

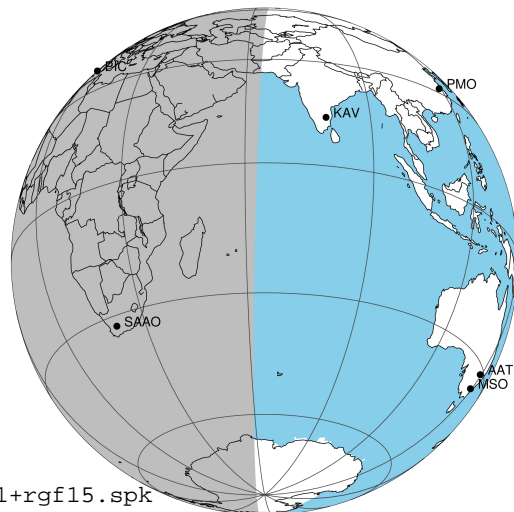
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-03-16T01:57:42.420
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068934441577397504
 2Mass ID (if available) : 17473418-2252101

Jupiter 2031-03-16T01:57:42 K9.12 G14.64 Pgt

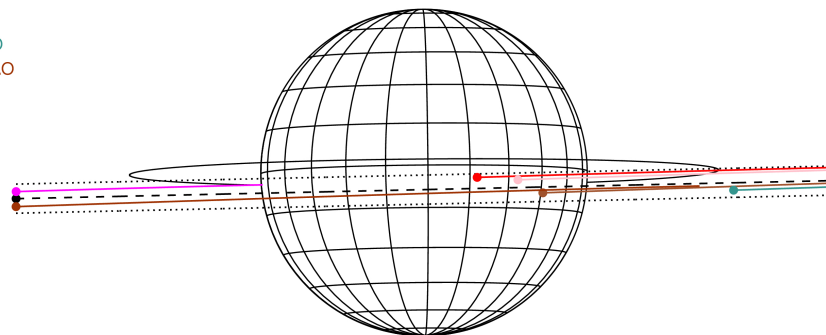
ICRS Star Coord at Epoch: 17h 47m 34.17935s -22:52:10.33165s

RUWE (>1.4 is poor) : 0.97
 K magnitude : 9.123
 G magnitude : 14.639
 RP magnitude : 13.232
 BP magnitude : 17.135
 DUPflag : 0
 Distance (au) : 5.257
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : 14.34
 Sun-Target sep (deg) : 87.71
 Sun-Moon sep (deg) : 5.02
 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 (") : 1.968
 C/A sky separation (km) : 7501.6
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-03-16T01:57:42 K9.12 G14.64
 Pgt



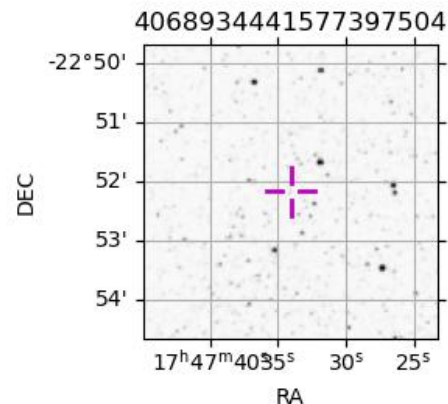
Earth
 PIC
 TEN
 KAV
 RIO
 ESO
 SAAO



2031-03-16T01:57:42.4200 @: 17 47 34.1794 @: -22 52 10.332 C/A 1.978" PA 1.26 deg v_sky +14.34 km/s D 05.26 AU
 Credit: Styled after SORA/Lucky Star

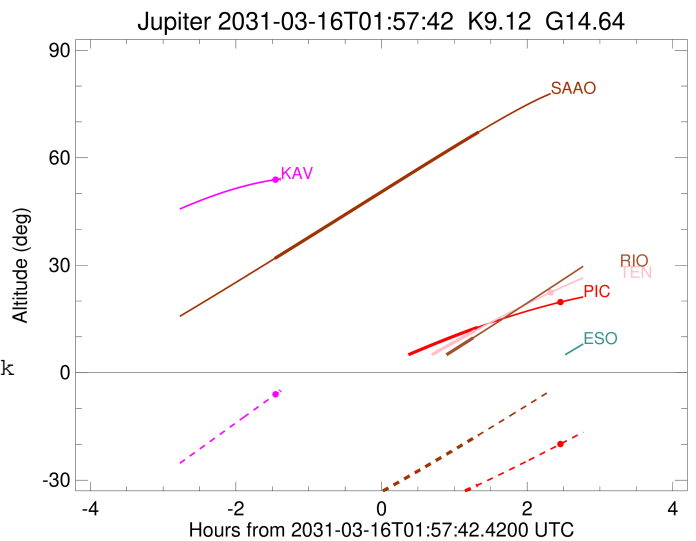
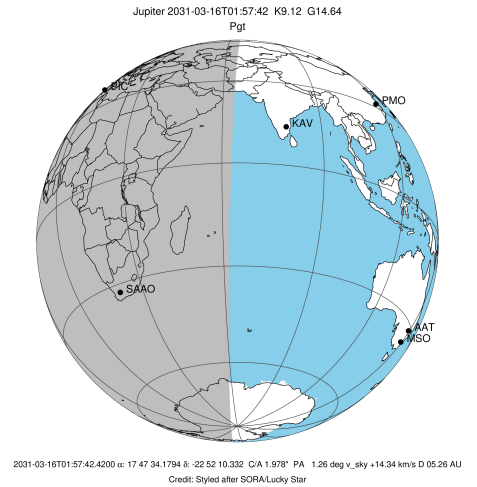
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	MAR 16 03:16 - MAR 16 03:16	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 16 03:14 - MAR 16 03:14	Pne
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+	MAR 16 00:33 - MAR 16 00:33	Pin
RIO	Rio de Janeiro	-22.9	316.8	+	MAR 16 03:13 - MAR 16 03:13	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 16 00:29 - MAR 16 03:17	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



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target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-16T01:52:40.900
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       : 4068934441577397504
2Mass ID (if available) : 17473418-2252101
ICRS Star Coord at Epoch: 17h 47m 34.17935s -22:52:10.33165s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 9.123
G magnitude           : 14.639
RP magnitude         : 13.232
BP magnitude         : 17.135
DUPflag              : 0
Distance (au)        : 5.257
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 14.34
Sun-Target sep (deg) : 87.71
Sun-Moon sep (deg)  : 4.22
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 (" ) : 0.747
C/A sky separation (km) : 2846.4
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
    
```

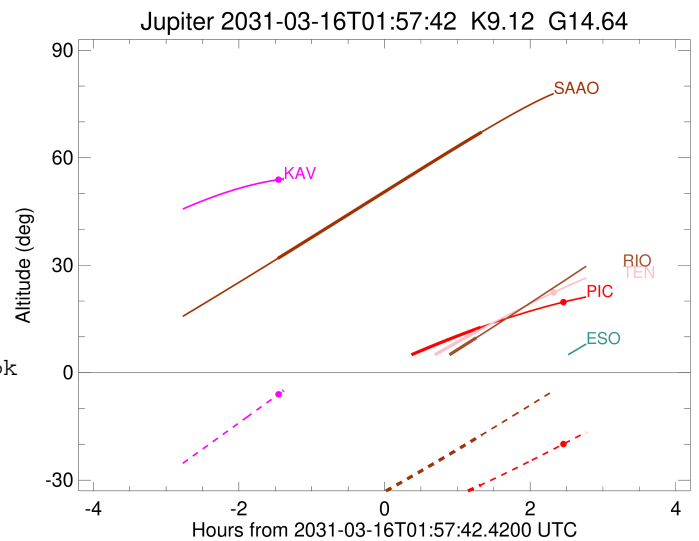
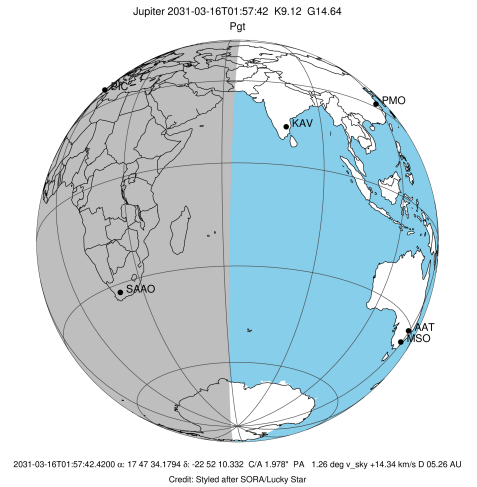


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-16T00:29:17.460	-12.84x	-48.88	71492.0	-3.56	-4.07
Jupiter	E	2031-03-16T03:16:54.847	12.65	-31.39	71492.0	-1.06	-1.22

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-16T01:51:13.220
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       : 4068934441577397504
2Mass ID (if available) : 17473418-2252101
ICRS Star Coord at Epoch: 17h 47m 34.17935s -22:52:10.33165s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 9.123
G magnitude           : 14.639
RP magnitude         : 13.232
BP magnitude         : 17.135
DUPflag              : 0
Distance (au)        : 5.257
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 14.34
Sun-Target sep (deg) : 87.71
Sun-Moon sep (deg)   : 4.06
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 (") : 1.195
C/A sky separation (km) : 4555.4
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
    
```

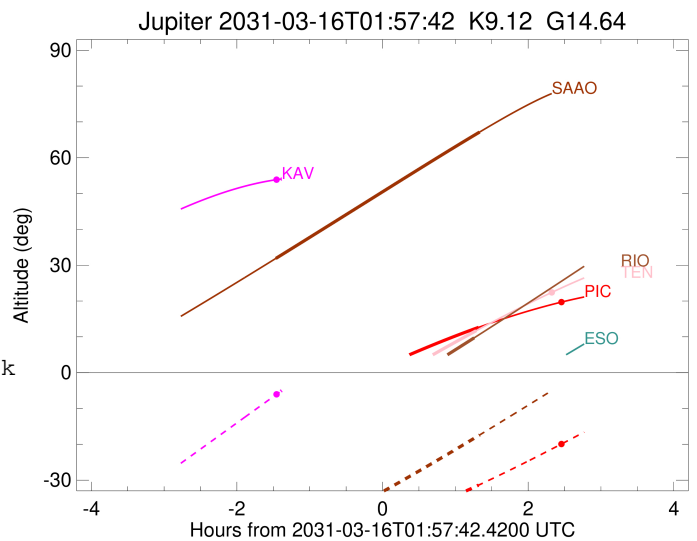
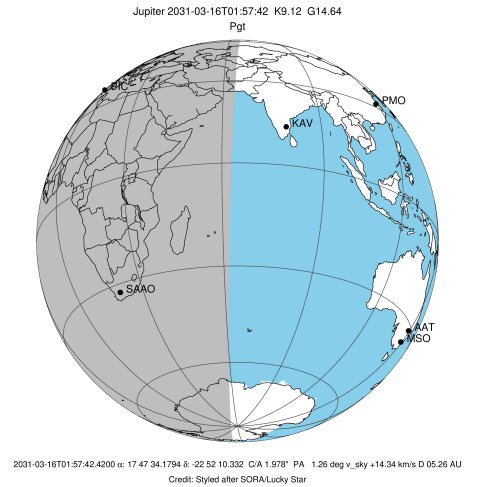


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-16T00:28:32.045	-21.74x	-61.53	71491.9	-5.04	-5.76
Jupiter	E	2031-03-16T03:14:55.746	11.72	-51.10	71492.0	-2.27	-2.59

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-16T01:59:27.940
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        : 4068934441577397504
2Mass ID (if available) : 17473418-2252101
ICRS Star Coord at Epoch: 17h 47m 34.17935s -22:52:10.33165s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 9.123
G magnitude           : 14.639
RP magnitude          : 13.232
BP magnitude          : 17.135
DUPflag              : 0
Distance (au)         : 5.257
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 14.34
Sun-Target sep (deg)  : 87.71
Sun-Moon sep (deg)    : 5.19
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 (") : 1.013
C/A sky separation (km) : 3860.8
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
    
```

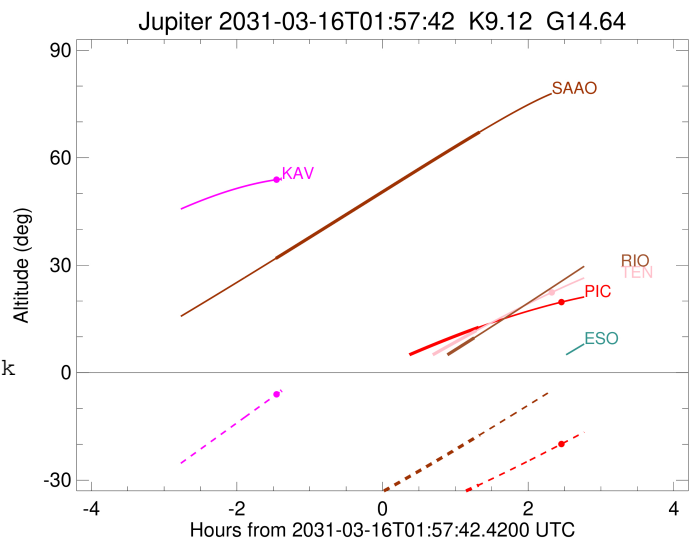
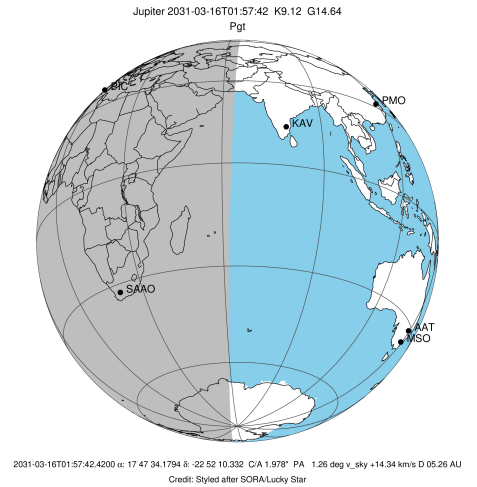


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-16T00:33:54.065	54.04	-5.19	71492.0	-3.84	-4.39
Jupiter	E	2031-03-16T03:24:57.621	39.90	36.31x	71492.0	-2.61	-2.98

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-16T01:51:27.350
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       : 4068934441577397504
2Mass ID (if available) : 17473418-2252101
ICRS Star Coord at Epoch: 17h 47m 34.17935s -22:52:10.33165s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 9.123
G magnitude           : 14.639
RP magnitude          : 13.232
BP magnitude          : 17.135
DUPflag              : 0
Distance (au)         : 5.257
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 14.34
Sun-Target sep (deg) : 87.71
Sun-Moon sep (deg)   : 4.38
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 ("): 2.789
C/A sky separation (km): 10631.5
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
    
```

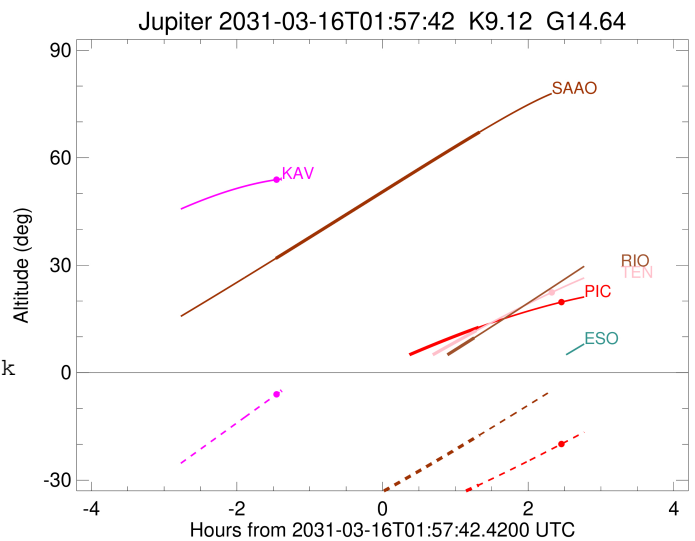
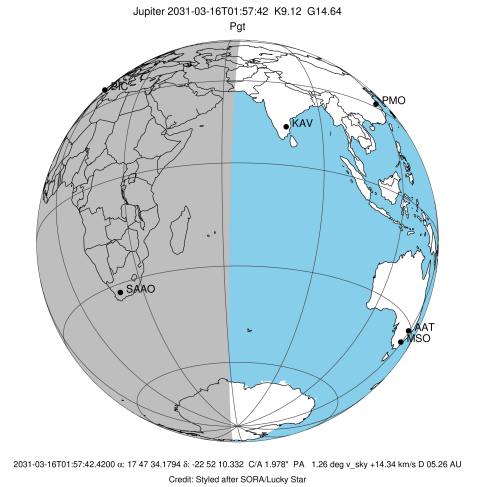


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-16T00:30:33.907	-22.98x	-45.70	71491.7	-9.86	-11.24
Jupiter	E	2031-03-16T03:13:18.119	9.73	-65.23	71491.9	-7.13	-8.14

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-16T01:53:25.090
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        : 4068934441577397504
2Mass ID (if available) : 17473418-2252101
ICRS Star Coord at Epoch: 17h 47m 34.17935s -22:52:10.33165s
RUWE (>1.4 is poor)  : 0.97
K magnitude           : 9.123
G magnitude           : 14.639
RP magnitude          : 13.232
BP magnitude          : 17.135
DUPflag              : 0
Distance (au)         : 5.257
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 14.34
Sun-Target sep (deg)  : 87.71
Sun-Moon sep (deg)   : 4.63
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 (") : 2.417
C/A sky separation (km) : 9213.1
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	2031-03-16T00:29:50.371	31.89	-47.90	71491.8	-8.68	-9.91
Jupiter	E	2031-03-16T03:17:46.571	67.17	-17.38	71491.9	-6.26	-7.15