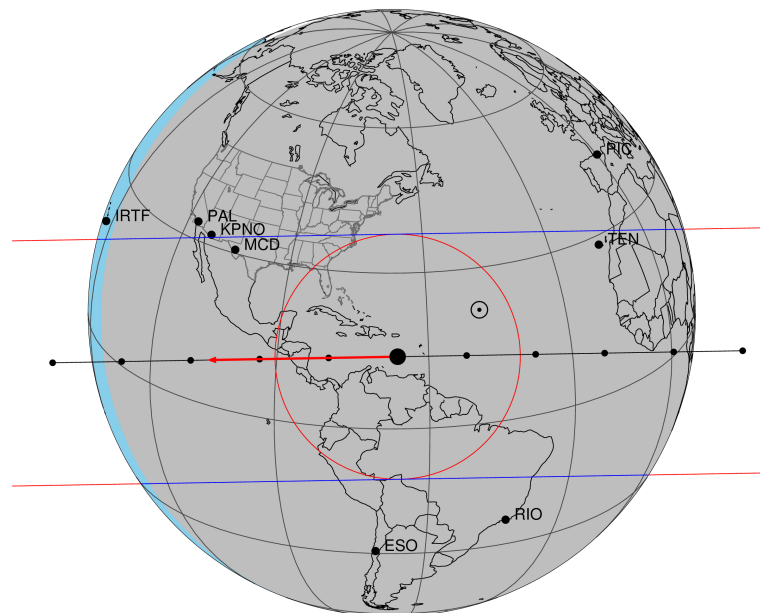


target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2033-01-09T03:23:22.500  
 Event type : Pgt  
 : Titan occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 3423574957709632640  
 2Mass ID (if available) : 06083304+2230204

Titan 2033-01-09T03:23:22 K14.52 G17.33 dots 60.0 sec  
 Pgt

ICRS Star Coord at Epoch: 06h 08m 33.03906s +22:30:20.29423s  
 RUWE (>1.4 is poor) : 0.91  
 K magnitude : 14.515  
 G magnitude : 17.326  
 RP magnitude : 16.479  
 BP magnitude : 18.099  
 DUPflag : 0  
 Distance (au) : 8.062  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -24.14  
 Sun-Target sep (deg) : 163.24  
 Sun-Moon sep (deg) : 60.57  
 B (ring opening deg) : -26.38  
 PA of pole (deg) : -5.83  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.159  
 C/A sky separation (km) : 928.0  
 NAIF SPICE kernels : RAJobs\_U111+rgf16.spk

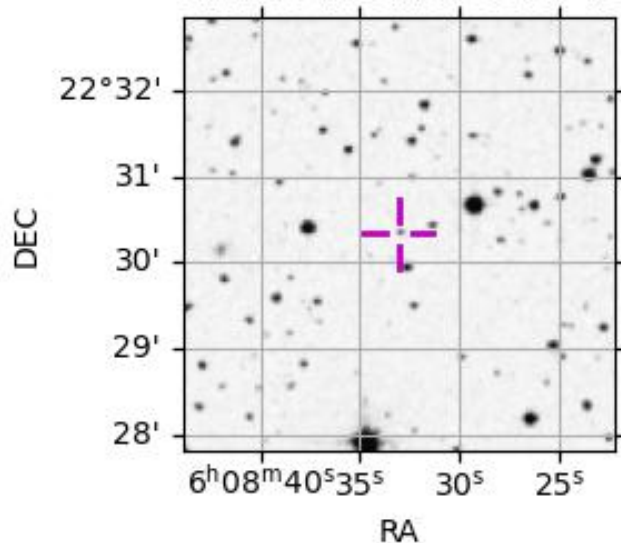


2033-01-09T03:23:22.5000 α: 06 08 33.0391 δ: +22 30 20.294 C/A 0.158" PA 179.05 deg v\_sky -24.15 km/s D 08.06 AU  
 Credit: Styled after SORA/Lucky Star

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	+ +	JAN 09 03:24 - JAN 09 03:26	Pie
TEN	Teide Obs./Tenerife	28.3	343.5	+ +	JAN 09 03:19 - JAN 09 03:21	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			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

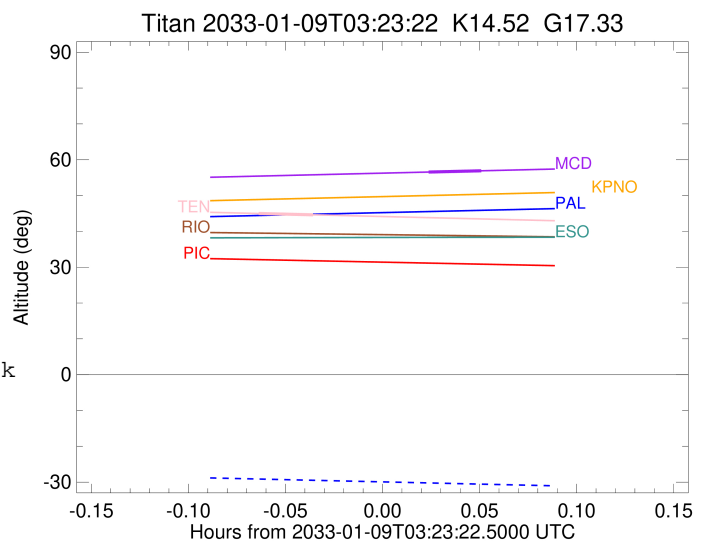
3423574957709632640



target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2033-01-09T03:25:36.620  
 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 : 3423574957709632640  
 2Mass ID (if available) : 06083304+2230204  
 ICRS Star Coord at Epoch: 06h 08m 33.03906s +22:30:20.29423s  
 RUWE (>1.4 is poor) : 0.91  
 K magnitude : 14.515  
 G magnitude : 17.326  
 RP magnitude : 16.479  
 BP magnitude : 18.099  
 DUPflag : 0  
 Distance (au) : 8.062  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -24.14  
 Sun-Target sep (deg) : 163.24  
 Sun-Moon sep (deg) : 61.04  
 B (ring opening deg) : -26.38  
 PA of pole (deg) : -5.83  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.388  
 C/A sky separation (km) : 2268.4  
 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	2033-01-09T03:24:46.821	56.55	-40.79	2575.1	55.43	55.44
Titan	E	2033-01-09T03:26:26.423	56.91	-41.15	2575.1	48.48	48.50



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2033-01-09T03:20:23.070
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       : 3423574957709632640
2Mass ID (if available) : 06083304+2230204
ICRS Star Coord at Epoch: 06h 08m 33.03906s +22:30:20.29423s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 14.515
G magnitude           : 17.326
RP magnitude          : 16.479
BP magnitude          : 18.099
DUPflag              : 0
Distance (au)        : 8.062
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -24.14
Sun-Target sep (deg) : 163.24
Sun-Moon sep (deg)   : 61.48
B (ring opening deg) : -26.38
PA of pole (deg)     : -5.83
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.387
C/A sky separation (km) : 2261.4
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	2033-01-09T03:19:32.633	44.98	-60.81	2575.1	54.91	54.93
Titan	E	2033-01-09T03:21:13.514	44.61	-60.44	2575.1	48.60	48.62

