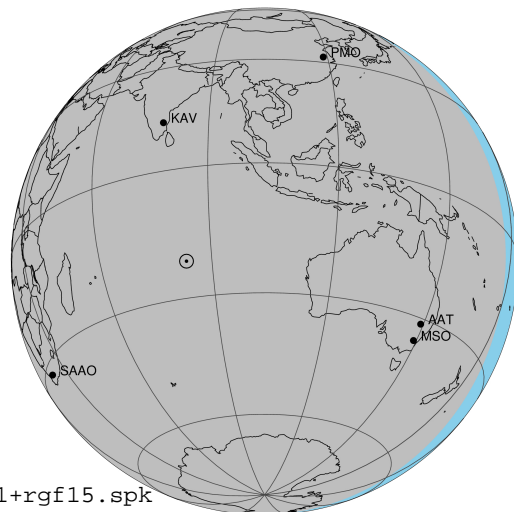


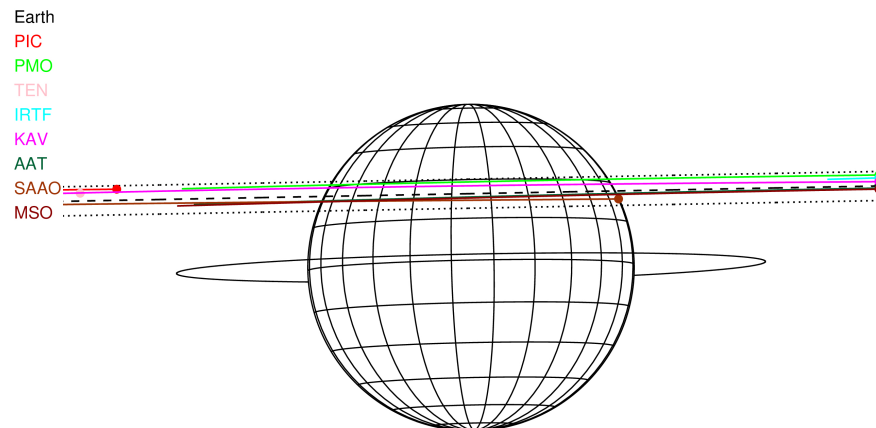
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-05-29T18:23:00.260
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116927986722347392
 2Mass ID (if available) : 17412362-2252084

Jupiter 2031-05-29T18:23:00 K8.32 G11.60 Pgt

ICRS Star Coord at Epoch: 17h 41m 23.61827s -22:52:08.80072s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 8.323
 G magnitude : 11.601
 RP magnitude : 10.650
 BP magnitude : 12.521
 DUPflag : 0
 Distance (au) : 4.313
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -15.01
 Sun-Target sep (deg) : 162.05
 Sun-Moon sep (deg) : 104.55
 B (ring opening deg) : -2.61
 PA of pole (deg) : 1.17
 Pole direction: RA (deg): 268.05693
 Dec (deg): 64.49651
 C/A sky separation (") : 10.340
 C/A sky separation (km) : 32340.7
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

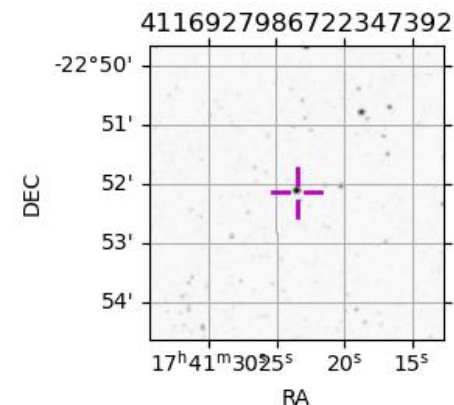


2031-05-29T18:23:00.2600 a: 17 41 23.6183 ð -22 52 08.801 C/A ***** PA 181.08 deg v_sky -15.01 km/s D 04.31 AU
 Credit: Styled after SORA/Lucky Star



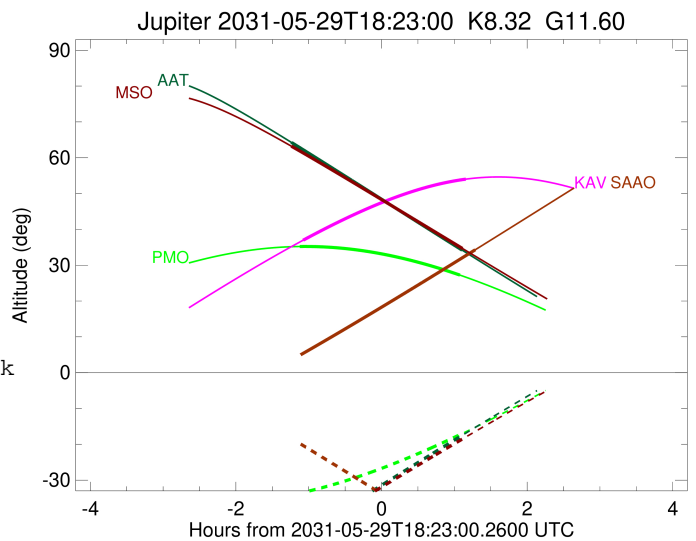
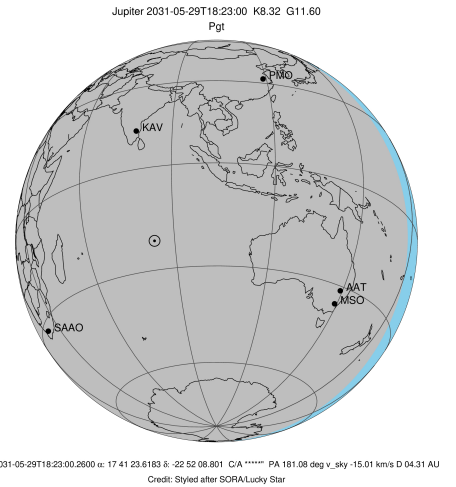
Observable events with sun below -5 deg and altitude above 5 deg

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			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+ +	MAY 29 17:15 - MAY 29 19:27	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	+ +	MAY 29 17:18 - MAY 29 19:32	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	+ +	MAY 29 17:08 - MAY 29 19:29	Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	MAY 29 19:40 - MAY 29 19:40	Pne
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	MAY 29 17:08 - MAY 29 19:29	Pie



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-29T18:21:35.080
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       : 4116927986722347392
2Mass ID (if available) : 17412362-2252084
ICRS Star Coord at Epoch: 17h 41m 23.61827s -22:52:08.80072s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 8.323
G magnitude           : 11.601
RP magnitude          : 10.650
BP magnitude          : 12.521
DUPflag              : 0
Distance (au)        : 4.313
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.01
Sun-Target sep (deg) : 162.05
Sun-Moon sep (deg)   : 104.98
B (ring opening deg) : -2.61
PA of pole (deg)     : 1.17
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 11.986
C/A sky separation (km) : 37491.9
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
    
```

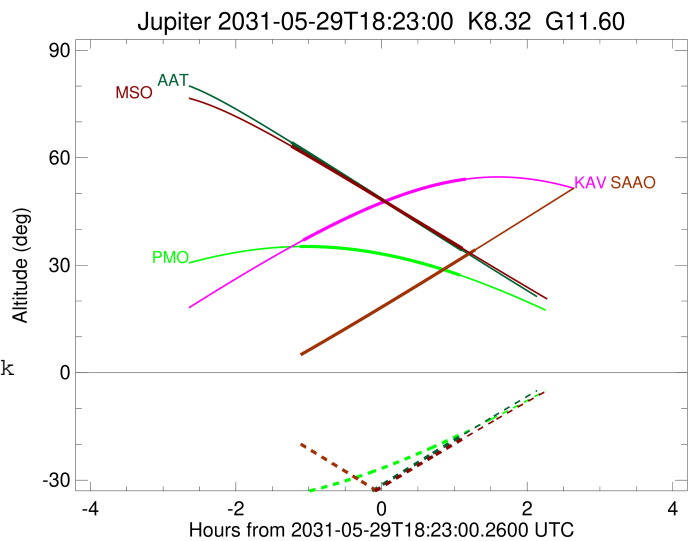
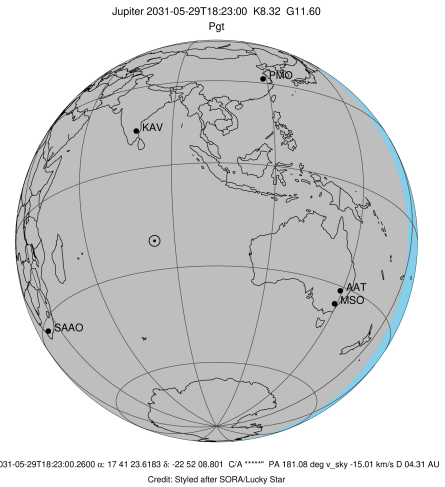


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-29T17:15:39.432	35.21	-33.63	71489.5	31.55	35.01
Jupiter	E	2031-05-29T19:27:36.414	27.23	-17.31	71489.5	31.47	34.92

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-29T18:25:37.330
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       : 4116927986722347392
2Mass ID (if available) : 17412362-2252084
ICRS Star Coord at Epoch: 17h 41m 23.61827s -22:52:08.80072s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 8.323
G magnitude           : 11.601
RP magnitude          : 10.650
BP magnitude          : 12.521
DUPflag              : 0
Distance (au)        : 4.313
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.01
Sun-Target sep (deg) : 162.05
Sun-Moon sep (deg)   : 105.30
B (ring opening deg) : -2.61
PA of pole (deg)     : 1.17
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 11.444
C/A sky separation (km) : 35793.9
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
    
```

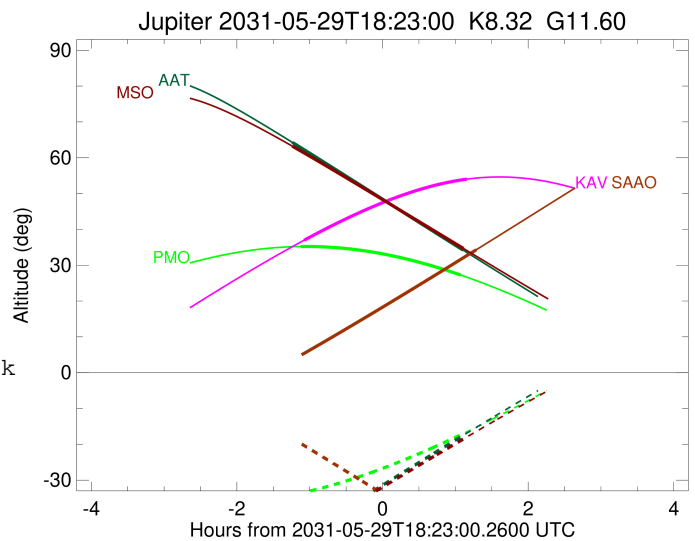
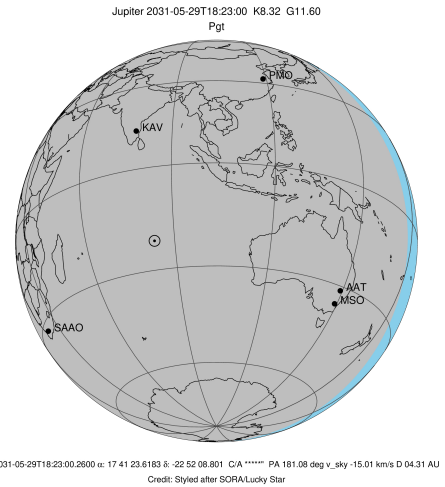


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-29T17:18:34.110	37.00	-50.16	71489.7	29.55	32.90
Jupiter	E	2031-05-29T19:32:25.198	54.01	-53.67	71489.6	30.29	33.68

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-29T18:18:55.600
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       : 4116927986722347392
2Mass ID (if available) : 17412362-2252084
ICRS Star Coord at Epoch: 17h 41m 23.61827s -22:52:08.80072s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 8.323
G magnitude           : 11.601
RP magnitude         : 10.650
BP magnitude         : 12.521
DUPflag              : 0
Distance (au)        : 4.313
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.01
Sun-Target sep (deg) : 162.05
Sun-Moon sep (deg)   : 105.08
B (ring opening deg) : -2.61
PA of pole (deg)     : 1.17
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation ("): 9.868
C/A sky separation (km): 30866.5
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
    
```

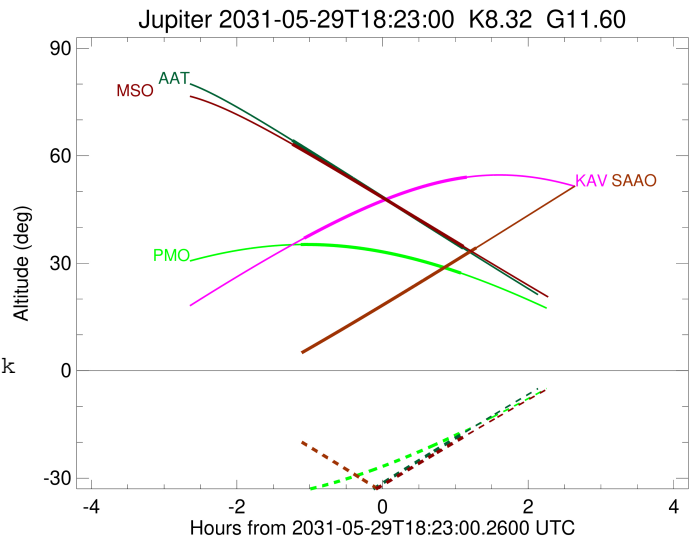
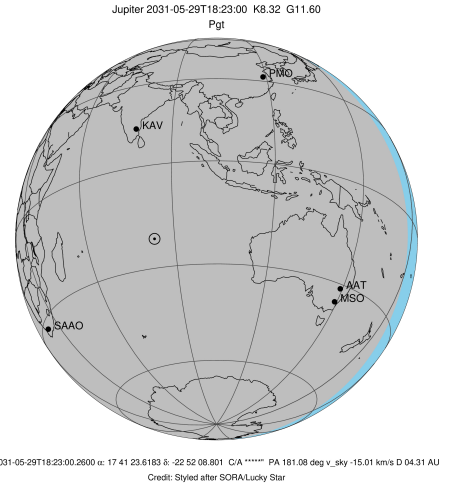


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-29T17:08:47.252	64.26	-47.26	71490.2	25.78	28.87
Jupiter	E	2031-05-29T19:29:25.068	34.21	-17.51	71490.3	25.19	28.23

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-29T18:28:32.120
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        : 4116927986722347392
2Mass ID (if available) : 17412362-2252084
ICRS Star Coord at Epoch: 17h 41m 23.61827s -22:52:08.80072s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 8.323
G magnitude           : 11.601
RP magnitude          : 10.650
BP magnitude          : 12.521
DUPflag              : 0
Distance (au)         : 4.313
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.01
Sun-Target sep (deg)  : 162.05
Sun-Moon sep (deg)    : 105.04
B (ring opening deg) : -2.61
PA of pole (deg)      : 1.17
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 9.421
C/A sky separation (km) : 29466.3
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
    
```

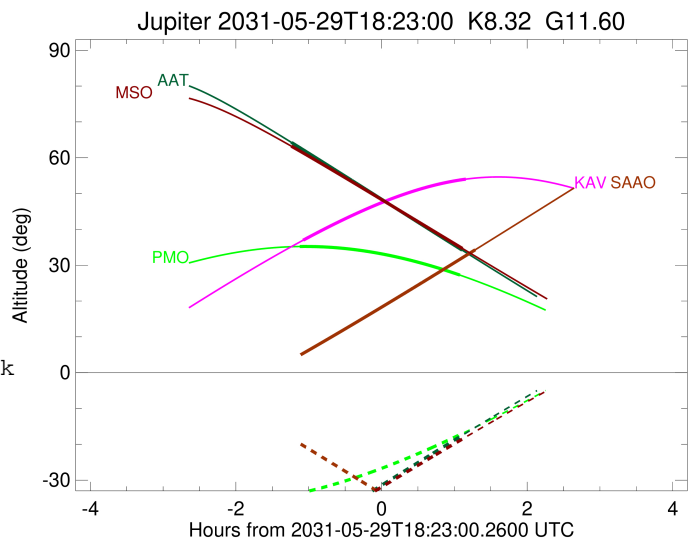
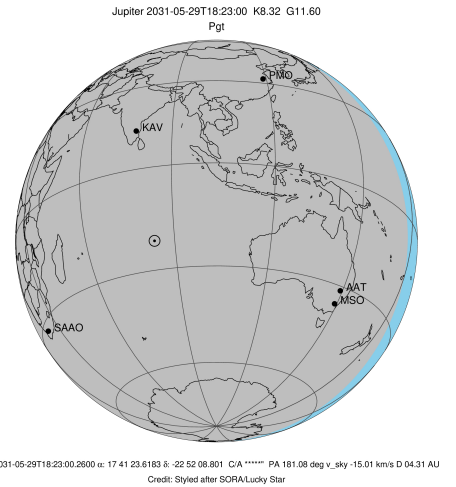


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-29T17:16:12.812	4.95x	-19.88	71490.5	23.64	26.56
Jupiter	E	2031-05-29T19:40:15.156	34.30	-50.11	71490.3	24.96	27.98

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-29T18:19:06.040
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       : 4116927986722347392
2Mass ID (if available) : 17412362-2252084
ICRS Star Coord at Epoch: 17h 41m 23.61827s -22:52:08.80072s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 8.323
G magnitude           : 11.601
RP magnitude         : 10.650
BP magnitude         : 12.521
DUPflag              : 0
Distance (au)        : 4.313
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.01
Sun-Target sep (deg) : 162.05
Sun-Moon sep (deg)   : 105.09
B (ring opening deg) : -2.61
PA of pole (deg)     : 1.17
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation ("): 9.735
C/A sky separation (km): 30451.4
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
    
```



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	2031-05-29T17:08:41.021	63.22	-47.10	71490.3	25.40	28.46
Jupiter	E	2031-05-29T19:29:51.310	34.63	-18.48	71490.4	24.84	27.85