

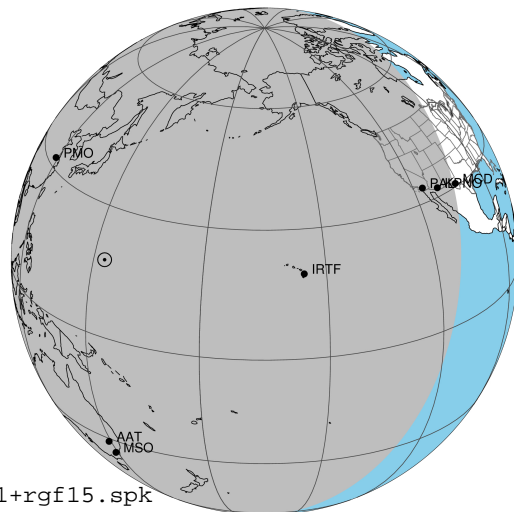
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2048-11-12T13:30:35.450
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 3424726386901744768
 2Mass ID (if available) : 05570027+2257179

Jupiter 2048-11-12T13:30:35 K8.86 G13.97 Pgt

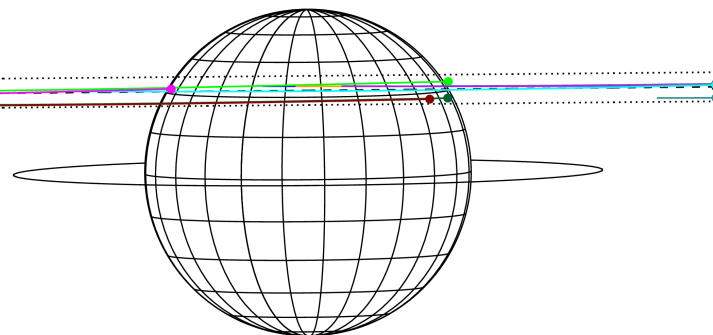
ICRS Star Coord at Epoch: 05h 57m 00.26950s +22:57:17.95937s

RUWE (>1.4 is poor) : 1.10
 K magnitude : 8.858
 G magnitude : 13.974
 RP magnitude : 12.714
 BP magnitude : 15.572
 DUPflag : 0
 Distance (au) : 4.288
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -10.44
 Sun-Target sep (deg) : 140.85
 Sun-Moon sep (deg) : 132.76
 B (ring opening deg) : 2.54
 PA of pole (deg) : 0.51
 Pole direction: RA (deg): 268.05736
 Dec (deg): 64.49721
 C/A sky separation (") : 11.555
 C/A sky separation (km) : 35937.5
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2048-11-12T13:30:35 K8.86 G13.97
 Pgt



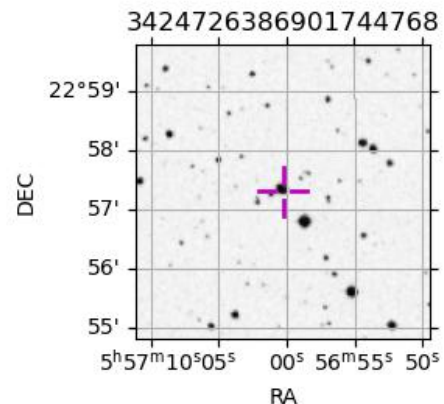
Earth
 PAL
 PMO
 KPNO
 MCD
 IRTF
 KAV
 ESO
 AAT
 MSO



2048-11-12T13:30:35.4500 a: 05 57 00.2695 s: +22 57 17.959 C/A ***** PA 180.51 deg v_sky -10.44 km/s D 04.29 AU
 Credit: Styled after SORA/Lucky Star

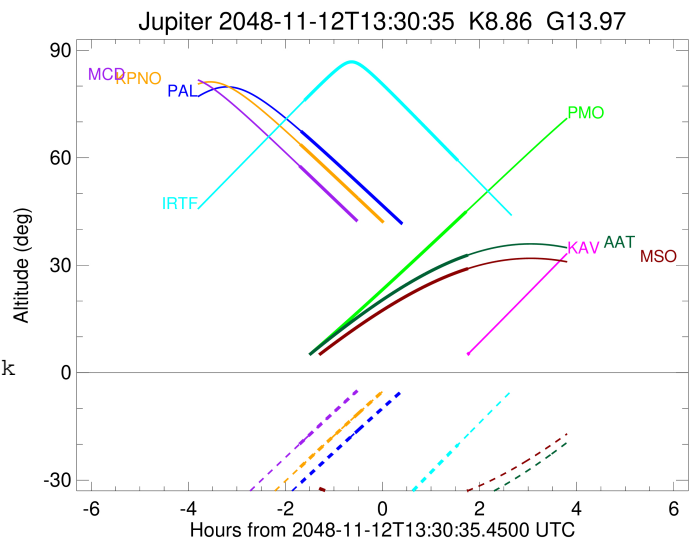
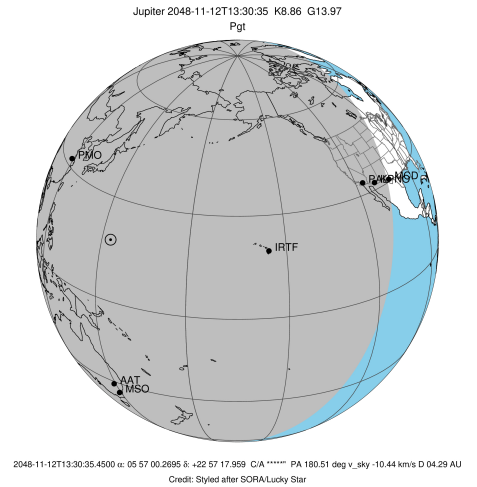
Observable events with sun below -5 deg and altitude above 5 deg

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	+	NOV 12 11:49	- NOV 12 11:49	Pin
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+ +	NOV 12 12:03	- NOV 12 15:14	Pie
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	NOV 12 11:49	- NOV 12 11:49	Pin
MCD	McDonald Obs. 2.7m	30.7	256.0	+	NOV 12 11:48	- NOV 12 11:48	Pin
TEN	Teide Obs./Tenerife	28.3	343.5				Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	NOV 12 11:53	- NOV 12 15:03	Pie
KAV	Kavalur Observatory	12.6	78.8	+	NOV 12 15:18	- NOV 12 15:18	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	+	NOV 12 15:16	- NOV 12 15:16	Pne
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8				Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	NOV 12 15:16	- NOV 12 15:16	Pne



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2048-11-12T13:23:48.920
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      : 3424726386901744768
2Mass ID (if available) : 05570027+2257179
ICRS Star Coord at Epoch: 05h 57m 00.26950s +22:57:17.95937s
RUWE (>1.4 is poor) : 1.10
K magnitude         : 8.858
G magnitude         : 13.974
RP magnitude        : 12.714
BP magnitude        : 15.572
DUPflag            : 0
Distance (au)       : 4.288
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -10.44
Sun-Target sep (deg) : 140.85
Sun-Moon sep (deg)  : 132.89
B (ring opening deg) : 2.54
PA of pole (deg)    : 0.51
Pole direction: RA (deg): 268.05736
Dec (deg): 64.49721
C/A sky separation ("): 12.146
C/A sky separation (km) : 37773.2
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
    
```

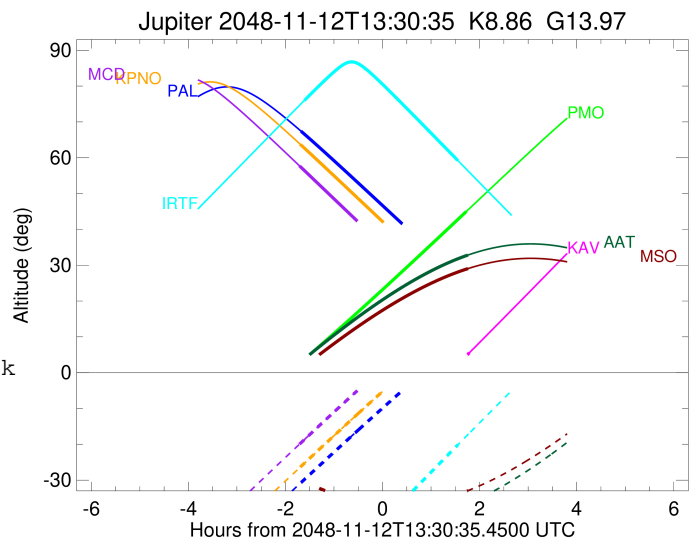
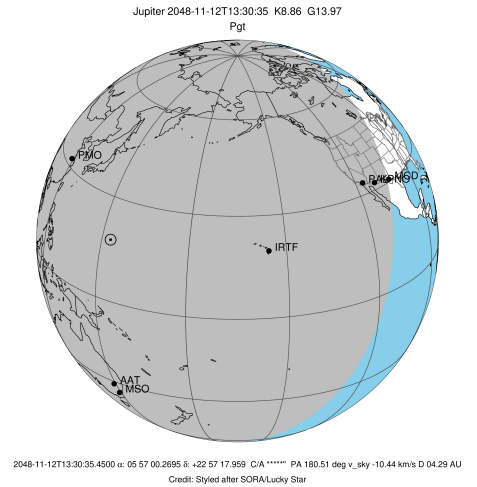


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2048-11-12T11:49:48.159	67.42	-30.70	71489.6	31.38	34.82
Jupiter	E	2048-11-12T14:58:41.424	28.27	7.27x	71489.4	32.57	36.07

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2048-11-12T13:39:47.390
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        : 3424726386901744768
2Mass ID (if available) : 05570027+2257179
ICRS Star Coord at Epoch: 05h 57m 00.26950s +22:57:17.95937s
RUWE (>1.4 is poor) : 1.10
K magnitude           : 8.858
G magnitude           : 13.974
RP magnitude          : 12.714
BP magnitude          : 15.572
DUPflag              : 0
Distance (au)         : 4.288
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -10.44
Sun-Target sep (deg)  : 140.85
Sun-Moon sep (deg)    : 133.62
B (ring opening deg) : 2.54
PA of pole (deg)      : 0.51
Pole direction: RA (deg): 268.05736
Dec (deg): 64.49721
C/A sky separation (" ) : 12.341
C/A sky separation (km) : 38380.1
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
    
```

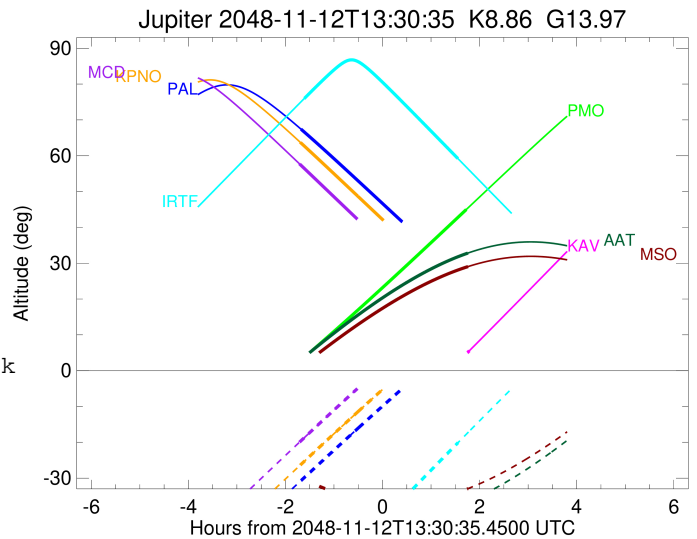
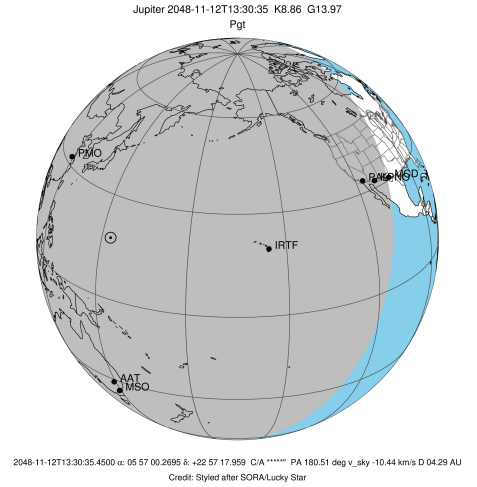


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2048-11-12T12:03:45.601	5.65	-37.69	71489.3	33.26	36.80
Jupiter	E	2048-11-12T15:14:10.926	44.98	-74.04	71489.5	31.73	35.19

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch              : 2048-11-12T13:23:09.230
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        : 3424726386901744768
2Mass ID (if available) : 05570027+2257179
ICRS Star Coord at Epoch: 05h 57m 00.26950s +22:57:17.95937s
RUWE (>1.4 is poor)  : 1.10
K magnitude            : 8.858
G magnitude            : 13.974
RP magnitude           : 12.714
BP magnitude           : 15.572
DUPflag               : 0
Distance (au)         : 4.288
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -10.44
Sun-Target sep (deg)  : 140.85
Sun-Moon sep (deg)    : 132.81
B (ring opening deg)  : 2.54
PA of pole (deg)      : 0.51
Pole direction: RA (deg): 268.05736
Dec (deg): 64.49721
C/A sky separation (") : 12.147
C/A sky separation (km) : 37778.8
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
    
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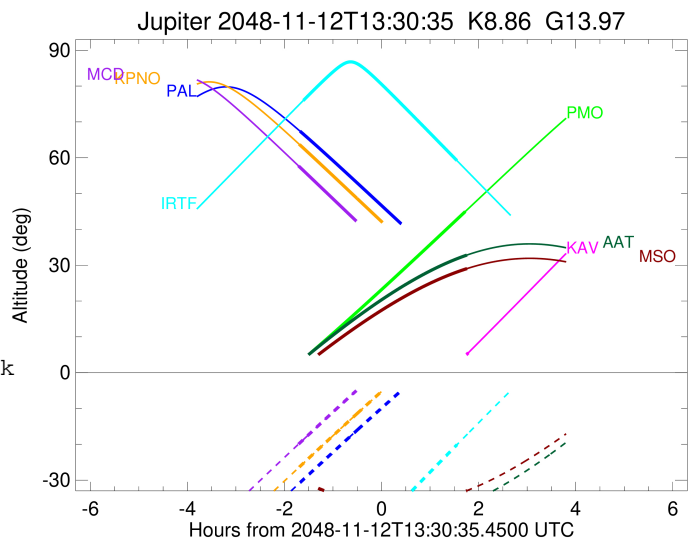
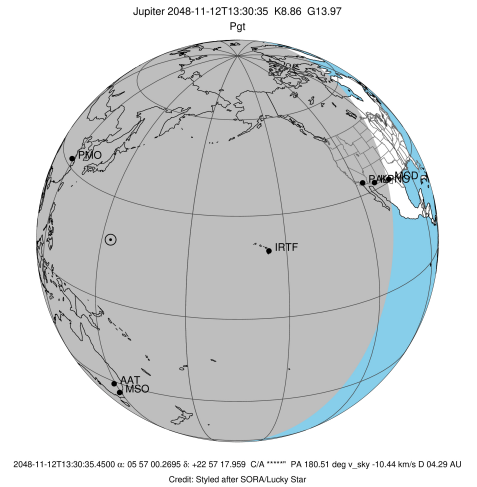


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2048-11-12T11:48:59.779	63.73	-26.35	71489.6	31.32	34.76
Jupiter	E	2048-11-12T14:58:16.873	23.72	11.75x	71489.4	32.62	36.12

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2048-11-12T13:22:20.660
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       : 3424726386901744768
2Mass ID (if available) : 05570027+2257179
ICRS Star Coord at Epoch: 05h 57m 00.26950s +22:57:17.95937s
RUWE (>1.4 is poor) : 1.10
K magnitude           : 8.858
G magnitude           : 13.974
RP magnitude          : 12.714
BP magnitude          : 15.572
DUPflag              : 0
Distance (au)        : 4.288
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -10.44
Sun-Target sep (deg) : 140.85
Sun-Moon sep (deg)   : 132.70
B (ring opening deg) : 2.54
PA of pole (deg)     : 0.51
Pole direction: RA (deg): 268.05736
Dec (deg): 64.49721
C/A sky separation (") : 12.180
C/A sky separation (km) : 37881.6
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
    
```

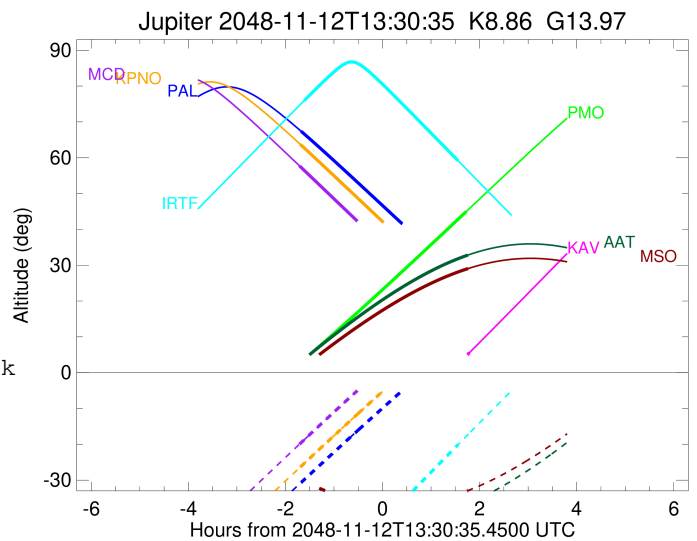
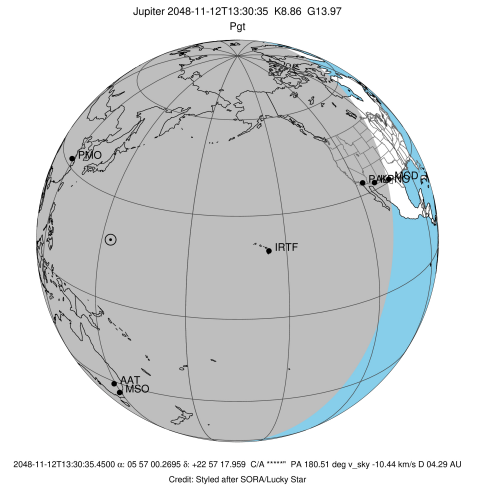


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2048-11-12T11:47:59.900	57.72	-19.96	71489.6	31.33	34.78
Jupiter	E	2048-11-12T14:57:47.727	17.23	17.84x	71489.4	32.77	36.28

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2048-11-12T13:28:53.160
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        : 3424726386901744768
2Mass ID (if available) : 05570027+2257179
ICRS Star Coord at Epoch: 05h 57m 00.26950s +22:57:17.95937s
RUWE (>1.4 is poor) : 1.10
K magnitude           : 8.858
G magnitude           : 13.974
RP magnitude          : 12.714
BP magnitude          : 15.572
DUPflag              : 0
Distance (au)         : 4.288
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -10.44
Sun-Target sep (deg)  : 140.85
Sun-Moon sep (deg)    : 133.36
B (ring opening deg) : 2.54
PA of pole (deg)      : 0.51
Pole direction: RA (deg): 268.05736
Dec (deg): 64.49721
C/A sky separation (") : 11.453
C/A sky separation (km) : 35619.0
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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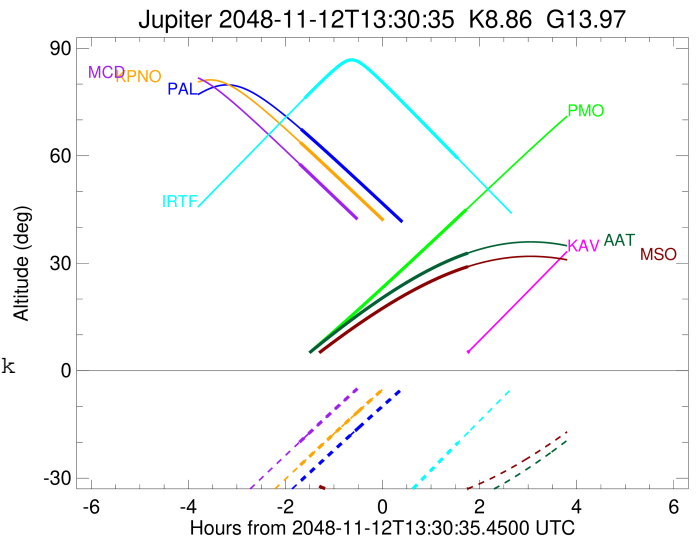
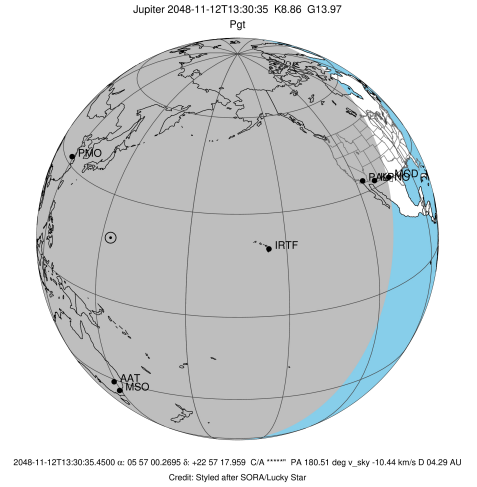


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2048-11-12T11:53:58.274	75.98	-64.41	71489.8	29.86	33.22
Jupiter	E	2048-11-12T15:03:52.779	59.19	-20.11	71489.8	30.21	33.59

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2048-11-12T13:40:43.560
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        : 3424726386901744768
2Mass ID (if available) : 05570027+2257179
ICRS Star Coord at Epoch: 05h 57m 00.26950s +22:57:17.95937s
RUWE (>1.4 is poor) : 1.10
K magnitude           : 8.858
G magnitude           : 13.974
RP magnitude          : 12.714
BP magnitude          : 15.572
DUPflag              : 0
Distance (au)         : 4.288
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -10.44
Sun-Target sep (deg)  : 140.85
Sun-Moon sep (deg)   : 133.15
B (ring opening deg) : 2.54
PA of pole (deg)     : 0.51
Pole direction: RA (deg): 268.05736
Dec (deg): 64.49721
C/A sky separation (") : 12.252
C/A sky separation (km) : 38103.8
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
    
```

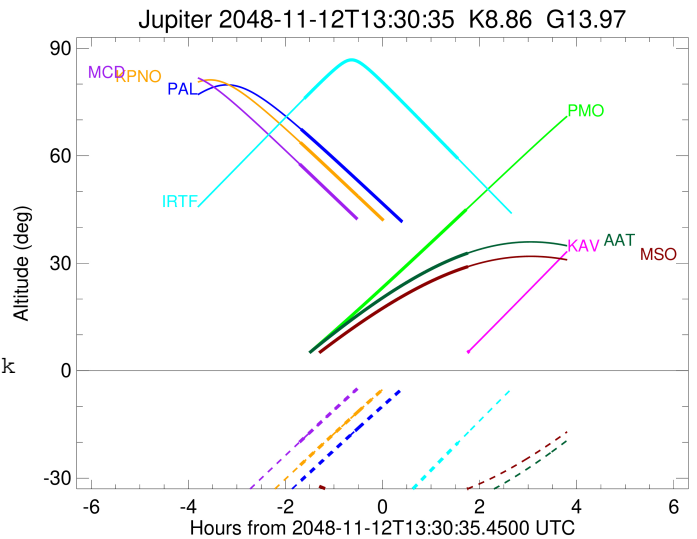
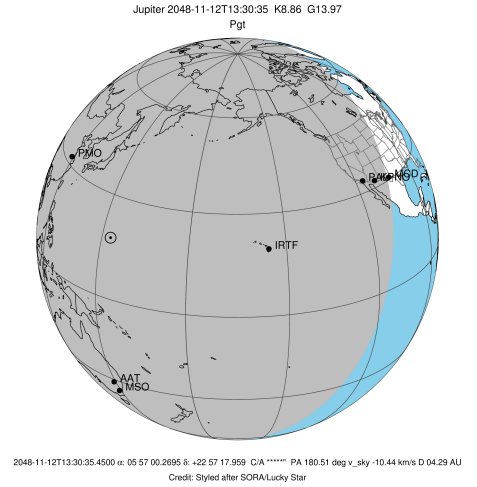


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2048-11-12T12:01:29.312	-36.06x	2.50x	71489.4	32.99	36.51
Jupiter	E	2048-11-12T15:17:59.868	5.57	-43.78	71489.6	31.22	34.66

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch              : 2048-11-12T13:37:03.250
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        : 3424726386901744768
2Mass ID (if available) : 05570027+2257179
ICRS Star Coord at Epoch: 05h 57m 00.26950s +22:57:17.95937s
RUWE (>1.4 is poor)  : 1.10
K magnitude           : 8.858
G magnitude           : 13.974
RP magnitude          : 12.714
BP magnitude          : 15.572
DUPflag              : 0
Distance (au)         : 4.288
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -10.44
Sun-Target sep (deg)  : 140.85
Sun-Moon sep (deg)    : 133.37
B (ring opening deg)  : 2.54
PA of pole (deg)      : 0.51
Pole direction: RA (deg): 268.05736
Dec (deg): 64.49721
C/A sky separation (") : 10.074
C/A sky separation (km) : 31329.5
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
    
```

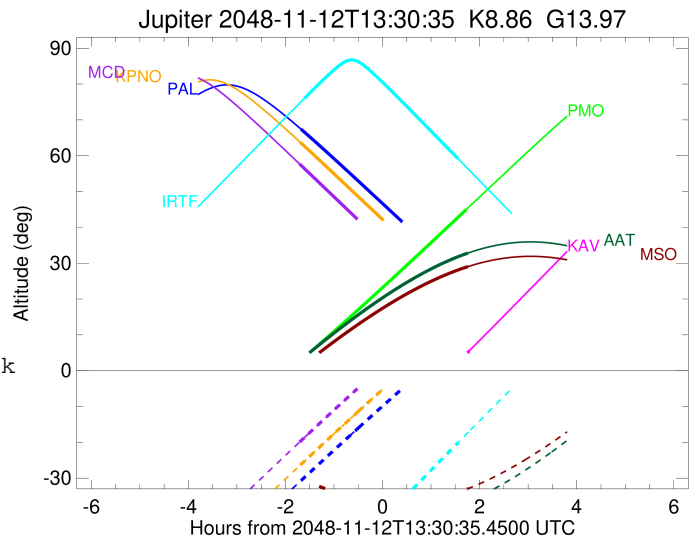
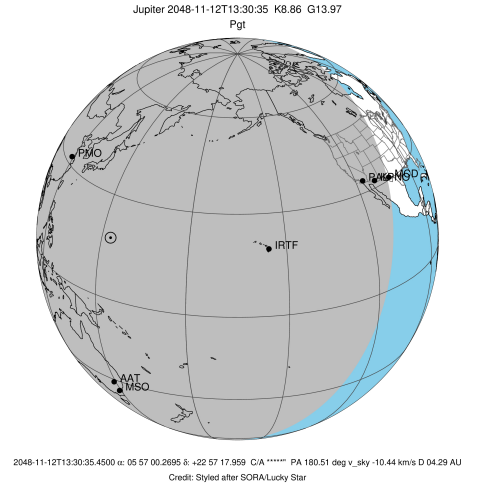


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2048-11-12T11:56:35.114	4.31x	-34.15	71490.2	26.64	29.79
Jupiter	E	2048-11-12T15:16:11.187	32.83	-36.52	71490.3	25.56	28.63


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2048-11-12T13:36:45.770
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       : 3424726386901744768
2Mass ID (if available) : 05570027+2257179
ICRS Star Coord at Epoch: 05h 57m 00.26950s +22:57:17.95937s
RUWE (>1.4 is poor) : 1.10
K magnitude           : 8.858
G magnitude           : 13.974
RP magnitude          : 12.714
BP magnitude          : 15.572
DUPflag              : 0
Distance (au)        : 4.288
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -10.44
Sun-Target sep (deg) : 140.85
Sun-Moon sep (deg)   : 133.31
B (ring opening deg) : 2.54
PA of pole (deg)     : 0.51
Pole direction: RA (deg): 268.05736
Dec (deg): 64.49721
C/A sky separation ("): 9.987
C/A sky separation (km): 31059.0
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	2048-11-12T11:55:58.761	2.13x	-30.63	71490.3	26.37	29.50
Jupiter	E	2048-11-12T15:16:14.862	29.05	-32.91	71490.4	25.34	28.39