

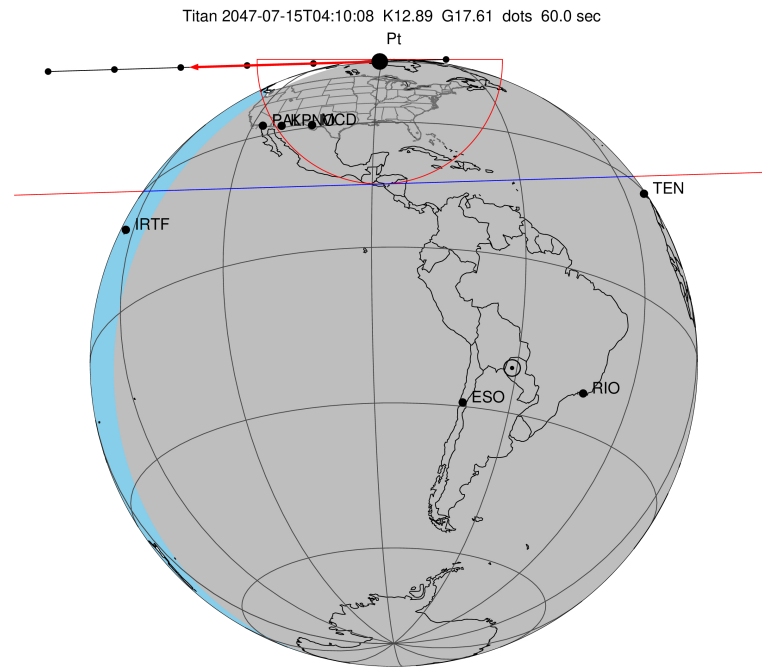
target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2047-07-15T04:10:08.030  
 Event type : Pt  
 : Titan occs: topocentric, not geocentric  
 : Not a ringed target  
 Gaia source ID : 4070197299403940480  
 2Mass ID (if available) : 17555867-2225182

ICRS Star Coord at Epoch: 17h 55m 58.66764s -22:25:18.55054s  
 RUWE (>1.4 is poor) : 0.97  
 K magnitude : 12.895  
 G magnitude : 17.615  
 RP magnitude : 16.311  
 BP magnitude : 19.565  
 DUPflag : 0  
 Distance (au) : 9.095  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -23.21  
 Sun-Target sep (deg) : 157.06  
 Sun-Moon sep (deg) : 114.53  
 B (ring opening deg) : 26.59  
 PA of pole (deg) : 5.59  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.960  
 C/A sky separation (km) : 6333.6  
 NAIF SPICE kernels : RAJobs\_U111+rgf16.spk

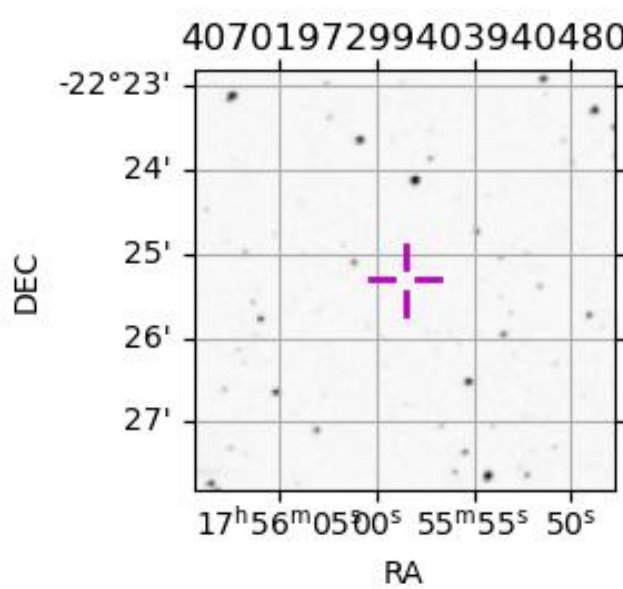
URKALLv1.spk  
 naif0012.tls  
 nep097.bsp  
 nep101.bsp  
 sat4401.bsp

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

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1			Pnn
PAL	Palomar Mt (200")	33.4	243.1	+ +	JUL 15 04:10 - JUL 15 04:13	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JUL 15 04:10 - JUL 15 04:13	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JUL 15 04:09 - JUL 15 04:12	Pie
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			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



2047-07-15T04:10:08.0300 cc: 17 55 58.6676 & -22 25 18.551 C/A 0.961" PA 358.25 deg v\_sky -23.22 km/s D 09.10 AU  
 Credit: Styled after SORA/Lucky Star



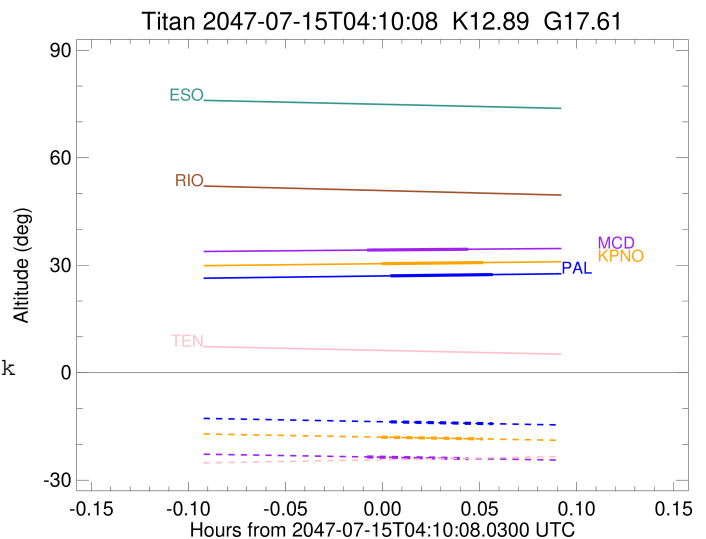
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2047-07-15T04:11:57.470
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        : 4070197299403940480
2Mass ID (if available) : 17555867-2225182
ICRS Star Coord at Epoch: 17h 55m 58.66764s -22:25:18.55054s
RUWE (>1.4 is poor)  : 0.97
K magnitude           : 12.895
G magnitude           : 17.615
RP magnitude          : 16.311
BP magnitude          : 19.565
DUPflag              : 0
Distance (au)         : 9.095
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -23.21
Sun-Target sep (deg)  : 157.06
Sun-Moon sep (deg)    : 114.77
B (ring opening deg) : 26.59
PA of pole (deg)     : 5.59
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.192
C/A sky separation (km) : 1264.9
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	2047-07-15T04:10:22.256	27.02	-13.73	2575.1	-32.48	-32.49
Titan	E	2047-07-15T04:13:32.676	27.38	-14.25	2575.1	-19.52	-19.53



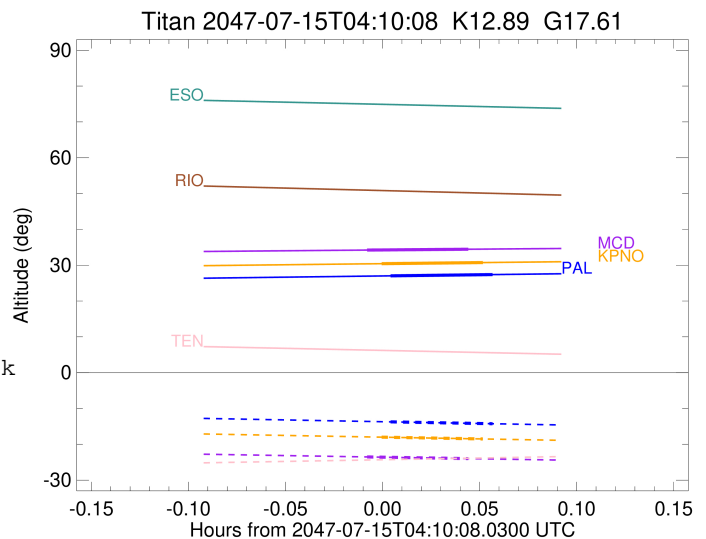
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2047-07-15T04:11:40.630
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       : 4070197299403940480
2Mass ID (if available) : 17555867-2225182
ICRS Star Coord at Epoch: 17h 55m 58.66764s -22:25:18.55054s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 12.895
G magnitude           : 17.615
RP magnitude          : 16.311
BP magnitude          : 19.565
DUPflag              : 0
Distance (au)         : 9.095
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -23.21
Sun-Target sep (deg) : 157.06
Sun-Moon sep (deg)   : 114.84
B (ring opening deg) : 26.59
PA of pole (deg)     : 5.59
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.195
C/A sky separation (km) : 1283.3
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	2047-07-15T04:10:05.952	30.42	-18.00	2575.1	-32.85	-32.87
Titan	E	2047-07-15T04:13:15.307	30.73	-18.51	2575.1	-19.96	-19.97



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2047-07-15T04:11:13.350
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       : 4070197299403940480
2Mass ID (if available) : 17555867-2225182
ICRS Star Coord at Epoch: 17h 55m 58.66764s -22:25:18.55054s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 12.895
G magnitude          : 17.615
RP magnitude         : 16.311
BP magnitude         : 19.565
DUPflag             : 0
Distance (au)        : 9.095
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -23.21
Sun-Target sep (deg) : 157.06
Sun-Moon sep (deg)  : 114.92
B (ring opening deg) : 26.59
PA of pole (deg)    : 5.59
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.196
C/A sky separation (km) : 1292.5
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	2047-07-15T04:09:38.987	34.22	-23.52	2575.1	-33.01	-33.03
Titan	E	2047-07-15T04:12:47.706	34.45	-23.99	2575.1	-20.20	-20.21

