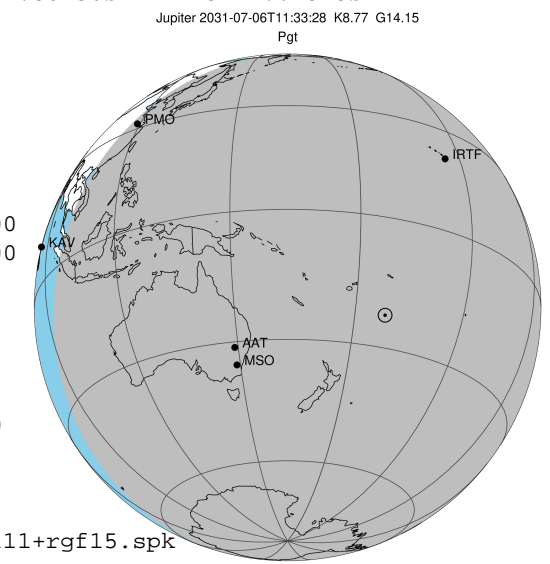


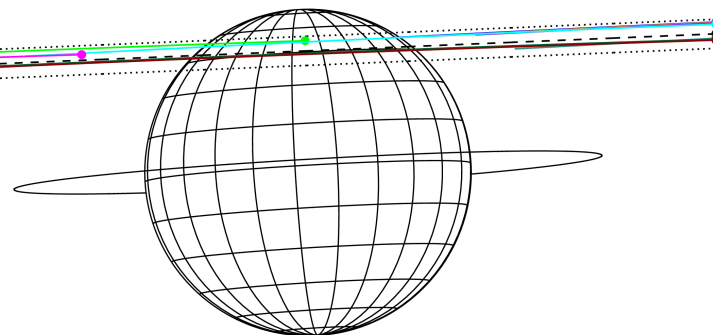
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-07-06T11:33:28.070
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4114655772822914304
 2Mass ID (if available) : 17212280-2243175

Jupiter 2031-07-06T11:33:28 K8.77 G14.15 Pgt

ICRS Star Coord at Epoch: 17h 21m 22.80230s -22:43:17.61573s
 RUWE (>1.4 is poor) : 1.07
 K magnitude : 8.767
 G magnitude : 14.146
 RP magnitude : 12.746
 BP magnitude : 16.599
 DUPflag : 0
 Distance (au) : 4.321
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -14.22
 Sun-Target sep (deg) : 157.30
 Sun-Moon sep (deg) : 46.96
 B (ring opening deg) : -2.58
 PA of pole (deg) : 3.32
 Pole direction: RA (deg): 268.05690
 Dec (deg): 64.49651
 C/A sky separation (") : 16.992
 C/A sky separation (km) : 53247.6
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk



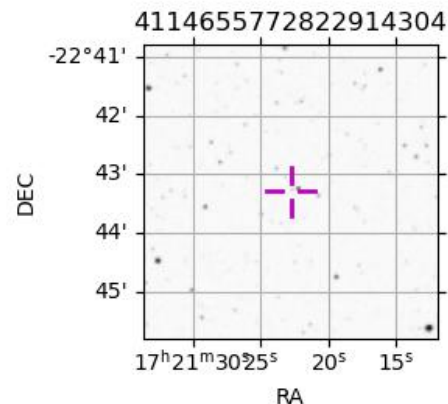
Earth
 PAL
 PMO
 KPNO
 MCD
 IRTF
 KAV
 ESO
 AAT
 MSO



2031-07-06T11:33:28.0700 a: 17 21 22.8023 s: -22 43 17.616 C/A ***** PA 182.39 deg v_sky -14.22 km/s D 04.32 AU
 Credit: Styled after SORA/Lucky Star

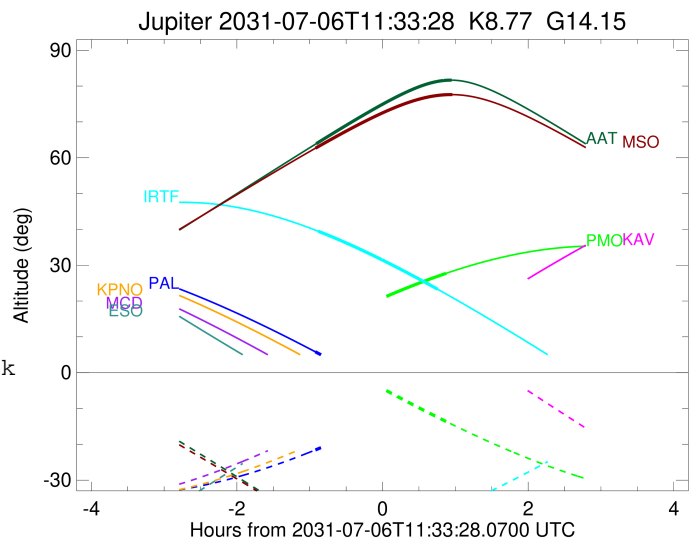
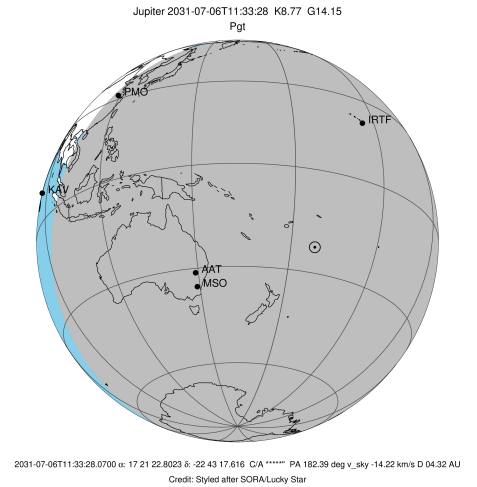
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1			Pnn
PAL	Palomar Mt (200")	33.4	243.1	+	JUL 06 10:38 - JUL 06 10:38	Pin
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+	JUL 06 12:25 - JUL 06 12:25	Pne
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	+	JUL 06 10:40 - JUL 06 12:18	Pie
KAV	Kavalur Observatory	12.6	78.8			Pnn
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	+	JUL 06 10:38 - JUL 06 12:30	Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	JUL 06 10:38 - JUL 06 12:31	Pie



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-07-06T11:28:10.970
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : PAL
Location             : Palomar Mt (200")
Latitude (deg)       : 33.35622
E. Longitude (deg)   : 243.13601
Altitude (km)        : 1.706
Gaia source ID       : 4114655772822914304
2Mass ID (if available) : 17212280-2243175
ICRS Star Coord at Epoch: 17h 21m 22.80230s -22:43:17.61573s
RUWE (>1.4 is poor) : 1.07
K magnitude          : 8.767
G magnitude           : 14.146
RP magnitude         : 12.746
BP magnitude         : 16.599
DUPflag              : 0
Distance (au)        : 4.321
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.22
Sun-Target sep (deg) : 157.30
Sun-Moon sep (deg)   : 46.31
B (ring opening deg) : -2.58
PA of pole (deg)     : 3.32
Pole direction: RA (deg): 268.05690
Dec (deg): 64.49651
C/A sky separation ("): 18.213
C/A sky separation (km): 57072.1
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
    
```

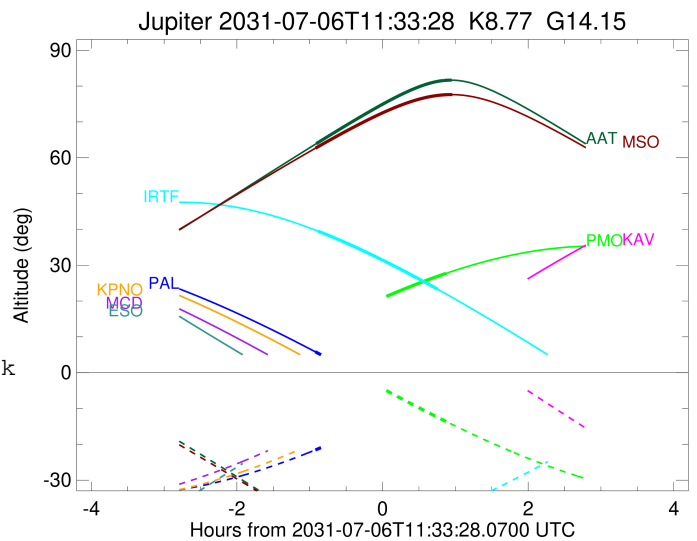
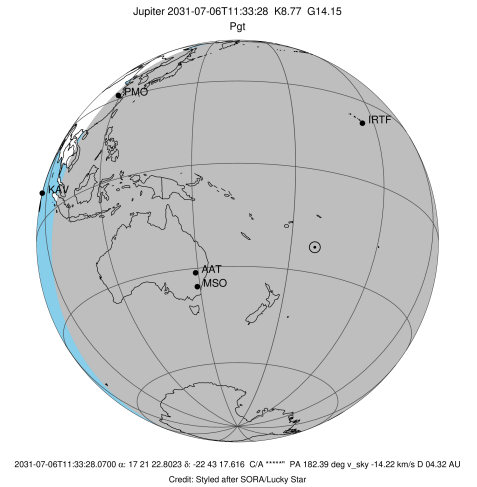


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-07-06T10:38:09.554	5.82	-21.57	71486.3	52.52	56.01
Jupiter	E	2031-07-06T12:18:30.552	-13.20x	-5.52	71486.2	53.23	56.69

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-07-06T11:37:29.180
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       : 4114655772822914304
2Mass ID (if available) : 17212280-2243175
ICRS Star Coord at Epoch: 17h 21m 22.80230s -22:43:17.61573s
RUWE (>1.4 is poor) : 1.07
K magnitude           : 8.767
G magnitude           : 14.146
RP magnitude          : 12.746
BP magnitude          : 16.599
DUPflag              : 0
Distance (au)        : 4.321
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.22
Sun-Target sep (deg) : 157.30
Sun-Moon sep (deg)   : 47.62
B (ring opening deg) : -2.58
PA of pole (deg)     : 3.32
Pole direction: RA (deg): 268.05690
Dec (deg): 64.49651
C/A sky separation ("): 18.422
C/A sky separation (km): 57729.5
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
    
```

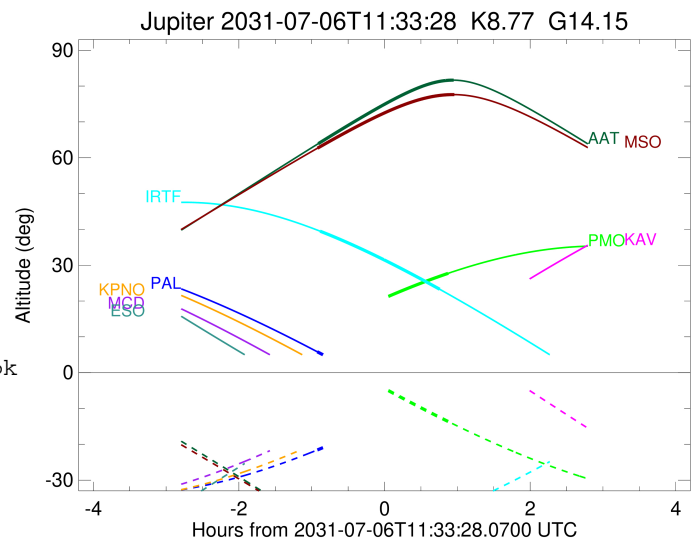
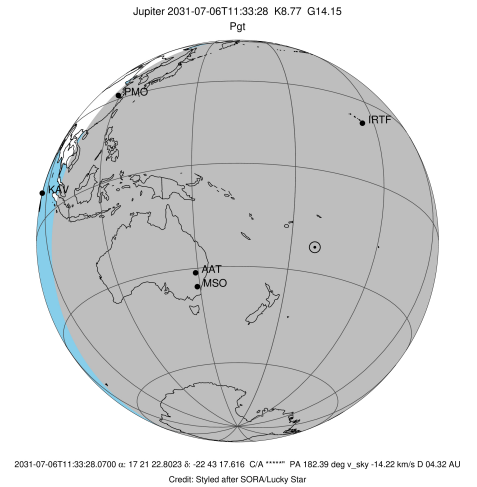


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-07-06T10:48:54.241	13.80	3.99x	71486.3	52.36	55.86
Jupiter	E	2031-07-06T12:25:54.125	27.72	-13.63	71485.9	55.11	58.48

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-07-06T11:29:31.710
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : IRTF
Location             : Mauna Kea/IRTF
Latitude (deg)       : 19.82622
E. Longitude (deg)   : 204.52800
Altitude (km)        : 4.168
Gaia source ID       : 4114655772822914304
2Mass ID (if available) : 17212280-2243175
ICRS Star Coord at Epoch: 17h 21m 22.80230s -22:43:17.61573s
RUWE (>1.4 is poor) : 1.07
K magnitude           : 8.767
G magnitude           : 14.146
RP magnitude         : 12.746
BP magnitude         : 16.599
DUPflag              : 0
Distance (au)        : 4.321
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.22
Sun-Target sep (deg) : 157.30
Sun-Moon sep (deg)   : 46.90
B (ring opening deg) : -2.58
PA of pole (deg)     : 3.32
Pole direction: RA (deg): 268.05690
Dec (deg): 64.49651
C/A sky separation ("): 18.237
C/A sky separation (km): 57149.1
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
    
```

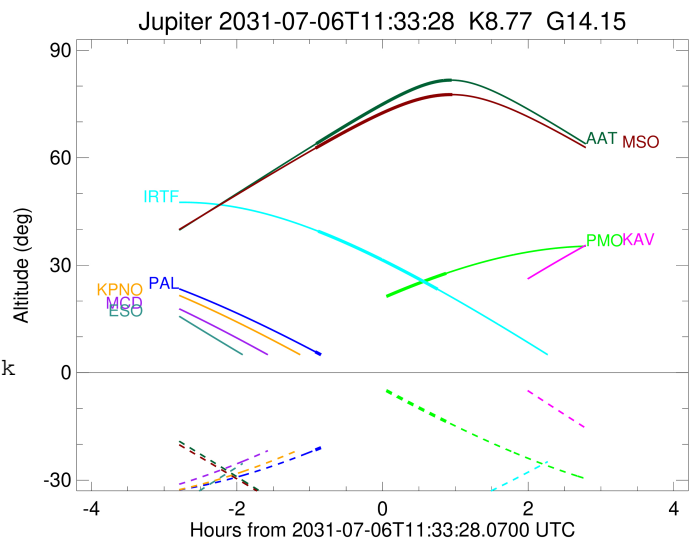
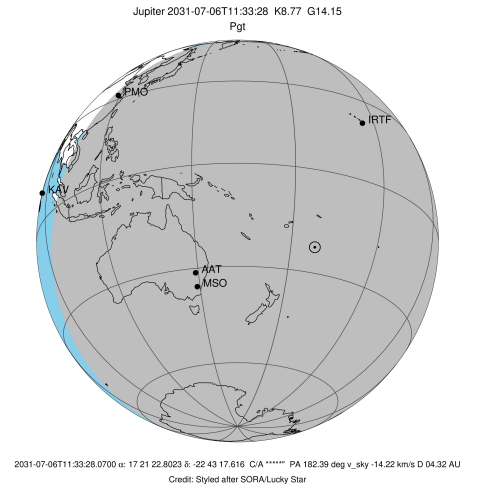


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-07-06T10:40:24.383	39.49	-47.49	71486.3	52.39	55.89
Jupiter	E	2031-07-06T12:18:52.022	23.29	-39.55	71486.2	53.49	56.93

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-07-06T11:34:43.980
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        : 4114655772822914304
2Mass ID (if available) : 17212280-2243175
ICRS Star Coord at Epoch: 17h 21m 22.80230s -22:43:17.61573s
RUWE (>1.4 is poor) : 1.07
K magnitude           : 8.767
G magnitude           : 14.146
RP magnitude          : 12.746
BP magnitude          : 16.599
DUPflag              : 0
Distance (au)         : 4.321
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.22
Sun-Target sep (deg)  : 157.30
Sun-Moon sep (deg)    : 47.84
B (ring opening deg) : -2.58
PA of pole (deg)      : 3.32
Pole direction: RA (deg): 268.05690
Dec (deg): 64.49651
C/A sky separation (") : 16.661
C/A sky separation (km) : 52211.3
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
    
```

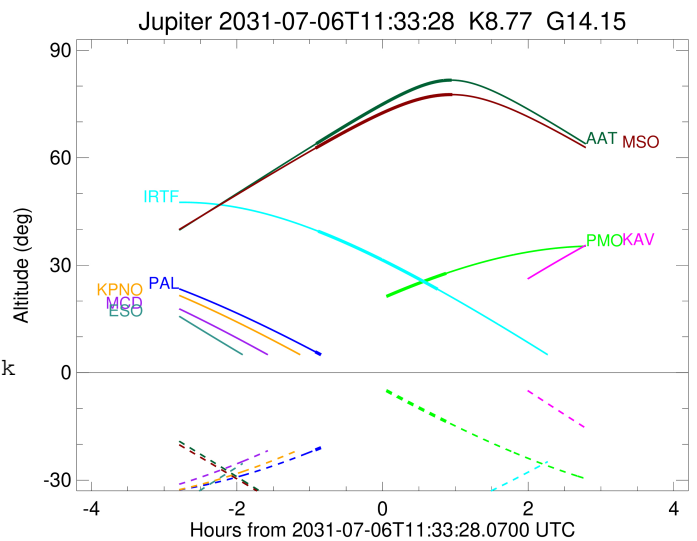
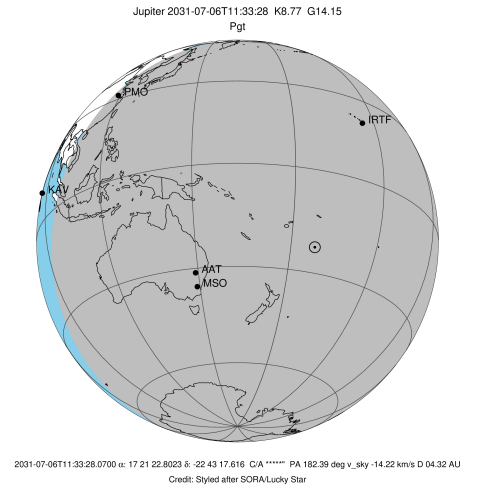


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-07-06T10:38:54.138	63.92	-42.94	71487.4	45.66	49.35
Jupiter	E	2031-07-06T12:30:30.067	81.65	-66.64	71487.0	47.91	51.56

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-07-06T11:34:39.760
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      : 4114655772822914304
2Mass ID (if available) : 17212280-2243175
ICRS Star Coord at Epoch: 17h 21m 22.80230s -22:43:17.61573s
RUWE (>1.4 is poor) : 1.07
K magnitude         : 8.767
G magnitude         : 14.146
RP magnitude        : 12.746
BP magnitude        : 16.599
DUPflag            : 0
Distance (au)       : 4.321
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -14.22
Sun-Target sep (deg) : 157.30
Sun-Moon sep (deg)  : 47.82
B (ring opening deg) : -2.58
PA of pole (deg)    : 3.32
Pole direction: RA (deg): 268.05690
Dec (deg): 64.49651
C/A sky separation (" ) : 16.522
C/A sky separation (km) : 51775.0
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	2031-07-06T10:38:14.468	62.66	-42.84	71487.4	45.16	48.86
Jupiter	E	2031-07-06T12:31:01.430	77.61	-65.35	71487.1	47.40	51.06