

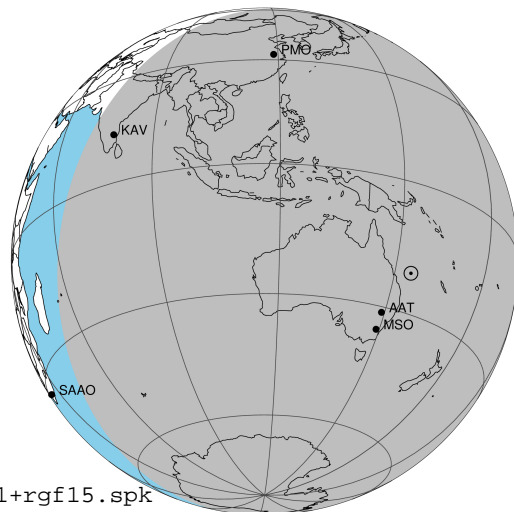
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-07-18T13:47:48.100
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4114516134844172032
 2Mass ID (if available) : 17161798-2240407

Jupiter 2031-07-18T13:47:48 K9.88 G12.45 Pgt

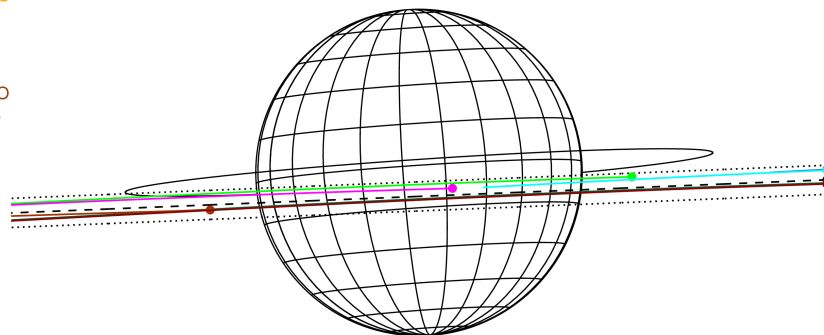
ICRS Star Coord at Epoch: 17h 16m 18.04556s -22:40:41.02329s

RUWE (>1.4 is poor) : 0.92
 K magnitude : 9.879
 G magnitude : 12.446
 RP magnitude : 11.620
 BP magnitude : 13.152
 DUPflag : 0
 Distance (au) : 4.408
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -11.11
 Sun-Target sep (deg) : 144.60
 Sun-Moon sep (deg) : 155.22
 B (ring opening deg) : -2.55
 PA of pole (deg) : 3.86
 Pole direction: RA (deg): 268.05689
 Dec (deg): 64.49652
 C/A sky separation (") : 3.273
 C/A sky separation (km) : 10463.1
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-07-18T13:47:48 K9.88 G12.45
 Pgt



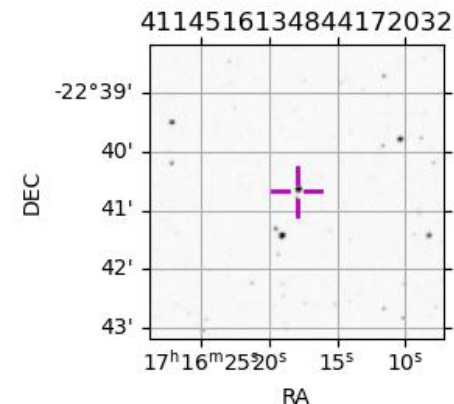
Earth
 PAL
 PMO
 KPNO
 IRTF
 KAV
 AAT
 SAAO
 MSO



2031-07-18T13:47:48.1000 a: 17 16 18.04556 s: -22 40 41.023 C/A 3.284" PA 2.33 deg v_sky -11.11 km/s D 04.41 AU
 Credit: Styled after SORA/Lucky Star

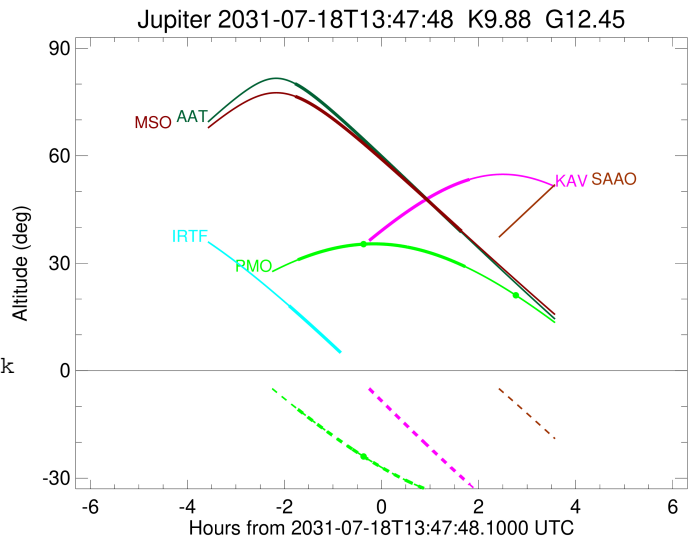
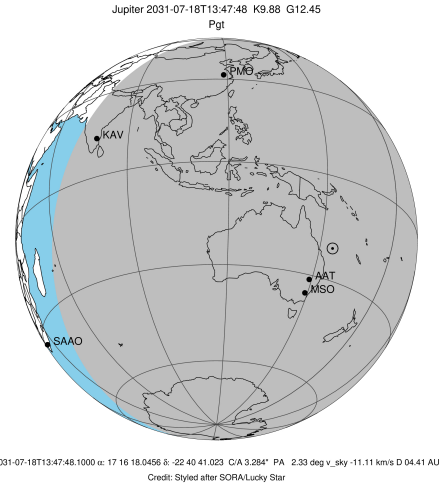
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OEncode
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	+ +	JUL 18 12:04 - JUL 18 15:31	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	+	JUL 18 11:53 - JUL 18 11:53	Pin
KAV	Kavalur Observatory	12.6	78.8	+	JUL 18 15:36 - JUL 18 15:36	Pne
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 18 12:01 - JUL 18 15:26	Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	JUL 18 12:01 - JUL 18 15:26	Pie



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target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-07-18T13:47:45.580
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       : 4114516134844172032
2Mass ID (if available) : 17161798-2240407
ICRS Star Coord at Epoch: 17h 16m 18.04556s -22:40:41.02329s
RUWE (>1.4 is poor) : 0.92
K magnitude           : 9.879
G magnitude           : 12.446
RP magnitude          : 11.620
BP magnitude          : 13.152
DUPflag              : 0
Distance (au)        : 4.408
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -11.11
Sun-Target sep (deg) : 144.60
Sun-Moon sep (deg)   : 155.35
B (ring opening deg) : -2.55
PA of pole (deg)     : 3.86
Pole direction: RA (deg): 268.05689
Dec (deg): 64.49652
C/A sky separation (") : 1.647
C/A sky separation (km) : 5265.6
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
    
```

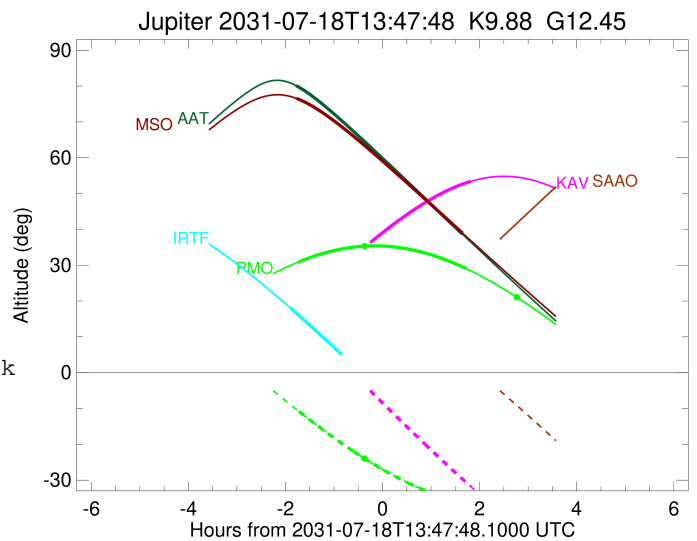
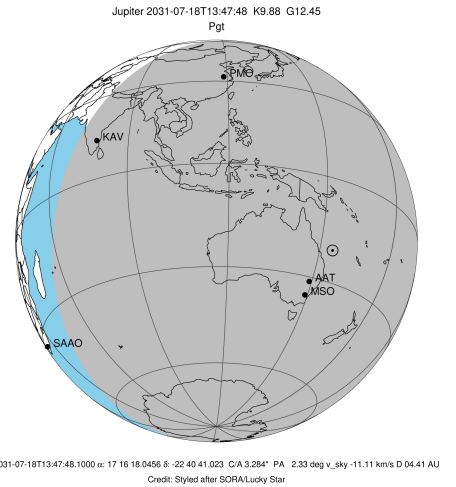


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-07-18T12:04:27.517	30.95	-10.80	71491.9	-5.96	-6.80
Jupiter	E	2031-07-18T15:31:17.348	29.03	-36.29	71492.0	-2.82	-3.22

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-07-18T13:38:45.470
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       : 4114516134844172032
2Mass ID (if available) : 17161798-2240407
ICRS Star Coord at Epoch: 17h 16m 18.04556s -22:40:41.02329s
RUWE (>1.4 is poor) : 0.92
K magnitude           : 9.879
G magnitude           : 12.446
RP magnitude          : 11.620
BP magnitude          : 13.152
DUPflag              : 0
Distance (au)        : 4.408
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -11.11
Sun-Target sep (deg) : 144.60
Sun-Moon sep (deg)   : 154.40
B (ring opening deg) : -2.55
PA of pole (deg)     : 3.86
Pole direction: RA (deg): 268.05689
Dec (deg): 64.49652
C/A sky separation (") : 2.531
C/A sky separation (km) : 8089.7
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
    
```

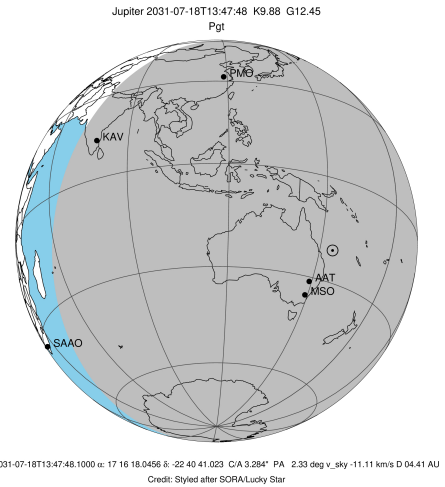


x: target alt < 5.0 deg or sun > -5.0 deg

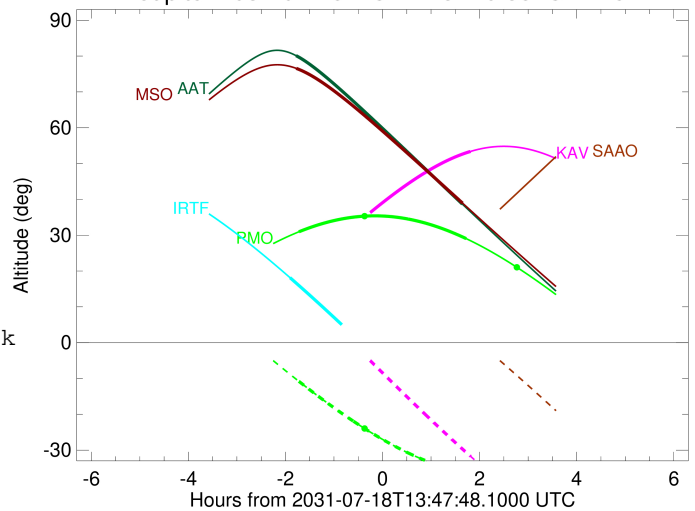
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-07-18T11:53:35.547	18.12	-44.25	71491.9	-7.23	-8.25
Jupiter	E	2031-07-18T15:26:01.927	-27.77x	-6.59	71491.9	-5.83	-6.66

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-07-18T13:53:36.060
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      : 4114516134844172032
2Mass ID (if available) : 17161798-2240407
ICRS Star Coord at Epoch: 17h 16m 18.04556s -22:40:41.02329s
RUWE (>1.4 is poor) : 0.92
K magnitude         : 9.879
G magnitude         : 12.446
RP magnitude        : 11.620
BP magnitude        : 13.152
DUPflag            : 0
Distance (au)      : 4.408
f0 (km)            : 0.00
g0 (km)            : 0.00
skyplane vel. (km/s) : -11.11
Sun-Target sep (deg) : 144.60
Sun-Moon sep (deg)  : 155.90
B (ring opening deg) : -2.55
PA of pole (deg)    : 3.86
Pole direction: RA (deg): 268.05689
Dec (deg): 64.49652
C/A sky separation (" ) : 2.311
C/A sky separation (km) : 7388.4
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
    
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Jupiter 2031-07-18T13:47:48 K9.88 G12.45

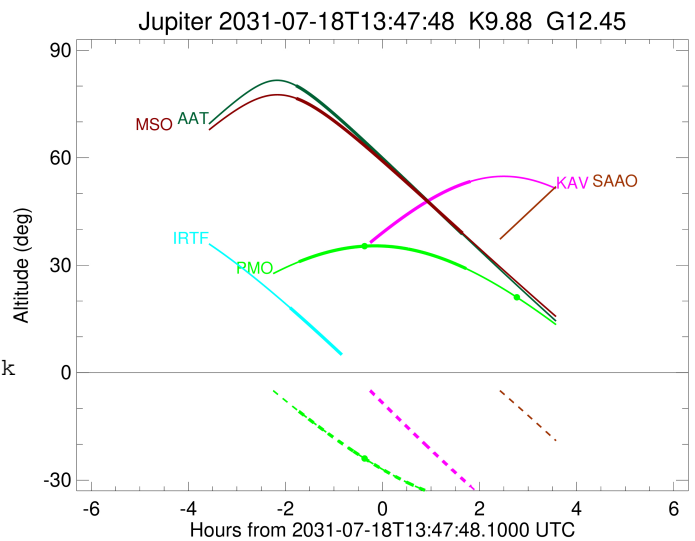
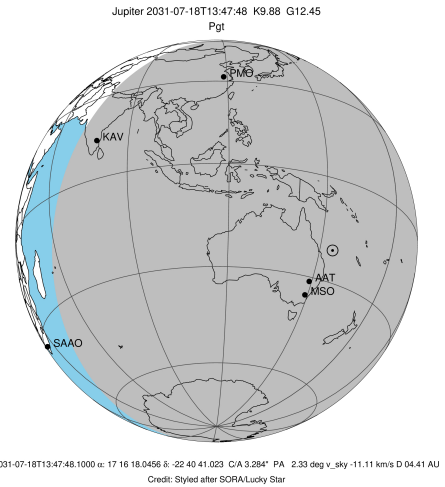


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-07-18T12:09:43.447	19.68	13.92x	71491.8	-8.17	-9.32
Jupiter	E	2031-07-18T15:36:33.848	53.38	-31.70	71492.0	-3.98	-4.55

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-07-18T13:43:21.020
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        : 4114516134844172032
2Mass ID (if available) : 17161798-2240407
ICRS Star Coord at Epoch: 17h 16m 18.04556s -22:40:41.02329s
RUWE (>1.4 is poor) : 0.92
K magnitude           : 9.879
G magnitude           : 12.446
RP magnitude          : 11.620
BP magnitude          : 13.152
DUPflag              : 0
Distance (au)         : 4.408
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -11.11
Sun-Target sep (deg) : 144.60
Sun-Moon sep (deg)   : 155.18
B (ring opening deg) : -2.55
PA of pole (deg)     : 3.86
Pole direction: RA (deg): 268.05689
Dec (deg): 64.49652
C/A sky separation ("): 3.628
C/A sky separation (km): 11597.8
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
    
```

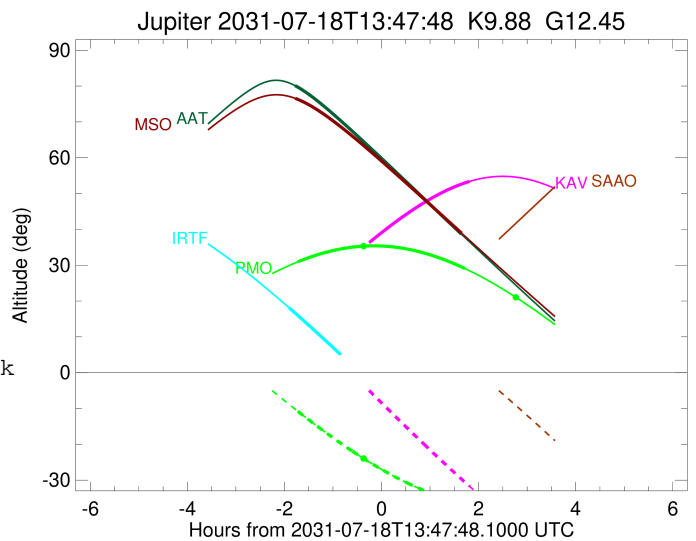
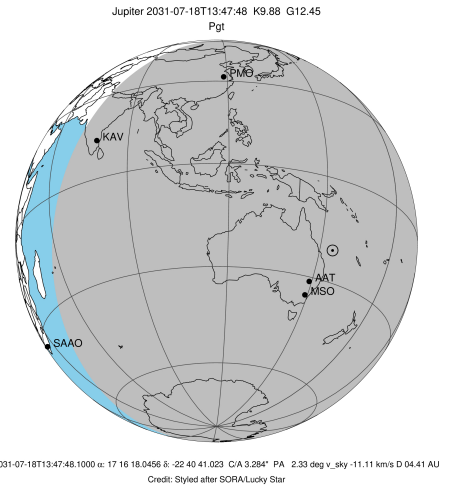


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-07-18T12:01:06.147	80.10	-59.47	71491.7	-10.68	-12.17
Jupiter	E	2031-07-18T15:26:35.533	38.66	-70.08	71491.8	-8.28	-9.45

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-07-18T13:43:31.340
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        : 4114516134844172032
2Mass ID (if available) : 17161798-2240407
ICRS Star Coord at Epoch: 17h 16m 18.04556s -22:40:41.02329s
RUWE (>1.4 is poor)  : 0.92
K magnitude           : 9.879
G magnitude           : 12.446
RP magnitude          : 11.620
BP magnitude          : 13.152
DUPflag              : 0
Distance (au)         : 4.408
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -11.11
Sun-Target sep (deg)  : 144.60
Sun-Moon sep (deg)    : 155.20
B (ring opening deg)  : -2.55
PA of pole (deg)      : 3.86
Pole direction: RA (deg): 268.05689
Dec (deg): 64.49652
C/A sky separation (") : 3.763
C/A sky separation (km) : 12028.7
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	2031-07-18T12:01:13.678	76.56	-58.42	71491.7	-11.04	-12.57
Jupiter	E	2031-07-18T15:26:46.556	38.94	-68.04	71491.8	-8.61	-9.82