

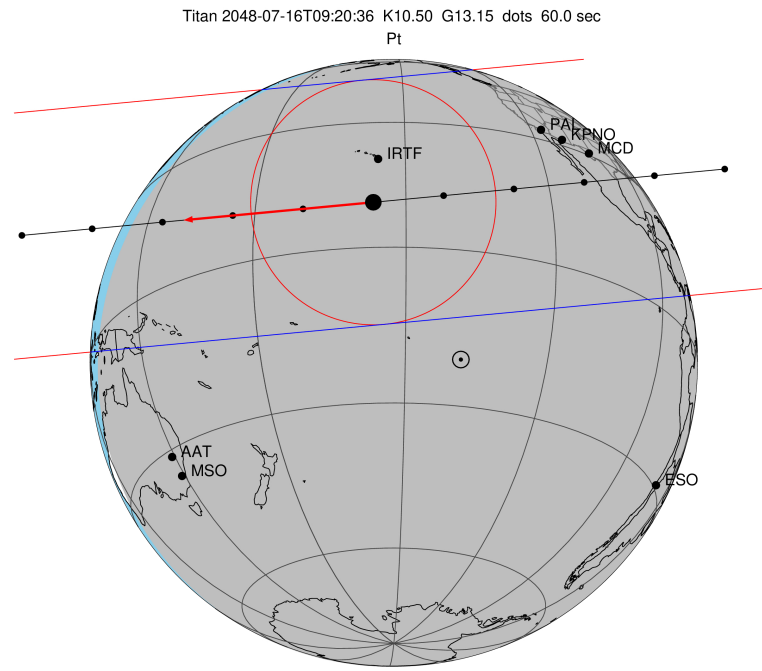
target : Titan
 target radius (km) : 2575.15
 C/A epoch : 2048-07-16T09:20:36.130
 Event type : Pt
 : Titan occs: topocentric, not geocentric
 : Not a ringed target
 Gaia source ID : 4078858045046425984
 2Mass ID (if available) : 18480537-2228030

ICRS Star Coord at Epoch: 18h 48m 05.38615s -22:28:03.30427s
 RUWE (>1.4 is poor) : 0.88
 K magnitude : 10.502
 G magnitude : 13.149
 RP magnitude : 12.345
 BP magnitude : 13.815
 DUPflag : 0
 Distance (au) : 9.035
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -24.70
 Sun-Target sep (deg) : 167.23
 Sun-Moon sep (deg) : 106.93
 B (ring opening deg) : 25.37
 PA of pole (deg) : 6.45
 Pole direction: RA (deg): 39.48270
 Dec (deg): 83.42790
 C/A sky separation (") : 0.518
 C/A sky separation (km) : 3397.4
 NAIF SPICE kernels : RAJobs_U111+rgf16.spk

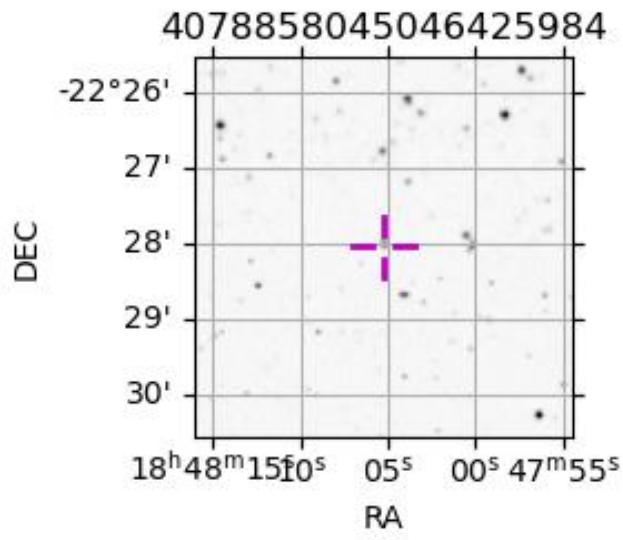
URKALLv1.spk
 naif0012.tls
 nep097.bsp
 nep101.bsp
 sat4401.bsp

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	+ +	JUL 16 09:16 - JUL 16 09:19		Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8				Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JUL 16 09:16 - JUL 16 09:19		Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JUL 16 09:15 - JUL 16 09:19		Pie
TEN	Teide Obs./Tenerife	28.3	343.5				Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	JUL 16 09:18 - JUL 16 09:22		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



2048-07-16T09:20:36.1300 cc: 18 48 05.3861 s -22 28 03.304 C/A 0.518" PA 354.61 deg v_sky -24.70 km/s D 09.04 AU
 Credit: Styled after SORA/Lucky Star



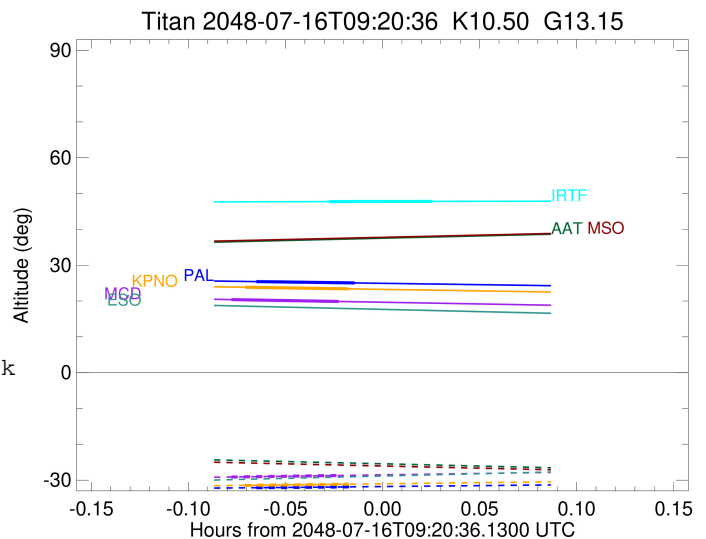
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target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2048-07-16T09:18:13.900
Event type           : Pt
: Titan occs: topocentric, not geocentric
: Not a ringed target
Observer code        : PAL
Location             : Palomar Mt (200")
Latitude (deg)       : 33.35622
E. Longitude (deg)  : 243.13601
Altitude (km)        : 1.706
Gaia source ID       : 4078858045046425984
2Mass ID (if available) : 18480537-2228030
ICRS Star Coord at Epoch: 18h 48m 05.38615s -22:28:03.30427s
RUWE (>1.4 is poor) : 0.88
K magnitude          : 10.502
G magnitude          : 13.149
RP magnitude         : 12.345
BP magnitude         : 13.815
DUPflag             : 0
Distance (au)        : 9.035
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -24.70
Sun-Target sep (deg) : 167.23
Sun-Moon sep (deg)  : 107.14
B (ring opening deg) : 25.37
PA of pole (deg)    : 6.45
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation ("): 0.178
C/A sky separation (km): 1169.5
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

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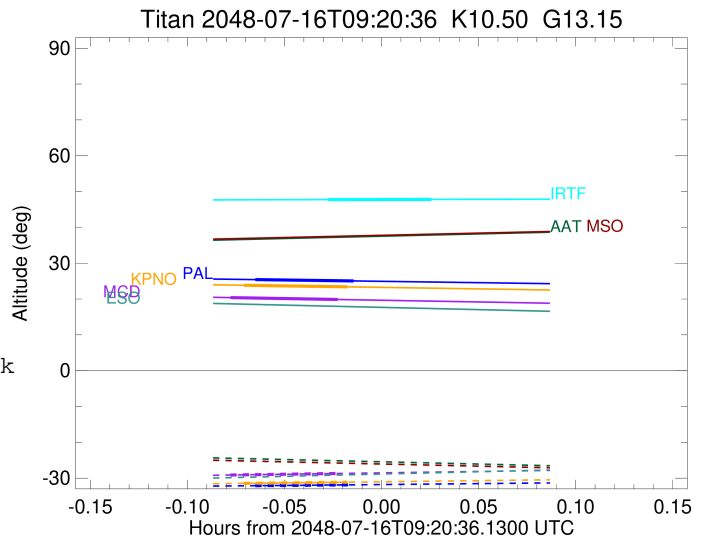
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2048-07-16T09:16:42.177	25.42	-32.11	2575.1	13.90	13.91
Titan	E	2048-07-16T09:19:45.626	25.04	-31.86	2575.1	34.31	34.32



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2048-07-16T09:17:57.080
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       : 4078858045046425984
2Mass ID (if available) : 18480537-2228030
ICRS Star Coord at Epoch: 18h 48m 05.38615s -22:28:03.30427s
RUWE (>1.4 is poor) : 0.88
K magnitude          : 10.502
G magnitude          : 13.149
RP magnitude         : 12.345
BP magnitude         : 13.815
DUPflag             : 0
Distance (au)        : 9.035
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -24.70
Sun-Target sep (deg) : 167.23
Sun-Moon sep (deg)  : 107.10
B (ring opening deg) : 25.37
PA of pole (deg)    : 6.45
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (" ) : 0.140
C/A sky separation (km) : 919.5
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	2048-07-16T09:16:20.841	23.84	-31.46	2575.2	8.44	8.45
Titan	E	2048-07-16T09:19:33.315	23.39	-31.13	2575.1	29.03	29.04

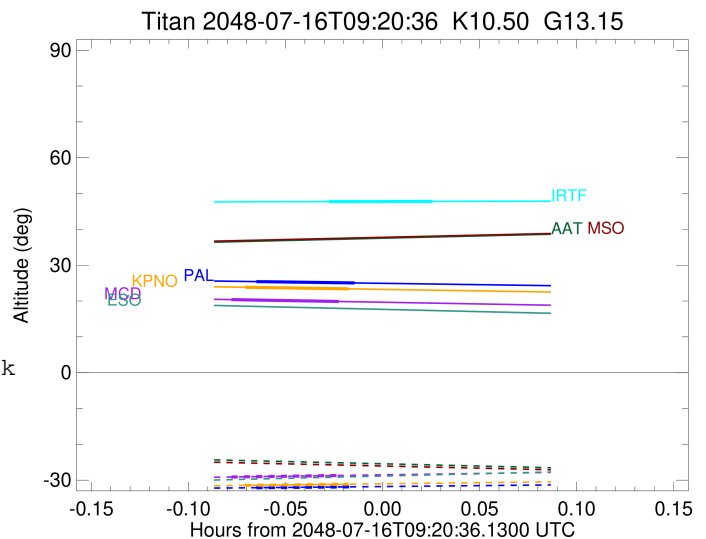
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target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2048-07-16T09:17:35.360
Event type           : Pt
: Titan occs: topocentric, not geocentric
: Not a ringed target
Observer code        : MCD
Location             : McDonald Obs. 2.7m
Latitude (deg)       : 30.67158
E. Longitude (deg)  : 255.97844
Altitude (km)        : 2.075
Gaia source ID       : 4078858045046425984
2Mass ID (if available) : 18480537-2228030
ICRS Star Coord at Epoch: 18h 48m 05.38615s -22:28:03.30427s
RUWE (>1.4 is poor) : 0.88
K magnitude           : 10.502
G magnitude           : 13.149
RP magnitude         : 12.345
BP magnitude         : 13.815
DUPflag              : 0
Distance (au)        : 9.035
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -24.70
Sun-Target sep (deg) : 167.23
Sun-Moon sep (deg)  : 107.02
B (ring opening deg) : 25.37
PA of pole (deg)    : 6.45
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation ("): 0.089
C/A sky separation (km): 584.0
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

```

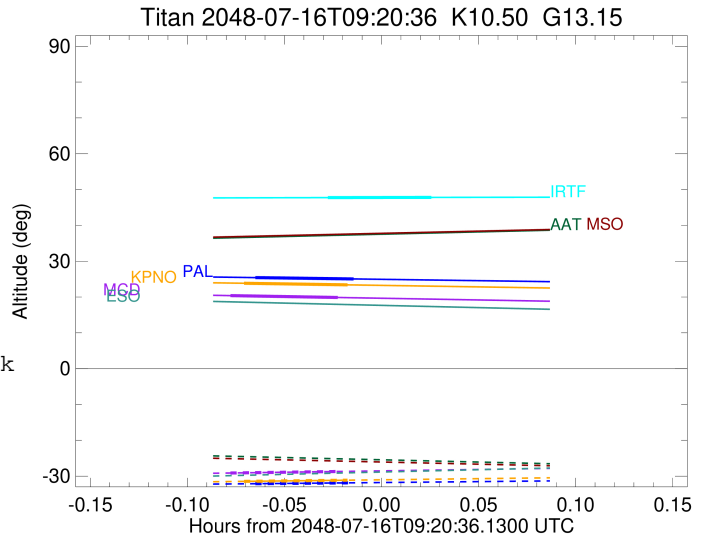
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2048-07-16T09:15:54.889	20.39	-29.13	2575.2	1.42	1.42
Titan	E	2048-07-16T09:19:15.844	19.87	-28.70	2575.1	22.13	22.14



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2048-07-16T09:20:32.400
Event type           : Pt
: Titan occs: topocentric, not geocentric
: 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       : 4078858045046425984
2Mass ID (if available) : 18480537-2228030
ICRS Star Coord at Epoch: 18h 48m 05.38615s -22:28:03.30427s
RUWE (>1.4 is poor) : 0.88
K magnitude           : 10.502
G magnitude           : 13.149
RP magnitude          : 12.345
BP magnitude          : 13.815
DUPflag              : 0
Distance (au)         : 9.035
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -24.70
Sun-Target sep (deg) : 167.23
Sun-Moon sep (deg)   : 107.58
B (ring opening deg) : 25.37
PA of pole (deg)     : 6.45
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation ("): 0.136
C/A sky separation (km): 889.3
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

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Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2048-07-16T09:18:56.263	47.74	-45.74	2575.2	7.61	7.61
Titan	E	2048-07-16T09:22:08.526	47.80	-46.04	2575.1	28.58	28.60