

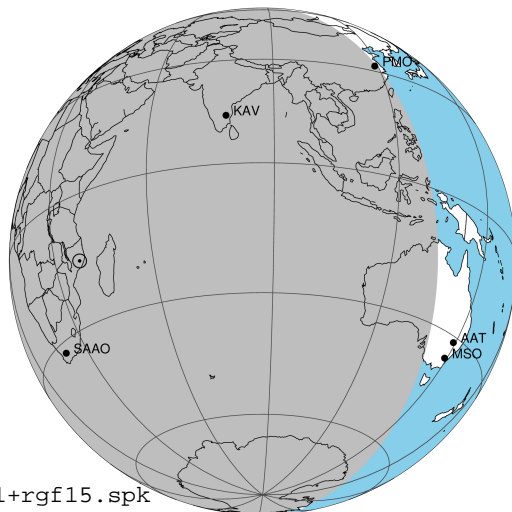
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-05-02T21:21:41.740
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068713675889698432
 2Mass ID (if available) : 17513704-2253373

Jupiter 2031-05-02T21:21:41 K9.43 G14.61 Pgt

ICRS Star Coord at Epoch: 17h 51m 37.04214s -22:53:37.27619s

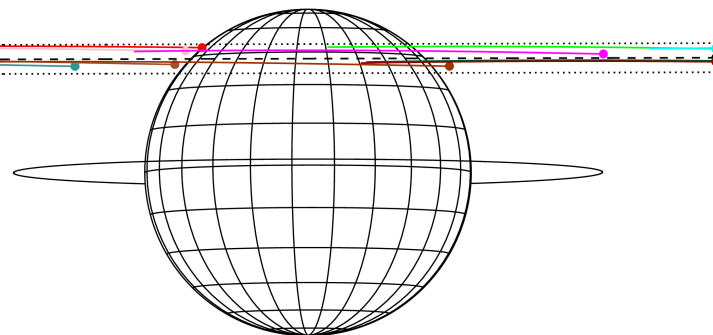
RUWE (>1.4 is poor) : 0.95
 K magnitude : 9.430
 G magnitude : 14.605
 RP magnitude : 13.310
 BP magnitude : 16.515
 DUPflag : 0
 Distance (au) : 4.548
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -7.35
 Sun-Target sep (deg) : 133.78
 Sun-Moon sep (deg) : 100.81
 B (ring opening deg) : -2.61
 PA of pole (deg) : 0.07
 Pole direction: RA (deg): 268.05696
 Dec (deg): 64.49651
 C/A sky separation (") : 15.122
 C/A sky separation (km) : 49875.1
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-05-02T21:21:41 K9.43 G14.61
 Pgt



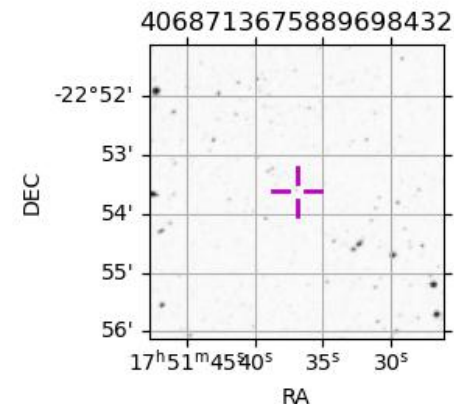
2031-05-02T21:21:41.7400 α: 17 51 37.0421 δ: -22 53 37.276 C/A ***** PA 180.14 deg v_sky - 7.35 km/s D 04.55 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 PMO
 TEN
 IRTF
 KAV
 RIO
 ESO
 AAT
 SAAO
 MSO



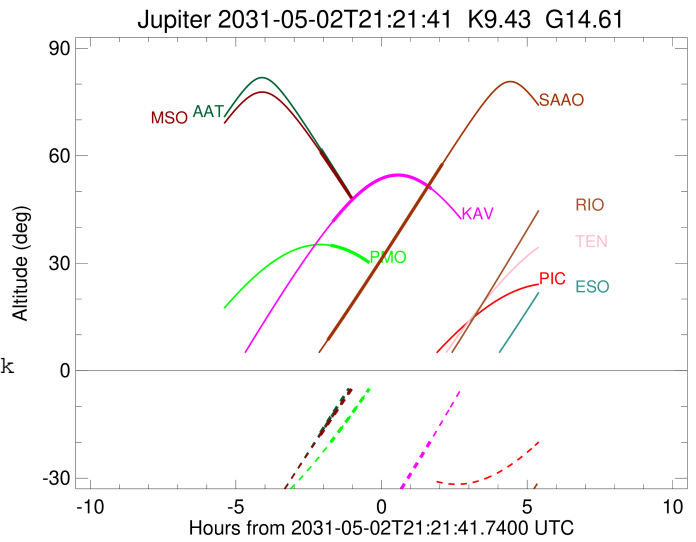
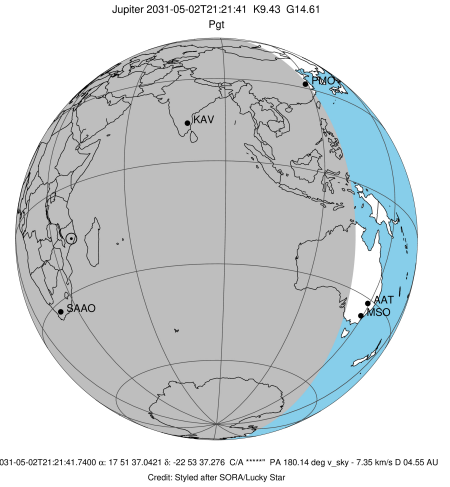
Observable events with sun below -5 deg and altitude above 5 deg

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	+	MAY 02 19:37 - MAY 02 19:37	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	+ +	MAY 02 19:41 - MAY 02 23:04	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 02 19:16 - MAY 02 19:16	Pin
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	MAY 02 19:30 - MAY 02 23:27	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	MAY 02 19:15 - MAY 02 19:15	Pin



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target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-02T21:16:45.850
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        : 4068713675889698432
2Mass ID (if available) : 17513704-2253373
ICRS Star Coord at Epoch: 17h 51m 37.04214s -22:53:37.27619s
RUWE (>1.4 is poor) : 0.95
K magnitude           : 9.430
G magnitude           : 14.605
RP magnitude          : 13.310
BP magnitude          : 16.515
DUPflag              : 0
Distance (au)         : 4.548
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -7.35
Sun-Target sep (deg)  : 133.78
Sun-Moon sep (deg)    : 101.14
B (ring opening deg) : -2.61
PA of pole (deg)      : 0.07
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation (") : 16.613
C/A sky separation (km) : 54795.8
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
    
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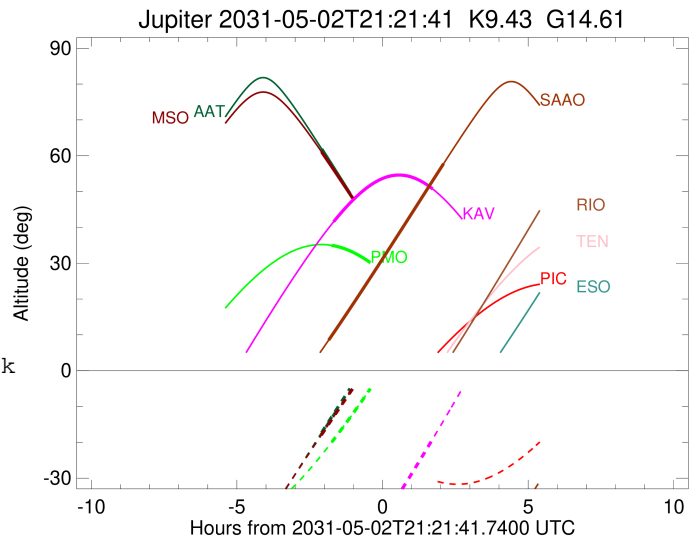
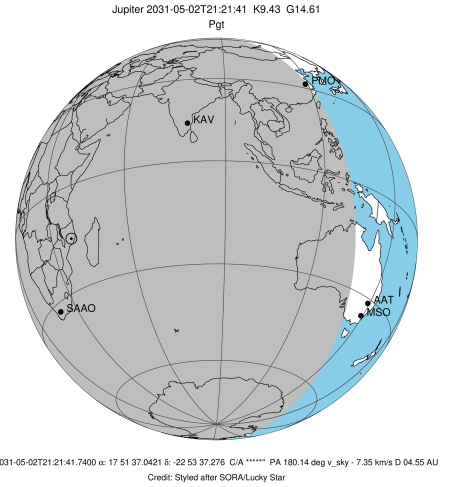


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-02T19:37:04.807	34.98	-19.97	71486.5	50.39	53.96
Jupiter	E	2031-05-02T22:57:10.210	13.80	19.73x	71486.7	49.13	52.74

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target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-02T21:23:18.040
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       : 4068713675889698432
2Mass ID (if available) : 17513704-2253373
ICRS Star Coord at Epoch: 17h 51m 37.04214s -22:53:37.27619s
RUWE (>1.4 is poor) : 0.95
K magnitude          : 9.430
G magnitude          : 14.605
RP magnitude         : 13.310
BP magnitude         : 16.515
DUPflag             : 0
Distance (au)        : 4.548
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -7.35
Sun-Target sep (deg) : 133.78
Sun-Moon sep (deg)  : 101.57
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.07
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation ("): 16.235
C/A sky separation (km): 53545.8
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
    
```

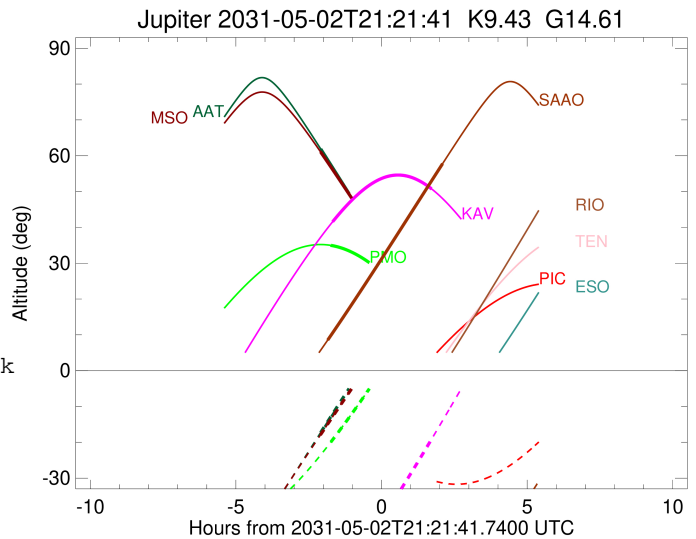
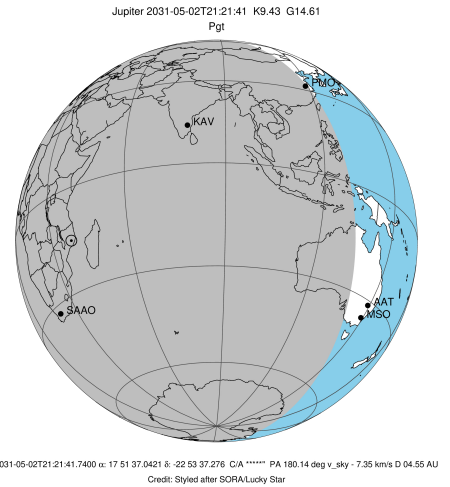


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-02T19:41:02.609	41.57	-58.39	71486.9	48.05	51.69
Jupiter	E	2031-05-02T23:04:52.577	50.74	-19.12	71486.8	48.26	51.90

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-02T21:12:57.690
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        : 4068713675889698432
2Mass ID (if available) : 17513704-2253373
ICRS Star Coord at Epoch: 17h 51m 37.04214s -22:53:37.27619s
RUWE (>1.4 is poor) : 0.95
K magnitude           : 9.430
G magnitude           : 14.605
RP magnitude          : 13.310
BP magnitude          : 16.515
DUPflag              : 0
Distance (au)         : 4.548
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -7.35
Sun-Target sep (deg)  : 133.78
Sun-Moon sep (deg)    : 101.21
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.07
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation (") : 14.529
C/A sky separation (km) : 47921.8
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
    
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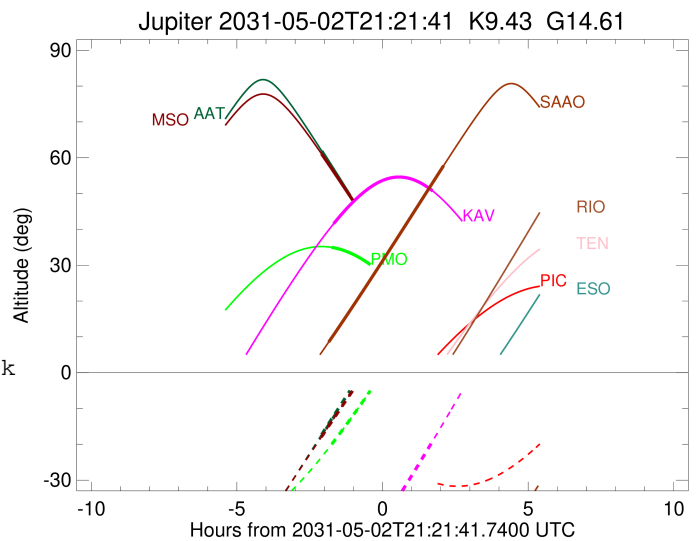
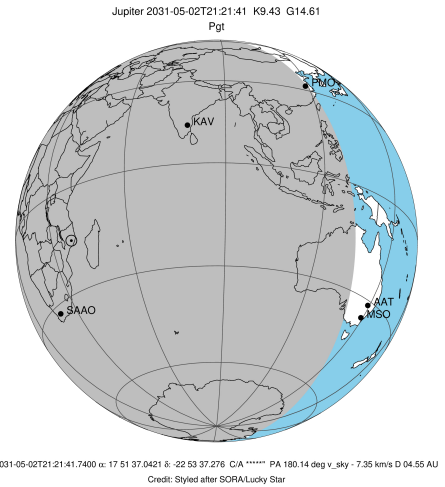


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-02T19:16:31.077	61.87	-17.23	71487.7	42.92	46.64
Jupiter	E	2031-05-02T23:11:29.069	12.21	28.14x	71488.0	40.84	44.55

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-02T21:30:44.140
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        : 4068713675889698432
2Mass ID (if available) : 17513704-2253373
ICRS Star Coord at Epoch: 17h 51m 37.04214s -22:53:37.27619s
RUWE (>1.4 is poor)  : 0.95
K magnitude           : 9.430
G magnitude           : 14.605
RP magnitude          : 13.310
BP magnitude          : 16.515
DUPflag              : 0
Distance (au)         : 4.548
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -7.35
Sun-Target sep (deg)  : 133.78
Sun-Moon sep (deg)    : 101.44
B (ring opening deg)  : -2.61
PA of pole (deg)      : 0.07
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation (") : 14.453
C/A sky separation (km) : 47669.1
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
    
```

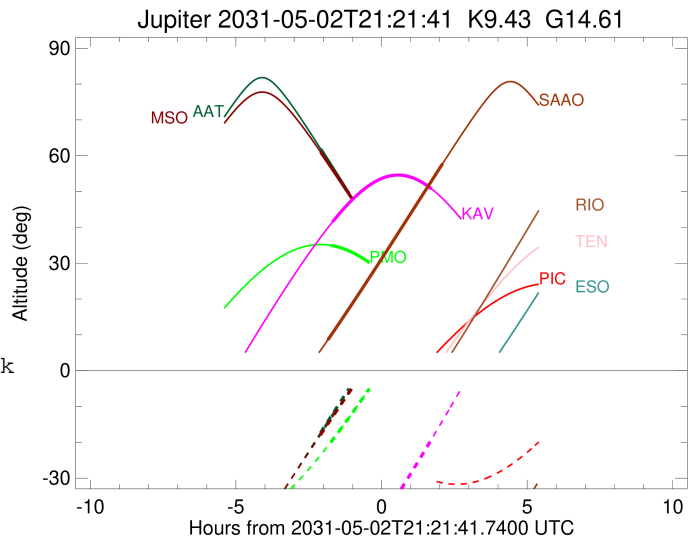
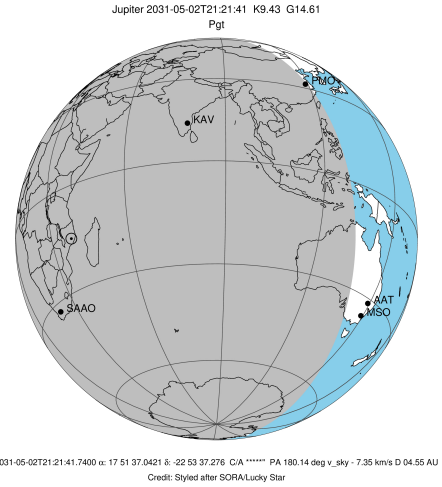


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-02T19:30:47.871	8.53	-45.36	71488.1	40.69	44.40
Jupiter	E	2031-05-02T23:27:32.649	57.77	-69.34	71487.8	42.56	46.28

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-02T21:13:20.450
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       : 4068713675889698432
2Mass ID (if available) : 17513704-2253373
ICRS Star Coord at Epoch: 17h 51m 37.04214s -22:53:37.27619s
RUWE (>1.4 is poor) : 0.95
K magnitude           : 9.430
G magnitude           : 14.605
RP magnitude         : 13.310
BP magnitude         : 16.515
DUPflag              : 0
Distance (au)        : 4.548
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -7.35
Sun-Target sep (deg) : 133.78
Sun-Moon sep (deg)   : 101.22
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.07
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation (") : 14.409
C/A sky separation (km) : 47526.5
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	2031-05-02T19:15:56.866	61.11	-17.91	71487.8	42.46	46.18
Jupiter	E	2031-05-02T23:12:43.976	13.34	25.51x	71488.1	40.46	44.18