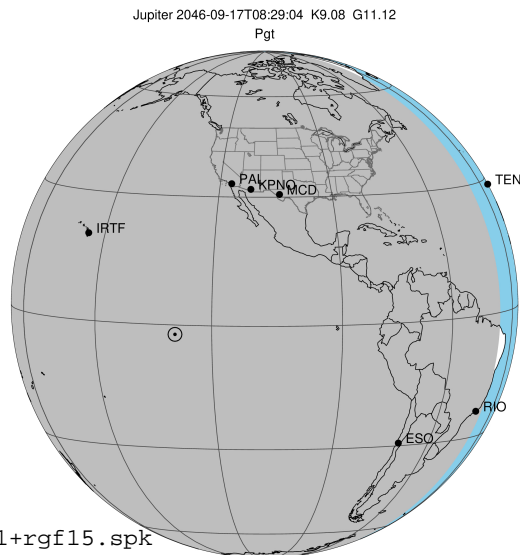


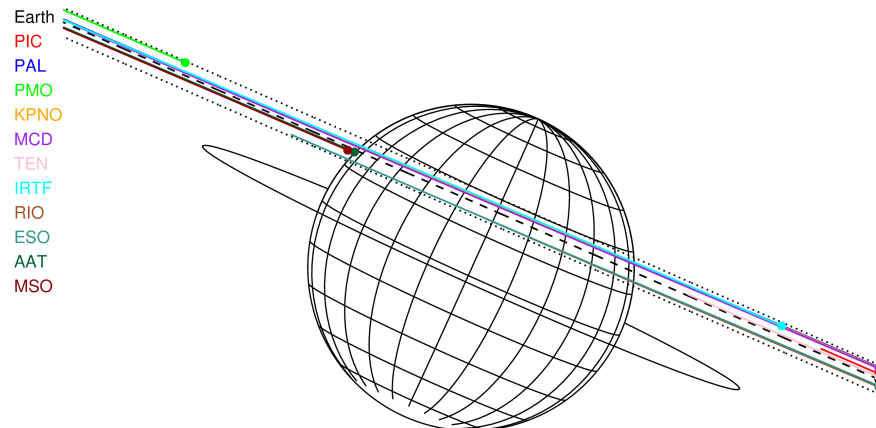
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2046-09-17T08:29:04.890
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 2552182305880877568
 2Mass ID (if available) : 01004856+0444388

Jupiter 2046-09-17T08:29:04 K9.08 G11.12 Pgt

ICRS Star Coord at Epoch: 01h 00m 48.53899s +04:44:38.33365s
 RUWE (>1.4 is poor) : 1.40
 K magnitude : 9.076
 G magnitude : 11.118
 RP magnitude : 10.466
 BP magnitude : 11.611
 DUPflag : 0
 Distance (au) : 4.007
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -13.99
 Sun-Target sep (deg) : 158.10
 Sun-Moon sep (deg) : 6.55
 B (ring opening deg) : 2.97
 PA of pole (deg) : -24.33
 Pole direction: RA (deg): 268.05713
 Dec (deg): 64.49722
 C/A sky separation (") : 9.212
 C/A sky separation (km) : 26772.4
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

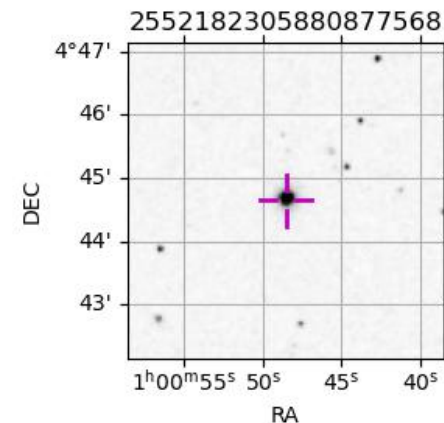


2046-09-17T08:29:04.8900 ex: 01 00 48.5390 s: +04 44 38.3334 C/A 9.221" PA 156.35 deg v_sky -13.99 km/s D 04.01 AU
 Credit: Styled after SORA/Lucky Star



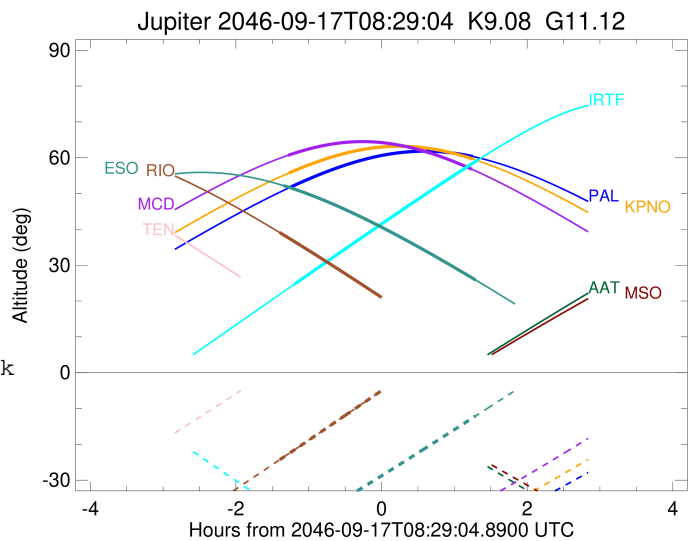
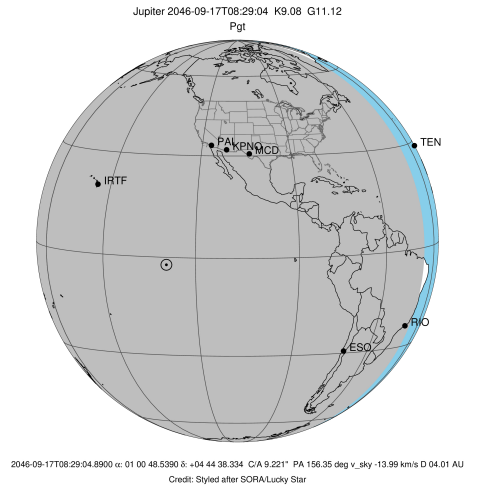
Observable events with sun below -5 deg and altitude above 5 deg

| 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 | + + | SEP 17 07:13 - SEP 17 09:44 | Pie |
| PMO | Purple Mtn Obs. Nanking | 32.1 | 118.8 | | | Pnn |
| KPNO | Kitt Peak Natl Obs | 32.0 | 248.4 | + + | SEP 17 07:12 - SEP 17 09:44 | Pie |
| MCD | McDonald Obs. 2.7m | 30.7 | 256.0 | + + | SEP 17 07:11 - SEP 17 09:43 | Pie |
| TEN | Teide Obs./Tenerife | 28.3 | 343.5 | | | Pnn |
| IRTF | Mauna Kea/IRTF | 19.8 | 204.5 | + + | SEP 17 07:17 - SEP 17 09:48 | Pie |
| KAV | Kavalur Observatory | 12.6 | 78.8 | | | Pnn |
| RIO | Rio de Janeiro | -22.9 | 316.8 | + | SEP 17 07:05 - SEP 17 07:05 | Pin |
| ESO | European Southern Obs. (3.6m) | -29.3 | 289.3 | + + | SEP 17 07:08 - SEP 17 09:46 | 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             : 2046-09-17T08:28:56.700
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       : 2552182305880877568
2Mass ID (if available) : 01004856+0444388
ICRS Star Coord at Epoch: 01h 00m 48.53899s +04:44:38.33365s
RUWE (>1.4 is poor) : 1.40
K magnitude          : 9.076
G magnitude          : 11.118
RP magnitude         : 10.466
BP magnitude         : 11.611
DUPflag             : 0
Distance (au)        : 4.007
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.99
Sun-Target sep (deg) : 158.10
Sun-Moon sep (deg)   : 6.20
B (ring opening deg) : 2.97
PA of pole (deg)     : -24.33
Pole direction: RA (deg): 268.05713
Dec (deg): 64.49722
C/A sky separation (") : 10.278
C/A sky separation (km) : 29870.5
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
    
```

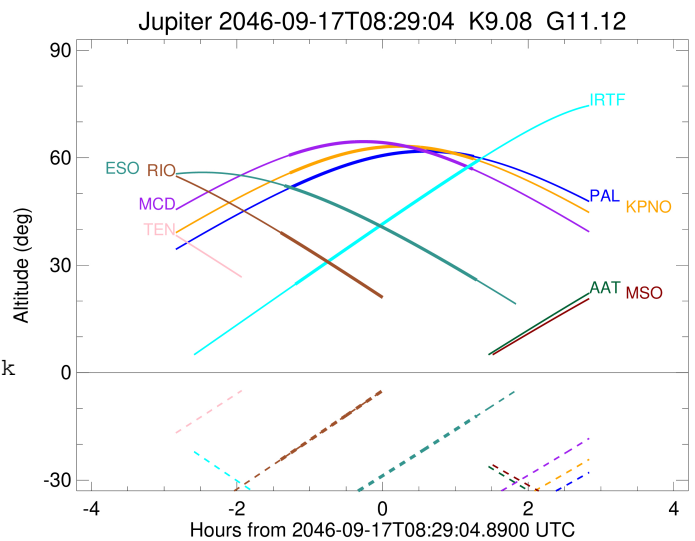
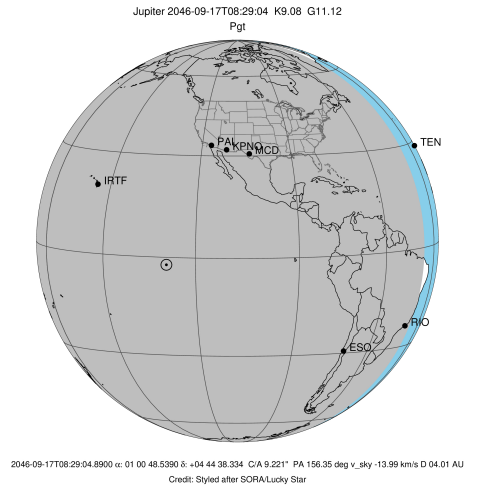


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2046-09-17T07:13:21.444 | 51.67 | -54.04 | 71489.7 | 25.97 | 29.07 |
| Jupiter | E | 2046-09-17T09:44:20.905 | 60.33 | -44.39 | 71490.1 | 23.36 | 26.25 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2046-09-17T08:28:29.810
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       : 2552182305880877568
2Mass ID (if available) : 01004856+0444388
ICRS Star Coord at Epoch: 01h 00m 48.53899s +04:44:38.33365s
RUWE (>1.4 is poor) : 1.40
K magnitude           : 9.076
G magnitude           : 11.118
RP magnitude         : 10.466
BP magnitude         : 11.611
DUPflag              : 0
Distance (au)        : 4.007
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -13.99
Sun-Target sep (deg) : 158.10
Sun-Moon sep (deg)   : 6.24
B (ring opening deg) : 2.97
PA of pole (deg)     : -24.33
Pole direction: RA (deg): 268.05713
Dec (deg): 64.49722
C/A sky separation (") : 10.169
C/A sky separation (km) : 29552.7
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
    
```

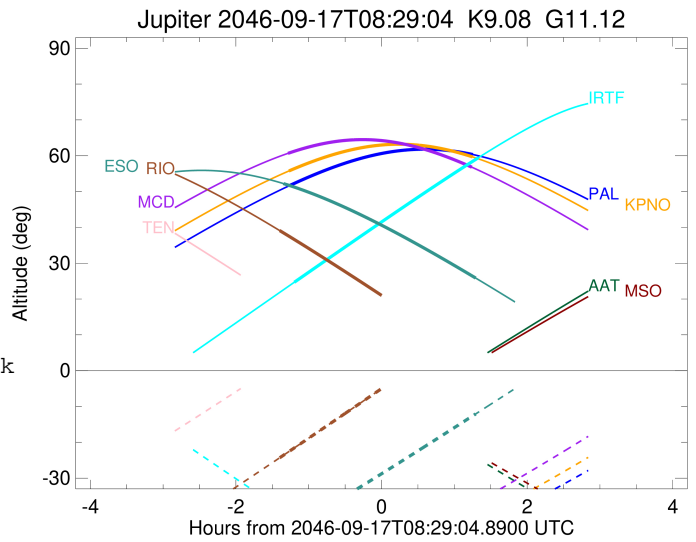
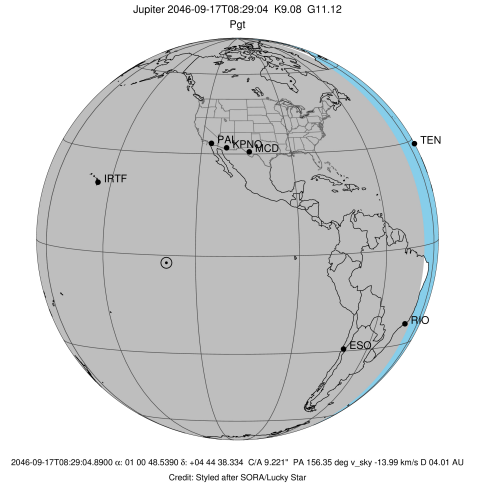


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2046-09-17T07:12:49.567 | 55.75 | -56.01 | 71489.7 | 25.70 | 28.78 |
| Jupiter | E | 2046-09-17T09:44:02.228 | 59.68 | -42.02 | 71490.1 | 23.09 | 25.95 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2046-09-17T08:27:46.780
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       : 2552182305880877568
2Mass ID (if available) : 01004856+0444388
ICRS Star Coord at Epoch: 01h 00m 48.53899s +04:44:38.33365s
RUWE (>1.4 is poor) : 1.40
K magnitude           : 9.076
G magnitude           : 11.118
RP magnitude         : 10.466
BP magnitude         : 11.611
DUPflag              : 0
Distance (au)        : 4.007
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.99
Sun-Target sep (deg) : 158.10
Sun-Moon sep (deg)   : 6.28
B (ring opening deg) : 2.97
PA of pole (deg)     : -24.33
Pole direction: RA (deg): 268.05713
Dec (deg): 64.49722
C/A sky separation (") : 10.031
C/A sky separation (km) : 29153.3
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
    
```

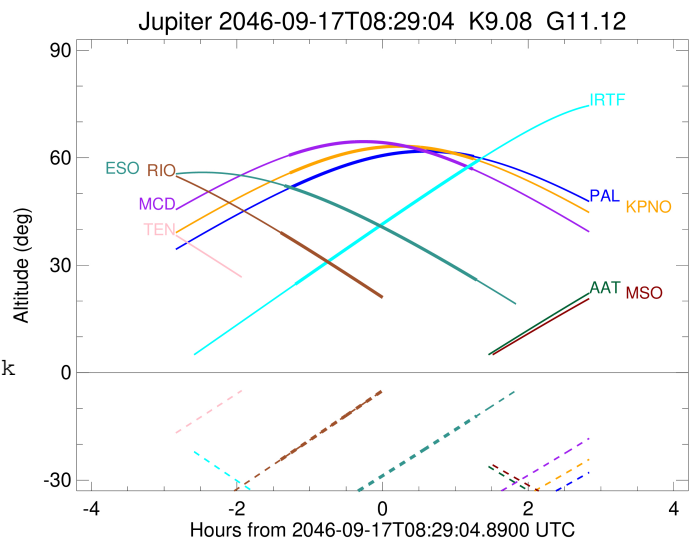
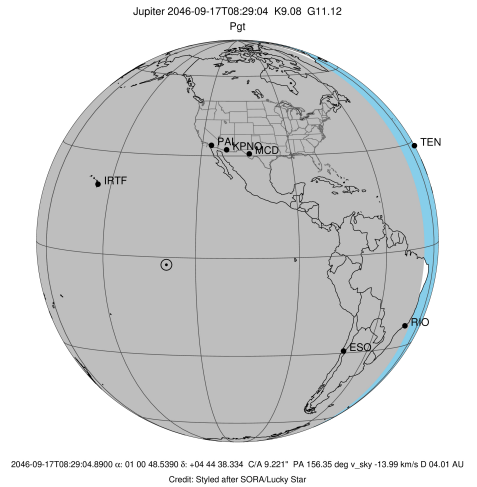


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2046-09-17T07:11:59.008 | 60.65 | -56.95 | 71489.8 | 25.36 | 28.41 |
| Jupiter | E | 2046-09-17T09:43:31.627 | 56.79 | -37.47 | 71490.2 | 22.76 | 25.60 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2046-09-17T08:33:21.180
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      : 2552182305880877568
2Mass ID (if available) : 01004856+0444388
ICRS Star Coord at Epoch: 01h 00m 48.53899s +04:44:38.33365s
RUWE (>1.4 is poor) : 1.40
K magnitude         : 9.076
G magnitude         : 11.118
RP magnitude        : 10.466
BP magnitude        : 11.611
DUPflag            : 0
Distance (au)       : 4.007
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -13.99
Sun-Target sep (deg) : 158.10
Sun-Moon sep (deg)  : 6.22
B (ring opening deg) : 2.97
PA of pole (deg)    : -24.33
Pole direction: RA (deg): 268.05713
Dec (deg): 64.49722
C/A sky separation (" ) : 10.374
C/A sky separation (km) : 30149.3
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
    
```

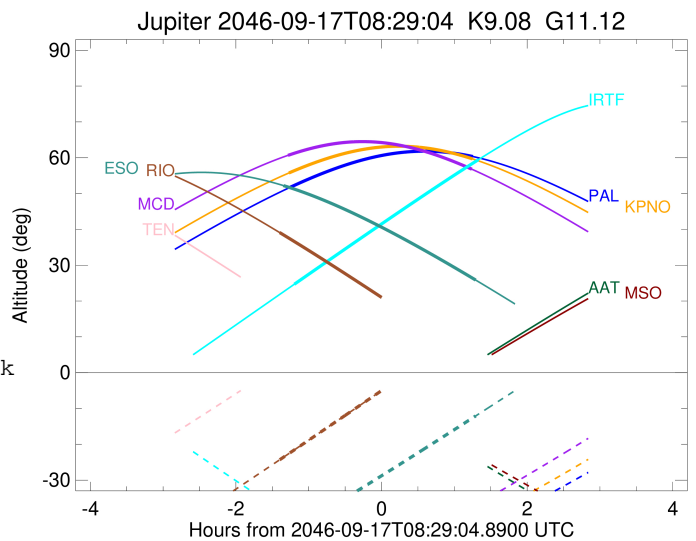
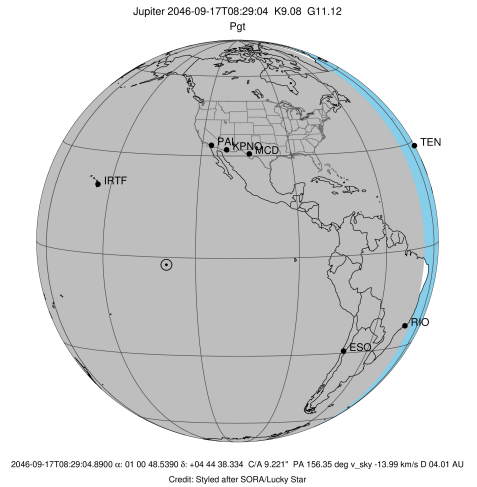


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2046-09-17T07:17:13.632 | 24.68 | -40.94 | 71489.7 | 26.10 | 29.21 |
| Jupiter | E | 2046-09-17T09:48:52.999 | 59.44 | -67.18 | 71490.1 | 23.58 | 26.49 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2046-09-17T08:24:41.790
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      : 2552182305880877568
2Mass ID (if available) : 01004856+0444388
ICRS Star Coord at Epoch: 01h 00m 48.53899s +04:44:38.33365s
RUWE (>1.4 is poor) : 1.40
K magnitude          : 9.076
G magnitude          : 11.118
RP magnitude         : 10.466
BP magnitude         : 11.611
DUPflag             : 0
Distance (au)       : 4.007
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.99
Sun-Target sep (deg) : 158.10
Sun-Moon sep (deg)  : 7.18
B (ring opening deg) : 2.97
PA of pole (deg)    : -24.33
Pole direction: RA (deg): 268.05713
Dec (deg): 64.49722
C/A sky separation (") : 7.641
C/A sky separation (km) : 22205.8
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
    
```

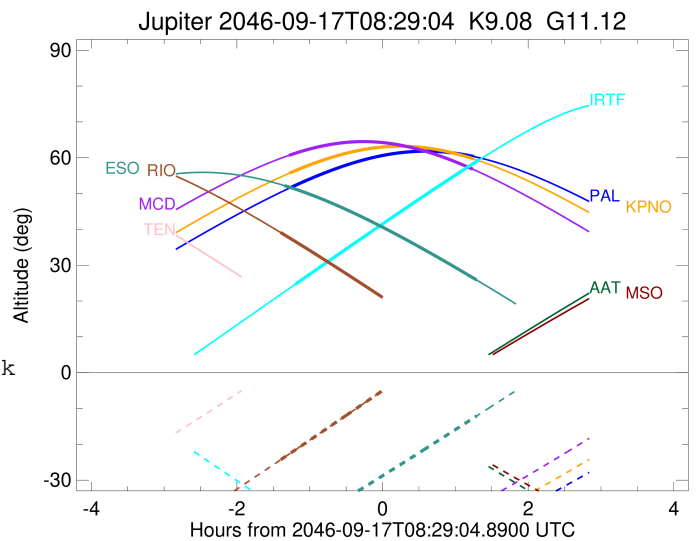
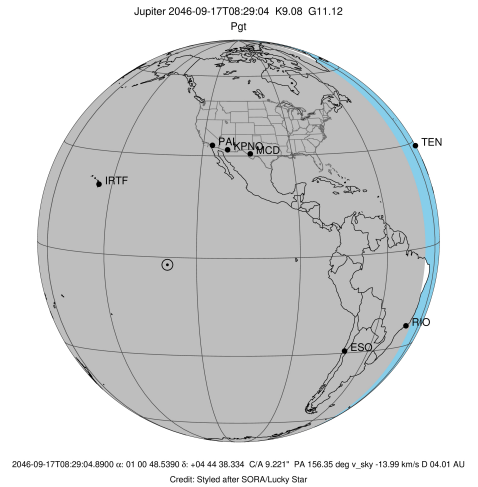


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2046-09-17T07:05:10.000 | 39.11 | -24.32 | 71490.7 | 19.05 | 21.52 |
| Jupiter | E | 2046-09-17T09:44:50.218 | 3.84x | 12.40x | 71490.9 | 17.33 | 19.62 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2046-09-17T08:27:18.240
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      : 2552182305880877568
2Mass ID (if available) : 01004856+0444388
ICRS Star Coord at Epoch: 01h 00m 48.53899s +04:44:38.33365s
RUWE (>1.4 is poor) : 1.40
K magnitude          : 9.076
G magnitude          : 11.118
RP magnitude         : 10.466
BP magnitude         : 11.611
DUPflag             : 0
Distance (au)       : 4.007
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.99
Sun-Target sep (deg) : 158.10
Sun-Moon sep (deg)  : 7.23
B (ring opening deg) : 2.97
PA of pole (deg)    : -24.33
Pole direction: RA (deg): 268.05713
Dec (deg): 64.49722
C/A sky separation ("): 7.657
C/A sky separation (km): 22252.4
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 | 2046-09-17T07:08:17.797 | 52.21 | -45.14 | 71490.7 | 19.31 | 21.81 |
| Jupiter | E | 2046-09-17T09:46:38.989 | 25.86 | -12.09 | 71491.0 | 17.08 | 19.34 |