

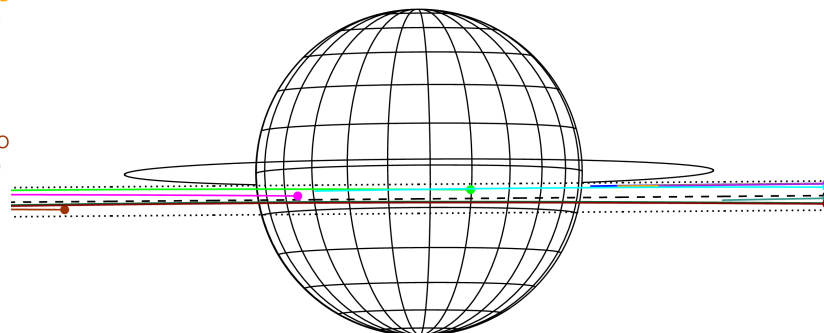
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-05-13T14:24:48.950
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068892350885442176
 2Mass ID (if available) : 17482624-2253414

Jupiter 2031-05-13T14:24:48 K9.85 G14.97 Pgt

ICRS Star Coord at Epoch: 17h 48m 26.23542s -22:53:41.72061s
 RUWE (>1.4 is poor) : 0.93
 K magnitude : 9.850
 G magnitude : 14.969
 RP magnitude : 13.710
 BP magnitude : 16.755
 DUPflag : 0
 Distance (au) : 4.433
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -11.06
 Sun-Target sep (deg) : 144.87
 Sun-Moon sep (deg) : 52.45
 B (ring opening deg) : -2.61
 PA of pole (deg) : 0.41
 Pole direction: RA (deg): 268.05695
 Dec (deg): 64.49651
 C/A sky separation (") : 3.593
 C/A sky separation (km) : 11552.9
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk



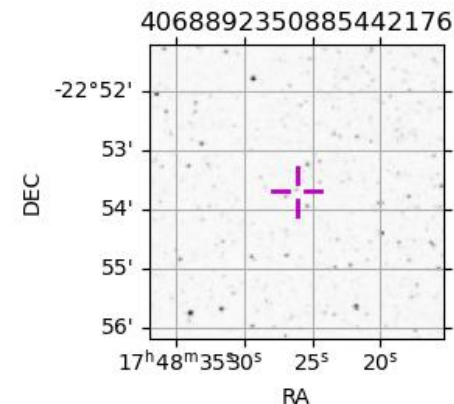
Earth
 PAL
 PMO
 KPNO
 MCD
 IRTF
 KAV
 ESO
 AAT
 SAAO
 MSO



2031-05-13T14:24:48.9500 a: 17 48 26.2354 s: -22 53 41.721 C/A 3.605" PA 0.47 deg v_sky -11.06 km/s D 04.43 AU
 Credit: Styled after SORA/Lucky Star

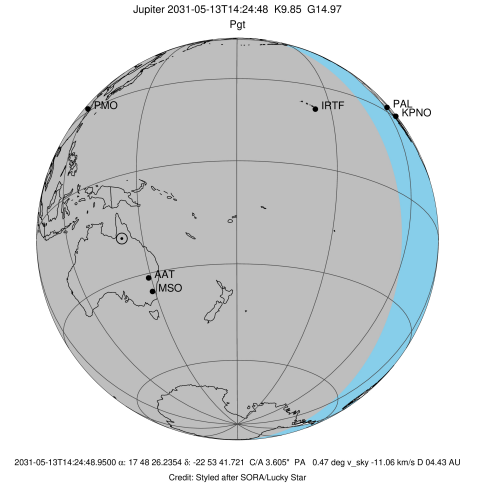
Observable events with sun below -5 deg and altitude above 5 deg

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	+	MAY 13 16:16 - MAY 13 16:16	Pne
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	+	MAY 13 12:38 - MAY 13 12:38	Pin
KAV	Kavalur Observatory	12.6	78.8	+	MAY 13 16:20 - MAY 13 16:20	Pne
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 13 12:45 - MAY 13 16:11	Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	MAY 13 12:45 - MAY 13 16:11	Pie

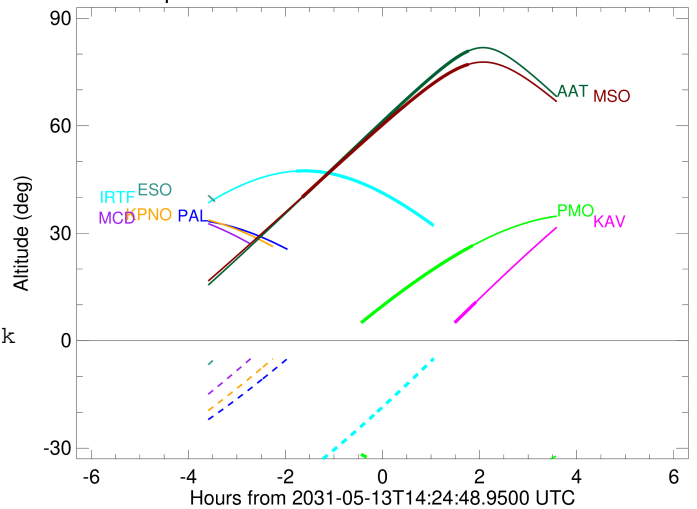


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target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-13T14:32:00.420
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : PMO
Location              : Purple Mtn Obs. Nanking
Latitude (deg)        : 32.06667
E. Longitude (deg)    : 118.82089
Altitude (km)         : 0.364
Gaia source ID        : 4068892350885442176
2Mass ID (if available) : 17482624-2253414
ICRS Star Coord at Epoch: 17h 48m 26.23542s -22:53:41.72061s
RUWE (>1.4 is poor) : 0.93
K magnitude           : 9.850
G magnitude           : 14.969
RP magnitude          : 13.710
BP magnitude          : 16.755
DUPflag              : 0
Distance (au)         : 4.433
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -11.06
Sun-Target sep (deg)  : 144.87
Sun-Moon sep (deg)    : 52.99
B (ring opening deg) : -2.61
PA of pole (deg)      : 0.41
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 2.304
C/A sky separation (km) : 7409.0
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 2031-05-13T14:24:48 K9.85 G14.97

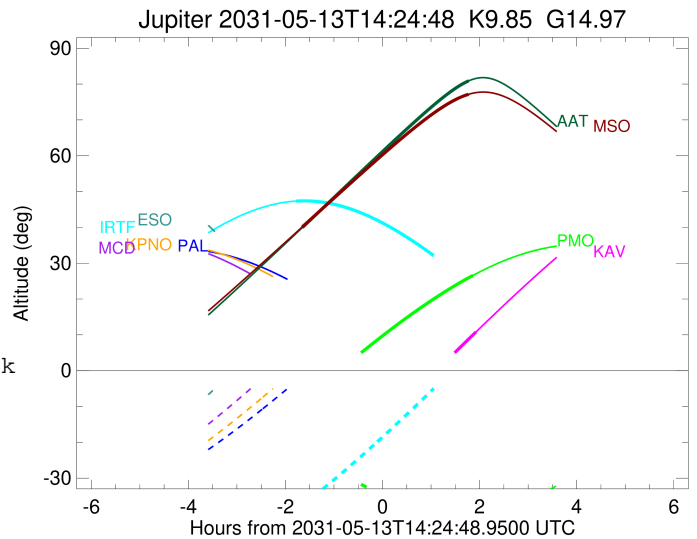
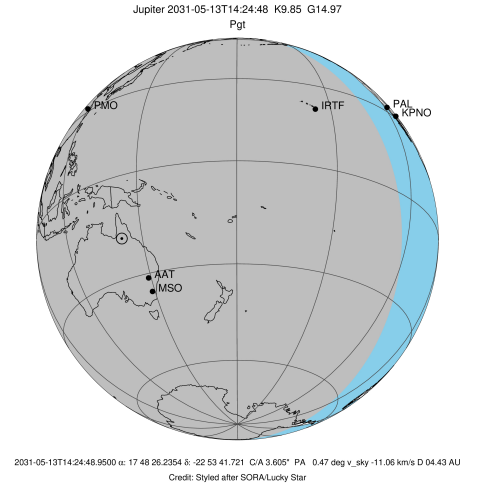


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-13T12:45:55.862	-8.85x	-21.34	71491.9	-6.63	-7.57
Jupiter	E	2031-05-13T16:16:26.367	26.57	-39.52	71491.9	-5.44	-6.21

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch             : 2031-05-13T14:21:11.390
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : IRTF
Location              : Mauna Kea/IRTF
Latitude (deg)        : 19.82622
E. Longitude (deg)    : 204.52800
Altitude (km)         : 4.168
Gaia source ID        : 4068892350885442176
2Mass ID (if available) : 17482624-2253414
ICRS Star Coord at Epoch: 17h 48m 26.23542s -22:53:41.72061s
RUWE (>1.4 is poor)  : 0.93
K magnitude           : 9.850
G magnitude           : 14.969
RP magnitude          : 13.710
BP magnitude          : 16.755
DUPflag              : 0
Distance (au)         : 4.433
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -11.06
Sun-Target sep (deg)  : 144.87
Sun-Moon sep (deg)    : 52.70
B (ring opening deg)  : -2.61
PA of pole (deg)      : 0.41
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 2.306
C/A sky separation (km) : 7414.9
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
    
```

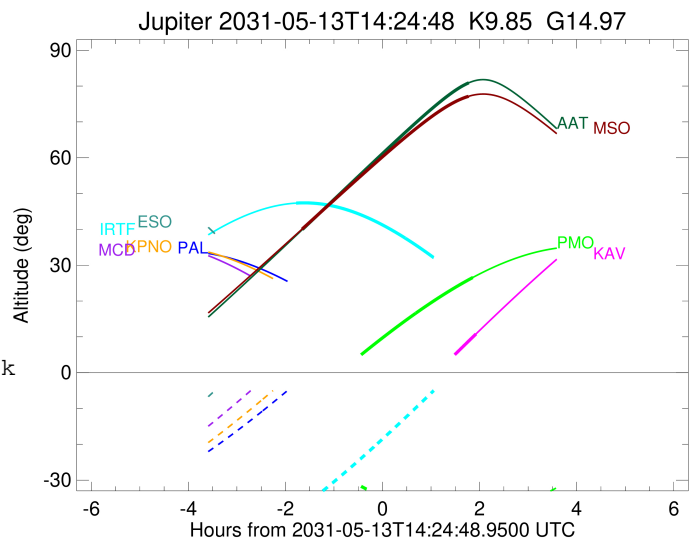
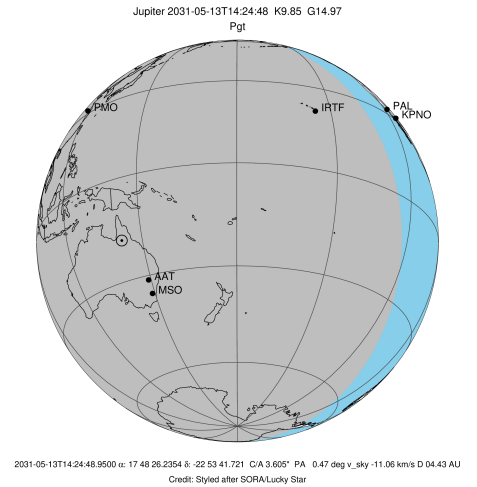


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-13T12:38:00.107	47.33	-38.74	71491.9	-5.75	-6.57
Jupiter	E	2031-05-13T16:04:53.319	25.67	3.13x	71491.9	-6.50	-7.42

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-13T14:34:20.410
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      : 4068892350885442176
2Mass ID (if available) : 17482624-2253414
ICRS Star Coord at Epoch: 17h 48m 26.23542s -22:53:41.72061s
RUWE (>1.4 is poor) : 0.93
K magnitude          : 9.850
G magnitude          : 14.969
RP magnitude         : 13.710
BP magnitude         : 16.755
DUPflag             : 0
Distance (au)       : 4.433
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -11.06
Sun-Target sep (deg) : 144.87
Sun-Moon sep (deg)  : 52.80
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.41
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (" ) : 3.325
C/A sky separation (km) : 10692.1
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
    
```

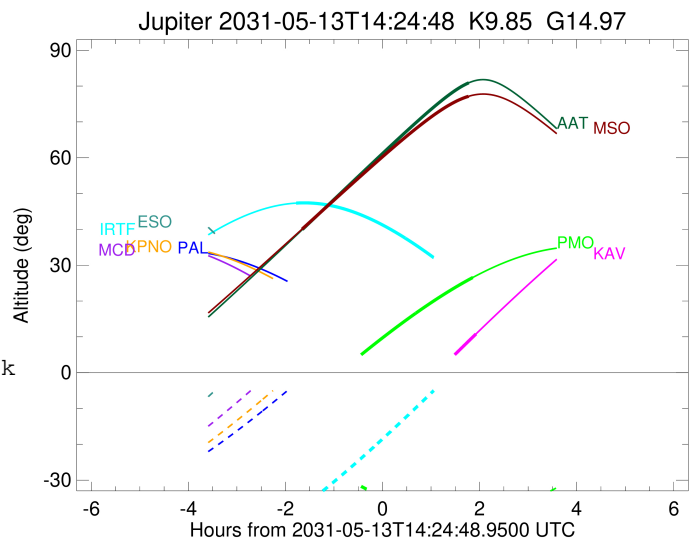
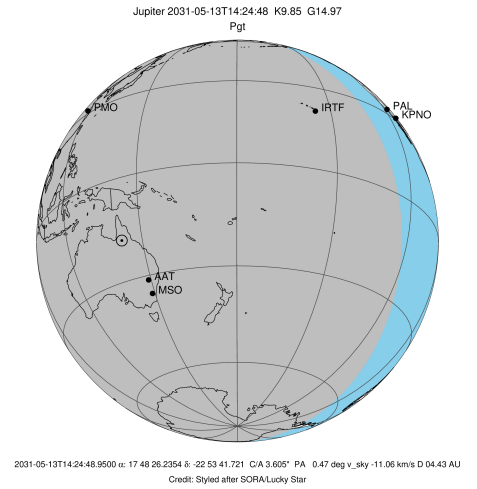


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-13T12:46:04.495	-37.93x	2.75x	71491.7	-9.38	-10.70
Jupiter	E	2031-05-13T16:20:22.038	10.80	-43.52	71491.8	-7.75	-8.85

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-13T14:29:03.760
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        : 4068892350885442176
2Mass ID (if available) : 17482624-2253414
ICRS Star Coord at Epoch: 17h 48m 26.23542s -22:53:41.72061s
RUWE (>1.4 is poor) : 0.93
K magnitude           : 9.850
G magnitude           : 14.969
RP magnitude          : 13.710
BP magnitude          : 16.755
DUPflag              : 0
Distance (au)         : 4.433
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -11.06
Sun-Target sep (deg)  : 144.87
Sun-Moon sep (deg)   : 53.41
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.41
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 3.969
C/A sky separation (km) : 12762.2
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
    
```

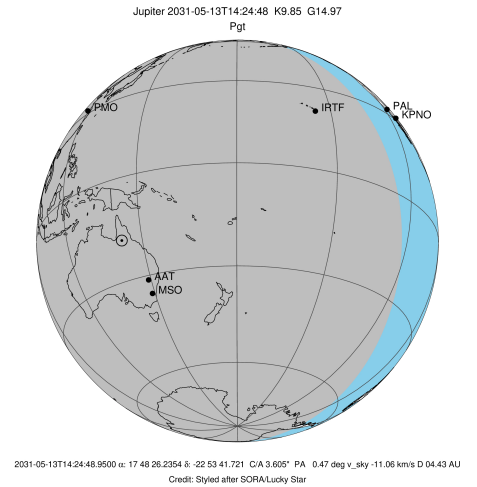


x: target alt < 5.0 deg or sun > -5.0 deg

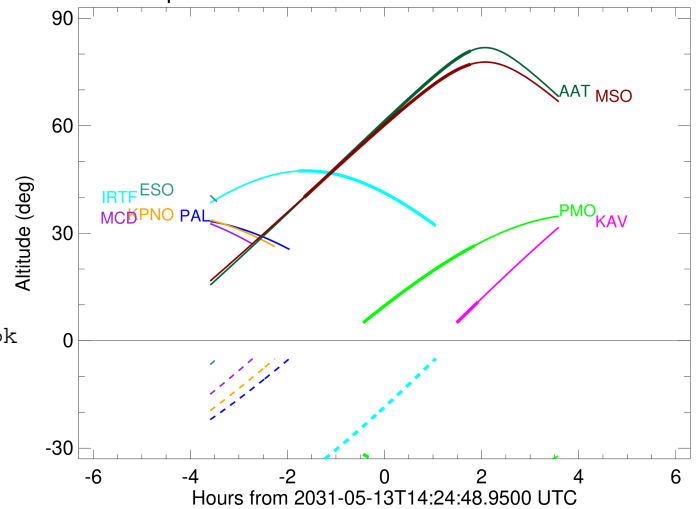
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-13T12:45:45.388	39.95	-68.94	71491.7	-10.75	-12.25
Jupiter	E	2031-05-13T16:11:22.784	80.89	-57.79	71491.7	-10.09	-11.50

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-13T14:28:53.060
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        : 4068892350885442176
2Mass ID (if available) : 17482624-2253414
ICRS Star Coord at Epoch: 17h 48m 26.23542s -22:53:41.72061s
RUWE (>1.4 is poor) : 0.93
K magnitude           : 9.850
G magnitude           : 14.969
RP magnitude          : 13.710
BP magnitude          : 16.755
DUPflag               : 0
Distance (au)         : 4.433
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -11.06
Sun-Target sep (deg) : 144.87
Sun-Moon sep (deg)   : 53.39
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.41
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 4.103
C/A sky separation (km) : 13191.4
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 2031-05-13T14:24:48 K9.85 G14.97



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	2031-05-13T12:45:34.238	40.10	-66.46	71491.7	-11.08	-12.62
Jupiter	E	2031-05-13T16:11:14.450	77.14	-56.59	71491.7	-10.45	-11.91