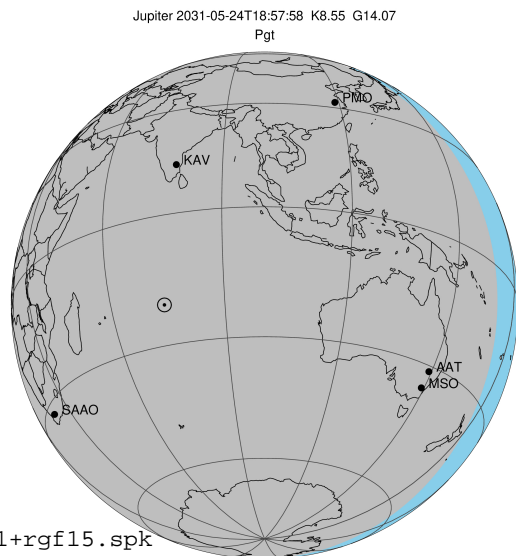


target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2031-05-24T18:57:58.690  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4116870159267830656  
 2Mass ID (if available) : 17434786-2252591

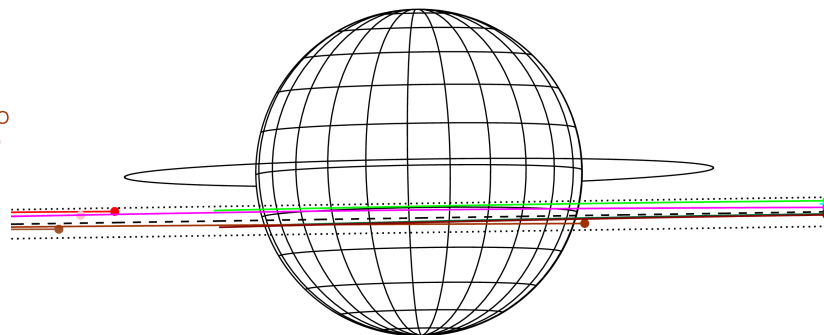
Jupiter 2031-05-24T18:57:58 K8.55 G14.07 Pgt

ICRS Star Coord at Epoch: 17h 43m 47.86081s -22:52:59.37204s  
 RUWE (>1.4 is poor) : 0.96  
 K magnitude : 8.551  
 G magnitude : 14.070  
 RP magnitude : 12.691  
 BP magnitude : 16.231  
 DUPflag : 0  
 Distance (au) : 4.342  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -14.05  
 Sun-Target sep (deg) : 156.72  
 Sun-Moon sep (deg) : 164.65  
 B (ring opening deg) : -2.60  
 PA of pole (deg) : 0.91  
 Pole direction: RA (deg): 268.05694  
 Dec (deg): 64.49651  
 C/A sky separation (") : 6.325  
 C/A sky separation (km) : 19920.3  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk



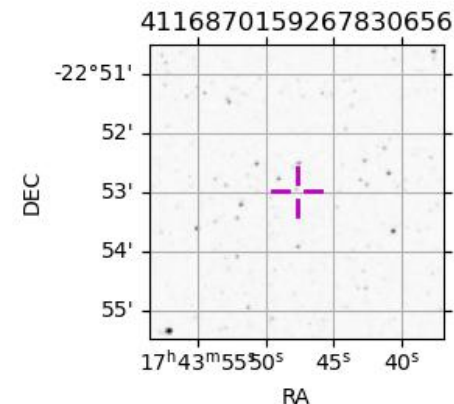
2031-05-24T18:57:58.6900 a: 17 43 47.8608 s: -22 52 59.372 C/A 6.325" PA 0.87 deg v\_sky -14.05 km/s D 04.34 AU  
 Credit: Styled after SORA/Lucky Star

Earth  
 PIC  
 PMO  
 TEN  
 IRTF  
 KAV  
 RIO  
 AAT  
 SAAO  
 MSO



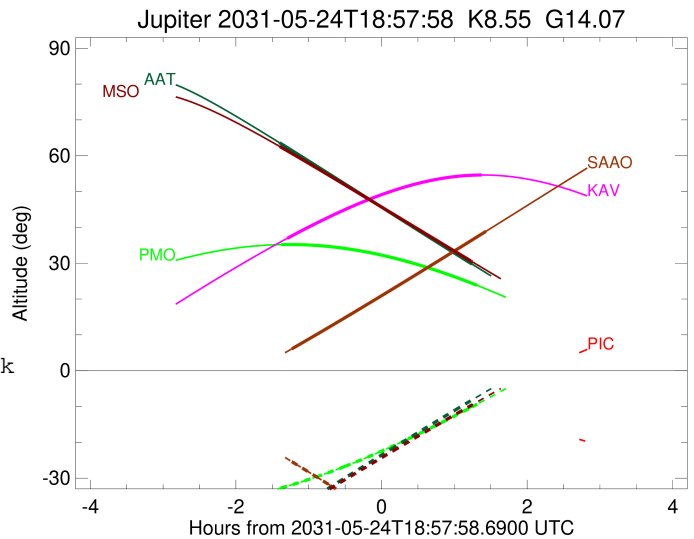
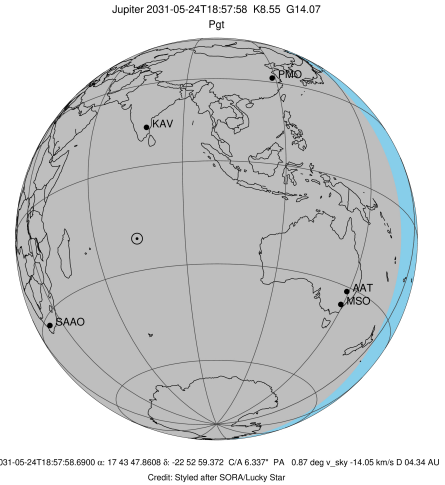
Observable events with sun below -5 deg and altitude above 5 deg

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	+ +	MAY 24 17:35 - MAY 24 20:16	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 24 17:40 - MAY 24 20:20	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 24 17:33 - MAY 24 20:12	Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	MAY 24 17:44 - MAY 24 20:23	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	MAY 24 17:34 - MAY 24 20:12	Pie



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-24T18:55:57.180
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       : 4116870159267830656
2Mass ID (if available) : 17434786-2252591
ICRS Star Coord at Epoch: 17h 43m 47.86081s -22:52:59.37204s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 8.551
G magnitude           : 14.070
RP magnitude         : 12.691
BP magnitude         : 16.231
DUPflag              : 0
Distance (au)        : 4.342
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.05
Sun-Target sep (deg) : 156.72
Sun-Moon sep (deg)   : 164.40
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.91
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation ("): 4.700
C/A sky separation (km): 14803.4
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
    
```

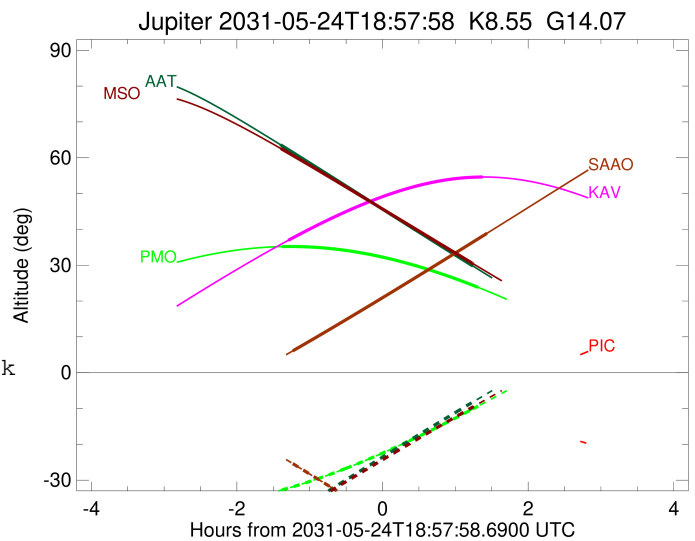
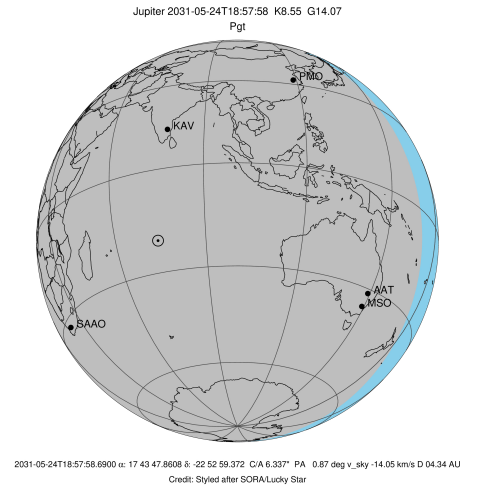


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-24T17:35:14.162	35.19	-32.71	71491.6	-11.91	-13.55
Jupiter	E	2031-05-24T20:16:51.123	23.80	-9.33	71491.6	-12.18	-13.86

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-24T19:00:40.300
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        : 4116870159267830656
2Mass ID (if available) : 17434786-2252591
ICRS Star Coord at Epoch: 17h 43m 47.86081s -22:52:59.37204s
RUWE (>1.4 is poor)  : 0.96
K magnitude           : 8.551
G magnitude           : 14.070
RP magnitude          : 12.691
BP magnitude          : 16.231
DUPflag              : 0
Distance (au)         : 4.342
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.05
Sun-Target sep (deg)  : 156.72
Sun-Moon sep (deg)    : 165.03
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.91
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 5.208
C/A sky separation (km) : 16402.4
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
    
```

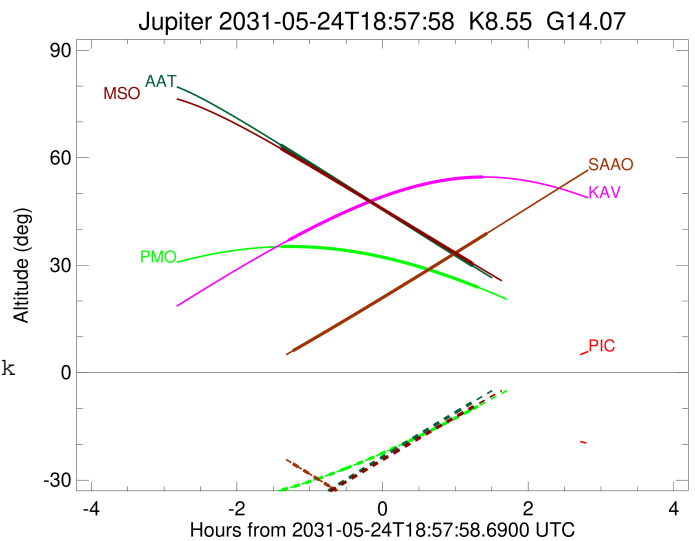
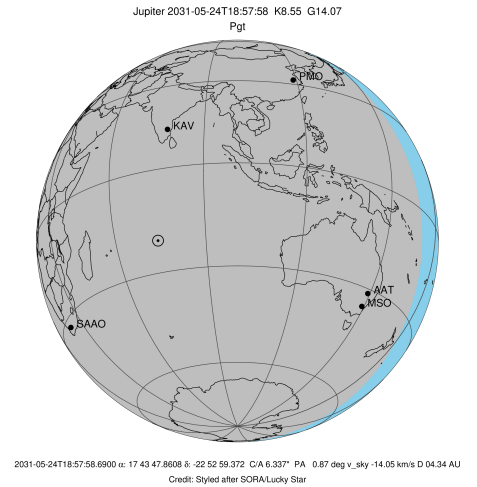


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-24T17:40:22.796	36.95	-53.45	71491.5	-13.66	-15.52
Jupiter	E	2031-05-24T20:20:35.698	54.61	-48.73	71491.5	-13.07	-14.86

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-24T18:52:56.570
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        : 4116870159267830656
2Mass ID (if available) : 17434786-2252591
ICRS Star Coord at Epoch: 17h 43m 47.86081s -22:52:59.37204s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 8.551
G magnitude           : 14.070
RP magnitude          : 12.691
BP magnitude          : 16.231
DUPflag              : 0
Distance (au)         : 4.342
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.05
Sun-Target sep (deg)  : 156.72
Sun-Moon sep (deg)    : 164.31
B (ring opening deg) : -2.60
PA of pole (deg)      : 0.91
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 6.823
C/A sky separation (km) : 21487.2
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
    
```

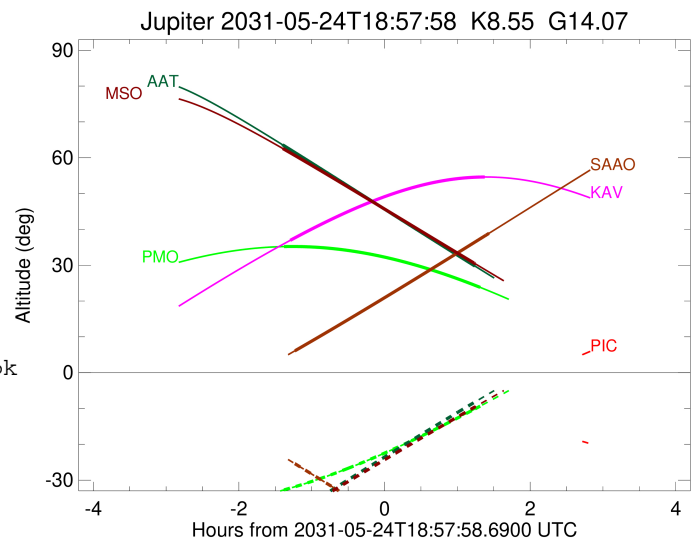
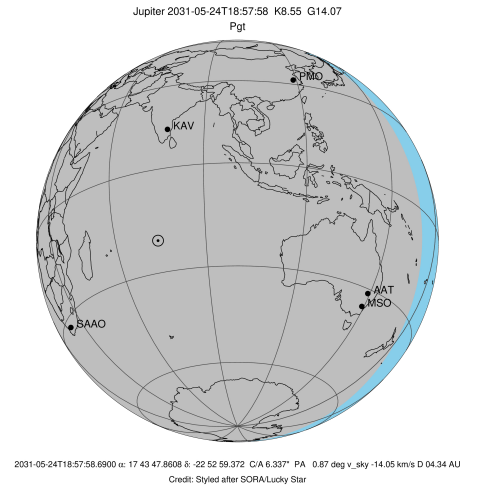


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-24T17:33:50.522	63.63	-41.44	71491.2	-17.15	-19.42
Jupiter	E	2031-05-24T20:12:33.041	29.75	-8.18	71491.1	-17.95	-20.31

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-24T19:04:27.920
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        : 4116870159267830656
2Mass ID (if available) : 17434786-2252591
ICRS Star Coord at Epoch: 17h 43m 47.86081s -22:52:59.37204s
RUWE (>1.4 is poor)  : 0.96
K magnitude           : 8.551
G magnitude           : 14.070
RP magnitude          : 12.691
BP magnitude          : 16.231
DUPflag              : 0
Distance (au)         : 4.342
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -14.05
Sun-Target sep (deg)  : 156.72
Sun-Moon sep (deg)    : 165.51
B (ring opening deg)  : -2.60
PA of pole (deg)      : 0.91
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 7.193
C/A sky separation (km) : 22652.3
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
    
```

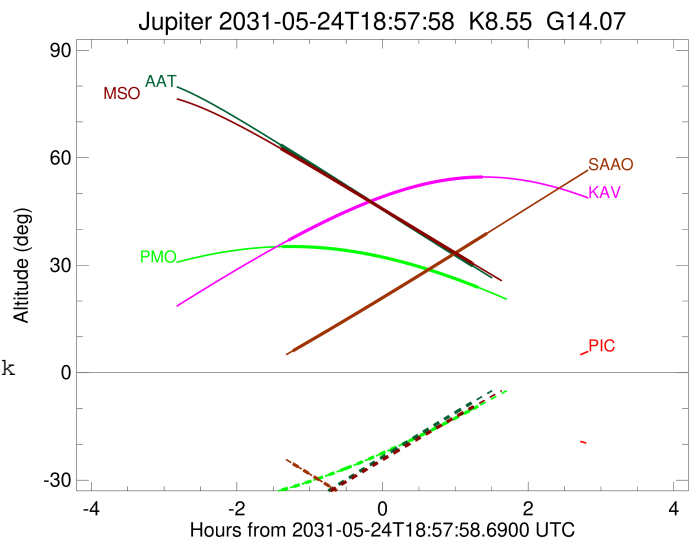
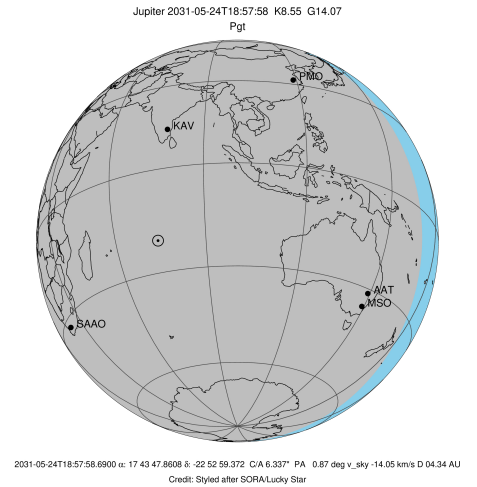


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-24T17:44:07.530	6.09	-25.40	71491.0	-19.11	-21.59
Jupiter	E	2031-05-24T20:23:58.857	38.88	-59.00	71491.1	-17.84	-20.19

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-24T18:53:09.600
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        : 4116870159267830656
2Mass ID (if available) : 17434786-2252591
ICRS Star Coord at Epoch: 17h 43m 47.86081s -22:52:59.37204s
RUWE (>1.4 is poor)  : 0.96
K magnitude           : 8.551
G magnitude           : 14.070
RP magnitude          : 12.691
BP magnitude          : 16.231
DUPflag              : 0
Distance (au)         : 4.342
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.05
Sun-Target sep (deg)  : 156.72
Sun-Moon sep (deg)    : 164.34
B (ring opening deg)  : -2.60
PA of pole (deg)      : 0.91
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (" ) : 6.953
C/A sky separation (km) : 21898.3
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	2031-05-24T17:34:07.945	62.57	-41.39	71491.2	-17.51	-19.82
Jupiter	E	2031-05-24T20:12:40.107	30.41	-9.53	71491.1	-18.27	-20.67