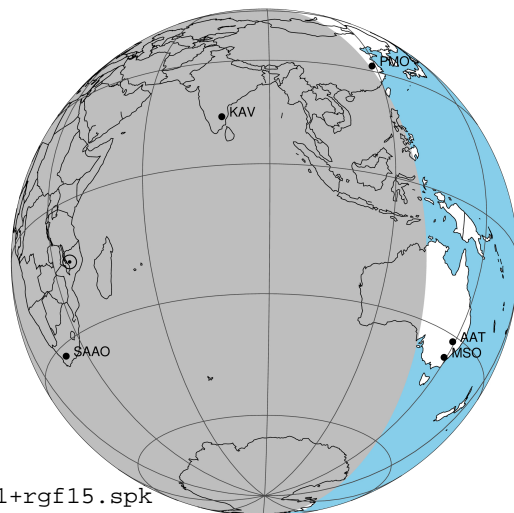


target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2031-04-28T21:32:26.110  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4068701963634270848  
 2Mass ID (if available) : 17522661-2253340

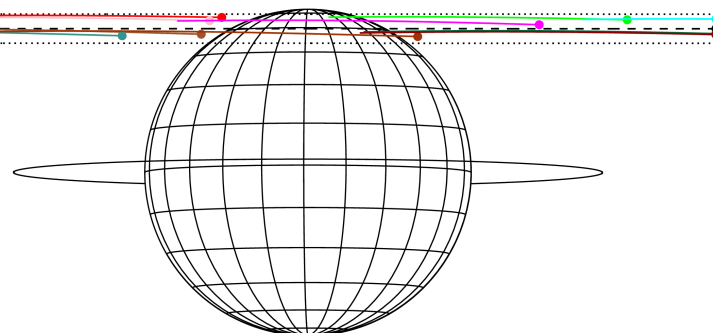
Jupiter 2031-04-28T21:32:26 K8.99 G14.22 Pgt

ICRS Star Coord at Epoch: 17h 52m 26.63015s -22:53:34.15467s  
 RUWE (>1.4 is poor) : 0.94  
 K magnitude : 8.991  
 G magnitude : 14.219  
 RP magnitude : 12.922  
 BP magnitude : 16.141  
 DUPflag : 0  
 Distance (au) : 4.596  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -5.80  
 Sun-Target sep (deg) : 129.71  
 Sun-Moon sep (deg) : 150.04  
 B (ring opening deg) : -2.61  
 PA of pole (deg) : -0.02  
 Pole direction: RA (deg): 268.05696  
 Dec (deg): 64.49651  
 C/A sky separation (") : 18.899  
 C/A sky separation (km) : 62999.6  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk



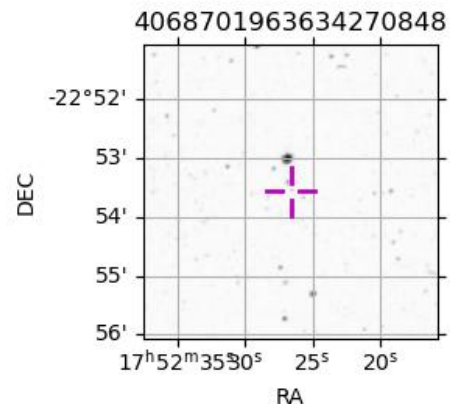
2031-04-28T21:32:26.1100 α: 17 52 26.6301 δ: -22 53 34.155 C/A \*\*\*\*\* PA 179.99 deg v\_sky - 5.80 km/s D 04.60 AU  
 Credit: Styled after SORA/Lucky Star

Earth  
 PIC  
 PMO  
 MCD  
 TEN  
 IRTF  
 KAV  
 RIO  
 ESO  
 AAT  
 SAAO  
 MSO



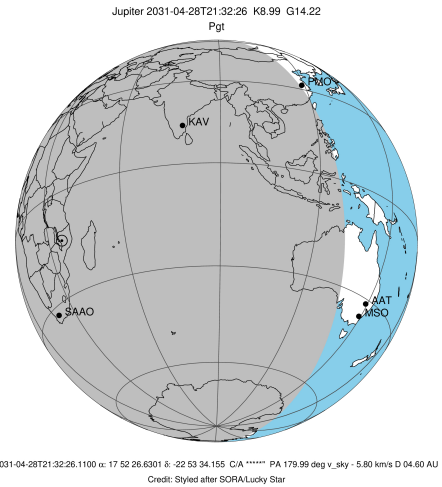
Observable events with sun below -5 deg and altitude above 5 deg

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	+	APR 28 20:26 - APR 28 20:26	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	+ +	APR 28 20:24 - APR 28 22:43	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	+	APR 28 19:40 - APR 28 19:40	Pin
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	APR 28 19:55 - APR 28 23:26	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	APR 28 19:38 - APR 28 19:38	Pin

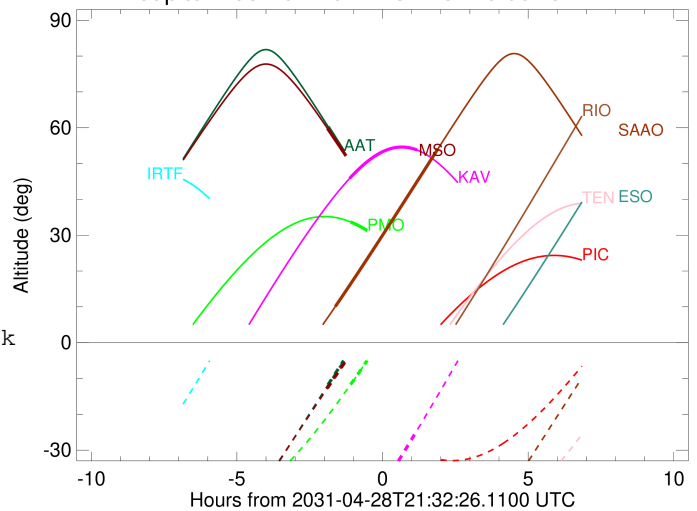


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-04-28T21:27:17.830
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      : 4068701963634270848
2Mass ID (if available) : 17522661-2253340
ICRS Star Coord at Epoch: 17h 52m 26.63015s -22:53:34.15467s
RUWE (>1.4 is poor) : 0.94
K magnitude          : 8.991
G magnitude          : 14.219
RP magnitude         : 12.922
BP magnitude         : 16.141
DUPflag             : 0
Distance (au)       : 4.596
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -5.80
Sun-Target sep (deg) : 129.71
Sun-Moon sep (deg)  : 149.84
B (ring opening deg) : -2.61
PA of pole (deg)    : -0.02
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation (" ) : 20.382
C/A sky separation (km) : 67943.4
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
    
```



Jupiter 2031-04-28T21:32:26 K8.99 G14.22

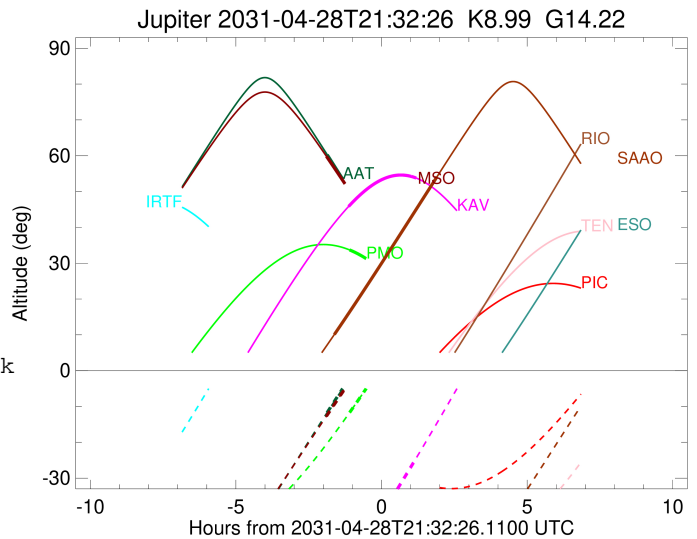
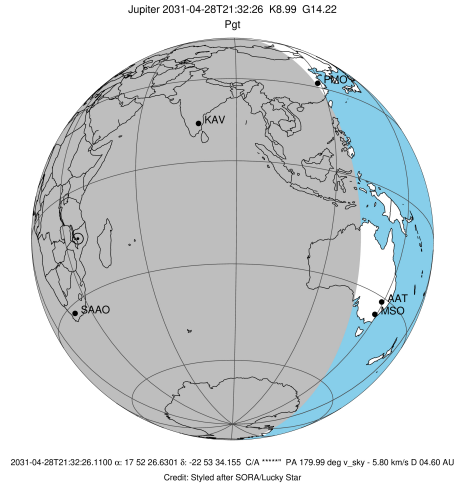


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-04-28T20:26:36.470	33.70	-11.71	71483.6	72.25	74.25
Jupiter	E	2031-04-28T22:28:16.535	20.91	12.95x	71483.7	70.84	72.98

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-04-28T21:34:29.900
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      : 4068701963634270848
2Mass ID (if available) : 17522661-2253340
ICRS Star Coord at Epoch: 17h 52m 26.63015s -22:53:34.15467s
RUWE (>1.4 is poor) : 0.94
K magnitude          : 8.991
G magnitude          : 14.219
RP magnitude         : 12.922
BP magnitude         : 16.141
DUPflag             : 0
Distance (au)       : 4.596
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -5.80
Sun-Target sep (deg) : 129.71
Sun-Moon sep (deg)  : 150.47
B (ring opening deg) : -2.61
PA of pole (deg)    : -0.02
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation (") : 19.998
C/A sky separation (km) : 66664.5
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
    
```

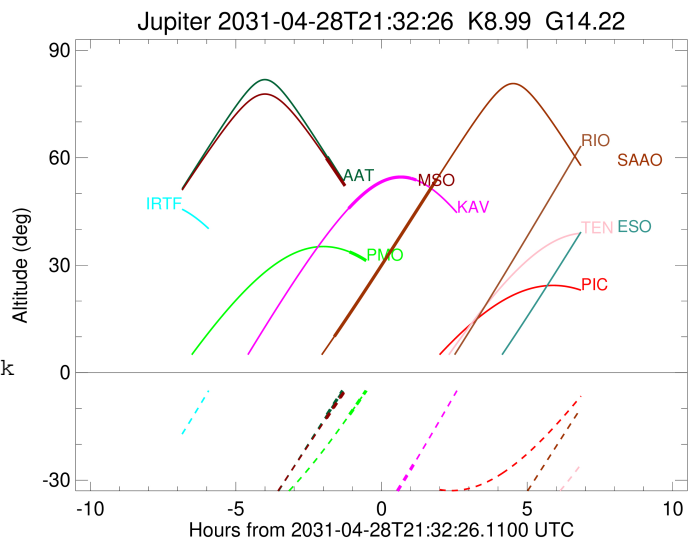
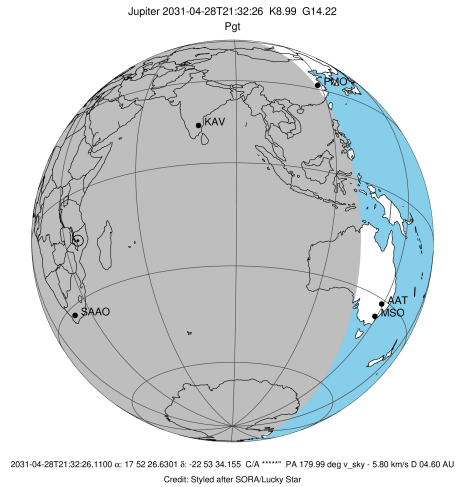


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-04-28T20:24:37.462	45.83	-53.10	71484.0	68.21	70.61
Jupiter	E	2031-04-28T22:43:55.704	53.76	-24.40	71483.9	68.68	71.02

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-04-28T21:23:01.340
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        : 4068701963634270848
2Mass ID (if available) : 17522661-2253340
ICRS Star Coord at Epoch: 17h 52m 26.63015s -22:53:34.15467s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 8.991
G magnitude           : 14.219
RP magnitude          : 12.922
BP magnitude          : 16.141
DUPflag              : 0
Distance (au)         : 4.596
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -5.80
Sun-Target sep (deg) : 129.71
Sun-Moon sep (deg)   : 149.76
B (ring opening deg) : -2.61
PA of pole (deg)     : -0.02
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation (") : 18.327
C/A sky separation (km) : 61093.6
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
    
```

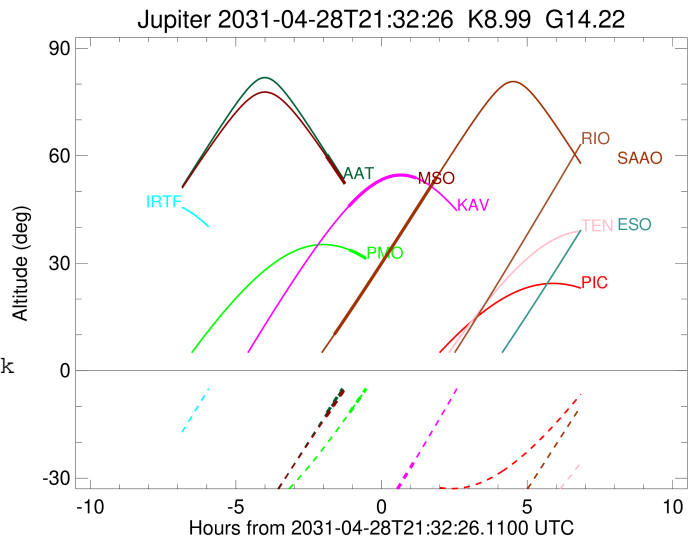
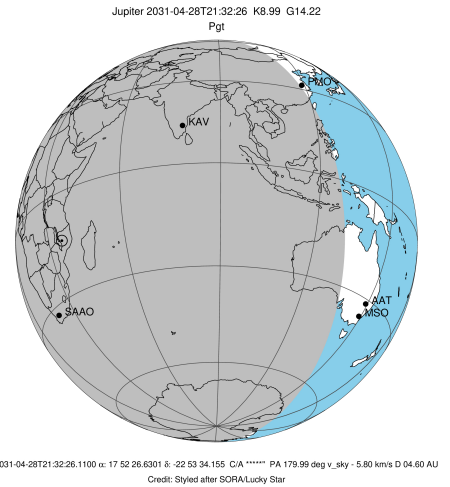


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-04-28T19:40:21.262	60.32	-11.71	71485.1	59.67	62.75
Jupiter	E	2031-04-28T23:07:34.424	16.38	28.35x	71485.4	57.20	60.45

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-04-28T21:42:29.830
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       : 4068701963634270848
2Mass ID (if available) : 17522661-2253340
ICRS Star Coord at Epoch: 17h 52m 26.63015s -22:53:34.15467s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 8.991
G magnitude           : 14.219
RP magnitude          : 12.922
BP magnitude          : 16.141
DUPflag              : 0
Distance (au)        : 4.596
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -5.80
Sun-Target sep (deg) : 129.71
Sun-Moon sep (deg)   : 150.91
B (ring opening deg) : -2.61
PA of pole (deg)     : -0.02
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation (") : 18.232
C/A sky separation (km) : 60774.3
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
    
```

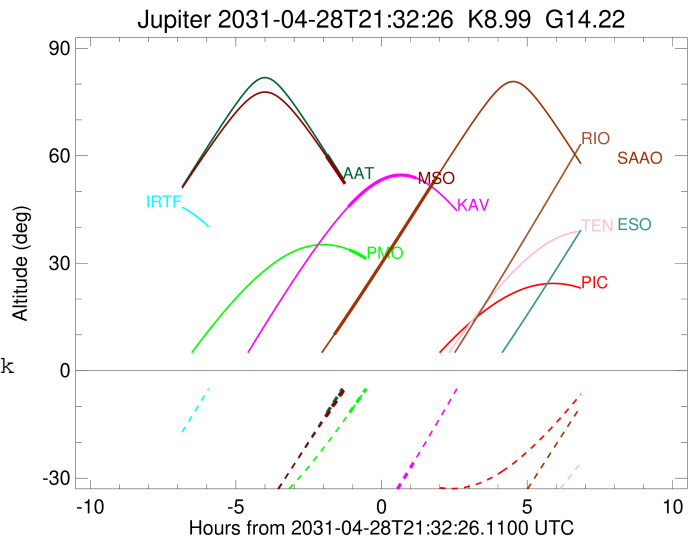
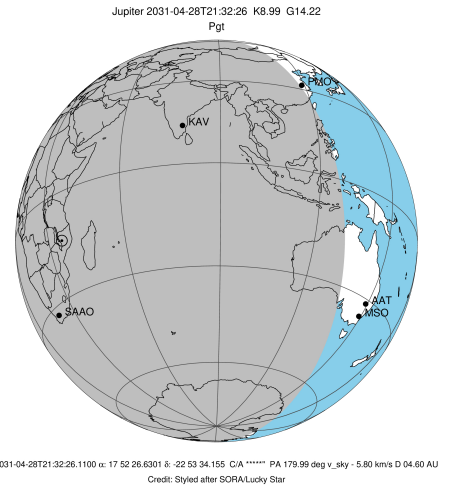


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-04-28T19:55:12.014	10.08	-49.63	71485.5	56.70	59.98
Jupiter	E	2031-04-28T23:26:39.483	54.10	-68.49	71485.1	59.24	62.35

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-04-28T21:23:25.800
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      : 4068701963634270848
2Mass ID (if available) : 17522661-2253340
ICRS Star Coord at Epoch: 17h 52m 26.63015s -22:53:34.15467s
RUWE (>1.4 is poor) : 0.94
K magnitude          : 8.991
G magnitude          : 14.219
RP magnitude         : 12.922
BP magnitude         : 16.141
DUPflag             : 0
Distance (au)       : 4.596
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -5.80
Sun-Target sep (deg) : 129.71
Sun-Moon sep (deg)  : 149.80
B (ring opening deg) : -2.61
PA of pole (deg)    : -0.02
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation (") : 18.207
C/A sky separation (km) : 60695.7
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	2031-04-28T19:38:47.813	59.87	-12.72	71485.2	59.01	62.14
Jupiter	E	2031-04-28T23:09:54.580	17.12	25.98x	71485.5	56.66	59.93