

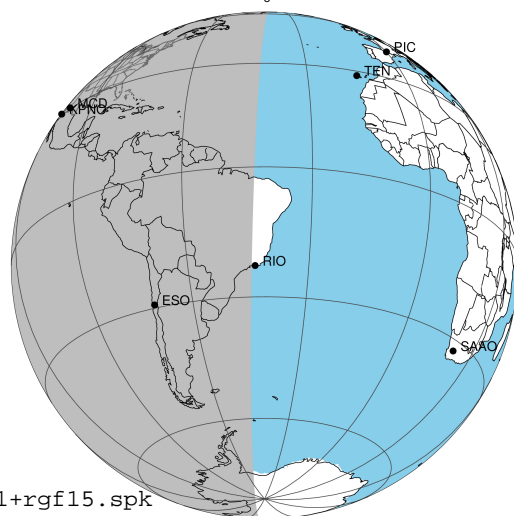
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2031-03-15T09:01:36.900  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4068933857462151424  
 2Mass ID (if available) : 17471740-2252111

Jupiter 2031-03-15T09:01:36 K8.05 G14.92 Pgt

ICRS Star Coord at Epoch: 17h 47m 17.40962s -22:52:11.23413s

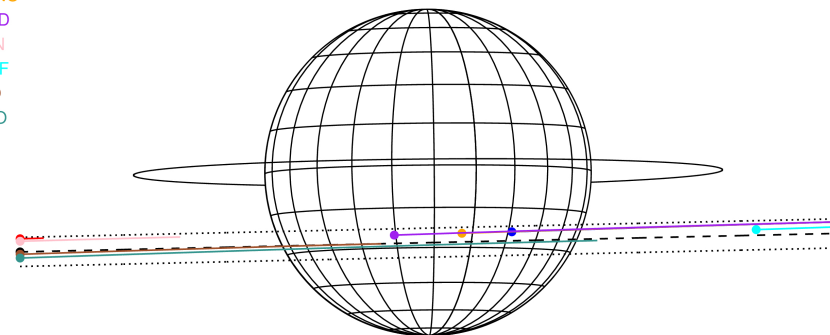
RUWE (>1.4 is poor) : 0.91  
 K magnitude : 8.049  
 G magnitude : 14.919  
 RP magnitude : 13.325  
 BP magnitude : 18.670  
 DUPflag : 0  
 Distance (au) : 5.268  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : 14.67  
 Sun-Target sep (deg) : 87.07  
 Sun-Moon sep (deg) : 14.69  
 B (ring opening deg) : -2.63  
 PA of pole (deg) : 0.53  
 Pole direction: RA (deg): 268.05700  
 Dec (deg): 64.49651  
 C/A sky separation (") : 8.043  
 C/A sky separation (km) : 30729.6  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2031-03-15T09:01:36 K8.05 G14.92 Pgt



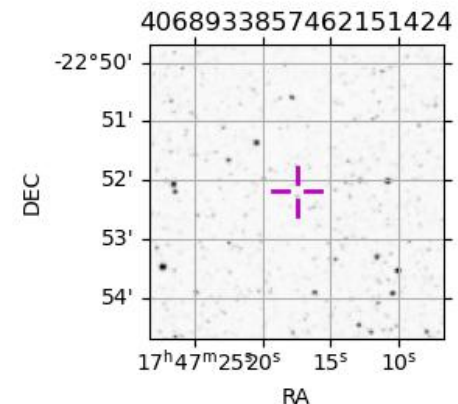
2031-03-15T09:01:36.9000 a: 17 47 17.4096 s: -22 52 11.234 C/A 8.053° PA 1.30 deg v\_sky +14.67 km/s D 05.27 AU  
 Credit: Styled after SORA/Lucky Star

Earth  
 PIC  
 PAL  
 KPNO  
 MCD  
 TEN  
 IRTF  
 RIO  
 ESO



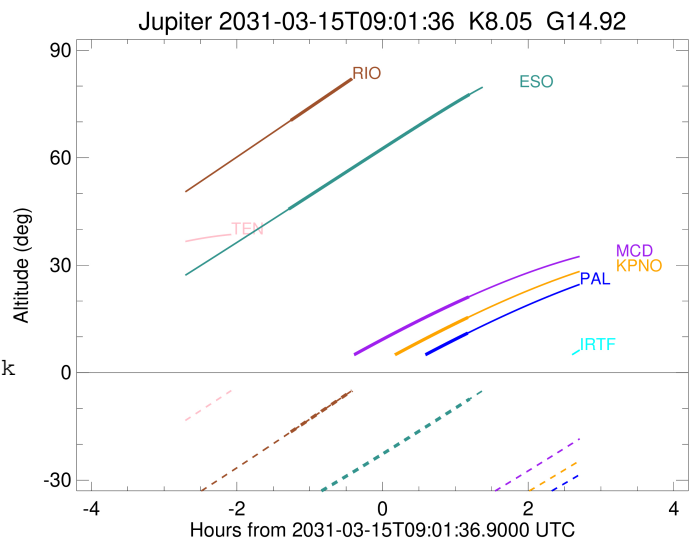
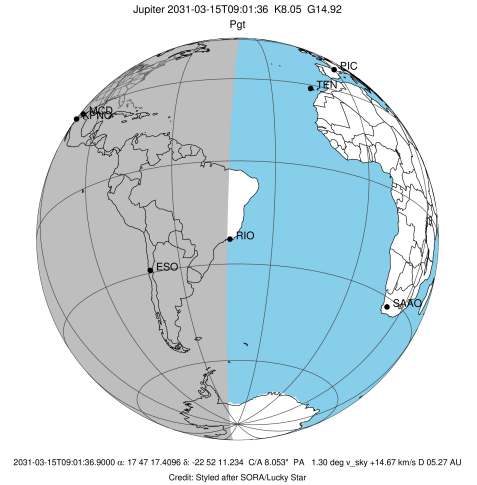
Observable events with sun below -5 deg and altitude above 5 deg

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 15 10:11 - MAR 15 10:11	Pne
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	MAR 15 10:12 - MAR 15 10:12	Pne
MCD	McDonald Obs. 2.7m	30.7	256.0	+	MAR 15 10:12 - MAR 15 10:12	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 15 07:46 - MAR 15 07:46	Pin
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	MAR 15 07:44 - MAR 15 10:13	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             : 2031-03-15T08:55:56.260
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       : 4068933857462151424
2Mass ID (if available) : 17471740-2252111
ICRS Star Coord at Epoch: 17h 47m 17.40962s -22:52:11.23413s
RUWE (>1.4 is poor) : 0.91
K magnitude          : 8.049
G magnitude          : 14.919
RP magnitude         : 13.325
BP magnitude         : 18.670
DUPflag             : 0
Distance (au)        : 5.268
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 14.67
Sun-Target sep (deg) : 87.07
Sun-Moon sep (deg)   : 13.88
B (ring opening deg) : -2.63
PA of pole (deg)     : 0.53
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation ("): 7.110
C/A sky separation (km): 27166.2
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
    
```

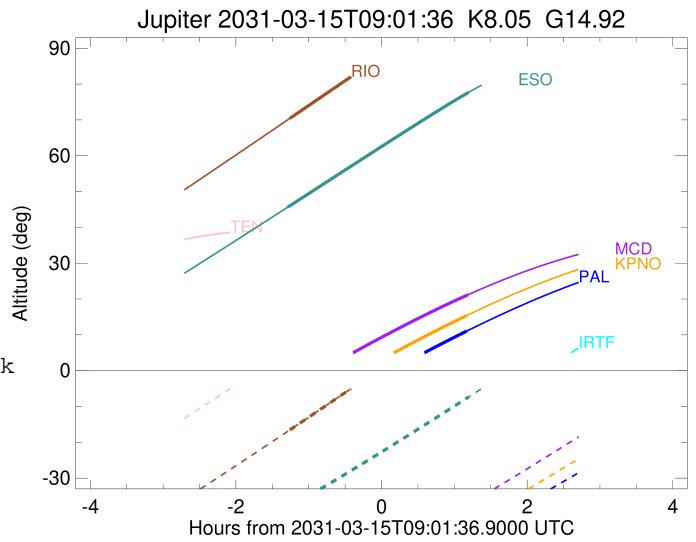
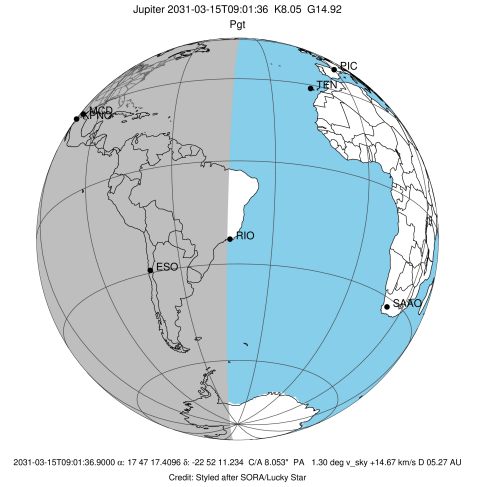


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-15T07:40:48.269	-17.24x	-58.78	71490.5	-23.66	-26.58
Jupiter	E	2031-03-15T10:11:50.674	11.05	-45.64	71490.8	-20.99	-23.66

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-15T08:55:59.440
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      : 4068933857462151424
2Mass ID (if available) : 17471740-2252111
ICRS Star Coord at Epoch: 17h 47m 17.40962s -22:52:11.23413s
RUWE (>1.4 is poor) : 0.91
K magnitude         : 8.049
G magnitude         : 14.919
RP magnitude        : 13.325
BP magnitude        : 18.670
DUPflag            : 0
Distance (au)       : 5.268
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : 14.67
Sun-Target sep (deg) : 87.07
Sun-Moon sep (deg)  : 13.91
B (ring opening deg) : -2.63
PA of pole (deg)    : 0.53
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (" ) : 7.090
C/A sky separation (km) : 27090.7
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
    
```

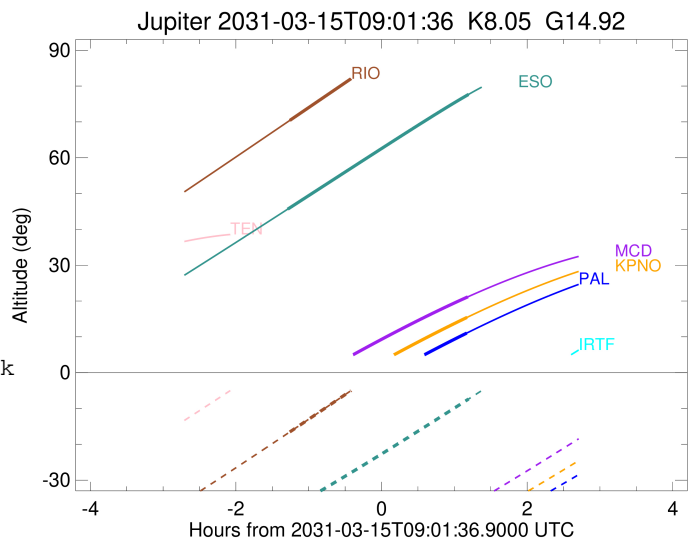
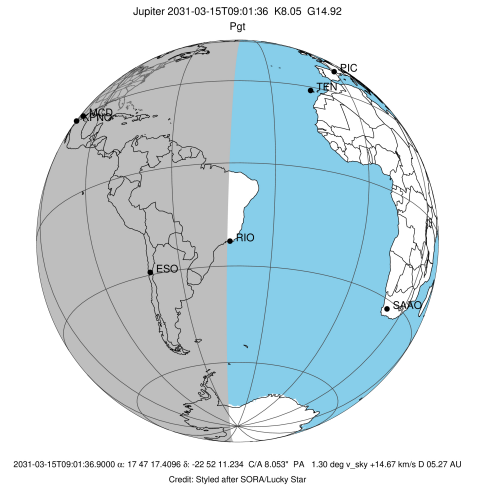


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-15T07:40:38.494	-12.62x	-60.36	71490.5	-23.60	-26.51
Jupiter	E	2031-03-15T10:12:06.840	15.43	-42.68	71490.8	-20.93	-23.60

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-15T08:56:12.180
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        : 4068933857462151424
2Mass ID (if available) : 17471740-2252111
ICRS Star Coord at Epoch: 17h 47m 17.40962s -22:52:11.23413s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 8.049
G magnitude           : 14.919
RP magnitude          : 13.325
BP magnitude          : 18.670
DUPflag              : 0
Distance (au)         : 5.268
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 14.67
Sun-Target sep (deg)  : 87.07
Sun-Moon sep (deg)   : 13.97
B (ring opening deg) : -2.63
PA of pole (deg)     : 0.53
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (") : 7.047
C/A sky separation (km) : 26926.6
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
    
```

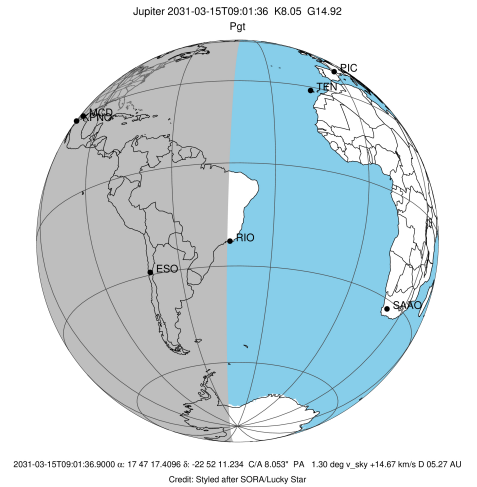


x: target alt < 5.0 deg or sun > -5.0 deg

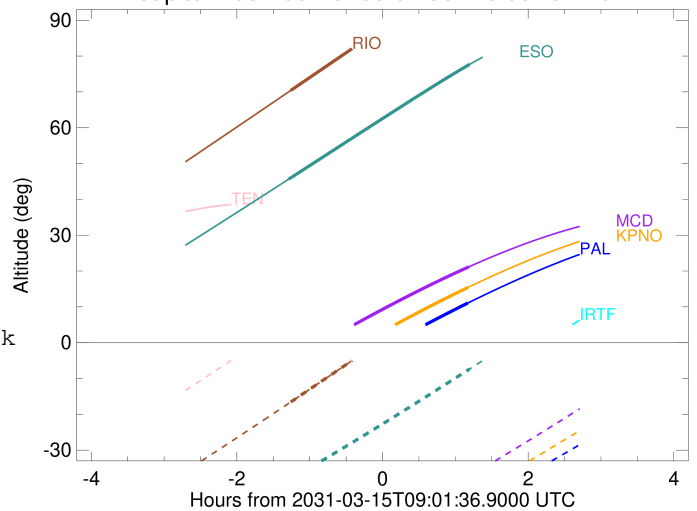
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-15T07:40:30.817	-6.14x	-60.45	71490.5	-23.46	-26.36
Jupiter	E	2031-03-15T10:12:39.119	21.15	-37.39	71490.8	-20.82	-23.47

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-15T09:01:22.370
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        : 4068933857462151424
2Mass ID (if available) : 17471740-2252111
ICRS Star Coord at Epoch: 17h 47m 17.40962s -22:52:11.23413s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 8.049
G magnitude           : 14.919
RP magnitude          : 13.325
BP magnitude          : 18.670
DUPflag              : 0
Distance (au)         : 5.268
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 14.67
Sun-Target sep (deg)  : 87.07
Sun-Moon sep (deg)   : 14.91
B (ring opening deg) : -2.63
PA of pole (deg)     : 0.53
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (") : 8.041
C/A sky separation (km) : 30723.0
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
    
```



Jupiter 2031-03-15T09:01:36 K8.05 G14.92

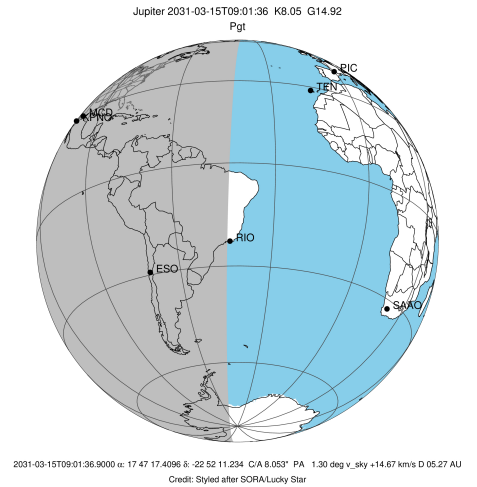


x: target alt < 5.0 deg or sun > -5.0 deg

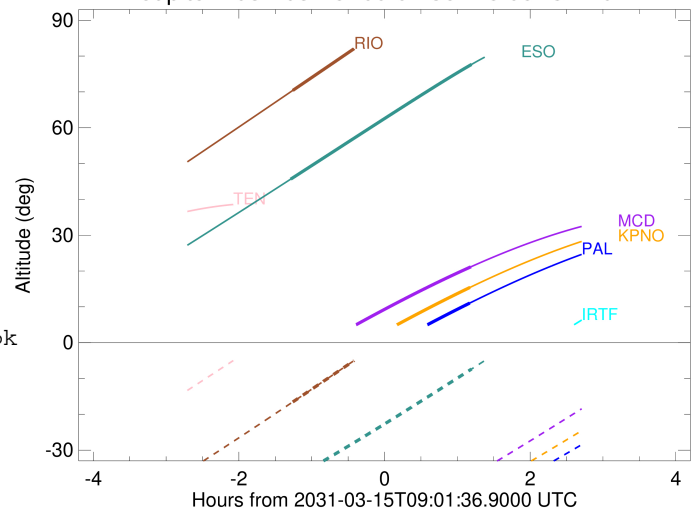
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-15T07:46:02.101	70.41	-16.55	71490.1	-26.36	-29.49
Jupiter	E	2031-03-15T10:16:53.357	74.77	18.10x	71490.3	-24.71	-27.71

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-15T08:58:38.170
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        : 4068933857462151424
2Mass ID (if available) : 17471740-2252111
ICRS Star Coord at Epoch: 17h 47m 17.40962s -22:52:11.23413s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 8.049
G magnitude           : 14.919
RP magnitude          : 13.325
BP magnitude          : 18.670
DUPflag              : 0
Distance (au)         : 5.268
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 14.67
Sun-Target sep (deg)  : 87.07
Sun-Moon sep (deg)   : 14.50
B (ring opening deg) : -2.63
PA of pole (deg)     : 0.53
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (" ) : 8.317
C/A sky separation (km) : 31776.8
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
    
```



Jupiter 2031-03-15T09:01:36 K8.05 G14.92



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	2031-03-15T07:44:26.999	45.67	-38.23	71490.0	-27.55	-30.77
Jupiter	E	2031-03-15T10:13:18.281	77.65	-7.37	71490.3	-25.34	-28.40