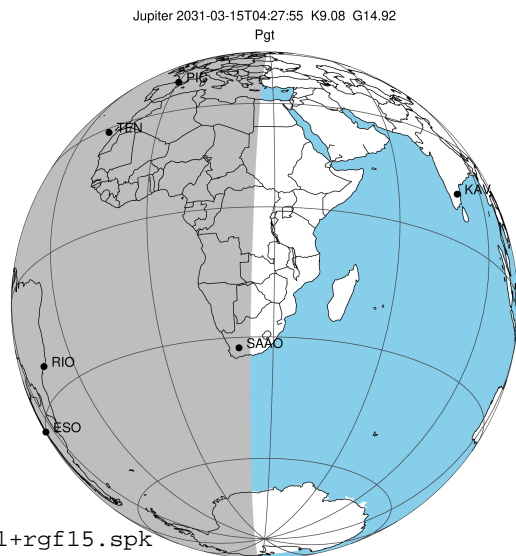


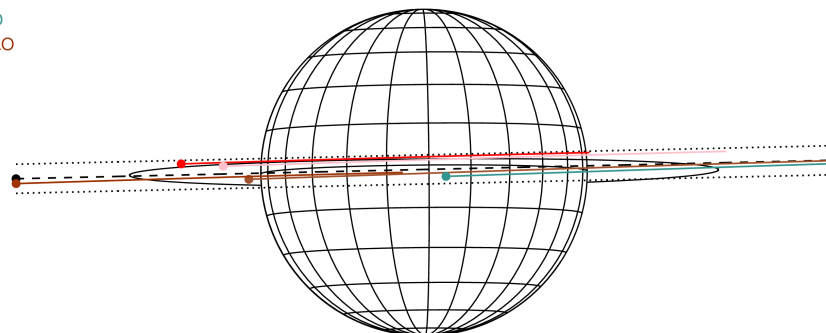
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-03-15T04:27:55.610
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068933887461176448
 2Mass ID (if available) : 17471291-2252019

Jupiter 2031-03-15T04:27:55 K9.08 G14.92 Pgt

ICRS Star Coord at Epoch: 17h 47m 12.84975s -22:52:01.41802s
 RUWE (>1.4 is poor) : 0.90
 K magnitude : 9.081
 G magnitude : 14.922
 RP magnitude : 0.000
 BP magnitude : 0.000
 DUPflag : 0
 Distance (au) : 5.271
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : 14.76
 Sun-Target sep (deg) : 86.90
 Sun-Moon sep (deg) : 17.33
 B (ring opening deg) : -2.63
 PA of pole (deg) : 0.54
 Pole direction: RA (deg): 268.05700
 Dec (deg): 64.49651
 C/A sky separation (") : 0.346
 C/A sky separation (km) : 1321.1
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk



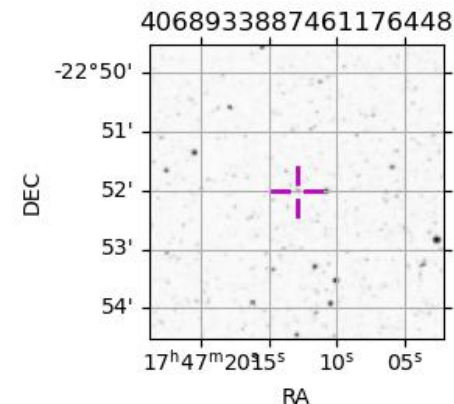
Earth
 PIC
 TEN
 RIO
 ESO
 SAAO



2031-03-15T04:27:55.6100 cc: 17 47 12.8497 s: -22 52 01.418 C/A 0.335" PA 181.30 deg v_sky +14.76 km/s D 05.27 AU
 Credit: Styled after SORA/Lucky Star

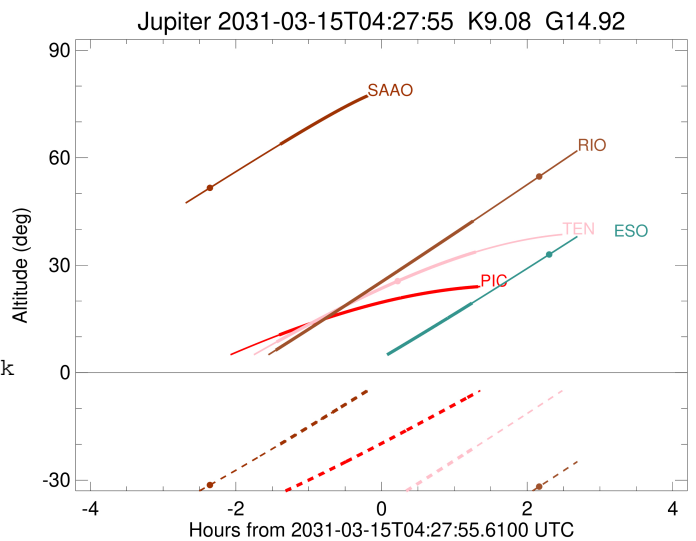
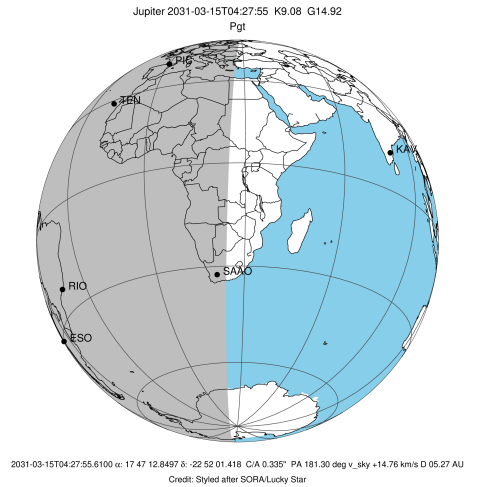
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+ +	MAR 15 03:03 - MAR 15 05:47	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 15 03:01 - MAR 15 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 15 03:00 - MAR 15 05:43	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	MAR 15 05:42 - MAR 15 05:42	Pne
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	MAR 15 03:04 - MAR 15 03:04	Pin
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-15T04:25:16.190
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        : 4068933887461176448
2Mass ID (if available) : 17471291-2252019
ICRS Star Coord at Epoch: 17h 47m 12.84975s -22:52:01.41802s
RUWE (>1.4 is poor) : 0.90
K magnitude           : 9.081
G magnitude           : 14.922
RP magnitude          : 0.000
BP magnitude          : 0.000
DUPflag              : 0
Distance (au)         : 5.271
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 14.76
Sun-Target sep (deg)  : 86.90
Sun-Moon sep (deg)    : 17.09
B (ring opening deg) : -2.63
PA of pole (deg)      : 0.54
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (") : 1.795
C/A sky separation (km) : 6864.1
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
    
```

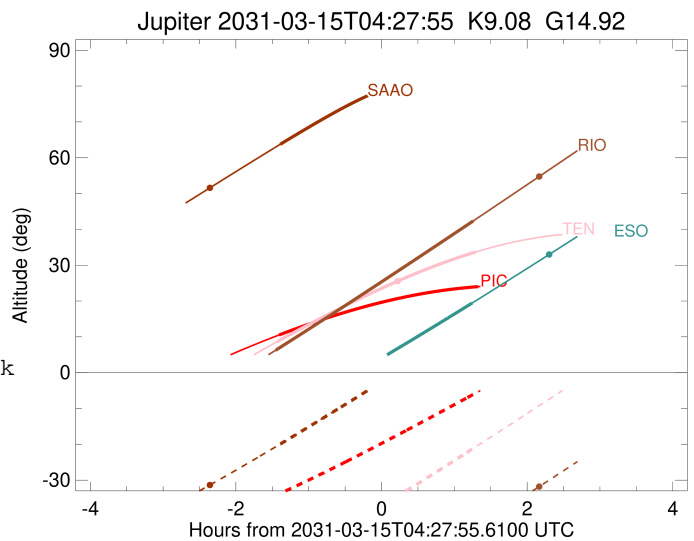
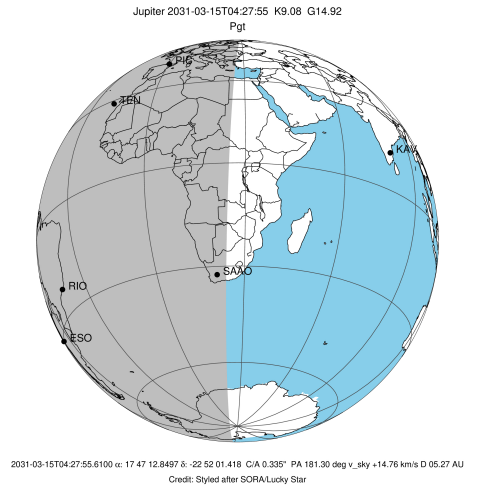


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-15T03:03:32.069	10.52	-33.82	71491.9	4.40	5.03
Jupiter	E	2031-03-15T05:47:30.203	24.00	-5.34	71491.9	6.45	7.36

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-15T04:23:15.870
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      : 4068933887461176448
2Mass ID (if available) : 17471291-2252019
ICRS Star Coord at Epoch: 17h 47m 12.84975s -22:52:01.41802s
RUWE (>1.4 is poor) : 0.90
K magnitude          : 9.081
G magnitude          : 14.922
RP magnitude         : 0.000
BP magnitude         : 0.000
DUPflag             : 0
Distance (au)        : 5.271
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 14.76
Sun-Target sep (deg) : 86.90
Sun-Moon sep (deg)  : 16.85
B (ring opening deg) : -2.63
PA of pole (deg)    : 0.54
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (" ) : 1.451
C/A sky separation (km) : 5548.3
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
    
```

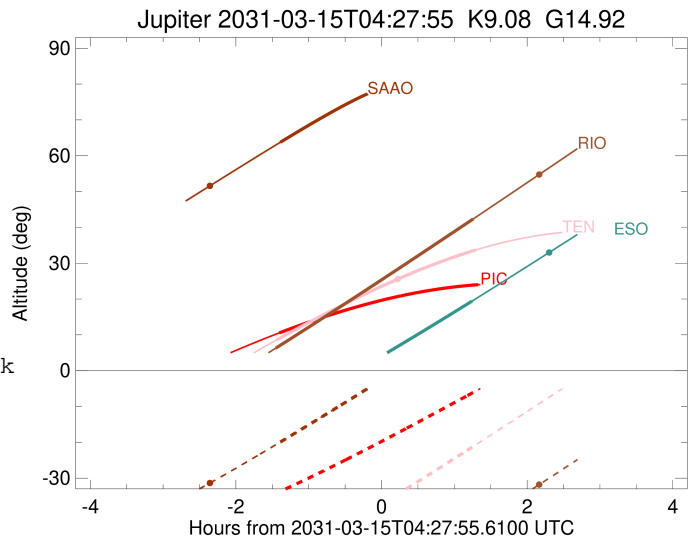
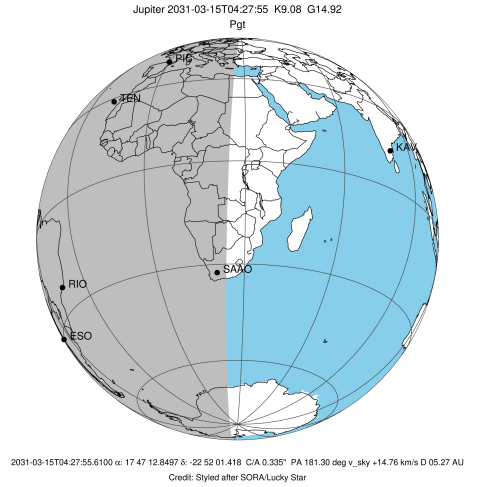


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-15T03:01:36.627	8.59	-53.72	71492.0	3.15	3.61
Jupiter	E	2031-03-15T05:45:40.784	33.70	-20.67	71491.9	5.59	6.39

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch             : 2031-03-15T04:21:38.220
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        : 4068933887461176448
2Mass ID (if available) : 17471291-2252019
ICRS Star Coord at Epoch: 17h 47m 12.84975s -22:52:01.41802s
RUWE (>1.4 is poor) : 0.90
K magnitude           : 9.081
G magnitude           : 14.922
RP magnitude          : 0.000
BP magnitude          : 0.000
DUPflag              : 0
Distance (au)         : 5.271
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 14.76
Sun-Target sep (deg) : 86.90
Sun-Moon sep (deg)   : 16.64
B (ring opening deg) : -2.63
PA of pole (deg)     : 0.54
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (") : 0.097
C/A sky separation (km) : 372.7
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
    
```

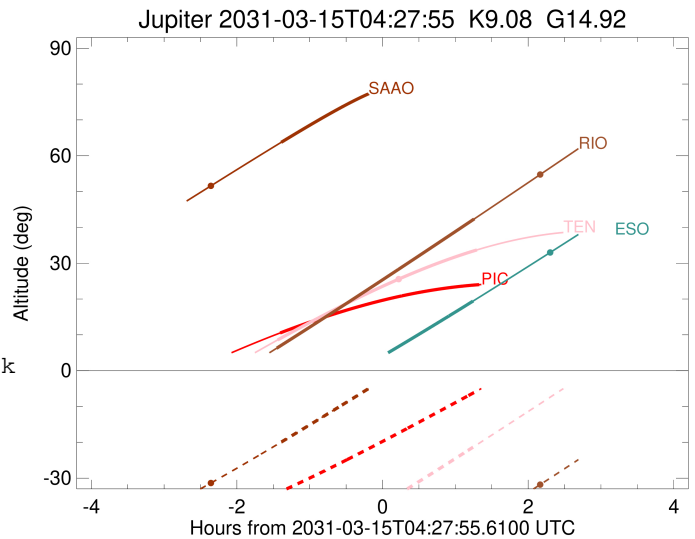
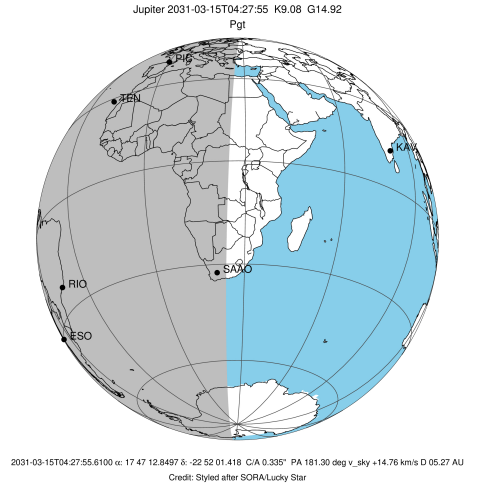


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-15T03:00:43.761	6.27	-64.99	71492.0	-1.70	-1.94
Jupiter	E	2031-03-15T05:43:30.605	42.35	-43.38	71492.0	1.05	1.20

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-15T04:21:49.640
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       : 4068933887461176448
2Mass ID (if available) : 17471291-2252019
ICRS Star Coord at Epoch: 17h 47m 12.84975s -22:52:01.41802s
RUWE (>1.4 is poor) : 0.90
K magnitude          : 9.081
G magnitude          : 14.922
RP magnitude         : 0.000
BP magnitude         : 0.000
DUPflag             : 0
Distance (au)        : 5.271
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 14.76
Sun-Target sep (deg) : 86.90
Sun-Moon sep (deg)   : 16.56
B (ring opening deg) : -2.63
PA of pole (deg)     : 0.54
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (") : 0.527
C/A sky separation (km) : 2016.0
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
    
```

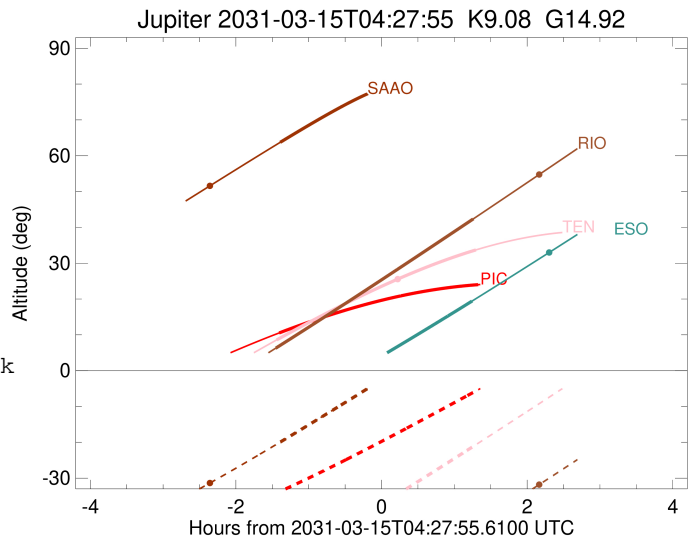
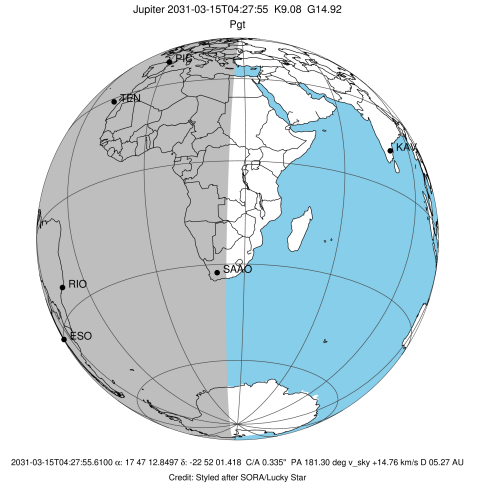


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-15T03:01:59.335	-12.31x	-49.06	71492.0	-2.93	-3.35
Jupiter	E	2031-03-15T05:42:34.324	19.43	-56.43	71492.0	-0.25	-0.28

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-15T04:27:11.950
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        : 4068933887461176448
2Mass ID (if available) : 17471291-2252019
ICRS Star Coord at Epoch: 17h 47m 12.84975s -22:52:01.41802s
RUWE (>1.4 is poor) : 0.90
K magnitude           : 9.081
G magnitude           : 14.922
RP magnitude          : 0.000
BP magnitude          : 0.000
DUPflag              : 0
Distance (au)         : 5.271
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 14.76
Sun-Target sep (deg)  : 86.90
Sun-Moon sep (deg)    : 17.53
B (ring opening deg) : -2.63
PA of pole (deg)      : 0.54
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (") : 0.068
C/A sky separation (km) : 259.1
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	2031-03-15T03:04:28.461	63.73	-19.93	71492.0	-0.76	-0.87
Jupiter	E	2031-03-15T05:50:12.117	74.69	14.77x	71492.0	0.96	1.10