

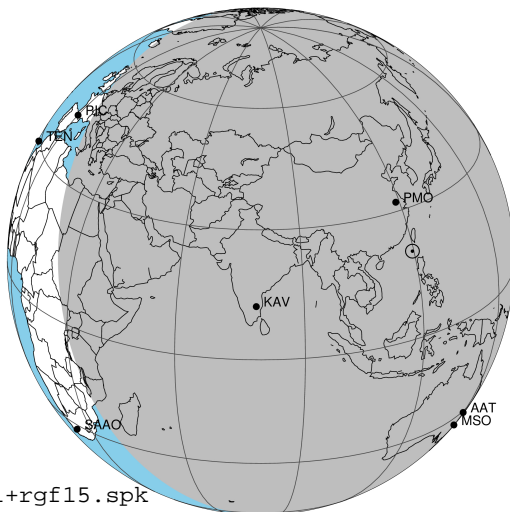
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2049-01-18T16:12:12.740
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 3414766422163725312
 2Mass ID (if available) : 05224394+2249387

Jupiter 2049-01-18T16:12:12 K7.19 G10.83 Pgt

ICRS Star Coord at Epoch: 05h 22m 43.91697s +22:49:38.14087s

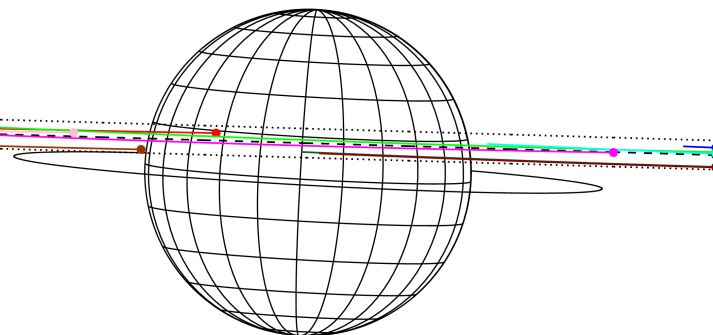
RUWE (>1.4 is poor) : 1.00
 K magnitude : 7.189
 G magnitude : 10.828
 RP magnitude : 9.798
 BP magnitude : 11.927
 DUPflag : 0
 Distance (au) : 4.296
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -11.03
 Sun-Target sep (deg) : 143.10
 Sun-Moon sep (deg) : 32.32
 B (ring opening deg) : 2.49
 PA of pole (deg) : -3.17
 Pole direction: RA (deg): 268.05739
 Dec (deg): 64.49721
 C/A sky separation (") : 4.119
 C/A sky separation (km) : 12833.5
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2049-01-18T16:12:12 K7.19 G10.83
 Pgt



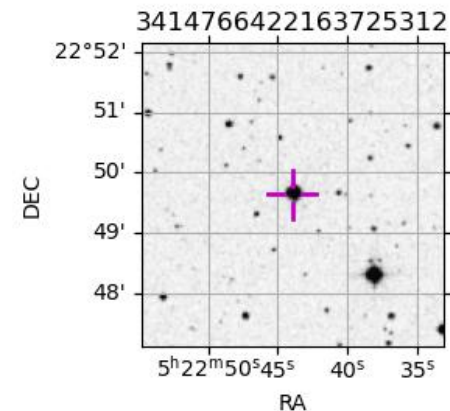
2049-01-18T16:12:12.7400 ex: 05 22 43.9170 s: +22 49 38.141 C/A 4.130° PA 178.33 deg v_sky -11.03 km/s D 04.30 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 PAL
 PMO
 TEN
 IRTF
 KAV
 AAT
 SAAO
 MSO



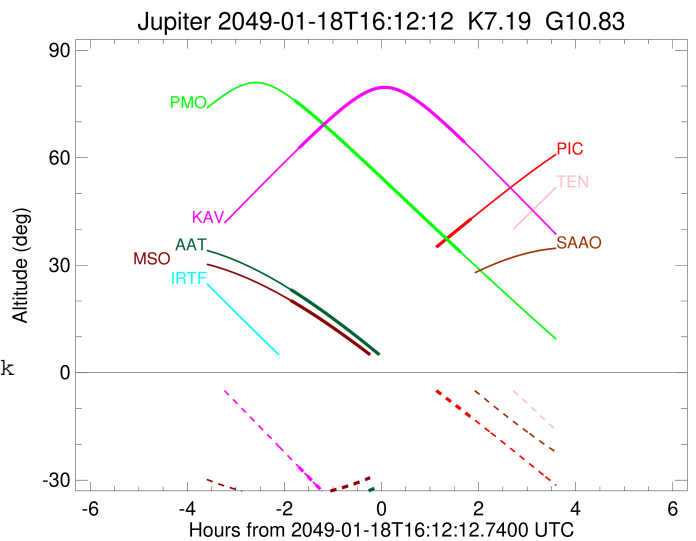
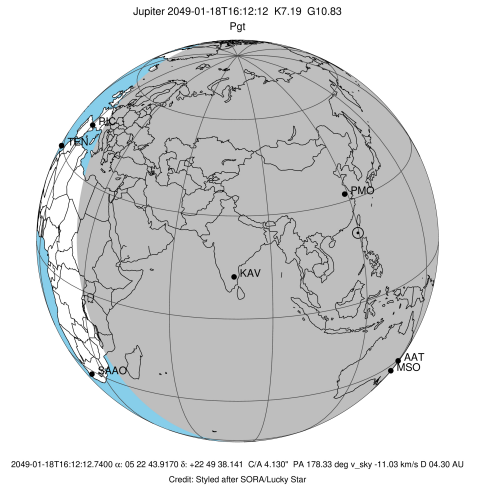
Observable events with sun below -5 deg and altitude above 5 deg

| Obs | Location | lat | Elon | Target | Observed Events Interval | OCode |
|------|-----------------------------------|-------|-------|--------|-----------------------------|-------|
| PIC | Pic du Midi | 42.9 | 0.1 | + | JAN 18 18:03 - JAN 18 18:03 | Pne |
| PAL | Palomar Mt (200") | 33.4 | 243.1 | | | Pnn |
| PMO | Purple Mtn Obs. Nanking | 32.1 | 118.8 | + | JAN 18 14:24 - JAN 18 17:50 | Pie |
| 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 | | | Pnn |
| IRTF | Mauna Kea/IRTF | 19.8 | 204.5 | | | Pnn |
| KAV | Kavalur Observatory | 12.6 | 78.8 | + | JAN 18 14:30 - JAN 18 17:54 | Pie |
| RIO | Rio de Janeiro | -22.9 | 316.8 | | | Pnn |
| ESO | European Southern Obs. (3.6m) | -29.3 | 289.3 | | | Pnn |
| AAT | Siding Spring (AAT) | -31.3 | 149.1 | + | JAN 18 14:19 - JAN 18 14:19 | Pin |
| SAAO | So. Afr. Astro. Obs. (Sutherland) | -32.4 | 20.8 | | | Pnn |
| MSO | Mt. Stromlo Observatory | -35.3 | 149.0 | + | JAN 18 14:20 - JAN 18 14:20 | Pin |



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2049-01-18T16:19:17.210
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       : 3414766422163725312
2Mass ID (if available) : 05224394+2249387
ICRS Star Coord at Epoch: 05h 22m 43.91697s +22:49:38.14087s
RUWE (>1.4 is poor) : 1.00
K magnitude           : 7.189
G magnitude           : 10.828
RP magnitude          : 9.798
BP magnitude          : 11.927
DUPflag              : 0
Distance (au)         : 4.296
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -11.03
Sun-Target sep (deg) : 143.10
Sun-Moon sep (deg)   : 33.07
B (ring opening deg) : 2.49
PA of pole (deg)     : -3.17
Pole direction: RA (deg): 268.05739
Dec (deg): 64.49721
C/A sky separation ("): 5.311
C/A sky separation (km): 16547.3
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
    
```

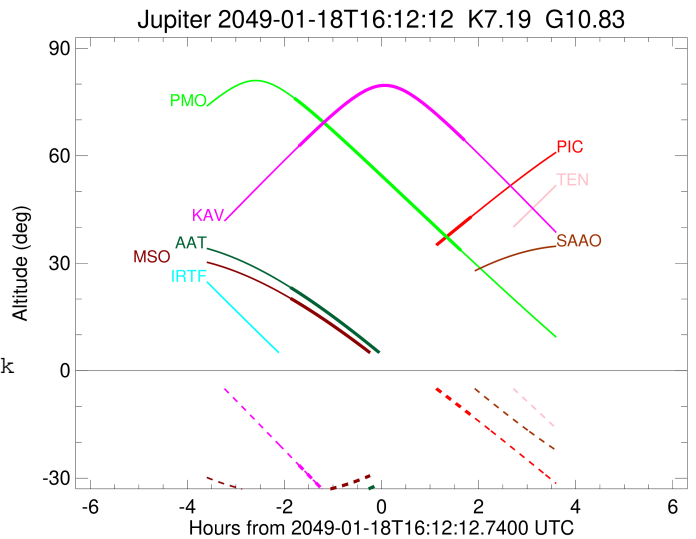
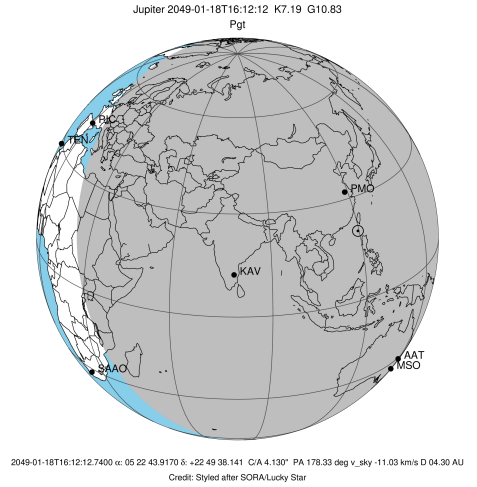


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2049-01-18T14:34:14.804 | 5.57 | 18.66x | 71491.4 | 15.55 | 17.64 |
| Jupiter | E | 2049-01-18T18:03:06.740 | 42.96 | -12.45 | 71491.7 | 11.24 | 12.80 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2049-01-18T16:07:00.230
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : PMO
Location            : Purple Mtn Obs. Nanking
Latitude (deg)     : 32.06667
E. Longitude (deg) : 118.82089
Altitude (km)      : 0.364
Gaia source ID     : 3414766422163725312
2Mass ID (if available) : 05224394+2249387
ICRS Star Coord at Epoch: 05h 22m 43.91697s +22:49:38.14087s
RUWE (>1.4 is poor) : 1.00
K magnitude         : 7.189
G magnitude         : 10.828
RP magnitude        : 9.798
BP magnitude        : 11.927
DUPflag            : 0
Distance (au)      : 4.296
f0 (km)            : 0.00
g0 (km)            : 0.00
skyplane vel. (km/s) : -11.03
Sun-Target sep (deg) : 143.10
Sun-Moon sep (deg) : 32.31
B (ring opening deg) : 2.49
PA of pole (deg)   : -3.17
Pole direction: RA (deg): 268.05739
Dec (deg): 64.49721
C/A sky separation (" ) : 4.555
C/A sky separation (km) : 14192.1
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
    
```

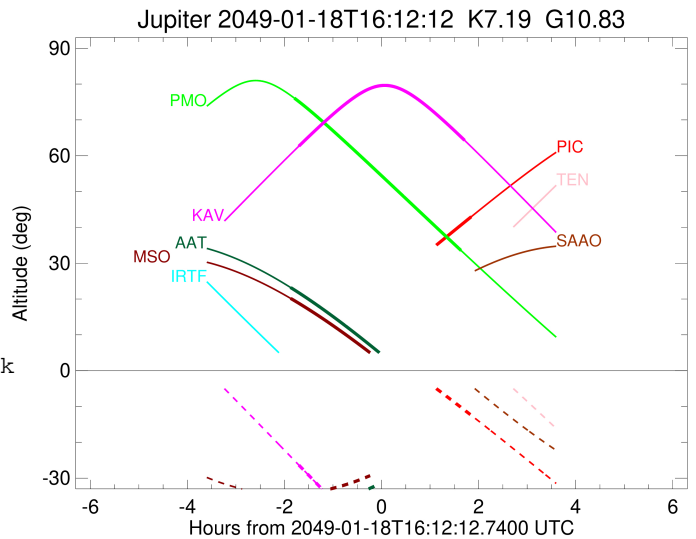
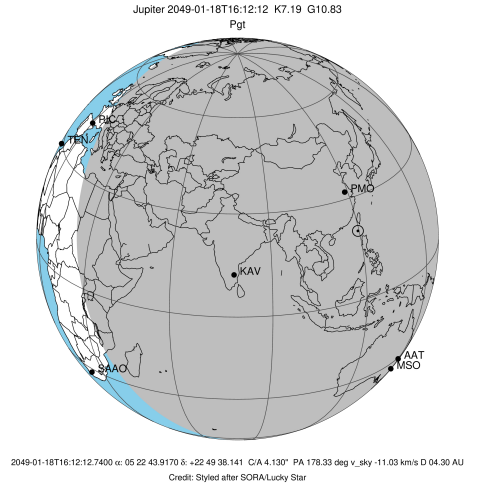


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2049-01-18T14:24:38.939 | 76.04 | -62.77 | 71491.6 | 12.66 | 14.40 |
| Jupiter | E | 2049-01-18T17:50:31.786 | 33.55 | -65.75 | 71491.7 | 10.51 | 11.97 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2049-01-18T16:12:25.860
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : KAV
Location             : Kavalur Observatory
Latitude (deg)       : 12.57556
E. Longitude (deg)   : 78.83167
Altitude (km)        : 0.722
Gaia source ID       : 3414766422163725312
2Mass ID (if available) : 05224394+2249387
ICRS Star Coord at Epoch: 05h 22m 43.91697s +22:49:38.14087s
RUWE (>1.4 is poor) : 1.00
K magnitude           : 7.189
G magnitude           : 10.828
RP magnitude          : 9.798
BP magnitude          : 11.927
DUPflag              : 0
Distance (au)         : 4.296
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -11.03
Sun-Target sep (deg) : 143.10
Sun-Moon sep (deg)   : 32.81
B (ring opening deg) : 2.49
PA of pole (deg)     : -3.17
Pole direction: RA (deg): 268.05739
Dec (deg): 64.49721
C/A sky separation ("): 3.751
C/A sky separation (km): 11688.0
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
    
```

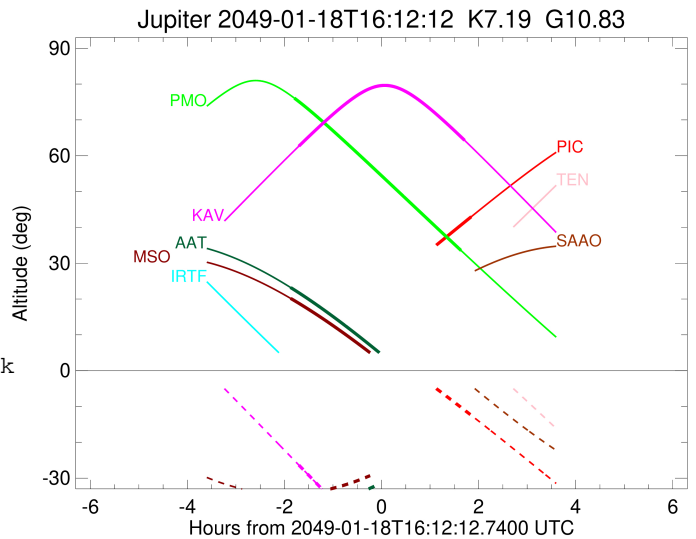
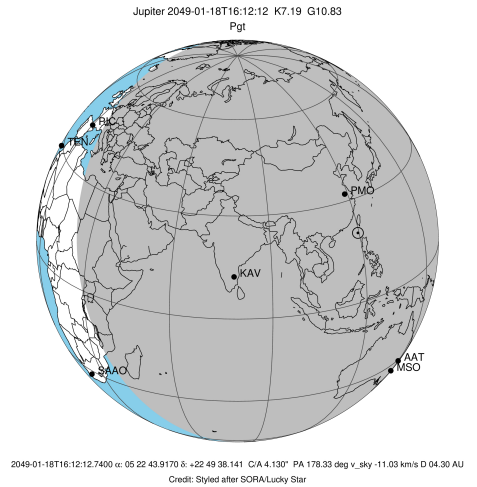


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I | 2049-01-18T14:30:06.443 | 62.67 | -26.37 | 71491.7 | 11.16 | 12.71 |
| Jupiter | E | 2049-01-18T17:54:54.589 | 64.29 | -73.59 | 71491.8 | 8.03 | 9.16 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2049-01-18T16:04:35.000
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      : 3414766422163725312
2Mass ID (if available) : 05224394+2249387
ICRS Star Coord at Epoch: 05h 22m 43.91697s +22:49:38.14087s
RUWE (>1.4 is poor) : 1.00
K magnitude         : 7.189
G magnitude         : 10.828
RP magnitude        : 9.798
BP magnitude        : 11.927
DUPflag            : 0
Distance (au)       : 4.296
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -11.03
Sun-Target sep (deg) : 143.10
Sun-Moon sep (deg)  : 31.74
B (ring opening deg) : 2.49
PA of pole (deg)    : -3.17
Pole direction: RA (deg): 268.05739
Dec (deg): 64.49721
C/A sky separation (" ) : 2.845
C/A sky separation (km) : 8862.6
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
    
```

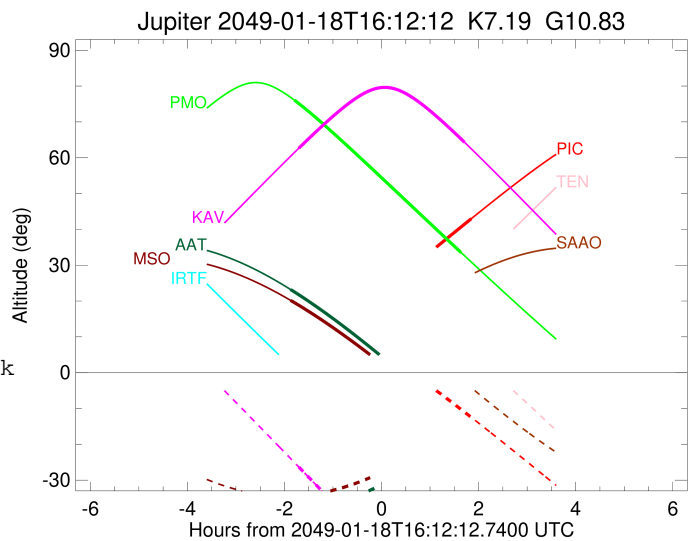
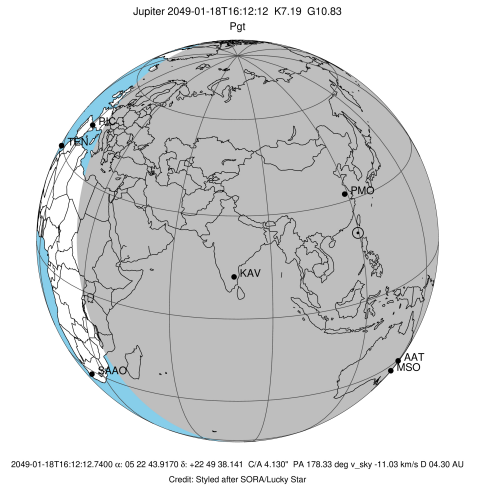


x: target alt < 5.0 deg or sun > -5.0 deg

| Target | I/E | UTC | alt | alt-sun | radius | lat-geo | lat-geodetic |
|---------|-----|-------------------------|---------|---------|---------|---------|--------------|
| Jupiter | I | 2049-01-18T14:19:48.403 | 23.22 | -38.51 | 71491.8 | 8.01 | 9.14 |
| Jupiter | E | 2049-01-18T17:51:09.443 | -14.86x | -16.83 | 71491.9 | 6.39 | 7.29 |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2049-01-18T16:04:56.920
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       : 3414766422163725312
2Mass ID (if available) : 05224394+2249387
ICRS Star Coord at Epoch: 05h 22m 43.91697s +22:49:38.14087s
RUWE (>1.4 is poor) : 1.00
K magnitude           : 7.189
G magnitude           : 10.828
RP magnitude          : 9.798
BP magnitude          : 11.927
DUPflag              : 0
Distance (au)        : 4.296
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -11.03
Sun-Target sep (deg) : 143.10
Sun-Moon sep (deg)   : 31.75
B (ring opening deg) : 2.49
PA of pole (deg)     : -3.17
Pole direction: RA (deg): 268.05739
Dec (deg): 64.49721
C/A sky separation ("): 2.748
C/A sky separation (km): 8561.0
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 | 2049-01-18T14:20:00.930 | 20.16 | -34.48 | 71491.8 | 7.79 | 8.89 |
| Jupiter | E | 2049-01-18T17:51:36.814 | -16.11x | -14.33 | 71491.9 | 6.11 | 6.98 |