Altitude-Intercept Worksheet

LoP = Jupiter

Section 0 - "Estimated Position"

EstLat (N)/S 37 ° 15 '

EstLon E/(W) 66 ° 3Ø '

Section 1 - "Time of Observation"

Date 2Ø16-1Ø-31

Chronometer 1Ø h 13 m 3Ø s

Error ± Ø m Ø s

Local Time ___ h ___ m ___ s

Time Zone ± Ø h

UTo 1Ø h 13 m 3Ø s

Section 2 - "Observed Altitude"

Hs		18 ° 25 . 4	cel.obj.
IE	±	Ø '	app.dir.
Dip	−	Ø '	
Ha		18 ° 25 . 4	
SD	±	Ø '	upper limb: − lower limb: +
Refr	−	2 . 9	1ØØØ hPa @ 1Ø°C
		18 ° 28 . 3	
Prllx	+	Ø ° Ø '	HP Ø ° Ø '
Ho		18 ° 28 . 3	

Section 3 - "Nautical Almanac"

GHA(NA)	359 ° 31 . 1		ddGHA + 2 . Ø	p(ddGHA)	2Ø791
dHA	+ 3 ° 22 . 5	<--	fMin 13 m 3Ø s	p(fMin)	29Ø84
Interp	+ 6 . 8	<-- (sign of ddGHA) <--		s( )	49875
GHA	3 ° Ø . 4	at UTo			

Dec(NA)	N/(S) 3 ° 2Ø . 8		dDec + Ø . 2	p(dDec)	1Ø791
			fMin 13 m 3Ø s	p(fMin)	29Ø84
Interp	+ Ø . 7	<-- (sign of dDec) <--		s( )	39875
Dec	N/(S) 3 ° 21 . 5	at UTo			

Section 4 - "Sight Reduction"

Sight-Reduction with Tables is done on a separate Worksheet. The trigonometric equations are:

Hc = asin(sin(LatEP)*sin(Dec) + cos(LatEP)*cos(Dec)*cos(GHA+LonEP))

Zc = atan(cos(Dec)*sin(GHA+LonEP) / cos(LatEP)*sin(Dec)-sin(LatEP)*cos(Dec)*cos(LHA+LonEP))

Section 5 - "Line of Position"

LatAP (N)/S 37 ° 15 '

LonAP E/(W) 66 ° 3Ø '

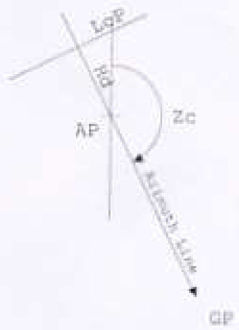
Hc 18 ° 36 . 8

Ho − 18 ° 28 . 3

Hd + 8 . 5

Zc ___ °

Hd > 0 draw LoP Hd miles away from GP
Hd < 0 draw LoP Hd miles towards GP



Sight-Reduction Worksheet for Ageton's Method

LoP = Jupiter

Section 4 - "Sight Reduction"

EP: LatEP = + 37° 15' (N/S)   GP: Dec = − 3° 21.5' (N/S)   (0)

LonEP = − 66° 30' (E/W)   GHA = 3° 04'

1. LHA = GHA + LonEP = 63° 29.6'

   t = − LHA = − 63° 29.6'   if(LHA < 180°)   (1)

   t = 360° − LHA = ± ° '   if(LHA > 180°)

   A(t) = 4823

2. A(Dec) = 123220   B(Dec) = 75

3. A(R) = A(t) + B(Dec) = 4823 + 75 = 4898

   R = 63° 17.8'   B(R) = 34739

4. A(LatQ) = A(Dec) − B(R) = 123220 − 34739 = 88481

   LatQ = − 7° 29.4' (N/S)   ($t < 90°$)   (4)

5. dLat = LatEP − LatQ = + 37° 15' − − 7° 29.4' = + 44° 44.4'   (5)

   B(dLat) = 14855

6. A(Hc) = B(R) + B(dLat) = 34739 + 14855 = 49594   Casio!

   Hc = 18° 36.8'   B(Hc) = 2333   [18° 36' 50'']

7. A(Z) = A(R) − B(Hc) = 4898 − 2333 = 2565

   Z = 109° 30'   (7)

8. Zc = 250° 30'   ??? !!!   (8)

Remarks and Instructions

(0) Use the appropriate signs for Latitude, Longitude and Declination:
positive for N and E, negative for S and W.

(1) The meridian angle "t" is calculated from "LHA" according to the following rule:
if LHA < 180°   t = − LHA
if LHA > 180°   t = 360° − LHA

(4) The sign of the Latitude of "Q" (N/S) depends on the values of "t" and "Dec":
if |t| < 90°   LatQ has the same sign as Dec
if |t| > 90°   LatQ has the contrary sign of Dec
Where |t| is the absolute value of "t"

(5) The value of "dLat" must be calculated taking the correct signs for "LatEP" and "LatQ" into
into account. The resulting sign of "dLat" should be recorded correcly (see remark 7).

(7) Select one out of four cases, depending on the value of "|t|" and the sign of "dLat" to
determine how to ~~select the~~ value of "Z" from the Tables:

|t|	|t| < 90°		|t| > 90°	
dLat	−	+	−	+
Z	< 90°	> 90°	> 90°	< 90°

if Z < 90° select Z from the top line - left column of the Table
if Z > 90° select Z from the bottom line - right column of the Table

(8) The true Azimuth "Zc" is obtained from "Z" depending on the sign of "t":
if t > 0   Zc = Z   (GP is East of EP)
if t < 0   Zc = 360° − Z   (GP is West of EP)