

target : Titan
 target radius (km) : 2575.15
 C/A epoch : 2042-05-22T05:42:10.820
 Event type : Pgt
 : Titan occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 3615717908900598144
 2Mass ID (if available) : 13574207-0910363

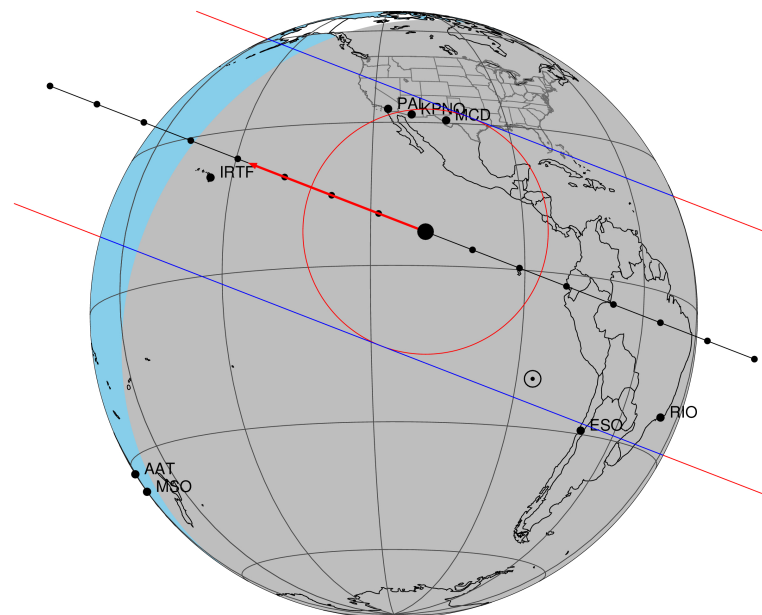
ICRS Star Coord at Epoch: 13h 57m 42.03234s -09:10:36.01087s
 RUWE (>1.4 is poor) : 0.91
 K magnitude : 14.415
 G magnitude : 17.546
 RP magnitude : 16.549
 BP magnitude : 18.573
 DUPflag : 0
 Distance (au) : 8.902
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -17.63
 Sun-Target sep (deg) : 149.78
 Sun-Moon sep (deg) : 112.88
 B (ring opening deg) : 15.65
 PA of pole (deg) : -1.19
 Pole direction: RA (deg): 39.48270
 Dec (deg): 83.42790
 C/A sky separation (") : 0.290
 C/A sky separation (km) : 1872.3
 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			Pnn
PAL	Palomar Mt (200")	33.4	243.1	+ +	MAY 22 05:42 - MAY 22 05:45	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	MAY 22 05:41 - MAY 22 05:44	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	MAY 22 05:41 - MAY 22 05:43	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	MAY 22 05:44 - MAY 22 05:48	Pie
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+ +	MAY 22 05:34 - MAY 22 05:38	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			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn

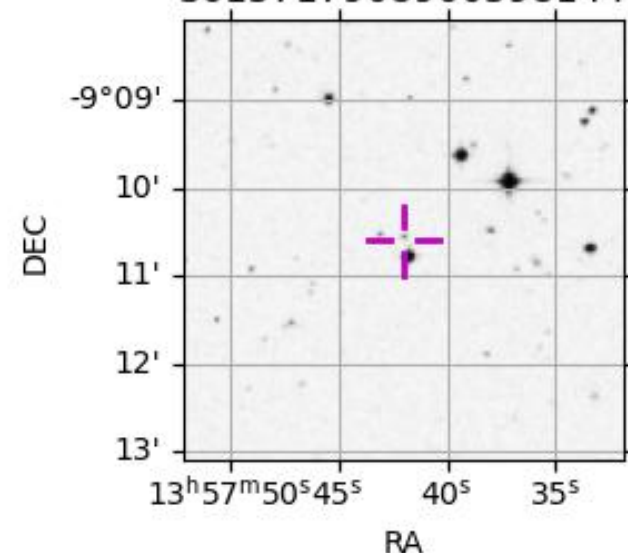
Titan 2042-05-22T05:42:10 K14.41 G17.55 dots 60.0 sec
 Pgt



2042-05-22T05:42:10.8200 α: 13 57 42.0323 δ: -09 10 36.011 C/A 0.290" PA 21.20 deg v_sky -17.63 km/s D 08.90 AU

Credit: Styled after SORA/Lucky Star

3615717908900598144



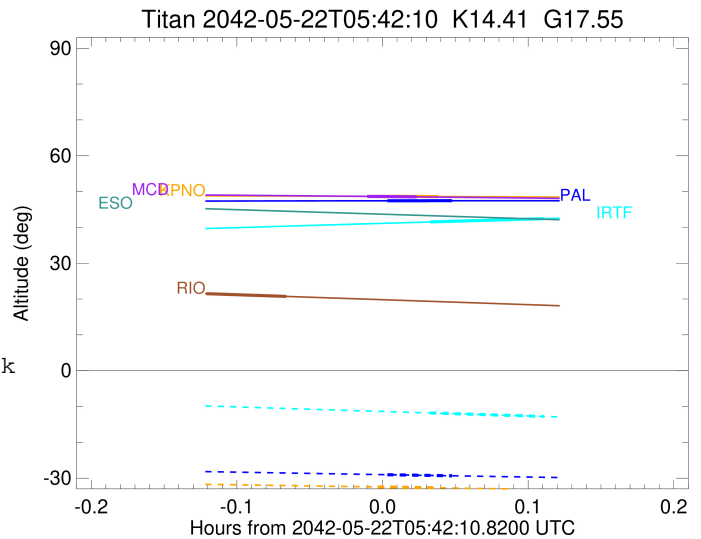
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2042-05-22T05:43:42.380
Event type           : Pgt
: Titan occs: geocentric, topocentric
: Not a ringed target
Observer code        : PAL
Location             : Palomar Mt (200")
Latitude (deg)       : 33.35622
E. Longitude (deg)   : 243.13601
Altitude (km)        : 1.706
Gaia source ID       : 3615717908900598144
2Mass ID (if available) : 13574207-0910363
ICRS Star Coord at Epoch: 13h 57m 42.03234s -09:10:36.01087s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 14.415
G magnitude           : 17.546
RP magnitude          : 16.549
BP magnitude          : 18.573
DUPflag              : 0
Distance (au)        : 8.902
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -17.63
Sun-Target sep (deg) : 149.78
Sun-Moon sep (deg)   : 113.65
B (ring opening deg) : 15.65
PA of pole (deg)     : -1.19
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation ("): 0.328
C/A sky separation (km): 2119.2
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	2042-05-22T05:42:21.054	47.42	-29.04	2575.1	69.97	69.98
Titan	E	2042-05-22T05:45:03.718	47.43	-29.35	2575.2	32.04	32.05



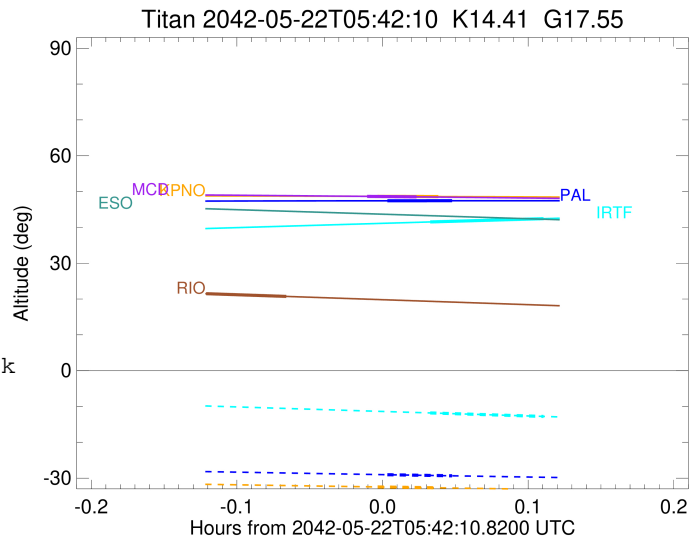
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch            : 2042-05-22T05:43:14.320
Event type           : Pgt
: Titan occs: geocentric, topocentric
: Not a ringed target
Observer code        : KPNO
Location             : Kitt Peak Natl Obs
Latitude (deg)       : 31.96333
E. Longitude (deg)  : 248.40000
Altitude (km)        : 2.120
Gaia source ID       : 3615717908900598144
2Mass ID (if available) : 13574207-0910363
ICRS Star Coord at Epoch: 13h 57m 42.03234s -09:10:36.01087s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 14.415
G magnitude           : 17.546
RP magnitude         : 16.549
BP magnitude         : 18.573
DUPflag              : 0
Distance (au)        : 8.902
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -17.63
Sun-Target sep (deg) : 149.78
Sun-Moon sep (deg)  : 113.63
B (ring opening deg) : 15.65
PA of pole (deg)    : -1.19
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (" ) : 0.338
C/A sky separation (km) : 2184.8
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	2042-05-22T05:41:58.581	48.66	-32.46	2575.1	71.50	71.51
Titan	E	2042-05-22T05:44:30.068	48.60	-32.71	2575.2	34.54	34.56



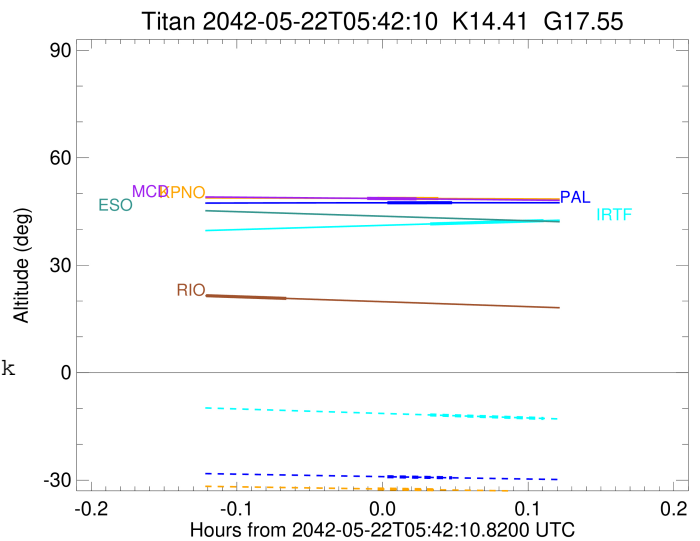
```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2042-05-22T05:42:34.260
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       : 3615717908900598144
2Mass ID (if available) : 13574207-0910363
ICRS Star Coord at Epoch: 13h 57m 42.03234s -09:10:36.01087s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 14.415
G magnitude           : 17.546
RP magnitude          : 16.549
BP magnitude          : 18.573
DUPflag              : 0
Distance (au)        : 8.902
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -17.63
Sun-Target sep (deg) : 149.78
Sun-Moon sep (deg)   : 113.59
B (ring opening deg) : 15.65
PA of pole (deg)     : -1.19
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation ("): 0.360
C/A sky separation (km): 2323.6
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

```

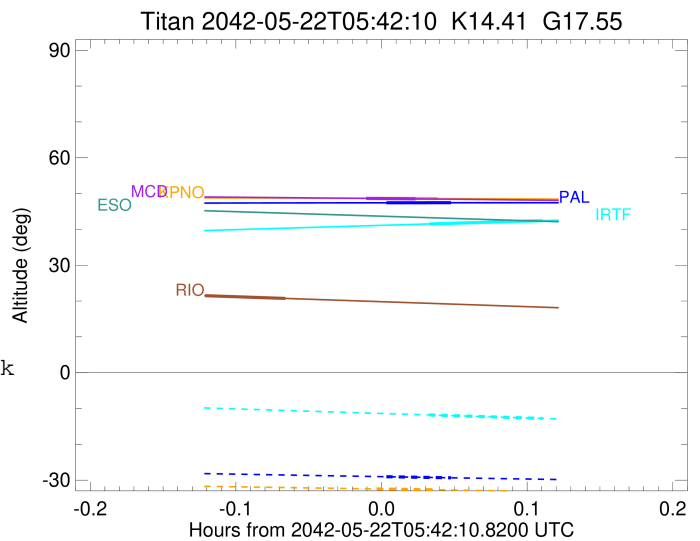
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2042-05-22T05:41:32.587	48.64	-36.29	2575.1	73.97	73.98
Titan	E	2042-05-22T05:43:35.952	48.51	-36.44	2575.2	40.56	40.57



```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2042-05-22T05:46:29.330
Event type            : Pgt
: Titan occs: geocentric, topocentric
: Not a ringed target
Observer code         : IRTF
Location              : Mauna Kea/IRTF
Latitude (deg)       : 19.82622
E. Longitude (deg)   : 204.52800
Altitude (km)        : 4.168
Gaia source ID       : 3615717908900598144
2Mass ID (if available) : 13574207-0910363
ICRS Star Coord at Epoch: 13h 57m 42.03234s -09:10:36.01087s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 14.415
G magnitude           : 17.546
RP magnitude          : 16.549
BP magnitude          : 18.573
DUPflag              : 0
Distance (au)        : 8.902
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -17.63
Sun-Target sep (deg) : 149.78
Sun-Moon sep (deg)   : 113.75
B (ring opening deg) : 15.65
PA of pole (deg)     : -1.19
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation ("): 0.083
C/A sky separation (km): 536.0
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
    
```

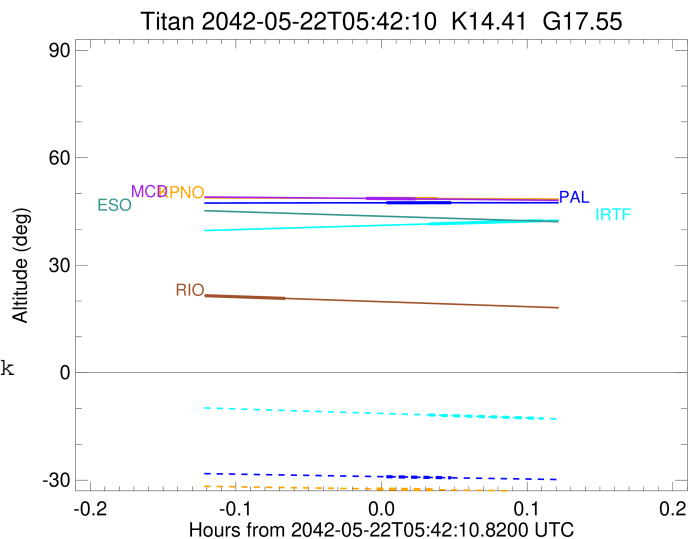


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Titan	I	2042-05-22T05:44:08.810	41.51	-11.80	2575.1	9.50	9.50
Titan	E	2042-05-22T05:48:49.859	42.43	-12.78	2575.1	-32.48	-32.49

```

target                : Titan
target radius (km)   : 2575.15
C/A epoch             : 2042-05-22T05:36:33.480
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       : 3615717908900598144
2Mass ID (if available) : 13574207-0910363
ICRS Star Coord at Epoch: 13h 57m 42.03234s -09:10:36.01087s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 14.415
G magnitude           : 17.546
RP magnitude          : 16.549
BP magnitude          : 18.573
DUPflag              : 0
Distance (au)        : 8.902
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -17.63
Sun-Target sep (deg) : 149.78
Sun-Moon sep (deg)   : 112.83
B (ring opening deg) : 15.65
PA of pole (deg)     : -1.19
Pole direction: RA (deg): 39.48270
Dec (deg): 83.42790
C/A sky separation (") : 0.287
C/A sky separation (km) : 1851.3
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	2042-05-22T05:34:52.888	21.50	-51.61	2575.1	-22.62	-22.63
Titan	E	2042-05-22T05:38:14.105	20.72	-50.84	2575.1	-63.54	-63.56