Sight Reduction Form for use with Formula Method
For use with Chapter 7 (Star)

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.

Observation Notes.
Date:
DR Pos:
Zone:
Ht:
IE:
DWE:
Temp:
Body Observed:
Sext. Alt: **Compass bearing:**
DWT: **Zone Time:** (see note 3)

Step 1. Convert DR lat and long to decimals.
Lat: Long:

Step 2. Calculate PZ. (90 - Lat). (See note 6).
PZ =

Step 3. Calculate Greenwich Date at time of observation. *(See note 3).*

Date:	
Zone time:	
Zone correction:	
Universal Time (GMT):	
Deck watch time:	
Deck watch error:	
Greenwich date:	

Step 4.Calculate Greenwich Hour Angle and Declination. (See notes 12 and 13

Date:

GHA	
GHA Aries:	(Stars only)
SHA:	(Stars only)
GHA:	(GHA Aries + SHA for Stars)
Inc:	
v correction: _____	(Moon and planets only)
Corrected GHA: _____	
Dec	
Dec:	
d correction: _____	(See note 13 for stars)
Corrected Dec: _____	(See Note 2)
HP:	(Moon only)

Step 6. Calculate PX. (90 - Dec if same) (90 + Dec if contrary). (See note 6).
PX =

Step 7 Calculate LHA: **Long East, LHA = GHA + LONG** (- 360° as necessary)
Long West, LHA = GHA – LONG (+ 360° as necessary) (See note 12)

GHA:
DR Long: West (-) East (+)
LHA=

Step 8. Determine Angle ZPX. (See note 18).
ZPX = LHA =

Step 9. Calculate True Altitude at True Position (Observed altitude corrected for IE, Dip, Parallax and Refraction). (See note 14).

Sextant Altitude:
Index error (IE): _____

Observed Altitude:
Dip (ht. 8m.): _____ (table 6a)
Apparent Altitude:
Altitude correction: _____ (table 6d)
HP Correction: (Moon only)
Semi-diameter: (Moon only)
Added refraction = _____ (table 6c)
True Altitude =
Note compass bearing at time of observation:

Step 10. Calculate Zenith Distance at True Pos. (90° - Altitude). (See note 11).
Zenith Dist =

Step 11. Calculate Zenith Distance at DR Position. (ZX). (See notes 6 and 11).

ZPX : (From Step 7)
PZ : (From Step 2)
PX : (From Step 6)

Reminder: The formula for calculating Zenith Distance (ZX) is:
Cos (ZX) = [Cos(PZ) x Cos(PX)] + [Sin(PZ) x Sin(PX) x Cos(ZPX)]
∴ Cos (ZX) =( )

ZX = Cos^{-1} ( ) =
∴ Zenith Distance at DR position =

Step 12. Calculate Azimuth Angle at DR Position (PZX) *(See notes 4 and 5 and 6).*

Data calculated to date:

PZ = (From Step 2)

PX = (From Step 6)

ZX = (From Step 11)

Reminder: The formula for calculating azimuth angle (PZX) is:

$$\cos PZX = \frac{\cos(PX) - [\cos(ZX) \times \cos(PZ]}{[\sin(ZX) \times \sin(PZ)]}$$

∴ Cos PZX = ( )

PZX = $\cos^{-1}$( ) =

∴ Calculated azimuth Angle at DR position =

Step 13. Convert azimuth angle to true azimuth (ZN): (See note 4).

Rules for converting Azimuth Angle (PZX) to True Azimuth (Zn)		
	Lat. North	**Lat. South**
LHA>180°	**Zn = Z**	**Zn = 180° - Z**
LHA<180°	**Zn = 360°-Z**	**Zn = 180° + Z**

DR Lat: (from step 1)

Azimuth Angle (Z): (from step 12)

LHA : (from step 7)

ZN = (calculate from the table above)

Therefore calculated true azimuth at DR position =

Step 14. Calculate intercept. (See note 7).

Reminder: Subtract the ZD at the true position (a) from the ZD at the DR position (b).

- If the result is positive, the intercept is towards the azimuth.
- If the result is negative, the intercept is from the azimuth.

a. Zen. Dist. at DR Pos: (from step 11)

b. Zen. Dist. at True Pos: (from step 10)

Intercept: a - b = (multiply by 60 to convert to minutes)

True Azimuth:

Intercept: (value of intercept from or to azimuth)

Step 15. Plot the position line. (See notes 8 and 9 and 10)

(Reminder: Plot intercept from DR position along azimuth line).