REFRACTION

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

R_o	Height above sea level in units of 1 000 ft.												R_o
	0	5	10	15	20	25	30	35	40	45	50	55	
	Sextant Altitude												
′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	′
0	90	90	90	90	90	90	90	90	90	90	90	90	0
1	63	59	55	51	46	41	36	31	26	20	17	13	1
2	33	29	26	22	19	16	14	11	9	7	6	4	2
3	21	19	16	14	12	10	8	7	5	4	2 40	1 40	3
4	16	14	12	10	8	7	6	5	3 10	2 20	1 30	0 40	4
5	12	11	9	8	7	5	4 00	3 10	2 10	1 30	0 39	+0 05	5
6	10	9	7	5 50	4 50	3 50	3 10	2 20	1 30	0 49	+0 11	−0 19	6
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
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
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
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
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
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
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
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
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
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
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
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
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
45		−0 53	−1 14	−1 31	−1 47	−2 03	−2 18	−2 33	−2 47	−2 59	−3 13	−3 25	45
50		−1 10	−1 28	−1 44	−1 59	−2 15	−2 28	−2 43	−2 56	−3 08	−3 22	−3 33	50
55			−1 40	−1 53	−2 09	−2 24	−2 38	−2 52	−3 04	−3 17	−3 29	−3 41	55
60				−2 03	−2 18	−2 33	−2 46	−3 01	−3 12	−3 25	−3 37	−3 48	60
							−2 53	−3 07	−3 19	−3 31	−3 42	−3 53	

f	Temperature in °C.												f
	0	5	10	15	20	25	30	35	40	45	50	55	
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 $R = R_o$

$R = R_o \times f$

f	0·9	1·0	1·1	1·2
R	′	′	′	′
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	4
4	4	4	4	5
5	5	5	5	6
6	5	6	7	7
7	6	7	8	8
8	7	8	9	10
9	8	9	10	11
10	9	10	11	12
12	11	12	13	14
14	13	14	15	17
16	14	16	18	19
18	16	18	20	22
20	18	20	22	24
25	22	25	28	30
30	27	30	33	36
35	31	35	38	42
40	36	40	44	48
45	40	45	50	54
50	45	50	55	60
55	49	55	60	66
60	54	60	66	72

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

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_o 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, $R = R_o \times f$.

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 0° 10°	20° 30°	40° 50°	60° 70°	80° 90°	G/S KNOTS	Latitude 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