THE
AIR ALMANAC
2009

Issued by
The Nautical Almanac Office
United States Naval Observatory
under the authority of the
Secretary of the Navy

Washington: 2008

REFRACTION

To be subtracted from sextant altitude (referred to as observed altitude in A.P. 3270)

Height above sea level in units of 1 000 ft.

Sextant Altitude

$R = R_0 \times f$

R_0	0	5	10	15	20	25	30	35	40	45	50	55	R_0	0·9	1·0	1·1	1·2
0	90	90	90	90	90	90	90	90	90	90	90	90	0	0	0	0	0
1	63	59	55	51	46	41	36	31	26	20	17	13	1	1	1	1	1
2	33	29	26	22	19	16	14	11	9	7	6	4	2	2	2	2	2
3	21	19	16	14	12	10	8	7	5	4	2 40	1 40	3	3	3	3	4
4	16	14	12	10	8	7	6	5	3 10	2 20	1 30	0 40	4	4	4	4	5
5	12	11	9	8	7	5	4 00	3 10	2 10	1 30	0 39	+0 05	5	5	5	5	6
6	10	9	7	5 50	4 50	3 50	3 10	2 20	1 30	0 49	+0 11	−0 19	6	5	6	7	7
7	8 10	6 50	5 50	4 50	4 00	3 00	2 20	1 50	1 10	0 24	−0 11	−0 38	7	6	7	8	8
8	6 50	5 50	5 00	4 00	3 10	2 30	1 50	1 20	0 38	+0 04	−0 28	−0 54	8	7	8	9	10
9	6 00	5 10	4 10	3 20	2 40	2 00	1 30	1 00	0 19	−0 13	−0 42	−1 08	9	8	9	10	11
10	5 20	4 30	3 40	2 50	2 10	1 40	1 10	0 35	+0 03	−0 27	−0 53	−1 18	10	9	10	11	12
12	4 30	3 40	2 50	2 20	1 40	1 10	0 37	+0 11	−0 16	−0 43	−1 08	−1 31	12	11	12	13	14
14	3 30	2 50	2 10	1 40	1 10	0 34	+0 09	−0 14	−0 37	−1 00	−1 23	−1 44	14	13	14	15	17
16	2 50	2 10	1 40	1 10	0 37	+0 10	−0 13	−0 34	−0 53	−1 14	−1 35	−1 56	16	14	16	18	19
18	2 20	1 40	1 20	0 43	+0 15	−0 08	−0 31	−0 52	−1 08	−1 27	−1 46	−2 05	18	16	18	20	22
20	1 50	1 20	0 49	+0 23	−0 02	−0 26	−0 46	−1 06	−1 22	−1 39	−1 57	−2 14	20	18	20	22	24
25	1 12	0 44	+0 19	−0 06	−0 28	−0 48	−1 09	−1 27	−1 42	−1 58	−2 14	−2 30	25	22	25	28	30
30	0 34	+0 10	−0 13	−0 36	−0 55	−1 14	−1 32	−1 51	−2 06	−2 21	−2 34	−2 49	30	27	30	33	36
35	+0 06	−0 16	−0 37	−0 59	−1 17	−1 33	−1 51	−2 07	−2 23	−2 37	−2 51	−3 04	35	31	35	38	42
40	−0 18	−0 37	−0 58	−1 16	−1 34	−1 49	−2 06	−2 22	−2 35	−2 49	−3 03	−3 16	40	36	40	44	48
45		−0 53	−1 14	−1 31	−1 47	−2 03	−2 18	−2 33	−2 47	−2 59	−3 13	−3 25	45	40	45	50	54
50		−1 10	−1 28	−1 44	−1 59	−2 15	−2 28	−2 43	−2 56	−3 08	−3 22	−3 33	50	45	50	55	60
55			−1 40	−1 53	−2 09	−2 24	−2 38	−2 52	−3 04	−3 17	−3 29	−3 41	55	49	55	60	66
60				−2 03	−2 18	−2 33	−2 46	−3 01	−3 12	−3 25	−3 37	−3 48	60	54	60	66	72
							−2 53	−3 07	−3 19	−3 31	−3 42	−3 53					

Temperature in °C.

f	0	5	10	15	20	25	30	35	40	45	50	55	f	0·9	1·0	1·1	1·2
0·9	+47	+36	+27	+18	+10	+3	−5	−13					0·9				
1·0	+26	+16	+6	−4	−13	−22	−31	−40					1·0				
1·1	+5	−5	−15	−25	−36	−46	−57	−68					1·1				
1·2	−16	−25	−36	−46	−58	−71	−83	−95					1·2				
	−37	−45	−56	−67	−81	−95											

For these heights no temperature correction is necessary, so use $R = R_0$

Where R_0 is less than 10′ or the height greater than 35 000 ft. use $R = R_0$

Choose the column appropriate to height, in units of 1 000 ft., and find the range of altitude in which the sextant altitude lies; the corresponding value of R_0 is the refraction, to be subtracted from sextant altitude, unless conditions are extreme. In that case find f from the lower table, with critical argument temperature. Use the table on the right to form the refraction, $R = R_0 \times f$.

CORIOLIS (Z) CORRECTION

To be applied by moving the position line a distance Z to starboard (right) of the track in northern latitudes and to port (left) in southern latitudes.

G/S KNOTS	Latitude										G/S KNOTS	Latitude									
	0°	10°	20°	30°	40°	50°	60°	70°	80°	90°		0°	10°	20°	30°	40°	50°	60°	70°	80°	90°
150	0	1	1	2	3	3	3	4	4	4	550	0	3	5	7	9	11	12	14	14	14
200	0	1	2	3	3	4	5	5	5	5	600	0	3	5	8	10	12	14	15	16	16
250	0	1	2	3	4	5	6	6	6	7	650	0	3	6	9	11	13	15	16	17	17
300	0	1	3	4	5	6	7	7	8	8	700	0	3	6	9	12	14	16	17	18	18
350	0	2	3	5	6	7	8	9	9	9	750	0	3	7	10	13	15	17	18	19	20
400	0	2	4	5	7	8	9	10	10	10	800	0	4	7	10	13	16	18	20	21	21
450	0	2	4	6	8	9	10	11	12	12	850	0	4	8	11	14	17	19	21	22	22
500	0	2	4	7	8	10	11	12	13	13	900	0	4	8	12	15	18	20	22	23	24

STANDARD DOME REFRACTION

To be *subtracted* from sextant altitude when using sextant suspension in a perspex dome.

Alt.	Refn.	Alt.	Refn.
°	′	°	′
10	8	50	4
20	7	60	4
30	6	70	3
40	5	80	3

This table must not be used if a calibration table is fitted to the dome, or if a flat glass plate is provided, or for non-standard domes.

BUBBLE SEXTANT ERROR

Sextant Number	Alt.	Corr.
	°	′

CORRECTIONS TO BE APPLIED TO MARINE SEXTANT ALTITUDES

CORRECTION FOR DIP OF THE HORIZON
To be subtracted from sextant altitude.

Ht.	Dip	Ht.	Dip	Ht.	Dip	Ht.	Dip	Ht.	Dip
Ft.	′	Ft.	′	Ft.	′	Ft.	′	Ft.	′
0		114		437		968		1 707	
	1		11		21		31		41
2		137		481		1 033		1 792	
	2		12		22		32		42
6		162		527		1 099		1 880	
	3		13		23		33		43
12		189		575		1 168		1 970	
	4		14		24		34		44
21		218		625		1 239		2 061	
	5		15		25		35		45
31		250		677		1 311		2 155	
	6		16		26		36		46
43		283		731		1 386		2 251	
	7		17		27		37		47
58		318		787		1 463		2 349	
	8		18		28		38		48
75		356		845		1 543		2 449	
	9		19		29		39		49
93		395		906		1 624		2 551	
	10		20		30		40		50
114		437		968		1 707		2 655	

CORRECTIONS

In addition to sextant error and dip, corrections are to be applied for:
Refraction
Semi-diameter (for the Sun and Moon)
Parallax (for the Moon)
Dome refraction (if applicable)

MARINE SEXTANT ERROR

Sextant Number

Index Error

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