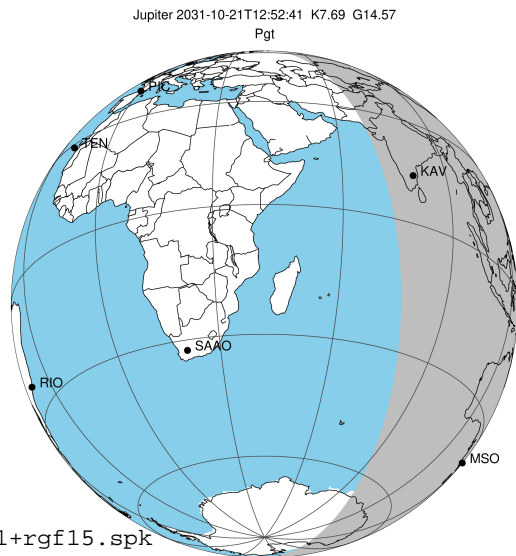


target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2031-10-21T12:52:41.390  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4116714097316128512  
 2Mass ID (if available) : 17373749-2312125

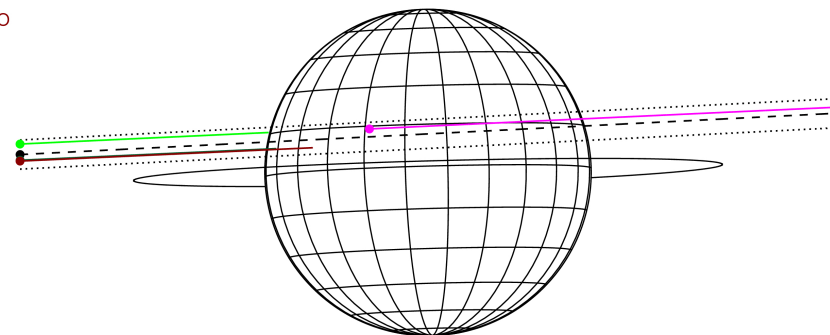
Jupiter 2031-10-21T12:52:41 K7.69 G14.57 Pgt

ICRS Star Coord at Epoch: 17h 37m 37.48320s -23:12:12.84317s  
 RUWE (>1.4 is poor) : 0.83  
 K magnitude : 7.687  
 G magnitude : 14.574  
 RP magnitude : 13.005  
 BP magnitude : 18.670  
 DUPflag : 0  
 Distance (au) : 5.705  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : 29.25  
 Sun-Target sep (deg) : 57.37  
 Sun-Moon sep (deg) : 9.83  
 B (ring opening deg) : -2.25  
 PA of pole (deg) : 1.57  
 Pole direction: RA (deg): 268.05681  
 Dec (deg): 64.49652  
 C/A sky separation (") : 4.081  
 C/A sky separation (km) : 16887.0  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk



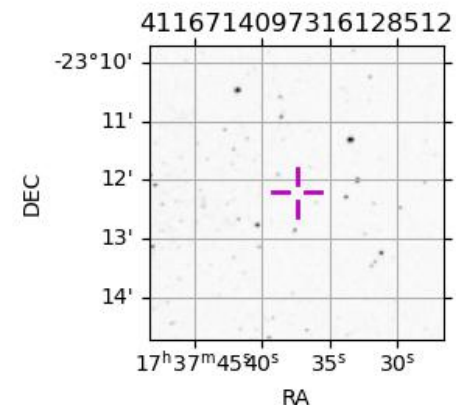
2031-10-21T12:52:41.3900 cc: 17 37 37.4832 s: -23 12 12.843 C/A 4.073" PA 182.90 deg v\_sky +29.25 km/s D 05.70 AU  
 Credit: Styled after SORA/Lucky Star

Earth  
 PMO  
 KAV  
 AAT  
 MSO



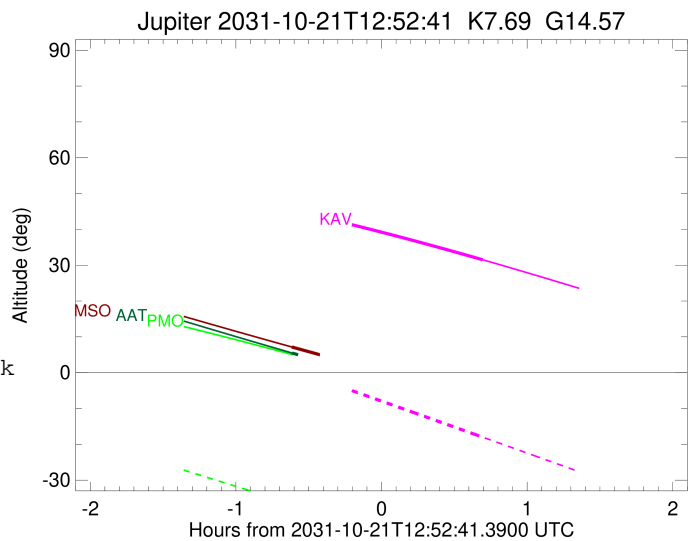
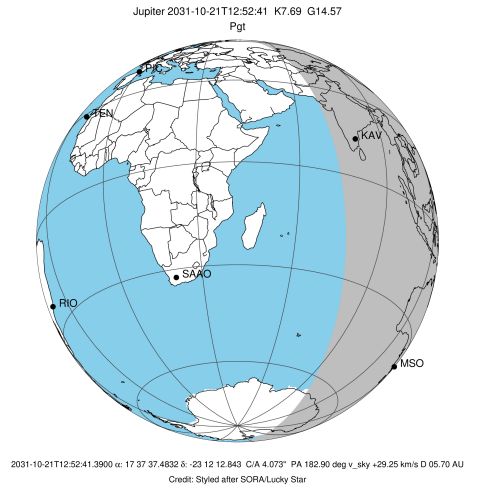
Observable events with sun below -5 deg and altitude above 5 deg

| Obs  | Location                          | lat   | Elon  | Target | Observed Events Interval    | OEncode |
|------|-----------------------------------|-------|-------|--------|-----------------------------|---------|
| 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 |        |                             | 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 |        |                             | Pnn     |
| IRTF | Mauna Kea/IRTF                    | 19.8  | 204.5 |        |                             | Pnn     |
| KAV  | Kavalur Observatory               | 12.6  | 78.8  | +      | OCT 21 13:34 - OCT 21 13:34 | Pne     |
| 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 | +      | OCT 21 12:15 - OCT 21 12:15 | Pin     |
| SAAO | So. Afr. Astro. Obs. (Sutherland) | -32.4 | 20.8  |        |                             | Pnn     |
| MSO  | Mt. Stromlo Observatory           | -35.3 | 149.0 | +      | OCT 21 12:15 - OCT 21 12:15 | Pin     |



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-10-21T12:54:47.640
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        : 4116714097316128512
2Mass ID (if available) : 17373749-2312125
ICRS Star Coord at Epoch: 17h 37m 37.48320s -23:12:12.84317s
RUWE (>1.4 is poor) : 0.83
K magnitude           : 7.687
G magnitude           : 14.574
RP magnitude          : 13.005
BP magnitude          : 18.670
DUPflag              : 0
Distance (au)         : 5.705
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 29.25
Sun-Target sep (deg) : 57.37
Sun-Moon sep (deg)   : 9.23
B (ring opening deg) : -2.25
PA of pole (deg)     : 1.57
Pole direction: RA (deg): 268.05681
Dec (deg): 64.49652
C/A sky separation (") : 4.901
C/A sky separation (km) : 20279.6
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
    
```

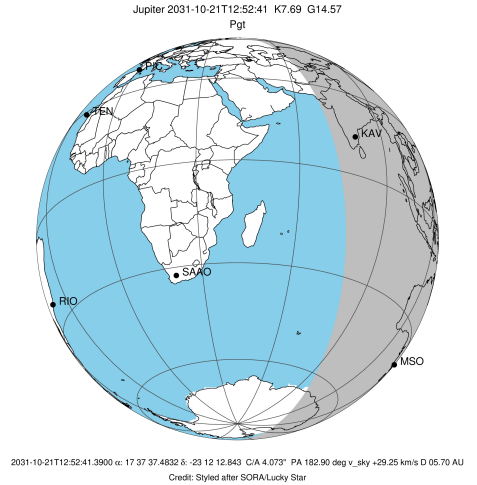


x: target alt < 5.0 deg or sun > -5.0 deg

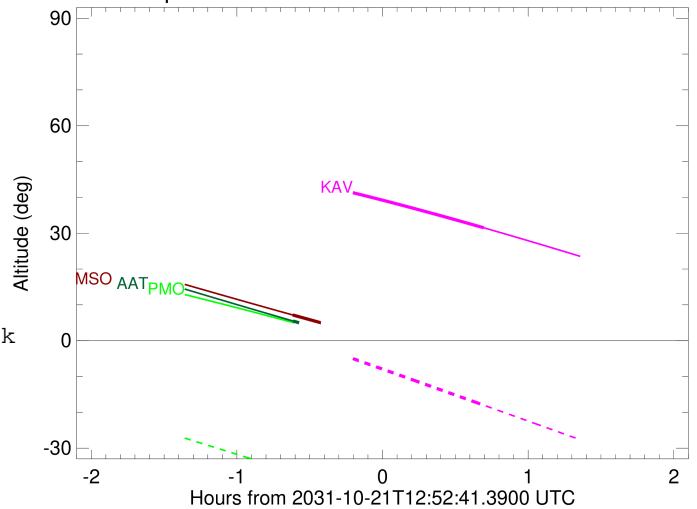
| Target  | I/E | UTC                     | alt   | alt-sun | radius  | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I   | 2031-10-21T12:15:11.462 | 45.28 | 1.07x   | 71491.5 | 15.29   | 17.35        |
| Jupiter | E   | 2031-10-21T13:34:18.982 | 31.52 | -17.99  | 71491.4 | 17.58   | 19.90        |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-10-21T12:55:47.110
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      : 4116714097316128512
2Mass ID (if available) : 17373749-2312125
ICRS Star Coord at Epoch: 17h 37m 37.48320s -23:12:12.84317s
RUWE (>1.4 is poor) : 0.83
K magnitude          : 7.687
G magnitude          : 14.574
RP magnitude         : 13.005
BP magnitude         : 18.670
DUPflag             : 0
Distance (au)       : 5.705
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : 29.25
Sun-Target sep (deg) : 57.37
Sun-Moon sep (deg)  : 9.30
B (ring opening deg) : -2.25
PA of pole (deg)    : 1.57
Pole direction: RA (deg): 268.05681
Dec (deg): 64.49652
C/A sky separation (" ) : 3.250
C/A sky separation (km) : 13448.7
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
    
```



Jupiter 2031-10-21T12:52:41 K7.69 G14.57

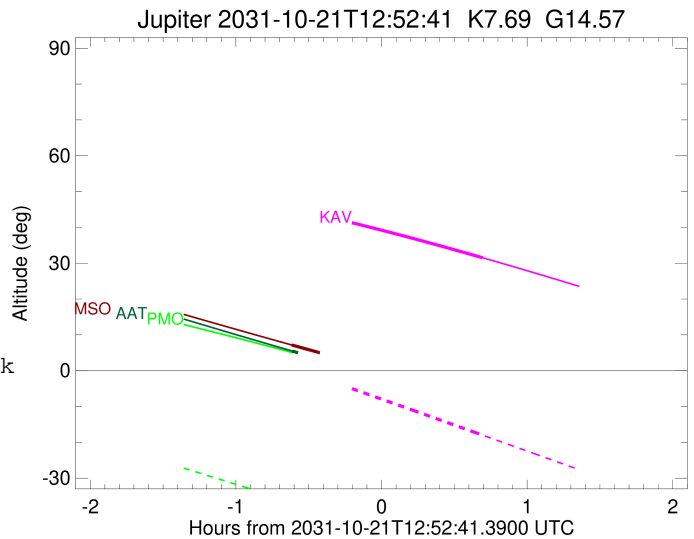
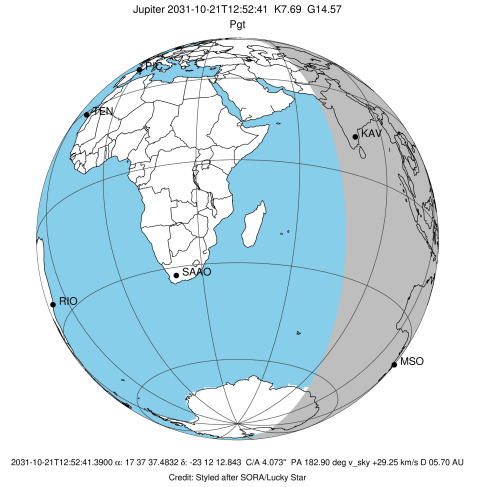


x: target alt < 5.0 deg or sun > -5.0 deg

| Target  | I/E | UTC                     | alt    | alt-sun | radius  | lat-geo | lat-geodetic |
|---------|-----|-------------------------|--------|---------|---------|---------|--------------|
| Jupiter | I   | 2031-10-21T12:15:52.663 | 5.48   | -42.65  | 71491.8 | 9.81    | 11.19        |
| Jupiter | E   | 2031-10-21T13:35:35.174 | -9.45x | -48.04  | 71491.7 | 11.86   | 13.50        |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-10-21T12:55:39.530
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       : 4116714097316128512
2Mass ID (if available) : 17373749-2312125
ICRS Star Coord at Epoch: 17h 37m 37.48320s -23:12:12.84317s
RUWE (>1.4 is poor) : 0.83
K magnitude          : 7.687
G magnitude          : 14.574
RP magnitude         : 13.005
BP magnitude         : 18.670
DUPflag             : 0
Distance (au)        : 5.705
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 29.25
Sun-Target sep (deg) : 57.37
Sun-Moon sep (deg)   : 9.36
B (ring opening deg) : -2.25
PA of pole (deg)     : 1.57
Pole direction: RA (deg): 268.05681
Dec (deg): 64.49652
C/A sky separation ("): 3.173
C/A sky separation (km): 13126.8
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   | 2031-10-21T12:15:42.639 | 7.17   | -39.14  | 71491.8 | 9.54    | 10.87        |
| Jupiter | E   | 2031-10-21T13:35:30.252 | -7.10x | -44.01  | 71491.7 | 11.61   | 13.22        |