

SUN SIGHTS

- Record altitude of Sun
- Note exact time and DR
- Correct sight from H_s to H_o
- Look up GHA and Declination of the Sun at time of sight
- Pick a reference position that when the longitude is added to GHA (East) or subtracted from GHA (west) it gives a whole degrees of LHA
- Enter SRTs for correct page of Latitude, Contrary / Same name, Declination and LHA
- Record H_c , d , Z
- Correct H_c using Table 5 and cross referencing d and minutes of Declination
- Convert Z to Z_n
- Plot

MERPASS

Predict time of Local Area Noon

- Look up Merpass on the daily pages and use the conversion of arc tables to convert this to your DR
- Track Sun as it approaches its maximum altitude
- Make sure you do not follow Sun down
- Record the maximum altitude
- Correct H_s to H_o
- Record the sun's declination at the hour of the sight
- $90^\circ - H_o = ZD$
- $ZD + \text{Sun's declination} = \text{Latitude (same name)}$
- $ZD - \text{Sun's declination} = \text{Latitude (contrary name)}$

**Star sights
USING PUB 249 VOLUME 1**

PREPARING YOUR SIGHTS

Your DR

45°22'N 140° 15'W

Find time of twilight in UT

0249hrs

Find GHA Aries at that time

76° 22'.7

Calculate rough LHA

76° 22'.7 minus 140° 15' (+360°) = 296° 7'.7 (rounded to 296°)

Look up stars

Go to page 45°N and LHA of 296

Get the seven stars to use. The brightest ones are in capitals and the ones with the LOPs crossing closest to 120° have diamonds next to them.

Take sights

Set sextant to Hc and aim at true bearing ZN

Adjust altitude and record exact time

Results

STAR	ALTITUDE (Hs)	TIME UT
MIRFAK	22° 21'.6	0304:06
ALTAIR	53° 32'.0	0251:15
ARCTURUS	19°07'.2	0248:20

Now calculate exact GHA and LHA for each star at time of sight, forming a reference position as usual for each one

STAR	LHA ARIES	REFERENCE LONG
MIRFAK	300°	140° 9'.9
ALTAIR	297°	139° 56'.6
ARCTURUS	296°	140° 12'.7

Look up the Hc and Zn for each star at that LHA. Correct your sights from Hs to Ho as normal and calculate intercept

STAR	Hc	Zn	Ho	Intercept
MIRFAK	22°16'	041°	22° 20'	4nm toward
ALTAIR	53°48'	179°	53° 32'.0	16nm away
ARCTURUS	18°49'	279°	19° 05'.1	16'1nm toward

PLOT RESULTS AS NORMAL

PLANET SIGHTS

These are almost identical to Sun sights with the following changes

- Use merpass of planets diagram to estimate which planets can be used.
- The process thereafter is almost exactly the same as a sun sight
- When recording the GHA of the planet, note the 'v' correction at the bottom.
- The 'v' size tells us how much their GHA differs from the hourly change shown on the daily pages
- We look up the 'v' correction exactly the same as we look up the 'd' correction. The 'v' correction is always added except (very occasionally) for Venus
- The only other difference is when finding the altitude correction to Ha. You must use the stars and planets column on the yellow sheet.

Latitude by Polaris

- This is very quick and simple
- Set your sextant to your DR Latitude
- Find Polaris and record its altitude
- Record the UT time and your log reading
- Convert Hs to Ho (using the star column after Ha)
- We now have to account for Polaris' movement around the true north pole
- Look up GHA Aries and calculate LHA Aries
- Turn to Polaris tables in the Nautical Almanac, where we will make 3 corrections
- Find LHA Aries (combination of top row and side column) and note A0 correction
- From the same column scroll down to your DR latitude and note A1 correction
- Still in same column scroll down to the date and note correction A2

$$\text{Latitude} = \text{Ho} - 1^\circ + a_0 + a_1 + a_2$$

MOON SIGHTS

- Moon sights are similar to planets. They are like a Sun sight with an additional v correction and an additional altitude correction to H_a .
- On the daily pages note down all the moon data, including the new data for Horizontal Parallax (HP). This is a measure of how far the Moon is from Earth. HP is used to find the additional correction to H_a
- Find the Moon's GHA as usual and calculate a reference position and LHA as usual
- Go to the Moon tables and correct H_s for IE and dip. This gives you H_a .
- Now make sure you are on the right page (one is for H_a from 0° - 35° and the other is for 35° - 90°)
- Find the column matching H_a and scroll down to the minutes.
- Record the correction.
- Stay in the same column and scroll down to the HP figure you recorded. Make sure you are in the Lower or Upper limb as appropriate.
- Record the correction
- To get H_o , add all these corrections to H_a
- If Upper Limb was used, subtract $30'$