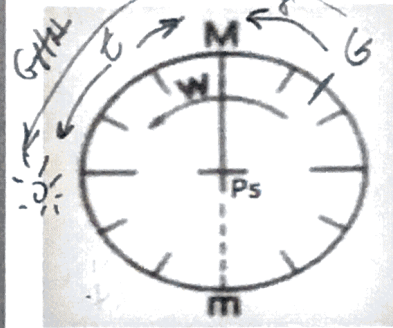


Time Sight	
Body	SUN LV
IC + off - on	+1.0
Dip (Ht: 2.8m)	-8.3
SUM=	-7.3
hs	12-19.7
ha	12-12.4
Alt. Corr. All sights	11.7
H.P. ()	—
U.L. moon - 30'	—
Add. Mars, Venus	—
Ho (Obs Alt)	12-24.1
Date	9/3/19
DR Lat (L)	46-46.7 (N)
DR Long	048-02.7 (W)
Obs. Time	
WE (S+, F-)	
ZT	
ZD (W+, E-)	
GMT	20-30 -30
Date (GMT)	9/3/19
Tab GHA	v
GHA incr'mt.	120-10.1
SHA or v Corr.	7-37.5
GHA	127-47.6
Tab Dec	d
d Corr (+ or -)	07-25.7 (N) -1.9
True Dec (d)	07 25.2 (N)
90°	90° 00 .0'
p (d +/- 90)	82-34.8
Ho	12-24.1
L	46-46.7
SUM=	141-45.6
Z	$\frac{60}{1140-105.6}$ 70-52.8
s=[1/2(SUM)]	70-52.8
Ho	12-24.1
(s-Ho)=	58-28.7
GHA	127-47.6
t	79-46.0
sum/difference	048-01.6 (W)
360° if needed	360-0-0-0 .0'
Longitude	048-01.6 (W)

Time (Hour Angle) Diagram



dz GHA

Azimuth (Norie's Nautical Tables ABC Tables)

LHA < 180 West else East				
Table A			19	(N) (S)
Table B			12	(N) (S)
SUM=			07	
North or South based on larger value above				
(Table C) Z=	S	87	3	W
360 or 180	1	80	0	
Zn=	2	67	3	

Notes

	1	1	1	2	2
L cosec(p)=	0	0	0	3	6
					7
L sec(L)=	0	1	6	4	3
					3
					4
					9
L cos(s)=	1	5	1	5	5
					7
L sin(s-Ho)=	1	9	3	0	6
					1
					5
L hav. t=(sum)	1	6	1	4	0
					2

DIFFERENCE - 048-02.7
 - 048-01.6
 —————
 01.1' longitude
 pretty close

**U.S. Naval Observatory
Astronomical Applications Department**

Celestial Navigation Data

Celestial Navigation Data for 2019 Sep 3 at 20:30:30 UT

For Assumed Position: Latitude N 46 46.7
Longitude W 48 02.7

Object	Almanac Data				Altitude Corrections			
	GHA	Dec	Hc	Zn	Refr	SD	PA	Sum
	° ' "	° ' "	° ' "	°	' "	' "	' "	' "
SUN	127 47.6	N 7 25.3	+12 24.9	267.6	-4.4	15.9	0.1	11.5
MOON	68 53.3	S11 12.4	+29 05.4	203.5	-1.9	16.2	52.0	66.3
VENUS	121 59.6	N 6 32.9	+15 44.3	262.7	-3.4	0.1	0.1	-3.3
MARS	127 48.9	N 8 35.7	+13 14.9	268.5	-4.1	0.0	0.1	-4.0
JUPITER	36 11.7	S22 17.8	+20 05.9	168.3	-2.7	0.3	0.0	-2.3
SATURN	5 02.7	S22 28.1	+10 37.4	140.1	-5.1	0.1	0.0	-4.9
ALIOTH	96 35.8	N55 51.5	+59 02.5	305.1	-0.6	0.0	0.0	-0.6
ALKAID	83 14.3	N49 13.3	+66 32.4	289.0	-0.4	0.0	0.0	-0.4
ALPHECCA	56 25.9	N26 39.3	+68 48.8	201.1	-0.4	0.0	0.0	-0.4
ALPHERAT	287 57.2	N29 11.9	+ 3 11.8	49.2	-13.1	0.0	0.0	-13.1
ALTAIR	352 22.3	N 8 55.4	+29 38.4	110.2	-1.7	0.0	0.0	-1.7
ANTARES	42 39.5	S26 28.4	+16 35.2	175.0	-3.3	0.0	0.0	-3.3
ARCTURUS	76 10.5	N19 05.2	+54 00.0	229.3	-0.7	0.0	0.0	-0.7
CAPELLA	210 46.7	N46 00.8	+ 4 01.3	348.1	-11.3	0.0	0.0	-11.3
DENEBO	339 46.6	N45 21.2	+44 09.5	65.5	-1.0	0.0	0.0	-1.0
DENEBOA	112 48.1	N14 28.0	+27 42.0	261.6	-1.9	0.0	0.0	-1.9
DUBHE	124 05.5	N61 38.8	+46 01.8	318.4	-1.0	0.0	0.0	-1.0
ELTANIN	21 02.4	N51 29.6	+71 49.7	65.0	-0.3	0.0	0.0	-0.3
ENIF	324 01.1	N 9 58.0	+11 19.3	87.4	-4.8	0.0	0.0	-4.8
GIENAH	106 06.7	S17 38.9	+ 7 08.3	234.6	-7.2	0.0	0.0	-7.2
KAUS AUS	13 56.4	S34 22.4	+ 3 14.7	152.4	-13.0	0.0	0.0	-13.0
KOCHAB	67 39.0	N74 04.9	+61 22.0	348.9	-0.5	0.0	0.0	-0.5
MARKAB	303 52.2	N15 18.7	+ 1 45.5	69.3	-17.9	0.0	0.0	-17.9
MENKENT	78 21.2	S36 27.9	+ 2 25.7	204.0	-15.4	0.0	0.0	-15.4
MIRFAK	238 52.5	N49 55.5	+ 7 09.4	7.0	-7.2	0.0	0.0	-7.2
NUNKI	6 11.3	S26 16.2	+ 7 45.0	142.9	-6.7	0.0	0.0	-6.7
RASALHAG	26 20.9	N12 33.1	+51 12.6	144.8	-0.8	0.0	0.0	-0.8
REGULUS	137 57.8	N11 52.4	+ 8 40.7	278.1	-6.1	0.0	0.0	-6.1
SABIK	32 26.1	S15 44.8	+25 55.0	163.3	-2.0	0.0	0.0	-2.0
SCHEDAR	279 53.6	N56 38.5	+22 05.3	27.8	-2.4	0.0	0.0	-2.4
SHAULA	26 34.5	S37 07.0	+ 3 55.5	163.0	-11.5	0.0	0.0	-11.5