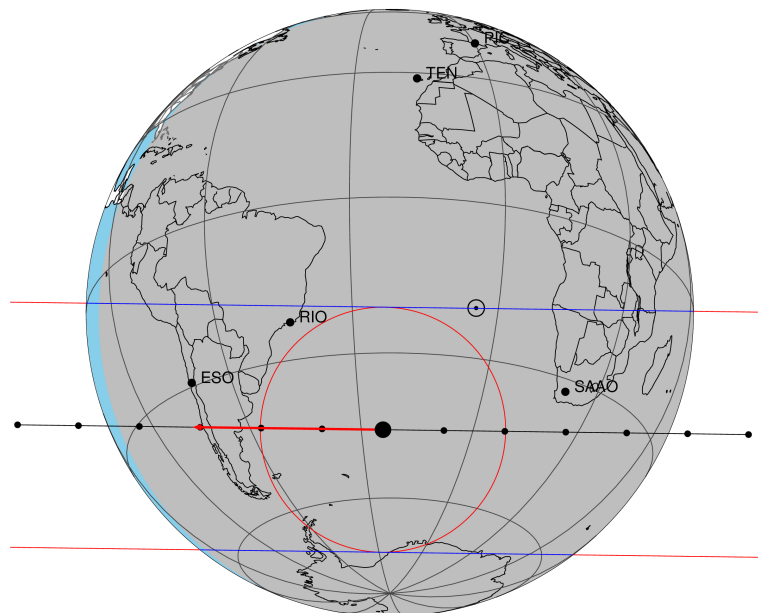


target : Titan
 target radius (km) : 2575.15
 C/A epoch : 2048-07-20T00:25:06.830
 Event type : Pgt
 : Titan occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4078497199075022208
 2Mass ID (if available) : 18464353-2228401

Titan 2048-07-20T00:25:06 K14.51 G16.94 dots 60.0 sec
 Pgt

ICRS Star Coord at Epoch: 18h 46m 43.52468s -22:28:40.26743s
 RUWE (>1.4 is poor) : 0.85
 K magnitude : 14.513
 G magnitude : 16.936
 RP magnitude : 16.195
 BP magnitude : 17.536
 DUPflag : 0
 Distance (au) : 9.053
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -21.32
 Sun-Target sep (deg) : 163.46
 Sun-Moon sep (deg) : 57.38
 B (ring opening deg) : 25.41
 PA of pole (deg) : 6.44
 Pole direction: RA (deg): 39.48270
 Dec (deg): 83.42790
 C/A sky separation (") : 0.373
 C/A sky separation (km) : 2447.7
 NAIF SPICE kernels : RAJobs_U111+rgf16.spk



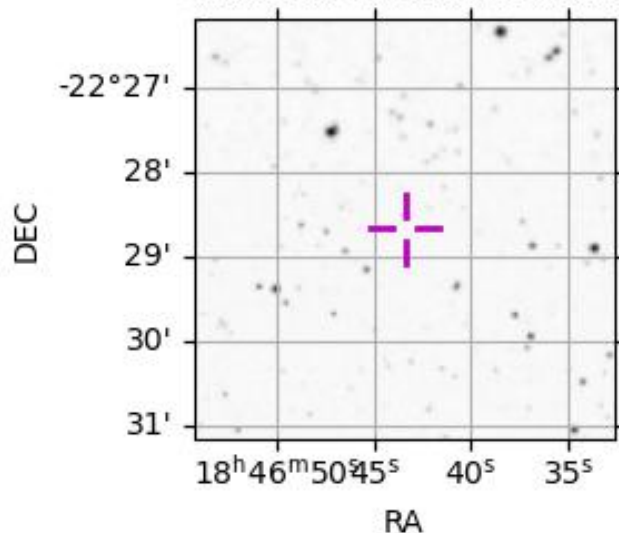
2048-07-20T00:25:06.8300 α: 18 46 43.5247 δ: -22 28 40.267 C/A 0.374" PA 180.77 deg v_sky -21.32 km/s D 09.05 AU

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			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	+ +	JUL 20 00:25 - JUL 20 00:27	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUL 20 00:26 - JUL 20 00:30	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	JUL 20 00:20 - JUL 20 00:24	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn

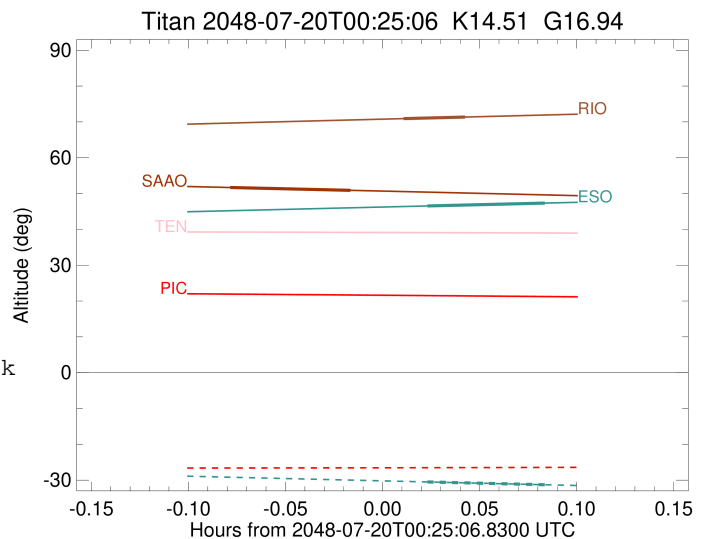
4078497199075022208



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2048-07-20T00:26:42.840
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        : 4078497199075022208
2Mass ID (if available) : 18464353-2228401
ICRS Star Coord at Epoch: 18h 46m 43.52468s -22:28:40.26743s
RUWE (>1.4 is poor) : 0.85
K magnitude           : 14.513
G magnitude           : 16.936
RP magnitude          : 16.195
BP magnitude          : 17.536
DUPflag              : 0
Distance (au)         : 9.053
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -21.32
Sun-Target sep (deg) : 163.46
Sun-Moon sep (deg)   : 58.00
B (ring opening deg) : 25.41
PA of pole (deg)     : 6.44
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.343
C/A sky separation (km) : 2251.8
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	2048-07-20T00:25:45.313	70.91	-54.37	2575.1	47.83	47.85
Titan	E	2048-07-20T00:27:40.372	71.35	-54.81	2575.1	56.12	56.14

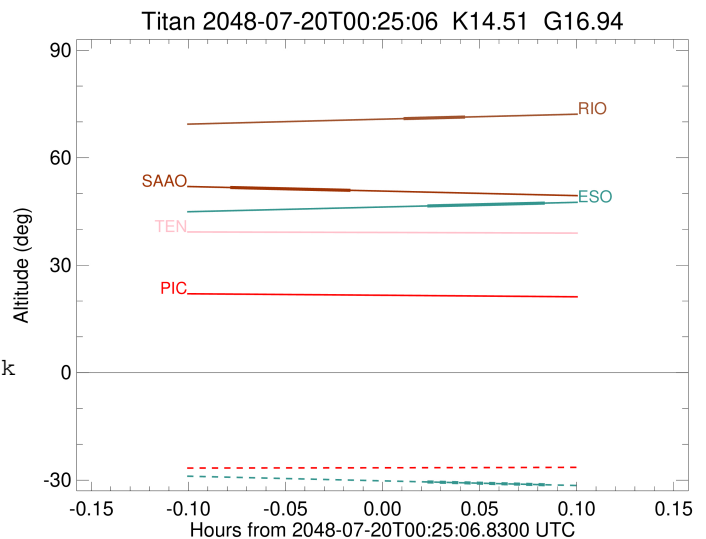
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2048-07-20T00:28:18.900
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       : 4078497199075022208
2Mass ID (if available) : 18464353-2228401
ICRS Star Coord at Epoch: 18h 46m 43.52468s -22:28:40.26743s
RUWE (>1.4 is poor) : 0.85
K magnitude           : 14.513
G magnitude           : 16.936
RP magnitude          : 16.195
BP magnitude          : 17.536
DUPflag              : 0
Distance (au)        : 9.053
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -21.32
Sun-Target sep (deg) : 163.46
Sun-Moon sep (deg)   : 57.62
B (ring opening deg) : 25.41
PA of pole (deg)     : 6.44
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.149
C/A sky separation (km) : 981.2
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	2048-07-20T00:26:28.604	46.53	-30.49	2575.1	14.79	14.80
Titan	E	2048-07-20T00:30:09.190	47.33	-31.29	2575.1	25.42	25.43



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2048-07-20T00:22:15.610
Event type           : Pgt
: Titan occs: geocentric, topocentric
: Not a ringed target
Observer code        : SAAO
Location             : So. Afr. Astro. Obs. (Sutherland)
Latitude (deg)       : -32.37953
E. Longitude (deg)   : 20.81070
Altitude (km)        : 1.768
Gaia source ID       : 4078497199075022208
2Mass ID (if available) : 18464353-2228401
ICRS Star Coord at Epoch: 18h 46m 43.52468s -22:28:40.26743s
RUWE (>1.4 is poor) : 0.85
K magnitude           : 14.513
G magnitude           : 16.936
RP magnitude          : 16.195
BP magnitude          : 17.536
DUPflag              : 0
Distance (au)        : 9.053
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -21.32
Sun-Target sep (deg) : 163.46
Sun-Moon sep (deg)   : 58.31
B (ring opening deg) : 25.41
PA of pole (deg)     : 6.44
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation ("): 0.130
C/A sky separation (km): 855.3
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	2048-07-20T00:20:23.237	51.68	-65.38	2575.1	12.61	12.61
Titan	E	2048-07-20T00:24:08.009	50.89	-64.65	2575.1	22.27	22.28

