©

Total GHA	44 deg.	24.20 min.		
DR Lo	80 deg.	23.40 min.	W	
LHA	324 deg.	0.80 min.		
DR Lat	27 deg.	40.00 min.	N	
DEC	3 deg.	46.10 min.	N	
Ho	48 deg.	12.20 min.		
Hc	48 deg.	12.67 min.		
a	0.47 n. mi.	Away		
Zn	118.4 deg.	Z	N	118.37 E
LHA	324.01333 deg.			
DR Lat	27.66667 deg.	EP Lat	27 deg.	40.22 min. N
DEC	3.76833 deg.	EP Lo	80 deg.	23.87 min. W
Hc	48.21114 deg.			

SR via LOC, H.O. 229 & NASR Methods
Enter Body, Total GHA, DEC & Ho from the front of ED SR 96a or ED SR 96b Sight Reduction Forms Into Yellow Cells.

To Clear Data Cells Click On This Box

Use "Nav Bodies" worksheet to specify DR Position, Date & Time

Body: VENUS Limb: NA

Sight Number: 1

Time Diagram ▪ 15° Mark (Hour) ▪ 5° Mark (1/3 Hour)

Moon, Planet or Star

LHA of Aries: 325.74 deg.

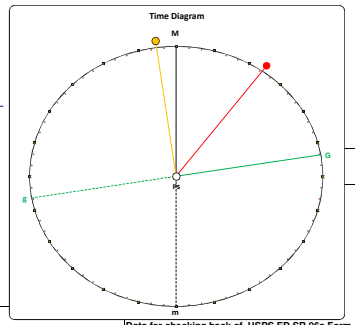
Aries

Date & MeanTime @ Greenwich: 7-Feb-17 17:52:22

Calculated values needed for entry on the ED SR 96a or ED SR 96b Sight Reduction Forms are shown in turquoise cells

Sight Reduction -- Intercept and Azimuth by the LAW of COSINES Method

West is Counterclockwise (CCW)
East is Clockwise (CW)
O marks South Pole (Ps)
M--Ps is Upper Btanch of Observer's Meridian
m--Ps is Lower Branch of Observer's Meridian
G--Ps is the Upper Btanch of Greenwich Meridain
g--Ps is the Lower Branch of Greenwich Meridain
On the Time Diagram the Sun is Positioned by **GMT**
The Time Diagram shows the **Mean Sun**



Steps for Nautical Almanac Sight Reduction Intercept & Azimuth by NASR method

DR Lat	27 deg.	40.00 min.	N
DR Lo	80 deg.	23.40 min.	W
Total GHA	44 deg.	24.20 min.	
Asm Lo	80 deg.	24.20 min.	W
Asm Lat	28 deg.	N	Asm LHA 324 deg.
A	31 deg.	16 min.	
Z	71.2 deg.		
B	56 deg.	41 min.	
DEC	3 deg.	46 min.	N
F	60 deg.	27 min.	
A°	31 deg.	F° 60 deg.	

Data for checking back of USPS ED SR 96a Form & CLS 98 Plotting Sheet

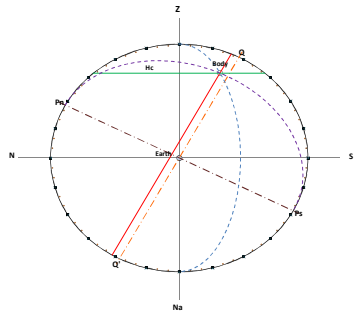
Use SR 96 worksheet to check data on the front of ED SR96a & ED SR 96b Sight Reduction Forms

Total GHA 44 deg. 24.24 min.
Dec 3 deg. 46.07 min. N

VENUS data shown in this box was calculated by the "**Nav Bodies**" worksheet.
The value of **Hc** shown in cells C14 & E14 should agree with the value of **Hc** shown here within ±0.3 arc minutes. **Hc** 48 deg. 12.68 min.

Scroll Down to Rows 61 through 94 for data needed to check back of USPS ED SR96b Form "H.O. PUB NO. 229 Sight Reduction"

Diagram on the Plane of the Observer's Celestial Meridian



Elevated Pole is North Pole

Observer's Latitude	27 deg.	40.0 min.	N
Observer's Meridian	80 deg.	23.4 min.	W
GHA of Sun	84 deg.	33.5 min.	
VENUS	Zn 118 deg.		
LHA of Body	324 deg.	0.8 min.	
DEC of Body	3 deg.	46.1 min.	N
Hc of Body	48 deg.	12.7 min.	

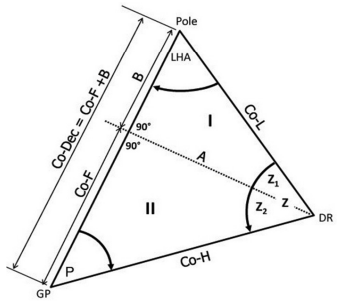
Celestial Horizon N—S
Celestial Equator Q—Q'
Polar Axis Pn—Ps
Declination of Body
Computed Altitude of Body Hc
West is in Front & East is Behind the Plane of the Observer's Meridian
Prime Vertical Circle Z—Na
Hour Circle of a Body West of Observer
Hour Circle of a Body East of Observer
Vertical Circle of a Body West of Observer
Vertical Circle of a Body East of Observer
Observer's Celestial Meridian ■ 15° Mark ▪ 5° Mark

H	47 deg.	55.70 min.	P 39.8 deg.	Zo 48.3 deg.
Corr 1	17.20 min.	← { F'	27	P° 40 }
Corr 2	-10.67 min.	← { A'	16	Zo° 48 }
Hc	48 deg.	2.23 min.		Z N 119.50 E
Ho	48 deg.	12.20 min.		
AP to NASR LOP distance	9.97 n. mi.	Toward	Zn 120 deg.	
Intercept - LOP Crossing Lat	27 deg.	55.17 min.	N	
Intercept - LOP Crossing Lo	80 deg.	14.33 min.	W	
DR to NASR LOP Distance	0.33 n. mi.	Away	Zn 119.5 deg.	
DR_EP Lat	27 deg.	40.16 min.	N	
DR_EP Lo	80 deg.	23.73 min.	W	
Ψ	2.1E-05 min.			

This Worksheet requires the Excel Solver Add-in to calculate values for DR_EP Lat & DR_EP Lo

Click on this box to solve for DR_EP Lat & DR_EP Lo

NASR Triangles



DR Lat	27 deg.	40.00 min.	N	
DR Lo	80 deg.	23.40 min.	W	
Total GHA	44 deg.	24.20 min.		
Asm Lo	80 deg.	24.20 min.	W	
Tab LHA	324 deg.			
Tab Hc	47 deg.	33.23 min.		
Total Corr	29.27 min.			
Hc	48 deg.	2.50 min.		
Ho	48 deg.	12.20 min.		
AP to HO 229 LOP distance	9.71 n. mi.	Toward	Zn 118.7 deg.	
Intercept - LOP Crossing Lat	27	55.44	N	
Intercept - LOP Crossing Lo	80	14.50	W	
DR to HO 229 LOP Distance	0.30 n. mi.	Away		
DR_EP Lat	27	40.14	N	
DR_EP Lo	80	23.70	W	

This Worksheet requires the Excel Solver Add-in to calculate values for DR_EP Lat & DR_EP Lo

Sight Number 1 Body VENUS Limb NA

Date & MeanTime @ Greenwich 7-Feb-17 17:52:22

d 38.01 min.
d1 Corr 23.05 min.
d2 Corr 6.15 min.
DSD Corr 0.07 min.
Total Corr 29.27 min.

DSD 1.39 min. Z diff -1.15 deg.

Data needed for checking back of USPS SR ED 96b Form & CLS 98 Plotting Sheet Sight Reduction -- Intercept and Azimuth by H.O. PUB. NO. 229 "Sight Reduction Tables for Marine Navigation"

Tab Dec 3 deg. N
Dec Incr 46.10 min.
Asm (Tab) Lat 28 deg. N
Dec and Lat have Same Names

Tab Z 119.57 deg.
Z Corr -0.89 deg.
Z N 118.69 E

Zn 118.7 deg.

Ψ 4.7E-06 min.

Click on this box to solve for DR_EP Lat & DR_EP Lo

Facsimile of HO 229 Table Excerpt Needed for Solution

324 ° LHA
36 ° LHA

Declination and Latitude have Same Names

28 ° Latitude

	Dec°	Hc'	d'	Z°
1	46	15.20	39.34	121.80
2	46	54.54	38.69	120.70
Tab Dec → 3	47	33.23	38.01	119.57
4	48	11.24	37.30	118.42
5	48	48.54	36.56	117.24

Celestial Sphere & the Navigational Triangle