

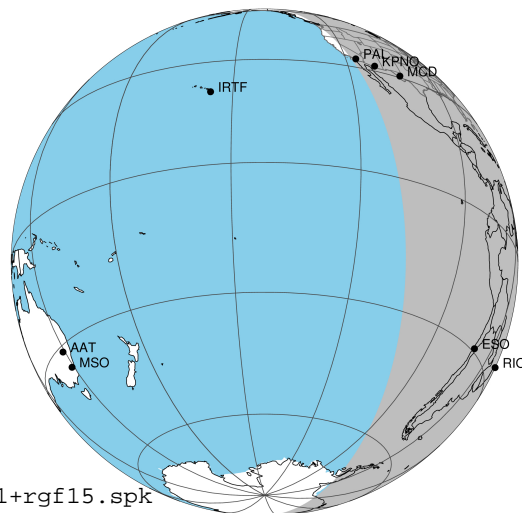
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-10-23T01:05:02.630
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116529100119777280
 2Mass ID (if available) : 17384476-2312536

Jupiter 2031-10-23T01:05:02 K9.16 G13.61 Pgt

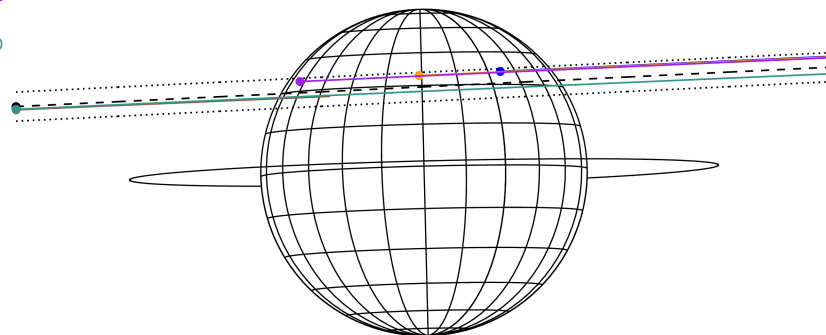
ICRS Star Coord at Epoch: 17h 38m 44.76302s -23:12:53.79871s

RUWE (>1.4 is poor) : 0.79
 K magnitude : 9.156
 G magnitude : 13.607
 RP magnitude : 12.463
 BP magnitude : 14.986
 DUPflag : 0
 Distance (au) : 5.724
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : 29.79
 Sun-Target sep (deg) : 56.13
 Sun-Moon sep (deg) : 30.60
 B (ring opening deg) : -2.25
 PA of pole (deg) : 1.45
 Pole direction: RA (deg): 268.05681
 Dec (deg): 64.49652
 C/A sky separation (") : 9.028
 C/A sky separation (km) : 37480.2
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-10-23T01:05:02 K9.16 G13.61
 Pgt



Earth
 PAL
 KPNO
 MCD
 RIO
 ESO

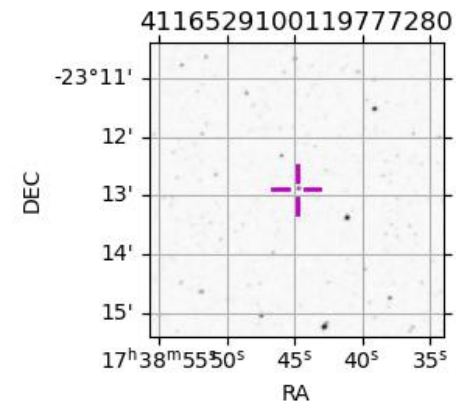


2031-10-23T01:05:02.6300 cc: 17 38 44.7630 s -23 12 53.799 C/A 9.028° PA 182.77 deg v_sky +29.79 km/s D 05.72 AU

Credit: Styled after SORA/Lucky Star

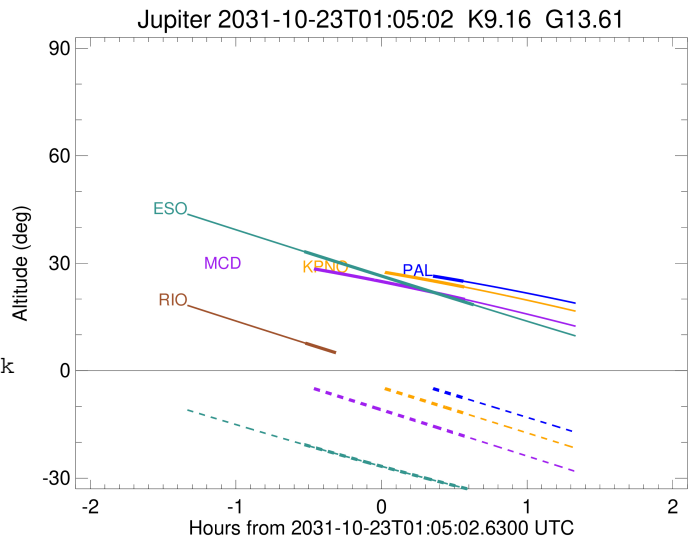
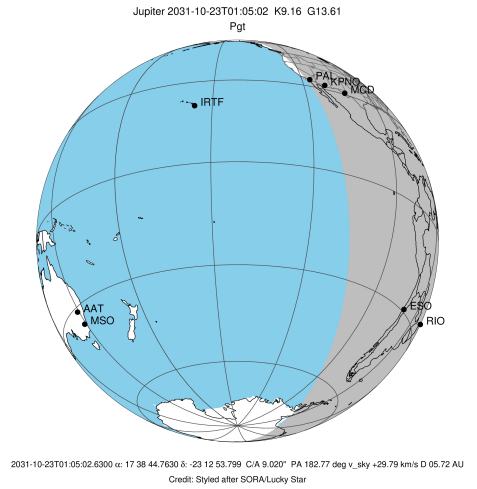
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1			Pnn
PAL	Palomar Mt (200")	33.4	243.1	+	OCT 23 01:38 - OCT 23 01:38	Pne
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	OCT 23 01:39 - OCT 23 01:39	Pne
MCD	McDonald Obs. 2.7m	30.7	256.0	+	OCT 23 01:39 - OCT 23 01:39	Pne
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
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	+	OCT 23 00:33 - OCT 23 00:33	Pin
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	OCT 23 00:33 - OCT 23 01:42	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-10-23T01:06:15.250
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : PAL
Location             : Palomar Mt (200")
Latitude (deg)       : 33.35622
E. Longitude (deg)   : 243.13601
Altitude (km)        : 1.706
Gaia source ID       : 4116529100119777280
2Mass ID (if available) : 17384476-2312536
ICRS Star Coord at Epoch: 17h 38m 44.76302s -23:12:53.79871s
RUWE (>1.4 is poor) : 0.79
K magnitude          : 9.156
G magnitude           : 13.607
RP magnitude         : 12.463
BP magnitude         : 14.986
DUPflag             : 0
Distance (au)        : 5.724
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 29.79
Sun-Target sep (deg) : 56.13
Sun-Moon sep (deg)   : 30.46
B (ring opening deg) : -2.25
PA of pole (deg)     : 1.45
Pole direction: RA (deg): 268.05681
Dec (deg): 64.49652
C/A sky separation ("): 10.280
C/A sky separation (km): 42678.9
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
    
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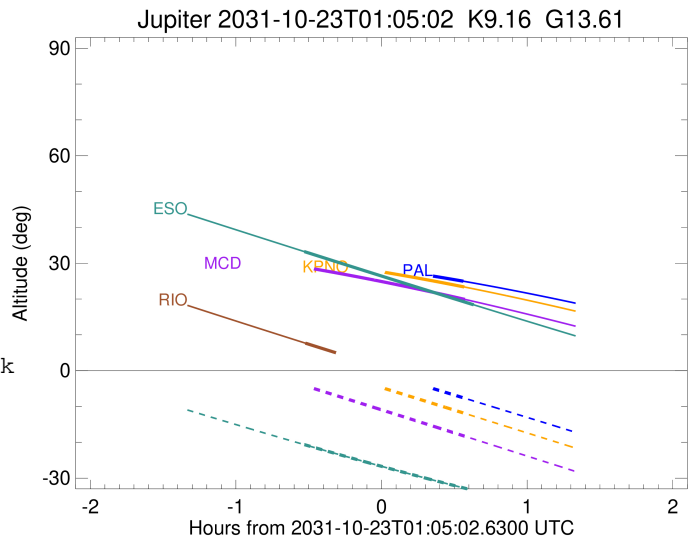
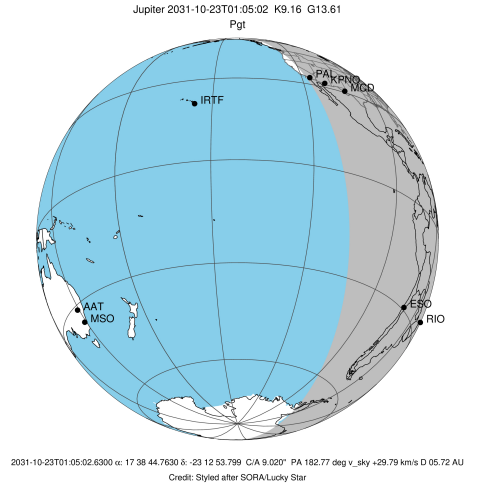


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-10-23T00:33:45.656	31.13	5.68x	71489.7	35.38	38.99
Jupiter	E	2031-10-23T01:38:42.640	24.98	-7.56	71489.4	37.82	41.50

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-10-23T01:06:32.300
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : KPNO
Location            : Kitt Peak Natl Obs
Latitude (deg)      : 31.96333
E. Longitude (deg)  : 248.40000
Altitude (km)       : 2.120
Gaia source ID      : 4116529100119777280
2Mass ID (if available) : 17384476-2312536
ICRS Star Coord at Epoch: 17h 38m 44.76302s -23:12:53.79871s
RUWE (>1.4 is poor) : 0.79
K magnitude          : 9.156
G magnitude          : 13.607
RP magnitude         : 12.463
BP magnitude         : 14.986
DUPflag             : 0
Distance (au)       : 5.724
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 29.79
Sun-Target sep (deg) : 56.13
Sun-Moon sep (deg)  : 30.39
B (ring opening deg) : -2.25
PA of pole (deg)    : 1.45
Pole direction: RA (deg): 268.05681
Dec (deg): 64.49652
C/A sky separation (") : 10.241
C/A sky separation (km) : 42516.4
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
    
```

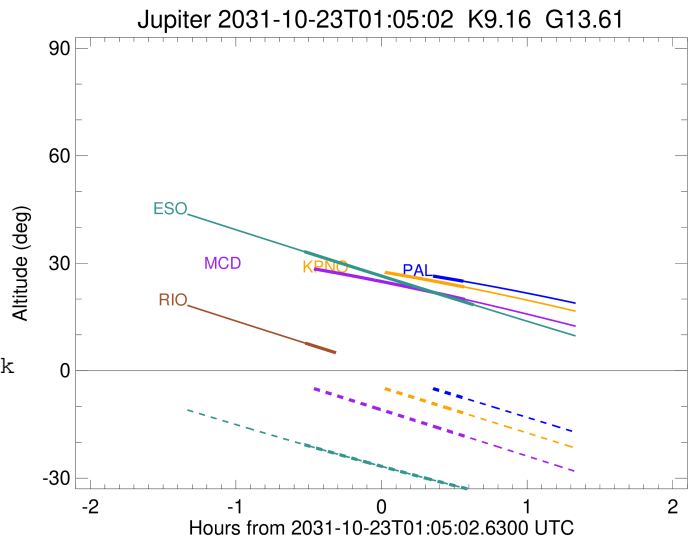
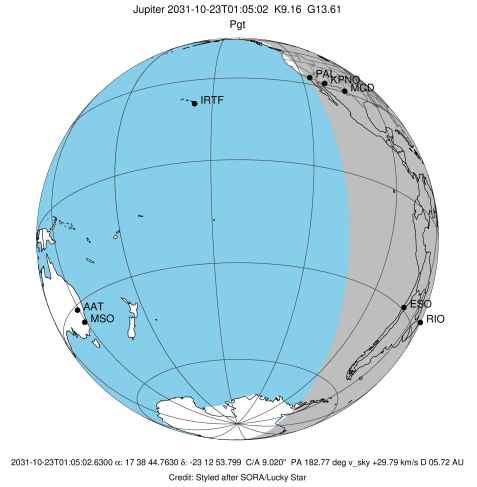


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-10-23T00:33:59.210	30.75	1.74x	71489.7	35.25	38.85
Jupiter	E	2031-10-23T01:39:02.843	23.38	-11.86	71489.4	37.63	41.30

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-10-23T01:06:55.090
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : MCD
Location              : McDonald Obs. 2.7m
Latitude (deg)       : 30.67158
E. Longitude (deg)   : 255.97844
Altitude (km)        : 2.075
Gaia source ID       : 4116529100119777280
2Mass ID (if available) : 17384476-2312536
ICRS Star Coord at Epoch: 17h 38m 44.76302s -23:12:53.79871s
RUWE (>1.4 is poor) : 0.79
K magnitude           : 9.156
G magnitude           : 13.607
RP magnitude          : 12.463
BP magnitude          : 14.986
DUPflag              : 0
Distance (au)         : 5.724
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 29.79
Sun-Target sep (deg) : 56.13
Sun-Moon sep (deg)   : 30.29
B (ring opening deg) : -2.25
PA of pole (deg)     : 1.45
Pole direction: RA (deg): 268.05681
Dec (deg): 64.49652
C/A sky separation (") : 10.187
C/A sky separation (km) : 42292.0
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
    
```

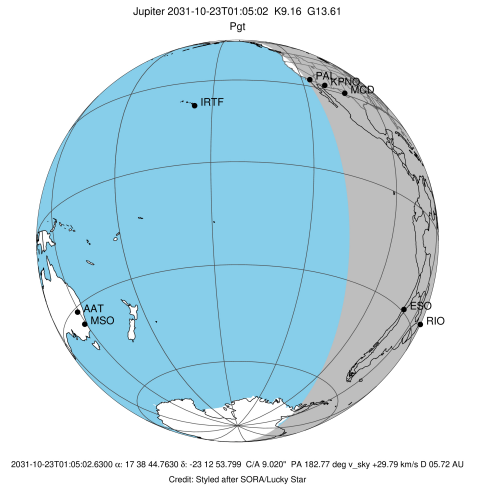


x: target alt < 5.0 deg or sun > -5.0 deg

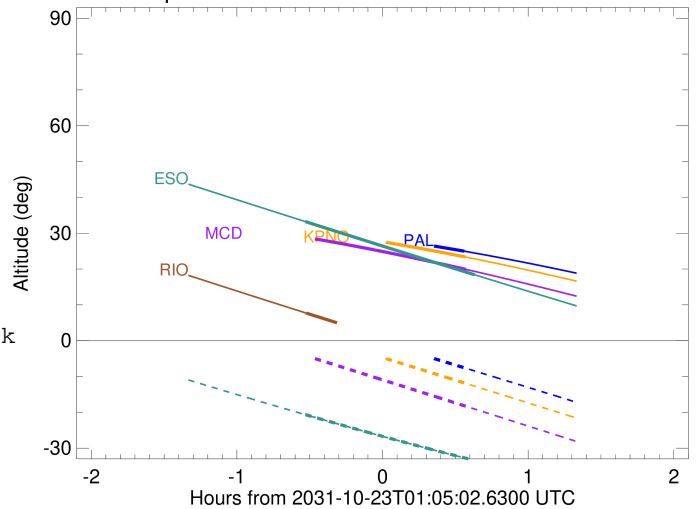
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-10-23T00:34:17.871	28.75	-4.38x	71489.7	35.06	38.66
Jupiter	E	2031-10-23T01:39:29.309	19.88	-18.33	71489.5	37.37	41.04

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch              : 2031-10-23T01:08:27.470
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        : 4116529100119777280
2Mass ID (if available) : 17384476-2312536
ICRS Star Coord at Epoch: 17h 38m 44.76302s -23:12:53.79871s
RUWE (>1.4 is poor)  : 0.79
K magnitude            : 9.156
G magnitude            : 13.607
RP magnitude           : 12.463
BP magnitude           : 14.986
DUPflag               : 0
Distance (au)         : 5.724
f0 (km)                : 0.00
g0 (km)                : 0.00
skyplane vel. (km/s)  : 29.79
Sun-Target sep (deg)  : 56.13
Sun-Moon sep (deg)    : 29.89
B (ring opening deg)  : -2.25
PA of pole (deg)      : 1.45
Pole direction: RA (deg): 268.05681
Dec (deg): 64.49652
C/A sky separation (") : 8.449
C/A sky separation (km) : 35075.5
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 2031-10-23T01:05:02 K9.16 G13.61

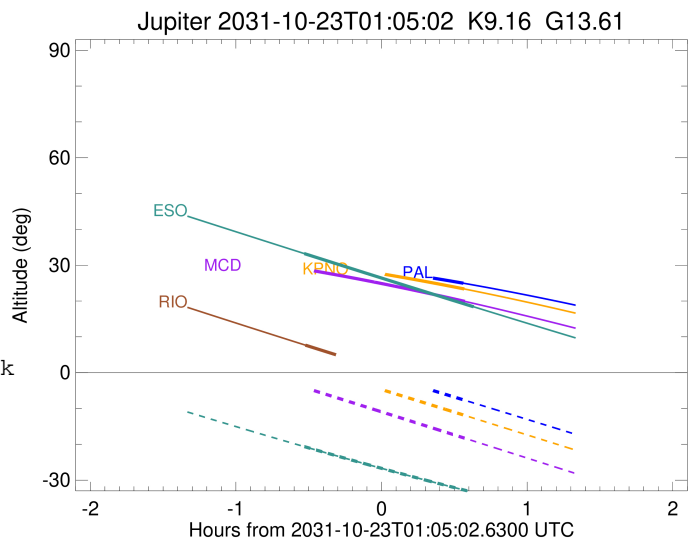
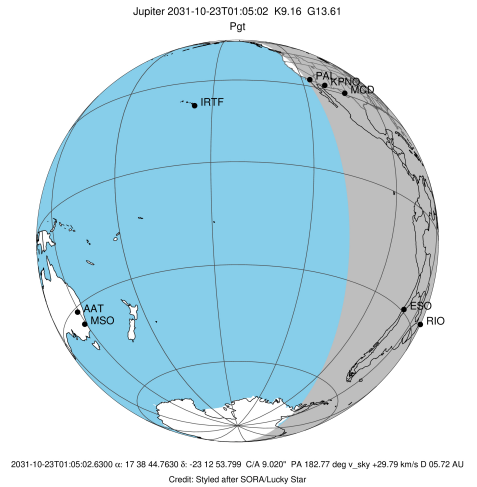


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-10-23T00:33:38.740	7.69	-44.46	71490.4	28.36	31.63
Jupiter	E	2031-10-23T01:43:10.938	-6.83x	-53.48	71490.2	30.35	33.74

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-10-23T01:08:09.900
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       : 4116529100119777280
2Mass ID (if available) : 17384476-2312536
ICRS Star Coord at Epoch: 17h 38m 44.76302s -23:12:53.79871s
RUWE (>1.4 is poor) : 0.79
K magnitude           : 9.156
G magnitude           : 13.607
RP magnitude         : 12.463
BP magnitude         : 14.986
DUPflag              : 0
Distance (au)        : 5.724
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 29.79
Sun-Target sep (deg) : 56.13
Sun-Moon sep (deg)   : 30.16
B (ring opening deg) : -2.25
PA of pole (deg)     : 1.45
Pole direction: RA (deg): 268.05681
Dec (deg): 64.49652
C/A sky separation ("): 8.560
C/A sky separation (km): 35536.8
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	2031-10-23T00:33:16.173	33.23	-20.65	71490.4	28.73	32.03
Jupiter	E	2031-10-23T01:42:58.707	18.40	-33.42	71490.2	30.81	34.22