21"	33°53'6"	33°54'51"	33°56'36"	33°58'21"	34°0'6"	34°1'50"	34°3'33"	34°5'17"	34°7'0"	34°8'44"
108	34°10'28"	34°12'11"	34°13'55"	34°15'40"	34°17'24"	34°19'8"	34°20'51"	34°22'34"	34°24'17"	34°25'60"	34°27'42"	34°29'25"
109	34°31'7"	34°32'50"	34°34'33"	34°36'17"	34°37'60"	34°39'43"	34°41'25"	34°43'7"	34°44'49"	34°46'31"	34°48'12"	34°49'54"
110	34°51'36"	34°53'18"	34°54'50"	34°56'42"	34°58'24"	35°0'6"	35°1'48"	35°3'29"	35°5'10"	35°6'50"	35°8'31"	35°10'11"
111	35°11'52"	35°13'33"	35°15'14"	35°16'56"	35°18'37"	35°20'18"	35°21'58"	35°23'38"	35°25'18"	35°26'58"	35°28'37"	35°30'17"
112	35°31'57"	35°33'36"	35°35'17"	35°36'57"	35°38'37"	35°40'17"	35°41'56"	35°43'36"	35°45'14"	35°46'53"	35°48'31"	35°50'10"
113	35°51'48"	35°53'27"	35°55'6"	35°56'45"	35°58'25"	36°0'3"	36°1'42"	36°3'20"	36°4'58"	36°6'35"	36°8'12"	36°9'50"
114	36°11'27"	36°13'5"	36°14'43"	36°16'21"	36°17'59"	36°19'37"	36°21'14"	36°22'51"	36°24'28"	36°26'4"	36°27'40"	36°29'17"
115	36°30'53"	36°32'30"	36°34'7"	36°35'44"	36°37'21"	36°38'57"	36°40'34"	36°42'10"	36°43'45"	36°45'20"	36°46'55"	36°48'30"
116	36°50'6"	36°51'41"	36°53'17"	36°54'53"	36°56'29"	36°58'4"	36°59'39"	37°1'14"	37°2'48"	37°4'22"	37°5'56"	37°7'30"
117	37°9'4"	37°10'39"	37°12'14"	37°13'48"	37°15'23"	37°16'57"	37°18'31"	37°20'5"	37°21'38"	37°23'11"	37°24'44"	37°26'16"
118	37°27'49"	37°29'23"	37°30'56"	37°32'30"	37°34'3"	37°35'36"	37°37'9"	37°38'41"	37°40'13"	37°41'45"	37°43'17"	37°44'48"
119	37°46'20"	37°47'52"	37°49'24"	37°50'57"	37°52'29"	37°54'1"	37°55'33"	37°57'4"	37°58'34"	38°0'5"	38°1'35"	38°3'5"
120	38°4'36"	38°6'7"	38°7'38"	38°9'9"	38°10'40"	38°12'11"	38°13'41"	38°15'11"	38°16'41"	38°18'10"	38°19'39"	38°21'8"
121	38°22'37"	38°24'7"	38°25'37"	38°27'7"	38°28'36"	38°30'6"	38°31'35"	38°33'4"	38°34'32"	38°35'60"	38°37'27"	38°38'55"
122	38°40'23"	38°41'52"	38°43'20"	38°44'49"	38°46'17"	38°47'46"	38°49'13"	38°50'41"	38°52'8"	38°53'34"	38°55'1"	38°56'27"
123	38°57'54"	38°59'21"	39°0'48"	39°2'15"	39°3'43"	39°5'10"	39°6'36"	39°8'2"	39°9'28"	39°10'53"	39°12'18"	39°13'43"
124	39°15'9"	39°16'34"	39°18'0"	39°19'26"	39°20'52"	39°22'18"	39°23'43"	39°25'8"	39°26'32"	39°27'56"	39°29'19"	39°30'43"
125	39°32'7"	39°33'32"	39°34'56"	39°36'21"	39°37'45"	39°39'10"	39°40'34"	39°41'57"	39°43'20"	39°44'42"	39°46'4"	39°47'27"
126	39°48'49"	39°50'12"	39°51'36"	39°52'59"	39°54'22"	39°55'45"	39°57'7"	39°58'29"	39°59'51"	40°0'12"	40°2'33"	40°3'54"
127	40°5'15"	40°6'36"	40°7'58"	40°9'20"	40°10'42"	40°12'4"	40°13'25"	40°14'45"	40°16'5"	40°17'25"	40°18'44"	40°20'4"
128	40°21'23"	40°22'43"	40°24'4"	40°25'24"	40°26'45"	40°28'5"	40°29'24"	40°30'43"	40°32'2"	40°33'20"	40°34'38"	40°35'56"
129	40°37'14"	40°38'33"	40°39'52"	40°41'11"	40°42'30"	40°43'49"	40°45'7"	40°46'24"	40°47'41"	40°48'58"	40°50'14"	40°51'31"
130	40°52'48"	40°54'5"	40°55'22"	40°56'40"	40°57'57"	40°59'14"	41°0'31"	41°1'47"	41°3'3"	41°4'18"	41°5'33"	41°6'48"
131	41°8'3"	41°9'19"	41°10'35"	41°11'51"	41°13'7"	41°14'22"	41°15'37"	41°16'52"	41°18'6"	41°19'19"	41°20'33"	41°21'46"
132	41°23'0"	41°24'14"	41°25'29"	41°26'43"	41°27'58"	41°29'12"	41°30'25"	41°31'38"	41°32'51"	41°34'3"	41°35'14"	41°36'26"
133	41°37'39"	41°38'51"	41°40'4"	41°41'17"	41°42'30"	41°43'42"	41°44'54"	41°46'6"	41°47'16"	41°48'27"	41°49'37"	41°50'48"
134	41°51'58"	41°53'9"	41°54'20"	41°55'32"	41°56'43"	41°57'54"	41°59'4"	42°0'14"	42°1'23"	42°2'32"	42°3'41"	42°4'50"
135	42°5'59"	42°7'8"	42°8'18"	42°9'27"	42°10'37"	42°11'46"	42°12'55"	42°14'3"	42°15'11"	42°16'18"	42°17'25"	42°18'32"
136	42°19'40"	42°20'47"	42°21'55"	42°23'3"	42°24'11"	42°25'19"	42°26'26"	42°27'33"	42°28'39"	42°29'44"	42°30'50"	42°31'55"
137	42°33'1"	42°34'7"	42°35'13"	42°36'20"	42°37'26"	42°38'32"	42°39'37"	42°40'42"	42°41'46"	42°42'50"	42°43'54"	42°44'58"
138	42°46'2"	42°47'6"	42°48'11"	42°49'16"	42°50'20"	42°51'25"	42°52'29"	42°53'32"	42°54'34"	42°55'36"	42°56'38"	42°57'40"
139	42°58'43"	42°59'45"	43°0'48"	43°1'51"	43°2'54"	43°3'57"	43°4'59"	43°6'1"	43°7'1"	43°8'2"	43°9'2"	43°10'2"
140	43°11'3"	43°12'4"	43°13'5"	43°14'7"	43°15'8"	43°16'9"	43°17'9"	43°18'9"	43°19'8"	43°20'6"	43°21'5"	43°22'3"
141	43°23'2"	43°24'2"	43°25'1"	43°26'1"	43°27'0"	43°27'59"	43°28'58"	43°29'56"	43°30'53"	43°31'50"	43°32'47"	43°33'44"
142	43°34'41"	43°35'38"	43°36'36"	43°37'34"	43°38'32"	43°39'29"	43°40'26"	43°41'22"	43°42'17"	43°43'13"	43°44'7"	43°45'2"
143	43°45'58"	43°46'54"	43°47'50"	43°48'46"	43°49'42"	43°50'37"	43°51'32"	43°52'27"	43°53'20"	43°54'14"	43°55'7"	43°55'60"
144	43°56'53"	43°57'47"	43°58'42"	43°59'36"	44°0'30"	44°1'24"	44°2'17"	44°3'10"	44°4'1"	44°4'53"	44°5'44"	44°6'36"
145	44°7'27"	44°8'19"	44°9'12"	44°10'4"	44°10'57"	44°11'49"	44°12'40"	44°13'31"	44°14'21"	44°15'10"	44°15'60"	44°16'50"
146	44°17'39"	44°18'30"	44°19'20"	44°20'11"	44°21'1"	44°21'52"	44°22'41"	44°23'30"	44°24'18"	44°25'6"	44°25'54"	44°26'41"
147	44°27'29"	44°28'18"	44°29'7"	44°29'55"	44°30'44"	44°31'32"	44°32'20"	44°33'7"	44°33'53"	44°34'39"	44°35'25"	44°36'11"
148	44°36'57"	44°37'44"	44°38'31"	44°39'18"	44°40'4"	44°40'51"	44°41'37"	44°42'22"	44°43'6"	44°43'50"	44°44'34"	44°45'18"
149	44°46'3"	44°46'47"	44°47'32"	44°48'17"	44°49'2"	44°49'47"	44°50'31"	44°51'14"	44°51'57"	44°52'39"	44°53'21"	44°54'3"
150	44°54'45"	44°55'28"	44°56'11"	44°56'54"	44°57'38"	44°58'20"	44°59'2"	44°59'44"	45°0'24"	45°1'5"	45°1'45"	45°2'25"
151	45°3'5"	45°3'46"	45°4'27"	45°5'9"	45°5'50"	45°6'31"	45°7'11"	45°7'50"	45°8'29"	45°9'7"	45°9'45"	45°10'24"
152	45°11'2"	45°11'41"	45°12'20"	45°12'60"	45°13'39"	45°14'18"	45°14'56"	45°15'34"	45°16'11"	45°16'47"	45°17'23"	45°17'59"
153	45°18'36"	45°19'13"	45°19'50"	45°20'28"	45°21'5"	45°21'42"	45°22'18"	45°22'54"	45°23'29"	45°24'3"	45°24'37"	45°25'12"
154	45°25'46"	45°26'22"	45°26'57"	45°27'32"	45°28'8"	45°28'43"	45°29'17"	45°29'51"	45°30'24"	45°30'56"	45°31'28"	45°32'1"
155	45°32'33"	45°33'6"	45°33'40"	45°34'13"	45°34'47"	45°35'20"	45°35'52"	45°36'24"	45°36'55"	45°37'25"	45°37'55"	45°38'26"
156	45°38'57"	45°39'28"	45°39'59"	45°40'31"	45°41'2"	45°41'33"	45°42'3"	45°42'33"	45°43'2"	45°43'31"	45°43'59"	45°44'27"
157	45°44'56"	45°45'25"	45°45'55"	45°46'24"	45°46'54"	45°47'23"	45°47'51"	45°48'19"	45°48'46"	45°49'12"	45°49'38"	45°50'5"
158	45°50'31"	45°50'59"	45°51'26"	45°51'54"	45°52'21"	45°52'48"	45°53'14"	45°53'40"	45°54'5"	45°54'29"	45°54'54"	45°55'18"
159	45°55'43"	45°56'8"	45°56'33"	45°56'59"	45°57'24"	45°57'49"	45°58'14"	45°58'37"	45°59'0"	45°59'23"	45°59'45"	46°0'7"
160	46°0'30"	46°0'53"	46°1'17"	46°1'40"	46°2'4"	46°2'26"	46°2'49"	46°3'10"	46°3'31"	46°3'52"	46°4'12"	46°4'32"
161	46°4'53"	46°5'14"	46°5'35"	46°5'57"	46°6'18"	46°6'39"	46°6'60"	46°7'19"	46°7'38"	46°7'56"	46°8'15"	46°8'33"
162	46°8'51"	46°9'10"	46°9'30"	46°9'49"	46°10'9"	46°10'28"	46°10'46"	46°11'3"	46°11'20"	46°11'36"	46°11'53"	46°12'9"
163	46°12'25"	46°12'42"	46°12'60"	46°13'17"	46°13'34"	46°13'51"	46°14'7"	46°14'23"	46°14'38"	46°14'52"	46°15'6"	46°15'20"
164	46°15'35"	46°15'50"	46°16'5"	46°16'20"	46°16'36"	46°16'50"	46°17'5"	46°17'18"	46°17'31"	46°17'43"	46°17'55"	46°18'7"
165	46°18'20"	46°18'32"	46°18'46"	46°18'59"	46°19'12"	46°19'25"	46°19'37"	46°1				

Solar Declination Differentials -- Epoch 2020 -- Leap Years +1 (LY1)

Dn	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
184	45°52' 14"	45°51' 48"	45°51' 22"	45°50' 57"	45°50' 31"	45°50' 5"	45°49' 38"	45°49' 11"	45°48' 42"	45°48' 14"	45°47' 45"	45°47' 16"
185	45°46' 48"	45°46' 20"	45°45' 52"	45°45' 24"	45°44' 57"	45°44' 29"	45°43' 60"	45°43' 30"	45°43' 0"	45°42' 30"	45°41' 59"	45°41' 28"
186	45°40' 58"	45°40' 28"	45°39' 58"	45°39' 28"	45°38' 57"	45°38' 28"	45°37' 58"	45°37' 26"	45°36' 54"	45°36' 22"	45°35' 49"	45°35' 16"
187	45°34' 44"	45°34' 12"	45°33' 40"	45°33' 9"	45°32' 37"	45°32' 5"	45°31' 32"	45°30' 59"	45°30' 25"	45°29' 50"	45°29' 15"	45°28' 41"
188	45°28' 6"	45°27' 33"	45°26' 59"	45°26' 25"	45°25' 52"	45°25' 18"	45°24' 43"	45°24' 8"	45°23' 32"	45°22' 55"	45°22' 19"	45°21' 42"
189	45°21' 6"	45°20' 30"	45°19' 54"	45°19' 19"	45°18' 43"	45°18' 8"	45°17' 31"	45°16' 54"	45°16' 16"	45°15' 37"	45°14' 59"	45°14' 20"
190	45°13' 42"	45°13' 4"	45°12' 27"	45°11' 49"	45°11' 12"	45°10' 34"	45° 9' 56"	45° 9' 16"	45° 8' 37"	45° 7' 56"	45° 7' 16"	45° 6' 35"
191	45° 5' 55"	45° 5' 16"	45° 4' 36"	45° 3' 57"	45° 3' 18"	45° 2' 38"	45° 1' 58"	45° 1' 16"	45° 0' 35"	44° 59' 53"	44° 59' 10"	44° 58' 28"
192	44°57' 46"	44°57' 4"	44°56' 23"	44°55' 42"	44°55' 1"	44°54' 19"	44°53' 37"	44°52' 54"	44°52' 10"	44°51' 26"	44°50' 42"	44°49' 58"
193	44°49' 14"	44°48' 30"	44°47' 47"	44°47' 4"	44°46' 21"	44°45' 37"	44°44' 53"	44°44' 8"	44°43' 23"	44°42' 37"	44°41' 51"	44°41' 5"
194	44°40' 19"	44°39' 34"	44°38' 49"	44°38' 4"	44°37' 19"	44°36' 34"	44°35' 48"	44°35' 1"	44°34' 14"	44°33' 26"	44°32' 38"	44°31' 50"
195	44°31' 2"	44°30' 15"	44°29' 28"	44°28' 42"	44°27' 55"	44°27' 8"	44°26' 20"	44°25' 31"	44°24' 42"	44°23' 53"	44°23' 3"	44°22' 13"
196	44°21' 24"	44°20' 35"	44°19' 46"	44°18' 58"	44°18' 9"	44°17' 20"	44°16' 30"	44°15' 40"	44°14' 49"	44°13' 58"	44°13' 6"	44°12' 15"
197	44°11' 23"	44°10' 33"	44° 9' 42"	44° 8' 52"	44° 8' 1"	44° 7' 10"	44° 6' 19"	44° 5' 27"	44° 4' 34"	44° 3' 41"	44° 2' 48"	44° 1' 54"
198	44° 1' 1"	44° 0' 9"	43°59' 16"	43°58' 24"	43°57' 32"	43°56' 39"	43°55' 46"	43°54' 52"	43°53' 58"	43°53' 3"	43°52' 8"	43°51' 13"
199	43°50' 18"	43°49' 24"	43°48' 30"	43°47' 36"	43°46' 42"	43°45' 47"	43°44' 52"	43°43' 57"	43°43' 0"	43°42' 4"	43°41' 7"	43°40' 10"
200	43°39' 14"	43°38' 18"	43°37' 22"	43°36' 26"	43°35' 30"	43°34' 34"	43°33' 37"	43°32' 40"	43°31' 42"	43°30' 44"	43°29' 45"	43°28' 47"
201	43°27' 49"	43°26' 51"	43°25' 53"	43°24' 56"	43°23' 58"	43°23' 0"	43°22' 2"	43°21' 3"	43°20' 3"	43°19' 3"	43°18' 3"	43°17' 3"
202	43°16' 3"	43°15' 3"	43°14' 4"	43°13' 5"	43°12' 6"	43°11' 6"	43°10' 6"	43° 9' 5"	43° 8' 4"	43° 7' 2"	43° 6' 0"	43° 4' 59"
203	43° 3' 57"	43° 2' 56"	43° 1' 55"	43° 0' 54"	42°59' 53"	42°58' 52"	42°57' 50"	42°56' 48"	42°55' 45"	42°54' 41"	42°53' 38"	42°52' 34"
204	42°51' 31"	42°50' 28"	42°49' 26"	42°48' 23"	42°47' 21"	42°46' 18"	42°45' 14"	42°44' 10"	42°43' 6"	42°42' 1"	42°40' 55"	42°39' 50"
205	42°38' 45"	42°37' 41"	42°36' 37"	42°35' 33"	42°34' 28"	42°33' 24"	42°32' 19"	42°31' 13"	42°30' 7"	42°29' 0"	42°27' 53"	42°26' 47"
206	42°25' 40"	42°24' 34"	42°23' 28"	42°22' 23"	42°21' 17"	42°20' 11"	42°19' 4"	42°17' 57"	42°16' 49"	42°15' 41"	42°14' 32"	42°13' 24"
207	42°12' 16"	42°11' 8"	42°10' 1"	42° 8' 53"	42° 7' 46"	42° 6' 38"	42° 5' 30"	42° 4' 21"	42° 3' 12"	42° 2' 2"	42° 0' 52"	41°59' 42"
208	41°58' 32"	41°57' 23"	41°56' 14"	41°55' 5"	41°53' 56"	41°52' 47"	41°51' 37"	41°50' 26"	41°49' 15"	41°48' 4"	41°46' 53"	41°45' 41"
209	41°44' 30"	41°43' 19"	41°42' 9"	41°40' 58"	41°39' 48"	41°38' 37"	41°37' 25"	41°36' 13"	41°35' 1"	41°33' 48"	41°32' 35"	41°31' 22"
210	41°30' 9"	41°28' 57"	41°27' 45"	41°26' 33"	41°25' 21"	41°24' 8"	41°22' 55"	41°21' 42"	41°20' 28"	41°19' 13"	41°17' 59"	41°16' 44"
211	41°15' 30"	41°14' 16"	41°13' 3"	41°11' 49"	41°10' 35"	41° 9' 22"	41° 8' 7"	41° 6' 52"	41° 5' 37"	41° 4' 21"	41° 3' 5"	41° 1' 49"
212	41° 0' 33"	40°59' 18"	40°58' 3"	40°56' 48"	40°55' 32"	40°54' 17"	40°53' 1"	40°51' 45"	40°50' 28"	40°49' 10"	40°47' 53"	40°46' 35"
213	40°45' 18"	40°44' 1"	40°42' 45"	40°41' 28"	40°40' 12"	40°38' 55"	40°37' 38"	40°36' 20"	40°35' 1"	40°33' 43"	40°32' 24"	40°31' 5"
214	40°29' 46"	40°28' 28"	40°27' 10"	40°25' 52"	40°24' 34"	40°23' 16"	40°21' 57"	40°20' 38"	40°19' 18"	40°17' 57"	40°16' 37"	40°15' 17"
215	40°13' 57"	40°12' 37"	40°11' 18"	40° 9' 58"	40° 8' 39"	40° 7' 19"	40° 5' 59"	40° 4' 38"	40° 3' 17"	40° 1' 56"	40° 0' 34"	39°59' 12"
216	39°57' 51"	39°56' 30"	39°55' 9"	39°53' 48"	39°52' 27"	39°51' 6"	39°49' 45"	39°48' 23"	39°47' 0"	39°45' 37"	39°44' 14"	39°42' 51"
217	39°41' 28"	39°40' 6"	39°38' 44"	39°37' 22"	39°35' 59"	39°34' 37"	39°33' 14"	39°31' 50"	39°30' 27"	39°29' 2"	39°27' 38"	39°26' 14"
218	39°24' 49"	39°23' 26"	39°22' 2"	39°20' 39"	39°19' 15"	39°17' 51"	39°16' 27"	39°15' 2"	39°13' 37"	39°12' 12"	39°10' 46"	39° 9' 20"
219	39° 7' 55"	39° 6' 30"	39° 5' 5"	39° 3' 40"	39° 2' 15"	39° 0' 50"	38°59' 25"	38°57' 59"	38°56' 32"	38°55' 5"	38°53' 38"	38°52' 11"
220	38°50' 45"	38°49' 18"	38°47' 52"	38°46' 26"	38°44' 60"	38°43' 33"	38°42' 7"	38°40' 39"	38°39' 12"	38°37' 43"	38°36' 15"	38°34' 47"
221	38°33' 19"	38°31' 51"	38°30' 24"	38°28' 57"	38°27' 29"	38°26' 2"	38°24' 34"	38°23' 5"	38°21' 36"	38°20' 7"	38°18' 37"	38°17' 8"
222	38°15' 39"	38°14' 10"	38°12' 41"	38°11' 13"	38° 9' 44"	38° 8' 15"	38° 6' 46"	38° 5' 16"	38° 3' 46"	38° 2' 15"	38° 0' 45"	37°59' 14"
223	37°57' 44"	37°56' 14"	37°54' 44"	37°53' 14"	37°51' 44"	37°50' 14"	37°48' 44"	37°47' 13"	37°45' 41"	37°44' 9"	37°42' 38"	37°41' 6"
224	37°39' 34"	37°38' 3"	37°36' 32"	37°35' 1"	37°33' 30"	37°31' 59"	37°30' 27"	37°28' 55"	37°27' 22"	37°25' 50"	37°24' 17"	37°22' 44"
225	37°21' 11"	37°19' 39"	37°18' 6"	37°16' 34"	37°15' 2"	37°13' 30"	37°11' 57"	37°10' 24"	37° 8' 50"	37° 7' 16"	37° 5' 42"	37° 4' 8"
226	37° 2' 34"	37° 1' 1"	36°59' 27"	36°57' 54"	36°56' 21"	36°54' 47"	36°53' 13"	36°51' 39"	36°50' 4"	36°48' 29"	36°46' 54"	36°45' 19"
227	36°43' 44"	36°42' 9"	36°40' 35"	36°39' 0"	36°37' 26"	36°35' 51"	36°34' 16"	36°32' 41"	36°31' 5"	36°29' 29"	36°27' 53"	36°26' 17"
228	36°24' 41"	36°23' 5"	36°21' 29"	36°19' 54"	36°18' 18"	36°16' 43"	36°15' 7"	36°13' 30"	36°11' 53"	36°10' 16"	36° 8' 39"	36° 7' 2"
229	36° 5' 25"	36° 3' 48"	36° 2' 11"	36° 0' 35"	35°58' 58"	35°57' 22"	35°55' 45"	35°54' 7"	35°52' 29"	35°50' 51"	35°49' 13"	35°47' 34"
230	35°45' 56"	35°44' 19"	35°42' 41"	35°41' 4"	35°39' 26"	35°37' 48"	35°36' 10"	35°34' 32"	35°32' 53"	35°31' 14"	35°29' 34"	35°27' 55"
231	35°26' 16"	35°24' 38"	35°22' 59"	35°21' 20"	35°19' 42"	35°18' 3"	35°16' 24"	35°14' 45"	35°13' 5"	35°11' 25"	35° 9' 44"	35° 8' 4"
232	35° 6' 24"	35° 4' 45"	35° 3' 5"	35° 1' 26"	34°59' 46"	34°58' 6"	34°56' 26"	34°54' 46"	34°53' 5"	34°51' 24"	34°49' 43"	34°48' 2"
233	34°46' 21"	34°44' 40"	34°42' 60"	34°41' 20"	34°39' 39"	34°37' 58"	34°36' 17"	34°34' 36"	34°32' 54"	34°31' 12"	34°29' 30"	34°27' 49"
234	34°26' 7"	34°24' 25"	34°22' 44"	34°21' 2"	34°19' 21"	34°17' 39"	34°15' 58"	34°14' 15"	34°12' 33"	34°10' 50"	34° 9' 7"	34° 7' 24"
235	34° 5' 42"	34° 3' 59"	34° 2' 17"	34° 0' 35"	33°58' 52"	33°57' 10"	33°55' 27"	33°53' 44"	33°52' 0"	33°50' 17"	33°48' 33"	33°46' 49"
236	33°45' 6"	33°43' 22"	33°41' 39"	33°39' 56"	33°38' 13"	33°36' 30"	33°34' 46"	33°33' 2"	33°31' 18"	33°29' 33"	33°27' 49"	33°26' 4"
237	33°24' 20"	33°22' 36"	33°20' 52"	33°19' 8"	33°17' 24"	33°15' 39"	33°13' 55"	33°12' 10"	33°10' 25"	33° 8' 40"	33° 6' 54"	33° 5' 9"
238	33° 3' 24"	33° 1' 39"	32°59' 54"	32°58' 9"	32°56' 24"	32°54' 39"	32°52' 54"	32°51' 9"	32°49' 23"	32°47' 37"	32°45' 50"	32°44' 4"
239	32°42' 18"	32°40' 33"	32°38' 47"	32°37' 1"	32°35' 16"	32°33' 30"	32°31' 44"	32°29' 57"	32°28' 11"	32°26' 24"	32°24' 37"	32°22' 50"
240	32°21' 3"	32°19' 17"	32°17' 30"	32°15' 44"	32°13' 58"	32°12' 11"	32°10' 24"	32° 8' 37"	32° 6' 50"	32° 5' 2"	32° 3' 15"	32° 1' 27"
241	31°59' 39"	31°57' 52"	31°56' 5"	31°54' 18"	31°52' 31"	31°50' 43"	31°48' 56"	31°47' 8"	31°45' 20"	31°43' 32"	31°41' 43"	31°39' 55"
242	31°38' 7"	31°36' 19"	31°34' 31"	31°32' 43"	31°30' 55"	31°29' 7"	31°27' 19"	31°25' 30"	31°23' 42"	31°21' 53"	31°20' 4"	31°18' 15"
243	31°16' 26"	31°14' 37"	31°12' 49"	31°11' 0"	31° 9' 11"	31° 7' 23"	31° 5' 34"	31° 3' 45"	31° 1' 55"	31° 0' 5"	30°58' 16"	30°56' 26"
244	30°54' 37"	30°52' 47"	30°50' 58"	30°49' 9"	30°47' 20"	30°45' 30"	30°43' 41"	30°41' 51"	30°40' 1"	30°38' 10"	30°36' 20"	30°34' 30"
245	30°32' 40"	30°30' 50"	30°28' 60"	30°27' 10"	30°25' 20"	30°23' 30"	30°21' 40"	30°19' 50"	30°17' 59"	30°16' 8"	30°14' 17"	30°12' 26"
246	30°10' 36"	30° 8' 45"	30° 6' 54"	30° 5' 4"	30° 3' 14"	30° 1' 23"	29°59' 32"	29°57' 41"	29°55' 50"	29°53' 58"	29°52' 7"	29°50' 16"
247	29°48' 44"	29°46' 33"	29°44' 42"	29°42' 51"	29°40' 60"	29°39' 9"	29°37' 17"	29°35' 26"	29°33' 34"	29°31' 42"	29°29' 50"	29°27' 58"
248	29°26' 6"	29°24' 14"	29°22' 23"	29°20' 31"	29°18' 40"	29°16' 48"	29°14' 56"	29°13' 4"	29°11' 11"	29° 9' 19"	29° 7' 27"	29° 5' 34"
249	29° 3' 42"	29° 1' 49"	28°59' 57"	28°58' 5"	28°56' 13"	28°54' 21"	28°52' 28"	28°50' 36"	28°48' 43"	28°46' 50"	28°44' 57"	28°43' 4"
250	28°41' 11"	28°39' 18"	28°37' 26"	28°35' 33"	28°33' 41"	28°31' 48"	28°29' 55"	28°28' 2"	28°26' 8"	28°24' 15"	28°22' 22"	28°20' 28"
251	28°18' 35"	28°16' 42"	28°14' 49"	28°12' 56"	28°11' 2"	28° 9' 9"	28° 7' 16"	28° 5' 22"	28° 3' 29"	28° 1'		

Solar Declination Differentials -- Epoch 2020 -- Leap Years +1 (LY1)

Dn	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
276	18°39' 4"	18°37' 8"	18°35' 12"	18°33' 16"	18°31' 20"	18°29' 25"	18°27' 29"	18°25' 34"	18°23' 38"	18°21' 43"	18°19' 48"	18°17' 52"
277	18°15' 57"	18°14' 1"	18°12' 6"	18°10' 10"	18° 8' 15"	18° 6' 19"	18° 4' 24"	18° 2' 28"	18° 0' 33"	17°58' 38"	17°56' 43"	17°54' 48"
278	17°52' 53"	17°50' 58"	17°49' 3"	17°47' 7"	17°45' 12"	17°43' 17"	17°41' 22"	17°39' 27"	17°37' 32"	17°35' 38"	17°33' 43"	17°31' 48"
279	17°29' 53"	17°27' 59"	17°26' 4"	17°24' 9"	17°22' 14"	17°20' 19"	17°18' 24"	17°16' 29"	17°14' 35"	17°12' 41"	17°10' 47"	17° 8' 52"
280	17° 6' 58"	17° 5' 3"	17° 3' 9"	17° 1' 14"	16°59' 20"	16°57' 25"	16°55' 31"	16°53' 36"	16°51' 43"	16°49' 49"	16°47' 55"	16°46' 1"
281	16°44' 7"	16°42' 13"	16°40' 19"	16°38' 24"	16°36' 30"	16°34' 36"	16°32' 42"	16°30' 48"	16°28' 55"	16°27' 1"	16°25' 8"	16°23' 14"
282	16°21' 21"	16°19' 27"	16°17' 33"	16°15' 40"	16°13' 46"	16°11' 52"	16° 9' 59"	16° 8' 5"	16° 6' 12"	16° 4' 19"	16° 2' 26"	16° 0' 33"
283	15°58' 40"	15°56' 47"	15°54' 54"	15°53' 0"	15°51' 7"	15°49' 14"	15°47' 21"	15°45' 28"	15°43' 35"	15°41' 43"	15°39' 51"	15°37' 58"
284	15°36' 6"	15°34' 13"	15°32' 20"	15°30' 27"	15°28' 34"	15°26' 41"	15°24' 49"	15°22' 57"	15°21' 5"	15°19' 13"	15°17' 21"	15°15' 29"
285	15°13' 37"	15°11' 45"	15° 9' 52"	15° 7' 60"	15° 6' 8"	15° 4' 15"	15° 2' 24"	15° 0' 32"	14°58' 40"	14°56' 49"	14°54' 58"	14°53' 6"
286	14°51' 15"	14°49' 23"	14°47' 31"	14°45' 40"	14°43' 48"	14°41' 56"	14°40' 5"	14°38' 14"	14°36' 23"	14°34' 32"	14°32' 41"	14°30' 51"
287	14°28' 60"	14°27' 9"	14°25' 18"	14°23' 26"	14°21' 35"	14°19' 44"	14°17' 53"	14°16' 3"	14°14' 13"	14°12' 22"	14°10' 32"	14° 8' 42"
288	14° 6' 52"	14° 5' 2"	14° 3' 11"	14° 1' 20"	13°59' 30"	13°57' 39"	13°55' 49"	13°53' 59"	13°52' 10"	13°50' 20"	13°48' 31"	13°46' 42"
289	13°44' 52"	13°43' 2"	13°41' 12"	13°39' 22"	13°37' 32"	13°35' 43"	13°33' 53"	13°32' 4"	13°30' 15"	13°28' 26"	13°26' 38"	13°24' 49"
290	13°23' 0"	13°21' 11"	13°19' 22"	13°17' 32"	13°15' 43"	13°13' 54"	13°12' 5"	13°10' 17"	13° 8' 29"	13° 6' 41"	13° 4' 53"	13° 3' 5"
291	13° 1' 17"	12°59' 28"	12°57' 40"	12°55' 51"	12°54' 3"	12°52' 14"	12°50' 26"	12°48' 38"	12°46' 51"	12°45' 4"	12°43' 17"	12°41' 29"
292	12°39' 42"	12°37' 54"	12°36' 6"	12°34' 19"	12°32' 31"	12°30' 43"	12°28' 56"	12°27' 9"	12°25' 22"	12°23' 36"	12°21' 49"	12°20' 3"
293	12°18' 16"	12°16' 29"	12°14' 42"	12°12' 55"	12°11' 8"	12° 9' 21"	12° 7' 35"	12° 5' 49"	12° 4' 3"	12° 2' 17"	12° 0' 32"	11°58' 46"
294	11°57' 0"	11°55' 14"	11°53' 28"	11°51' 42"	11°49' 55"	11°48' 9"	11°46' 24"	11°44' 38"	11°42' 53"	11°41' 9"	11°39' 24"	11°37' 39"
295	11°35' 54"	11°34' 9"	11°32' 23"	11°30' 38"	11°28' 52"	11°27' 7"	11°25' 22"	11°23' 38"	11°21' 54"	11°20' 10"	11°18' 26"	11°16' 42"
296	11°14' 58"	11°13' 14"	11°11' 29"	11° 9' 44"	11° 7' 60"	11° 6' 16"	11° 4' 32"	11° 2' 48"	11° 1' 5"	10°59' 22"	10°57' 39"	10°55' 56"
297	10°54' 13"	10°52' 29"	10°50' 45"	10°49' 2"	10°47' 18"	10°45' 35"	10°43' 52"	10°42' 9"	10°40' 27"	10°38' 45"	10°37' 3"	10°35' 21"
298	10°33' 38"	10°31' 56"	10°30' 13"	10°28' 30"	10°26' 47"	10°25' 5"	10°23' 23"	10°21' 41"	10°19' 60"	10°18' 19"	10°16' 38"	10°14' 57"
299	10°13' 15"	10°11' 34"	10° 9' 52"	10° 8' 10"	10° 6' 28"	10° 4' 47"	10° 3' 6"	10° 1' 25"	9°59' 45"	9°58' 5"	9°56' 25"	9°54' 44"
300	9°53' 4"	9°51' 23"	9°49' 43"	9°48' 2"	9°46' 21"	9°44' 41"	9°43' 0"	9°41' 21"	9°39' 41"	9°38' 2"	9°36' 23"	9°34' 44"
301	9°33' 15"	9°31' 26"	9°29' 46"	9°28' 6"	9°26' 26"	9°24' 47"	9°23' 8"	9°21' 29"	9°19' 51"	9°18' 13"	9°16' 35"	9°14' 57"
302	9°13' 19"	9°11' 40"	9°10' 1"	9° 8' 23"	9° 6' 44"	9° 5' 6"	9° 3' 28"	9° 1' 50"	9° 0' 13"	8°58' 36"	8°56' 59"	8°55' 22"
303	8°53' 45"	8°52' 8"	8°50' 30"	8°48' 53"	8°47' 15"	8°45' 38"	8°44' 1"	8°42' 24"	8°40' 48"	8°39' 13"	8°37' 37"	8°36' 1"
304	8°34' 25"	8°32' 49"	8°31' 12"	8°29' 36"	8°27' 59"	8°26' 23"	8°24' 48"	8°23' 12"	8°21' 37"	8°20' 3"	8°18' 28"	8°16' 54"
305	8°15' 19"	8°13' 44"	8°12' 9"	8°10' 33"	8° 8' 58"	8° 7' 23"	8° 5' 48"	8° 4' 14"	8° 2' 41"	8° 1' 7"	7°59' 34"	7°58' 1"
306	7°56' 27"	7°54' 53"	7°53' 19"	7°51' 45"	7°50' 11"	7°48' 37"	7°47' 4"	7°45' 31"	7°43' 58"	7°42' 26"	7°40' 54"	7°39' 22"
307	7°37' 50"	7°36' 17"	7°34' 44"	7°33' 11"	7°31' 38"	7°30' 6"	7°28' 34"	7°27' 2"	7°25' 31"	7°24' 0"	7°22' 30"	7°20' 59"
308	7°19' 28"	7°17' 56"	7°16' 25"	7°14' 53"	7°13' 21"	7°11' 50"	7°10' 19"	7° 8' 49"	7° 7' 19"	7° 5' 50"	7° 4' 20"	7° 2' 51"
309	7° 1' 21"	6°59' 51"	6°58' 21"	6°56' 50"	6°55' 20"	6°53' 50"	6°52' 21"	6°50' 52"	6°49' 23"	6°47' 55"	6°46' 27"	6°44' 59"
310	6°43' 30"	6°42' 2"	6°40' 33"	6°39' 4"	6°37' 35"	6°36' 6"	6°34' 38"	6°33' 10"	6°31' 43"	6°30' 16"	6°28' 50"	6°27' 23"
311	6°25' 56"	6°24' 29"	6°23' 1"	6°21' 33"	6°20' 6"	6°18' 39"	6°17' 12"	6°15' 46"	6°14' 20"	6°12' 55"	6°11' 29"	6°10' 4"
312	6° 8' 38"	6° 7' 13"	6° 5' 46"	6° 4' 20"	6° 2' 54"	6° 1' 28"	6° 0' 3"	5°58' 38"	5°57' 14"	5°55' 50"	5°54' 26"	5°53' 2"
313	5°51' 38"	5°50' 14"	5°48' 49"	5°47' 24"	5°45' 60"	5°44' 35"	5°43' 11"	5°41' 48"	5°40' 25"	5°39' 3"	5°37' 41"	5°36' 18"
314	5°34' 56"	5°33' 33"	5°32' 9"	5°30' 46"	5°29' 23"	5°28' 0"	5°26' 38"	5°25' 16"	5°23' 55"	5°22' 34"	5°21' 13"	5°19' 52"
315	5°18' 31"	5°17' 10"	5°15' 48"	5°14' 26"	5°13' 4"	5°11' 43"	5°10' 22"	5° 9' 2"	5° 7' 43"	5° 6' 23"	5° 5' 4"	5° 3' 45"
316	5° 2' 25"	5° 1' 5"	4°59' 45"	4°58' 25"	4°57' 5"	4°55' 45"	4°54' 26"	4°53' 7"	4°51' 49"	4°50' 31"	4°49' 14"	4°47' 56"
317	4°46' 38"	4°45' 20"	4°44' 1"	4°42' 42"	4°41' 24"	4°40' 6"	4°38' 48"	4°37' 31"	4°36' 15"	4°34' 58"	4°33' 42"	4°32' 26"
318	4°31' 10"	4°29' 53"	4°28' 36"	4°27' 19"	4°26' 2"	4°24' 46"	4°23' 30"	4°22' 14"	4°20' 60"	4°19' 45"	4°18' 31"	4°17' 16"
319	4°16' 2"	4°14' 47"	4°13' 31"	4°12' 16"	4°11' 1"	4° 9' 46"	4° 8' 31"	4° 7' 18"	4° 6' 4"	4° 4' 52"	4° 3' 39"	4° 2' 26"
320	4° 1' 13"	3°59' 60"	3°58' 46"	3°57' 32"	3°56' 19"	3°55' 6"	3°53' 53"	3°52' 41"	3°51' 30"	3°50' 19"	3°49' 8"	3°47' 57"
321	3°46' 45"	3°45' 34"	3°44' 22"	3°43' 10"	3°41' 58"	3°40' 46"	3°39' 35"	3°38' 25"	3°37' 15"	3°36' 6"	3°34' 57"	3°33' 47"
322	3°32' 38"	3°31' 28"	3°30' 18"	3°29' 7"	3°27' 57"	3°26' 47"	3°25' 38"	3°24' 30"	3°23' 22"	3°22' 14"	3°21' 7"	3°19' 59"
323	3°18' 51"	3°17' 43"	3°16' 35"	3°15' 26"	3°14' 18"	3°13' 10"	3°12' 2"	3°10' 56"	3° 9' 50"	3° 8' 44"	3° 7' 38"	3° 6' 32"
324	3° 5' 26"	3° 4' 20"	3° 3' 13"	3° 2' 7"	3° 0' 60"	2°59' 54"	2°58' 48"	2°57' 43"	2°56' 39"	2°55' 35"	2°54' 31"	2°53' 27"
325	2°52' 23"	2°51' 19"	2°50' 14"	2°49' 9"	2°48' 4"	2°46' 60"	2°45' 56"	2°44' 53"	2°43' 50"	2°42' 48"	2°41' 46"	2°40' 44"
326	2°39' 42"	2°38' 39"	2°37' 36"	2°36' 33"	2°35' 30"	2°34' 28"	2°33' 26"	2°32' 25"	2°31' 24"	2°30' 24"	2°29' 24"	2°28' 23"
327	2°27' 23"	2°26' 22"	2°25' 21"	2°24' 20"	2°23' 19"	2°22' 18"	2°21' 18"	2°20' 19"	2°19' 20"	2°18' 22"	2°17' 24"	2°16' 25"
328	2°15' 27"	2°14' 28"	2°13' 29"	2°12' 29"	2°11' 30"	2°10' 32"	2° 9' 34"	2° 8' 36"	2° 7' 39"	2° 6' 43"	2° 5' 47"	2° 4' 50"
329	2° 3' 54"	2° 2' 57"	2° 1' 60"	2° 1' 2"	2° 0' 5"	1°59' 8"	1°58' 12"	1°57' 17"	1°56' 22"	1°55' 27"	1°54' 33"	1°53' 39"
330	1°52' 44"	1°51' 49"	1°50' 54"	1°49' 58"	1°49' 3"	1°48' 8"	1°47' 14"	1°46' 21"	1°45' 28"	1°44' 36"	1°43' 43"	1°42' 51"
331	1°41' 58"	1°41' 5"	1°40' 12"	1°39' 19"	1°38' 25"	1°37' 32"	1°36' 40"	1°35' 49"	1°34' 58"	1°34' 8"	1°33' 17"	1°32' 27"
332	1°31' 36"	1°30' 45"	1°29' 54"	1°29' 3"	1°28' 12"	1°27' 21"	1°26' 31"	1°25' 41"	1°24' 52"	1°24' 4"	1°23' 16"	1°22' 28"
333	1°21' 39"	1°20' 50"	1°20' 1"	1°19' 11"	1°18' 22"	1°17' 34"	1°16' 45"	1°15' 58"	1°15' 11"	1°14' 25"	1°13' 39"	1°12' 53"
334	1°12' 6"	1°11' 19"	1°10' 32"	1° 9' 45"	1° 8' 58"	1° 8' 11"	1° 7' 25"	1° 6' 40"	1° 5' 55"	1° 5' 11"	1° 4' 27"	1° 3' 43"
335	1° 2' 58"	1° 2' 14"	1° 1' 29"	1° 0' 43"	59' 58"	59' 14"	58' 30"	57' 47"	57' 4"	56' 22"	55' 40"	54' 58"
336	54' 16"	53' 33"	52' 50"	52' 7"	51' 24"	50' 42"	50' 0"	49' 19"	48' 39"	47' 59"	47' 19"	46' 39"
337	45' 59"	45' 18"	44' 38"	43' 57"	43' 16"	42' 36"	41' 56"	41' 17"	40' 39"	40' 1"	39' 23"	38' 46"
338	38' 8"	37' 29"	36' 51"	36' 12"	35' 33"	34' 55"	34' 18"	33' 41"	33' 5"	32' 29"	31' 54"	31' 19"
339	30' 43"	30' 6"	29' 30"	28' 53"	28' 17"	27' 41"	27' 6"	26' 31"	25' 57"	25' 24"	24' 51"	24' 18"
340	23' 44"	23' 10"	22' 36"	22' 1"	21' 27"	20' 53"	20' 20"	19' 48"	19' 16"	18' 45"	18' 14"	17' 43"
341	17' 12"	16' 40"	16' 8"	15' 36"	15' 4"	14' 32"	14' 1"	13' 31"	13' 2"	12' 33"	12' 4"	11' 35"
342	11' 6"	10' 37"	10' 7"	9' 37"	9' 7"	8' 38"	8' 9"	7' 42"	7' 14"	6' 48"	6' 21"	5' 55"
343	5' 28"	5' 1"	4' 33"	4' 5"	3' 38"	3' 11"	2' 45"	2' 19"	1' 54"	1' 30"	1' 6"	41"
344	17"	8"	-34"	-59"	-1' 24"	-1' 49"	-2' 13"	-2' 36"	-2' 59"	-3' 21"	-3' 43"	-4' 5"
345	-4' 27"	-4' 50"	-5' 13"	-5' 36"	-5' 59"	-6' 21"	-6' 43"	-7' 4"	-7' 24"	-7' 44"	-8' 4"	-8' 23"
346	-8' 43"	-9' 4"	-9' 25"	-9' 45"	-10' 6"	-10' 26"	-10' 46"	-11' 4"	-11' 22"	-11' 40"	-11' 57"	-12' 14"
347	-12' 32"	-12' 50"	-13' 9"	-13' 27"	-13' 45"	-14' 3"	-14' 20"	-14' 37"	-14' 53"	-15' 8"	-15' 23"	-15' 38"
348	-15' 53"	-16' 9"	-16' 25"	-16' 41"	-16' 57"	-17' 13"	-17' 28"	-17' 42"	-17' 55"	-18' 8"	-18' 20"	-18' 33"
349	-18' 46"	-18' 60"	-19' 1									

Solar E Differentials -- Epoch 2020 -- Leap Years +1 (LY1)

Dn	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
0	0°	-38'	-1'16"	-1'52"	-2'27"	-2'60"	-3'32"	-4'4"	-4'37"	-5'11"	-5'46"	-6'23"
1	-7'1"	-7'39"	-8'16"	-8'52"	-9'26"	-9'59"	-10'31"	-11'2"	-11'34"	-12'8"	-12'43"	-13'20"
2	-13'57"	-14'35"	-15'12"	-15'47"	-16'21"	-16'53"	-17'24"	-17'55"	-18'27"	-19'0"	-19'35"	-20'11"
3	-20'48"	-21'25"	-22'1"	-22'36"	-23'9"	-23'41"	-24'12"	-24'43"	-25'14"	-25'47"	-26'21"	-26'56"
4	-27'33"	-28'9"	-28'45"	-29'20"	-29'52"	-30'23"	-30'54"	-31'24"	-31'55"	-32'27"	-33'1"	-33'36"
5	-34'12"	-34'48"	-35'23"	-35'57"	-36'29"	-36'59"	-37'29"	-37'59"	-38'29"	-39'1"	-39'34"	-40'8"
6	-40'44"	-41'19"	-41'54"	-42'27"	-42'59"	-43'29"	-43'58"	-44'27"	-44'57"	-45'28"	-46'0"	-46'34"
7	-47'9"	-47'44"	-48'18"	-48'50"	-49'21"	-49'51"	-50'19"	-50'48"	-51'17"	-51'47"	-52'19"	-52'52"
8	-53'26"	-54'1"	-54'34"	-55'6"	-55'36"	-56'5"	-56'33"	-57'1"	-57'29"	-57'59"	-58'30"	-59'3"
9	-59'36"	-1° 0'10"	-1° 0'43"	-1° 1'14"	-1° 1'44"	-1° 2'12"	-1° 2'39"	-1° 3'6"	-1° 3'34"	-1° 4'3"	-1° 4'33"	-1° 5'5"
10	-1° 5'38"	-1° 6'11"	-1° 6'43"	-1° 7'13"	-1° 7'42"	-1° 8'10"	-1° 8'36"	-1° 9'3"	-1° 9'30"	-1° 9'58"	-1° 10'28"	-1° 10'59"
11	-1° 11'31"	-1° 12'3"	-1° 12'34"	-1° 13'4"	-1° 13'32"	-1° 13'59"	-1° 14'25"	-1° 14'50"	-1° 15'17"	-1° 15'44"	-1° 16'13"	-1° 16'44"
12	-1° 17'15"	-1° 17'46"	-1° 18'17"	-1° 18'46"	-1° 19'13"	-1° 19'39"	-1° 20'4"	-1° 20'29"	-1° 20'54"	-1° 21'21"	-1° 21'49"	-1° 22'19"
13	-1° 22'49"	-1° 23'20"	-1° 23'49"	-1° 24'18"	-1° 24'44"	-1° 25'10"	-1° 25'34"	-1° 25'58"	-1° 26'22"	-1° 26'48"	-1° 27'16"	-1° 27'44"
14	-1° 28'14"	-1° 28'44"	-1° 29'12"	-1° 29'40"	-1° 30'6"	-1° 30'30"	-1° 30'53"	-1° 31'16"	-1° 31'40"	-1° 32'5"	-1° 32'32"	-1° 32'60"
15	-1° 33'28"	-1° 33'57"	-1° 34'25"	-1° 34'52"	-1° 35'17"	-1° 35'40"	-1° 36'3"	-1° 36'25"	-1° 36'48"	-1° 37'12"	-1° 37'37"	-1° 38'4"
16	-1° 38'32"	-1° 39'0"	-1° 39'27"	-1° 39'53"	-1° 40'17"	-1° 40'40"	-1° 41'1"	-1° 41'23"	-1° 41'44"	-1° 42'8"	-1° 42'58"	-1° 43'28"
17	-1° 43'25"	-1° 43'52"	-1° 44'19"	-1° 44'43"	-1° 45'7"	-1° 45'28"	-1° 45'49"	-1° 46'9"	-1° 46'30"	-1° 46'53"	-1° 47'16"	-1° 47'42"
18	-1° 48'7"	-1° 48'34"	-1° 48'59"	-1° 49'23"	-1° 49'45"	-1° 50'6"	-1° 50'25"	-1° 50'45"	-1° 51'5"	-1° 51'26"	-1° 51'49"	-1° 52'13"
19	-1° 52'38"	-1° 53'3"	-1° 53'28"	-1° 53'51"	-1° 54'12"	-1° 54'32"	-1° 54'50"	-1° 55'9"	-1° 55'28"	-1° 55'48"	-1° 56'10"	-1° 56'34"
20	-1° 56'58"	-1° 57'22"	-1° 57'45"	-1° 58'7"	-1° 58'27"	-1° 58'46"	-1° 59'4"	-1° 59'21"	-1° 59'40"	-1° 59'59"	-2° 0'20"	-2° 0'42"
21	-2° 1'5"	-2° 1'28"	-2° 1'51"	-2° 2'12"	-2° 2'31"	-2° 2'49"	-2° 3'6"	-2° 3'22"	-2° 3'39"	-2° 3'58"	-2° 4'18"	-2° 4'39"
22	-2° 5'1"	-2° 5'23"	-2° 5'45"	-2° 6'5"	-2° 6'23"	-2° 6'40"	-2° 6'56"	-2° 7'11"	-2° 7'27"	-2° 7'45"	-2° 8'4"	-2° 8'24"
23	-2° 8'45"	-2° 9'6"	-2° 9'26"	-2° 9'45"	-2° 10'3"	-2° 10'19"	-2° 10'33"	-2° 10'48"	-2° 11'3"	-2° 11'20"	-2° 11'38"	-2° 11'57"
24	-2° 12'17"	-2° 12'37"	-2° 12'56"	-2° 13'14"	-2° 13'31"	-2° 13'45"	-2° 13'59"	-2° 14'13"	-2° 14'27"	-2° 14'42"	-2° 14'59"	-2° 15'18"
25	-2° 15'37"	-2° 15'56"	-2° 16'14"	-2° 16'31"	-2° 16'46"	-2° 17'0"	-2° 17'13"	-2° 17'26"	-2° 17'39"	-2° 17'53"	-2° 18'9"	-2° 18'26"
26	-2° 18'44"	-2° 19'2"	-2° 19'20"	-2° 19'36"	-2° 19'50"	-2° 20'3"	-2° 20'14"	-2° 20'26"	-2° 20'38"	-2° 20'52"	-2° 21'6"	-2° 21'23"
27	-2° 21'40"	-2° 21'57"	-2° 22'13"	-2° 22'28"	-2° 22'41"	-2° 22'53"	-2° 23'4"	-2° 23'14"	-2° 23'25"	-2° 23'38"	-2° 23'52"	-2° 24'7"
28	-2° 24'23"	-2° 24'39"	-2° 24'54"	-2° 25'8"	-2° 25'20"	-2° 25'31"	-2° 25'41"	-2° 25'50"	-2° 26'0"	-2° 26'12"	-2° 26'25"	-2° 26'39"
29	-2° 26'54"	-2° 27'9"	-2° 27'23"	-2° 27'36"	-2° 27'47"	-2° 27'57"	-2° 28'6"	-2° 28'14"	-2° 28'23"	-2° 28'34"	-2° 28'45"	-2° 28'59"
30	-2° 29'12"	-2° 29'26"	-2° 29'40"	-2° 29'52"	-2° 30'2"	-2° 30'11"	-2° 30'18"	-2° 30'26"	-2° 30'34"	-2° 30'43"	-2° 30'54"	-2° 31'6"
31	-2° 31'19"	-2° 31'32"	-2° 31'44"	-2° 31'55"	-2° 32'5"	-2° 32'12"	-2° 32'19"	-2° 32'26"	-2° 32'33"	-2° 32'41"	-2° 32'51"	-2° 33'2"
32	-2° 33'14"	-2° 33'26"	-2° 33'37"	-2° 33'47"	-2° 33'55"	-2° 34'2"	-2° 34'8"	-2° 34'13"	-2° 34'20"	-2° 34'27"	-2° 34'36"	-2° 34'46"
33	-2° 34'57"	-2° 35'8"	-2° 35'18"	-2° 35'27"	-2° 35'34"	-2° 35'40"	-2° 35'45"	-2° 35'49"	-2° 35'54"	-2° 36'1"	-2° 36'8"	-2° 36'18"
34	-2° 36'28"	-2° 36'37"	-2° 36'47"	-2° 36'55"	-2° 37'1"	-2° 37'6"	-2° 37'10"	-2° 37'13"	-2° 37'17"	-2° 37'23"	-2° 37'29"	-2° 37'38"
35	-2° 37'47"	-2° 37'56"	-2° 38'4"	-2° 38'11"	-2° 38'16"	-2° 38'20"	-2° 38'23"	-2° 38'25"	-2° 38'28"	-2° 38'33"	-2° 38'39"	-2° 38'46"
36	-2° 38'54"	-2° 39'2"	-2° 39'9"	-2° 39'15"	-2° 39'19"	-2° 39'22"	-2° 39'24"	-2° 39'26"	-2° 39'28"	-2° 39'31"	-2° 39'36"	-2° 39'42"
37	-2° 39'49"	-2° 39'56"	-2° 40'3"	-2° 40'8"	-2° 40'11"	-2° 40'13"	-2° 40'14"	-2° 40'14"	-2° 40'16"	-2° 40'18"	-2° 40'22"	-2° 40'27"
38	-2° 40'33"	-2° 40'39"	-2° 40'44"	-2° 40'48"	-2° 40'51"	-2° 40'52"	-2° 40'52"	-2° 40'51"	-2° 40'52"	-2° 40'53"	-2° 40'56"	-2° 41'0"
39	-2° 41'5"	-2° 41'10"	-2° 41'15"	-2° 41'18"	-2° 41'19"	-2° 41'19"	-2° 41'18"	-2° 41'17"	-2° 41'16"	-2° 41'17"	-2° 41'19"	-2° 41'22"
40	-2° 41'26"	-2° 41'30"	-2° 41'33"	-2° 41'36"	-2° 41'36"	-2° 41'35"	-2° 41'33"	-2° 41'31"	-2° 41'29"	-2° 41'29"	-2° 41'30"	-2° 41'32"
41	-2° 41'35"	-2° 41'38"	-2° 41'41"	-2° 41'42"	-2° 41'41"	-2° 41'39"	-2° 41'36"	-2° 41'33"	-2° 41'31"	-2° 41'29"	-2° 41'29"	-2° 41'30"
42	-2° 41'33"	-2° 41'35"	-2° 41'36"	-2° 41'37"	-2° 41'35"	-2° 41'32"	-2° 41'28"	-2° 41'24"	-2° 41'21"	-2° 41'18"	-2° 41'17"	-2° 41'18"
43	-2° 41'19"	-2° 41'20"	-2° 41'21"	-2° 41'20"	-2° 41'18"	-2° 41'14"	-2° 41'9"	-2° 41'4"	-2° 40'59"	-2° 40'56"	-2° 40'54"	-2° 40'54"
44	-2° 40'54"	-2° 40'54"	-2° 40'54"	-2° 40'52"	-2° 40'49"	-2° 40'44"	-2° 40'38"	-2° 40'32"	-2° 40'27"	-2° 40'23"	-2° 40'20"	-2° 40'18"
45	-2° 40'18"	-2° 40'17"	-2° 40'16"	-2° 40'13"	-2° 40'9"	-2° 40'3"	-2° 39'57"	-2° 39'50"	-2° 39'43"	-2° 39'38"	-2° 39'34"	-2° 39'32"
46	-2° 39'30"	-2° 39'29"	-2° 39'27"	-2° 39'23"	-2° 39'18"	-2° 39'11"	-2° 39'4"	-2° 38'56"	-2° 38'49"	-2° 38'43"	-2° 38'38"	-2° 38'35"
47	-2° 38'32"	-2° 38'30"	-2° 38'27"	-2° 38'22"	-2° 38'16"	-2° 38'9"	-2° 38'0"	-2° 37'52"	-2° 37'44"	-2° 37'37"	-2° 37'31"	-2° 37'27"
48	-2° 37'24"	-2° 37'20"	-2° 37'16"	-2° 37'11"	-2° 37'4"	-2° 36'56"	-2° 36'46"	-2° 36'37"	-2° 36'28"	-2° 36'20"	-2° 36'14"	-2° 36'8"
49	-2° 36'4"	-2° 36'0"	-2° 35'55"	-2° 35'49"	-2° 35'41"	-2° 35'32"	-2° 35'22"	-2° 35'11"	-2° 35'2"	-2° 34'53"	-2° 34'46"	-2° 34'40"
50	-2° 34'35"	-2° 34'30"	-2° 34'24"	-2° 34'17"	-2° 34'8"	-2° 33'58"	-2° 33'47"	-2° 33'36"	-2° 33'25"	-2° 33'16"	-2° 33'8"	-2° 33'1"
51	-2° 32'55"	-2° 32'49"	-2° 32'42"	-2° 32'34"	-2° 32'25"	-2° 32'14"	-2° 32'2"	-2° 31'50"	-2° 31'39"	-2° 31'28"	-2° 31'20"	-2° 31'12"
52	-2° 31'5"	-2° 30'58"	-2° 30'51"	-2° 30'42"	-2° 30'32"	-2° 30'20"	-2° 30'8"	-2° 29'55"	-2° 29'43"	-2° 29'32"	-2° 29'22"	-2° 29'13"
53	-2° 29'6"	-2° 28'58"	-2° 28'50"	-2° 28'41"	-2° 28'30"	-2° 28'17"	-2° 28'4"	-2° 27'50"	-2° 27'37"	-2° 27'25"	-2° 27'15"	-2° 27'6"
54	-2° 26'57"	-2° 26'49"	-2° 26'40"	-2° 26'30"	-2° 26'18"	-2° 26'5"	-2° 25'51"	-2° 25'36"	-2° 25'22"	-2° 25'10"	-2° 24'59"	-2° 24'49"
55	-2° 24'40"	-2° 24'31"	-2° 24'21"	-2° 24'10"	-2° 23'57"	-2° 23'43"	-2° 23'28"	-2° 23'13"	-2° 22'59"	-2° 22'45"	-2° 22'33"	-2° 22'23"
56	-2° 22'13"	-2° 22'3"	-2° 21'53"	-2° 21'41"	-2° 21'28"	-2° 21'13"	-2° 20'58"	-2° 20'42"	-2° 20'27"	-2° 20'12"	-2° 19'60"	-2° 19'49"
57	-2° 19'38"	-2° 19'28"	-2° 19'16"	-2° 19'4"	-2° 18'50"	-2° 18'35"	-2° 18'18"	-2° 18'2"	-2° 17'46"	-2° 17'31"	-2° 17'18"	-2° 17'6"
58	-2° 16'55"	-2° 16'44"	-2° 16'32"	-2° 16'19"	-2° 16'4"	-2° 15'48"	-2° 15'31"	-2° 15'14"	-2° 14'58"	-2° 14'42"	-2° 14'28"	-2° 14'16"
59	-2° 14'4"	-2° 13'52"	-2° 13'40"	-2° 13'26"	-2° 13'11"	-2° 12'54"	-2° 12'37"	-2° 12'19"	-2° 12'2"	-2° 11'46"	-2° 11'31"	-2° 11'18"
60	-2° 11'5"	-2° 10'53"	-2° 10'40"	-2° 10'26"	-2° 10'10"	-2° 9'53"	-2° 9'34"	-2° 9'16"	-2° 8'58"	-2° 8'42"	-2° 8'27"	-2° 8'13"
61	-2° 7'60"	-2° 7'47"	-2° 7'33"	-2° 7'18"	-2° 7'2"	-2° 6'44"	-2° 6'25"	-2° 6'7"	-2° 5'48"	-2° 5'31"	-2° 5'15"	-2° 5'1"
62	-2° 4'47"	-2° 4'34"	-2° 4'20"	-2° 4'4"	-2° 3'47"	-2° 3'29"	-2° 3'10"	-2° 2'50"	-2° 2'31"	-2° 2'14"	-2° 1'57"	-2° 1'43"
63	-2° 1'28"	-2° 1'14"	-2° 0'60"	-2° 0'44"	-2° 0'26"	-2° 0'7"	-1° 59'48"	-1° 59'28"	-1° 59'8"	-1° 58'50"	-1° 58'33"	-1° 58'18"
64	-1° 58'3"	-1° 57'49"	-1° 57'34"	-1° 57'17"	-1° 56'59"	-1° 56'40"	-1° 56'19"	-1° 55'59"	-1° 55'39"	-1° 55'21"	-1° 55'3"	-1° 54'47"
65	-1° 54'32"	-1° 54'17"	-1° 54'2"	-1° 53'45"	-1° 53'26"	-1° 53'6"	-1° 52'46"	-1° 52'25"	-1° 52'4"	-1° 51'45"	-1° 51'28"	-1° 51'11"
66	-1° 50'56"	-1° 50'40"	-1° 50'24"	-1° 50'7"	-1° 49'48"	-1° 49'27"	-1° 49'6"	-1° 48'45"	-1° 48'24"	-1° 48'5"	-1° 47'46"	-1° 47'30"
67	-1° 47'14"	-1° 46'58"	-1° 46'41"	-1° 46'23"	-1° 46'4"	-1° 45'43"	-1° 45'22"	-1° 44'60"	-1° 44'39"	-1° 44'19"	-1° 44'0"	-1° 43'43"
68	-1° 43'27"	-1° 43'10"	-1° 42'53"	-1° 42'35"	-1° 42'15"	-1° 41'54"	-1° 41'32"	-1° 41'10"	-1° 40'48"	-1° 40'28"	-1° 40'9"	-1° 39'51"
69	-1° 39'35"	-1° 39'18"	-1° 39'0"	-1° 38'42"	-1° 38'22"	-1° 38'0"	-1° 37'38"	-1° 37'15"	-1° 36'53"	-1° 36'32"	-1° 36'13"	-1° 35'55"
70	-1° 35'38"	-1° 35'21"	-1° 35'3"	-1° 34'44"	-1° 34'24"	-1° 34'2"	-1° 33'39"	-1° 33'16"	-1° 32'54"	-1° 32'33"	-1° 32'13"	-1° 31'55"
71	-1° 31'37"	-1° 31'20"	-1° 31'1"	-1° 30'42"	-1° 30'21"	-1° 29'59"	-1° 29'36"	-1° 29'13"	-1° 28'50"	-1° 28'28"	-1° 28'8"	-1° 27'50"
72	-1° 27'32"	-1° 27'14"	-1° 26'56"	-1° 26'36"	-1° 26'15"	-1° 25'52"	-1° 25'29"	-1° 25'5"	-1° 24'42"	-1° 24'21"	-1° 24'0"	-1° 23'41"
73	-1° 23'23"	-1° 23'5"	-1° 22'46"	-1° 22'26"	-1° 22'5"	-1° 21'42"	-1° 21'18"	-1° 20'54"	-1° 20'31"	-1° 20'9"	-1° 19'48"	-1° 19'29"
74	-1° 19'11"	-1° 18'52"	-1° 18'33"	-1° 18'13"	-1° 17'51"	-1° 17'28"	-1° 17'4"	-1° 16'40"	-1° 16'16"	-1° 15'54"	-1° 15'33"	-1° 15'13"
75	-1° 14'55"	-1° 14'36"	-1° 14'17"	-1° 13'56"	-1° 13'34"	-1° 13'11"	-1° 12'46"	-1° 12'22"	-1			

Solar E Differentials -- Epoch 2020 -- Leap Years +1 (LY1)

Dn	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
92	1' 14"	1' 33"	1' 53"	2' 14"	2' 36"	3' 0"	3' 25"	3' 50"	4' 14"	4' 36"	4' 58"	5' 17"
93	5' 37"	5' 56"	6' 15"	6' 36"	6' 58"	7' 22"	7' 46"	8' 11"	8' 35"	8' 57"	9' 18"	9' 38"
94	9' 57"	10' 15"	10' 35"	10' 55"	11' 17"	11' 41"	12' 5"	12' 29"	12' 53"	13' 15"	13' 36"	13' 55"
95	14' 14"	14' 32"	14' 51"	15' 12"	15' 33"	15' 56"	16' 20"	16' 44"	17' 8"	17' 29"	17' 50"	18' 9"
96	18' 27"	18' 46"	19' 4"	19' 24"	19' 46"	20' 9"	20' 32"	20' 56"	21' 19"	21' 41"	22' 1"	22' 20"
97	22' 38"	22' 55"	23' 14"	23' 34"	23' 55"	24' 17"	24' 41"	25' 4"	25' 27"	25' 48"	26' 8"	26' 26"
98	26' 44"	27' 2"	27' 20"	27' 39"	28' 0"	28' 22"	28' 45"	29' 8"	29' 31"	29' 52"	30' 11"	30' 29"
99	30' 47"	31' 4"	31' 22"	31' 41"	32' 1"	32' 23"	32' 46"	33' 8"	33' 30"	33' 51"	34' 10"	34' 28"
100	34' 45"	35' 2"	35' 19"	35' 38"	35' 58"	36' 20"	36' 42"	37' 4"	37' 26"	37' 46"	38' 5"	38' 22"
101	38' 39"	38' 55"	39' 13"	39' 31"	39' 51"	40' 12"	40' 34"	40' 56"	41' 17"	41' 37"	41' 55"	42' 12"
102	42' 28"	42' 44"	43' 1"	43' 19"	43' 39"	43' 59"	44' 21"	44' 42"	45' 3"	45' 23"	45' 41"	45' 57"
103	46' 13"	46' 29"	46' 45"	47' 3"	47' 22"	47' 42"	48' 3"	48' 24"	48' 45"	49' 4"	49' 21"	49' 37"
104	49' 53"	50' 8"	50' 24"	50' 41"	50' 60"	51' 20"	51' 40"	52' 1"	52' 21"	52' 39"	52' 57"	53' 12"
105	53' 27"	53' 42"	53' 58"	54' 14"	54' 32"	54' 52"	55' 12"	55' 32"	55' 52"	56' 10"	56' 27"	56' 42"
106	56' 56"	57' 11"	57' 26"	57' 42"	57' 60"	58' 19"	58' 39"	58' 58"	59' 17"	59' 35"	59' 51"	1° 0' 6"
107	1° 0' 20"	1° 0' 34"	1° 0' 48"	1° 1' 4"	1° 1' 22"	1° 1' 40"	1° 1' 59"	1° 2' 19"	1° 2' 37"	1° 2' 54"	1° 3' 10"	1° 3' 24"
108	1° 3' 38"	1° 3' 51"	1° 4' 5"	1° 4' 21"	1° 4' 38"	1° 4' 56"	1° 5' 14"	1° 5' 33"	1° 5' 51"	1° 6' 8"	1° 6' 23"	1° 6' 37"
109	1° 6' 50"	1° 7' 3"	1° 7' 16"	1° 7' 31"	1° 7' 48"	1° 8' 5"	1° 8' 23"	1° 8' 42"	1° 8' 59"	1° 9' 15"	1° 9' 30"	1° 9' 43"
110	1° 9' 56"	1° 10' 8"	1° 10' 21"	1° 10' 36"	1° 10' 51"	1° 11' 8"	1° 11' 26"	1° 11' 44"	1° 12' 1"	1° 12' 17"	1° 12' 31"	1° 12' 44"
111	1° 12' 56"	1° 13' 7"	1° 13' 20"	1° 13' 34"	1° 13' 49"	1° 14' 5"	1° 14' 23"	1° 14' 40"	1° 14' 56"	1° 15' 11"	1° 15' 25"	1° 15' 37"
112	1° 15' 49"	1° 16' 0"	1° 16' 12"	1° 16' 25"	1° 16' 40"	1° 16' 56"	1° 17' 12"	1° 17' 29"	1° 17' 45"	1° 17' 60"	1° 18' 13"	1° 18' 24"
113	1° 18' 35"	1° 18' 46"	1° 18' 57"	1° 19' 10"	1° 19' 24"	1° 19' 40"	1° 19' 56"	1° 20' 12"	1° 20' 27"	1° 20' 41"	1° 20' 54"	1° 21' 5"
114	1° 21' 15"	1° 21' 25"	1° 21' 36"	1° 21' 48"	1° 22' 1"	1° 22' 16"	1° 22' 32"	1° 22' 47"	1° 23' 2"	1° 23' 15"	1° 23' 27"	1° 23' 38"
115	1° 23' 47"	1° 23' 57"	1° 24' 7"	1° 24' 19"	1° 24' 32"	1° 24' 46"	1° 25' 1"	1° 25' 16"	1° 25' 30"	1° 25' 43"	1° 25' 54"	1° 26' 4"
116	1° 26' 13"	1° 26' 22"	1° 26' 31"	1° 26' 42"	1° 26' 54"	1° 27' 8"	1° 27' 22"	1° 27' 36"	1° 27' 50"	1° 28' 2"	1° 28' 13"	1° 28' 22"
117	1° 28' 30"	1° 28' 39"	1° 28' 48"	1° 28' 58"	1° 29' 9"	1° 29' 22"	1° 29' 36"	1° 29' 50"	1° 30' 3"	1° 30' 14"	1° 30' 24"	1° 30' 33"
118	1° 30' 40"	1° 30' 48"	1° 30' 56"	1° 31' 6"	1° 31' 17"	1° 31' 29"	1° 31' 42"	1° 31' 55"	1° 32' 7"	1° 32' 18"	1° 32' 27"	1° 32' 35"
119	1° 32' 42"	1° 32' 49"	1° 32' 57"	1° 33' 6"	1° 33' 16"	1° 33' 28"	1° 33' 40"	1° 33' 52"	1° 34' 4"	1° 34' 14"	1° 34' 23"	1° 34' 30"
120	1° 34' 36"	1° 34' 42"	1° 34' 49"	1° 34' 58"	1° 35' 7"	1° 35' 18"	1° 35' 30"	1° 35' 41"	1° 35' 52"	1° 36' 2"	1° 36' 10"	1° 36' 16"
121	1° 36' 22"	1° 36' 27"	1° 36' 34"	1° 36' 41"	1° 36' 50"	1° 37' 0"	1° 37' 11"	1° 37' 22"	1° 37' 32"	1° 37' 41"	1° 37' 48"	1° 37' 54"
122	1° 37' 59"	1° 38' 4"	1° 38' 9"	1° 38' 16"	1° 38' 24"	1° 38' 34"	1° 38' 44"	1° 38' 54"	1° 39' 4"	1° 39' 12"	1° 39' 18"	1° 39' 23"
123	1° 39' 27"	1° 39' 32"	1° 39' 36"	1° 39' 43"	1° 39' 50"	1° 39' 59"	1° 40' 8"	1° 40' 18"	1° 40' 27"	1° 40' 34"	1° 40' 40"	1° 40' 44"
124	1° 40' 48"	1° 40' 51"	1° 40' 55"	1° 41' 0"	1° 41' 7"	1° 41' 15"	1° 41' 24"	1° 41' 33"	1° 41' 41"	1° 41' 47"	1° 41' 53"	1° 41' 56"
125	1° 41' 59"	1° 42' 2"	1° 42' 5"	1° 42' 10"	1° 42' 16"	1° 42' 23"	1° 42' 31"	1° 42' 39"	1° 42' 46"	1° 42' 52"	1° 42' 57"	1° 42' 60"
126	1° 43' 2"	1° 43' 4"	1° 43' 6"	1° 43' 10"	1° 43' 16"	1° 43' 22"	1° 43' 30"	1° 43' 37"	1° 43' 43"	1° 43' 49"	1° 43' 52"	1° 43' 54"
127	1° 43' 56"	1° 43' 57"	1° 43' 59"	1° 44' 2"	1° 44' 7"	1° 44' 13"	1° 44' 19"	1° 44' 26"	1° 44' 32"	1° 44' 36"	1° 44' 39"	1° 44' 40"
128	1° 44' 41"	1° 44' 41"	1° 44' 43"	1° 44' 45"	1° 44' 49"	1° 44' 54"	1° 45' 0"	1° 45' 6"	1° 45' 11"	1° 45' 15"	1° 45' 18"	1° 45' 18"
129	1° 45' 18"	1° 45' 17"	1° 45' 18"	1° 45' 19"	1° 45' 23"	1° 45' 27"	1° 45' 32"	1° 45' 37"	1° 45' 42"	1° 45' 45"	1° 45' 46"	1° 45' 46"
130	1° 45' 45"	1° 45' 44"	1° 45' 44"	1° 45' 45"	1° 45' 48"	1° 45' 51"	1° 45' 56"	1° 46' 0"	1° 46' 4"	1° 46' 6"	1° 46' 7"	1° 46' 6"
131	1° 46' 5"	1° 46' 3"	1° 46' 2"	1° 46' 2"	1° 46' 4"	1° 46' 7"	1° 46' 11"	1° 46' 15"	1° 46' 18"	1° 46' 19"	1° 46' 19"	1° 46' 18"
132	1° 46' 15"	1° 46' 13"	1° 46' 11"	1° 46' 11"	1° 46' 12"	1° 46' 14"	1° 46' 17"	1° 46' 20"	1° 46' 23"	1° 46' 23"	1° 46' 23"	1° 46' 21"
133	1° 46' 18"	1° 46' 14"	1° 46' 12"	1° 46' 11"	1° 46' 11"	1° 46' 13"	1° 46' 15"	1° 46' 17"	1° 46' 19"	1° 46' 19"	1° 46' 18"	1° 46' 15"
134	1° 46' 11"	1° 46' 8"	1° 46' 4"	1° 46' 3"	1° 46' 2"	1° 46' 3"	1° 46' 5"	1° 46' 6"	1° 46' 7"	1° 46' 7"	1° 46' 5"	1° 46' 1"
135	1° 45' 57"	1° 45' 52"	1° 45' 48"	1° 45' 46"	1° 45' 45"	1° 45' 45"	1° 45' 46"	1° 45' 47"	1° 45' 47"	1° 45' 46"	1° 45' 43"	1° 45' 39"
136	1° 45' 34"	1° 45' 29"	1° 45' 24"	1° 45' 21"	1° 45' 19"	1° 45' 19"	1° 45' 19"	1° 45' 19"	1° 45' 19"	1° 45' 17"	1° 45' 13"	1° 45' 9"
137	1° 45' 3"	1° 44' 57"	1° 44' 52"	1° 44' 48"	1° 44' 46"	1° 44' 44"	1° 44' 44"	1° 44' 44"	1° 44' 43"	1° 44' 40"	1° 44' 36"	1° 44' 30"
138	1° 44' 24"	1° 44' 17"	1° 44' 11"	1° 44' 7"	1° 44' 4"	1° 44' 2"	1° 44' 1"	1° 44' 0"	1° 43' 58"	1° 43' 55"	1° 43' 50"	1° 43' 44"
139	1° 43' 37"	1° 43' 30"	1° 43' 23"	1° 43' 18"	1° 43' 14"	1° 43' 12"	1° 43' 10"	1° 43' 9"	1° 43' 6"	1° 43' 2"	1° 42' 57"	1° 42' 50"
140	1° 42' 42"	1° 42' 34"	1° 42' 27"	1° 42' 21"	1° 42' 17"	1° 42' 14"	1° 42' 12"	1° 42' 9"	1° 42' 6"	1° 42' 2"	1° 41' 56"	1° 41' 48"
141	1° 41' 40"	1° 41' 31"	1° 41' 23"	1° 41' 17"	1° 41' 12"	1° 41' 8"	1° 41' 5"	1° 41' 2"	1° 40' 59"	1° 40' 54"	1° 40' 47"	1° 40' 39"
142	1° 40' 30"	1° 40' 21"	1° 40' 12"	1° 40' 5"	1° 39' 59"	1° 39' 55"	1° 39' 52"	1° 39' 48"	1° 39' 44"	1° 39' 38"	1° 39' 31"	1° 39' 22"
143	1° 39' 12"	1° 39' 2"	1° 38' 53"	1° 38' 46"	1° 38' 40"	1° 38' 35"	1° 38' 30"	1° 38' 26"	1° 38' 21"	1° 38' 15"	1° 38' 7"	1° 37' 58"
144	1° 37' 47"	1° 37' 37"	1° 37' 27"	1° 37' 19"	1° 37' 12"	1° 37' 7"	1° 37' 2"	1° 36' 57"	1° 36' 52"	1° 36' 45"	1° 36' 36"	1° 36' 26"
145	1° 36' 15"	1° 36' 4"	1° 35' 54"	1° 35' 45"	1° 35' 38"	1° 35' 32"	1° 35' 26"	1° 35' 21"	1° 35' 15"	1° 35' 7"	1° 34' 58"	1° 34' 47"
146	1° 34' 36"	1° 34' 24"	1° 34' 14"	1° 34' 4"	1° 33' 56"	1° 33' 49"	1° 33' 43"	1° 33' 37"	1° 33' 31"	1° 33' 22"	1° 33' 13"	1° 33' 1"
147	1° 32' 49"	1° 32' 37"	1° 32' 26"	1° 32' 16"	1° 32' 7"	1° 31' 60"	1° 31' 53"	1° 31' 47"	1° 31' 39"	1° 31' 31"	1° 31' 20"	1° 31' 9"
148	1° 30' 56"	1° 30' 43"	1° 30' 31"	1° 30' 21"	1° 30' 11"	1° 30' 4"	1° 29' 56"	1° 29' 49"	1° 29' 41"	1° 29' 32"	1° 29' 21"	1° 29' 9"
149	1° 28' 56"	1° 28' 43"	1° 28' 30"	1° 28' 19"	1° 28' 9"	1° 28' 1"	1° 27' 53"	1° 27' 45"	1° 27' 37"	1° 27' 27"	1° 27' 16"	1° 27' 3"
150	1° 26' 49"	1° 26' 35"	1° 26' 22"	1° 26' 10"	1° 25' 60"	1° 25' 51"	1° 25' 43"	1° 25' 35"	1° 25' 26"	1° 25' 15"	1° 25' 3"	1° 24' 50"
151	1° 24' 36"	1° 24' 21"	1° 24' 8"	1° 23' 55"	1° 23' 44"	1° 23' 35"	1° 23' 26"	1° 23' 18"	1° 23' 8"	1° 22' 57"	1° 22' 45"	1° 22' 31"
152	1° 22' 16"	1° 22' 1"	1° 21' 47"	1° 21' 34"	1° 21' 23"	1° 21' 13"	1° 21' 4"	1° 20' 54"	1° 20' 44"	1° 20' 33"	1° 20' 20"	1° 20' 6"
153	1° 19' 50"	1° 19' 35"	1° 19' 21"	1° 19' 7"	1° 18' 55"	1° 18' 45"	1° 18' 35"	1° 18' 26"	1° 18' 15"	1° 18' 3"	1° 17' 50"	1° 17' 35"
154	1° 17' 19"	1° 17' 3"	1° 16' 48"	1° 16' 34"	1° 16' 22"	1° 16' 11"	1° 16' 1"	1° 15' 51"	1° 15' 40"	1° 15' 28"	1° 15' 14"	1° 14' 59"
155	1° 14' 42"	1° 14' 26"	1° 14' 11"	1° 13' 56"	1° 13' 44"	1° 13' 32"	1° 13' 22"	1° 13' 11"	1° 12' 60"	1° 12' 47"	1° 12' 33"	1° 12' 17"
156	1° 12' 1"	1° 11' 44"	1° 11' 28"	1° 11' 13"	1° 11' 0"	1° 10' 48"	1° 10' 38"	1° 10' 27"	1° 10' 15"	1° 10' 2"	1° 9' 47"	1° 9' 31"
157	1° 9' 14"	1° 8' 57"	1° 8' 41"	1° 8' 26"	1° 8' 12"	1° 7' 60"	1° 7' 49"	1° 7' 37"	1° 7' 25"	1° 7' 12"	1° 6' 57"	1° 6' 40"
158	1° 6' 23"	1° 6' 5"	1° 5' 49"	1° 5' 33"	1° 5' 19"	1° 5' 7"	1° 4' 55"	1° 4' 44"	1° 4' 31"	1° 4' 17"	1° 4' 2"	1° 3' 45"
159	1° 3' 28"	1° 3' 10"	1° 2' 53"	1° 2' 37"	1° 2' 23"	1° 2' 10"	1° 1' 58"	1° 1' 46"	1° 1' 33"	1° 1' 19"	1° 1' 4"	1° 0' 46"
160	1° 0' 28"	1° 0' 10"	59' 53"	59' 37"	59' 23"	59' 10"	58' 57"	58' 45"	58' 32"	58' 18"	58' 2"	57' 44"
161	57' 26"	57' 8"	56' 50"	56' 34"	56' 19"	56' 6"	55' 53"	55' 41"	55' 27"	55' 13"	54' 57"	54' 39"
162	54' 21"	54' 2"	53' 44"	53' 28"	53' 13"	52' 59"	52' 46"	52' 34"	52' 20"	52' 5"	51' 49"	51' 31"
163	51' 13"	50' 54"	50' 36"	50' 19"	50' 4"	49' 50"	49' 37"	49' 24"	49' 11"	48' 56"	48' 39"	48' 21"
164	48' 2"	47'										

Solar E Differentials -- Epoch 2020 -- Leap Years +1 (LY1)

Dn	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
184	-14' 11"	-14' 27"	-14' 43"	-14' 57"	-15' 10"	-15' 21"	-15' 32"	-15' 42"	-15' 53"	-16' 5"	-16' 19"	-16' 34"
185	-16' 50"	-17' 6"	-17' 22"	-17' 35"	-17' 48"	-17' 59"	-18' 9"	-18' 19"	-18' 29"	-18' 41"	-18' 54"	-19' 9"
186	-19' 25"	-19' 40"	-19' 55"	-20' 9"	-20' 21"	-20' 31"	-20' 41"	-20' 50"	-21' 0"	-21' 12"	-21' 24"	-21' 39"
187	-21' 54"	-22' 9"	-22' 23"	-22' 37"	-22' 48"	-22' 58"	-23' 7"	-23' 16"	-23' 26"	-23' 37"	-23' 49"	-24' 3"
188	-24' 18"	-24' 32"	-24' 46"	-24' 59"	-25' 10"	-25' 19"	-25' 28"	-25' 36"	-25' 46"	-25' 56"	-26' 8"	-26' 21"
189	-26' 35"	-26' 50"	-27' 3"	-27' 15"	-27' 26"	-27' 35"	-27' 43"	-27' 51"	-27' 60"	-28' 9"	-28' 21"	-28' 34"
190	-28' 47"	-29' 1"	-29' 14"	-29' 25"	-29' 35"	-29' 44"	-29' 51"	-29' 59"	-30' 7"	-30' 16"	-30' 27"	-30' 39"
191	-30' 53"	-31' 6"	-31' 18"	-31' 29"	-31' 38"	-31' 46"	-31' 53"	-32' 0"	-32' 8"	-32' 17"	-32' 27"	-32' 39"
192	-32' 51"	-33' 4"	-33' 15"	-33' 26"	-33' 35"	-33' 42"	-33' 48"	-33' 55"	-34' 2"	-34' 10"	-34' 20"	-34' 31"
193	-34' 43"	-34' 54"	-35' 6"	-35' 15"	-35' 24"	-35' 30"	-35' 36"	-35' 42"	-35' 48"	-35' 56"	-36' 5"	-36' 15"
194	-36' 27"	-36' 38"	-36' 49"	-36' 58"	-37' 5"	-37' 11"	-37' 17"	-37' 22"	-37' 27"	-37' 34"	-37' 43"	-37' 53"
195	-38' 3"	-38' 14"	-38' 24"	-38' 32"	-38' 39"	-38' 45"	-38' 49"	-38' 54"	-38' 59"	-39' 5"	-39' 13"	-39' 22"
196	-39' 32"	-39' 42"	-39' 51"	-39' 59"	-40' 5"	-40' 10"	-40' 14"	-40' 18"	-40' 22"	-40' 28"	-40' 35"	-40' 43"
197	-40' 53"	-41' 2"	-41' 10"	-41' 18"	-41' 23"	-41' 27"	-41' 31"	-41' 34"	-41' 37"	-41' 42"	-41' 49"	-41' 56"
198	-42' 5"	-42' 14"	-42' 21"	-42' 28"	-42' 33"	-42' 36"	-42' 39"	-42' 41"	-42' 44"	-42' 48"	-42' 54"	-43' 1"
199	-43' 9"	-43' 17"	-43' 24"	-43' 30"	-43' 34"	-43' 37"	-43' 39"	-43' 40"	-43' 42"	-43' 46"	-43' 51"	-43' 57"
200	-44' 4"	-44' 12"	-44' 18"	-44' 23"	-44' 27"	-44' 29"	-44' 30"	-44' 31"	-44' 32"	-44' 35"	-44' 39"	-44' 45"
201	-44' 51"	-44' 58"	-45' 3"	-45' 8"	-45' 10"	-45' 12"	-45' 12"	-45' 12"	-45' 13"	-45' 15"	-45' 19"	-45' 24"
202	-45' 29"	-45' 35"	-45' 40"	-45' 44"	-45' 46"	-45' 46"	-45' 46"	-45' 45"	-45' 45"	-45' 47"	-45' 50"	-45' 54"
203	-45' 59"	-46' 4"	-46' 8"	-46' 11"	-46' 12"	-46' 12"	-46' 11"	-46' 9"	-46' 9"	-46' 9"	-46' 12"	-46' 15"
204	-46' 19"	-46' 23"	-46' 27"	-46' 29"	-46' 30"	-46' 29"	-46' 27"	-46' 25"	-46' 24"	-46' 23"	-46' 25"	-46' 27"
205	-46' 31"	-46' 34"	-46' 37"	-46' 38"	-46' 38"	-46' 37"	-46' 34"	-46' 31"	-46' 29"	-46' 28"	-46' 29"	-46' 31"
206	-46' 34"	-46' 36"	-46' 38"	-46' 39"	-46' 38"	-46' 36"	-46' 33"	-46' 29"	-46' 26"	-46' 25"	-46' 25"	-46' 26"
207	-46' 28"	-46' 30"	-46' 31"	-46' 31"	-46' 29"	-46' 26"	-46' 22"	-46' 18"	-46' 15"	-46' 12"	-46' 11"	-46' 12"
208	-46' 13"	-46' 14"	-46' 15"	-46' 14"	-46' 12"	-46' 8"	-46' 3"	-45' 58"	-45' 54"	-45' 51"	-45' 49"	-45' 49"
209	-45' 49"	-45' 50"	-45' 50"	-45' 48"	-45' 45"	-45' 41"	-45' 35"	-45' 29"	-45' 24"	-45' 21"	-45' 18"	-45' 17"
210	-45' 17"	-45' 17"	-45' 16"	-45' 14"	-45' 10"	-45' 4"	-44' 58"	-44' 52"	-44' 46"	-44' 42"	-44' 38"	-44' 37"
211	-44' 36"	-44' 35"	-44' 33"	-44' 30"	-44' 25"	-44' 19"	-44' 12"	-44' 5"	-43' 59"	-43' 54"	-43' 50"	-43' 47"
212	-43' 46"	-43' 44"	-43' 41"	-43' 38"	-43' 32"	-43' 26"	-43' 18"	-43' 10"	-43' 3"	-42' 57"	-42' 52"	-42' 49"
213	-42' 47"	-42' 44"	-42' 41"	-42' 37"	-42' 30"	-42' 23"	-42' 15"	-42' 6"	-41' 58"	-41' 51"	-41' 46"	-41' 42"
214	-41' 39"	-41' 36"	-41' 32"	-41' 27"	-41' 20"	-41' 11"	-41' 2"	-40' 53"	-40' 44"	-40' 37"	-40' 31"	-40' 26"
215	-40' 22"	-40' 18"	-40' 14"	-40' 8"	-40' 0"	-39' 51"	-39' 41"	-39' 31"	-39' 22"	-39' 14"	-39' 7"	-39' 1"
216	-38' 57"	-38' 52"	-38' 47"	-38' 40"	-38' 32"	-38' 22"	-38' 11"	-38' 1"	-37' 50"	-37' 42"	-37' 34"	-37' 28"
217	-37' 22"	-37' 17"	-37' 11"	-37' 3"	-36' 54"	-36' 44"	-36' 33"	-36' 21"	-36' 10"	-36' 1"	-35' 52"	-35' 45"
218	-35' 39"	-35' 33"	-35' 26"	-35' 18"	-35' 8"	-34' 57"	-34' 45"	-34' 33"	-34' 21"	-34' 11"	-34' 2"	-33' 54"
219	-33' 47"	-33' 41"	-33' 33"	-33' 24"	-33' 14"	-33' 2"	-32' 49"	-32' 36"	-32' 24"	-32' 12"	-32' 3"	-31' 54"
220	-31' 47"	-31' 39"	-31' 31"	-31' 21"	-31' 10"	-30' 57"	-30' 44"	-30' 30"	-30' 17"	-30' 5"	-29' 55"	-29' 46"
221	-29' 37"	-29' 29"	-29' 20"	-29' 10"	-28' 58"	-28' 44"	-28' 30"	-28' 16"	-28' 2"	-27' 49"	-27' 38"	-27' 28"
222	-27' 19"	-27' 10"	-27' 0"	-26' 49"	-26' 37"	-26' 22"	-26' 7"	-25' 52"	-25' 38"	-25' 25"	-25' 13"	-25' 2"
223	-24' 52"	-24' 43"	-24' 32"	-24' 20"	-24' 7"	-23' 52"	-23' 36"	-23' 21"	-23' 5"	-22' 51"	-22' 39"	-22' 27"
224	-22' 17"	-22' 6"	-21' 55"	-21' 43"	-21' 29"	-21' 13"	-20' 57"	-20' 40"	-20' 24"	-20' 10"	-19' 56"	-19' 44"
225	-19' 33"	-19' 22"	-19' 10"	-18' 57"	-18' 42"	-18' 26"	-18' 9"	-17' 51"	-17' 35"	-17' 19"	-17' 5"	-16' 53"
226	-16' 41"	-16' 29"	-16' 16"	-16' 2"	-15' 47"	-15' 30"	-15' 12"	-14' 54"	-14' 37"	-14' 21"	-14' 6"	-13' 53"
227	-13' 40"	-13' 27"	-13' 14"	-12' 59"	-12' 43"	-12' 26"	-12' 7"	-11' 49"	-11' 31"	-11' 14"	-10' 59"	-10' 45"
228	-10' 31"	-10' 18"	-10' 4"	-9' 49"	-9' 32"	-9' 14"	-8' 55"	-8' 35"	-8' 17"	-7' 59"	-7' 43"	-7' 29"
229	-7' 15"	-7' 1"	-6' 46"	-6' 30"	-6' 13"	-5' 54"	-5' 34"	-5' 14"	-4' 55"	-4' 37"	-4' 20"	-4' 5"
230	-3' 50"	-3' 36"	-3' 20"	-3' 4"	-2' 46"	-2' 26"	-2' 6"	-1' 45"	-1' 25"	-1' 7"	-49"	-33"
231	-18" 1"	-3"	13"	30"	49"	1' 9"	1' 30"	1' 51"	2' 12"	2' 31"	2' 49"	3' 5"
232	3' 21"	3' 37"	3' 53"	4' 11"	4' 31"	4' 51"	5' 13"	5' 35"	5' 56"	6' 16"	6' 34"	6' 51"
233	7' 8"	7' 24"	7' 41"	7' 59"	8' 19"	8' 41"	9' 3"	9' 25"	9' 47"	10' 7"	10' 26"	10' 44"
234	11' 1"	11' 18"	11' 35"	11' 54"	12' 15"	12' 36"	12' 59"	13' 22"	13' 44"	14' 5"	14' 25"	14' 43"
235	15' 0"	15' 18"	15' 36"	15' 55"	16' 16"	16' 39"	17' 2"	17' 25"	17' 48"	18' 9"	18' 29"	18' 48"
236	19' 6"	19' 24"	19' 43"	20' 3"	20' 24"	20' 47"	21' 11"	21' 35"	21' 58"	22' 20"	22' 40"	22' 59"
237	23' 18"	23' 36"	23' 56"	24' 16"	24' 38"	25' 1"	25' 26"	25' 50"	26' 13"	26' 36"	26' 57"	27' 17"
238	27' 36"	27' 54"	28' 14"	28' 35"	28' 58"	29' 21"	29' 46"	30' 11"	30' 35"	30' 58"	31' 19"	31' 39"
239	31' 59"	32' 18"	32' 38"	32' 59"	33' 22"	33' 47"	34' 12"	34' 37"	35' 1"	35' 25"	35' 46"	36' 7"
240	36' 27"	36' 47"	37' 7"	37' 29"	37' 52"	38' 17"	38' 42"	39' 8"	39' 33"	39' 57"	40' 19"	40' 40"
241	41' 0"	41' 20"	41' 41"	42' 3"	42' 27"	42' 52"	43' 18"	43' 44"	44' 9"	44' 33"	44' 56"	45' 18"
242	45' 38"	45' 59"	46' 20"	46' 43"	47' 7"	47' 32"	47' 58"	48' 25"	48' 50"	49' 15"	49' 38"	49' 60"
243	50' 21"	50' 42"	51' 3"	51' 26"	51' 51"	52' 16"	52' 43"	53' 10"	53' 36"	54' 1"	54' 24"	54' 46"
244	55' 7"	55' 29"	55' 51"	56' 14"	56' 39"	57' 5"	57' 32"	57' 59"	58' 25"	58' 50"	59' 14"	59' 36"
245	59' 58"	1' 0' 20"	1' 0' 42"	1' 0' 6"	1' 0' 31"	1' 0' 57"	1' 2' 24"	1' 2' 52"	1' 3' 18"	1' 3' 44"	1' 4' 8"	1' 4' 30"
246	1' 4' 52"	1' 5' 14"	1' 5' 37"	1' 6' 1"	1' 6' 26"	1' 6' 53"	1' 7' 21"	1' 7' 48"	1' 8' 15"	1' 8' 41"	1' 9' 5"	1' 9' 28"
247	1' 9' 50"	1' 10' 13"	1' 10' 36"	1' 10' 60"	1' 11' 26"	1' 11' 53"	1' 12' 20"	1' 12' 48"	1' 13' 16"	1' 13' 42"	1' 14' 6"	1' 14' 29"
248	1' 14' 52"	1' 15' 14"	1' 15' 38"	1' 16' 2"	1' 16' 28"	1' 16' 55"	1' 17' 23"	1' 17' 51"	1' 18' 19"	1' 18' 45"	1' 19' 10"	1' 19' 34"
249	1' 19' 56"	1' 20' 19"	1' 20' 42"	1' 21' 7"	1' 21' 33"	1' 22' 1"	1' 22' 29"	1' 22' 58"	1' 23' 25"	1' 23' 52"	1' 24' 17"	1' 24' 41"
250	1' 25' 4"	1' 25' 27"	1' 25' 50"	1' 26' 15"	1' 26' 42"	1' 27' 9"	1' 27' 38"	1' 28' 7"	1' 28' 35"	1' 29' 1"	1' 29' 26"	1' 29' 50"
251	1' 30' 14"	1' 30' 37"	1' 31' 1"	1' 31' 26"	1' 31' 53"	1' 32' 21"	1' 32' 49"	1' 33' 18"	1' 33' 46"	1' 34' 13"	1' 34' 39"	1' 35' 3"
252	1' 35' 26"	1' 35' 49"	1' 36' 14"	1' 36' 39"	1' 37' 6"	1' 37' 34"	1' 38' 3"	1' 38' 32"	1' 39' 0"	1' 39' 27"	1' 39' 53"	1' 40' 17"
253	1' 40' 41"	1' 41' 4"	1' 41' 29"	1' 41' 54"	1' 42' 21"	1' 42' 50"	1' 43' 19"	1' 43' 48"	1' 44' 16"	1' 44' 43"	1' 45' 9"	1' 45' 34"
254	1' 45' 57"	1' 46' 21"	1' 46' 46"	1' 47' 11"	1' 47' 39"	1' 48' 7"	1' 48' 36"	1' 49' 6"	1' 49' 34"	1' 50' 1"	1' 50' 27"	1' 50' 52"
255	1' 51' 16"	1' 51' 40"	1' 52' 4"	1' 52' 30"	1' 52' 57"	1' 53' 26"	1' 53' 55"	1' 54' 25"	1' 54' 54"	1' 55' 21"	1' 55' 47"	1' 56' 12"
256	1' 56' 36"	1' 56' 60"	1' 57' 24"	1' 57' 50"	1' 58' 18"	1' 58' 46"	1' 59' 16"	1' 59' 45"	2' 0' 14"	2' 0' 42"	2' 1' 8"	2' 1' 33"
257	2' 1' 57"	2' 2' 21"	2' 2' 46"	2' 3' 12"	2' 3' 39"	2' 4' 8"	2' 4' 37"	2' 5' 7"	2' 5' 36"	2' 6' 3"	2' 6' 30"	2' 6' 54"
258	2' 7' 19"	2' 7' 43"	2' 8' 7"	2' 8' 34"	2' 9' 1"	2' 9' 30"	2' 9' 60"	2' 10' 29"	2' 10' 58"	2' 11' 26"	2' 11' 52"	2' 12' 17"
259	2' 12' 41"	2' 13' 5"	2' 13' 30"	2' 13' 56"	2' 14' 24"	2' 14' 52"	2' 15' 22"	2' 15' 52"	2' 16' 21"	2' 16' 48"	2' 17' 14"	2' 17' 39"
260	2' 18' 3"	2' 18' 28"	2' 18' 52"	2' 19' 18"	2' 19' 46"	2' 20' 15"	2' 20' 44"	2' 21' 14"	2' 21' 43"	2' 22' 11"	2' 22' 37"	2' 23' 2"
261	2' 23' 26"	2' 23' 50"	2' 24' 15"	2' 24' 41"	2' 25' 8"	2' 25' 37"	2' 26' 7"	2' 26' 36"	2' 27' 5"	2' 27' 33"	2' 27' 59"	2' 28' 23"
262	2' 28' 48"	2' 29' 12"	2' 29' 36"	2' 30' 2"	2' 30' 30"	2' 30' 59"	2' 31' 28"	2' 31' 58"	2' 32' 26"	2' 32' 54"	2' 33' 20"	2' 33' 44"
263	2' 34' 8"	2' 34' 32"	2' 34' 57"	2' 35' 23"	2' 35' 50"	2' 36' 19"	2' 36' 48"	2' 37' 18"	2' 37' 46"	2' 38' 14"	2' 38' 40"	2' 39' 4"
264	2' 39' 28"	2' 39' 52"	2' 40' 16"	2' 40' 42"	2' 41' 9"	2' 41' 38"	2' 42' 7"	2' 42' 36"				

Solar E Differentials -- Epoch 2020 -- Leap Years +1 (LY1)

Dn	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
276	3°39'42"	3°40'2"	3°40'23"	3°40'45"	3°41'9"	3°41'34"	3°41'59"	3°42'25"	3°42'50"	3°43'13"	3°43'35"	3°43'55"
277	3°44'15"	3°44'35"	3°44'55"	3°45'17"	3°45'40"	3°46'5"	3°46'30"	3°46'55"	3°47'19"	3°47'42"	3°48'3"	3°48'23"
278	3°48'43"	3°49'2"	3°49'22"	3°49'43"	3°50'6"	3°50'30"	3°50'55"	3°51'19"	3°51'43"	3°52'5"	3°52'26"	3°52'46"
279	3°53'5"	3°53'23"	3°53'43"	3°54'4"	3°54'26"	3°54'49"	3°55'13"	3°55'37"	3°56'1"	3°56'22"	3°56'43"	3°57'2"
280	3°57'20"	3°57'38"	3°57'57"	3°58'18"	3°58'39"	3°59'2"	3°59'26"	3°59'49"	4°0'12"	4°0'33"	4°0'53"	4°1'12"
281	4°1'29"	4°1'47"	4°2'6"	4°2'25"	4°2'47"	4°3'9"	4°3'32"	4°3'55"	4°4'17"	4°4'38"	4°4'57"	4°5'15"
282	4°5'32"	4°5'49"	4°6'7"	4°6'27"	4°6'47"	4°7'9"	4°7'31"	4°7'54"	4°8'15"	4°8'36"	4°8'54"	4°9'12"
283	4°9'28"	4°9'45"	4°10'2"	4°10'21"	4°10'41"	4°11'2"	4°11'24"	4°11'46"	4°12'7"	4°12'26"	4°12'45"	4°13'1"
284	4°13'17"	4°13'33"	4°13'50"	4°14'8"	4°14'28"	4°14'48"	4°15'9"	4°15'31"	4°15'51"	4°16'10"	4°16'28"	4°16'44"
285	4°16'59"	4°17'15"	4°17'31"	4°17'48"	4°18'7"	4°18'27"	4°18'47"	4°19'8"	4°19'28"	4°19'46"	4°20'3"	4°20'19"
286	4°20'33"	4°20'48"	4°21'4"	4°21'20"	4°21'38"	4°21'58"	4°22'18"	4°22'38"	4°22'57"	4°23'15"	4°23'31"	4°23'46"
287	4°23'60"	4°24'14"	4°24'29"	4°24'45"	4°25'2"	4°25'21"	4°25'40"	4°25'59"	4°26'18"	4°26'35"	4°26'50"	4°27'5"
288	4°27'18"	4°27'31"	4°27'46"	4°28'1"	4°28'18"	4°28'36"	4°28'54"	4°29'13"	4°29'31"	4°29'47"	4°30'2"	4°30'15"
289	4°30'28"	4°30'41"	4°30'54"	4°31'9"	4°31'25"	4°31'42"	4°31'60"	4°32'18"	4°32'35"	4°32'50"	4°33'4"	4°33'17"
290	4°33'29"	4°33'41"	4°33'54"	4°34'7"	4°34'23"	4°34'39"	4°34'57"	4°35'14"	4°35'30"	4°35'45"	4°35'58"	4°36'10"
291	4°36'21"	4°36'32"	4°36'44"	4°36'57"	4°37'12"	4°37'28"	4°37'44"	4°38'0"	4°38'16"	4°38'30"	4°38'42"	4°38'53"
292	4°39'4"	4°39'14"	4°39'25"	4°39'38"	4°39'51"	4°40'6"	4°40'22"	4°40'38"	4°40'52"	4°41'5"	4°41'17"	4°41'27"
293	4°41'37"	4°41'47"	4°41'57"	4°42'8"	4°42'21"	4°42'35"	4°42'50"	4°43'5"	4°43'19"	4°43'31"	4°43'42"	4°43'52"
294	4°44'0"	4°44'9"	4°44'18"	4°44'29"	4°44'41"	4°44'55"	4°45'8"	4°45'22"	4°45'35"	4°45'47"	4°45'57"	4°46'6"
295	4°46'13"	4°46'21"	4°46'30"	4°46'40"	4°46'51"	4°47'3"	4°47'16"	4°47'29"	4°47'41"	4°47'52"	4°48'1"	4°48'9"
296	4°48'16"	4°48'23"	4°48'31"	4°48'40"	4°48'50"	4°49'2"	4°49'14"	4°49'26"	4°49'37"	4°49'47"	4°49'55"	4°50'2"
297	4°50'8"	4°50'14"	4°50'21"	4°50'29"	4°50'38"	4°50'49"	4°51'0"	4°51'11"	4°51'22"	4°51'31"	4°51'38"	4°51'44"
298	4°51'49"	4°51'54"	4°51'60"	4°52'7"	4°52'16"	4°52'25"	4°52'36"	4°52'46"	4°52'55"	4°53'3"	4°53'10"	4°53'15"
299	4°53'19"	4°53'23"	4°53'28"	4°53'34"	4°53'42"	4°53'50"	4°53'60"	4°54'9"	4°54'18"	4°54'25"	4°54'30"	4°54'34"
300	4°54'37"	4°54'41"	4°54'44"	4°54'50"	4°54'56"	4°55'4"	4°55'13"	4°55'21"	4°55'28"	4°55'35"	4°55'39"	4°55'42"
301	4°55'44"	4°55'46"	4°55'49"	4°55'54"	4°55'59"	4°56'6"	4°56'14"	4°56'21"	4°56'28"	4°56'33"	4°56'36"	4°56'38"
302	4°56'39"	4°56'41"	4°56'43"	4°56'46"	4°56'51"	4°56'56"	4°57'3"	4°57'9"	4°57'15"	4°57'19"	4°57'21"	4°57'22"
303	4°57'23"	4°57'23"	4°57'24"	4°57'26"	4°57'30"	4°57'35"	4°57'40"	4°57'46"	4°57'50"	4°57'53"	4°57'54"	4°57'55"
304	4°57'54"	4°57'53"	4°57'53"	4°57'54"	4°57'57"	4°58'1"	4°58'5"	4°58'10"	4°58'13"	4°58'15"	4°58'15"	4°58'15"
305	4°58'13"	4°58'11"	4°58'10"	4°58'10"	4°58'12"	4°58'15"	4°58'18"	4°58'21"	4°58'24"	4°58'25"	4°58'24"	4°58'22"
306	4°58'19"	4°58'17"	4°58'14"	4°58'14"	4°58'14"	4°58'16"	4°58'18"	4°58'21"	4°58'22"	4°58'22"	4°58'21"	4°58'18"
307	4°58'14"	4°58'10"	4°58'7"	4°58'5"	4°58'4"	4°58'5"	4°58'7"	4°58'8"	4°58'8"	4°58'7"	4°58'5"	4°58'0"
308	4°57'56"	4°57'51"	4°57'46"	4°57'44"	4°57'42"	4°57'42"	4°57'42"	4°57'42"	4°57'42"	4°57'40"	4°57'36"	4°57'31"
309	4°57'25"	4°57'19"	4°57'14"	4°57'10"	4°57'7"	4°57'6"	4°57'5"	4°57'5"	4°57'3"	4°56'60"	4°56'55"	4°56'49"
310	4°56'42"	4°56'35"	4°56'29"	4°56'24"	4°56'20"	4°56'18"	4°56'16"	4°56'14"	4°56'12"	4°56'8"	4°56'2"	4°55'55"
311	4°55'47"	4°55'38"	4°55'31"	4°55'25"	4°55'21"	4°55'17"	4°55'15"	4°55'12"	4°55'8"	4°54'56"	4°54'48"	4°54'48"
312	4°54'39"	4°54'30"	4°54'21"	4°54'14"	4°54'9"	4°54'4"	4°54'0"	4°53'57"	4°53'52"	4°53'46"	4°53'38"	4°53'28"
313	4°53'18"	4°53'8"	4°52'59"	4°52'51"	4°52'44"	4°52'39"	4°52'34"	4°52'29"	4°52'23"	4°52'16"	4°52'7"	4°51'57"
314	4°51'46"	4°51'35"	4°51'24"	4°51'15"	4°51'7"	4°51'1"	4°50'55"	4°50'49"	4°50'42"	4°50'34"	4°50'24"	4°50'13"
315	4°50'1"	4°49'48"	4°49'37"	4°49'27"	4°49'18"	4°49'11"	4°49'4"	4°48'57"	4°48'49"	4°48'40"	4°48'29"	4°48'16"
316	4°48'3"	4°47'50"	4°47'37"	4°47'26"	4°47'16"	4°47'8"	4°46'60"	4°46'52"	4°46'43"	4°46'33"	4°46'7"	4°46'7"
317	4°45'53"	4°45'39"	4°45'25"	4°45'13"	4°45'2"	4°44'52"	4°44'44"	4°44'35"	4°44'25"	4°44'13"	4°44'0"	4°43'46"
318	4°43'30"	4°43'15"	4°43'0"	4°42'47"	4°42'35"	4°42'25"	4°42'15"	4°42'5"	4°41'54"	4°41'41"	4°41'27"	4°41'12"
319	4°40'55"	4°40'39"	4°40'23"	4°40'9"	4°39'56"	4°39'45"	4°39'34"	4°39'23"	4°39'11"	4°38'57"	4°38'42"	4°38'25"
320	4°38'8"	4°37'51"	4°37'34"	4°37'19"	4°37'5"	4°36'52"	4°36'40"	4°36'28"	4°36'15"	4°36'0"	4°35'44"	4°35'27"
321	4°35'8"	4°34'50"	4°34'32"	4°34'16"	4°34'1"	4°33'47"	4°33'34"	4°33'21"	4°33'7"	4°32'51"	4°32'34"	4°32'16"
322	4°31'56"	4°31'37"	4°31'18"	4°31'0"	4°30'44"	4°30'30"	4°30'16"	4°30'2"	4°29'46"	4°29'30"	4°29'12"	4°28'52"
323	4°28'32"	4°28'11"	4°27'51"	4°27'33"	4°27'16"	4°27'0"	4°26'45"	4°26'30"	4°26'14"	4°25'56"	4°25'37"	4°25'16"
324	4°24'55"	4°24'33"	4°24'13"	4°23'53"	4°23'35"	4°23'18"	4°23'2"	4°22'46"	4°22'29"	4°22'10"	4°21'50"	4°21'29"
325	4°21'6"	4°20'44"	4°20'22"	4°20'1"	4°19'42"	4°19'24"	4°19'7"	4°18'50"	4°18'32"	4°18'13"	4°17'51"	4°17'29"
326	4°17'5"	4°16'42"	4°16'19"	4°15'57"	4°15'37"	4°15'19"	4°15'1"	4°14'42"	4°14'23"	4°14'3"	4°13'41"	4°13'17"
327	4°12'53"	4°12'28"	4°12'4"	4°11'42"	4°11'21"	4°11'1"	4°10'42"	4°10'23"	4°10'3"	4°9'41"	4°9'18"	4°8'54"
328	4°8'28"	4°8'3"	4°7'38"	4°7'14"	4°6'52"	4°6'32"	4°6'12"	4°5'52"	4°5'31"	4°5'8"	4°4'44"	4°4'18"
329	4°3'52"	4°3'26"	4°2'60"	4°2'35"	4°2'12"	4°1'51"	4°1'30"	4°1'9"	4°0'47"	4°0'24"	3°59'59"	3°59'32"
330	3°59'5"	3°58'37"	3°58'11"	3°57'45"	3°57'21"	3°56'59"	3°56'37"	3°56'15"	3°55'52"	3°55'28"	3°55'2"	3°54'34"
331	3°54'6"	3°53'38"	3°53'10"	3°52'44"	3°52'19"	3°51'56"	3°51'33"	3°51'10"	3°50'46"	3°50'21"	3°49'54"	3°49'26"
332	3°48'57"	3°48'27"	3°47'59"	3°47'32"	3°47'6"	3°46'42"	3°46'18"	3°45'54"	3°45'30"	3°45'4"	3°44'36"	3°44'7"
333	3°43'37"	3°43'7"	3°42'37"	3°42'9"	3°41'43"	3°41'17"	3°40'53"	3°40'28"	3°40'3"	3°39'36"	3°39'7"	3°38'37"
334	3°38'6"	3°37'35"	3°37'5"	3°36'36"	3°36'9"	3°35'43"	3°35'18"	3°34'52"	3°34'26"	3°33'58"	3°33'29"	3°32'58"
335	3°32'26"	3°31'54"	3°31'23"	3°30'54"	3°30'25"	3°29'59"	3°29'32"	3°29'6"	3°28'39"	3°28'11"	3°27'40"	3°27'9"
336	3°26'36"	3°26'4"	3°25'32"	3°25'1"	3°24'32"	3°24'5"	3°23'38"	3°23'11"	3°22'43"	3°22'14"	3°21'43"	3°21'10"
337	3°20'37"	3°20'4"	3°19'31"	3°18'60"	3°18'30"	3°18'2"	3°17'34"	3°17'7"	3°16'38"	3°16'8"	3°15'36"	3°15'3"
338	3°14'29"	3°13'55"	3°13'22"	3°12'50"	3°12'20"	3°11'51"	3°11'22"	3°10'54"	3°10'25"	3°9'54"	3°9'22"	3°8'48"
339	3°8'13"	3°7'39"	3°7'5"	3°6'32"	3°6'1"	3°5'31"	3°5'2"	3°4'33"	3°4'3"	3°3'32"	3°2'59"	3°2'25"
340	3°1'49"	3°1'14"	3°0'39"	3°0'6"	2°59'35"	2°59'4"	2°58'35"	2°58'5"	2°57'35"	2°57'3"	2°56'29"	2°55'54"
341	2°55'18"	2°54'42"	2°54'7"	2°53'33"	2°53'1"	2°52'30"	2°52'0"	2°51'30"	2°50'59"	2°50'26"	2°49'52"	2°49'17"
342	2°48'40"	2°48'4"	2°47'28"	2°46'54"	2°46'21"	2°45'50"	2°45'19"	2°44'48"	2°44'17"	2°43'44"	2°43'9"	2°42'33"
343	2°41'56"	2°41'19"	2°40'43"	2°40'8"	2°39'35"	2°39'3"	2°38'31"	2°38'0"	2°37'28"	2°36'55"	2°36'20"	2°35'43"
344	2°35'6"	2°34'28"	2°33'51"	2°33'16"	2°32'42"	2°32'10"	2°31'38"	2°31'7"	2°30'34"	2°30'0"	2°29'25"	2°28'48"
345	2°28'10"	2°27'32"	2°26'55"	2°26'19"	2°25'45"	2°25'12"	2°24'40"	2°24'8"	2°23'35"	2°23'1"	2°22'25"	2°21'47"
346	2°21'9"	2°20'31"	2°19'53"	2°19'17"	2°18'42"	2°18'9"	2°17'37"	2°17'4"	2°16'31"	2°15'57"	2°15'20"	2°14'42"
347	2°14'4"	2°13'25"	2°12'47"	2°12'11"	2°11'36"	2°11'2"	2°10'29"	2°9'57"	2°9'23"	2°8'48"	2°8'11"	2°7'33"
348	2°6'54"	2°6'15"	2°5'37"	2°5'0"	2°4'25"	2°3'51"	2°3'18"	2°2'45"	2°2'11"	2°1'36"	2°0'59"	2°0'20"
349	1°59'41"	1°59'2"	1°58'23"	1°57'46"	1°57'10"	1°56'36"	1°56'3"	1°55'30"	1°54'55"	1°54'20"	1°53'43"	1°53'4"
350	1°52'25"	1°51'45"	1°51'6"	1°50'29"	1°49'53"	1°49'19"	1°48'45"	1°48'11"	1°47'37"	1°47'1"	1°46'24"	1°45'45"
351	1°45'5"	1°44'25"	1°43'46"	1°43'9"	1°42'33"	1°41'58"	1°41'24"	1°40'51"	1°40'16"	1°39'40"	1°39'3"	1°38'23"
352	1°37'44"	1°37'4"	1°36'24"	1°35'47"	1°35'10"	1°34'36"	1°34'2"	1°33'28"	1°32'53"	1°32'17"	1°31'39"	1°31'0"
353	1°30'20"	1°29'40"	1°29'1"	1°28'23"	1°27'46"	1°27'11"	1°26'37"	1°26'3"	1°25'29"	1°24'52"	1°24'14"	1°23'35"
354	1°22'55"	1°22'15"	1°21'35"	1°20'57"	1°20'21"	1°19'46"	1°19'12"	1°18'38"	1°18'3"	1°17'27"	1°16'49"	1°16'9"

Solar Declination Differentials -- Epoch 2020 -- Leap Years +2 (LY2)

Dn	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
0	0°	24'	48"	1' 11"	1' 35"	1' 59"	2' 24"	2' 50"	3' 16"	3' 43"	4' 10"	4' 37"
1	5' 4"	5' 30"	5' 56"	6' 22"	6' 48"	7' 14"	7' 41"	8' 9"	8' 38"	9' 7"	9' 36"	10' 5"
2	10' 34"	11' 3"	11' 31"	11' 59"	12' 28"	12' 56"	13' 26"	13' 56"	14' 27"	14' 58"	15' 30"	16' 1"
3	16' 33"	17' 4"	17' 34"	18' 4"	18' 35"	19' 6"	19' 38"	20' 10"	20' 43"	21' 17"	21' 51"	22' 25"
4	22' 58"	23' 31"	24' 4"	24' 37"	25' 9"	25' 43"	26' 17"	26' 51"	27' 27"	28' 2"	28' 39"	29' 15"
5	29' 50"	30' 26"	31' 1"	31' 36"	32' 11"	32' 46"	33' 22"	33' 59"	34' 37"	35' 15"	35' 53"	36' 31"
6	37' 9"	37' 47"	38' 24"	39' 1"	39' 38"	40' 16"	40' 54"	41' 34"	42' 13"	42' 54"	43' 34"	44' 15"
7	44' 55"	45' 34"	46' 14"	46' 53"	47' 33"	48' 13"	48' 53"	49' 34"	50' 16"	50' 59"	51' 41"	52' 24"
8	53' 6"	53' 48"	54' 30"	55' 11"	55' 53"	56' 35"	57' 18"	58' 1"	58' 45"	59' 30"	1° 0' 15"	1° 0' 60"
9	1° 1' 44"	1° 2' 28"	1° 3' 12"	1° 3' 56"	1° 4' 39"	1° 5' 24"	1° 6' 9"	1° 6' 54"	1° 7' 40"	1° 8' 27"	1° 9' 14"	1° 10' 1"
10	1° 10' 48"	1° 11' 34"	1° 12' 20"	1° 13' 6"	1° 13' 52"	1° 14' 38"	1° 15' 25"	1° 16' 13"	1° 17' 1"	1° 17' 50"	1° 18' 39"	1° 19' 28"
11	1° 20' 17"	1° 21' 5"	1° 21' 53"	1° 22' 41"	1° 23' 29"	1° 24' 17"	1° 25' 7"	1° 25' 56"	1° 26' 47"	1° 27' 38"	1° 28' 29"	1° 29' 20"
12	1° 30' 11"	1° 31' 1"	1° 31' 51"	1° 32' 41"	1° 33' 32"	1° 34' 22"	1° 35' 13"	1° 36' 5"	1° 36' 58"	1° 37' 51"	1° 38' 44"	1° 39' 37"
13	1° 40' 30"	1° 41' 22"	1° 42' 15"	1° 43' 7"	1° 43' 59"	1° 44' 52"	1° 45' 45"	1° 46' 39"	1° 47' 33"	1° 48' 28"	1° 49' 24"	1° 50' 19"
14	1° 51' 14"	1° 52' 8"	1° 53' 2"	1° 53' 57"	1° 54' 51"	1° 55' 45"	1° 56' 41"	1° 57' 37"	1° 58' 33"	1° 59' 30"	2° 0' 28"	2° 1' 25"
15	2° 2' 22"	2° 3' 18"	2° 4' 14"	2° 5' 11"	2° 6' 7"	2° 7' 3"	2° 8' 1"	2° 8' 59"	2° 9' 57"	2° 10' 56"	2° 11' 56"	2° 12' 55"
16	2° 13' 54"	2° 14' 52"	2° 15' 50"	2° 16' 49"	2° 17' 47"	2° 18' 45"	2° 19' 45"	2° 20' 45"	2° 21' 45"	2° 22' 46"	2° 23' 47"	2° 24' 48"
17	2° 25' 49"	2° 26' 50"	2° 27' 50"	2° 28' 50"	2° 29' 50"	2° 30' 51"	2° 31' 52"	2° 32' 54"	2° 33' 56"	2° 34' 59"	2° 36' 2"	2° 37' 5"
18	2° 38' 8"	2° 39' 11"	2° 40' 13"	2° 41' 15"	2° 42' 17"	2° 43' 20"	2° 44' 23"	2° 45' 26"	2° 46' 31"	2° 47' 36"	2° 48' 41"	2° 49' 46"
19	2° 50' 50"	2° 51' 55"	2° 52' 59"	2° 54' 3"	2° 55' 7"	2° 56' 11"	2° 57' 16"	2° 58' 22"	2° 59' 28"	3° 0' 35"	3° 1' 42"	3° 2' 48"
20	3° 3' 55"	3° 5' 1"	3° 6' 7"	3° 7' 13"	3° 8' 19"	3° 9' 25"	3° 10' 32"	3° 11' 40"	3° 12' 48"	3° 13' 56"	3° 15' 5"	3° 16' 14"
21	3° 17' 22"	3° 18' 30"	3° 19' 38"	3° 20' 46"	3° 21' 53"	3° 23' 1"	3° 24' 10"	3° 25' 19"	3° 26' 29"	3° 27' 40"	3° 28' 50"	3° 30' 1"
22	3° 31' 11"	3° 32' 21"	3° 33' 31"	3° 34' 40"	3° 35' 50"	3° 36' 60"	3° 38' 10"	3° 39' 21"	3° 40' 33"	3° 41' 45"	3° 42' 58"	3° 44' 10"
23	3° 45' 22"	3° 46' 34"	3° 47' 45"	3° 48' 56"	3° 50' 8"	3° 51' 19"	3° 52' 32"	3° 53' 45"	3° 54' 58"	3° 56' 12"	3° 57' 26"	3° 58' 40"
24	3° 59' 54"	4° 1' 8"	4° 2' 21"	4° 3' 34"	4° 4' 47"	4° 6' 0"	4° 7' 14"	4° 8' 29"	4° 9' 44"	4° 11' 0"	4° 12' 16"	4° 13' 32"
25	4° 14' 47"	4° 16' 2"	4° 17' 17"	4° 18' 32"	4° 19' 47"	4° 21' 2"	4° 22' 18"	4° 23' 34"	4° 24' 51"	4° 26' 9"	4° 27' 26"	4° 28' 44"
26	4° 30' 1"	4° 31' 18"	4° 32' 34"	4° 33' 51"	4° 35' 8"	4° 36' 24"	4° 37' 42"	4° 38' 60"	4° 40' 19"	4° 41' 38"	4° 42' 57"	4° 44' 16"
27	4° 45' 35"	4° 46' 54"	4° 48' 12"	4° 49' 30"	4° 50' 48"	4° 52' 7"	4° 53' 26"	4° 54' 46"	4° 56' 6"	4° 57' 27"	4° 58' 47"	5° 0' 8"
28	5° 1' 29"	5° 2' 49"	5° 4' 9"	5° 5' 29"	5° 6' 49"	5° 8' 9"	5° 9' 30"	5° 10' 51"	5° 12' 13"	5° 13' 35"	5° 14' 57"	5° 16' 20"
29	5° 17' 42"	5° 19' 4"	5° 20' 25"	5° 21' 47"	5° 23' 8"	5° 24' 30"	5° 25' 52"	5° 27' 15"	5° 28' 39"	5° 30' 3"	5° 31' 27"	5° 32' 51"
30	5° 34' 14"	5° 35' 38"	5° 37' 1"	5° 38' 24"	5° 39' 47"	5° 41' 10"	5° 42' 34"	5° 43' 59"	5° 45' 24"	5° 46' 49"	5° 48' 14"	5° 49' 40"
31	5° 51' 5"	5° 52' 30"	5° 53' 55"	5° 55' 19"	5° 56' 44"	5° 58' 9"	5° 59' 34"	6° 1' 0"	6° 2' 27"	6° 3' 54"	6° 5' 21"	6° 6' 48"
32	6° 8' 14"	6° 9' 41"	6° 11' 7"	6° 12' 33"	6° 13' 59"	6° 15' 25"	6° 16' 52"	6° 18' 20"	6° 19' 48"	6° 21' 16"	6° 22' 45"	6° 24' 13"
33	6° 25' 41"	6° 27' 9"	6° 28' 37"	6° 30' 4"	6° 31' 32"	6° 32' 60"	6° 34' 28"	6° 35' 57"	6° 37' 26"	6° 38' 56"	6° 40' 26"	6° 41' 56"
34	6° 43' 25"	6° 44' 55"	6° 46' 24"	6° 47' 53"	6° 49' 22"	6° 50' 51"	6° 52' 21"	6° 53' 51"	6° 55' 22"	6° 56' 53"	6° 58' 24"	6° 59' 55"
35	7° 1' 26"	7° 2' 57"	7° 4' 28"	7° 5' 58"	7° 7' 28"	7° 8' 59"	7° 10' 30"	7° 12' 12"	7° 13' 34"	7° 15' 7"	7° 16' 39"	7° 18' 12"
36	7° 19' 44"	7° 21' 16"	7° 22' 48"	7° 24' 20"	7° 25' 51"	7° 27' 24"	7° 28' 56"	7° 30' 29"	7° 32' 2"	7° 33' 36"	7° 35' 10"	7° 36' 44"
37	7° 38' 18"	7° 39' 51"	7° 41' 24"	7° 42' 57"	7° 44' 31"	7° 46' 4"	7° 47' 38"	7° 49' 12"	7° 50' 47"	7° 52' 22"	7° 53' 57"	7° 55' 32"
38	7° 57' 7"	7° 58' 42"	8° 0' 16"	8° 1' 51"	8° 3' 25"	8° 4' 60"	8° 6' 35"	8° 8' 10"	8° 9' 46"	8° 11' 23"	8° 12' 59"	8° 14' 36"
39	8° 16' 12"	8° 17' 48"	8° 19' 23"	8° 20' 59"	8° 22' 35"	8° 24' 11"	8° 25' 47"	8° 27' 24"	8° 29' 1"	8° 30' 38"	8° 32' 16"	8° 33' 54"
40	8° 35' 31"	8° 37' 8"	8° 38' 45"	8° 40' 22"	8° 41' 59"	8° 43' 36"	8° 45' 14"	8° 46' 52"	8° 48' 30"	8° 50' 9"	8° 51' 48"	8° 53' 26"
41	8° 55' 5"	8° 56' 43"	8° 58' 21"	8° 59' 59"	9° 1' 37"	9° 3' 16"	9° 4' 54"	9° 6' 34"	9° 8' 13"	9° 9' 53"	9° 11' 33"	9° 13' 13"
42	9° 14' 53"	9° 16' 32"	9° 18' 11"	9° 19' 51"	9° 21' 30"	9° 23' 9"	9° 24' 49"	9° 26' 29"	9° 28' 10"	9° 29' 51"	9° 31' 32"	9° 33' 13"
43	9° 34' 54"	9° 36' 34"	9° 38' 15"	9° 39' 55"	9° 41' 35"	9° 43' 16"	9° 44' 57"	9° 46' 38"	9° 48' 20"	9° 50' 2"	9° 51' 44"	9° 53' 26"
44	9° 55' 8"	9° 56' 50"	9° 58' 31"	10° 0' 13"	10° 1' 54"	10° 3' 36"	10° 5' 18"	10° 7' 0"	10° 8' 43"	10° 10' 26"	10° 12' 9"	10° 13' 52"
45	10° 15' 35"	10° 17' 18"	10° 19' 0"	10° 20' 43"	10° 22' 25"	10° 24' 8"	10° 25' 51"	10° 27' 34"	10° 29' 18"	10° 31' 2"	10° 32' 46"	10° 34' 30"
46	10° 36' 14"	10° 37' 58"	10° 39' 42"	10° 41' 25"	10° 43' 9"	10° 44' 52"	10° 46' 36"	10° 48' 21"	10° 50' 5"	10° 51' 50"	10° 53' 36"	10° 55' 21"
47	10° 57' 6"	10° 58' 50"	11° 0' 35"	11° 2' 19"	11° 4' 4"	11° 5' 48"	11° 7' 33"	11° 9' 19"	11° 11' 4"	11° 12' 50"	11° 14' 36"	11° 16' 22"
48	11° 18' 8"	11° 19' 54"	11° 21' 39"	11° 23' 25"	11° 25' 10"	11° 26' 56"	11° 28' 42"	11° 30' 28"	11° 32' 15"	11° 34' 1"	11° 35' 48"	11° 37' 35"
49	11° 39' 22"	11° 41' 9"	11° 42' 55"	11° 44' 41"	11° 46' 28"	11° 48' 14"	11° 50' 1"	11° 51' 48"	11° 53' 36"	11° 55' 23"	11° 57' 11"	11° 58' 59"
50	12° 0' 47"	12° 2' 34"	12° 4' 21"	12° 6' 8"	12° 7' 56"	12° 9' 43"	12° 11' 31"	12° 13' 19"	12° 15' 7"	12° 16' 56"	12° 18' 44"	12° 20' 33"
51	12° 22' 21"	12° 24' 10"	12° 25' 58"	12° 27' 46"	12° 29' 34"	12° 31' 22"	12° 33' 11"	12° 34' 60"	12° 36' 49"	12° 38' 38"	12° 40' 28"	12° 42' 17"
52	12° 44' 6"	12° 45' 55"	12° 47' 44"	12° 49' 33"	12° 51' 22"	12° 53' 11"	12° 55' 0"	12° 56' 50"	12° 58' 40"	13° 0' 30"	13° 2' 21"	13° 4' 11"
53	13° 6' 1"	13° 7' 51"	13° 9' 40"	13° 11' 30"	13° 13' 20"	13° 15' 10"	13° 16' 60"	13° 18' 50"	13° 20' 41"	13° 22' 32"	13° 24' 23"	13° 26' 14"
54	13° 28' 4"	13° 29' 55"	13° 31' 46"	13° 33' 36"	13° 35' 26"	13° 37' 17"	13° 39' 8"	13° 40' 59"	13° 42' 50"	13° 44' 42"	13° 46' 34"	13° 48' 25"
55	13° 50' 17"	13° 52' 8"	13° 53' 59"	13° 55' 51"	13° 57' 42"	13° 59' 33"	14° 1' 25"	14° 3' 16"	14° 5' 9"	14° 7' 1"	14° 8' 53"	14° 10' 46"
56	14° 12' 38"	14° 14' 30"	14° 16' 22"	14° 18' 13"	14° 20' 5"	14° 21' 57"	14° 23' 50"	14° 25' 42"	14° 27' 35"	14° 29' 28"	14° 31' 21"	14° 33' 14"
57	14° 35' 7"	14° 36' 59"	14° 38' 52"	14° 40' 44"	14° 42' 37"	14° 44' 29"	14° 46' 22"	14° 48' 15"	14° 50' 9"	14° 52' 2"	14° 53' 56"	14° 55' 49"
58	14° 57' 43"	14° 59' 36"	15° 1' 29"	15° 3' 22"	15° 5' 16"	15° 7' 9"	15° 9' 2"	15° 10' 56"	15° 12' 50"	15° 14' 44"	15° 16' 38"	15° 18' 32"
59	15° 20' 26"	15° 22' 20"	15° 24' 14"	15° 26' 8"	15° 28' 1"	15° 29' 55"	15° 31' 49"	15° 33' 44"	15° 35' 38"	15° 37' 33"	15° 39' 27"	15° 41' 22"
60	15° 43' 17"	15° 45' 11"	15° 47' 5"	15° 48' 60"	15° 50' 54"	15° 52' 48"	15° 54' 43"	15° 56' 38"	15° 58' 33"	16° 0' 28"	16° 2' 23"	16° 4' 18"
61	16° 6' 13"	16° 8' 8"	16° 10' 3"	16° 11' 58"	16° 13' 52"	16° 15' 47"	16° 17' 42"	16° 19' 38"	16° 21' 33"	16° 23' 29"	16° 25' 24"	16° 27' 20"
62	16° 29' 16"	16° 31' 11"	16° 33' 6"	16° 35' 2"	16° 36' 57"	16° 38' 52"	16° 40' 48"	16° 42' 43"	16° 44' 39"	16° 46' 35"	16° 48' 31"	16° 50' 28"
63	16° 52' 23"	16° 54' 19"	16° 56' 15"	16° 58' 11"	17° 0' 6"	17° 2' 2"	17° 3' 58"	17° 5' 54"	17° 7' 51"	17° 9' 47"	17° 11' 44"	17° 13' 40"
64	17° 15' 36"	17° 17' 33"	17° 19' 29"	17° 21' 25"	17° 23' 21"	17° 25' 17"	17° 27' 14"	17° 29' 10"	17° 31' 7"	17° 33' 4"	17° 35' 1"	17° 36' 57"
65	17° 38' 54"	17° 40' 51"	17° 42' 47"	17° 44' 44"	17° 46' 40"	17° 48' 37"	17° 50' 33"	17° 52' 30"	17° 54' 27"	17° 56' 25"	17° 58' 22"	18° 0' 19"
66	18° 2' 16"	18° 4' 13"	18° 6' 10"	18° 8' 7"	18° 10' 3"	18° 12' 0"	18° 13' 57"	18° 15' 55"	18° 17' 52"	18° 19' 49"	18° 21' 47"	18° 23' 44"
67	18° 25' 42"	18° 27' 39"	18° 29' 36"	18° 31' 33"	18° 33' 30"	18° 35' 28"	18° 37' 25"	18° 39' 22"	18° 41' 20"	18° 43' 18"	18° 45' 15"	18° 47' 13"
68	18° 49' 11"	18° 51' 8"	18° 53' 6"	18° 55' 3"	18° 57' 1"	18° 58' 58"	19° 0' 56"	19° 2' 53"	19° 4' 51"	19° 6' 49"	19° 8' 47"	19° 10' 45"
69	19° 12' 43"</											

Solar Declination Differentials -- Epoch 2020 -- Leap Years +2 (LY2)

Dn	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
92	28°14' 17"	28°16' 12"	28°18' 7"	28°20' 2"	28°21' 58"	28°23' 53"	28°25' 48"	28°27' 42"	28°29' 37"	28°31' 32"	28°33' 26"	28°35' 20"
93	28°37' 15"	28°39' 10"	28°41' 4"	28°42' 59"	28°44' 54"	28°46' 49"	28°48' 43"	28°50' 37"	28°52' 31"	28°54' 25"	28°56' 19"	28°58' 13"
94	29° 0' 7"	29° 2' 1"	29° 3' 56"	29° 5' 50"	29° 7' 44"	29° 9' 38"	29°11' 32"	29°13' 26"	29°15' 20"	29°17' 13"	29°19' 6"	29°20' 60"
95	29°22' 53"	29°24' 47"	29°26' 41"	29°28' 34"	29°30' 28"	29°32' 22"	29°34' 15"	29°36' 8"	29°38' 1"	29°39' 54"	29°41' 47"	29°43' 40"
96	29°45' 33"	29°47' 26"	29°49' 19"	29°51' 12"	29°53' 5"	29°56' 58"	29°59' 51"	30°02' 44"	30° 0' 36"	30° 2' 28"	30° 4' 20"	30° 6' 13"
97	30° 8' 5"	30° 9' 57"	30°11' 50"	30°13' 42"	30°15' 35"	30°17' 27"	30°19' 20"	30°21' 12"	30°23' 3"	30°24' 55"	30°26' 47"	30°28' 38"
98	30°30' 30"	30°32' 22"	30°34' 14"	30°36' 6"	30°37' 58"	30°39' 49"	30°41' 41"	30°43' 32"	30°45' 23"	30°47' 14"	30°49' 5"	30°50' 56"
99	30°52' 47"	30°54' 38"	30°56' 30"	30°58' 21"	31° 0' 12"	31° 2' 3"	31° 3' 54"	31° 5' 45"	31° 7' 35"	31° 9' 26"	31°11' 16"	31°13' 6"
100	31°14' 56"	31°16' 47"	31°18' 37"	31°20' 28"	31°22' 19"	31°24' 9"	31°25' 59"	31°27' 49"	31°29' 39"	31°31' 28"	31°33' 18"	31°35' 7"
101	31°36' 57"	31°38' 47"	31°40' 37"	31°42' 27"	31°44' 16"	31°46' 6"	31°47' 56"	31°49' 45"	31°51' 34"	31°53' 23"	31°55' 11"	31°57' 0"
102	31°58' 49"	32° 0' 38"	32° 2' 27"	32° 4' 16"	32° 6' 6"	32° 7' 55"	32° 9' 43"	32°11' 32"	32°13' 20"	32°15' 8"	32°16' 56"	32°18' 44"
103	32°20' 32"	32°22' 20"	32°24' 9"	32°25' 57"	32°27' 45"	32°29' 34"	32°31' 22"	32°33' 9"	32°34' 57"	32°36' 44"	32°38' 31"	32°40' 18"
104	32°42' 5"	32°43' 53"	32°45' 40"	32°47' 28"	32°49' 16"	32°51' 3"	32°52' 50"	32°54' 37"	32°56' 24"	32°58' 10"	32°59' 56"	33° 1' 43"
105	33° 3' 29"	33° 5' 16"	33° 7' 3"	33° 8' 50"	33°10' 36"	33°12' 23"	33°14' 9"	33°15' 55"	33°17' 41"	33°19' 27"	33°21' 12"	33°22' 57"
106	33°24' 43"	33°26' 29"	33°28' 15"	33°30' 1"	33°31' 47"	33°33' 33"	33°35' 18"	33°37' 3"	33°38' 48"	33°40' 33"	33°42' 17"	33°44' 2"
107	33°45' 47"	33°47' 32"	33°49' 17"	33°51' 2"	33°52' 47"	33°54' 32"	33°56' 16"	33°58' 1"	33°59' 45"	34° 1' 28"	34° 3' 12"	34° 4' 56"
108	34° 6' 40"	34° 8' 24"	34°10' 8"	34°11' 52"	34°13' 36"	34°15' 20"	34°17' 4"	34°18' 47"	34°20' 30"	34°22' 13"	34°23' 56"	34°25' 39"
109	34°27' 22"	34°29' 5"	34°30' 48"	34°32' 31"	34°34' 15"	34°35' 58"	34°37' 41"	34°39' 23"	34°41' 5"	34°42' 47"	34°44' 29"	34°46' 11"
110	34°47' 52"	34°49' 35"	34°51' 17"	34°52' 59"	34°54' 42"	34°56' 24"	34°58' 6"	34°59' 47"	35° 1' 28"	35° 3' 9"	35° 4' 50"	35° 6' 31"
111	35° 8' 12"	35° 9' 53"	35°11' 34"	35°13' 16"	35°14' 57"	35°16' 39"	35°18' 19"	35°19' 60"	35°21' 40"	35°23' 20"	35°24' 60"	35°26' 39"
112	35°28' 19"	35°29' 60"	35°31' 40"	35°33' 21"	35°35' 1"	35°36' 41"	35°38' 21"	35°40' 0"	35°41' 40"	35°43' 18"	35°44' 57"	35°46' 36"
113	35°48' 15"	35°49' 54"	35°51' 33"	35°53' 13"	35°54' 52"	35°56' 31"	35°58' 10"	35°59' 49"	36° 1' 27"	36° 3' 4"	36° 4' 42"	36° 6' 20"
114	36° 9' 58"	36° 9' 36"	36°11' 14"	36°12' 53"	36°14' 31"	36°16' 9"	36°17' 47"	36°19' 24"	36°21' 1"	36°22' 38"	36°24' 14"	36°25' 51"
115	36°27' 28"	36°29' 5"	36°30' 42"	36°32' 19"	36°33' 57"	36°35' 34"	36°37' 10"	36°38' 47"	36°40' 22"	36°41' 58"	36°43' 33"	36°45' 9"
116	36°46' 44"	36°48' 20"	36°49' 57"	36°51' 33"	36°53' 9"	36°54' 45"	36°56' 20"	36°57' 56"	36°59' 30"	37° 1' 5"	37° 2' 39"	37° 4' 13"
117	37° 5' 48"	37° 7' 23"	37° 8' 58"	37°10' 33"	37°12' 8"	37°13' 43"	37°15' 17"	37°16' 51"	37°18' 24"	37°19' 58"	37°21' 31"	37°23' 4"
118	37°24' 37"	37°26' 11"	37°27' 45"	37°29' 19"	37°30' 53"	37°32' 26"	37°33' 59"	37°35' 32"	37°37' 4"	37°38' 36"	37°40' 8"	37°41' 40"
119	37°43' 12"	37°44' 45"	37°46' 18"	37°47' 50"	37°49' 23"	37°50' 55"	37°52' 27"	37°53' 59"	37°55' 30"	37°57' 1"	37°58' 31"	38° 0' 2"
120	38° 1' 33"	38° 3' 4"	38° 4' 36"	38° 6' 7"	38° 7' 39"	38° 9' 10"	38°10' 41"	38°12' 11"	38°13' 41"	38°15' 10"	38°16' 40"	38°18' 9"
121	38°19' 39"	38°21' 9"	38°22' 39"	38°24' 9"	38°25' 40"	38°27' 9"	38°28' 39"	38°30' 8"	38°31' 36"	38°33' 5"	38°34' 33"	38°36' 1"
122	38°37' 29"	38°38' 58"	38°40' 27"	38°41' 56"	38°43' 25"	38°44' 54"	38°46' 22"	38°47' 49"	38°49' 17"	38°50' 44"	38°52' 10"	38°53' 37"
123	38°55' 4"	38°56' 32"	38°57' 59"	38°59' 27"	39° 0' 55"	39° 2' 22"	39° 3' 49"	39° 5' 15"	39° 6' 41"	39° 8' 17"	39° 9' 32"	39°10' 58"
124	39°12' 23"	39°13' 50"	39°15' 16"	39°16' 42"	39°18' 9"	39°19' 35"	39°21' 0"	39°22' 25"	39°23' 50"	39°25' 14"	39°26' 38"	39°28' 2"
125	39°29' 26"	39°30' 51"	39°32' 16"	39°33' 41"	39°35' 6"	39°36' 31"	39°37' 55"	39°39' 18"	39°40' 42"	39°42' 4"	39°43' 27"	39°44' 50"
126	39°46' 13"	39°47' 36"	39°48' 60"	39°50' 23"	39°51' 47"	39°53' 10"	39°54' 33"	39°55' 55"	39°57' 17"	39°58' 38"	39°59' 58"	40° 1' 21"
127	40° 2' 42"	40° 4' 4"	40° 5' 26"	40° 6' 49"	40° 8' 11"	40° 9' 33"	40°10' 54"	40°12' 15"	40°13' 35"	40°14' 55"	40°16' 15"	40°17' 35"
128	40°18' 55"	40°20' 15"	40°21' 36"	40°22' 57"	40°24' 17"	40°25' 38"	40°26' 58"	40°28' 17"	40°29' 36"	40°30' 54"	40°32' 13"	40°33' 31"
129	40°34' 50"	40°36' 9"	40°37' 28"	40°38' 47"	40°40' 6"	40°41' 25"	40°42' 44"	40°44' 2"	40°45' 19"	40°46' 36"	40°47' 53"	40°49' 10"
130	40°50' 27"	40°51' 44"	40°53' 2"	40°54' 20"	40°55' 38"	40°56' 55"	40°58' 12"	40°59' 28"	41° 0' 44"	41° 1' 60"	41° 3' 15"	41° 4' 30"
131	41° 5' 46"	41° 7' 2"	41° 8' 18"	41° 9' 34"	41°10' 51"	41°12' 7"	41°13' 22"	41°14' 37"	41°15' 51"	41°17' 5"	41°18' 19"	41°19' 33"
132	41°20' 47"	41°22' 1"	41°23' 16"	41°24' 31"	41°25' 45"	41°26' 60"	41°28' 14"	41°29' 27"	41°30' 39"	41°31' 52"	41°33' 4"	41°34' 16"
133	41°35' 29"	41°36' 42"	41°37' 55"	41°39' 8"	41°40' 21"	41°41' 34"	41°42' 46"	41°43' 58"	41°45' 9"	41°46' 20"	41°47' 30"	41°48' 41"
134	41°49' 52"	41°51' 3"	41°52' 15"	41°53' 27"	41°54' 38"	41°55' 49"	41°57' 0"	41°58' 10"	41°59' 20"	42° 0' 29"	42° 1' 38"	42° 2' 47"
135	42° 3' 56"	42° 5' 6"	42° 6' 16"	42° 7' 26"	42° 8' 36"	42° 9' 46"	42°10' 55"	42°12' 3"	42°13' 11"	42°14' 19"	42°15' 26"	42°16' 34"
136	42°17' 41"	42°18' 49"	42°19' 58"	42°21' 6"	42°22' 15"	42°23' 23"	42°24' 30"	42°25' 37"	42°26' 43"	42°27' 49"	42°28' 55"	42°30' 0"
137	42°31' 7"	42°32' 13"	42°33' 20"	42°34' 27"	42°35' 33"	42°36' 40"	42°37' 45"	42°38' 51"	42°39' 55"	42°40' 59"	42°42' 4"	42°43' 8"
138	42°44' 12"	42°45' 17"	42°46' 22"	42°47' 27"	42°48' 32"	42°49' 37"	42°50' 41"	42°51' 45"	42°52' 47"	42°53' 50"	42°54' 52"	42°55' 55"
139	42°56' 58"	42°58' 1"	42°59' 4"	43° 0' 8"	43° 1' 11"	43° 2' 14"	43° 3' 16"	43° 4' 18"	43° 5' 19"	43° 6' 20"	43° 7' 21"	43° 8' 22"
140	43° 9' 23"	43°10' 24"	43°11' 26"	43°12' 28"	43°13' 29"	43°14' 31"	43°15' 31"	43°16' 32"	43°17' 31"	43°18' 30"	43°19' 29"	43°20' 28"
141	43°21' 27"	43°22' 27"	43°23' 27"	43°24' 27"	43°25' 27"	43°26' 27"	43°27' 26"	43°28' 24"	43°29' 22"	43°30' 19"	43°31' 16"	43°32' 14"
142	43°33' 11"	43°34' 9"	43°35' 7"	43°36' 6"	43°37' 4"	43°38' 2"	43°38' 59"	43°39' 56"	43°40' 52"	43°41' 47"	43°42' 43"	43°43' 38"
143	43°44' 34"	43°45' 30"	43°46' 27"	43°47' 23"	43°48' 20"	43°49' 16"	43°50' 11"	43°51' 6"	43°52' 0"	43°52' 54"	43°53' 48"	43°54' 41"
144	43°55' 35"	43°56' 30"	43°57' 24"	43°58' 19"	43°59' 14"	44° 0' 8"	44° 1' 2"	44° 1' 55"	44° 2' 47"	44° 3' 39"	44° 4' 31"	44° 5' 23"
145	44° 6' 15"	44° 7' 8"	44° 8' 1"	44° 8' 54"	44° 9' 46"	44°10' 39"	44°11' 31"	44°12' 22"	44°13' 12"	44°14' 3"	44°14' 53"	44°15' 43"
146	44°16' 33"	44°17' 24"	44°18' 15"	44°19' 6"	44°19' 57"	44°20' 48"	44°21' 38"	44°22' 27"	44°23' 16"	44°24' 4"	44°24' 52"	44°25' 41"
147	44°26' 29"	44°27' 18"	44°28' 7"	44°28' 57"	44°29' 46"	44°30' 35"	44°31' 23"	44°32' 10"	44°32' 57"	44°33' 44"	44°34' 30"	44°35' 16"
148	44°36' 3"	44°36' 50"	44°37' 37"	44°38' 25"	44°39' 12"	44°39' 59"	44°40' 45"	44°41' 31"	44°42' 16"	44°43' 0"	44°43' 45"	44°44' 29"
149	44°45' 14"	44°45' 59"	44°46' 45"	44°47' 30"	44°48' 16"	44°49' 1"	44°49' 45"	44°50' 29"	44°51' 12"	44°51' 55"	44°52' 37"	44°53' 20"
150	44°54' 3"	44°54' 46"	44°55' 30"	44°56' 13"	44°56' 57"	44°57' 40"	44°58' 23"	44°59' 4"	44°59' 46"	45° 0' 26"	45° 1' 7"	45° 1' 48"
151	45° 2' 28"	45° 3' 10"	45° 3' 52"	45° 4' 33"	45° 5' 15"	45° 5' 56"	45° 6' 37"	45° 7' 17"	45° 7' 56"	45° 8' 35"	45° 9' 13"	45° 9' 52"
152	45°10' 31"	45°11' 11"	45°11' 50"	45°12' 30"	45°13' 10"	45°13' 49"	45°14' 28"	45°15' 6"	45°15' 43"	45°16' 20"	45°16' 57"	45°17' 34"
153	45°18' 11"	45°18' 48"	45°19' 26"	45°20' 4"	45°20' 42"	45°21' 19"	45°21' 56"	45°22' 32"	45°23' 7"	45°23' 42"	45°24' 17"	45°24' 52"
154	45°25' 27"	45°26' 2"	45°26' 38"	45°27' 14"	45°27' 50"	45°28' 25"	45°29' 0"	45°29' 34"	45°30' 8"	45°30' 40"	45°31' 13"	45°31' 46"
155	45°32' 19"	45°32' 53"	45°33' 27"	45°34' 1"	45°34' 35"	45°35' 8"	45°35' 41"	45°36' 13"	45°36' 44"	45°37' 15"	45°37' 46"	45°38' 17"
156	45°38' 48"	45°39' 20"	45°39' 51"	45°40' 23"	45°40' 55"	45°41' 27"	45°41' 58"	45°42' 28"	45°42' 57"	45°43' 26"	45°43' 55"	45°44' 24"
157	45°44' 53"	45°45' 22"	45°45' 52"	45°46' 22"	45°46' 52"	45°47' 22"	45°47' 50"	45°48' 19"	45°48' 46"	45°49' 13"	45°49' 40"	45°50' 7"
158	45°50' 34"	45°51' 1"	45°51' 29"	45°51' 57"	45°52' 25"	45°52' 52"	45°53' 19"	45°53' 45"	45°54' 11"	45°54' 36"	45°55' 0"	45°55' 25"
159	45°55' 50"	45°56' 16"	45°56' 42"	45°57' 8"	45°57' 34"	45°57' 59"	45°58' 24"	45°58' 48"	45°59'			

Solar Declination Differentials -- Epoch 2020 -- Leap Years +2 (LY2)

Dn	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
184	45°54' 44"	45°54' 18"	45°53' 53"	45°53' 28"	45°53' 3"	45°52' 37"	45°52' 11"	45°51' 44"	45°51' 16"	45°50' 48"	45°50' 19"	45°49' 51"
185	45°49' 23"	45°48' 56"	45°48' 28"	45°48' 1"	45°47' 34"	45°47' 7"	45°46' 38"	45°46' 9"	45°45' 39"	45°45' 9"	45°44' 39"	45°44' 8"
186	45°43' 38"	45°43' 9"	45°42' 39"	45°42' 10"	45°41' 41"	45°41' 11"	45°40' 41"	45°40' 10"	45°39' 39"	45°39' 6"	45°38' 34"	45°38' 2"
187	45°37' 30"	45°36' 58"	45°36' 27"	45°35' 56"	45°35' 25"	45°34' 53"	45°34' 21"	45°33' 48"	45°33' 14"	45°32' 40"	45°32' 6"	45°31' 32"
188	45°30' 58"	45°30' 24"	45°29' 51"	45°29' 18"	45°28' 45"	45°28' 11"	45°27' 37"	45°27' 2"	45°26' 27"	45°25' 51"	45°25' 15"	45°24' 38"
189	45°24' 3"	45°23' 27"	45°22' 52"	45°22' 17"	45°21' 42"	45°21' 7"	45°20' 30"	45°19' 54"	45°19' 16"	45°18' 38"	45°18' 0"	45°17' 22"
190	45°16' 44"	45°16' 7"	45°15' 30"	45°14' 53"	45°14' 16"	45°13' 38"	45°13' 0"	45°12' 22"	45°11' 42"	45°11' 2"	45°10' 22"	45°9' 42"
191	45°9' 3"	45°8' 24"	45°7' 45"	45°7' 6"	45°6' 27"	45°5' 48"	45°5' 8"	45°4' 27"	45°3' 46"	45°3' 4"	45°2' 52"	45°1' 40"
192	45°0' 59"	45°0' 18"	44°59' 37"	44°58' 56"	44°58' 15"	44°57' 34"	44°56' 52"	44°56' 10"	44°55' 27"	44°54' 43"	44°53' 59"	44°53' 15"
193	44°52' 32"	44°51' 49"	44°51' 6"	44°50' 24"	44°49' 41"	44°48' 58"	44°48' 14"	44°47' 30"	44°46' 45"	44°45' 59"	44°45' 14"	44°44' 28"
194	44°43' 43"	44°42' 58"	44°42' 14"	44°41' 29"	44°40' 45"	44°39' 60"	44°38' 28"	44°37' 41"	44°36' 54"	44°36' 6"	44°35' 19"	44°34' 31"
195	44°34' 32"	44°33' 45"	44°32' 59"	44°32' 12"	44°31' 26"	44°30' 39"	44°29' 52"	44°29' 4"	44°28' 15"	44°27' 26"	44°26' 37"	44°25' 48"
196	44°24' 59"	44°24' 10"	44°23' 22"	44°22' 34"	44°21' 46"	44°20' 57"	44°20' 8"	44°19' 18"	44°18' 27"	44°17' 37"	44°16' 45"	44°15' 54"
197	44°15' 4"	44°14' 13"	44°13' 23"	44°12' 33"	44°11' 43"	44°10' 53"	44°10' 2"	44°9' 10"	44°8' 18"	44°7' 25"	44°6' 32"	44°5' 40"
198	44°4' 47"	44°3' 55"	44°3' 3"	44°2' 11"	44°1' 20"	44°0' 27"	43°59' 35"	43°58' 41"	43°57' 47"	43°56' 53"	43°55' 58"	43°55' 3"
199	43°54' 9"	43°53' 15"	43°52' 22"	43°51' 28"	43°50' 35"	43°49' 41"	43°48' 46"	43°47' 51"	43°46' 55"	43°45' 59"	43°45' 2"	43°44' 6"
200	43°43' 10"	43°42' 14"	43°41' 19"	43°40' 24"	43°39' 28"	43°38' 33"	43°37' 36"	43°36' 39"	43°35' 42"	43°34' 44"	43°33' 46"	43°32' 48"
201	43°31' 50"	43°30' 53"	43°29' 55"	43°28' 58"	43°28' 1"	43°27' 4"	43°26' 6"	43°25' 7"	43°24' 8"	43°23' 8"	43°22' 8"	43°21' 9"
202	43°20' 9"	43°19' 10"	43°18' 11"	43°17' 13"	43°16' 14"	43°15' 15"	43°14' 15"	43°13' 14"	43°12' 13"	43°11' 12"	43°10' 11"	43°9' 9"
203	43°8' 8"	43°7' 7"	43°6' 7"	43°5' 6"	43°4' 6"	43°3' 5"	43°2' 3"	43°1' 1"	42°59' 59"	42°58' 56"	42°57' 52"	42°56' 49"
204	42°55' 46"	42°54' 44"	42°53' 42"	42°52' 40"	42°51' 38"	42°50' 35"	42°49' 32"	42°48' 28"	42°47' 24"	42°46' 19"	42°45' 14"	42°44' 10"
205	42°43' 5"	42°42' 1"	42°40' 57"	42°39' 53"	42°38' 49"	42°37' 45"	42°36' 41"	42°35' 35"	42°34' 29"	42°33' 23"	42°32' 17"	42°31' 10"
206	42°30' 4"	42°28' 58"	42°27' 53"	42°26' 47"	42°25' 42"	42°24' 36"	42°23' 30"	42°22' 23"	42°21' 15"	42°20' 7"	42°18' 59"	42°17' 51"
207	42°16' 43"	42°15' 36"	42°14' 29"	42°13' 22"	42°12' 15"	42°11' 8"	42°9' 60"	42°8' 51"	42°7' 42"	42°6' 32"	42°5' 23"	42°4' 13"
208	42°3' 4"	42°1' 55"	42°0' 46"	41°59' 38"	41°58' 29"	41°57' 20"	41°56' 10"	41°55' 0"	41°53' 50"	41°52' 39"	41°51' 27"	41°50' 16"
209	41°49' 5"	41°47' 55"	41°46' 45"	41°45' 34"	41°44' 24"	41°43' 14"	41°42' 3"	41°40' 51"	41°39' 39"	41°38' 26"	41°37' 13"	41°36' 1"
210	41°34' 48"	41°33' 36"	41°32' 24"	41°31' 13"	41°30' 1"	41°28' 49"	41°27' 36"	41°26' 23"	41°25' 9"	41°23' 55"	41°22' 41"	41°21' 27"
211	41°20' 13"	41°18' 59"	41°17' 46"	41°16' 33"	41°15' 20"	41°14' 6"	41°12' 52"	41°11' 37"	41°10' 22"	41°9' 7"	41°7' 51"	41°6' 35"
212	41°5' 20"	41°4' 5"	41°2' 50"	41°1' 35"	41°0' 20"	40°59' 5"	40°57' 50"	40°56' 34"	40°55' 17"	40°53' 60"	40°52' 43"	40°51' 26"
213	40°50' 9"	40°48' 52"	40°47' 36"	40°46' 20"	40°45' 4"	40°43' 47"	40°42' 30"	40°41' 12"	40°39' 54"	40°38' 36"	40°37' 17"	40°35' 59"
214	40°34' 40"	40°33' 22"	40°32' 5"	40°30' 47"	40°29' 29"	40°28' 12"	40°26' 53"	40°25' 34"	40°24' 15"	40°22' 55"	40°21' 35"	40°20' 15"
215	40°18' 55"	40°17' 36"	40°16' 16"	40°14' 57"	40°13' 38"	40°12' 19"	40°10' 59"	40°9' 39"	40°8' 18"	40°6' 57"	40°5' 35"	40°4' 14"
216	40°2' 53"	40°1' 32"	40°0' 12"	39°58' 51"	39°57' 31"	39°56' 10"	39°54' 49"	39°53' 27"	39°52' 5"	39°50' 42"	39°49' 19"	39°47' 57"
217	39°46' 34"	39°45' 12"	39°43' 50"	39°42' 28"	39°41' 7"	39°39' 44"	39°38' 22"	39°36' 59"	39°35' 35"	39°34' 11"	39°32' 47"	39°31' 23"
218	39°29' 59"	39°28' 36"	39°27' 13"	39°25' 50"	39°24' 26"	39°23' 3"	39°21' 39"	39°20' 15"	39°18' 50"	39°17' 24"	39°15' 59"	39°14' 34"
219	39°13' 9"	39°11' 44"	39°10' 19"	39°8' 55"	39°7' 31"	39°6' 6"	39°4' 41"	39°3' 15"	39°1' 49"	39°0' 22"	38°58' 55"	38°57' 29"
220	38°56' 3"	38°54' 36"	38°53' 11"	38°51' 45"	38°50' 19"	38°48' 53"	38°47' 27"	38°45' 60"	38°44' 32"	38°43' 5"	38°41' 37"	38°40' 9"
221	38°38' 41"	38°37' 14"	38°35' 47"	38°34' 20"	38°32' 53"	38°31' 26"	38°29' 58"	38°28' 30"	38°27' 1"	38°25' 32"	38°24' 3"	38°22' 34"
222	38°21' 5"	38°19' 36"	38°18' 8"	38°16' 40"	38°15' 12"	38°13' 43"	38°12' 14"	38°10' 45"	38°9' 15"	38°7' 45"	38°6' 14"	38°4' 44"
223	38°3' 14"	38°1' 44"	38°0' 15"	37°58' 46"	37°57' 16"	37°55' 46"	37°54' 16"	37°52' 46"	37°51' 15"	37°49' 43"	37°48' 12"	37°46' 40"
224	37°45' 9"	37°43' 38"	37°42' 8"	37°40' 37"	37°39' 6"	37°37' 35"	37°36' 4"	37°34' 32"	37°32' 60"	37°31' 27"	37°29' 55"	37°28' 22"
225	37°26' 50"	37°25' 18"	37°23' 46"	37°22' 14"	37°20' 42"	37°19' 10"	37°17' 38"	37°16' 5"	37°14' 32"	37°12' 58"	37°11' 24"	37°9' 51"
226	37°8' 17"	37°6' 44"	37°5' 11"	37°3' 38"	37°2' 5"	37°0' 32"	36°58' 58"	36°57' 24"	36°55' 50"	36°54' 15"	36°52' 40"	36°51' 5"
227	36°49' 31"	36°47' 56"	36°46' 22"	36°44' 48"	36°43' 14"	36°41' 40"	36°40' 5"	36°38' 30"	36°36' 54"	36°35' 18"	36°33' 42"	36°32' 7"
228	36°30' 31"	36°28' 56"	36°27' 20"	36°25' 45"	36°24' 10"	36°22' 35"	36°20' 59"	36°19' 23"	36°17' 46"	36°16' 9"	36°14' 32"	36°12' 55"
229	36°11' 18"	36°9' 42"	36°8' 6"	36°6' 29"	36°4' 53"	36°3' 17"	36°1' 40"	36°0' 3"	35°58' 25"	35°56' 47"	35°55' 9"	35°53' 31"
230	35°51' 53"	35°50' 16"	35°48' 38"	35°47' 1"	35°45' 24"	35°43' 46"	35°42' 8"	35°40' 30"	35°38' 51"	35°37' 13"	35°35' 33"	35°33' 55"
231	35°32' 16"	35°30' 37"	35°28' 59"	35°27' 21"	35°25' 42"	35°24' 4"	35°22' 25"	35°20' 46"	35°19' 6"	35°17' 26"	35°15' 46"	35°14' 6"
232	35°12' 26"	35°10' 47"	35°9' 7"	35°7' 28"	35°5' 49"	35°4' 9"	35°2' 29"	35°0' 49"	34°59' 9"	34°57' 28"	34°55' 47"	34°54' 6"
233	34°52' 25"	34°50' 45"	34°49' 4"	34°47' 24"	34°45' 44"	34°44' 3"	34°42' 23"	34°40' 41"	34°38' 60"	34°37' 18"	34°35' 36"	34°33' 54"
234	34°32' 13"	34°30' 31"	34°28' 50"	34°27' 9"	34°25' 28"	34°23' 46"	34°22' 5"	34°20' 22"	34°18' 40"	34°16' 57"	34°15' 15"	34°13' 32"
235	34°11' 49"	34°10' 7"	34°8' 25"	34°6' 43"	34°5' 1"	34°3' 18"	34°1' 36"	33°59' 53"	33°58' 9"	33°56' 26"	33°54' 42"	33°52' 59"
236	33°51' 15"	33°49' 32"	33°47' 49"	33°46' 6"	33°44' 23"	33°42' 40"	33°40' 56"	33°39' 12"	33°37' 28"	33°35' 44"	33°33' 59"	33°32' 15"
237	33°30' 31"	33°28' 47"	33°27' 3"	33°25' 19"	33°23' 35"	33°21' 51"	33°20' 7"	33°18' 22"	33°16' 37"	33°14' 52"	33°13' 7"	33°11' 21"
238	33°9' 36"	33°7' 51"	33°6' 7"	33°4' 22"	33°2' 37"	33°0' 53"	32°59' 7"	32°57' 22"	32°55' 36"	32°53' 50"	32°52' 4"	32°50' 18"
239	32°48' 32"	32°46' 47"	32°45' 1"	32°43' 16"	32°41' 30"	32°39' 44"	32°37' 58"	32°36' 12"	32°34' 26"	32°32' 39"	32°30' 52"	32°29' 5"
240	32°27' 19"	32°25' 32"	32°23' 46"	32°21' 60"	32°20' 14"	32°18' 27"	32°16' 40"	32°14' 53"	32°13' 6"	32°11' 19"	32°9' 31"	32°7' 44"
241	32°5' 56"	32°4' 9"	32°2' 22"	32°0' 35"	31°58' 48"	31°57' 1"	31°55' 13"	31°53' 26"	31°51' 38"	31°49' 50"	31°48' 1"	31°46' 13"
242	31°44' 25"	31°42' 37"	31°40' 49"	31°39' 2"	31°37' 14"	31°35' 26"	31°33' 38"	31°31' 50"	31°30' 1"	31°28' 12"	31°26' 23"	31°24' 34"
243	31°22' 46"	31°20' 57"	31°19' 9"	31°17' 20"	31°15' 32"	31°13' 43"	31°11' 54"	31°10' 5"	31°8' 16"	31°6' 27"	31°4' 37"	31°2' 48"
244	31°0' 58"	30°59' 9"	30°57' 20"	30°55' 31"	30°53' 42"	30°51' 53"	30°50' 3"	30°48' 13"	30°46' 23"	30°44' 33"	30°42' 43"	30°40' 53"
245	30°39' 3"	30°37' 13"	30°35' 24"	30°33' 34"	30°31' 44"	30°29' 54"	30°28' 4"	30°26' 14"	30°24' 23"	30°22' 33"	30°20' 42"	30°18' 51"
246	30°17' 1"	30°15' 10"	30°13' 20"	30°11' 30"	30°9' 39"	30°7' 49"	30°5' 58"	30°4' 7"	30°2' 16"	30°0' 25"	29°58' 34"	29°56' 43"
247	29°54' 52"	29°53' 1"	29°51' 10"	29°49' 19"	29°47' 28"	29°45' 37"	29°43' 46"	29°41' 54"	29°40' 3"	29°38' 11"	29°36' 19"	29°34' 27"
248	29°32' 36"	29°30' 44"	29°28' 53"	29°27' 1"	29°25' 10"	29°23' 18"	29°21' 26"	29°19' 35"	29°17' 42"	29°15' 50"	29°13' 58"	29°12' 6"
249	29°10' 13"	29°8' 21"	29°6' 29"	29°4' 37"	29°2' 46"	29°0' 53"	28°59' 1"	28°57' 9"	28°55' 16"	28°53' 23"	28°51' 31"	28°49' 38"
250	28°47' 45"	28°45' 53"	28°44' 0"	28°42' 8"	28°40' 15"	28°38' 23"	28°36' 30"	28°34' 37"	28°32' 44"	28°30' 51"	28°28' 58"	28°27' 5"
251	28°25' 12"	28°23' 19"	28°21' 26"	28°19' 33"	28°17' 40"	28°15' 47"	28°13' 54"	28°12' 0"	28°10' 7"	28°8' 13"	28°6' 20"	28°4' 26"
252	28°2' 32"	28°0' 39"	27°58' 46"	27°56' 52"	27°54' 59"	27°53' 5"						

Solar Declination Differentials -- Epoch 2020 -- Leap Years +2 (LY2)

Dn	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
276	18°45'45"	18°43'49"	18°41'54"	18°39'58"	18°38'2"	18°36'6"	18°34'10"	18°32'15"	18°30'19"	18°28'24"	18°26'29"	18°24'33"
277	18°22'38"	18°20'43"	18°18'47"	18°16'51"	18°14'56"	18°13'0"	18°11'5"	18°9'10"	18°7'15"	18°5'20"	18°3'25"	18°1'30"
278	17°59'35"	17°57'39"	17°55'44"	17°53'49"	17°51'53"	17°49'58"	17°48'3"	17°46'8"	17°44'14"	17°42'19"	17°40'24"	17°38'30"
279	17°36'35"	17°34'40"	17°32'45"	17°30'50"	17°28'55"	17°27'0"	17°25'6"	17°23'11"	17°21'17"	17°19'22"	17°17'28"	17°15'34"
280	17°13'40"	17°11'45"	17°9'50"	17°7'56"	17°6'1"	17°4'7"	17°2'12"	17°0'18"	16°58'24"	16°56'30"	16°54'37"	16°52'43"
281	16°50'49"	16°48'55"	16°47'0"	16°45'6"	16°43'12"	16°41'18"	16°39'24"	16°37'30"	16°35'37"	16°33'43"	16°31'50"	16°29'56"
282	16°28'3"	16°26'9"	16°24'15"	16°22'21"	16°20'28"	16°18'34"	16°16'41"	16°14'47"	16°12'54"	16°11'1"	16°9'8"	16°7'15"
283	16°5'22"	16°3'29"	16°1'36"	15°59'42"	15°57'49"	15°55'56"	15°54'2"	15°52'10"	15°50'17"	15°48'25"	15°46'32"	15°44'40"
284	15°42'47"	15°40'54"	15°39'1"	15°37'8"	15°35'15"	15°33'23"	15°31'30"	15°29'38"	15°27'46"	15°25'54"	15°24'1"	15°22'10"
285	15°20'18"	15°18'25"	15°16'33"	15°14'41"	15°12'48"	15°10'56"	15°9'4"	15°7'12"	15°5'21"	15°3'29"	15°1'38"	14°59'46"
286	14°57'55"	14°56'3"	14°54'11"	14°52'19"	14°50'27"	14°48'36"	14°46'44"	14°44'53"	14°43'2"	14°41'11"	14°39'20"	14°37'29"
287	14°35'38"	14°33'47"	14°31'56"	14°30'5"	14°28'13"	14°26'22"	14°24'31"	14°22'41"	14°20'50"	14°18'60"	14°17'10"	14°15'19"
288	14°13'29"	14°11'38"	14°9'48"	14°7'57"	14°6'6"	14°4'16"	14°2'25"	14°0'35"	13°58'46"	13°56'56"	13°55'6"	13°53'17"
289	13°51'27"	13°49'37"	13°47'47"	13°45'57"	13°44'7"	13°42'17"	13°40'27"	13°38'38"	13°36'49"	13°34'60"	13°33'11"	13°31'22"
290	13°29'33"	13°27'43"	13°25'54"	13°24'4"	13°22'15"	13°20'26"	13°18'37"	13°16'48"	13°14'60"	13°13'11"	13°11'23"	13°9'35"
291	13°7'47"	13°5'58"	13°4'9"	13°2'20"	13°0'32"	12°58'43"	12°56'55"	12°55'7"	12°53'19"	12°51'32"	12°49'44"	12°47'57"
292	12°46'9"	12°44'21"	12°42'33"	12°40'45"	12°38'57"	12°37'9"	12°35'21"	12°33'34"	12°31'47"	12°30'1"	12°28'14"	12°26'27"
293	12°24'40"	12°22'53"	12°21'6"	12°19'19"	12°17'31"	12°15'44"	12°13'57"	12°12'11"	12°10'25"	12°8'39"	12°6'53"	12°5'7"
294	12°3'21"	12°1'35"	11°59'48"	11°58'2"	11°56'15"	11°54'29"	11°52'43"	11°50'57"	11°49'12"	11°47'27"	11°45'42"	11°43'57"
295	11°42'11"	11°40'26"	11°38'40"	11°36'54"	11°35'9"	11°33'23"	11°31'38"	11°29'53"	11°28'9"	11°26'25"	11°24'41"	11°22'56"
296	11°21'12"	11°19'27"	11°17'42"	11°15'57"	11°14'13"	11°12'28"	11°10'44"	11°8'60"	11°7'16"	11°5'33"	11°3'50"	11°2'6"
297	11°0'23"	10°58'39"	10°56'55"	10°55'11"	10°53'27"	10°51'44"	10°50'0"	10°48'17"	10°46'35"	10°44'52"	10°43'10"	10°41'28"
298	10°39'45"	10°38'2"	10°36'19"	10°34'36"	10°32'53"	10°31'10"	10°29'28"	10°27'46"	10°26'4"	10°24'23"	10°22'42"	10°21'0"
299	10°19'19"	10°17'37"	10°15'55"	10°14'12"	10°12'30"	10°10'49"	10°9'7"	10°7'26"	10°5'46"	10°4'5"	10°2'25"	10°0'44"
300	9°59'4"	9°57'23"	9°55'42"	9°54'1"	9°52'20"	9°50'39"	9°48'59"	9°47'19"	9°45'39"	9°43'60"	9°42'20"	9°40'41"
301	9°39'1"	9°37'22"	9°35'41"	9°34'1"	9°32'21"	9°30'42"	9°29'2"	9°27'23"	9°25'45"	9°24'7"	9°22'28"	9°20'50"
302	9°19'12"	9°17'33"	9°15'54"	9°14'15"	9°12'36"	9°10'57"	9°9'19"	9°7'41"	9°6'4"	9°4'27"	9°2'50"	9°1'12"
303	8°59'35"	8°57'57"	8°56'19"	8°54'41"	8°53'4"	8°51'26"	8°49'49"	8°48'12"	8°46'36"	8°45'0"	8°43'24"	8°41'48"
304	8°40'12"	8°38'35"	8°36'59"	8°35'22"	8°33'45"	8°32'9"	8°30'33"	8°28'57"	8°27'22"	8°25'47"	8°24'13"	8°22'38"
305	8°21'3"	8°19'27"	8°17'52"	8°16'16"	8°14'41"	8°13'5"	8°11'31"	8°9'56"	8°8'22"	8°6'49"	8°5'15"	8°3'42"
306	8°2'8"	8°0'34"	7°58'59"	7°57'25"	7°55'51"	7°54'17"	7°52'43"	7°51'10"	7°49'37"	7°48'5"	7°46'33"	7°45'0"
307	7°43'28"	7°41'55"	7°40'22"	7°38'49"	7°37'16"	7°35'43"	7°34'11"	7°32'39"	7°31'7"	7°29'36"	7°28'5"	7°26'34"
308	7°25'3"	7°23'31"	7°21'60"	7°20'28"	7°18'56"	7°17'24"	7°15'53"	7°14'23"	7°12'53"	7°11'23"	7°9'53"	7°8'24"
309	7°6'54"	7°5'23"	7°3'53"	7°2'22"	7°0'52"	6°59'22"	6°57'52"	6°56'23"	6°54'54"	6°53'26"	6°51'57"	6°50'29"
310	6°49'0"	6°47'31"	6°46'2"	6°44'33"	6°43'4"	6°41'35"	6°40'6"	6°38'39"	6°37'11"	6°35'44"	6°34'17"	6°32'50"
311	6°31'23"	6°29'55"	6°28'28"	6°26'60"	6°25'32"	6°24'4"	6°22'38"	6°21'11"	6°19'45"	6°18'20"	6°16'54"	6°15'28"
312	6°14'3"	6°12'36"	6°11'10"	6°9'43"	6°8'17"	6°6'51"	6°5'25"	6°4'0"	6°2'36"	6°1'12"	5°59'48"	5°58'23"
313	5°56'59"	5°55'34"	5°54'9"	5°52'44"	5°51'19"	5°49'55"	5°48'30"	5°47'7"	5°45'44"	5°44'21"	5°42'59"	5°41'36"
314	5°40'13"	5°38'50"	5°37'26"	5°36'2"	5°34'39"	5°33'16"	5°31'53"	5°30'31"	5°29'9"	5°27'48"	5°26'27"	5°25'6"
315	5°23'44"	5°22'23"	5°21'1"	5°19'38"	5°18'16"	5°16'55"	5°15'34"	5°14'13"	5°12'53"	5°11'33"	5°10'14"	5°8'54"
316	5°7'34"	5°6'14"	5°4'53"	5°3'33"	5°2'12"	5°0'52"	4°59'33"	4°58'14"	4°56'55"	4°55'37"	4°54'19"	4°53'1"
317	4°51'43"	4°50'24"	4°49'5"	4°47'46"	4°46'27"	4°45'8"	4°43'50"	4°42'33"	4°41'16"	4°39'59"	4°38'43"	4°37'27"
318	4°36'10"	4°34'53"	4°33'35"	4°32'18"	4°31'0"	4°29'43"	4°28'27"	4°27'11"	4°25'56"	4°24'41"	4°23'26"	4°22'11"
319	4°20'56"	4°19'41"	4°18'25"	4°17'9"	4°15'53"	4°14'38"	4°13'23"	4°12'9"	4°10'56"	4°9'42"	4°8'29"	4°7'16"
320	4°6'3"	4°4'49"	4°3'35"	4°2'20"	4°1'6"	3°59'53"	3°58'40"	3°57'27"	3°56'15"	3°55'4"	3°53'52"	3°52'41"
321	3°51'29"	3°50'17"	3°49'4"	3°47'52"	3°46'40"	3°45'28"	3°44'16"	3°43'5"	3°41'55"	3°40'45"	3°39'36"	3°38'26"
322	3°37'16"	3°36'6"	3°34'55"	3°33'44"	3°32'33"	3°31'23"	3°30'13"	3°29'4"	3°27'56"	3°26'48"	3°25'40"	3°24'32"
323	3°23'24"	3°22'15"	3°21'6"	3°19'57"	3°18'48"	3°17'40"	3°16'32"	3°15'25"	3°14'18"	3°13'12"	3°12'6"	3°10'59"
324	3°9'53"	3°8'46"	3°7'39"	3°6'31"	3°5'24"	3°4'18"	3°3'12"	3°2'6"	3°1'1"	2°59'57"	2°58'53"	2°57'48"
325	2°56'44"	2°55'38"	2°54'33"	2°53'28"	2°52'22"	2°51'18"	2°50'13"	2°49'10"	2°48'7"	2°47'4"	2°46'2"	2°44'59"
326	2°43'56"	2°42'53"	2°41'50"	2°40'46"	2°39'42"	2°38'39"	2°37'37"	2°36'35"	2°35'34"	2°34'34"	2°33'33"	2°32'32"
327	2°31'31"	2°30'30"	2°29'28"	2°28'27"	2°27'25"	2°26'24"	2°25'23"	2°24'24"	2°23'24"	2°22'26"	2°21'27"	2°20'28"
328	2°19'29"	2°18'30"	2°17'30"	2°16'30"	2°15'31"	2°14'31"	2°13'33"	2°12'35"	2°11'38"	2°10'41"	2°9'44"	2°8'47"
329	2°7'50"	2°6'53"	2°5'55"	2°4'57"	2°3'59"	2°3'0"	2°2'5"	2°1'9"	2°0'14"	1°59'19"	1°58'25"	1°57'30"
330	1°56'35"	1°55'39"	1°54'43"	1°53'47"	1°52'52"	1°51'56"	1°51'2"	1°50'8"	1°49'14"	1°48'21"	1°47'29"	1°46'36"
331	1°45'43"	1°44'49"	1°43'55"	1°43'1"	1°42'8"	1°41'14"	1°40'22"	1°39'30"	1°38'39"	1°37'48"	1°36'57"	1°36'6"
332	1°35'15"	1°34'24"	1°33'32"	1°32'40"	1°31'48"	1°30'57"	1°30'6"	1°29'16"	1°28'27"	1°27'38"	1°26'50"	1°26'1"
333	1°25'12"	1°24'22"	1°23'33"	1°22'43"	1°21'53"	1°21'4"	1°20'15"	1°19'28"	1°18'40"	1°17'54"	1°17'7"	1°16'20"
334	1°15'33"	1°14'46"	1°13'58"	1°13'11"	1°12'23"	1°11'36"	1°10'49"	1°10'4"	1°9'19"	1°8'34"	1°7'49"	1°7'5"
335	1°6'20"	1°5'35"	1°4'49"	1°4'3"	1°3'18"	1°2'33"	1°1'49"	1°1'5"	1°0'22"	59'39"	58'57"	58'15"
336	57'32"	56'49"	56'5"	55'22"	54'38"	53'55"	53'13"	52'32"	51'51"	51'10"	50'30"	49'50"
337	49'9"	48'28"	47'47"	47'6"	46'24"	45'44"	45'3"	44'24"	43'45"	43'7"	42'29"	41'51"
338	41'12"	40'34"	39'54"	39'15"	38'36"	37'58"	37'20"	36'42"	36'6"	35'30"	34'54"	34'18"
339	33'42"	33'5"	32'28"	31'51"	31'14"	30'38"	30'2"	29'27"	28'53"	28'19"	27'45"	27'11"
340	26'37"	26'3"	25'28"	24'53"	24'18"	23'44"	23'11"	22'38"	22'6"	21'34"	21'3"	20'31"
341	19'59"	19'27"	18'54"	18'22"	17'49"	17'17"	16'46"	16'15"	15'45"	15'16"	14'47"	14'17"
342	13'48"	13'18"	12'47"	12'17"	11'47"	11'17"	10'48"	10'19"	9'52"	9'24"	8'57"	8'30"
343	8'3"	7'35"	7'7"	6'39"	6'11"	5'43"	5'16"	4'50"	4'25"	3'60"	3'35"	3'10"
344	2'45"	2'20"	1'54"	1'28"	1'2"	37"	12"	-12"	-35"	-57"	-1'20"	-1'42"
345	-2'5"	-2'28"	-2'52"	-3'16"	-3'39"	-4'2"	-4'25"	-4'46"	-5'7"	-5'27"	-5'47"	-6'8"
346	-6'28"	-6'49"	-7'11"	-7'32"	-7'53"	-8'14"	-8'34"	-8'53"	-9'12"	-9'30"	-9'48"	-10'6"
347	-10'24"	-10'43"	-11'2"	-11'21"	-11'40"	-11'58"	-12'16"	-12'33"	-12'49"	-13'5"	-13'20"	-13'36"
348	-13'52"	-14'8"	-14'25"	-14'42"	-14'58"	-15'15"	-15'30"	-15'45"	-15'59"	-16'12"	-16'25"	-16'39"
349	-16'52"	-17'6"	-17'21"	-17'35"	-17'49"	-18'3"	-18'16"	-18'29"	-18'40"	-18'51"	-19'2"	-19'13"
350	-19'25"	-19'36"	-19'48"	-20'0"	-20'12"	-20'24"	-20'35"	-20'45"	-20'54"	-21'3"	-21'11"	-21'20"
351	-21'29"	-21'38"	-21'48"	-21'58"	-22'7"	-22'17"	-22'25"	-22'33"	-22'40"	-22'46"	-22'52"	-22'59"
352	-23'5"	-23'12"	-23'20"	-23'27"	-23'34"	-23'41"	-23'47"	-23'52"	-23'57"	-24'1"	-24'5"	-24'9"
353	-24'13"	-24'18"	-24'23"	-24'28"	-24'33"	-24'37"	-24'41"	-24'44"	-24'46"	-24'48"	-24'50"	-24'51"
354	-24'53"	-24'55"	-24'58"	-25'1"	-25'3"	-25'5"	-25'7"	-25'7"	-25'7"	-25'7"	-25'6"	-25'5"
355	-25'5"	-25'5"	-25'5"	-25'5"	-25'6"	-25'5"	-25'4"	-25'3"	-25'0"	-24'57"	-24'54"	-24'51"
356	-24'48"	-24'46"	-24'44"	-24'42"	-24'40"	-24'38"	-24'34"	-24'30"	-24'25"	-24'19"	-24'14	

Solar E Differentials -- Epoch 2020 -- Leap Years +2 (LY2)

Dn	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
0	0°	-39'	-1'17"	-1'53"	-2'28"	-3'1"	-3'34"	-4'6"	-4'39"	-5'13"	-5'49"	-6'27"
1	-7'5"	-7'43"	-8'21"	-8'57"	-9'31"	-10'4"	-10'36"	-11'8"	-11'41"	-12'15"	-12'50"	-13'27"
2	-14'5"	-14'43"	-15'20"	-15'56"	-16'30"	-17'2"	-17'34"	-18'5"	-18'37"	-19'11"	-19'46"	-20'22"
3	-20'59"	-21'37"	-22'13"	-22'48"	-23'22"	-23'54"	-24'25"	-24'56"	-25'28"	-26'1"	-26'35"	-27'11"
4	-27'48"	-28'25"	-29'1"	-29'35"	-30'8"	-30'40"	-31'10"	-31'41"	-32'12"	-32'44"	-33'18"	-33'53"
5	-34'29"	-35'6"	-35'41"	-36'15"	-36'48"	-37'18"	-37'48"	-38'18"	-38'49"	-39'20"	-39'54"	-40'28"
6	-41'4"	-41'40"	-42'14"	-42'48"	-43'20"	-43'50"	-44'19"	-44'48"	-45'18"	-45'49"	-46'22"	-46'56"
7	-47'31"	-48'6"	-48'40"	-49'13"	-49'44"	-50'14"	-50'42"	-51'11"	-51'40"	-52'11"	-52'43"	-53'16"
8	-53'50"	-54'24"	-54'58"	-55'30"	-56'0"	-56'29"	-56'57"	-57'25"	-57'54"	-58'23"	-58'55"	-59'27"
9	-1°0'1"	-1°0'34"	-1°1'7"	-1°1'39"	-1°2'8"	-1°2'37"	-1°3'4"	-1°3'31"	-1°3'59"	-1°4'28"	-1°4'58"	-1°5'30"
10	-1°6'3"	-1°6'36"	-1°7'8"	-1°7'39"	-1°8'8"	-1°8'35"	-1°9'2"	-1°9'28"	-1°9'55"	-1°10'23"	-1°10'53"	-1°11'24"
11	-1°11'56"	-1°12'28"	-1°12'59"	-1°13'29"	-1°13'58"	-1°14'24"	-1°14'50"	-1°15'16"	-1°15'42"	-1°16'9"	-1°16'38"	-1°17'9"
12	-1°17'40"	-1°18'11"	-1°18'42"	-1°19'11"	-1°19'38"	-1°20'4"	-1°20'29"	-1°20'54"	-1°21'19"	-1°21'46"	-1°22'14"	-1°22'44"
13	-1°23'14"	-1°23'44"	-1°24'14"	-1°24'42"	-1°25'9"	-1°25'34"	-1°25'58"	-1°26'22"	-1°26'47"	-1°27'13"	-1°27'40"	-1°28'9"
14	-1°28'38"	-1°29'8"	-1°29'37"	-1°30'4"	-1°30'30"	-1°30'54"	-1°31'18"	-1°31'41"	-1°32'4"	-1°32'29"	-1°32'56"	-1°33'24"
15	-1°33'53"	-1°34'21"	-1°34'49"	-1°35'16"	-1°35'41"	-1°36'4"	-1°36'27"	-1°36'49"	-1°37'12"	-1°37'36"	-1°38'2"	-1°38'29"
16	-1°38'56"	-1°39'24"	-1°39'51"	-1°40'17"	-1°40'41"	-1°41'4"	-1°41'25"	-1°41'47"	-1°42'9"	-1°42'32"	-1°42'57"	-1°43'23"
17	-1°43'50"	-1°44'17"	-1°44'43"	-1°45'8"	-1°45'31"	-1°45'53"	-1°46'13"	-1°46'34"	-1°46'55"	-1°47'17"	-1°47'41"	-1°48'6"
18	-1°48'32"	-1°48'58"	-1°49'24"	-1°49'48"	-1°50'10"	-1°50'31"	-1°50'50"	-1°51'10"	-1°51'30"	-1°51'52"	-1°52'15"	-1°52'39"
19	-1°53'4"	-1°53'29"	-1°53'54"	-1°54'17"	-1°54'38"	-1°54'58"	-1°55'17"	-1°55'35"	-1°55'55"	-1°56'15"	-1°56'37"	-1°57'1"
20	-1°57'25"	-1°57'49"	-1°58'12"	-1°58'35"	-1°58'55"	-1°59'14"	-1°59'32"	-1°59'50"	-2°0'8"	-2°0'28"	-2°0'49"	-2°1'11"
21	-2°1'34"	-2°1'58"	-2°2'20"	-2°2'41"	-2°3'1"	-2°3'19"	-2°3'36"	-2°3'53"	-2°4'10"	-2°4'29"	-2°4'49"	-2°5'10"
22	-2°5'33"	-2°5'55"	-2°6'16"	-2°6'37"	-2°6'55"	-2°7'12"	-2°7'28"	-2°7'44"	-2°8'1"	-2°8'18"	-2°8'38"	-2°8'58"
23	-2°9'19"	-2°9'41"	-2°10'1"	-2°10'21"	-2°10'38"	-2°10'54"	-2°11'10"	-2°11'24"	-2°11'40"	-2°11'57"	-2°12'15"	-2°12'34"
24	-2°12'55"	-2°13'15"	-2°13'35"	-2°13'53"	-2°14'10"	-2°14'25"	-2°14'39"	-2°14'53"	-2°15'8"	-2°15'23"	-2°15'41"	-2°15'59"
25	-2°16'19"	-2°16'38"	-2°16'57"	-2°17'14"	-2°17'30"	-2°17'44"	-2°17'57"	-2°18'10"	-2°18'24"	-2°18'39"	-2°18'55"	-2°19'12"
26	-2°19'31"	-2°19'49"	-2°20'7"	-2°20'23"	-2°20'38"	-2°20'51"	-2°21'4"	-2°21'16"	-2°21'28"	-2°21'42"	-2°21'57"	-2°22'14"
27	-2°22'31"	-2°22'49"	-2°23'6"	-2°23'21"	-2°23'35"	-2°23'47"	-2°23'58"	-2°24'9"	-2°24'21"	-2°24'34"	-2°24'48"	-2°25'3"
28	-2°25'20"	-2°25'36"	-2°25'52"	-2°26'6"	-2°26'19"	-2°26'30"	-2°26'41"	-2°26'51"	-2°27'1"	-2°27'13"	-2°27'26"	-2°27'41"
29	-2°27'56"	-2°28'12"	-2°28'27"	-2°28'40"	-2°28'52"	-2°29'2"	-2°29'11"	-2°29'20"	-2°29'30"	-2°29'41"	-2°29'53"	-2°30'7"
30	-2°30'21"	-2°30'36"	-2°30'49"	-2°31'2"	-2°31'12"	-2°31'22"	-2°31'30"	-2°31'38"	-2°31'46"	-2°31'56"	-2°32'7"	-2°32'20"
31	-2°32'33"	-2°32'47"	-2°32'60"	-2°33'11"	-2°33'21"	-2°33'29"	-2°33'36"	-2°33'43"	-2°33'51"	-2°33'59"	-2°34'10"	-2°34'21"
32	-2°34'34"	-2°34'46"	-2°34'58"	-2°35'8"	-2°35'17"	-2°35'24"	-2°35'30"	-2°35'36"	-2°35'43"	-2°35'50"	-2°35'60"	-2°36'10"
33	-2°36'21"	-2°36'33"	-2°36'44"	-2°36'53"	-2°37'1"	-2°37'7"	-2°37'12"	-2°37'17"	-2°37'22"	-2°37'29"	-2°37'37"	-2°37'47"
34	-2°37'57"	-2°38'7"	-2°38'17"	-2°38'25"	-2°38'32"	-2°38'37"	-2°38'41"	-2°38'45"	-2°38'50"	-2°38'55"	-2°39'2"	-2°39'11"
35	-2°39'20"	-2°39'29"	-2°39'38"	-2°39'45"	-2°39'51"	-2°39'55"	-2°39'58"	-2°40'1"	-2°40'4"	-2°40'9"	-2°40'15"	-2°40'23"
36	-2°40'31"	-2°40'39"	-2°40'47"	-2°40'53"	-2°40'58"	-2°41'1"	-2°41'3"	-2°41'5"	-2°41'7"	-2°41'11"	-2°41'16"	-2°41'22"
37	-2°41'29"	-2°41'37"	-2°41'43"	-2°41'48"	-2°41'52"	-2°41'54"	-2°41'55"	-2°41'56"	-2°41'57"	-2°41'60"	-2°42'4"	-2°42'9"
38	-2°42'16"	-2°42'22"	-2°42'27"	-2°42'31"	-2°42'34"	-2°42'35"	-2°42'35"	-2°42'35"	-2°42'35"	-2°42'37"	-2°42'40"	-2°42'44"
39	-2°42'50"	-2°42'55"	-2°42'59"	-2°43'3"	-2°43'4"	-2°43'4"	-2°43'3"	-2°43'2"	-2°43'2"	-2°43'2"	-2°43'4"	-2°43'8"
40	-2°43'12"	-2°43'16"	-2°43'19"	-2°43'22"	-2°43'22"	-2°43'21"	-2°43'19"	-2°43'17"	-2°43'16"	-2°43'15"	-2°43'16"	-2°43'19"
41	-2°43'22"	-2°43'25"	-2°43'28"	-2°43'29"	-2°43'28"	-2°43'27"	-2°43'24"	-2°43'21"	-2°43'18"	-2°43'17"	-2°43'17"	-2°43'18"
42	-2°43'20"	-2°43'23"	-2°43'24"	-2°43'24"	-2°43'23"	-2°43'20"	-2°43'16"	-2°43'12"	-2°43'9"	-2°43'6"	-2°43'6"	-2°43'6"
43	-2°43'7"	-2°43'9"	-2°43'9"	-2°43'8"	-2°43'6"	-2°43'2"	-2°42'57"	-2°42'52"	-2°42'48"	-2°42'45"	-2°42'42"	-2°42'42"
44	-2°42'43"	-2°42'43"	-2°42'43"	-2°42'41"	-2°42'38"	-2°42'33"	-2°42'27"	-2°42'21"	-2°42'16"	-2°42'12"	-2°42'9"	-2°42'8"
45	-2°42'7"	-2°42'6"	-2°42'5"	-2°42'3"	-2°41'58"	-2°41'53"	-2°41'46"	-2°41'39"	-2°41'33"	-2°41'28"	-2°41'24"	-2°41'22"
46	-2°41'20"	-2°41'19"	-2°41'17"	-2°41'13"	-2°41'8"	-2°41'2"	-2°40'54"	-2°40'46"	-2°40'39"	-2°40'33"	-2°40'29"	-2°40'25"
47	-2°40'23"	-2°40'21"	-2°40'18"	-2°40'13"	-2°40'7"	-2°39'60"	-2°39'51"	-2°39'43"	-2°39'35"	-2°39'28"	-2°39'23"	-2°39'18"
48	-2°39'15"	-2°39'12"	-2°39'8"	-2°39'3"	-2°38'56"	-2°38'48"	-2°38'38"	-2°38'29"	-2°38'20"	-2°38'12"	-2°38'6"	-2°38'1"
49	-2°37'57"	-2°37'53"	-2°37'48"	-2°37'42"	-2°37'34"	-2°37'25"	-2°37'15"	-2°37'5"	-2°36'55"	-2°36'47"	-2°36'40"	-2°36'34"
50	-2°36'29"	-2°36'24"	-2°36'19"	-2°36'12"	-2°36'3"	-2°35'53"	-2°35'42"	-2°35'31"	-2°35'21"	-2°35'11"	-2°35'4"	-2°34'57"
51	-2°34'51"	-2°34'46"	-2°34'39"	-2°34'31"	-2°34'22"	-2°34'11"	-2°33'60"	-2°33'48"	-2°33'37"	-2°33'27"	-2°33'18"	-2°33'11"
52	-2°33'4"	-2°32'58"	-2°32'50"	-2°32'42"	-2°32'32"	-2°32'20"	-2°32'8"	-2°31'55"	-2°31'43"	-2°31'32"	-2°31'23"	-2°31'15"
53	-2°31'8"	-2°31'0"	-2°30'52"	-2°30'43"	-2°30'32"	-2°30'20"	-2°30'7"	-2°29'54"	-2°29'41"	-2°29'29"	-2°29'19"	-2°29'10"
54	-2°29'2"	-2°28'54"	-2°28'46"	-2°28'36"	-2°28'24"	-2°28'11"	-2°27'57"	-2°27'43"	-2°27'30"	-2°27'18"	-2°27'7"	-2°26'57"
55	-2°26'48"	-2°26'40"	-2°26'30"	-2°26'20"	-2°26'7"	-2°25'54"	-2°25'39"	-2°25'24"	-2°25'10"	-2°24'57"	-2°24'46"	-2°24'35"
56	-2°24'26"	-2°24'17"	-2°24'7"	-2°23'55"	-2°23'42"	-2°23'28"	-2°23'13"	-2°22'57"	-2°22'42"	-2°22'29"	-2°22'16"	-2°22'6"
57	-2°21'55"	-2°21'45"	-2°21'35"	-2°21'23"	-2°21'9"	-2°20'54"	-2°20'38"	-2°20'22"	-2°20'6"	-2°19'52"	-2°19'39"	-2°19'28"
58	-2°19'17"	-2°19'6"	-2°18'55"	-2°18'42"	-2°18'28"	-2°18'12"	-2°17'56"	-2°17'39"	-2°17'23"	-2°17'8"	-2°16'54"	-2°16'42"
59	-2°16'30"	-2°16'19"	-2°16'7"	-2°15'54"	-2°15'39"	-2°15'23"	-2°15'5"	-2°14'48"	-2°14'31"	-2°14'16"	-2°14'1"	-2°13'49"
60	-2°13'36"	-2°13'25"	-2°13'12"	-2°12'58"	-2°12'42"	-2°12'26"	-2°12'8"	-2°11'50"	-2°11'32"	-2°11'16"	-2°11'1"	-2°10'48"
61	-2°10'35"	-2°10'23"	-2°10'9"	-2°9'55"	-2°9'39"	-2°9'21"	-2°9'3"	-2°8'44"	-2°8'26"	-2°8'9"	-2°7'54"	-2°7'40"
62	-2°7'27"	-2°7'14"	-2°6'60"	-2°6'45"	-2°6'28"	-2°6'10"	-2°5'51"	-2°5'32"	-2°5'13"	-2°4'56"	-2°4'40"	-2°4'25"
63	-2°4'11"	-2°3'58"	-2°3'43"	-2°3'27"	-2°3'10"	-2°2'52"	-2°2'32"	-2°2'12"	-2°1'53"	-2°1'35"	-2°1'19"	-2°1'4"
64	-2°0'49"	-2°0'35"	-2°0'20"	-2°0'4"	-1°59'46"	-1°59'27"	-1°59'7"	-1°58'46"	-1°58'27"	-1°58'8"	-1°57'51"	-1°57'36"
65	-1°57'21"	-1°57'6"	-1°56'50"	-1°56'34"	-1°56'15"	-1°55'56"	-1°55'35"	-1°55'14"	-1°54'54"	-1°54'35"	-1°54'18"	-1°54'1"
66	-1°53'46"	-1°53'31"	-1°53'15"	-1°52'57"	-1°52'39"	-1°52'18"	-1°51'57"	-1°51'36"	-1°51'15"	-1°50'56"	-1°50'38"	-1°50'21"
67	-1°50'5"	-1°49'49"	-1°49'33"	-1°49'15"	-1°48'56"	-1°48'35"	-1°48'14"	-1°47'52"	-1°47'31"	-1°47'11"	-1°46'53"	-1°46'35"
68	-1°46'19"	-1°46'3"	-1°45'46"	-1°45'28"	-1°45'8"	-1°44'47"	-1°44'25"	-1°44'3"	-1°43'41"	-1°43'21"	-1°43'2"	-1°42'44"
69	-1°42'27"	-1°42'11"	-1°41'53"	-1°41'35"	-1°41'15"	-1°40'53"	-1°40'31"	-1°40'8"	-1°39'46"	-1°39'25"	-1°39'6"	-1°38'48"
70	-1°38'31"	-1°38'14"	-1°37'56"	-1°37'37"	-1°37'16"	-1°36'54"	-1°36'32"	-1°36'9"	-1°35'46"	-1°35'25"	-1°35'5"	-1°34'47"
71	-1°34'30"	-1°34'12"	-1°33'54"	-1°33'34"	-1°33'13"	-1°32'51"	-1°32'28"	-1°32'5"	-1°31'42"	-1°31'21"	-1°31'0"	-1°30'42"
72	-1°30'24"	-1°30'6"	-1°29'47"	-1°29'28"	-1°29'6"	-1°28'44"	-1°28'20"	-1°27'57"	-1°27'34"	-1°27'12"	-1°26'51"	-1°26'32"
73	-1°26'14"	-1°25'56"	-1°25'37"	-1°25'17"	-1°24'55"	-1°24'32"	-1°24'9"	-1°23'45"	-1°23'21"	-1°22'59"	-1°22'38"	-1°22'19"
74	-1°22'1"	-1°21'42"	-1°21'23"	-1°21'3"	-1°20'41"	-1°20'17"	-1°19'53"	-1°19'29"	-1°19'5"	-1°18'43"	-1°18'22"	-1°18'2"
75	-1°17'44"	-1°17'25"	-1°17'5"	-1°16'45"	-1°16'23"	-1°15'59"	-1°15'35"	-1°15'10"	-1°14'47"	-1°14'24"	-1°14'3"	-1°13'43"
76	-1°13'24"	-1°13'5"	-1°12'45"	-1°12'24"	-1°12'2"	-1°11'38"	-1°11'14"	-1°10'49"	-1°10'25"	-1°10'2"	-1°9'41"	-1°9'20"
77	-1°9'1"	-1°8'42"	-1°8'22"	-1°8'1"	-1°7'38"	-1°7'15"	-1°6'50"	-1°6'25"	-1°6'1"	-1°5'38"	-1°5'16"	-1°4'56"
78	-1°4'36"	-1°4'17"	-1°3'57"	-1°3'36"	-1°3'13"	-1°2'49"	-1°2'24"	-1°1'59"	-1°1'34"	-1°1'11"	-1°0'50"	-1°0'29"
79	-1°0'10"	-59'50"	-59'30"	-59'8"	-58'46"	-58'21"	-57'56"	-57'31"	-57'7"	-56'43"	-56'21"	-56'1"
80	-55'41"	-55'22"	-55'1"	-54'40"	-54'17"	-53'52"	-53'27"	-53'2"	-52'37"	-52'14"	-51'52"	-51'31"
81	-51'12"	-50'52"	-50'32"	-50'10"	-49'47"	-49'22"</						

Solar E Differentials -- Epoch 2020 -- Leap Years +2 (LY2)

Dn	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
92	-1' 53"	-1' 34"	-1' 14"	-53"	-31"	-7"	17"	42"	1' 6"	1' 28"	1' 50"	2' 9"
93	2' 28"	2' 47"	3' 7"	3' 28"	3' 50"	4' 13"	4' 38"	5' 2"	5' 26"	5' 48"	6' 9"	6' 29"
94	6' 48"	7' 6"	7' 26"	7' 46"	8' 8"	8' 32"	8' 56"	9' 20"	9' 43"	10' 6"	10' 26"	10' 46"
95	11' 4"	11' 23"	11' 42"	12' 2"	12' 24"	12' 47"	13' 11"	13' 35"	13' 58"	14' 20"	14' 41"	15' 0"
96	15' 18"	15' 37"	15' 56"	16' 16"	16' 37"	17' 0"	17' 24"	17' 47"	18' 10"	18' 32"	18' 52"	19' 11"
97	19' 29"	19' 47"	20' 6"	20' 26"	20' 47"	21' 10"	21' 33"	21' 57"	22' 19"	22' 41"	23' 1"	23' 19"
98	23' 37"	23' 55"	24' 13"	24' 33"	24' 54"	25' 16"	25' 39"	26' 2"	26' 25"	26' 46"	27' 6"	27' 24"
99	27' 41"	27' 59"	28' 17"	28' 36"	28' 57"	29' 19"	29' 42"	30' 4"	30' 26"	30' 47"	31' 7"	31' 25"
100	31' 42"	31' 59"	32' 16"	32' 35"	32' 56"	33' 18"	33' 40"	34' 2"	34' 24"	34' 45"	35' 4"	35' 21"
101	35' 38"	35' 55"	36' 12"	36' 31"	36' 51"	37' 12"	37' 34"	37' 56"	38' 18"	38' 38"	38' 56"	39' 14"
102	39' 30"	39' 47"	40' 4"	40' 22"	40' 41"	41' 2"	41' 24"	41' 46"	42' 7"	42' 27"	42' 45"	43' 2"
103	43' 18"	43' 34"	43' 50"	44' 8"	44' 27"	44' 48"	45' 9"	45' 31"	45' 51"	46' 11"	46' 28"	46' 45"
104	47' 0"	47' 16"	47' 32"	47' 49"	48' 8"	48' 28"	48' 49"	49' 10"	49' 30"	49' 49"	50' 7"	50' 23"
105	50' 38"	50' 53"	51' 9"	51' 26"	51' 44"	52' 4"	52' 24"	52' 45"	53' 4"	53' 23"	53' 40"	53' 55"
106	54' 10"	54' 25"	54' 40"	54' 56"	55' 14"	55' 34"	55' 54"	56' 14"	56' 33"	56' 51"	57' 7"	57' 22"
107	57' 37"	57' 51"	58' 5"	58' 21"	58' 39"	58' 58"	59' 17"	59' 37"	59' 55"	1' 0' 13"	1' 0' 29"	1' 0' 43"
108	1' 0' 57"	1' 1' 11"	1' 1' 25"	1' 1' 40"	1' 1' 57"	1' 2' 16"	1' 2' 35"	1' 2' 53"	1' 3' 12"	1' 3' 29"	1' 3' 44"	1' 3' 58"
109	1' 4' 11"	1' 4' 24"	1' 4' 38"	1' 4' 53"	1' 5' 9"	1' 5' 27"	1' 5' 46"	1' 6' 4"	1' 6' 22"	1' 6' 38"	1' 6' 53"	1' 7' 6"
110	1' 7' 19"	1' 7' 31"	1' 7' 45"	1' 7' 59"	1' 8' 15"	1' 8' 32"	1' 8' 50"	1' 9' 8"	1' 9' 25"	1' 9' 41"	1' 9' 55"	1' 10' 8"
111	1' 10' 20"	1' 10' 32"	1' 10' 44"	1' 10' 58"	1' 11' 14"	1' 11' 30"	1' 11' 47"	1' 12' 5"	1' 12' 21"	1' 12' 36"	1' 12' 50"	1' 13' 2"
112	1' 13' 14"	1' 13' 25"	1' 13' 37"	1' 13' 51"	1' 14' 5"	1' 14' 21"	1' 14' 38"	1' 14' 55"	1' 15' 11"	1' 15' 25"	1' 15' 38"	1' 15' 50"
113	1' 16' 1"	1' 16' 11"	1' 16' 23"	1' 16' 36"	1' 16' 50"	1' 17' 5"	1' 17' 21"	1' 17' 37"	1' 17' 53"	1' 18' 7"	1' 18' 19"	1' 18' 30"
114	1' 18' 40"	1' 18' 50"	1' 19' 1"	1' 19' 13"	1' 19' 27"	1' 19' 41"	1' 19' 57"	1' 20' 12"	1' 20' 27"	1' 20' 40"	1' 20' 52"	1' 21' 3"
115	1' 21' 12"	1' 21' 22"	1' 21' 32"	1' 21' 43"	1' 21' 56"	1' 22' 10"	1' 22' 25"	1' 22' 40"	1' 22' 54"	1' 23' 7"	1' 23' 18"	1' 23' 28"
116	1' 23' 37"	1' 23' 46"	1' 23' 55"	1' 24' 6"	1' 24' 18"	1' 24' 32"	1' 24' 46"	1' 25' 0"	1' 25' 13"	1' 25' 26"	1' 25' 36"	1' 25' 45"
117	1' 25' 54"	1' 26' 2"	1' 26' 11"	1' 26' 21"	1' 26' 32"	1' 26' 45"	1' 26' 59"	1' 27' 12"	1' 27' 25"	1' 27' 36"	1' 27' 46"	1' 27' 55"
118	1' 28' 3"	1' 28' 10"	1' 28' 18"	1' 28' 28"	1' 28' 39"	1' 28' 51"	1' 29' 4"	1' 29' 17"	1' 29' 29"	1' 29' 40"	1' 29' 49"	1' 29' 57"
119	1' 30' 4"	1' 30' 10"	1' 30' 18"	1' 30' 27"	1' 30' 37"	1' 30' 49"	1' 31' 1"	1' 31' 13"	1' 31' 25"	1' 31' 35"	1' 31' 43"	1' 31' 50"
120	1' 31' 57"	1' 32' 3"	1' 32' 10"	1' 32' 18"	1' 32' 27"	1' 32' 38"	1' 32' 50"	1' 33' 2"	1' 33' 12"	1' 33' 22"	1' 33' 30"	1' 33' 36"
121	1' 33' 42"	1' 33' 47"	1' 33' 54"	1' 34' 1"	1' 34' 10"	1' 34' 20"	1' 34' 31"	1' 34' 42"	1' 34' 52"	1' 35' 1"	1' 35' 8"	1' 35' 14"
122	1' 35' 19"	1' 35' 24"	1' 35' 29"	1' 35' 36"	1' 35' 44"	1' 35' 54"	1' 36' 4"	1' 36' 14"	1' 36' 24"	1' 36' 32"	1' 36' 38"	1' 36' 43"
123	1' 36' 48"	1' 36' 52"	1' 36' 57"	1' 37' 3"	1' 37' 10"	1' 37' 19"	1' 37' 29"	1' 37' 38"	1' 37' 47"	1' 37' 54"	1' 38' 0"	1' 38' 5"
124	1' 38' 8"	1' 38' 12"	1' 38' 16"	1' 38' 21"	1' 38' 28"	1' 38' 37"	1' 38' 45"	1' 38' 54"	1' 39' 2"	1' 39' 9"	1' 39' 14"	1' 39' 18"
125	1' 39' 21"	1' 39' 24"	1' 39' 27"	1' 39' 32"	1' 39' 38"	1' 39' 46"	1' 39' 54"	1' 40' 2"	1' 40' 9"	1' 40' 15"	1' 40' 20"	1' 40' 23"
126	1' 40' 25"	1' 40' 27"	1' 40' 30"	1' 40' 34"	1' 40' 40"	1' 40' 47"	1' 40' 54"	1' 41' 2"	1' 41' 8"	1' 41' 14"	1' 41' 17"	1' 41' 20"
127	1' 41' 21"	1' 41' 23"	1' 41' 25"	1' 41' 28"	1' 41' 33"	1' 41' 39"	1' 41' 46"	1' 41' 53"	1' 41' 59"	1' 42' 3"	1' 42' 7"	1' 42' 8"
128	1' 42' 9"	1' 42' 10"	1' 42' 11"	1' 42' 14"	1' 42' 18"	1' 42' 23"	1' 42' 30"	1' 42' 36"	1' 42' 41"	1' 42' 45"	1' 42' 47"	1' 42' 48"
129	1' 42' 49"	1' 42' 49"	1' 42' 49"	1' 42' 51"	1' 42' 55"	1' 42' 59"	1' 43' 5"	1' 43' 10"	1' 43' 15"	1' 43' 18"	1' 43' 20"	1' 43' 20"
130	1' 43' 20"	1' 43' 19"	1' 43' 19"	1' 43' 20"	1' 43' 23"	1' 43' 27"	1' 43' 32"	1' 43' 37"	1' 43' 41"	1' 43' 43"	1' 43' 44"	1' 43' 44"
131	1' 43' 43"	1' 43' 41"	1' 43' 41"	1' 43' 41"	1' 43' 43"	1' 43' 47"	1' 44' 51"	1' 44' 55"	1' 44' 58"	1' 44' 60"	1' 44' 60"	1' 44' 59"
132	1' 43' 57"	1' 43' 55"	1' 43' 54"	1' 43' 54"	1' 43' 55"	1' 43' 58"	1' 44' 1"	1' 44' 4"	1' 44' 7"	1' 44' 8"	1' 44' 8"	1' 44' 6"
133	1' 44' 3"	1' 44' 1"	1' 43' 58"	1' 43' 58"	1' 43' 58"	1' 44' 0"	1' 44' 3"	1' 44' 6"	1' 44' 8"	1' 44' 8"	1' 44' 7"	1' 44' 4"
134	1' 44' 1"	1' 43' 58"	1' 43' 55"	1' 43' 53"	1' 43' 53"	1' 43' 55"	1' 43' 57"	1' 43' 59"	1' 43' 60"	1' 43' 60"	1' 43' 58"	1' 43' 54"
135	1' 43' 50"	1' 43' 46"	1' 43' 43"	1' 43' 41"	1' 43' 40"	1' 43' 40"	1' 43' 42"	1' 43' 43"	1' 43' 43"	1' 43' 43"	1' 43' 40"	1' 43' 36"
136	1' 43' 31"	1' 43' 27"	1' 43' 22"	1' 43' 19"	1' 43' 18"	1' 43' 18"	1' 43' 18"	1' 43' 19"	1' 43' 19"	1' 43' 17"	1' 43' 14"	1' 43' 9"
137	1' 43' 4"	1' 42' 58"	1' 42' 53"	1' 42' 50"	1' 42' 48"	1' 42' 47"	1' 42' 47"	1' 42' 47"	1' 42' 46"	1' 42' 43"	1' 42' 39"	1' 42' 34"
138	1' 42' 28"	1' 42' 22"	1' 42' 16"	1' 42' 12"	1' 42' 9"	1' 42' 7"	1' 42' 7"	1' 42' 6"	1' 42' 4"	1' 42' 1"	1' 41' 56"	1' 41' 50"
139	1' 41' 44"	1' 41' 37"	1' 41' 30"	1' 41' 25"	1' 41' 22"	1' 41' 19"	1' 41' 18"	1' 41' 16"	1' 41' 14"	1' 41' 10"	1' 41' 5"	1' 40' 58"
140	1' 40' 51"	1' 40' 43"	1' 40' 36"	1' 40' 30"	1' 40' 26"	1' 40' 23"	1' 40' 21"	1' 40' 19"	1' 40' 16"	1' 40' 11"	1' 40' 5"	1' 39' 58"
141	1' 39' 50"	1' 39' 41"	1' 39' 34"	1' 39' 27"	1' 39' 22"	1' 39' 19"	1' 39' 16"	1' 39' 13"	1' 39' 9"	1' 39' 4"	1' 38' 58"	1' 38' 49"
142	1' 38' 41"	1' 38' 31"	1' 38' 23"	1' 38' 16"	1' 38' 10"	1' 38' 6"	1' 38' 3"	1' 37' 59"	1' 37' 55"	1' 37' 49"	1' 37' 42"	1' 37' 33"
143	1' 37' 23"	1' 37' 14"	1' 37' 4"	1' 36' 57"	1' 36' 50"	1' 36' 46"	1' 36' 41"	1' 36' 37"	1' 36' 32"	1' 36' 26"	1' 36' 18"	1' 36' 8"
144	1' 35' 58"	1' 35' 48"	1' 35' 38"	1' 35' 30"	1' 35' 23"	1' 35' 17"	1' 35' 12"	1' 35' 7"	1' 35' 2"	1' 34' 55"	1' 34' 46"	1' 34' 36"
145	1' 34' 25"	1' 34' 14"	1' 34' 4"	1' 33' 55"	1' 33' 47"	1' 33' 41"	1' 33' 36"	1' 33' 30"	1' 33' 24"	1' 33' 16"	1' 33' 7"	1' 32' 56"
146	1' 32' 45"	1' 32' 33"	1' 32' 22"	1' 32' 13"	1' 32' 4"	1' 31' 58"	1' 31' 52"	1' 31' 45"	1' 31' 39"	1' 31' 30"	1' 31' 20"	1' 31' 9"
147	1' 30' 57"	1' 30' 45"	1' 30' 33"	1' 30' 23"	1' 30' 14"	1' 30' 7"	1' 30' 0"	1' 29' 54"	1' 29' 46"	1' 29' 37"	1' 29' 27"	1' 29' 15"
148	1' 29' 2"	1' 28' 50"	1' 28' 37"	1' 28' 27"	1' 28' 17"	1' 28' 9"	1' 28' 2"	1' 27' 55"	1' 27' 47"	1' 27' 38"	1' 27' 27"	1' 27' 14"
149	1' 27' 1"	1' 26' 48"	1' 26' 35"	1' 26' 24"	1' 26' 14"	1' 26' 5"	1' 25' 57"	1' 25' 50"	1' 25' 41"	1' 25' 31"	1' 25' 20"	1' 25' 7"
150	1' 24' 53"	1' 24' 39"	1' 24' 26"	1' 24' 14"	1' 24' 4"	1' 23' 54"	1' 23' 46"	1' 23' 38"	1' 23' 29"	1' 23' 18"	1' 23' 6"	1' 22' 53"
151	1' 22' 39"	1' 22' 24"	1' 22' 11"	1' 21' 58"	1' 21' 47"	1' 21' 38"	1' 21' 29"	1' 21' 20"	1' 21' 11"	1' 20' 60"	1' 20' 47"	1' 20' 33"
152	1' 20' 19"	1' 20' 4"	1' 19' 49"	1' 19' 37"	1' 19' 25"	1' 19' 15"	1' 19' 6"	1' 18' 57"	1' 18' 47"	1' 18' 35"	1' 18' 22"	1' 18' 8"
153	1' 17' 53"	1' 17' 37"	1' 17' 23"	1' 17' 9"	1' 16' 58"	1' 16' 47"	1' 16' 38"	1' 16' 28"	1' 16' 17"	1' 16' 6"	1' 15' 52"	1' 15' 37"
154	1' 15' 22"	1' 15' 6"	1' 14' 51"	1' 14' 37"	1' 14' 25"	1' 14' 14"	1' 14' 4"	1' 13' 54"	1' 13' 43"	1' 13' 31"	1' 13' 17"	1' 13' 2"
155	1' 12' 46"	1' 12' 29"	1' 12' 14"	1' 11' 60"	1' 11' 47"	1' 11' 36"	1' 11' 25"	1' 11' 15"	1' 11' 4"	1' 10' 51"	1' 10' 37"	1' 10' 21"
156	1' 10' 5"	1' 9' 48"	1' 9' 32"	1' 9' 18"	1' 9' 5"	1' 8' 53"	1' 8' 42"	1' 8' 31"	1' 8' 20"	1' 8' 7"	1' 7' 52"	1' 7' 36"
157	1' 7' 20"	1' 7' 3"	1' 6' 46"	1' 6' 32"	1' 6' 18"	1' 6' 6"	1' 5' 55"	1' 5' 44"	1' 5' 32"	1' 5' 19"	1' 5' 4"	1' 4' 47"
158	1' 4' 30"	1' 4' 13"	1' 3' 57"	1' 3' 41"	1' 3' 28"	1' 3' 15"	1' 3' 4"	1' 2' 52"	1' 2' 40"	1' 2' 27"	1' 2' 11"	1' 1' 55"
159	1' 1' 37"	1' 1' 20"	1' 1' 3"	1' 0' 47"	1' 0' 33"	1' 0' 21"	1' 0' 9"	59' 57"	59' 45"	59' 31"	59' 15"	58' 59"
160	58' 41"	58' 23"	58' 6"	57' 50"	57' 36"	57' 23"	57' 11"	56' 59"	56' 46"	56' 32"	56' 16"	55' 59"
161	55' 41"	55' 23"	55' 6"	54' 50"	54' 35"	54' 22"	54' 10"	53' 58"	53' 45"	53' 30"	53' 14"	52' 57"
162	52' 39"	52' 20"	52' 3"	51' 47"	51' 32"	51' 19"	51' 6"	50' 54"	50' 40"	50' 26"	50' 10"	49' 52"
163	49' 34"	49' 15"	48' 57"	48' 41"	48' 26"	48' 13"	47' 60"	47' 47"	47' 34"	47' 19"	47' 3"	46' 45"
164	46' 26"	46' 8"	45' 50"	45' 33"	45' 18"	45' 4"	44' 51"	44' 39"	44' 2			

Solar E Differentials -- Epoch 2020 -- Leap Years +2 (LY2)

Dn	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
184	-16'12"	-16'29"	-16'45"	-16'59"	-17'12"	-17'23"	-17'34"	-17'44"	-17'55"	-18' 8"	-18'22"	-18'37"
185	-18'53"	-19' 9"	-19'24"	-19'38"	-19'51"	-20' 2"	-20'12"	-20'22"	-20'32"	-20'44"	-20'58"	-21'12"
186	-21'28"	-21'44"	-21'59"	-22'12"	-22'24"	-22'35"	-22'44"	-22'54"	-23' 4"	-23'15"	-23'28"	-23'42"
187	-23'58"	-24'13"	-24'27"	-24'40"	-24'52"	-25' 2"	-25'11"	-25'20"	-25'29"	-25'40"	-25'53"	-26' 7"
188	-26'21"	-26'36"	-26'50"	-27' 2"	-27'13"	-27'23"	-27'31"	-27'40"	-27'49"	-27'59"	-28'11"	-28'24"
189	-28'39"	-28'53"	-29' 6"	-29'18"	-29'28"	-29'37"	-29'46"	-29'53"	-30' 2"	-30'12"	-30'23"	-30'36"
190	-30'49"	-31' 3"	-31'16"	-31'27"	-31'37"	-31'46"	-31'53"	-32' 1"	-32' 9"	-32'18"	-32'29"	-32'41"
191	-32'54"	-33' 7"	-33'19"	-33'30"	-33'39"	-33'47"	-33'54"	-34' 1"	-34' 8"	-34'17"	-34'27"	-34'39"
192	-34'51"	-35' 4"	-35'15"	-35'26"	-35'34"	-35'42"	-35'48"	-35'54"	-36' 1"	-36' 9"	-36'19"	-36'30"
193	-36'42"	-36'53"	-37' 4"	-37'14"	-37'22"	-37'29"	-37'35"	-37'40"	-37'47"	-37'54"	-38' 3"	-38'14"
194	-38'25"	-38'36"	-38'46"	-38'56"	-39' 3"	-39' 9"	-39'14"	-39'19"	-39'25"	-39'32"	-39'40"	-39'50"
195	-40' 1"	-40'11"	-40'21"	-40'30"	-40'37"	-40'42"	-40'47"	-40'51"	-40'56"	-41' 2"	-41'10"	-41'19"
196	-41'29"	-41'39"	-41'48"	-41'56"	-42' 3"	-42' 7"	-42'11"	-42'15"	-42'20"	-42'25"	-42'32"	-42'41"
197	-42'50"	-42'60"	-43' 8"	-43'15"	-43'21"	-43'25"	-43'29"	-43'32"	-43'35"	-43'40"	-43'47"	-43'55"
198	-44' 3"	-44'12"	-44'20"	-44'27"	-44'32"	-44'35"	-44'38"	-44'41"	-44'44"	-44'48"	-44'54"	-45' 1"
199	-45' 9"	-45'17"	-45'24"	-45'30"	-45'35"	-45'38"	-45'40"	-45'41"	-45'44"	-45'48"	-45'53"	-45'59"
200	-46' 7"	-46'14"	-46'21"	-46'26"	-46'30"	-46'34"	-46'37"	-46'40"	-46'43"	-46'46"	-46'50"	-46'54"
201	-46'56"	-47' 3"	-47' 9"	-47'14"	-47'17"	-47'18"	-47'19"	-47'19"	-47'20"	-47'23"	-47'27"	-47'32"
202	-47'38"	-47'44"	-47'49"	-47'53"	-47'55"	-47'56"	-47'56"	-47'56"	-47'56"	-47'58"	-48' 1"	-48' 6"
203	-48'11"	-48'16"	-48'21"	-48'24"	-48'26"	-48'26"	-48'25"	-48'24"	-48'24"	-48'25"	-48'27"	-48'31"
204	-48'35"	-48'40"	-48'44"	-48'46"	-48'47"	-48'47"	-48'45"	-48'44"	-48'43"	-48'43"	-48'45"	-48'48"
205	-48'52"	-48'55"	-48'59"	-49' 0"	-49' 0"	-48'59"	-48'57"	-48'55"	-48'53"	-48'53"	-48'54"	-48'56"
206	-48'59"	-49' 2"	-49' 4"	-49' 5"	-49' 5"	-49' 3"	-49' 0"	-48'57"	-48'55"	-48'53"	-48'54"	-48'55"
207	-48'57"	-48'60"	-49' 1"	-49' 2"	-49' 0"	-48'58"	-48'54"	-48'50"	-48'47"	-48'45"	-48'45"	-48'45"
208	-48'47"	-48'49"	-48'50"	-48'49"	-48'47"	-48'44"	-48'39"	-48'35"	-48'31"	-48'28"	-48'27"	-48'27"
209	-48'28"	-48'28"	-48'29"	-48'27"	-48'25"	-48'20"	-48'15"	-48'10"	-48' 5"	-48' 2"	-47'60"	-47'59"
210	-47'59"	-47'59"	-47'58"	-47'56"	-47'53"	-47'48"	-47'42"	-47'36"	-47'30"	-47'26"	-47'23"	-47'22"
211	-47'21"	-47'21"	-47'19"	-47'16"	-47'12"	-47' 6"	-46'60"	-46'53"	-46'47"	-46'42"	-46'38"	-46'36"
212	-46'34"	-46'33"	-46'31"	-46'27"	-46'22"	-46'15"	-46' 8"	-46' 0"	-45'53"	-45'48"	-45'43"	-45'40"
213	-45'38"	-45'36"	-45'33"	-45'28"	-45'23"	-45'15"	-45' 7"	-44'59"	-44'51"	-44'44"	-44'39"	-44'35"
214	-44'32"	-44'29"	-44'25"	-44'20"	-44'14"	-44' 6"	-43'57"	-43'47"	-43'39"	-43'32"	-43'26"	-43'21"
215	-43'17"	-43'13"	-43' 9"	-43' 3"	-42'56"	-42'47"	-42'37"	-42'27"	-42'18"	-42'10"	-42' 3"	-41'58"
216	-41'53"	-41'48"	-41'43"	-41'36"	-41'28"	-41'19"	-41' 8"	-40'57"	-40'47"	-40'38"	-40'31"	-40'25"
217	-40'19"	-40'14"	-40' 8"	-40' 0"	-39'51"	-39'41"	-39'30"	-39'18"	-39' 7"	-38'58"	-38'49"	-38'42"
218	-38'36"	-38'30"	-38'23"	-38'15"	-38' 5"	-37'54"	-37'42"	-37'30"	-37'18"	-37' 8"	-36'59"	-36'51"
219	-36'44"	-36'37"	-36'30"	-36'21"	-36'10"	-35'58"	-35'45"	-35'33"	-35'20"	-35' 9"	-34'59"	-34'51"
220	-34'43"	-34'35"	-34'27"	-34'17"	-34' 6"	-33'53"	-33'40"	-33'26"	-33'13"	-33' 1"	-32'51"	-32'41"
221	-32'33"	-32'25"	-32'15"	-32' 5"	-31'53"	-31'40"	-31'25"	-31'11"	-30'57"	-30'44"	-30'33"	-30'23"
222	-30'14"	-30' 5"	-29'55"	-29'44"	-29'31"	-29'17"	-29' 2"	-28'47"	-28'32"	-28'19"	-28' 7"	-27'57"
223	-27'47"	-27'37"	-27'26"	-27'14"	-27' 1"	-26'46"	-26'30"	-26'15"	-25'59"	-25'45"	-25'33"	-25'21"
224	-25'11"	-25' 0"	-24'49"	-24'36"	-24'22"	-24' 7"	-23'50"	-23'34"	-23'18"	-23' 3"	-22'58"	-22'38"
225	-22'27"	-22'16"	-22' 4"	-21'50"	-21'36"	-21'19"	-21' 2"	-20'45"	-20'29"	-20'13"	-19'59"	-19'47"
226	-19'35"	-19'23"	-19'10"	-18'56"	-18'41"	-18'24"	-18' 6"	-17'48"	-17'31"	-17'15"	-17' 1"	-16'47"
227	-16'35"	-16'22"	-16' 9"	-15'54"	-15'38"	-15'21"	-15' 3"	-14'44"	-14'26"	-14'10"	-13'54"	-13'40"
228	-13'27"	-13'14"	-13' 0"	-12'45"	-12'28"	-12'10"	-11'51"	-11'32"	-11'14"	-10'56"	-10'41"	-10'26"
229	-10'12"	-9'58"	-9'44"	-9'28"	-9'11"	-8'52"	-8'33"	-8'13"	-7'54"	-7'36"	-7'19"	-7' 4"
230	-6'50"	-6'36"	-6'21"	-6' 4"	-5'46"	-5'27"	-5' 7"	-4'46"	-4'27"	-4' 8"	-3'51"	-3'36"
231	-3'21"	-3' 6"	-2'50"	-2'33"	-2'14"	-1'55"	-1'34"	-1'13"	-53"	-34"	-16"	0"
232	16' 31"	17' 47"	18' 51"	19' 55"	20' 58"	21' 59"	22' 59"	23' 58"	24' 56"	25' 53"	26' 50"	27' 46"
233	3'59"	4'15"	4'32"	4'50"	5' 9"	5'30"	5'52"	6'14"	6'36"	6'56"	7'14"	7'32"
234	7'48"	8' 5"	8'22"	8'41"	9' 1"	9'23"	9'45"	10' 8"	10'30"	10'50"	11' 9"	11'27"
235	11'45"	12' 2"	12'20"	12'39"	12'59"	13'22"	13'44"	14' 7"	14'30"	14'51"	15'11"	15'29"
236	15'47"	16' 5"	16'23"	16'43"	17' 4"	17'26"	17'50"	18'13"	18'36"	18'58"	19'18"	19'37"
237	19'55"	20'14"	20'32"	20'53"	21'14"	21'37"	22' 1"	22'25"	22'49"	23'11"	23'32"	23'51"
238	24'10"	24'28"	24'48"	25' 8"	25'31"	25'54"	26'19"	26'43"	27' 7"	27'30"	27'51"	28'11"
239	28'30"	28'49"	29' 9"	29'30"	29'53"	30'17"	30'42"	31' 6"	31'31"	31'54"	32'16"	32'36"
240	32'56"	33'15"	33'35"	33'57"	34'20"	34'45"	35'10"	35'35"	36' 0"	36'24"	36'46"	37' 6"
241	37'27"	37'47"	38' 7"	38'29"	38'53"	39'18"	39'44"	40' 9"	40'35"	40'59"	41'21"	41'42"
242	42' 3"	42'23"	42'44"	43' 7"	43'31"	43'56"	44'22"	44'49"	45'14"	45'39"	46' 1"	46'23"
243	46'44"	47' 5"	47'26"	47'49"	48'14"	48'39"	49' 6"	49'33"	49'59"	50'27"	50'47"	51' 9"
244	51'30"	51'51"	52'13"	52'37"	53' 1"	53'27"	53'54"	54'21"	54'48"	55'13"	55'36"	55'59"
245	56'20"	56'42"	57' 4"	57'28"	57'53"	58'20"	58'47"	59'14"	59'41"	1'0' 7"	1'0'31"	1'0'53"
246	1' 1'15"	1' 1'37"	1' 2' 0"	1' 2'24"	1' 2'49"	1' 3'16"	1' 3'44"	1' 4'12"	1' 4'39"	1' 5' 4"	1' 5'29"	1' 5'52"
247	1' 6'14"	1' 6'36"	1' 6'60"	1' 7'24"	1' 7'50"	1' 8'17"	1' 8'45"	1' 9'13"	1' 9'40"	1'10' 6"	1'10'31"	1'10'54"
248	1'11'17"	1'11'39"	1'12' 3"	1'12'27"	1'12'53"	1'13'21"	1'13'49"	1'14'17"	1'14'45"	1'15'11"	1'15'36"	1'15'60"
249	1'16'23"	1'16'46"	1'17' 9"	1'17'34"	1'18' 1"	1'18'28"	1'18'57"	1'19'25"	1'19'53"	1'20'20"	1'20'45"	1'21' 9"
250	1'21'32"	1'21'55"	1'22'19"	1'22'44"	1'23'11"	1'23'39"	1'24' 7"	1'24'36"	1'25' 4"	1'25'31"	1'25'57"	1'26'21"
251	1'26'44"	1'27' 7"	1'27'32"	1'27'57"	1'28'24"	1'28'52"	1'29'21"	1'29'50"	1'30'18"	1'30'45"	1'31'11"	1'31'35"
252	1'31'59"	1'32'22"	1'32'46"	1'33'12"	1'33'39"	1'34' 7"	1'34'36"	1'35' 6"	1'35'34"	1'36' 1"	1'36'27"	1'36'51"
253	1'37'15"	1'37'39"	1'38' 3"	1'38'29"	1'38'56"	1'39'25"	1'39'54"	1'40'23"	1'40'52"	1'41'19"	1'41'45"	1'42'10"
254	1'42'34"	1'42'57"	1'43'22"	1'43'48"	1'44'15"	1'44'44"	1'45'13"	1'45'43"	1'46'11"	1'46'39"	1'47' 5"	1'47'29"
255	1'47'53"	1'48'17"	1'48'42"	1'49' 8"	1'49'35"	1'50' 4"	1'50'34"	1'51' 3"	1'51'32"	1'51'59"	1'52'25"	1'52'50"
256	1'53'14"	1'53'38"	1'54' 3"	1'54'29"	1'54'57"	1'55'25"	1'55'55"	1'56'24"	1'56'53"	1'57'21"	1'57'47"	1'58'12"
257	1'58'36"	1'58'60"	1'59'25"	1'59'51"	2'0'18"	2'0'47"	2' 1'17"	2' 1'46"	2' 2'15"	2' 2'43"	2' 3' 9"	2' 3'34"
258	2' 3'58"	2' 4'22"	2' 4'47"	2' 5'13"	2' 5'40"	2' 6' 9"	2' 6'39"	2' 7' 8"	2' 7'37"	2' 8' 5"	2' 8'31"	2' 8'56"
259	2' 9'20"	2' 9'44"	2'10' 9"	2'10'35"	2'11' 3"	2'11'31"	2'12' 1"	2'12'30"	2'12'59"	2'13'27"	2'13'53"	2'14'18"
260	2'14'42"	2'15' 6"	2'15'31"	2'15'57"	2'16'24"	2'16'53"	2'17'23"	2'17'52"	2'18'21"	2'18'49"	2'19'15"	2'19'39"
261	2'20' 3"	2'20'27"	2'20'52"	2'21'18"	2'21'46"	2'22'14"	2'22'44"	2'23'13"	2'23'42"	2'24' 9"	2'24'35"	2'25' 0"
262	2'25'24"	2'25'48"	2'26'13"	2'26'39"	2'27' 6"	2'27'35"	2'28' 4"	2'28'33"	2'29' 2"	2'29'29"	2'29'55"	2'30'20"
263	2'30'44"	2'31' 7"	2'31'32"	2'31'58"	2'32'25"	2'32'54"	2'33'23"	2'33'52"	2'34'21"	2'34'48"	2'35'14"	2'35'38"
264	2'36' 2"	2'36'26"	2'36'50"	2'37'16"	2'37'43"	2'38'11"	2'38'40"	2'39' 9"	2'39'38"	2'40' 5"	2'40'31"	2'40'55"
265	2'41'18"	2'41'42"	2'42' 6"	2'42'32"	2'42'59"	2'43'27"	2'43'56"	2'44'25"	2'44'53"	2'45'20"	2'45'45"	2'46'10"
266	2'46'33"	2'46'56"	2'47'21"	2'47'46"	2'48'13"	2'48'41"	2'49'10"	2'49'38"	2'50' 6"	2'50'33"	2'50'58"	2'51'22"
267	2'51'46"	2'52' 9"	2'52'33"	2'52'58"	2'53'24"	2'53'52"	2'54'21"	2'54'49"	2'55'17"	2'55'44"	2'56' 9"	2'56'33"
268	2'56'56"	2'57'19"	2'57'42"	2'58' 7"	2'58'34"	2'59' 1"	2'59'30"	2'59'58"	3' 0'26"	3' 0'52"	3' 1'17"	3' 1'40"
269	3' 2' 3"	3' 2'26"	3' 2'49"	3' 3'14"	3' 3'40"	3' 4' 7"	3' 4'36"	3' 5' 4"	3' 5'31"	3' 5'57"	3' 6'22"	3' 6'45"
270	3' 7' 0"	3' 7'30"	3' 7'53"	3' 8'17"	3' 8'43"	3' 9'10"	3' 9'38"	3'10' 6"	3'10'33"	3'10'59"	3'11'23"	3'11'46"

Solar E Differentials -- Epoch 2020 -- Leap Years +2 (LY2)

Dn	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
276	3°36' 17"	3°36' 38"	3°36' 59"	3°37' 21"	3°37' 45"	3°38' 10"	3°38' 36"	3°39' 2"	3°39' 27"	3°39' 50"	3°40' 12"	3°40' 33"
277	3°40' 53"	3°41' 13"	3°41' 34"	3°41' 56"	3°42' 20"	3°42' 44"	3°43' 10"	3°43' 35"	3°43' 60"	3°44' 23"	3°44' 44"	3°45' 5"
278	3°45' 24"	3°45' 44"	3°46' 4"	3°46' 26"	3°46' 49"	3°47' 13"	3°47' 38"	3°48' 3"	3°48' 27"	3°48' 50"	3°49' 11"	3°49' 31"
279	3°49' 50"	3°50' 9"	3°50' 29"	3°50' 50"	3°51' 13"	3°51' 36"	3°52' 1"	3°52' 25"	3°52' 49"	3°53' 11"	3°53' 32"	3°53' 51"
280	3°54' 10"	3°54' 28"	3°54' 48"	3°55' 8"	3°55' 30"	3°55' 53"	3°56' 17"	3°56' 41"	3°57' 4"	3°57' 26"	3°57' 46"	3°58' 5"
281	3°58' 23"	3°58' 41"	3°59' 0"	3°59' 20"	3°59' 42"	4° 0' 4"	4° 0' 28"	4° 0' 51"	4° 1' 13"	4° 1' 35"	4° 1' 54"	4° 2' 12"
282	4° 2' 30"	4° 2' 48"	4° 3' 6"	4° 3' 25"	4° 3' 46"	4° 4' 8"	4° 4' 31"	4° 4' 54"	4° 5' 16"	4° 5' 36"	4° 5' 55"	4° 6' 13"
283	4° 6' 30"	4° 6' 47"	4° 7' 4"	4° 7' 23"	4° 7' 44"	4° 8' 5"	4° 8' 27"	4° 8' 50"	4° 9' 11"	4° 9' 31"	4° 9' 49"	4° 10' 6"
284	4°10' 23"	4°10' 39"	4°10' 56"	4°11' 14"	4°11' 34"	4°11' 55"	4°12' 16"	4°12' 38"	4°12' 58"	4°13' 18"	4°13' 36"	4°13' 52"
285	4°14' 8"	4°14' 23"	4°14' 40"	4°14' 57"	4°15' 16"	4°15' 37"	4°15' 57"	4°16' 18"	4°16' 38"	4°16' 57"	4°17' 14"	4°17' 30"
286	4°17' 45"	4°17' 60"	4°18' 15"	4°18' 32"	4°18' 51"	4°19' 10"	4°19' 31"	4°19' 51"	4°20' 10"	4°20' 28"	4°20' 44"	4°20' 59"
287	4°21' 14"	4°21' 28"	4°21' 43"	4°21' 59"	4°22' 17"	4°22' 36"	4°22' 55"	4°23' 15"	4°23' 33"	4°23' 51"	4°24' 6"	4°24' 21"
288	4°24' 34"	4°24' 48"	4°25' 2"	4°25' 17"	4°25' 34"	4°25' 53"	4°26' 11"	4°26' 30"	4°26' 48"	4°27' 4"	4°27' 19"	4°27' 33"
289	4°27' 46"	4°27' 59"	4°28' 12"	4°28' 27"	4°28' 43"	4°29' 0"	4°29' 18"	4°29' 36"	4°29' 54"	4°30' 9"	4°30' 23"	4°30' 36"
290	4°30' 48"	4°31' 0"	4°31' 13"	4°31' 27"	4°31' 42"	4°31' 59"	4°32' 16"	4°32' 34"	4°32' 50"	4°33' 5"	4°33' 18"	4°33' 30"
291	4°33' 42"	4°33' 53"	4°34' 5"	4°34' 18"	4°34' 33"	4°34' 48"	4°35' 5"	4°35' 21"	4°35' 37"	4°35' 51"	4°36' 3"	4°36' 15"
292	4°36' 25"	4°36' 36"	4°36' 47"	4°36' 59"	4°37' 13"	4°37' 28"	4°37' 44"	4°37' 59"	4°38' 14"	4°38' 27"	4°38' 39"	4°38' 49"
293	4°38' 59"	4°39' 9"	4°39' 19"	4°39' 30"	4°39' 43"	4°39' 58"	4°40' 13"	4°40' 27"	4°40' 41"	4°40' 54"	4°41' 4"	4°41' 14"
294	4°41' 23"	4°41' 32"	4°41' 41"	4°41' 52"	4°42' 4"	4°42' 17"	4°42' 31"	4°42' 45"	4°42' 58"	4°43' 10"	4°43' 20"	4°43' 28"
295	4°43' 36"	4°43' 44"	4°43' 53"	4°44' 3"	4°44' 14"	4°44' 27"	4°44' 40"	4°44' 53"	4°45' 5"	4°45' 16"	4°45' 25"	4°45' 33"
296	4°45' 40"	4°45' 47"	4°45' 54"	4°46' 3"	4°46' 14"	4°46' 25"	4°46' 38"	4°46' 50"	4°47' 1"	4°47' 11"	4°47' 19"	4°47' 26"
297	4°47' 32"	4°47' 38"	4°47' 45"	4°47' 53"	4°48' 3"	4°48' 13"	4°48' 25"	4°48' 36"	4°48' 46"	4°48' 55"	4°49' 3"	4°49' 9"
298	4°49' 14"	4°49' 19"	4°49' 25"	4°49' 32"	4°49' 41"	4°49' 51"	4°50' 1"	4°50' 12"	4°50' 21"	4°50' 29"	4°50' 35"	4°50' 41"
299	4°50' 45"	4°50' 49"	4°50' 54"	4°51' 0"	4°51' 8"	4°51' 17"	4°51' 27"	4°51' 36"	4°51' 45"	4°51' 52"	4°51' 57"	4°52' 1"
300	4°52' 5"	4°52' 8"	4°52' 12"	4°52' 18"	4°52' 24"	4°52' 32"	4°52' 41"	4°52' 49"	4°52' 57"	4°53' 3"	4°53' 8"	4°53' 11"
301	4°53' 14"	4°53' 16"	4°53' 19"	4°53' 24"	4°53' 29"	4°53' 36"	4°53' 44"	4°53' 52"	4°53' 58"	4°54' 4"	4°54' 7"	4°54' 10"
302	4°54' 11"	4°54' 13"	4°54' 15"	4°54' 18"	4°54' 23"	4°54' 29"	4°54' 36"	4°54' 43"	4°54' 48"	4°54' 53"	4°54' 55"	4°54' 57"
303	4°54' 57"	4°54' 58"	4°54' 59"	4°55' 2"	4°55' 6"	4°55' 11"	4°55' 16"	4°55' 22"	4°55' 27"	4°55' 30"	4°55' 32"	4°55' 32"
304	4°55' 32"	4°55' 32"	4°55' 32"	4°55' 33"	4°55' 36"	4°55' 41"	4°55' 45"	4°55' 50"	4°55' 54"	4°55' 56"	4°55' 57"	4°55' 56"
305	4°55' 55"	4°55' 54"	4°55' 53"	4°55' 53"	4°55' 55"	4°55' 59"	4°56' 3"	4°56' 6"	4°56' 9"	4°56' 11"	4°56' 10"	4°56' 9"
306	4°56' 6"	4°56' 4"	4°56' 2"	4°56' 2"	4°56' 3"	4°56' 5"	4°56' 8"	4°56' 11"	4°56' 12"	4°56' 13"	4°56' 12"	4°56' 9"
307	4°56' 6"	4°56' 2"	4°55' 60"	4°55' 58"	4°55' 58"	4°55' 59"	4°56' 1"	4°56' 3"	4°56' 4"	4°56' 3"	4°56' 1"	4°55' 57"
308	4°55' 53"	4°55' 49"	4°55' 45"	4°55' 42"	4°55' 41"	4°55' 42"	4°55' 42"	4°55' 43"	4°55' 43"	4°55' 41"	4°55' 38"	4°55' 34"
309	4°55' 28"	4°55' 23"	4°55' 18"	4°55' 14"	4°55' 12"	4°55' 12"	4°55' 11"	4°55' 11"	4°55' 10"	4°55' 7"	4°55' 3"	4°54' 57"
310	4°54' 51"	4°54' 44"	4°54' 39"	4°54' 34"	4°54' 31"	4°54' 29"	4°54' 28"	4°54' 27"	4°54' 24"	4°54' 21"	4°54' 15"	4°54' 9"
311	4°54' 1"	4°53' 54"	4°53' 47"	4°53' 41"	4°53' 37"	4°53' 34"	4°53' 32"	4°53' 30"	4°53' 26"	4°53' 21"	4°53' 15"	4°53' 7"
312	4°52' 59"	4°52' 50"	4°52' 42"	4°52' 36"	4°52' 30"	4°52' 26"	4°52' 23"	4°52' 20"	4°52' 15"	4°52' 10"	4°52' 2"	4°51' 53"
313	4°51' 44"	4°51' 34"	4°51' 25"	4°51' 17"	4°51' 11"	4°51' 6"	4°51' 2"	4°50' 57"	4°50' 52"	4°50' 45"	4°50' 37"	4°50' 27"
314	4°50' 16"	4°50' 5"	4°49' 55"	4°49' 46"	4°49' 39"	4°49' 33"	4°49' 28"	4°49' 22"	4°49' 15"	4°49' 8"	4°48' 58"	4°48' 47"
315	4°48' 35"	4°48' 23"	4°48' 12"	4°48' 2"	4°47' 54"	4°47' 47"	4°47' 40"	4°47' 34"	4°47' 26"	4°47' 17"	4°47' 7"	4°46' 54"
316	4°46' 42"	4°46' 29"	4°46' 16"	4°46' 6"	4°45' 56"	4°45' 48"	4°45' 40"	4°45' 33"	4°45' 24"	4°45' 14"	4°45' 2"	4°44' 49"
317	4°44' 35"	4°44' 21"	4°44' 8"	4°43' 56"	4°43' 45"	4°43' 36"	4°43' 27"	4°43' 19"	4°43' 9"	4°42' 58"	4°42' 45"	4°42' 31"
318	4°42' 16"	4°42' 0"	4°41' 46"	4°41' 33"	4°41' 21"	4°41' 11"	4°41' 1"	4°40' 52"	4°40' 41"	4°40' 29"	4°40' 15"	4°39' 59"
319	4°39' 43"	4°39' 27"	4°39' 12"	4°38' 57"	4°38' 45"	4°38' 33"	4°38' 23"	4°38' 12"	4°37' 60"	4°37' 32"	4°37' 15"	4°37' 15"
320	4°36' 58"	4°36' 41"	4°36' 24"	4°36' 9"	4°35' 55"	4°35' 43"	4°35' 31"	4°35' 19"	4°35' 6"	4°34' 52"	4°34' 36"	4°34' 18"
321	4°33' 60"	4°33' 42"	4°33' 24"	4°33' 8"	4°32' 53"	4°32' 39"	4°32' 26"	4°32' 13"	4°31' 59"	4°31' 44"	4°31' 27"	4°31' 8"
322	4°30' 49"	4°30' 30"	4°30' 11"	4°29' 54"	4°29' 38"	4°29' 23"	4°29' 9"	4°28' 55"	4°28' 40"	4°28' 24"	4°28' 6"	4°27' 46"
323	4°27' 26"	4°27' 5"	4°26' 46"	4°26' 27"	4°26' 10"	4°25' 55"	4°25' 40"	4°25' 25"	4°25' 9"	4°24' 51"	4°24' 32"	4°24' 11"
324	4°23' 50"	4°23' 28"	4°23' 8"	4°22' 48"	4°22' 30"	4°22' 14"	4°21' 58"	4°21' 41"	4°21' 24"	4°21' 6"	4°20' 46"	4°20' 24"
325	4°20' 2"	4°19' 39"	4°19' 17"	4°18' 57"	4°18' 38"	4°18' 20"	4°18' 3"	4°17' 46"	4°17' 28"	4°17' 9"	4°16' 47"	4°16' 25"
326	4°16' 1"	4°15' 38"	4°15' 15"	4°14' 54"	4°14' 34"	4°14' 15"	4°13' 57"	4°13' 39"	4°13' 20"	4°12' 59"	4°12' 37"	4°12' 14"
327	4°11' 49"	4°11' 25"	4°11' 1"	4°10' 39"	4°10' 18"	4° 9' 58"	4° 9' 39"	4° 9' 39"	4° 8' 60"	4° 8' 39"	4° 8' 15"	4° 7' 51"
328	4° 7' 25"	4° 6' 60"	4° 6' 35"	4° 6' 12"	4° 5' 50"	4° 5' 29"	4° 5' 10"	4° 4' 50"	4° 4' 29"	4° 4' 6"	4° 3' 42"	4° 3' 17"
329	4° 2' 50"	4° 2' 24"	4° 1' 58"	4° 1' 34"	4° 1' 11"	4° 0' 50"	4° 0' 29"	4° 0' 8"	3°59' 46"	3°59' 23"	3°58' 58"	3°58' 32"
330	3°58' 4"	3°57' 37"	3°57' 10"	3°56' 45"	3°56' 22"	3°55' 59"	3°55' 37"	3°55' 16"	3°54' 53"	3°54' 29"	3°54' 3"	3°53' 36"
331	3°53' 8"	3°52' 39"	3°52' 12"	3°51' 46"	3°51' 21"	3°50' 58"	3°50' 36"	3°50' 13"	3°49' 49"	3°49' 24"	3°48' 58"	3°48' 29"
332	3°48' 0"	3°47' 31"	3°47' 3"	3°46' 36"	3°46' 11"	3°45' 47"	3°45' 23"	3°44' 60"	3°44' 35"	3°44' 10"	3°43' 42"	3°43' 13"
333	3°42' 43"	3°42' 13"	3°41' 44"	3°41' 17"	3°40' 50"	3°40' 25"	3°40' 1"	3°39' 37"	3°39' 12"	3°38' 45"	3°38' 17"	3°37' 47"
334	3°37' 16"	3°36' 46"	3°36' 16"	3°35' 47"	3°35' 20"	3°34' 54"	3°34' 30"	3°34' 4"	3°33' 38"	3°33' 11"	3°32' 42"	3°32' 11"
335	3°31' 40"	3°31' 9"	3°30' 38"	3°30' 9"	3°29' 41"	3°29' 14"	3°28' 48"	3°28' 23"	3°27' 56"	3°27' 28"	3°26' 58"	3°26' 27"
336	3°25' 54"	3°25' 22"	3°24' 51"	3°24' 21"	3°23' 52"	3°23' 25"	3°22' 58"	3°22' 32"	3°22' 4"	3°21' 36"	3°21' 5"	3°20' 33"
337	3°20' 0"	3°19' 27"	3°18' 55"	3°18' 24"	3°17' 55"	3°17' 27"	3°16' 60"	3°16' 32"	3°16' 4"	3°15' 35"	3°15' 3"	3°14' 31"
338	3°13' 57"	3°13' 24"	3°12' 51"	3°12' 19"	3°11' 49"	3°11' 21"	3°10' 53"	3°10' 25"	3° 9' 56"	3° 9' 26"	3° 8' 54"	3° 8' 20"
339	3° 7' 46"	3° 7' 12"	3° 6' 38"	3° 6' 6"	3° 5' 35"	3° 5' 6"	3° 4' 37"	3° 4' 9"	3° 3' 39"	3° 3' 8"	3° 2' 36"	3° 2' 2"
340	3° 1' 27"	3° 0' 52"	3° 0' 18"	2°59' 45"	2°59' 14"	2°58' 44"	2°58' 15"	2°57' 45"	2°57' 15"	2°56' 44"	2°56' 11"	2°55' 36"
341	2°55' 0"	2°54' 25"	2°53' 50"	2°53' 17"	2°52' 45"	2°52' 14"	2°51' 44"	2°51' 15"	2°50' 44"	2°50' 12"	2°49' 38"	2°49' 3"
342	2°48' 27"	2°47' 50"	2°47' 15"	2°46' 41"	2°46' 9"	2°45' 37"	2°45' 7"	2°44' 37"	2°44' 5"	2°43' 33"	2°42' 58"	2°42' 23"
343	2°41' 46"	2°41' 9"	2°40' 33"	2°39' 59"	2°39' 26"	2°38' 54"	2°38' 23"	2°37' 52"	2°37' 20"	2°36' 47"	2°36' 12"	2°35' 36"
344	2°34' 59"	2°34' 22"	2°33' 45"	2°33' 10"	2°32' 37"	2°32' 4"	2°31' 33"	2°31' 2"	2°30' 29"	2°29' 56"	2°29' 20"	2°28' 43"
345	2°28' 6"	2°27' 28"	2°26' 51"	2°26' 16"	2°25' 42"	2°25' 9"	2°24' 37"	2°24' 5"	2°23' 32"	2°22' 58"	2°22' 22"	2°21' 45"
346	2°21' 7"	2°20' 29"	2°19' 51"	2°19' 15"	2°18' 41"	2°18' 8"	2°17' 36"	2°17' 3"	2°16' 30"	2°15' 56"	2°15' 19"	2°14' 42"
347	2°14' 3"	2°13' 25"	2°12' 47"	2°12' 10"	2°11' 35"	2°11' 2"	2°10' 29"	2° 9' 57"	2° 9' 23"	2° 8' 48"	2° 8' 11"	2° 7' 33"
348	2° 6' 54"	2° 6' 15"	2° 5' 37"	2° 5' 0"	2° 4' 25"	2° 3' 51"	2° 3' 18"					

Solar Declination Differentials -- Epoch 2020 -- Leap Years +3 (LY3)

Dn	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
0	0°	23'	47"	1° 10'	1° 33'	1° 56'	2° 21'	2° 46'	3° 12'	3° 38'	4° 4'	4° 31'
1	4' 57"	5' 23"	5' 48"	6' 13"	6' 39"	7' 5"	7' 31"	7' 59"	8' 27"	8' 55"	9' 24"	9' 53"
2	10' 21"	10' 49"	11' 17"	11' 45"	12' 12"	12' 41"	13' 10"	13' 39"	14' 9"	14' 40"	15' 11"	15' 42"
3	16' 13"	16' 43"	17' 13"	17' 43"	18' 13"	18' 44"	19' 15"	19' 47"	20' 19"	20' 52"	21' 26"	21' 59"
4	22' 32"	23' 4"	23' 37"	24' 9"	24' 41"	25' 14"	25' 47"	26' 21"	26' 56"	27' 31"	28' 7"	28' 42"
5	29' 17"	29' 52"	30' 27"	31' 1"	31' 35"	32' 10"	32' 46"	33' 22"	33' 59"	34' 37"	35' 15"	35' 52"
6	36' 30"	37' 7"	37' 43"	38' 20"	38' 57"	39' 34"	40' 12"	40' 50"	41' 29"	42' 9"	42' 49"	43' 29"
7	44' 8"	44' 48"	45' 27"	46' 5"	46' 44"	47' 24"	48' 4"	48' 44"	49' 26"	50' 8"	50' 50"	51' 32"
8	52' 13"	52' 55"	53' 36"	54' 17"	54' 58"	55' 39"	56' 22"	57' 4"	57' 48"	58' 32"	59' 16"	1° 0' 1"
9	1° 0' 45"	1° 1' 28"	1° 2' 11"	1° 2' 54"	1° 3' 38"	1° 4' 21"	1° 5' 6"	1° 5' 51"	1° 6' 36"	1° 7' 23"	1° 8' 9"	1° 8' 55"
10	1° 9' 41"	1° 10' 27"	1° 11' 12"	1° 11' 58"	1° 12' 43"	1° 13' 29"	1° 14' 15"	1° 15' 2"	1° 15' 50"	1° 16' 39"	1° 17' 27"	1° 18' 16"
11	1° 19' 4"	1° 19' 52"	1° 20' 39"	1° 21' 26"	1° 22' 14"	1° 23' 2"	1° 23' 50"	1° 24' 40"	1° 25' 30"	1° 26' 20"	1° 27' 11"	1° 28' 1"
12	1° 28' 52"	1° 29' 41"	1° 30' 31"	1° 31' 20"	1° 32' 10"	1° 33' 0"	1° 33' 51"	1° 34' 42"	1° 35' 34"	1° 36' 27"	1° 37' 19"	1° 38' 12"
13	1° 39' 4"	1° 39' 56"	1° 40' 48"	1° 41' 39"	1° 42' 31"	1° 43' 23"	1° 44' 16"	1° 45' 9"	1° 46' 3"	1° 46' 58"	1° 47' 53"	1° 48' 47"
14	1° 49' 42"	1° 50' 36"	1° 51' 30"	1° 52' 23"	1° 53' 17"	1° 54' 11"	1° 55' 6"	1° 56' 1"	1° 56' 57"	1° 57' 54"	1° 58' 51"	1° 59' 47"
15	2° 0' 44"	2° 1' 40"	2° 2' 36"	2° 3' 31"	2° 4' 27"	2° 5' 23"	2° 6' 20"	2° 7' 17"	2° 8' 16"	2° 9' 14"	2° 10' 13"	2° 11' 12"
16	2° 12' 10"	2° 13' 8"	2° 14' 6"	2° 15' 4"	2° 16' 1"	2° 16' 60"	2° 17' 58"	2° 18' 58"	2° 19' 58"	2° 20' 58"	2° 21' 59"	2° 22' 60"
17	2° 24' 0"	2° 25' 0"	2° 26' 0"	2° 26' 60"	2° 27' 59"	2° 28' 60"	2° 30' 0"	2° 31' 2"	2° 32' 4"	2° 33' 6"	2° 34' 9"	2° 35' 12"
18	2° 36' 14"	2° 37' 16"	2° 38' 18"	2° 39' 19"	2° 40' 21"	2° 41' 23"	2° 42' 26"	2° 43' 29"	2° 44' 33"	2° 45' 37"	2° 46' 42"	2° 47' 47"
19	2° 48' 51"	2° 49' 55"	2° 50' 58"	2° 52' 2"	2° 53' 5"	2° 54' 9"	2° 55' 14"	2° 56' 19"	2° 57' 25"	2° 58' 31"	2° 59' 38"	3° 0' 44"
20	3° 1' 51"	3° 2' 56"	3° 4' 2"	3° 5' 7"	3° 6' 13"	3° 7' 19"	3° 8' 25"	3° 9' 32"	3° 10' 40"	3° 11' 48"	3° 12' 57"	3° 14' 5"
21	3° 15' 13"	3° 16' 21"	3° 17' 28"	3° 18' 35"	3° 19' 43"	3° 20' 50"	3° 21' 59"	3° 23' 7"	3° 24' 17"	3° 25' 27"	3° 26' 37"	3° 27' 47"
22	3° 28' 57"	3° 30' 7"	3° 31' 16"	3° 32' 25"	3° 33' 34"	3° 34' 44"	3° 35' 54"	3° 37' 5"	3° 38' 16"	3° 39' 28"	3° 40' 40"	3° 41' 52"
23	3° 43' 3"	3° 44' 15"	3° 45' 26"	3° 46' 37"	3° 47' 48"	3° 48' 59"	3° 50' 11"	3° 51' 23"	3° 52' 36"	3° 53' 50"	3° 55' 4"	3° 56' 17"
24	3° 57' 31"	3° 58' 44"	3° 59' 57"	4° 1' 9"	4° 2' 22"	4° 3' 35"	4° 4' 49"	4° 6' 3"	4° 7' 18"	4° 8' 33"	4° 9' 49"	4° 11' 4"
25	4° 12' 19"	4° 13' 34"	4° 14' 49"	4° 16' 3"	4° 17' 18"	4° 18' 32"	4° 19' 48"	4° 21' 4"	4° 22' 20"	4° 23' 37"	4° 24' 55"	4° 26' 12"
26	4° 27' 28"	4° 28' 45"	4° 30' 1"	4° 31' 17"	4° 32' 34"	4° 33' 50"	4° 35' 7"	4° 36' 25"	4° 37' 43"	4° 39' 2"	4° 40' 21"	4° 41' 39"
27	4° 42' 58"	4° 44' 16"	4° 45' 34"	4° 46' 52"	4° 48' 10"	4° 49' 28"	4° 50' 46"	4° 52' 6"	4° 53' 26"	4° 54' 46"	4° 56' 6"	4° 57' 27"
28	4° 58' 47"	5° 0' 7"	5° 1' 26"	5° 2' 46"	5° 4' 5"	5° 5' 25"	5° 6' 45"	5° 8' 6"	5° 9' 28"	5° 10' 50"	5° 12' 12"	5° 13' 34"
29	5° 14' 55"	5° 16' 17"	5° 17' 38"	5° 18' 59"	5° 20' 20"	5° 21' 42"	5° 23' 3"	5° 24' 26"	5° 25' 49"	5° 27' 12"	5° 28' 36"	5° 29' 60"
30	5° 31' 23"	5° 32' 46"	5° 34' 9"	5° 35' 31"	5° 36' 54"	5° 38' 17"	5° 39' 40"	5° 41' 4"	5° 42' 29"	5° 43' 54"	5° 45' 19"	5° 46' 44"
31	5° 48' 9"	5° 49' 33"	5° 50' 58"	5° 52' 22"	5° 53' 46"	5° 55' 11"	5° 56' 36"	5° 58' 1"	5° 59' 27"	6° 0' 54"	6° 2' 20"	6° 3' 47"
32	6° 5' 13"	6° 6' 39"	6° 8' 5"	6° 9' 31"	6° 10' 56"	6° 12' 22"	6° 13' 49"	6° 15' 16"	6° 16' 43"	6° 18' 11"	6° 19' 39"	6° 21' 7"
33	6° 22' 35"	6° 24' 3"	6° 25' 30"	6° 26' 57"	6° 28' 24"	6° 29' 52"	6° 31' 20"	6° 32' 48"	6° 34' 17"	6° 35' 46"	6° 37' 16"	6° 38' 45"
34	6° 40' 15"	6° 41' 43"	6° 43' 12"	6° 44' 41"	6° 46' 9"	6° 47' 38"	6° 49' 7"	6° 50' 37"	6° 52' 8"	6° 53' 38"	6° 55' 9"	6° 56' 40"
35	6° 58' 11"	6° 59' 41"	7° 1' 11"	7° 2' 41"	7° 4' 11"	7° 5' 41"	7° 7' 12"	7° 8' 43"	7° 10' 15"	7° 11' 47"	7° 13' 20"	7° 14' 52"
36	7° 16' 24"	7° 17' 55"	7° 19' 27"	7° 20' 58"	7° 22' 29"	7° 24' 1"	7° 25' 33"	7° 27' 6"	7° 28' 39"	7° 30' 12"	7° 31' 46"	7° 33' 19"
37	7° 34' 53"	7° 36' 26"	7° 37' 59"	7° 39' 31"	7° 41' 4"	7° 42' 37"	7° 44' 10"	7° 45' 44"	7° 47' 19"	7° 48' 53"	7° 50' 28"	7° 52' 3"
38	7° 53' 38"	7° 55' 12"	7° 56' 46"	7° 58' 20"	7° 59' 54"	8° 1' 28"	8° 3' 3"	8° 4' 38"	8° 6' 14"	8° 7' 50"	8° 9' 26"	8° 11' 2"
39	8° 12' 38"	8° 14' 13"	8° 15' 49"	8° 17' 24"	8° 18' 59"	8° 20' 35"	8° 22' 11"	8° 23' 47"	8° 25' 24"	8° 27' 1"	8° 28' 39"	8° 30' 16"
40	8° 31' 53"	8° 33' 30"	8° 35' 6"	8° 36' 43"	8° 38' 19"	8° 39' 56"	8° 41' 33"	8° 43' 11"	8° 44' 49"	8° 46' 28"	8° 48' 6"	8° 49' 45"
41	8° 51' 23"	8° 53' 1"	8° 54' 39"	8° 56' 16"	8° 57' 54"	8° 59' 32"	9° 1' 10"	9° 2' 49"	9° 4' 29"	9° 6' 8"	9° 7' 48"	9° 9' 27"
42	9° 11' 7"	9° 12' 46"	9° 14' 25"	9° 16' 4"	9° 17' 43"	9° 19' 22"	9° 21' 1"	9° 22' 41"	9° 24' 22"	9° 26' 3"	9° 27' 43"	9° 29' 24"
43	9° 31' 5"	9° 32' 45"	9° 34' 25"	9° 36' 5"	9° 37' 45"	9° 39' 26"	9° 41' 6"	9° 42' 47"	9° 44' 29"	9° 46' 11"	9° 47' 52"	9° 49' 34"
44	9° 51' 16"	9° 52' 57"	9° 54' 39"	9° 56' 20"	9° 58' 1"	9° 59' 42"	10° 1' 24"	10° 3' 6"	10° 4' 49"	10° 6' 32"	10° 8' 15"	10° 9' 58"
45	10° 11' 40"	10° 13' 23"	10° 15' 5"	10° 16' 47"	10° 18' 30"	10° 20' 12"	10° 21' 55"	10° 23' 38"	10° 25' 22"	10° 27' 6"	10° 28' 50"	10° 30' 34"
46	10° 32' 17"	10° 34' 1"	10° 35' 44"	10° 37' 27"	10° 39' 11"	10° 40' 54"	10° 42' 38"	10° 44' 22"	10° 46' 7"	10° 47' 52"	10° 49' 37"	10° 51' 22"
47	10° 53' 6"	10° 54' 51"	10° 56' 35"	10° 58' 19"	11° 0' 4"	11° 1' 48"	11° 3' 33"	11° 5' 18"	11° 7' 4"	11° 8' 50"	11° 10' 36"	11° 12' 21"
48	11° 14' 7"	11° 15' 53"	11° 17' 38"	11° 19' 23"	11° 21' 8"	11° 22' 54"	11° 24' 40"	11° 26' 26"	11° 28' 12"	11° 29' 59"	11° 31' 46"	11° 33' 33"
49	11° 35' 19"	11° 37' 6"	11° 38' 52"	11° 40' 38"	11° 42' 24"	11° 44' 11"	11° 45' 57"	11° 47' 44"	11° 49' 32"	11° 51' 19"	11° 53' 7"	11° 54' 55"
50	11° 56' 42"	11° 58' 30"	12° 0' 17"	12° 2' 4"	12° 3' 51"	12° 5' 38"	12° 7' 26"	12° 9' 14"	12° 11' 2"	12° 12' 50"	12° 14' 39"	12° 16' 27"
51	12° 18' 16"	12° 20' 4"	12° 21' 52"	12° 23' 40"	12° 25' 28"	12° 27' 16"	12° 29' 4"	12° 30' 53"	12° 32' 42"	12° 34' 31"	12° 36' 21"	12° 38' 10"
52	12° 39' 59"	12° 41' 48"	12° 43' 37"	12° 45' 26"	12° 47' 14"	12° 49' 3"	12° 50' 53"	12° 52' 42"	12° 54' 32"	12° 56' 22"	12° 58' 12"	13° 0' 2"
53	13° 1' 52"	13° 3' 42"	13° 5' 31"	13° 7' 21"	13° 9' 11"	13° 11' 0"	13° 12' 50"	13° 14' 41"	13° 16' 31"	13° 18' 22"	13° 20' 13"	13° 22' 4"
54	13° 23' 54"	13° 25' 45"	13° 27' 35"	13° 29' 25"	13° 31' 16"	13° 33' 6"	13° 34' 57"	13° 36' 48"	13° 38' 39"	13° 40' 31"	13° 42' 22"	13° 44' 14"
55	13° 46' 5"	13° 47' 56"	13° 49' 47"	13° 51' 38"	13° 53' 29"	13° 55' 21"	13° 57' 12"	13° 59' 4"	14° 0' 56"	14° 2' 48"	14° 4' 40"	14° 6' 32"
56	14° 8' 24"	14° 10' 16"	14° 12' 8"	14° 13' 59"	14° 15' 51"	14° 17' 43"	14° 19' 35"	14° 21' 27"	14° 23' 20"	14° 25' 13"	14° 27' 6"	14° 28' 59"
57	14° 30' 51"	14° 32' 44"	14° 34' 36"	14° 36' 28"	14° 38' 21"	14° 40' 13"	14° 42' 6"	14° 43' 59"	14° 45' 52"	14° 47' 45"	14° 49' 39"	14° 51' 32"
58	14° 53' 26"	14° 55' 19"	14° 57' 12"	14° 59' 5"	15° 0' 58"	15° 2' 51"	15° 4' 44"	15° 6' 38"	15° 8' 31"	15° 10' 25"	15° 12' 19"	15° 14' 13"
59	15° 16' 17"	15° 18' 1"	15° 19' 54"	15° 21' 48"	15° 23' 41"	15° 25' 35"	15° 27' 29"	15° 29' 23"	15° 31' 17"	15° 33' 12"	15° 35' 6"	15° 37' 1"
60	15° 38' 55"	15° 40' 49"	15° 42' 43"	15° 44' 38"	15° 46' 32"	15° 48' 26"	15° 50' 20"	15° 52' 15"	15° 54' 10"	15° 56' 5"	15° 57' 60"	15° 59' 55"
61	16° 1' 49"	16° 3' 44"	16° 5' 39"	16° 7' 33"	16° 9' 28"	16° 11' 23"	16° 13' 18"	16° 15' 13"	16° 17' 8"	16° 19' 3"	16° 20' 59"	16° 22' 54"
62	16° 24' 50"	16° 26' 45"	16° 28' 40"	16° 30' 35"	16° 32' 30"	16° 34' 25"	16° 36' 21"	16° 38' 16"	16° 40' 12"	16° 42' 8"	16° 44' 4"	16° 45' 59"
63	16° 47' 55"	16° 49' 51"	16° 51' 46"	16° 53' 42"	16° 55' 37"	16° 57' 33"	16° 59' 29"	17° 1' 25"	17° 3' 21"	17° 5' 17"	17° 7' 14"	17° 9' 10"
64	17° 11' 6"	17° 13' 2"	17° 14' 58"	17° 16' 54"	17° 18' 50"	17° 20' 46"	17° 22' 42"	17° 24' 38"	17° 26' 35"	17° 28' 32"	17° 30' 28"	17° 32' 25"
65	17° 34' 21"	17° 36' 18"	17° 38' 14"	17° 40' 10"	17° 42' 7"	17° 44' 3"	17° 45' 60"	17° 47' 56"	17° 49' 53"	17° 51' 50"	17° 53' 47"	17° 55' 44"
66	17° 57' 41"	17° 59' 38"	18° 1' 35"	18° 3' 31"	18° 5' 28"	18° 7' 25"	18° 9' 22"	18° 11' 19"	18° 13' 16"	18° 15' 13"	18° 17' 10"	18° 19' 8"
67	18° 21' 5"	18° 23' 2"	18° 24' 59"	18° 26' 56"	18° 28' 53"	18° 30' 50"	18° 32' 47"	18° 34' 45"	18° 36' 42"	18° 38' 40"	18° 40' 37"	18° 42' 35"
68	18° 44' 32"	18° 46' 30"	18° 48' 27"	18° 50' 24"	18° 52' 22"	18° 54' 19"	18° 56' 17"	18° 58' 14"	19° 0' 12"	19° 2' 10"	19° 4' 8"	19° 6' 5"
69	19° 8' 3"	19° 10' 1"	1									

Solar Declination Differentials -- Epoch 2020 -- Leap Years +3 (LY3)

Dn	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
92	28° 9' 52"	28° 11' 47"	28° 13' 42"	28° 15' 38"	28° 17' 33"	28° 19' 28"	28° 21' 23"	28° 23' 18"	28° 25' 12"	28° 27' 7"	28° 29' 1"	28° 30' 56"
93	28° 32' 50"	28° 34' 45"	28° 36' 40"	28° 38' 35"	28° 40' 29"	28° 42' 24"	28° 44' 19"	28° 46' 13"	28° 48' 7"	28° 50' 1"	28° 51' 55"	28° 53' 49"
94	28° 55' 43"	28° 57' 37"	28° 59' 31"	29° 1' 26"	29° 3' 20"	29° 5' 14"	29° 7' 8"	29° 9' 2"	29° 10' 56"	29° 12' 49"	29° 14' 42"	29° 16' 36"
95	29° 18' 29"	29° 20' 23"	29° 22' 17"	29° 24' 11"	29° 26' 4"	29° 27' 58"	29° 29' 52"	29° 31' 45"	29° 33' 38"	29° 35' 31"	29° 37' 24"	29° 39' 16"
96	29° 41' 9"	29° 43' 3"	29° 44' 56"	29° 46' 49"	29° 48' 42"	29° 50' 35"	29° 52' 28"	29° 54' 21"	29° 56' 13"	29° 58' 6"	29° 59' 58"	30° 1' 50"
97	30° 3' 43"	30° 5' 35"	30° 7' 28"	30° 9' 20"	30° 11' 13"	30° 13' 6"	30° 14' 58"	30° 16' 50"	30° 18' 42"	30° 20' 34"	30° 22' 25"	30° 24' 17"
98	30° 26' 9"	30° 28' 1"	30° 29' 53"	30° 31' 45"	30° 33' 37"	30° 35' 29"	30° 37' 20"	30° 39' 12"	30° 41' 3"	30° 42' 54"	30° 44' 45"	30° 46' 36"
99	30° 48' 27"	30° 50' 19"	30° 52' 10"	30° 54' 1"	30° 55' 53"	30° 57' 44"	30° 59' 35"	31° 1' 26"	31° 3' 17"	31° 5' 7"	31° 6' 57"	31° 8' 48"
100	31° 10' 38"	31° 12' 29"	31° 14' 20"	31° 16' 10"	31° 18' 1"	31° 19' 52"	31° 21' 42"	31° 23' 32"	31° 25' 22"	31° 27' 12"	31° 29' 2"	31° 30' 51"
101	31° 32' 41"	31° 34' 31"	31° 36' 21"	31° 38' 11"	31° 40' 1"	31° 41' 51"	31° 43' 41"	31° 45' 30"	31° 47' 20"	31° 49' 9"	31° 50' 57"	31° 52' 46"
102	31° 54' 36"	31° 56' 25"	31° 58' 14"	32° 0' 4"	32° 1' 53"	32° 3' 42"	32° 5' 31"	32° 7' 20"	32° 9' 8"	32° 10' 57"	32° 12' 45"	32° 14' 33"
103	32° 16' 21"	32° 18' 10"	32° 19' 58"	32° 21' 47"	32° 23' 36"	32° 25' 24"	32° 27' 13"	32° 29' 0"	32° 30' 48"	32° 32' 36"	32° 34' 23"	32° 36' 10"
104	32° 37' 58"	32° 39' 46"	32° 41' 34"	32° 43' 22"	32° 45' 9"	32° 46' 57"	32° 48' 45"	32° 50' 32"	32° 52' 19"	32° 54' 5"	32° 55' 52"	32° 57' 38"
105	32° 59' 25"	33° 1' 12"	33° 2' 59"	33° 4' 46"	33° 6' 33"	33° 8' 20"	33° 10' 7"	33° 11' 53"	33° 13' 39"	33° 15' 25"	33° 17' 11"	33° 18' 57"
106	33° 20' 43"	33° 22' 29"	33° 24' 15"	33° 26' 1"	33° 27' 48"	33° 29' 34"	33° 31' 19"	33° 33' 5"	33° 34' 50"	33° 36' 35"	33° 38' 20"	33° 40' 5"
107	33° 41' 50"	33° 43' 35"	33° 45' 21"	33° 47' 6"	33° 48' 51"	33° 50' 37"	33° 52' 22"	33° 54' 6"	33° 55' 50"	33° 57' 35"	33° 59' 18"	34° 1' 2"
108	34° 2' 47"	34° 4' 31"	34° 6' 16"	34° 8' 0"	34° 9' 45"	34° 11' 29"	34° 13' 13"	34° 14' 57"	34° 16' 40"	34° 18' 23"	34° 20' 6"	34° 21' 49"
109	34° 23' 33"	34° 25' 16"	34° 26' 60"	34° 28' 43"	34° 30' 27"	34° 32' 10"	34° 33' 54"	34° 35' 36"	34° 37' 19"	34° 39' 1"	34° 40' 43"	34° 42' 25"
110	34° 44' 7"	34° 45' 50"	34° 47' 32"	34° 49' 15"	34° 50' 58"	34° 52' 40"	34° 54' 23"	34° 56' 4"	34° 57' 46"	34° 59' 27"	35° 1' 8"	35° 2' 49"
111	35° 4' 30"	35° 6' 12"	35° 7' 54"	35° 9' 35"	35° 11' 17"	35° 12' 59"	35° 14' 40"	35° 16' 21"	35° 18' 1"	35° 19' 41"	35° 21' 21"	35° 23' 1"
112	35° 24' 42"	35° 26' 22"	35° 28' 3"	35° 29' 44"	35° 31' 24"	35° 33' 5"	35° 34' 45"	35° 36' 25"	35° 38' 4"	35° 39' 43"	35° 41' 22"	35° 43' 1"
113	35° 44' 40"	35° 46' 20"	35° 47' 60"	35° 49' 39"	35° 51' 19"	35° 52' 59"	35° 54' 38"	35° 56' 16"	35° 57' 55"	35° 59' 33"	36° 1' 11"	36° 2' 49"
114	36° 4' 27"	36° 6' 5"	36° 7' 44"	36° 9' 23"	36° 11' 1"	36° 12' 40"	36° 14' 18"	36° 15' 55"	36° 17' 32"	36° 19' 9"	36° 20' 46"	36° 22' 23"
115	36° 24' 0"	36° 25' 37"	36° 27' 15"	36° 28' 53"	36° 30' 30"	36° 32' 7"	36° 33' 44"	36° 35' 21"	36° 36' 57"	36° 38' 33"	36° 40' 8"	36° 41' 44"
116	36° 43' 20"	36° 44' 56"	36° 46' 33"	36° 48' 9"	36° 49' 46"	36° 51' 22"	36° 52' 58"	36° 54' 33"	36° 56' 8"	36° 57' 42"	36° 59' 17"	37° 0' 52"
117	37° 2' 26"	37° 4' 2"	37° 5' 37"	37° 7' 12"	37° 8' 47"	37° 10' 22"	37° 11' 57"	37° 13' 31"	37° 15' 5"	37° 16' 38"	37° 18' 12"	37° 19' 45"
118	37° 21' 19"	37° 22' 53"	37° 24' 27"	37° 26' 1"	37° 27' 35"	37° 29' 9"	37° 30' 42"	37° 32' 15"	37° 33' 48"	37° 35' 20"	37° 36' 52"	37° 38' 25"
119	37° 39' 57"	37° 41' 30"	37° 43' 3"	37° 44' 36"	37° 46' 8"	37° 47' 41"	37° 49' 13"	37° 50' 45"	37° 52' 16"	37° 53' 47"	37° 55' 18"	37° 56' 49"
120	37° 58' 20"	37° 59' 52"	38° 1' 24"	38° 2' 55"	38° 4' 27"	38° 5' 58"	38° 7' 29"	38° 8' 60"	38° 10' 30"	38° 11' 60"	38° 13' 29"	38° 14' 59"
121	38° 16' 29"	38° 17' 59"	38° 19' 30"	38° 21' 0"	38° 22' 31"	38° 24' 1"	38° 25' 31"	38° 26' 60"	38° 28' 28"	38° 29' 57"	38° 31' 25"	38° 32' 54"
122	38° 34' 22"	38° 35' 51"	38° 37' 20"	38° 38' 50"	38° 40' 19"	38° 41' 48"	38° 43' 16"	38° 44' 44"	38° 46' 12"	38° 47' 39"	38° 49' 6"	38° 50' 33"
123	38° 52' 0"	38° 53' 28"	38° 54' 56"	38° 56' 24"	38° 57' 52"	38° 59' 19"	39° 0' 46"	39° 2' 13"	39° 3' 39"	39° 5' 5"	39° 6' 31"	39° 7' 56"
124	39° 9' 22"	39° 10' 49"	39° 12' 15"	39° 13' 42"	39° 15' 8"	39° 16' 35"	39° 18' 0"	39° 19' 26"	39° 20' 50"	39° 22' 15"	39° 23' 39"	39° 25' 4"
125	39° 26' 28"	39° 27' 53"	39° 29' 19"	39° 30' 44"	39° 32' 9"	39° 33' 34"	39° 34' 58"	39° 36' 22"	39° 37' 46"	39° 39' 9"	39° 40' 32"	39° 41' 55"
126	39° 43' 18"	39° 44' 42"	39° 46' 6"	39° 47' 29"	39° 48' 53"	39° 50' 17"	39° 51' 40"	39° 53' 2"	39° 54' 24"	39° 55' 46"	39° 57' 8"	39° 58' 29"
127	39° 59' 51"	40° 1' 13"	40° 2' 36"	40° 3' 58"	40° 5' 21"	40° 6' 43"	40° 8' 5"	40° 9' 26"	40° 10' 46"	40° 12' 7"	40° 13' 27"	40° 14' 47"
128	40° 16' 7"	40° 17' 28"	40° 18' 49"	40° 20' 10"	40° 21' 31"	40° 22' 52"	40° 24' 12"	40° 25' 32"	40° 26' 51"	40° 28' 10"	40° 29' 29"	40° 30' 47"
129	40° 32' 6"	40° 33' 26"	40° 34' 45"	40° 36' 5"	40° 37' 25"	40° 38' 44"	40° 40' 3"	40° 41' 21"	40° 42' 39"	40° 43' 56"	40° 45' 13"	40° 46' 30"
130	40° 47' 48"	40° 49' 6"	40° 50' 24"	40° 51' 42"	40° 53' 0"	40° 54' 18"	40° 55' 35"	40° 56' 52"	40° 58' 8"	40° 59' 24"	41° 0' 40"	41° 1' 56"
131	41° 3' 12"	41° 4' 28"	41° 5' 45"	41° 7' 2"	41° 8' 18"	41° 9' 35"	41° 10' 50"	41° 12' 6"	41° 13' 20"	41° 14' 35"	41° 15' 49"	41° 17' 3"
132	41° 18' 18"	41° 19' 32"	41° 20' 48"	41° 22' 3"	41° 23' 18"	41° 24' 33"	41° 25' 47"	41° 27' 1"	41° 28' 14"	41° 29' 27"	41° 30' 39"	41° 31' 52"
133	41° 33' 5"	41° 34' 18"	41° 35' 32"	41° 36' 46"	41° 37' 59"	41° 39' 12"	41° 40' 25"	41° 41' 37"	41° 42' 49"	41° 44' 0"	41° 45' 11"	41° 46' 22"
134	41° 47' 34"	41° 48' 45"	41° 49' 58"	41° 51' 10"	41° 52' 22"	41° 53' 33"	41° 54' 45"	41° 55' 55"	41° 57' 5"	41° 58' 15"	41° 59' 24"	42° 0' 34"
135	42° 1' 44"	42° 2' 54"	42° 4' 4"	42° 5' 15"	42° 6' 25"	42° 7' 35"	42° 8' 45"	42° 9' 54"	42° 11' 2"	42° 12' 10"	42° 13' 18"	42° 14' 26"
136	42° 15' 34"	42° 16' 43"	42° 17' 51"	42° 19' 0"	42° 20' 9"	42° 21' 18"	42° 22' 26"	42° 23' 33"	42° 24' 40"	42° 25' 46"	42° 26' 52"	42° 27' 58"
137	42° 29' 5"	42° 30' 12"	42° 31' 19"	42° 32' 26"	42° 33' 34"	42° 34' 40"	42° 35' 47"	42° 36' 52"	42° 37' 57"	42° 39' 2"	42° 40' 7"	42° 41' 11"
138	42° 42' 16"	42° 43' 21"	42° 44' 27"	42° 45' 33"	42° 46' 38"	42° 47' 43"	42° 48' 48"	42° 49' 52"	42° 50' 55"	42° 51' 58"	42° 53' 1"	42° 54' 4"
139	42° 55' 7"	42° 56' 11"	42° 57' 15"	42° 58' 19"	42° 59' 23"	43° 0' 26"	43° 1' 29"	43° 2' 31"	43° 3' 33"	43° 4' 34"	43° 5' 35"	43° 6' 36"
140	43° 7' 38"	43° 8' 40"	43° 9' 42"	43° 10' 44"	43° 11' 46"	43° 12' 48"	43° 13' 49"	43° 14' 50"	43° 15' 50"	43° 16' 49"	43° 17' 49"	43° 18' 48"
141	43° 19' 48"	43° 20' 48"	43° 21' 49"	43° 22' 49"	43° 23' 50"	43° 24' 50"	43° 25' 49"	43° 26' 48"	43° 27' 46"	43° 28' 44"	43° 29' 41"	43° 30' 39"
142	43° 31' 37"	43° 32' 36"	43° 33' 34"	43° 34' 33"	43° 35' 32"	43° 36' 30"	43° 37' 28"	43° 38' 25"	43° 39' 21"	43° 40' 17"	43° 41' 13"	43° 42' 9"
143	43° 43' 5"	43° 44' 2"	43° 44' 59"	43° 45' 56"	43° 46' 53"	43° 47' 49"	43° 48' 45"	43° 49' 40"	43° 50' 35"	43° 51' 29"	43° 52' 23"	43° 53' 17"
144	43° 54' 12"	43° 55' 7"	43° 56' 2"	43° 56' 57"	43° 57' 52"	43° 58' 47"	43° 59' 41"	44° 0' 34"	44° 1' 27"	44° 2' 20"	44° 3' 12"	44° 4' 4"
145	44° 4' 57"	44° 5' 50"	44° 6' 43"	44° 7' 37"	44° 8' 30"	44° 9' 23"	44° 10' 15"	44° 11' 7"	44° 11' 58"	44° 12' 48"	44° 13' 39"	44° 14' 29"
146	44° 15' 20"	44° 16' 11"	44° 17' 3"	44° 17' 54"	44° 18' 46"	44° 19' 37"	44° 20' 27"	44° 21' 17"	44° 22' 6"	44° 22' 55"	44° 23' 43"	44° 24' 32"
147	44° 25' 21"	44° 26' 10"	44° 26' 60"	44° 27' 50"	44° 28' 39"	44° 29' 28"	44° 30' 17"	44° 31' 5"	44° 31' 52"	44° 32' 39"	44° 33' 26"	44° 34' 13"
148	44° 34' 60"	44° 35' 47"	44° 36' 35"	44° 37' 23"	44° 38' 11"	44° 38' 58"	44° 39' 45"	44° 40' 31"	44° 41' 16"	44° 42' 1"	44° 42' 46"	44° 43' 31"
149	44° 44' 16"	44° 45' 2"	44° 45' 47"	44° 46' 33"	44° 47' 19"	44° 48' 5"	44° 48' 50"	44° 49' 34"	44° 50' 17"	44° 51' 0"	44° 51' 43"	44° 52' 26"
150	44° 53' 9"	44° 53' 53"	44° 54' 37"	44° 55' 21"	44° 56' 5"	44° 56' 49"	44° 57' 32"	44° 58' 14"	44° 58' 56"	44° 59' 37"	45° 0' 18"	45° 0' 59"
151	45° 1' 40"	45° 2' 22"	45° 3' 4"	45° 3' 46"	45° 4' 28"	45° 5' 10"	45° 5' 51"	45° 6' 31"	45° 7' 11"	45° 7' 50"	45° 8' 29"	45° 9' 8"
152	45° 9' 48"	45° 10' 28"	45° 11' 8"	45° 11' 48"	45° 12' 28"	45° 13' 8"	45° 13' 47"	45° 14' 26"	45° 15' 3"	45° 15' 41"	45° 16' 18"	45° 16' 55"
153	45° 17' 32"	45° 18' 10"	45° 18' 49"	45° 19' 27"	45° 20' 5"	45° 20' 43"	45° 21' 20"	45° 21' 57"	45° 22' 32"	45° 23' 8"	45° 23' 43"	45° 24' 18"
154	45° 24' 54"	45° 25' 30"	45° 26' 6"	45° 26' 42"	45° 27' 19"	45° 27' 55"	45° 28' 30"	45° 29' 4"	45° 29' 38"	45° 30' 11"	45° 30' 45"	45° 31' 18"
155	45° 31' 52"	45° 32' 26"	45° 32' 60"	45° 33' 34"	45° 34' 9"	45° 34' 43"	45° 35' 16"	45° 35' 48"	45° 36' 20"	45° 36' 52"	45° 37' 23"	45° 37' 54"
156	45° 38' 26"	45° 38'										

Solar Declination Differentials -- Epoch 2020 -- Leap Years +3 (LY3)

Dn	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
184	45°57' 9"	45°56' 44"	45°56' 20"	45°55' 55"	45°55' 30"	45°55' 5"	45°54' 39"	45°54' 13"	45°53' 45"	45°53' 18"	45°52' 50"	45°52' 22"
185	45°51' 54"	45°51' 27"	45°51' 1"	45°50' 34"	45°50' 7"	45°49' 40"	45°49' 12"	45°48' 44"	45°48' 15"	45°47' 45"	45°47' 15"	45°46' 45"
186	45°46' 16"	45°45' 47"	45°45' 18"	45°44' 49"	45°44' 21"	45°43' 51"	45°43' 22"	45°42' 51"	45°42' 20"	45°41' 48"	45°41' 17"	45°40' 45"
187	45°40' 13"	45°39' 42"	45°39' 12"	45°38' 41"	45°38' 10"	45°37' 39"	45°37' 8"	45°36' 35"	45°36' 2"	45°35' 28"	45°34' 55"	45°34' 21"
188	45°33' 48"	45°33' 15"	45°32' 42"	45°32' 9"	45°31' 37"	45°31' 4"	45°30' 30"	45°29' 56"	45°29' 20"	45°28' 45"	45°28' 9"	45°27' 34"
189	45°26' 58"	45°26' 23"	45°25' 49"	45°25' 14"	45°24' 40"	45°24' 5"	45°23' 29"	45°22' 53"	45°22' 16"	45°21' 38"	45°21' 1"	45°20' 23"
190	45°19' 46"	45°19' 9"	45°18' 32"	45°17' 56"	45°17' 19"	45°16' 42"	45°16' 5"	45°15' 27"	45°14' 48"	45°14' 8"	45°13' 29"	45°12' 49"
191	45°12' 10"	45°11' 31"	45°10' 53"	45°10' 15"	45° 9' 36"	45° 8' 57"	45° 8' 18"	45° 7' 38"	45° 6' 57"	45° 6' 15"	45° 5' 34"	45° 4' 53"
192	45° 4' 12"	45° 3' 31"	45° 2' 50"	45° 2' 10"	45° 1' 30"	45° 0' 49"	45° 0' 8"	44°59' 26"	44°58' 43"	44°57' 60"	44°57' 16"	44°56' 33"
193	44°55' 50"	44°55' 8"	44°54' 25"	44°53' 43"	44°53' 1"	44°52' 18"	44°51' 35"	44°50' 51"	44°50' 7"	44°49' 22"	44°48' 36"	44°47' 51"
194	44°47' 6"	44°46' 22"	44°45' 38"	44°44' 54"	44°44' 10"	44°43' 25"	44°42' 40"	44°41' 54"	44°41' 8"	44°40' 21"	44°39' 34"	44°38' 47"
195	44°38' 0"	44°37' 14"	44°36' 28"	44°35' 42"	44°34' 56"	44°34' 10"	44°33' 23"	44°32' 35"	44°31' 47"	44°30' 58"	44°30' 9"	44°29' 21"
196	44°28' 32"	44°27' 44"	44°26' 56"	44°26' 8"	44°25' 21"	44°24' 32"	44°23' 44"	44°22' 54"	44°22' 4"	44°21' 14"	44°20' 23"	44°19' 32"
197	44°18' 42"	44°17' 52"	44°17' 2"	44°16' 13"	44°15' 23"	44°14' 33"	44°13' 43"	44°12' 51"	44°11' 59"	44°11' 7"	44°10' 15"	44° 9' 22"
198	44° 8' 30"	44° 7' 38"	44° 6' 47"	44° 5' 55"	44° 5' 4"	44° 4' 12"	44° 3' 20"	44° 2' 27"	44° 1' 33"	44° 0' 39"	43°59' 45"	43°58' 51"
199	43°57' 57"	43°57' 3"	43°56' 10"	43°55' 17"	43°54' 24"	43°53' 30"	43°52' 36"	43°51' 41"	43°50' 46"	43°49' 50"	43°48' 54"	43°47' 58"
200	43°47' 2"	43°46' 7"	43°45' 12"	43°44' 17"	43°43' 22"	43°42' 27"	43°41' 31"	43°40' 34"	43°39' 37"	43°38' 40"	43°37' 42"	43°36' 44"
201	43°35' 47"	43°34' 50"	43°33' 53"	43°32' 56"	43°31' 60"	43°31' 3"	43°30' 5"	43°29' 7"	43°28' 8"	43°27' 9"	43°26' 9"	43°25' 10"
202	43°24' 11"	43°23' 12"	43°22' 13"	43°21' 15"	43°20' 17"	43°19' 18"	43°18' 19"	43°17' 19"	43°16' 18"	43°15' 17"	43°14' 16"	43°13' 15"
203	43°12' 14"	43°11' 14"	43°10' 13"	43° 9' 13"	43° 8' 13"	43° 7' 13"	43° 6' 12"	43° 5' 10"	43° 4' 8"	43° 3' 5"	43° 2' 2"	43° 0' 60"
204	42°59' 57"	42°58' 55"	42°57' 53"	42°56' 52"	42°55' 50"	42°54' 48"	42°53' 45"	42°52' 42"	42°51' 38"	42°50' 33"	42°49' 29"	42°48' 25"
205	42°47' 20"	42°46' 17"	42°45' 13"	42°44' 10"	42°43' 6"	42°42' 3"	42°40' 58"	42°39' 53"	42°38' 48"	42°37' 42"	42°36' 36"	42°35' 30"
206	42°34' 24"	42°33' 19"	42°32' 14"	42°31' 9"	42°30' 3"	42°28' 58"	42°27' 52"	42°26' 46"	42°25' 38"	42°24' 31"	42°23' 23"	42°22' 16"
207	42°21' 8"	42°20' 1"	42°18' 55"	42°17' 48"	42°16' 41"	42°15' 34"	42°14' 27"	42°13' 19"	42°12' 10"	42°11' 1"	42° 9' 51"	42° 8' 42"
208	42° 7' 33"	42° 6' 25"	42° 5' 17"	42° 4' 8"	42° 3' 0"	42° 1' 52"	42° 0' 42"	41°59' 33"	41°58' 22"	41°57' 12"	41°56' 1"	41°54' 50"
209	41°53' 40"	41°52' 30"	41°51' 20"	41°50' 10"	41°49' 0"	41°47' 50"	41°46' 39"	41°45' 28"	41°44' 16"	41°43' 4"	41°41' 52"	41°40' 40"
210	41°39' 28"	41°38' 16"	41°37' 4"	41°35' 53"	41°34' 42"	41°33' 30"	41°32' 18"	41°31' 5"	41°29' 52"	41°28' 38"	41°27' 24"	41°26' 11"
211	41°24' 57"	41°23' 44"	41°22' 31"	41°21' 18"	41°20' 5"	41°18' 52"	41°17' 39"	41°16' 24"	41°15' 10"	41°13' 54"	41°12' 39"	41°11' 24"
212	41°10' 9"	41° 8' 54"	41° 7' 40"	41° 6' 26"	41° 5' 11"	41° 3' 57"	41° 2' 41"	41° 1' 26"	41° 0' 9"	40°58' 53"	40°57' 36"	40°56' 19"
213	40°55' 3"	40°53' 47"	40°52' 31"	40°51' 15"	40°49' 59"	40°48' 43"	40°47' 27"	40°46' 9"	40°44' 52"	40°43' 34"	40°42' 15"	40°40' 57"
214	40°39' 39"	40°38' 22"	40°37' 5"	40°35' 47"	40°34' 30"	40°33' 13"	40°31' 55"	40°30' 36"	40°29' 17"	40°27' 57"	40°26' 38"	40°25' 18"
215	40°23' 59"	40°22' 40"	40°21' 21"	40°20' 3"	40°18' 44"	40°17' 25"	40°16' 5"	40°14' 45"	40°13' 25"	40°12' 4"	40°10' 43"	40° 9' 22"
216	40° 8' 1"	40° 6' 41"	40° 5' 21"	40° 4' 1"	40° 2' 41"	40° 1' 20"	39°59' 60"	39°58' 38"	39°57' 16"	39°55' 54"	39°54' 32"	39°53' 9"
217	39°51' 47"	39°50' 26"	39°49' 4"	39°47' 43"	39°46' 21"	39°44' 59"	39°43' 37"	39°42' 14"	39°40' 51"	39°39' 28"	39°38' 4"	39°36' 40"
218	39°35' 17"	39°33' 54"	39°32' 31"	39°31' 8"	39°29' 45"	39°28' 22"	39°26' 59"	39°25' 35"	39°24' 10"	39°22' 45"	39°21' 20"	39°19' 55"
219	39°18' 30"	39°17' 6"	39°15' 42"	39°14' 18"	39°12' 53"	39°11' 29"	39°10' 4"	39° 8' 39"	39° 7' 13"	39° 5' 47"	39° 4' 20"	39° 2' 54"
220	39° 1' 28"	39° 0' 2"	38°58' 37"	38°57' 11"	38°55' 46"	38°54' 20"	38°52' 54"	38°51' 27"	38°50' 0"	38°48' 33"	38°47' 5"	38°45' 37"
221	38°44' 10"	38°42' 43"	38°41' 16"	38°39' 50"	38°38' 23"	38°36' 56"	38°35' 28"	38°34' 0"	38°32' 32"	38°31' 3"	38°29' 35"	38°28' 6"
222	38°26' 37"	38°25' 9"	38°23' 41"	38°22' 13"	38°20' 45"	38°19' 17"	38°17' 48"	38°16' 19"	38°14' 49"	38°13' 19"	38°11' 49"	38°10' 19"
223	38° 8' 49"	38° 7' 20"	38° 5' 51"	38° 4' 21"	38° 2' 52"	38° 1' 23"	37°59' 53"	37°58' 22"	37°56' 51"	37°55' 20"	37°53' 49"	37°52' 18"
224	37°50' 47"	37°49' 16"	37°47' 46"	37°46' 15"	37°44' 45"	37°43' 14"	37°41' 43"	37°40' 12"	37°38' 40"	37°37' 7"	37°35' 35"	37°34' 2"
225	37°32' 30"	37°30' 58"	37°29' 27"	37°27' 55"	37°26' 24"	37°24' 52"	37°23' 19"	37°21' 47"	37°20' 14"	37°18' 40"	37°17' 7"	37°15' 33"
226	37°13' 60"	37°12' 27"	37°10' 54"	37° 9' 21"	37° 7' 49"	37° 6' 16"	37° 4' 42"	37° 3' 8"	37° 1' 34"	36°59' 59"	36°58' 25"	36°56' 50"
227	36°55' 16"	36°53' 42"	36°52' 8"	36°50' 34"	36°48' 60"	36°46' 26"	36°44' 51"	36°44' 16"	36°42' 41"	36°41' 5"	36°39' 30"	36°37' 54"
228	36°36' 18"	36°34' 43"	36°33' 8"	36°31' 33"	36°29' 58"	36°28' 23"	36°26' 47"	36°25' 11"	36°23' 35"	36°21' 58"	36°20' 22"	36°18' 45"
229	36°17' 8"	36°15' 32"	36°13' 56"	36°12' 20"	36°10' 44"	36° 9' 8"	36° 7' 31"	36° 5' 54"	36° 4' 16"	36° 2' 39"	36° 1' 1"	35°59' 23"
230	35°57' 45"	35°56' 8"	35°54' 31"	35°52' 54"	35°51' 17"	35°49' 40"	35°48' 2"	35°46' 24"	35°44' 45"	35°43' 7"	35°41' 28"	35°39' 49"
231	35°38' 10"	35°36' 32"	35°34' 54"	35°33' 16"	35°31' 38"	35°29' 59"	35°28' 21"	35°26' 42"	35°25' 2"	35°23' 22"	35°21' 43"	35°20' 3"
232	35°18' 23"	35°16' 44"	35°15' 5"	35°13' 26"	35°11' 47"	35°10' 8"	35° 8' 28"	35° 6' 48"	35° 5' 7"	35° 3' 27"	35° 1' 46"	35° 0' 5"
233	34°58' 25"	34°56' 45"	34°55' 5"	34°53' 25"	34°51' 44"	34°50' 4"	34°48' 24"	34°46' 43"	34°45' 1"	34°43' 20"	34°41' 38"	34°39' 56"
234	34°38' 15"	34°36' 34"	34°34' 53"	34°33' 12"	34°31' 31"	34°29' 50"	34°28' 8"	34°26' 26"	34°24' 44"	34°23' 2"	34°21' 19"	34°19' 37"
235	34°17' 54"	34°16' 12"	34°14' 30"	34°12' 48"	34°11' 7"	34° 9' 24"	34° 7' 42"	34° 5' 59"	34° 4' 16"	34° 2' 33"	34° 0' 50"	33°59' 6"
236	33°57' 23"	33°55' 40"	33°53' 57"	33°52' 15"	33°50' 32"	33°48' 49"	33°47' 6"	33°45' 22"	33°43' 38"	33°41' 54"	33°40' 10"	33°38' 25"
237	33°36' 41"	33°34' 58"	33°33' 14"	33°31' 30"	33°29' 47"	33°28' 3"	33°26' 19"	33°24' 34"	33°22' 50"	33°21' 5"	33°19' 20"	33°17' 35"
238	33°15' 50"	33°14' 5"	33°12' 21"	33°10' 37"	33° 8' 52"	33° 7' 7"	33° 5' 23"	33° 3' 37"	33° 1' 52"	33° 0' 6"	32°58' 20"	32°56' 35"
239	32°54' 59"	32°53' 4"	32°51' 18"	32°49' 33"	32°47' 48"	32°46' 12"	32°44' 17"	32°42' 31"	32°40' 45"	32°38' 58"	32°37' 12"	32°35' 25"
240	32°33' 39"	32°31' 53"	32°30' 6"	32°28' 21"	32°26' 35"	32°24' 48"	32°23' 2"	32°21' 15"	32°19' 28"	32°17' 41"	32°15' 54"	32°14' 6"
241	32°12' 19"	32°10' 33"	32° 8' 46"	32° 6' 59"	32° 5' 12"	32° 3' 25"	32° 1' 38"	31°59' 51"	31°58' 3"	31°56' 15"	31°54' 27"	31°52' 39"
242	31°50' 51"	31°49' 49"	31°47' 16"	31°45' 29"	31°43' 41"	31°41' 54"	31°40' 6"	31°38' 18"	31°36' 29"	31°34' 41"	31°32' 52"	31°31' 4"
243	31°29' 15"	31°27' 27"	31°25' 39"	31°23' 51"	31°22' 2"	31°20' 14"	31°18' 26"	31°16' 37"	31°14' 48"	31°12' 58"	31°11' 9"	31° 9' 20"
244	31° 7' 31"	31° 5' 42"	31° 3' 53"	31° 2' 4"	31° 0' 15"	30°58' 26"	30°56' 37"	30°54' 48"	30°52' 58"	30°51' 8"	30°49' 18"	30°47' 28"
245	30°45' 38"	30°43' 49"	30°41' 59"	30°40' 10"	30°38' 20"	30°36' 31"	30°34' 41"	30°32' 51"	30°31' 0"	30°29' 10"	30°27' 19"	30°25' 29"
246	30°23' 39"	30°21' 48"	30°19' 58"	30°18' 8"	30°16' 18"	30°14' 28"	30°12' 37"	30°10' 47"	30° 8' 56"	30° 7' 5"	30° 5' 13"	30° 3' 22"
247	30° 1' 31"	29°59' 41"	29°57' 50"	29°55' 59"	29°54' 8"	29°52' 18"	29°50' 27"	29°48' 35"	29°46' 44"	29°44' 52"	29°43' 0"	29°41' 9"
248	29°39' 17"	29°37' 26"	29°35' 35"	29°33' 43"	29°31' 52"	29°30' 1"	29°28' 9"	29°26' 17"	29°24' 25"	29°22' 33"	29°20' 41"	29°18' 49"
249	29°16' 57"	29°15' 5"	29°13' 13"	29°11' 21"	29° 9' 29"	29° 7' 37"	29° 5' 45"	29° 3' 53"	29° 2' 0"	29° 0' 7"	28°58' 15"	28°56' 22"
250	28°54' 30"	28°52' 37"	28°50' 45"	28°48' 52"	28°46' 60"	28°45' 7"	28°43' 15"	28°41' 22"	28°39' 29"	28°37' 36"	28°35' 43"	28°33' 50"
251	28°31' 57"	28°30' 4"	28°28' 11"	28°26' 18"	28°24' 25"	28°22' 32"	28°20' 39"	28°18' 46"	28°16' 52"			

Solar Declination Differentials -- Epoch 2020 -- Leap Years +3 (LY3)

Dn	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
276	18°52'39"	18°50'43"	18°48'47"	18°46'51"	18°44'55"	18°42'60"	18°41'4"	18°39'8"	18°37'13"	18°35'17"	18°33'22"	18°31'27"
277	18°29'31"	18°27'36"	18°25'40"	18°23'44"	18°21'49"	18°19'53"	18°17'58"	18°16'2"	18°14'7"	18°12'12"	18°10'17"	18°8'22"
278	18°6'27"	18°4'31"	18°2'36"	18°0'41"	17°58'45"	17°56'50"	17°54'55"	17°52'60"	17°51'5"	17°49'10"	17°47'15"	17°45'20"
279	17°43'26"	17°41'31"	17°39'36"	17°37'40"	17°35'45"	17°33'50"	17°31'55"	17°30'1"	17°28'6"	17°26'12"	17°24'17"	17°22'23"
280	17°20'28"	17°18'34"	17°16'39"	17°14'44"	17°12'49"	17°10'55"	17°9'0"	17°7'6"	17°5'12"	17°3'18"	17°1'24"	16°59'30"
281	16°57'36"	16°55'41"	16°53'47"	16°51'52"	16°49'58"	16°48'4"	16°46'10"	16°44'16"	16°42'22"	16°40'28"	16°38'35"	16°36'41"
282	16°34'47"	16°32'54"	16°30'60"	16°29'5"	16°27'11"	16°25'18"	16°23'24"	16°21'30"	16°19'37"	16°17'44"	16°15'51"	16°13'58"
283	16°12'4"	16°10'11"	16°8'17"	16°6'24"	16°4'30"	16°2'37"	16°0'43"	15°58'50"	15°56'58"	15°55'5"	15°53'12"	15°51'19"
284	15°49'27"	15°47'34"	15°45'40"	15°43'47"	15°41'54"	15°40'1"	15°38'8"	15°36'16"	15°34'24"	15°32'31"	15°30'39"	15°28'47"
285	15°26'55"	15°25'2"	15°23'10"	15°21'17"	15°19'24"	15°17'32"	15°15'40"	15°13'48"	15°11'56"	15°10'4"	15°8'12"	15°6'21"
286	15°4'29"	15°2'37"	15°0'45"	14°58'53"	14°57'1"	14°55'9"	14°53'17"	14°51'26"	14°49'34"	14°47'43"	14°45'52"	14°44'1"
287	14°42'10"	14°40'19"	14°38'27"	14°36'35"	14°34'44"	14°32'53"	14°31'1"	14°29'11"	14°27'20"	14°25'29"	14°23'39"	14°21'49"
288	14°19'58"	14°18'7"	14°16'16"	14°14'25"	14°12'34"	14°10'43"	14°8'53"	14°7'3"	14°5'13"	14°3'23"	14°1'33"	13°59'43"
289	13°57'53"	13°56'3"	13°54'13"	13°52'22"	13°50'32"	13°48'42"	13°46'52"	13°45'3"	13°43'13"	13°41'24"	13°39'35"	13°37'46"
290	13°35'56"	13°34'7"	13°32'17"	13°30'28"	13°28'38"	13°26'48"	13°24'59"	13°23'10"	13°21'22"	13°19'33"	13°17'45"	13°15'56"
291	13°14'8"	13°12'19"	13°10'30"	13°8'41"	13°6'52"	13°5'3"	13°3'15"	13°1'27"	12°59'39"	12°57'51"	12°56'4"	12°54'16"
292	12°52'28"	12°50'40"	12°48'52"	12°47'3"	12°45'15"	12°43'27"	12°41'39"	12°39'52"	12°38'5"	12°36'18"	12°34'31"	12°32'44"
293	12°30'57"	12°29'10"	12°27'22"	12°25'35"	12°23'47"	12°21'60"	12°20'13"	12°18'26"	12°16'40"	12°14'54"	12°13'8"	12°11'22"
294	12°9'36"	12°7'49"	12°6'2"	12°4'16"	12°2'29"	12°0'42"	11°58'56"	11°57'11"	11°55'25"	11°53'40"	11°51'55"	11°50'9"
295	11°48'24"	11°46'38"	11°44'52"	11°43'7"	11°41'21"	11°39'35"	11°37'50"	11°36'5"	11°34'20"	11°32'36"	11°30'52"	11°29'7"
296	11°27'23"	11°25'38"	11°23'53"	11°22'8"	11°20'23"	11°18'38"	11°16'54"	11°15'10"	11°13'26"	11°11'42"	11°9'59"	11°8'16"
297	11°6'32"	11°4'48"	11°3'4"	11°1'20"	10°59'36"	10°57'52"	10°56'8"	10°54'25"	10°52'43"	10°51'0"	10°49'18"	10°47'35"
298	10°45'52"	10°44'9"	10°42'26"	10°40'43"	10°38'60"	10°37'17"	10°35'34"	10°33'52"	10°32'10"	10°30'29"	10°28'47"	10°27'6"
299	10°25'24"	10°23'42"	10°21'60"	10°20'18"	10°18'35"	10°16'53"	10°15'12"	10°13'31"	10°11'50"	10°10'9"	10°8'29"	10°6'48"
300	10°5'8"	10°3'27"	10°1'45"	10°0'4"	9°58'23"	9°56'42"	9°55'1"	9°53'21"	9°51'41"	9°50'2"	9°48'22"	9°46'43"
301	9°45'3"	9°43'23"	9°41'43"	9°40'3"	9°38'22"	9°36'43"	9°35'3"	9°33'24"	9°31'45"	9°30'7"	9°28'28"	9°26'50"
302	9°25'11"	9°23'32"	9°21'53"	9°20'14"	9°18'35"	9°16'56"	9°15'17"	9°13'39"	9°12'2"	9°10'24"	9°8'47"	9°7'10"
303	9°5'32"	9°3'54"	9°2'16"	9°0'38"	8°59'0"	8°57'22"	8°55'45"	8°54'8"	8°52'31"	8°50'55"	8°49'19"	8°47'43"
304	8°46'6"	8°44'30"	8°42'53"	8°41'16"	8°39'39"	8°38'2"	8°36'26"	8°34'50"	8°33'15"	8°31'39"	8°30'4"	8°28'29"
305	8°26'54"	8°25'18"	8°23'43"	8°22'7"	8°20'31"	8°18'55"	8°17'20"	8°15'46"	8°14'12"	8°12'38"	8°11'4"	8°9'30"
306	8°7'56"	8°6'21"	8°4'47"	8°3'12"	8°1'37"	8°0'3"	7°58'29"	7°56'56"	7°55'23"	7°53'50"	7°52'18"	7°50'45"
307	7°49'12"	7°47'39"	7°46'5"	7°44'32"	7°42'58"	7°41'25"	7°39'53"	7°38'20"	7°36'49"	7°35'17"	7°33'46"	7°32'15"
308	7°30'43"	7°29'11"	7°27'39"	7°26'7"	7°24'34"	7°23'3"	7°21'31"	7°20'0"	7°18'30"	7°16'60"	7°15'30"	7°13'60"
309	7°12'29"	7°10'58"	7°9'28"	7°7'57"	7°6'26"	7°4'55"	7°3'25"	7°1'56"	7°0'26"	6°58'58"	6°57'29"	6°56'0"
310	6°54'31"	6°53'2"	6°51'32"	6°50'2"	6°48'33"	6°47'4"	6°45'35"	6°44'7"	6°42'39"	6°41'11"	6°39'44"	6°38'17"
311	6°36'49"	6°35'21"	6°33'53"	6°32'24"	6°30'56"	6°29'28"	6°28'1"	6°26'34"	6°25'8"	6°23'42"	6°22'16"	6°20'50"
312	6°19'23"	6°17'57"	6°16'30"	6°15'3"	6°13'36"	6°12'10"	6°10'44"	6°9'18"	6°8'53"	6°6'29"	6°5'4"	6°3'40"
313	6°2'15"	6°0'50"	5°59'24"	5°57'59"	5°56'33"	5°55'8"	5°53'44"	5°52'20"	5°50'56"	5°49'33"	5°48'10"	5°46'47"
314	5°45'23"	5°43'60"	5°42'36"	5°41'12"	5°39'48"	5°38'24"	5°37'1"	5°35'38"	5°34'17"	5°32'55"	5°31'33"	5°30'12"
315	5°28'50"	5°27'28"	5°26'5"	5°24'42"	5°23'20"	5°21'58"	5°20'36"	5°19'15"	5°17'55"	5°16'35"	5°15'15"	5°13'55"
316	5°12'34"	5°11'14"	5°9'53"	5°8'32"	5°7'11"	5°5'50"	5°4'30"	5°3'11"	5°1'52"	5°0'33"	4°59'15"	4°57'56"
317	4°56'37"	4°55'18"	4°53'59"	4°52'39"	4°51'20"	4°50'1"	4°48'42"	4°47'25"	4°46'7"	4°44'50"	4°43'34"	4°42'17"
318	4°40'59"	4°39'42"	4°38'24"	4°37'6"	4°35'48"	4°34'31"	4°33'14"	4°31'58"	4°30'42"	4°29'27"	4°28'12"	4°26'56"
319	4°25'41"	4°24'25"	4°23'9"	4°21'52"	4°20'36"	4°19'20"	4°18'5"	4°16'51"	4°15'37"	4°14'23"	4°13'10"	4°11'56"
320	4°10'42"	4°9'28"	4°8'13"	4°6'59"	4°5'44"	4°4'30"	4°3'16"	4°2'4"	4°0'51"	3°59'39"	3°58'27"	3°57'16"
321	3°56'3"	3°54'51"	3°53'38"	3°52'25"	3°51'12"	3°49'60"	3°48'48"	3°47'37"	3°46'26"	3°45'16"	3°44'6"	3°42'56"
322	3°41'45"	3°40'34"	3°39'23"	3°38'12"	3°37'1"	3°35'50"	3°34'40"	3°33'31"	3°32'22"	3°31'14"	3°30'5"	3°28'57"
323	3°27'48"	3°26'39"	3°25'30"	3°24'20"	3°23'11"	3°22'2"	3°20'54"	3°19'46"	3°18'39"	3°17'33"	3°16'26"	3°15'19"
324	3°14'12"	3°13'5"	3°11'58"	3°10'50"	3°9'42"	3°8'35"	3°7'29"	3°6'23"	3°5'18"	3°4'13"	3°3'4"	3°2'4"
325	3°0'58"	2°59'53"	2°58'47"	2°57'41"	2°56'36"	2°55'30"	2°54'26"	2°53'22"	2°52'18"	2°51'15"	2°50'13"	2°49'10"
326	2°48'6"	2°47'3"	2°45'59"	2°44'55"	2°43'51"	2°42'48"	2°41'45"	2°40'43"	2°39'41"	2°38'40"	2°37'39"	2°36'38"
327	2°35'37"	2°34'35"	2°33'33"	2°32'31"	2°31'29"	2°30'28"	2°29'27"	2°28'26"	2°27'27"	2°26'28"	2°25'29"	2°24'29"
328	2°23'30"	2°22'30"	2°21'30"	2°20'30"	2°19'30"	2°18'30"	2°17'31"	2°16'33"	2°15'35"	2°14'38"	2°13'41"	2°12'44"
329	2°11'46"	2°10'48"	2°9'50"	2°8'52"	2°7'54"	2°6'56"	2°5'59"	2°4'59"	2°4'7"	2°3'12"	2°2'16"	2°1'21"
330	2°0'26"	1°59'30"	1°58'33"	1°57'37"	1°56'41"	1°55'45"	1°54'50"	1°53'56"	1°53'2"	1°52'9"	1°51'15"	1°50'22"
331	1°49'29"	1°48'35"	1°47'40"	1°46'46"	1°45'52"	1°44'58"	1°44'5"	1°43'13"	1°42'21"	1°41'30"	1°40'38"	1°39'47"
332	1°38'56"	1°38'4"	1°37'11"	1°36'19"	1°35'27"	1°34'35"	1°33'44"	1°32'54"	1°32'4"	1°31'15"	1°30'25"	1°29'36"
333	1°28'47"	1°27'57"	1°27'7"	1°26'16"	1°25'26"	1°24'36"	1°23'47"	1°22'59"	1°22'11"	1°21'24"	1°20'37"	1°19'50"
334	1°19'2"	1°18'14"	1°17'26"	1°16'38"	1°15'50"	1°15'2"	1°14'15"	1°13'29"	1°12'43"	1°11'58"	1°11'13"	1°10'28"
335	1°9'43"	1°8'57"	1°8'11"	1°7'25"	1°6'39"	1°5'53"	1°5'8"	1°4'24"	1°3'41"	1°2'58"	1°2'15"	1°1'32"
336	1°0'48"	1°0'5"	59'21"	58'37"	57'53"	57'9"	56'26"	55'44"	55'3"	54'22"	53'41"	53'0"
337	52'19"	51'38"	50'56"	50'14"	49'32"	48'51"	48'10"	47'30"	46'51"	46'12"	45'34"	44'55"
338	44'16"	43'36"	42'57"	42'17"	41'37"	40'58"	40'20"	39'42"	39'5"	38'28"	37'52"	37'15"
339	36'38"	36'1"	35'23"	34'46"	34'8"	33'31"	32'55"	32'19"	31'45"	31'10"	30'36"	30'2"
340	29'27"	28'52"	28'16"	27'41"	27'6"	26'31"	25'57"	25'23"	24'51"	24'19"	23'46"	23'14"
341	22'42"	22'9"	21'36"	21'3"	20'30"	19'57"	19'25"	18'54"	18'23"	17'53"	17'24"	16'54"
342	16'24"	15'53"	15'22"	14'51"	14'20"	13'50"	13'20"	12'51"	12'23"	11'55"	11'28"	10'60"
343	10'32"	10'4"	9'35"	9'6"	8'38"	8'9"	7'42"	7'15"	6'49"	6'24"	5'59"	5'33"
344	5'8"	4'41"	4'15"	3'49"	3'22"	2'56"	2'31"	2'7"	1'43"	1'20"	57"	34"
345	10"	-14"	-38"	-1'2"	-1'26"	-1'50"	-2'12"	-2'35"	-2'56"	-3'17"	-3'38"	-3'58"
346	-4'20"	-4'41"	-5'3"	-5'25"	-5'47"	-6'8"	-6'29"	-6'48"	-7'8"	-7'26"	-7'45"	-8'3"
347	-8'22"	-8'41"	-9'1"	-9'20"	-9'40"	-9'59"	-10'17"	-10'35"	-10'51"	-11'8"	-11'24"	-11'40"
348	-11'57"	-12'13"	-12'31"	-12'48"	-13'5"	-13'22"	-13'38"	-13'53"	-14'8"	-14'22"	-14'35"	-14'49"
349	-15'3"	-15'18"	-15'33"	-15'48"	-16'3"	-16'17"	-16'31"	-16'44"	-16'56"	-17'7"	-17'19"	-17'30"
350	-17'42"	-17'54"	-18'7"	-18'20"	-18'32"	-18'44"	-18'56"	-19'6"	-19'16"	-19'25"	-19'34"	-19'44"
351	-19'53"	-20'3"	-20'13"	-20'24"	-20'34"	-20'43"	-20'52"	-21'1"	-21'8"	-21'15"	-21'22"	-21'29"
352	-21'36"	-21'43"	-21'51"	-21'59"	-22'7"	-22'14"	-22'21"	-22'27"	-22'32"	-22'37"	-22'41"	-22'45"
353	-22'50"	-22'55"	-23'1"	-23'7"	-23'12"	-23'17"	-23'21"	-23'25"	-23'28"	-23'30"	-23'32"	-23'34"
354	-23'37"	-23'39"	-23'43"	-23'46"	-23'49"	-23'52"	-23'54"	-23'55"	-23'55"	-23'55"	-23'55"	-23'54"
355	-23'55"	-23'55"	-23'56"	-23'57"	-23'58"	-23'58"	-23'57"	-23'56"	-23'54"	-23'52"	-23'49"	-23'47"
356	-23'44"	-23'42"	-23'41"	-23'40"	-23'38"	-23'36"	-23'33"					

Solar E Differentials -- Epoch 2020 -- Leap Years +3 (LY3)

Dn	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
0	0°	-39'	-1'16"	-1'53"	-2'28"	-3'1"	-3'33"	-4'5"	-4'38"	-5'13"	-5'48"	-6'26"
1	-7'4"	-7'42"	-8'19"	-8'55"	-9'30"	-10'2"	-10'34"	-11'6"	-11'39"	-12'12"	-12'48"	-13'25"
2	-14'2"	-14'40"	-15'17"	-15'52"	-16'26"	-16'59"	-17'30"	-18'2"	-18'34"	-19'7"	-19'42"	-20'18"
3	-20'55"	-21'32"	-22'9"	-22'44"	-23'17"	-23'49"	-24'20"	-24'51"	-25'23"	-25'55"	-26'30"	-27'6"
4	-27'42"	-28'19"	-28'55"	-29'29"	-30'2"	-30'34"	-31'4"	-31'34"	-32'5"	-32'37"	-33'11"	-33'47"
5	-34'23"	-34'59"	-35'34"	-36'8"	-36'40"	-37'11"	-37'41"	-38'11"	-38'41"	-39'13"	-39'46"	-40'21"
6	-40'56"	-41'32"	-42'7"	-42'40"	-43'12"	-43'42"	-44'11"	-44'40"	-45'10"	-45'41"	-46'14"	-46'48"
7	-47'23"	-47'58"	-48'32"	-49'5"	-49'36"	-50'6"	-50'34"	-51'3"	-51'32"	-52'2"	-52'34"	-53'8"
8	-53'42"	-54'16"	-54'50"	-55'22"	-55'53"	-56'21"	-56'49"	-57'17"	-57'46"	-58'16"	-58'47"	-59'20"
9	-59'53"	-1° 0'27"	-1° 0'60"	-1° 1'31"	-1° 2'1"	-1° 2'29"	-1° 2'57"	-1° 3'24"	-1° 3'52"	-1° 4'21"	-1° 4'52"	-1° 5'24"
10	-1° 5'56"	-1° 6'29"	-1° 7'2"	-1° 7'32"	-1° 8'2"	-1° 8'29"	-1° 8'56"	-1° 9'22"	-1° 9'49"	-1° 10'18"	-1° 10'48"	-1° 11'19"
11	-1° 11'51"	-1° 12'23"	-1° 12'55"	-1° 13'25"	-1° 13'53"	-1° 14'20"	-1° 14'46"	-1° 15'12"	-1° 15'38"	-1° 16'6"	-1° 16'35"	-1° 17'6"
12	-1° 17'37"	-1° 18'9"	-1° 18'39"	-1° 19'9"	-1° 19'36"	-1° 20'2"	-1° 20'28"	-1° 20'53"	-1° 21'18"	-1° 21'45"	-1° 22'14"	-1° 22'43"
13	-1° 23'14"	-1° 23'45"	-1° 24'15"	-1° 24'43"	-1° 25'10"	-1° 25'36"	-1° 25'60"	-1° 26'24"	-1° 26'49"	-1° 27'15"	-1° 27'43"	-1° 28'12"
14	-1° 28'42"	-1° 29'12"	-1° 29'41"	-1° 30'9"	-1° 30'35"	-1° 30'59"	-1° 31'23"	-1° 31'46"	-1° 32'10"	-1° 32'36"	-1° 33'2"	-1° 33'31"
15	-1° 33'60"	-1° 34'29"	-1° 34'57"	-1° 35'24"	-1° 35'49"	-1° 36'13"	-1° 36'36"	-1° 36'59"	-1° 37'22"	-1° 37'46"	-1° 38'12"	-1° 38'40"
16	-1° 39'8"	-1° 39'36"	-1° 40'4"	-1° 40'30"	-1° 40'54"	-1° 41'17"	-1° 41'39"	-1° 42'1"	-1° 42'23"	-1° 42'47"	-1° 43'12"	-1° 43'39"
17	-1° 44'6"	-1° 44'33"	-1° 44'60"	-1° 45'25"	-1° 45'49"	-1° 46'11"	-1° 46'32"	-1° 46'53"	-1° 47'14"	-1° 47'37"	-1° 48'1"	-1° 48'27"
18	-1° 48'54"	-1° 49'20"	-1° 49'46"	-1° 50'10"	-1° 50'33"	-1° 50'54"	-1° 51'14"	-1° 51'34"	-1° 51'55"	-1° 52'17"	-1° 52'40"	-1° 53'5"
19	-1° 53'31"	-1° 53'56"	-1° 54'21"	-1° 54'45"	-1° 55'6"	-1° 55'27"	-1° 55'46"	-1° 56'5"	-1° 56'25"	-1° 56'46"	-1° 57'8"	-1° 57'32"
20	-1° 57'57"	-1° 58'21"	-1° 58'45"	-1° 59'8"	-1° 59'29"	-1° 59'48"	-2° 0'6"	-2° 0'25"	-2° 0'43"	-2° 1'3"	-2° 1'25"	-2° 1'48"
21	-2° 2'11"	-2° 2'35"	-2° 2'58"	-2° 3'20"	-2° 3'40"	-2° 3'58"	-2° 4'16"	-2° 4'33"	-2° 4'51"	-2° 5'10"	-2° 5'30"	-2° 5'52"
22	-2° 6'15"	-2° 6'38"	-2° 6'60"	-2° 7'20"	-2° 7'39"	-2° 7'57"	-2° 8'13"	-2° 8'29"	-2° 8'46"	-2° 9'4"	-2° 9'24"	-2° 9'45"
23	-2° 10'6"	-2° 10'28"	-2° 10'49"	-2° 11'9"	-2° 11'27"	-2° 11'43"	-2° 11'59"	-2° 12'14"	-2° 12'30"	-2° 12'47"	-2° 13'5"	-2° 13'25"
24	-2° 13'46"	-2° 14'7"	-2° 14'27"	-2° 14'45"	-2° 15'2"	-2° 15'18"	-2° 15'32"	-2° 15'47"	-2° 16'1"	-2° 16'18"	-2° 16'35"	-2° 16'54"
25	-2° 17'14"	-2° 17'33"	-2° 17'52"	-2° 18'10"	-2° 18'26"	-2° 18'40"	-2° 18'54"	-2° 19'7"	-2° 19'21"	-2° 19'36"	-2° 19'52"	-2° 20'10"
26	-2° 20'29"	-2° 20'48"	-2° 21'6"	-2° 21'22"	-2° 21'37"	-2° 21'51"	-2° 22'3"	-2° 22'15"	-2° 22'28"	-2° 22'42"	-2° 22'57"	-2° 23'14"
27	-2° 23'32"	-2° 23'49"	-2° 24'6"	-2° 24'22"	-2° 24'36"	-2° 24'48"	-2° 24'60"	-2° 25'11"	-2° 25'23"	-2° 25'36"	-2° 25'50"	-2° 26'6"
28	-2° 26'22"	-2° 26'39"	-2° 26'55"	-2° 27'9"	-2° 27'22"	-2° 27'34"	-2° 27'44"	-2° 27'54"	-2° 28'5"	-2° 28'17"	-2° 28'30"	-2° 28'45"
29	-2° 29'0"	-2° 29'16"	-2° 29'31"	-2° 29'44"	-2° 29'56"	-2° 30'6"	-2° 30'16"	-2° 30'25"	-2° 30'35"	-2° 30'45"	-2° 30'58"	-2° 31'11"
30	-2° 31'26"	-2° 31'40"	-2° 31'54"	-2° 32'7"	-2° 32'17"	-2° 32'27"	-2° 32'35"	-2° 32'43"	-2° 32'52"	-2° 33'2"	-2° 33'13"	-2° 33'25"
31	-2° 33'39"	-2° 33'52"	-2° 34'5"	-2° 34'17"	-2° 34'26"	-2° 34'35"	-2° 34'42"	-2° 34'49"	-2° 34'57"	-2° 35'5"	-2° 35'16"	-2° 35'27"
32	-2° 35'40"	-2° 35'52"	-2° 36'4"	-2° 36'14"	-2° 36'23"	-2° 36'30"	-2° 36'36"	-2° 36'42"	-2° 36'49"	-2° 36'57"	-2° 37'6"	-2° 37'16"
33	-2° 37'28"	-2° 37'39"	-2° 37'50"	-2° 37'59"	-2° 38'7"	-2° 38'13"	-2° 38'18"	-2° 38'23"	-2° 38'29"	-2° 38'36"	-2° 38'44"	-2° 38'53"
34	-2° 39'4"	-2° 39'14"	-2° 39'24"	-2° 39'32"	-2° 39'39"	-2° 39'44"	-2° 39'48"	-2° 39'52"	-2° 39'57"	-2° 40'2"	-2° 40'10"	-2° 40'18"
35	-2° 40'27"	-2° 40'37"	-2° 40'45"	-2° 40'53"	-2° 40'58"	-2° 41'3"	-2° 41'6"	-2° 41'9"	-2° 41'12"	-2° 41'17"	-2° 41'23"	-2° 41'31"
36	-2° 41'39"	-2° 41'47"	-2° 41'55"	-2° 42'1"	-2° 42'6"	-2° 42'9"	-2° 42'11"	-2° 42'13"	-2° 42'16"	-2° 42'19"	-2° 42'25"	-2° 42'31"
37	-2° 42'38"	-2° 42'46"	-2° 42'52"	-2° 42'58"	-2° 43'1"	-2° 43'4"	-2° 43'5"	-2° 43'6"	-2° 43'7"	-2° 43'10"	-2° 43'14"	-2° 43'20"
38	-2° 43'26"	-2° 43'32"	-2° 43'38"	-2° 43'42"	-2° 43'45"	-2° 43'46"	-2° 43'46"	-2° 43'46"	-2° 43'47"	-2° 43'49"	-2° 43'52"	-2° 43'56"
39	-2° 44'2"	-2° 44'7"	-2° 44'12"	-2° 44'15"	-2° 44'17"	-2° 44'17"	-2° 44'16"	-2° 44'15"	-2° 44'15"	-2° 44'16"	-2° 44'18"	-2° 44'22"
40	-2° 44'26"	-2° 44'30"	-2° 44'34"	-2° 44'37"	-2° 44'37"	-2° 44'37"	-2° 44'35"	-2° 44'33"	-2° 44'32"	-2° 44'31"	-2° 44'33"	-2° 44'35"
41	-2° 44'39"	-2° 44'42"	-2° 44'45"	-2° 44'46"	-2° 44'46"	-2° 44'45"	-2° 44'42"	-2° 44'39"	-2° 44'37"	-2° 44'36"	-2° 44'36"	-2° 44'38"
42	-2° 44'40"	-2° 44'43"	-2° 44'44"	-2° 44'45"	-2° 44'44"	-2° 44'41"	-2° 44'38"	-2° 44'34"	-2° 44'31"	-2° 44'29"	-2° 44'28"	-2° 44'29"
43	-2° 44'30"	-2° 44'32"	-2° 44'33"	-2° 44'32"	-2° 44'30"	-2° 44'27"	-2° 44'23"	-2° 44'18"	-2° 44'14"	-2° 44'11"	-2° 44'9"	-2° 44'9"
44	-2° 44'10"	-2° 44'10"	-2° 44'10"	-2° 44'9"	-2° 44'6"	-2° 44'2"	-2° 43'56"	-2° 43'51"	-2° 43'46"	-2° 43'42"	-2° 43'40"	-2° 43'38"
45	-2° 43'38"	-2° 43'38"	-2° 43'37"	-2° 43'35"	-2° 43'31"	-2° 43'26"	-2° 43'20"	-2° 43'13"	-2° 43'7"	-2° 43'2"	-2° 42'59"	-2° 42'57"
46	-2° 42'56"	-2° 42'55"	-2° 42'53"	-2° 42'50"	-2° 42'45"	-2° 42'39"	-2° 42'32"	-2° 42'25"	-2° 42'18"	-2° 42'12"	-2° 42'8"	-2° 42'5"
47	-2° 42'3"	-2° 42'2"	-2° 41'59"	-2° 41'55"	-2° 41'49"	-2° 41'42"	-2° 41'34"	-2° 41'26"	-2° 41'19"	-2° 41'12"	-2° 41'7"	-2° 41'3"
48	-2° 41'1"	-2° 40'58"	-2° 40'54"	-2° 40'49"	-2° 40'43"	-2° 40'35"	-2° 40'26"	-2° 40'17"	-2° 40'9"	-2° 40'1"	-2° 39'56"	-2° 39'51"
49	-2° 39'47"	-2° 39'44"	-2° 39'39"	-2° 39'34"	-2° 39'26"	-2° 39'18"	-2° 39'9"	-2° 38'58"	-2° 38'49"	-2° 38'41"	-2° 38'34"	-2° 38'29"
50	-2° 38'24"	-2° 38'20"	-2° 38'14"	-2° 38'8"	-2° 37'60"	-2° 37'50"	-2° 37'40"	-2° 37'29"	-2° 37'19"	-2° 37'10"	-2° 37'3"	-2° 36'56"
51	-2° 36'51"	-2° 36'46"	-2° 36'40"	-2° 36'32"	-2° 36'23"	-2° 36'13"	-2° 36'2"	-2° 35'50"	-2° 35'39"	-2° 35'29"	-2° 35'21"	-2° 35'14"
52	-2° 35'8"	-2° 35'2"	-2° 34'55"	-2° 34'47"	-2° 34'37"	-2° 34'26"	-2° 34'14"	-2° 34'2"	-2° 33'50"	-2° 33'39"	-2° 33'30"	-2° 33'22"
53	-2° 33'15"	-2° 33'8"	-2° 33'1"	-2° 32'52"	-2° 32'41"	-2° 32'29"	-2° 32'16"	-2° 32'3"	-2° 31'51"	-2° 31'39"	-2° 31'30"	-2° 31'21"
54	-2° 31'13"	-2° 31'5"	-2° 30'57"	-2° 30'47"	-2° 30'36"	-2° 30'23"	-2° 30'10"	-2° 29'56"	-2° 29'43"	-2° 29'30"	-2° 29'20"	-2° 29'10"
55	-2° 29'2"	-2° 28'53"	-2° 28'44"	-2° 28'34"	-2° 28'22"	-2° 28'8"	-2° 27'54"	-2° 27'39"	-2° 27'25"	-2° 27'12"	-2° 27'1"	-2° 26'51"
56	-2° 26'41"	-2° 26'32"	-2° 26'22"	-2° 26'11"	-2° 25'58"	-2° 25'44"	-2° 25'29"	-2° 25'14"	-2° 24'59"	-2° 24'45"	-2° 24'33"	-2° 24'22"
57	-2° 24'12"	-2° 24'2"	-2° 23'52"	-2° 23'40"	-2° 23'26"	-2° 23'11"	-2° 22'55"	-2° 22'39"	-2° 22'24"	-2° 22'10"	-2° 21'57"	-2° 21'45"
58	-2° 21'34"	-2° 21'24"	-2° 21'12"	-2° 20'60"	-2° 20'46"	-2° 20'30"	-2° 20'13"	-2° 19'57"	-2° 19'41"	-2° 19'26"	-2° 19'12"	-2° 18'60"
59	-2° 18'48"	-2° 18'37"	-2° 18'25"	-2° 18'12"	-2° 17'57"	-2° 17'41"	-2° 17'24"	-2° 17'6"	-2° 16'49"	-2° 16'34"	-2° 16'20"	-2° 16'7"
60	-2° 15'55"	-2° 15'43"	-2° 15'30"	-2° 15'16"	-2° 15'0"	-2° 14'44"	-2° 14'26"	-2° 14'8"	-2° 13'50"	-2° 13'34"	-2° 13'19"	-2° 13'6"
61	-2° 12'53"	-2° 12'40"	-2° 12'27"	-2° 12'12"	-2° 11'56"	-2° 11'39"	-2° 11'20"	-2° 11'2"	-2° 10'44"	-2° 10'27"	-2° 10'11"	-2° 9'57"
62	-2° 9'44"	-2° 9'31"	-2° 9'17"	-2° 9'2"	-2° 8'45"	-2° 8'27"	-2° 8'8"	-2° 7'49"	-2° 7'30"	-2° 7'13"	-2° 6'57"	-2° 6'42"
63	-2° 6'28"	-2° 6'14"	-2° 5'60"	-2° 5'44"	-2° 5'27"	-2° 5'8"	-2° 4'48"	-2° 4'29"	-2° 4'10"	-2° 3'52"	-2° 3'35"	-2° 3'20"
64	-2° 3'5"	-2° 2'51"	-2° 2'36"	-2° 2'20"	-2° 2'2"	-2° 1'43"	-2° 1'22"	-2° 1'2"	-2° 0'43"	-2° 0'24"	-2° 0'7"	-1° 59'51"
65	-1° 59'36"	-1° 59'21"	-1° 59'6"	-1° 58'49"	-1° 58'31"	-1° 58'11"	-1° 57'50"	-1° 57'30"	-1° 57'9"	-1° 56'50"	-1° 56'33"	-1° 56'16"
66	-1° 56'1"	-1° 55'46"	-1° 55'30"	-1° 55'12"	-1° 54'54"	-1° 54'33"	-1° 54'12"	-1° 53'51"	-1° 53'30"	-1° 53'11"	-1° 52'53"	-1° 52'36"
67	-1° 52'20"	-1° 52'4"	-1° 51'48"	-1° 51'30"	-1° 51'11"	-1° 50'50"	-1° 50'29"	-1° 50'7"	-1° 49'46"	-1° 49'26"	-1° 49'7"	-1° 48'50"
68	-1° 48'34"	-1° 48'18"	-1° 48'1"	-1° 47'43"	-1° 47'23"	-1° 47'2"	-1° 46'40"	-1° 46'18"	-1° 45'56"	-1° 45'36"	-1° 45'17"	-1° 44'59"
69	-1° 44'43"	-1° 44'26"	-1° 44'9"	-1° 43'50"	-1° 43'30"	-1° 43'8"	-1° 42'46"	-1° 42'24"	-1° 42'2"	-1° 41'41"	-1° 41'22"	-1° 41'4"
70	-1° 40'47"	-1° 40'30"	-1° 40'12"	-1° 39'53"	-1° 39'32"	-1° 39'11"	-1° 38'48"	-1° 38'25"	-1° 38'3"	-1° 37'42"	-1° 37'22"	-1° 37'4"
71	-1° 36'46"	-1° 36'29"	-1° 36'11"	-1° 35'52"	-1° 35'31"	-1° 35'9"	-1° 34'45"	-1° 34'22"	-1° 33'60"	-1° 33'38"	-1° 33'18"	-1° 32'60"
72	-1° 32'42"	-1° 32'24"	-1° 32'6"	-1° 31'46"	-1° 31'25"	-1° 31'3"	-1° 30'39"	-1° 30'16"	-1° 29'53"	-1° 29'31"	-1° 29'11"	-1° 28'52"
73	-1° 28'34"	-1° 28'16"	-1° 27'57"	-1° 27'37"	-1° 27'16"	-1° 26'53"	-1° 26'29"	-1° 26'6"	-1° 25'43"	-1° 25'21"	-1° 25'0"	-1° 24'41"
74	-1° 24'23"	-1° 24'4"	-1° 23'45"	-1° 23'25"	-1° 23'3"	-1° 22'40"	-1° 22'16"	-1° 21'52"	-1° 21'29"	-1° 21'7"	-1° 20'46"	-1° 20'27"
75	-1° 20'3"	-1° 19'50"	-1° 19'30"	-1° 19'10"	-1° 18'48"	-1° 18'25"	-1° 18'1"	-1° 17'36"	-1°			

Solar E Differentials -- Epoch 2020 -- Leap Years +3 (LY3)

Dn	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
92	-4' 27"	-4' 8"	-3' 48"	-3' 27"	-3' 4"	-2' 40"	-2' 15"	-1' 51"	-1' 27"	-1' 4"	-42"	-22"
93	-3'	16"	36"	57"	1' 19"	1' 43"	2' 8"	2' 32"	2' 56"	3' 19"	3' 40"	3' 60"
94	4' 19"	4' 38"	4' 57"	5' 18"	5' 40"	6' 4"	6' 28"	6' 53"	7' 16"	7' 39"	7' 60"	8' 19"
95	8' 38"	8' 57"	9' 16"	9' 37"	9' 59"	10' 22"	10' 46"	11' 10"	11' 34"	11' 56"	12' 17"	12' 36"
96	12' 55"	13' 13"	13' 32"	13' 52"	14' 14"	14' 37"	15' 1"	15' 25"	15' 48"	16' 10"	16' 31"	16' 50"
97	17' 8"	17' 26"	17' 45"	18' 5"	18' 26"	18' 49"	19' 13"	19' 36"	19' 59"	20' 21"	20' 41"	20' 60"
98	21' 18"	21' 35"	21' 54"	22' 14"	22' 35"	22' 57"	23' 21"	23' 44"	24' 6"	24' 28"	24' 47"	25' 6"
99	25' 24"	25' 41"	25' 59"	26' 19"	26' 39"	27' 2"	27' 24"	27' 47"	28' 10"	28' 31"	28' 50"	29' 8"
100	29' 25"	29' 42"	30' 0"	30' 19"	30' 40"	31' 1"	31' 24"	31' 47"	32' 8"	32' 29"	32' 48"	33' 6"
101	33' 23"	33' 39"	33' 57"	34' 15"	34' 35"	34' 57"	35' 19"	35' 41"	36' 3"	36' 23"	36' 41"	36' 59"
102	37' 15"	37' 31"	37' 48"	38' 7"	38' 26"	38' 47"	39' 9"	39' 31"	39' 52"	40' 12"	40' 30"	40' 47"
103	41' 3"	41' 19"	41' 35"	41' 53"	42' 12"	42' 33"	42' 54"	43' 15"	43' 36"	43' 55"	44' 13"	44' 30"
104	44' 45"	45' 1"	45' 17"	45' 34"	45' 53"	46' 13"	46' 34"	46' 55"	47' 15"	47' 34"	47' 51"	48' 7"
105	48' 22"	48' 37"	48' 53"	49' 10"	49' 28"	49' 48"	50' 8"	50' 28"	50' 48"	51' 6"	51' 23"	51' 39"
106	51' 53"	52' 8"	52' 23"	52' 39"	52' 57"	53' 16"	53' 36"	53' 56"	54' 15"	54' 33"	54' 50"	55' 5"
107	55' 19"	55' 33"	55' 47"	56' 3"	56' 21"	56' 39"	56' 59"	57' 18"	57' 37"	57' 54"	58' 10"	58' 25"
108	58' 38"	58' 52"	59' 6"	59' 21"	59' 38"	59' 56"	1' 0' 15"	1' 0' 34"	1' 0' 52"	1' 1' 9"	1' 1' 24"	1' 1' 38"
109	1' 1' 52"	1' 2' 5"	1' 2' 18"	1' 2' 33"	1' 2' 49"	1' 3' 7"	1' 3' 25"	1' 3' 44"	1' 4' 1"	1' 4' 18"	1' 4' 33"	1' 4' 46"
110	1' 4' 59"	1' 5' 11"	1' 5' 24"	1' 5' 39"	1' 5' 54"	1' 6' 12"	1' 6' 29"	1' 6' 47"	1' 7' 4"	1' 7' 20"	1' 7' 34"	1' 7' 47"
111	1' 7' 59"	1' 8' 11"	1' 8' 24"	1' 8' 38"	1' 8' 53"	1' 9' 9"	1' 9' 27"	1' 9' 44"	1' 10' 1"	1' 10' 16"	1' 10' 29"	1' 10' 42"
112	1' 10' 53"	1' 11' 5"	1' 11' 17"	1' 11' 30"	1' 11' 45"	1' 12' 1"	1' 12' 18"	1' 12' 34"	1' 12' 50"	1' 13' 5"	1' 13' 18"	1' 13' 30"
113	1' 13' 41"	1' 13' 52"	1' 14' 3"	1' 14' 16"	1' 14' 30"	1' 14' 45"	1' 15' 2"	1' 15' 18"	1' 15' 33"	1' 15' 47"	1' 15' 60"	1' 16' 11"
114	1' 16' 21"	1' 16' 32"	1' 16' 42"	1' 16' 55"	1' 17' 8"	1' 17' 23"	1' 17' 39"	1' 17' 54"	1' 18' 9"	1' 18' 23"	1' 18' 35"	1' 18' 45"
115	1' 18' 55"	1' 19' 5"	1' 19' 15"	1' 19' 26"	1' 19' 39"	1' 19' 54"	1' 20' 9"	1' 20' 24"	1' 20' 38"	1' 20' 51"	1' 21' 2"	1' 21' 12"
116	1' 21' 21"	1' 21' 31"	1' 21' 40"	1' 21' 51"	1' 22' 4"	1' 22' 17"	1' 22' 32"	1' 22' 46"	1' 22' 60"	1' 23' 12"	1' 23' 23"	1' 23' 32"
117	1' 23' 41"	1' 23' 49"	1' 23' 58"	1' 24' 9"	1' 24' 20"	1' 24' 34"	1' 24' 47"	1' 25' 1"	1' 25' 14"	1' 25' 26"	1' 25' 36"	1' 25' 45"
118	1' 25' 53"	1' 26' 1"	1' 26' 9"	1' 26' 19"	1' 26' 30"	1' 26' 42"	1' 26' 56"	1' 27' 9"	1' 27' 21"	1' 27' 32"	1' 27' 42"	1' 27' 50"
119	1' 27' 57"	1' 28' 4"	1' 28' 12"	1' 28' 21"	1' 28' 32"	1' 28' 44"	1' 28' 56"	1' 29' 9"	1' 29' 21"	1' 29' 31"	1' 29' 40"	1' 29' 47"
120	1' 29' 54"	1' 30' 0"	1' 30' 8"	1' 30' 16"	1' 30' 26"	1' 30' 37"	1' 30' 49"	1' 31' 1"	1' 31' 12"	1' 31' 22"	1' 31' 30"	1' 31' 37"
121	1' 31' 43"	1' 31' 49"	1' 31' 55"	1' 32' 3"	1' 32' 12"	1' 32' 23"	1' 32' 34"	1' 32' 45"	1' 32' 56"	1' 33' 5"	1' 33' 13"	1' 33' 19"
122	1' 33' 24"	1' 33' 29"	1' 33' 35"	1' 33' 42"	1' 33' 51"	1' 34' 1"	1' 34' 11"	1' 34' 22"	1' 34' 32"	1' 34' 40"	1' 34' 47"	1' 34' 52"
123	1' 34' 57"	1' 35' 2"	1' 35' 7"	1' 35' 13"	1' 35' 21"	1' 35' 30"	1' 35' 40"	1' 35' 50"	1' 35' 59"	1' 36' 7"	1' 36' 13"	1' 36' 18"
124	1' 36' 22"	1' 36' 26"	1' 36' 30"	1' 36' 36"	1' 36' 43"	1' 36' 52"	1' 37' 1"	1' 37' 10"	1' 37' 19"	1' 37' 26"	1' 37' 31"	1' 37' 35"
125	1' 37' 38"	1' 37' 42"	1' 37' 45"	1' 37' 50"	1' 37' 57"	1' 38' 5"	1' 38' 13"	1' 38' 22"	1' 38' 30"	1' 38' 36"	1' 38' 41"	1' 38' 44"
126	1' 38' 47"	1' 38' 49"	1' 38' 52"	1' 38' 56"	1' 39' 2"	1' 39' 9"	1' 39' 17"	1' 39' 25"	1' 39' 32"	1' 39' 38"	1' 39' 42"	1' 39' 44"
127	1' 39' 46"	1' 39' 48"	1' 39' 50"	1' 39' 54"	1' 39' 59"	1' 40' 5"	1' 40' 12"	1' 40' 20"	1' 40' 26"	1' 40' 31"	1' 40' 34"	1' 40' 36"
128	1' 40' 37"	1' 40' 38"	1' 40' 40"	1' 40' 43"	1' 40' 47"	1' 40' 53"	1' 40' 59"	1' 41' 5"	1' 41' 11"	1' 41' 15"	1' 41' 18"	1' 41' 19"
129	1' 41' 19"	1' 41' 20"	1' 41' 20"	1' 41' 23"	1' 41' 26"	1' 41' 31"	1' 41' 37"	1' 41' 42"	1' 41' 47"	1' 41' 51"	1' 41' 53"	1' 41' 53"
130	1' 41' 53"	1' 41' 52"	1' 41' 52"	1' 41' 54"	1' 41' 57"	1' 42' 1"	1' 42' 6"	1' 42' 11"	1' 42' 15"	1' 42' 17"	1' 42' 19"	1' 42' 18"
131	1' 42' 17"	1' 42' 16"	1' 42' 15"	1' 42' 16"	1' 42' 18"	1' 42' 22"	1' 42' 26"	1' 42' 30"	1' 42' 33"	1' 42' 35"	1' 42' 36"	1' 42' 35"
132	1' 42' 33"	1' 42' 31"	1' 42' 29"	1' 42' 29"	1' 42' 31"	1' 42' 34"	1' 42' 37"	1' 42' 40"	1' 42' 43"	1' 42' 44"	1' 42' 44"	1' 42' 42"
133	1' 42' 39"	1' 42' 37"	1' 42' 35"	1' 42' 34"	1' 42' 35"	1' 42' 37"	1' 42' 39"	1' 42' 42"	1' 42' 44"	1' 42' 44"	1' 42' 43"	1' 42' 41"
134	1' 42' 37"	1' 42' 34"	1' 42' 31"	1' 42' 30"	1' 42' 30"	1' 42' 31"	1' 42' 33"	1' 42' 35"	1' 42' 36"	1' 42' 36"	1' 42' 34"	1' 42' 31"
135	1' 42' 26"	1' 42' 22"	1' 42' 19"	1' 42' 17"	1' 42' 16"	1' 42' 16"	1' 42' 18"	1' 42' 19"	1' 42' 19"	1' 42' 18"	1' 42' 16"	1' 42' 12"
136	1' 42' 7"	1' 42' 2"	1' 41' 58"	1' 41' 55"	1' 41' 53"	1' 41' 53"	1' 41' 54"	1' 41' 54"	1' 41' 54"	1' 41' 52"	1' 41' 49"	1' 41' 44"
137	1' 41' 39"	1' 41' 33"	1' 41' 28"	1' 41' 24"	1' 41' 22"	1' 41' 21"	1' 41' 21"	1' 41' 21"	1' 41' 20"	1' 41' 18"	1' 41' 14"	1' 41' 8"
138	1' 41' 2"	1' 40' 56"	1' 40' 50"	1' 40' 46"	1' 40' 43"	1' 40' 41"	1' 40' 40"	1' 40' 39"	1' 40' 38"	1' 40' 35"	1' 40' 30"	1' 40' 24"
139	1' 40' 17"	1' 40' 10"	1' 40' 4"	1' 39' 59"	1' 39' 55"	1' 39' 53"	1' 39' 51"	1' 39' 50"	1' 39' 47"	1' 39' 44"	1' 39' 38"	1' 39' 32"
140	1' 39' 24"	1' 39' 16"	1' 39' 9"	1' 39' 4"	1' 38' 59"	1' 38' 56"	1' 38' 54"	1' 38' 52"	1' 38' 49"	1' 38' 45"	1' 38' 39"	1' 38' 31"
141	1' 38' 23"	1' 38' 15"	1' 38' 7"	1' 38' 1"	1' 37' 56"	1' 37' 52"	1' 37' 49"	1' 37' 46"	1' 37' 43"	1' 37' 38"	1' 37' 31"	1' 37' 23"
142	1' 37' 14"	1' 37' 5"	1' 36' 57"	1' 36' 50"	1' 36' 44"	1' 36' 40"	1' 36' 37"	1' 36' 33"	1' 36' 29"	1' 36' 23"	1' 36' 16"	1' 36' 7"
143	1' 35' 58"	1' 35' 48"	1' 35' 39"	1' 35' 31"	1' 35' 25"	1' 35' 20"	1' 35' 16"	1' 35' 12"	1' 35' 7"	1' 35' 1"	1' 34' 53"	1' 34' 44"
144	1' 34' 34"	1' 34' 24"	1' 34' 14"	1' 34' 6"	1' 33' 59"	1' 33' 54"	1' 33' 49"	1' 33' 44"	1' 33' 39"	1' 33' 32"	1' 33' 23"	1' 33' 13"
145	1' 33' 3"	1' 32' 52"	1' 32' 42"	1' 32' 33"	1' 32' 25"	1' 32' 18"	1' 32' 14"	1' 32' 9"	1' 32' 3"	1' 31' 55"	1' 31' 46"	1' 31' 36"
146	1' 31' 24"	1' 31' 13"	1' 31' 2"	1' 30' 53"	1' 30' 45"	1' 30' 38"	1' 30' 33"	1' 30' 27"	1' 30' 20"	1' 30' 12"	1' 30' 2"	1' 29' 51"
147	1' 29' 39"	1' 29' 27"	1' 29' 16"	1' 29' 6"	1' 28' 58"	1' 28' 51"	1' 28' 44"	1' 28' 38"	1' 28' 31"	1' 28' 22"	1' 28' 12"	1' 28' 0"
148	1' 27' 48"	1' 27' 35"	1' 27' 23"	1' 27' 13"	1' 27' 4"	1' 26' 56"	1' 26' 49"	1' 26' 42"	1' 26' 34"	1' 26' 25"	1' 26' 15"	1' 26' 3"
149	1' 25' 50"	1' 25' 36"	1' 25' 24"	1' 25' 13"	1' 25' 3"	1' 24' 55"	1' 24' 48"	1' 24' 40"	1' 24' 32"	1' 24' 22"	1' 24' 11"	1' 23' 59"
150	1' 23' 45"	1' 23' 32"	1' 23' 19"	1' 23' 7"	1' 22' 57"	1' 22' 48"	1' 22' 40"	1' 22' 32"	1' 22' 24"	1' 22' 14"	1' 22' 2"	1' 21' 49"
151	1' 21' 35"	1' 21' 21"	1' 21' 7"	1' 20' 55"	1' 20' 45"	1' 20' 35"	1' 20' 27"	1' 20' 18"	1' 20' 9"	1' 19' 59"	1' 19' 46"	1' 19' 33"
152	1' 19' 18"	1' 19' 4"	1' 18' 50"	1' 18' 37"	1' 18' 26"	1' 18' 17"	1' 18' 8"	1' 17' 59"	1' 17' 49"	1' 17' 38"	1' 17' 25"	1' 17' 11"
153	1' 16' 56"	1' 16' 41"	1' 16' 27"	1' 16' 14"	1' 16' 2"	1' 15' 52"	1' 15' 43"	1' 15' 34"	1' 15' 23"	1' 15' 12"	1' 14' 59"	1' 14' 44"
154	1' 14' 29"	1' 14' 13"	1' 13' 59"	1' 13' 45"	1' 13' 33"	1' 13' 23"	1' 13' 13"	1' 13' 3"	1' 12' 52"	1' 12' 40"	1' 12' 27"	1' 12' 12"
155	1' 11' 56"	1' 11' 40"	1' 11' 25"	1' 11' 11"	1' 10' 59"	1' 10' 48"	1' 10' 37"	1' 10' 27"	1' 10' 16"	1' 10' 4"	1' 9' 50"	1' 9' 35"
156	1' 9' 18"	1' 9' 2"	1' 8' 46"	1' 8' 32"	1' 8' 19"	1' 8' 8"	1' 7' 57"	1' 7' 47"	1' 7' 35"	1' 7' 22"	1' 7' 8"	1' 6' 52"
157	1' 6' 36"	1' 6' 19"	1' 6' 3"	1' 5' 48"	1' 5' 35"	1' 5' 23"	1' 5' 12"	1' 5' 1"	1' 4' 49"	1' 4' 36"	1' 4' 21"	1' 4' 5"
158	1' 3' 48"	1' 3' 31"	1' 3' 15"	1' 2' 60"	1' 2' 46"	1' 2' 34"	1' 2' 23"	1' 2' 11"	1' 1' 59"	1' 1' 46"	1' 1' 30"	1' 1' 14"
159	1' 0' 57"	1' 0' 39"	1' 0' 22"	1' 0' 7"	59' 53"	59' 41"	59' 29"	59' 17"	59' 5"	58' 51"	58' 35"	58' 18"
160	58' 1"	57' 43"	57' 26"	57' 10"	56' 56"	56' 43"	56' 31"	56' 19"	56' 6"	55' 52"	55' 36"	55' 19"
161	55' 1"	54' 43"	54' 26"	54' 10"	53' 55"	53' 42"	53' 30"	53' 17"	53' 4"	52' 50"	52' 34"	52' 16"
162	51' 58"	51' 40"	51' 22"	51' 6"	50' 51"	50' 37"	50' 25"	50' 12"	49' 59"	49' 44"	49' 28"	49' 10"
163	48' 52"	48' 33"	48' 15"	47' 58"	47' 43"	47' 30"	47' 17"	47' 4"	46' 51"	46' 36"	46' 19"	46' 1"
164	45' 42"	45' 24"	45' 5"	44' 49"	44' 33"	44' 19"	44' 6"	43' 53"	43' 40"	43' 25"	4	

Solar E Differentials -- Epoch 2020 -- Leap Years +3 (LY3)

Dn	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
184	-17' 3"	-17' 20"	-17' 36"	-17' 50"	-18' 3"	-18' 14"	-18' 24"	-18' 35"	-18' 46"	-18' 58"	-19' 12"	-19' 27"
185	-19' 43"	-19' 59"	-20' 14"	-20' 28"	-20' 41"	-20' 52"	-21' 2"	-21' 12"	-21' 22"	-21' 34"	-21' 47"	-22' 2"
186	-22' 18"	-22' 33"	-22' 48"	-23' 2"	-23' 14"	-23' 24"	-23' 34"	-23' 43"	-23' 53"	-24' 5"	-24' 18"	-24' 32"
187	-24' 47"	-25' 3"	-25' 17"	-25' 30"	-25' 42"	-25' 52"	-26' 1"	-26' 10"	-26' 20"	-26' 31"	-26' 43"	-26' 57"
188	-27' 12"	-27' 26"	-27' 40"	-27' 53"	-28' 4"	-28' 14"	-28' 22"	-28' 31"	-28' 40"	-28' 51"	-29' 3"	-29' 16"
189	-29' 30"	-29' 45"	-29' 58"	-30' 10"	-30' 21"	-30' 30"	-30' 38"	-30' 47"	-30' 55"	-31' 5"	-31' 17"	-31' 30"
190	-31' 44"	-31' 57"	-32' 10"	-32' 22"	-32' 32"	-32' 41"	-32' 49"	-32' 56"	-33' 4"	-33' 14"	-33' 25"	-33' 37"
191	-33' 51"	-34' 4"	-34' 16"	-34' 28"	-34' 37"	-34' 45"	-34' 52"	-34' 60"	-35' 7"	-35' 16"	-35' 27"	-35' 39"
192	-35' 51"	-36' 4"	-36' 16"	-36' 28"	-36' 36"	-36' 43"	-36' 50"	-36' 57"	-37' 4"	-37' 12"	-37' 22"	-37' 33"
193	-37' 46"	-37' 58"	-38' 9"	-38' 19"	-38' 28"	-38' 35"	-38' 41"	-38' 47"	-38' 53"	-39' 1"	-39' 11"	-39' 21"
194	-39' 33"	-39' 44"	-39' 55"	-40' 5"	-40' 13"	-40' 19"	-40' 25"	-40' 30"	-40' 36"	-40' 43"	-40' 52"	-41' 2"
195	-41' 13"	-41' 24"	-41' 34"	-41' 43"	-41' 51"	-41' 56"	-42' 1"	-42' 6"	-42' 12"	-42' 18"	-42' 26"	-42' 36"
196	-42' 46"	-42' 57"	-43' 6"	-43' 14"	-43' 21"	-43' 26"	-43' 31"	-43' 35"	-43' 40"	-43' 46"	-43' 53"	-44' 2"
197	-44' 12"	-44' 21"	-44' 30"	-44' 38"	-44' 44"	-44' 48"	-44' 52"	-44' 56"	-44' 60"	-45' 5"	-45' 12"	-45' 20"
198	-45' 29"	-45' 38"	-45' 47"	-45' 53"	-45' 59"	-46' 3"	-46' 6"	-46' 9"	-46' 12"	-46' 17"	-46' 23"	-46' 30"
199	-46' 39"	-46' 47"	-46' 55"	-47' 1"	-47' 6"	-47' 9"	-47' 11"	-47' 13"	-47' 16"	-47' 20"	-47' 26"	-47' 32"
200	-47' 40"	-47' 48"	-47' 55"	-48' 0"	-48' 4"	-48' 7"	-48' 8"	-48' 10"	-48' 12"	-48' 15"	-48' 20"	-48' 26"
201	-48' 33"	-48' 40"	-48' 46"	-48' 51"	-48' 54"	-48' 56"	-48' 57"	-48' 58"	-48' 59"	-49' 1"	-49' 6"	-49' 11"
202	-49' 17"	-49' 23"	-49' 29"	-49' 33"	-49' 35"	-49' 36"	-49' 37"	-49' 37"	-49' 37"	-49' 39"	-49' 42"	-49' 47"
203	-49' 52"	-49' 58"	-50' 3"	-50' 6"	-50' 8"	-50' 8"	-50' 8"	-50' 7"	-50' 7"	-50' 8"	-50' 10"	-50' 14"
204	-50' 19"	-50' 24"	-50' 28"	-50' 30"	-50' 31"	-50' 31"	-50' 30"	-50' 28"	-50' 27"	-50' 28"	-50' 29"	-50' 33"
205	-50' 36"	-50' 40"	-50' 44"	-50' 45"	-50' 46"	-50' 45"	-50' 42"	-50' 40"	-50' 39"	-50' 38"	-50' 39"	-50' 42"
206	-50' 45"	-50' 48"	-50' 50"	-50' 51"	-50' 51"	-50' 49"	-50' 46"	-50' 43"	-50' 41"	-50' 40"	-50' 40"	-50' 41"
207	-50' 44"	-50' 46"	-50' 48"	-50' 48"	-50' 47"	-50' 44"	-50' 41"	-50' 37"	-50' 34"	-50' 32"	-50' 31"	-50' 32"
208	-50' 34"	-50' 35"	-50' 36"	-50' 36"	-50' 34"	-50' 30"	-50' 26"	-50' 20"	-50' 17"	-50' 15"	-50' 13"	-50' 13"
209	-50' 14"	-50' 15"	-50' 15"	-50' 14"	-50' 11"	-50' 7"	-50' 2"	-49' 56"	-49' 52"	-49' 48"	-49' 46"	-49' 45"
210	-49' 45"	-49' 45"	-49' 45"	-49' 43"	-49' 39"	-49' 34"	-49' 28"	-49' 22"	-49' 16"	-49' 12"	-49' 9"	-49' 8"
211	-49' 7"	-49' 6"	-49' 5"	-49' 2"	-48' 58"	-48' 52"	-48' 45"	-48' 38"	-48' 32"	-48' 27"	-48' 23"	-48' 21"
212	-48' 20"	-48' 18"	-48' 16"	-48' 12"	-48' 7"	-48' 1"	-47' 53"	-47' 46"	-47' 39"	-47' 33"	-47' 28"	-47' 25"
213	-47' 23"	-47' 21"	-47' 18"	-47' 14"	-47' 8"	-47' 0"	-46' 52"	-46' 44"	-46' 36"	-46' 29"	-46' 24"	-46' 20"
214	-46' 17"	-46' 14"	-46' 11"	-46' 6"	-45' 59"	-45' 51"	-45' 42"	-45' 33"	-45' 24"	-45' 17"	-45' 11"	-45' 7"
215	-45' 3"	-44' 59"	-44' 55"	-44' 49"	-44' 41"	-44' 33"	-44' 23"	-44' 13"	-44' 4"	-43' 56"	-43' 49"	-43' 44"
216	-43' 39"	-43' 35"	-43' 30"	-43' 23"	-43' 15"	-43' 5"	-42' 55"	-42' 43"	-42' 34"	-42' 26"	-42' 18"	-42' 12"
217	-42' 7"	-42' 2"	-41' 56"	-41' 49"	-41' 40"	-41' 29"	-41' 18"	-41' 7"	-40' 56"	-40' 47"	-40' 39"	-40' 32"
218	-40' 26"	-40' 20"	-40' 13"	-40' 5"	-39' 56"	-39' 45"	-39' 33"	-39' 21"	-39' 9"	-38' 59"	-38' 50"	-38' 43"
219	-38' 36"	-38' 30"	-38' 22"	-38' 14"	-38' 3"	-37' 52"	-37' 39"	-37' 26"	-37' 14"	-37' 3"	-36' 54"	-36' 46"
220	-36' 38"	-36' 31"	-36' 23"	-36' 13"	-36' 2"	-35' 50"	-35' 37"	-35' 23"	-35' 10"	-34' 59"	-34' 48"	-34' 40"
221	-34' 31"	-34' 23"	-34' 15"	-34' 4"	-33' 53"	-33' 40"	-33' 26"	-33' 12"	-32' 58"	-32' 46"	-32' 35"	-32' 25"
222	-32' 16"	-32' 8"	-31' 58"	-31' 47"	-31' 35"	-31' 21"	-31' 6"	-30' 52"	-30' 37"	-30' 24"	-30' 13"	-30' 3"
223	-29' 53"	-29' 44"	-29' 33"	-29' 22"	-29' 9"	-28' 54"	-28' 39"	-28' 23"	-28' 9"	-27' 55"	-27' 43"	-27' 32"
224	-27' 21"	-27' 11"	-27' 0"	-26' 48"	-26' 34"	-26' 19"	-26' 3"	-25' 47"	-25' 32"	-25' 17"	-25' 4"	-24' 53"
225	-24' 42"	-24' 31"	-24' 19"	-24' 6"	-23' 52"	-23' 36"	-23' 19"	-23' 3"	-22' 46"	-22' 31"	-22' 18"	-22' 5"
226	-21' 54"	-21' 42"	-21' 30"	-21' 16"	-21' 1"	-20' 45"	-20' 27"	-20' 10"	-19' 53"	-19' 37"	-19' 23"	-19' 10"
227	-18' 58"	-18' 46"	-18' 33"	-18' 19"	-18' 3"	-17' 46"	-17' 28"	-17' 9"	-16' 52"	-16' 36"	-16' 21"	-16' 7"
228	-15' 54"	-15' 41"	-15' 28"	-15' 13"	-14' 56"	-14' 39"	-14' 20"	-14' 1"	-13' 43"	-13' 26"	-13' 10"	-12' 56"
229	-12' 43"	-12' 29"	-12' 15"	-11' 59"	-11' 42"	-11' 24"	-11' 4"	-10' 45"	-10' 26"	-10' 9"	-9' 52"	-9' 37"
230	-9' 23"	-9' 9"	-8' 54"	-8' 38"	-8' 20"	-8' 1"	-7' 41"	-7' 21"	-7' 2"	-6' 44"	-6' 27"	-6' 11"
231	-5' 56"	-5' 42"	-5' 26"	-5' 9"	-4' 51"	-4' 31"	-4' 11"	-3' 50"	-3' 30"	-3' 11"	-2' 54"	-2' 38"
232	-2' 22"	-2' 7"	-1' 51"	-1' 33"	-1' 14"	-54"	-33"	-12"	9"	28"	46"	1' 3"
233	1' 19"	1' 35"	1' 52"	2' 10"	2' 29"	2' 50"	3' 12"	3' 34"	3' 55"	4' 15"	4' 34"	4' 51"
234	5' 8"	5' 24"	5' 42"	6' 0"	6' 20"	6' 42"	7' 4"	7' 27"	7' 48"	8' 9"	8' 28"	8' 46"
235	9' 3"	9' 20"	9' 38"	9' 57"	10' 18"	10' 40"	11' 3"	11' 26"	11' 48"	12' 9"	12' 29"	12' 48"
236	13' 5"	13' 23"	13' 41"	14' 1"	14' 22"	14' 45"	15' 8"	15' 32"	15' 55"	16' 17"	16' 37"	16' 56"
237	17' 14"	17' 32"	17' 51"	18' 11"	18' 33"	18' 56"	19' 20"	19' 44"	20' 8"	20' 30"	20' 51"	21' 10"
238	21' 29"	21' 48"	22' 7"	22' 28"	22' 50"	23' 14"	23' 38"	24' 3"	24' 27"	24' 50"	25' 11"	25' 31"
239	25' 50"	26' 9"	26' 29"	26' 50"	27' 13"	27' 37"	28' 2"	28' 27"	28' 52"	29' 15"	29' 37"	29' 57"
240	30' 17"	30' 36"	30' 57"	31' 19"	31' 42"	32' 6"	32' 32"	32' 57"	33' 22"	33' 46"	34' 8"	34' 29"
241	34' 49"	35' 9"	35' 30"	35' 52"	36' 16"	36' 41"	37' 7"	37' 33"	37' 58"	38' 22"	38' 44"	39' 6"
242	39' 26"	39' 47"	40' 8"	40' 31"	40' 55"	41' 20"	41' 46"	42' 13"	42' 38"	43' 3"	43' 26"	43' 48"
243	44' 9"	44' 30"	44' 51"	45' 14"	45' 39"	46' 4"	46' 31"	46' 58"	47' 24"	47' 49"	48' 12"	48' 34"
244	48' 55"	49' 17"	49' 39"	50' 2"	50' 27"	50' 53"	51' 20"	51' 47"	52' 13"	52' 38"	53' 2"	53' 25"
245	53' 46"	54' 8"	54' 30"	54' 54"	55' 19"	55' 46"	56' 13"	56' 40"	57' 7"	57' 32"	57' 56"	58' 19"
246	58' 41"	59' 3"	59' 26"	59' 50"	1' 0' 15"	1' 0' 42"	1' 0' 9"	1' 0' 37"	1' 0' 2' 4"	1' 0' 2' 30"	1' 0' 2' 54"	1' 0' 3' 17"
247	1' 3' 39"	1' 4' 2"	1' 4' 25"	1' 4' 49"	1' 5' 15"	1' 5' 42"	1' 6' 10"	1' 6' 37"	1' 7' 5"	1' 7' 31"	1' 7' 55"	1' 8' 19"
248	1' 8' 41"	1' 9' 4"	1' 9' 27"	1' 9' 51"	1' 10' 17"	1' 10' 45"	1' 11' 13"	1' 11' 41"	1' 12' 8"	1' 12' 35"	1' 13' 60"	1' 13' 23"
249	1' 13' 46"	1' 14' 9"	1' 14' 32"	1' 14' 57"	1' 15' 23"	1' 15' 51"	1' 16' 19"	1' 16' 47"	1' 17' 15"	1' 17' 41"	1' 18' 7"	1' 18' 30"
250	1' 18' 53"	1' 19' 16"	1' 19' 40"	1' 20' 5"	1' 20' 31"	1' 20' 59"	1' 21' 28"	1' 21' 56"	1' 22' 24"	1' 22' 51"	1' 23' 16"	1' 23' 40"
251	1' 24' 3"	1' 24' 26"	1' 24' 50"	1' 25' 15"	1' 25' 42"	1' 26' 10"	1' 26' 39"	1' 27' 8"	1' 27' 36"	1' 28' 2"	1' 28' 28"	1' 28' 52"
252	1' 29' 15"	1' 29' 39"	1' 30' 3"	1' 30' 28"	1' 30' 55"	1' 31' 23"	1' 31' 52"	1' 32' 21"	1' 32' 49"	1' 33' 16"	1' 33' 42"	1' 34' 6"
253	1' 34' 30"	1' 34' 53"	1' 35' 17"	1' 35' 43"	1' 36' 10"	1' 36' 38"	1' 37' 7"	1' 37' 36"	1' 38' 4"	1' 38' 32"	1' 38' 57"	1' 39' 22"
254	1' 39' 45"	1' 40' 9"	1' 40' 33"	1' 40' 59"	1' 41' 26"	1' 41' 55"	1' 42' 24"	1' 42' 53"	1' 43' 21"	1' 43' 49"	1' 44' 14"	1' 44' 39"
255	1' 45' 3"	1' 45' 26"	1' 45' 51"	1' 46' 17"	1' 46' 44"	1' 47' 12"	1' 47' 42"	1' 48' 11"	1' 48' 40"	1' 49' 7"	1' 49' 33"	1' 49' 57"
256	1' 50' 21"	1' 50' 45"	1' 51' 10"	1' 51' 36"	1' 52' 3"	1' 52' 31"	1' 53' 1"	1' 53' 30"	1' 53' 59"	1' 54' 26"	1' 54' 52"	1' 55' 17"
257	1' 55' 41"	1' 56' 5"	1' 56' 29"	1' 56' 55"	1' 57' 23"	1' 57' 51"	1' 58' 21"	1' 58' 50"	1' 59' 19"	1' 59' 46"	2' 0' 12"	2' 0' 37"
258	2' 1' 1"	2' 1' 25"	2' 1' 50"	2' 2' 16"	2' 2' 43"	2' 3' 12"	2' 3' 41"	2' 4' 11"	2' 4' 39"	2' 5' 7"	2' 5' 33"	2' 5' 58"
259	2' 6' 22"	2' 6' 46"	2' 7' 10"	2' 7' 36"	2' 8' 4"	2' 8' 33"	2' 9' 2"	2' 9' 32"	2' 10' 0"	2' 10' 28"	2' 10' 54"	2' 11' 19"
260	2' 11' 43"	2' 12' 7"	2' 12' 31"	2' 12' 57"	2' 13' 25"	2' 13' 53"	2' 14' 23"	2' 14' 52"	2' 15' 21"	2' 15' 49"	2' 16' 15"	2' 16' 39"
261	2' 17' 3"	2' 17' 27"	2' 17' 52"	2' 18' 18"	2' 18' 46"	2' 19' 14"	2' 19' 44"	2' 20' 13"	2' 20' 42"	2' 21' 9"	2' 21' 35"	2' 22' 0"
262	2' 22' 24"	2' 22' 48"	2' 23' 13"	2' 23' 38"	2' 24' 6"	2' 24' 35"	2' 25' 4"	2' 25' 33"	2' 26' 2"	2' 26' 29"	2' 26' 55"	2' 27' 20"
263	2' 27' 44"	2' 28' 8"	2' 28' 32"	2' 28' 58"	2' 29' 26"	2' 29' 54"	2' 30' 23"	2' 30' 53"	2' 31' 21"	2' 31' 49"	2' 32' 15"	2' 32' 39"
264	2' 33' 3"	2' 33' 27"	2' 33' 51"	2' 34' 17"	2' 34' 44"	2' 35' 13"	2' 35' 42"	2' 36' 11"	2' 36' 40"	2' 37' 7"	2' 37' 33"	2' 37' 57"</

Solar E Differentials -- Epoch 2020 -- Leap Years +3 (LY3)

Dn	00:00 UT	02:00 UT	04:00 UT	06:00 UT	08:00 UT	10:00 UT	12:00 UT	14:00 UT	16:00 UT	18:00 UT	20:00 UT	22:00 UT
276	3°33'47"	3°34'8"	3°34'29"	3°34'52"	3°35'16"	3°35'41"	3°36'7"	3°36'33"	3°36'58"	3°37'21"	3°37'44"	3°38'5"
277	3°38'25"	3°38'45"	3°39'6"	3°39'28"	3°39'51"	3°40'16"	3°40'42"	3°41'7"	3°41'32"	3°41'55"	3°42'17"	3°42'37"
278	3°42'57"	3°43'16"	3°43'37"	3°43'58"	3°44'21"	3°44'46"	3°45'11"	3°45'36"	3°45'60"	3°46'22"	3°46'44"	3°47'4"
279	3°47'23"	3°47'42"	3°48'2"	3°48'23"	3°48'45"	3°49'9"	3°49'34"	3°49'58"	3°50'22"	3°50'44"	3°51'5"	3°51'24"
280	3°51'43"	3°52'1"	3°52'21"	3°52'41"	3°53'3"	3°53'26"	3°53'50"	3°54'14"	3°54'37"	3°54'59"	3°55'19"	3°55'38"
281	3°55'56"	3°56'14"	3°56'33"	3°56'53"	3°57'14"	3°57'37"	3°58'0"	3°58'24"	3°58'46"	3°59'7"	3°59'27"	3°59'45"
282	4°0'3"	4°0'20"	4°0'38"	4°0'58"	4°1'19"	4°1'41"	4°2'3"	4°2'26"	4°2'48"	4°3'9"	4°3'27"	4°3'45"
283	4°4'2"	4°4'19"	4°4'37"	4°4'55"	4°5'16"	4°5'37"	4°5'59"	4°6'21"	4°6'43"	4°7'3"	4°7'21"	4°7'38"
284	4°7'54"	4°8'11"	4°8'28"	4°8'46"	4°9'5"	4°9'26"	4°9'48"	4°10'9"	4°10'30"	4°10'49"	4°11'7"	4°11'23"
285	4°11'39"	4°11'55"	4°12'11"	4°12'28"	4°12'48"	4°13'8"	4°13'29"	4°13'49"	4°14'9"	4°14'28"	4°14'45"	4°15'1"
286	4°15'16"	4°15'31"	4°15'46"	4°16'3"	4°16'22"	4°16'41"	4°17'2"	4°17'22"	4°17'41"	4°17'59"	4°18'15"	4°18'30"
287	4°18'45"	4°18'59"	4°19'14"	4°19'30"	4°19'48"	4°20'7"	4°20'26"	4°20'46"	4°21'4"	4°21'22"	4°21'37"	4°21'52"
288	4°22'5"	4°22'19"	4°22'33"	4°22'49"	4°23'6"	4°23'24"	4°23'43"	4°24'2"	4°24'19"	4°24'36"	4°24'51"	4°25'5"
289	4°25'17"	4°25'30"	4°25'44"	4°25'59"	4°26'15"	4°26'32"	4°26'51"	4°27'9"	4°27'26"	4°27'42"	4°27'56"	4°28'9"
290	4°28'21"	4°28'33"	4°28'46"	4°29'0"	4°29'16"	4°29'32"	4°29'50"	4°30'7"	4°30'23"	4°30'39"	4°30'52"	4°31'4"
291	4°31'16"	4°31'27"	4°31'39"	4°31'52"	4°32'7"	4°32'23"	4°32'40"	4°32'56"	4°33'12"	4°33'26"	4°33'39"	4°33'50"
292	4°34'1"	4°34'12"	4°34'23"	4°34'36"	4°34'50"	4°35'5"	4°35'21"	4°35'36"	4°35'51"	4°36'5"	4°36'17"	4°36'27"
293	4°36'37"	4°36'47"	4°36'58"	4°37'9"	4°37'23"	4°37'37"	4°37'52"	4°38'7"	4°38'21"	4°38'34"	4°38'45"	4°38'55"
294	4°39'4"	4°39'13"	4°39'23"	4°39'34"	4°39'46"	4°39'60"	4°40'14"	4°40'28"	4°40'42"	4°40'53"	4°41'4"	4°41'13"
295	4°41'21"	4°41'29"	4°41'38"	4°41'48"	4°41'60"	4°42'13"	4°42'26"	4°42'40"	4°42'52"	4°43'3"	4°43'13"	4°43'21"
296	4°43'28"	4°43'35"	4°43'44"	4°43'53"	4°44'4"	4°44'16"	4°44'28"	4°44'41"	4°44'52"	4°45'3"	4°45'11"	4°45'18"
297	4°45'25"	4°45'31"	4°45'39"	4°45'47"	4°45'57"	4°46'8"	4°46'20"	4°46'32"	4°46'42"	4°46'52"	4°46'59"	4°47'6"
298	4°47'11"	4°47'17"	4°47'23"	4°47'31"	4°47'40"	4°47'50"	4°48'1"	4°48'12"	4°48'22"	4°48'30"	4°48'37"	4°48'43"
299	4°48'47"	4°48'52"	4°48'57"	4°49'4"	4°49'12"	4°49'21"	4°49'31"	4°49'41"	4°49'50"	4°49'58"	4°50'4"	4°50'8"
300	4°50'12"	4°50'16"	4°50'20"	4°50'26"	4°50'33"	4°50'42"	4°50'51"	4°50'60"	4°51'8"	4°51'14"	4°51'19"	4°51'23"
301	4°51'26"	4°51'29"	4°51'32"	4°51'37"	4°51'43"	4°51'51"	4°51'59"	4°52'7"	4°52'14"	4°52'19"	4°52'23"	4°52'26"
302	4°52'28"	4°52'30"	4°52'32"	4°52'36"	4°52'42"	4°52'48"	4°52'55"	4°53'2"	4°53'8"	4°53'13"	4°53'16"	4°53'18"
303	4°53'19"	4°53'19"	4°53'21"	4°53'24"	4°53'28"	4°53'34"	4°53'40"	4°53'46"	4°53'51"	4°53'55"	4°53'57"	4°53'57"
304	4°53'57"	4°53'57"	4°53'58"	4°53'60"	4°54'3"	4°54'7"	4°54'13"	4°54'18"	4°54'22"	4°54'24"	4°54'25"	4°54'25"
305	4°54'24"	4°54'23"	4°54'22"	4°54'23"	4°54'25"	4°54'29"	4°54'33"	4°54'37"	4°54'40"	4°54'42"	4°54'42"	4°54'41"
306	4°54'38"	4°54'36"	4°54'35"	4°54'34"	4°54'36"	4°54'38"	4°54'41"	4°54'44"	4°54'46"	4°54'47"	4°54'46"	4°54'44"
307	4°54'40"	4°54'37"	4°54'35"	4°54'33"	4°54'34"	4°54'35"	4°54'37"	4°54'39"	4°54'40"	4°54'40"	4°54'38"	4°54'34"
308	4°54'30"	4°54'26"	4°54'22"	4°54'20"	4°54'19"	4°54'19"	4°54'20"	4°54'21"	4°54'21"	4°54'20"	4°54'16"	4°54'12"
309	4°54'7"	4°54'1"	4°53'57"	4°53'53"	4°53'51"	4°53'51"	4°53'51"	4°53'51"	4°53'49"	4°53'47"	4°53'43"	4°53'37"
310	4°53'31"	4°53'24"	4°53'19"	4°53'14"	4°53'11"	4°53'10"	4°53'8"	4°53'7"	4°53'5"	4°53'1"	4°52'56"	4°52'50"
311	4°52'42"	4°52'35"	4°52'28"	4°52'22"	4°52'18"	4°52'15"	4°52'13"	4°52'11"	4°52'8"	4°52'3"	4°51'57"	4°51'49"
312	4°51'40"	4°51'32"	4°51'24"	4°51'18"	4°51'12"	4°51'9"	4°51'5"	4°51'2"	4°50'58"	4°50'52"	4°50'44"	4°50'36"
313	4°50'26"	4°50'16"	4°50'7"	4°49'60"	4°49'54"	4°49'49"	4°49'44"	4°49'40"	4°49'35"	4°49'28"	4°49'19"	4°49'9"
314	4°48'59"	4°48'48"	4°48'38"	4°48'29"	4°48'22"	4°48'16"	4°48'11"	4°48'5"	4°47'59"	4°47'51"	4°47'41"	4°47'30"
315	4°47'18"	4°47'7"	4°46'56"	4°46'46"	4°46'37"	4°46'30"	4°46'24"	4°46'17"	4°46'10"	4°46'1"	4°45'50"	4°45'38"
316	4°45'25"	4°45'13"	4°45'0"	4°44'50"	4°44'40"	4°44'32"	4°44'24"	4°44'17"	4°44'8"	4°43'58"	4°43'47"	4°43'33"
317	4°43'20"	4°43'6"	4°42'52"	4°42'40"	4°42'30"	4°42'21"	4°42'12"	4°42'4"	4°41'54"	4°41'43"	4°41'30"	4°41'16"
318	4°41'1"	4°40'46"	4°40'32"	4°40'19"	4°40'7"	4°39'57"	4°39'47"	4°39'38"	4°39'27"	4°39'15"	4°39'1"	4°38'46"
319	4°38'30"	4°38'14"	4°37'58"	4°37'44"	4°37'32"	4°37'21"	4°37'10"	4°36'59"	4°36'47"	4°36'34"	4°36'19"	4°36'3"
320	4°35'46"	4°35'29"	4°35'13"	4°34'58"	4°34'44"	4°34'32"	4°34'20"	4°34'8"	4°33'56"	4°33'41"	4°33'25"	4°33'8"
321	4°32'50"	4°32'32"	4°32'15"	4°31'59"	4°31'44"	4°31'31"	4°31'18"	4°31'5"	4°30'51"	4°30'36"	4°30'19"	4°30'1"
322	4°29'42"	4°29'23"	4°29'4"	4°28'47"	4°28'32"	4°28'17"	4°28'4"	4°27'50"	4°27'35"	4°27'19"	4°27'1"	4°26'42"
323	4°26'22"	4°26'1"	4°25'42"	4°25'24"	4°25'7"	4°24'52"	4°24'37"	4°24'22"	4°24'7"	4°23'50"	4°23'31"	4°23'10"
324	4°22'49"	4°22'28"	4°22'8"	4°21'49"	4°21'31"	4°21'15"	4°20'59"	4°20'43"	4°20'27"	4°20'8"	4°19'49"	4°19'27"
325	4°19'5"	4°18'43"	4°18'22"	4°18'2"	4°17'43"	4°17'26"	4°17'9"	4°16'52"	4°16'35"	4°16'16"	4°15'55"	4°15'33"
326	4°15'10"	4°14'46"	4°14'24"	4°14'3"	4°13'44"	4°13'25"	4°13'8"	4°12'50"	4°12'31"	4°12'11"	4°11'50"	4°11'26"
327	4°11'2"	4°10'38"	4°10'15"	4°9'53"	4°9'32"	4°9'13"	4°8'55"	4°8'36"	4°8'16"	4°7'55"	4°7'33"	4°7'9"
328	4°6'44"	4°6'19"	4°5'54"	4°5'31"	4°5'10"	4°4'50"	4°4'30"	4°4'11"	4°3'50"	4°3'28"	4°3'5"	4°2'40"
329	4°2'14"	4°1'48"	4°1'23"	4°0'59"	4°0'36"	4°0'15"	3°59'55"	3°59'34"	3°59'13"	3°58'50"	3°58'26"	3°57'60"
330	3°57'33"	3°57'6"	3°56'40"	3°56'15"	3°55'52"	3°55'30"	3°55'8"	3°54'47"	3°54'25"	3°54'1"	3°53'35"	3°53'8"
331	3°52'41"	3°52'13"	3°51'46"	3°51'20"	3°50'56"	3°50'33"	3°50'11"	3°49'49"	3°49'25"	3°49'1"	3°48'34"	3°48'7"
332	3°47'38"	3°47'9"	3°46'15"	3°46'15"	3°45'50"	3°45'26"	3°45'3"	3°44'40"	3°44'16"	3°43'50"	3°43'23"	3°42'54"
333	3°42'25"	3°41'55"	3°41'26"	3°40'59"	3°40'33"	3°40'8"	3°39'44"	3°39'20"	3°38'56"	3°38'29"	3°38'1"	3°37'32"
334	3°37'1"	3°36'31"	3°36'1"	3°35'33"	3°35'6"	3°34'41"	3°34'16"	3°33'51"	3°33'25"	3°32'58"	3°32'29"	3°31'59"
335	3°31'28"	3°30'56"	3°30'26"	3°29'57"	3°29'29"	3°29'3"	3°28'37"	3°28'12"	3°27'45"	3°27'17"	3°26'47"	3°26'16"
336	3°25'44"	3°25'12"	3°24'41"	3°24'11"	3°23'43"	3°23'15"	3°22'49"	3°22'23"	3°21'55"	3°21'27"	3°20'56"	3°20'24"
337	3°19'51"	3°19'19"	3°18'47"	3°18'16"	3°17'47"	3°17'19"	3°16'52"	3°16'24"	3°15'56"	3°15'27"	3°14'56"	3°14'23"
338	3°13'50"	3°13'16"	3°12'43"	3°12'12"	3°11'42"	3°11'13"	3°10'45"	3°10'17"	3°9'49"	3°9'18"	3°8'46"	3°8'13"
339	3°7'29"	3°7'5"	3°6'31"	3°5'59"	3°5'28"	3°4'59"	3°4'30"	3°4'2"	3°3'32"	3°3'1"	3°2'29"	3°1'55"
340	3°1'20"	3°0'45"	3°0'11"	2°59'38"	2°59'6"	2°58'36"	2°58'7"	2°57'38"	2°57'8"	2°56'36"	2°56'3"	2°55'28"
341	2°54'53"	2°54'17"	2°53'42"	2°53'9"	2°52'37"	2°52'6"	2°51'36"	2°51'6"	2°50'36"	2°50'3"	2°49'29"	2°48'54"
342	2°48'18"	2°47'42"	2°47'6"	2°46'32"	2°45'60"	2°45'28"	2°44'58"	2°44'27"	2°43'56"	2°43'23"	2°42'49"	2°42'13"
343	2°41'36"	2°40'59"	2°40'23"	2°39'49"	2°39'15"	2°38'44"	2°38'13"	2°37'42"	2°37'10"	2°36'36"	2°36'1"	2°35'25"
344	2°34'48"	2°34'10"	2°33'34"	2°32'58"	2°32'25"	2°31'53"	2°31'21"	2°30'49"	2°30'17"	2°29'43"	2°29'8"	2°28'31"
345	2°27'53"	2°27'15"	2°26'38"	2°26'2"	2°25'28"	2°24'55"	2°24'23"	2°23'51"	2°23'19"	2°22'44"	2°22'8"	2°21'31"
346	2°20'53"	2°20'14"	2°19'37"	2°19'1"	2°18'26"	2°17'53"	2°17'21"	2°16'48"	2°16'15"	2°15'40"	2°15'4"	2°14'26"
347	2°13'47"	2°13'9"	2°12'31"	2°11'54"	2°11'19"	2°10'46"	2°10'13"	2°9'40"	2°9'6"	2°8'31"	2°7'55"	2°7'16"
348	2°6'37"	2°5'58"	2°5'20"	2°4'43"	2°4'8"	2°3'34"	2°3'1"	2°2'28"	2°1'54"	2°1'18"	2°0'41"	2°0'3"
349	1°59'23"	1°58'44"	1°58'6"	1°57'28"	1°56'53"	1°56'18"	1°55'45"	1°55'12"	1°54'37"	1°54'2"	1°53'24"	1°52'46"
350	1°52'6"	1°51'27"	1°50'48"	1°50'10"	1°49'34"	1°48'60"	1°48'26"	1°47'53"	1°47'18"	1°46'42"	1°46'5"	1°45'26"
351	1°44'46"	1°44'6"	1°43'27"	1°42'49"	1°42'13"	1°41'39"	1°41'5"	1°40'31"	1°39'56"	1°39'20"	1°38'43"	1°38'3"
352	1°37'23"	1°36'43"	1°36'4"	1°35'26"	1°34'50"	1°34'15"	1°33'41"	1°33'7"	1°32'32"	1°31'56"	1°31'18"	1°30'39"
353	1°29'59"	1°29'19"	1°28'40"	1°28'2"	1°27'25"	1°26'50"	1°26'16"	1°25'42"	1°25'7"	1°24'31"	1°23'53"	1°23'14"
354	1°22'34"	1°21'53"	1°21'14"	1°20'36"	1°19'59"	1°19'24"	1°18'50"	1°18'16"	1°17'41"	1°17'5"	1	

Navigational Stars J2000.0

No	Name	λ_0	μ	β_0	μ'	Proper motion
1	Acamar	23.2723	-0.00152	-53.7402	0.00112	$\lambda_1 = \lambda_0 + \mu T$
2	Achernar	345.3117	0.00285	-59.3783	-0.00275	$\beta_1 = \beta_0 + \mu' T$
3	Acrux	221.8701	-0.00047	-52.8787	-0.00070	Aberration
4	Adhara	110.7630	0.00025	-51.3602	0.00010	$\lambda_n = 280.460^\circ + 36000.770^\circ T$
5	Aldebaran	69.7892	0.00104	-5.4674	-0.00550	$\lambda_2 = \lambda_1 - (0.0057^\circ \times (\lambda_1 - \lambda_n) \cdot \cos) / \beta_1 \cdot \cos$
6	Alioth	158.9334	0.00417	54.3188	0.00194	$\beta_2 = \beta_1 + 0.0057^\circ \times (\lambda_1 - \lambda_n) \cdot \sin \times \beta_1 \cdot \sin$
7	Alkaid	176.9331	-0.00430	54.3880	-0.00230	Precession
8	Al Na'ir	315.9070	0.00184	-32.9133	-0.00536	$a = 1.39697^\circ T + 0.000309^\circ T^2$
9	Alnilam	83.4636	-0.00002	-24.5064	-0.00007	$b = 0.0131^\circ T - 0.00001^\circ T^2$
10	Alphard	147.2792	-0.00074	-22.3825	0.00067	$c = 5.1236^\circ + 0.2416^\circ T$
11	Alphecca	222.2959	0.00568	44.3236	-0.00118	$\beta_3 = \beta_2 + b \times (\lambda_2 + c) \cdot \sin$
12	Alpheratz	14.3085	0.00162	25.6804	-0.00575	$\lambda_3 = \lambda_2 + a - b \times (\lambda_2 + c) \cdot \cos \times \beta_3 \cdot \tan$
13	Altair	301.7765	0.01939	29.3035	0.00733	Nutation
14	Ankaa	345.4938	-0.00100	-40.6331	-0.01237	$\lambda = \lambda_3 - 0.0048^\circ \times \Omega \cdot \sin$
15	Antares	249.7623	-0.00007	-4.5699	-0.00061	$\beta = \beta_3$
16	Arcturus	204.2337	-0.00768	30.7363	-0.00288	Rectangular coordinates
17	Atria	260.8962	0.00123	-46.1513	-0.00075	$x = \beta \cdot \cos \times \lambda \cdot \cos$
18	Avior	173.1294	-0.00250	-72.6798	-0.00013	$y = (\epsilon \cdot \cos \times \beta \cdot \cos \times \lambda \cdot \sin) - (\epsilon \cdot \sin \times \beta \cdot \sin)$
19	Bellatrix	80.9464	-0.00032	-16.8161	-0.00037	$z = (\epsilon \cdot \sin \times \beta \cdot \cos \times \lambda \cdot \sin) + (\epsilon \cdot \cos \times \beta \cdot \sin)$
20	Betelgeuse	88.7547	0.00080	-16.0270	0.00026	Right ascension
21	Canopus	104.9614	0.00308	-75.8239	0.00076	$\alpha = 180^\circ / \pi \times (y, x) \cdot \text{atan2}$
22	Capella	81.8579	0.00126	22.8643	-0.01191	Declination
23	Deneb	335.3293	0.00029	59.9061	-0.00002	$\delta = 180^\circ / \pi \times z \cdot \text{asin}$
24	Denebola	171.6176	-0.01153	12.2669	-0.00849	Sidereal hour angle
25	Diphda	2.5835	0.00673	-20.7836	-0.00191	$\text{SHA}^* = 360^\circ - \alpha$
26	Dubhe	135.1975	-0.00239	49.6802	-0.00343	Time variables
27	Elnath	82.5750	0.00037	5.3851	-0.00491	$\tau = \text{JDN} - 2451544$
28	Eltanin	267.9687	-0.00080	74.9223	-0.00055	$\Delta T = 0.808(T-2)^2 \times 10^{-8}$
29	Enif	331.8850	0.00090	22.0999	-0.00029	$T = \tau / 3625; T_0 = T + \Delta T$
30	Fomalhaut	333.8604	0.00716	-21.1357	-0.00802	Navigation
31	Gacrux	216.7397	0.00737	-47.8312	-0.00543	$\text{LHA}^* = \text{GHA}^* + \text{SHA}^* + \text{Lon}$
32	Gienah	190.7256	-0.00449	-14.5009	-0.00128	$\text{GHA}^* = 280.46061837^\circ$
33	Hadar	233.7925	-0.00036	-44.1375	-0.00076	$+ 360.98564736629^\circ \tau$
34	Hamal	37.6625	0.00364	9.9651	-0.00569	$+ 0.000387933^\circ T^2$
35	Kaus Aust.	275.0787	-0.00106	-11.0519	-0.00346	$- T^3 / 38710000.0^\circ$
36	Kochab	133.3195	-0.00112	72.9876	-0.00088	
37	Markab	353.4857	0.00125	19.4060	-0.00182	
38	Menkar	44.3201	-0.00091	-12.5856	-0.00197	
39	Menkent	222.3086	-0.00873	-22.0800	-0.01871	
40	Miaplacidus	211.9692	-0.01254	-72.2357	-0.00329	
41	Mirfak	62.0810	0.00051	30.1255	-0.00084	
42	Nunki	282.3853	0.00026	-3.4495	-0.00156	
43	Peacock	293.8176	-0.00041	-36.2677	-0.00244	
44	Pollux	113.2156	-0.01700	6.6842	-0.00436	
45	Procyon	115.7855	-0.01504	-16.0196	-0.03143	
46	Rasalhague	262.4487	0.00459	35.8352	-0.00609	
47	Regulus	149.8292	-0.00648	0.4649	-0.00222	
48	Rigel	76.8295	-0.00003	-31.1228	-0.00007	
49	Rigel Kent.	239.4793	-0.13521	-42.5959	-0.02399	
50	Sabik	257.9696	0.00084	7.1978	0.00275	
51	Schedar	37.7838	0.00105	46.6222	-0.00157	
52	Shaula	264.5858	0.00007	-13.7884	-0.00079	
53	Sirius	104.0816	-0.01524	-39.6053	-0.03492	
54	Spica	203.8414	-0.00075	-2.0545	-0.00118	
55	Suhail	161.1877	-0.00116	-55.8708	0.00011	
56	Vega	285.3164	0.01403	61.7328	0.00709	
57	Zuben.	225.0827	-0.00226	0.3330	-0.00267	
58	Polaris	88.5676	0.00098	66.1014	-0.00118	
59	σ Octantis	271.8706	0.00118	-65.8402	-0.00042	

Useful Equations

Sight reduction

$$\text{Dip} = 0.97 \times \sqrt{\text{eye_height_ft}}$$

$$\text{Hc}^\circ = \arcsin(\text{lat} \cdot \sin \times \text{decl} \cdot \sin) + (\text{lat} \cdot \cos \times \text{decl} \cdot \cos \times \text{lha} \cdot \cos)$$

$$\text{Zn}^\circ = \arcsin((\text{decl} \cdot \sin - \text{lat} \cdot \text{trig} \times \text{alt} \cdot \sin) / (\text{lat} \cdot \cos \times \text{alt} \cdot \cos)) \text{ If } \text{LHA} < 180: \text{Zn} = 360 - \text{Zn}$$

Longitude by time

$$\text{LHA}(\text{Sun}) = ((\text{Ho} \cdot \sin - \text{decl} \cdot \sin) \times \text{lat} \cdot \sin) / (\text{decl} \cdot \sin \times \text{lat} \cdot \sin) \text{ If } \text{Z}??: \text{LHA} = 360 - \text{LHA}$$

$$\text{Lon} = \text{GHA}(\text{Sun}) - \text{LHA}(\text{Sun})$$

Position from 2 observations

Latitude from 2 sights

$$h = ((h1 \cdot \sin \times \text{gha}2 \cdot \cos) / \text{dec}1 \cdot \cos) - ((h2 \cdot \sin \times \text{gha}1 \cdot \cos) / \text{dec}2 \cdot \cos)$$

$$i = (\text{dec}2 \cdot \tan \times \text{gha}1 \cdot \cos) - (\text{dec}1 \cdot \tan \times \text{gha}2 \cdot \cos)$$

$$j = (\text{gha}1 \cdot \sin \times \text{gha}2 \cdot \cos) - (\text{gha}2 \cdot \sin \times \text{gha}1 \cdot \cos)$$

$$k = ((h1 \cdot \sin \times \text{gha}2 \cdot \sin) / \text{dec}1 \cdot \cos) - ((h2 \cdot \sin \times \text{gha}1 \cdot \sin) / \text{dec}2 \cdot \cos)$$

$$l = (\text{dec}2 \cdot \tan \times \text{gha}1 \cdot \sin) - (\text{dec}1 \cdot \tan \times \text{gha}2 \cdot \sin)$$

$$M = -(i \cdot h) - (k \cdot l)$$

$$N = (((i \cdot h) + (k \cdot l))^2) - ((i^2 + l^2 + j^2) \times (h^2 + k^2 - j^2))$$

$$W = i^2 + l^2 + j^2$$

$$\text{L1} = \arcsin((M + \text{math} \cdot \sqrt{\text{N}}) / W)$$

$$\text{L2} = \arcsin((M - \text{math} \cdot \sqrt{\text{N}}) / W)$$

Julian Date Tables and Solar Equations

JDN Base Jan 1 2000 UT 0000: 2451544.5

JDN = JDN Base + Yn + Mi + day of month | τ = Yn + Mi + day of month + 0.5 = JDN - 2451544
 = 367 × Y - [7 × (Y + ((M + 9) / 12))] / 4 + [(275 × month)/9] + day + 1721014

Jan 1 of year UT 0000 (Yn)

Calculate Decimal Days from HMS.s
 (n/100000)

2020*	7304	2021	7670	2022	8035	2023	8400
2024*	8765	2025	9131	2026	9496	2027	9861
2028*	10226	2029	10592	2030	10957	2031	11322
2032*	11687	2033	12053	2034	12418	2035	12783
2036*	13148	2037	13514	2038	13879	2039	14244
2040*	14609	2041	14975	2042	15340	2043	15705

nr.	Hr.	Min.	Sec.	0.1	nr.	Min.	Sec.
1	041667	694	12	1	31	21528	359
2	083333	1389	23	2	32	22222	370
3	125000	2083	35	3	33	22917	382
4	166667	2778	46	5	34	23611	394
5	208333	3472	58	6	35	24306	405
6	250000	4167	69	7	36	25000	417
7	291667	4861	81	8	37	25694	428
8	333333	5556	93	9	38	26389	440
9	375000	6250	104	10	39	27083	451
10	416667	6944	116	12	40	27778	463
11	458333	7639	127	--	41	28472	475
12	500000	8333	139	--	42	29167	486
13	541667	9028	150	--	43	29861	497
14	583333	9722	162	--	44	30556	509
15	625000	10417	174	--	45	31250	521
16	666667	11111	185	--	46	31944	532
17	708333	11806	197	--	47	32639	544
18	750000	12500	208	--	48	33333	556
19	791667	13194	220	--	49	34028	567
20	833333	13889	231	--	50	34722	579
21	875000	14583	243	--	51	35417	590
22	916667	15278	255	--	52	36111	602
23	958333	15972	266	--	53	36806	613
24	----	16667	278	--	54	37500	625
25	----	17361	289	--	55	38194	637
26	----	18056	301	--	56	38889	648
27	----	18750	313	--	57	39583	660
28	----	19444	324	--	58	40278	671
29	----	20139	336	--	59	40972	683
30	----	20833	347	--	60	41667	694

Julian centuries: T = Base + incr (0.00082/30 days)

Year	Base	Month	Incr.	Mi/*
*2020	0.20	Jan	0.00082	-1/-1
2021	0.21	Feb	0.00164	30/30
2022	0.22	Mar	0.00246	58/59
2023	0.23	Apr	0.00328	89/90
*2024	0.24	May	0.00410	119/120
2025	0.25	Jun	0.00492	150/151
2026	0.26	Jul	0.00574	180/181
2027	0.27	Aug	0.00656	211/212
*2028	0.28	Sep	0.00738	242/243
2029	0.29	Oct	0.00820	272/273
2030	0.30	Nov	0.00902	303/304
2031	0.31	Dec	0.00984	333/334
*2032	0.32			
2033	0.33			
2034	0.34			
2035	0.35			
*2036	0.36			
2037	0.37			
2038	0.38			
2039	0.39			
*2040	0.40			
2041	0.41			
2042	0.42			

$\Delta T = 0.808(T-2)^2 * 10^{-8}$
 $T_0 = T + \Delta T$
 $T = \tau / 3625$

Solar Variables

α	Right ascension	δ	Declination	λ	Longitude	β	Latitude	Ω	Lon ↘ As. Node
g_0	Mean anomaly	τ	Days fm J2000.0	H	Altitude	Z	Azimuth	\mathcal{C}	Sun Eq Center
v	True anomaly	e	Eccentricity	L_0	Mean lon	ϵ	Obliquity ecl	λ^a	True lon.

Solar Equations and Formulae

Symbols

$L_0 = 280.460^\circ + 0.9856474^\circ \tau$; cor aber.	[Sym]	Object
$= 280.46645^\circ + 36000.76983^\circ T + 0.0003032^\circ T^2$ (?3132?)	[♁]	Merc.
$\beta = 0^\circ$	[☉]	Sun
$GHA^\circ = 280.46061837^\circ + 360.98564736629^\circ \tau + 0.000387933^\circ T^2 - T^3/38710000.0^\circ$	[♁]	Earth
$= 0.9856474^\circ \tau + (15 \times UT^h)^\circ + 100.46062^\circ$	[♈]	Aries
$= 100.4606^\circ + 3600.76998^\circ T + 0.000387^\circ T^2 + 15UTC - 0.0048^\circ \Omega \cdot \sin \times \epsilon_0 \cdot \cos$	[☾]	Moon
$g_0 = 357.52910^\circ + 35999.05030^\circ T - 0.0001559^\circ T^2 - 0.00000048^\circ T^3$	[♂]	Mars
$= 357.528^\circ + 0.9856003^\circ \tau$	[★]	Star
$k = 2\pi/360^\circ = 0.0175$	[♁]	Sat.
$\lambda_0 = L_0 + 1.915^\circ * g_0 \cdot \sin + 0.020^\circ 2g_0 \cdot \sin$	[♀]	Venus
$\Omega = 125.045^\circ - 1934.136^\circ T$	[♃]	Jup.
$\Delta\lambda = 1.914600 - 0.004817T - 0.000014T^2 + k g_0 \cdot \sin + (0.019993 - 0.000101T) k 2g_0 \cdot \sin + 0.000290k 3g_0 \cdot \sin$		
$\lambda = \lambda_0 - \Delta\lambda$		
$\epsilon_0 = 23.0^\circ + 26.0/60.0 + 21.448/3600.0 - (46.8150T + 0.00059T^2 - 0.001813T^3)/3600$		
$= 23.439^\circ - 0.0000004^\circ \tau$		
$= 23.4393^\circ - 0.01301^\circ T_0 - 0.0000001^\circ T_0^2 + 0.0000006^\circ T_0^3$		
$\epsilon = \epsilon_0 + 0.0026^\circ \Omega \cdot \cos$		
$\alpha = (24/180) \times \arctan(Y/(X+R))$ // in hours		
$= 2 \operatorname{atan}[(\epsilon_0 \cdot \cos \times \lambda \cdot \sin) / (6 \cdot \cos \times \lambda \cdot \cos)]$		
$= \operatorname{atan}(\epsilon_0 \cdot \cos \times \lambda_0 \cdot \tan)$		
$= 180/\pi(\operatorname{atan}2(x,y))$		
$\mathcal{C} = (1.9147^\circ - 0.00482^\circ T_0 - 0.000015^\circ T_0^2) \times g_0 \cdot \sin + 0.1999(2g_0 \cdot \sin)$		
$\lambda^a = \lambda_0 + \mathcal{C} - 0.0057^\circ - 0.0048^\circ (\Omega \cdot \sin)$		
Rect: $x = \lambda^a \cdot \cos$; $y = \epsilon \cdot \cos \times \lambda^a \cdot \sin$; $z = \epsilon \cdot \sin \times \lambda^a \cdot \sin$; $R = \sqrt{(1 - z^2)}$; $\delta = (z - r) \cdot \operatorname{atan}$		
$\delta = \arcsin(\epsilon_0 \cdot \sin \times \lambda_0 \cdot \sin)$		
$= 180/\pi(\operatorname{asin}z)$		
$GAT_0 = (GHA^\circ/15) + 12^h$; $EoT = GAT - UT$ // if $EoT > 0.3^h \rightarrow -24^h$; if $EoT < -0.3^h \rightarrow +24^h$		
$R = 1.00014 - 0.01671 \times g_0 \cdot \cos - 0.00014 \times 2g_0 \cdot \cos$ AU		
Semidiameter: $SD^\circ = 16/R$; Mean horizontal parallax HP = 0.15'		
$= 0.2666^\circ / (1 - 0.017 \cos \cdot g_0) = 15.96' / (1 - 0.017 \cos \cdot g_0)$		
$= 0.2666^\circ / R$		
$GHA_0 = GHA^\circ - \alpha^\circ$		
Equation of Time: $(L_0 - \alpha)^\circ \times 4^m$		
Amplitude: $A \cdot \sin = L \cdot \sec \times \delta \cdot \sin$		
$GMST = 0.014506^\circ + 4612.156534^\circ T + 1.3915817^\circ T^2 - 0.00000044^\circ T^3 - 0.000029956^\circ T^4 - 3.68^\circ T^5$		

Astronomical formulae

Sun altitude at noon H from latitude: $H = (90^\circ - \phi) + \delta$
 Azimuth asr of rising/setting sun: $\operatorname{asr} \cdot \cos = \delta \cdot \sin / \phi \cdot \cos$
 Hour angle tsr of rising/setting sun (from noon): $\operatorname{tsr} \cdot \cos = -1 * (\phi \cdot \tan) * \delta \cdot \tan$
 Hour angle t from instantaneous Sun altitude h: $t \cdot \cos = (h \cdot \sin - \delta \cdot \sin * \phi \cdot \sin) / (\delta \cdot \cos * \phi \cdot \cos)$
 Sun azimuth as for a given hour: $\operatorname{as} \cdot \tan = (t \cdot \sin / (\phi \cdot \sin * t \cdot \cos)) - \phi \cdot \cos * \delta \cdot \tan$
 Altitude (α) of sun from length (l) of shadow from gnomon of height (h): $\alpha \cdot \cot = l/h$
 Rough solar declination: $\delta = 23.44^\circ * (360^\circ * ([284^\circ + \operatorname{daynum}]/365)) \cdot \sin$
 Rough Equation of Time: $\operatorname{eot} = [-7.655 * \operatorname{dn} \cdot \sin] + [9.873 * (2 \operatorname{dn} + 3.588) \cdot \sin]$
 Amplitude: $A \cdot \sin = L \cdot \sec * \delta \cdot \sin$

Perpetual Almanac Worksheet

Date: Month (M) Day (D) Year (Y) UT Time: (hh) (mm) (ss)
 Day Number: (Mn) + D = (Dn) Orbit Time: +/- (OT) (ho) (mo) (so)

Determine table series and cycle from year: LY0/LY1/LY2/LY3 (S) 0/1/2/3/4/5/6/7 (C)

Orbit Time (ho) (mo) (OT)
 Early Time - (ET) *ET and LT are the times bracketing OT in the tables.*
 Increment Time (Nearest 10 min) = (IT)

$$Dn = Mn + D$$

Leap Year

Calculate GHA Aries

GHA 1 Jan 0000UT → ° ' " (GHAA)
 (Dn) → + ° ' " (GHAA)
 (hh) → + ° ' " (GHAA)
 (mm) → + ° ' " (GHAA)
 (ss) → + ° ' " (GHAA)
GHA Aries = ° ' " (GHAA)

Mon	Mn	Mon	Mn	Mon	Mn
Jan	-1	May	119/120	Sep	242/243
Feb	30	Jun	150/151	Oct	272/273
Mar	58/59	Jul	180/181	Nov	303/303
Apr	89/90	Aug	211/212	Dec	333/334

Calculate Solar Declination

Declination 1 Jan 0000UT ° ' " (DB)
 Decl diff for Dn ET → ° ' " (DE) ---> + ° ' " (DE)
 Decl diff for Dn LT → - ° ' " (DL) ---> + ° ' " (DE)
Difference = ° ' " (DF) **Positive if increasing from LT to ET, negative if decreasing**

Look up Increment in Interpolation Table using DF and IT -----> + ° ' " (DI)
 Quadrennial correction for series * (C) = ° ' " --> + ° ' " (DQ)
Solar Declination for observation -----> = ° ' " (DEC)

Calculate GHA Sun

Solar E 1 Jan 0000UT ° ' " (EB)
 E diff for Dn ET → ° ' " (EE) -----> + ° ' " (EE)
 E diff for Dn LT → - ° ' " (EL) -----> + ° ' " (EE)
Difference = ° ' " (EF) **Positive if increasing from LT to ET, negative if decreasing**

Look up Increment in Interpolation Table using EF and IT -----> + ° ' " (EI)
E for observation -----> = ° ' " (EO)

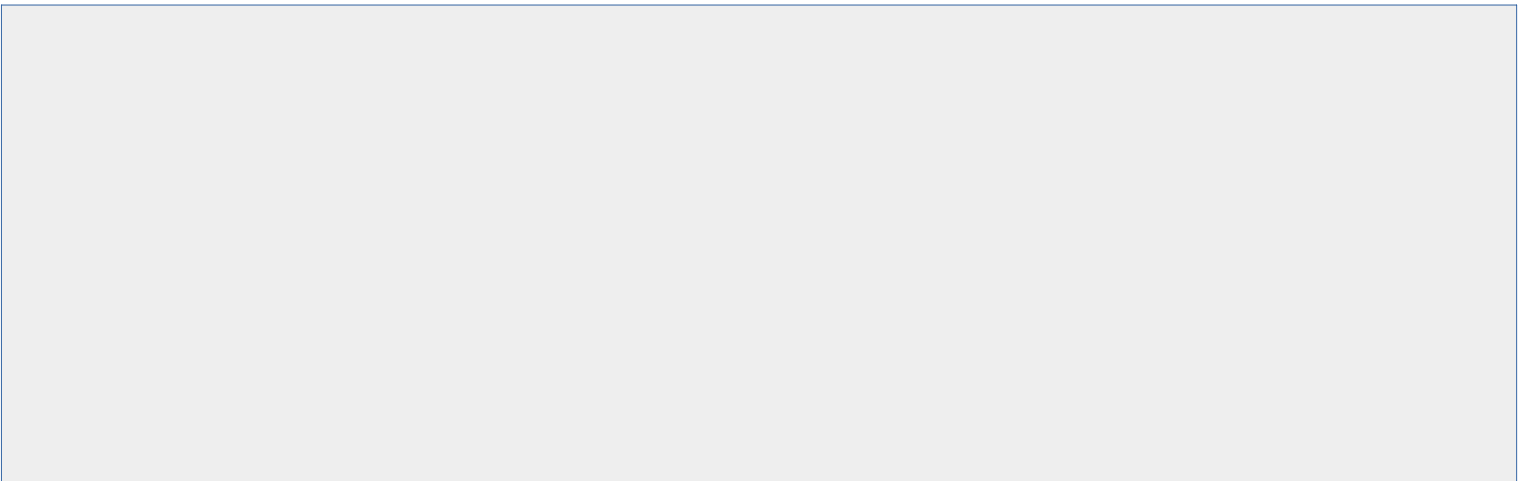
Solar Increment

Hour (hh) → + ° ' " (SI)
 Minutes (mm) → + ° ' " (SI)
 Seconds (ss) → + ° ' " (SI)
Solar Increment = ° ' " (SI)
GHA Sun = ° ' " (GHAS)

Calculate Equation of Time

EoT for 1 Jan 0000UT m s (EB)
 Arc-to-Time (EE) ° ' " → m s (TE)
 Arc-to-Time (EF) ° ' " → m s (TF)

Look up Increment in Interpolation Table using TF and IT -----> - m s (TI)
Equation of Time for observation -----> = m s (T0)



Worksheet for Star SHA and Declination

Star Observation Month Day Year

Sidereal Hour Angle

Declination

SHA 2020 ° ' "
 $\Delta 20xx$ +/- ° ' "
 $\Delta 1$ yr +/- ° ' "
 $\Delta 1$ yr +/- ° ' "
 Result = ° ' " (SR)

Decl. 2020 ° ' "
 $\Delta 20xx$ +/- ° ' "
 $\Delta 1$ yr +/- ° ' "
 $\Delta 1$ yr +/- ° ' "
 Result = ° ' " (DR)

SHA Monthly Corrections

Decl. Monthly Corrections

Jan +/- ' "
 Feb +/- ' "
 Mar +/- ' "
 Apr +/- ' "
 May +/- ' "
 Jun +/- ' "
 Jul +/- ' "
 Aug +/- ' "
 Sep +/- ' "
 Oct +/- ' "
 Nov +/- ' "
 Dec +/- ' "
 Total = ' " (SM)

Jan +/- ' "
 Feb +/- ' "
 Mar +/- ' "
 Apr +/- ' "
 May +/- ' "
 Jun +/- ' "
 Jul +/- ' "
 Aug +/- ' "
 Sep +/- ' "
 Oct +/- ' "
 Nov +/- ' "
 Dec +/- ' "
 Total = ' " (DM)

(SR) ° ' "
 (SM) + ° ' "
 SHA = ° ' " (SHA)

(DR) ° ' "
 (DM) + ° ' "
 Decl. = ° ' " (DEC)

Star Observation Month Day Year

Sidereal Hour Angle

Declination

SHA 2020 ° ' "
 $\Delta 20xx$ +/- ° ' "
 $\Delta 1$ yr +/- ° ' "
 $\Delta 1$ yr +/- ° ' "
 Result = ° ' " (SR)

Decl. 2020 ° ' "
 $\Delta 20xx$ +/- ° ' "
 $\Delta 1$ yr +/- ° ' "
 $\Delta 1$ yr +/- ° ' "
 Result = ° ' " (DR)

SHA Monthly Corrections

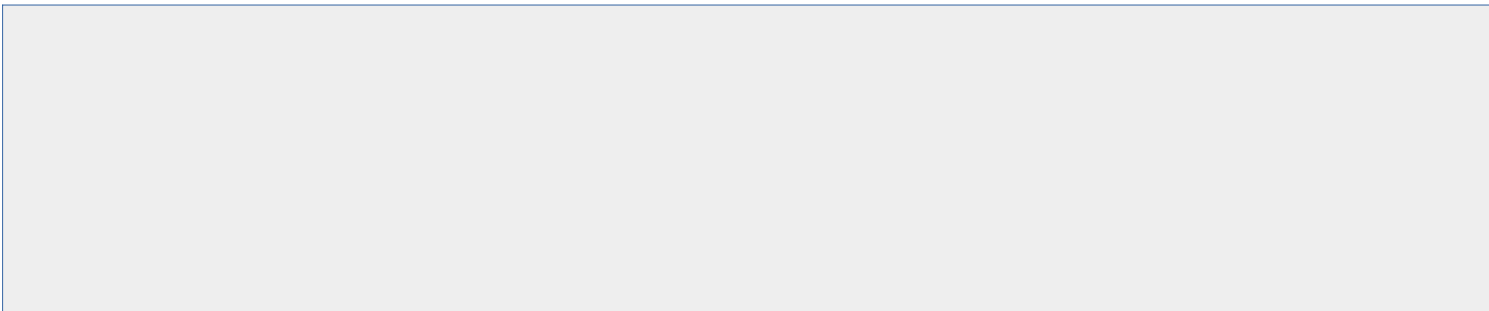
Decl. Monthly Corrections

Jan +/- ' "
 Feb +/- ' "
 Mar +/- ' "
 Apr +/- ' "
 May +/- ' "
 Jun +/- ' "
 Jul +/- ' "
 Aug +/- ' "
 Sep +/- ' "
 Oct +/- ' "
 Nov +/- ' "
 Dec +/- ' "
 Total = ' " (SM)

Jan +/- ' "
 Feb +/- ' "
 Mar +/- ' "
 Apr +/- ' "
 May +/- ' "
 Jun +/- ' "
 Jul +/- ' "
 Aug +/- ' "
 Sep +/- ' "
 Oct +/- ' "
 Nov +/- ' "
 Dec +/- ' "
 Total = ' " (DM)

(SR) ° ' "
 (SM) + ° ' "
 SHA = ° ' " (SHA)

(DR) ° ' "
 (DM) + ° ' "
 Decl = ° ' " (DEC)



Math Tables

Sexigesimal Multiplication Table

Sexigesimal Division Table

	2	3	4	5	6	7	8	9	10		2	3	4	5	6	7	8	9	10
2	4	6	8	10	12	14	16	18	20	1	30	20	15	12	10	9	8	7	6
3	6	9	12	15	18	21	24	27	30	2	60	40	30	24	20	17	15	13	12
4	8	12	16	20	24	28	32	36	40	3	1'30	1'0	45	36	30	26	22	20	18
5	10	15	20	25	30	35	40	45	50	4	1'60	1'20	1'0	48	40	34	30	27	24
6	12	18	24	30	36	42	48	54	1'0	5	2'30	1'40	1'15	1'0	50	43	38	33	30
7	14	21	28	35	42	49	56	1'3	1'10	6	3'0	2'20	1'45	1'24	1'10	1'0	52	47	42
8	16	24	32	40	48	56	1'4	1'12	1'20	7	4'0	2'40	1'60	1'36	1'20	1'9	1'0	53	48
9	18	27	36	45	54	1'3	1'12	1'21	1'30	8	4'30	3'0	2'15	1'48	1'30	1'17	1'8	1'0	54
10	20	30	40	50	1'0	1'10	1'20	1'30	1'40	9	5'0	3'20	2'30	1'60	1'40	1'26	1'15	1'7	1'0
11	22	33	44	55	1'6	1'17	1'28	1'39	1'50	10	5'30	3'40	2'45	2'12	1'50	1'34	1'22	1'13	1'6
12	24	36	48	1'0	1'12	1'24	1'36	1'48	2'0	11	6'0	4'0	3'0	2'24	1'60	1'43	1'30	1'20	1'12
13	26	39	52	1'5	1'18	1'31	1'44	1'57	2'10	12	6'30	4'20	3'15	2'36	2'10	1'51	1'38	1'27	1'18
14	28	42	56	1'10	1'24	1'38	1'52	2'6	2'20	13	7'0	4'40	3'30	2'48	2'20	1'60	1'45	1'33	1'24
15	30	45	1'0	1'15	1'30	1'45	2'0	2'15	2'30	14	7'30	4'60	3'45	3'0	2'30	2'9	1'52	1'40	1'30
16	32	48	1'4	1'20	1'36	1'52	2'8	2'24	2'40	15	8'0	5'20	4'0	3'12	2'40	2'17	1'60	1'47	1'36
17	34	51	1'8	1'25	1'42	1'59	2'16	2'33	2'50	16	8'30	5'40	4'15	3'24	2'50	2'26	2'8	1'53	1'42
18	36	54	1'12	1'30	1'48	2'6	2'24	2'42	3'0	17	9'0	6'0	4'30	3'36	3'0	2'34	2'15	1'60	1'48
19	38	57	1'16	1'35	1'54	2'13	2'32	2'51	3'10	18	9'30	6'20	4'45	3'48	3'10	2'43	2'22	2'7	1'54
20	40	1'0	1'20	1'40	2'0	2'20	2'40	3'0	3'20	19	10'0	6'40	4'60	4'0	3'20	2'51	2'30	2'13	1'60
21	42	1'3	1'24	1'45	2'6	2'27	2'48	3'9	3'30	20	10'30	7'0	5'15	4'12	3'30	3'0	2'38	2'20	2'6
22	44	1'6	1'28	1'50	2'12	2'34	2'56	3'18	3'40	21	10'60	7'20	5'30	4'24	3'40	3'9	2'45	2'27	2'12
23	46	1'9	1'32	1'55	2'18	2'41	3'4	3'27	3'50	22	11'30	7'40	5'45	4'36	3'50	3'17	2'52	2'33	2'18
24	48	1'12	1'36	2'0	2'24	2'48	3'12	3'36	4'0	23	12'0	7'60	6'0	4'48	4'0	3'26	3'0	2'40	2'24
25	50	1'15	1'40	2'5	2'30	2'55	3'20	3'45	4'10	24	12'30	8'20	6'15	4'60	4'10	3'34	3'8	2'47	2'30
26	52	1'18	1'44	2'10	2'36	3'2	3'28	3'54	4'20	25	12'60	8'40	6'30	5'12	4'20	3'43	3'15	2'53	2'36
27	54	1'21	1'48	2'15	2'42	3'9	3'36	4'3	4'30	26	13'30	9'0	6'45	5'24	4'30	3'51	3'22	3'0	2'42
28	56	1'24	1'52	2'20	2'48	3'16	3'44	4'12	4'40	27	13'60	9'20	7'0	5'36	4'40	4'0	3'30	3'7	2'48
29	58	1'27	1'56	2'25	2'54	3'23	3'52	4'21	4'50	28	14'30	9'40	7'15	5'48	4'50	4'9	3'38	3'13	2'54
30	1'0	1'30	2'0	2'30	3'0	3'30	4'0	4'30	5'0	29	15'0	10'0	7'30	6'0	4'60	4'17	3'45	3'20	3'0
31	1'2	1'33	2'4	2'35	3'6	3'37	4'8	4'39	5'10	30	15'30	10'20	7'45	6'12	5'10	4'26	3'52	3'27	3'6
32	1'4	1'36	2'8	2'40	3'12	3'44	4'16	4'48	5'20	31	16'0	10'40	7'60	6'24	5'20	4'34	4'0	3'33	3'12
33	1'6	1'39	2'12	2'45	3'18	3'51	4'24	4'57	5'30	32	16'30	10'60	8'15	6'36	5'30	4'43	4'8	3'40	3'18
34	1'8	1'42	2'16	2'50	3'24	3'58	4'32	5'6	5'40	33	17'0	11'20	8'30	6'48	5'40	4'51	4'15	3'47	3'24
35	1'10	1'45	2'20	2'55	3'30	4'5	4'40	5'15	5'50	34	17'30	11'40	8'45	7'0	5'50	4'60	4'22	3'53	3'30
36	1'12	1'48	2'24	3'0	3'36	4'12	4'48	5'24	6'0	35	18'0	12'0	9'0	7'12	6'0	5'9	4'30	4'0	3'36
37	1'14	1'51	2'28	3'5	3'42	4'19	4'56	5'33	6'10	36	18'30	12'20	9'15	7'24	6'10	5'17	4'38	4'7	3'42
38	1'16	1'54	2'32	3'10	3'48	4'26	5'4	5'42	6'20	37	19'0	12'40	9'30	7'36	6'20	5'26	4'45	4'13	3'48
39	1'18	1'57	2'36	3'15	3'54	4'33	5'12	5'51	6'30	38	19'30	13'0	9'45	7'48	6'30	5'34	4'52	4'20	3'54
40	1'20	2'0	2'40	3'20	4'0	4'40	5'20	6'0	6'40	39	20'0	13'20	10'0	7'60	6'40	5'43	4'60	4'27	4'0
41	1'22	2'3	2'44	3'25	4'6	4'47	5'28	6'9	6'50	40	20'30	13'40	10'15	8'12	6'50	5'51	5'8	4'33	4'6
42	1'24	2'6	2'48	3'30	4'12	4'54	5'36	6'18	7'0	41	21'0	13'60	10'30	8'24	7'0	6'0	5'15	4'40	4'12
43	1'26	2'9	2'52	3'35	4'18	5'1	5'44	6'27	7'10	42	21'30	14'20	10'45	8'36	7'10	6'9	5'22	4'47	4'18
44	1'28	2'12	2'56	3'40	4'24	5'8	5'52	6'36	7'20	43	21'60	14'40	10'60	8'48	7'20	6'17	5'30	4'53	4'24
45	1'30	2'15	3'0	3'45	4'30	5'15	6'0	6'45	7'30	44	22'30	15'0	11'15	9'0	7'30	6'26	5'38	4'60	4'30
46	1'32	2'18	3'4	3'50	4'36	5'22	6'8	6'54	7'40	45	23'0	15'20	11'30	9'12	7'40	6'34	5'45	5'7	4'36
47	1'34	2'21	3'8	3'55	4'42	5'29	6'16	7'3	7'50	46	23'30	15'40	11'45	9'24	7'50	6'43	5'52	5'13	4'42
48	1'36	2'24	3'12	4'0	4'48	5'36	6'24	7'12	8'0	47	24'0	16'0	12'0	9'36	7'60	6'51	6'0	5'20	4'48
49	1'38	2'27	3'16	4'5	4'54	5'43	6'32	7'21	8'10	48	24'30	16'20	12'15	9'48	8'10	7'0	6'8	5'27	4'54
50	1'40	2'30	3'20	4'10	5'0	5'50	6'40	7'30	8'20	49	25'0	16'40	12'30	10'0	8'20	7'9	6'15	5'33	4'60
51	1'42	2'33	3'24	4'15	5'6	5'57	6'48	7'39	8'30	50	25'30	17'0	12'45	10'12	8'30	7'17	6'22	5'40	5'6
52	1'44	2'36	3'28	4'20	5'12	6'4	6'56	7'48	8'40	51	25'60	17'20	13'0	10'24	8'40	7'26	6'30	5'47	5'12
53	1'46	2'39	3'32	4'25	5'18	6'11	7'4	7'57	8'50	52	26'0	17'40	13'15	10'36	8'50	7'34	6'38	5'53	5'18
54	1'48	2'42	3'36	4'30	5'24	6'18	7'12	8'6	9'0	53	26'30	18'0	13'30	10'48	9'0	7'43	6'45	6'0	5'24
55	1'50	2'45	3'40	4'35	5'30	6'25	7'20	8'15	9'10	54	27'0	18'20	13'45	10'60	9'10	7'51	6'52	6'7	5'30
56	1'52	2'48	3'44	4'40	5'36	6'32	7'28	8'24	9'20	55	27'30	18'40	13'60	11'12	9'20	7'60	7'0	6'13	5'36
57	1'54	2'51	3'48	4'45	5'42	6'39	7'36	8'33	9'30	56	28'0	19'0	14'15	11'24	9'30	8'9	7'8	6'20	5'42
58	1'56	2'54	3'52	4'50	5'48	6'46	7'44	8'42	9'40	57	28'30	19'20	14'30	11'36	9'40	8'17	7'15	6'27	5'48
59	1'58	2'57	3'56	4'55	5'54	6'53	7'52	8'51	9'50	58	29'0	19'40	14'45	11'48	9'50	8'26	7'22	6'33	5'54
60	2'0	3'0	4'0	5'0	6'0	7'0	8'0	9'0	10'0	59	29'30	19'60	15'0	12'0	10'0	8'34	7'30	6'40	6'0