

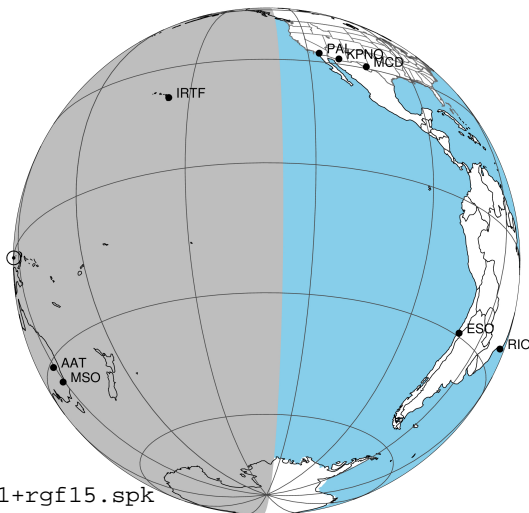
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-03-22T14:37:02.500
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068901250060832896
 2Mass ID (if available) : 17495243-2252493

Jupiter 2031-03-22T14:37:02 K9.41 G14.66 Pgt

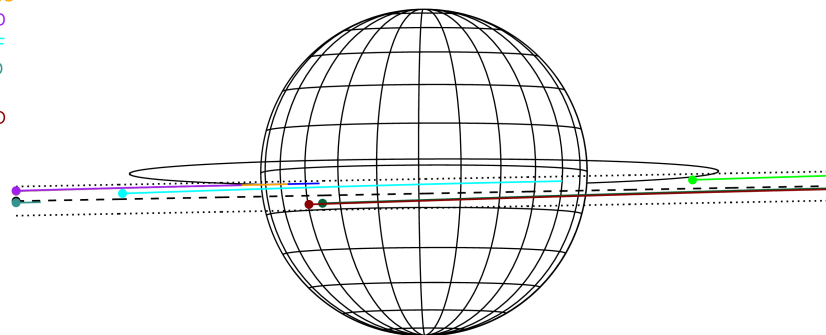
ICRS Star Coord at Epoch: 17h 49m 52.43248s -22:52:49.52230s

RUWE (>1.4 is poor) : 0.88
 K magnitude : 9.410
 G magnitude : 14.657
 RP magnitude : 13.361
 BP magnitude : 16.595
 DUPflag : 0
 Distance (au) : 5.151
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : 11.24
 Sun-Target sep (deg) : 93.67
 Sun-Moon sep (deg) : 86.69
 B (ring opening deg) : -2.62
 PA of pole (deg) : 0.25
 Pole direction: RA (deg): 268.05699
 Dec (deg): 64.49651
 C/A sky separation (") : 2.468
 C/A sky separation (km) : 9220.6
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-03-22T14:37:02 K9.41 G14.66
 Pgt



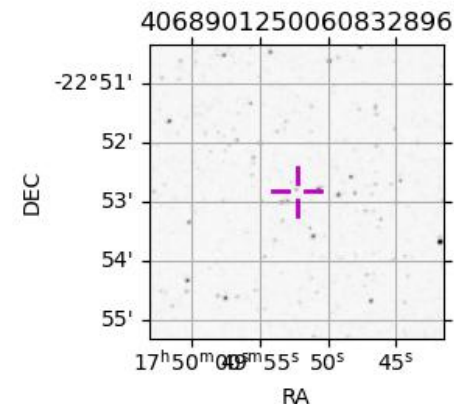
Earth
 PAL
 PMO
 KPNO
 MCD
 IRTF
 ESO
 AAT
 MSO



2031-03-22T14:37:02.5000 a: 17 49 52.4325 b: -22 52 49.522 C/A 2.479" PA 1.06 deg v_sky +11.24 km/s D 05.15 AU
 Credit: Styled after SORA/Lucky Star

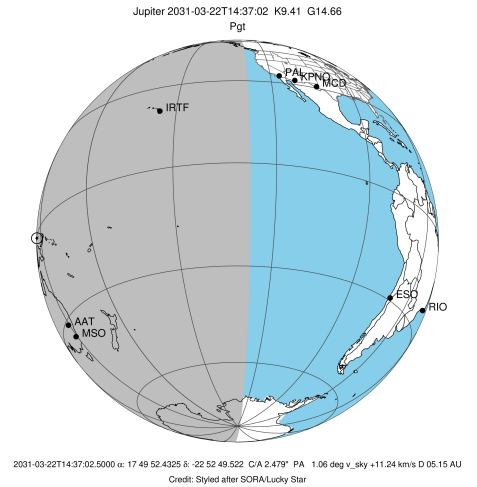
Observable events with sun below -5 deg and altitude above 5 deg

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 22 12:49 - MAR 22 12:49	Pin
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	MAR 22 12:50 - MAR 22 12:50	Pin
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	+	MAR 22 12:44 - MAR 22 12:44	Pin
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			Pnn
AAT	Siding Spring (AAT)	-31.3	149.1	+	MAR 22 16:15 - MAR 22 16:15	Pne
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	MAR 22 16:15 - MAR 22 16:15	Pne

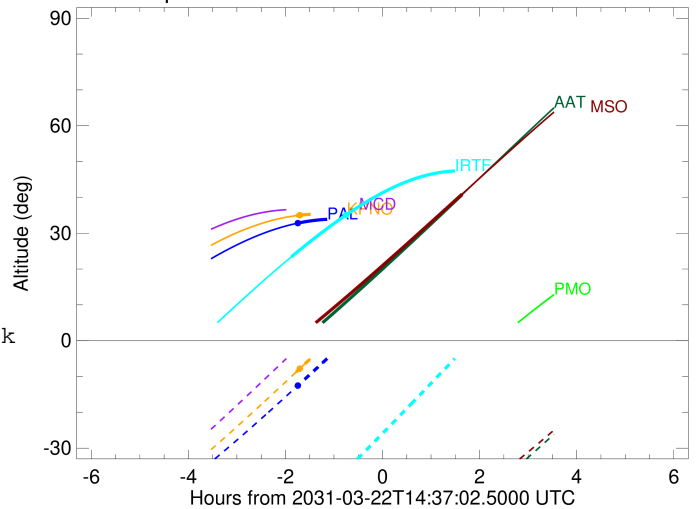


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target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-22T14:38:55.910
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : PAL
Location            : Palomar Mt (200")
Latitude (deg)      : 33.35622
E. Longitude (deg) : 243.13601
Altitude (km)       : 1.706
Gaia source ID      : 4068901250060832896
2Mass ID (if available) : 17495243-2252493
ICRS Star Coord at Epoch: 17h 49m 52.43248s -22:52:49.52230s
RUWE (>1.4 is poor) : 0.88
K magnitude          : 9.410
G magnitude          : 14.657
RP magnitude         : 13.361
BP magnitude         : 16.595
DUPflag             : 0
Distance (au)       : 5.151
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 11.24
Sun-Target sep (deg) : 93.67
Sun-Moon sep (deg)  : 87.19
B (ring opening deg) : -2.62
PA of pole (deg)    : 0.25
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 1.066
C/A sky separation (km) : 3981.7
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
    
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Jupiter 2031-03-22T14:37:02 K9.41 G14.66

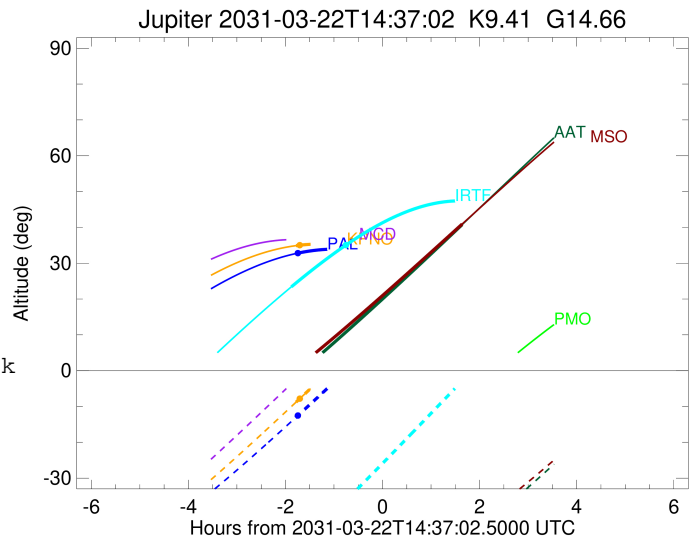
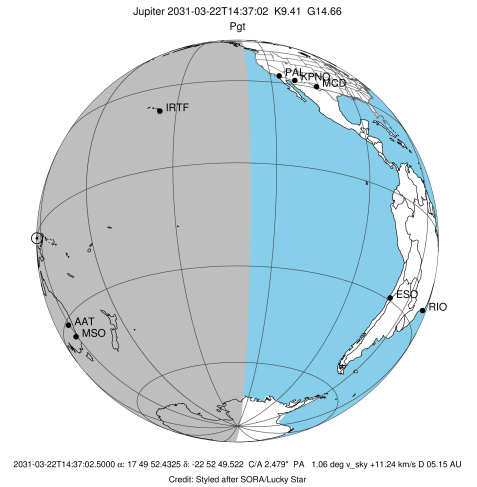


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-22T12:49:30.638	32.66	-13.13	71492.0	-4.01	-4.59
Jupiter	E	2031-03-22T16:28:17.323	20.97	31.87x	71492.0	-2.73	-3.12

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-22T14:39:41.220
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       : 4068901250060832896
2Mass ID (if available) : 17495243-2252493
ICRS Star Coord at Epoch: 17h 49m 52.43248s -22:52:49.52230s
RUWE (>1.4 is poor) : 0.88
K magnitude           : 9.410
G magnitude           : 14.657
RP magnitude         : 13.361
BP magnitude         : 16.595
DUPflag              : 0
Distance (au)        : 5.151
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 11.24
Sun-Target sep (deg) : 93.67
Sun-Moon sep (deg)   : 87.19
B (ring opening deg) : -2.62
PA of pole (deg)     : 0.25
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 1.104
C/A sky separation (km) : 4122.5
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
    
```

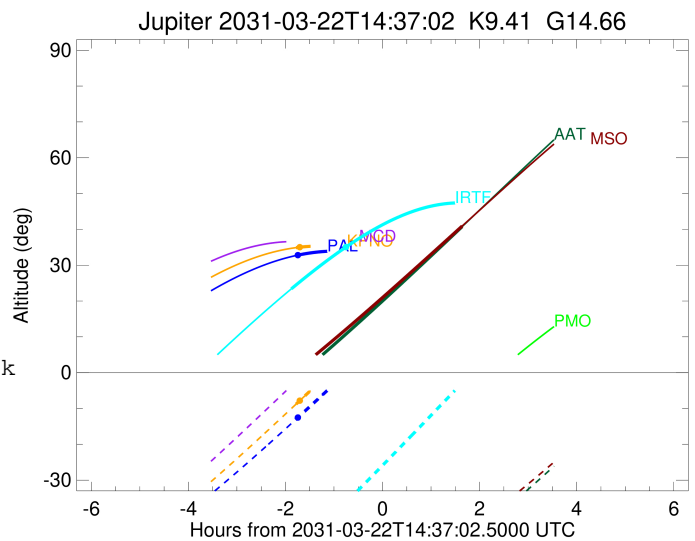
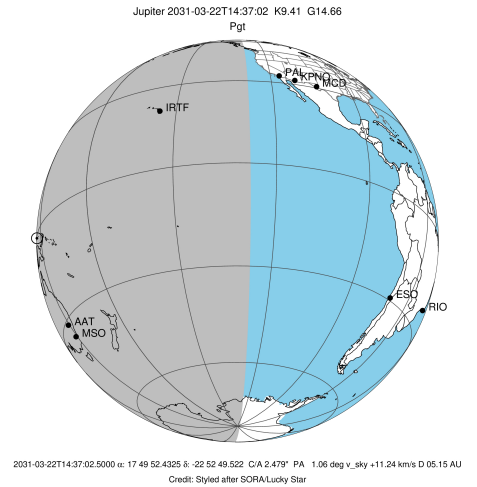


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-22T12:50:14.302	34.90	-8.78	71491.9	-4.05	-4.63
Jupiter	E	2031-03-22T16:28:53.718	18.81	36.60x	71492.0	-2.92	-3.34

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-22T14:33:12.690
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        : 4068901250060832896
2Mass ID (if available) : 17495243-2252493
ICRS Star Coord at Epoch: 17h 49m 52.43248s -22:52:49.52230s
RUWE (>1.4 is poor) : 0.88
K magnitude           : 9.410
G magnitude           : 14.657
RP magnitude          : 13.361
BP magnitude          : 16.595
DUPflag              : 0
Distance (au)         : 5.151
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 11.24
Sun-Target sep (deg)  : 93.67
Sun-Moon sep (deg)    : 87.34
B (ring opening deg) : -2.62
PA of pole (deg)     : 0.25
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 1.383
C/A sky separation (km) : 5164.9
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
    
```

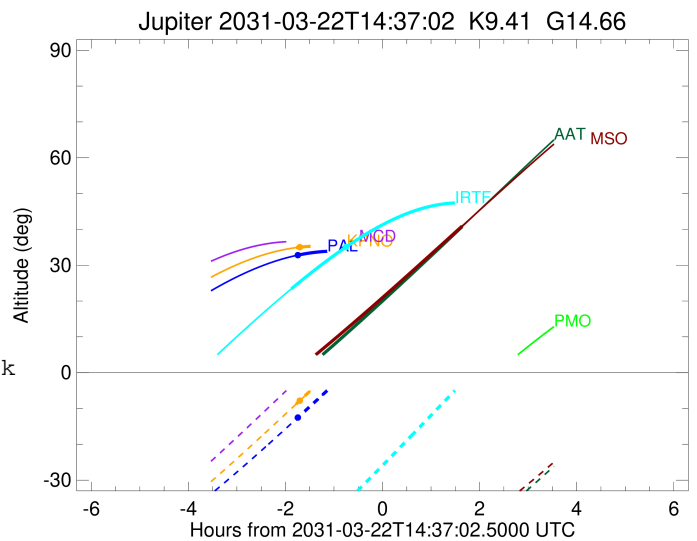
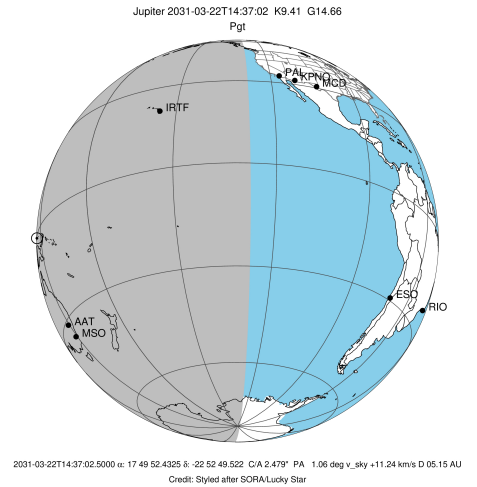


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-22T12:44:25.458	23.41	-51.02	71491.9	-5.53	-6.31
Jupiter	E	2031-03-22T16:23:17.168	47.35	-1.04x	71492.0	-3.12	-3.57

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-22T14:29:20.550
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        : 4068901250060832896
2Mass ID (if available) : 17495243-2252493
ICRS Star Coord at Epoch: 17h 49m 52.43248s -22:52:49.52230s
RUWE (>1.4 is poor) : 0.88
K magnitude           : 9.410
G magnitude           : 14.657
RP magnitude          : 13.361
BP magnitude          : 16.595
DUPflag              : 0
Distance (au)         : 5.151
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 11.24
Sun-Target sep (deg)  : 93.67
Sun-Moon sep (deg)    : 87.06
B (ring opening deg) : -2.62
PA of pole (deg)      : 0.25
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 3.220
C/A sky separation (km) : 12028.3
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
    
```

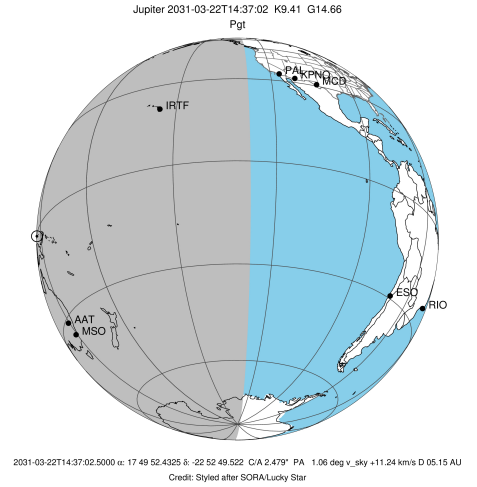


x: target alt < 5.0 deg or sun > -5.0 deg

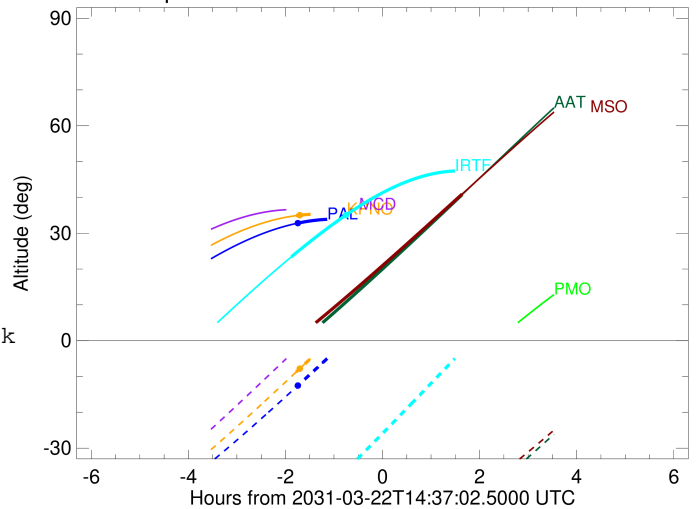
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-22T12:45:20.273	-2.23x	-53.48	71491.6	-11.26	-12.82
Jupiter	E	2031-03-22T16:15:21.259	40.74	-47.65	71491.8	-8.12	-9.27

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-22T14:29:42.510
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      : 4068901250060832896
2Mass ID (if available) : 17495243-2252493
ICRS Star Coord at Epoch: 17h 49m 52.43248s -22:52:49.52230s
RUWE (>1.4 is poor) : 0.88
K magnitude         : 9.410
G magnitude         : 14.657
RP magnitude        : 13.361
BP magnitude        : 16.595
DUPflag            : 0
Distance (au)       : 5.151
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : 11.24
Sun-Target sep (deg) : 93.67
Sun-Moon sep (deg)  : 87.08
B (ring opening deg) : -2.62
PA of pole (deg)    : 0.25
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 3.315
C/A sky separation (km) : 12382.3
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 2031-03-22T14:37:02 K9.41 G14.66



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	2031-03-22T12:45:46.538	-0.26x	-50.25	71491.6	-11.51	-13.10
Jupiter	E	2031-03-22T16:15:34.143	40.94	-44.99	71491.8	-8.44	-9.63