

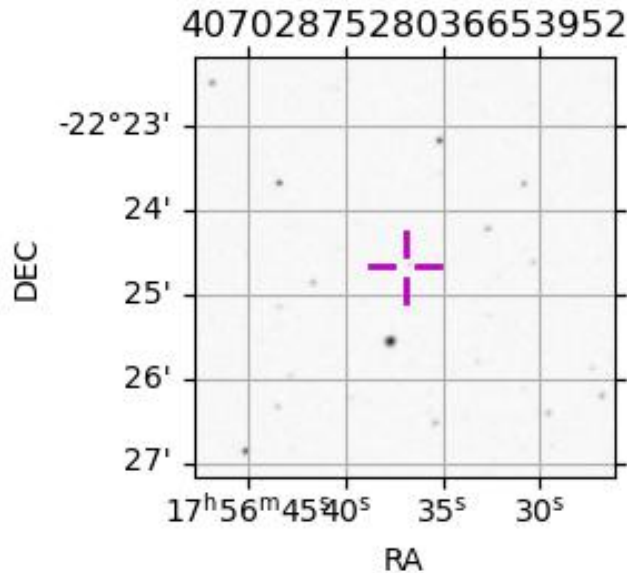
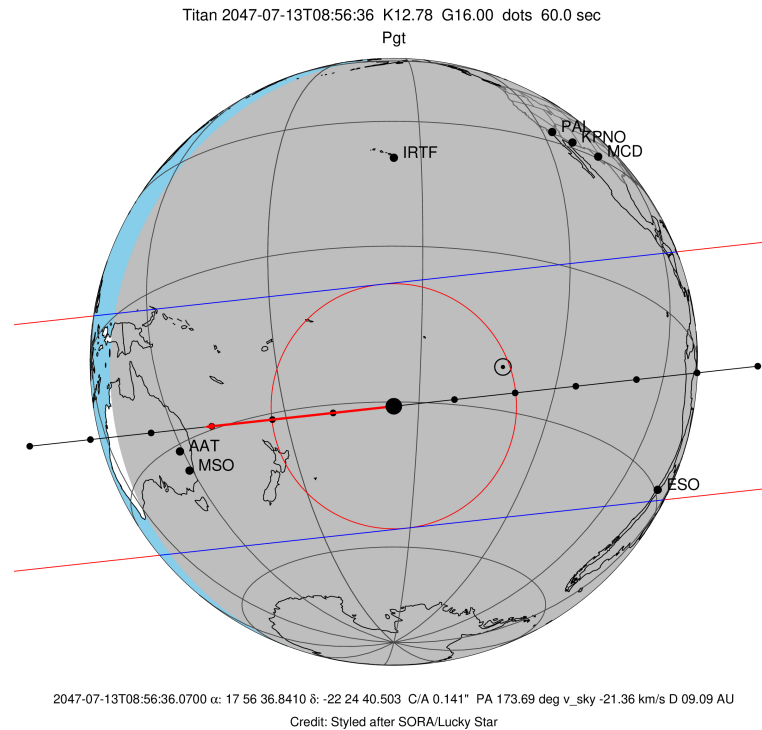
target : Titan
 target radius (km) : 2575.15
 C/A epoch : 2047-07-13T08:56:36.070
 Event type : Pgt
 : Titan occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4070287528036653952
 2Mass ID (if available) : 17563685-2224399

ICRS Star Coord at Epoch: 17h 56m 36.84102s -22:24:40.50335s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 12.776
 G magnitude : 15.998
 RP magnitude : 15.018
 BP magnitude : 16.994
 DUPflag : 0
 Distance (au) : 9.088
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -21.35
 Sun-Target sep (deg) : 158.92
 Sun-Moon sep (deg) : 92.83
 B (ring opening deg) : 26.57
 PA of pole (deg) : 5.60
 Pole direction: RA (deg): 39.48270
 Dec (deg): 83.42790
 C/A sky separation (") : 0.143
 C/A sky separation (km) : 940.1
 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				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	+ +	JUL 13 08:51 - JUL 13 08:53		Pie
AAT	Siding Spring (AAT)	-31.3	149.1	+ +	JUL 13 08:58 - JUL 13 09:02		Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8				Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	JUL 13 08:58 - JUL 13 09:01		Pie



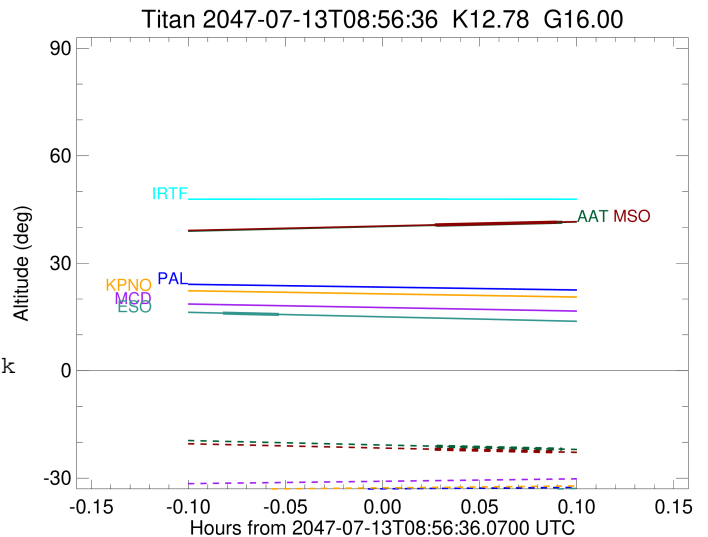
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target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2047-07-13T08:52:31.800
Event type            : Pgt
: Titan occs: geocentric, topocentric
: Not a ringed target
Observer code         : ESO
Location              : European Southern Obs. (3.6m)
Latitude (deg)       : -29.26097
E. Longitude (deg)   : 289.26831
Altitude (km)        : 2.400
Gaia source ID       : 4070287528036653952
2Mass ID (if available) : 17563685-2224399
ICRS Star Coord at Epoch: 17h 56m 36.84102s -22:24:40.50335s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 12.776
G magnitude           : 15.998
RP magnitude          : 15.018
BP magnitude          : 16.994
DUPflag              : 0
Distance (au)        : 9.088
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -21.35
Sun-Target sep (deg) : 158.92
Sun-Moon sep (deg)   : 93.11
B (ring opening deg) : 26.57
PA of pole (deg)     : 5.60
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.351
C/A sky separation (km) : 2310.4
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	2047-07-13T08:51:38.614	16.07	-35.25	2575.0	-59.88	-59.89
Titan	E	2047-07-13T08:53:24.988	15.70	-34.86	2575.1	-45.07	-45.09



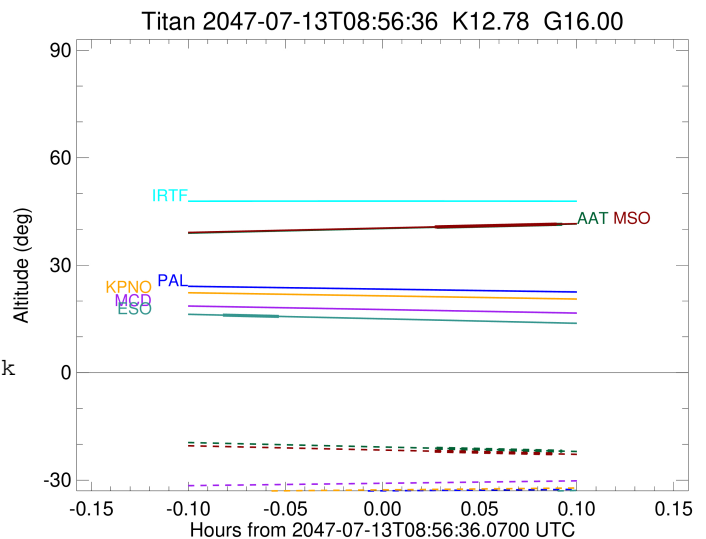
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target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2047-07-13T09:00:12.720
Event type            : Pgt
: Titan occs: geocentric, topocentric
: Not a ringed target
Observer code         : AAT
Location              : Siding Spring (AAT)
Latitude (deg)        : -31.27703
E. Longitude (deg)    : 149.06608
Altitude (km)         : 1.164
Gaia source ID        : 4070287528036653952
2Mass ID (if available) : 17563685-2224399
ICRS Star Coord at Epoch: 17h 56m 36.84102s -22:24:40.50335s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 12.776
G magnitude           : 15.998
RP magnitude          : 15.018
BP magnitude          : 16.994
DUPflag              : 0
Distance (au)         : 9.088
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -21.35
Sun-Target sep (deg)  : 158.92
Sun-Moon sep (deg)    : 93.38
B (ring opening deg) : 26.57
PA of pole (deg)      : 5.60
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.057
C/A sky separation (km) : 377.1
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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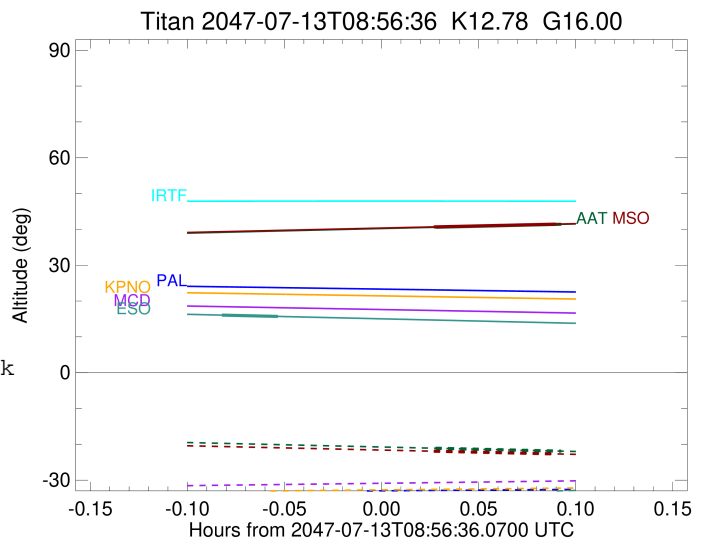
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2047-07-13T08:58:14.808	40.58	-21.09	2575.1	-18.29	-18.30
Titan	E	2047-07-13T09:02:10.607	41.42	-21.91	2575.2	3.32	3.32



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2047-07-13T09:00:05.830
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       : 4070287528036653952
2Mass ID (if available) : 17563685-2224399
ICRS Star Coord at Epoch: 17h 56m 36.84102s -22:24:40.50335s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 12.776
G magnitude           : 15.998
RP magnitude         : 15.018
BP magnitude         : 16.994
DUPflag              : 0
Distance (au)        : 9.088
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -21.35
Sun-Target sep (deg) : 158.92
Sun-Moon sep (deg)   : 93.38
B (ring opening deg) : 26.57
PA of pole (deg)     : 5.60
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.121
C/A sky separation (km) : 799.8
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	2047-07-13T08:58:12.473	40.69	-21.92	2575.1	-26.75	-26.76
Titan	E	2047-07-13T09:01:59.170	41.46	-22.68	2575.2	-5.35	-5.35