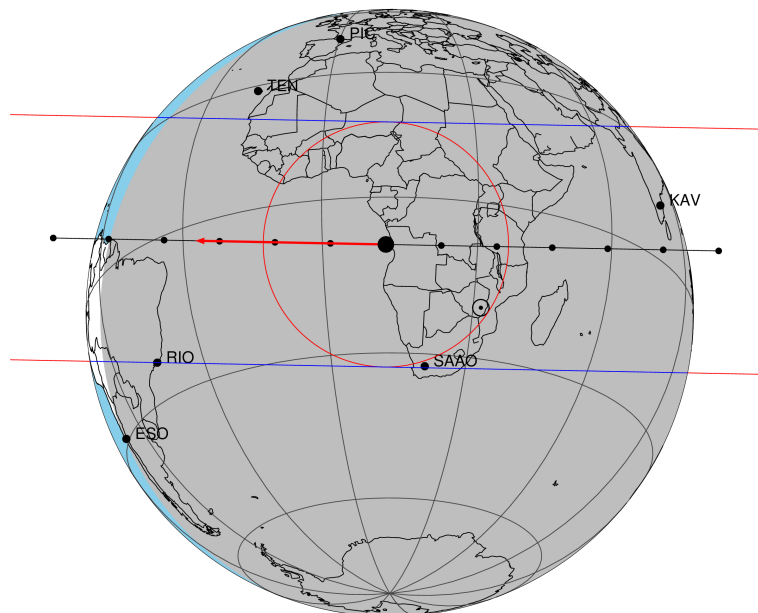


target : Titan
 target radius (km) : 2575.15
 C/A epoch : 2048-07-20T21:59:51.540
 Event type : Pgt
 : Titan occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4078499952187952384
 2Mass ID (if available) : 18462621-2228365

ICRS Star Coord at Epoch: 18h 46m 26.13719s -22:28:36.68190s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 14.217
 G magnitude : 18.426
 RP magnitude : 0.000
 BP magnitude : 0.000
 DUPflag : 0
 Distance (au) : 9.060
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -19.41
 Sun-Target sep (deg) : 162.53
 Sun-Moon sep (deg) : 44.46
 B (ring opening deg) : 25.42
 PA of pole (deg) : 6.43
 Pole direction: RA (deg): 39.48270
 Dec (deg): 83.42790
 C/A sky separation (") : 0.220
 C/A sky separation (km) : 1445.4
 NAIF SPICE kernels : RAJobs_U111+rgf16.spk

Titan 2048-07-20T21:59:51 K14.22 G18.43 dots 60.0 sec
 Pgt



2048-07-20T21:59:51.5400 α: 18 46 26.1372 δ: -22 28 36.682 C/A 0.218" PA 1.13 deg v_sky -19.41 km/s D 09.06 AU

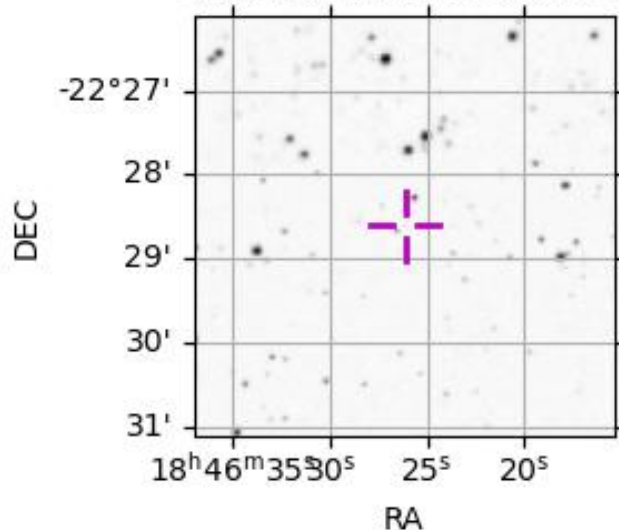
Credit: Styled after SORA/Lucky Star

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	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	+ +	JUL 20 21:53 - JUL 20 21:57	Pie
RIO	Rio de Janeiro	-22.9	316.8	+ +	JUL 20 22:03 - JUL 20 22:04	Pie
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	+ +	JUL 20 21:58 - JUL 20 21:59	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn

4078499952187952384



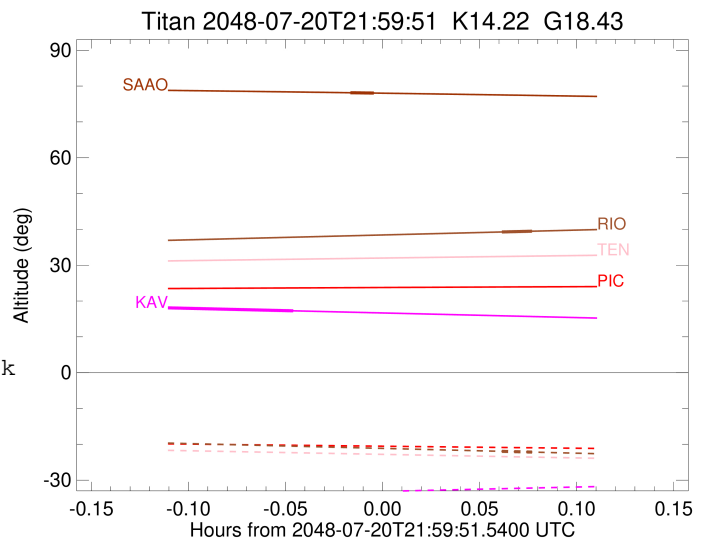
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2048-07-20T21:55:03.790
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       : 4078499952187952384
2Mass ID (if available) : 18462621-2228365
ICRS Star Coord at Epoch: 18h 46m 26.13719s -22:28:36.68190s
RUWE (>1.4 is poor) : 1.04
K magnitude          : 14.217
G magnitude          : 18.426
RP magnitude         : 0.000
BP magnitude         : 0.000
DUPflag             : 0
Distance (au)        : 9.060
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -19.41
Sun-Target sep (deg) : 162.53
Sun-Moon sep (deg)   : 45.32
B (ring opening deg) : 25.42
PA of pole (deg)     : 6.43
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.141
C/A sky separation (km) : 927.9
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

```

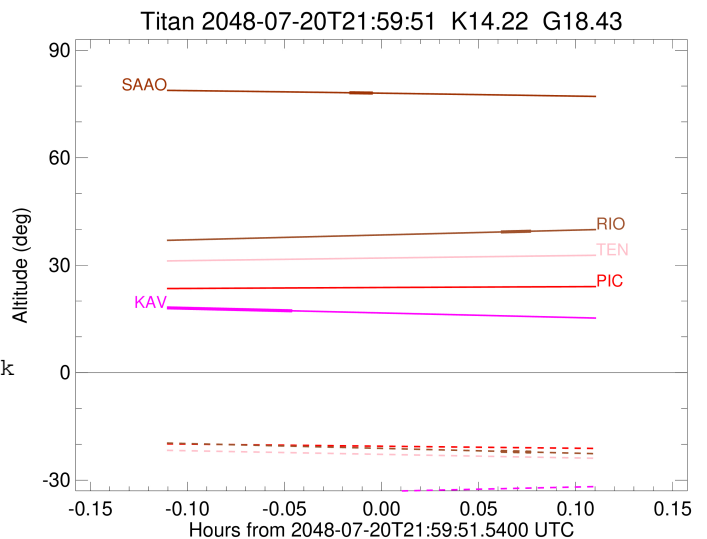
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2048-07-20T21:53:01.334	18.14	-34.49	2575.1	14.64	14.64
Titan	E	2048-07-20T21:57:06.286	17.26	-33.68	2575.1	23.31	23.33



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2048-07-20T22:04:00.360
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      : 4078499952187952384
2Mass ID (if available) : 18462621-2228365
ICRS Star Coord at Epoch: 18h 46m 26.13719s -22:28:36.68190s
RUWE (>1.4 is poor) : 1.04
K magnitude          : 14.217
G magnitude          : 18.426
RP magnitude         : 0.000
BP magnitude         : 0.000
DUPflag             : 0
Distance (au)       : 9.060
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -19.41
Sun-Target sep (deg) : 162.53
Sun-Moon sep (deg)  : 44.34
B (ring opening deg) : 25.42
PA of pole (deg)    : 6.43
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (" ) : 0.383
C/A sky separation (km) : 2513.8
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
    
```



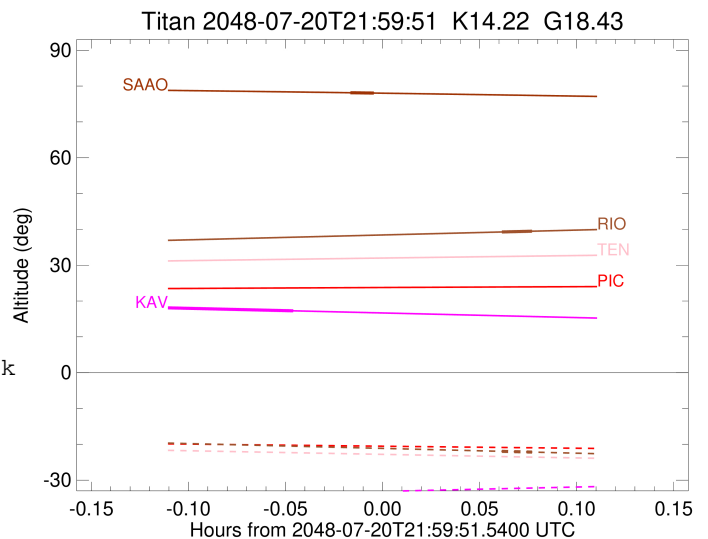
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2048-07-20T22:03:31.946	39.27	-21.96	2575.1	-63.75	-63.76
Titan	E	2048-07-20T22:04:28.765	39.48	-22.17	2575.0	-59.07	-59.08

```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2048-07-20T21:59:13.580
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       : 4078499952187952384
2Mass ID (if available) : 18462621-2228365
ICRS Star Coord at Epoch: 18h 46m 26.13719s -22:28:36.68190s
RUWE (>1.4 is poor) : 1.04
K magnitude          : 14.217
G magnitude          : 18.426
RP magnitude         : 0.000
BP magnitude         : 0.000
DUPflag             : 0
Distance (au)        : 9.060
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -19.41
Sun-Target sep (deg) : 162.53
Sun-Moon sep (deg)   : 45.22
B (ring opening deg) : 25.42
PA of pole (deg)     : 6.43
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation ("): 0.386
C/A sky separation (km): 2536.7
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	2048-07-20T21:58:51.221	78.13	-74.58	2575.1	-64.19	-64.20
Titan	E	2048-07-20T21:59:35.950	78.04	-74.69	2575.1	-60.65	-60.67