

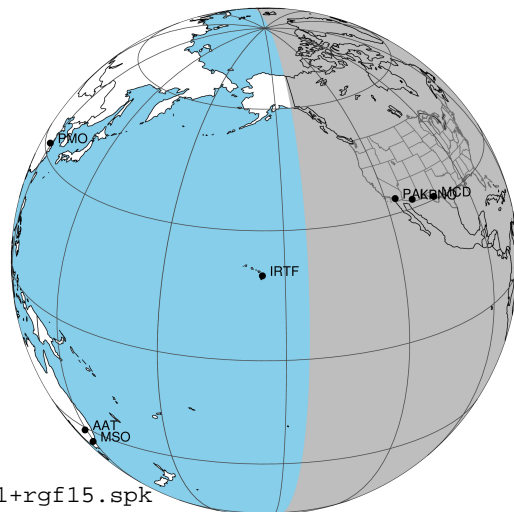
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2049-03-23T03:45:29.080  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 3416101955131553664  
 2Mass ID (if available) : 05271045+2303518

Jupiter 2049-03-23T03:45:29 K9.83 G12.72 Pgt

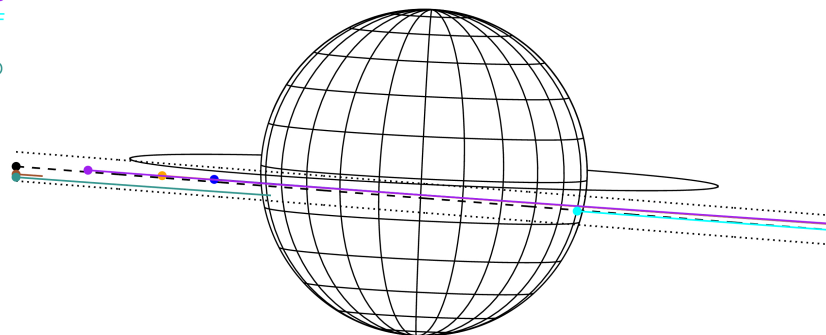
ICRS Star Coord at Epoch: 05h 27m 10.49296s +23:03:51.37973s

RUWE (>1.4 is poor) : 1.00  
 K magnitude : 9.831  
 G magnitude : 12.719  
 RP magnitude : 11.844  
 BP magnitude : 13.507  
 DUPflag : 0  
 Distance (au) : 5.214  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : 17.68  
 Sun-Target sep (deg) : 80.19  
 Sun-Moon sep (deg) : 144.85  
 B (ring opening deg) : 2.30  
 PA of pole (deg) : -2.69  
 Pole direction: RA (deg): 268.05741  
 Dec (deg): 64.49720  
 C/A sky separation (") : 2.974  
 C/A sky separation (km) : 11246.7  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2049-03-23T03:45:29 K9.83 G12.72  
 Pgt



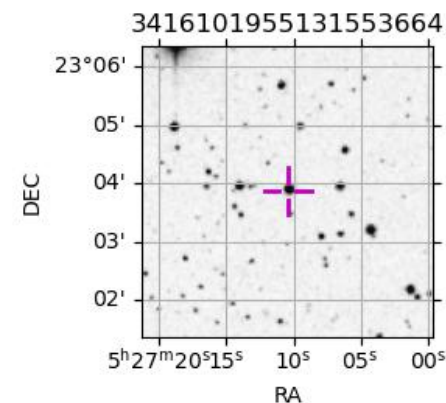
Earth  
 PAL  
 KPNO  
 MCD  
 IRTF  
 RIO  
 ESO



2049-03-23T03:45:29.0800 ex: 05 27 10.4930 s: +23 03 51.380 C/A 2.965" PA 355.54 deg v\_sky +17.68 km/s D 05.21 AU  
 Credit: Styled after SORA/Lucky Star

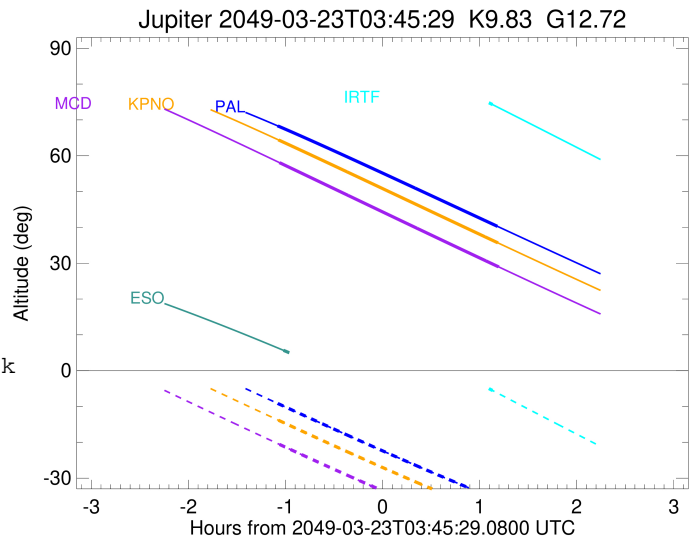
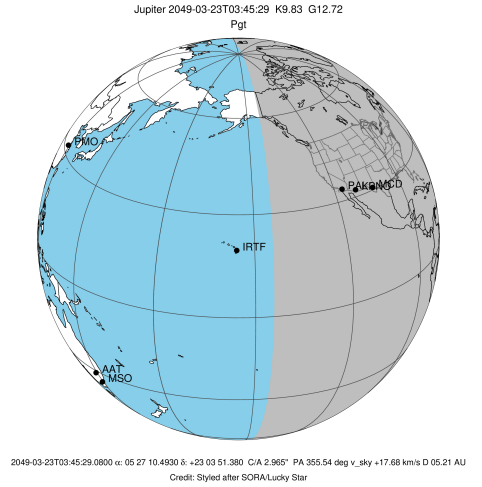
Observable events with sun below -5 deg and altitude above 5 deg

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	+ +	MAR 23 02:40 - MAR 23 04:56	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	MAR 23 02:41 - MAR 23 04:56	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	MAR 23 02:41 - MAR 23 04:57	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5		MAR 23 04:53 - MAR 23 04:53	Pne
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8			Pnn
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	MAR 23 02:44 - MAR 23 02:44	Pin
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



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target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2049-03-23T03:48:46.850
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        : 3416101955131553664
2Mass ID (if available) : 05271045+2303518
ICRS Star Coord at Epoch: 05h 27m 10.49296s +23:03:51.37973s
RUWE (>1.4 is poor) : 1.00
K magnitude           : 9.831
G magnitude           : 12.719
RP magnitude          : 11.844
BP magnitude          : 13.507
DUPflag              : 0
Distance (au)         : 5.214
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 17.68
Sun-Target sep (deg) : 80.19
Sun-Moon sep (deg)   : 145.71
B (ring opening deg) : 2.30
PA of pole (deg)     : -2.69
Pole direction: RA (deg): 268.05741
Dec (deg): 64.49720
C/A sky separation (" ) : 2.622
C/A sky separation (km) : 9914.5
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
    
```

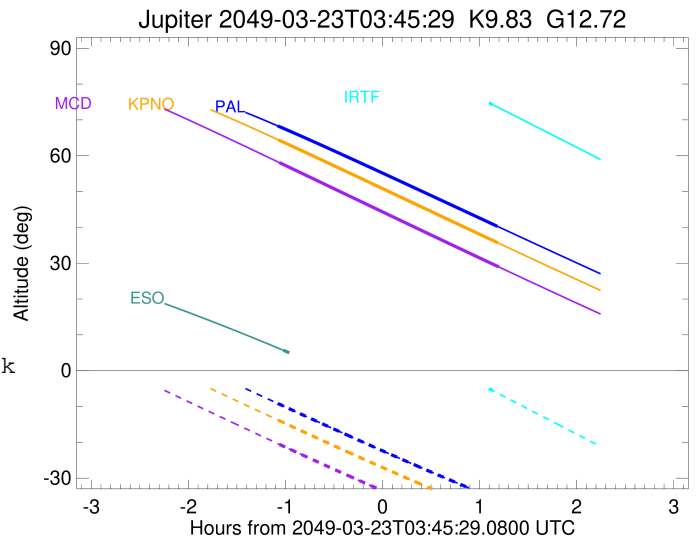
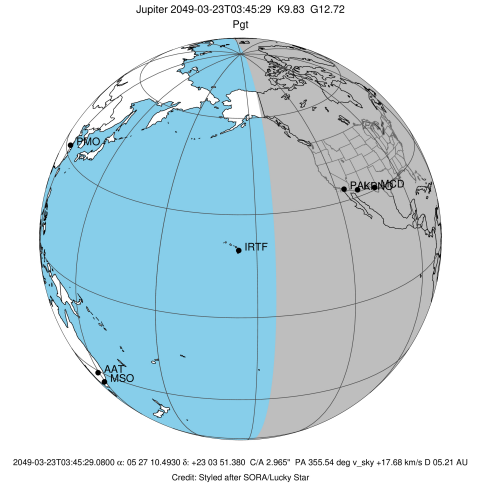


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2049-03-23T02:40:41.675	68.33	-9.14	71491.9	-6.37	-7.28
Jupiter	E	2049-03-23T04:56:30.082	40.29	-35.96	71491.8	-9.42	-10.74

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2049-03-23T03:49:11.620
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       : 3416101955131553664
2Mass ID (if available) : 05271045+2303518
ICRS Star Coord at Epoch: 05h 27m 10.49296s +23:03:51.37973s
RUWE (>1.4 is poor) : 1.00
K magnitude           : 9.831
G magnitude           : 12.719
RP magnitude         : 11.844
BP magnitude         : 13.507
DUPflag              : 0
Distance (au)        : 5.214
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 17.68
Sun-Target sep (deg) : 80.19
Sun-Moon sep (deg)   : 145.74
B (ring opening deg) : 2.30
PA of pole (deg)     : -2.69
Pole direction: RA (deg): 268.05741
Dec (deg): 64.49720
C/A sky separation ("): 2.633
C/A sky separation (km): 9958.8
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
    
```

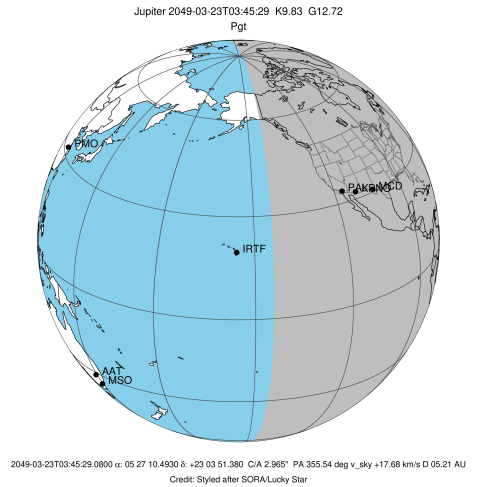


x: target alt < 5.0 deg or sun > -5.0 deg

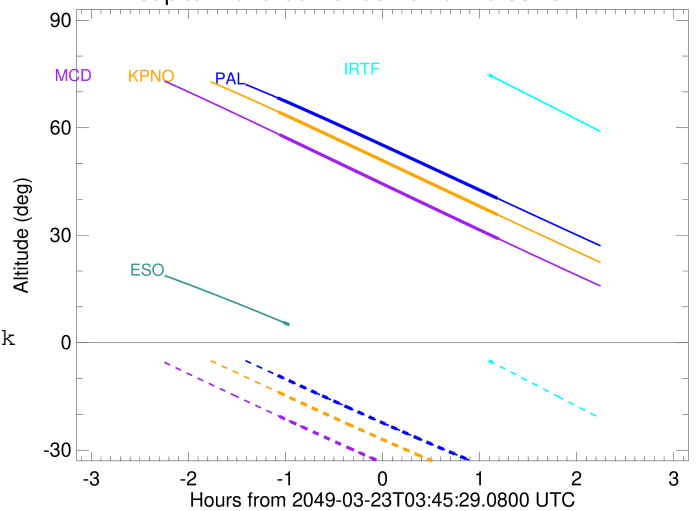
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2049-03-23T02:41:10.138	64.41	-13.84	71491.9	-6.46	-7.37
Jupiter	E	2049-03-23T04:56:49.008	35.67	-40.51	71491.8	-9.42	-10.73

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2049-03-23T03:49:43.260
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       : 3416101955131553664
2Mass ID (if available) : 05271045+2303518
ICRS Star Coord at Epoch: 05h 27m 10.49296s +23:03:51.37973s
RUWE (>1.4 is poor) : 1.00
K magnitude           : 9.831
G magnitude           : 12.719
RP magnitude          : 11.844
BP magnitude          : 13.507
DUPflag              : 0
Distance (au)        : 5.214
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 17.68
Sun-Target sep (deg) : 80.19
Sun-Moon sep (deg)   : 145.76
B (ring opening deg) : 2.30
PA of pole (deg)     : -2.69
Pole direction: RA (deg): 268.05741
Dec (deg): 64.49720
C/A sky separation ("): 2.622
C/A sky separation (km): 9916.3
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
    
```



Jupiter 2049-03-23T03:45:29 K9.83 G12.72

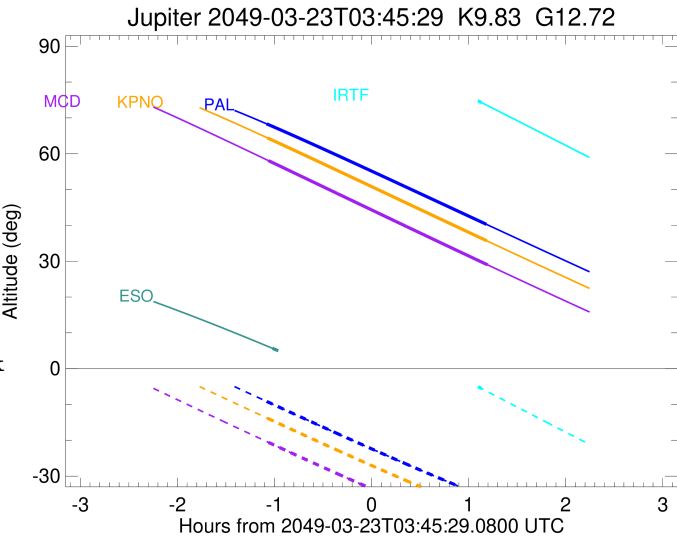
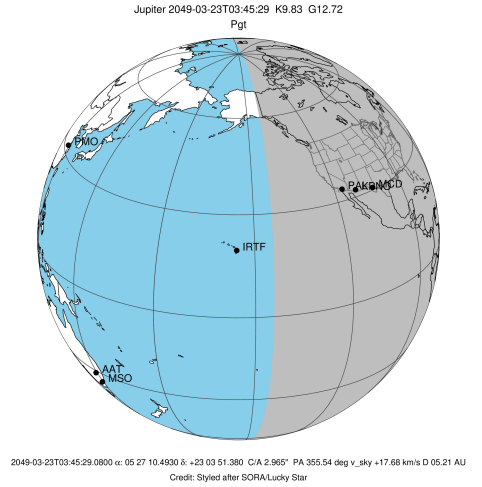


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2049-03-23T02:41:48.257	58.07	-20.58	71491.9	-6.49	-7.41
Jupiter	E	2049-03-23T04:57:11.501	28.99	-46.50	71491.8	-9.33	-10.64

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2049-03-23T03:45:22.950
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : IRTF
Location              : Mauna Kea/IRTF
Latitude (deg)       : 19.82622
E. Longitude (deg)   : 204.52800
Altitude (km)        : 4.168
Gaia source ID       : 3416101955131553664
2Mass ID (if available) : 05271045+2303518
ICRS Star Coord at Epoch: 05h 27m 10.49296s +23:03:51.37973s
RUWE (>1.4 is poor) : 1.00
K magnitude           : 9.831
G magnitude           : 12.719
RP magnitude          : 11.844
BP magnitude          : 13.507
DUPflag              : 0
Distance (au)         : 5.214
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 17.68
Sun-Target sep (deg) : 80.19
Sun-Moon sep (deg)   : 145.39
B (ring opening deg) : 2.30
PA of pole (deg)     : -2.69
Pole direction: RA (deg): 268.05741
Dec (deg): 64.49720
C/A sky separation (") : 3.073
C/A sky separation (km) : 11619.5
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
    
```

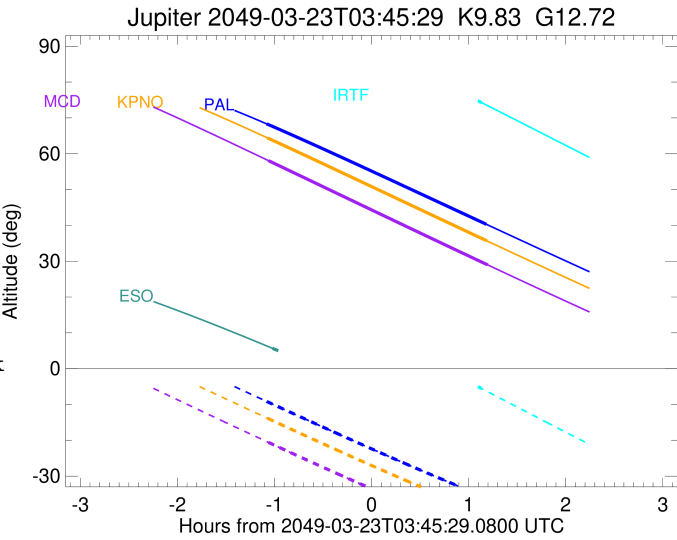
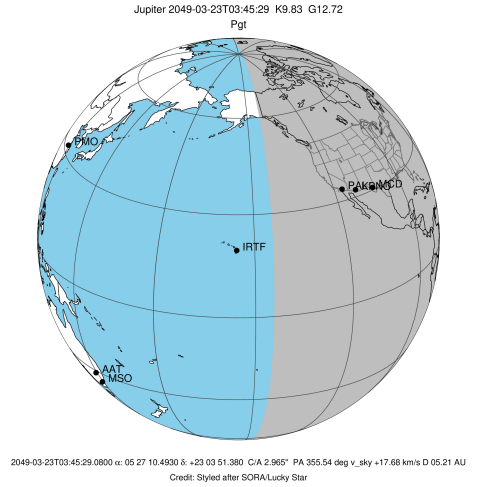


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2049-03-23T02:37:11.265	73.23	26.45x	71491.9	-7.39	-8.43
Jupiter	E	2049-03-23T04:53:30.184	74.26	-5.54	71491.7	-11.13	-12.68

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2049-03-23T03:50:37.230
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        : 3416101955131553664
2Mass ID (if available) : 05271045+2303518
ICRS Star Coord at Epoch: 05h 27m 10.49296s +23:03:51.37973s
RUWE (>1.4 is poor) : 1.00
K magnitude           : 9.831
G magnitude           : 12.719
RP magnitude          : 11.844
BP magnitude          : 13.507
DUPflag              : 0
Distance (au)         : 5.214
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 17.68
Sun-Target sep (deg) : 80.19
Sun-Moon sep (deg)   : 145.49
B (ring opening deg) : 2.30
PA of pole (deg)     : -2.69
Pole direction: RA (deg): 268.05741
Dec (deg): 64.49720
C/A sky separation ("): 3.878
C/A sky separation (km): 14665.7
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
    
```



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	2049-03-23T02:44:15.301	5.68	-49.16	71491.8	-10.55	-12.01
Jupiter	E	2049-03-23T04:56:27.677	-20.97x	-62.05	71491.6	-13.07	-14.86