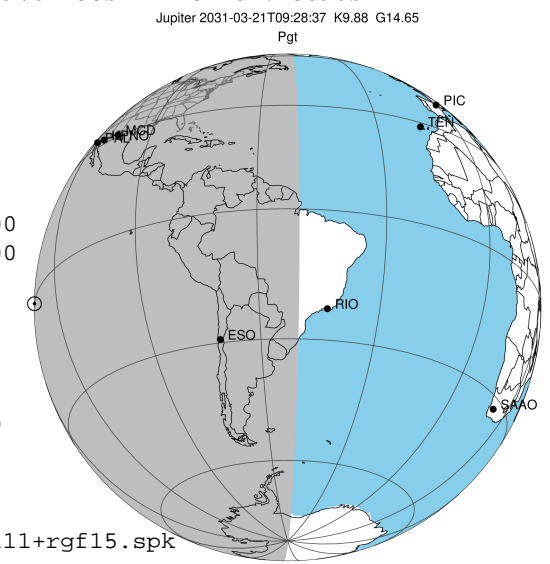


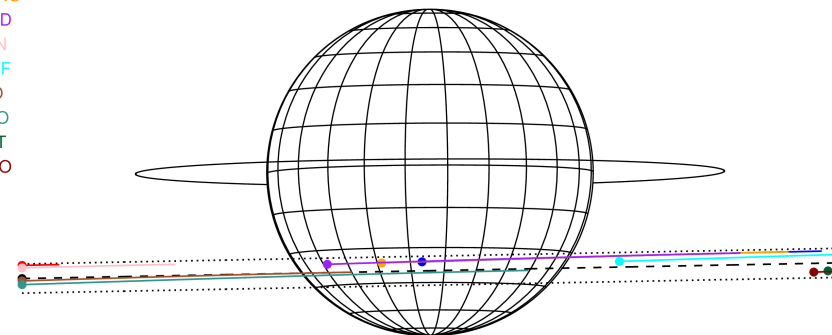
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-03-21T09:28:37.340
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068878675703485440
 2Mass ID (if available) : 17492905-2252524

Jupiter 2031-03-21T09:28:37 K9.88 G14.65 Pgt

ICRS Star Coord at Epoch: 17h 49m 29.04238s -22:52:52.45590s
 RUWE (>1.4 is poor) : 1.01
 K magnitude : 9.881
 G magnitude : 14.654
 RP magnitude : 13.436
 BP magnitude : 16.200
 DUPflag : 0
 Distance (au) : 5.170
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : 11.82
 Sun-Target sep (deg) : 92.56
 Sun-Moon sep (deg) : 70.02
 B (ring opening deg) : -2.62
 PA of pole (deg) : 0.30
 Pole direction: RA (deg): 268.05699
 Dec (deg): 64.49651
 C/A sky separation (") : 11.471
 C/A sky separation (km) : 43014.8
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk



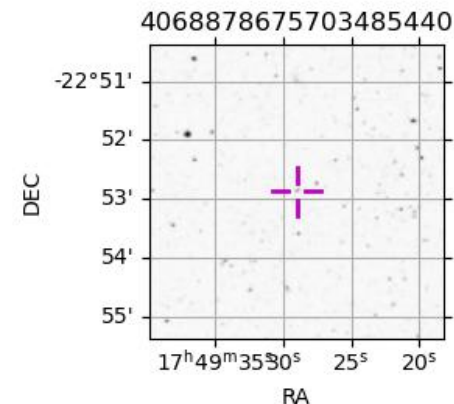
Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 AAT
 MSO



2031-03-21T09:28:37.3400 α: 17 49 29.0424 δ: -22 52 52.456 C/A ***** PA 1.10 deg v_sky +11.82 km/s D 05.17 AU
 Credit: Styled after SORA/Lucky Star

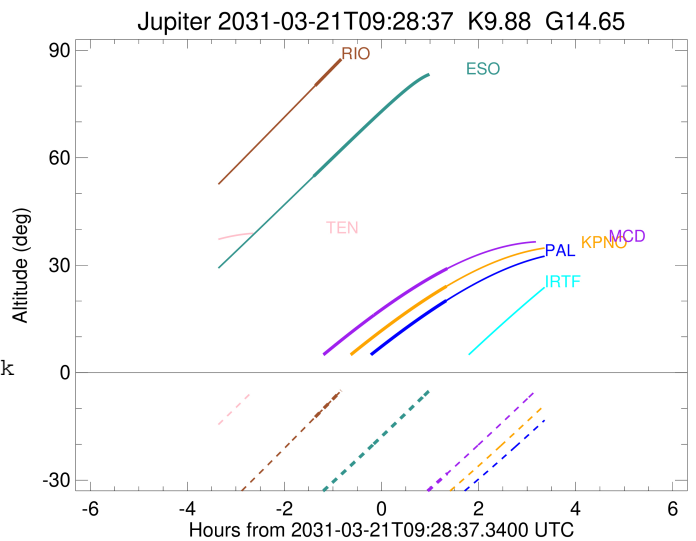
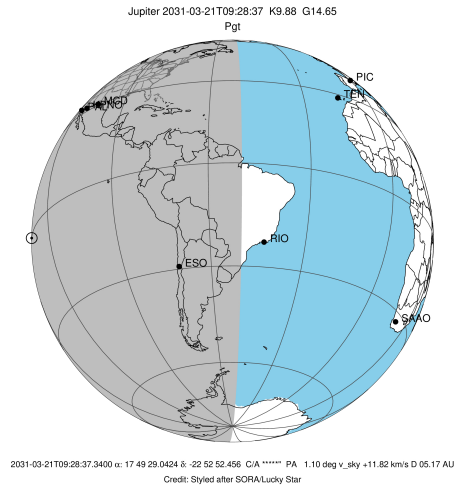
Observable events with sun below -5 deg and altitude above 5 deg

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	+	MAR 21 10:48 - MAR 21 10:48	Pne
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	MAR 21 10:48 - MAR 21 10:48	Pne
MCD	McDonald Obs. 2.7m	30.7	256.0	+	MAR 21 10:49 - MAR 21 10:49	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	+	MAR 21 08:06 - MAR 21 08:06	Pin
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	MAR 21 08:04 - MAR 21 08:04	Pin
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             : 2031-03-21T09:22:21.220
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        : 4068878675703485440
2Mass ID (if available) : 17492905-2252524
ICRS Star Coord at Epoch: 17h 49m 29.04238s -22:52:52.45590s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 9.881
G magnitude           : 14.654
RP magnitude          : 13.436
BP magnitude          : 16.200
DUPflag              : 0
Distance (au)         : 5.171
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 11.82
Sun-Target sep (deg)  : 92.56
Sun-Moon sep (deg)   : 70.37
B (ring opening deg) : -2.62
PA of pole (deg)     : 0.30
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 10.405
C/A sky separation (km) : 39018.5
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
    
```

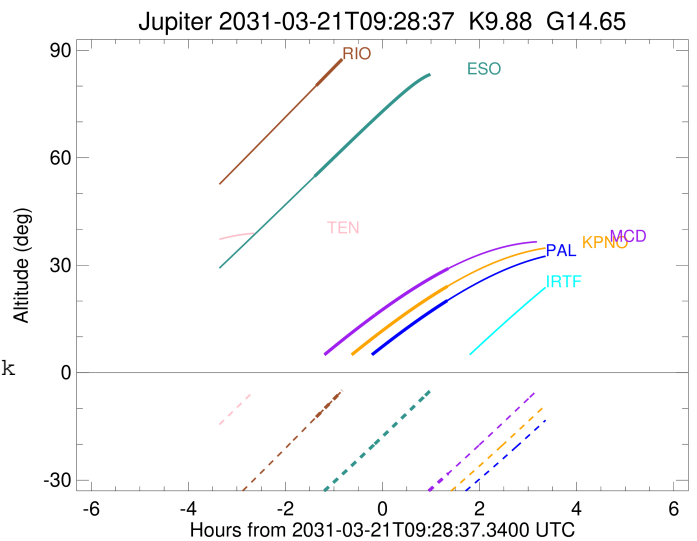
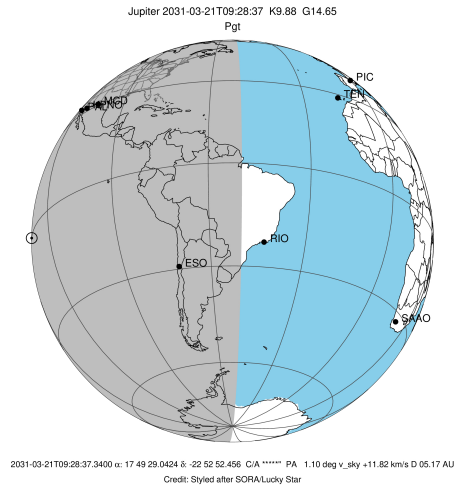


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-21T07:57:23.757	-9.70x	-56.61	71489.0	-34.56	-38.14
Jupiter	E	2031-03-21T10:48:27.963	20.09	-37.25	71489.4	-31.61	-35.07

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-21T09:22:33.110
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        : 4068878675703485440
2Mass ID (if available) : 17492905-2252524
ICRS Star Coord at Epoch: 17h 49m 29.04238s -22:52:52.45590s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 9.881
G magnitude           : 14.654
RP magnitude          : 13.436
BP magnitude          : 16.200
DUPflag              : 0
Distance (au)         : 5.171
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 11.82
Sun-Target sep (deg)  : 92.56
Sun-Moon sep (deg)   : 70.43
B (ring opening deg) : -2.62
PA of pole (deg)     : 0.30
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 10.386
C/A sky separation (km) : 38948.3
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
    
```

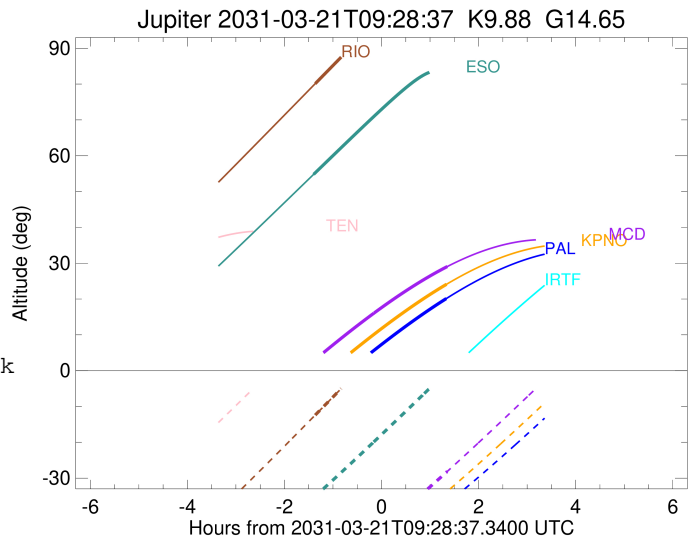
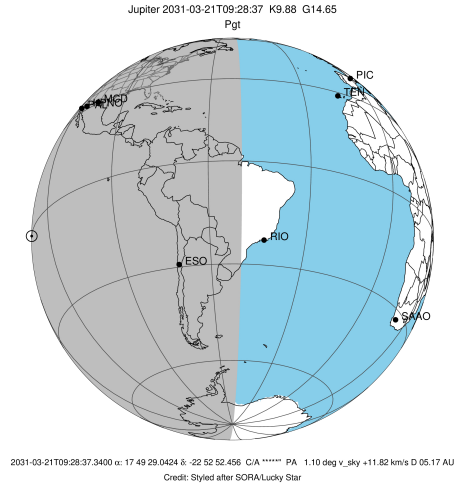


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-21T07:57:16.776	-5.09x	-57.52	71489.0	-34.49	-38.07
Jupiter	E	2031-03-21T10:48:57.650	24.11	-33.86	71489.4	-31.58	-35.03

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-21T09:22:59.530
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        : 4068878675703485440
2Mass ID (if available) : 17492905-2252524
ICRS Star Coord at Epoch: 17h 49m 29.04238s -22:52:52.45590s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 9.881
G magnitude           : 14.654
RP magnitude          : 13.436
BP magnitude          : 16.200
DUPflag              : 0
Distance (au)         : 5.171
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 11.82
Sun-Target sep (deg)  : 92.56
Sun-Moon sep (deg)   : 70.50
B (ring opening deg) : -2.62
PA of pole (deg)     : 0.30
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 10.347
C/A sky separation (km) : 38802.7
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
    
```

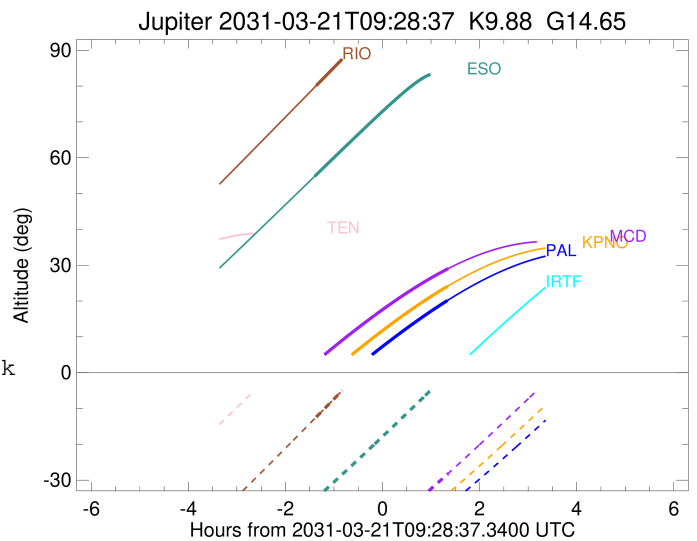
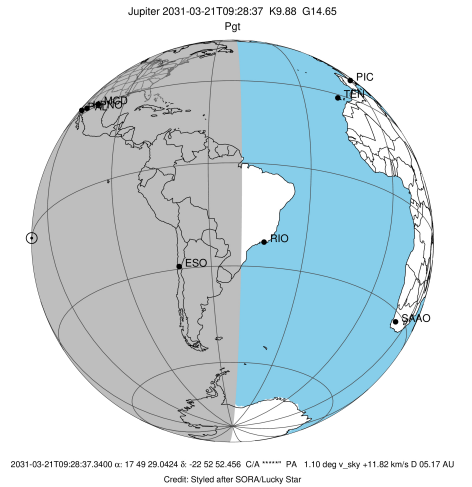


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-21T07:57:13.928	1.30x	-56.73	71489.0	-34.33	-37.90
Jupiter	E	2031-03-21T10:49:50.305	29.05	-28.15	71489.4	-31.50	-34.95

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-21T09:29:57.640
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      : 4068878675703485440
2Mass ID (if available) : 17492905-2252524
ICRS Star Coord at Epoch: 17h 49m 29.04238s -22:52:52.45590s
RUWE (>1.4 is poor) : 1.01
K magnitude          : 9.881
G magnitude          : 14.654
RP magnitude         : 13.436
BP magnitude         : 16.200
DUPflag             : 0
Distance (au)       : 5.170
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : 11.82
Sun-Target sep (deg) : 92.56
Sun-Moon sep (deg)  : 70.88
B (ring opening deg) : -2.62
PA of pole (deg)    : 0.30
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 11.472
C/A sky separation (km) : 43019.7
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
    
```

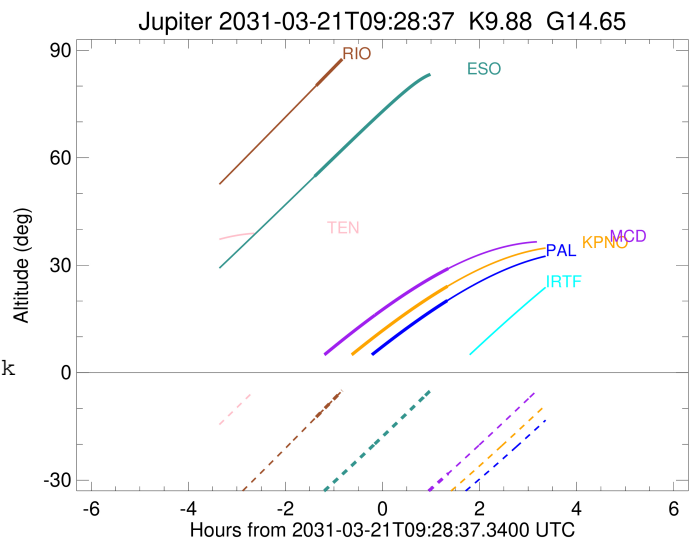
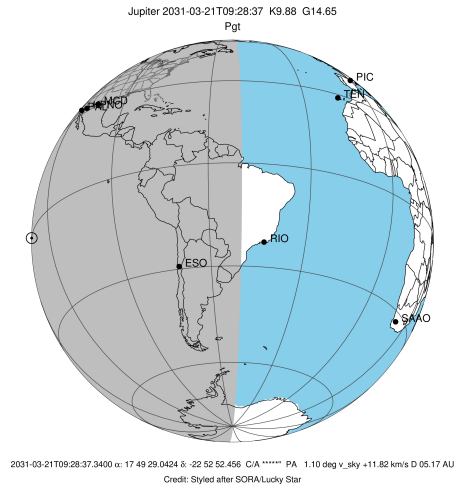


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-21T08:06:42.695	80.11	-12.39	71488.5	-37.79	-41.47
Jupiter	E	2031-03-21T10:53:14.403	61.47	25.79x	71488.7	-36.41	-40.05

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-21T09:26:28.880
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       : 4068878675703485440
2Mass ID (if available) : 17492905-2252524
ICRS Star Coord at Epoch: 17h 49m 29.04238s -22:52:52.45590s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 9.881
G magnitude           : 14.654
RP magnitude          : 13.436
BP magnitude          : 16.200
DUPflag              : 0
Distance (au)         : 5.171
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 11.82
Sun-Target sep (deg)  : 92.56
Sun-Moon sep (deg)   : 70.99
B (ring opening deg) : -2.62
PA of pole (deg)     : 0.30
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 11.691
C/A sky separation (km) : 43841.4
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	2031-03-21T08:04:39.051	54.78	-35.41	71488.3	-38.98	-42.68
Jupiter	E	2031-03-21T10:48:50.296	83.42	-0.41x	71488.6	-36.84	-40.49