

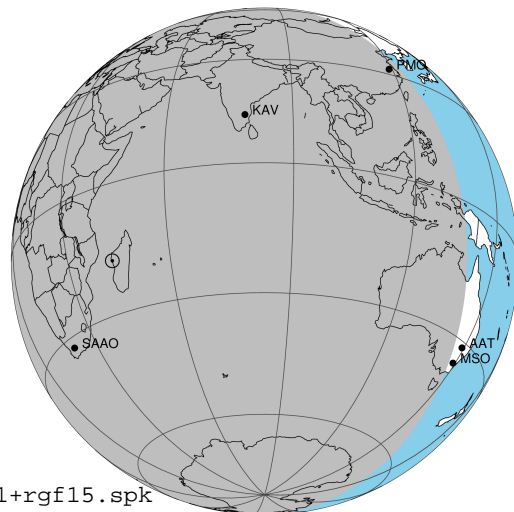
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2031-05-11T20:59:30.240  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4068890186221236224  
 2Mass ID (if available) : 17490238-2253227

Jupiter 2031-05-11T20:59:30 K8.00 G14.65 Pgt

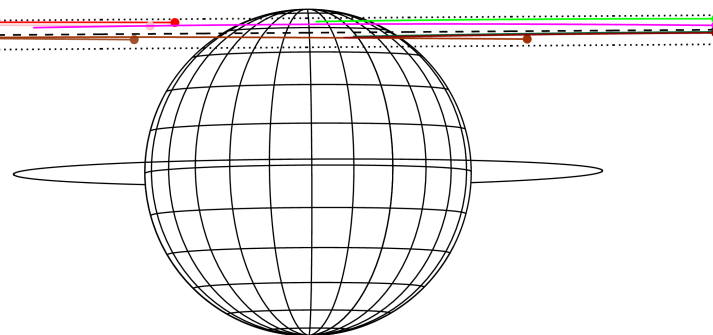
ICRS Star Coord at Epoch: 17h 49m 02.39747s -22:53:23.00191s

RUWE (>1.4 is poor) : 1.06  
 K magnitude : 7.998  
 G magnitude : 14.646  
 RP magnitude : 13.102  
 BP magnitude : 18.048  
 DUPflag : 0  
 Distance (au) : 4.450  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -10.51  
 Sun-Target sep (deg) : 143.07  
 Sun-Moon sep (deg) : 27.89  
 B (ring opening deg) : -2.61  
 PA of pole (deg) : 0.34  
 Pole direction: RA (deg): 268.05695  
 Dec (deg): 64.49651  
 C/A sky separation (") : 18.968  
 C/A sky separation (km) : 61217.2  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2031-05-11T20:59:30 K8.00 G14.65  
 Pgt



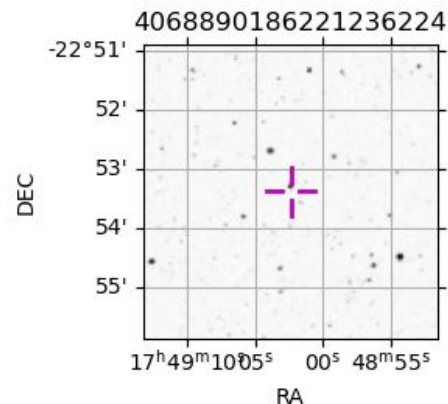
Earth  
 PIC  
 PMO  
 TEN  
 KAV  
 RIO  
 ESO  
 AAT  
 SAAO  
 MSO



2031-05-11T20:59:30.2400 a: 17 49 02.3975 ð -22 53 23.002 C/A \*\*\*\*\* PA 180.42 deg v\_sky -10.51 km/s D 04.45 AU  
 Credit: Styled after SORA/Lucky Star

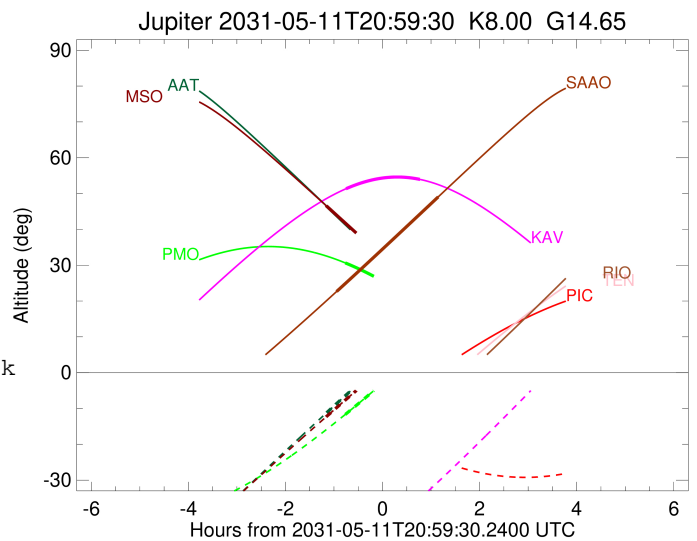
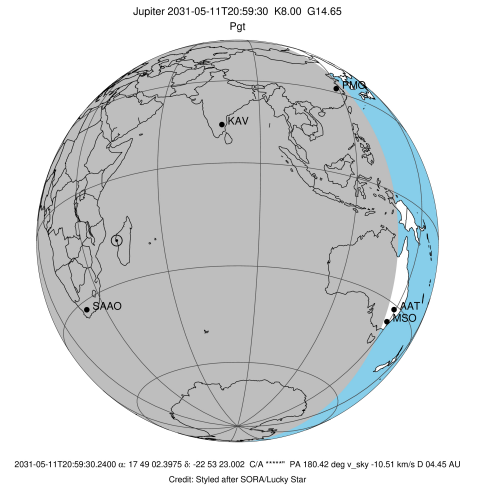
Observable events with sun below -5 deg and altitude above 5 deg

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			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+	MAY 11 20:13 - MAY 11 20:13	Pin
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			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+ +	MAY 11 20:14 - MAY 11 21:45	Pie
RIO	Rio de Janeiro	-22.9	316.8			Pnn
ESO	European Southern Obs. (3.6m)	-29.3	289.3			Pnn
AAT	Siding Spring (AAT)	-31.3	149.1	+	MAY 11 19:50 - MAY 11 19:50	Pin
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	MAY 11 20:02 - MAY 11 22:08	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	MAY 11 19:49 - MAY 11 19:49	Pin



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-11T20:55:30.790
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : PMO
Location              : Purple Mtn Obs. Nanking
Latitude (deg)        : 32.06667
E. Longitude (deg)    : 118.82089
Altitude (km)         : 0.364
Gaia source ID        : 4068890186221236224
2Mass ID (if available) : 17490238-2253227
ICRS Star Coord at Epoch: 17h 49m 02.39747s -22:53:23.00191s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 7.998
G magnitude           : 14.646
RP magnitude          : 13.102
BP magnitude          : 18.048
DUPflag              : 0
Distance (au)         : 4.450
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -10.51
Sun-Target sep (deg)  : 143.07
Sun-Moon sep (deg)    : 27.58
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.34
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 20.471
C/A sky separation (km) : 66069.6
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
    
```

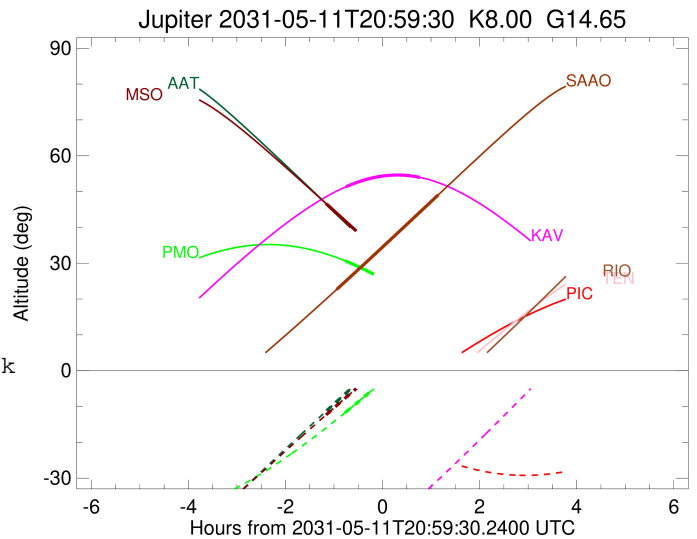
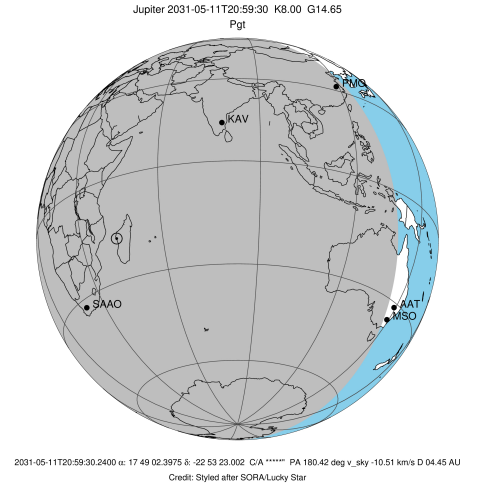


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-11T20:13:29.323	30.63	-11.67	71484.0	67.87	70.30
Jupiter	E	2031-05-11T21:37:39.226	20.34	4.64x	71484.1	66.83	69.34

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-11T21:00:08.560
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        : 4068890186221236224
2Mass ID (if available) : 17490238-2253227
ICRS Star Coord at Epoch: 17h 49m 02.39747s -22:53:23.00191s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 7.998
G magnitude           : 14.646
RP magnitude          : 13.102
BP magnitude          : 18.048
DUPflag              : 0
Distance (au)         : 4.450
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -10.51
Sun-Target sep (deg)  : 143.07
Sun-Moon sep (deg)    : 28.28
B (ring opening deg) : -2.61
PA of pole (deg)      : 0.34
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (" ) : 20.110
C/A sky separation (km) : 64901.8
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
    
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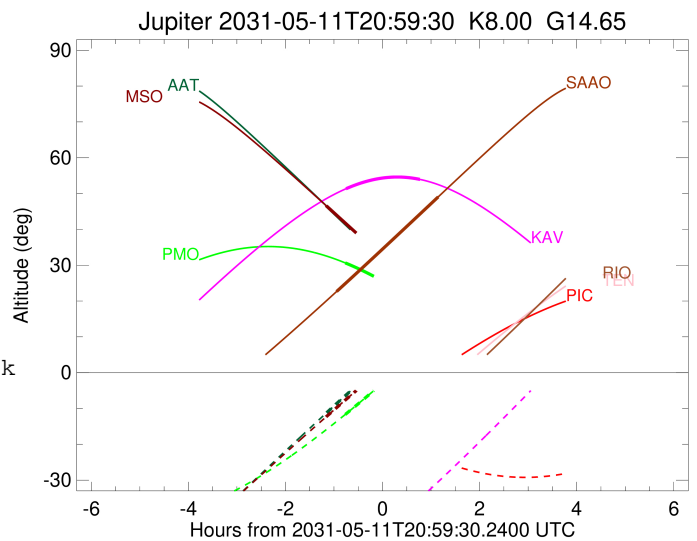
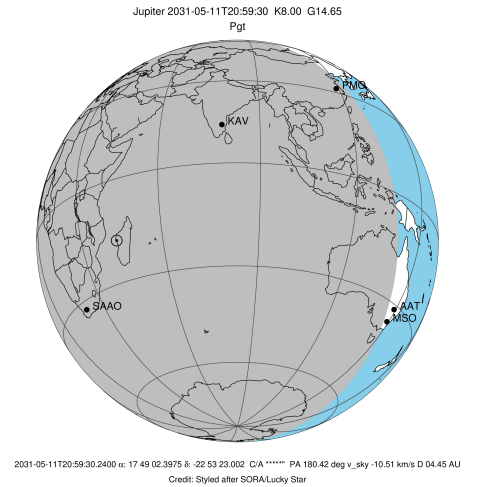


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-11T20:14:24.026	51.34	-51.80	71484.4	65.00	67.67
Jupiter	E	2031-05-11T21:45:49.043	53.94	-35.16	71484.4	65.00	67.68

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-11T20:52:55.740
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : AAT
Location             : Siding Spring (AAT)
Latitude (deg)       : -31.27703
E. Longitude (deg)   : 149.06608
Altitude (km)        : 1.164
Gaia source ID       : 4068890186221236224
2Mass ID (if available) : 17490238-2253227
ICRS Star Coord at Epoch: 17h 49m 02.39747s -22:53:23.00191s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 7.998
G magnitude           : 14.646
RP magnitude         : 13.102
BP magnitude         : 18.048
DUPflag              : 0
Distance (au)        : 4.450
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -10.51
Sun-Target sep (deg) : 143.07
Sun-Moon sep (deg)   : 27.50
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.34
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation ("): 18.324
C/A sky separation (km): 59138.8
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
    
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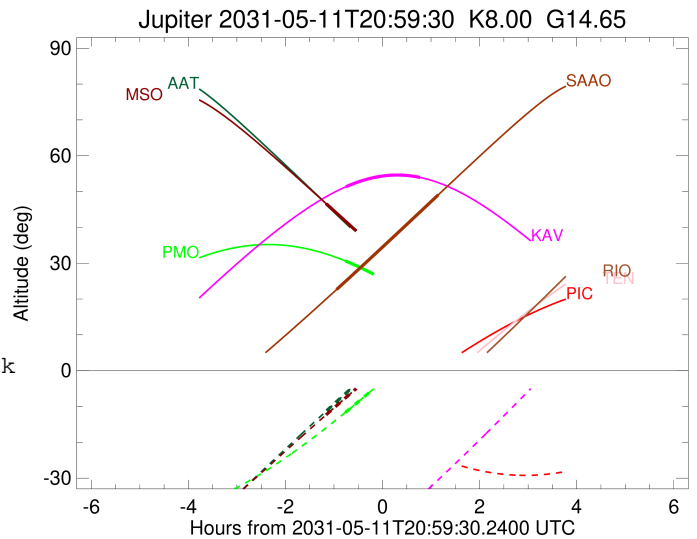
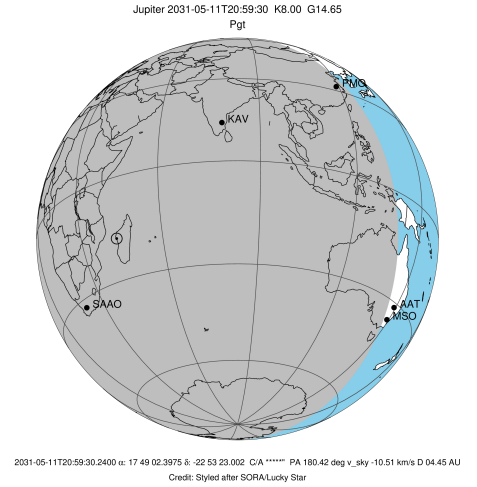


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-11T19:50:26.243	46.49	-11.19	71485.5	56.49	59.78
Jupiter	E	2031-05-11T21:55:53.250	19.92	13.55x	71485.8	54.87	58.25

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-11T21:05:47.470
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        : 4068890186221236224
2Mass ID (if available) : 17490238-2253227
ICRS Star Coord at Epoch: 17h 49m 02.39747s -22:53:23.00192s
RUWE (>1.4 is poor)  : 1.06
K magnitude           : 7.998
G magnitude           : 14.646
RP magnitude          : 13.102
BP magnitude          : 18.048
DUPflag              : 0
Distance (au)         : 4.450
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -10.51
Sun-Target sep (deg)  : 143.07
Sun-Moon sep (deg)    : 28.86
B (ring opening deg)  : -2.61
PA of pole (deg)      : 0.34
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 18.309
C/A sky separation (km) : 59090.2
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
    
```

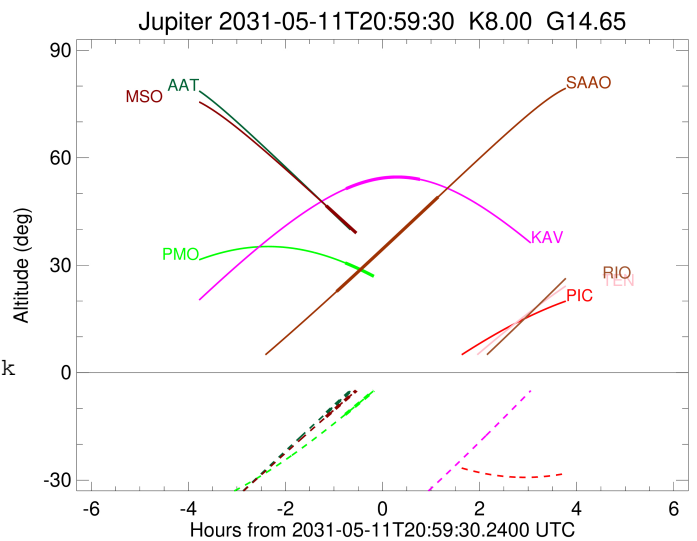
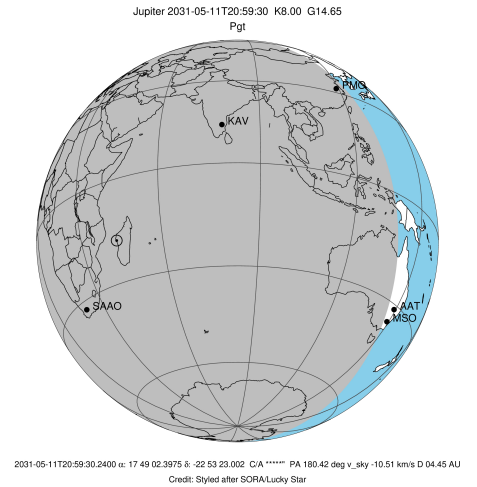


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-11T20:02:45.089	22.65	-53.34	71485.8	54.97	58.35
Jupiter	E	2031-05-11T22:08:13.886	49.03	-74.74	71485.6	56.24	59.54

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-11T20:53:12.920
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : MSO
Location              : Mt. Stromlo Observatory
Latitude (deg)       : -35.32000
E. Longitude (deg)   : 149.00833
Altitude (km)        : 0.770
Gaia source ID       : 4068890186221236224
2Mass ID (if available) : 17490238-2253227
ICRS Star Coord at Epoch: 17h 49m 02.39747s -22:53:23.00191s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 7.998
G magnitude           : 14.646
RP magnitude          : 13.102
BP magnitude          : 18.048
DUPflag              : 0
Distance (au)        : 4.450
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -10.51
Sun-Target sep (deg) : 143.07
Sun-Moon sep (deg)   : 27.54
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.34
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation ("): 18.203
C/A sky separation (km): 58749.9
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	2031-05-11T19:49:47.416	46.62	-12.33	71485.6	55.91	59.23
Jupiter	E	2031-05-11T21:57:05.791	20.74	11.61x	71485.9	54.36	57.76