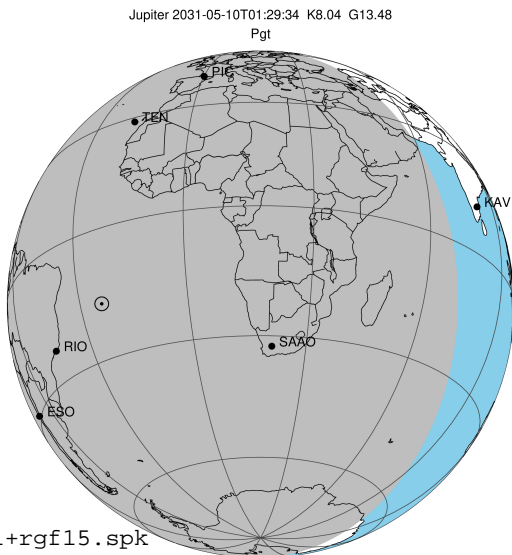


target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-05-10T01:29:34.320
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068877919789000192
 2Mass ID (if available) : 17493820-2253281

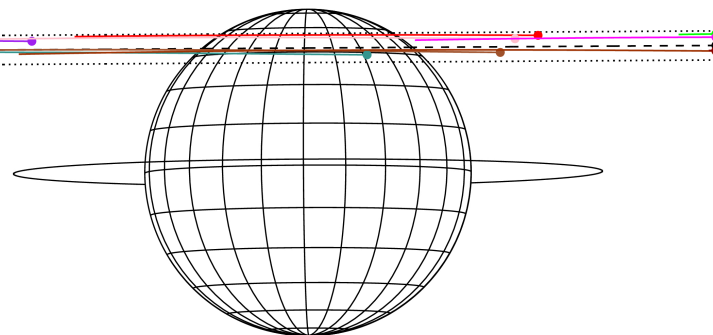
Jupiter 2031-05-10T01:29:34 K8.04 G13.48 Pgt

ICRS Star Coord at Epoch: 17h 49m 38.19200s -22:53:28.46497s
 RUWE (>1.4 is poor) : 0.86
 K magnitude : 8.036
 G magnitude : 13.478
 RP magnitude : 12.151
 BP magnitude : 15.560
 DUPflag : 0
 Distance (au) : 4.468
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -9.91
 Sun-Target sep (deg) : 141.18
 Sun-Moon sep (deg) : 2.45
 B (ring opening deg) : -2.61
 PA of pole (deg) : 0.28
 Pole direction: RA (deg): 268.05695
 Dec (deg): 64.49651
 C/A sky separation (") : 16.826
 C/A sky separation (km) : 54528.2
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 naif0012.tls
 nep097.bsp
 nep101.bsp
 sat4401.bsp



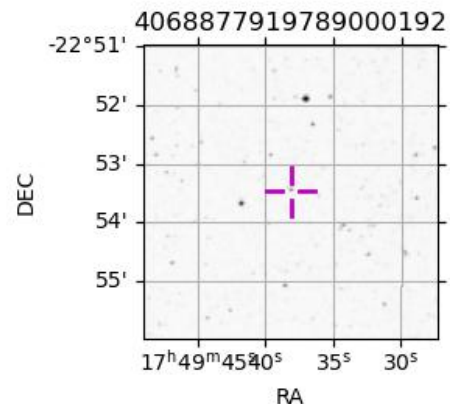
2031-05-10T01:29:34.3200 α: 17 49 38.1920 δ: -22 53 28.465 C/A ***** PA 180.36 deg v_sky - 9.91 km/s D 04.47 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 PAL
 PMO
 KPNO
 MCD
 TEN
 KAV
 RIO
 ESO
 SAAO
 MSO



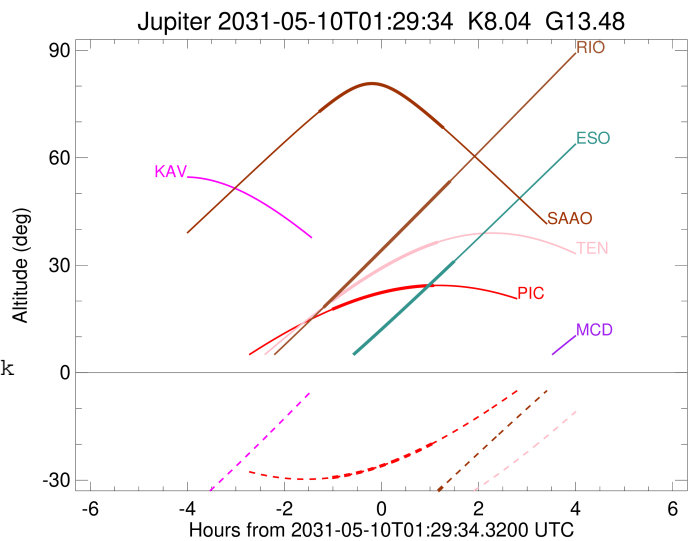
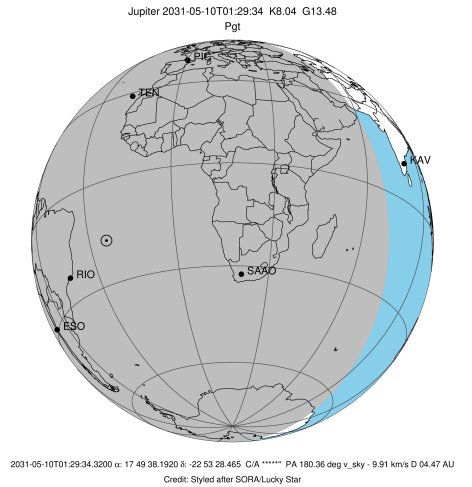
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+ +	MAY 10 00:28 - MAY 10 02:34	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	+ +	MAY 10 00:28 - MAY 10 02:39	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	+ +	MAY 10 00:17 - MAY 10 02:54	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	MAY 10 02:59 - MAY 10 02:59	Pne
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	MAY 10 00:12 - MAY 10 02:46	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch             : 2031-05-10T01:31:31.700
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        : 4068877919789000192
2Mass ID (if available) : 17493820-2253281
ICRS Star Coord at Epoch: 17h 49m 38.19200s -22:53:28.46497s
RUWE (>1.4 is poor)  : 0.86
K magnitude           : 8.036
G magnitude           : 13.478
RP magnitude          : 12.151
BP magnitude          : 15.560
DUPflag              : 0
Distance (au)         : 4.468
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -9.91
Sun-Target sep (deg)  : 141.18
Sun-Moon sep (deg)    : 1.86
B (ring opening deg)  : -2.61
PA of pole (deg)      : 0.28
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 18.591
C/A sky separation (km) : 60247.1
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
    
```

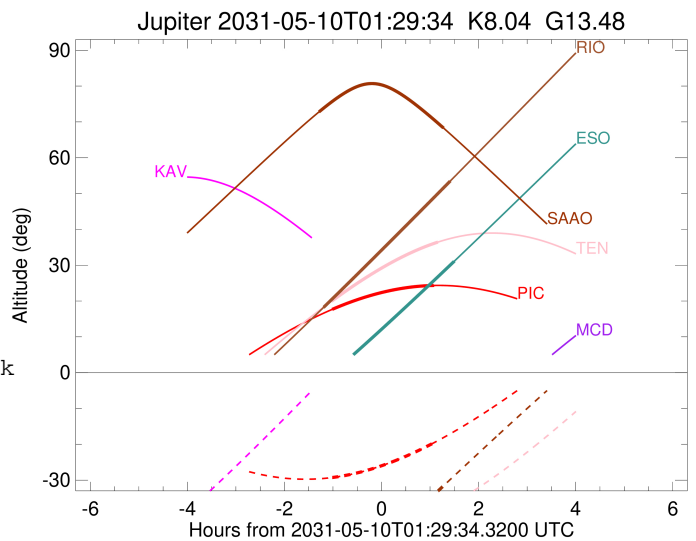
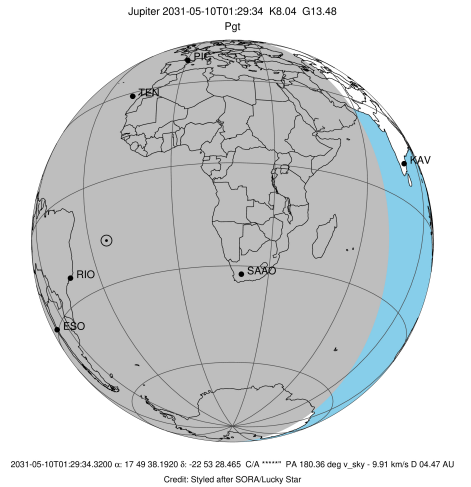


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-10T00:28:35.268	17.66	-29.27	71485.4	57.11	60.36
Jupiter	E	2031-05-10T02:34:13.468	24.34	-19.58	71485.4	57.38	60.62

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch              : 2031-05-10T01:33:55.100
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        : 4068877919789000192
2Mass ID (if available) : 17493820-2253281
ICRS Star Coord at Epoch: 17h 49m 38.19200s -22:53:28.46497s
RUWE (>1.4 is poor)  : 0.86
K magnitude            : 8.036
G magnitude            : 13.478
RP magnitude           : 12.151
BP magnitude           : 15.560
DUPflag               : 0
Distance (au)         : 4.468
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -9.91
Sun-Target sep (deg)  : 141.18
Sun-Moon sep (deg)    : 2.19
B (ring opening deg)  : -2.61
PA of pole (deg)      : 0.28
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 18.243
C/A sky separation (km) : 59120.2
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
    
```

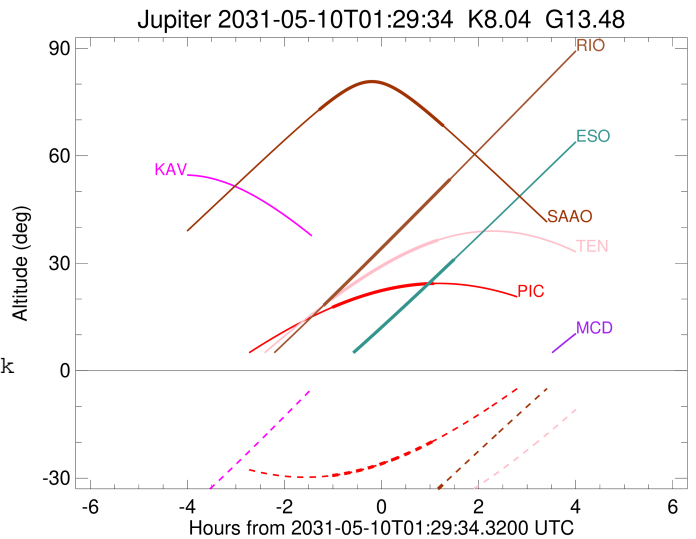
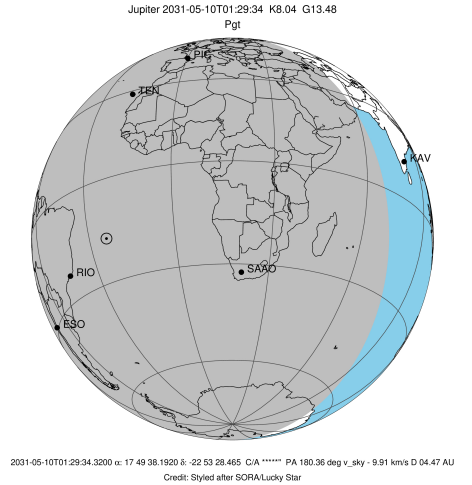


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-10T00:28:10.154	19.98	-43.60	71485.7	55.20	58.56
Jupiter	E	2031-05-10T02:39:11.308	36.44	-38.68	71485.6	56.00	59.32

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch              : 2031-05-10T01:36:46.970
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        : 4068877919789000192
2Mass ID (if available) : 17493820-2253281
ICRS Star Coord at Epoch: 17h 49m 38.19200s -22:53:28.46497s
RUWE (>1.4 is poor)  : 0.86
K magnitude            : 8.036
G magnitude           : 13.478
RP magnitude          : 12.151
BP magnitude          : 15.560
DUPflag              : 0
Distance (au)         : 4.468
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -9.91
Sun-Target sep (deg)  : 141.18
Sun-Moon sep (deg)    : 3.07
B (ring opening deg)  : -2.61
PA of pole (deg)      : 0.28
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 16.483
C/A sky separation (km) : 53416.4
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
    
```

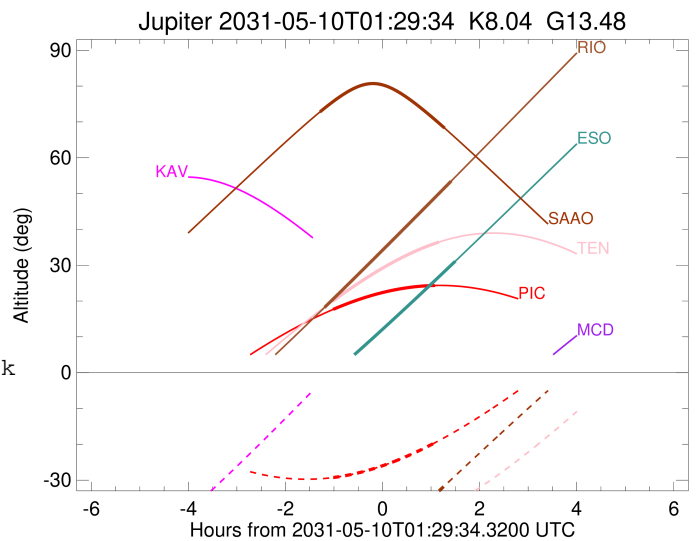
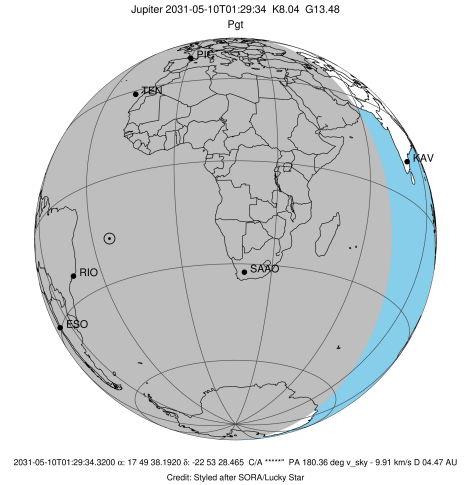


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-10T00:17:57.433	18.21	-54.18	71487.0	47.48	51.14
Jupiter	E	2031-05-10T02:54:33.443	53.49	-84.65	71486.7	48.91	52.53

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-10T01:37:31.430
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        : 4068877919789000192
2Mass ID (if available) : 17493820-2253281
ICRS Star Coord at Epoch: 17h 49m 38.19200s -22:53:28.46497s
RUWE (>1.4 is poor) : 0.86
K magnitude           : 8.036
G magnitude           : 13.478
RP magnitude          : 12.151
BP magnitude          : 15.560
DUPflag              : 0
Distance (au)         : 4.468
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -9.91
Sun-Target sep (deg) : 141.18
Sun-Moon sep (deg)   : 3.30
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.28
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation ("): 15.982
C/A sky separation (km): 51791.9
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
    
```

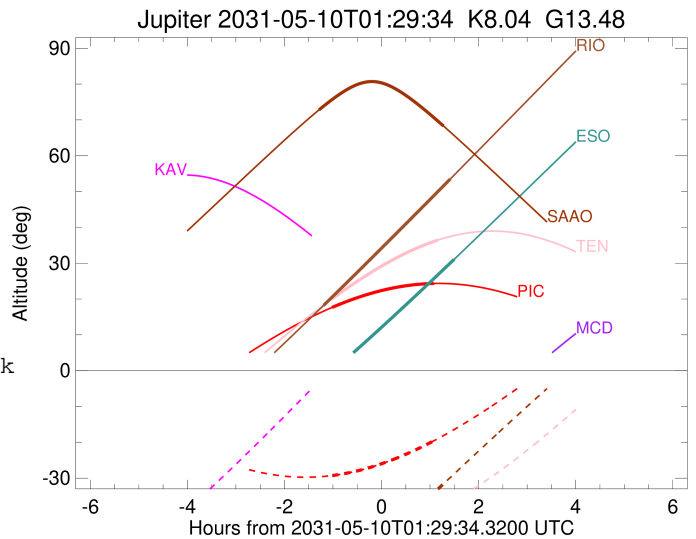
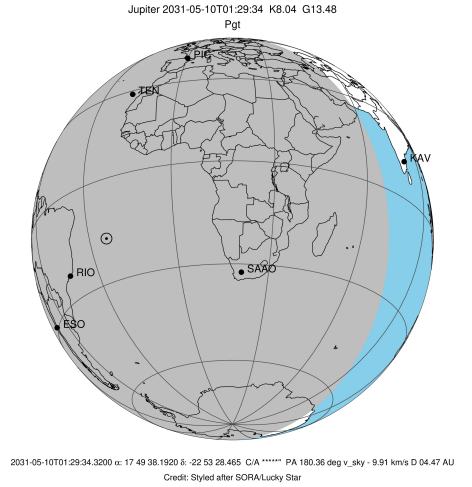


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-10T00:14:13.124	-2.99x	-28.78	71487.3	45.54	49.24
Jupiter	E	2031-05-10T02:59:31.967	31.11	-64.42	71487.0	47.15	50.82

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-10T01:29:10.060
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        : 4068877919789000192
2Mass ID (if available) : 17493820-2253281
ICRS Star Coord at Epoch: 17h 49m 38.19200s -22:53:28.46497s
RUWE (>1.4 is poor) : 0.86
K magnitude           : 8.036
G magnitude           : 13.478
RP magnitude          : 12.151
BP magnitude          : 15.560
DUPflag              : 0
Distance (au)         : 4.468
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -9.91
Sun-Target sep (deg) : 141.18
Sun-Moon sep (deg)   : 2.63
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.28
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation ("): 16.507
C/A sky separation (km): 53495.4
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	2031-05-10T00:12:10.448	72.76	-63.28	71486.8	48.36	51.99
Jupiter	E	2031-05-10T02:46:04.964	68.31	-31.61	71486.8	48.12	51.76