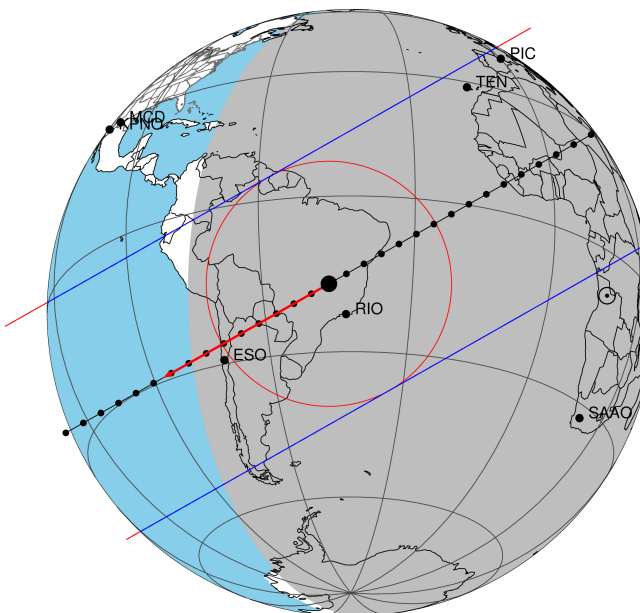


target : Titan  
 target radius (km) : 2575.15  
 C/A epoch : 2048-08-29T22:55:01.700  
 Event type : Pgt  
 : Titan occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4079219479502780544  
 2Mass ID (if available) : 18383043-2242024

ICRS Star Coord at Epoch: 18h 38m 30.45009s -22:42:03.50520s  
 RUWE (>1.4 is poor) : 0.94  
 K magnitude : 13.578  
 G magnitude : 15.519  
 RP magnitude : 14.858  
 BP magnitude : 16.011  
 DUPflag : 0  
 Distance (au) : 9.459  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -7.05  
 Sun-Target sep (deg) : 122.28  
 Sun-Moon sep (deg) : 132.63  
 B (ring opening deg) : 25.85  
 PA of pole (deg) : 6.33  
 Pole direction: RA (deg): 39.48270  
 Dec (deg): 83.42790  
 C/A sky separation (") : 0.103  
 C/A sky separation (km) : 709.5  
 NAIF SPICE kernels : RAJobs\_U111+rgf16.spk

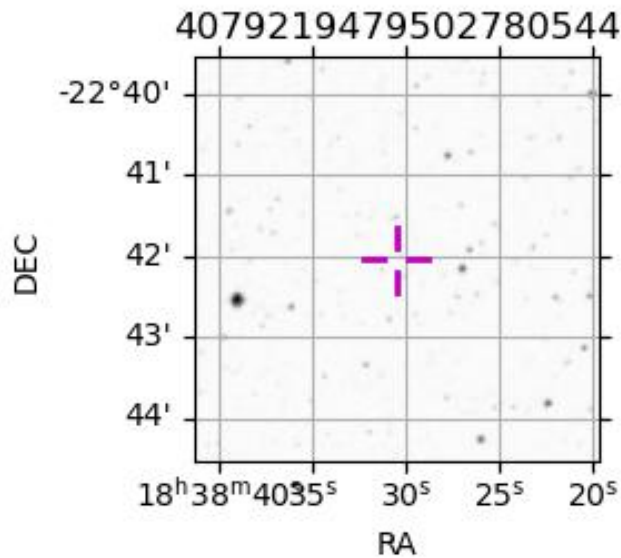
Titan 2048-08-29T22:55:01 K13.58 G15.52 dots 60.0 sec  
 Pgt



2048-08-29T22:55:01.7000 α: 18 38 30.4501 δ: -22 42 03.505 C/A 0.110" PA 330.38 deg v\_sky - 7.05 km/s D 09.46 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	OCode
PIC	Pic du Midi	42.9	0.1	+ +	AUG 29 22:41 - AUG 29 22:44	Pie
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	+ +	AUG 29 22:42 - AUG 29 22:47	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	+ +	AUG 29 22:49 - AUG 29 23:00	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	AUG 29 22:55 - AUG 29 23:07	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



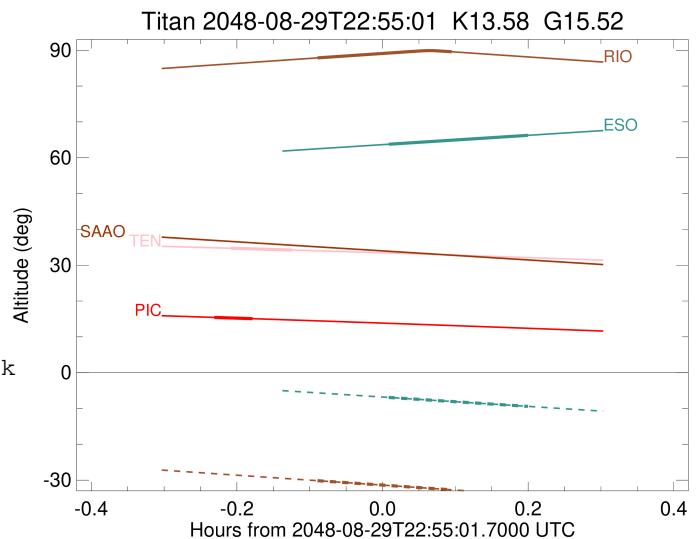
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2048-08-29T22:42:45.060
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        : 4079219479502780544
2Mass ID (if available) : 18383043-2242024
ICRS Star Coord at Epoch: 18h 38m 30.45009s -22:42:03.50520s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 13.578
G magnitude           : 15.519
RP magnitude          : 14.858
BP magnitude          : 16.011
DUPflag              : 0
Distance (au)         : 9.459
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -7.05
Sun-Target sep (deg) : 122.28
Sun-Moon sep (deg)   : 133.17
B (ring opening deg) : 25.85
PA of pole (deg)     : 6.33
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation ("): 0.361
C/A sky separation (km): 2479.1
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

```

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	2048-08-29T22:41:08.585	15.42	-35.38	2575.1	35.26	35.27
Titan	E	2048-08-29T22:44:21.515	15.06	-35.61	2575.1	58.48	58.50



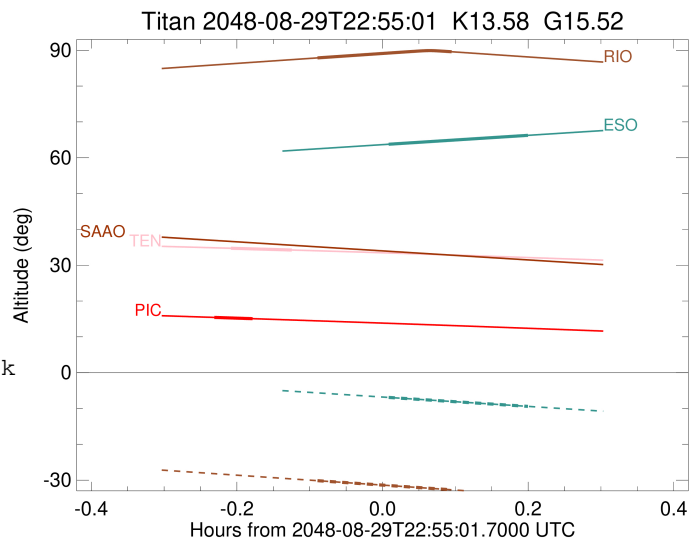
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2048-08-29T22:45:01.900
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       : 4079219479502780544
2Mass ID (if available) : 18383043-2242024
ICRS Star Coord at Epoch: 18h 38m 30.45009s -22:42:03.50520s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 13.578
G magnitude           : 15.519
RP magnitude         : 14.858
BP magnitude         : 16.011
DUPflag              : 0
Distance (au)        : 9.459
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -7.05
Sun-Target sep (deg) : 122.28
Sun-Moon sep (deg)   : 133.30
B (ring opening deg) : 25.85
PA of pole (deg)     : 6.33
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation ("): 0.337
C/A sky separation (km): 2313.7
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	2048-08-29T22:42:27.731	34.73	-39.23	2575.2	26.60	26.61
Titan	E	2048-08-29T22:47:36.033	34.23	-40.08	2575.1	63.01	63.02



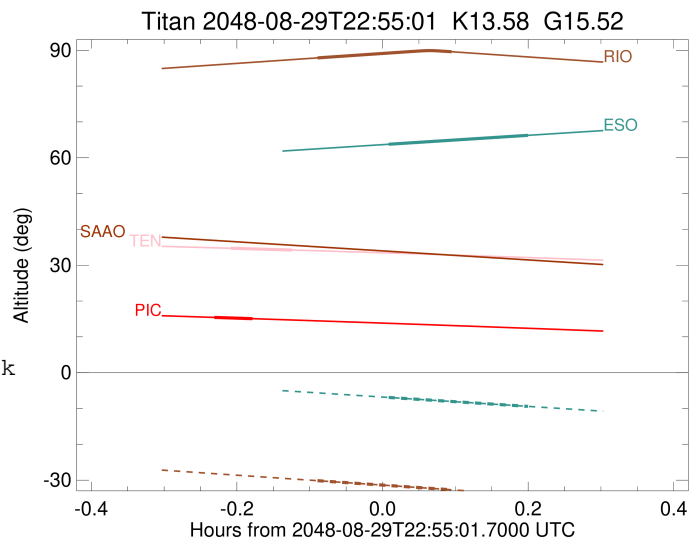
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2048-08-29T22:55:11.640
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        : 4079219479502780544
2Mass ID (if available) : 18383043-2242024
ICRS Star Coord at Epoch: 18h 38m 30.45009s -22:42:03.50520s
RUWE (>1.4 is poor)  : 0.94
K magnitude           : 13.578
G magnitude           : 15.519
RP magnitude          : 14.858
BP magnitude          : 16.011
DUPflag              : 0
Distance (au)         : 9.459
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -7.05
Sun-Target sep (deg)  : 122.28
Sun-Moon sep (deg)    : 133.29
B (ring opening deg) : 25.85
PA of pole (deg)      : 6.33
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.098
C/A sky separation (km) : 672.1
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

```

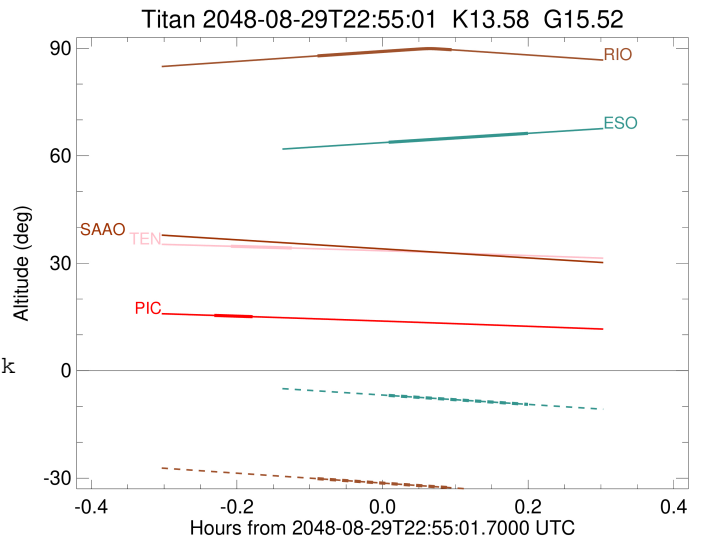
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2048-08-29T22:49:36.764	87.84	-30.13	2575.1	-43.16	-43.17
Titan	E	2048-08-29T23:00:46.330	89.56	-32.70	2575.1	17.17	17.18



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2048-08-29T23:01:18.070
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       : 4079219479502780544
2Mass ID (if available) : 18383043-2242024
ICRS Star Coord at Epoch: 18h 38m 30.45009s -22:42:03.50520s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 13.578
G magnitude           : 15.519
RP magnitude          : 14.858
BP magnitude          : 16.011
DUPflag              : 0
Distance (au)         : 9.459
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -7.05
Sun-Target sep (deg) : 122.28
Sun-Moon sep (deg)   : 132.96
B (ring opening deg) : 25.85
PA of pole (deg)     : 6.33
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation ("): 0.040
C/A sky separation (km): 275.4
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	2048-08-29T22:55:32.145	63.76	-6.91	2575.1	-36.31	-36.33
Titan	E	2048-08-29T23:07:03.600	66.25	-9.42	2575.1	25.70	25.71