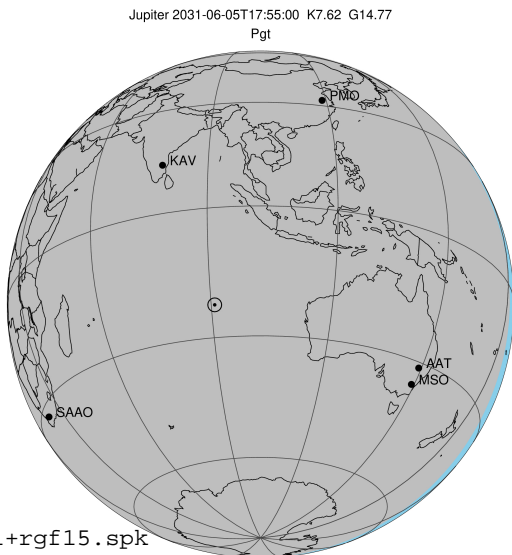


target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-06-05T17:55:00.230
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116741241514281728
 2Mass ID (if available) : 17374623-2251286

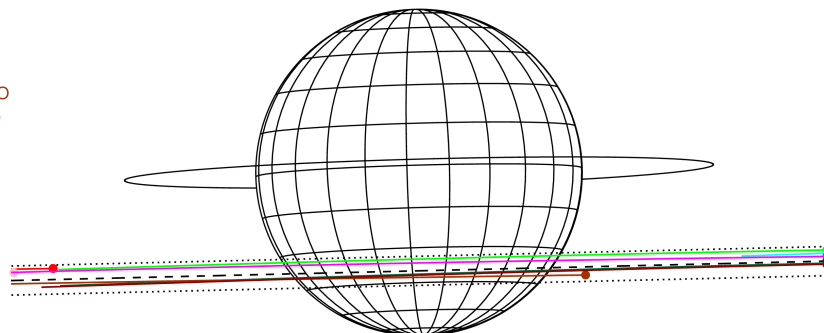
Jupiter 2031-06-05T17:55:00 K7.62 G14.77 Pgt

ICRS Star Coord at Epoch: 17h 37m 46.24079s -22:51:28.82781s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 7.620
 G magnitude : 14.769
 RP magnitude : 13.121
 BP magnitude : 18.734
 DUPflag : 0
 Distance (au) : 4.283
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -15.95
 Sun-Target sep (deg) : 169.56
 Sun-Moon sep (deg) : 7.08
 B (ring opening deg) : -2.60
 PA of pole (deg) : 1.56
 Pole direction: RA (deg): 268.05693
 Dec (deg): 64.49651
 C/A sky separation (") : 13.862
 C/A sky separation (km) : 43059.1
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLv1.spk
 naif0012.tls
 nep097.bsp
 nep101.bsp
 sat4401.bsp



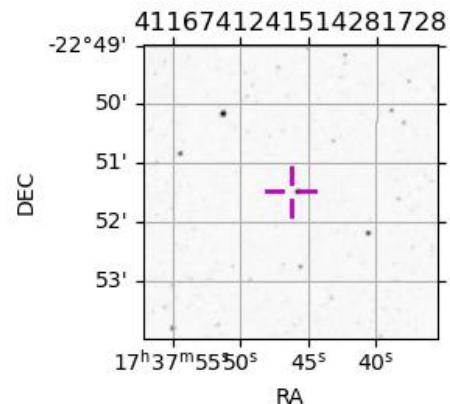
2031-06-05T17:55:00.2300 α: 17 37 46.2408 δ: -22 51 28.828 C/A ***** PA 1.37 deg v_sky -15.95 km/s D 04.28 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 PMO
 TEN
 IRTF
 KAV
 AAT
 SAAO
 MSO



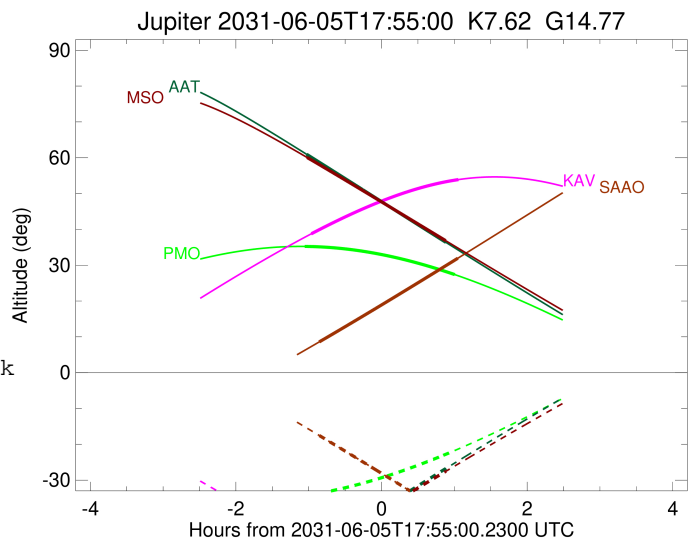
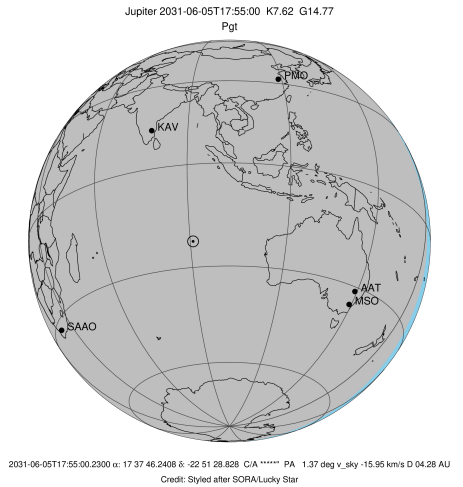
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1			Pnn
PAL	Palomar Mt (200")	33.4	243.1			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+ +	JUN 05 16:51 - JUN 05 18:55	Pie
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			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+ +	JUN 05 16:57 - JUN 05 18:58	Pie
RIO	Rio de Janeiro	-22.9	316.8			Pnn
ESO	European Southern Obs. (3.6m)	-29.3	289.3			Pnn
AAT	Siding Spring (AAT)	-31.3	149.1	+ +	JUN 05 16:53 - JUN 05 18:48	Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	JUN 05 17:03 - JUN 05 18:57	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	JUN 05 16:53 - JUN 05 18:47	Pie



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-06-05T17:53:26.940
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : PMO
Location              : Purple Mtn Obs. Nanking
Latitude (deg)        : 32.06667
E. Longitude (deg)    : 118.82089
Altitude (km)         : 0.364
Gaia source ID        : 4116741241514281728
2Mass ID (if available) : 17374623-2251286
ICRS Star Coord at Epoch: 17h 37m 46.24079s -22:51:28.82781s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 7.620
G magnitude           : 14.769
RP magnitude          : 13.121
BP magnitude          : 18.734
DUPflag              : 0
Distance (au)         : 4.283
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.95
Sun-Target sep (deg) : 169.56
Sun-Moon sep (deg)   : 7.25
B (ring opening deg) : -2.60
PA of pole (deg)     : 1.56
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 12.204
C/A sky separation (km) : 37907.9
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
    
```

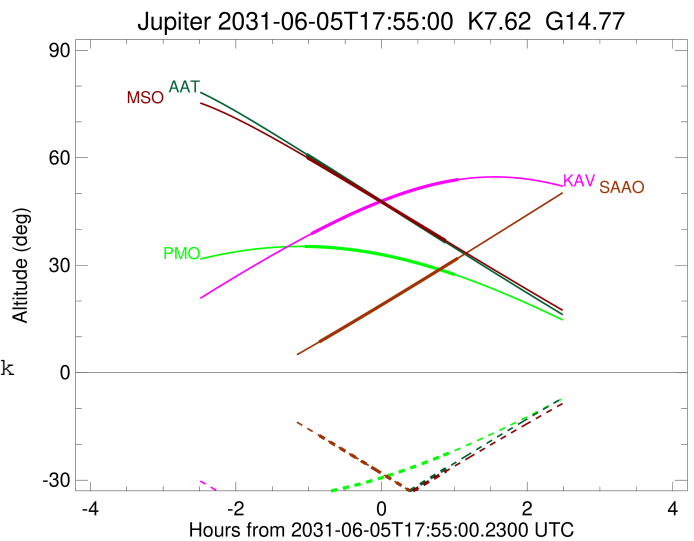
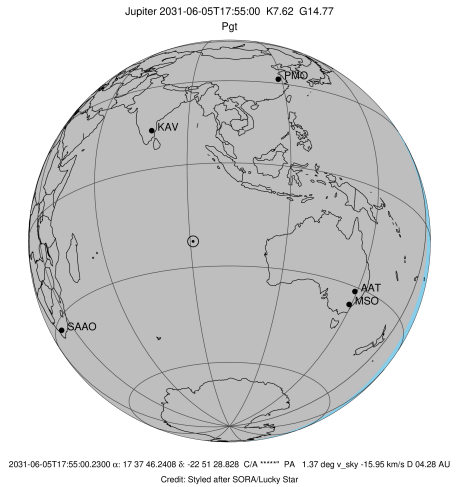


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-05T16:51:40.798	35.23	-34.32	71489.4	-32.13	-35.61
Jupiter	E	2031-06-05T18:55:18.889	27.38	-21.74	71489.4	-31.99	-35.46

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch              : 2031-06-05T17:57:46.770
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        : 4116741241514281728
2Mass ID (if available) : 17374623-2251286
ICRS Star Coord at Epoch: 17h 37m 46.24079s -22:51:28.82781s
RUWE (>1.4 is poor)  : 0.96
K magnitude            : 7.620
G magnitude            : 14.769
RP magnitude          : 13.121
BP magnitude          : 18.734
DUPflag               : 0
Distance (au)         : 4.283
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -15.95
Sun-Target sep (deg)  : 169.56
Sun-Moon sep (deg)    : 6.68
B (ring opening deg)  : -2.60
PA of pole (deg)      : 1.56
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 12.750
C/A sky separation (km) : 39605.0
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
    
```

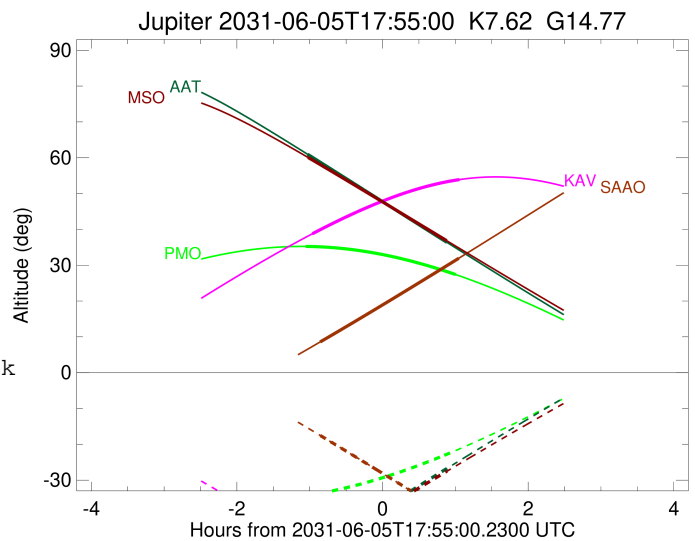
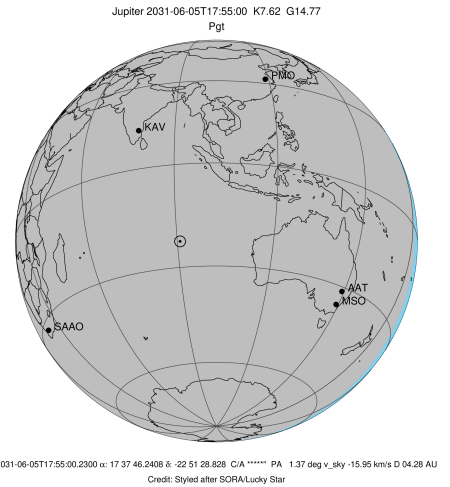


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-05T16:57:07.808	38.75	-46.35	71489.1	-34.13	-37.70
Jupiter	E	2031-06-05T18:58:14.318	53.88	-54.73	71489.2	-33.22	-36.75

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-06-05T17:50:35.160
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : AAT
Location             : Siding Spring (AAT)
Latitude (deg)       : -31.27703
E. Longitude (deg)   : 149.06608
Altitude (km)        : 1.164
Gaia source ID       : 4116741241514281728
2Mass ID (if available) : 17374623-2251286
ICRS Star Coord at Epoch: 17h 37m 46.24079s -22:51:28.82781s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 7.620
G magnitude           : 14.769
RP magnitude         : 13.121
BP magnitude         : 18.734
DUPflag              : 0
Distance (au)        : 4.283
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.95
Sun-Target sep (deg) : 169.56
Sun-Moon sep (deg)   : 7.85
B (ring opening deg) : -2.60
PA of pole (deg)     : 1.56
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 14.337
C/A sky separation (km) : 44533.5
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
    
```

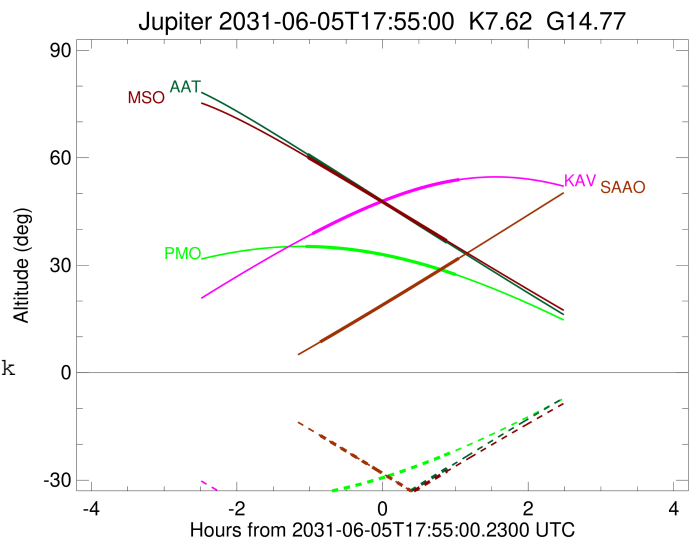
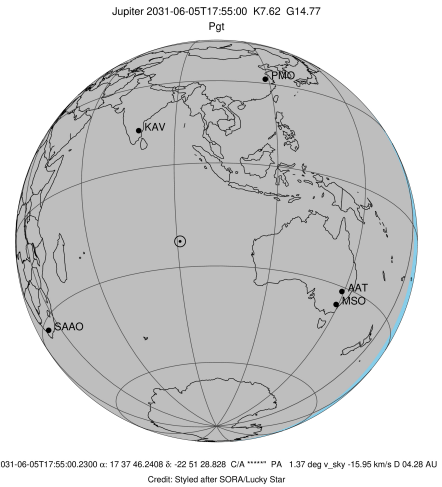


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-05T16:53:19.412	60.94	-51.15	71488.4	-38.36	-42.04
Jupiter	E	2031-06-05T18:48:05.475	36.38	-26.74	71488.4	-38.71	-42.40

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-06-05T18:00:56.710
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       : 4116741241514281728
2Mass ID (if available) : 17374623-2251286
ICRS Star Coord at Epoch: 17h 37m 46.24079s -22:51:28.82781s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 7.620
G magnitude           : 14.769
RP magnitude         : 13.121
BP magnitude         : 18.734
DUPflag              : 0
Distance (au)        : 4.283
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.95
Sun-Target sep (deg) : 169.56
Sun-Moon sep (deg)   : 6.42
B (ring opening deg) : -2.60
PA of pole (deg)     : 1.56
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 14.787
C/A sky separation (km) : 45931.8
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
    
```

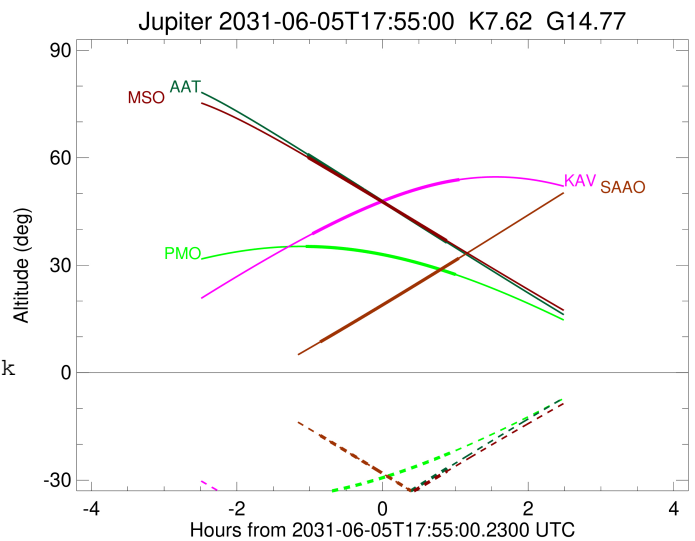
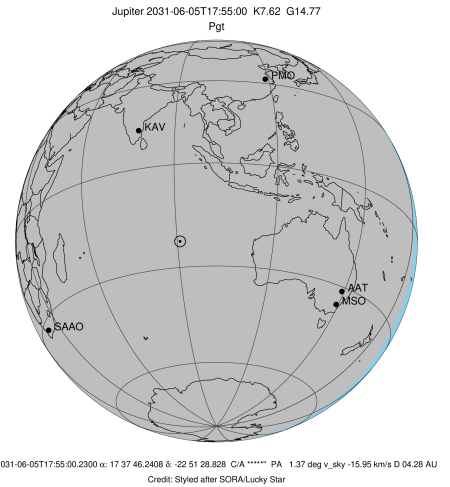


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-05T17:03:46.834	8.60	-17.55	71488.1	-40.67	-44.38
Jupiter	E	2031-06-05T18:57:44.813	31.91	-41.27	71488.3	-39.21	-42.91

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-06-05T17:50:46.380
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : MSO
Location              : Mt. Stromlo Observatory
Latitude (deg)       : -35.32000
E. Longitude (deg)   : 149.00833
Altitude (km)        : 0.770
Gaia source ID       : 4116741241514281728
2Mass ID (if available) : 17374623-2251286
ICRS Star Coord at Epoch: 17h 37m 46.24079s -22:51:28.82781s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 7.620
G magnitude           : 14.769
RP magnitude         : 13.121
BP magnitude         : 18.734
DUPflag              : 0
Distance (au)        : 4.283
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.95
Sun-Target sep (deg) : 169.56
Sun-Moon sep (deg)  : 7.84
B (ring opening deg) : -2.60
PA of pole (deg)    : 1.56
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 14.471
C/A sky separation (km) : 44948.7
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	2031-06-05T16:53:48.035	60.04	-50.79	71488.4	-38.80	-42.49
Jupiter	E	2031-06-05T18:47:58.485	36.82	-27.54	71488.3	-39.12	-42.82