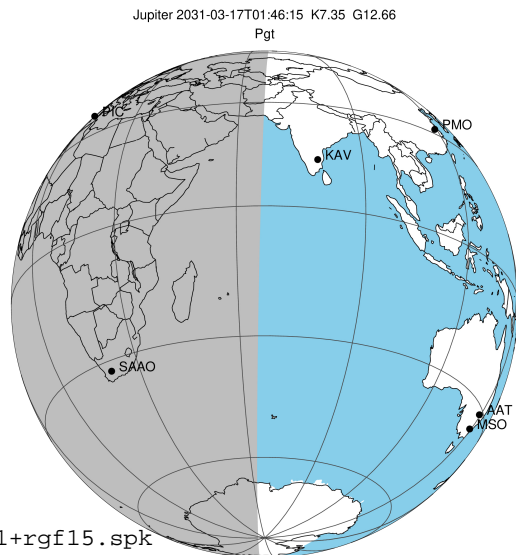


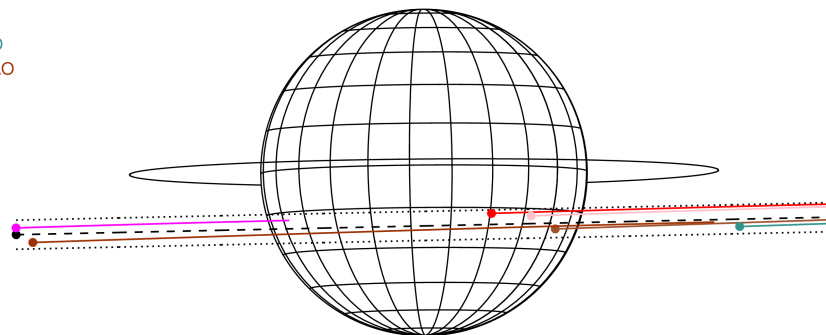
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2031-03-17T01:46:15.200  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4068887707964747776  
 2Mass ID (if available) : 17475714-2252212

Jupiter 2031-03-17T01:46:15 K7.35 G12.66 Pgt

ICRS Star Coord at Epoch: 17h 47m 57.14968s -22:52:21.43334s  
 RUWE (>1.4 is poor) : 0.74  
 K magnitude : 7.351  
 G magnitude : 12.661  
 RP magnitude : 11.325  
 BP magnitude : 14.764  
 DUPflag : 0  
 Distance (au) : 5.241  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : 13.87  
 Sun-Target sep (deg) : 88.61  
 Sun-Moon sep (deg) : 9.43  
 B (ring opening deg) : -2.63  
 PA of pole (deg) : 0.46  
 Pole direction: RA (deg): 268.05700  
 Dec (deg): 64.49651  
 C/A sky separation (") : 6.156  
 C/A sky separation (km) : 23397.6  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk



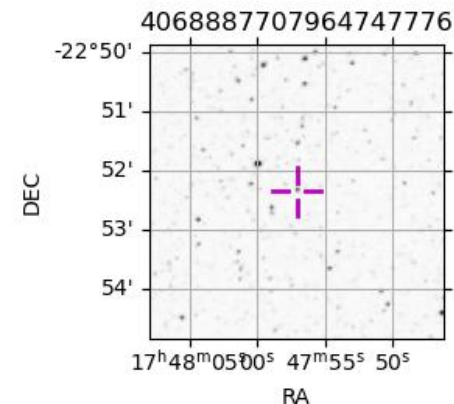
Earth  
 PIC  
 TEN  
 KAV  
 RIO  
 ESO  
 SAAO



2031-03-17T01:46:15.2000 a: 17 47 57.1497 b: -22 52 21.4333 C/A 6.1567 PA 1.23 deg v\_sky +13.87 km/s D 05.24 AU  
 Credit: Styled after SORA/Lucky Star

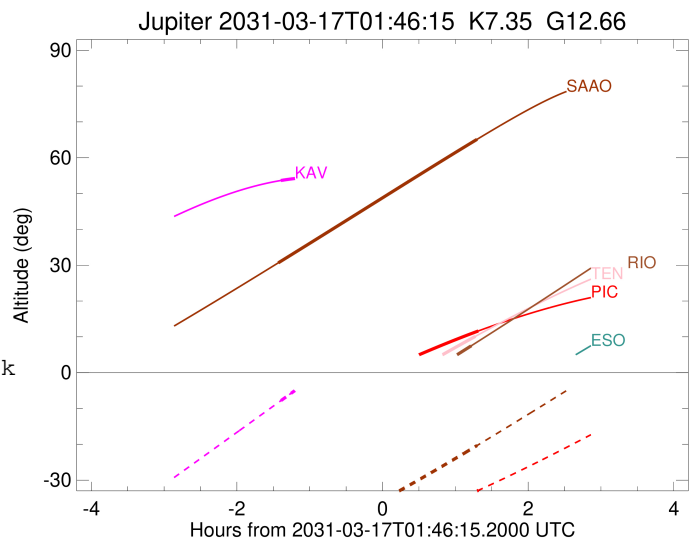
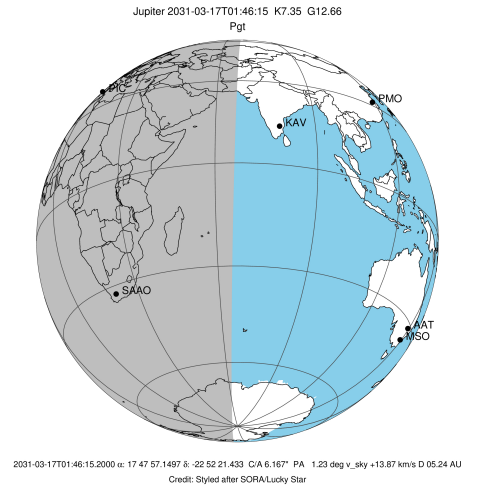
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	MAR 17 03:05 - MAR 17 03:05	Pne
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	+	MAR 17 03:02 - MAR 17 03:02	Pne
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+	MAR 17 00:22 - MAR 17 00:22	Pin
RIO	Rio de Janeiro	-22.9	316.8	+	MAR 17 02:59 - MAR 17 02:59	Pne
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	+	MAR 17 00:20 - MAR 17 03:04	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-17T01:41:09.680
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : PIC
Location              : Pic du Midi
Latitude (deg)        : 42.93656
E. Longitude (deg)    : 0.14231
Altitude (km)         : 2.890
Gaia source ID        : 4068887707964747776
2Mass ID (if available) : 17475714-2252212
ICRS Star Coord at Epoch: 17h 47m 57.14968s -22:52:21.43334s
RUWE (>1.4 is poor) : 0.74
K magnitude           : 7.351
G magnitude           : 12.661
RP magnitude          : 11.325
BP magnitude          : 14.764
DUPflag              : 0
Distance (au)         : 5.241
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 13.87
Sun-Target sep (deg)  : 88.61
Sun-Moon sep (deg)   : 9.93
B (ring opening deg) : -2.63
PA of pole (deg)     : 0.46
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (") : 4.946
C/A sky separation (km) : 18799.9
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
    
```

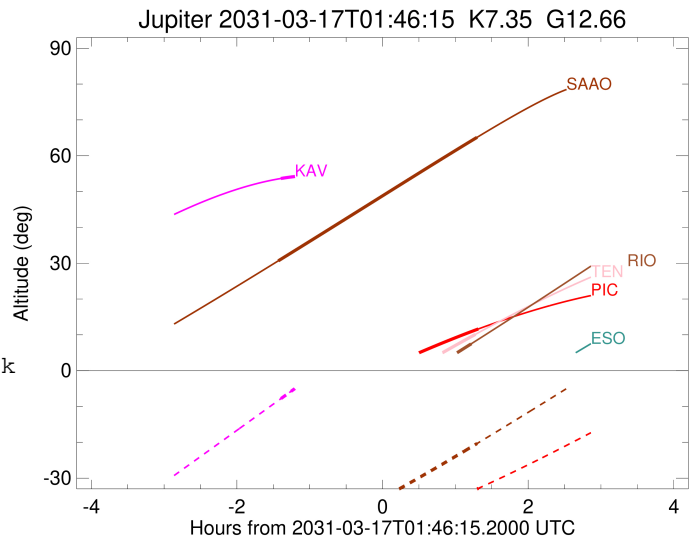
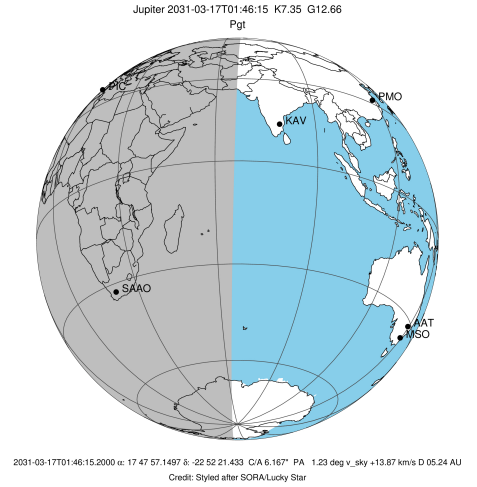


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-17T00:17:59.915	-14.19x	-48.70	71491.2	-16.54	-18.75
Jupiter	E	2031-03-17T03:05:11.617	11.64	-32.86	71491.4	-13.98	-15.89

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-17T01:39:44.950
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : TEN
Location            : Teide Obs./Tenerife
Latitude (deg)      : 28.30050
E. Longitude (deg)  : 343.48909
Altitude (km)       : 2.395
Gaia source ID      : 4068887707964747776
2Mass ID (if available) : 17475714-2252212
ICRS Star Coord at Epoch: 17h 47m 57.14968s -22:52:21.43334s
RUWE (>1.4 is poor) : 0.74
K magnitude          : 7.351
G magnitude          : 12.661
RP magnitude         : 11.325
BP magnitude         : 14.764
DUPflag             : 0
Distance (au)       : 5.241
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 13.87
Sun-Target sep (deg) : 88.61
Sun-Moon sep (deg)   : 10.15
B (ring opening deg) : -2.63
PA of pole (deg)     : 0.46
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation ("): 5.400
C/A sky separation (km): 20524.8
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
    
```

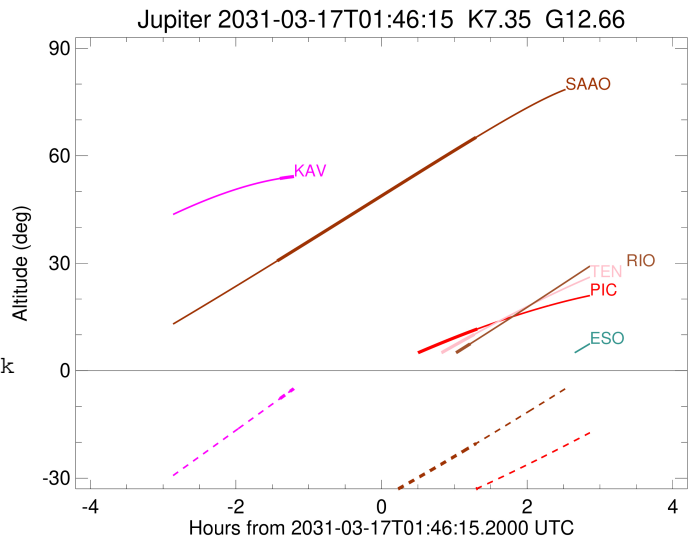
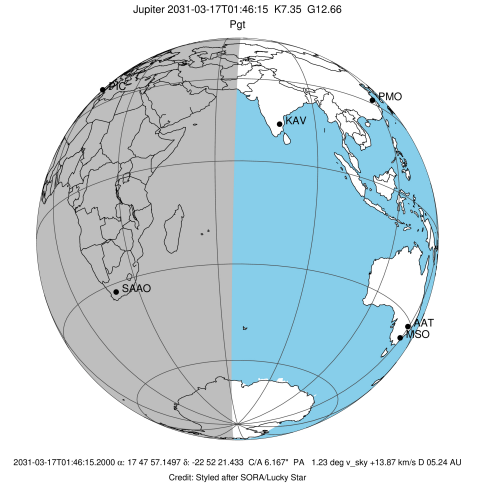


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-17T00:17:47.846	-23.27x	-60.12	71491.1	-18.08	-20.46
Jupiter	E	2031-03-17T03:02:44.054	10.12	-52.85	71491.3	-15.25	-17.31

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-17T01:47:46.330
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      : 4068887707964747776
2Mass ID (if available) : 17475714-2252212
ICRS Star Coord at Epoch: 17h 47m 57.14968s -22:52:21.43334s
RUWE (>1.4 is poor) : 0.74
K magnitude          : 7.351
G magnitude          : 12.661
RP magnitude         : 11.325
BP magnitude         : 14.764
DUPflag             : 0
Distance (au)       : 5.241
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : 13.87
Sun-Target sep (deg) : 88.61
Sun-Moon sep (deg)  : 9.24
B (ring opening deg) : -2.63
PA of pole (deg)    : 0.46
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (") : 5.194
C/A sky separation (km) : 19740.9
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
    
```

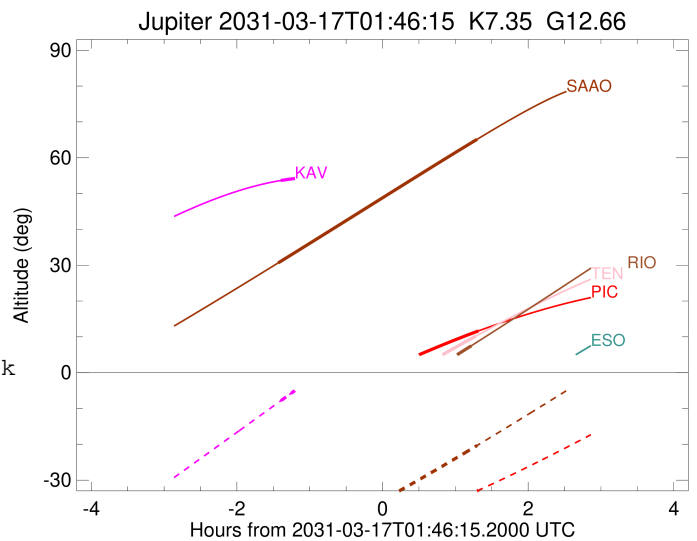
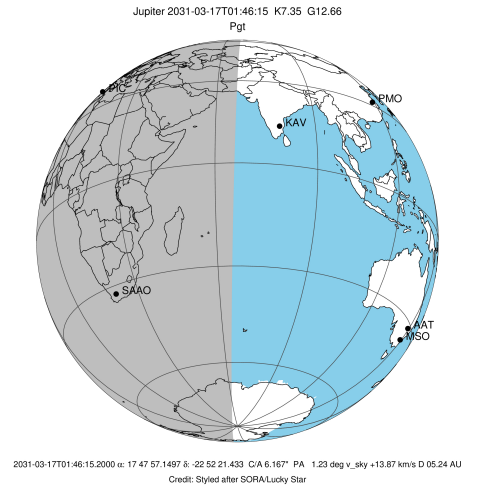


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-17T00:22:36.061	53.64	-7.79	71491.2	-16.79	-19.02
Jupiter	E	2031-03-17T03:12:54.741	41.35	33.60x	71491.3	-15.51	-17.59

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-17T01:40:05.150
Event type          : Pgt
                    : Jupiter 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      : 4068887707964747776
2Mass ID (if available) : 17475714-2252212
ICRS Star Coord at Epoch: 17h 47m 57.14968s -22:52:21.43334s
RUWE (>1.4 is poor) : 0.74
K magnitude          : 7.351
G magnitude          : 12.661
RP magnitude         : 11.325
BP magnitude         : 14.764
DUPflag             : 0
Distance (au)       : 5.241
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 13.87
Sun-Target sep (deg) : 88.61
Sun-Moon sep (deg)  : 10.34
B (ring opening deg) : -2.63
PA of pole (deg)    : 0.46
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (" ) : 6.998
C/A sky separation (km) : 26597.4
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
    
```

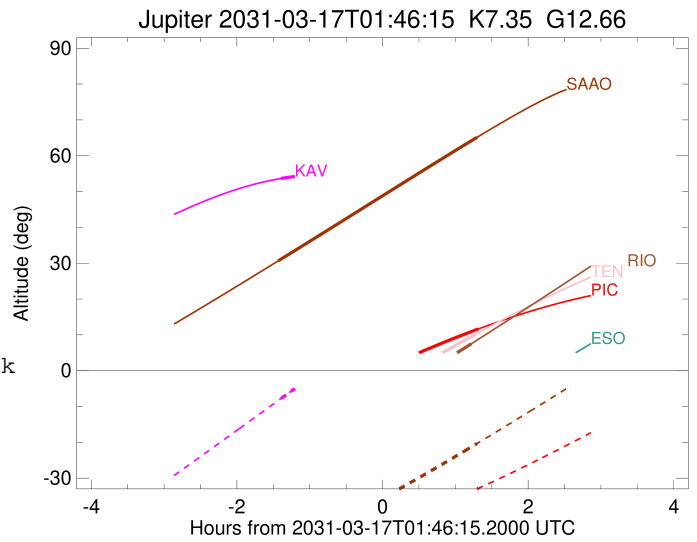
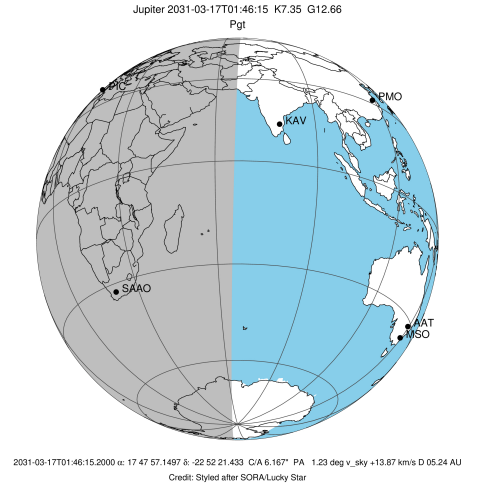


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-17T00:21:40.937	-23.92x	-44.17	71490.5	-23.15	-26.02
Jupiter	E	2031-03-17T02:59:24.033	7.50	-65.78	71490.9	-20.39	-23.00

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-17T01:41:49.840
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        : 4068887707964747776
2Mass ID (if available) : 17475714-2252212
ICRS Star Coord at Epoch: 17h 47m 57.14968s -22:52:21.43334s
RUWE (>1.4 is poor) : 0.74
K magnitude           : 7.351
G magnitude           : 12.661
RP magnitude          : 11.325
BP magnitude          : 14.764
DUPflag              : 0
Distance (au)         : 5.241
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 13.87
Sun-Target sep (deg)  : 88.61
Sun-Moon sep (deg)   : 10.20
B (ring opening deg) : -2.63
PA of pole (deg)     : 0.46
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (") : 6.620
C/A sky separation (km) : 25162.5
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	2031-03-17T00:20:19.817	30.64	-49.48	71490.7	-21.91	-24.67
Jupiter	E	2031-03-17T03:04:06.727	65.12	-20.35	71491.0	-19.41	-21.92