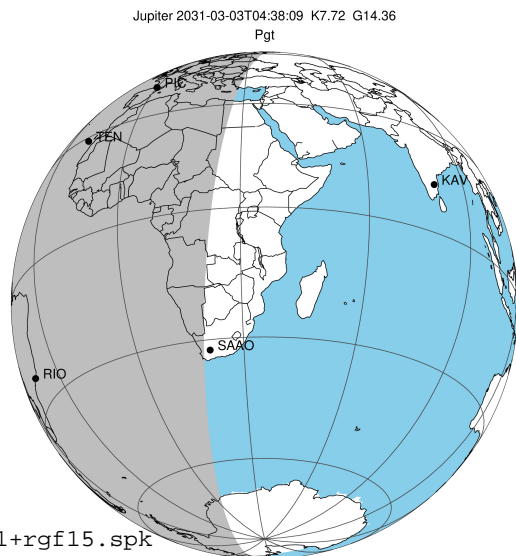


target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-03-03T04:38:09.820
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116928536478142208
 2Mass ID (if available) : 17413595-2249497

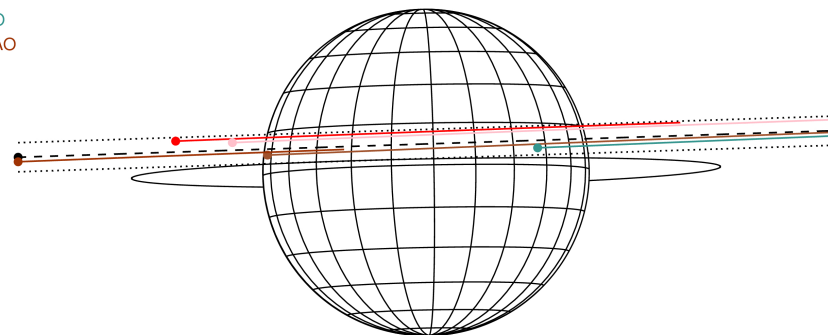
Jupiter 2031-03-03T04:38:09 K7.72 G14.36 Pgt

ICRS Star Coord at Epoch: 17h 41m 35.97098s -22:49:50.01696s
 RUWE (>1.4 is poor) : 0.82
 K magnitude : 7.720
 G magnitude : 14.358
 RP magnitude : 12.812
 BP magnitude : 17.823
 DUPflag : 0
 Distance (au) : 5.463
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : 20.23
 Sun-Target sep (deg) : 76.21
 Sun-Moon sep (deg) : 171.63
 B (ring opening deg) : -2.65
 PA of pole (deg) : 1.14
 Pole direction: RA (deg): 268.05701
 Dec (deg): 64.49651
 C/A sky separation (") : 3.154
 C/A sky separation (km) : 12497.6
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk



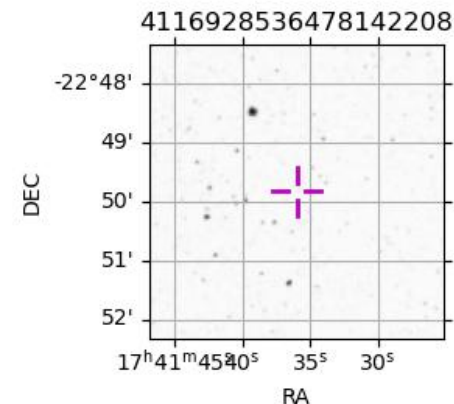
2031-03-03T04:38:09.8200 cc: 17 41 35.9710 s: -22 49 50.017 C/A 3.144" PA 181.86 deg v_sky +20.23 km/s D 05.46 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 TEN
 RIO
 ESO
 SAAO



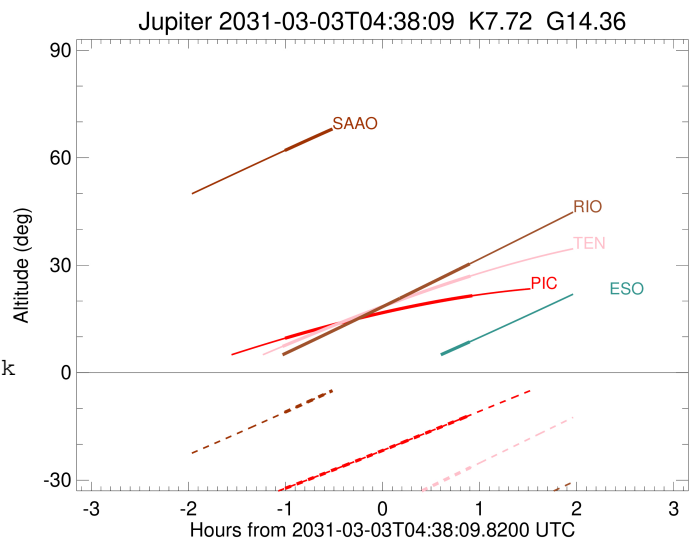
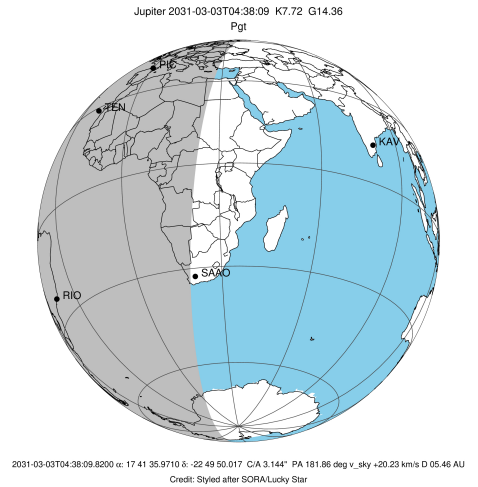
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+ +	MAR 03 03:37 - MAR 03 05:33	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 03 03:36 - MAR 03 05:32	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 03 05:32 - MAR 03 05:32	Pne
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	MAR 03 05:32 - MAR 03 05:32	Pne
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	MAR 03 03:37 - MAR 03 03:37	Pin
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-03T04:35:42.110
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       : 4116928536478142208
2Mass ID (if available) : 17413595-2249497
ICRS Star Coord at Epoch: 17h 41m 35.97098s -22:49:50.01696s
RUWE (>1.4 is poor) : 0.82
K magnitude          : 7.720
G magnitude          : 14.358
RP magnitude         : 12.812
BP magnitude         : 17.823
DUPflag             : 0
Distance (au)        : 5.463
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 20.23
Sun-Target sep (deg) : 76.21
Sun-Moon sep (deg)   : 171.81
B (ring opening deg) : -2.65
PA of pole (deg)     : 1.14
Pole direction: RA (deg): 268.05701
Dec (deg): 64.49651
C/A sky separation (") : 4.510
C/A sky separation (km) : 17868.9
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
    
```

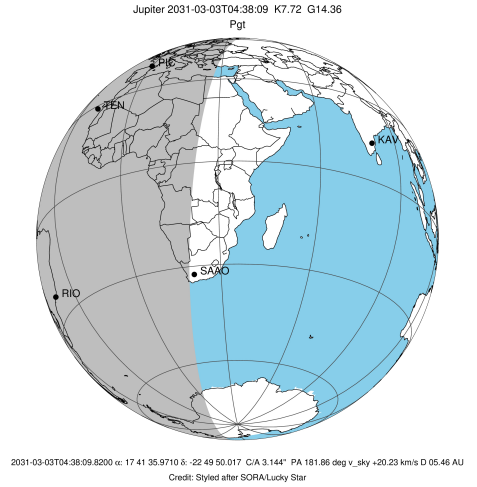


x: target alt < 5.0 deg or sun > -5.0 deg

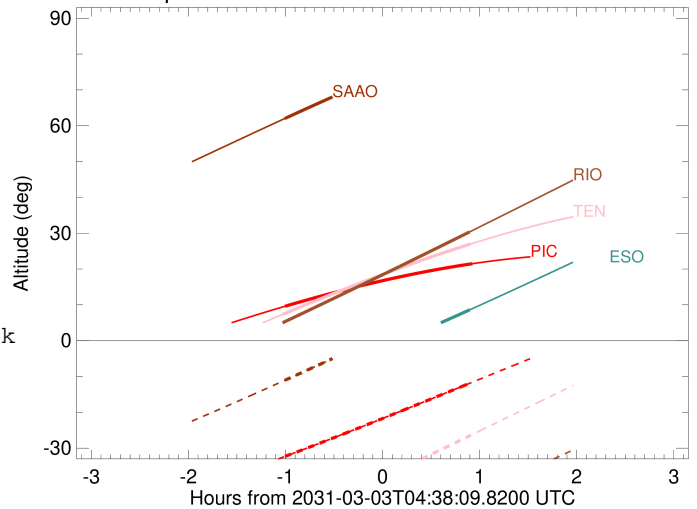
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-03T03:37:59.253	9.61	-32.30	71491.5	13.46	15.30
Jupiter	E	2031-03-03T05:33:37.505	21.48	-11.61	71491.3	15.39	17.46

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-03T04:34:16.460
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        : 4116928536478142208
2Mass ID (if available) : 17413595-2249497
ICRS Star Coord at Epoch: 17h 41m 35.97098s -22:49:50.01696s
RUWE (>1.4 is poor) : 0.82
K magnitude           : 7.720
G magnitude           : 14.358
RP magnitude          : 12.812
BP magnitude          : 17.823
DUPflag              : 0
Distance (au)         : 5.463
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 20.23
Sun-Target sep (deg)  : 76.21
Sun-Moon sep (deg)    : 172.11
B (ring opening deg) : -2.65
PA of pole (deg)      : 1.14
Pole direction: RA (deg): 268.05701
Dec (deg): 64.49651
C/A sky separation (") : 4.151
C/A sky separation (km) : 16447.9
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
    
```



Jupiter 2031-03-03T04:38:09 K7.72 G14.36

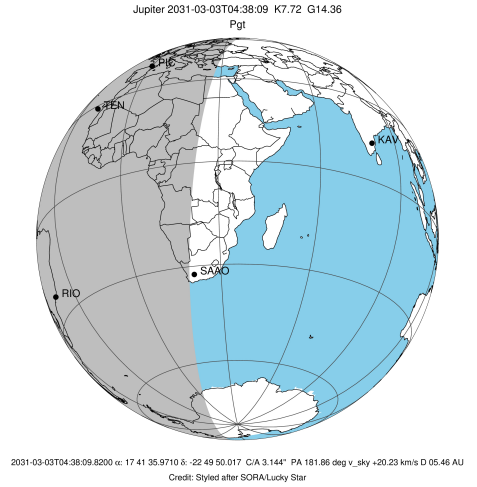


x: target alt < 5.0 deg or sun > -5.0 deg

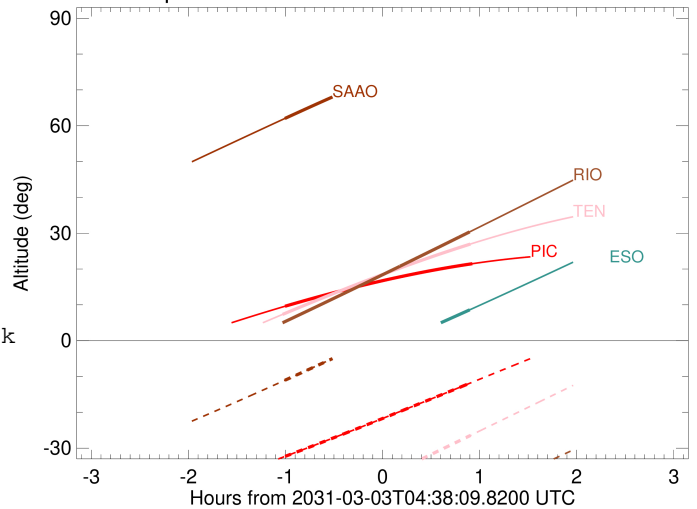
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-03T03:36:24.380	7.33	-51.03	71491.6	12.15	13.83
Jupiter	E	2031-03-03T05:32:26.747	26.96	-26.47	71491.4	14.36	16.30

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-03T04:33:22.200
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      : 4116928536478142208
2Mass ID (if available) : 17413595-2249497
ICRS Star Coord at Epoch: 17h 41m 35.97098s -22:49:50.01696s
RUWE (>1.4 is poor) : 0.82
K magnitude          : 7.720
G magnitude          : 14.358
RP magnitude         : 12.812
BP magnitude         : 17.823
DUPflag             : 0
Distance (au)       : 5.463
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 20.23
Sun-Target sep (deg) : 76.21
Sun-Moon sep (deg)  : 172.51
B (ring opening deg) : -2.65
PA of pole (deg)    : 1.14
Pole direction: RA (deg): 268.05701
Dec (deg): 64.49651
C/A sky separation (" ) : 2.638
C/A sky separation (km) : 10453.7
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
    
```



Jupiter 2031-03-03T04:38:09 K7.72 G14.36

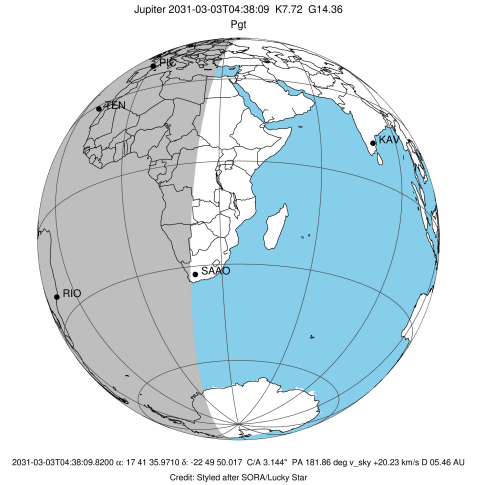


x: target alt < 5.0 deg or sun > -5.0 deg

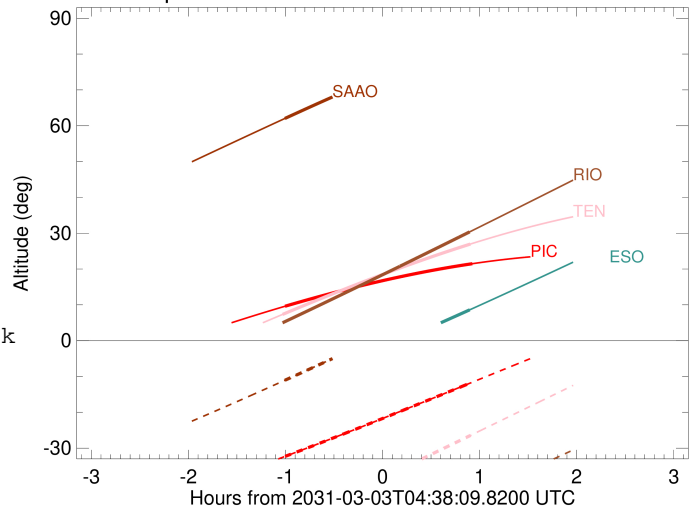
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-03T03:35:05.207	4.71x	-59.42	71491.8	7.21	8.23
Jupiter	E	2031-03-03T05:32:01.584	30.36	-43.38	71491.7	9.58	10.92

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-03T04:33:49.010
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        : 4116928536478142208
2Mass ID (if available) : 17413595-2249497
ICRS Star Coord at Epoch: 17h 41m 35.97098s -22:49:50.01696s
RUWE (>1.4 is poor) : 0.82
K magnitude           : 7.720
G magnitude           : 14.358
RP magnitude          : 12.812
BP magnitude          : 17.823
DUPflag              : 0
Distance (au)         : 5.463
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 20.23
Sun-Target sep (deg)  : 76.21
Sun-Moon sep (deg)    : 172.46
B (ring opening deg) : -2.65
PA of pole (deg)      : 1.14
Pole direction: RA (deg): 268.05701
Dec (deg): 64.49651
C/A sky separation (" ) : 2.231
C/A sky separation (km) : 8840.6
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
    
```



Jupiter 2031-03-03T04:38:09 K7.72 G14.36

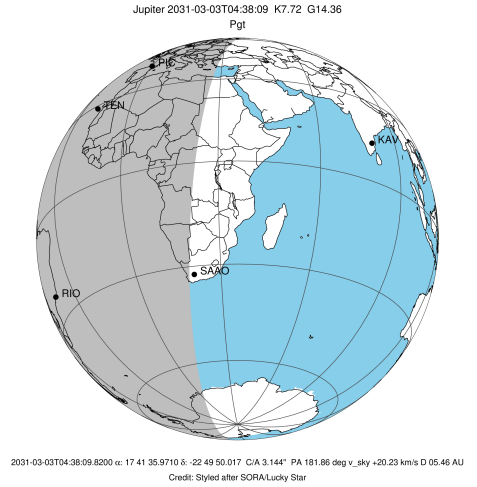


x: target alt < 5.0 deg or sun > -5.0 deg

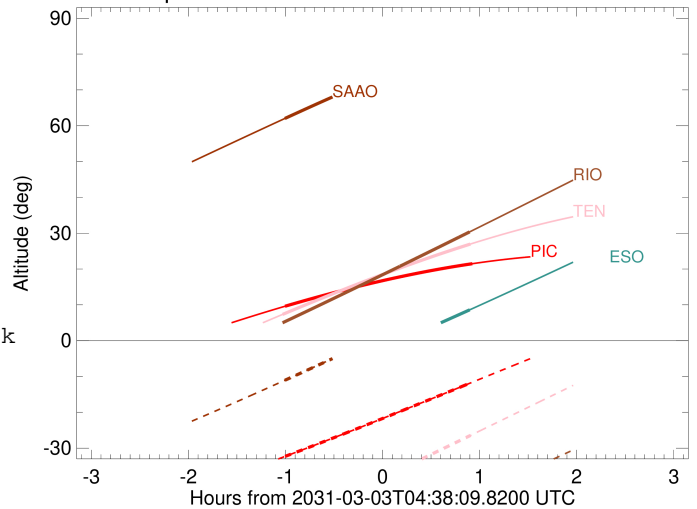
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-03T03:35:53.646	-13.69x	-49.27	71491.9	5.99	6.84
Jupiter	E	2031-03-03T05:32:04.636	8.61	-52.92	71491.8	8.25	9.41

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-03T04:37:00.840
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        : 4116928536478142208
2Mass ID (if available) : 17413595-2249497
ICRS Star Coord at Epoch: 17h 41m 35.97098s -22:49:50.01696s
RUWE (>1.4 is poor) : 0.82
K magnitude           : 7.720
G magnitude           : 14.358
RP magnitude          : 12.812
BP magnitude          : 17.823
DUPflag              : 0
Distance (au)         : 5.463
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 20.23
Sun-Target sep (deg)  : 76.21
Sun-Moon sep (deg)   : 171.97
B (ring opening deg) : -2.65
PA of pole (deg)     : 1.14
Pole direction: RA (deg): 268.05701
Dec (deg): 64.49651
C/A sky separation (") : 2.864
C/A sky separation (km) : 11348.6
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
    
```



Jupiter 2031-03-03T04:38:09 K7.72 G14.36



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	2031-03-03T03:37:49.235	62.02	-11.05	71491.8	8.20	9.36
Jupiter	E	2031-03-03T05:36:21.122	80.64	13.71x	71491.7	9.93	11.32