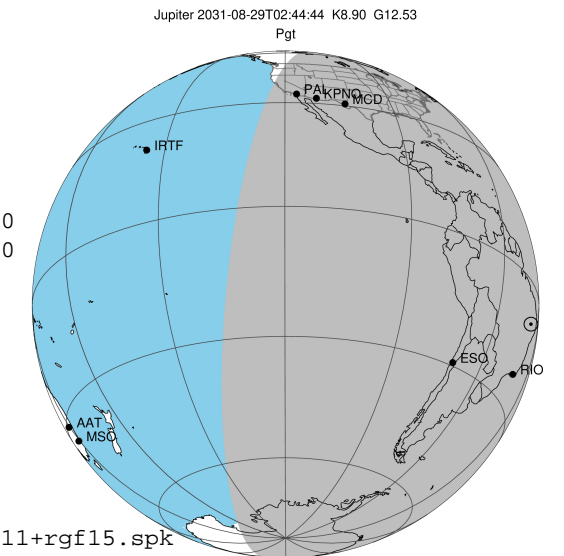


target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-08-29T02:44:44.660
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4114459823584736512
 2Mass ID (if available) : 17120280-2243280

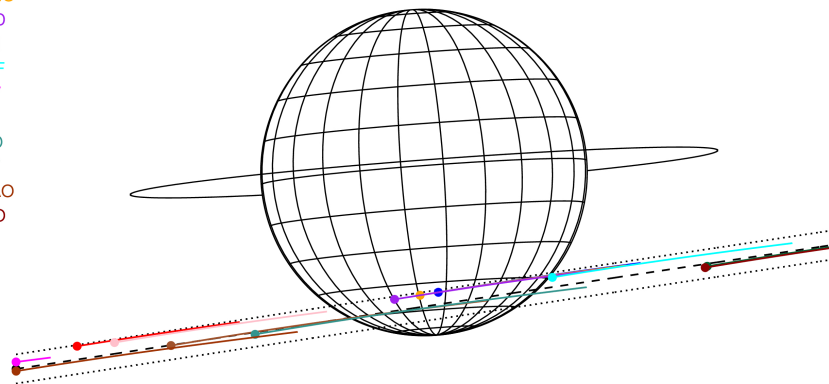
Jupiter 2031-08-29T02:44:44 K8.90 G12.53 Pgt

ICRS Star Coord at Epoch: 17h 12m 02.79818s -22:43:27.94855s

RUWE (>1.4 is poor) : 1.08
 K magnitude : 8.898
 G magnitude : 12.532
 RP magnitude : 11.527
 BP magnitude : 13.569
 DUPflag : 0
 Distance (au) : 4.921
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : 5.95
 Sun-Target sep (deg) : 103.79
 Sun-Moon sep (deg) : 30.86
 B (ring opening deg) : -2.43
 PA of pole (deg) : 4.31
 Pole direction: RA (deg): 268.05686
 Dec (deg): 64.49652
 C/A sky separation (") : 16.268
 C/A sky separation (km) : 58066.9
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk



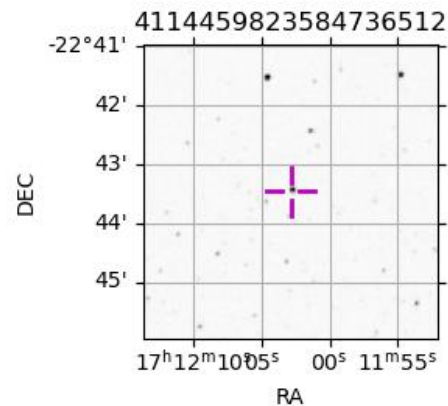
Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 KAV
 RIO
 ESO
 AAT
 SAAO
 MSO



2031-08-29T02:44:44.6600 α: 17 12 02.7982 δ: -22 43 27.949 C/A ***** PA 8.63 deg v_sky + 5.95 km/s D 04.92 AU
 Credit: Styled after SORA/Lucky Star

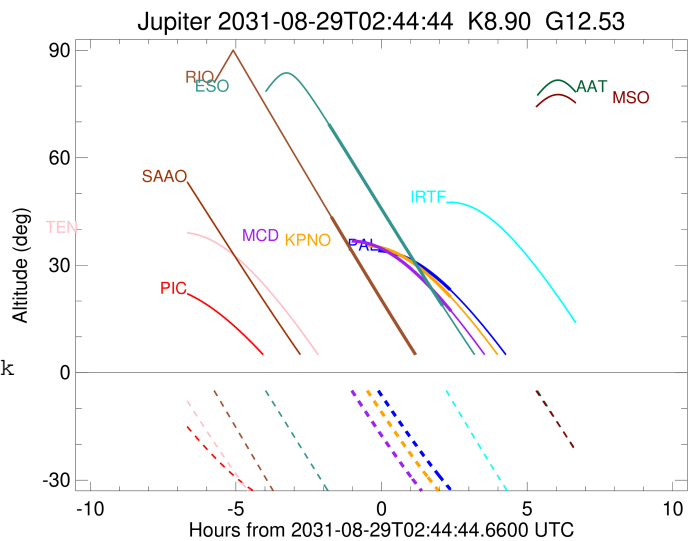
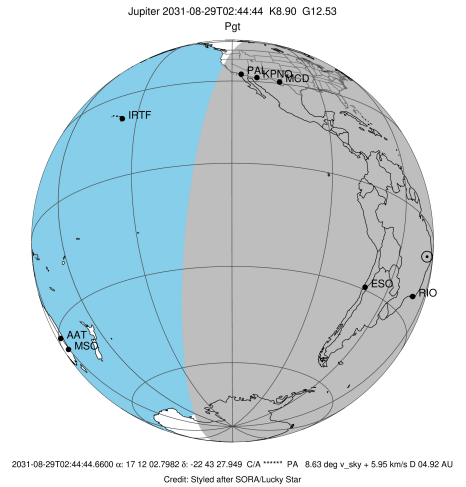
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1			Pnn
PAL	Palomar Mt (200")	33.4	243.1	+	AUG 29 05:06 - AUG 29 05:06	Pne
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	AUG 29 05:07 - AUG 29 05:07	Pne
MCD	McDonald Obs. 2.7m	30.7	256.0	+	AUG 29 05:08 - AUG 29 05:08	Pne
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			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+	AUG 29 01:01 - AUG 29 01:01	Pin
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	AUG 29 00:55 - AUG 29 04:50	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-08-29T02:44:38.620
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : PAL
Location              : Palomar Mt (200")
Latitude (deg)        : 33.35622
E. Longitude (deg)    : 243.13601
Altitude (km)         : 1.706
Gaia source ID        : 4114459823584736512
2Mass ID (if available) : 17120280-2243280
ICRS Star Coord at Epoch: 17h 12m 02.79818s -22:43:27.94855s
RUWE (>1.4 is poor) : 1.08
K magnitude           : 8.898
G magnitude           : 12.532
RP magnitude          : 11.527
BP magnitude          : 13.569
DUPflag              : 0
Distance (au)         : 4.921
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 5.95
Sun-Target sep (deg)  : 103.79
Sun-Moon sep (deg)    : 31.08
B (ring opening deg) : -2.43
PA of pole (deg)      : 4.31
Pole direction: RA (deg): 268.05686
Dec (deg): 64.49652
C/A sky separation (" ) : 14.795
C/A sky separation (km) : 52808.8
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
    
```

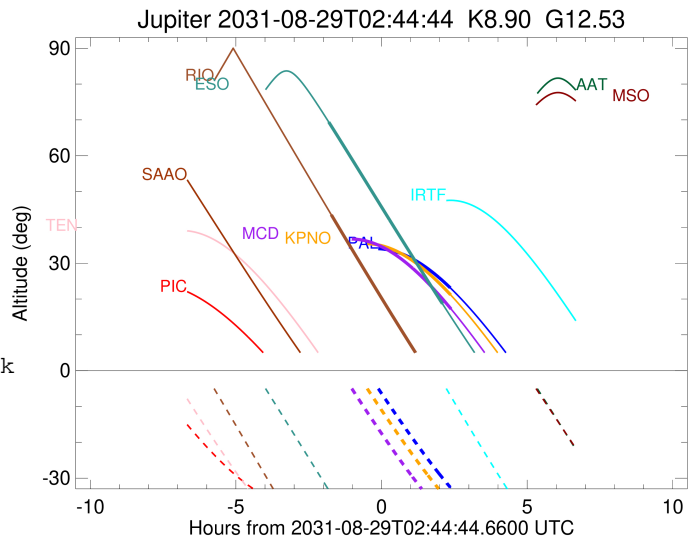
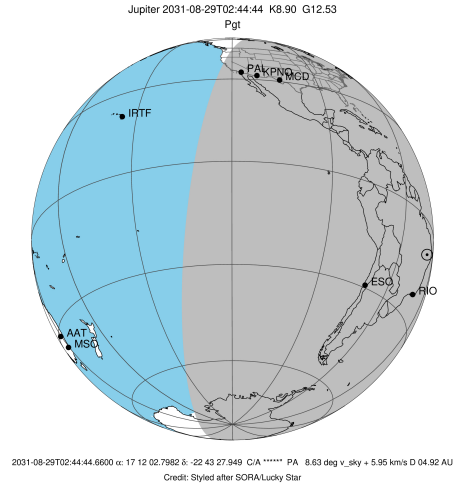


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-08-29T00:21:39.693	25.87	23.32x	71486.9	-52.84	-56.31
Jupiter	E	2031-08-29T05:06:19.302	23.13	-32.53	71488.2	-43.26	-46.98

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-08-29T02:45:45.830
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : KPNO
Location              : Kitt Peak Natl Obs
Latitude (deg)        : 31.96333
E. Longitude (deg)    : 248.40000
Altitude (km)         : 2.120
Gaia source ID        : 4114459823584736512
2Mass ID (if available) : 17120280-2243280
ICRS Star Coord at Epoch: 17h 12m 02.79818s -22:43:27.94855s
RUWE (>1.4 is poor) : 1.08
K magnitude           : 8.898
G magnitude           : 12.532
RP magnitude          : 11.527
BP magnitude          : 13.569
DUPflag              : 0
Distance (au)         : 4.921
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 5.95
Sun-Target sep (deg)  : 103.79
Sun-Moon sep (deg)   : 31.02
B (ring opening deg) : -2.43
PA of pole (deg)     : 4.31
Pole direction: RA (deg): 268.05686
Dec (deg): 64.49652
C/A sky separation (") : 14.803
C/A sky separation (km) : 52837.0
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
    
```

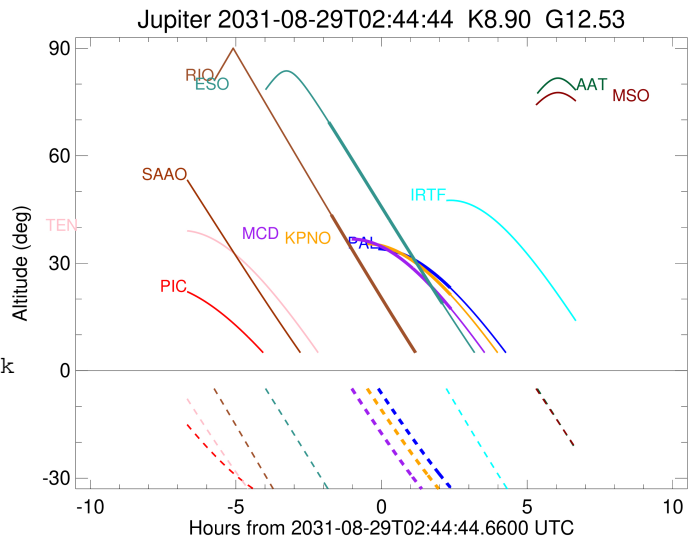
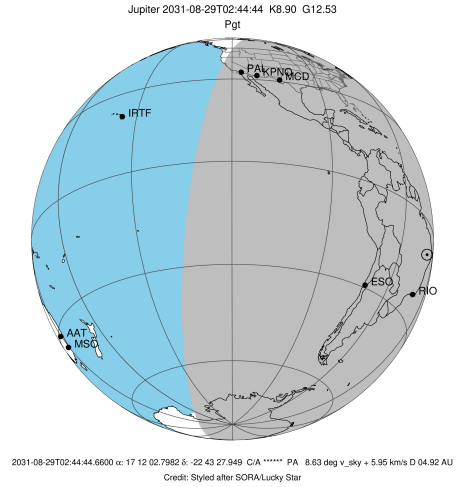


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-08-29T00:22:34.091	29.47	18.74x	71486.9	-52.75	-56.23
Jupiter	E	2031-08-29T05:07:08.418	21.15	-36.87	71488.2	-43.45	-47.16

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-08-29T02:47:19.930
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : MCD
Location              : McDonald Obs. 2.7m
Latitude (deg)        : 30.67158
E. Longitude (deg)    : 255.97844
Altitude (km)         : 2.075
Gaia source ID        : 4114459823584736512
2Mass ID (if available) : 17120280-2243280
ICRS Star Coord at Epoch: 17h 12m 02.79818s -22:43:27.94855s
RUWE (>1.4 is poor) : 1.08
K magnitude           : 8.898
G magnitude           : 12.532
RP magnitude          : 11.527
BP magnitude          : 13.569
DUPflag              : 0
Distance (au)         : 4.921
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 5.95
Sun-Target sep (deg) : 103.79
Sun-Moon sep (deg)   : 30.92
B (ring opening deg) : -2.43
PA of pole (deg)     : 4.31
Pole direction: RA (deg): 268.05686
Dec (deg): 64.49652
C/A sky separation (") : 14.813
C/A sky separation (km) : 52871.6
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
    
```

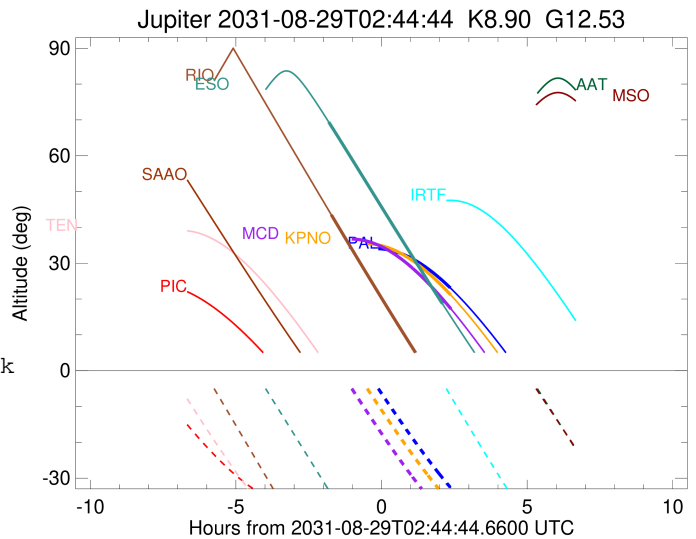
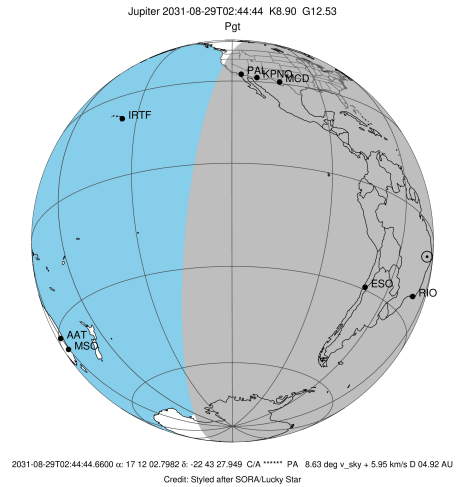


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-08-29T00:24:00.222	33.56	11.91x	71486.9	-52.60	-56.09
Jupiter	E	2031-08-29T05:08:06.260	17.20	-42.26	71488.1	-43.71	-47.43

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-08-29T02:57:16.930
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       : 4114459823584736512
2Mass ID (if available) : 17120280-2243280
ICRS Star Coord at Epoch: 17h 12m 02.79818s -22:43:27.94855s
RUWE (>1.4 is poor) : 1.08
K magnitude           : 8.898
G magnitude           : 12.532
RP magnitude         : 11.527
BP magnitude         : 13.569
DUPflag              : 0
Distance (au)        : 4.922
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 5.95
Sun-Target sep (deg) : 103.79
Sun-Moon sep (deg)   : 30.28
B (ring opening deg) : -2.43
PA of pole (deg)     : 4.31
Pole direction: RA (deg): 268.05686
Dec (deg): 64.49652
C/A sky separation (") : 16.553
C/A sky separation (km) : 59086.2
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
    
```

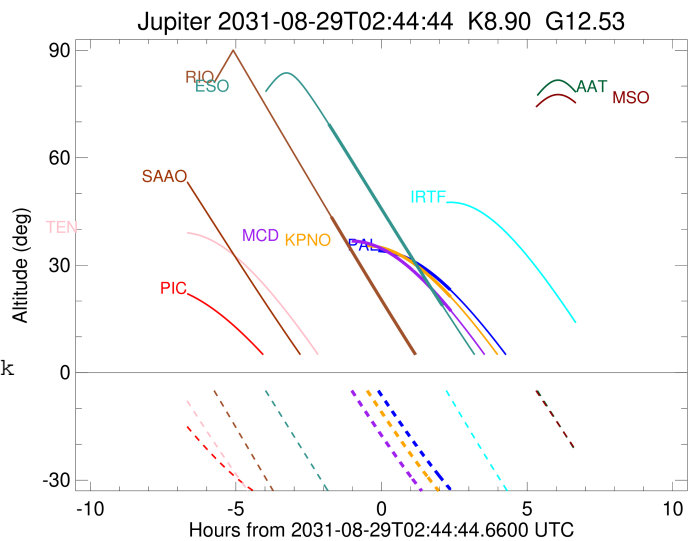
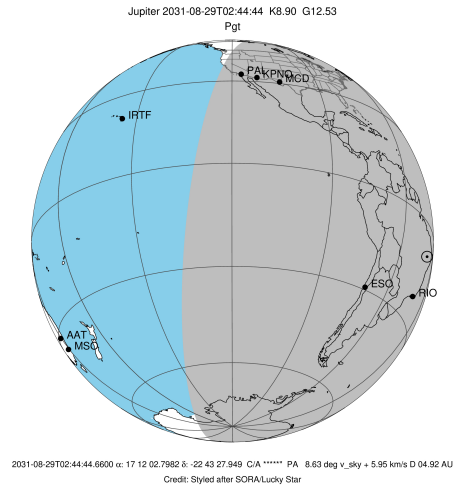


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-08-29T01:01:14.479	43.53	-59.92	71486.1	-58.78	-61.92
Jupiter	E	2031-08-29T04:49:03.239	-6.30x	-59.40	71486.8	-52.96	-56.43

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-08-29T02:55:00.020
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        : 4114459823584736512
2Mass ID (if available) : 17120280-2243280
ICRS Star Coord at Epoch: 17h 12m 02.79818s -22:43:27.94855s
RUWE (>1.4 is poor) : 1.08
K magnitude           : 8.898
G magnitude           : 12.532
RP magnitude          : 11.527
BP magnitude          : 13.569
DUPflag              : 0
Distance (au)         : 4.921
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 5.95
Sun-Target sep (deg)  : 103.79
Sun-Moon sep (deg)    : 30.67
B (ring opening deg) : -2.43
PA of pole (deg)      : 4.31
Pole direction: RA (deg): 268.05686
Dec (deg): 64.49652
C/A sky separation (") : 16.512
C/A sky separation (km) : 58937.9
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	2031-08-29T00:55:54.478	69.42	-33.30	71486.0	-59.32	-62.43
Jupiter	E	2031-08-29T04:50:28.340	18.64	-70.27	71486.9	-52.32	-55.81