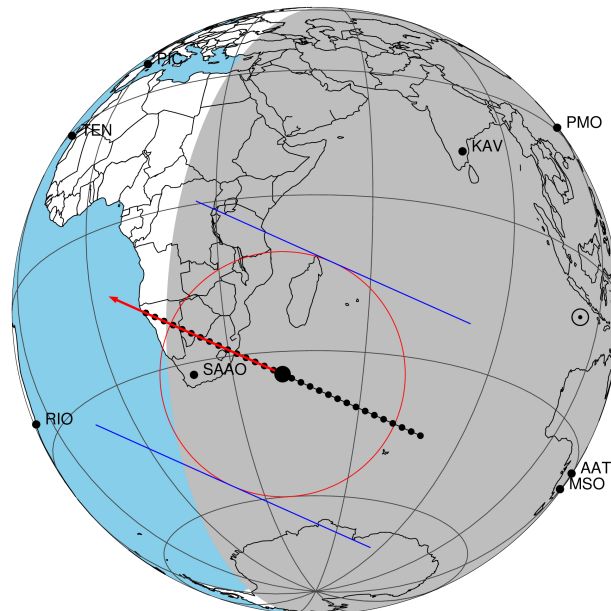


target : Titan
 target radius (km) : 2575.15
 C/A epoch : 2047-08-21T16:34:59.790
 Event type : Pgt
 : Titan occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068974775546670720
 2Mass ID (if available) : 17483688-2227280

Titan 2047-08-21T16:34:59 K12.34 G16.13 dots 60.0 sec
 Pgt

ICRS Star Coord at Epoch: 17h 48m 36.89695s -22:27:28.20170s
 RUWE (>1.4 is poor) : 1.27
 K magnitude : 12.342
 G magnitude : 16.131
 RP magnitude : 15.047
 BP magnitude : 16.844
 DUPflag : 0
 Distance (au) : 9.511
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -3.51
 Sun-Target sep (deg) : 119.46
 Sun-Moon sep (deg) : 115.49
 B (ring opening deg) : 26.79
 PA of pole (deg) : 5.44
 Pole direction: RA (deg): 39.48270
 Dec (deg): 83.42790
 C/A sky separation (") : 0.212
 C/A sky separation (km) : 1461.0
 NAIF SPICE kernels : RAJobs_U111+rgf16.spk

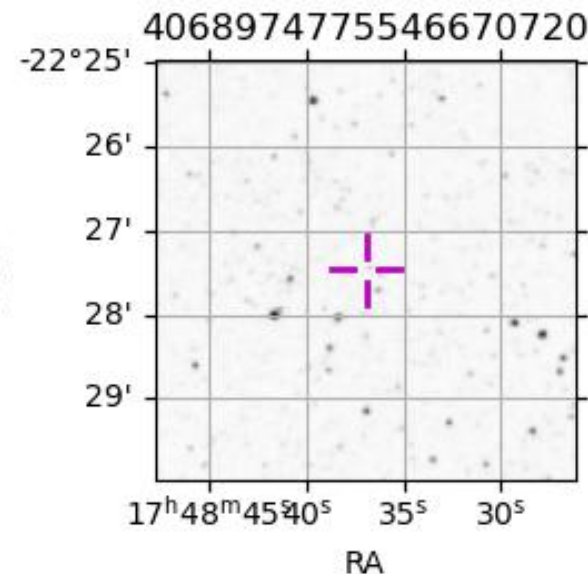


2047-08-21T16:34:59.7900 α: 17 48 36.8970 δ: -22 27 28.202 C/A 0.217" PA 204.11 deg v_sky - 3.51 km/s D 09.51 AU
 Credit: Styled after SORA/Lucky Star

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 | | | | 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 | | | | Pnn |
| 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 | + + | AUG 21 15:54 - AUG 21 16:17 | | Pie |
| SAAO | So. Afr. Astro. Obs. (Sutherland) | -32.4 | 20.8 | + + | AUG 21 16:54 - AUG 21 16:54 | | Pne |
| MSO | Mt. Stromlo Observatory | -35.3 | 149.0 | + + | AUG 21 15:54 - AUG 21 16:17 | | Pie |



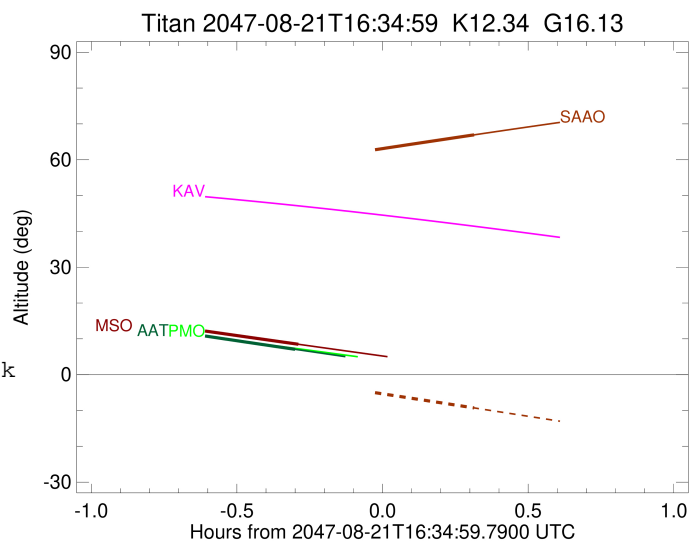
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2047-08-21T16:05:38.200
Event type           : Pgt
: Titan 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       : 4068974775546670720
2Mass ID (if available) : 17483688-2227280
ICRS Star Coord at Epoch: 17h 48m 36.89695s -22:27:28.20170s
RUWE (>1.4 is poor) : 1.27
K magnitude           : 12.342
G magnitude           : 16.131
RP magnitude          : 15.047
BP magnitude          : 16.844
DUPflag              : 0
Distance (au)         : 9.511
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -3.51
Sun-Target sep (deg) : 119.46
Sun-Moon sep (deg)   : 115.21
B (ring opening deg) : 26.79
PA of pole (deg)     : 5.44
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.114
C/A sky separation (km) : 785.5
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

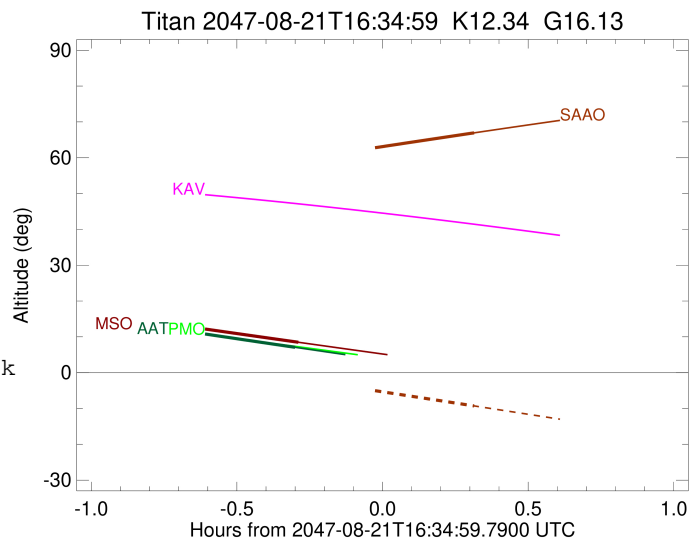
```

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 | 2047-08-21T15:54:20.967 | 11.62 | -58.68 | 2575.1 | 33.73 | 33.75 |
| Titan | E | 2047-08-21T16:17:02.331 | 7.07 | -54.40 | 2575.2 | -2.82 | -2.83 |



target : Titan
 target radius (km) : 2575.15
 C/A epoch : 2047-08-21T16:43:05.990
 Event type : Pgt
 : Titan 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 : 4068974775546670720
 2Mass ID (if available) : 17483688-2227280
 ICRS Star Coord at Epoch: 17h 48m 36.89695s -22:27:28.20170s
 RUWE (>1.4 is poor) : 1.27
 K magnitude : 12.342
 G magnitude : 16.131
 RP magnitude : 15.047
 BP magnitude : 16.844
 DUPflag : 0
 Distance (au) : 9.511
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -3.51
 Sun-Target sep (deg) : 119.46
 Sun-Moon sep (deg) : 116.46
 B (ring opening deg) : 26.79
 PA of pole (deg) : 5.44
 Pole direction: RA (deg): 39.48270
 Dec (deg): 83.42790
 C/A sky separation (") : 0.100
 C/A sky separation (km) : 688.4
 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 | 2047-08-21T16:32:13.184 | 62.53 | -4.77x | 2575.2 | 0.09 | 0.09 |
| Titan | E | 2047-08-21T16:54:00.173 | 66.96 | -9.31 | 2575.1 | -27.54 | -27.55 |

```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2047-08-21T16:05:58.100
Event type            : Pgt
: Titan 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       : 4068974775546670720
2Mass ID (if available) : 17483688-2227280
ICRS Star Coord at Epoch: 17h 48m 36.89695s -22:27:28.20170s
RUWE (>1.4 is poor) : 1.27
K magnitude           : 12.342
G magnitude           : 16.131
RP magnitude          : 15.047
BP magnitude          : 16.844
DUPflag              : 0
Distance (au)        : 9.511
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -3.51
Sun-Target sep (deg) : 119.46
Sun-Moon sep (deg)   : 115.25
B (ring opening deg) : 26.79
PA of pole (deg)     : 5.44
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.054
C/A sky separation (km) : 372.4
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 | 2047-08-21T15:54:14.145 | 13.00 | -56.46 | 2575.1 | 25.58 | 25.59 |
| Titan | E | 2047-08-21T16:17:49.342 | 8.46 | -52.43 | 2575.1 | -11.15 | -11.16 |

