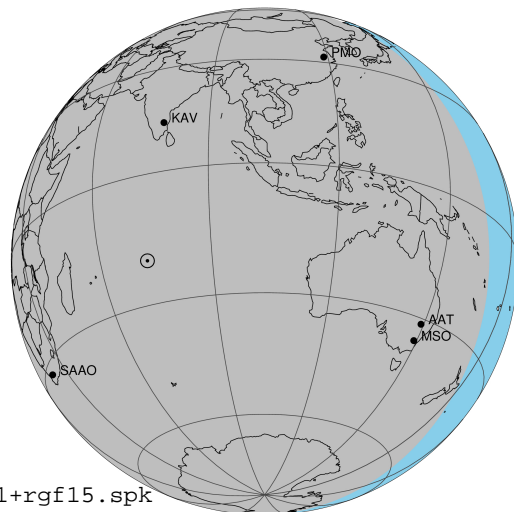


target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-05-20T19:03:05.480
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068857235282744192
 2Mass ID (if available) : 17453538-2253228

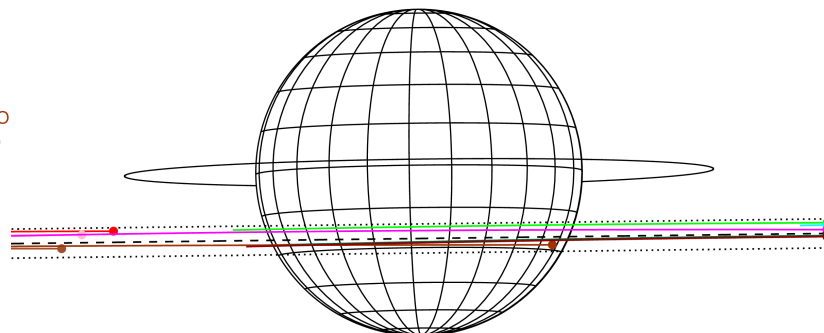
Jupiter 2031-05-20T19:03:05 K8.41 G14.82 Pgt

ICRS Star Coord at Epoch: 17h 45m 35.37420s -22:53:22.78624s
 RUWE (>1.4 is poor) : 1.48
 K magnitude : 8.410
 G magnitude : 14.825
 RP magnitude : 13.254
 BP magnitude : 17.973
 DUPflag : 0
 Distance (au) : 4.371
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -13.11
 Sun-Target sep (deg) : 152.46
 Sun-Moon sep (deg) : 146.73
 B (ring opening deg) : -2.60
 PA of pole (deg) : 0.72
 Pole direction: RA (deg): 268.05694
 Dec (deg): 64.49651
 C/A sky separation (") : 9.122
 C/A sky separation (km) : 28918.1
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk



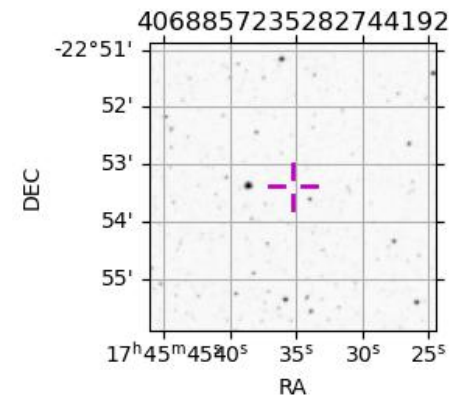
2031-05-20T19:03:05.4800 a: 17 45 35.3742 d: -22 53 22.786 C/A 9.134" PA 0.71 deg v_sky -13.11 km/s D 04.37 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 PMO
 TEN
 IRTF
 KAV
 RIO
 AAT
 SAAO
 MSO



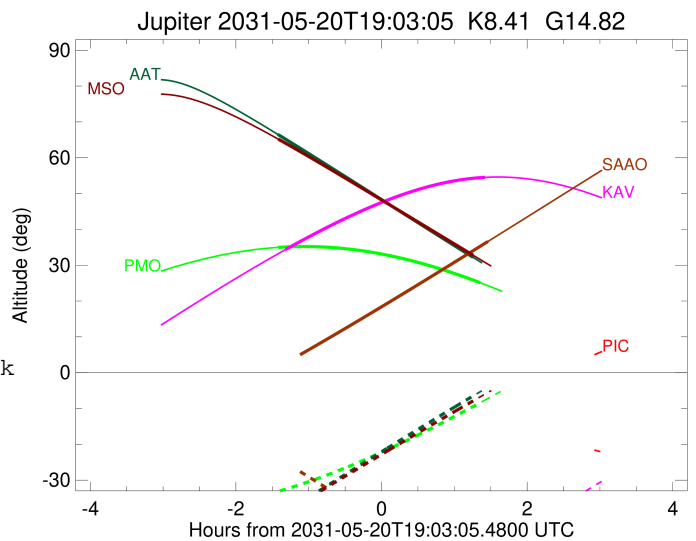
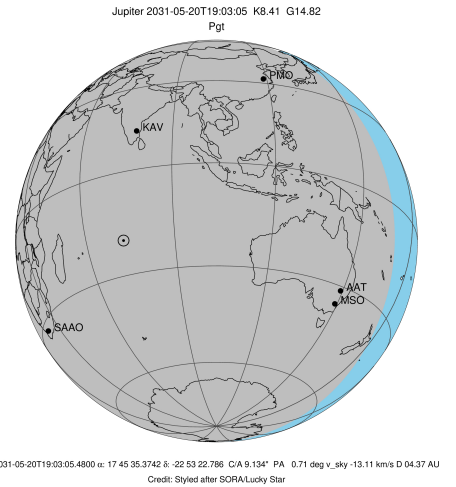
Observable events with sun below -5 deg and altitude above 5 deg

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 20 17:38 - MAY 20 20:24	Pie
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 20 17:43 - MAY 20 20:28	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 20 17:37 - MAY 20 20:18	Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	MAY 20 20:30 - MAY 20 20:30	Pne
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	MAY 20 17:38 - MAY 20 20:18	Pie



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-20T19:01:13.770
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       : 4068857235282744192
2Mass ID (if available) : 17453538-2253228
ICRS Star Coord at Epoch: 17h 45m 35.37420s -22:53:22.78624s
RUWE (>1.4 is poor) : 1.48
K magnitude           : 8.410
G magnitude           : 14.825
RP magnitude          : 13.254
BP magnitude          : 17.973
DUPflag              : 0
Distance (au)        : 4.371
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.11
Sun-Target sep (deg) : 152.46
Sun-Moon sep (deg)   : 147.17
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.72
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 7.499
C/A sky separation (km) : 23775.0
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
    
```

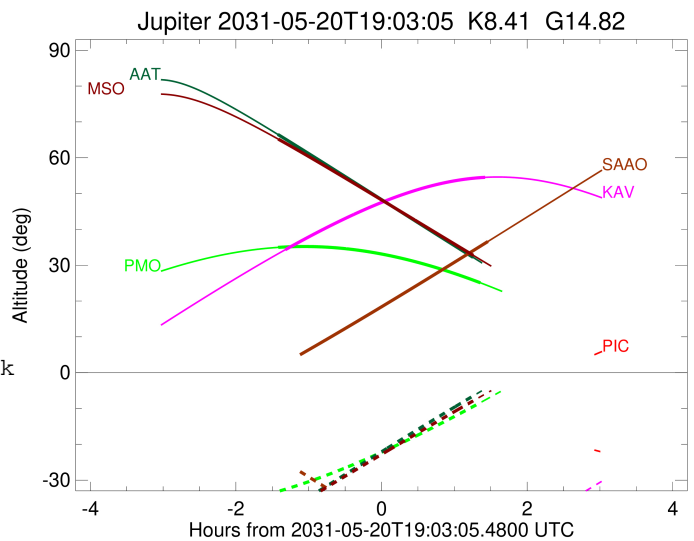
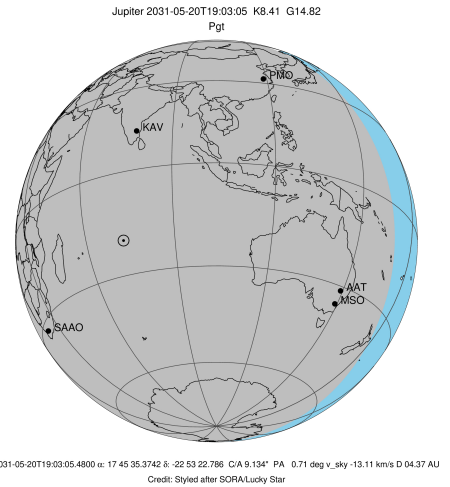


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-20T17:38:02.115	34.97	-33.13	71491.0	-19.36	-21.87
Jupiter	E	2031-05-20T20:24:34.554	25.09	-8.36	71490.9	-19.67	-22.22

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-20T19:06:25.410
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        : 4068857235282744192
2Mass ID (if available) : 17453538-2253228
ICRS Star Coord at Epoch: 17h 45m 35.37420s -22:53:22.78624s
RUWE (>1.4 is poor) : 1.48
K magnitude           : 8.410
G magnitude           : 14.825
RP magnitude          : 13.254
BP magnitude          : 17.973
DUPflag              : 0
Distance (au)         : 4.371
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -13.11
Sun-Target sep (deg)  : 152.46
Sun-Moon sep (deg)    : 146.79
B (ring opening deg) : -2.60
PA of pole (deg)      : 0.72
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 8.026
C/A sky separation (km) : 25442.9
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
    
```

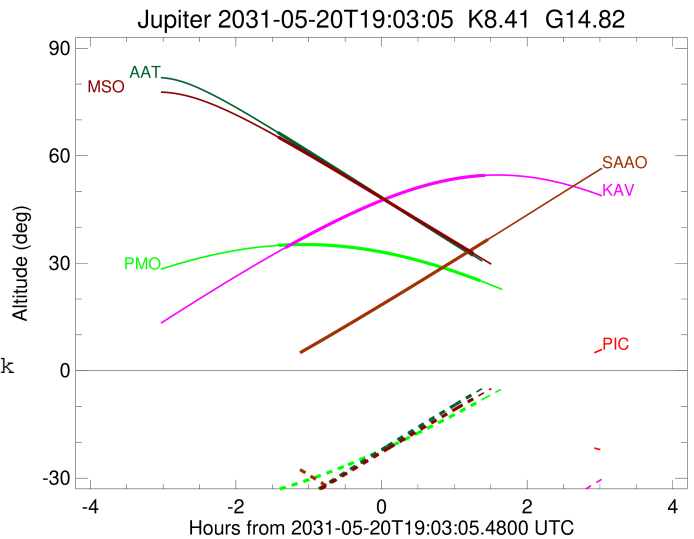
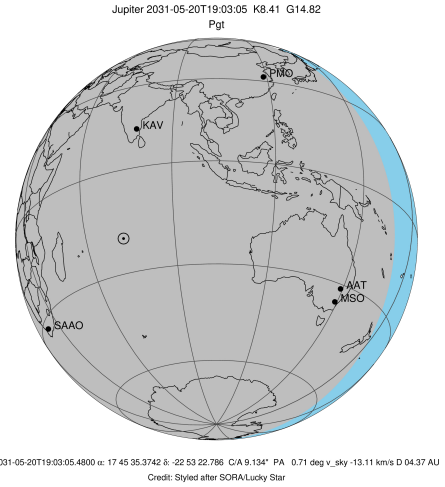


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-20T17:43:54.125	34.34	-54.54	71490.8	-21.25	-23.95
Jupiter	E	2031-05-20T20:28:28.187	54.52	-48.10	71490.8	-20.64	-23.28

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-20T18:57:52.190
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       : 4068857235282744192
2Mass ID (if available) : 17453538-2253228
ICRS Star Coord at Epoch: 17h 45m 35.37420s -22:53:22.78624s
RUWE (>1.4 is poor) : 1.48
K magnitude          : 8.410
G magnitude           : 14.825
RP magnitude         : 13.254
BP magnitude         : 17.973
DUPflag             : 0
Distance (au)        : 4.371
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.11
Sun-Target sep (deg) : 152.46
Sun-Moon sep (deg)   : 147.57
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.72
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation ("): 9.593
C/A sky separation (km): 30413.1
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
    
```

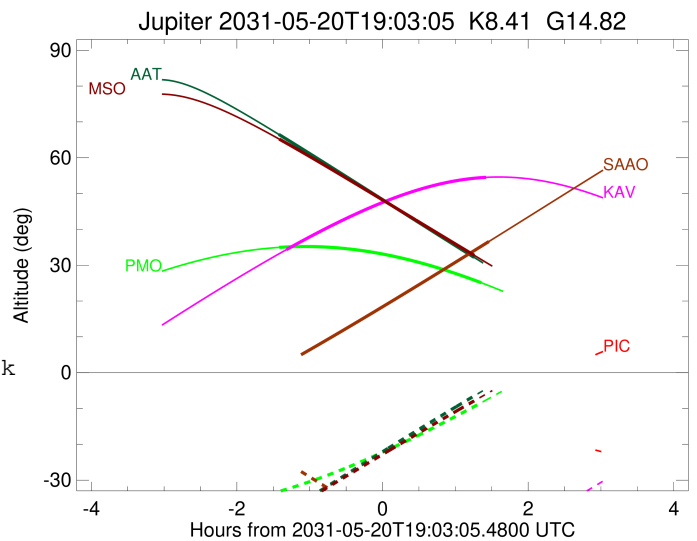
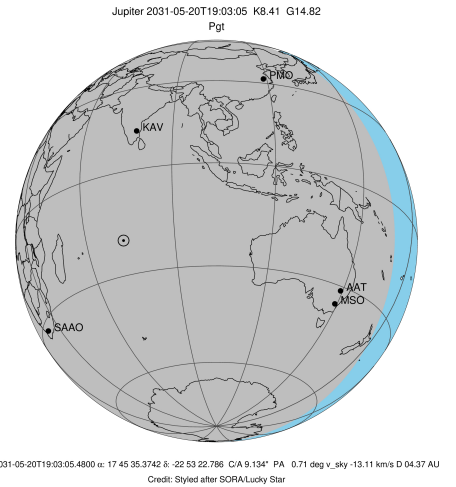


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-20T17:37:39.109	66.50	-40.24	71490.4	-24.79	-27.80
Jupiter	E	2031-05-20T20:18:36.408	32.17	-6.50	71490.3	-25.68	-28.76

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-20T19:10:16.650
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      : 4068857235282744192
2Mass ID (if available) : 17453538-2253228
ICRS Star Coord at Epoch: 17h 45m 35.37420s -22:53:22.78624s
RUWE (>1.4 is poor) : 1.48
K magnitude         : 8.410
G magnitude         : 14.825
RP magnitude        : 13.254
BP magnitude        : 17.973
DUPflag            : 0
Distance (au)       : 4.371
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -13.11
Sun-Target sep (deg) : 152.46
Sun-Moon sep (deg)  : 146.25
B (ring opening deg) : -2.60
PA of pole (deg)    : 0.72
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 10.013
C/A sky separation (km) : 31742.4
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
    
```

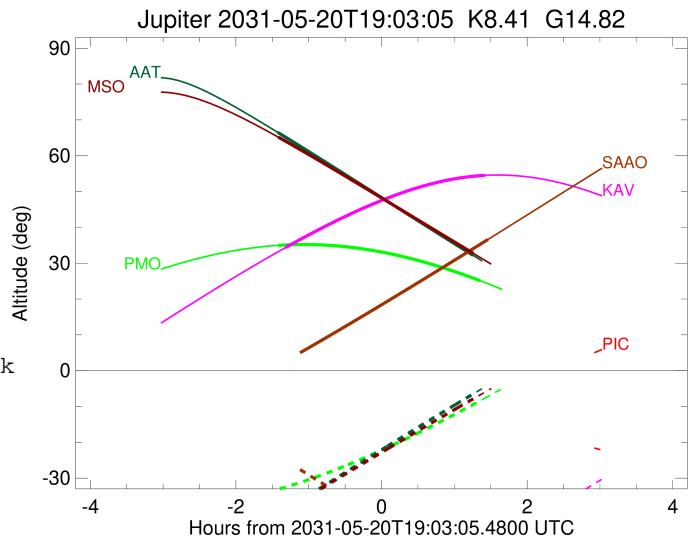
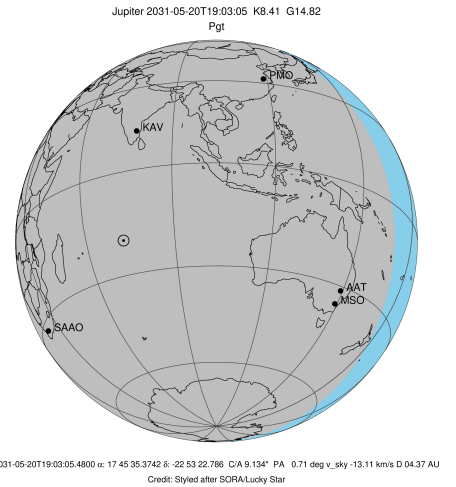


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-20T17:48:48.711	3.61x	-26.09	71490.1	-27.00	-30.17
Jupiter	E	2031-05-20T20:30:48.601	36.62	-60.09	71490.2	-25.71	-28.79

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-20T18:58:05.750
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        : 4068857235282744192
2Mass ID (if available) : 17453538-2253228
ICRS Star Coord at Epoch: 17h 45m 35.37420s -22:53:22.78624s
RUWE (>1.4 is poor) : 1.48
K magnitude           : 8.410
G magnitude           : 14.825
RP magnitude          : 13.254
BP magnitude          : 17.973
DUPflag              : 0
Distance (au)         : 4.371
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -13.11
Sun-Target sep (deg) : 152.46
Sun-Moon sep (deg)   : 147.55
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.72
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 9.724
C/A sky separation (km) : 30827.5
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	2031-05-20T17:38:01.903	65.18	-40.15	71490.3	-25.17	-28.21
Jupiter	E	2031-05-20T20:18:39.047	32.76	-7.87	71490.2	-26.03	-29.13