

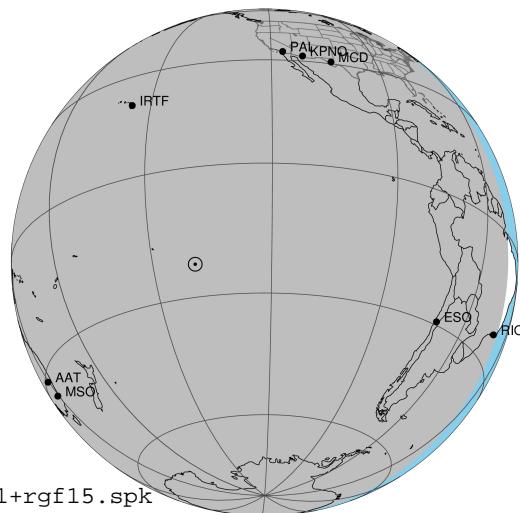
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-06-05T09:14:27.430
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4069432554644439936
 2Mass ID (if available) : 17594264-2304012

Jupiter 2043-06-05T09:14:27 K8.29 G11.27 Pgt

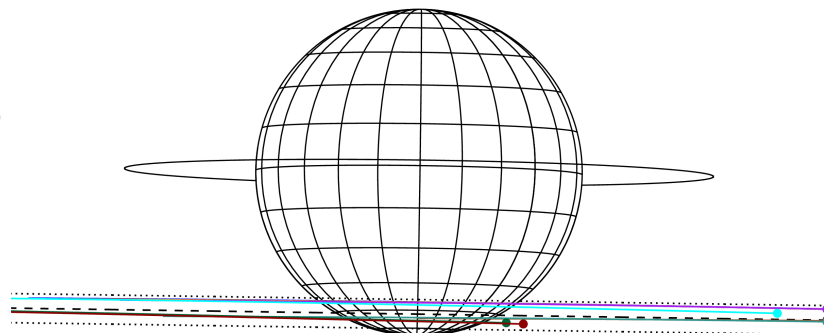
ICRS Star Coord at Epoch: 17h 59m 42.62856s -23:04:01.84103s

RUWE (>1.4 is poor) : 0.76
 K magnitude : 8.290
 G magnitude : 11.274
 RP magnitude : 10.419
 BP magnitude : 12.045
 DUPflag : 0
 Distance (au) : 4.289
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -15.29
 Sun-Target sep (deg) : 164.10
 Sun-Moon sep (deg) : 134.84
 B (ring opening deg) : -2.42
 PA of pole (deg) : -0.81
 Pole direction: RA (deg): 268.05668
 Dec (deg): 64.49732
 C/A sky separation (") : 19.946
 C/A sky separation (km) : 62039.4
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-06-05T09:14:27 K8.29 G11.27
 Pgt



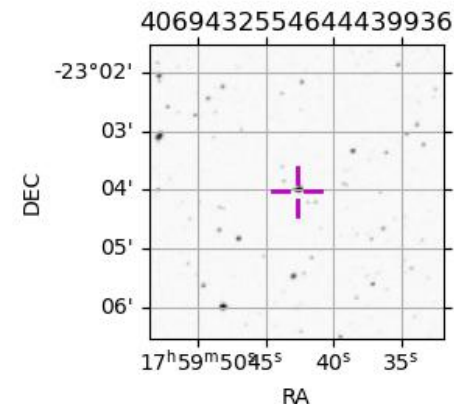
Earth
 PAL
 KPNO
 MCD
 IRTF
 RIO
 ESO
 AAT
 MSO



2043-06-05T09:14:27.4300 a: 17 59 42.62856 s: -23 04 01.84103 C/A ***** PA 359.15 deg v_sky -15.29 km/s D 04.29 AU
 Credit: Styled after SORA/Lucky Star

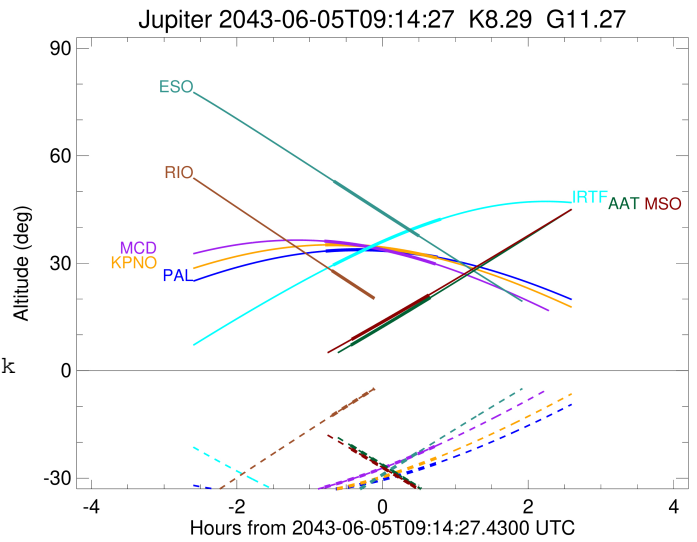
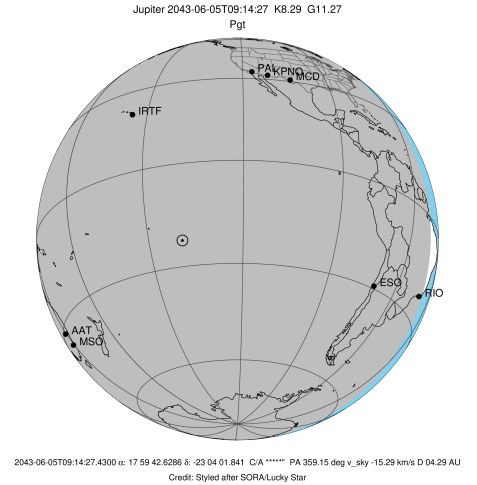
Observable events with sun below -5 deg and altitude above 5 deg

| 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 | + + | JUN 05 08:27 - JUN 05 09:59 | Pie |
| PMO | Purple Mtn Obs. Nanking | 32.1 | 118.8 | | | Pnn |
| KPNO | Kitt Peak Natl Obs | 32.0 | 248.4 | + + | JUN 05 08:27 - JUN 05 09:59 | Pie |
| MCD | McDonald Obs. 2.7m | 30.7 | 256.0 | + + | JUN 05 08:26 - JUN 05 09:58 | Pie |
| TEN | Teide Obs./Tenerife | 28.3 | 343.5 | | | Pnn |
| IRTF | Mauna Kea/IRTF | 19.8 | 204.5 | + + | JUN 05 08:33 - JUN 05 10:02 | Pie |
| KAV | Kavalur Observatory | 12.6 | 78.8 | | | Pnn |
| RIO | Rio de Janeiro | -22.9 | 316.8 | + | JUN 05 08:32 - JUN 05 08:32 | Pin |
| ESO | European Southern Obs. (3.6m) | -29.3 | 289.3 | + + | JUN 05 08:34 - JUN 05 09:44 | Pie |
| AAT | Siding Spring (AAT) | -31.3 | 149.1 | + + | JUN 05 08:48 - JUN 05 09:53 | Pie |
| SAAO | So. Afr. Astro. Obs. (Sutherland) | -32.4 | 20.8 | | | Pnn |
| MSO | Mt. Stromlo Observatory | -35.3 | 149.0 | + + | JUN 05 08:49 - JUN 05 09:52 | Pie |



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-05T09:13:47.270
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        : 4069432554644439936
2Mass ID (if available) : 17594264-2304012
ICRS Star Coord at Epoch: 17h 59m 42.62856s -23:04:01.84103s
RUWE (>1.4 is poor) : 0.76
K magnitude           : 8.290
G magnitude           : 11.274
RP magnitude          : 10.419
BP magnitude          : 12.045
DUPflag              : 0
Distance (au)         : 4.289
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.29
Sun-Target sep (deg)  : 164.10
Sun-Moon sep (deg)   : 135.33
B (ring opening deg) : -2.42
PA of pole (deg)     : -0.81
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation ("): 18.248
C/A sky separation (km): 56756.9
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
    
```

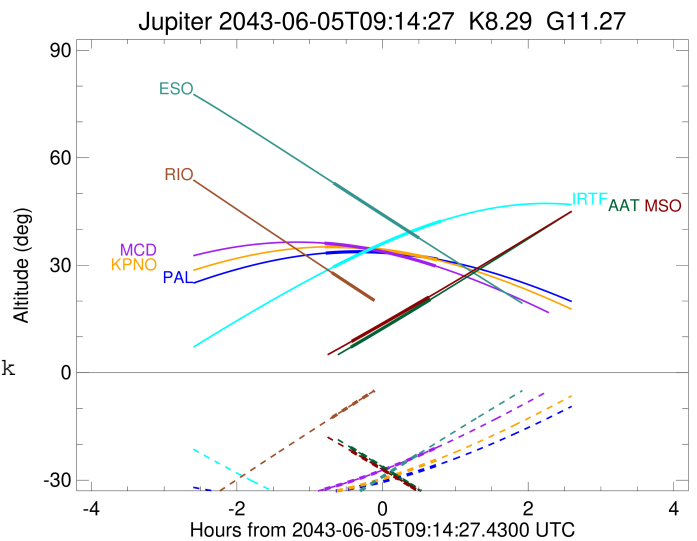
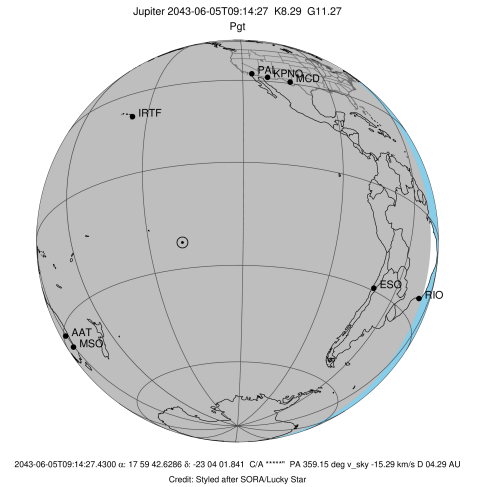


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2043-06-05T08:27:37.690 | 33.38 | -33.39 | 71486.9 | -52.52 | -56.01 |
| Jupiter | E | 2043-06-05T09:59:57.347 | 31.65 | -25.76 | 71486.9 | -52.57 | -56.06 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-05T09:13:12.250
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        : 4069432554644439936
2Mass ID (if available) : 17594264-2304012
ICRS Star Coord at Epoch: 17h 59m 42.62856s -23:04:01.84103s
RUWE (>1.4 is poor) : 0.76
K magnitude           : 8.290
G magnitude           : 11.274
RP magnitude          : 10.419
BP magnitude          : 12.045
DUPflag              : 0
Distance (au)         : 4.289
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.29
Sun-Target sep (deg)  : 164.10
Sun-Moon sep (deg)    : 135.40
B (ring opening deg) : -2.42
PA of pole (deg)      : -0.81
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 18.286
C/A sky separation (km) : 56877.2
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
    
```

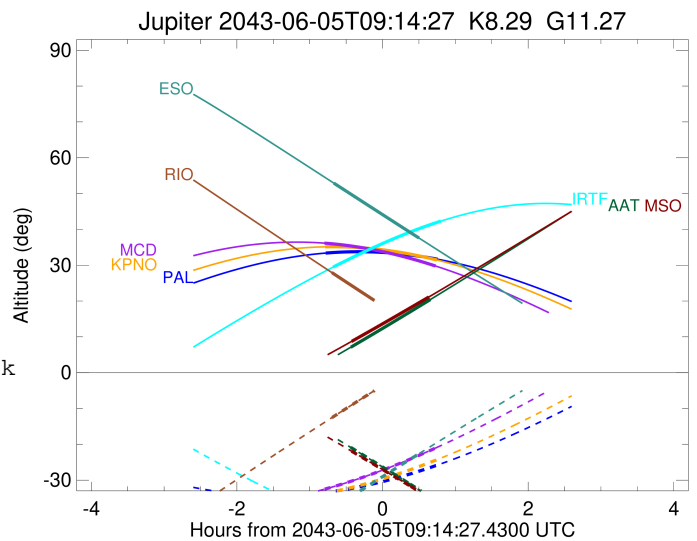
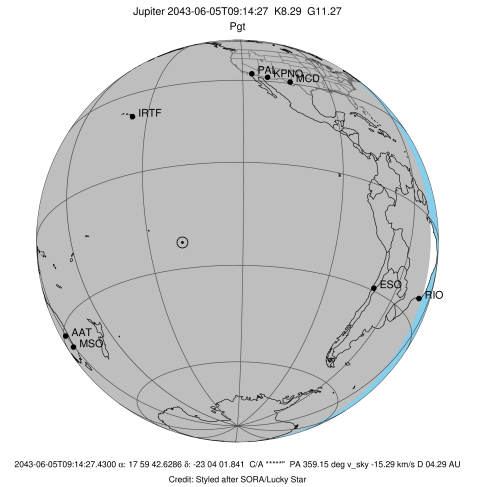


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2043-06-05T08:27:13.601 | 35.12 | -33.65 | 71486.9 | -52.62 | -56.11 |
| Jupiter | E | 2043-06-05T09:59:12.691 | 31.46 | -24.30 | 71486.9 | -52.78 | -56.26 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-05T09:12:21.970
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       : 4069432554644439936
2Mass ID (if available) : 17594264-2304012
ICRS Star Coord at Epoch: 17h 59m 42.62856s -23:04:01.84103s
RUWE (>1.4 is poor) : 0.76
K magnitude          : 8.290
G magnitude          : 11.274
RP magnitude         : 10.419
BP magnitude         : 12.045
DUPflag             : 0
Distance (au)        : 4.289
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.29
Sun-Target sep (deg) : 164.10
Sun-Moon sep (deg)   : 135.47
B (ring opening deg) : -2.42
PA of pole (deg)     : -0.81
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation ("): 18.339
C/A sky separation (km): 57039.5
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
    
```

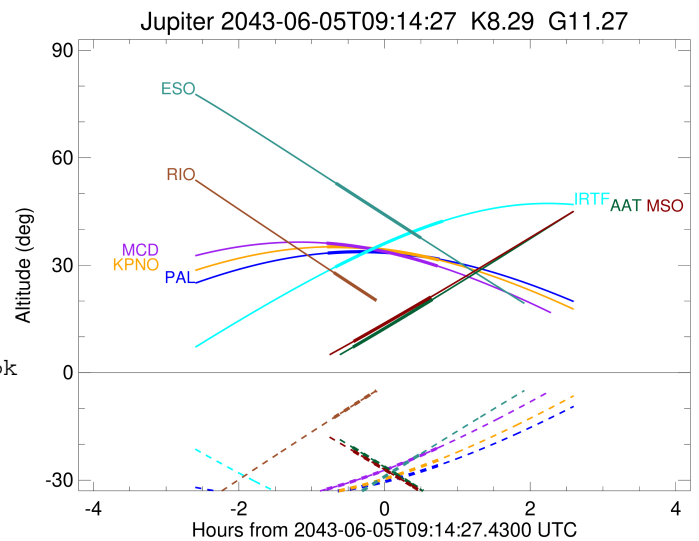
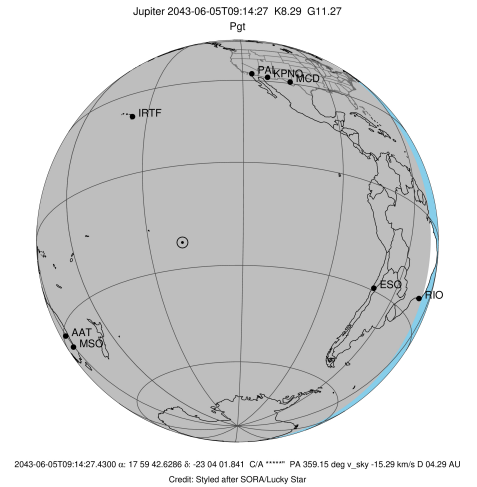


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2043-06-05T08:26:36.569 | 36.15 | -32.53 | 71486.9 | -52.76 | -56.24 |
| Jupiter | E | 2043-06-05T09:58:10.977 | 29.77 | -21.04 | 71486.8 | -53.07 | -56.53 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-05T09:18:15.810
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      : 4069432554644439936
2Mass ID (if available) : 17594264-2304012
ICRS Star Coord at Epoch: 17h 59m 42.62856s -23:04:01.84103s
RUWE (>1.4 is poor) : 0.76
K magnitude          : 8.290
G magnitude          : 11.274
RP magnitude         : 10.419
BP magnitude         : 12.045
DUPflag             : 0
Distance (au)       : 4.289
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.29
Sun-Target sep (deg) : 164.10
Sun-Moon sep (deg)  : 134.92
B (ring opening deg) : -2.42
PA of pole (deg)    : -0.81
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation ("): 18.654
C/A sky separation (km): 58020.0
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
    
```

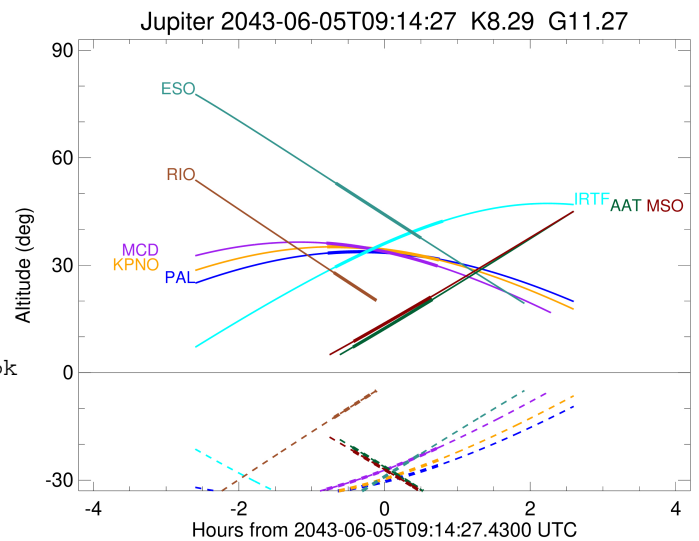
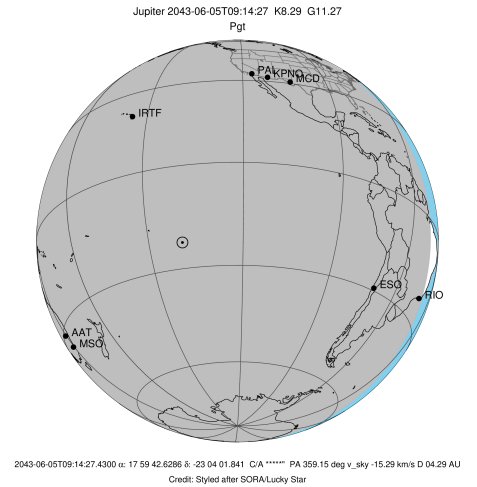


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2043-06-05T08:33:47.348 | 29.46 | -40.39 | 71486.6 | -54.59 | -57.98 |
| Jupiter | E | 2043-06-05T10:02:35.614 | 42.30 | -47.52 | 71486.7 | -53.88 | -57.31 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-05T09:07:30.390
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      : 4069432554644439936
2Mass ID (if available) : 17594264-2304012
ICRS Star Coord at Epoch: 17h 59m 42.62856s -23:04:01.84103s
RUWE (>1.4 is poor) : 0.76
K magnitude          : 8.290
G magnitude          : 11.274
RP magnitude         : 10.419
BP magnitude         : 12.045
DUPflag             : 0
Distance (au)       : 4.289
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.29
Sun-Target sep (deg) : 164.10
Sun-Moon sep (deg)  : 135.70
B (ring opening deg) : -2.42
PA of pole (deg)    : -0.81
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 20.543
C/A sky separation (km) : 63896.1
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
    
```

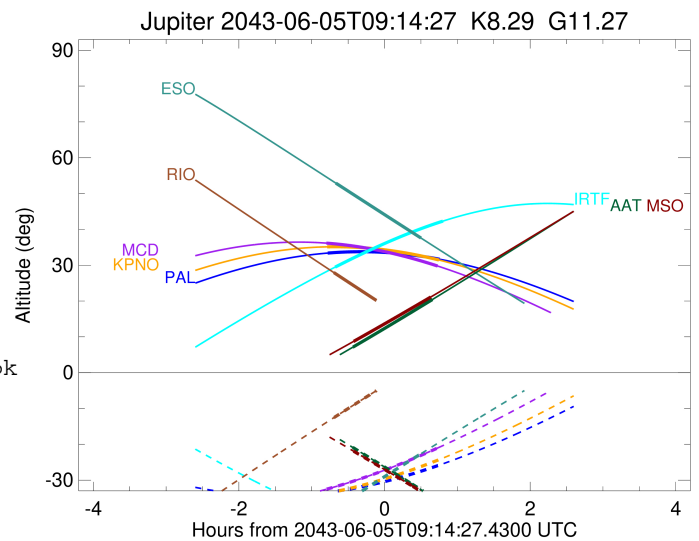
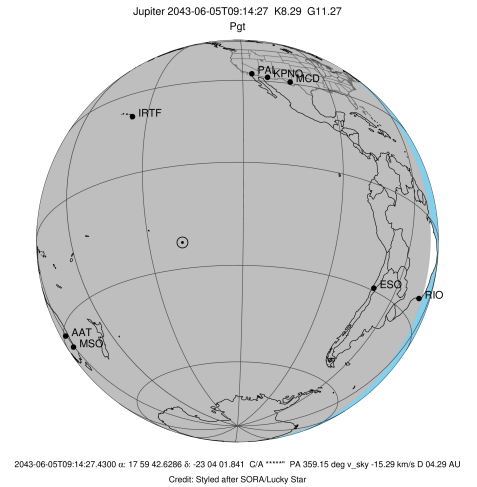


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2043-06-05T08:32:51.384 | 27.91 | -12.53 | 71485.6 | -62.70 | -65.56 |
| Jupiter | E | 2043-06-05T09:42:17.829 | 12.59 | 2.25x | 71485.5 | -63.83 | -66.61 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-05T09:09:17.450
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        : 4069432554644439936
2Mass ID (if available) : 17594264-2304012
ICRS Star Coord at Epoch: 17h 59m 42.62856s -23:04:01.84103s
RUWE (>1.4 is poor) : 0.76
K magnitude           : 8.290
G magnitude           : 11.274
RP magnitude          : 10.419
BP magnitude          : 12.045
DUPflag              : 0
Distance (au)         : 4.289
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.29
Sun-Target sep (deg)  : 164.10
Sun-Moon sep (deg)    : 135.81
B (ring opening deg) : -2.42
PA of pole (deg)      : -0.81
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 20.437
C/A sky separation (km) : 63565.0
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
    
```

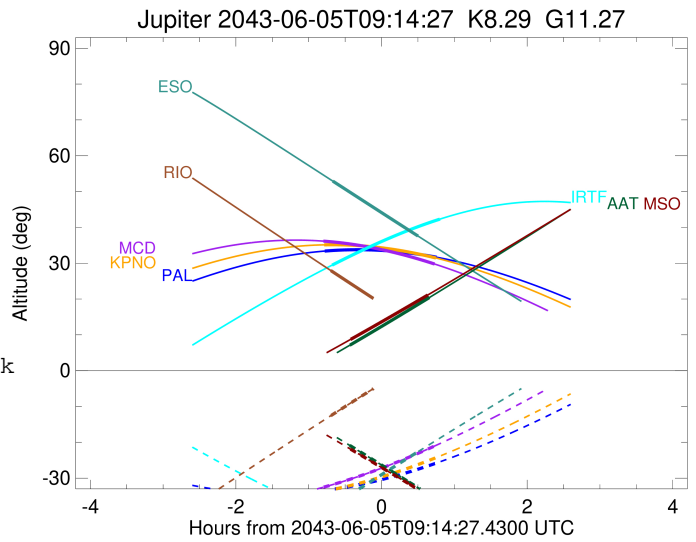
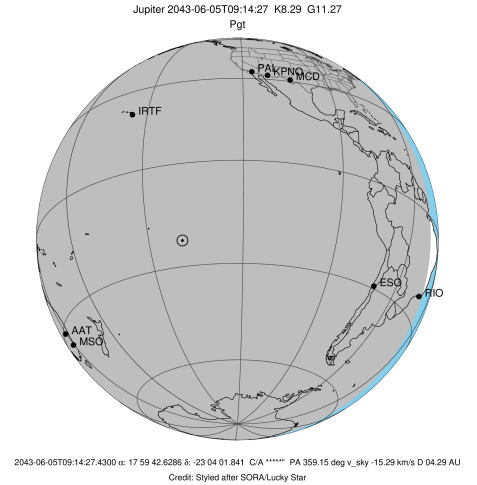


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2043-06-05T08:34:18.753 | 52.91 | -37.69 | 71485.7 | -62.28 | -65.18 |
| Jupiter | E | 2043-06-05T09:44:22.347 | 37.61 | -22.66 | 71485.6 | -63.12 | -65.95 |


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-05T09:21:10.810
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      : 4069432554644439936
2Mass ID (if available) : 17594264-2304012
ICRS Star Coord at Epoch: 17h 59m 42.62856s -23:04:01.84103s
RUWE (>1.4 is poor) : 0.76
K magnitude          : 8.290
G magnitude          : 11.274
RP magnitude        : 10.419
BP magnitude        : 12.045
DUPflag             : 0
Distance (au)       : 4.289
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -15.29
Sun-Target sep (deg) : 164.10
Sun-Moon sep (deg)  : 134.36
B (ring opening deg) : -2.42
PA of pole (deg)    : -0.81
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (" ) : 20.857
C/A sky separation (km) : 64872.6
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
    
```

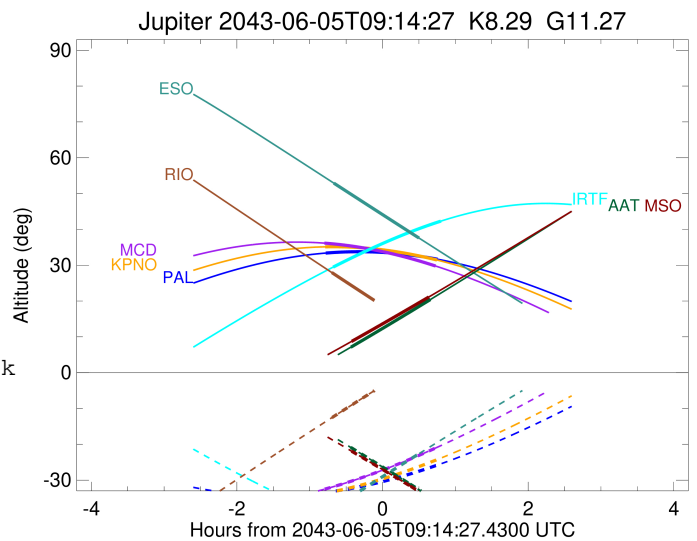
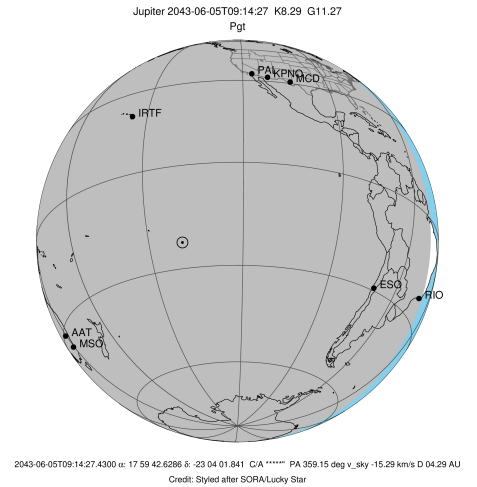


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2043-06-05T08:48:25.678 | 7.12 | -20.89 | 71485.3 | -65.68 | -68.29 |
| Jupiter | E | 2043-06-05T09:53:47.999 | 20.39 | -34.63 | 71485.4 | -64.44 | -67.16 |


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-05T09:20:53.480
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       : 4069432554644439936
2Mass ID (if available) : 17594264-2304012
ICRS Star Coord at Epoch: 17h 59m 42.62856s -23:04:01.84103s
RUWE (>1.4 is poor) : 0.76
K magnitude          : 8.290
G magnitude          : 11.274
RP magnitude         : 10.419
BP magnitude         : 12.045
DUPflag             : 0
Distance (au)        : 4.289
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.29
Sun-Target sep (deg) : 164.10
Sun-Moon sep (deg)   : 134.40
B (ring opening deg) : -2.42
PA of pole (deg)     : -0.81
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation ("): 20.972
C/A sky separation (km): 65230.4
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 | 2043-06-05T08:48:59.774 | 8.73 | -21.91 | 71485.2 | -66.34 | -68.90 |
| Jupiter | E | 2043-06-05T09:52:39.973 | 21.13 | -34.77 | 71485.4 | -65.15 | -67.81 |