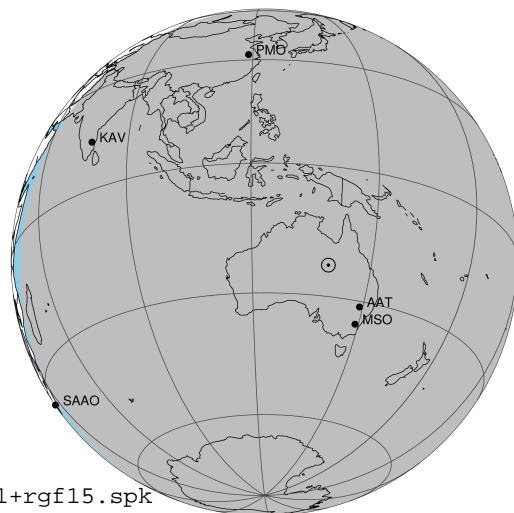


target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-07-03T14:48:26.120
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068825452512514432
 2Mass ID (if available) : 17442309-2304228

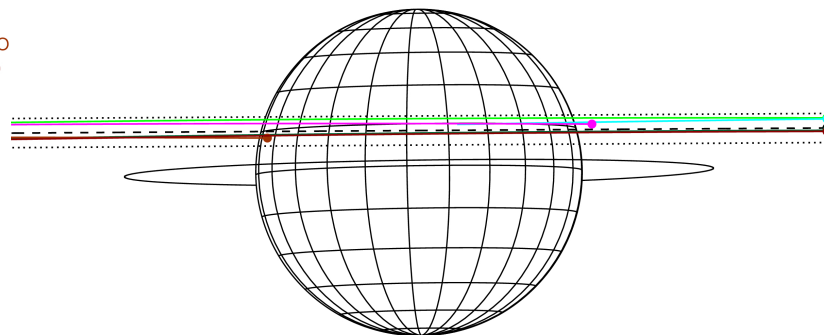
Jupiter 2043-07-03T14:48:26 K9.40 G13.08 Pgt

ICRS Star Coord at Epoch: 17h 44m 23.08431s -23:04:23.09675s
 RUWE (>1.4 is poor) : 0.91
 K magnitude : 9.398
 G magnitude : 13.078
 RP magnitude : 12.052
 BP magnitude : 14.156
 DUPflag : 0
 Distance (au) : 4.272
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -15.51
 Sun-Target sep (deg) : 165.41
 Sun-Moon sep (deg) : 150.97
 B (ring opening deg) : -2.42
 PA of pole (deg) : 0.84
 Pole direction: RA (deg): 268.05669
 Dec (deg): 64.49732
 C/A sky separation (") : 5.934
 C/A sky separation (km) : 18385.6
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk



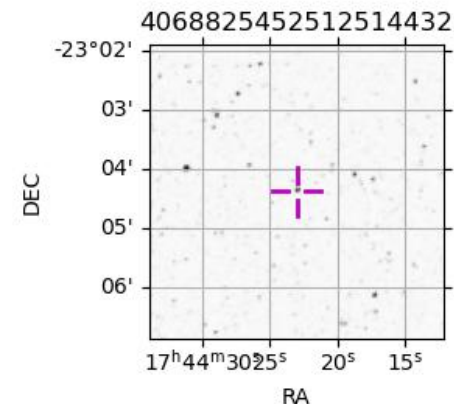
2043-07-03T14:48:26.1200 at: 17 44 23.0843 s: -23 04 23.097 C/A 5.923" PA 180.36 deg v_sky -15.51 km/s D 04.27 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PMO
 IRTF
 KAV
 AAT
 SAAO
 MSO



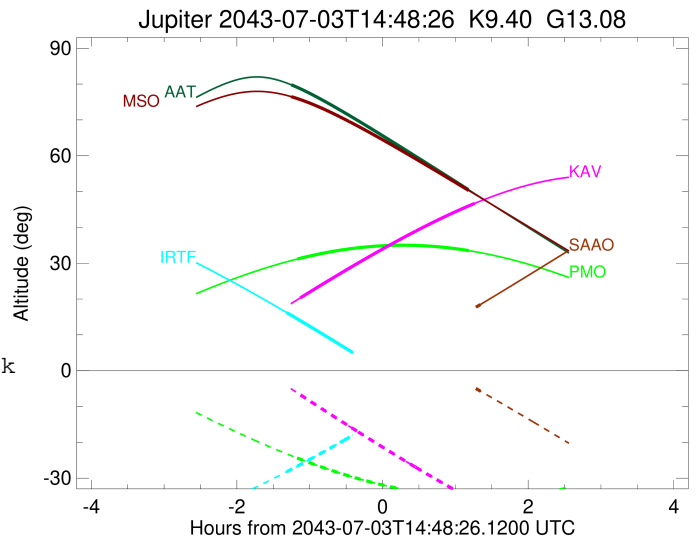
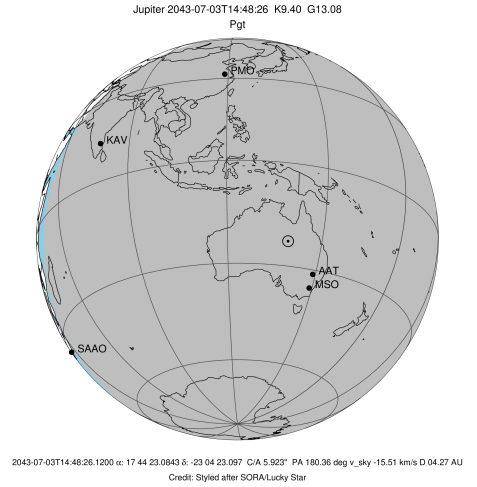
Observable events with sun below -5 deg and altitude above 5 deg

| 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 | + + | JUL 03 13:38 - JUL 03 15:59 | Pie |
| 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 | + | JUL 03 13:29 - JUL 03 13:29 | Pin |
| KAV | Kavalur Observatory | 12.6 | 78.8 | + + | JUL 03 13:40 - JUL 03 16:04 | 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 | + + | JUL 03 13:33 - JUL 03 15:59 | Pie |
| SAAO | So. Afr. Astro. Obs. (Sutherland) | -32.4 | 20.8 | + | JUL 03 16:09 - JUL 03 16:09 | Pne |
| MSO | Mt. Stromlo Observatory | -35.3 | 149.0 | + + | JUL 03 13:33 - JUL 03 15:59 | Pie |



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-03T14:48:50.940
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       : 4068825452512514432
2Mass ID (if available) : 17442309-2304228
ICRS Star Coord at Epoch: 17h 44m 23.08431s -23:04:23.09675s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 9.398
G magnitude           : 13.078
RP magnitude          : 12.052
BP magnitude          : 14.156
DUPflag              : 0
Distance (au)        : 4.272
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.51
Sun-Target sep (deg) : 165.41
Sun-Moon sep (deg)   : 151.28
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.84
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 7.617
C/A sky separation (km): 23598.3
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
    
```

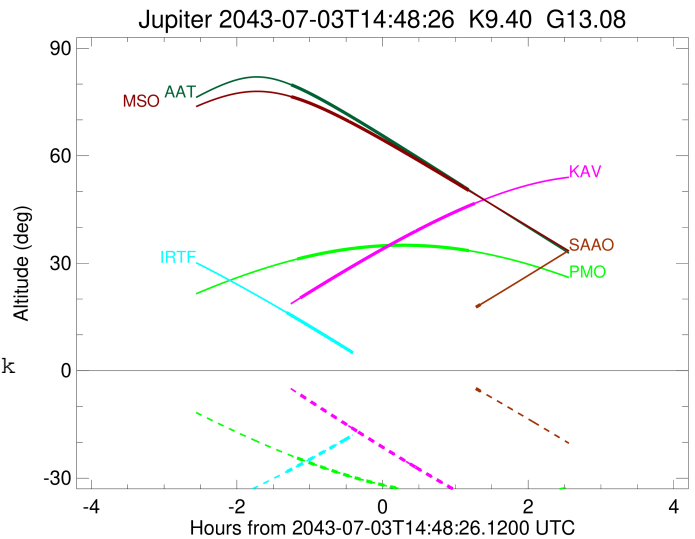
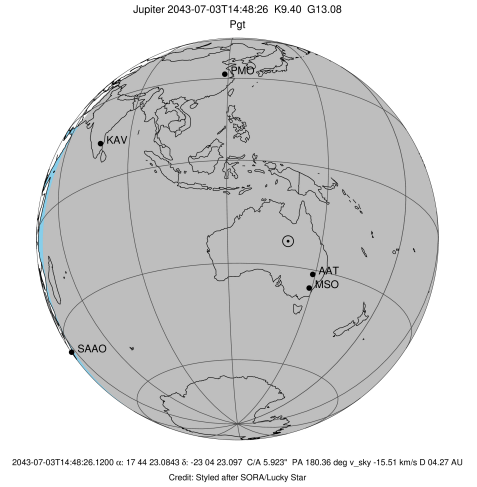


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2043-07-03T13:38:03.495 | 31.15 | -24.37 | 71491.2 | 18.64 | 21.08 |
| Jupiter | E | 2043-07-03T15:59:37.626 | 33.50 | -35.14 | 71491.1 | 19.70 | 22.24 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-03T14:42:19.690
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        : 4068825452512514432
2Mass ID (if available) : 17442309-2304228
ICRS Star Coord at Epoch: 17h 44m 23.08431s -23:04:23.09675s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 9.398
G magnitude           : 13.078
RP magnitude          : 12.052
BP magnitude          : 14.156
DUPflag              : 0
Distance (au)         : 4.272
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.51
Sun-Target sep (deg)  : 165.41
Sun-Moon sep (deg)   : 151.83
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.84
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 6.710
C/A sky separation (km) : 20788.6
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
    
```

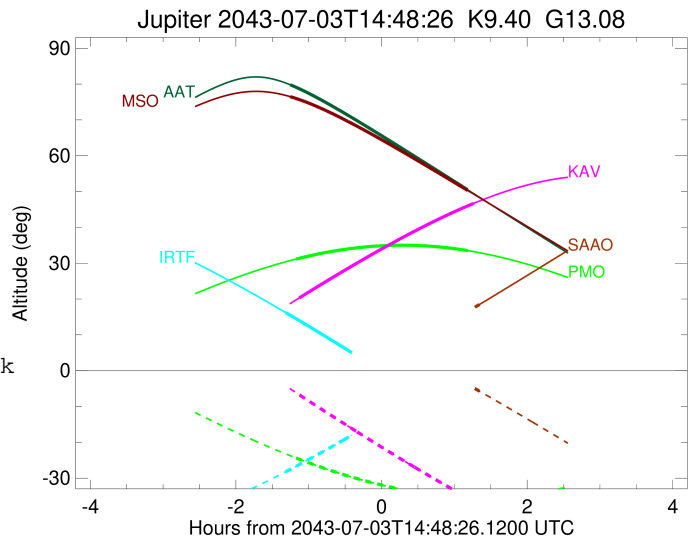
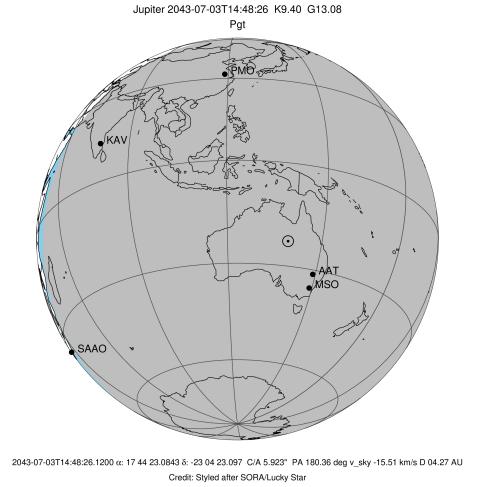


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|---------|---------|---------|---------|--------------|
| Jupiter | I | 2043-07-03T13:29:30.735 | 16.21 | -28.20 | 71491.3 | 16.99 | 19.25 |
| Jupiter | E | 2043-07-03T15:55:48.379 | -14.93x | 0.97x | 71491.3 | 16.74 | 18.97 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-03T14:52:50.410
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       : 4068825452512514432
2Mass ID (if available) : 17442309-2304228
ICRS Star Coord at Epoch: 17h 44m 23.08431s -23:04:23.09675s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 9.398
G magnitude           : 13.078
RP magnitude         : 12.052
BP magnitude         : 14.156
DUPflag              : 0
Distance (au)        : 4.272
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.51
Sun-Target sep (deg) : 165.41
Sun-Moon sep (deg)   : 150.70
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.84
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 6.917
C/A sky separation (km) : 21429.6
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
    
```

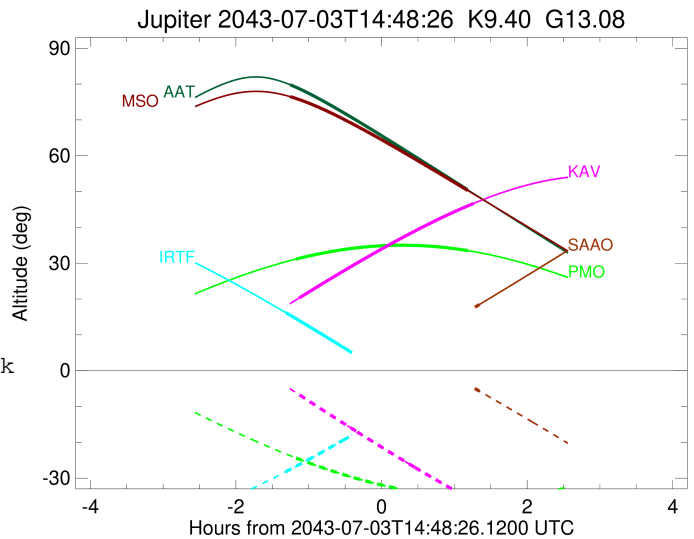
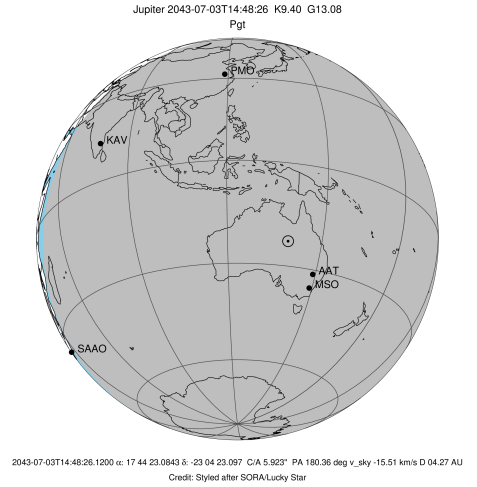


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2043-07-03T13:40:49.621 | 20.34 | -6.76 | 71491.4 | 16.43 | 18.62 |
| Jupiter | E | 2043-07-03T16:04:26.854 | 46.70 | -36.38 | 71491.2 | 18.27 | 20.67 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-03T14:45:59.990
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        : 4068825452512514432
2Mass ID (if available) : 17442309-2304228
ICRS Star Coord at Epoch: 17h 44m 23.08431s -23:04:23.09675s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 9.398
G magnitude           : 13.078
RP magnitude          : 12.052
BP magnitude          : 14.156
DUPflag              : 0
Distance (au)         : 4.272
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.51
Sun-Target sep (deg)  : 165.41
Sun-Moon sep (deg)    : 151.71
B (ring opening deg) : -2.42
PA of pole (deg)      : 0.84
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 5.582
C/A sky separation (km) : 17294.7
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
    
```

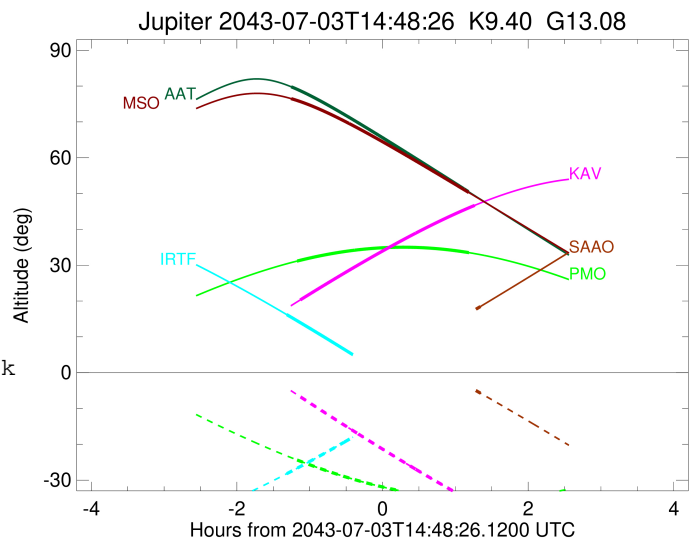
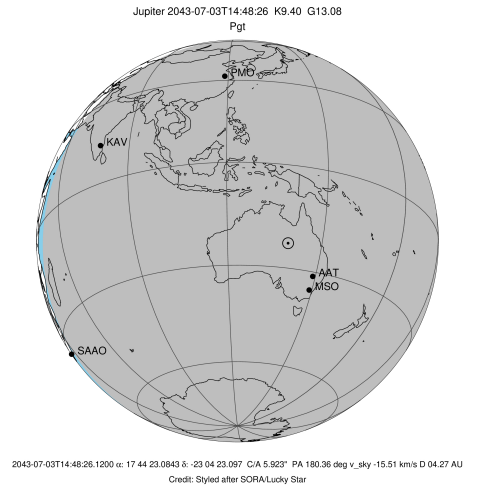


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2043-07-03T13:33:14.106 | 79.79 | -78.76 | 71491.6 | 13.65 | 15.52 |
| Jupiter | E | 2043-07-03T15:59:02.227 | 50.56 | -64.04 | 71491.5 | 14.15 | 16.08 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-03T14:53:57.790
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       : 4068825452512514432
2Mass ID (if available) : 17442309-2304228
ICRS Star Coord at Epoch: 17h 44m 23.08431s -23:04:23.09675s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 9.398
G magnitude           : 13.078
RP magnitude          : 12.052
BP magnitude          : 14.156
DUPflag              : 0
Distance (au)        : 4.272
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.51
Sun-Target sep (deg) : 165.41
Sun-Moon sep (deg)   : 150.21
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.84
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 4.794
C/A sky separation (km): 14852.5
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
    
```

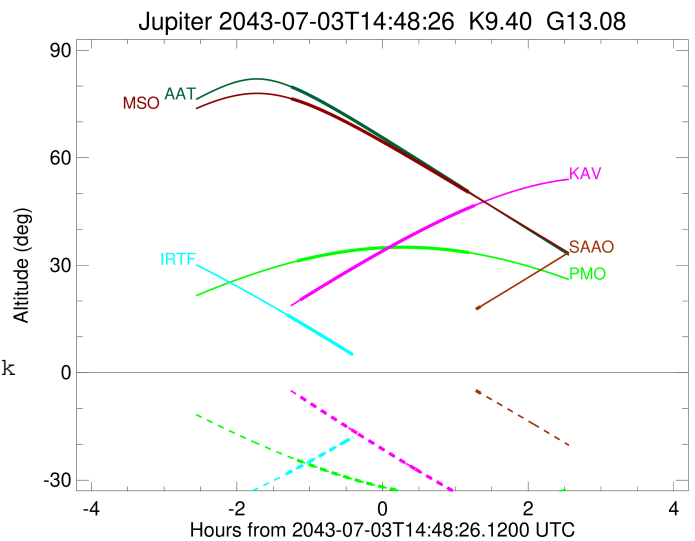
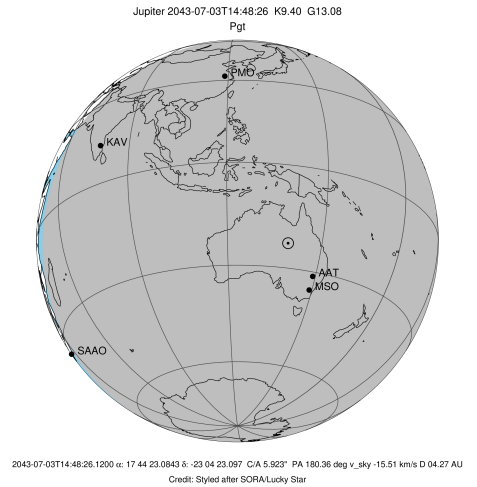


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|---------|---------|---------|---------|--------------|
| Jupiter | I | 2043-07-03T13:38:10.518 | -10.31x | 20.49x | 71491.7 | 10.96 | 12.48 |
| Jupiter | E | 2043-07-03T16:09:10.147 | 18.47 | -5.72 | 71491.6 | 13.03 | 14.82 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-03T14:46:06.590
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       : 4068825452512514432
2Mass ID (if available) : 17442309-2304228
ICRS Star Coord at Epoch: 17h 44m 23.08431s -23:04:23.09675s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 9.398
G magnitude           : 13.078
RP magnitude         : 12.052
BP magnitude         : 14.156
DUPflag              : 0
Distance (au)        : 4.272
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.51
Sun-Target sep (deg) : 165.41
Sun-Moon sep (deg)   : 151.68
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.84
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 5.443
C/A sky separation (km) : 16863.0
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 | 2043-07-03T13:33:09.417 | 76.49 | -75.61 | 71491.6 | 13.29 | 15.11 |
| Jupiter | E | 2043-07-03T15:59:19.531 | 50.33 | -62.95 | 71491.5 | 13.81 | 15.70 |