# Sight Reduction Form for use with Formula Method
# For use with chapters 15 & 16
# (Meridian Passage Long Method)

Note. This sight form has been designed as a learning aid for use with the book 'Celestial Navigation' by Jack Case. It is not designed for practical use although it may be. 

| **Pre Planning.** | |
|---|---|
| **Date:** | |
| **First DR Pos:** | |
| **Zone Time at 1st DR:** | |
| **LMT of Mer Pas:** | |
| **Course and speed:** | |
| **Ht:** | |
| **IE:** | |
| **DWE:** | |
| | |

**Step 1. Convert 1st DR Longitude to time.** (See note 3)

| DR Longitude: | *Multiply by 4 and divide by 60* | Convert decimals to time units<br>h m s |
|---|---|---|
| Convert degrees to time: | | |
| Convert minutes to time: | | |
| Long converted to time: | | |
| To nearest minute: | | |

**Step 2. Calculate GMT and ZoneTime of Mer Pas at 1st DR**

| | h m | |
|---|---|---|
| LMT of Mer Pas: | | (from daily page) |
| Long converted to time: | | (East - / West +) |
| GMT of Mer Pas at 1st DR: | | |
| Zone: | | (Reverse sign) |
| Zone Time: | | (To predict approx local Mer Pas) |

**Step 3. Calculate Distance Run Between Zone Time at 1stDR and predicted Zone Time of Mer Pas at 1st DR.**

| | h m |
|---|---|
| Predicted Zone Time of Mer Pas: | |
| Zone Time at 1st DR: | |
| Time Elapsed: | |
| As a Decimal: | |
| Speed: | |
| Distance Run: | |

| | | |
|---|---|---|
| **Step 4. Calculate New Position at Zone Time of Mer Pas at 1st DR.** (See note 15) | | |
| | | |
| **New Position (2nd DR):** | | |
| | | |
| **Step 5. Convert New Long to Time.** (see note 3) | | |
| New Long: | | h m s |
| Convert degrees to time: | | |
| Convert minutes to time: | | |
| Long converted to time: | | |
| To nearest minute: | | |
| | | |
| **Step 6. Calculate Time of Mer Pas at 2ndDR.** | | |
| | h m | |
| LMT of Mer Pas: | | |
| Long converted to time: | (East - / West +) | |
| GMT of Mer Pas at 2ndDR : | | |
| Zone: | (Reverse sign) | |
| Zone time Mer Pas at 2ndDR: | | |
| | | |
| **Step 7.Record Sextant Altitude, Azimuth and Time of Local Mer Pas.** | | |
| Sextant Altitude: | | |
| Azimuth: (True bearing) | (Should be either ooo° or 180° at local Mer Pas) | |
| Deck Watch Time: | | |
| DWE: | | |
| GMT: | | |
| Zone: | (Reverse sign) | |
| Zone Time: | | |
| | | |
| **Step 8. Calculate Sextant Altitude of Local Mer Pas.** (See note 14) | | |

| | |
|---|---|
| Sext. Alt. at Mer Pas: | |
| I.E: | |
| Observed Altitude: | |
| Dip (12m) : | (table 6a) |
| Apparent Altitude: | |
| Altitude Correction: | (table 6d) |
| True Altitude: | |
| Convert to decimal: | |

| | |
|---|---|
| **Step 9. Calculate Declination at GMT of Local Mer Pas.** (See note 13) | |
| GMT Local Mer Pas: | (from step 7) |
| Dec Sun: (whole hour) | (from Daily Page) |
| d = | (from Daily Page) |
| d correction: (minutes) | (from increments table) |
| Corrected declination: | |
| As a decimal: | |

| | |
|---|---|
| **Step 10. Determine Rule For Calculating Latitude.** (See note 16) | |
| Latitude at 2nd DR: | |
| DR Latitude as a decimal: | |
| Declination: | |

Decide rule: (Tick appropriate box)

[ ] Rule (i) (Lat and Dec same / Lat greater): LAT = DEC + (90° - ALT)

[ ] Rule (ii) (Lat and Dec same / Dec greater): LAT = DEC - (90° - ALT)

[ ] Rule (iii) (Lat and Dec opposite): LAT = (90° - ALT) - DEC

| | |
|---|---|
| **Step 11. Calculate Latitude at Local Mer Pas.** (See note 16) | |
| Declination: | |
| Altitude: | |
| Rule: | |
| Apply rule: | |
| **Calculated Latitude:** | (in arc units) |

| | |
|---|---|
| **Step 12. Calculate time difference between LMT and GMT of Local Mer Pas.** **(Latitude West: GMT Best. Latitude East: GMT Least).** | |
| GMT at Local Mer Pas: | (from step 7) (Subtract from LMT if DR East) |
| LMT at Local Mer Pas: | (from daily page) (Subtract from GMT if DR West) |
| Time Diff: | |

| **Step 13. Calculate Longitude at Local Mer Pas. (**Convert time difference to Arc - see note 3) | | |
|---|---|---|
| Time Difference = | *Multiply the hours by 15 and divide the minutes and seconds by 4.* | Convert decimals to units of arc.<br>degs mins secs |
| Convert hours: | | |
| Convert minutes: | | |
| Convert seconds: | | |
| Total | | |
| **Calculated Longitude:** | | |
| | | |
| **Step 14. Summarize Observed Position.** | | |
| Zone Time of Local Mer Pas: | | |
| GMT of Local Mer Pas: | | |
| Observed Position at Local Mer Pas: | | |
| Calculated Position at 2nd DR for comparison: (from step 4) | | |