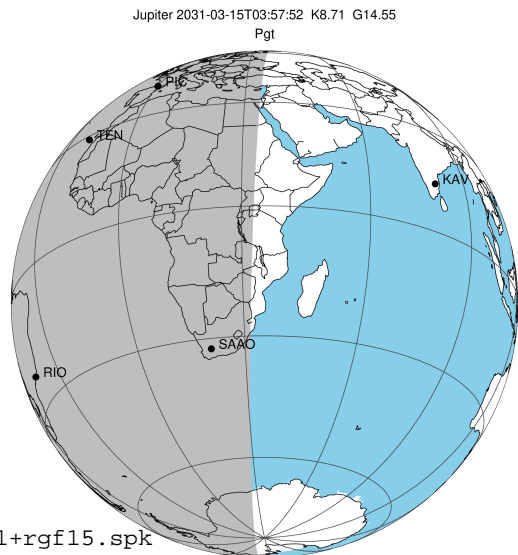


target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-03-15T03:57:52.880
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068933891823261184
 2Mass ID (if available) : 17471236-2251508

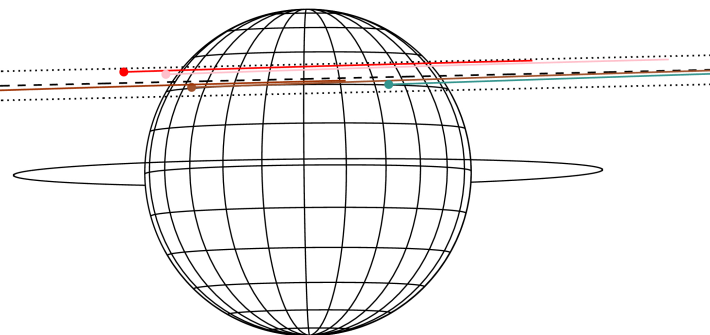
Jupiter 2031-03-15T03:57:52 K8.71 G14.55 Pgt

ICRS Star Coord at Epoch: 17h 47m 12.36309s -22:51:50.88328s
 RUWE (>1.4 is poor) : 0.92
 K magnitude : 8.711
 G magnitude : 14.550
 RP magnitude : 13.091
 BP magnitude : 17.351
 DUPflag : 0
 Distance (au) : 5.271
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : 14.77
 Sun-Target sep (deg) : 86.88
 Sun-Moon sep (deg) : 17.62
 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 (") : 10.725
 C/A sky separation (km) : 41004.2
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk



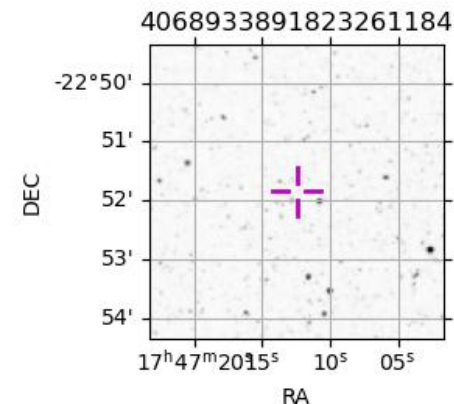
2031-03-15T03:57:52.8800 az: 17 47 12.3631 δ: -22 51 50.883 C/A ***** PA 181.29 deg v_sky +14.77 km/s D 05.27 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 TEN
 RIO
 ESO
 SAAO



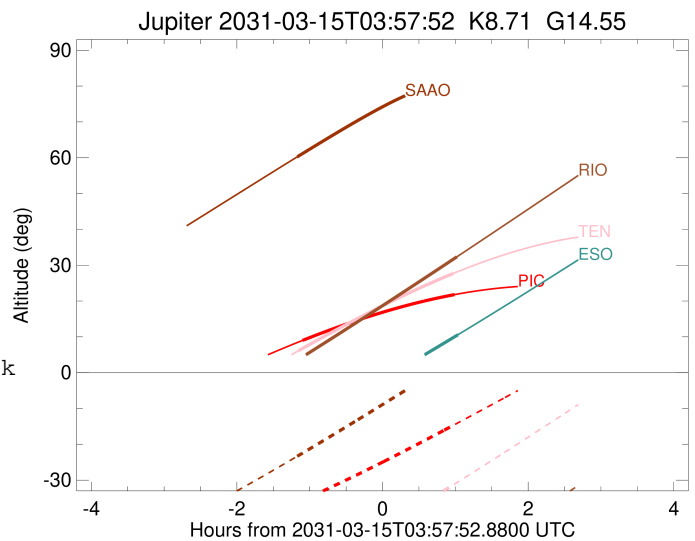
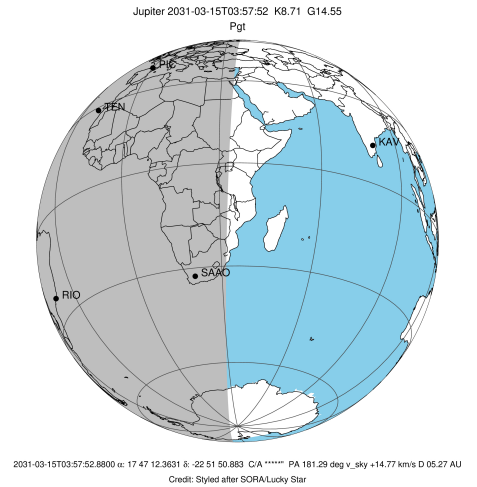
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+ +	MAR 15 02:51 - MAR 15 04:57	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 02:48 - MAR 15 04:56	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 04:59 - MAR 15 04:59	Pne
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	MAR 15 05:00 - MAR 15 05:00	Pne
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	MAR 15 02:47 - MAR 15 02:47	Pin
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-15T03:54:21.700
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      : 4068933891823261184
2Mass ID (if available) : 17471236-2251508
ICRS Star Coord at Epoch: 17h 47m 12.36309s -22:51:50.88328s
RUWE (>1.4 is poor) : 0.92
K magnitude          : 8.711
G magnitude          : 14.550
RP magnitude         : 13.091
BP magnitude         : 17.351
DUPflag             : 0
Distance (au)       : 5.272
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : 14.77
Sun-Target sep (deg) : 86.88
Sun-Moon sep (deg)  : 17.29
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 (" ) : 12.138
C/A sky separation (km) : 46407.1
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
    
```

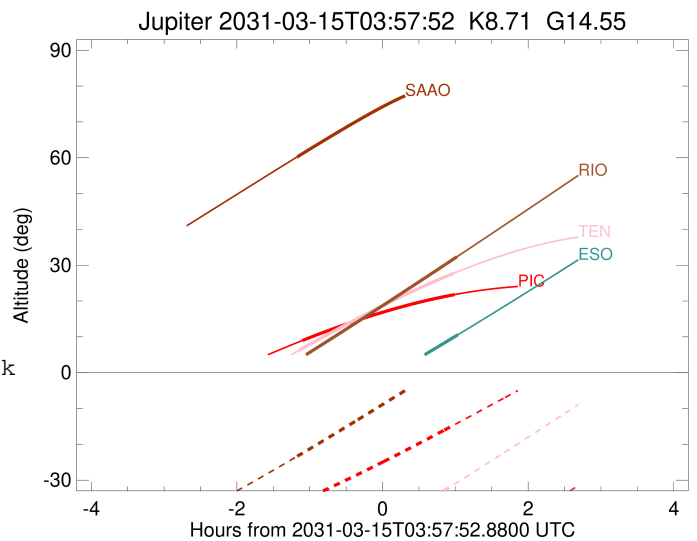
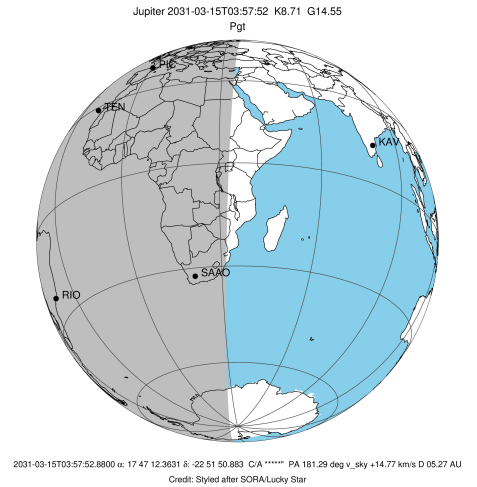


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-15T02:51:58.837	9.00	-35.56	71488.2	39.30	42.99
Jupiter	E	2031-03-15T04:57:05.127	21.77	-14.55	71487.8	41.45	45.16

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-15T03:52:15.340
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      : 4068933891823261184
2Mass ID (if available) : 17471236-2251508
ICRS Star Coord at Epoch: 17h 47m 12.36309s -22:51:50.88328s
RUWE (>1.4 is poor) : 0.92
K magnitude          : 8.711
G magnitude          : 14.550
RP magnitude         : 13.091
BP magnitude         : 17.351
DUPflag             : 0
Distance (au)       : 5.272
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 14.77
Sun-Target sep (deg) : 86.88
Sun-Moon sep (deg)  : 17.05
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 (") : 11.770
C/A sky separation (km) : 44999.4
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
    
```

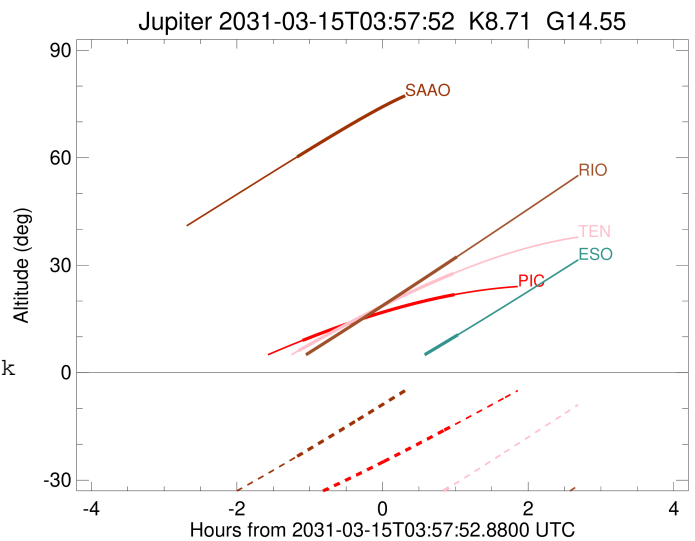
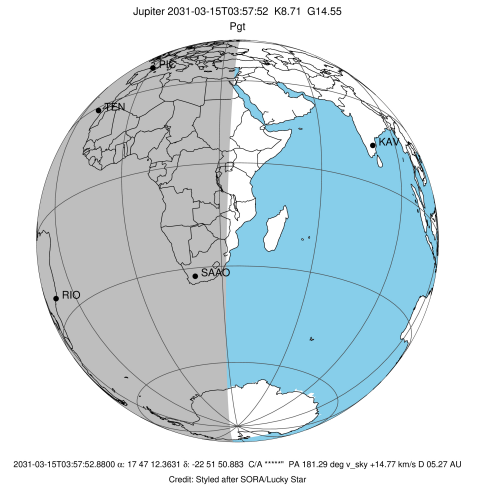


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-15T02:48:45.774	6.16	-55.80	71488.5	37.65	41.32
Jupiter	E	2031-03-15T04:56:15.777	27.70	-31.32	71488.1	40.18	43.89

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-15T03:50:53.500
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       : 4068933891823261184
2Mass ID (if available) : 17471236-2251508
ICRS Star Coord at Epoch: 17h 47m 12.36309s -22:51:50.88328s
RUWE (>1.4 is poor) : 0.92
K magnitude           : 8.711
G magnitude           : 14.550
RP magnitude          : 13.091
BP magnitude          : 17.351
DUPflag              : 0
Distance (au)         : 5.272
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 14.77
Sun-Target sep (deg) : 86.88
Sun-Moon sep (deg)   : 16.87
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 ("): 10.204
C/A sky separation (km): 39011.9
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
    
```

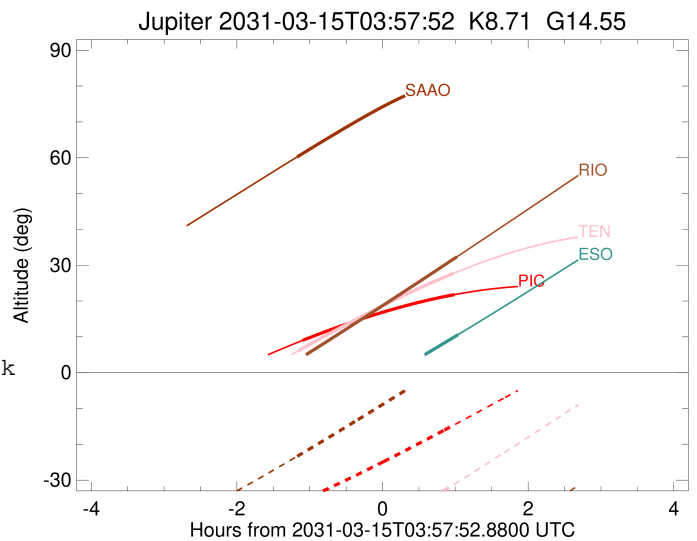
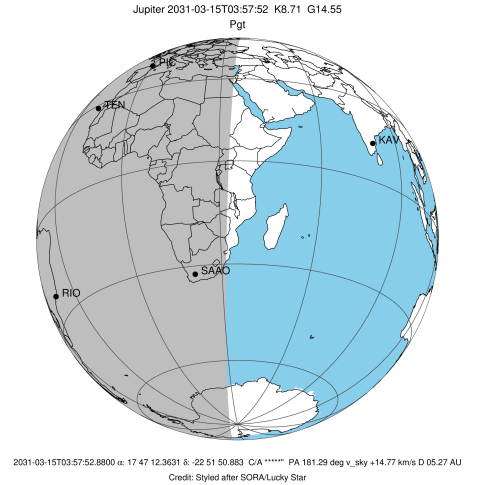


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-15T02:43:20.091	2.57x	-64.58	71489.4	31.64	35.09
Jupiter	E	2031-03-15T04:59:09.087	32.33	-52.05	71489.0	34.41	37.99

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-15T03:51:32.780
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        : 4068933891823261184
2Mass ID (if available) : 17471236-2251508
ICRS Star Coord at Epoch: 17h 47m 12.36309s -22:51:50.88328s
RUWE (>1.4 is poor) : 0.92
K magnitude           : 8.711
G magnitude           : 14.550
RP magnitude          : 13.091
BP magnitude          : 17.351
DUPflag              : 0
Distance (au)         : 5.272
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 14.77
Sun-Target sep (deg) : 86.88
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 (") : 9.781
C/A sky separation (km) : 37394.9
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
    
```

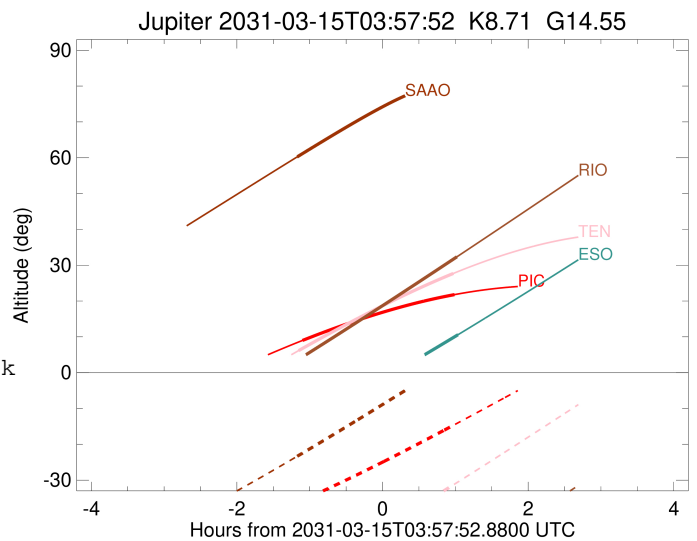
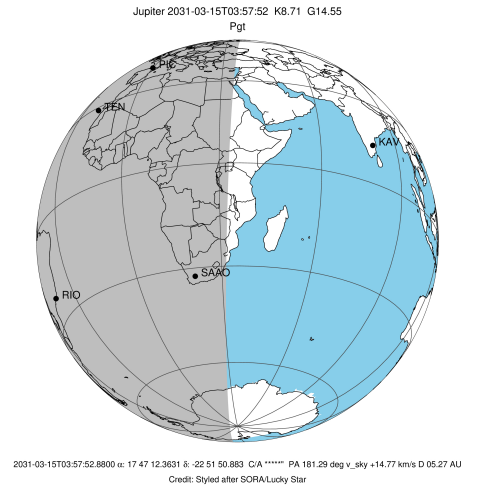


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-15T02:43:43.358	-15.52x	-46.12	71489.6	30.22	33.60
Jupiter	E	2031-03-15T05:00:00.928	10.58	-58.63	71489.2	32.85	36.36

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-15T03:56:12.080
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        : 4068933891823261184
2Mass ID (if available) : 17471236-2251508
ICRS Star Coord at Epoch: 17h 47m 12.36309s -22:51:50.88328s
RUWE (>1.4 is poor) : 0.92
K magnitude           : 8.711
G magnitude           : 14.550
RP magnitude          : 13.091
BP magnitude          : 17.351
DUPflag              : 0
Distance (au)         : 5.271
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 14.77
Sun-Target sep (deg)  : 86.88
Sun-Moon sep (deg)   : 17.72
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 (") : 10.429
C/A sky separation (km) : 39874.4
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	2031-03-15T02:47:34.689	60.23	-23.34	71489.2	32.84	36.35
Jupiter	E	2031-03-15T05:05:05.710	80.43	5.26x	71488.9	34.71	38.30