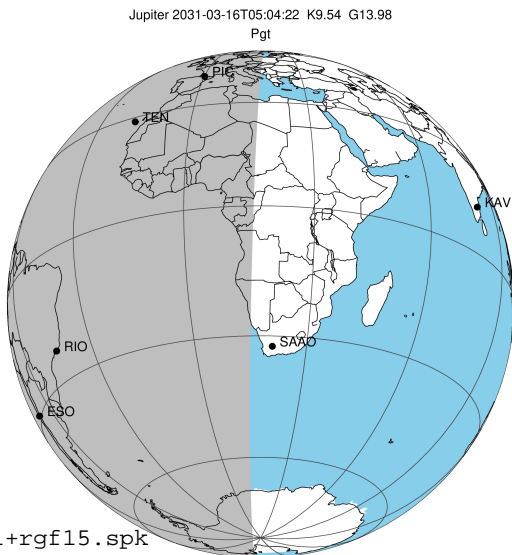


target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-03-16T05:04:22.040
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068934475937094272
 2Mass ID (if available) : 17473723-2252008

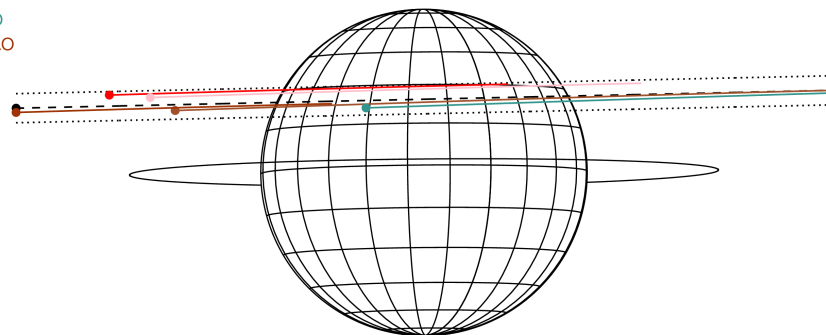
Jupiter 2031-03-16T05:04:22 K9.54 G13.98 Pgt

ICRS Star Coord at Epoch: 17h 47m 37.23709s -22:52:00.87458s
 RUWE (>1.4 is poor) : 0.93
 K magnitude : 9.539
 G magnitude : 13.977
 RP magnitude : 12.820
 BP magnitude : 15.406
 DUPflag : 0
 Distance (au) : 5.255
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : 14.28
 Sun-Target sep (deg) : 87.83
 Sun-Moon sep (deg) : 3.38
 B (ring opening deg) : -2.63
 PA of pole (deg) : 0.50
 Pole direction: RA (deg): 268.05700
 Dec (deg): 64.49651
 C/A sky separation (") : 8.419
 C/A sky separation (km) : 32083.6
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLv1.spk
 naif0012.tls
 nep097.bsp
 nep101.bsp
 sat4401.bsp



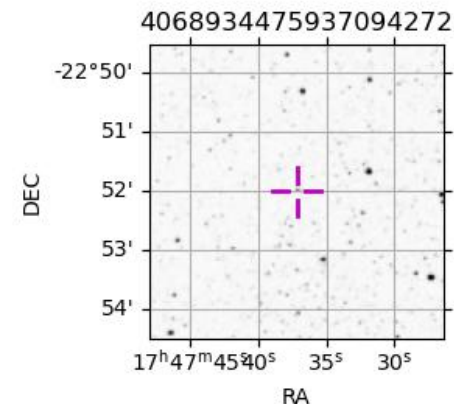
2031-03-16T05:04:22.0400 cc: 17 47 37.2371 s: -22 52 00.875 C/A 8.409" PA 181.26 deg v_sky +14.28 km/s D 05.25 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 TEN
 RIO
 ESO
 SAAO



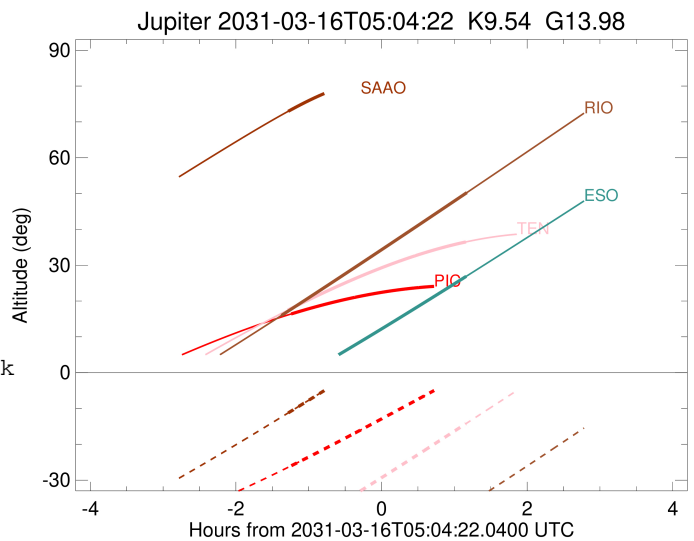
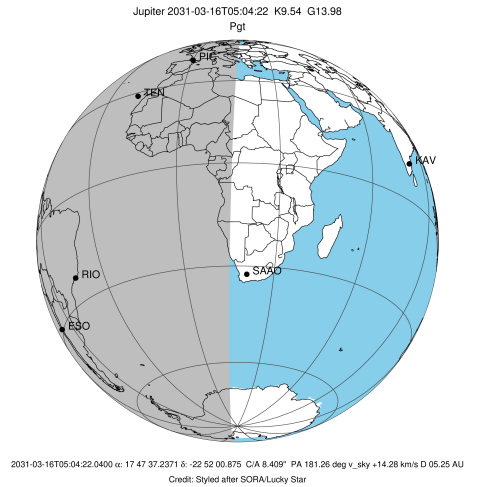
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	MAR 16 03:50 - MAR 16 03:50	Pin
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 16 03:47 - MAR 16 06:13	Pie
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+ +	MAR 16 03:41 - MAR 16 06:14	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	MAR 16 06:14 - MAR 16 06:14	Pne
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	MAR 16 03:47 - MAR 16 03:47	Pin
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-16T05:02:24.260
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       : 4068934475937094272
2Mass ID (if available) : 17473723-2252008
ICRS Star Coord at Epoch: 17h 47m 37.23709s -22:52:00.87458s
RUWE (>1.4 is poor) : 0.93
K magnitude          : 9.539
G magnitude          : 13.977
RP magnitude         : 12.820
BP magnitude         : 15.406
DUPflag             : 0
Distance (au)        : 5.255
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 14.28
Sun-Target sep (deg) : 87.83
Sun-Moon sep (deg)   : 2.87
B (ring opening deg) : -2.63
PA of pole (deg)     : 0.50
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (") : 9.911
C/A sky separation (km) : 37769.5
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
    
```

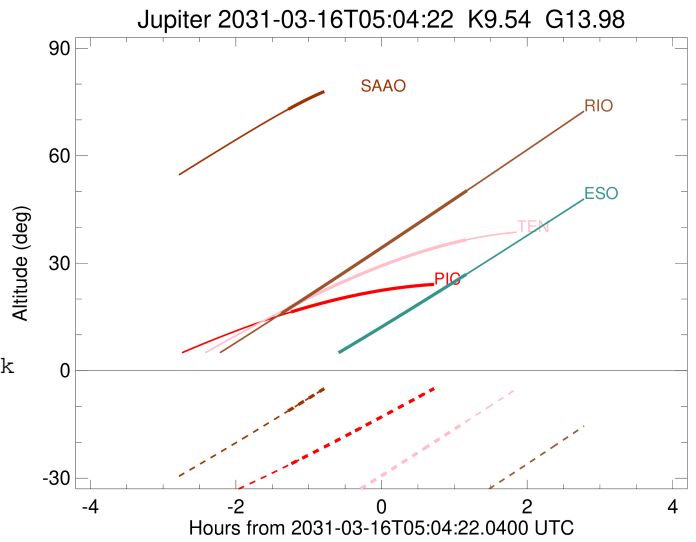
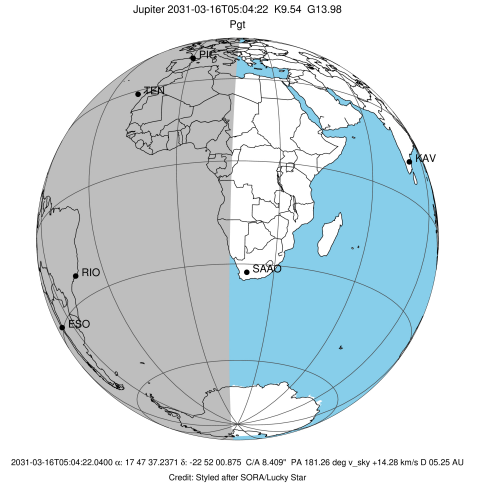


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-16T03:50:02.322	16.40	-25.98	71489.5	30.83	34.24
Jupiter	E	2031-03-16T06:15:05.154	24.38	0.05x	71489.2	32.72	36.23

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-16T05:00:10.990
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      : 4068934475937094272
2Mass ID (if available) : 17473723-2252008
ICRS Star Coord at Epoch: 17h 47m 37.23709s -22:52:00.87458s
RUWE (>1.4 is poor) : 0.93
K magnitude          : 9.539
G magnitude          : 13.977
RP magnitude         : 12.820
BP magnitude         : 15.406
DUPflag             : 0
Distance (au)       : 5.255
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 14.28
Sun-Target sep (deg) : 87.83
Sun-Moon sep (deg)  : 2.67
B (ring opening deg) : -2.63
PA of pole (deg)    : 0.50
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (") : 9.598
C/A sky separation (km) : 36578.4
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
    
```

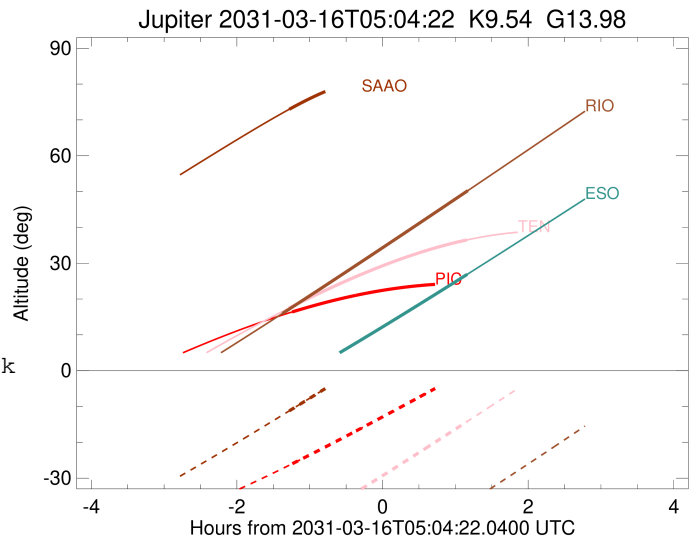
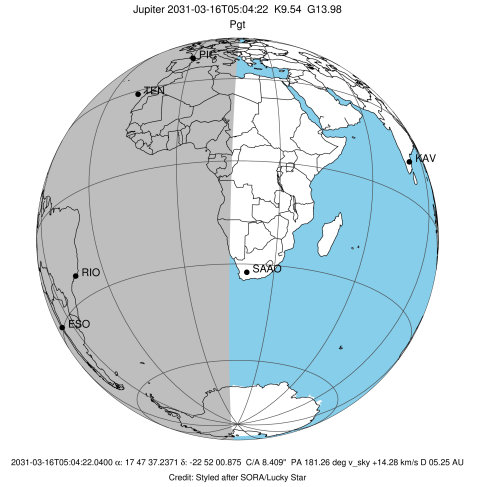


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-16T03:47:01.520	17.41	-45.16	71489.7	29.50	32.84
Jupiter	E	2031-03-16T06:13:53.451	36.49	-14.24	71489.4	31.81	35.28

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-16T04:57:55.280
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      : 4068934475937094272
2Mass ID (if available) : 17473723-2252008
ICRS Star Coord at Epoch: 17h 47m 37.23709s -22:52:00.87458s
RUWE (>1.4 is poor) : 0.93
K magnitude          : 9.539
G magnitude          : 13.977
RP magnitude         : 12.820
BP magnitude         : 15.406
DUPflag             : 0
Distance (au)       : 5.255
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 14.28
Sun-Target sep (deg) : 87.83
Sun-Moon sep (deg)  : 2.85
B (ring opening deg) : -2.63
PA of pole (deg)    : 0.50
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (") : 8.074
C/A sky separation (km) : 30770.9
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
    
```

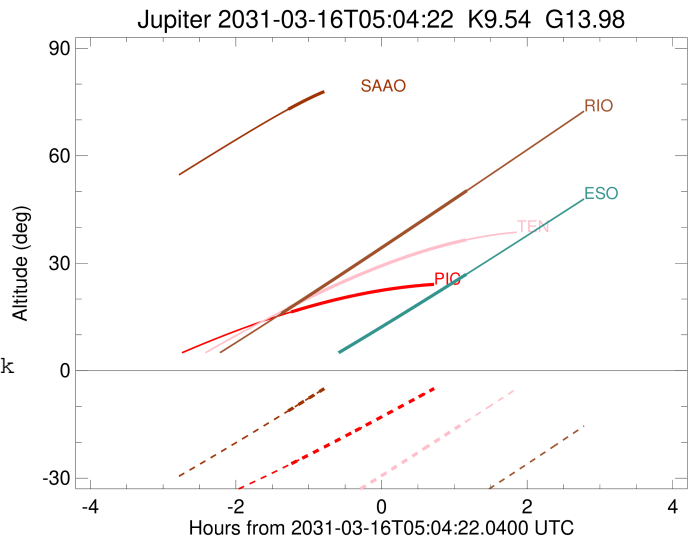
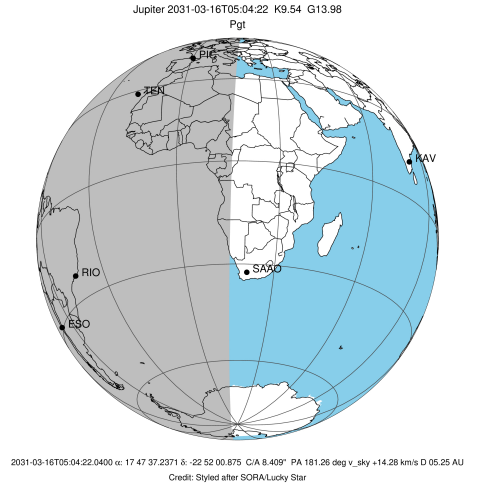


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-16T03:41:59.058	15.97	-63.51	71490.4	24.06	27.01
Jupiter	E	2031-03-16T06:14:42.345	50.26	-36.97	71490.1	26.78	29.95

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-16T04:57:33.180
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : ESO
Location              : European Southern Obs. (3.6m)
Latitude (deg)        : -29.26097
E. Longitude (deg)    : 289.26831
Altitude (km)         : 2.400
Gaia source ID        : 4068934475937094272
2Mass ID (if available) : 17473723-2252008
ICRS Star Coord at Epoch: 17h 47m 37.23709s -22:52:00.87458s
RUWE (>1.4 is poor)  : 0.93
K magnitude           : 9.539
G magnitude           : 13.977
RP magnitude          : 12.820
BP magnitude          : 15.406
DUPflag              : 0
Distance (au)         : 5.255
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 14.28
Sun-Target sep (deg)  : 87.83
Sun-Moon sep (deg)   : 2.95
B (ring opening deg) : -2.63
PA of pole (deg)     : 0.50
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (") : 7.641
C/A sky separation (km) : 29121.1
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
    
```

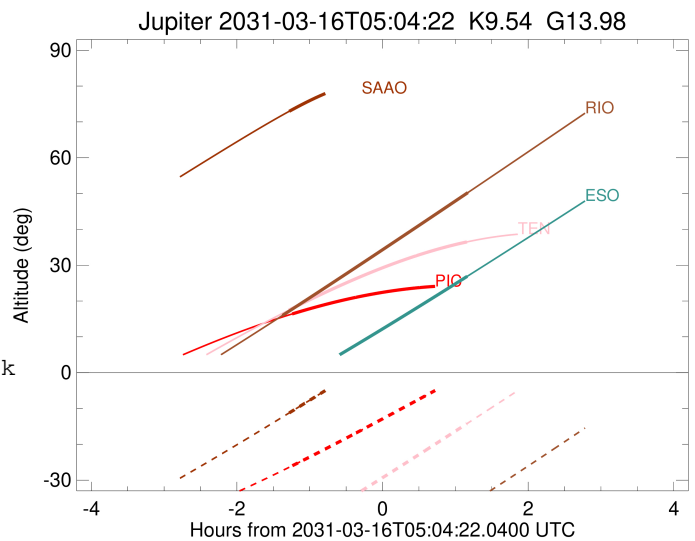
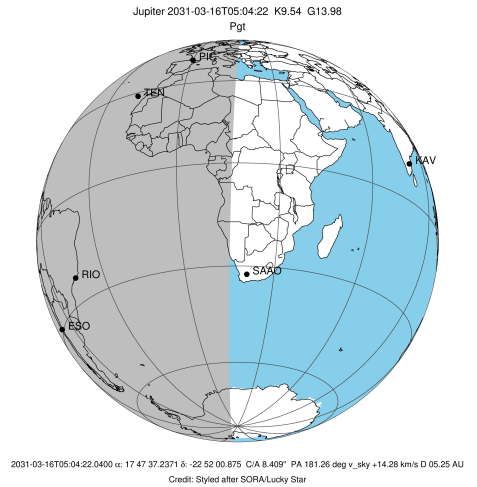


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-16T03:41:49.000	-4.27x	-54.83	71490.6	22.64	25.47
Jupiter	E	2031-03-16T06:14:09.717	26.88	-53.33	71490.3	25.40	28.46

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-16T05:04:44.820
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       : 4068934475937094272
2Mass ID (if available) : 17473723-2252008
ICRS Star Coord at Epoch: 17h 47m 37.23709s -22:52:00.87458s
RUWE (>1.4 is poor) : 0.93
K magnitude           : 9.539
G magnitude           : 13.977
RP magnitude          : 12.820
BP magnitude          : 15.406
DUPflag              : 0
Distance (au)        : 5.255
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 14.28
Sun-Target sep (deg) : 87.83
Sun-Moon sep (deg)   : 3.56
B (ring opening deg) : -2.63
PA of pole (deg)     : 0.50
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (") : 8.148
C/A sky separation (km) : 31052.7
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	2031-03-16T03:47:29.242	72.95	-11.23	71490.3	24.86	27.87
Jupiter	E	2031-03-16T06:22:07.383	67.95	21.27x	71490.1	26.36	29.49