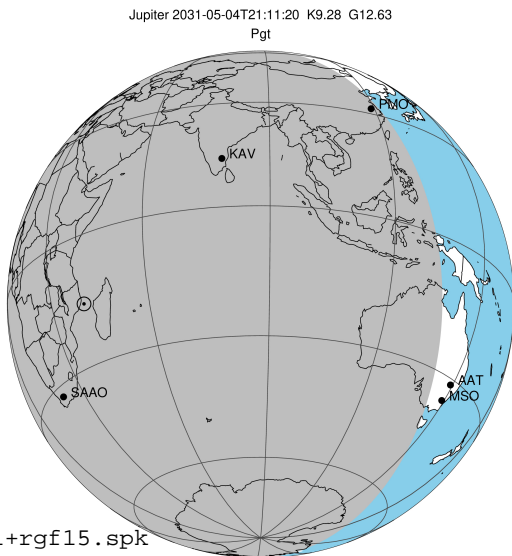


target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-05-04T21:11:20.410
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068716459025498880
 2Mass ID (if available) : 17510777-2253356

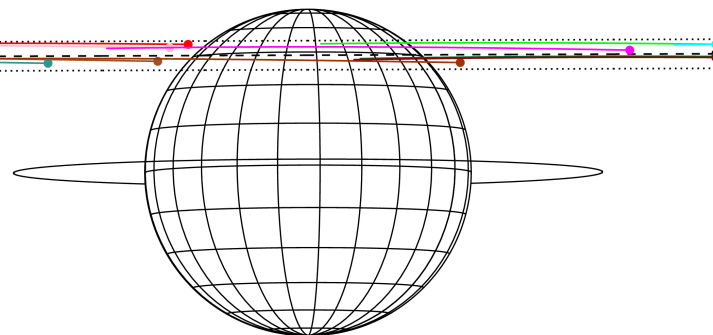
Jupiter 2031-05-04T21:11:20 K9.28 G12.63 Pgt

ICRS Star Coord at Epoch: 17h 51m 07.77670s -22:53:35.61888s
 RUWE (>1.4 is poor) : 0.82
 K magnitude : 9.283
 G magnitude : 12.630
 RP magnitude : 11.659
 BP magnitude : 13.601
 DUPflag : 0
 Distance (au) : 4.524
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -8.10
 Sun-Target sep (deg) : 135.82
 Sun-Moon sep (deg) : 74.16
 B (ring opening deg) : -2.61
 PA of pole (deg) : 0.12
 Pole direction: RA (deg): 268.05695
 Dec (deg): 64.49651
 C/A sky separation (") : 15.658
 C/A sky separation (km) : 51382.4
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk



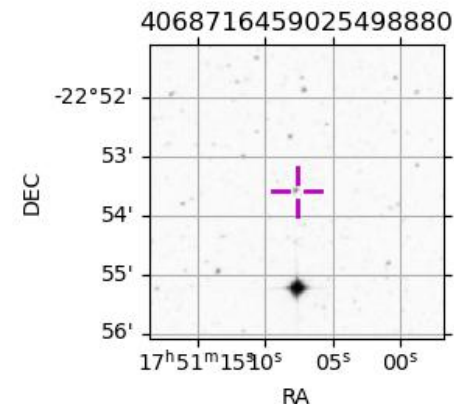
2031-05-04T21:11:20.4100 α: 17 51 07.7767 δ: -22 53 35.619 C/A ***** PA 180.20 deg v_sky - 8.10 km/s D 04.52 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 PMO
 TEN
 IRTF
 KAV
 RIO
 ESO
 AAT
 SAAO
 MSO



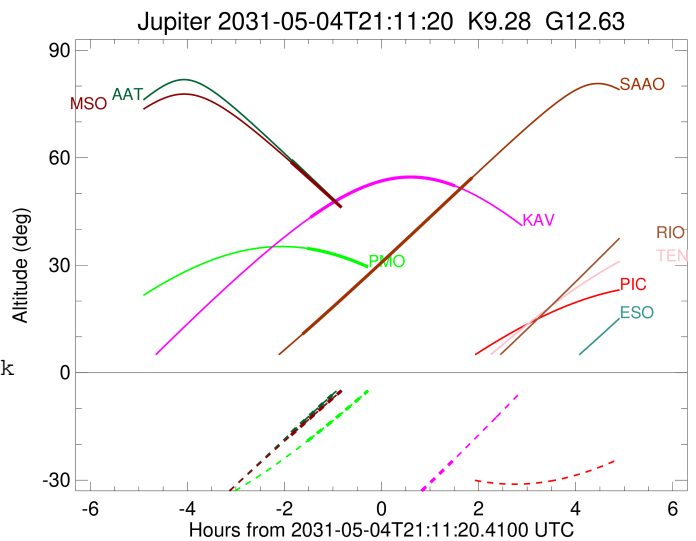
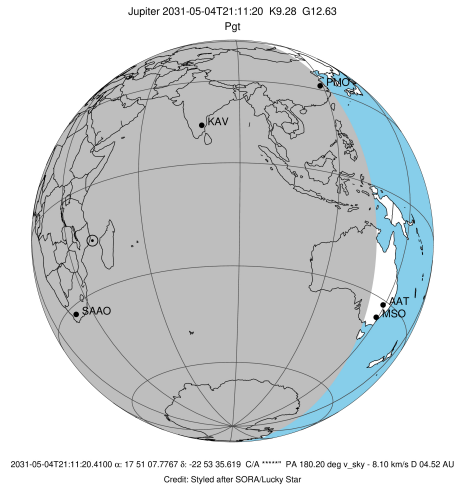
Observable events with sun below -5 deg and altitude above 5 deg

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	+	MAY 04 19:39 - MAY 04 19:39	Pin
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	+ +	MAY 04 19:43 - MAY 04 22:42	Pie
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	+	MAY 04 19:20 - MAY 04 19:20	Pin
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	MAY 04 19:33 - MAY 04 23:03	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	MAY 04 19:19 - MAY 04 19:19	Pin



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-04T21:06:50.940
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : PMO
Location              : Purple Mtn Obs. Nanking
Latitude (deg)       : 32.06667
E. Longitude (deg)   : 118.82089
Altitude (km)        : 0.364
Gaia source ID       : 4068716459025498880
2Mass ID (if available) : 17510777-2253356
ICRS Star Coord at Epoch: 17h 51m 07.77670s -22:53:35.61888s
RUWE (>1.4 is poor) : 0.82
K magnitude           : 9.283
G magnitude           : 12.630
RP magnitude          : 11.659
BP magnitude          : 13.601
DUPflag              : 0
Distance (au)        : 4.525
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -8.10
Sun-Target sep (deg) : 135.82
Sun-Moon sep (deg)   : 74.72
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.12
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation ("): 17.161
C/A sky separation (km): 56312.9
NAIF SPICE kernels   : RAJobs_U111+rgf15.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
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
```

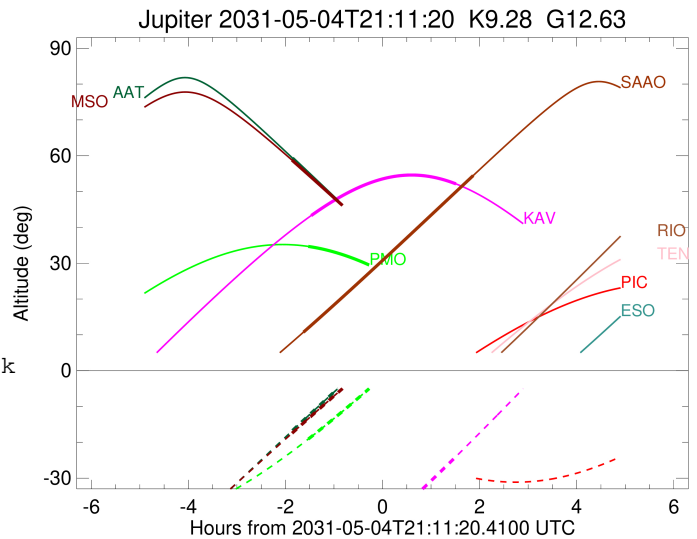
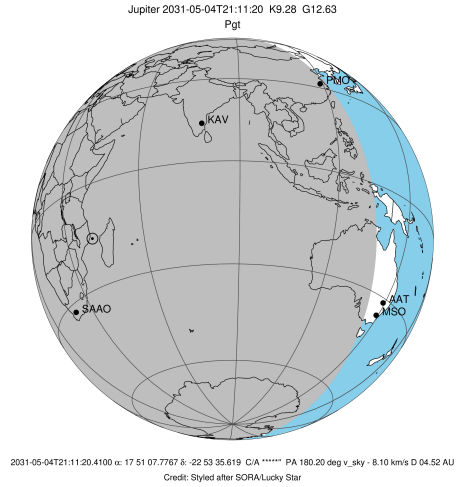


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-04T19:39:41.536	34.67	-19.08	71486.2	52.32	55.81
Jupiter	E	2031-05-04T22:34:30.744	16.13	15.29x	71486.4	51.14	54.68

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-04T21:12:54.810
Event type           : Pgt
: Jupiter 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       : 4068716459025498880
2Mass ID (if available) : 17510777-2253356
ICRS Star Coord at Epoch: 17h 51m 07.77670s -22:53:35.61888s
RUWE (>1.4 is poor) : 0.82
K magnitude          : 9.283
G magnitude          : 12.630
RP magnitude         : 11.659
BP magnitude         : 13.601
DUPflag             : 0
Distance (au)        : 4.524
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -8.10
Sun-Target sep (deg) : 135.82
Sun-Moon sep (deg)   : 74.88
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.12
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation ("): 16.776
C/A sky separation (km): 55048.9
NAIF SPICE kernels   : RAJobs_U111+rgf15.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
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
```

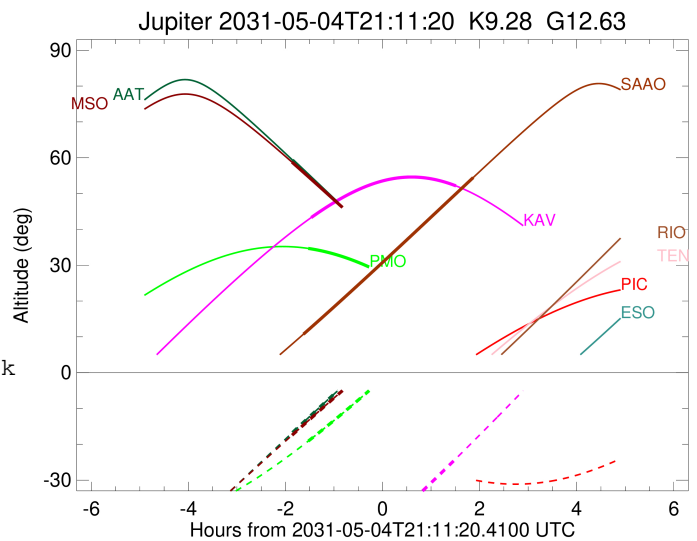
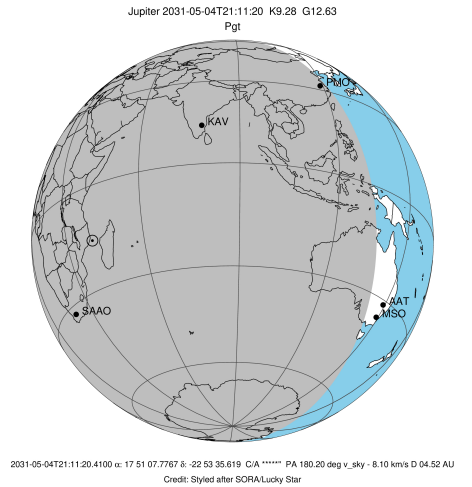


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-04T19:43:10.148	43.28	-57.60	71486.5	49.97	53.56
Jupiter	E	2031-05-04T22:42:10.170	52.13	-23.98	71486.5	50.15	53.73

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-04T21:03:19.200
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : AAT
Location              : Siding Spring (AAT)
Latitude (deg)        : -31.27703
E. Longitude (deg)    : 149.06608
Altitude (km)         : 1.164
Gaia source ID        : 4068716459025498880
2Mass ID (if available) : 17510777-2253356
ICRS Star Coord at Epoch: 17h 51m 07.77670s -22:53:35.61888s
RUWE (>1.4 is poor) : 0.82
K magnitude           : 9.283
G magnitude           : 12.630
RP magnitude          : 11.659
BP magnitude          : 13.601
DUPflag              : 0
Distance (au)         : 4.525
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -8.10
Sun-Target sep (deg)  : 135.82
Sun-Moon sep (deg)    : 74.89
B (ring opening deg) : -2.61
PA of pole (deg)      : 0.12
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 15.067
C/A sky separation (km) : 49443.6
NAIF SPICE kernels    : RAJobs_U111+rgf15.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
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
```

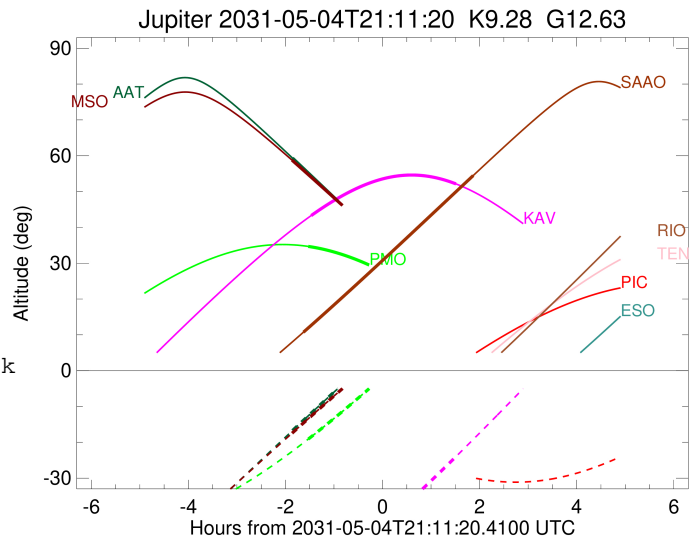
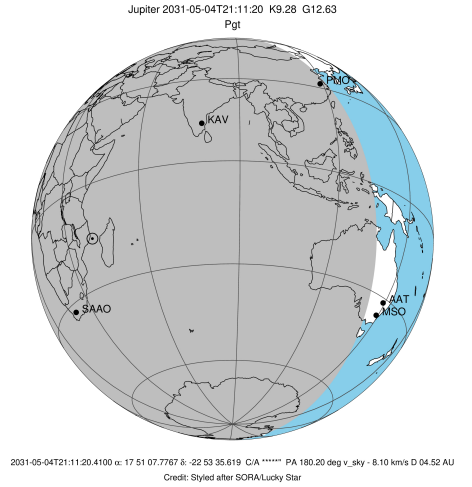


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-04T19:20:03.242	59.34	-16.72	71487.4	44.54	48.25
Jupiter	E	2031-05-04T22:48:05.329	15.27	23.94x	71487.7	42.60	46.32

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-04T21:19:41.980
Event type            : Pgt
: Jupiter 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       : 4068716459025498880
2Mass ID (if available) : 17510777-2253356
ICRS Star Coord at Epoch: 17h 51m 07.77670s -22:53:35.61888s
RUWE (>1.4 is poor) : 0.82
K magnitude           : 9.283
G magnitude           : 12.630
RP magnitude          : 11.659
BP magnitude          : 13.601
DUPflag              : 0
Distance (au)        : 4.524
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -8.10
Sun-Target sep (deg) : 135.82
Sun-Moon sep (deg)   : 74.43
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.12
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation ("): 14.977
C/A sky separation (km): 49147.4
NAIF SPICE kernels   : RAJobs_U111+rgf15.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
uranus_ringframes_rfrench20220627_v1.tf
neptune_ringframes_rfrench20220702a_v1.tf
earth_flat_IAU.spk
    
```

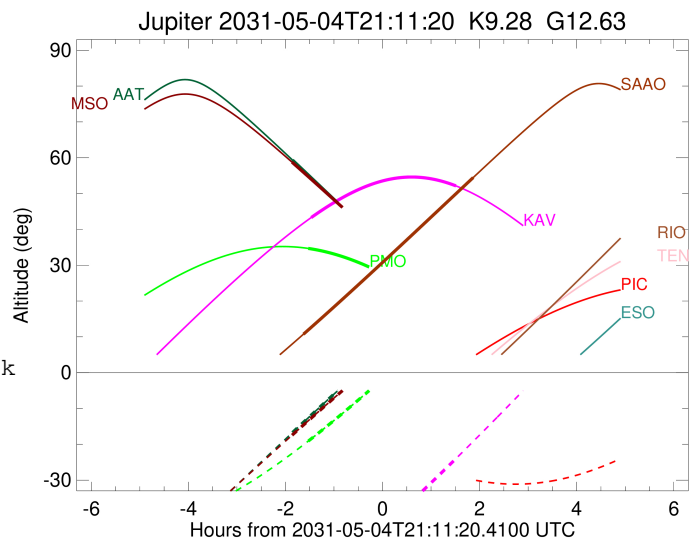
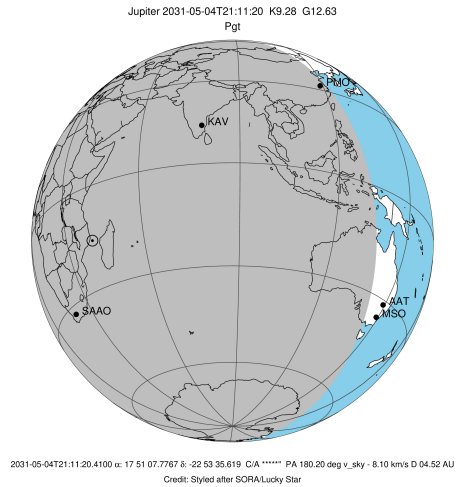


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-04T19:33:35.961	10.73	-46.28	71487.8	42.42	46.14
Jupiter	E	2031-05-04T23:03:32.753	54.47	-72.54	71487.5	44.11	47.82

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-04T21:03:40.140
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : MSO
Location              : Mt. Stromlo Observatory
Latitude (deg)        : -35.32000
E. Longitude (deg)    : 149.00833
Altitude (km)         : 0.770
Gaia source ID        : 4068716459025498880
2Mass ID (if available) : 17510777-2253356
ICRS Star Coord at Epoch: 17h 51m 07.77670s -22:53:35.61888s
RUWE (>1.4 is poor)  : 0.82
K magnitude           : 9.283
G magnitude           : 12.630
RP magnitude          : 11.659
BP magnitude          : 13.601
DUPflag              : 0
Distance (au)         : 4.525
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -8.10
Sun-Target sep (deg)  : 135.82
Sun-Moon sep (deg)    : 74.88
B (ring opening deg) : -2.61
PA of pole (deg)      : 0.12
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 14.947
C/A sky separation (km) : 49048.0
NAIF SPICE kernels   : RAJobs_U111+rgf15.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
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
Jupiter	I	2031-05-04T19:19:30.870	58.75	-17.46	71487.5	44.07	47.78
Jupiter	E	2031-05-04T22:49:16.207	16.29	21.54x	71487.8	42.21	45.93