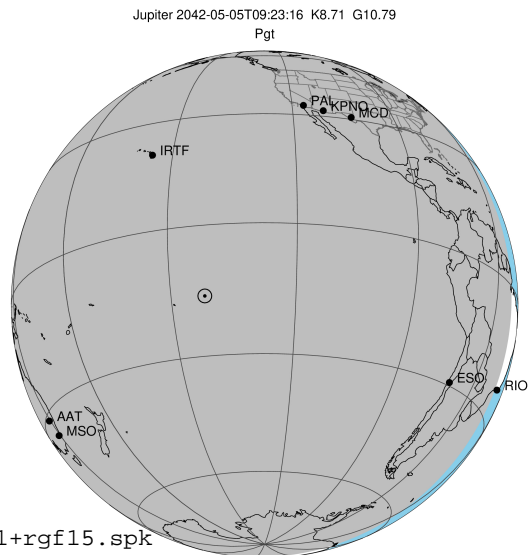


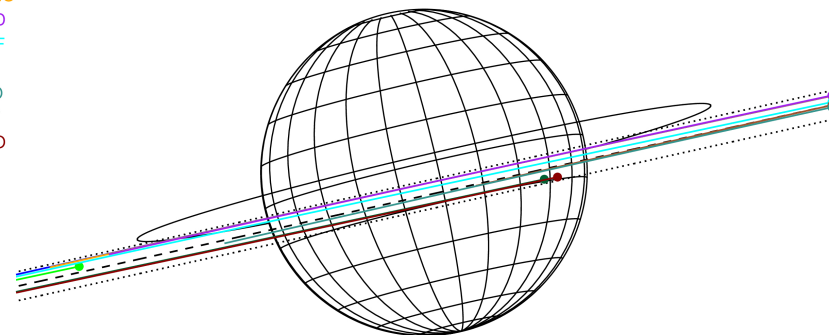
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2042-05-05T09:23:16.920
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 6260114468300854912
 2Mass ID (if available) : 15444770-1839304

Jupiter 2042-05-05T09:23:16 K8.71 G10.79 Pgt

ICRS Star Coord at Epoch: 15h 44m 47.61036s -18:39:31.50940s
 RUWE (>1.4 is poor) : 20.66
 K magnitude : 8.712
 G magnitude : 10.788
 RP magnitude : 10.122
 BP magnitude : 11.294
 DUPflag : 0
 Distance (au) : 4.404
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -15.97
 Sun-Target sep (deg) : 166.21
 Sun-Moon sep (deg) : 12.87
 B (ring opening deg) : -3.31
 PA of pole (deg) : 13.16
 Pole direction: RA (deg): 268.05645
 Dec (deg): 64.49730
 C/A sky separation (") : 3.117
 C/A sky separation (km) : 9956.2
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk



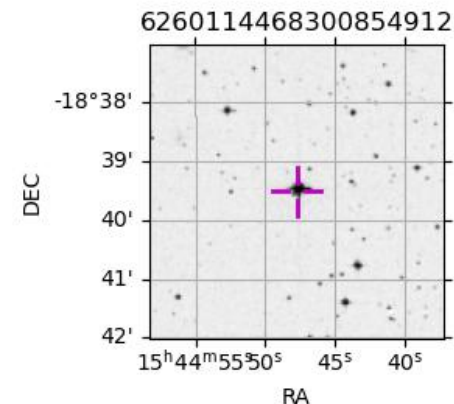
Earth
 PAL
 PMO
 KPNO
 MCD
 IRTF
 RIO
 ESO
 AAT
 MSO



2042-05-05T09:23:16.9200 at: 15 44 47.6104 s -18 39 31.509 C/A 3.130" PA 12.54 deg v_sky -15.97 km/s D 04.40 AU
 Credit: Styled after SORA/Lucky Star

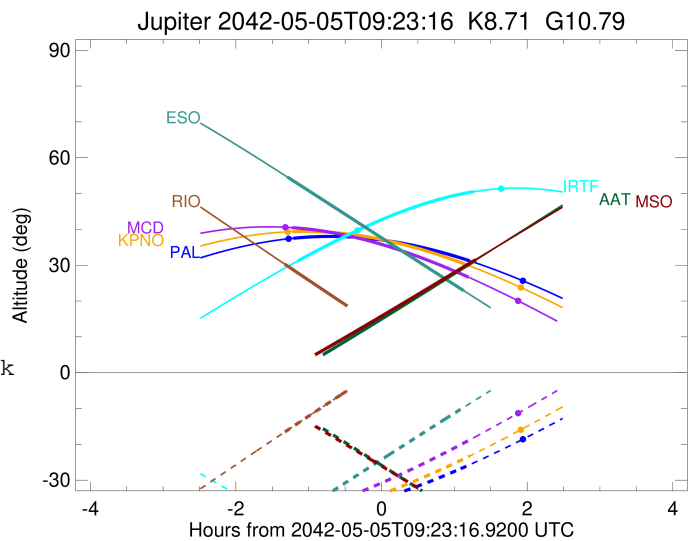
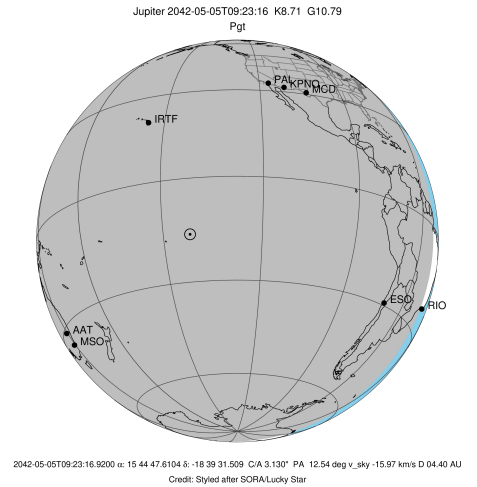
Observable events with sun below -5 deg and altitude above 5 deg

| 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 | + + | MAY 05 08:10 - MAY 05 10:36 | Pie |
| PMO | Purple Mtn Obs. Nanking | 32.1 | 118.8 | | | Pnn |
| KPNO | Kitt Peak Natl Obs | 32.0 | 248.4 | + + | MAY 05 08:10 - MAY 05 10:35 | Pie |
| MCD | McDonald Obs. 2.7m | 30.7 | 256.0 | + + | MAY 05 08:09 - MAY 05 10:35 | Pie |
| TEN | Teide Obs./Tenerife | 28.3 | 343.5 | | | Pnn |
| IRTF | Mauna Kea/IRTF | 19.8 | 204.5 | + + | MAY 05 08:14 - MAY 05 10:39 | Pie |
| KAV | Kavalur Observatory | 12.6 | 78.8 | | | Pnn |
| RIO | Rio de Janeiro | -22.9 | 316.8 | + | MAY 05 08:03 - MAY 05 08:03 | Pin |
| ESO | European Southern Obs. (3.6m) | -29.3 | 289.3 | + + | MAY 05 08:05 - MAY 05 10:30 | Pie |
| AAT | Siding Spring (AAT) | -31.3 | 149.1 | + | MAY 05 10:41 - MAY 05 10:41 | Pne |
| SAAO | So. Afr. Astro. Obs. (Sutherland) | -32.4 | 20.8 | | | Pnn |
| MSO | Mt. Stromlo Observatory | -35.3 | 149.0 | + | MAY 05 10:40 - MAY 05 10:40 | Pne |



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2042-05-05T09:23:24.790
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        : 6260114468300854912
2Mass ID (if available) : 15444770-1839304
ICRS Star Coord at Epoch: 15h 44m 47.61036s -18:39:31.50940s
RUWE (>1.4 is poor) : 20.66
K magnitude           : 8.712
G magnitude           : 10.788
RP magnitude          : 10.122
BP magnitude          : 11.294
DUPflag               : 0
Distance (au)         : 4.404
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.97
Sun-Target sep (deg) : 166.21
Sun-Moon sep (deg)   : 13.16
B (ring opening deg) : -3.31
PA of pole (deg)     : 13.16
Pole direction: RA (deg): 268.05645
Dec (deg): 64.49730
C/A sky separation ("): 1.525
C/A sky separation (km): 4870.9
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
    
```

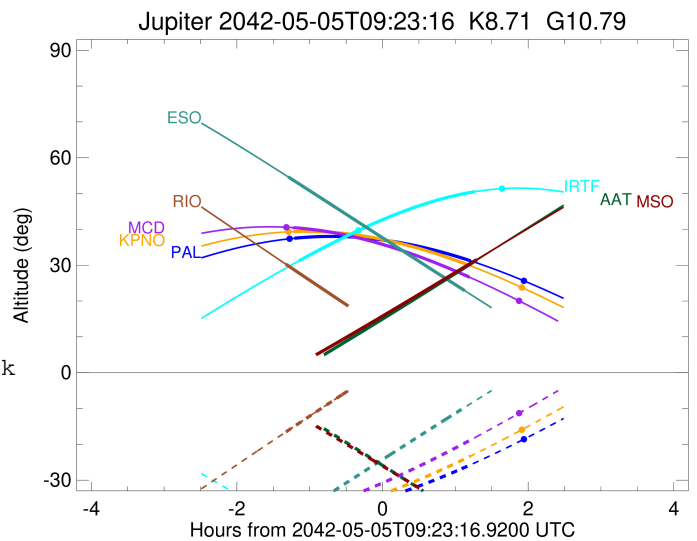
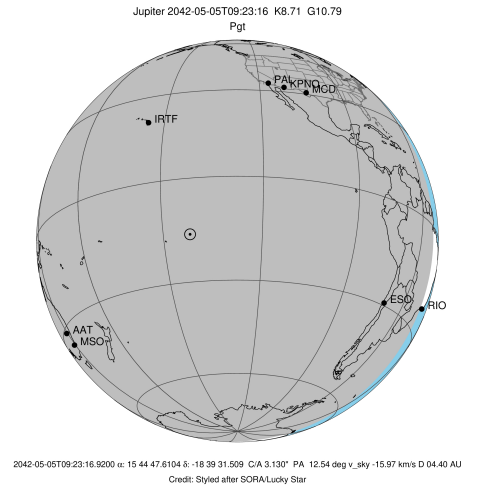


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2042-05-05T08:10:41.024 | 37.52 | -40.09 | 71491.9 | -4.80 | -5.48 |
| Jupiter | E | 2042-05-05T10:36:10.568 | 31.19 | -25.66 | 71492.0 | -3.15 | -3.60 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2042-05-05T09:22:52.970
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       : 6260114468300854912
2Mass ID (if available) : 15444770-1839304
ICRS Star Coord at Epoch: 15h 44m 47.61036s -18:39:31.50940s
RUWE (>1.4 is poor) : 20.66
K magnitude          : 8.712
G magnitude          : 10.788
RP magnitude         : 10.122
BP magnitude         : 11.294
DUPflag             : 0
Distance (au)        : 4.404
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.97
Sun-Target sep (deg) : 166.21
Sun-Moon sep (deg)   : 13.23
B (ring opening deg) : -3.31
PA of pole (deg)     : 13.16
Pole direction: RA (deg): 268.05645
Dec (deg): 64.49730
C/A sky separation (") : 1.533
C/A sky separation (km) : 4895.8
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
    
```

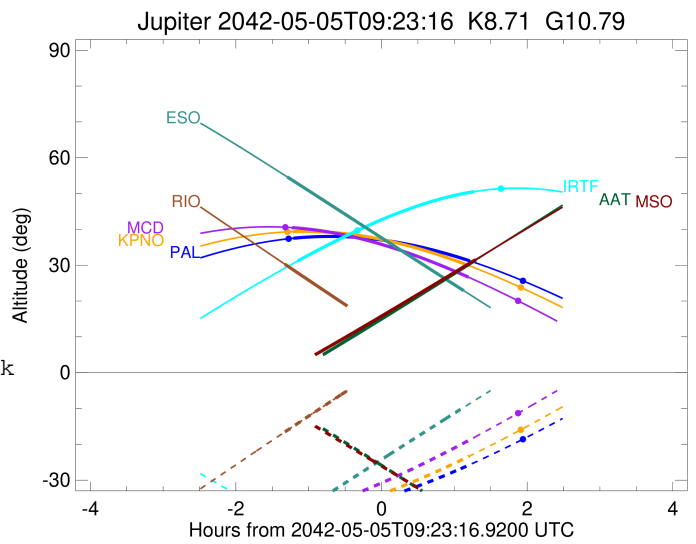
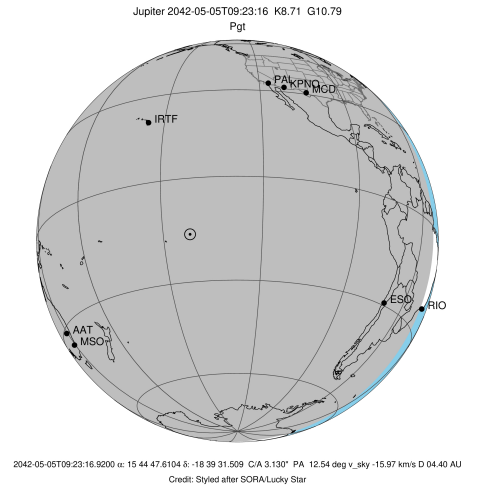


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2042-05-05T08:10:10.897 | 39.36 | -40.57 | 71491.9 | -4.78 | -5.46 |
| Jupiter | E | 2042-05-05T10:35:40.004 | 29.84 | -23.31 | 71491.9 | -3.22 | -3.68 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2042-05-05T09:22:08.280
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        : 6260114468300854912
2Mass ID (if available) : 15444770-1839304
ICRS Star Coord at Epoch: 15h 44m 47.61036s -18:39:31.50940s
RUWE (>1.4 is poor) : 20.66
K magnitude           : 8.712
G magnitude           : 10.788
RP magnitude          : 10.122
BP magnitude          : 11.294
DUPflag              : 0
Distance (au)         : 4.404
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.97
Sun-Target sep (deg)  : 166.21
Sun-Moon sep (deg)    : 13.32
B (ring opening deg)  : -3.31
PA of pole (deg)      : 13.16
Pole direction: RA (deg): 268.05645
Dec (deg): 64.49730
C/A sky separation (") : 1.538
C/A sky separation (km) : 4913.6
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
    
```

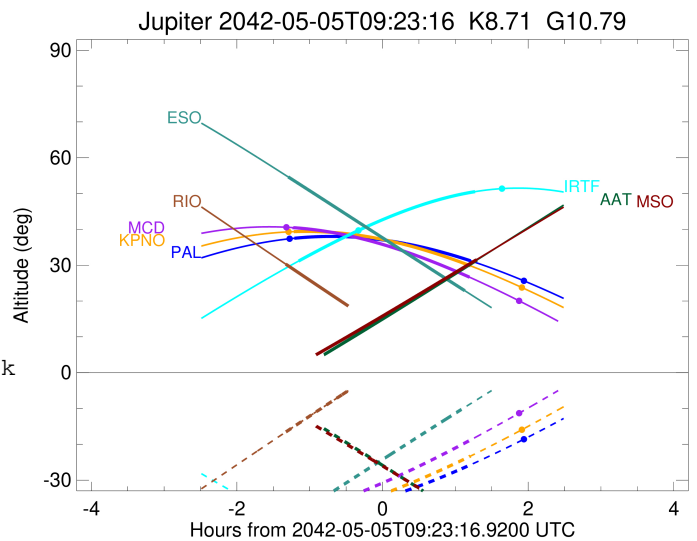
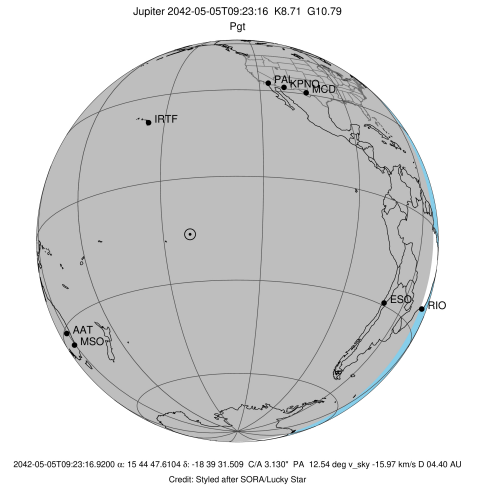


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2042-05-05T08:09:26.217 | 40.48 | -39.66 | 71491.9 | -4.74 | -5.41 |
| Jupiter | E | 2042-05-05T10:34:59.519 | 26.65 | -18.94 | 71492.0 | -3.30 | -3.77 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2042-05-05T09:26:58.570
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        : 6260114468300854912
2Mass ID (if available) : 15444770-1839304
ICRS Star Coord at Epoch: 15h 44m 47.61036s -18:39:31.50940s
RUWE (>1.4 is poor) : 20.66
K magnitude           : 8.712
G magnitude           : 10.788
RP magnitude          : 10.122
BP magnitude          : 11.294
DUPflag              : 0
Distance (au)         : 4.404
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.97
Sun-Target sep (deg)  : 166.21
Sun-Moon sep (deg)    : 12.63
B (ring opening deg)  : -3.31
PA of pole (deg)      : 13.16
Pole direction: RA (deg): 268.05645
Dec (deg): 64.49730
C/A sky separation (") : 2.151
C/A sky separation (km) : 6869.7
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
    
```

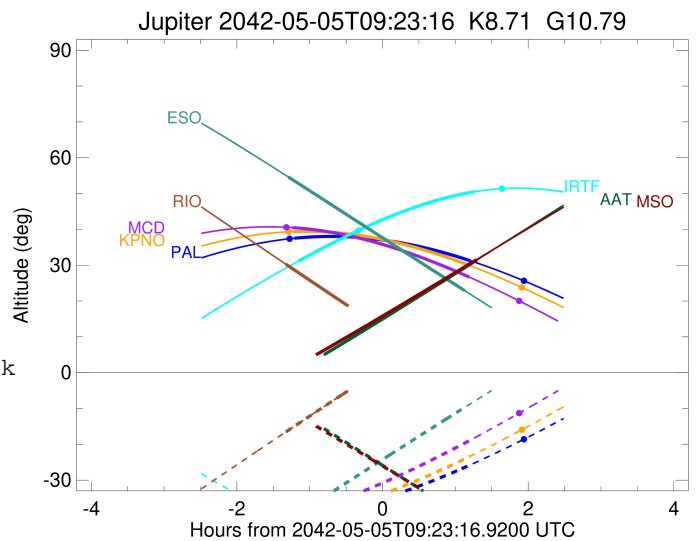
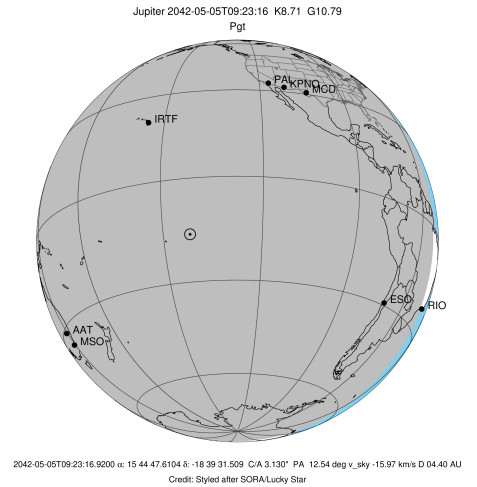


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2042-05-05T08:14:10.825 | 31.16 | -42.76 | 71491.8 | -6.67 | -7.62 |
| Jupiter | E | 2042-05-05T10:39:25.919 | 50.52 | -53.58 | 71491.9 | -4.43 | -5.06 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2042-05-05T09:16:47.190
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      : 6260114468300854912
2Mass ID (if available) : 15444770-1839304
ICRS Star Coord at Epoch: 15h 44m 47.61036s -18:39:31.50940s
RUWE (>1.4 is poor) : 20.66
K magnitude          : 8.712
G magnitude          : 10.788
RP magnitude         : 10.122
BP magnitude         : 11.294
DUPflag             : 0
Distance (au)       : 4.404
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.97
Sun-Target sep (deg) : 166.21
Sun-Moon sep (deg)  : 13.73
B (ring opening deg) : -3.31
PA of pole (deg)    : 13.16
Pole direction: RA (deg): 268.05645
Dec (deg): 64.49730
C/A sky separation ("): 3.367
C/A sky separation (km): 10753.1
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
    
```

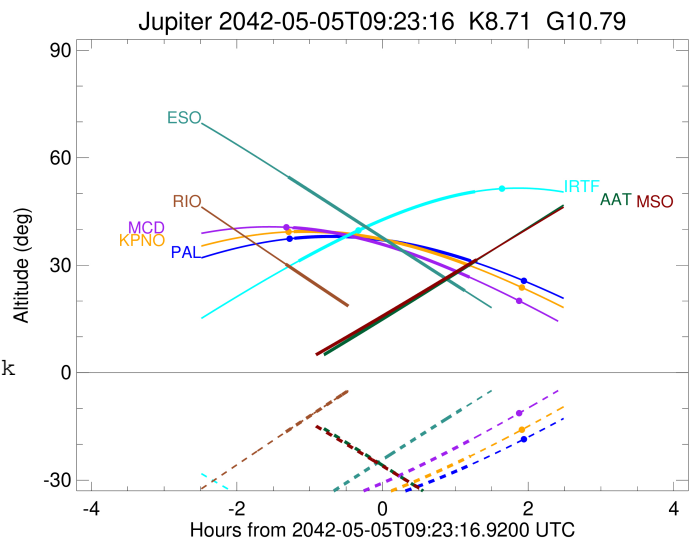
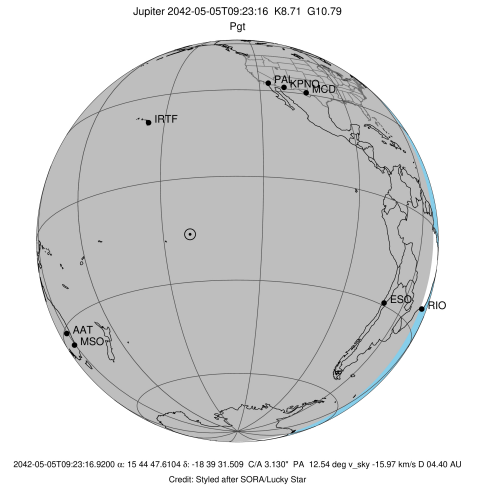


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|--------|---------|---------|---------|--------------|
| Jupiter | I | 2042-05-05T08:03:41.161 | 30.26 | -16.54 | 71491.6 | -8.89 | -10.14 |
| Jupiter | E | 2042-05-05T10:30:27.530 | -2.45x | 15.56x | 71491.7 | -8.51 | -9.71 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2042-05-05T09:18:08.380
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        : 6260114468300854912
2Mass ID (if available) : 15444770-1839304
ICRS Star Coord at Epoch: 15h 44m 47.61036s -18:39:31.50940s
RUWE (>1.4 is poor) : 20.66
K magnitude           : 8.712
G magnitude           : 10.788
RP magnitude          : 10.122
BP magnitude          : 11.294
DUPflag              : 0
Distance (au)         : 4.404
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.97
Sun-Target sep (deg)  : 166.21
Sun-Moon sep (deg)    : 13.65
B (ring opening deg) : -3.31
PA of pole (deg)      : 13.16
Pole direction: RA (deg): 268.05645
Dec (deg): 64.49730
C/A sky separation (") : 3.397
C/A sky separation (km) : 10848.9
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
    
```

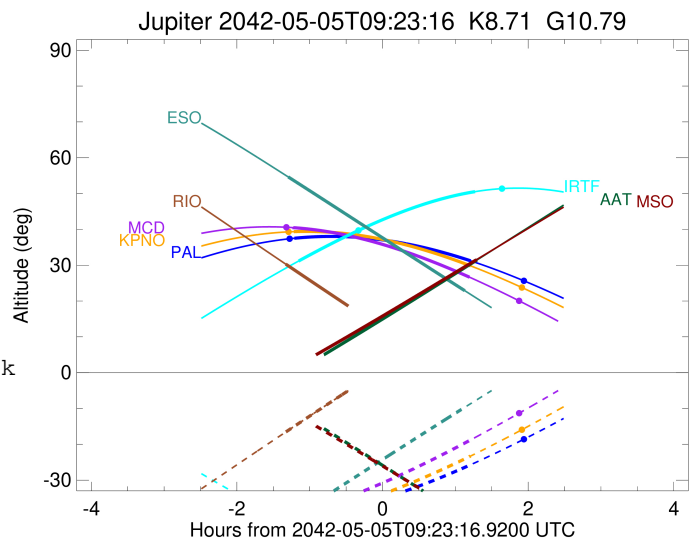
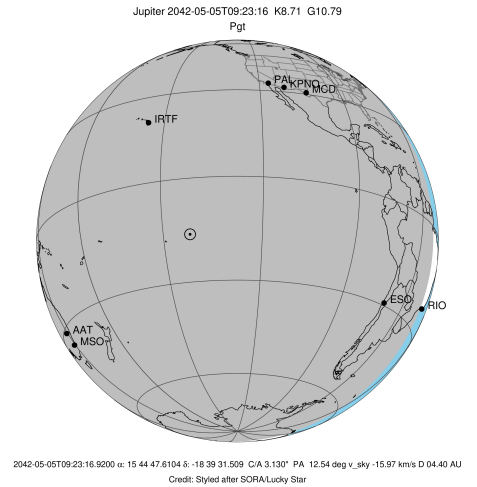


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2042-05-05T08:05:42.715 | 54.61 | -41.17 | 71491.6 | -9.22 | -10.51 |
| Jupiter | E | 2042-05-05T10:30:58.732 | 22.91 | -9.69 | 71491.7 | -8.37 | -9.55 |


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2042-05-05T09:28:16.610
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      : 6260114468300854912
2Mass ID (if available) : 15444770-1839304
ICRS Star Coord at Epoch: 15h 44m 47.61036s -18:39:31.50940s
RUWE (>1.4 is poor) : 20.66
K magnitude          : 8.712
G magnitude          : 10.788
RP magnitude         : 10.122
BP magnitude         : 11.294
DUPflag             : 0
Distance (au)       : 4.404
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.97
Sun-Target sep (deg) : 166.21
Sun-Moon sep (deg)  : 12.17
B (ring opening deg) : -3.31
PA of pole (deg)    : 13.16
Pole direction: RA (deg): 268.05645
Dec (deg): 64.49730
C/A sky separation (") : 4.360
C/A sky separation (km) : 13925.6
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
    
```

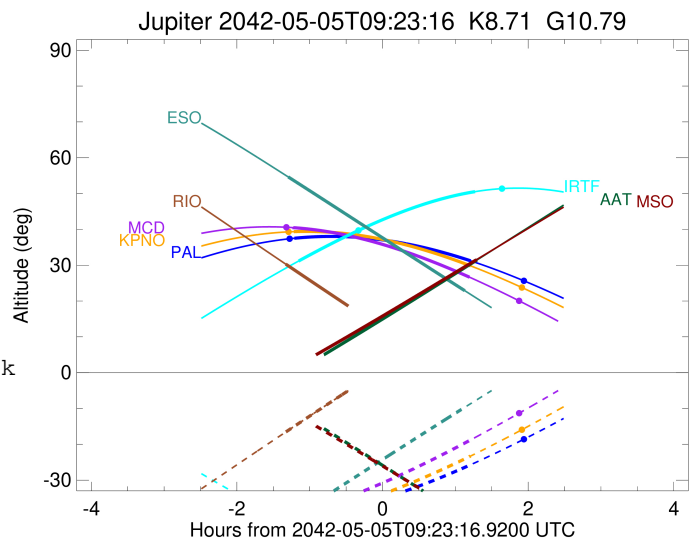
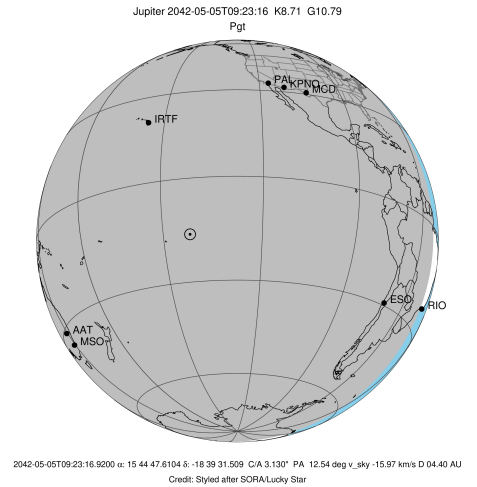


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2042-05-05T08:14:53.554 | 0.94x | -11.38 | 71491.3 | -12.27 | -13.96 |
| Jupiter | E | 2042-05-05T10:41:03.849 | 31.45 | -42.49 | 71491.5 | -10.08 | -11.49 |


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2042-05-05T09:27:56.650
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        : 6260114468300854912
2Mass ID (if available) : 15444770-1839304
ICRS Star Coord at Epoch: 15h 44m 47.61036s -18:39:31.50940s
RUWE (>1.4 is poor) : 20.66
K magnitude           : 8.712
G magnitude           : 10.788
RP magnitude          : 10.122
BP magnitude          : 11.294
DUPflag              : 0
Distance (au)         : 4.404
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.97
Sun-Target sep (deg) : 166.21
Sun-Moon sep (deg)   : 12.21
B (ring opening deg) : -3.31
PA of pole (deg)     : 13.16
Pole direction: RA (deg): 268.05645
Dec (deg): 64.49730
C/A sky separation (") : 4.457
C/A sky separation (km) : 14234.6
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 | 2042-05-05T08:14:37.712 | 2.32x | -12.11 | 71491.3 | -12.50 | -14.22 |
| Jupiter | E | 2042-05-05T10:40:41.345 | 31.52 | -41.81 | 71491.5 | -10.36 | -11.80 |