

Ver 7a
USNO
Star Eph

15-Jan-20 : Date DOY: 15
2018 Wed

057	41	25.9
0	0	1.3
0	0	1.7

Average Astro Azimuth to BS
Std Dev Direct -13
Std Dev Reverse D-R sec.

057	41	33.5
059	22	21.3

Geo Azimuth Astro 39 38 22.347 Latitude
Grid Azimuth Astro 077 38 08.142 Longitude

Latitude 39 38 16.65
Longitude 77 37 56.35

Sun Select Sun Star
Left Sun Center Left Right

1339.243 BS Angle 075 19 56.7 Direct

UT1	AZ	Sun	Elev.	Eph. Data
18	37	8.3	Residual	Az DD.dddd DD.dd GHA Decl.

DUT+Clock corr 63779.81 seconds
LaPlace corr 7.52 seconds
Xi 5.70 seconds
Eta -9.08 seconds
Grid convergence -1.67994794 DD.dddd
UTM Zone 18

Time settings:
DUT -0.20
Stop Watch 17 43 0.01 UTC of 0:00
Source: SW For Stop Watch times use table below

15-Jan-20	Max Elev	29.233	Degrees
Local Transit UT1	17	19	49.7
Greenwich Transit	12	09	12.5
Leng. of Day Solar	24	00	21.4

2016
Sun
Aldebaran
Altair
Antares
Arcturus
Betelgeuse
Capella
Deneb
Fomalhaut
Polaris
Pollux
Procyon
Regulus
Rigel
Saturn
Sirius
Spica
Vega
Jupiter

Enter Date and Times in UTC.
(If times entered are UT1, then set 0.0 DUT)
Note: Astronomic Az + LaPlace = Geodetic Az
Note: Geodetic Az - convergence = Grid Az
DUT, LaPlace, and Grid conv. can be negative or positive
To determine the LaPlace correction, visit: http://www.ngs.noaa.gov/cgi-bin/GEOID_STUFF/deflec12A_prompt.prl
Source of ephemeris data: <http://www.cadastral.com/2015sephs.htm>
To include/exclude an observation in the average and Std. Dev., enter a 1 or null in the I/O column.
The upper and lower sections are for Direct and Reverse.
The time of the ephemeris data is in GMT, which is also known as UT1.
GMT is offset by DUT to approximate UTC. Therefore, UTC + DUT = GMT. (GMT - DUT = UTC)
For current DUT value visit: <http://stiarnhimlen.se/comp/time.html#deltat72p>
DUT may be negative or positive. <http://toshi.nofs.navy.mil/ser7/ser7.dat>
For Polaris transit time is upper columnation. Elongation occurs approx. 6 hrs before and after that time.

3867.300	FS angle	217	32	08.2	1	57	41	27.6	-8.3	200.19737	26.6181	96.95808	-21.11752
3894.300	FS angle	219	03	15.7	1	57	41	17.9	1.5	201.7123	26.1996	98.48020	-21.11675
3874.300	FS angle	217	55	45.7	1	57	41	21.8	-2.5	200.5892	26.5130	97.35032	-21.11732
3877.300	FS angle	218	05	53.2	1	57	41	18.4	0.9	200.7569	26.4674	97.51848	-21.11723
3880.300	FS angle	218	16	00.7	1	57	41	19.8	-0.5	200.9259	26.4210	97.68815	-21.11715
3884.300	FS angle	218	29	30.7	1	57	41	19.5	-0.2	201.1507	26.3586	97.91409	-21.11703
3887.300	FS angle	218	39	38.2	1	57	41	19.4	-0.1	201.3193	26.3114	98.08380	-21.11695
3891.300	FS angle	218	53	08.2	1	57	41	18.4	0.9	201.5438	26.2478	98.31016	-21.11683
4539.278	BS Angle	255	20	03.8	Reverse								
702.300	FS angle	039	30	15.7	1	57	41	29.8	2.7	202.1633	26.0686	98.93642	-21.11652
705.300	FS angle	039	40	23.2	1	57	41	32.3	0.3	202.3326	26.0186	99.10805	-21.11643
708.300	FS angle	039	50	30.7	1	57	41	34.5	-2.0	202.5019	25.9683	99.27984	-21.11634
711.300	FS angle	040	00	38.2	1	57	41	34.8	-2.2	202.6706	25.9177	99.45125	-21.11626
715.300	FS angle	040	14	08.2	1	57	41	32.0	0.5	202.8946	25.8498	99.67928	-21.11614
718.300	FS angle	040	24	15.7	1	57	41	32.1	0.4	203.0633	25.7982	99.85116	-21.11605
721.300	FS angle	040	34	23.2	1	57	41	31.4	1.2	203.2317	25.7462	100.02299	-21.11597
724.300	FS angle	040	44	30.7	1	57	41	33.6	-1.1	203.4009	25.6936	100.19590	-21.11588

Average D/R	057	41	25.9	Both
Std D/R average	0.0	0.0	1.5	
Az Dir Average	057	41	19.3	Direct
Std Dev Dir	0.0	0.0	1.3	
Az Rev Average	057	41	32.6	Reverse
Std Dev Rev	0.0	0.0	1.7	

Note: Initial Stop Watch time 0:00:00.x. SW must be less than 0.3" off of a UTC integer second initial time for AutoUTC time calculation
Enter Stop Watch time and observed UTC time. For UTC only select UT above. Enter 1 or Null to accept/reject.

SW hr	min	sec	UTC HR	MIN	SEC	Seconds	Seconds	IN / OUT	Resid	
1	0	00	00.00	17	43	00.01	63780.01	63780.01	1	0.00
2				17	42	60.00				
3				17	42	60.00				
4				17	42	60.00				
5				17	42	60.00				
6				17	42	60.00				
7				17	42	60.00				
8				17	42	60.00				
9				17	42	60.00				
10				17	42	60.00				
11				17	42	60.00				
12				17	42	60.00				
						63780.01	63780.01	Avg. UTC Seconds		
						#DIV/0!	#DIV/0!	Stand Dev		
						17	43	0.01	Average UTC	

Utilities				
01-Jan-16	1877	GPS Week	6-Jan-80	GPS week caclator
Hr	Min	Sec	DOW	
20	42	55.5	3	HMS to weeksecond
333775.5	GSP weeksec. DOW Sun=0 Sat=6			
Weeksec	Sunday=0	Saturday=6		
333775.5	DOW			Weeksecond to HMS
20	42	55.5	3	
Degrees	Minutes	Seconds	Decimal	
1	38	43.30	1.6453611	DMS to DD.ddd
Positive numbers only				
Decimal	Degrees	Minutes	Seconds	
1.6453518	1	38	43.27	DD.ddd to DMS
Mils	Degrees	Minutes	Seconds	
3222.00	181	14	15.3	Mils to DMS