

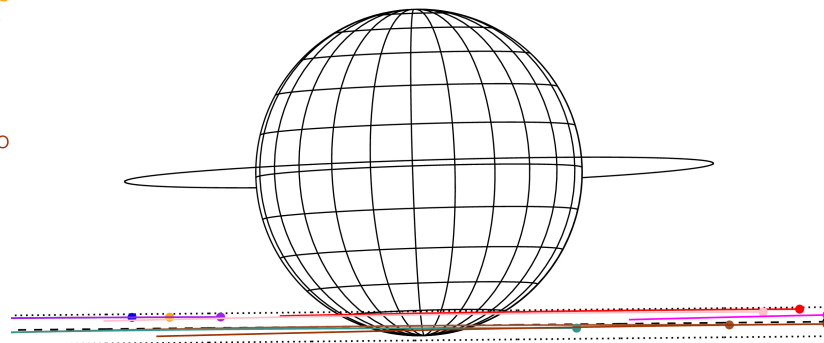
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2043-07-23T00:02:13.430  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4116686884435693440  
 2Mass ID (if available) : 17353659-2303418

Jupiter 2043-07-23T00:02:13 K7.49 G13.08 Pgt

ICRS Star Coord at Epoch: 17h 35m 36.59531s -23°03'41.80112s  
 RUWE (>1.4 is poor) : 0.80  
 K magnitude : 7.489  
 G magnitude : 13.076  
 RP magnitude : 11.682  
 BP magnitude : 15.504  
 DUPflag : 0  
 Distance (au) : 4.391  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -11.13  
 Sun-Target sep (deg) : 144.91  
 Sun-Moon sep (deg) : 45.46  
 B (ring opening deg) : -2.38  
 PA of pole (deg) : 1.79  
 Pole direction: RA (deg): 268.05670  
 Dec (deg): 64.49731  
 C/A sky separation (") : 21.092  
 C/A sky separation (km) : 67174.1  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk  
 URKALLv1.spk  
 naif0012.tls  
 nep097.bsp  
 nep101.bsp  
 sat4401.bsp



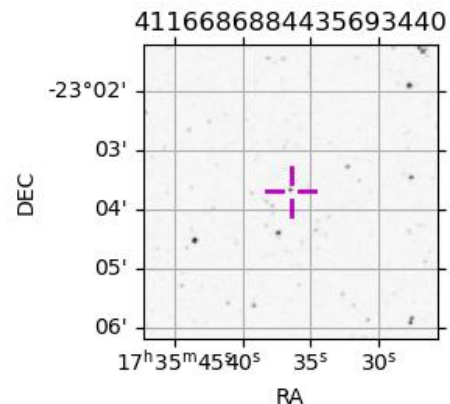
Earth  
 PIC  
 PAL  
 KPNO  
 MCD  
 TEN  
 KAV  
 RIO  
 ESO  
 SAAO



2043-07-23T00:02:13.4300 α: 17 35 36.5953 δ: -23 03 41.801 C/A \*\*\*\*\* PA 0.58 deg v\_sky -11.13 km/s D 04.39 AU  
 Credit: Styled after SORA/Lucky Star

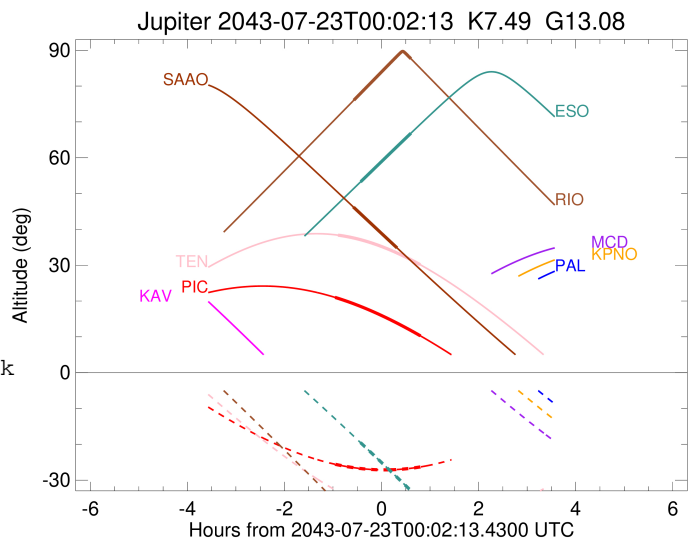
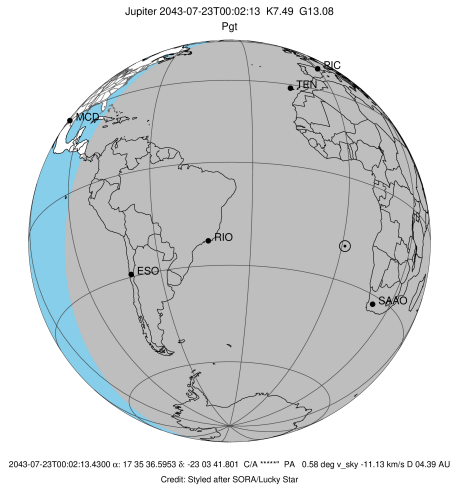
Observable events with sun below -5 deg and altitude above 5 deg

| Obs  | Location                          | lat   | Elon  | Target | Observed Events Interval    | OCode |
|------|-----------------------------------|-------|-------|--------|-----------------------------|-------|
| PIC  | Pic du Midi                       | 42.9  | 0.1   | + +    | JUL 22 23:05 - JUL 23 00:50 | Pie   |
| 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 | + +    | JUL 22 23:08 - JUL 23 00:49 | 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 | + +    | JUL 22 23:28 - JUL 23 00:38 | Pie   |
| ESO  | European Southern Obs. (3.6m)     | -29.3 | 289.3 | + +    | JUL 22 23:36 - JUL 23 00:38 | Pie   |
| AAT  | Siding Spring (AAT)               | -31.3 | 149.1 |        |                             | Pnn   |
| SAAO | So. Afr. Astro. Obs. (Sutherland) | -32.4 | 20.8  | + +    | JUL 22 23:27 - JUL 23 00:21 | Pie   |
| MSO  | Mt. Stromlo Observatory           | -35.3 | 149.0 |        |                             | Pnn   |



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-22T23:57:34.210
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      : 4116686884435693440
2Mass ID (if available) : 17353659-2303418
ICRS Star Coord at Epoch: 17h 35m 36.59531s -23:03:41.80112s
RUWE (>1.4 is poor) : 0.80
K magnitude          : 7.489
G magnitude          : 13.076
RP magnitude         : 11.682
BP magnitude         : 15.504
DUPflag             : 0
Distance (au)       : 4.391
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -11.13
Sun-Target sep (deg) : 144.91
Sun-Moon sep (deg)  : 45.44
B (ring opening deg) : -2.38
PA of pole (deg)    : 1.79
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49731
C/A sky separation (" ) : 19.370
C/A sky separation (km) : 61690.9
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
    
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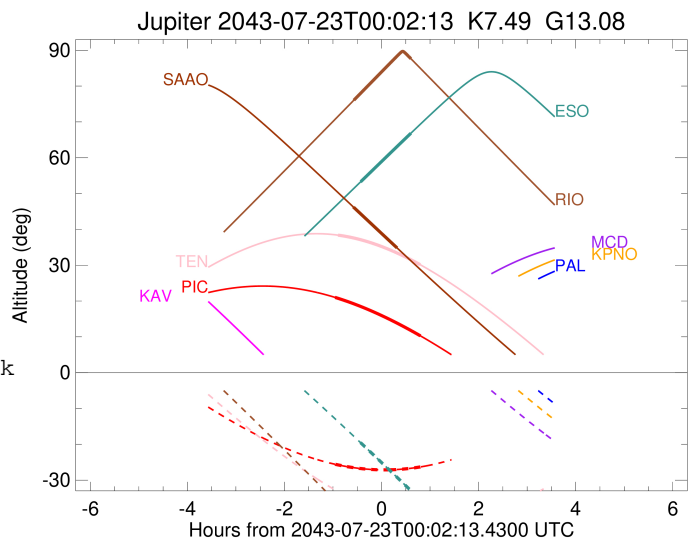
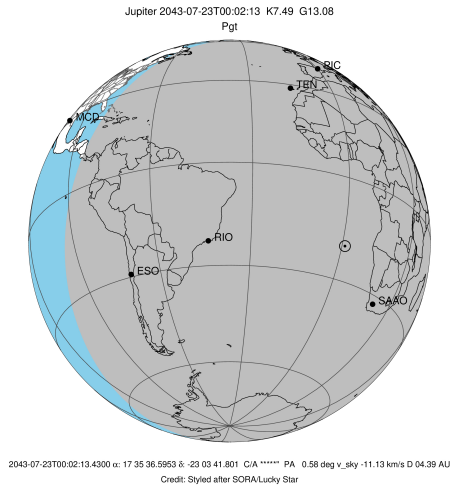


x: target alt < 5.0 deg or sun > -5.0 deg

| Target  | I/E | UTC                     | alt   | alt-sun | radius  | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I   | 2043-07-22T23:05:01.762 | 20.99 | -25.58  | 71486.1 | -60.45  | -63.48       |
| Jupiter | E   | 2043-07-23T00:50:22.673 | 10.27 | -26.31  | 71486.3 | -58.81  | -61.95       |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-22T23:59:03.570
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       : 4116686884435693440
2Mass ID (if available) : 17353659-2303418
ICRS Star Coord at Epoch: 17h 35m 36.59531s -23:03:41.80112s
RUWE (>1.4 is poor) : 0.80
K magnitude           : 7.489
G magnitude           : 13.076
RP magnitude         : 11.682
BP magnitude         : 15.504
DUPflag              : 0
Distance (au)        : 4.391
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -11.13
Sun-Target sep (deg) : 144.91
Sun-Moon sep (deg)  : 45.72
B (ring opening deg) : -2.38
PA of pole (deg)    : 1.79
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49731
C/A sky separation ("): 19.567
C/A sky separation (km): 62318.8
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
    
```

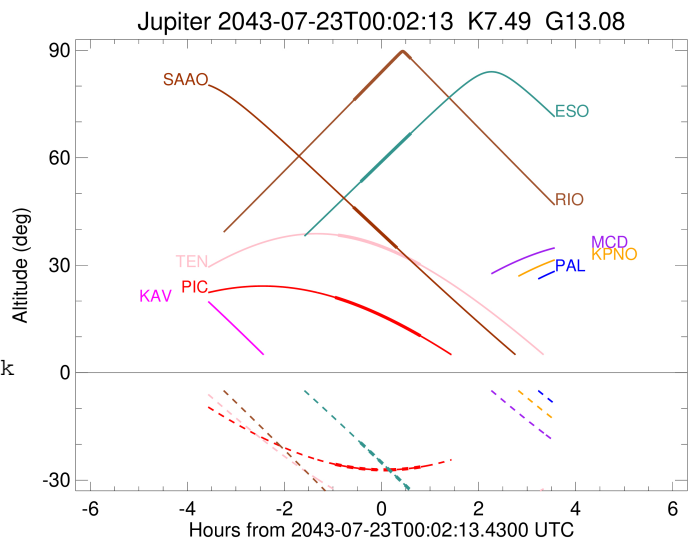
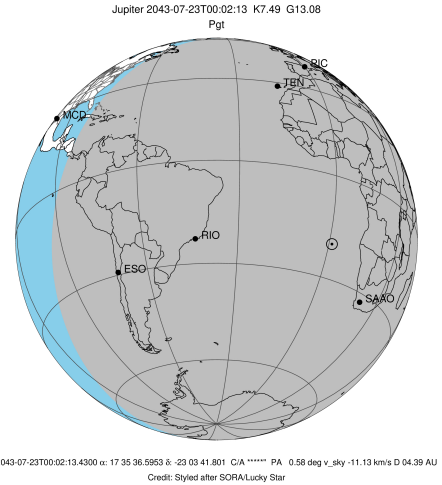


x: target alt < 5.0 deg or sun > -5.0 deg

| Target  | I/E | UTC                     | alt   | alt-sun | radius  | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I   | 2043-07-22T23:08:35.206 | 38.38 | -33.21  | 71486.0 | -61.61  | -64.55       |
| Jupiter | E   | 2043-07-23T00:49:42.684 | 30.18 | -41.44  | 71486.2 | -59.71  | -62.79       |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-23T00:03:22.160
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      : 4116686884435693440
2Mass ID (if available) : 17353659-2303418
ICRS Star Coord at Epoch: 17h 35m 36.59531s -23:03:41.80112s
RUWE (>1.4 is poor) : 0.80
K magnitude          : 7.489
G magnitude          : 13.076
RP magnitude         : 11.682
BP magnitude         : 15.504
DUPflag             : 0
Distance (au)       : 4.391
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -11.13
Sun-Target sep (deg) : 144.91
Sun-Moon sep (deg)  : 46.20
B (ring opening deg) : -2.38
PA of pole (deg)    : 1.79
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49731
C/A sky separation ("): 21.086
C/A sky separation (km) : 67154.9
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
    
```

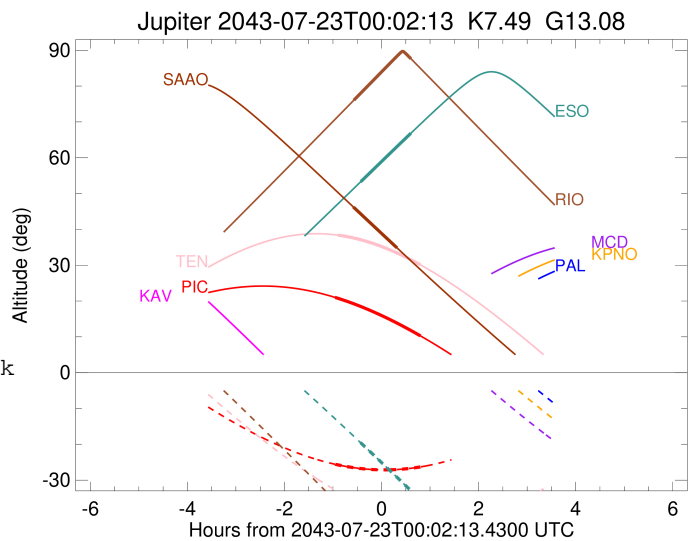
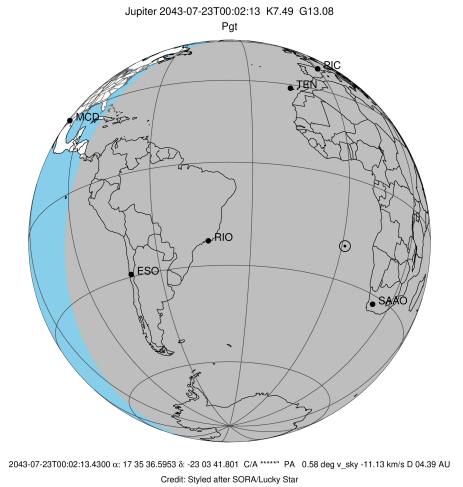


x: target alt < 5.0 deg or sun > -5.0 deg

| Target  | I/E | UTC                     | alt   | alt-sun | radius  | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I   | 2043-07-22T23:28:07.900 | 76.07 | -41.04  | 71485.0 | -71.18  | -73.29       |
| Jupiter | E   | 2043-07-23T00:38:36.314 | 87.63 | -57.22  | 71485.2 | -68.58  | -70.94       |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-23T00:07:30.860
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      : 4116686884435693440
2Mass ID (if available) : 17353659-2303418
ICRS Star Coord at Epoch: 17h 35m 36.59531s -23:03:41.80112s
RUWE (>1.4 is poor) : 0.80
K magnitude          : 7.489
G magnitude          : 13.076
RP magnitude         : 11.682
BP magnitude         : 15.504
DUPflag             : 0
Distance (au)       : 4.391
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -11.13
Sun-Target sep (deg) : 144.91
Sun-Moon sep (deg)  : 46.34
B (ring opening deg) : -2.38
PA of pole (deg)    : 1.79
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49731
C/A sky separation (") : 21.416
C/A sky separation (km) : 68207.8
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
    
```

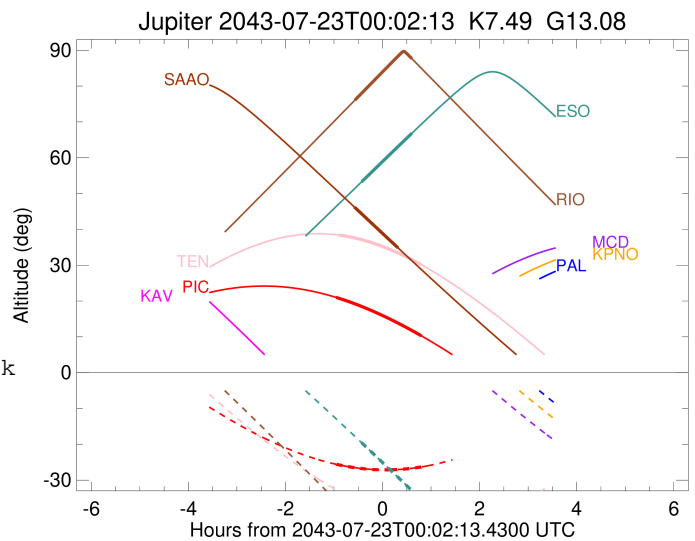
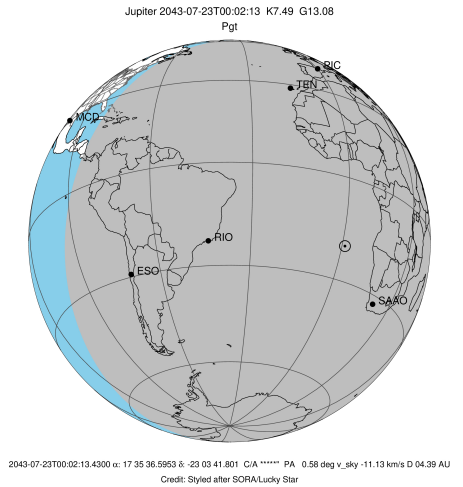


x: target alt < 5.0 deg or sun > -5.0 deg

| Target  | I/E | UTC                     | alt   | alt-sun | radius  | lat-geo | lat-geodetic |
|---------|-----|-------------------------|-------|---------|---------|---------|--------------|
| Jupiter | I   | 2043-07-22T23:36:28.038 | 53.28 | -19.56  | 71484.8 | -74.10  | -75.91       |
| Jupiter | E   | 2043-07-23T00:38:29.650 | 66.82 | -32.91  | 71485.0 | -70.84  | -72.98       |

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-22T23:54:24.360
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       : 4116686884435693440
2Mass ID (if available) : 17353659-2303418
ICRS Star Coord at Epoch: 17h 35m 36.59531s -23:03:41.80112s
RUWE (>1.4 is poor) : 0.80
K magnitude           : 7.489
G magnitude           : 13.076
RP magnitude          : 11.682
BP magnitude          : 15.504
DUPflag              : 0
Distance (au)        : 4.391
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -11.13
Sun-Target sep (deg) : 144.91
Sun-Moon sep (deg)   : 45.38
B (ring opening deg) : -2.38
PA of pole (deg)     : 1.79
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49731
C/A sky separation (") : 21.690
C/A sky separation (km) : 69080.4
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   | 2043-07-22T23:27:31.500 | 46.23 | -74.39  | 71484.7 | -75.50  | -77.16       |
| Jupiter | E   | 2043-07-23T00:21:23.674 | 34.83 | -64.97  | 71484.8 | -74.37  | -76.15       |