

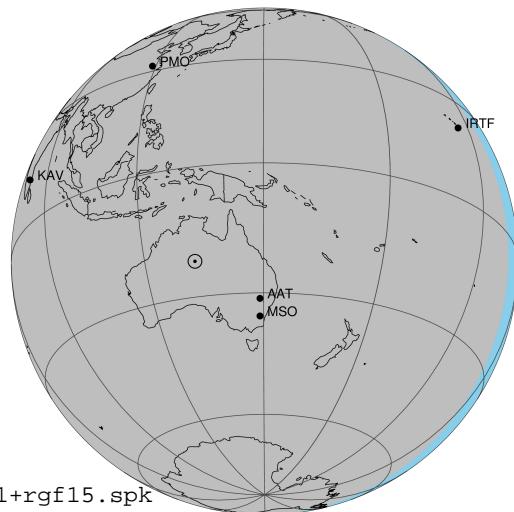
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-05-31T15:05:27.830
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116564559376360192
 2Mass ID (if available) : 17402708-2252109

Jupiter 2031-05-31T15:05:27 K8.69 G12.21 Pgt

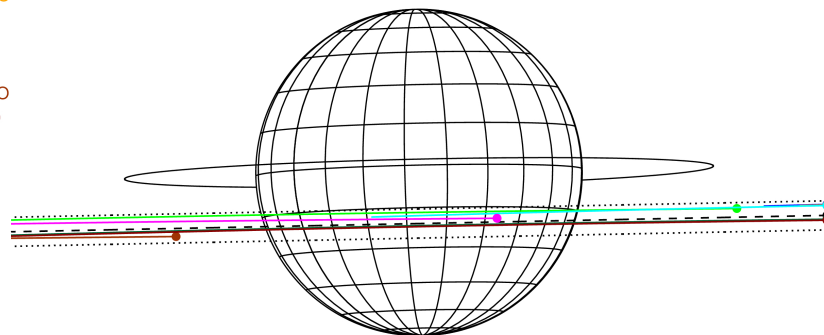
ICRS Star Coord at Epoch: 17h 40m 27.07869s -22:52:11.10641s

RUWE (>1.4 is poor) : 0.86
 K magnitude : 8.692
 G magnitude : 12.211
 RP magnitude : 11.207
 BP magnitude : 13.248
 DUPflag : 0
 Distance (au) : 4.303
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -15.31
 Sun-Target sep (deg) : 164.05
 Sun-Moon sep (deg) : 80.51
 B (ring opening deg) : -2.60
 PA of pole (deg) : 1.27
 Pole direction: RA (deg): 268.05693
 Dec (deg): 64.49651
 C/A sky separation (") : 7.166
 C/A sky separation (km) : 22365.5
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-05-31T15:05:27 K8.69 G12.21
 Pgt



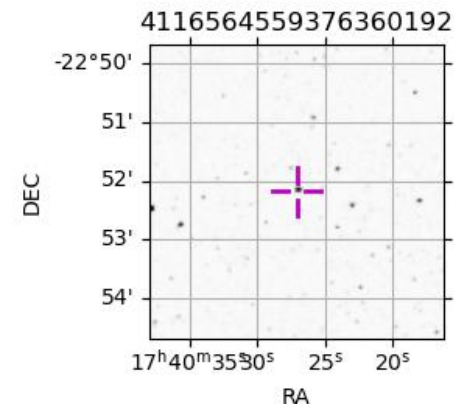
Earth
 PAL
 PMO
 KPNO
 IRTF
 KAV
 AAT
 SAAO
 MSO



2031-05-31T15:05:27.8300 a: 17 40 27.0787 δ: -22 52 11.106 C/A 7.178" PA 1.15 deg v_sky -15.31 km/s D 04.30 AU
 Credit: Styled after SORA/Lucky Star

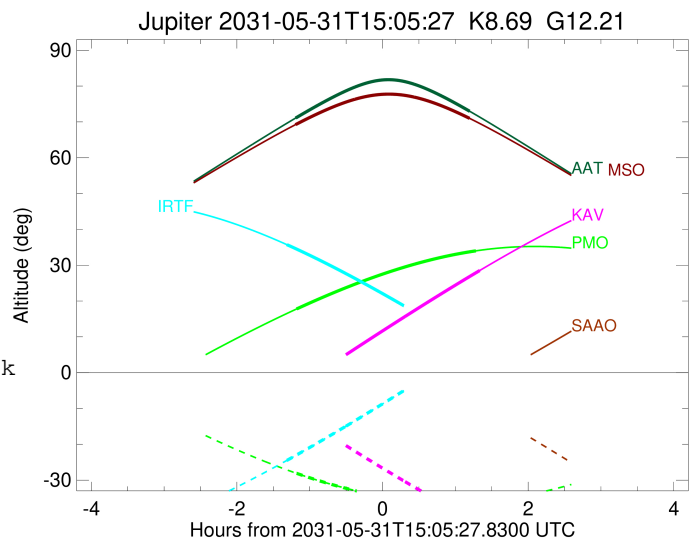
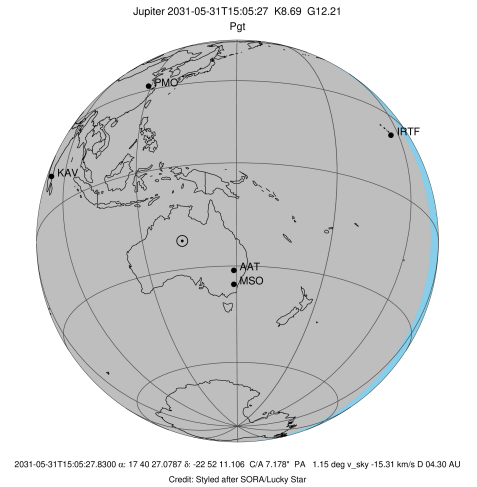
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1			Pnn
PAL	Palomar Mt (200")	33.4	243.1			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+ +	MAY 31 13:54 - MAY 31 16:22	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	+	MAY 31 13:46 - MAY 31 13:46	Pin
KAV	Kavalur Observatory	12.6	78.8	+	MAY 31 16:25 - MAY 31 16:25	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	+ +	MAY 31 13:53 - MAY 31 16:17	Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	MAY 31 13:53 - MAY 31 16:17	Pie



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-31T15:08:39.620
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      : 4116564559376360192
2Mass ID (if available) : 17402708-2252109
ICRS Star Coord at Epoch: 17h 40m 27.07869s -22:52:11.10641s
RUWE (>1.4 is poor) : 0.86
K magnitude          : 8.692
G magnitude          : 12.211
RP magnitude         : 11.207
BP magnitude         : 13.248
DUPflag             : 0
Distance (au)       : 4.303
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.31
Sun-Target sep (deg) : 164.05
Sun-Moon sep (deg)  : 80.88
B (ring opening deg) : -2.60
PA of pole (deg)    : 1.27
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 5.607
C/A sky separation (km) : 17501.4
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
    
```

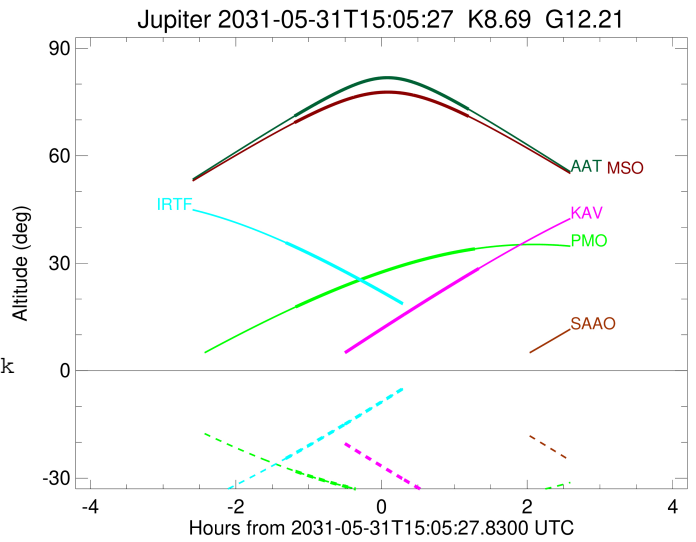
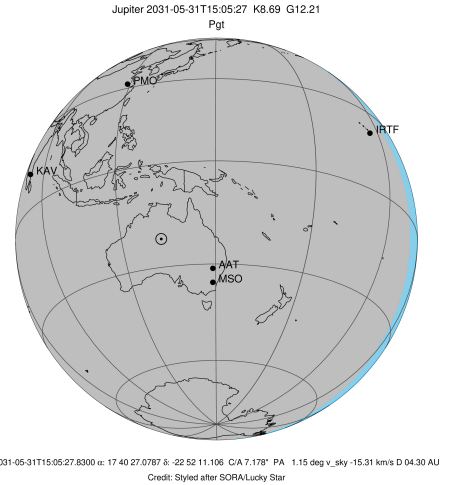


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-31T13:54:39.620	17.78	-28.10	71491.4	-14.65	-16.63
Jupiter	E	2031-05-31T16:22:19.098	33.99	-35.95	71491.5	-13.81	-15.70

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-31T15:00:08.300
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        : 4116564559376360192
2Mass ID (if available) : 17402708-2252109
ICRS Star Coord at Epoch: 17h 40m 27.07869s -22:52:11.10641s
RUWE (>1.4 is poor) : 0.86
K magnitude           : 8.692
G magnitude           : 12.211
RP magnitude          : 11.207
BP magnitude          : 13.248
DUPflag              : 0
Distance (au)         : 4.303
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.31
Sun-Target sep (deg) : 164.05
Sun-Moon sep (deg)   : 80.98
B (ring opening deg) : -2.60
PA of pole (deg)     : 1.27
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 6.054
C/A sky separation (km) : 18895.5
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
    
```

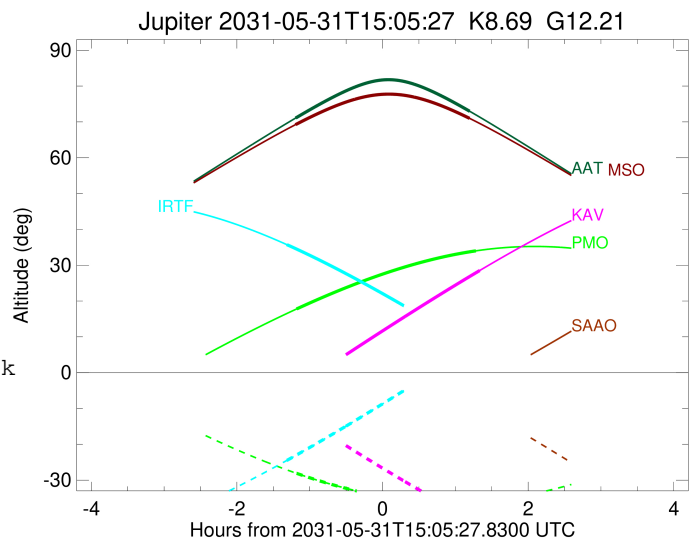
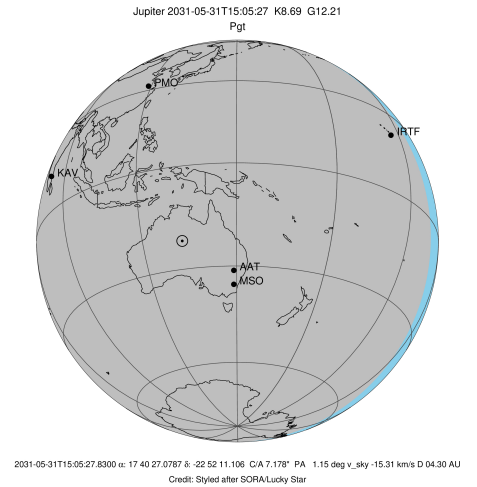


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-31T13:46:36.834	35.74	-24.50	71491.4	-15.02	-17.04
Jupiter	E	2031-05-31T16:14:09.703	8.32	6.04x	71491.3	-15.73	-17.85

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-31T15:12:06.260
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        : 4116564559376360192
2Mass ID (if available) : 17402708-2252109
ICRS Star Coord at Epoch: 17h 40m 27.07869s -22:52:11.10641s
RUWE (>1.4 is poor) : 0.86
K magnitude           : 8.692
G magnitude           : 12.211
RP magnitude          : 11.207
BP magnitude          : 13.248
DUPflag              : 0
Distance (au)         : 4.303
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.31
Sun-Target sep (deg)  : 164.05
Sun-Moon sep (deg)    : 80.56
B (ring opening deg) : -2.60
PA of pole (deg)      : 1.27
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 6.523
C/A sky separation (km) : 20357.9
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
    
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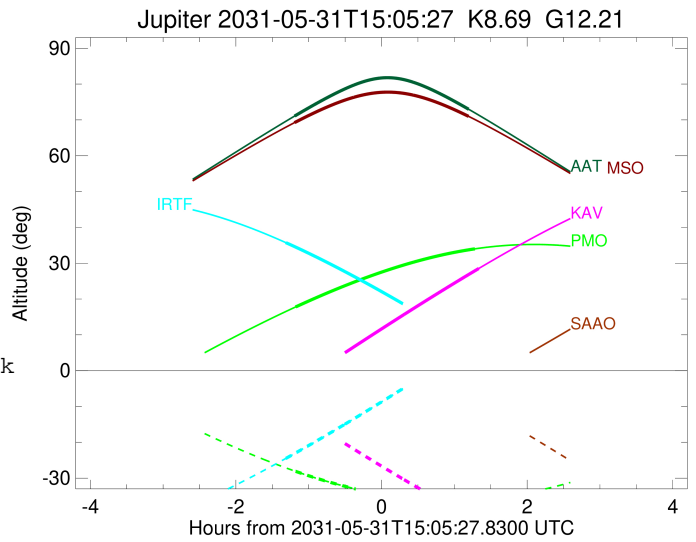
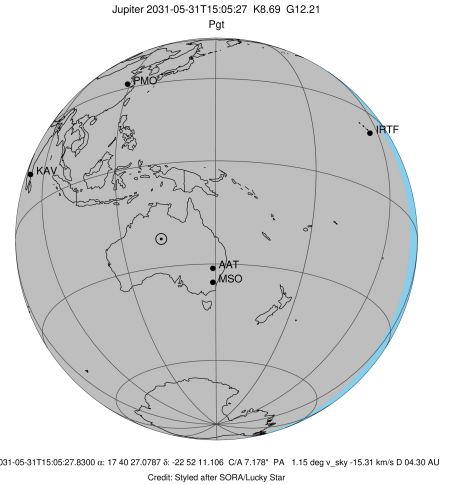


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-31T13:57:54.101	-3.39x	-12.25	71491.2	-17.29	-19.58
Jupiter	E	2031-05-31T16:25:36.817	28.52	-41.92	71491.3	-15.83	-17.96

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-31T15:05:35.280
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        : 4116564559376360192
2Mass ID (if available) : 17402708-2252109
ICRS Star Coord at Epoch: 17h 40m 27.07869s -22:52:11.10641s
RUWE (>1.4 is poor)  : 0.86
K magnitude           : 8.692
G magnitude           : 12.211
RP magnitude          : 11.207
BP magnitude          : 13.248
DUPflag              : 0
Distance (au)         : 4.303
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.31
Sun-Target sep (deg)  : 164.05
Sun-Moon sep (deg)    : 81.44
B (ring opening deg) : -2.60
PA of pole (deg)      : 1.27
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 7.459
C/A sky separation (km) : 23279.5
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
    
```

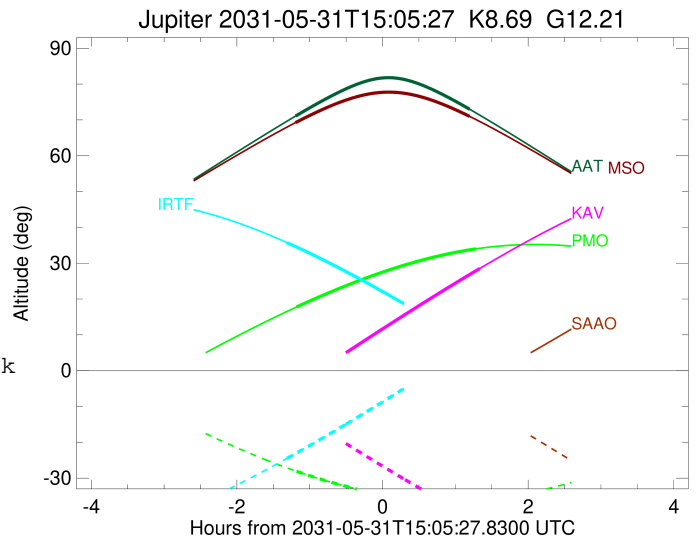
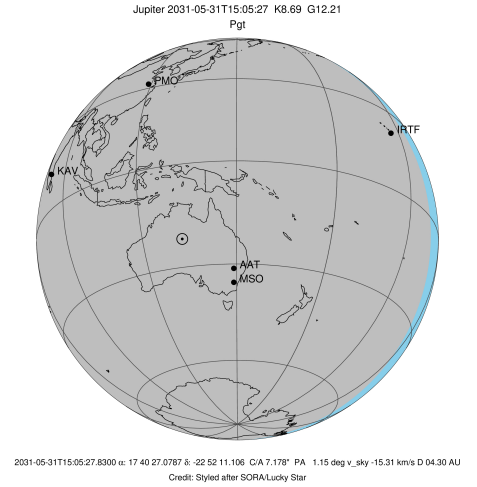


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-31T13:53:51.181	71.06	-80.68	71491.0	-19.22	-21.72
Jupiter	E	2031-05-31T16:17:16.602	72.97	-58.42	71491.0	-18.92	-21.38

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-31T15:05:34.800
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       : 4116564559376360192
2Mass ID (if available) : 17402708-2252109
ICRS Star Coord at Epoch: 17h 40m 27.07869s -22:52:11.10641s
RUWE (>1.4 is poor) : 0.86
K magnitude           : 8.692
G magnitude           : 12.211
RP magnitude          : 11.207
BP magnitude          : 13.248
DUPflag              : 0
Distance (au)        : 4.303
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.31
Sun-Target sep (deg) : 164.05
Sun-Moon sep (deg)   : 81.43
B (ring opening deg) : -2.60
PA of pole (deg)     : 1.27
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 7.600
C/A sky separation (km) : 23720.4
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	2031-05-31T13:53:55.589	69.25	-76.69	71491.0	-19.59	-22.13
Jupiter	E	2031-05-31T16:17:11.254	70.99	-57.66	71491.0	-19.29	-21.79