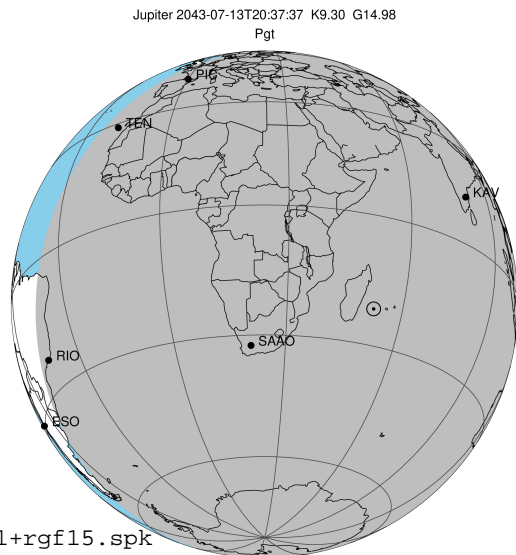


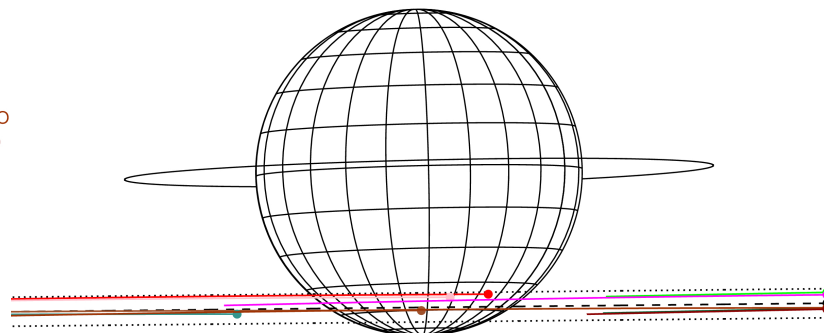
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2043-07-13T20:37:37.450  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4116555419684742016  
 2Mass ID (if available) : 17392161-2304123

Jupiter 2043-07-13T20:37:37 K9.30 G14.98 Pgt

ICRS Star Coord at Epoch: 17h 39m 21.63041s -23:04:12.46065s  
 RUWE (>1.4 is poor) : 0.98  
 K magnitude : 9.300  
 G magnitude : 14.979  
 RP magnitude : 13.565  
 BP magnitude : 17.342  
 DUPflag : 0  
 Distance (au) : 4.323  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -13.60  
 Sun-Target sep (deg) : 154.49  
 Sun-Moon sep (deg) : 66.89  
 B (ring opening deg) : -2.40  
 PA of pole (deg) : 1.39  
 Pole direction: RA (deg): 268.05670  
 Dec (deg): 64.49732  
 C/A sky separation (") : 18.860  
 C/A sky separation (km) : 59128.7  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk



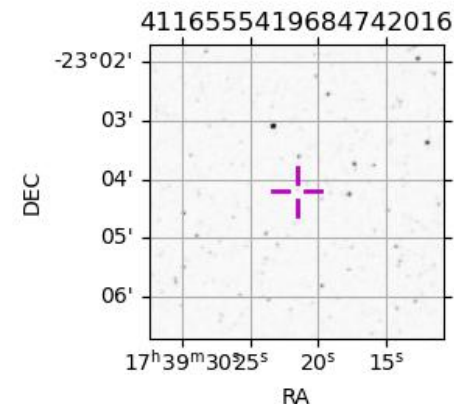
Earth  
 PIC  
 PMO  
 TEN  
 KAV  
 RIO  
 ESO  
 AAT  
 SAAO  
 MSO



2043-07-13T20:37:37.4500 α: 17 39 21.6304 δ: -23 04 12.461 C/A \*\*\*\*\* PA 0.59 deg v\_sky -13.60 km/s D 04.32 AU  
 Credit: Styled after SORA/Lucky Star

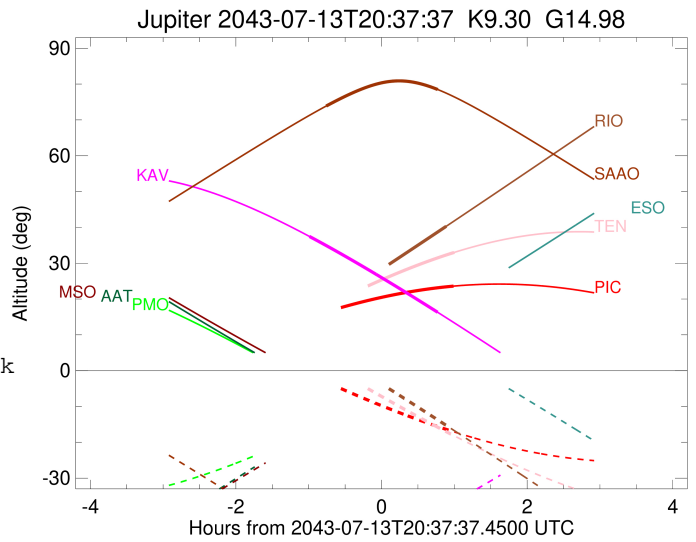
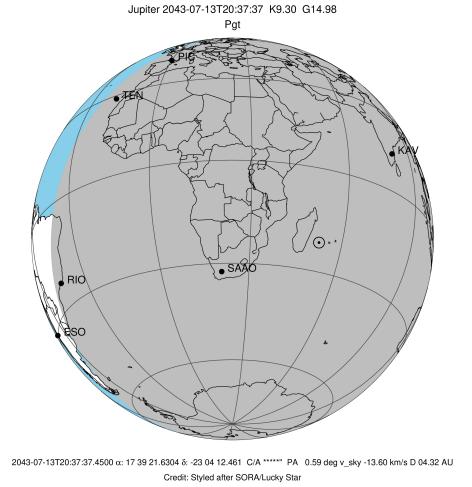
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	JUL 13 21:36 - JUL 13 21:36	Pne
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 13 21:37 - JUL 13 21:37	Pne
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+ +	JUL 13 19:38 - JUL 13 21:23	Pie
RIO	Rio de Janeiro	-22.9	316.8	+ +	JUL 13 21:30 - JUL 13 21:30	Pne
ESO	European Southern Obs. (3.6m)	-29.3	289.3			Pnn
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	JUL 13 19:52 - JUL 13 21:24	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-13T20:40:13.590
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       : 4116555419684742016
2Mass ID (if available) : 17392161-2304123
ICRS Star Coord at Epoch: 17h 39m 21.63041s -23:04:12.46065s
RUWE (>1.4 is poor) : 0.98
K magnitude           : 9.300
G magnitude           : 14.979
RP magnitude         : 13.565
BP magnitude         : 17.342
DUPflag              : 0
Distance (au)        : 4.323
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.60
Sun-Target sep (deg) : 154.49
Sun-Moon sep (deg)   : 67.08
B (ring opening deg) : -2.40
PA of pole (deg)     : 1.39
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 17.059
C/A sky separation (km): 53481.2
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
    
```

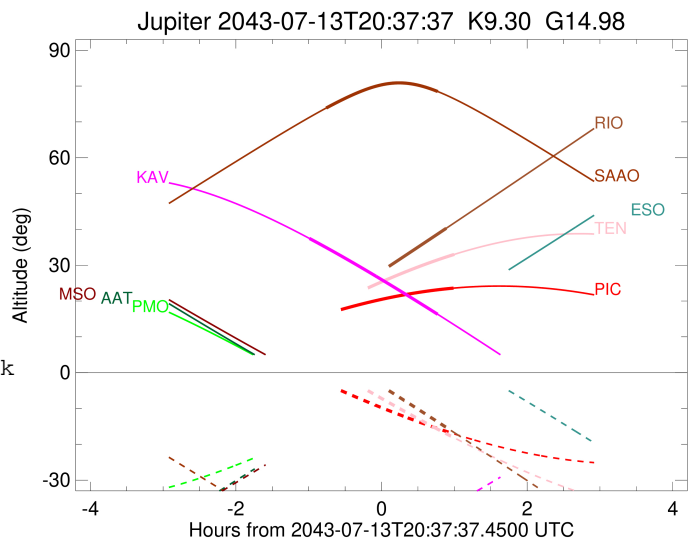
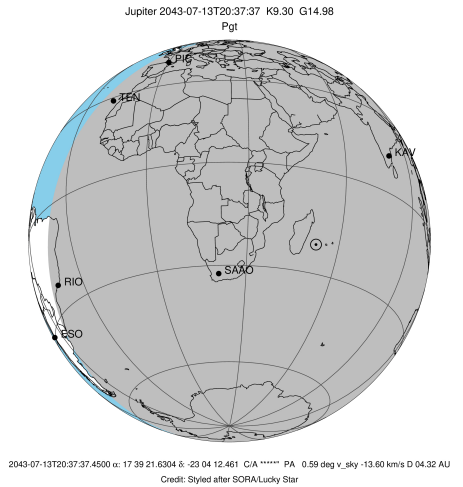


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-13T19:43:23.826	15.48	-1.83x	71487.4	-49.45	-53.05
Jupiter	E	2043-07-13T21:36:56.885	23.59	-17.04	71487.7	-47.42	-51.08

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-13T20:42:33.720
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        : 4116555419684742016
2Mass ID (if available) : 17392161-2304123
ICRS Star Coord at Epoch: 17h 39m 21.63041s -23:04:12.46065s
RUWE (>1.4 is poor)  : 0.98
K magnitude           : 9.300
G magnitude           : 14.979
RP magnitude          : 13.565
BP magnitude          : 17.342
DUPflag              : 0
Distance (au)         : 4.323
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -13.60
Sun-Target sep (deg)  : 154.49
Sun-Moon sep (deg)    : 67.04
B (ring opening deg)  : -2.40
PA of pole (deg)      : 1.39
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 17.444
C/A sky separation (km) : 54689.2
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
    
```

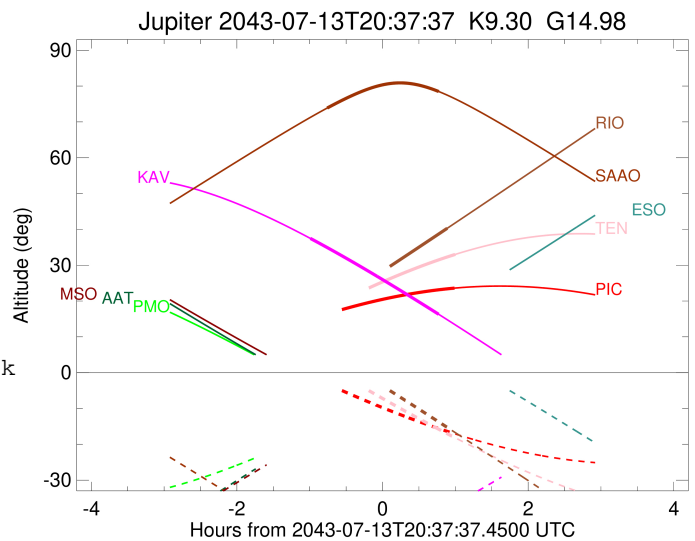
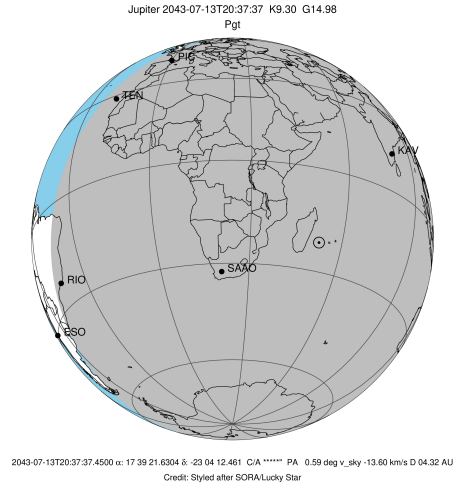


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-13T19:47:21.647	17.28	2.75x	71487.2	-51.13	-54.67
Jupiter	E	2043-07-13T21:37:32.357	33.01	-18.18	71487.5	-48.69	-52.32

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-13T20:30:52.620
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : KAV
Location              : Kavalur Observatory
Latitude (deg)        : 12.57556
E. Longitude (deg)    : 78.83167
Altitude (km)         : 0.722
Gaia source ID        : 4116555419684742016
2Mass ID (if available) : 17392161-2304123
ICRS Star Coord at Epoch: 17h 39m 21.63041s -23:04:12.46065s
RUWE (>1.4 is poor) : 0.98
K magnitude           : 9.300
G magnitude           : 14.979
RP magnitude          : 13.565
BP magnitude          : 17.342
DUPflag              : 0
Distance (au)         : 4.323
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -13.60
Sun-Target sep (deg) : 154.49
Sun-Moon sep (deg)   : 67.54
B (ring opening deg) : -2.40
PA of pole (deg)     : 1.39
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 17.975
C/A sky separation (km) : 56353.4
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
    
```

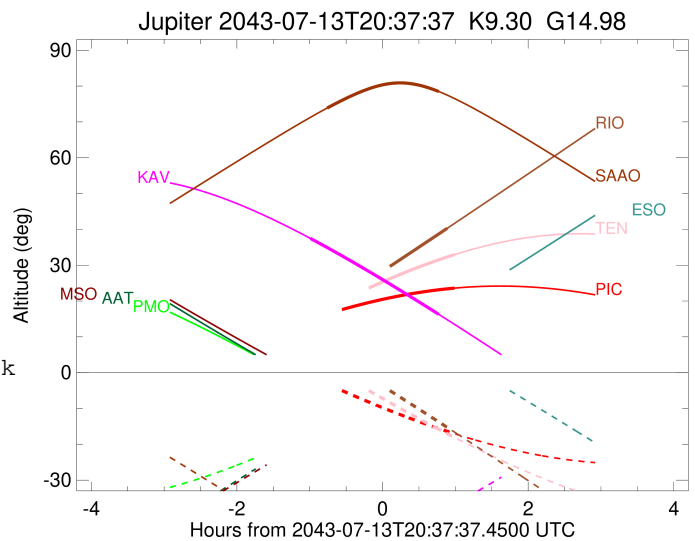
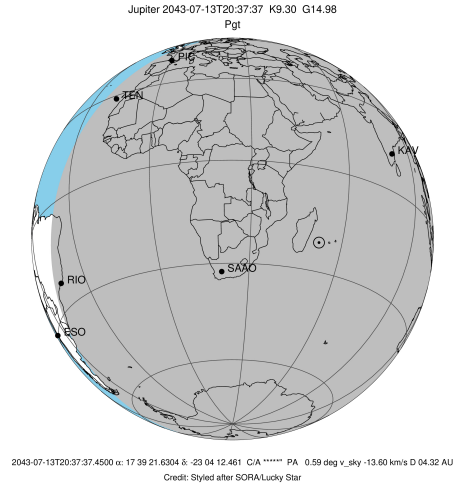


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-13T19:38:16.909	37.46	-53.81	71487.1	-52.23	-55.74
Jupiter	E	2043-07-13T21:23:49.692	16.31	-39.14	71487.1	-51.80	-55.32

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-13T20:45:01.120
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        : 4116555419684742016
2Mass ID (if available) : 17392161-2304123
ICRS Star Coord at Epoch: 17h 39m 21.63041s -23:04:12.46065s
RUWE (>1.4 is poor)  : 0.98
K magnitude           : 9.300
G magnitude           : 14.979
RP magnitude          : 13.565
BP magnitude          : 17.342
DUPflag              : 0
Distance (au)         : 4.323
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -13.60
Sun-Target sep (deg)  : 154.49
Sun-Moon sep (deg)    : 66.98
B (ring opening deg)  : -2.40
PA of pole (deg)      : 1.39
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 19.294
C/A sky separation (km) : 60487.3
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
    
```

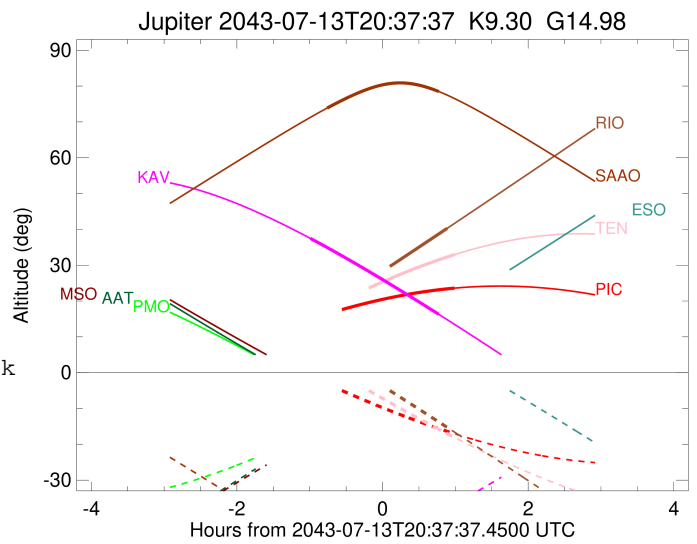
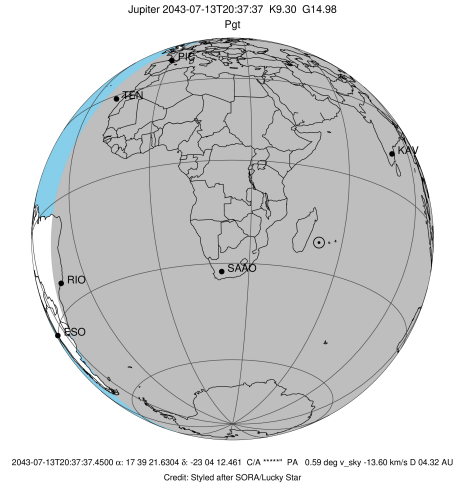


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-13T19:58:49.555	19.68	4.47x	71486.2	-59.17	-62.29
Jupiter	E	2043-07-13T21:30:57.735	40.30	-15.28	71486.5	-56.32	-59.62

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-13T20:38:05.110
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       : 4116555419684742016
2Mass ID (if available) : 17392161-2304123
ICRS Star Coord at Epoch: 17h 39m 21.63041s -23:04:12.46065s
RUWE (>1.4 is poor) : 0.98
K magnitude          : 9.300
G magnitude          : 14.979
RP magnitude         : 13.565
BP magnitude         : 17.342
DUPflag             : 0
Distance (au)       : 4.323
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -13.60
Sun-Target sep (deg) : 154.49
Sun-Moon sep (deg)  : 67.70
B (ring opening deg) : -2.40
PA of pole (deg)    : 1.39
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 19.184
C/A sky separation (km): 60144.0
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	2043-07-13T19:52:07.950	73.88	-50.89	71486.3	-58.10	-61.29
Jupiter	E	2043-07-13T21:24:02.638	78.46	-69.66	71486.5	-56.43	-59.72