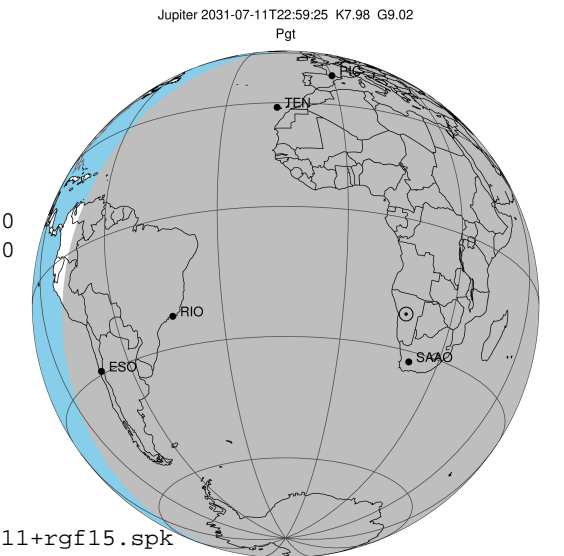


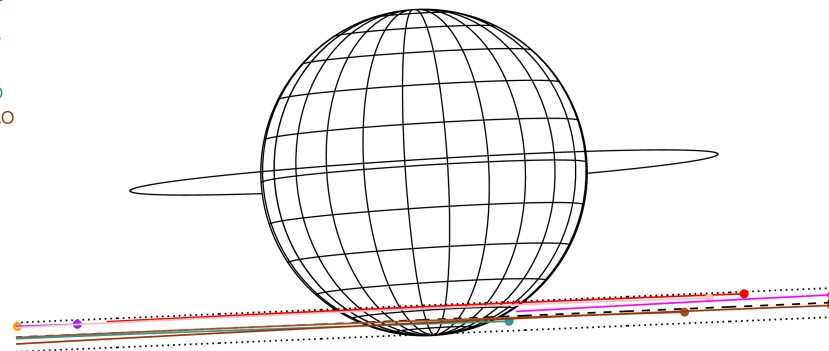
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-07-11T22:59:25.110
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4114691580031381376
 2Mass ID (if available) : 17185477-2242281

Jupiter 2031-07-11T22:59:25 K7.98 G9.02 Pgt

ICRS Star Coord at Epoch: 17h 18m 54.78433s -22:42:28.73721s
 RUWE (>1.4 is poor) : 0.88
 K magnitude : 7.984
 G magnitude : 9.019
 RP magnitude : 8.628
 BP magnitude : 9.248
 DUPflag : 0
 Distance (au) : 4.355
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -12.97
 Sun-Target sep (deg) : 151.51
 Sun-Moon sep (deg) : 123.96
 B (ring opening deg) : -2.56
 PA of pole (deg) : 3.58
 Pole direction: RA (deg): 268.05690
 Dec (deg): 64.49651
 C/A sky separation (") : 20.419
 C/A sky separation (km) : 64502.3
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLv1.spk
 naif0012.tls
 nep097.bsp
 nep101.bsp
 sat4401.bsp



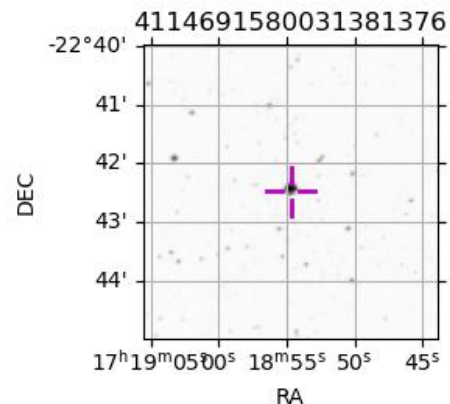
Earth
 PIC
 KPNO
 MCD
 TEN
 KAV
 RIO
 ESO
 SAAO



2031-07-11T22:59:25.1100 α: 17 18 54.7843 δ: -22 42 28.737 C/A ***** PA 2.43 deg v_sky -12.97 km/s D 04.36 AU
 Credit: Styled after SORA/Lucky Star

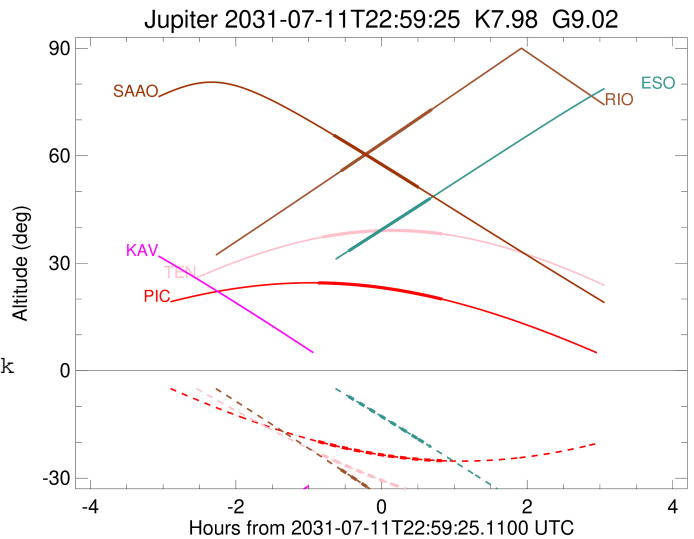
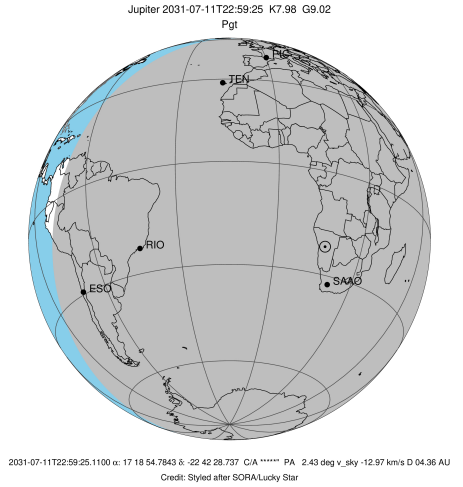
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+ +	JUL 11 22:07 - JUL 11 23:49	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	+ +	JUL 11 22:10 - JUL 11 23:49	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	+ +	JUL 11 22:26 - JUL 11 23:40	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUL 11 22:32 - JUL 11 23:39	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	JUL 11 22:20 - JUL 11 23:30	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-07-11T22:58:07.840
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      : 4114691580031381376
2Mass ID (if available) : 17185477-2242281
ICRS Star Coord at Epoch: 17h 18m 54.78433s -22:42:28.73721s
RUWE (>1.4 is poor) : 0.88
K magnitude          : 7.984
G magnitude          : 9.019
RP magnitude         : 8.628
BP magnitude         : 9.248
DUPflag             : 0
Distance (au)       : 4.355
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -12.97
Sun-Target sep (deg) : 151.51
Sun-Moon sep (deg)  : 124.35
B (ring opening deg) : -2.56
PA of pole (deg)    : 3.58
Pole direction: RA (deg): 268.05690
Dec (deg): 64.49651
C/A sky separation ("): 18.589
C/A sky separation (km): 58720.1
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
    
```

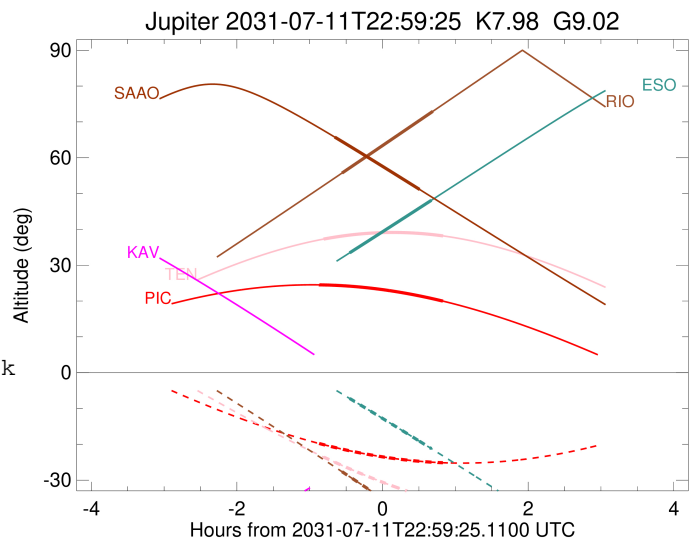
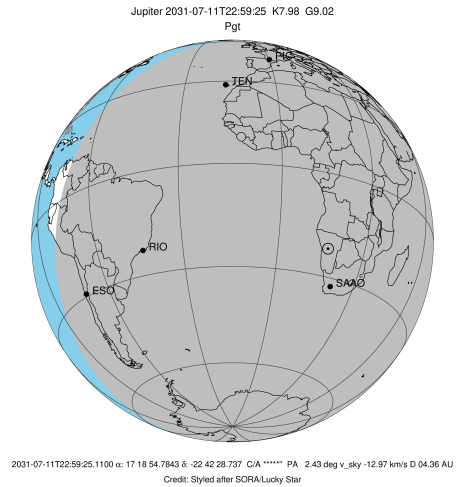


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-07-11T22:07:09.449	24.51	-19.77	71485.8	-56.27	-59.57
Jupiter	E	2031-07-11T23:49:12.232	19.97	-25.14	71486.1	-54.14	-57.56

```

target           : Jupiter
target radius (km) : 71492.00
C/A epoch       : 2031-07-11T23:00:02.780
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  : 4114691580031381376
2Mass ID (if available) : 17185477-2242281
ICRS Star Coord at Epoch: 17h 18m 54.78433s -22:42:28.73721s
RUWE (>1.4 is poor) : 0.88
K magnitude     : 7.984
G magnitude     : 9.019
RP magnitude    : 8.628
BP magnitude    : 9.248
DUPflag        : 0
Distance (au)  : 4.355
f0 (km)        : 0.00
g0 (km)        : 0.00
skyplane vel. (km/s) : -12.97
Sun-Target sep (deg) : 151.51
Sun-Moon sep (deg) : 124.42
B (ring opening deg) : -2.56
PA of pole (deg) : 3.58
Pole direction: RA (deg): 268.05690
Dec (deg): 64.49651
C/A sky separation (") : 18.858
C/A sky separation (km) : 59569.5
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
    
```

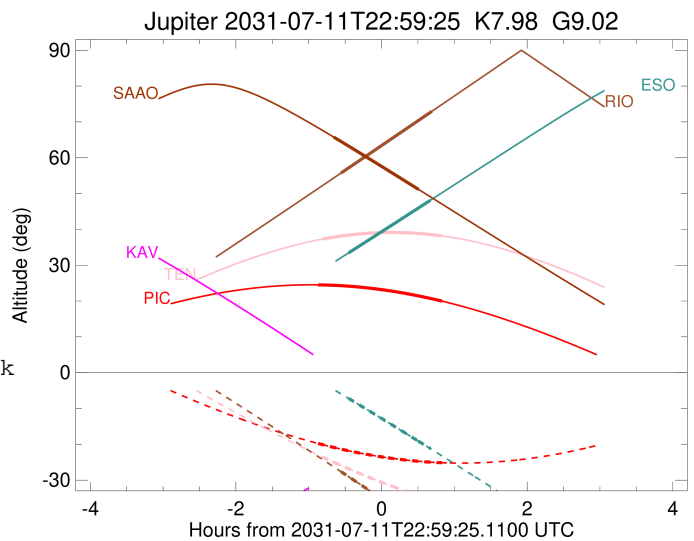
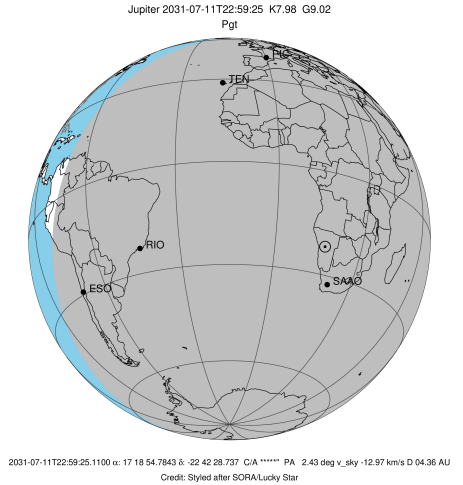


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-07-11T22:10:53.702	37.28	-23.55	71485.6	-57.67	-60.88
Jupiter	E	2031-07-11T23:49:12.560	38.17	-36.06	71486.0	-55.19	-58.55

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-07-11T23:03:30.810
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      : 4114691580031381376
2Mass ID (if available) : 17185477-2242281
ICRS Star Coord at Epoch: 17h 18m 54.78433s -22:42:28.73721s
RUWE (>1.4 is poor) : 0.88
K magnitude          : 7.984
G magnitude          : 9.019
RP magnitude         : 8.628
BP magnitude         : 9.248
DUPflag             : 0
Distance (au)       : 4.356
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.97
Sun-Target sep (deg) : 151.51
Sun-Moon sep (deg)  : 124.41
B (ring opening deg) : -2.56
PA of pole (deg)    : 3.58
Pole direction: RA (deg): 268.05690
Dec (deg): 64.49651
C/A sky separation (") : 20.538
C/A sky separation (km) : 64877.0
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
    
```

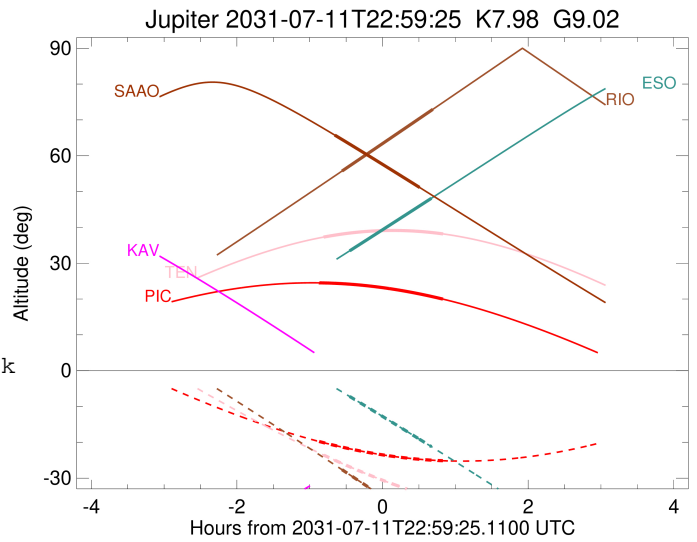
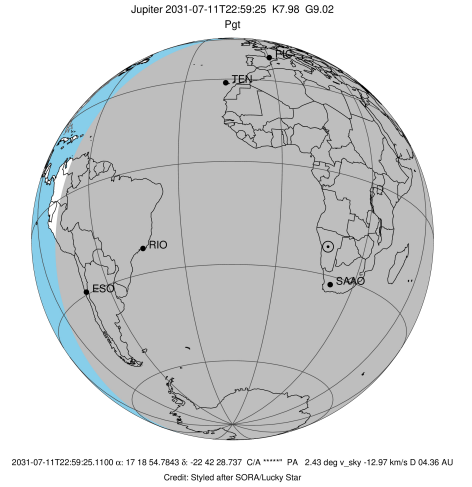


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-07-11T22:26:02.501	55.71	-27.63	71484.4	-66.63	-69.17
Jupiter	E	2031-07-11T23:40:54.274	72.94	-44.54	71484.8	-63.56	-66.35

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-07-11T23:06:04.080
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       : 4114691580031381376
2Mass ID (if available) : 17185477-2242281
ICRS Star Coord at Epoch: 17h 18m 54.78433s -22:42:28.73721s
RUWE (>1.4 is poor) : 0.88
K magnitude           : 7.984
G magnitude           : 9.019
RP magnitude         : 8.628
BP magnitude         : 9.248
DUPflag              : 0
Distance (au)        : 4.356
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.97
Sun-Target sep (deg) : 151.51
Sun-Moon sep (deg)   : 124.07
B (ring opening deg) : -2.56
PA of pole (deg)     : 3.58
Pole direction: RA (deg): 268.05690
Dec (deg): 64.49651
C/A sky separation (") : 20.988
C/A sky separation (km) : 66299.1
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
    
```

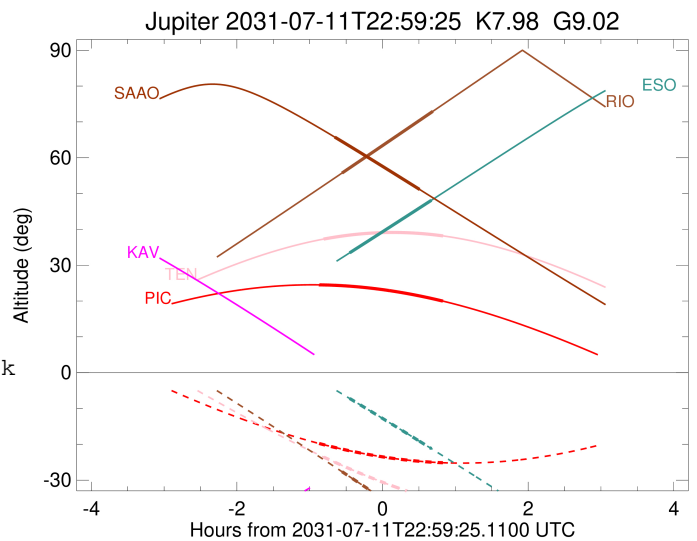
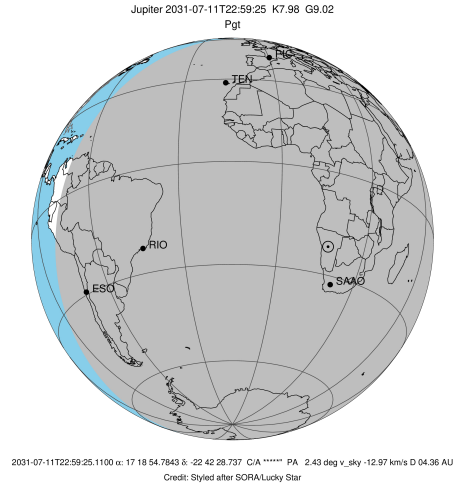


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-07-11T22:32:17.162	33.43	-7.19	71484.1	-69.66	-71.91
Jupiter	E	2031-07-11T23:39:43.988	48.12	-21.21	71484.5	-66.19	-68.77

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-07-11T22:55:00.840
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       : 4114691580031381376
2Mass ID (if available) : 17185477-2242281
ICRS Star Coord at Epoch: 17h 18m 54.78433s -22:42:28.73721s
RUWE (>1.4 is poor) : 0.88
K magnitude          : 7.984
G magnitude          : 9.019
RP magnitude         : 8.628
BP magnitude         : 9.248
DUPflag             : 0
Distance (au)        : 4.355
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.97
Sun-Target sep (deg) : 151.51
Sun-Moon sep (deg)   : 124.87
B (ring opening deg) : -2.56
PA of pole (deg)     : 3.58
Pole direction: RA (deg): 268.05690
Dec (deg): 64.49651
C/A sky separation ("): 20.827
C/A sky separation (km): 65789.6
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	2031-07-11T22:20:04.905	65.75	-78.68	71484.3	-67.72	-70.16
Jupiter	E	2031-07-11T23:30:03.035	51.13	-75.31	71484.5	-66.05	-68.63