

target : Titan
 target radius (km) : 2575.15
 C/A epoch : 2033-01-03T07:48:45.990
 Event type : Pgt
 : Titan occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 3425018410319421184
 2Mass ID (if available) : 06105144+2227288

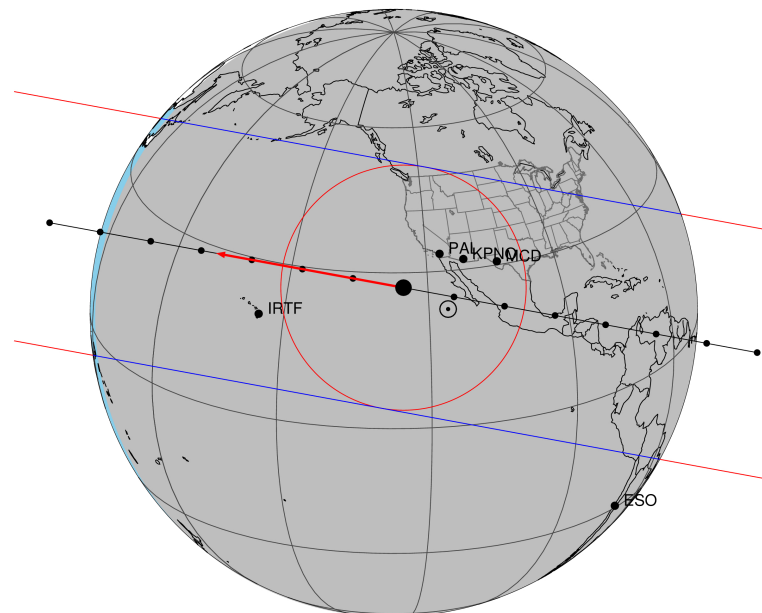
ICRS Star Coord at Epoch: 06h 10m 51.44319s +22:27:28.94847s
 RUWE (>1.4 is poor) : 0.99
 K magnitude : 14.616
 G magnitude : 16.410
 RP magnitude : 15.806
 BP magnitude : 16.834
 DUPflag : 0
 Distance (au) : 8.049
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -17.98
 Sun-Target sep (deg) : 169.68
 Sun-Moon sep (deg) : 144.01
 B (ring opening deg) : -26.28
 PA of pole (deg) : -5.87
 Pole direction: RA (deg): 39.48270
 Dec (deg): 83.42790
 C/A sky separation (") : 0.091
 C/A sky separation (km) : 532.5
 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	+ +	JAN 03 07:45 - JAN 03 07:50	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JAN 03 07:45 - JAN 03 07:49	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JAN 03 07:44 - JAN 03 07:49	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	JAN 03 07:49 - JAN 03 07:53	Pie
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

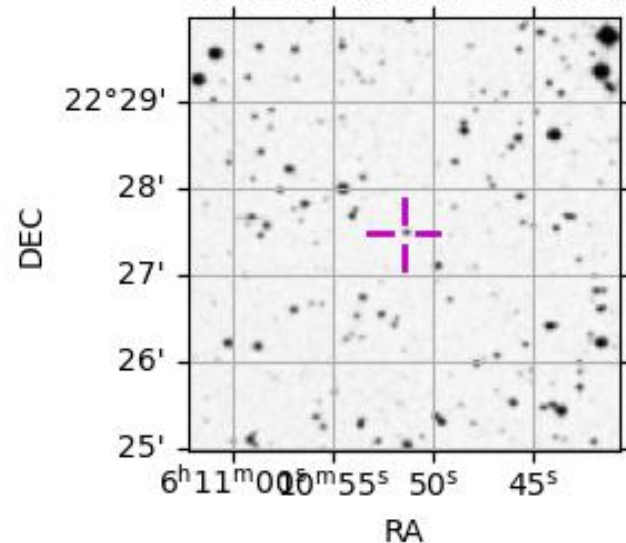
Titan 2033-01-03T07:48:45 K14.62 G16.41 dots 60.0 sec
 Pgt



2033-01-03T07:48:45.9900 cc: 06 10 51.4432 d: +22 27 28.948 C/A 0.095" PA 10.46 deg v_sky -17.98 km/s D 08.05 AU

Credit: Styled after SORA/Lucky Star

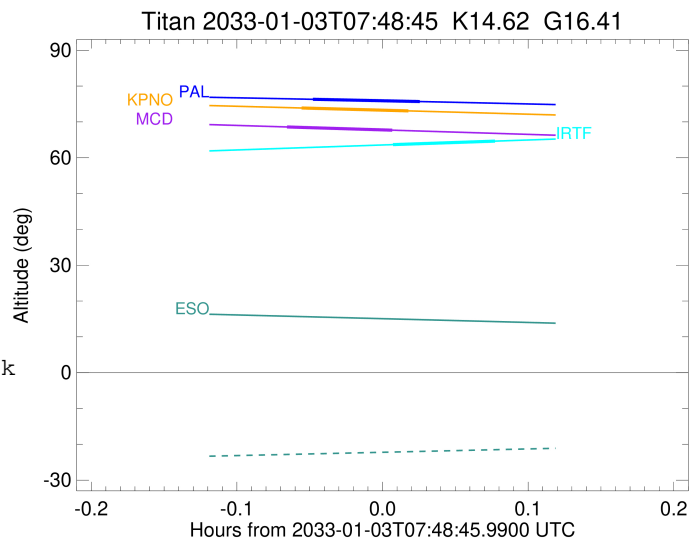
3425018410319421184



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2033-01-03T07:48:06.550
Event type            : Pgt
: Titan occs: geocentric, topocentric
: 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        : 3425018410319421184
2Mass ID (if available) : 06105144+2227288
ICRS Star Coord at Epoch: 06h 10m 51.44319s +22:27:28.94847s
RUWE (>1.4 is poor) : 0.99
K magnitude           : 14.616
G magnitude           : 16.410
RP magnitude          : 15.806
BP magnitude          : 16.834
DUPflag              : 0
Distance (au)         : 8.049
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -17.98
Sun-Target sep (deg)  : 169.68
Sun-Moon sep (deg)   : 144.48
B (ring opening deg) : -26.28
PA of pole (deg)     : -5.87
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.144
C/A sky separation (km) : 840.0
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	2033-01-03T07:45:53.907	76.30	-79.51	2575.1	30.96	30.98
Titan	E	2033-01-03T07:50:19.191	75.67	-79.59	2575.2	2.74	2.75

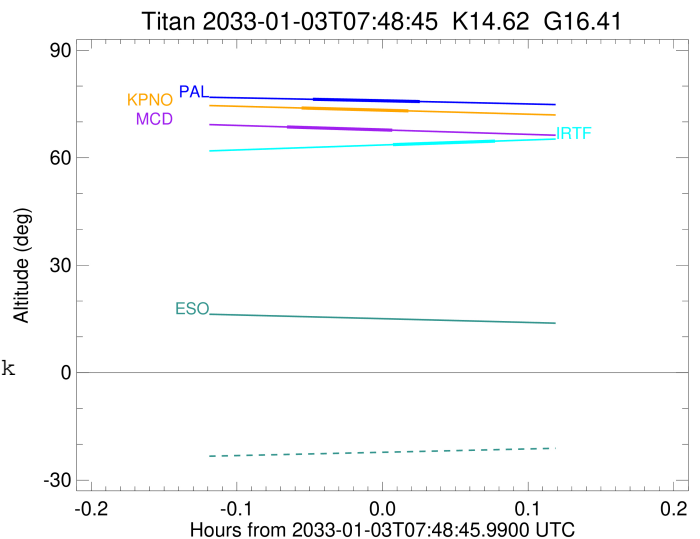
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2033-01-03T07:47:38.650
Event type           : Pgt
: Titan occs: geocentric, topocentric
: 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       : 3425018410319421184
2Mass ID (if available) : 06105144+2227288
ICRS Star Coord at Epoch: 06h 10m 51.44319s +22:27:28.94847s
RUWE (>1.4 is poor) : 0.99
K magnitude           : 14.616
G magnitude           : 16.410
RP magnitude         : 15.806
BP magnitude         : 16.834
DUPflag              : 0
Distance (au)        : 8.049
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -17.98
Sun-Target sep (deg) : 169.68
Sun-Moon sep (deg)   : 144.41
B (ring opening deg) : -26.28
PA of pole (deg)     : -5.87
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.141
C/A sky separation (km) : 821.6
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

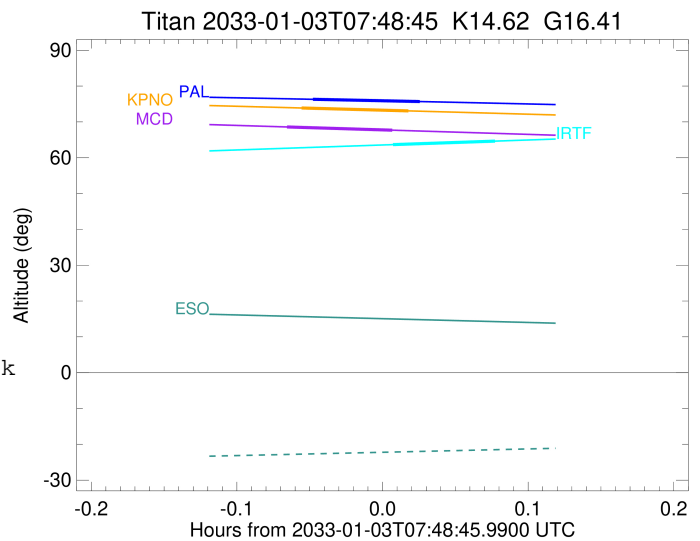
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2033-01-03T07:45:25.622	73.88	-80.43	2575.1	30.56	30.57
Titan	E	2033-01-03T07:49:51.660	73.06	-80.05	2575.2	2.39	2.39



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2033-01-03T07:47:00.250
Event type            : Pgt
: Titan occs: geocentric, topocentric
: 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        : 3425018410319421184
2Mass ID (if available) : 06105144+2227288
ICRS Star Coord at Epoch: 06h 10m 51.44319s +22:27:28.94847s
RUWE (>1.4 is poor) : 0.99
K magnitude           : 14.616
G magnitude           : 16.410
RP magnitude          : 15.806
BP magnitude          : 16.834
DUPflag              : 0
Distance (au)         : 8.049
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -17.98
Sun-Target sep (deg) : 169.68
Sun-Moon sep (deg)   : 144.30
B (ring opening deg) : -26.28
PA of pole (deg)     : -5.87
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.154
C/A sky separation (km) : 897.8
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

```



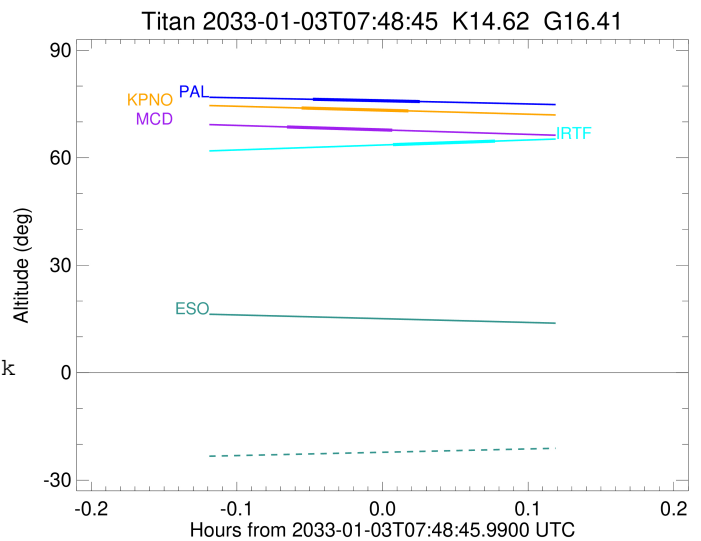
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2033-01-03T07:44:48.586	68.59	-77.47	2575.1	32.05	32.07
Titan	E	2033-01-03T07:49:11.905	67.67	-76.69	2575.2	4.05	4.06

```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2033-01-03T07:51:17.630
Event type           : Pgt
: Titan occs: geocentric, topocentric
: Not a ringed target
Observer code        : IRTF
Location             : Mauna Kea/IRTF
Latitude (deg)       : 19.82622
E. Longitude (deg)   : 204.52800
Altitude (km)        : 4.168
Gaia source ID       : 3425018410319421184
2Mass ID (if available) : 06105144+2227288
ICRS Star Coord at Epoch: 06h 10m 51.44319s +22:27:28.94847s
RUWE (>1.4 is poor) : 0.99
K magnitude           : 14.616
G magnitude           : 16.410
RP magnitude         : 15.806
BP magnitude         : 16.834
DUPflag              : 0
Distance (au)        : 8.049
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -17.98
Sun-Target sep (deg) : 169.68
Sun-Moon sep (deg)   : 144.89
B (ring opening deg) : -26.28
PA of pole (deg)     : -5.87
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.186
C/A sky separation (km) : 1088.4
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	2033-01-03T07:49:10.635	63.65	-53.34	2575.2	-7.80	-7.80
Titan	E	2033-01-03T07:53:24.592	64.63	-54.31	2575.1	-36.27	-36.29