

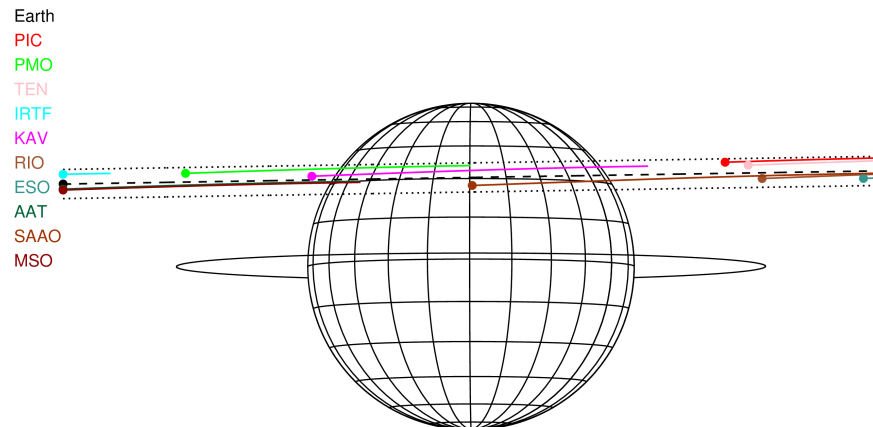
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2031-03-29T21:35:40.210  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4068714466168649472  
 2Mass ID (if available) : 17514946-2253041

Jupiter 2031-03-29T21:35:40 K8.96 G14.89 Pgt

ICRS Star Coord at Epoch: 17h 51m 49.46513s -22:53:04.33212s  
 RUWE (>1.4 is poor) : 0.97  
 K magnitude : 8.961  
 G magnitude : 14.888  
 RP magnitude : 13.436  
 BP magnitude : 17.780  
 DUPflag : 0  
 Distance (au) : 5.034  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : 7.74  
 Sun-Target sep (deg) : 100.45  
 Sun-Moon sep (deg) : 177.48  
 B (ring opening deg) : -2.62  
 PA of pole (deg) : 0.04  
 Pole direction: RA (deg): 268.05699  
 Dec (deg): 64.49651  
 C/A sky separation (") : 10.683  
 C/A sky separation (km) : 38999.4  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk  
 URKALLv1.spk  
 naif0012.tls  
 nep097.bsp  
 nep101.bsp  
 sat4401.bsp

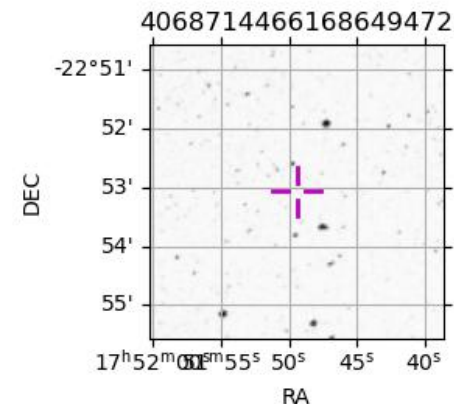


2031-03-29T21:35:40.2100 α: 17 51 49.4651 δ: -22 53 04.332 C/A \*\*\*\*\* PA 180.92 deg v\_sky + 7.74 km/s D 05.03 AU  
 Credit: Styled after SORA/Lucky Star



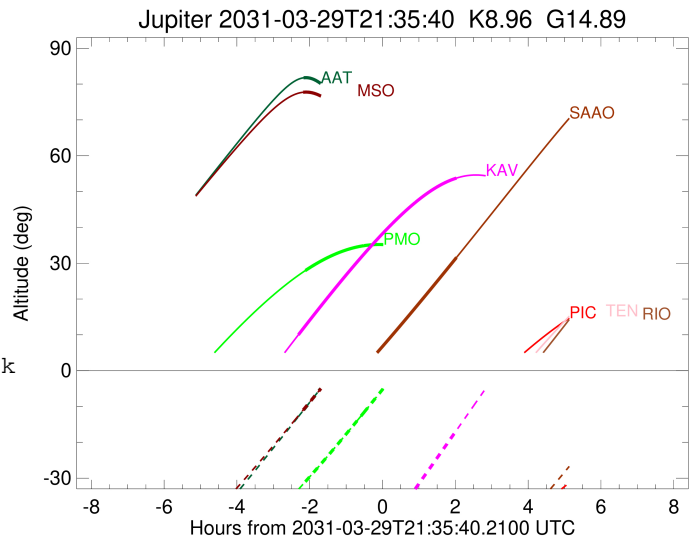
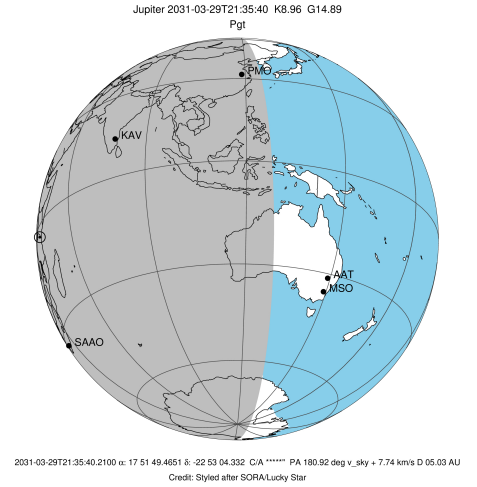
Observable events with sun below -5 deg and altitude above 5 deg

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			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+	MAR 29 19:28 - MAR 29 19:28	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	+ +	MAR 29 19:16 - MAR 29 23:37	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	+	MAR 29 19:25 - MAR 29 19:25	Pin
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	MAR 29 23:37 - MAR 29 23:37	Pne
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	MAR 29 19:25 - MAR 29 19:25	Pin



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-29T21:35:48.190
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       : 4068714466168649472
2Mass ID (if available) : 17514946-2253041
ICRS Star Coord at Epoch: 17h 51m 49.46513s -22:53:04.33212s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 8.961
G magnitude           : 14.888
RP magnitude         : 13.436
BP magnitude         : 17.780
DUPflag              : 0
Distance (au)        : 5.034
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 7.74
Sun-Target sep (deg) : 100.45
Sun-Moon sep (deg)   : 176.93
B (ring opening deg) : -2.62
PA of pole (deg)     : 0.04
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 12.109
C/A sky separation (km) : 44206.2
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
    
```

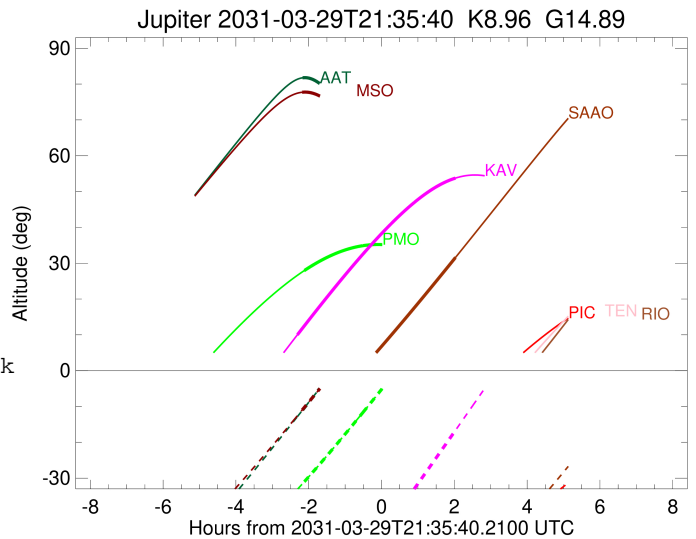
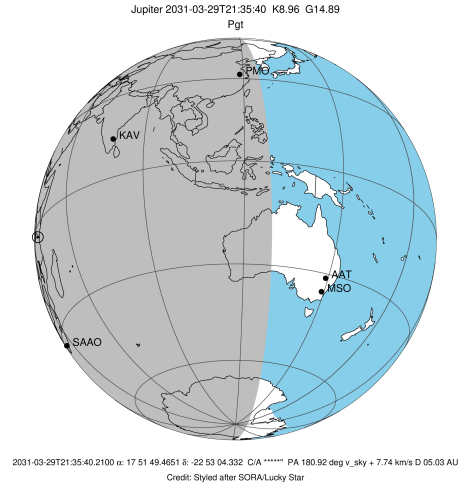


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-29T19:28:29.359	27.94	-30.99	71488.6	36.94	40.59
Jupiter	E	2031-03-29T23:43:49.123	26.52	21.87x	71488.3	38.71	42.40

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-29T21:25:17.100
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       : 4068714466168649472
2Mass ID (if available) : 17514946-2253041
ICRS Star Coord at Epoch: 17h 51m 49.46513s -22:53:04.33212s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 8.961
G magnitude          : 14.888
RP magnitude         : 13.436
BP magnitude         : 17.780
DUPflag             : 0
Distance (au)        : 5.034
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 7.74
Sun-Target sep (deg) : 100.45
Sun-Moon sep (deg)   : 176.80
B (ring opening deg) : -2.62
PA of pole (deg)     : 0.04
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 11.517
C/A sky separation (km) : 42046.0
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
    
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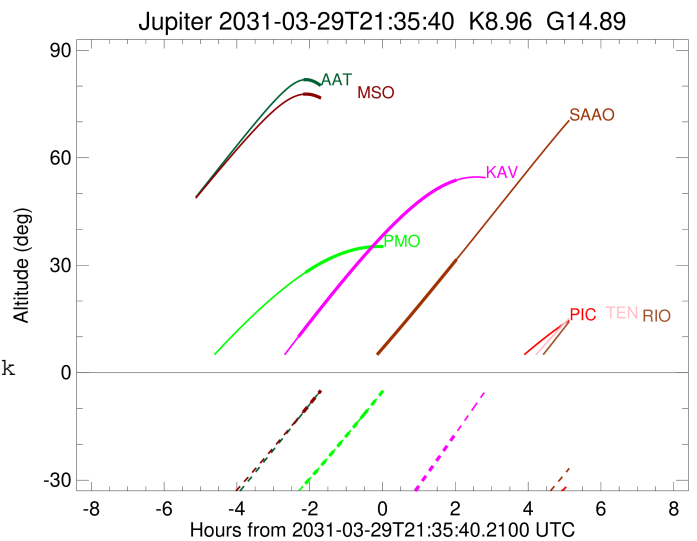
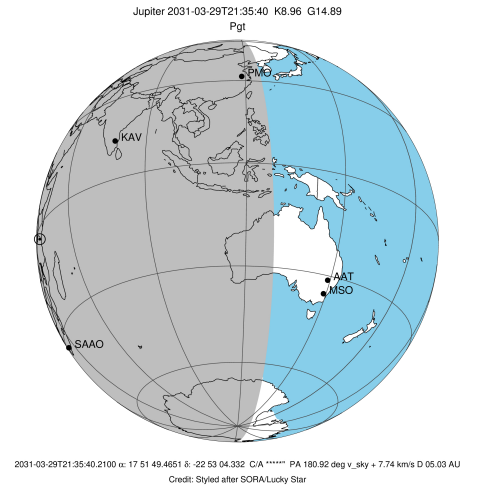


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-29T19:16:57.565	9.99	-72.57	71489.1	33.97	37.53
Jupiter	E	2031-03-29T23:37:31.993	53.75	-16.67	71488.5	37.47	41.13

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-29T21:43:04.950
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       : 4068714466168649472
2Mass ID (if available) : 17514946-2253041
ICRS Star Coord at Epoch: 17h 51m 49.46513s -22:53:04.33213s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 8.961
G magnitude           : 14.888
RP magnitude          : 13.436
BP magnitude          : 17.780
DUPflag              : 0
Distance (au)        : 5.033
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 7.74
Sun-Target sep (deg) : 100.45
Sun-Moon sep (deg)   : 177.90
B (ring opening deg) : -2.62
PA of pole (deg)     : 0.04
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 10.348
C/A sky separation (km) : 37776.6
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
    
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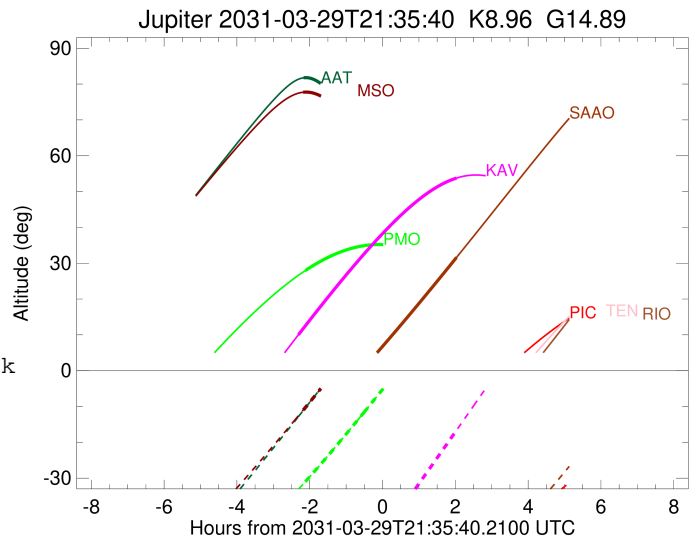
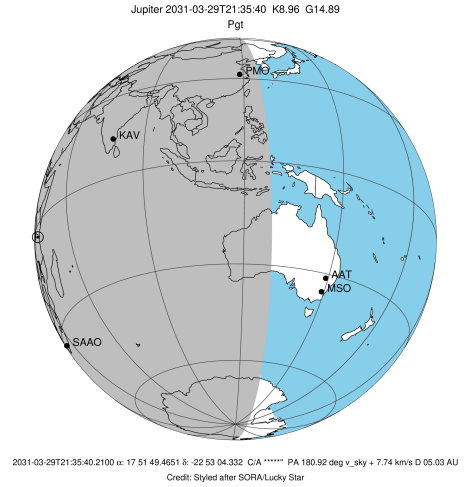


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-29T19:25:38.168	81.74	-10.99	71489.5	31.28	34.72
Jupiter	E	2031-03-29T23:58:56.966	30.13	43.57x	71489.4	31.86	35.33

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-29T21:22:52.020
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       : 4068714466168649472
2Mass ID (if available) : 17514946-2253041
ICRS Star Coord at Epoch: 17h 51m 49.46513s -22:53:04.33212s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 8.961
G magnitude           : 14.888
RP magnitude          : 13.436
BP magnitude          : 17.780
DUPflag              : 0
Distance (au)         : 5.034
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 7.74
Sun-Target sep (deg) : 100.45
Sun-Moon sep (deg)   : 177.18
B (ring opening deg) : -2.62
PA of pole (deg)     : 0.04
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation ("): 9.711
C/A sky separation (km): 35451.1
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
    
```

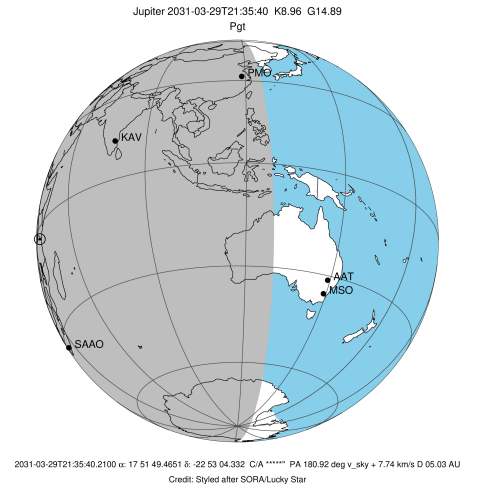


x: target alt < 5.0 deg or sun > -5.0 deg

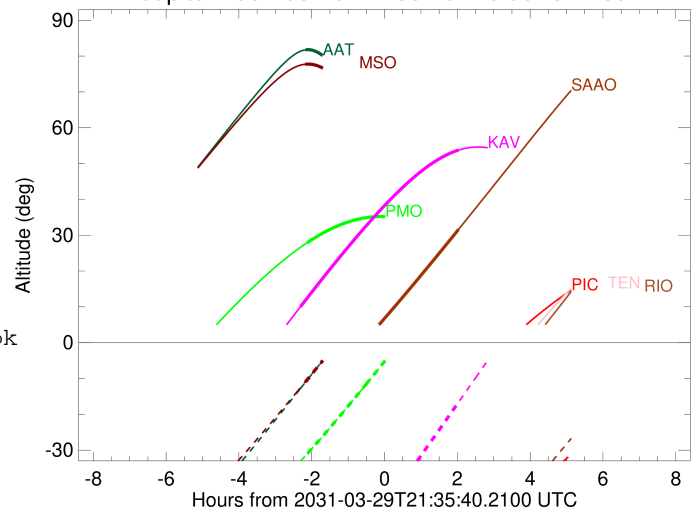
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-29T19:12:46.408	-18.57x	-33.42	71490.0	27.85	31.09
Jupiter	E	2031-03-29T23:37:35.407	31.59	-58.51	71489.4	31.69	35.15

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-29T21:42:43.290
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        : 4068714466168649472
2Mass ID (if available) : 17514946-2253041
ICRS Star Coord at Epoch: 17h 51m 49.46513s -22:53:04.33213s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 8.961
G magnitude           : 14.888
RP magnitude          : 13.436
BP magnitude          : 17.780
DUPflag              : 0
Distance (au)         : 5.033
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 7.74
Sun-Target sep (deg)  : 100.45
Sun-Moon sep (deg)    : 177.93
B (ring opening deg) : -2.62
PA of pole (deg)      : 0.04
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 10.232
C/A sky separation (km) : 37352.4
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
    
```



Jupiter 2031-03-29T21:35:40 K8.96 G14.89



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	2031-03-29T19:25:01.567	77.71	-10.96	71489.5	30.86	34.28
Jupiter	E	2031-03-29T23:58:57.445	30.80	40.74x	71489.4	31.51	34.96