

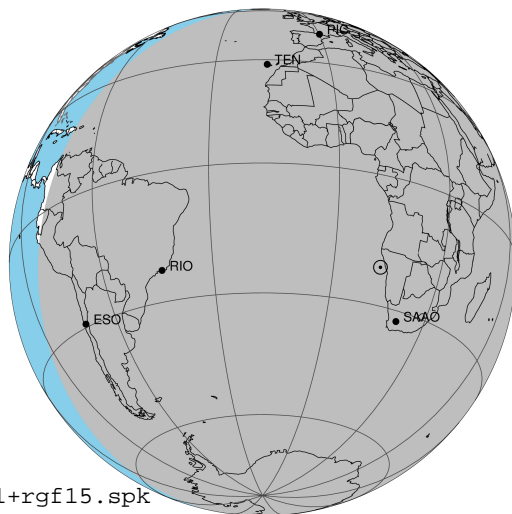
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-07-15T23:16:57.820
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116721823889542016
 2Mass ID (if available) : 17382548-2304054

Jupiter 2043-07-15T23:16:57 K9.89 G14.97 Pgt

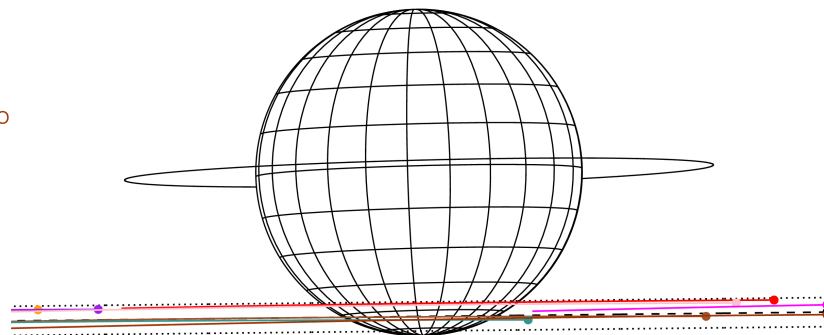
ICRS Star Coord at Epoch: 17h 38m 25.47482s -23:04:05.52963s

RUWE (>1.4 is poor) : 1.01
 K magnitude : 9.886
 G magnitude : 14.968
 RP magnitude : 13.671
 BP magnitude : 16.850
 DUPflag : 0
 Distance (au) : 4.337
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -13.08
 Sun-Target sep (deg) : 152.26
 Sun-Moon sep (deg) : 41.67
 B (ring opening deg) : -2.39
 PA of pole (deg) : 1.49
 Pole direction: RA (deg): 268.05670
 Dec (deg): 64.49732
 C/A sky separation (") : 20.053
 C/A sky separation (km) : 63072.0
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-07-15T23:16:57 K9.89 G14.97
 Pgt



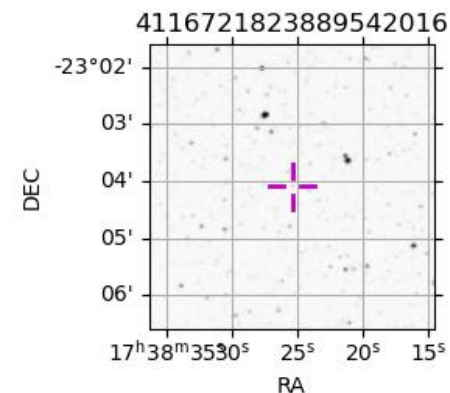
Earth
 PIC
 KPNO
 MCD
 TEN
 KAV
 RIO
 ESO
 SAAO



2043-07-15T23:16:57.8200 α: 17 38 25.4748 δ: -23 04 05.530 C/A ***** PA 0.62 deg v_sky -13.08 km/s D 04.34 AU
 Credit: Styled after SORA/Lucky Star

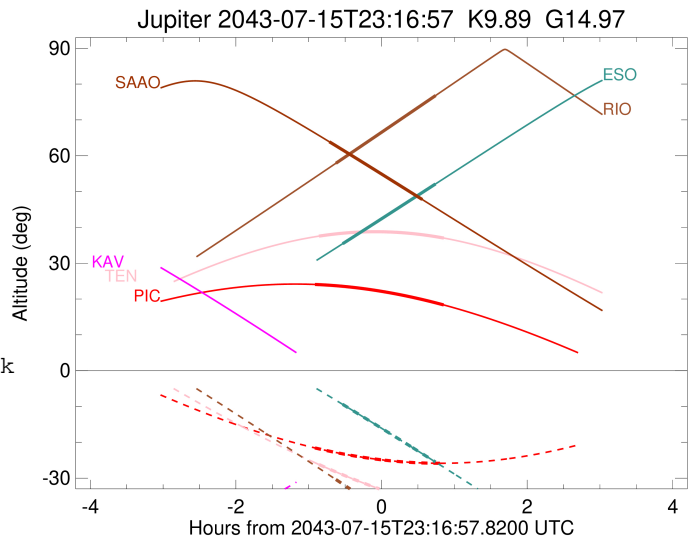
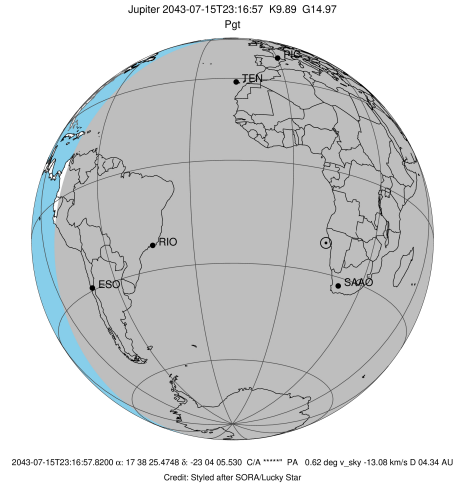
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+ +	JUL 15 22:22 - JUL 16 00:08	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	+ +	JUL 15 22:25 - JUL 16 00:08	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	+ +	JUL 15 22:39 - JUL 16 00:01	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUL 15 22:44 - JUL 16 00:01	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	JUL 15 22:34 - JUL 15 23:50	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



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target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-15T23:15:01.460
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        : 4116721823889542016
2Mass ID (if available) : 17382548-2304054
ICRS Star Coord at Epoch: 17h 38m 25.47482s -23:04:05.52963s
RUWE (>1.4 is poor)  : 1.01
K magnitude           : 9.886
G magnitude           : 14.968
RP magnitude          : 13.671
BP magnitude          : 16.850
DUPflag              : 0
Distance (au)         : 4.337
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -13.08
Sun-Target sep (deg)  : 152.26
Sun-Moon sep (deg)   : 42.09
B (ring opening deg) : -2.39
PA of pole (deg)     : 1.49
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 18.229
C/A sky separation (km) : 57334.4
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
    
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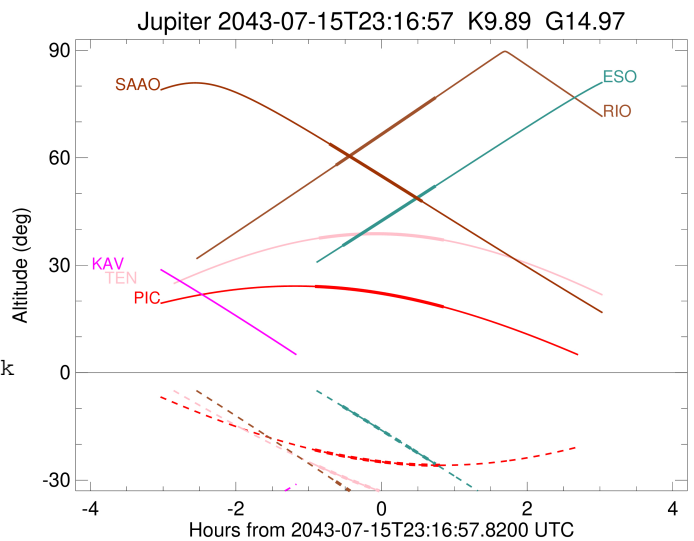
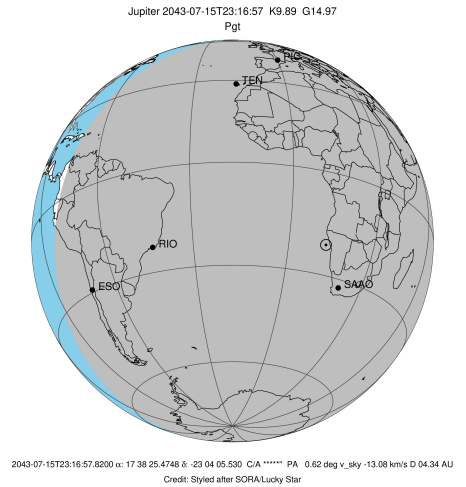


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-15T22:22:05.399	24.06	-21.56	71486.8	-54.03	-57.45
Jupiter	E	2043-07-16T00:08:05.249	18.36	-25.85	71487.0	-52.61	-56.10

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-15T23:16:51.100
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       : 4116721823889542016
2Mass ID (if available) : 17382548-2304054
ICRS Star Coord at Epoch: 17h 38m 25.47482s -23:04:05.52963s
RUWE (>1.4 is poor) : 1.01
K magnitude          : 9.886
G magnitude          : 14.968
RP magnitude         : 13.671
BP magnitude         : 16.850
DUPflag             : 0
Distance (au)        : 4.337
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.08
Sun-Target sep (deg) : 152.26
Sun-Moon sep (deg)   : 42.10
B (ring opening deg) : -2.39
PA of pole (deg)     : 1.49
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 18.473
C/A sky separation (km): 58101.4
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
    
```

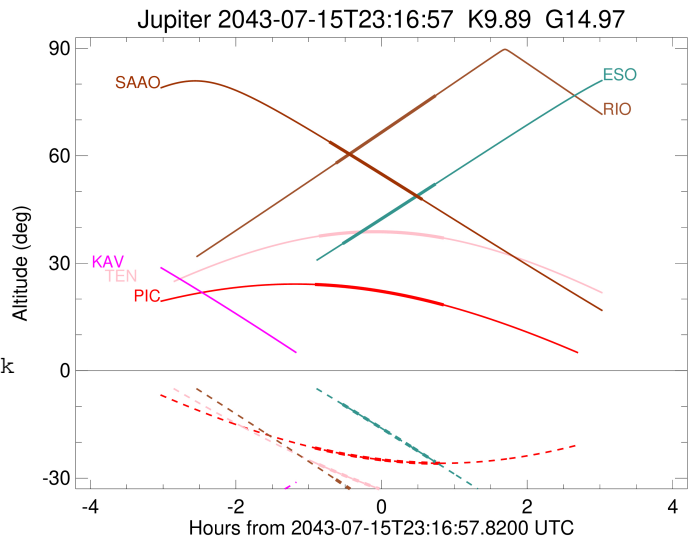
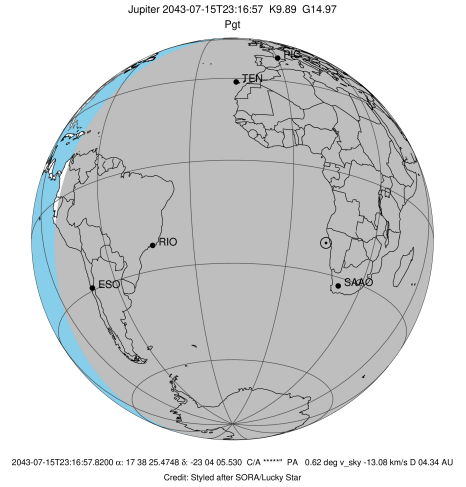


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-15T22:25:30.783	37.55	-26.20	71486.7	-55.24	-58.60
Jupiter	E	2043-07-16T00:08:13.695	37.02	-38.13	71486.9	-53.51	-56.95

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-15T23:20:31.030
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        : 4116721823889542016
2Mass ID (if available) : 17382548-2304054
ICRS Star Coord at Epoch: 17h 38m 25.47482s -23:04:05.52963s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 9.886
G magnitude           : 14.968
RP magnitude          : 13.671
BP magnitude          : 16.850
DUPflag              : 0
Distance (au)         : 4.337
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -13.08
Sun-Target sep (deg) : 152.26
Sun-Moon sep (deg)   : 41.96
B (ring opening deg) : -2.39
PA of pole (deg)     : 1.49
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 20.113
C/A sky separation (km): 63260.6
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
    
```

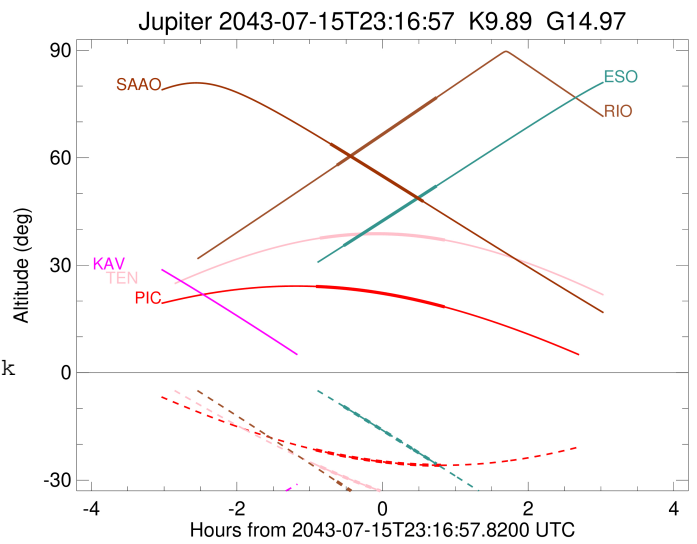
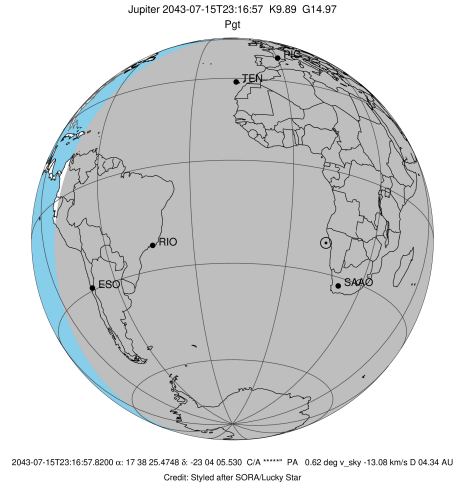


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-15T22:39:22.003	57.89	-30.37	71485.7	-63.38	-66.19
Jupiter	E	2043-07-16T00:01:35.188	76.80	-49.05	71486.0	-61.03	-64.02

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-15T23:23:16.830
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      : 4116721823889542016
2Mass ID (if available) : 17382548-2304054
ICRS Star Coord at Epoch: 17h 38m 25.47482s -23:04:05.52963s
RUWE (>1.4 is poor) : 1.01
K magnitude          : 9.886
G magnitude          : 14.968
RP magnitude         : 13.671
BP magnitude         : 16.850
DUPflag             : 0
Distance (au)       : 4.337
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.08
Sun-Target sep (deg) : 152.26
Sun-Moon sep (deg)   : 41.60
B (ring opening deg) : -2.39
PA of pole (deg)     : 1.49
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 20.536
C/A sky separation (km): 64591.9
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
    
```

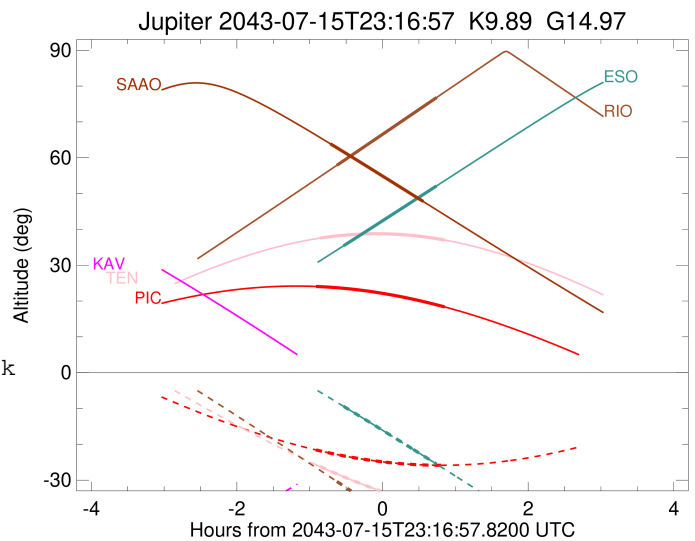
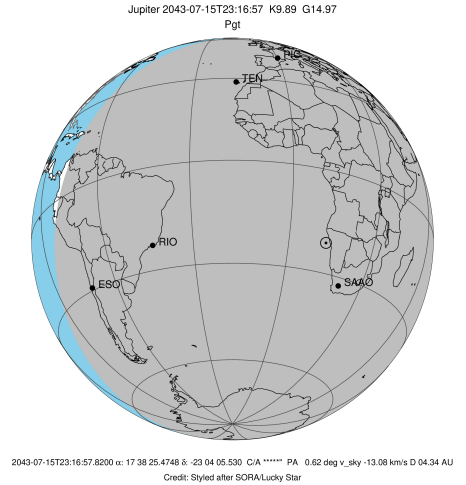


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-15T22:44:58.826	35.43	-9.41	71485.4	-65.96	-68.56
Jupiter	E	2043-07-16T00:01:26.419	52.11	-25.50	71485.7	-63.16	-65.98

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-15T23:12:13.550
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      : 4116721823889542016
2Mass ID (if available) : 17382548-2304054
ICRS Star Coord at Epoch: 17h 38m 25.47482s -23:04:05.52963s
RUWE (>1.4 is poor) : 1.01
K magnitude          : 9.886
G magnitude          : 14.968
RP magnitude         : 13.671
BP magnitude         : 16.850
DUPflag             : 0
Distance (au)       : 4.337
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -13.08
Sun-Target sep (deg) : 152.26
Sun-Moon sep (deg)  : 42.51
B (ring opening deg) : -2.39
PA of pole (deg)    : 1.49
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (" ) : 20.506
C/A sky separation (km) : 64496.1
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	2043-07-15T22:34:00.195	63.88	-79.04	71485.6	-64.87	-67.56
Jupiter	E	2043-07-15T23:50:35.036	47.77	-71.46	71485.7	-63.91	-66.68