

target : Titan
 target radius (km) : 2575.15
 C/A epoch : 2033-12-24T20:11:57.140
 Event type : Pgt
 : Titan occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 866171036746705664
 2Mass ID (if available) : 072009666+2151321

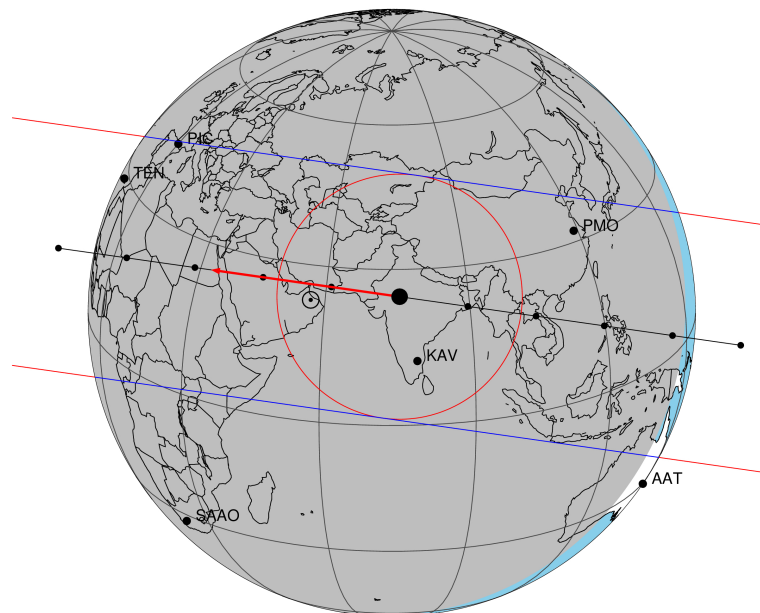
ICRS Star Coord at Epoch: 07h 20m 09.65311s +21:51:31.87055s
 RUWE (>1.4 is poor) : 0.96
 K magnitude : 14.895
 G magnitude : 18.137
 RP magnitude : 17.103
 BP magnitude : 19.214
 DUPflag : 0
 Distance (au) : 8.073
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -24.11
 Sun-Target sep (deg) : 164.31
 Sun-Moon sep (deg) : 158.33
 B (ring opening deg) : -23.91
 PA of pole (deg) : -6.78
 Pole direction: RA (deg): 39.48270
 Dec (deg): 83.42790
 C/A sky separation (") : 0.060
 C/A sky separation (km) : 351.1
 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

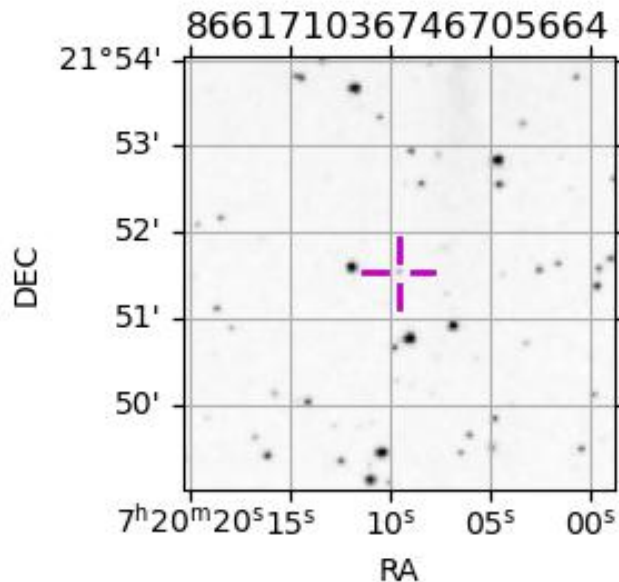
Obs	Location	lat	Elon	Target	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+ +	DEC 24 20:14 - DEC 24 20:15	Pie
PAL	Palomar Mt (200")	33.4	243.1			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+ +	DEC 24 20:08 - DEC 24 20:10	Pie
KPNO	Kitt Peak Natl Obs	32.0	248.4			Pnn
MCD	McDonald Obs. 2.7m	30.7	256.0			Pnn
TEN	Teide Obs./Tenerife	28.3	343.5	+ +	DEC 24 20:14 - DEC 24 20:17	Pie
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+ +	DEC 24 20:09 - DEC 24 20:13	Pie
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 2033-12-24T20:11:57 K14.89 G18.14 dots 60.0 sec
 Pgt



2033-12-24T20:11:57.1400 α: 07 20 09.6531 δ: +21 51 31.871 C/A 0.061" PA 8.09 deg v_sky -24.12 km/s D 08.07 AU

Credit: Styled after SORA/Lucky Star



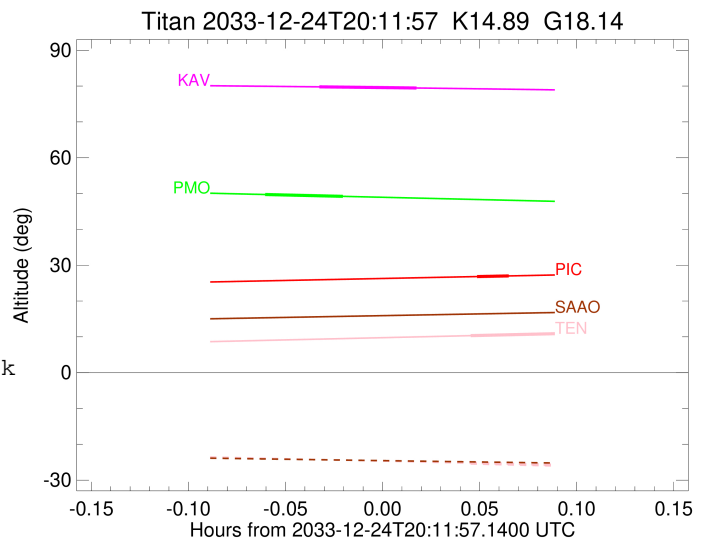
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2033-12-24T20:15:22.020
Event type            : Pgt
: Titan occs: geocentric, topocentric
: Not a ringed target
Observer code         : PIC
Location              : Pic du Midi
Latitude (deg)        : 42.93656
E. Longitude (deg)    : 0.14231
Altitude (km)         : 2.890
Gaia source ID        : 866171036746705664
2Mass ID (if available) : 07200966+2151321
ICRS Star Coord at Epoch: 07h 20m 09.65311s +21:51:31.87055s
RUWE (>1.4 is poor)  : 0.96
K magnitude           : 14.895
G magnitude           : 18.137
RP magnitude          : 17.103
BP magnitude          : 19.214
DUPflag              : 0
Distance (au)         : 8.073
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -24.11
Sun-Target sep (deg)  : 164.31
Sun-Moon sep (deg)    : 159.24
B (ring opening deg) : -23.91
PA of pole (deg)     : -6.78
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.422
C/A sky separation (km) : 2471.3
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	2033-12-24T20:14:52.164	26.82	-40.20	2575.1	66.07	66.08
Titan	E	2033-12-24T20:15:51.880	27.00	-40.38	2575.1	51.25	51.26



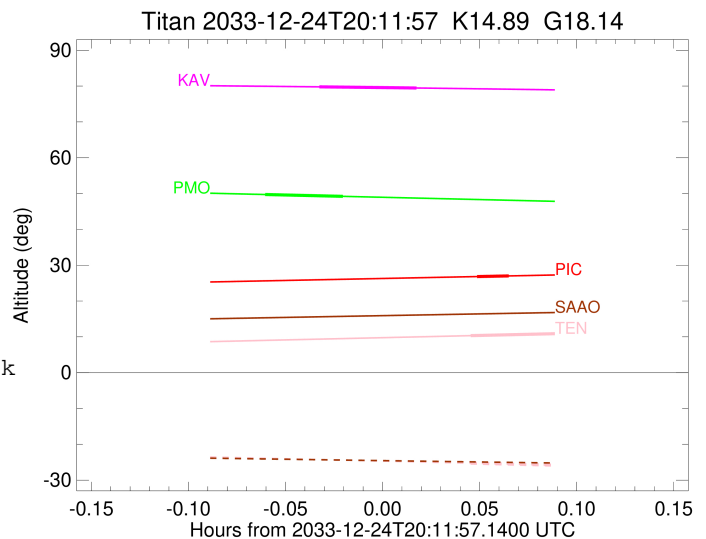
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2033-12-24T20:09:31.680
Event type           : Pgt
: Titan occs: geocentric, topocentric
: Not a ringed target
Observer code        : PMO
Location             : Purple Mtn Obs. Nanking
Latitude (deg)       : 32.06667
E. Longitude (deg)   : 118.82089
Altitude (km)        : 0.364
Gaia source ID       : 866171036746705664
2Mass ID (if available) : 07200966+2151321
ICRS Star Coord at Epoch: 07h 20m 09.65311s +21:51:31.87055s
RUWE (>1.4 is poor) : 0.96
K magnitude          : 14.895
G magnitude          : 18.137
RP magnitude         : 17.103
BP magnitude         : 19.214
DUPflag             : 0
Distance (au)        : 8.073
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -24.11
Sun-Target sep (deg) : 164.31
Sun-Moon sep (deg)   : 158.17
B (ring opening deg) : -23.91
PA of pole (deg)     : -6.78
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation ("): 0.319
C/A sky separation (km): 1866.7
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	2033-12-24T20:08:18.924	49.73	-36.03	2575.1	53.11	53.12
Titan	E	2033-12-24T20:10:44.436	49.21	-35.52	2575.2	28.89	28.91



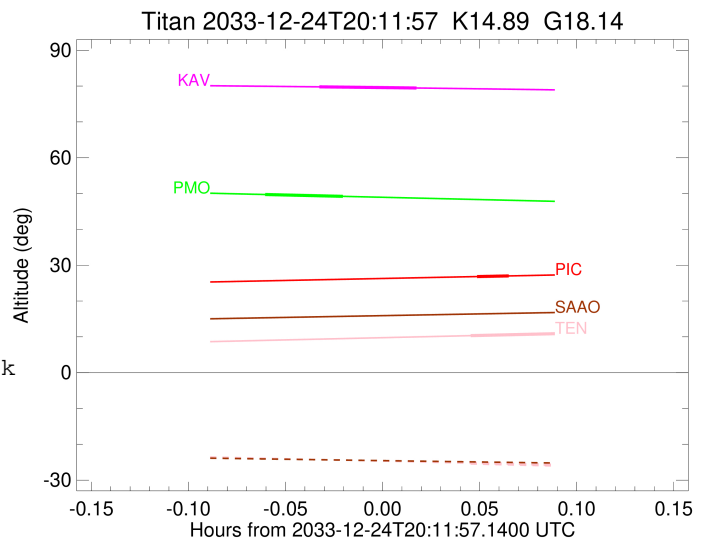
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2033-12-24T20:16:04.780
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       : 866171036746705664
2Mass ID (if available) : 07200966+2151321
ICRS Star Coord at Epoch: 07h 20m 09.65311s +21:51:31.87055s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 14.895
G magnitude           : 18.137
RP magnitude          : 17.103
BP magnitude          : 19.214
DUPflag              : 0
Distance (au)        : 8.073
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -24.11
Sun-Target sep (deg) : 164.31
Sun-Moon sep (deg)   : 159.26
B (ring opening deg) : -23.91
PA of pole (deg)     : -6.78
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.269
C/A sky separation (km) : 1576.4
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	2033-12-24T20:14:40.446	10.33	-25.26	2575.1	46.88	46.90
Titan	E	2033-12-24T20:17:29.099	10.92	-25.86	2575.2	20.49	20.50



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2033-12-24T20:11:29.670
Event type            : Pgt
: Titan occs: geocentric, topocentric
: Not a ringed target
Observer code         : KAV
Location              : Kavalur Observatory
Latitude (deg)        : 12.57556
E. Longitude (deg)   : 78.83167
Altitude (km)         : 0.722
Gaia source ID        : 866171036746705664
2Mass ID (if available) : 07200966+2151321
ICRS Star Coord at Epoch: 07h 20m 09.65311s +21:51:31.87055s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 14.895
G magnitude           : 18.137
RP magnitude          : 17.103
BP magnitude          : 19.214
DUPflag              : 0
Distance (au)         : 8.073
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -24.11
Sun-Target sep (deg) : 164.31
Sun-Moon sep (deg)   : 158.56
B (ring opening deg) : -23.91
PA of pole (deg)     : -6.78
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.220
C/A sky separation (km) : 1286.8
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	2033-12-24T20:09:58.850	79.78	-66.98	2575.2	-13.93	-13.94
Titan	E	2033-12-24T20:13:00.485	79.46	-66.35	2575.1	-40.00	-40.02

