

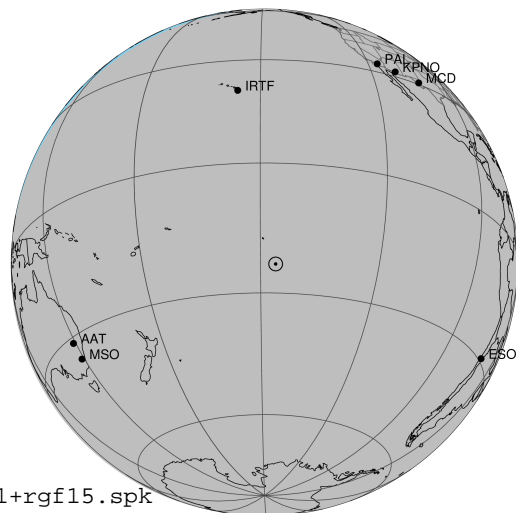
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2043-06-22T09:47:04.720  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4068681171574198272  
 2Mass ID (if available) : 17502792-2305040

Jupiter 2043-06-22T09:47:04 K9.75 G12.36 Pgt

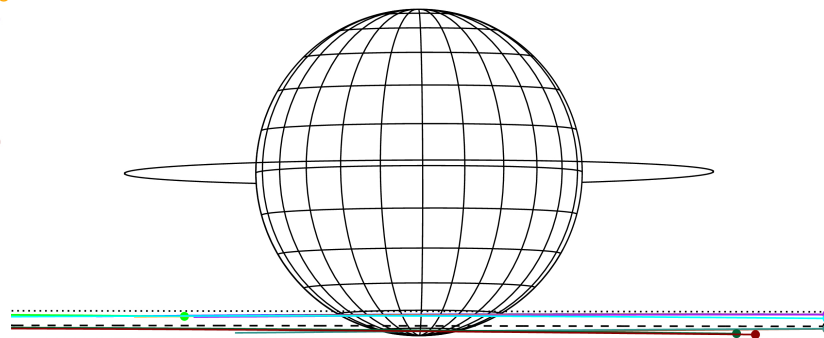
ICRS Star Coord at Epoch: 17h 50m 27.93223s -23:05:04.24070s

RUWE (>1.4 is poor) : 0.93  
 K magnitude : 9.752  
 G magnitude : 12.363  
 RP magnitude : 11.550  
 BP magnitude : 13.037  
 DUPflag : 0  
 Distance (au) : 4.250  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -16.39  
 Sun-Target sep (deg) : 177.48  
 Sun-Moon sep (deg) : 5.32  
 B (ring opening deg) : -2.42  
 PA of pole (deg) : 0.19  
 Pole direction: RA (deg): 268.05669  
 Dec (deg): 64.49732  
 C/A sky separation (") : 21.793  
 C/A sky separation (km) : 67181.1  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2043-06-22T09:47:04 K9.75 G12.36 Pgt



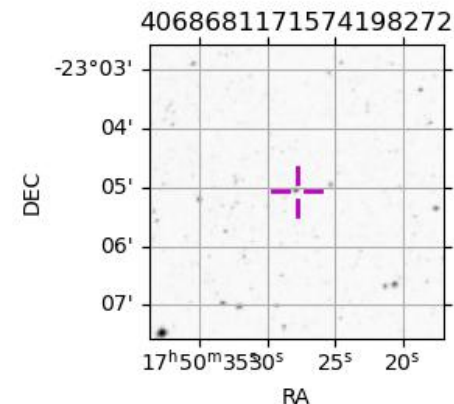
Earth  
 PAL  
 PMO  
 KPNO  
 MCD  
 IRTF  
 RIO  
 ESO  
 AAT  
 MSO



2043-06-22T09:47:04.7200 a: 17 50 27.93223 -23 05 04.241 C/A \*\*\*\*\* PA 359.93 deg v\_sky -16.39 km/s D 04.25 AU  
 Credit: Styled after SORA/Lucky Star

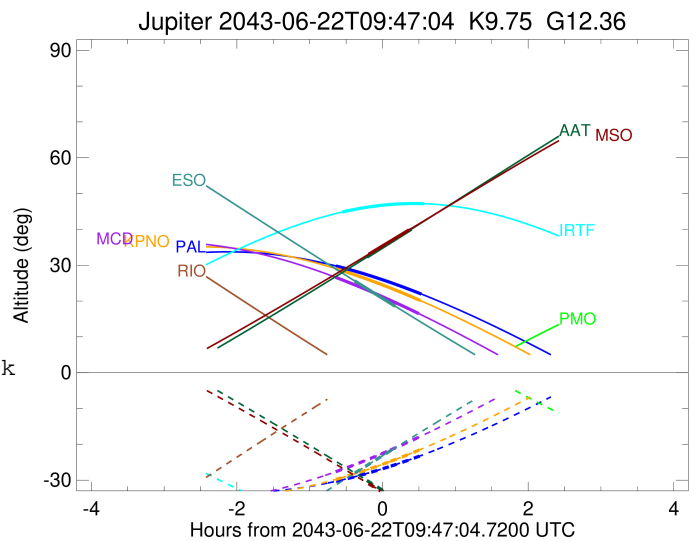
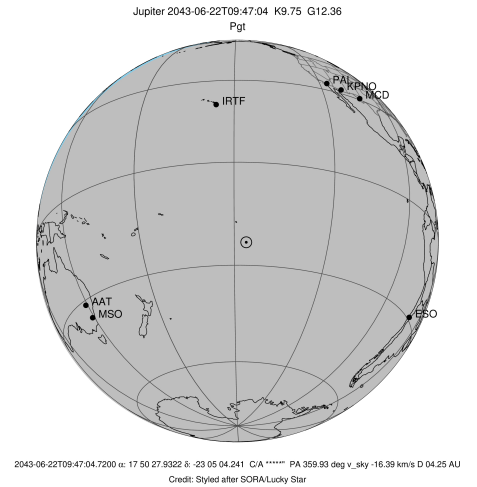
Observable events with sun below -5 deg and altitude above 5 deg

| Obs  | Location                          | lat   | Elon  | Target | Observed Events Interval    | OEcode |
|------|-----------------------------------|-------|-------|--------|-----------------------------|--------|
| PIC  | Pic du Midi                       | 42.9  | 0.1   |        |                             | Pnn    |
| PAL  | Palomar Mt (200")                 | 33.4  | 243.1 | + +    | JUN 22 09:08 - JUN 22 10:19 | Pie    |
| PMO  | Purple Mtn Obs. Nanking           | 32.1  | 118.8 |        |                             | Pnn    |
| KPNO | Kitt Peak Natl Obs                | 32.0  | 248.4 | + +    | JUN 22 09:08 - JUN 22 10:18 | Pie    |
| MCD  | McDonald Obs. 2.7m                | 30.7  | 256.0 | + +    | JUN 22 09:08 - JUN 22 10:17 | Pie    |
| TEN  | Teide Obs./Tenerife               | 28.3  | 343.5 |        |                             | Pnn    |
| IRTF | Mauna Kea/IRTF                    | 19.8  | 204.5 | + +    | JUN 22 09:14 - JUN 22 10:21 | Pie    |
| KAV  | Kavalur Observatory               | 12.6  | 78.8  |        |                             | Pnn    |
| RIO  | Rio de Janeiro                    | -22.9 | 316.8 |        |                             | Pnn    |
| ESO  | European Southern Obs. (3.6m)     | -29.3 | 289.3 | + +    | JUN 22 09:24 - JUN 22 09:57 | Pie    |
| AAT  | Siding Spring (AAT)               | -31.3 | 149.1 | + +    | JUN 22 09:34 - JUN 22 10:10 | Pie    |
| SAAO | So. Afr. Astro. Obs. (Sutherland) | -32.4 | 20.8  |        |                             | Pnn    |
| MSO  | Mt. Stromlo Observatory           | -35.3 | 149.0 | + +    | JUN 22 09:35 - JUN 22 10:08 | Pie    |



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-22T09:43:55.180
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        : 4068681171574198272
2Mass ID (if available) : 17502792-2305040
ICRS Star Coord at Epoch: 17h 50m 27.93223s -23:05:04.24070s
RUWE (>1.4 is poor) : 0.93
K magnitude           : 9.752
G magnitude           : 12.363
RP magnitude          : 11.550
BP magnitude          : 13.037
DUPflag               : 0
Distance (au)         : 4.250
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.39
Sun-Target sep (deg) : 177.48
Sun-Moon sep (deg)   : 6.06
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.19
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 20.178
C/A sky separation (km): 62202.6
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
    
```

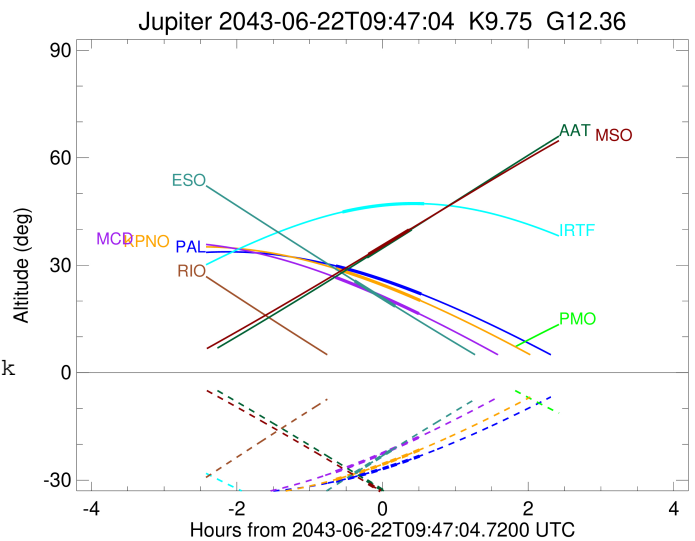
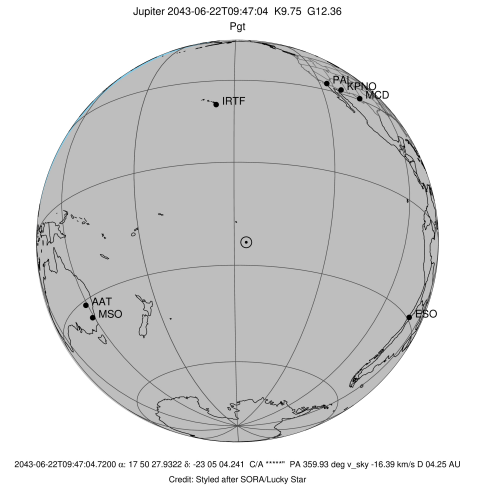


x: target alt < 5.0 deg or sun > -5.0 deg

| Target  | I/E | UTC                     | alt   | alt-sun | radius  | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I   | 2043-06-22T09:08:52.288 | 29.76 | -30.31  | 71485.9 | -60.40  | -63.44       |
| Jupiter | E   | 2043-06-22T10:19:02.192 | 21.96 | -23.11  | 71485.9 | -60.43  | -63.47       |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-22T09:43:25.030
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        : 4068681171574198272
2Mass ID (if available) : 17502792-2305040
ICRS Star Coord at Epoch: 17h 50m 27.93223s -23:05:04.24070s
RUWE (>1.4 is poor) : 0.93
K magnitude           : 9.752
G magnitude           : 12.363
RP magnitude          : 11.550
BP magnitude          : 13.037
DUPflag              : 0
Distance (au)         : 4.250
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.39
Sun-Target sep (deg) : 177.48
Sun-Moon sep (deg)   : 6.03
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.19
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 20.244
C/A sky separation (km): 62403.1
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
    
```

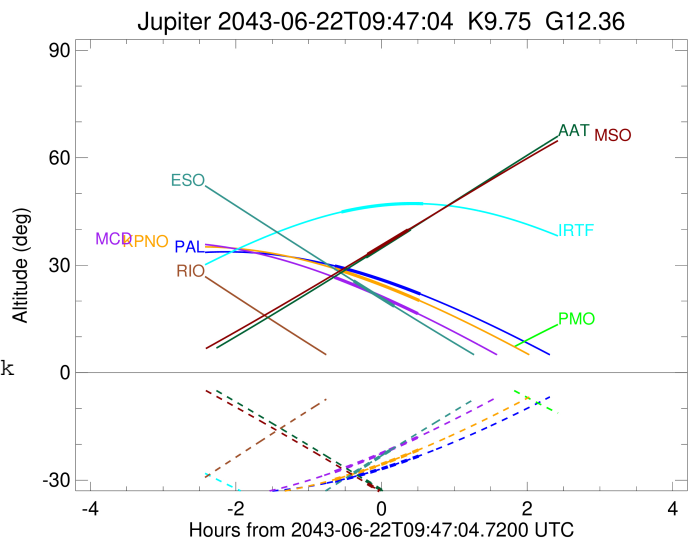
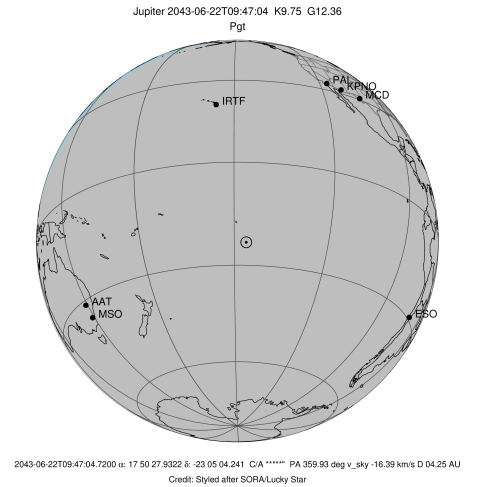


x: target alt < 5.0 deg or sun > -5.0 deg

| Target  | I/E | UTC                     | alt   | alt-sun | radius  | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I   | 2043-06-22T09:08:41.833 | 29.03 | -29.79  | 71485.9 | -60.69  | -63.70       |
| Jupiter | E   | 2043-06-22T10:18:12.905 | 20.14 | -21.46  | 71485.9 | -60.80  | -63.81       |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-22T09:42:45.380
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        : 4068681171574198272
2Mass ID (if available) : 17502792-2305040
ICRS Star Coord at Epoch: 17h 50m 27.93223s -23:05:04.24070s
RUWE (>1.4 is poor) : 0.93
K magnitude           : 9.752
G magnitude           : 12.363
RP magnitude          : 11.550
BP magnitude          : 13.037
DUPflag              : 0
Distance (au)         : 4.250
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.39
Sun-Target sep (deg) : 177.48
Sun-Moon sep (deg)   : 5.99
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.19
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 20.332
C/A sky separation (km) : 62675.8
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
    
```

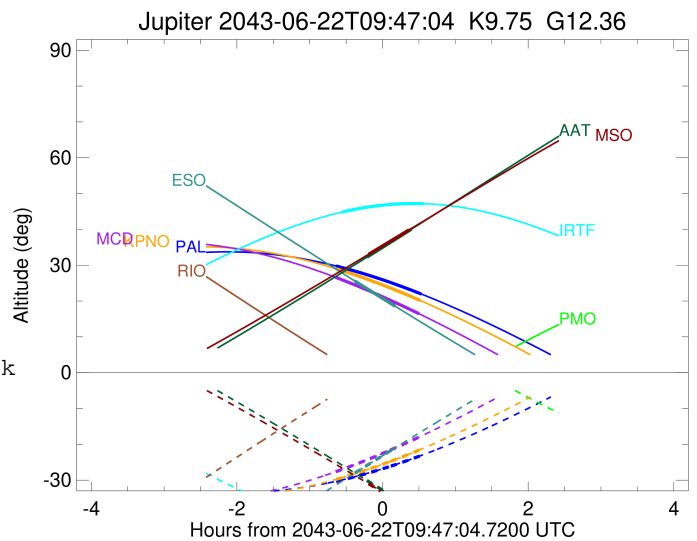
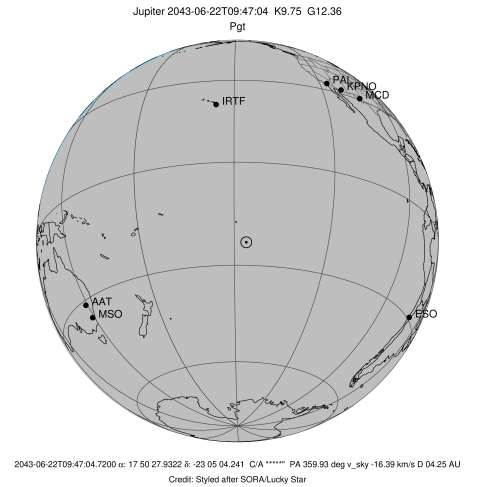


x: target alt < 5.0 deg or sun > -5.0 deg

| Target  | I/E | UTC                     | alt   | alt-sun | radius  | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I   | 2043-06-22T09:08:28.264 | 26.61 | -27.65  | 71485.8 | -61.07  | -64.06       |
| Jupiter | E   | 2043-06-22T10:17:07.885 | 16.46 | -17.99  | 71485.8 | -61.31  | -64.27       |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-22T09:47:47.120
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       : 4068681171574198272
2Mass ID (if available) : 17502792-2305040
ICRS Star Coord at Epoch: 17h 50m 27.93223s -23:05:04.24070s
RUWE (>1.4 is poor) : 0.93
K magnitude           : 9.752
G magnitude           : 12.363
RP magnitude         : 11.550
BP magnitude         : 13.037
DUPflag              : 0
Distance (au)        : 4.250
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.39
Sun-Target sep (deg) : 177.48
Sun-Moon sep (deg)   : 6.01
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.19
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 20.391
C/A sky separation (km): 62856.9
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
    
```

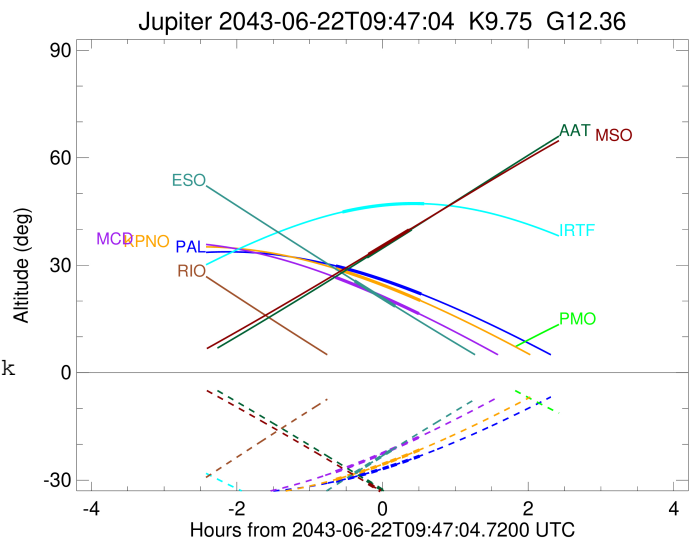
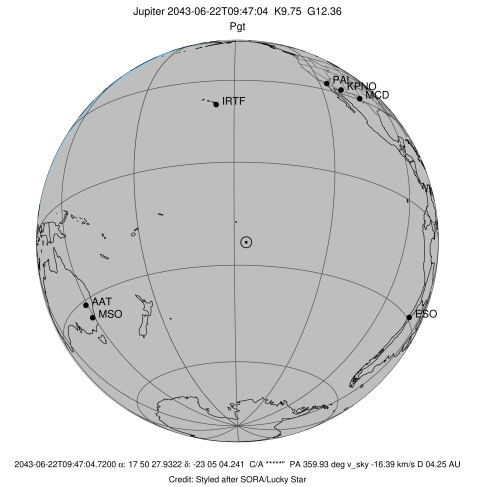


x: target alt < 5.0 deg or sun > -5.0 deg

| Target  | I/E | UTC                     | alt   | alt-sun | radius  | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I   | 2043-06-22T09:14:05.508 | 44.85 | -43.63  | 71485.8 | -61.82  | -64.75       |
| Jupiter | E   | 2043-06-22T10:21:27.952 | 47.16 | -46.86  | 71485.8 | -61.19  | -64.17       |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-22T09:40:54.640
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      : 4068681171574198272
2Mass ID (if available) : 17502792-2305040
ICRS Star Coord at Epoch: 17h 50m 27.93223s -23:05:04.24070s
RUWE (>1.4 is poor) : 0.93
K magnitude         : 9.752
G magnitude         : 12.363
RP magnitude        : 11.550
BP magnitude        : 13.037
DUPflag            : 0
Distance (au)       : 4.250
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -16.39
Sun-Target sep (deg) : 177.48
Sun-Moon sep (deg)  : 5.02
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.19
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (" ) : 22.567
C/A sky separation (km) : 69565.7
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
    
```

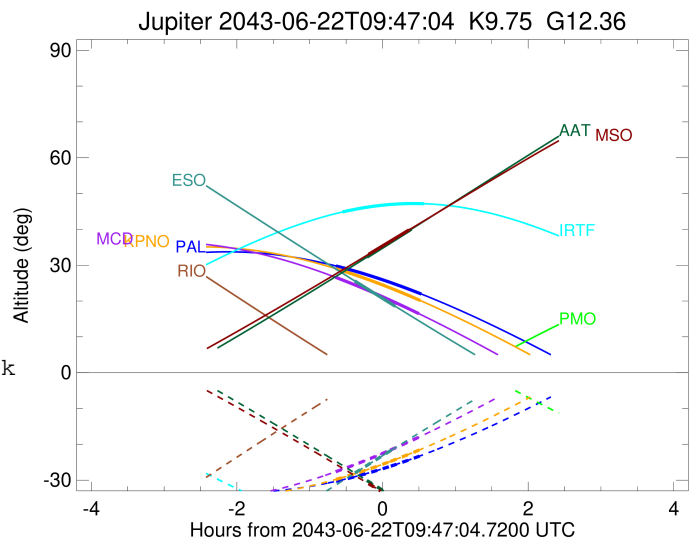
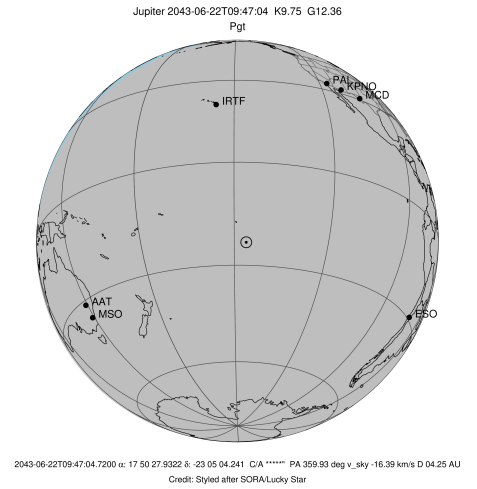


x: target alt < 5.0 deg or sun > -5.0 deg

| Target  | I/E | UTC                     | alt   | alt-sun | radius  | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I   | 2043-06-22T09:24:17.732 | 25.58 | -28.01  | 71484.4 | -76.21  | -77.80       |
| Jupiter | E   | 2043-06-22T09:57:33.355 | 18.54 | -20.97  | 71484.4 | -76.76  | -78.28       |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-22T09:52:29.790
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        : 4068681171574198272
2Mass ID (if available) : 17502792-2305040
ICRS Star Coord at Epoch: 17h 50m 27.93223s -23:05:04.24070s
RUWE (>1.4 is poor) : 0.93
K magnitude           : 9.752
G magnitude           : 12.363
RP magnitude          : 11.550
BP magnitude          : 13.037
DUPflag              : 0
Distance (au)         : 4.250
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.39
Sun-Target sep (deg)  : 177.48
Sun-Moon sep (deg)    : 5.16
B (ring opening deg) : -2.42
PA of pole (deg)      : 0.19
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 22.427
C/A sky separation (km) : 69132.9
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
    
```



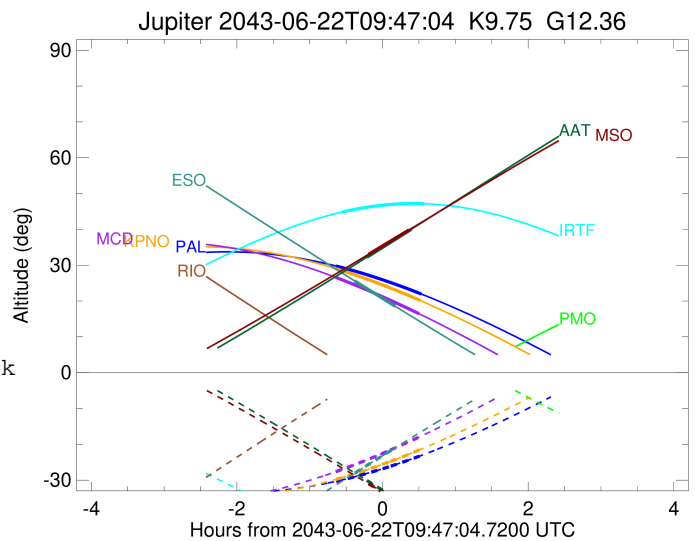
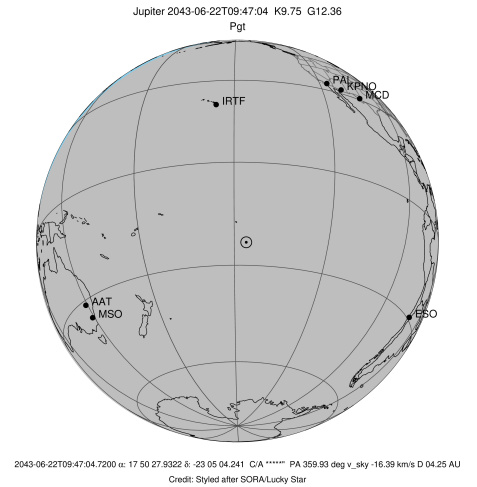
x: target alt < 5.0 deg or sun > -5.0 deg

| Target  | I/E | UTC                     | alt   | alt-sun | radius  | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I   | 2043-06-22T09:34:13.193 | 32.24 | -30.09  | 71484.4 | -75.80  | -77.43       |
| Jupiter | E   | 2043-06-22T10:10:44.537 | 40.01 | -37.82  | 71484.6 | -74.36  | -76.14       |



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-22T09:52:15.840
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       : 4068681171574198272
2Mass ID (if available) : 17502792-2305040
ICRS Star Coord at Epoch: 17h 50m 27.93223s -23:05:04.24070s
RUWE (>1.4 is poor) : 0.93
K magnitude           : 9.752
G magnitude           : 12.363
RP magnitude          : 11.550
BP magnitude          : 13.037
DUPflag              : 0
Distance (au)         : 4.250
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.39
Sun-Target sep (deg) : 177.48
Sun-Moon sep (deg)   : 5.10
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.19
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 22.555
C/A sky separation (km) : 69529.5
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   | 2043-06-22T09:35:34.112 | 33.03 | -30.99  | 71484.4 | -77.06  | -78.55       |
| Jupiter | E   | 2043-06-22T10:08:56.097 | 39.85 | -37.77  | 71484.5 | -75.67  | -77.31       |