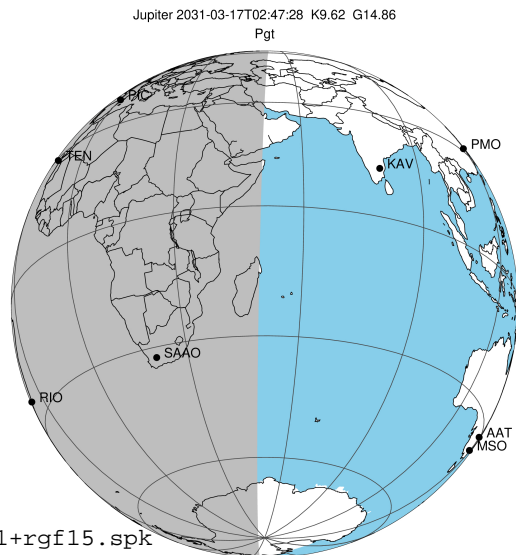


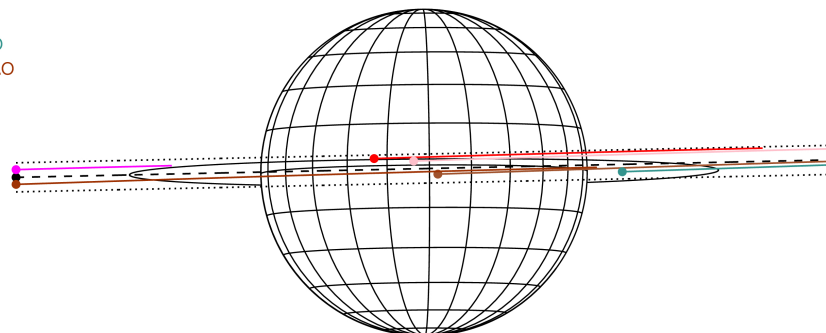
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-03-17T02:47:28.680
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068887677958338944
 2Mass ID (if available) : 17475812-2252149

Jupiter 2031-03-17T02:47:28 K9.62 G14.86 Pgt

ICRS Star Coord at Epoch: 17h 47m 58.12923s -22:52:15.11761s
 RUWE (>1.4 is poor) : 0.91
 K magnitude : 9.625
 G magnitude : 14.861
 RP magnitude : 13.563
 BP magnitude : 16.821
 DUPflag : 0
 Distance (au) : 5.240
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : 13.85
 Sun-Target sep (deg) : 88.65
 Sun-Moon sep (deg) : 10.02
 B (ring opening deg) : -2.63
 PA of pole (deg) : 0.46
 Pole direction: RA (deg): 268.05700
 Dec (deg): 64.49651
 C/A sky separation (") : 0.449
 C/A sky separation (km) : 1704.6
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk



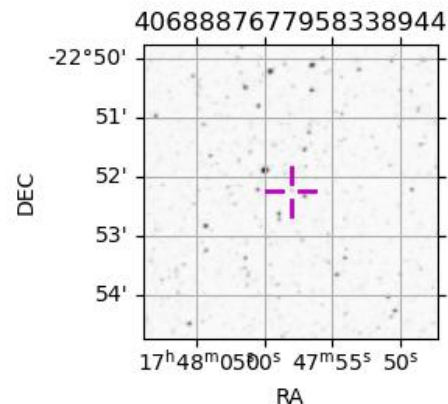
Earth
 PIC
 TEN
 KAV
 RIO
 ESO
 SAAO



2031-03-17T02:47:28.6800 cc: 17 47 58.1292 3: -22 52 15.118 C/A 0.438° PA 181.24 deg v_sky +13.85 km/s D 05.24 AU
 Credit: Styled after SORA/Lucky Star

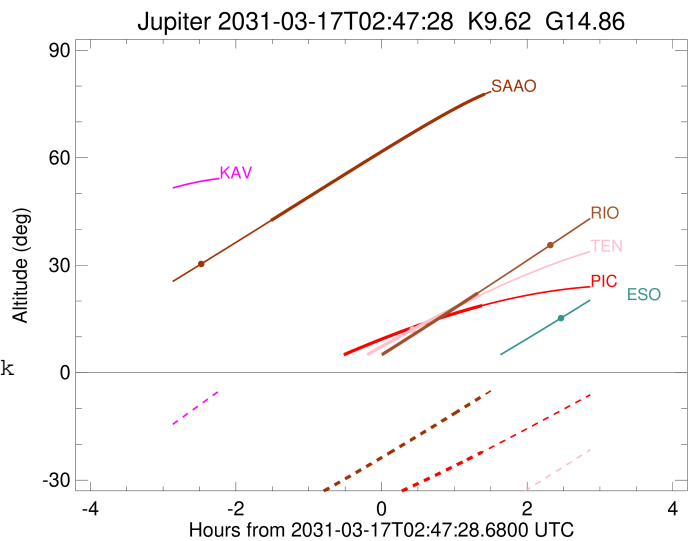
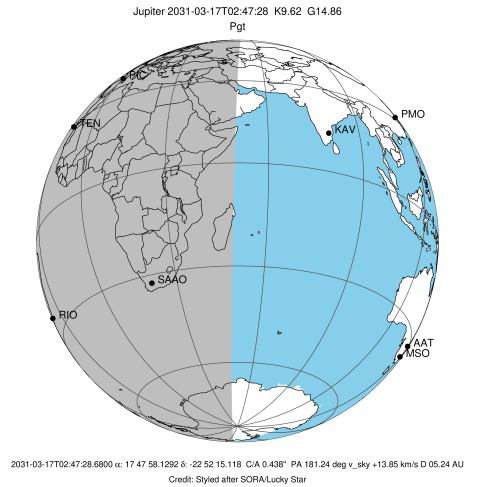
Observable events with sun below -5 deg and altitude above 5 deg

| Obs | Location | lat | Elon | Target | Observed Events Interval | OEncode |
|------|-----------------------------------|-------|-------|--------|-----------------------------|---------|
| PIC | Pic du Midi | 42.9 | 0.1 | + | MAR 17 04:10 - MAR 17 04:10 | Pne |
| PAL | Palomar Mt (200") | 33.4 | 243.1 | | | Pnn |
| PMO | Purple Mtn Obs. Nanking | 32.1 | 118.8 | | | Pnn |
| KPNO | Kitt Peak Natl Obs | 32.0 | 248.4 | | | Pnn |
| MCD | McDonald Obs. 2.7m | 30.7 | 256.0 | | | Pnn |
| TEN | Teide Obs./Tenerife | 28.3 | 343.5 | + | MAR 17 04:08 - MAR 17 04:08 | Pne |
| 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 | + | MAR 17 04:06 - MAR 17 04:06 | Pne |
| ESO | European Southern Obs. (3.6m) | -29.3 | 289.3 | | | Pnn |
| AAT | Siding Spring (AAT) | -31.3 | 149.1 | | | Pnn |
| SAAO | So. Afr. Astro. Obs. (Sutherland) | -32.4 | 20.8 | + | MAR 17 01:16 - MAR 17 04:12 | Pie |
| MSO | Mt. Stromlo Observatory | -35.3 | 149.0 | | | Pnn |



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-17T02:42:51.630
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       : 4068887677958338944
2Mass ID (if available) : 17475812-2252149
ICRS Star Coord at Epoch: 17h 47m 58.12923s -22:52:15.11761s
RUWE (>1.4 is poor) : 0.91
K magnitude          : 9.625
G magnitude          : 14.861
RP magnitude         : 13.563
BP magnitude         : 16.821
DUPflag             : 0
Distance (au)        : 5.240
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 13.85
Sun-Target sep (deg) : 88.65
Sun-Moon sep (deg)  : 10.44
B (ring opening deg) : -2.63
PA of pole (deg)    : 0.46
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (" ) : 1.773
C/A sky separation (km) : 6738.4
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
    
```

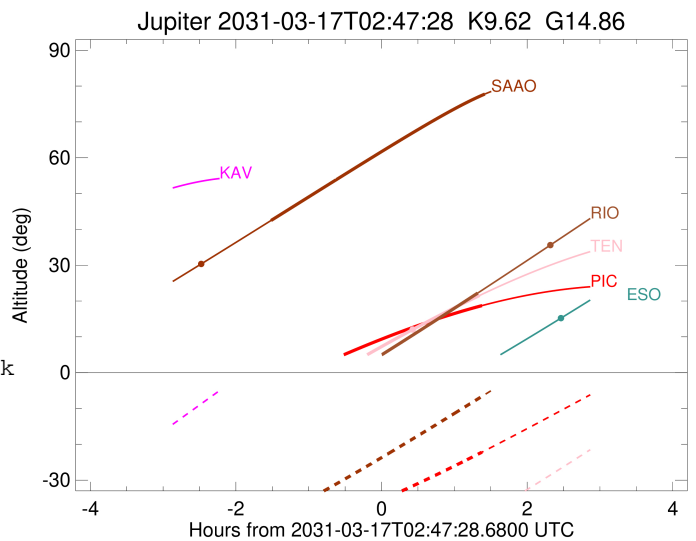
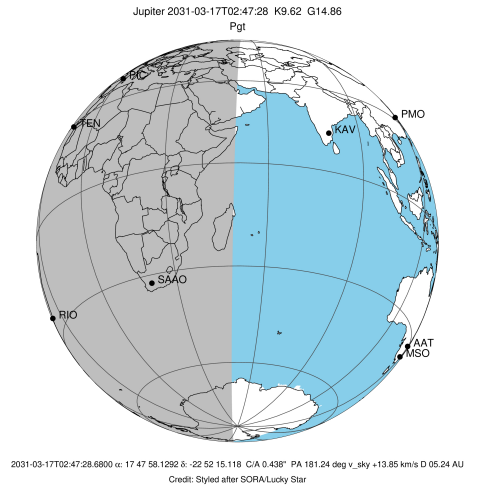


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|--------|---------|---------|---------|--------------|
| Jupiter | I | 2031-03-17T01:16:22.968 | -4.30x | -46.00 | 71492.0 | 4.13 | 4.72 |
| Jupiter | E | 2031-03-17T04:10:11.301 | 18.71 | -22.20 | 71491.9 | 6.55 | 7.48 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-17T02:41:00.540
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        : 4068887677958338944
2Mass ID (if available) : 17475812-2252149
ICRS Star Coord at Epoch: 17h 47m 58.12923s -22:52:15.11761s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 9.625
G magnitude           : 14.861
RP magnitude          : 13.563
BP magnitude          : 16.821
DUPflag              : 0
Distance (au)         : 5.240
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 13.85
Sun-Target sep (deg)  : 88.65
Sun-Moon sep (deg)   : 10.71
B (ring opening deg) : -2.63
PA of pole (deg)     : 0.46
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (") : 1.356
C/A sky separation (km) : 5154.5
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
    
```

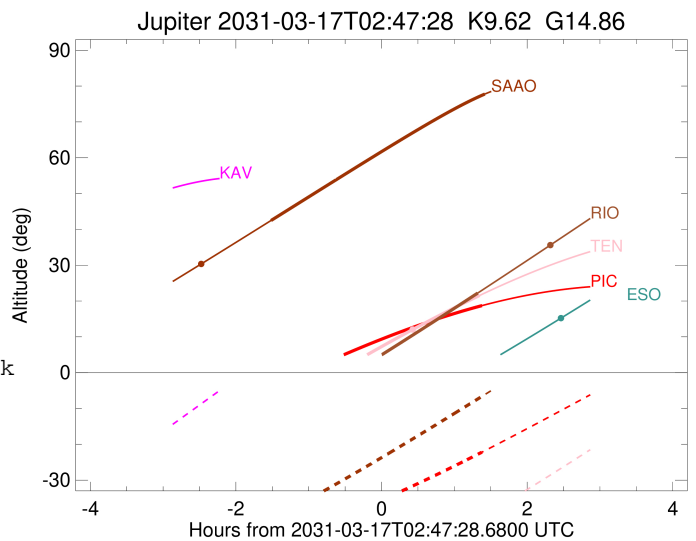
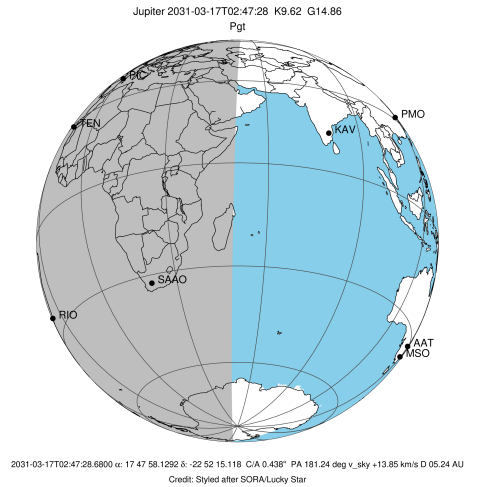


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|---------|---------|---------|---------|--------------|
| Jupiter | I | 2031-03-17T01:14:54.593 | -11.22x | -63.36 | 71492.0 | 2.71 | 3.10 |
| Jupiter | E | 2031-03-17T04:08:13.116 | 21.53 | -40.69 | 71491.9 | 5.48 | 6.26 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-17T02:40:30.850
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       : 4068887677958338944
2Mass ID (if available) : 17475812-2252149
ICRS Star Coord at Epoch: 17h 47m 58.12923s -22:52:15.11761s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 9.625
G magnitude           : 14.861
RP magnitude          : 13.563
BP magnitude          : 16.821
DUPflag              : 0
Distance (au)        : 5.240
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 13.85
Sun-Target sep (deg) : 88.65
Sun-Moon sep (deg)   : 10.99
B (ring opening deg) : -2.63
PA of pole (deg)     : 0.46
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (") : 0.241
C/A sky separation (km) : 914.5
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
    
```

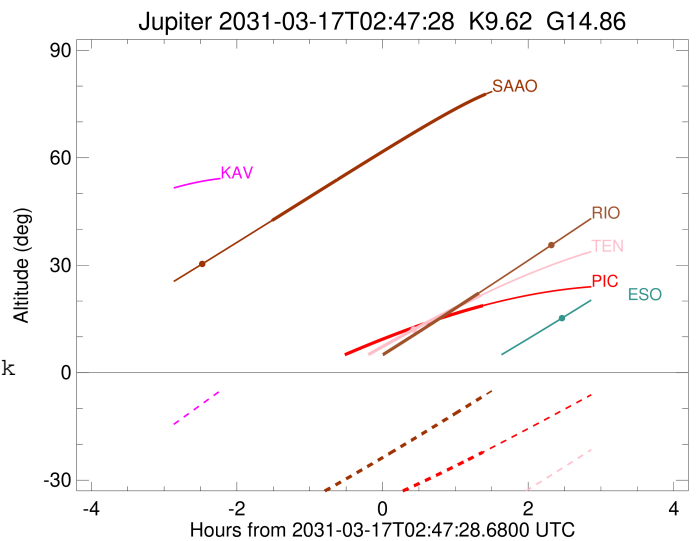
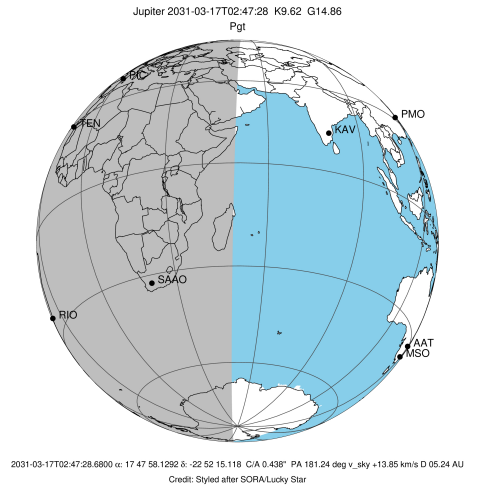


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|---------|---------|---------|---------|--------------|
| Jupiter | I | 2031-03-17T01:15:23.514 | -13.92x | -54.58 | 71492.0 | -2.14 | -2.45 |
| Jupiter | E | 2031-03-17T04:06:47.901 | 22.22 | -61.02 | 71492.0 | 0.72 | 0.83 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-17T02:44:09.070
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        : 4068887677958338944
2Mass ID (if available) : 17475812-2252149
ICRS Star Coord at Epoch: 17h 47m 58.12923s -22:52:15.11761s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 9.625
G magnitude           : 14.861
RP magnitude          : 13.563
BP magnitude          : 16.821
DUPflag              : 0
Distance (au)         : 5.240
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 13.85
Sun-Target sep (deg)  : 88.65
Sun-Moon sep (deg)   : 10.63
B (ring opening deg) : -2.63
PA of pole (deg)     : 0.46
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (") : 0.084
C/A sky separation (km) : 320.5
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 | 2031-03-17T01:16:25.327 | 42.47 | -40.89 | 71492.0 | -0.96 | -1.10 |
| Jupiter | E | 2031-03-17T04:12:35.834 | 77.76 | -6.12 | 71492.0 | 1.27 | 1.45 |