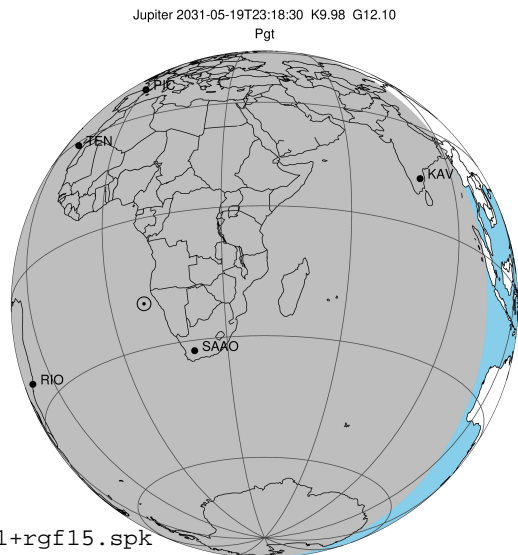


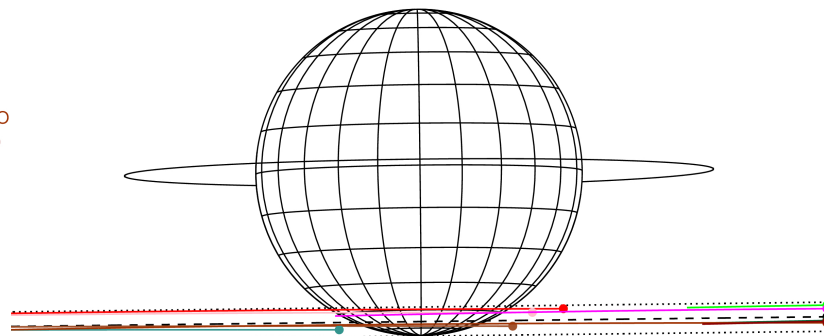
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-05-19T23:18:30.380
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068854379026923008
 2Mass ID (if available) : 17455647-2253377

Jupiter 2031-05-19T23:18:30 K9.98 G12.10 Pgt

ICRS Star Coord at Epoch: 17h 45m 56.45162s -22:53:37.80839s
 RUWE (>1.4 is poor) : 0.92
 K magnitude : 9.983
 G magnitude : 12.098
 RP magnitude : 11.391
 BP magnitude : 12.643
 DUPflag : 0
 Distance (au) : 4.378
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -12.90
 Sun-Target sep (deg) : 151.59
 Sun-Moon sep (deg) : 136.50
 B (ring opening deg) : -2.60
 PA of pole (deg) : 0.68
 Pole direction: RA (deg): 268.05694
 Dec (deg): 64.49651
 C/A sky separation (") : 20.571
 C/A sky separation (km) : 65312.0
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk



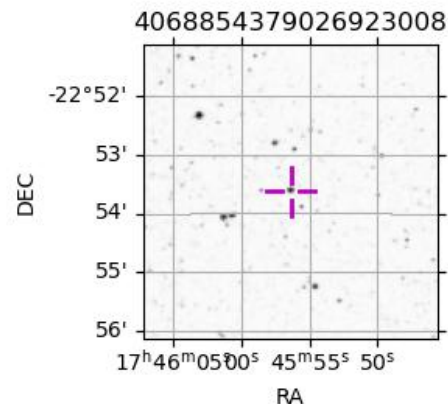
Earth
 PIC
 PMO
 TEN
 KAV
 RIO
 ESO
 AAT
 SAAO
 MSO



2031-05-19T23:18:30.3800 α: 17 45 56.4516 δ: -22 53 37.808 C/A ***** PA 0.68 deg v_sky -12.90 km/s D 04.38 AU
 Credit: Styled after SORA/Lucky Star

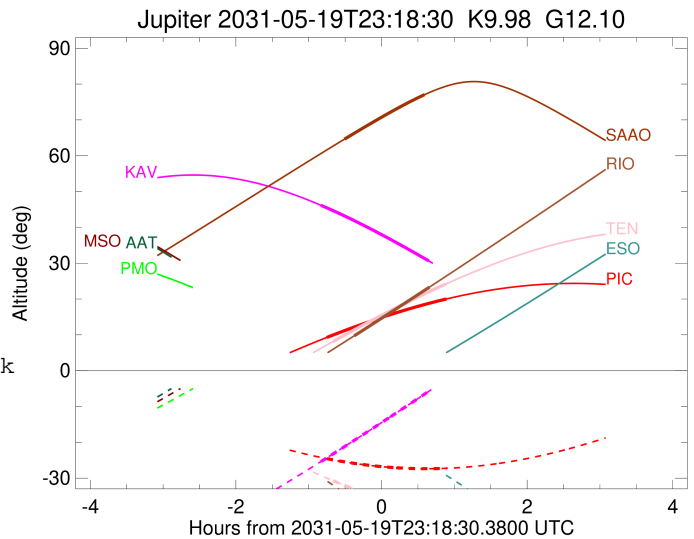
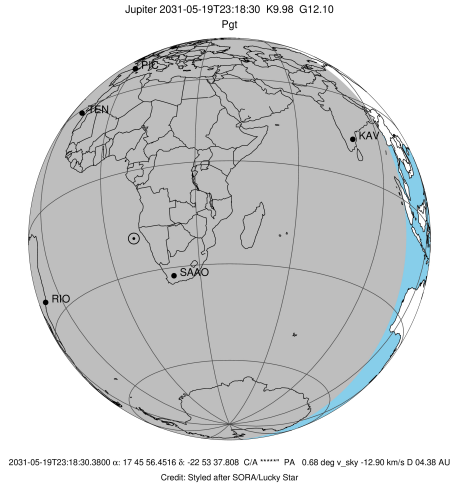
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+ +	MAY 19 22:33 - MAY 20 00:12	Pie
PAL	Palomar Mt (200")	33.4	243.1			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4			Pnn
MCD	McDonald Obs. 2.7m	30.7	256.0			Pnn
TEN	Teide Obs./Tenerife	28.3	343.5	+ +	MAY 19 22:38 - MAY 20 00:11	Pie
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+ +	MAY 19 22:28 - MAY 19 23:57	Pie
RIO	Rio de Janeiro	-22.9	316.8	+ +	MAY 19 22:55 - MAY 19 23:58	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3			Pnn
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	MAY 19 22:48 - MAY 19 23:53	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-19T23:22:50.620
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : PIC
Location            : Pic du Midi
Latitude (deg)      : 42.93656
E. Longitude (deg)  : 0.14231
Altitude (km)       : 2.890
Gaia source ID      : 4068854379026923008
2Mass ID (if available) : 17455647-2253377
ICRS Star Coord at Epoch: 17h 45m 56.45162s -22:53:37.80839s
RUWE (>1.4 is poor) : 0.92
K magnitude          : 9.983
G magnitude          : 12.098
RP magnitude         : 11.391
BP magnitude         : 12.643
DUPflag             : 0
Distance (au)        : 4.378
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.90
Sun-Target sep (deg) : 151.59
Sun-Moon sep (deg)   : 136.35
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.68
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 18.877
C/A sky separation (km) : 59933.5
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLv1.spk
naif0012.tls
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
jup365.bsp
urall6.bsp
IAU_SATURN_for_RINGFIT.tpc
pck00010.tpc
earth_200101_990628_predict.bpc
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
```

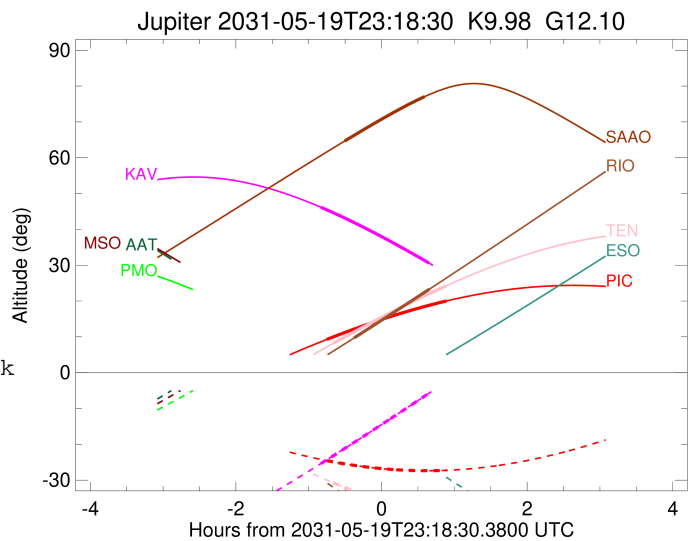
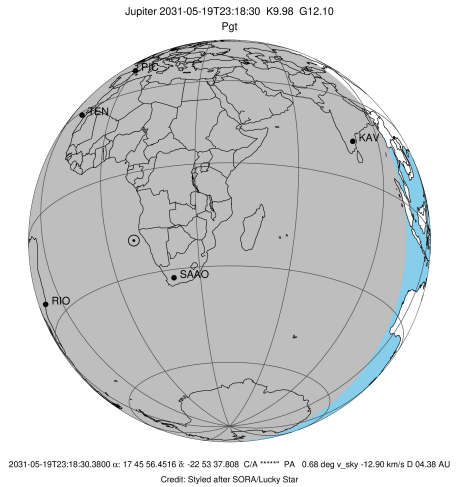


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-19T22:33:28.857	9.28	-24.56	71485.4	-57.29	-60.53
Jupiter	E	2031-05-20T00:11:59.862	20.01	-27.25	71485.5	-56.57	-59.85

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-19T23:25:16.540
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : TEN
Location            : Teide Obs./Tenerife
Latitude (deg)      : 28.30050
E. Longitude (deg)  : 343.48909
Altitude (km)       : 2.395
Gaia source ID      : 4068854379026923008
2Mass ID (if available) : 17455647-2253377
ICRS Star Coord at Epoch: 17h 45m 56.45162s -22:53:37.80839s
RUWE (>1.4 is poor) : 0.92
K magnitude          : 9.983
G magnitude          : 12.098
RP magnitude         : 11.391
BP magnitude         : 12.643
DUPflag             : 0
Distance (au)        : 4.378
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.90
Sun-Target sep (deg) : 151.59
Sun-Moon sep (deg)   : 136.19
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.68
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation ("): 19.314
C/A sky separation (km): 61321.0
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLv1.spk
naif0012.tls
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
jup365.bsp
urall6.bsp
IAU_SATURN_for_RINGFIT.tpc
pck00010.tpc
earth_200101_990628_predict.bpc
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
```

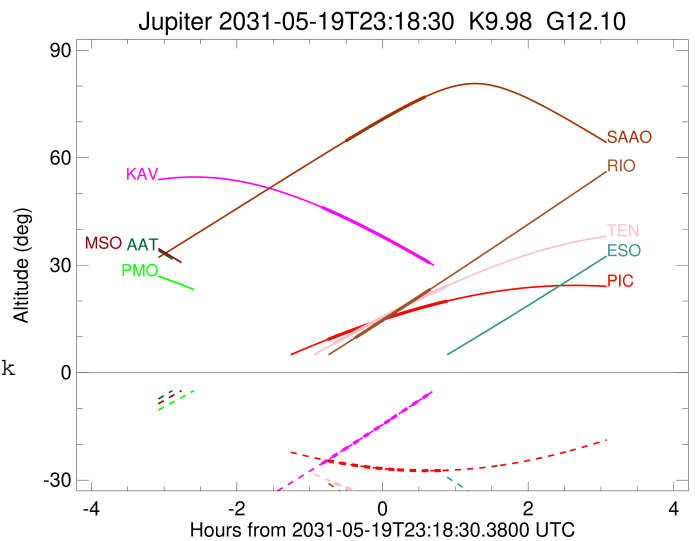
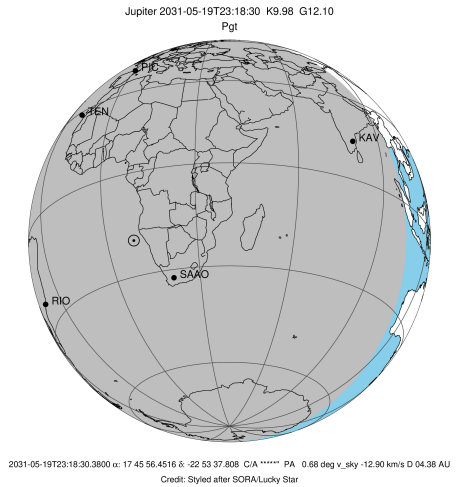


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-19T22:38:34.951	8.15	-30.72	71485.1	-59.58	-62.67
Jupiter	E	2031-05-20T00:11:41.468	24.21	-40.43	71485.2	-58.45	-61.62

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-19T23:13:00.380
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : KAV
Location            : Kavalur Observatory
Latitude (deg)      : 12.57556
E. Longitude (deg)  : 78.83167
Altitude (km)       : 0.722
Gaia source ID      : 4068854379026923008
2Mass ID (if available) : 17455647-2253377
ICRS Star Coord at Epoch: 17h 45m 56.45162s -22:53:37.80839s
RUWE (>1.4 is poor) : 0.92
K magnitude          : 9.983
G magnitude          : 12.098
RP magnitude         : 11.391
BP magnitude         : 12.643
DUPflag             : 0
Distance (au)       : 4.378
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.90
Sun-Target sep (deg) : 151.59
Sun-Moon sep (deg)  : 137.30
B (ring opening deg) : -2.60
PA of pole (deg)    : 0.68
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 19.556
C/A sky separation (km) : 62089.5
NAIF SPICE kernels  : RAJobs_U111+rgf15.spk
URKALLv1.spk
naif0012.tls
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
jup365.bsp
urall6.bsp
IAU_SATURN_for_RINGFIT.tpc
pck00010.tpc
earth_200101_990628_predict.bpc
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
```

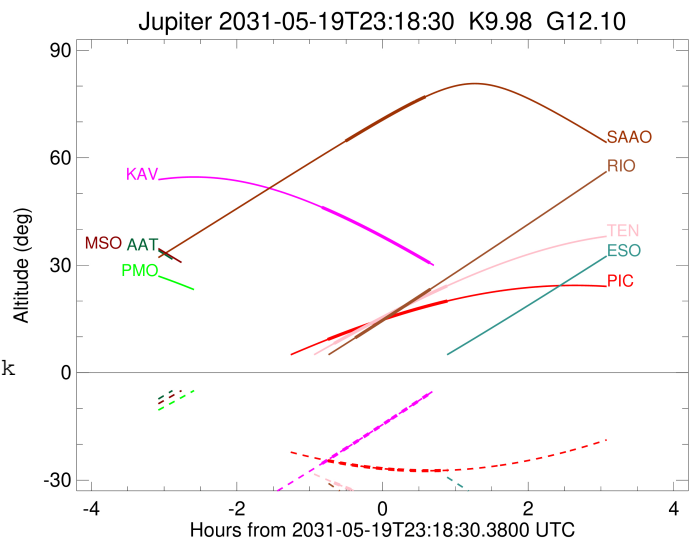
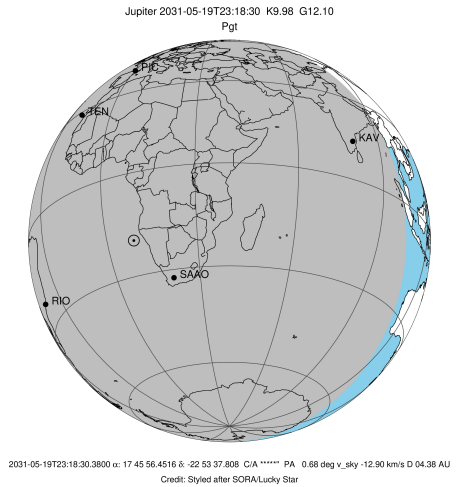


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-19T22:28:38.437	46.16	-25.36	71485.1	-59.80	-62.87
Jupiter	E	2031-05-19T23:57:31.919	30.61	-5.75	71484.9	-60.70	-63.71

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-19T23:27:05.550
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : RIO
Location             : Rio de Janeiro
Latitude (deg)       : -22.89506
E. Longitude (deg)   : 316.77708
Altitude (km)        : 0.033
Gaia source ID       : 4068854379026923008
2Mass ID (if available) : 17455647-2253377
ICRS Star Coord at Epoch: 17h 45m 56.45162s -22:53:37.80839s
RUWE (>1.4 is poor) : 0.92
K magnitude           : 9.983
G magnitude           : 12.098
RP magnitude          : 11.391
BP magnitude          : 12.643
DUPflag              : 0
Distance (au)         : 4.378
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -12.90
Sun-Target sep (deg)  : 151.59
Sun-Moon sep (deg)   : 136.05
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.68
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 21.191
C/A sky separation (km) : 67279.7
NAIF SPICE kernels   : RAJobs_U111+rgf15.spk
URKALLv1.spk
naif0012.tls
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
jup365.bsp
urall6.bsp
IAU_SATURN_for_RINGFIT.tpc
pck00010.tpc
earth_200101_990628_predict.bpc
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
```

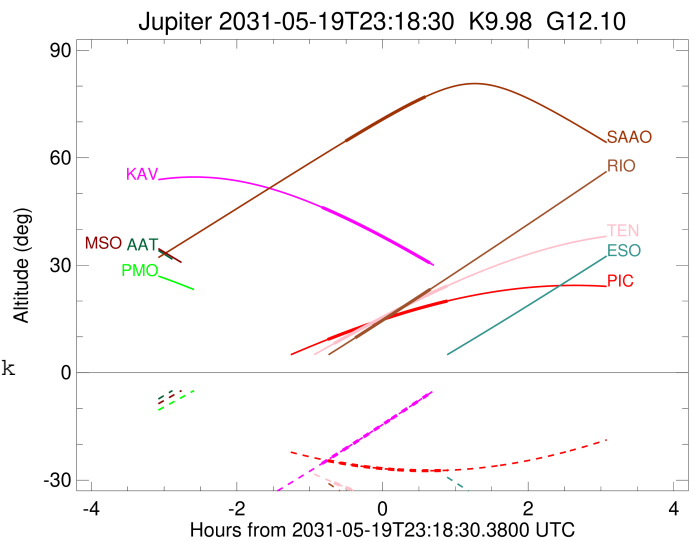
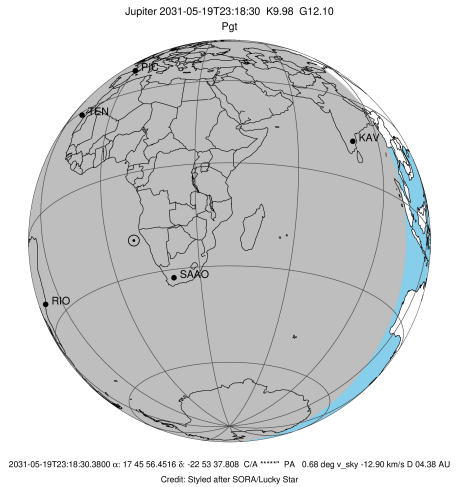


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-19T22:55:59.394	9.71	-35.91	71483.7	-70.81	-72.96
Jupiter	E	2031-05-19T23:58:02.374	23.32	-50.12	71483.9	-69.38	-71.66

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-19T23:21:02.010
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : SAAO
Location              : So. Afr. Astro. Obs. (Sutherland)
Latitude (deg)        : -32.37953
E. Longitude (deg)    : 20.81070
Altitude (km)         : 1.768
Gaia source ID        : 4068854379026923008
2Mass ID (if available) : 17455647-2253377
ICRS Star Coord at Epoch: 17h 45m 56.45162s -22:53:37.80839s
RUWE (>1.4 is poor) : 0.92
K magnitude           : 9.983
G magnitude           : 12.098
RP magnitude          : 11.391
BP magnitude          : 12.643
DUPflag              : 0
Distance (au)         : 4.378
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -12.90
Sun-Target sep (deg)  : 151.59
Sun-Moon sep (deg)   : 136.90
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.68
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 20.935
C/A sky separation (km) : 66465.5
NAIF SPICE kernels   : RAJobs_U111+rgf15.spk
URKALLv1.spk
naif0012.tls
nep097.bsp
nep101.bsp
sat4401.bsp
de440.bsp
earth_720101_070426.bpc
jup365.bsp
urall6.bsp
IAU_SATURN_for_RINGFIT.tpc
pck00010.tpc
earth_200101_990628_predict.bpc
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
```



x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-19T22:48:01.884	64.63	-77.24	71484.0	-68.52	-70.88
Jupiter	E	2031-05-19T23:53:58.520	77.04	-68.15	71484.0	-68.08	-70.49