

Celestial Navigation

The Forms

The necessary forms are on the following pages. You may copy them for you own personal use only.

Position Line from Sun

Position Line from Moon

Position Line from Planet

Position Line from Star

Altitude by Tables

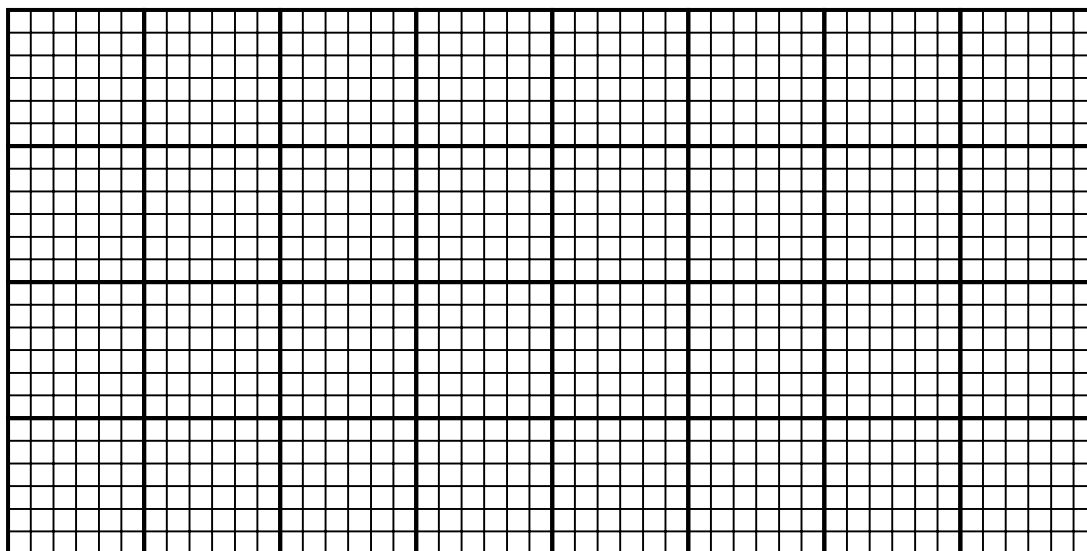
Position Line Plot

Position Line from Sun

Limb	Lower/Upper	Watch	Sextant
		h m s	° ' "
Date		h m s	° ' "
		h m s	° ' "
Temperature	°C	h m s	° ' "
Pressure	mb	h m s	° ' "
Bearing to Sun	°	h m s	° ' "

Check graph

Sextant ... /division



Watch 10^s/division

Mean watch	h m s		
Watch corr.	h m s	DR	Latitude (ϕ_d) +/-.....°.....'
UT (GMT)	h m s	position	Longitude (λ_d) +/-.....°.....'
GHA @ 0 ^h UT	.....°.....'..... (d'	Declination @ 0 ^h UT	+/-.....°.....'..... (d'
d' for hours	+/-.....'.....	d' for hours	+/-.....'.....
d' for 10s of minutes	+/-.....'.....	d' for 10s of minutes	+/-.....'.....
d' for minutes	+/-.....'.....	d' for minutes	+/-.....'.....
GHA increment for hours	+°	Declination @ obs'n (δ)°.....'.....
GHA increment for minutes	+°.....'	Mean Sextant°.....'.....
GHA increment for seconds	+.....'.....	Calibration correction	+/-.....'.....
GHA @ obs'n	.....°.....'.....	Index correction	+/-.....'.....
λ_d	+/-.....°.....'.....	Refraction - standard	-.....'.....
(-360°)	-.....°	Refraction - temperature	-.....'.....
LHA @ DR pos'n (t_d)	.....°.....'.....	Refraction - pressure	-.....'.....
		Dip	-.....'.....
		Parallax & semi-diameter	+/-.....'.....
		Corrected observed altitude (h_o)°.....'.....
$\sin h_d = \sin \phi_d \sin \delta + \cos \phi_d \cos \delta \cos t_d$		Altitude at DR pos'n (h_d)°.....'.....
If offset is positive, plot towards Sun, negative plot away.		Offset ($h_o - h_d$)'.....

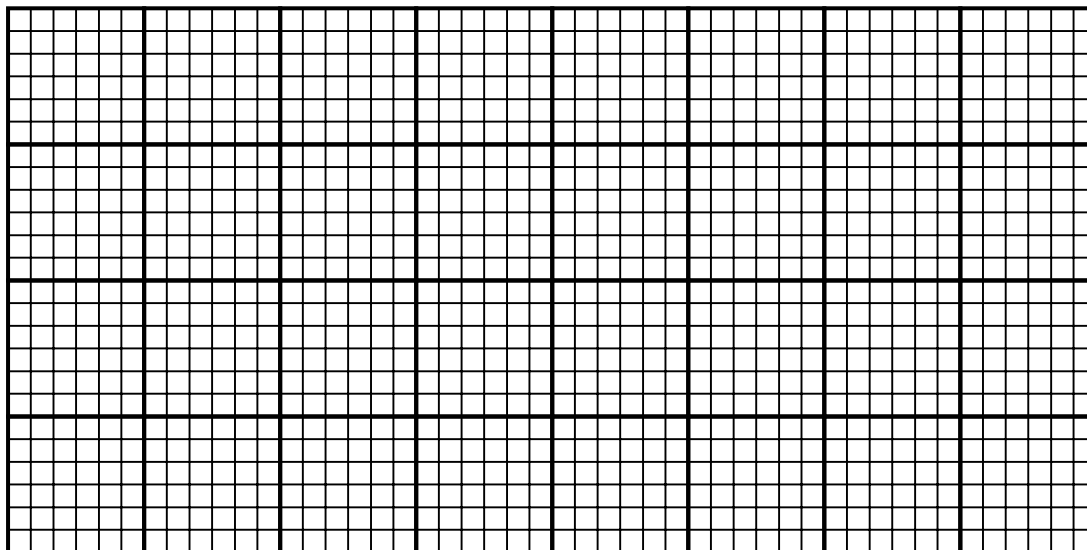
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Position Line from Moon

Limb Lower/Upper	Watch	h	m	s	Sextant	°	'
Date		h	m	s		°	'
		h	m	s		°	'
Temperature	°C	h	m	s		°	'
Pressure	mb	h	m	s		°	'
Bearing to Moon	°	h	m	s		°	'

Check graph

Sextant ...'/division



Watch 10^s/division

Mean watch	h	m	s		
Watch corr.	h	m	s	DR Latitude (ϕ_d)	+/-.....°.....'
UT (GMT)	h	m	s	position Longitude (λ_d)	+/-.....°.....'
GHA @ ^h ^m UT	.....°.....'	(d'	Declination @ ^h ^m UT	+/-.....°.....'	(d'
d' for minutes	+/-.....'		d' for minutes	+/-.....'	
d' for seconds	+/-.....'		d' for seconds	+/-.....'	
GHA @ obs'n	.....°.....'		Declination @ obs'n (δ)°.....'	
λ_d	+/-.....°.....'				
(-360°)	-.....°.....'		Mean Sextant°.....'	
LHA @ DR pos'n (t_d)	.....°.....'		Calibration correction	+/-.....'	
			Index correction	+/-.....'	
			Refraction – standard	-.....'	
			Refraction – temperature	-.....'	
			Refraction – pressure	-.....'	
			Dip	-.....'	
			Parallax & semi-diameter @ 0 ^h UT	+/-.....'	
			Parallax & semi-diameter a incr't	+/-.....'	
			Parallax & semi-diameter t incr't	+/-.....'	
			Corrected observed altitude (h_o)°.....'	
			Altitude at DR pos'n (h_d)°.....'	
			Offset ($h_o - h_d$)'	

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$\sin h_d = \sin \phi_d \sin \delta + \cos \phi_d \cos \delta \cos t_d$

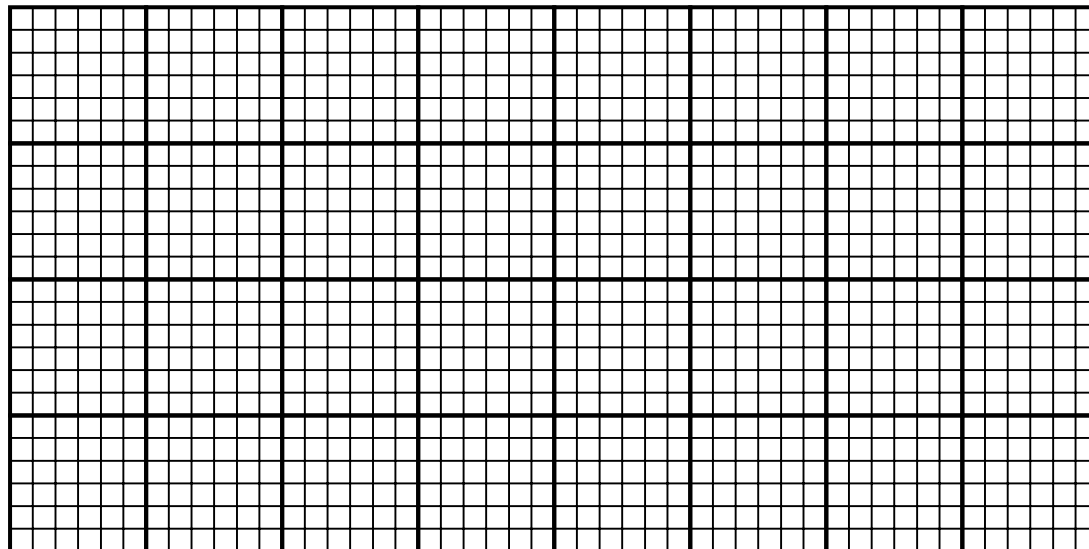
If offset is positive, plot towards Moon, negative plot away.

Position Line from Planet

Planet	Watch	h	m	s	Sextant	°	'
Date		h	m	s		°	'
		h	m	s		°	'
Temperature .....°C		h	m	s		°	'
Pressure .....mb		h	m	s		°	'
Bearing to Planet.....°		h	m	s		°	'

Check graph

Sextant ...'/division



Watch 10^s/division

Mean watch	h	m	s				
Watch corr.	h	m	s	DR	Latitude (ϕ_d)	+/-	°.....'
UT (GMT)	h	m	s		position Longitude (λ_d)	+/-	°.....'
GHA @ 0 ^h UT	.....°.....' (d'			Declination @ 0 ^h UT	+/-.....°.....' (d'		
d' for hours	+/-.....'			d' for hours	+/-.....'		
d' for 10s of minutes	+/-.....'			d' for 10s of minutes	+/-.....'		
d' for minutes	+/-.....'			d' for minutes	+/-.....'		
(dd' for Mercury)	+/-.....'			(dd' for Mercury)	+/-.....'		
GHA increment for hours	+	.....°		Declination @ obs'n (δ)°.....'		
GHA increment for minutes	+	.....°.....'		Mean Sextant°.....'		
GHA increment for seconds		+.....'		Calibration correction	+/-.....'		
GHA @ obs'n	.....°.....'			Index correction	+/-.....'		
λ_d	+/-.....°.....'			Refraction – standard	-.....'		
(-360°)	-	.....°		Refraction - temperature	-.....'		
LHA @ DR pos'n (t_d)	.....°.....'			Refraction - pressure	-.....'		
				Dip	-.....'		
				Parallax	+.....'		
				Corrected observed altitude (h_o)°.....'		
				Altitude at DR pos'n (h_d)°.....'		
				Offset ($h_o - h_d$)'		

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$\sin h_d = \sin \phi_d \sin \delta + \cos \phi_d \cos \delta \cos t_d$

If offset is positive, plot towards Planet, negative plot away.

Position Line from Star

Star	Watch	h	m	s	Sextant	°	'
Date		h	m	s		°	'
		h	m	s		°	'
Temperature .....°C		h	m	s		°	'
Pressure .....mb		h	m	s		°	'
Bearing to Star°		h	m	s		°	'

Check graph

Sextant ...'/division

Mean watch	h	m	s		Watch 10⁵/division
Watch corn.	h	m	s	DR Latitude (ϕ_d)	+/-.....°.....'
UT (GMT)	h	m	s	position Longitude (λ_d)	+/-.....°.....'
GHA Aries @ 0 ^h UT	.....°.....'			Declination (δ)	+/-.....°.....'
Increment for hours	+.....°.....'			Mean Sextant°.....'
Increment for minutes	+.....°.....'			Calibration correction	+/-.....'
Increment for seconds	+.....'			Index correction	+/-.....'
SHA star	+.....°.....'			Refraction - standard	-.....'
λ_d	+/-.....°.....'			Refraction - temperature	-.....'
(-360°)	-.....°			Refraction - pressure	-.....'
LHA @ DR pos'n (t_d)°.....'			Dip'
				Corrected observed altitude (h_o)°.....'
				Altitude at DR pos'n (h_d)°.....'
				Offset ($h_o - h_d$)'

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$\sin h_d = \sin \phi_d \sin \delta + \cos \phi_d \cos \delta \cos t_d$

If offset is positive, plot towards Star, negative plot away.

Altitude by Tables

Latitude (ϕ_d) +/-°.....'.....

Declination (δ) +/-°.....'.....

LHA (t_d) °.....'.....

from F tables:

$U = \phi_d - \delta = +/-^\circ'$ $F_U = =$

$V = \phi_d + \delta = +/-^\circ'$ $F_V = =$

$W = U + t_d = +/-^\circ'$ $F_W = =$

$X = U - t_d = +/-^\circ'$ $F_X = =$

$Y = V + t_d = +/-^\circ'$ $F_Y = =$

$Z = V - t_d = +/-^\circ'$ $F_Z = =$

$F_U - F_V =$

+ -

$F_W = \quad \quad$

$F_X = \quad \quad$

$F_Y = \quad \quad$

$F_Z = \underline{\quad \quad \quad}$

Add

Difference =

Divide by 2 =

Add ($F_U - F_V$)

=

Divide by 2 =

From F table °' -°' =°'

Subtract from 90° $h_d =^\circ'$

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Position Line Plot

