

# BAG'S SIGHTINGS

Just the Facts



Recipes for fat free Celestial Navigation

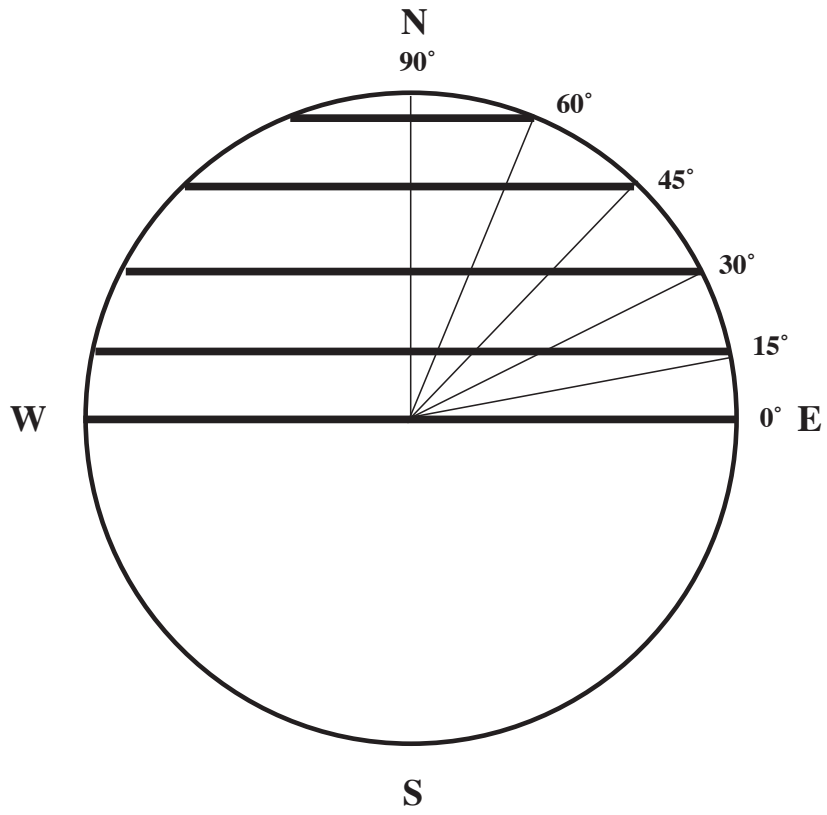


by Capt. Sanders

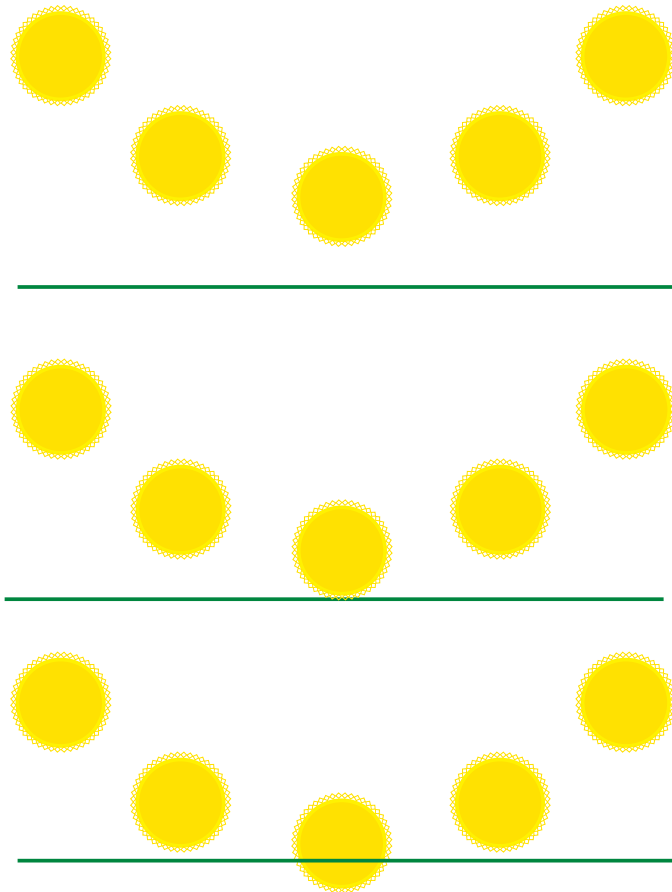
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# Parallels of Latitude

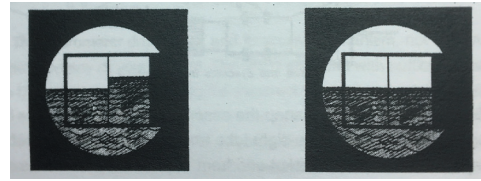
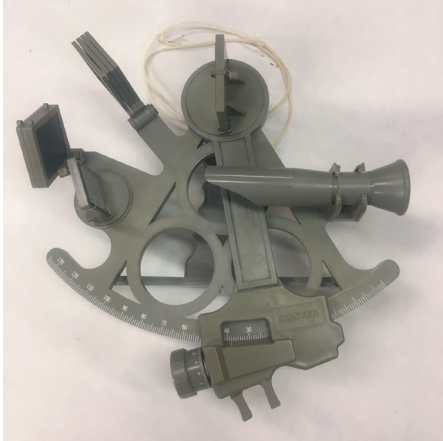


# Sextant Hula



# Instrument Correction (Ic)

Instrument Correction (Ic) is taken on the Sextant itself. It is a correction for the misalignment of the mirrors caused by adjustment or thermo distortion from temperature fluctuations. To find the correction you line up a horizontal surface and adjust sextant to make it appear straight. Correction is the difference from 0° setting.

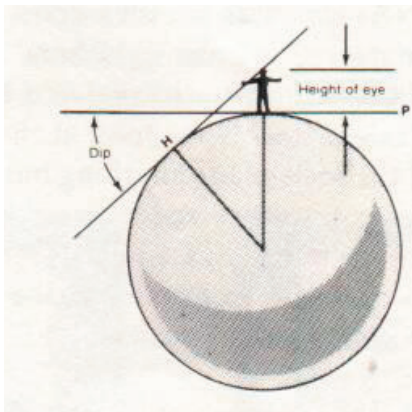


IC 1.6' ahead of 0 therefore Subtract!



# DIP and DIP SHORT

The Dip is the angle from the Height of your eye down to the actual horizon. When at sea and you have an actual horizon the Dip is calculated from a table in the Almanac. The DIP SHORT table (below) allows you to correct for the Dip when there isn't a visible or distant horizon - for example on lakes or even the waterline of another boat when horizon is obscured by fog.

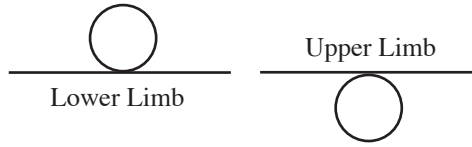


**TABLE 14**  
Dip of the Sea Short of the Horizon

Distance	Height of eye above the sea, in feet and (meters)										Distance
	5 (1.5)	10 (3.0)	15 (4.6)	20 (6.1)	25 (7.6)	30 (9.1)	35 (10.7)	40 (12.2)	45 (13.7)	50 (15.2)	
<i>Miles</i>	'	'	'	'	'	'	'	'	'	'	<i>Miles</i>
0.2	14.2	28.4	42.5	56.7	70.8	84.9	99.1	113.2	127.3	141.5	0.2
0.3	9.6	19.0	28.4	37.8	47.3	56.7	66.1	75.6	85.0	94.4	0.3
0.4	7.2	14.3	21.4	28.5	35.5	42.6	49.7	56.7	63.8	70.9	0.4
0.5	5.9	11.5	17.2	22.8	28.5	34.2	39.8	45.5	51.1	56.8	0.5
0.6	5.0	9.7	14.4	19.1	23.8	28.5	33.3	38.0	42.7	47.4	0.6
0.7	4.3	8.4	12.4	16.5	20.5	24.5	28.6	32.6	36.7	40.7	0.7
0.8	3.9	7.4	10.9	14.5	18.0	21.5	25.1	28.6	32.2	35.7	0.8
0.9	3.5	6.7	9.8	12.9	16.1	19.2	22.4	25.5	28.7	31.8	0.9
1.0	3.2	6.1	8.9	11.7	14.6	17.4	20.2	23.0	25.9	28.7	1.0
1.1	3.0	5.6	8.2	10.7	13.3	15.9	18.5	21.0	23.6	26.2	1.1
1.2	2.9	5.2	7.6	9.9	12.3	14.6	17.0	19.4	21.7	24.1	1.2
1.3	2.7	4.9	7.1	9.2	11.4	13.6	15.8	17.9	20.1	22.3	1.3
1.4	2.6	4.6	6.6	8.7	10.7	12.7	14.7	16.7	18.8	20.8	1.4
1.5	2.5	4.4	6.3	8.2	10.1	11.9	13.8	15.7	17.6	19.5	1.5
1.6	2.4	4.2	6.0	7.7	9.5	11.3	13.0	14.8	16.6	18.3	1.6
1.7	2.4	4.0	5.7	7.4	9.0	10.7	12.4	14.0	15.7	17.3	1.7
1.8	2.3	3.9	5.5	7.0	8.6	10.2	11.7	13.3	14.9	16.5	1.8
1.9	2.3	3.8	5.3	6.7	8.2	9.7	11.2	12.7	14.2	15.7	1.9
2.0	2.2	3.7	5.1	6.5	7.9	9.3	10.7	12.1	13.6	15.0	2.0
2.1	2.2	3.6	4.9	6.3	7.6	9.0	10.3	11.7	13.0	14.3	2.1
2.2	2.2	3.5	4.8	6.1	7.3	8.6	9.9	11.2	12.5	13.8	2.2
2.3	2.2	3.4	4.6	5.9	7.1	8.3	9.6	10.8	12.0	13.3	2.3
2.4	2.2	3.4	4.5	5.7	6.9	8.1	9.2	10.4	11.6	12.8	2.4
2.5	2.2	3.3	4.4	5.6	6.7	7.8	9.0	10.1	11.2	12.4	2.5
2.6	2.2	3.3	4.3	5.4	6.5	7.6	8.7	9.8	10.9	12.0	2.6
2.7	2.2	3.2	4.3	5.3	6.4	7.4	8.5	9.5	10.6	11.6	2.7
2.8	2.2	3.2	4.2	5.2	6.2	7.2	8.2	9.2	10.3	11.3	2.8
2.9	2.2	3.2	4.1	5.1	6.1	7.1	8.0	9.0	10.0	11.0	2.9
3.0	2.2	3.1	4.1	5.0	6.0	6.9	7.8	8.8	9.7	10.7	3.0
3.1	2.2	3.1	4.0	4.9	5.9	6.8	7.7	8.6	9.5	10.4	3.1

## Height Sighted (Hs)

Height Sighted is the initial angle between the horizon and the celestial body being shot (Sun) It is read directly off the sextant by looking at the horizon and bringing the mirrored reflection of the Sun down to the horizon moving the arc arm. We can use the upper or lower limb of the body. See illustration for Sextant Hula!



## Apparent Altitude (App. Alt.)

Apparent Altitude is the height of the SUN after being corrected for Ic & Dip.

## Altitude Correction (Alt Corr)

The Altitude correction is found by entering the table in the Almanac with the App. Alt for the proper time of year. It corrects the Apparent Altitude to the center of the Sun and the the refraction caused by the atmosphere.

## Height Observed (Ho)

The Height Observed (Ho) is the angle of the Sun from the observers position fully corrected for the above!

## Declination (Dec)

Declination is the the angle of the sun hitting the surface of the earth differently due to our axis being tilted as we spin about the sun. It explains why we have seasons! The Declination is either N or S of the equator and is found in the Nautical Almanac daily pages.

Tilt of earth  $23\frac{1}{2}^{\circ}$  resulting in seasons and solstices!  
 Winter Solstice: December 21<sup>st</sup> Dec.  $23^{\circ}$  S Tropic of Capricorn  
 Spring Equinox: March 20<sup>th</sup> Dec.  $0^{\circ}$  Over equator  
 Summer Solstice: June 21<sup>st</sup> Dec.  $23^{\circ}$  N Tropic of Cancer  
 Fall Equinox: September 23<sup>rd</sup> Dec.  $0^{\circ}$  Over equator

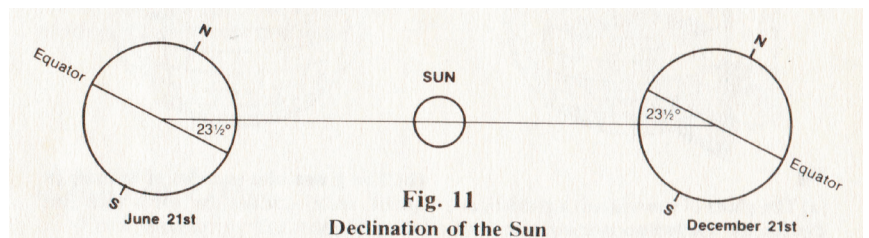
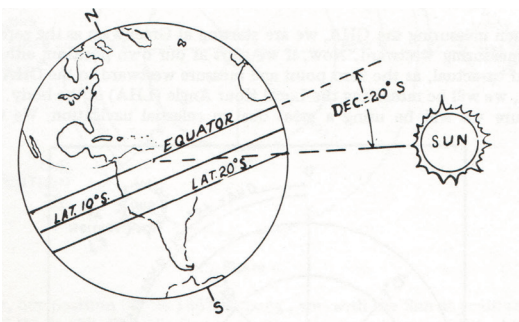


Fig. 11  
Declination of the Sun

# Nautical Almanac

## September 6th & 7th, 2024

### SUN

### ALTITUDE CORRECTION SUN

Sun		
h	GHA	Dec
0	180°24.6	N06°20.0
1	195°24.8	19.0
2	210°25.0	18.1
3	225°25.3	· · 17.2
4	240°25.5	16.2
5	255°25.7	15.3
6	270°25.9	N06°14.4
7	285°26.1	13.4
8	300°26.3	12.5
9	315°26.5	· · 11.6
10	330°26.7	10.6
11	345°26.9	09.7
12	0°27.2	N06°08.8
13	15°27.4	07.8
14	30°27.6	06.9
15	45°27.8	· · 06.0
16	60°28.0	05.0
17	75°28.2	04.1
18	90°28.4	N06°03.1
19	105°28.6	02.2
20	120°28.9	01.3
21	135°29.1	06°00.3
22	150°29.3	05°59.4
23	165°29.5	58.5
	SD = 15.9'	d = -0.9'

N 06° 01.3'

Sun		
h	GHA	Dec
0	180°29.7	N05°57.5
1	195°29.9	56.6
2	210°30.1	55.7
3	225°30.4	· · 54.7
4	240°30.6	53.8
5	255°30.8	52.8
6	270°31.0	N05°51.9
7	285°31.2	51.0
8	300°31.4	50.0
9	315°31.6	· · 49.1
10	330°31.9	48.2
11	345°32.1	47.2
12	0°32.3	N05°46.3
13	15°32.5	45.3
14	30°32.7	44.4
15	45°32.9	· · 43.5
16	60°33.1	42.5
17	75°33.4	41.6
18	90°33.6	N05°40.6
19	105°33.8	39.7
20	120°34.0	38.8
21	135°34.2	· · 37.8
22	150°34.4	36.9
23	165°34.6	35.9

N 05° 38.8'

OCT.—MAR. SUN			APR.—SEPT.		
App. Alt.	Lower Limb	Upper Limb	App. Alt.	Lower Limb	Upper Limb
9 34	+10.8	-21.5	9 39	+10.6	-21.2
9 45	+10.9	-21.4	9 51	+10.7	-21.1
9 56	+11.0	-21.3	10 03	+10.8	-21.0
10 08	+11.1	-21.2	10 15	+10.9	-20.9
10 21	+11.2	-21.1	10 27	+11.0	-20.8
10 34	+11.3	-21.0	10 40	+11.1	-20.7
10 47	+11.4	-20.9	10 54	+11.2	-20.6
11 01	+11.5	-20.8	11 08	+11.3	-20.5
11 15	+11.6	-20.7	11 23	+11.4	-20.4
11 30	+11.7	-20.6	11 38	+11.5	-20.3
11 46	+11.8	-20.5	11 54	+11.6	-20.2
12 02	+11.9	-20.4	12 10	+11.7	-20.1
12 19	+12.0	-20.3	12 28	+11.8	-20.0
12 37	+12.1	-20.2	12 46	+11.9	-19.9
12 55	+12.2	-20.1	13 05	+12.0	-19.8
13 14	+12.3	-20.0	13 24	+12.1	-19.7
13 35	+12.4	-19.9	13 45	+12.2	-19.6
13 56	+12.5	-19.8	14 07	+12.3	-19.5
14 18	+12.6	-19.7	14 30	+12.4	-19.4
14 42	+12.7	-19.6	14 54	+12.5	-19.3
15 06	+12.8	-19.5	15 19	+12.6	-19.2
15 32	+12.9	-19.4	15 46	+12.7	-19.1
15 59	+13.0	-19.3	16 14	+12.8	-19.0
16 28	+13.1	-19.2	16 44	+12.9	-18.9
16 59	+13.2	-19.1	17 15	+13.0	-18.8
17 32	+13.3	-19.0	17 48	+13.1	-18.7
18 06	+13.4	-18.9	18 24	+13.2	-18.6
18 42	+13.5	-18.8	19 01	+13.3	-18.5
19 21	+13.6	-18.7	19 42	+13.4	-18.4
20 03	+13.7	-18.6	20 25	+13.5	-18.3
20 48	+13.8	-18.5	21 11	+13.6	-18.2
21 35	+13.9	-18.4	22 00	+13.7	-18.1
22 26	+14.0	-18.3	22 54	+13.8	-18.0
23 22	+14.1	-18.2	23 51	+13.9	-17.9
24 21	+14.2	-18.1	24 53	+14.0	-17.8
25 26	+14.3	-18.0	26 00	+14.1	-17.7
26 36	+14.4	-17.9	27 13	+14.2	-17.6
27 52	+14.5	-17.8	28 33	+14.3	-17.5
29 15	+14.6	-17.7	30 00	+14.4	-17.4
30 46	+14.7	-17.6	31 35	+14.5	-17.3
32 26	+14.8	-17.5	33 20	+14.6	-17.2
34 17	+14.9	-17.4	35 17	+14.7	-17.1
36 20	+15.0	-17.3	37 26	+14.8	-17.0
38 36	+15.1	-17.2	39 50	+14.9	-16.9
41 08	+15.2	-17.1	42 31	+15.0	-16.8
43 59	+15.3	-17.0	45 31	+15.1	-16.7
47 10	+15.4	-16.9	48 55	+15.2	-16.6
50 46	+15.5	-16.8	52 44	+15.3	-16.5
54 49	+15.6	-16.7	57 02	+15.4	-16.4
59 23	+15.7	-16.6	61 51	+15.5	-16.3
64 30	+15.8	-16.5	67 17	+15.6	-16.2
70 12	+15.9	-16.4	73 16	+15.7	-16.1
76 26	+16.0	-16.3	79 43	+15.8	-16.0
83 05	+16.1	-16.2	86 32	+15.9	-15.9
90 00			90 00		

# Latitude at Noon with Sextant: Series of Corrections!

September 8th, 2023

Ic                    - 7.0'      (from sextant)  
Dip:                - 4.9'      (from Almanac- Ht. of eye 15+' ) - used dip short

Ic & Dip:        - 11.9'

Hs:                47° 27.9' (at noon)

Ic & Dip:        -11.9'

App. Alt:        47° 16.0' (lower limb)

Alt Corr:        + 15.1' (to center of sun & Refraction from Almanac)

Ho:                47° 31.1' (fully corrected )

90° - Ho    + Same  
              - Contrary    Declination = Latitude

90° 00.0'  
- Ho: 47° 31.1'  
      42° 28.9'

+ (Same) Noon Dec: 5° 38.8' N (from Almanac)

48° 07.7' N



Latitude at Noon (1307 DST) Port Townsend Warf - Sept. 7th, 2024

GPS: 48° 06.9' N

**[www.usmaritime.us](http://www.usmaritime.us)**

# Latitude at Noon:

$90^\circ - Ho$  + Same  
- Contrary Declination = Latitude

