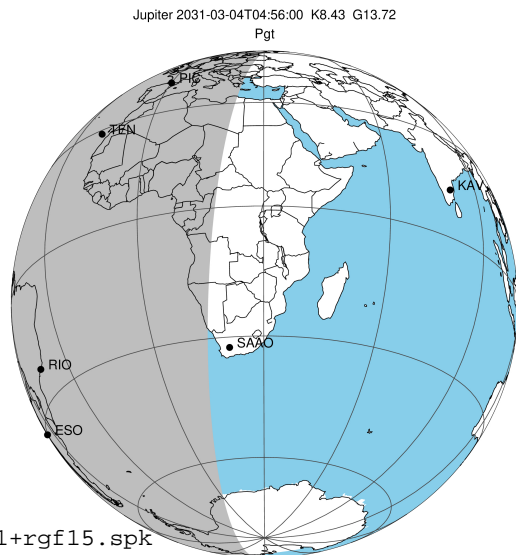


target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2031-03-04T04:56:00.750  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4116926474893406464  
 2Mass ID (if available) : 17420795-2249591

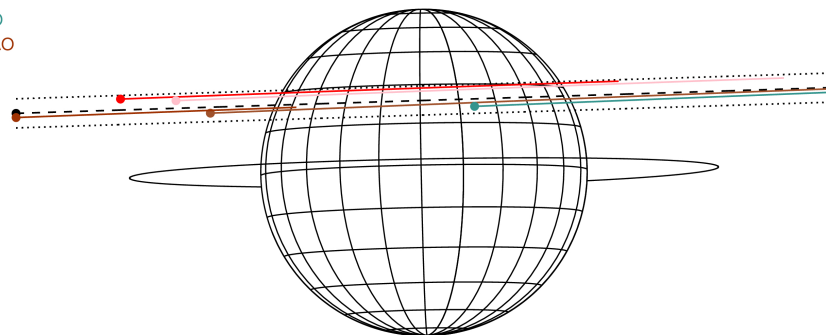
Jupiter 2031-03-04T04:56:00 K8.43 G13.72 Pgt

ICRS Star Coord at Epoch: 17h 42m 07.95167s -22:49:59.39000s  
 RUWE (>1.4 is poor) : 0.88  
 K magnitude : 8.432  
 G magnitude : 13.722  
 RP magnitude : 12.353  
 BP magnitude : 15.939  
 DUPflag : 0  
 Distance (au) : 5.447  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : 19.78  
 Sun-Target sep (deg) : 77.10  
 Sun-Moon sep (deg) : 159.81  
 B (ring opening deg) : -2.65  
 PA of pole (deg) : 1.09  
 Pole direction: RA (deg): 268.05701  
 Dec (deg): 64.49651  
 C/A sky separation (") : 7.984  
 C/A sky separation (km) : 31542.8  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk



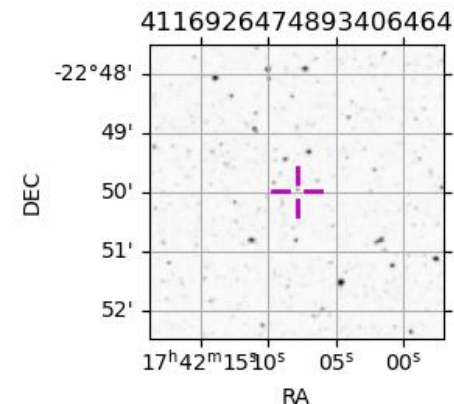
2031-03-04T04:56:00.7500 cc: 17 42 07.9517 s: -22 49 59.3900 C/A 7.974" PA 181.81 deg v\_sky +19.78 km/s D 05.45 AU  
 Credit: Styled after SORA/Lucky Star

Earth  
 PIC  
 TEN  
 RIO  
 ESO  
 SAAO



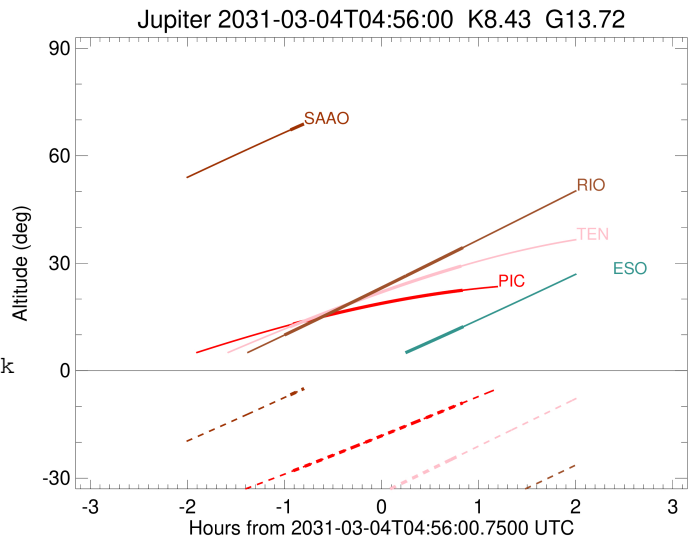
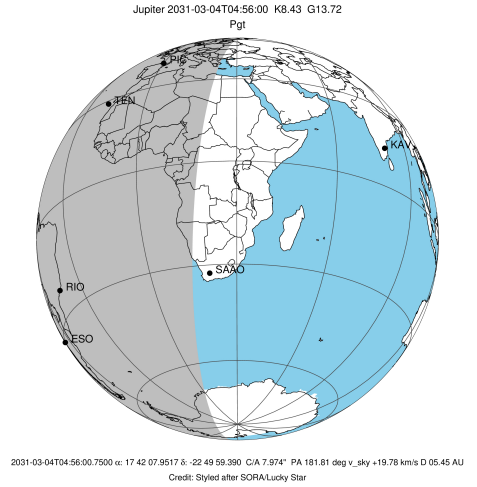
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+ +	MAR 04 04:01 - MAR 04 05:46	Pie
PAL	Palomar Mt (200")	33.4	243.1			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
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	+ +	MAR 04 03:59 - MAR 04 05:45	Pie
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+ +	MAR 04 03:56 - MAR 04 05:46	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	MAR 04 05:46 - MAR 04 05:46	Pne
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	MAR 04 03:59 - MAR 04 03:59	Pin
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-04T04:53:44.950
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : PIC
Location              : Pic du Midi
Latitude (deg)        : 42.93656
E. Longitude (deg)    : 0.14231
Altitude (km)         : 2.890
Gaia source ID        : 4116926474893406464
2Mass ID (if available) : 17420795-2249591
ICRS Star Coord at Epoch: 17h 42m 07.95167s -22:49:59.39000s
RUWE (>1.4 is poor)  : 0.88
K magnitude           : 8.432
G magnitude           : 13.722
RP magnitude          : 12.353
BP magnitude          : 15.939
DUPflag              : 0
Distance (au)         : 5.447
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 19.78
Sun-Target sep (deg)  : 77.10
Sun-Moon sep (deg)    : 160.11
B (ring opening deg)  : -2.65
PA of pole (deg)      : 1.09
Pole direction: RA (deg): 268.05701
Dec (deg): 64.49651
C/A sky separation (") : 9.371
C/A sky separation (km) : 37021.2
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
    
```

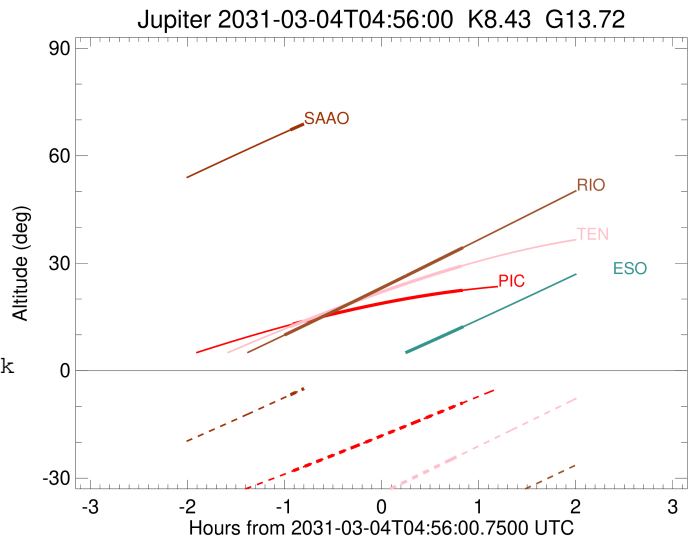
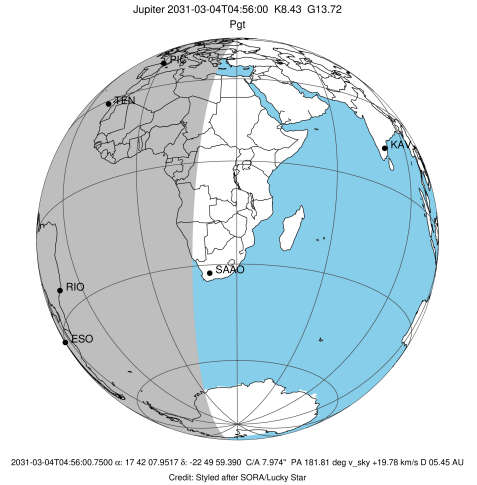


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-04T04:01:30.485	13.02	-27.94	71489.6	30.17	33.55
Jupiter	E	2031-03-04T05:46:09.001	22.45	-9.01	71489.3	32.06	35.53

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-04T04:52:12.970
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : TEN
Location              : Teide Obs./Tenerife
Latitude (deg)        : 28.30050
E. Longitude (deg)    : 343.48909
Altitude (km)         : 2.395
Gaia source ID        : 4116926474893406464
2Mass ID (if available) : 17420795-2249591
ICRS Star Coord at Epoch: 17h 42m 07.95167s -22:49:59.39000s
RUWE (>1.4 is poor) : 0.88
K magnitude           : 8.432
G magnitude           : 13.722
RP magnitude          : 12.353
BP magnitude          : 15.939
DUPflag              : 0
Distance (au)         : 5.447
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 19.78
Sun-Target sep (deg) : 77.10
Sun-Moon sep (deg)   : 160.39
B (ring opening deg) : -2.65
PA of pole (deg)     : 1.09
Pole direction: RA (deg): 268.05701
Dec (deg): 64.49651
C/A sky separation (" ) : 9.027
C/A sky separation (km) : 35664.3
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
    
```

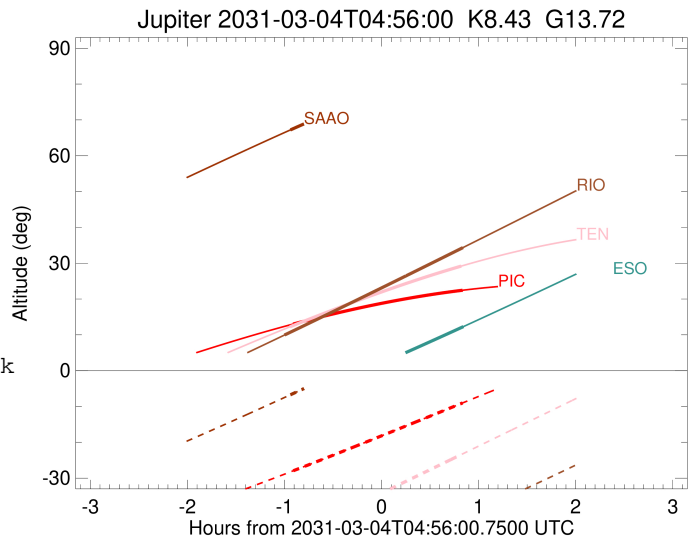
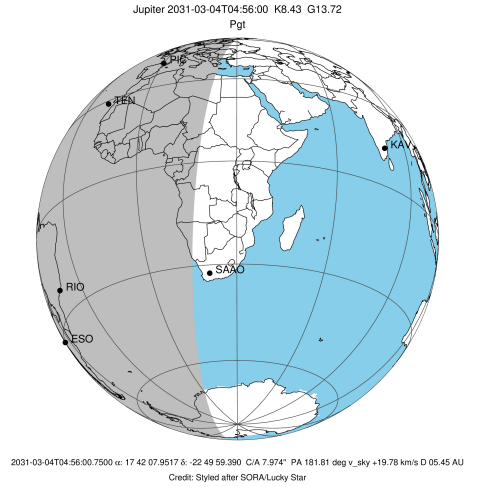


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-04T03:59:23.291	12.24	-46.13	71489.8	28.77	32.07
Jupiter	E	2031-03-04T05:45:17.378	29.19	-23.42	71489.5	30.94	34.37

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-04T04:51:04.050
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : RIO
Location             : Rio de Janeiro
Latitude (deg)       : -22.89506
E. Longitude (deg)   : 316.77708
Altitude (km)        : 0.033
Gaia source ID       : 4116926474893406464
2Mass ID (if available) : 17420795-2249591
ICRS Star Coord at Epoch: 17h 42m 07.95167s -22:49:59.39000s
RUWE (>1.4 is poor) : 0.88
K magnitude          : 8.432
G magnitude           : 13.722
RP magnitude         : 12.353
BP magnitude         : 15.939
DUPflag              : 0
Distance (au)        : 5.447
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 19.78
Sun-Target sep (deg) : 77.10
Sun-Moon sep (deg)   : 160.71
B (ring opening deg) : -2.65
PA of pole (deg)     : 1.09
Pole direction: RA (deg): 268.05701
Dec (deg): 64.49651
C/A sky separation (") : 7.521
C/A sky separation (km) : 29714.1
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
    
```

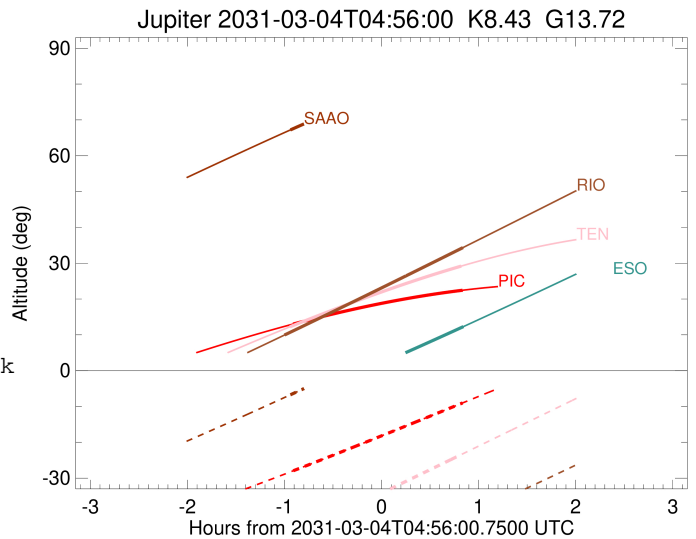
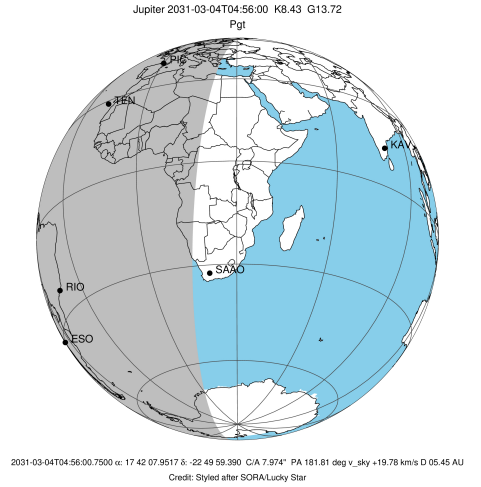


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-04T03:56:08.454	9.97	-58.12	71490.5	23.33	26.21
Jupiter	E	2031-03-04T05:46:19.844	34.35	-40.83	71490.2	25.71	28.80

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-04T04:51:19.380
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : ESO
Location              : European Southern Obs. (3.6m)
Latitude (deg)       : -29.26097
E. Longitude (deg)   : 289.26831
Altitude (km)        : 2.400
Gaia source ID       : 4116926474893406464
2Mass ID (if available) : 17420795-2249591
ICRS Star Coord at Epoch: 17h 42m 07.95167s -22:49:59.39000s
RUWE (>1.4 is poor) : 0.88
K magnitude           : 8.432
G magnitude           : 13.722
RP magnitude          : 12.353
BP magnitude          : 15.939
DUPflag              : 0
Distance (au)        : 5.447
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 19.78
Sun-Target sep (deg) : 77.10
Sun-Moon sep (deg)   : 160.60
B (ring opening deg) : -2.65
PA of pole (deg)     : 1.09
Pole direction: RA (deg): 268.05701
Dec (deg): 64.49651
C/A sky separation ("): 7.107
C/A sky separation (km): 28079.0
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
    
```

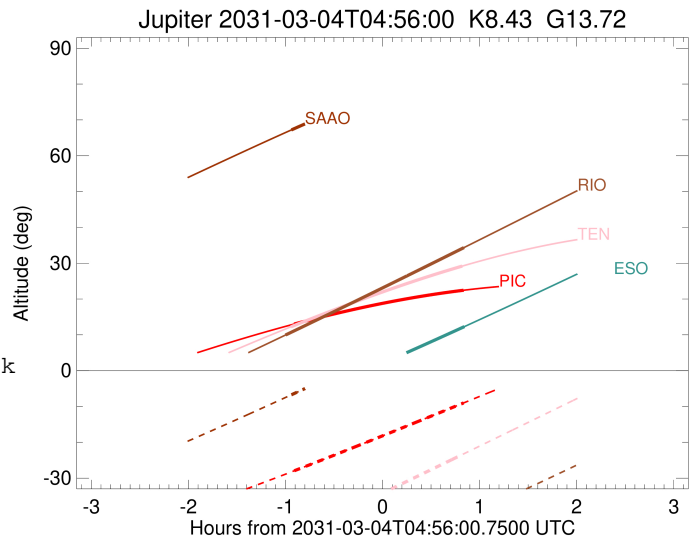
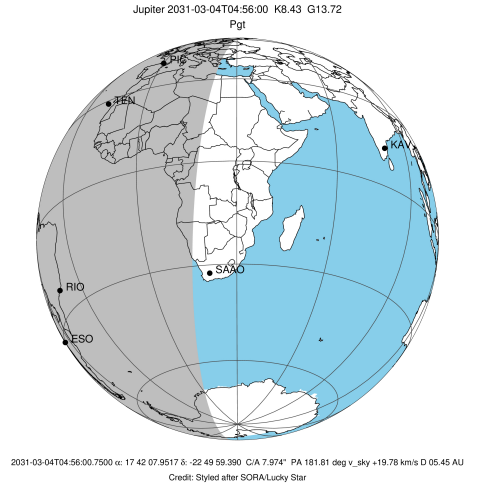


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-04T03:56:20.238	-9.39x	-51.70	71490.7	21.96	24.73
Jupiter	E	2031-03-04T05:46:37.749	12.30	-52.27	71490.4	24.27	27.24

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-04T04:55:13.820
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      : 4116926474893406464
2Mass ID (if available) : 17420795-2249591
ICRS Star Coord at Epoch: 17h 42m 07.95167s -22:49:59.39000s
RUWE (>1.4 is poor) : 0.88
K magnitude          : 8.432
G magnitude          : 13.722
RP magnitude         : 12.353
BP magnitude         : 15.939
DUPflag             : 0
Distance (au)       : 5.447
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : 19.78
Sun-Target sep (deg) : 77.10
Sun-Moon sep (deg)  : 160.25
B (ring opening deg) : -2.65
PA of pole (deg)    : 1.09
Pole direction: RA (deg): 268.05701
Dec (deg): 64.49651
C/A sky separation ("): 7.708
C/A sky separation (km): 30451.7
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	2031-03-04T03:59:40.480	67.19	-6.74	71490.4	24.30	27.27
Jupiter	E	2031-03-04T05:50:53.492	79.89	16.63x	71490.2	25.96	29.06