

target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-06-29T03:46:24.410
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068835996560459392
 2Mass ID (if available) : 17464552-2304518

Jupiter 2043-06-29T03:46:24 K8.57 G13.50 Pgt

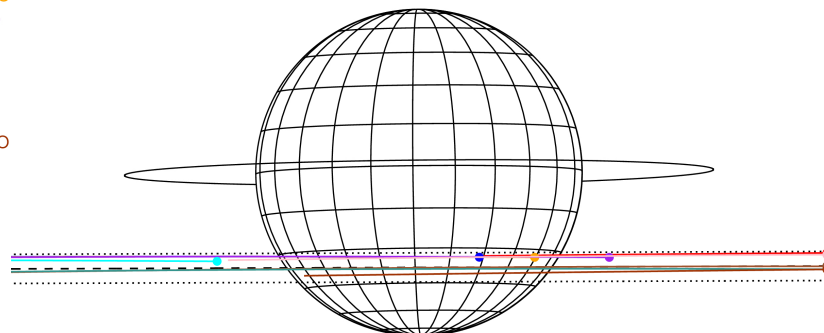
ICRS Star Coord at Epoch: 17h 46m 45.50880s -23:04:52.24098s

RUWE (>1.4 is poor) : 0.92
 K magnitude : 8.567
 G magnitude : 13.498
 RP magnitude : 12.232
 BP magnitude : 15.298
 DUPflag : 0
 Distance (au) : 4.259
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -16.01
 Sun-Target sep (deg) : 170.21
 Sun-Moon sep (deg) : 87.55
 B (ring opening deg) : -2.42
 PA of pole (deg) : 0.59
 Pole direction: RA (deg): 268.05669
 Dec (deg): 64.49732
 C/A sky separation (") : 13.464
 C/A sky separation (km) : 41588.6
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-06-29T03:46:24 K8.57 G13.50
 Pgt



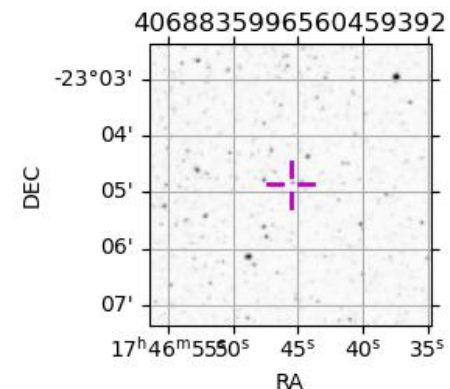
Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 SAAO



2043-06-29T03:46:24.4100 α: 17 46 45.5088 δ: -23 04 52.241 C/A ***** PA 0.21 deg v_sky -16.01 km/s D 04.26 AU
 Credit: Styled after SORA/Lucky Star

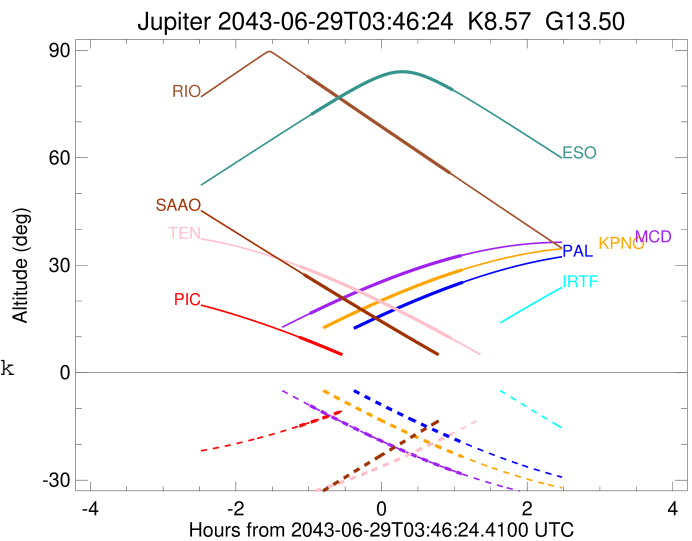
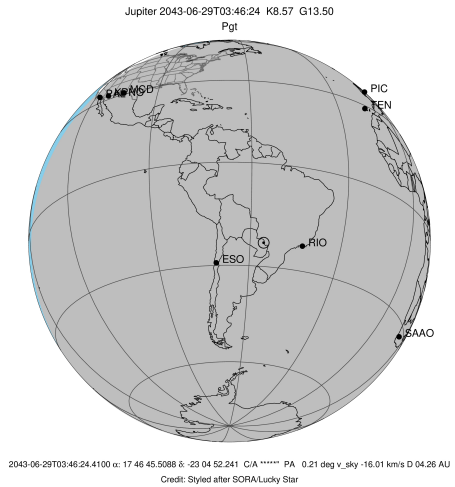
Observable events with sun below -5 deg and altitude above 5 deg

| Obs | Location | lat | Elon | Target | Observed Events Interval | OCode |
|------|-----------------------------------|-------|-------|--------|-----------------------------|-------|
| PIC | Pic du Midi | 42.9 | 0.1 | + | JUN 29 02:38 - JUN 29 02:38 | Pin |
| PAL | Palomar Mt (200") | 33.4 | 243.1 | + | JUN 29 04:53 - JUN 29 04:53 | Pne |
| PMO | Purple Mtn Obs. Nanking | 32.1 | 118.8 | | | Pnn |
| KPNO | Kitt Peak Natl Obs | 32.0 | 248.4 | + | JUN 29 04:53 - JUN 29 04:53 | Pne |
| MCD | McDonald Obs. 2.7m | 30.7 | 256.0 | + | JUN 29 02:47 - JUN 29 04:52 | Pie |
| TEN | Teide Obs./Tenerife | 28.3 | 343.5 | + | JUN 29 02:39 - JUN 29 04:44 | Pie |
| IRTF | Mauna Kea/IRTF | 19.8 | 204.5 | | | Pnn |
| KAV | Kavalur Observatory | 12.6 | 78.8 | | | Pnn |
| RIO | Rio de Janeiro | -22.9 | 316.8 | + | JUN 29 02:45 - JUN 29 04:42 | Pie |
| ESO | European Southern Obs. (3.6m) | -29.3 | 289.3 | + | JUN 29 02:48 - JUN 29 04:45 | Pie |
| AAT | Siding Spring (AAT) | -31.3 | 149.1 | | | Pnn |
| SAAO | So. Afr. Astro. Obs. (Sutherland) | -32.4 | 20.8 | + | JUN 29 02:42 - JUN 29 02:42 | Pin |
| MSO | Mt. Stromlo Observatory | -35.3 | 149.0 | | | Pnn |



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-29T03:41:41.160
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : PIC
Location              : Pic du Midi
Latitude (deg)        : 42.93656
E. Longitude (deg)   : 0.14231
Altitude (km)         : 2.890
Gaia source ID        : 4068835996560459392
2Mass ID (if available) : 17464552-2304518
ICRS Star Coord at Epoch: 17h 46m 45.50880s -23:04:52.24098s
RUWE (>1.4 is poor) : 0.92
K magnitude           : 8.567
G magnitude           : 13.498
RP magnitude          : 12.232
BP magnitude          : 15.298
DUPflag              : 0
Distance (au)         : 4.259
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.01
Sun-Target sep (deg) : 170.21
Sun-Moon sep (deg)   : 87.52
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.59
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 11.931
C/A sky separation (km) : 36851.1
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
    
```

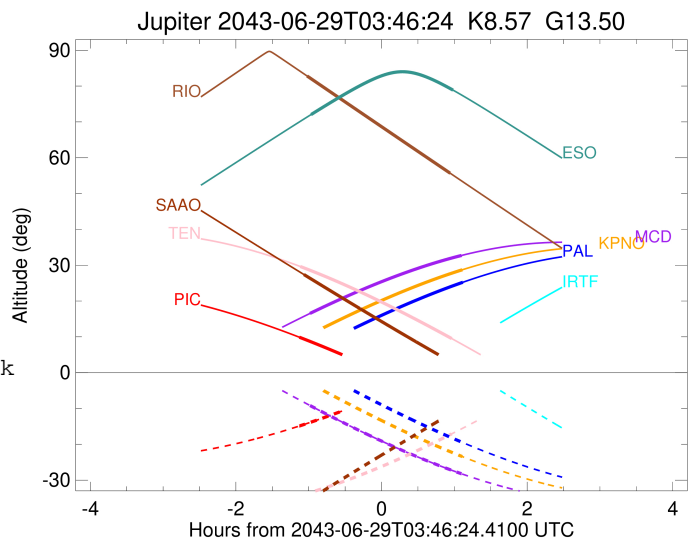
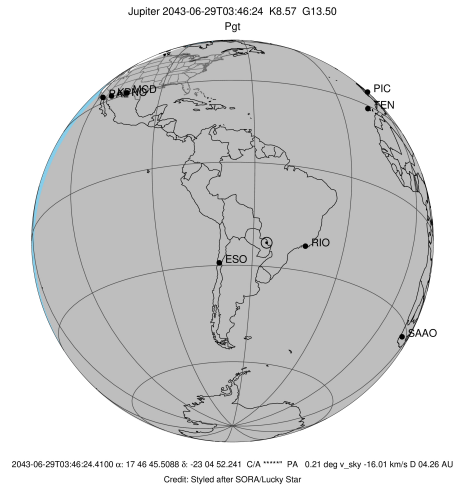


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|--------|---------|---------|---------|--------------|
| Jupiter | I | 2043-06-29T02:38:40.539 | 9.90 | -14.89 | 71489.9 | -30.98 | -34.41 |
| Jupiter | E | 2043-06-29T04:45:03.008 | -9.41x | 2.47x | 71489.9 | -31.07 | -34.50 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-29T03:50:53.220
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        : 4068835996560459392
2Mass ID (if available) : 17464552-2304518
ICRS Star Coord at Epoch: 17h 46m 45.50880s -23:04:52.24098s
RUWE (>1.4 is poor)  : 0.92
K magnitude           : 8.567
G magnitude           : 13.498
RP magnitude          : 12.232
BP magnitude          : 15.298
DUPflag              : 0
Distance (au)         : 4.259
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -16.01
Sun-Target sep (deg)  : 170.21
Sun-Moon sep (deg)    : 87.84
B (ring opening deg)  : -2.42
PA of pole (deg)      : 0.59
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 11.983
C/A sky separation (km) : 37013.5
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
    
```

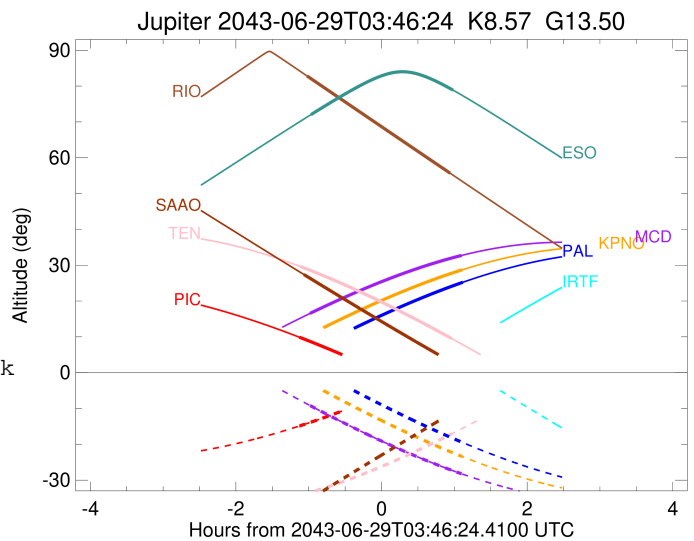
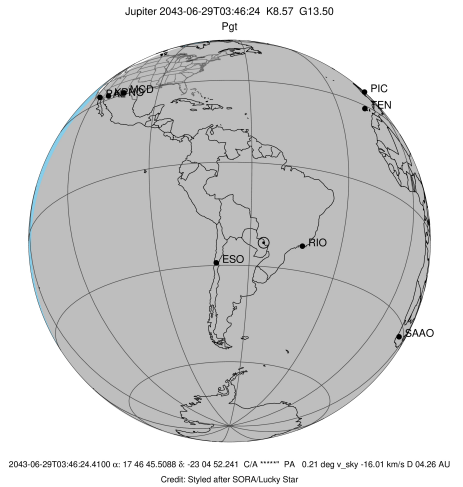


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2043-06-29T02:48:05.357 | 6.30 | 1.47x | 71489.8 | -31.98 | -35.46 |
| Jupiter | E | 2043-06-29T04:53:23.020 | 25.22 | -19.51 | 71490.0 | -30.42 | -33.81 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T03:50:35.050
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      : 4068835996560459392
2Mass ID (if available) : 17464552-2304518
ICRS Star Coord at Epoch: 17h 46m 45.50880s -23:04:52.24098s
RUWE (>1.4 is poor) : 0.92
K magnitude          : 8.567
G magnitude          : 13.498
RP magnitude         : 12.232
BP magnitude         : 15.298
DUPflag             : 0
Distance (au)       : 4.259
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.01
Sun-Target sep (deg) : 170.21
Sun-Moon sep (deg)  : 87.90
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.59
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 11.970
C/A sky separation (km) : 36971.6
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
    
```

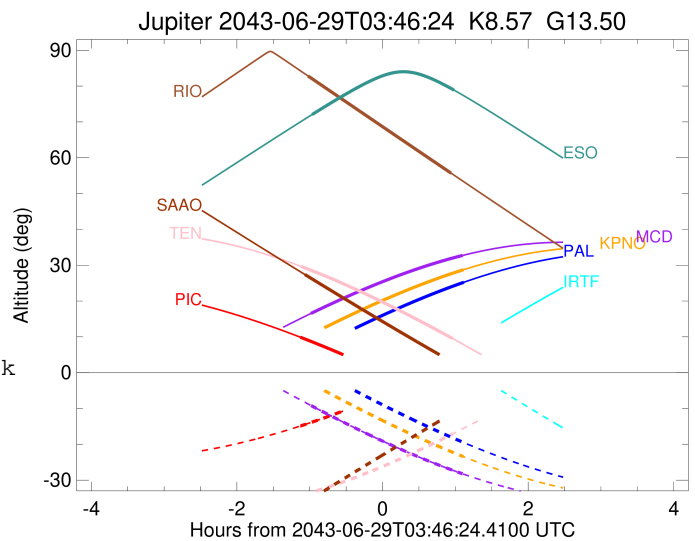
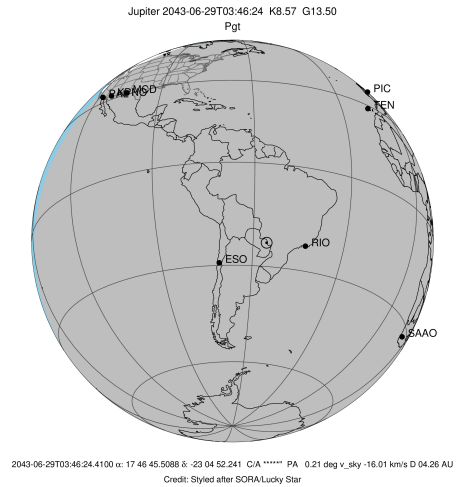


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2043-06-29T02:47:53.348 | 10.71 | -3.05x | 71489.8 | -31.92 | -35.39 |
| Jupiter | E | 2043-06-29T04:53:00.026 | 28.72 | -23.42 | 71489.9 | -30.41 | -33.80 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T03:50:02.330
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      : 4068835996560459392
2Mass ID (if available) : 17464552-2304518
ICRS Star Coord at Epoch: 17h 46m 45.50880s -23:04:52.24098s
RUWE (>1.4 is poor) : 0.92
K magnitude         : 8.567
G magnitude         : 13.498
RP magnitude        : 12.232
BP magnitude        : 15.298
DUPflag            : 0
Distance (au)       : 4.259
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -16.01
Sun-Target sep (deg) : 170.21
Sun-Moon sep (deg)  : 87.98
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.59
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (" ) : 11.941
C/A sky separation (km) : 36882.2
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
    
```

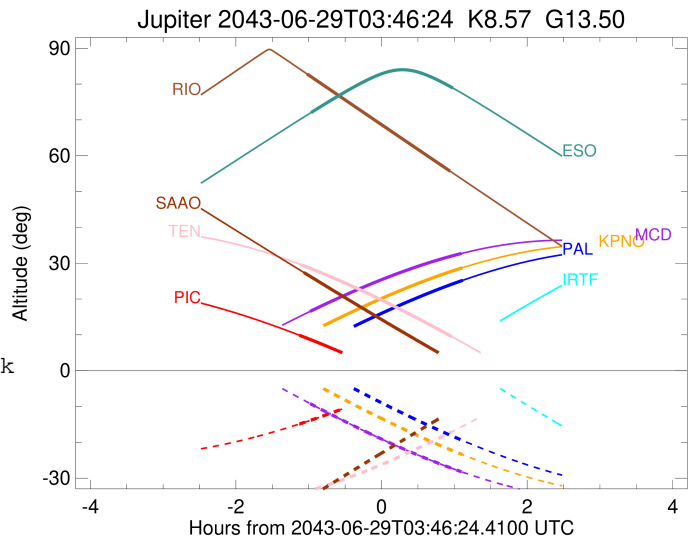
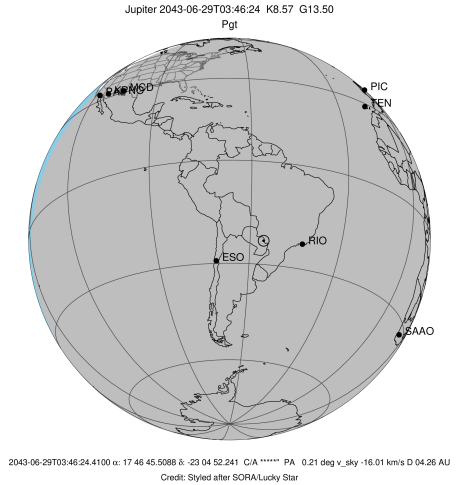


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2043-06-29T02:47:27.301 | 16.53 | -9.16 | 71489.8 | -31.80 | -35.26 |
| Jupiter | E | 2043-06-29T04:52:23.009 | 32.72 | -28.22 | 71490.0 | -30.38 | -33.77 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-29T03:41:42.850
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : TEN
Location              : Teide Obs./Tenerife
Latitude (deg)        : 28.30050
E. Longitude (deg)    : 343.48909
Altitude (km)         : 2.395
Gaia source ID        : 4068835996560459392
2Mass ID (if available) : 17464552-2304518
ICRS Star Coord at Epoch: 17h 46m 45.50880s -23:04:52.24098s
RUWE (>1.4 is poor) : 0.92
K magnitude           : 8.567
G magnitude           : 13.498
RP magnitude          : 12.232
BP magnitude          : 15.298
DUPflag              : 0
Distance (au)         : 4.259
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.01
Sun-Target sep (deg) : 170.21
Sun-Moon sep (deg)   : 87.85
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.59
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 12.100
C/A sky separation (km): 37373.9
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
    
```

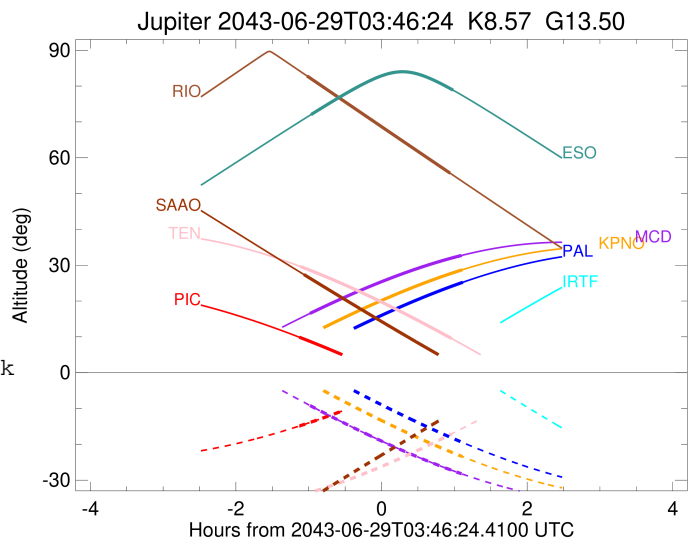
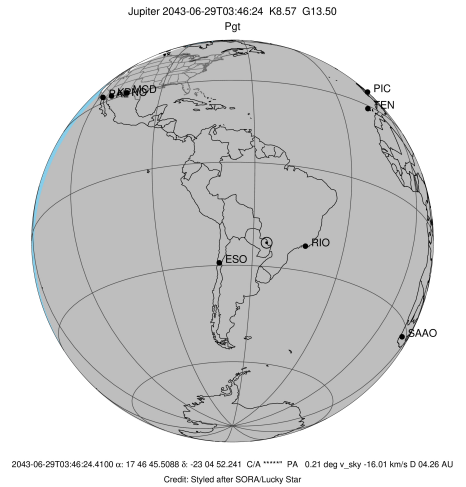


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2043-06-29T02:39:31.765 | 29.63 | -34.23 | 71489.8 | -31.50 | -34.95 |
| Jupiter | E | 2043-06-29T04:44:14.309 | 9.52 | -17.08 | 71489.8 | -31.58 | -35.03 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T03:43:53.320
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      : 4068835996560459392
2Mass ID (if available) : 17464552-2304518
ICRS Star Coord at Epoch: 17h 46m 45.50880s -23:04:52.24098s
RUWE (>1.4 is poor) : 0.92
K magnitude         : 8.567
G magnitude         : 13.498
RP magnitude        : 12.232
BP magnitude        : 15.298
DUPflag            : 0
Distance (au)       : 4.259
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -16.01
Sun-Target sep (deg) : 170.21
Sun-Moon sep (deg)  : 88.44
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.59
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (" ) : 13.510
C/A sky separation (km) : 41729.8
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
    
```

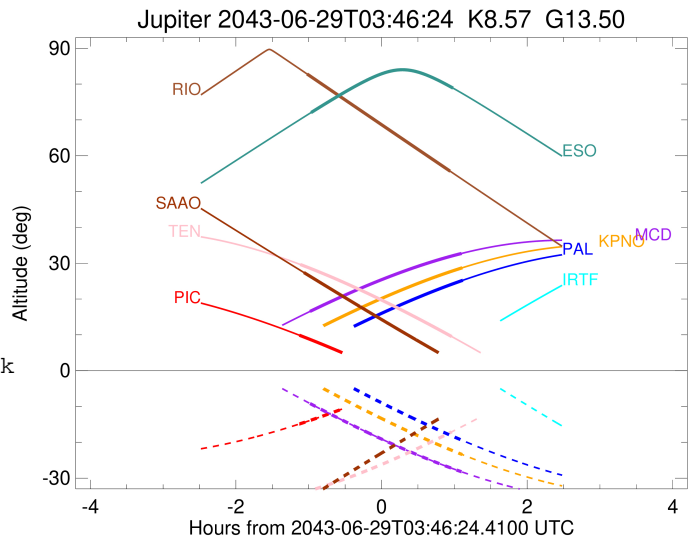
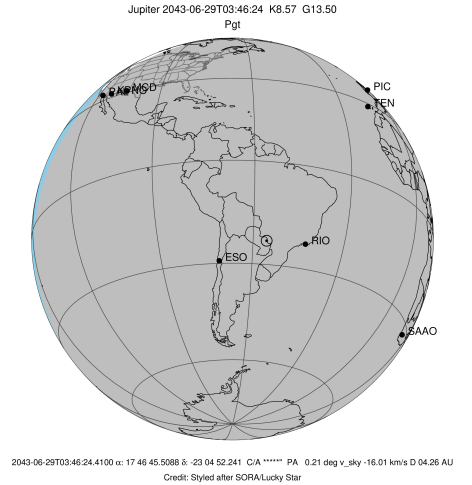


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2043-06-29T02:45:02.988 | 82.81 | -87.37 | 71489.2 | -35.91 | -39.53 |
| Jupiter | E | 2043-06-29T04:42:53.634 | 55.69 | -65.50 | 71489.3 | -35.59 | -39.20 |


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T03:46:51.820
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       : 4068835996560459392
2Mass ID (if available) : 17464552-2304518
ICRS Star Coord at Epoch: 17h 46m 45.50880s -23:04:52.24098s
RUWE (>1.4 is poor) : 0.92
K magnitude          : 8.567
G magnitude           : 13.498
RP magnitude         : 12.232
BP magnitude         : 15.298
DUPflag             : 0
Distance (au)        : 4.259
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.01
Sun-Target sep (deg) : 170.21
Sun-Moon sep (deg)   : 88.51
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.59
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 13.682
C/A sky separation (km) : 42260.6
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
    
```

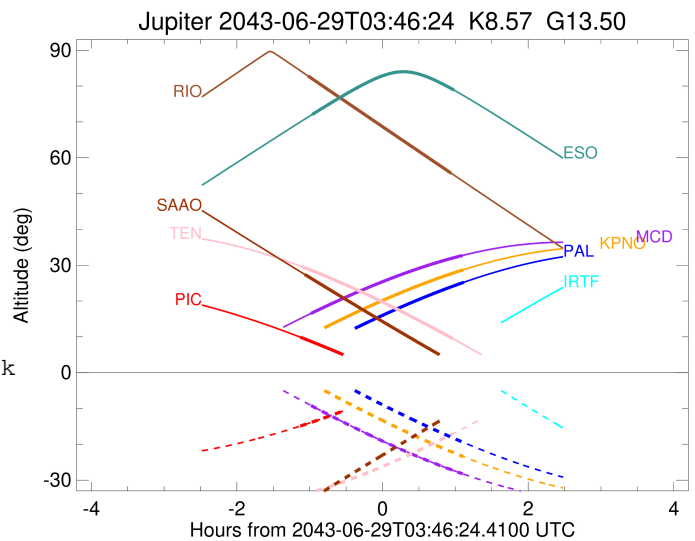
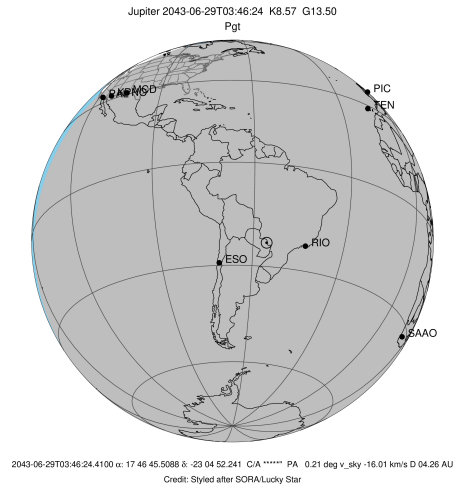


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2043-06-29T02:48:21.541 | 72.04 | -62.97 | 71489.1 | -36.69 | -40.34 |
| Jupiter | E | 2043-06-29T04:45:21.175 | 78.86 | -84.13 | 71489.3 | -35.85 | -39.48 |


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T03:40:22.040
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : SAAO
Location             : So. Afr. Astro. Obs. (Sutherland)
Latitude (deg)       : -32.37953
E. Longitude (deg)   : 20.81070
Altitude (km)        : 1.768
Gaia source ID       : 4068835996560459392
2Mass ID (if available) : 17464552-2304518
ICRS Star Coord at Epoch: 17h 46m 45.50880s -23:04:52.24098s
RUWE (>1.4 is poor) : 0.92
K magnitude          : 8.567
G magnitude          : 13.498
RP magnitude         : 12.232
BP magnitude         : 15.298
DUPflag             : 0
Distance (au)        : 4.259
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.01
Sun-Target sep (deg) : 170.21
Sun-Moon sep (deg)   : 87.75
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.59
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 14.427
C/A sky separation (km): 44562.2
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 | 2043-06-29T02:42:29.256 | 27.39 | -36.31 | 71488.9 | -38.37 | -42.05 |
| Jupiter | E | 2043-06-29T04:38:37.632 | 4.00x | -12.44 | 71488.9 | -38.69 | -42.38 |