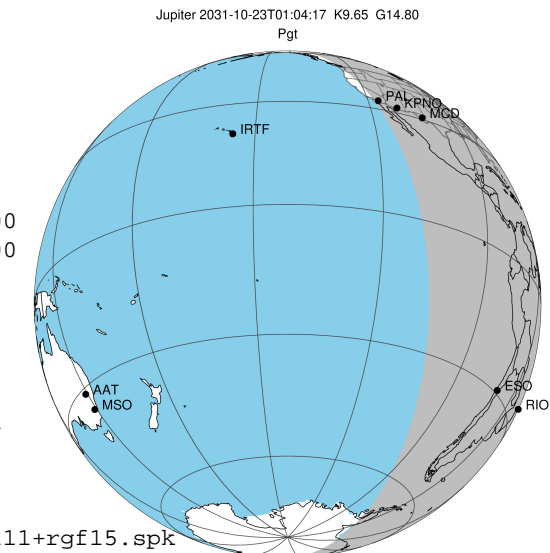


target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2031-10-23T01:04:17.530  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4116529070133438464  
 2Mass ID (if available) : 17384467-2313144

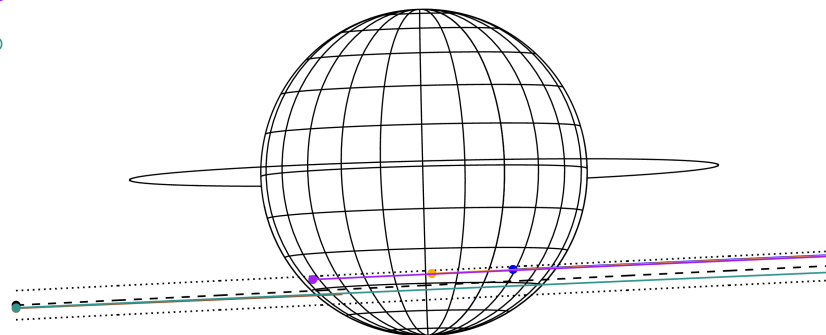
Jupiter 2031-10-23T01:04:17 K9.65 G14.80 Pgt

ICRS Star Coord at Epoch: 17h 38m 44.66619s -23:13:14.69033s

RUWE (>1.4 is poor) : 0.96  
 K magnitude : 9.655  
 G magnitude : 14.805  
 RP magnitude : 13.528  
 BP magnitude : 16.682  
 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) : 30.59  
 B (ring opening deg) : -2.24  
 PA of pole (deg) : 1.45  
 Pole direction: RA (deg): 268.05681  
 Dec (deg): 64.49652  
 C/A sky separation (") : 11.904  
 C/A sky separation (km) : 49417.9  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk



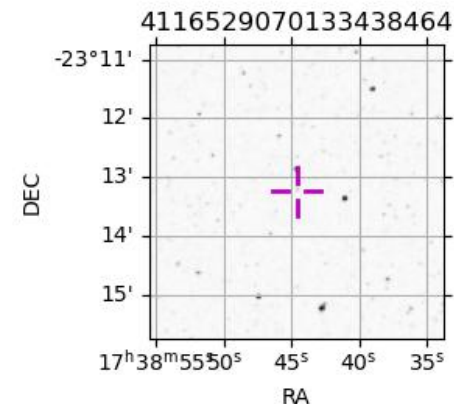
Earth  
 PAL  
 KPNO  
 MCD  
 RIO  
 ESO



2031-10-23T01:04:17.5300 α: 17 38 44.6662 δ: -23 13 14.690 C/A \*\*\*\*\* PA 2.77 deg v\_sky +29.79 km/s D 05.72 AU  
 Credit: Styled after SORA/Lucky Star

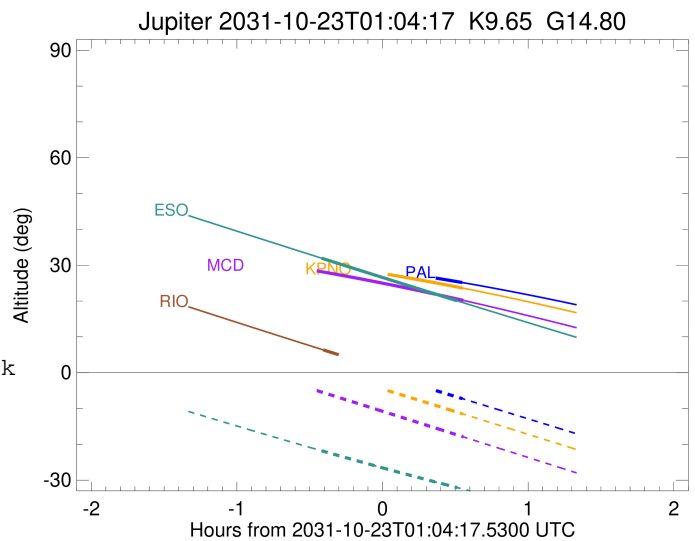
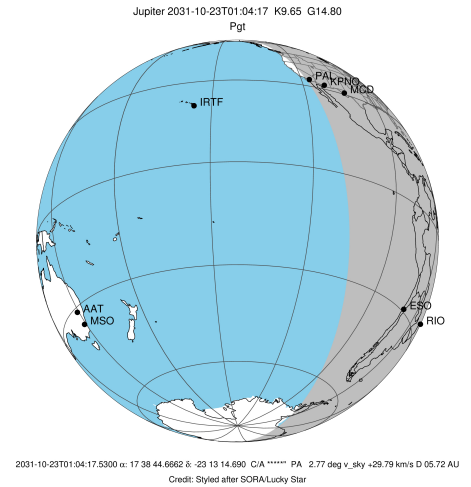
Observable events with sun below -5 deg and altitude above 5 deg

| 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 01:37 - OCT 23 01:37 | Pne   |
| PMO  | Purple Mtn Obs. Nanking           | 32.1  | 118.8 |        |                             | Pnn   |
| KPNO | Kitt Peak Natl Obs                | 32.0  | 248.4 | +      | OCT 23 01:37 - OCT 23 01:37 | Pne   |
| MCD  | McDonald Obs. 2.7m                | 30.7  | 256.0 | +      | OCT 23 01:37 - OCT 23 01:37 | 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 00:39 - OCT 23 00:39 | Pin   |
| ESO  | European Southern Obs. (3.6m)     | -29.3 | 289.3 | +      | OCT 23 00:39 - OCT 23 01:35 | 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            : 2031-10-23T01:05:24.540
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       : 4116529070133438464
2Mass ID (if available) : 17384467-2313144
ICRS Star Coord at Epoch: 17h 38m 44.66619s -23:13:14.69033s
RUWE (>1.4 is poor) : 0.96
K magnitude          : 9.655
G magnitude          : 14.805
RP magnitude         : 13.528
BP magnitude         : 16.682
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)   : 30.45
B (ring opening deg) : -2.24
PA of pole (deg)     : 1.45
Pole direction: RA (deg): 268.05681
Dec (deg): 64.49652
C/A sky separation ("): 10.651
C/A sky separation (km): 44216.6
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
    
```

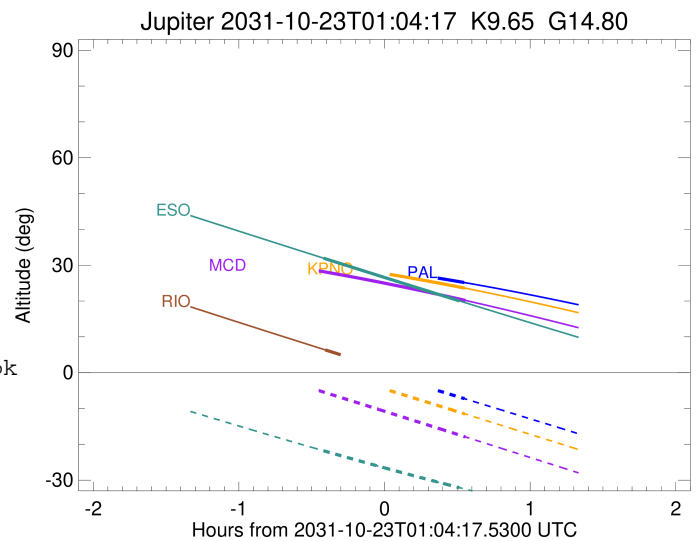
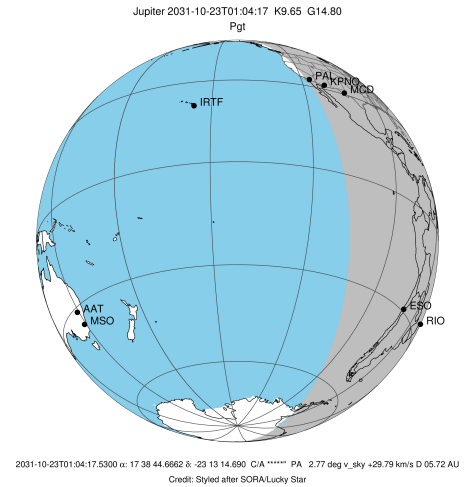


x: target alt < 5.0 deg or sun > -5.0 deg

| Target  | I/E | UTC                     | alt   | alt-sun | radius  | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I   | 2031-10-23T00:33:36.022 | 31.14 | 5.71x   | 71489.2 | -39.41  | -43.11       |
| Jupiter | E   | 2031-10-23T01:37:11.015 | 25.16 | -7.25   | 71489.5 | -36.98  | -40.63       |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-10-23T01:05:40.170
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       : 4116529070133438464
2Mass ID (if available) : 17384467-2313144
ICRS Star Coord at Epoch: 17h 38m 44.66619s -23:13:14.69033s
RUWE (>1.4 is poor) : 0.96
K magnitude          : 9.655
G magnitude          : 14.805
RP magnitude         : 13.528
BP magnitude         : 16.682
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)   : 30.38
B (ring opening deg) : -2.24
PA of pole (deg)     : 1.45
Pole direction: RA (deg): 268.05681
Dec (deg): 64.49652
C/A sky separation (") : 10.690
C/A sky separation (km) : 44378.5
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
    
```

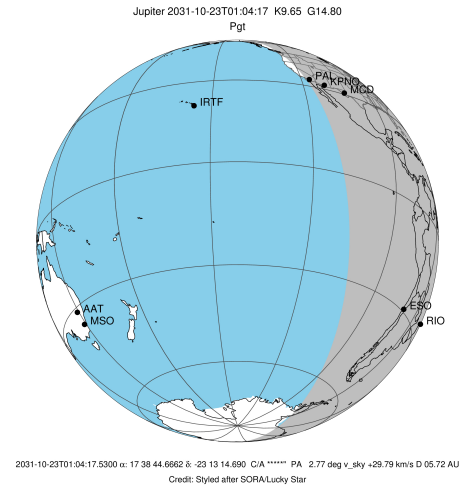


x: target alt < 5.0 deg or sun > -5.0 deg

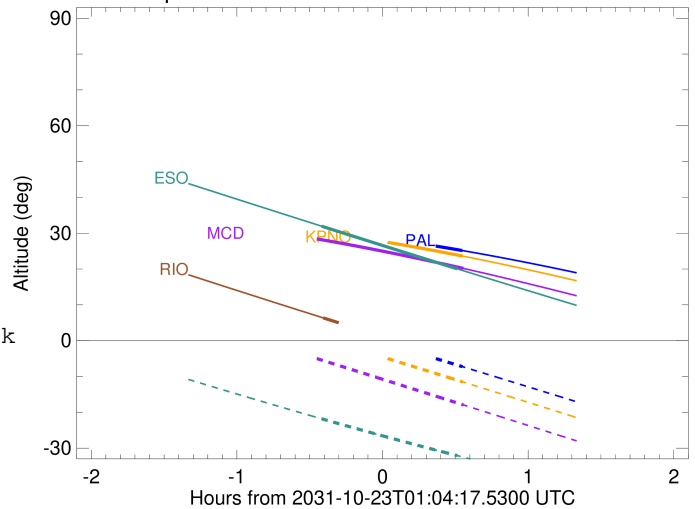
| Target  | I/E | UTC                     | alt   | alt-sun | radius  | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I   | 2031-10-23T00:33:56.570 | 30.75 | 1.75x   | 71489.2 | -39.55  | -43.25       |
| Jupiter | E   | 2031-10-23T01:37:21.440 | 23.60 | -11.51  | 71489.5 | -37.17  | -40.83       |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-10-23T01:06:01.060
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       : 4116529070133438464
2Mass ID (if available) : 17384467-2313144
ICRS Star Coord at Epoch: 17h 38m 44.66619s -23:13:14.69033s
RUWE (>1.4 is poor) : 0.96
K magnitude          : 9.655
G magnitude          : 14.805
RP magnitude         : 13.528
BP magnitude         : 16.682
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)   : 30.28
B (ring opening deg) : -2.24
PA of pole (deg)     : 1.45
Pole direction: RA (deg): 268.05681
Dec (deg): 64.49652
C/A sky separation (") : 10.744
C/A sky separation (km) : 44601.9
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
    
```



Jupiter 2031-10-23T01:04:17 K9.65 G14.80

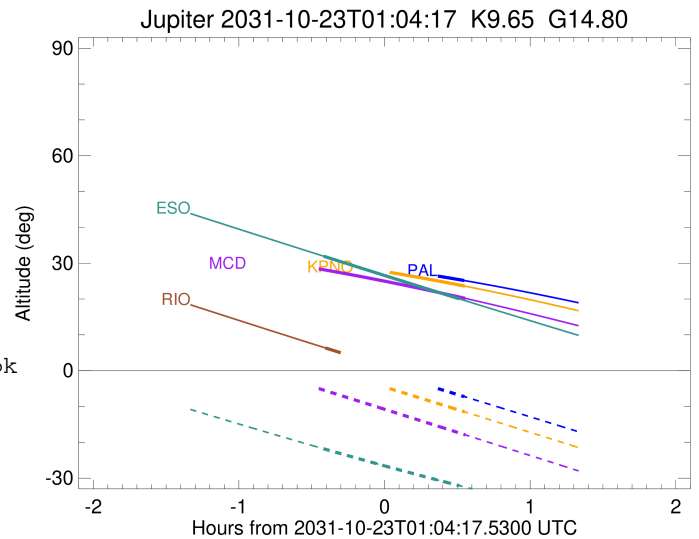
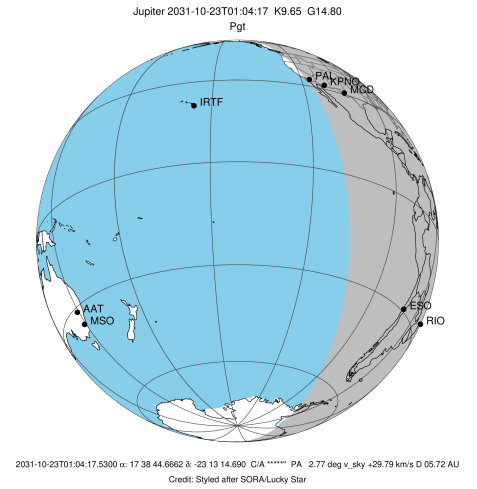


x: target alt < 5.0 deg or sun > -5.0 deg

| Target  | I/E | UTC                     | alt   | alt-sun | radius  | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I   | 2031-10-23T00:34:24.873 | 28.74 | -4.40x  | 71489.2 | -39.74  | -43.44       |
| Jupiter | E   | 2031-10-23T01:37:34.512 | 20.17 | -17.92  | 71489.5 | -37.43  | -41.10       |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-10-23T01:07:25.920
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       : 4116529070133438464
2Mass ID (if available) : 17384467-2313144
ICRS Star Coord at Epoch: 17h 38m 44.66619s -23:13:14.69033s
RUWE (>1.4 is poor) : 0.96
K magnitude          : 9.655
G magnitude           : 14.805
RP magnitude         : 13.528
BP magnitude         : 16.682
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)   : 29.88
B (ring opening deg) : -2.24
PA of pole (deg)     : 1.45
Pole direction: RA (deg): 268.05681
Dec (deg): 64.49652
C/A sky separation (" ) : 12.481
C/A sky separation (km) : 51814.0
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
    
```

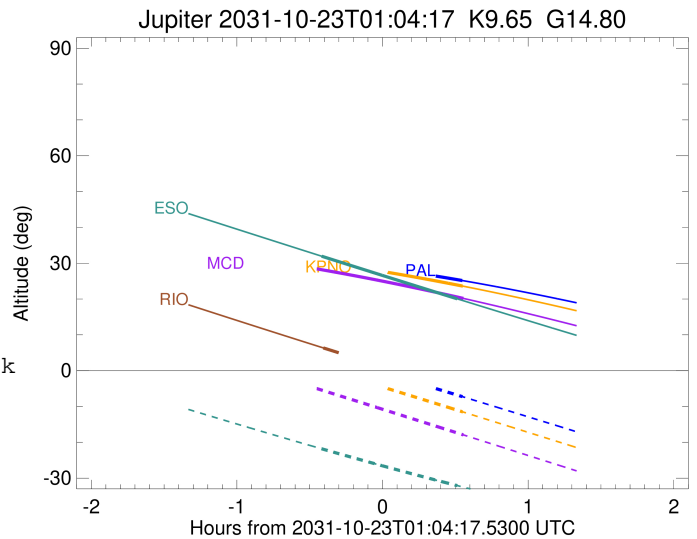
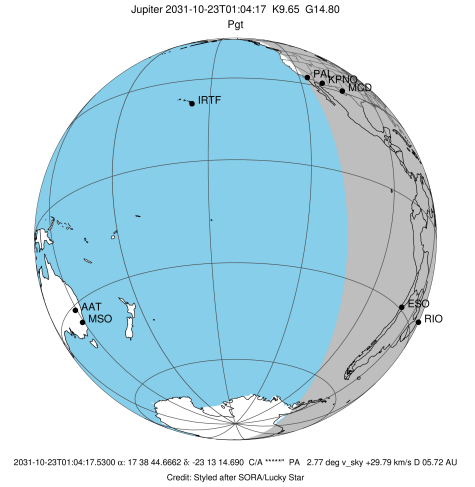


x: target alt < 5.0 deg or sun > -5.0 deg

| Target  | I/E | UTC                     | alt    | alt-sun | radius  | lat-geo | lat-geodetic |
|---------|-----|-------------------------|--------|---------|---------|---------|--------------|
| Jupiter | I   | 2031-10-23T00:39:54.788 | 6.35   | -45.46  | 71488.3 | -47.39  | -51.05       |
| Jupiter | E   | 2031-10-23T01:34:53.856 | -5.15x | -52.69  | 71488.5 | -45.41  | -49.11       |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-10-23T01:07:10.080
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        : 4116529070133438464
2Mass ID (if available) : 17384467-2313144
ICRS Star Coord at Epoch: 17h 38m 44.66619s -23:13:14.69033s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 9.655
G magnitude           : 14.805
RP magnitude          : 13.528
BP magnitude          : 16.682
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) : -2.24
PA of pole (deg)     : 1.45
Pole direction: RA (deg): 268.05681
Dec (deg): 64.49652
C/A sky separation (") : 12.370
C/A sky separation (km) : 51353.8
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   | 2031-10-23T00:39:12.229 | 31.95 | -21.80  | 71488.3 | -46.91  | -50.58       |
| Jupiter | E   | 2031-10-23T01:35:04.878 | 20.05 | -32.07  | 71488.6 | -44.85  | -48.55       |