

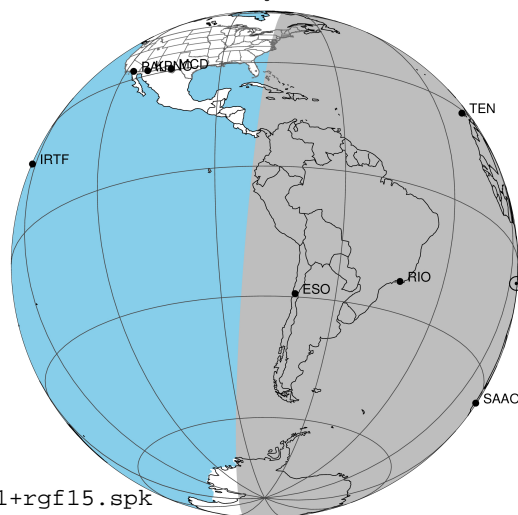
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-09-07T23:23:29.710
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4114539847403507840
 2Mass ID (if available) : 17142173-2247203

Jupiter 2031-09-07T23:23:29 K9.86 G14.60 Pgt

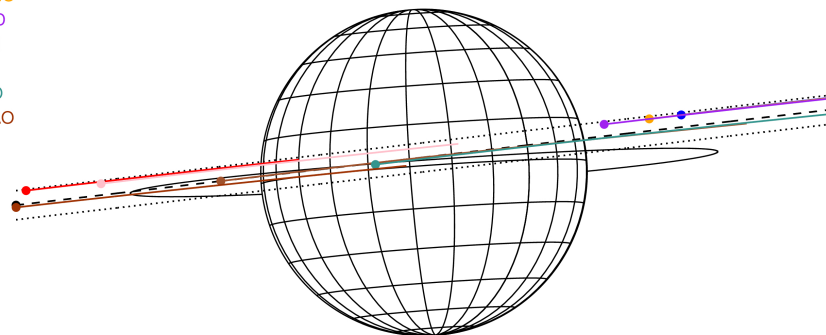
ICRS Star Coord at Epoch: 17h 14m 21.73299s -22:47:20.44351s

RUWE (>1.4 is poor) : 1.06
 K magnitude : 9.859
 G magnitude : 14.602
 RP magnitude : 13.405
 BP magnitude : 16.143
 DUPflag : 0
 Distance (au) : 5.070
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : 10.54
 Sun-Target sep (deg) : 94.79
 Sun-Moon sep (deg) : 167.33
 B (ring opening deg) : -2.40
 PA of pole (deg) : 4.06
 Pole direction: RA (deg): 268.05685
 Dec (deg): 64.49652
 C/A sky separation (") : 1.804
 C/A sky separation (km) : 6632.4
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-09-07T23:23:29 K9.86 G14.60
 Pgt



Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 RIO
 ESO
 SAAO

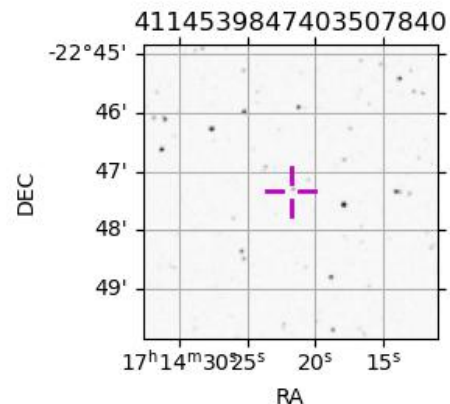


2031-09-07T23:23:29.7100 ex: 17 14 21.7330 s: -22 47 20.444 C/A 1.794" PA 186.68 deg v_sky +10.54 km/s D 05.07 AU

Credit: Styled after SORA/Lucky Star

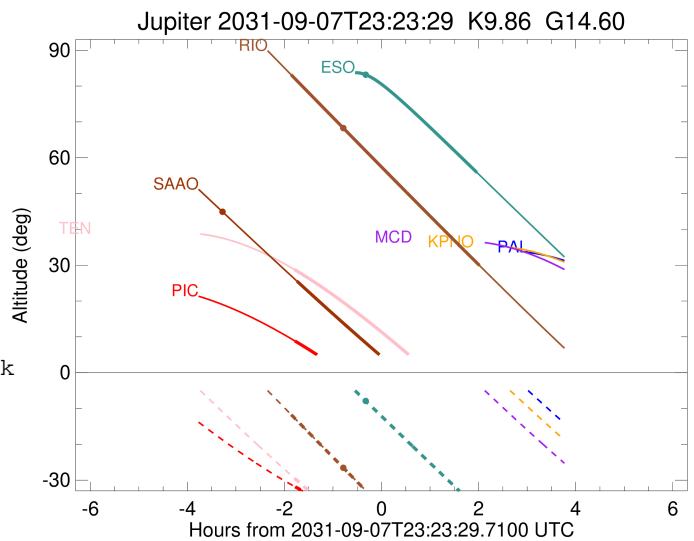
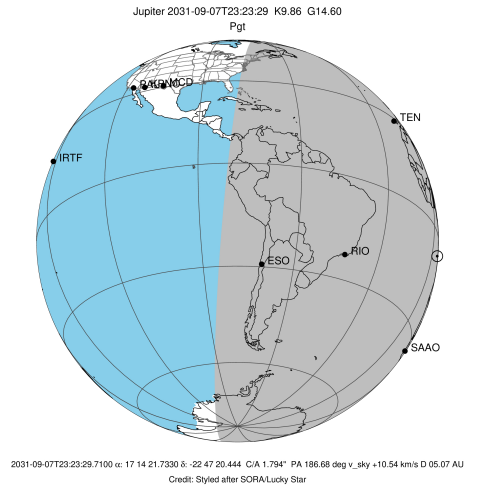
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	SEP 07 21:36 - SEP 07 21:36	Pin
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	+	SEP 07 21:35 - SEP 07 21:35	Pin
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	+	SEP 07 21:31 - SEP 08 01:24	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	SEP 08 01:21 - SEP 08 01:21	Pne
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	SEP 07 21:39 - SEP 07 21:39	Pin
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-09-07T23:30:11.490
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      : 4114539847403507840
2Mass ID (if available) : 17142173-2247203
ICRS Star Coord at Epoch: 17h 14m 21.73299s -22:47:20.44351s
RUWE (>1.4 is poor) : 1.06
K magnitude          : 9.859
G magnitude          : 14.602
RP magnitude         : 13.405
BP magnitude         : 16.143
DUPflag             : 0
Distance (au)       : 5.070
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : 10.54
Sun-Target sep (deg) : 94.79
Sun-Moon sep (deg)  : 167.82
B (ring opening deg) : -2.40
PA of pole (deg)    : 4.06
Pole direction: RA (deg): 268.05685
Dec (deg): 64.49652
C/A sky separation (" ) : 3.104
C/A sky separation (km) : 11413.9
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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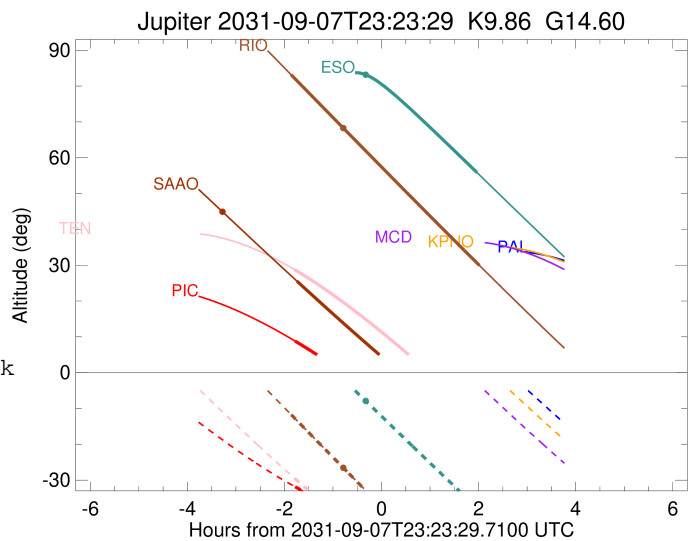
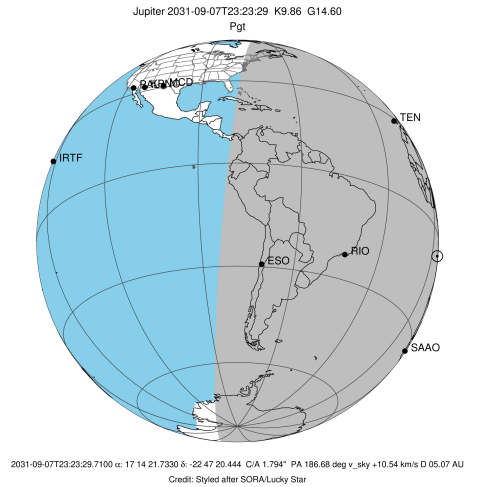


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-09-07T21:36:45.365	8.81	-31.86	71491.9	7.13	8.14
Jupiter	E	2031-09-08T01:21:28.543	-28.46x	-37.81	71491.7	11.07	12.61

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-09-07T23:30:58.440
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        : 4114539847403507840
2Mass ID (if available) : 17142173-2247203
ICRS Star Coord at Epoch: 17h 14m 21.73299s -22:47:20.44351s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 9.859
G magnitude           : 14.602
RP magnitude          : 13.405
BP magnitude          : 16.143
DUPflag              : 0
Distance (au)         : 5.070
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 10.54
Sun-Target sep (deg)  : 94.79
Sun-Moon sep (deg)    : 167.95
B (ring opening deg) : -2.40
PA of pole (deg)      : 4.06
Pole direction: RA (deg): 268.05685
Dec (deg): 64.49652
C/A sky separation (") : 2.966
C/A sky separation (km) : 10906.9
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
    
```

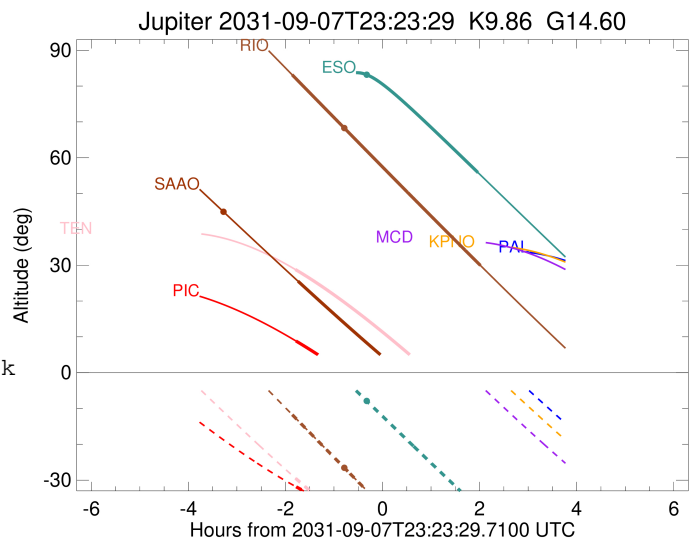
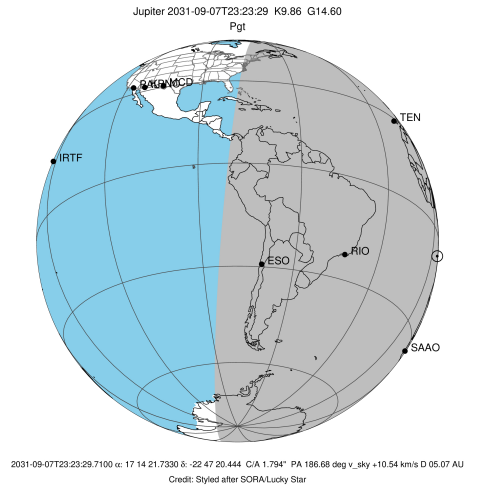


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-09-07T21:35:59.418	28.77	-29.47	71491.9	6.64	7.59
Jupiter	E	2031-09-08T01:23:35.024	-12.41x	-55.72	71491.7	10.59	12.07

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-09-07T23:29:10.590
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        : 4114539847403507840
2Mass ID (if available) : 17142173-2247203
ICRS Star Coord at Epoch: 17h 14m 21.73299s -22:47:20.44351s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 9.859
G magnitude           : 14.602
RP magnitude          : 13.405
BP magnitude          : 16.143
DUPflag              : 0
Distance (au)         : 5.070
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 10.54
Sun-Target sep (deg) : 94.79
Sun-Moon sep (deg)   : 167.97
B (ring opening deg) : -2.40
PA of pole (deg)     : 4.06
Pole direction: RA (deg): 268.05685
Dec (deg): 64.49652
C/A sky separation ("): 1.791
C/A sky separation (km): 6585.8
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
    
```

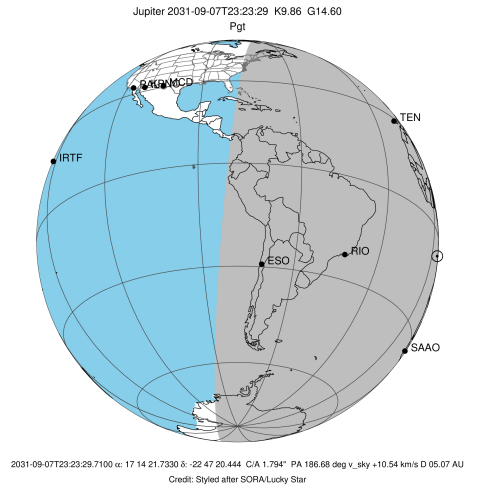


x: target alt < 5.0 deg or sun > -5.0 deg

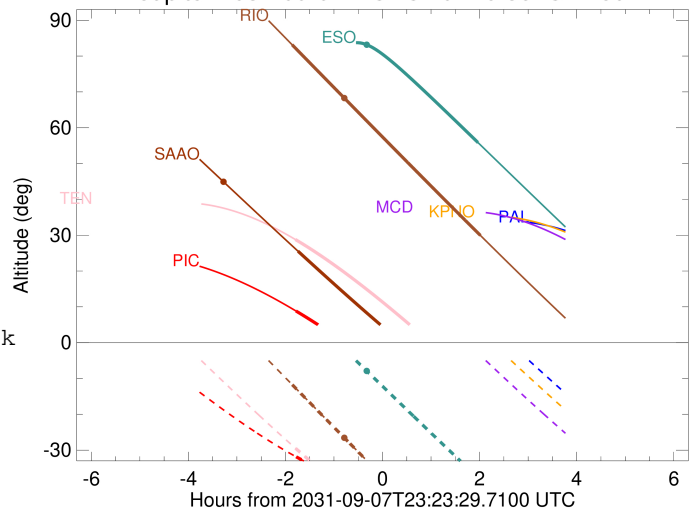
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-09-07T21:31:55.095	83.12	-11.73	71492.0	2.76	3.15
Jupiter	E	2031-09-08T01:24:36.337	29.91	-63.20	71491.9	7.35	8.39

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-09-07T23:24:51.570
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       : 4114539847403507840
2Mass ID (if available) : 17142173-2247203
ICRS Star Coord at Epoch: 17h 14m 21.73299s -22:47:20.44351s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 9.859
G magnitude           : 14.602
RP magnitude         : 13.405
BP magnitude         : 16.143
DUPflag              : 0
Distance (au)        : 5.070
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 10.54
Sun-Target sep (deg) : 94.79
Sun-Moon sep (deg)   : 167.64
B (ring opening deg) : -2.40
PA of pole (deg)     : 4.06
Pole direction: RA (deg): 268.05685
Dec (deg): 64.49652
C/A sky separation ("): 1.634
C/A sky separation (km): 6008.3
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 2031-09-07T23:23:29 K9.86 G14.60

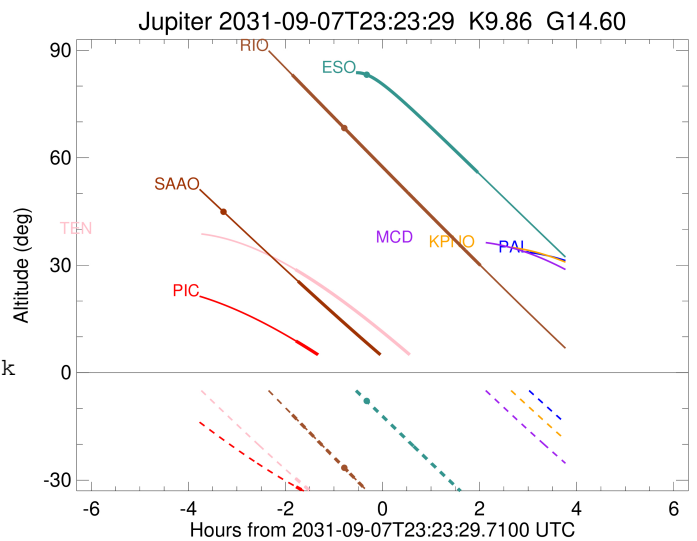
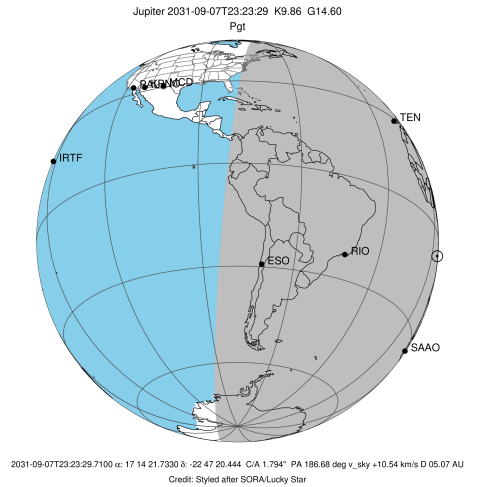


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-09-07T21:27:32.272	70.01	12.92x	71492.0	1.84	2.10
Jupiter	E	2031-09-08T01:21:29.419	55.86	-37.60	71491.9	7.33	8.36

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-09-07T23:32:30.910
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      : 4114539847403507840
2Mass ID (if available) : 17142173-2247203
ICRS Star Coord at Epoch: 17h 14m 21.73299s -22:47:20.44351s
RUWE (>1.4 is poor) : 1.06
K magnitude          : 9.859
G magnitude          : 14.602
RP magnitude         : 13.405
BP magnitude         : 16.143
DUPflag             : 0
Distance (au)       : 5.070
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 10.54
Sun-Target sep (deg) : 94.79
Sun-Moon sep (deg)  : 168.16
B (ring opening deg) : -2.40
PA of pole (deg)    : 4.06
Pole direction: RA (deg): 268.05685
Dec (deg): 64.49652
C/A sky separation (") : 1.005
C/A sky separation (km) : 3696.9
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	2031-09-07T21:39:03.519	25.53	-60.65	71492.0	1.15	1.31
Jupiter	E	2031-09-08T01:23:35.104	-16.86x	-42.63	71491.9	4.75	5.43