

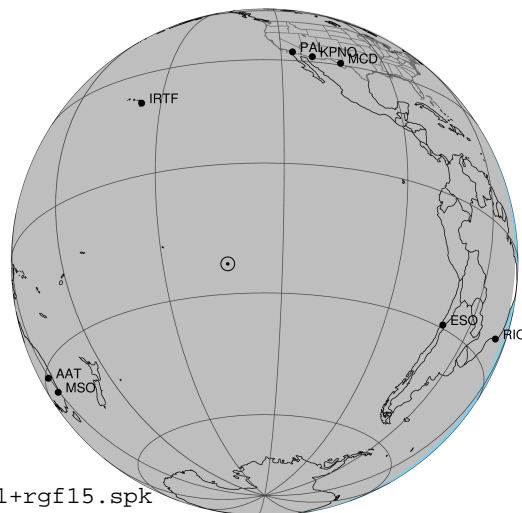
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2043-06-12T08:53:54.370  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4069387852651770368  
 2Mass ID (if available) : 17560055-2303588

Jupiter 2043-06-12T08:53:54 K7.93 G13.62 Pgt

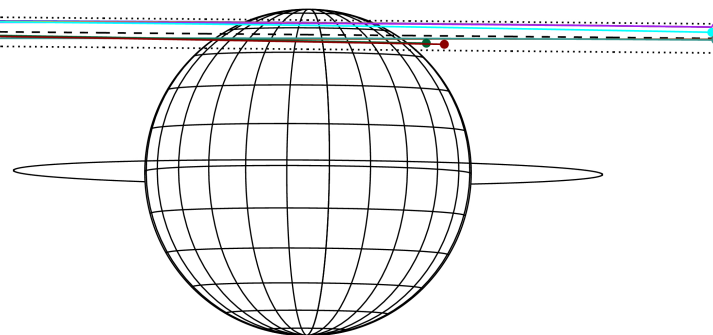
ICRS Star Coord at Epoch: 17h 56m 00.54451s -23°03:59.03849s

RUWE (>1.4 is poor) : 0.85  
 K magnitude : 7.934  
 G magnitude : 13.622  
 RP magnitude : 12.269  
 BP magnitude : 15.787  
 DUPflag : 0  
 Distance (au) : 4.263  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -16.10  
 Sun-Target sep (deg) : 171.63  
 Sun-Moon sep (deg) : 122.56  
 B (ring opening deg) : -2.43  
 PA of pole (deg) : -0.41  
 Pole direction: RA (deg): 268.05668  
 Dec (deg): 64.49732  
 C/A sky separation (") : 19.531  
 C/A sky separation (km) : 60380.5  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2043-06-12T08:53:54 K7.93 G13.62  
 Pgt



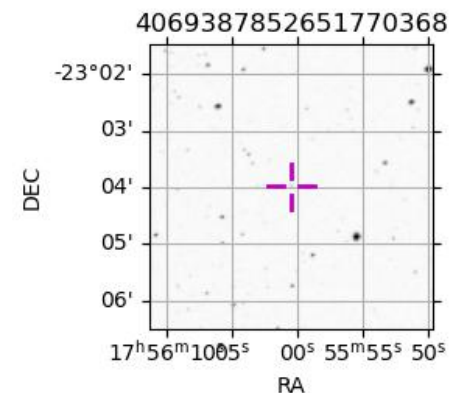
Earth  
 PAL  
 KPNO  
 MCD  
 TEN  
 IRTF  
 RIO  
 ESO  
 AAT  
 MSO



2043-06-12T08:53:54.3700 a: 17 56 00.5445 s -23 03 59.03849 s C/A \*\*\*\*\* PA 179.47 deg v\_sky -16.10 km/s D 04.26 AU  
 Credit: Styled after SORA/Lucky Star

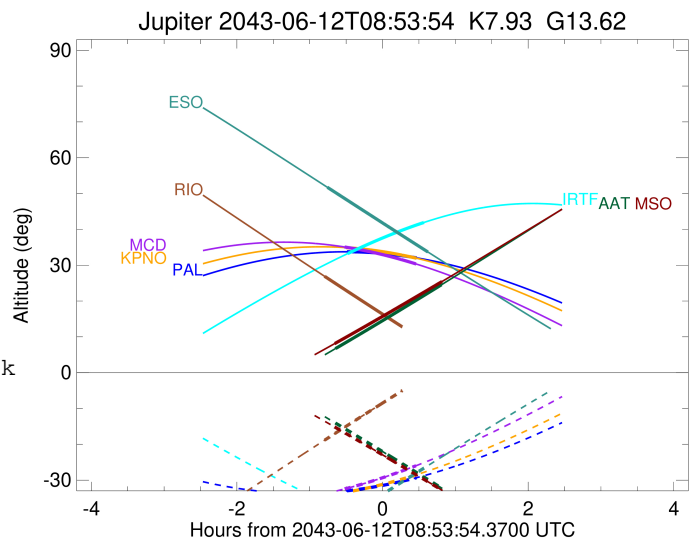
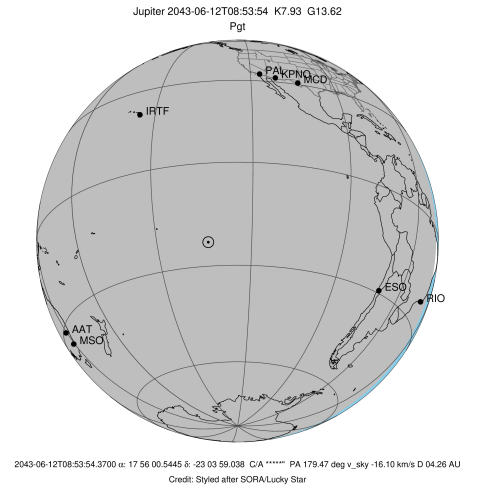
Observable events with sun below -5 deg and altitude above 5 deg

| 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 12 08:24 - JUN 12 09:21 | Pie   |
| PMO  | Purple Mtn Obs. Nanking           | 32.1  | 118.8 |        |                             | Pnn   |
| KPNO | Kitt Peak Natl Obs                | 32.0  | 248.4 | + +    | JUN 12 08:23 - JUN 12 09:21 | Pie   |
| MCD  | McDonald Obs. 2.7m                | 30.7  | 256.0 | + +    | JUN 12 08:22 - JUN 12 09:21 | Pie   |
| TEN  | Teide Obs./Tenerife               | 28.3  | 343.5 |        |                             | Pnn   |
| IRTF | Mauna Kea/IRTF                    | 19.8  | 204.5 | + +    | JUN 12 08:25 - JUN 12 09:27 | Pie   |
| KAV  | Kavalur Observatory               | 12.6  | 78.8  |        |                             | Pnn   |
| RIO  | Rio de Janeiro                    | -22.9 | 316.8 | +      | JUN 12 08:06 - JUN 12 08:06 | Pin   |
| ESO  | European Southern Obs. (3.6m)     | -29.3 | 289.3 | + +    | JUN 12 08:08 - JUN 12 09:31 | Pie   |
| AAT  | Siding Spring (AAT)               | -31.3 | 149.1 | + +    | JUN 12 08:15 - JUN 12 09:42 | Pie   |
| SAAO | So. Afr. Astro. Obs. (Sutherland) | -32.4 | 20.8  |        |                             | Pnn   |
| MSO  | Mt. Stromlo Observatory           | -35.3 | 149.0 | + +    | JUN 12 08:14 - JUN 12 09:42 | Pie   |



```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch             : 2043-06-12T08:53:13.430
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        : 4069387852651770368
2Mass ID (if available) : 17560055-2303588
ICRS Star Coord at Epoch: 17h 56m 00.54451s -23:03:59.03849s
RUWE (>1.4 is poor)  : 0.85
K magnitude           : 7.934
G magnitude           : 13.622
RP magnitude          : 12.269
BP magnitude          : 15.787
DUPflag              : 0
Distance (au)         : 4.263
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -16.10
Sun-Target sep (deg)  : 171.63
Sun-Moon sep (deg)    : 122.97
B (ring opening deg)  : -2.43
PA of pole (deg)      : -0.41
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 21.237
C/A sky separation (km) : 65652.7
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
    
```

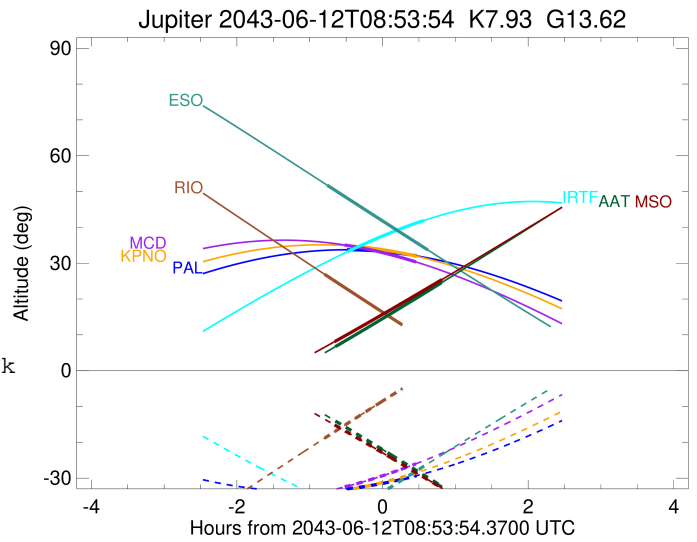
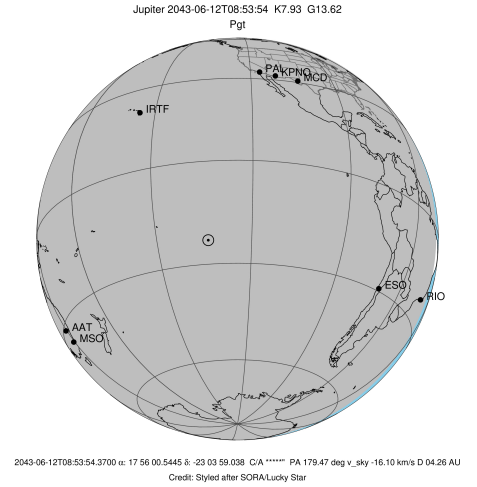


x: target alt < 5.0 deg or sun > -5.0 deg

| Target  | I/E | UTC                     | alt   | alt-sun | radius  | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I   | 2043-06-12T08:24:36.170 | 33.74 | -32.97  | 71485.2 | 66.51   | 69.06        |
| Jupiter | E   | 2043-06-12T09:21:51.190 | 32.05 | -29.33  | 71485.2 | 66.57   | 69.11        |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-12T08:52:46.530
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        : 4069387852651770368
2Mass ID (if available) : 17560055-2303588
ICRS Star Coord at Epoch: 17h 56m 00.54451s -23:03:59.03849s
RUWE (>1.4 is poor)  : 0.85
K magnitude           : 7.934
G magnitude           : 13.622
RP magnitude          : 12.269
BP magnitude          : 15.787
DUPflag              : 0
Distance (au)         : 4.263
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.10
Sun-Target sep (deg)  : 171.63
Sun-Moon sep (deg)    : 122.93
B (ring opening deg)  : -2.43
PA of pole (deg)      : -0.41
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 21.196
C/A sky separation (km) : 65526.1
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
    
```

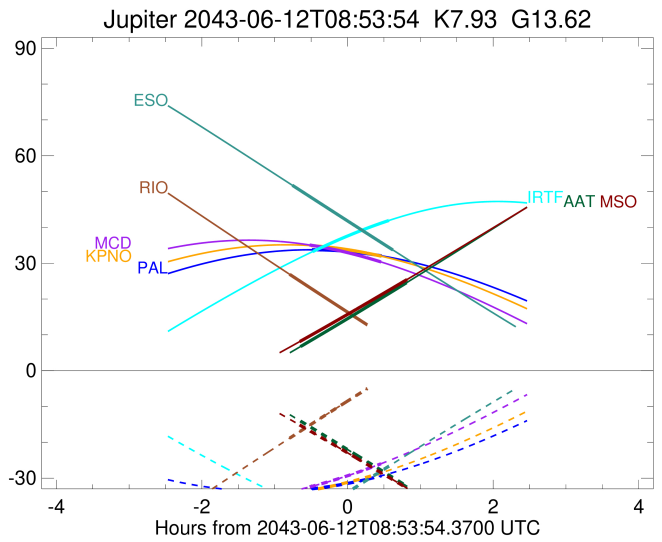
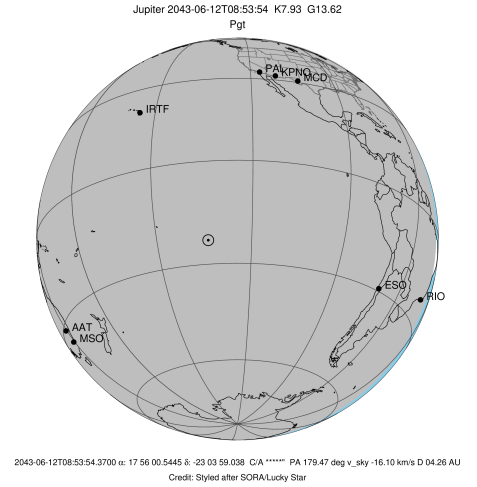


x: target alt < 5.0 deg or sun > -5.0 deg

| Target  | I/E | UTC                     | alt   | alt-sun | radius  | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I   | 2043-06-12T08:23:51.743 | 34.90 | -33.36  | 71485.2 | 66.30   | 68.87        |
| Jupiter | E   | 2043-06-12T09:21:42.286 | 31.95 | -28.51  | 71485.2 | 66.27   | 68.84        |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-12T08:52:08.170
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       : 4069387852651770368
2Mass ID (if available) : 17560055-2303588
ICRS Star Coord at Epoch: 17h 56m 00.54451s -23:03:59.03849s
RUWE (>1.4 is poor) : 0.85
K magnitude           : 7.934
G magnitude           : 13.622
RP magnitude         : 12.269
BP magnitude         : 15.787
DUPflag              : 0
Distance (au)        : 4.263
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.10
Sun-Target sep (deg) : 171.63
Sun-Moon sep (deg)  : 122.86
B (ring opening deg) : -2.43
PA of pole (deg)    : -0.41
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation ("): 21.140
C/A sky separation (km): 65354.6
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
    
```

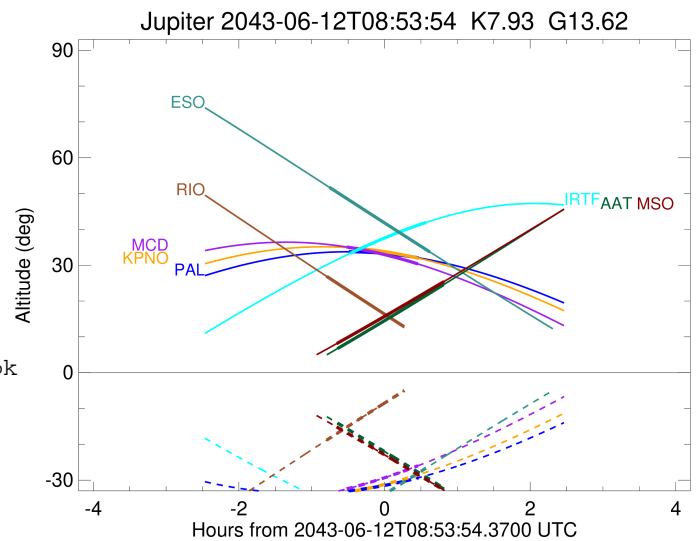
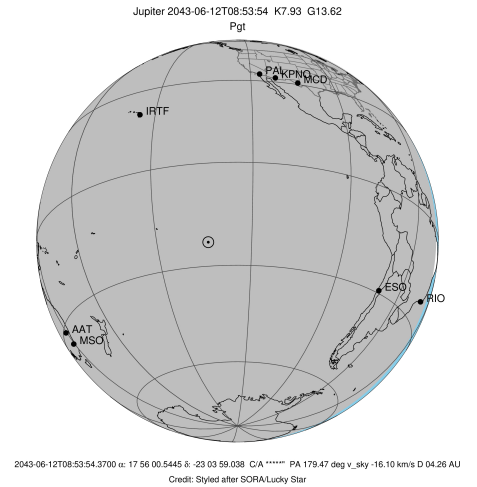


x: target alt < 5.0 deg or sun > -5.0 deg

| Target  | I/E | UTC                     | alt   | alt-sun | radius  | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I   | 2043-06-12T08:22:49.103 | 35.07 | -32.44  | 71485.3 | 66.03   | 68.62        |
| Jupiter | E   | 2043-06-12T09:21:28.908 | 30.35 | -25.99  | 71485.3 | 65.86   | 68.47        |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-12T08:56:39.630
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        : 4069387852651770368
2Mass ID (if available) : 17560055-2303588
ICRS Star Coord at Epoch: 17h 56m 00.54451s -23:03:59.03849s
RUWE (>1.4 is poor) : 0.85
K magnitude           : 7.934
G magnitude           : 13.622
RP magnitude          : 12.269
BP magnitude          : 15.787
DUPflag              : 0
Distance (au)         : 4.263
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.10
Sun-Target sep (deg)  : 171.63
Sun-Moon sep (deg)   : 123.32
B (ring opening deg) : -2.43
PA of pole (deg)     : -0.41
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 20.842
C/A sky separation (km) : 64432.7
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
    
```

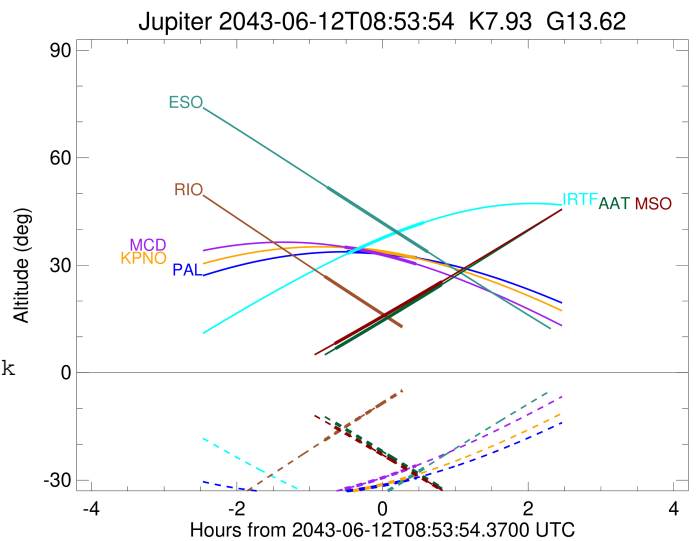
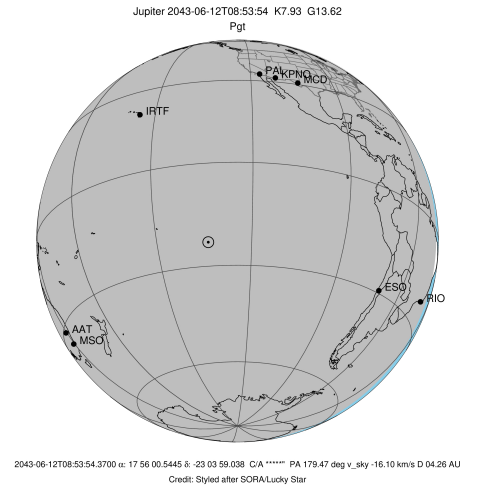


x: target alt < 5.0 deg or sun > -5.0 deg

| Target  | I/E | UTC                     | alt   | alt-sun | radius  | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I   | 2043-06-12T08:25:16.969 | 33.25 | -38.59  | 71485.5 | 63.79   | 66.57        |
| Jupiter | E   | 2043-06-12T09:27:58.804 | 41.91 | -45.19  | 71485.4 | 64.59   | 67.30        |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-12T08:48:33.990
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      : 4069387852651770368
2Mass ID (if available) : 17560055-2303588
ICRS Star Coord at Epoch: 17h 56m 00.54451s -23:03:59.03849s
RUWE (>1.4 is poor) : 0.85
K magnitude          : 7.934
G magnitude          : 13.622
RP magnitude         : 12.269
BP magnitude         : 15.787
DUPflag             : 0
Distance (au)       : 4.263
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.10
Sun-Target sep (deg) : 171.63
Sun-Moon sep (deg)  : 122.31
B (ring opening deg) : -2.43
PA of pole (deg)    : -0.41
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 18.904
C/A sky separation (km) : 58440.8
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
    
```

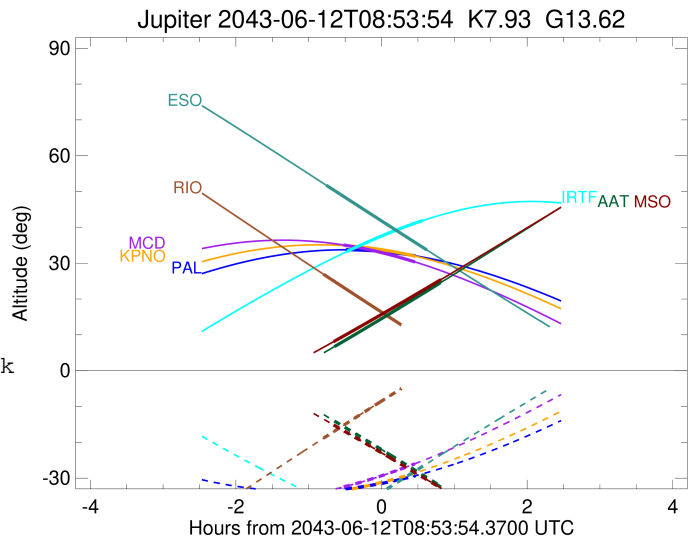
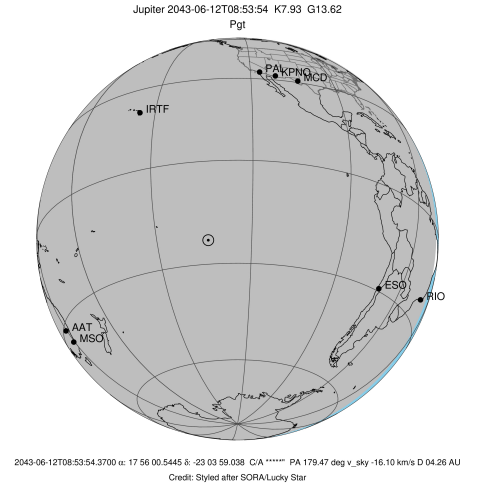


x: target alt < 5.0 deg or sun > -5.0 deg

| Target  | I/E | UTC                     | alt   | alt-sun | radius  | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I   | 2043-06-12T08:06:14.257 | 26.89 | -18.83  | 71486.5 | 55.22   | 58.58        |
| Jupiter | E   | 2043-06-12T09:31:05.285 | 8.27  | -0.62x  | 71486.7 | 54.29   | 57.69        |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-12T08:49:49.680
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        : 4069387852651770368
2Mass ID (if available) : 17560055-2303588
ICRS Star Coord at Epoch: 17h 56m 00.54451s -23:03:59.03849s
RUWE (>1.4 is poor) : 0.85
K magnitude           : 7.934
G magnitude           : 13.622
RP magnitude          : 12.269
BP magnitude          : 15.787
DUPflag              : 0
Distance (au)         : 4.263
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.10
Sun-Target sep (deg)  : 171.63
Sun-Moon sep (deg)    : 122.72
B (ring opening deg) : -2.43
PA of pole (deg)     : -0.41
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 19.018
C/A sky separation (km) : 58793.0
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
    
```

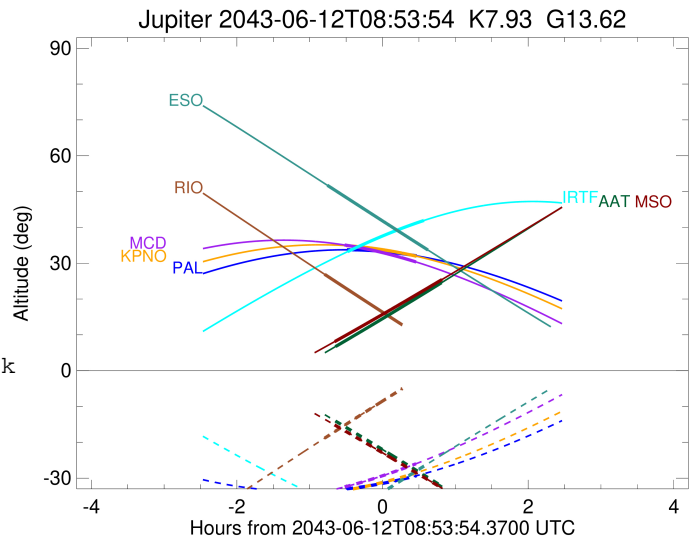
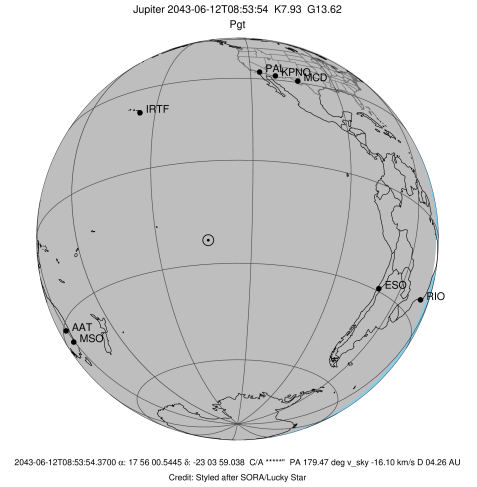


x: target alt < 5.0 deg or sun > -5.0 deg

| Target  | I/E | UTC                     | alt   | alt-sun | radius  | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I   | 2043-06-12T08:08:24.397 | 51.75 | -43.81  | 71486.5 | 55.56   | 58.90        |
| Jupiter | E   | 2043-06-12T09:31:23.279 | 33.67 | -25.94  | 71486.6 | 54.89   | 58.27        |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-12T08:59:00.120
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        : 4069387852651770368
2Mass ID (if available) : 17560055-2303588
ICRS Star Coord at Epoch: 17h 56m 00.54451s -23:03:59.03849s
RUWE (>1.4 is poor) : 0.85
K magnitude           : 7.934
G magnitude           : 13.622
RP magnitude          : 12.269
BP magnitude          : 15.787
DUPflag              : 0
Distance (au)         : 4.263
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.10
Sun-Target sep (deg)  : 171.63
Sun-Moon sep (deg)    : 123.18
B (ring opening deg) : -2.43
PA of pole (deg)      : -0.41
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 18.634
C/A sky separation (km) : 57606.6
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
    
```



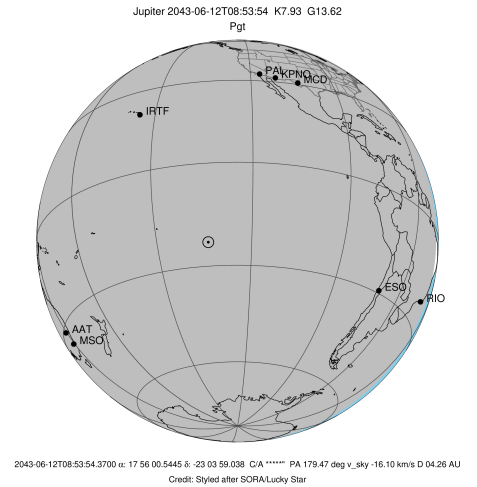
x: target alt < 5.0 deg or sun > -5.0 deg

| Target  | I/E | UTC                     | alt   | alt-sun | radius  | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I   | 2043-06-12T08:15:10.855 | 6.73  | -14.07  | 71486.9 | 52.95   | 56.42        |
| Jupiter | E   | 2043-06-12T09:42:37.157 | 24.57 | -32.21  | 71486.7 | 54.28   | 57.68        |

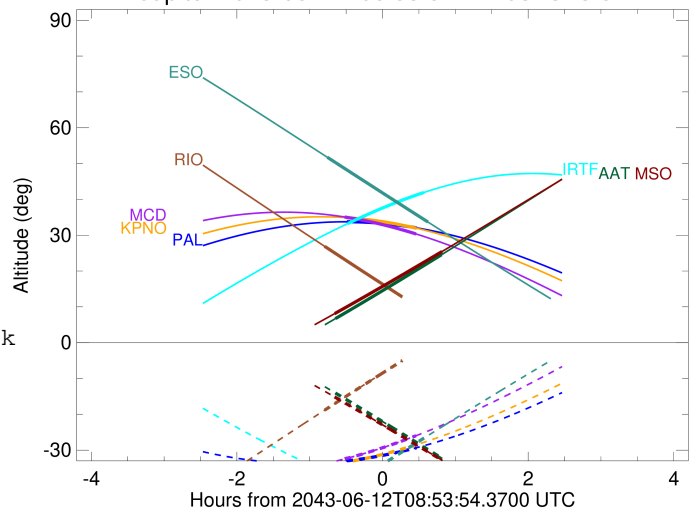


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-12T08:58:46.970
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      : 4069387852651770368
2Mass ID (if available) : 17560055-2303588
ICRS Star Coord at Epoch: 17h 56m 00.54451s -23:03:59.03849s
RUWE (>1.4 is poor) : 0.85
K magnitude          : 7.934
G magnitude          : 13.622
RP magnitude         : 12.269
BP magnitude         : 15.787
DUPflag             : 0
Distance (au)        : 4.263
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.10
Sun-Target sep (deg) : 171.63
Sun-Moon sep (deg)  : 123.18
B (ring opening deg) : -2.43
PA of pole (deg)    : -0.41
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation ("): 18.517
C/A sky separation (km): 57246.4
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
    
```



Jupiter 2043-06-12T08:53:54 K7.93 G13.62



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   | 2043-06-12T08:14:27.359 | 8.10  | -15.15  | 71486.9 | 52.49   | 55.98        |
| Jupiter | E   | 2043-06-12T09:42:54.611 | 25.43 | -32.79  | 71486.8 | 53.77   | 57.20        |