

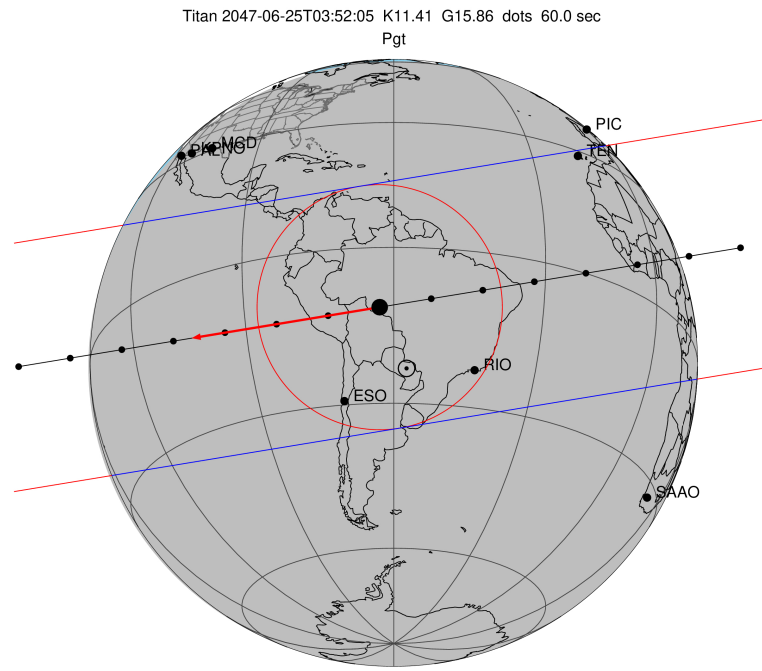
target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2047-06-25T03:52:05.010  
 Event type : Pgt  
 : Titan occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4069867652015016960  
 2Mass ID (if available) : 18021350-2221416

ICRS Star Coord at Epoch: 18h 02m 13.50106s -22:21:41.73419s  
 RUWE (>1.4 is poor) : 0.94  
 K magnitude : 11.406  
 G magnitude : 15.857  
 RP magnitude : 14.598  
 BP magnitude : 17.603  
 DUPflag : 0  
 Distance (au) : 9.034  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -18.29  
 Sun-Target sep (deg) : 177.38  
 Sun-Moon sep (deg) : 157.47  
 B (ring opening deg) : 26.39  
 PA of pole (deg) : 5.70  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.181  
 C/A sky separation (km) : 1184.8  
 NAIF SPICE kernels : RAJobs\_U111+rgf16.spk

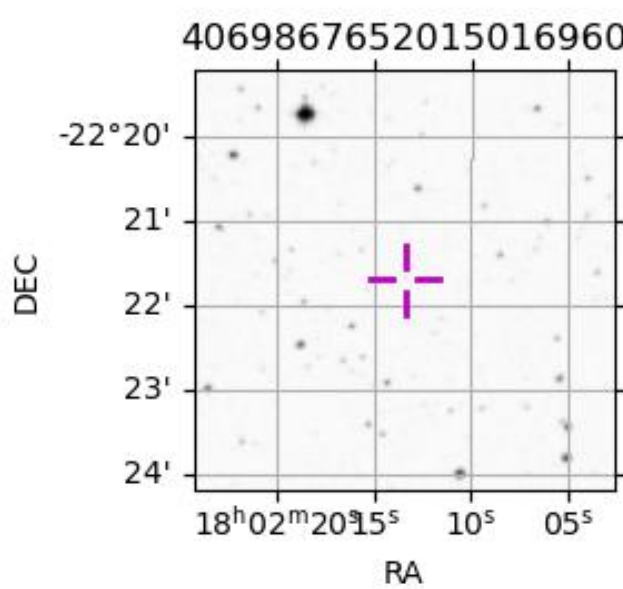
URKALLv1.spk  
 naif0012.tls  
 nep097.bsp  
 nep101.bsp  
 sat4401.bsp

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			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	+ +	JUN 25 03:47 - JUN 25 03:48	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	+ +	JUN 25 03:48 - JUN 25 03:52	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUN 25 03:51 - JUN 25 03:54	Pie
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 2047-06-25T03:52:05 K11.41 G15.86 dots 60.0 sec  
 Pgt  
 2047-06-25T03:52:05.0100 cc: 18 02 13.50111 & -22 21 41.734 C/A 0.183" PA 350.62 deg v\_sky -18.29 km/s D 09.03 AU  
 Credit: Styled after SORA/Lucky Star



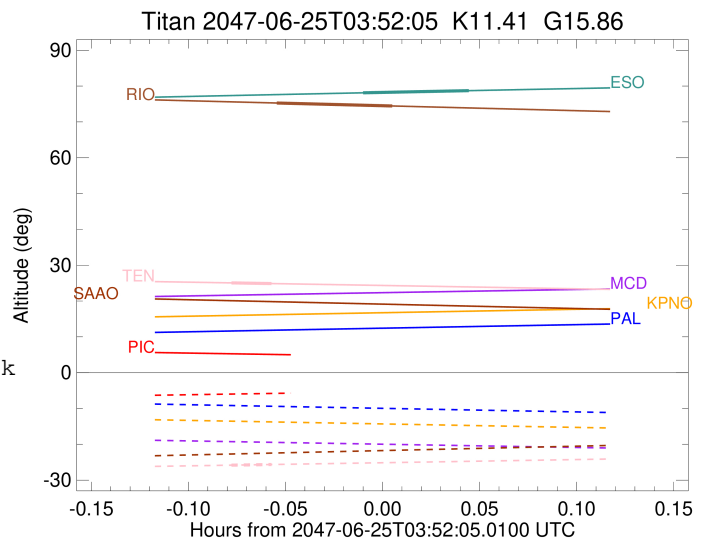
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target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2047-06-25T03:48:01.450
Event type            : Pgt
: Titan occs: geocentric, topocentric
: Not a ringed target
Observer code         : TEN
Location              : Teide Obs./Tenerife
Latitude (deg)        : 28.30050
E. Longitude (deg)    : 343.48909
Altitude (km)         : 2.395
Gaia source ID        : 4069867652015016960
2Mass ID (if available) : 18021350-2221416
ICRS Star Coord at Epoch: 18h 02m 13.50106s -22:21:41.73419s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 11.406
G magnitude           : 15.857
RP magnitude          : 14.598
BP magnitude          : 17.603
DUPflag              : 0
Distance (au)         : 9.034
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -18.29
Sun-Target sep (deg)  : 177.38
Sun-Moon sep (deg)    : 157.09
B (ring opening deg) : 26.39
PA of pole (deg)     : 5.70
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (" ) : 0.378
C/A sky separation (km) : 2474.9
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

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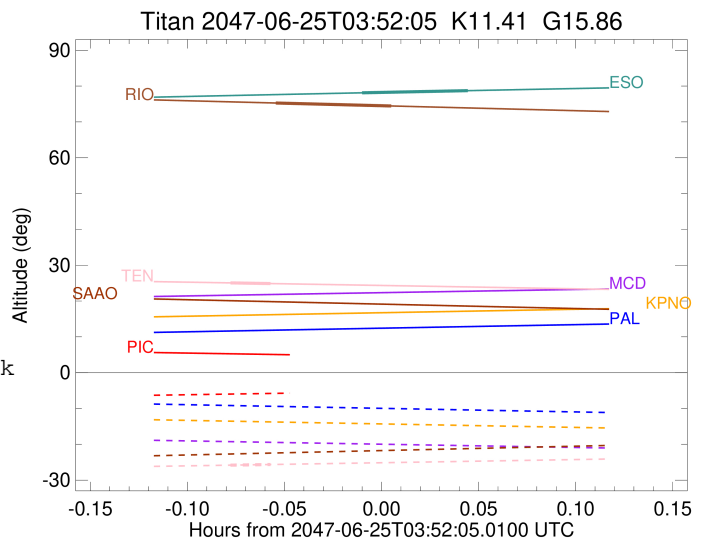
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2047-06-25T03:47:23.139	25.06	-25.82	2575.1	50.44	50.45
Titan	E	2047-06-25T03:48:39.760	24.87	-25.64	2575.1	63.57	63.59



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target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2047-06-25T03:50:36.210
Event type            : Pgt
: Titan 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        : 4069867652015016960
2Mass ID (if available) : 18021350-2221416
ICRS Star Coord at Epoch: 18h 02m 13.50106s -22:21:41.73419s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 11.406
G magnitude           : 15.857
RP magnitude          : 14.598
BP magnitude          : 17.603
DUPflag              : 0
Distance (au)         : 9.034
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -18.29
Sun-Target sep (deg) : 177.38
Sun-Moon sep (deg)   : 157.58
B (ring opening deg) : 26.39
PA of pole (deg)     : 5.70
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (" ) : 0.244
C/A sky separation (km) : 1596.5
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
    
```

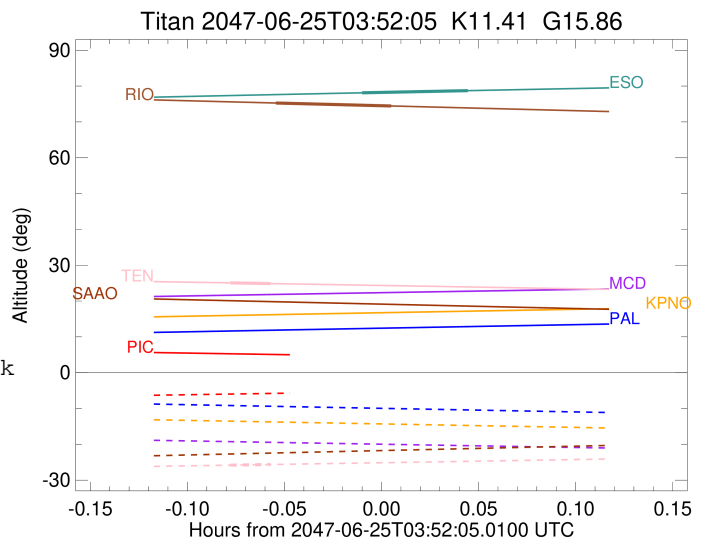


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2047-06-25T03:48:48.063	75.27	-77.72	2575.1	-45.70	-45.71
Titan	E	2047-06-25T03:52:24.350	74.43	-76.89	2575.2	-21.02	-21.03

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target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2047-06-25T03:53:06.590
Event type          : Pgt
                    : Titan 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      : 4069867652015016960
2Mass ID (if available) : 18021350-2221416
ICRS Star Coord at Epoch: 18h 02m 13.50106s -22:21:41.73419s
RUWE (>1.4 is poor) : 0.94
K magnitude          : 11.406
G magnitude          : 15.857
RP magnitude         : 14.598
BP magnitude         : 17.603
DUPflag             : 0
Distance (au)       : 9.034
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -18.29
Sun-Target sep (deg) : 177.38
Sun-Moon sep (deg)  : 157.95
B (ring opening deg) : 26.39
PA of pole (deg)    : 5.70
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (" ) : 0.273
C/A sky separation (km) : 1787.4
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

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Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2047-06-25T03:51:27.387	78.11	-76.62	2575.1	-50.09	-50.10
Titan	E	2047-06-25T03:54:45.774	78.72	-77.28	2575.2	-25.76	-25.77