

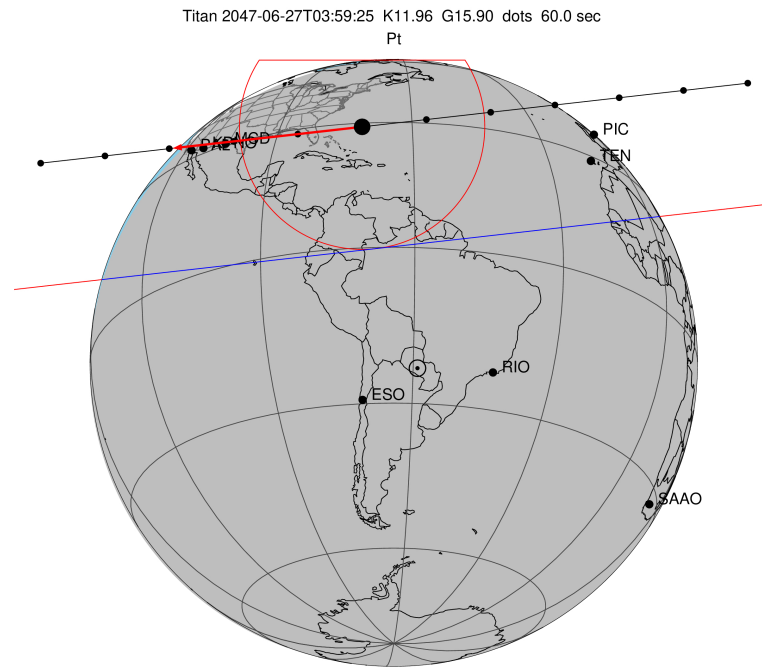
target : Titan
 target radius (km) : 2575.15
 C/A epoch : 2047-06-27T03:59:25.150
 Event type : Pt
 : Titan occs: topocentric, not geocentric
 : Not a ringed target
 Gaia source ID : 4069869782318852352
 2Mass ID (if available) : 18013483-2222587

ICRS Star Coord at Epoch: 18h 01m 34.83158s -22:22:59.02995s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 11.963
 G magnitude : 15.899
 RP magnitude : 14.765
 BP magnitude : 17.195
 DUPflag : 0
 Distance (au) : 9.030
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -22.64
 Sun-Target sep (deg) : 175.42
 Sun-Moon sep (deg) : 131.10
 B (ring opening deg) : 26.42
 PA of pole (deg) : 5.69
 Pole direction: RA (deg): 39.48270
 Dec (deg): 83.42790
 C/A sky separation (") : 0.762
 C/A sky separation (km) : 4990.2
 NAIF SPICE kernels : RAJobs_U111+rgf16.spk

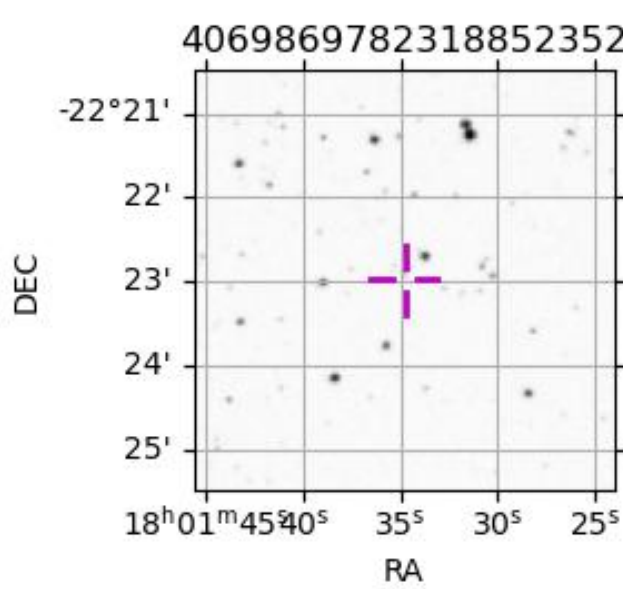
URKALLv1.spk
 naif0012.tls
 nep097.bsp
 nep101.bsp
 sat4401.bsp

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

| Obs | Location | lat | Elon | Target | Observed Events Interval | OEcode |
|------|-----------------------------------|-------|-------|--------|-----------------------------|--------|
| PIC | Pic du Midi | 42.9 | 0.1 | | | Pnn |
| PAL | Palomar Mt (200") | 33.4 | 243.1 | + + | JUN 27 04:00 - JUN 27 04:03 | Pie |
| PMO | Purple Mtn Obs. Nanking | 32.1 | 118.8 | | | Pnn |
| KPNO | Kitt Peak Natl Obs | 32.0 | 248.4 | + + | JUN 27 04:00 - JUN 27 04:03 | Pie |
| MCD | McDonald Obs. 2.7m | 30.7 | 256.0 | + + | JUN 27 03:59 - JUN 27 04:03 | Pie |
| TEN | Teide Obs./Tenerife | 28.3 | 343.5 | + + | JUN 27 03:54 - JUN 27 03:57 | 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 | | | Pnn |
| 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 | | | Pnn |
| MSO | Mt. Stromlo Observatory | -35.3 | 149.0 | | | Pnn |



2047-06-27T03:59:25.1500 cc: 18 01 34.8316 d: -22 22 59.030 C/A 0.764" PA 353.54 deg v_sky -22.64 km/s D 09.03 AU
 Credit: Styled after SORA/Lucky Star



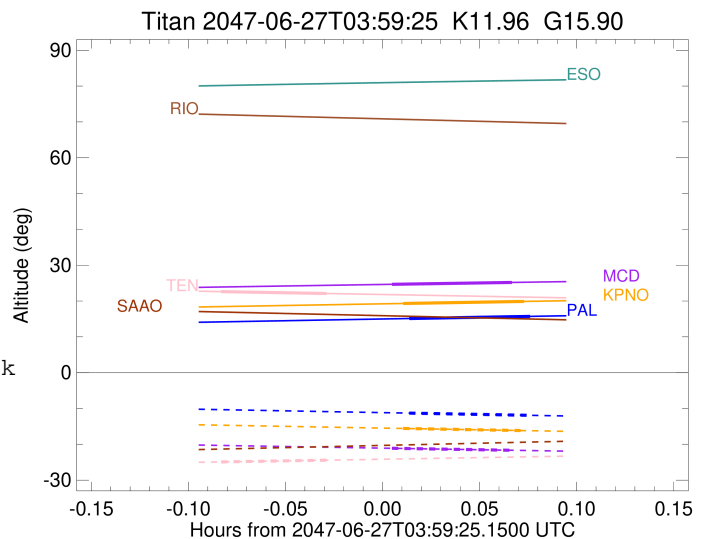
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2047-06-27T04:02:06.880
Event type            : Pt
: Titan occs: topocentric, not geocentric
: 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        : 4069869782318852352
2Mass ID (if available) : 18013483-2222587
ICRS Star Coord at Epoch: 18h 01m 34.83158s -22:22:59.02995s
RUWE (>1.4 is poor) : 1.04
K magnitude           : 11.963
G magnitude           : 15.899
RP magnitude          : 14.765
BP magnitude          : 17.195
DUPflag              : 0
Distance (au)         : 9.030
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -22.64
Sun-Target sep (deg) : 175.42
Sun-Moon sep (deg)   : 131.68
B (ring opening deg) : 26.42
PA of pole (deg)     : 5.69
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (" ) : 0.009
C/A sky separation (km) : 56.3
NAIF SPICE kernels   : RAJobs_U111+rgf16.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
IAU_NEPTUNE_for_RINGFIT.tpc.BECAREFUL
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 |
|--------|-----|-------------------------|-------|---------|--------|---------|--------------|
| Titan | I | 2047-06-27T04:00:14.409 | 15.12 | -11.29 | 2575.1 | -12.18 | -12.18 |
| Titan | E | 2047-06-27T04:03:59.328 | 15.71 | -11.91 | 2575.1 | 9.94 | 9.95 |



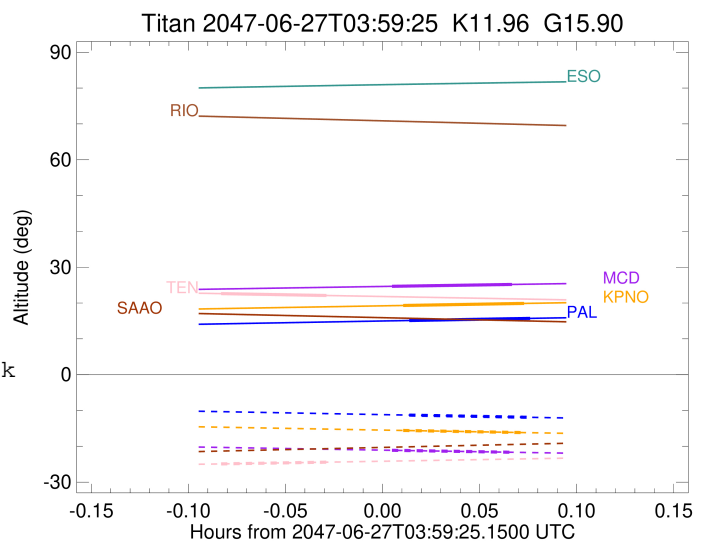
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2047-06-27T04:01:55.540
Event type           : Pt
: Titan occs: topocentric, not geocentric
: 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       : 4069869782318852352
2Mass ID (if available) : 18013483-2222587
ICRS Star Coord at Epoch: 18h 01m 34.83158s -22:22:59.02995s
RUWE (>1.4 is poor) : 1.04
K magnitude           : 11.963
G magnitude           : 15.899
RP magnitude          : 14.765
BP magnitude          : 17.195
DUPflag              : 0
Distance (au)         : 9.030
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -22.64
Sun-Target sep (deg) : 175.42
Sun-Moon sep (deg)   : 131.70
B (ring opening deg) : 26.42
PA of pole (deg)     : 5.69
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.007
C/A sky separation (km) : 43.8
NAIF SPICE kernels   : RAJobs_U111+rgf16.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
IAU_NEPTUNE_for_RINGFIT.tpc.BECAREFUL
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 |
|--------|-----|-------------------------|-------|---------|--------|---------|--------------|
| Titan | I | 2047-06-27T04:00:03.209 | 19.31 | -15.57 | 2575.1 | -11.91 | -11.91 |
| Titan | E | 2047-06-27T04:03:47.857 | 19.88 | -16.17 | 2575.1 | 10.17 | 10.17 |



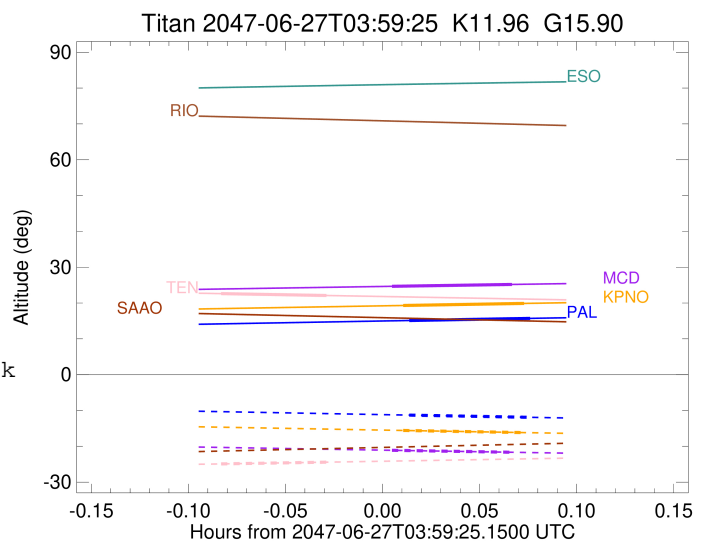
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2047-06-27T04:01:34.520
Event type           : Pt
: Titan occs: topocentric, not geocentric
: 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       : 4069869782318852352
2Mass ID (if available) : 18013483-2222587
ICRS Star Coord at Epoch: 18h 01m 34.83158s -22:22:59.02995s
RUWE (>1.4 is poor) : 1.04
K magnitude           : 11.963
G magnitude           : 15.899
RP magnitude          : 14.765
BP magnitude          : 17.195
DUPflag              : 0
Distance (au)        : 9.030
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -22.64
Sun-Target sep (deg) : 175.42
Sun-Moon sep (deg)   : 131.72
B (ring opening deg) : 26.42
PA of pole (deg)     : 5.69
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.001
C/A sky separation (km) : 8.2
NAIF SPICE kernels   : RAJobs_U111+rgf16.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
IAU_NEPTUNE_for_RINGFIT.tpc.BECAREFUL
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 |
|--------|-----|-------------------------|-------|---------|--------|---------|--------------|
| Titan | I | 2047-06-27T03:59:42.352 | 24.66 | -21.11 | 2575.1 | -11.12 | -11.13 |
| Titan | E | 2047-06-27T04:03:26.668 | 25.18 | -21.66 | 2575.1 | 10.87 | 10.88 |



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2047-06-27T03:56:03.430
Event type           : Pt
: Titan occs: topocentric, not geocentric
: 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       : 4069869782318852352
2Mass ID (if available) : 18013483-2222587
ICRS Star Coord at Epoch: 18h 01m 34.83158s -22:22:59.02995s
RUWE (>1.4 is poor) : 1.04
K magnitude           : 11.963
G magnitude           : 15.899
RP magnitude          : 14.765
BP magnitude          : 17.195
DUPflag              : 0
Distance (au)        : 9.030
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -22.64
Sun-Target sep (deg) : 175.42
Sun-Moon sep (deg)  : 130.93
B (ring opening deg) : 26.42
PA of pole (deg)    : 5.69
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.191
C/A sky separation (km) : 1250.4
NAIF SPICE kernels   : RAJobs_U111+rgf16.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
IAU_NEPTUNE_for_RINGFIT.tpc.BECAREFUL
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 |
|--------|-----|-------------------------|-------|---------|--------|---------|--------------|
| Titan | I | 2047-06-27T03:54:25.131 | 22.62 | -24.91 | 2575.1 | -35.85 | -35.87 |
| Titan | E | 2047-06-27T03:57:41.726 | 22.10 | -24.42 | 2575.2 | -15.41 | -15.42 |

