

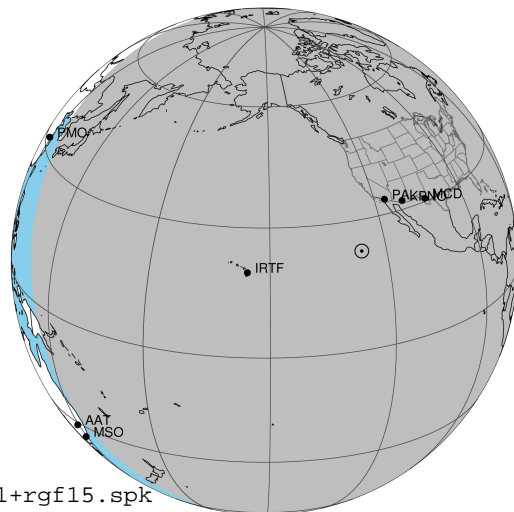
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2037-01-01T08:30:30.620  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 3415302193565301888  
 2Mass ID (if available) : 05082318+2224472

Jupiter 2037-01-01T08:30:30 K8.26 G11.69 Pgt

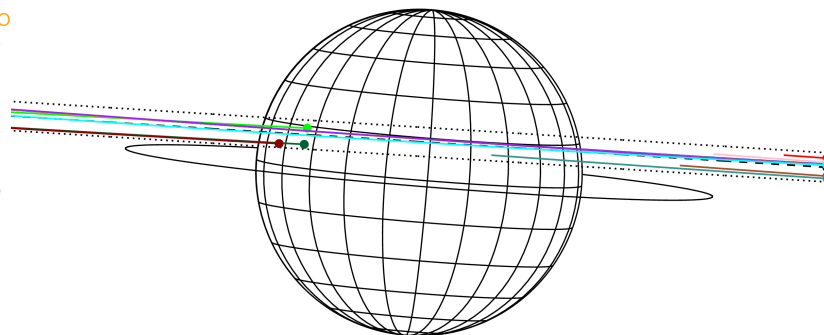
ICRS Star Coord at Epoch: 05h 08m 23.18081s +22:24:47.26027s

RUWE (>1.4 is poor) : 1.22  
 K magnitude : 8.263  
 G magnitude : 11.694  
 RP magnitude : 10.732  
 BP magnitude : 12.658  
 DUPflag : 0  
 Distance (au) : 4.177  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -14.61  
 Sun-Target sep (deg) : 157.33  
 Sun-Moon sep (deg) : 12.71  
 B (ring opening deg) : 2.67  
 PA of pole (deg) : -4.70  
 Pole direction: RA (deg): 268.05631  
 Dec (deg): 64.49687  
 C/A sky separation (") : 4.445  
 C/A sky separation (km) : 13467.3  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2037-01-01T08:30:30 K8.26 G11.69  
 Pgt



Earth  
 PIC  
 PAL  
 PMO  
 KPNO  
 MCD  
 TEN  
 IRTF  
 RIO  
 ESO  
 AAT  
 MSO

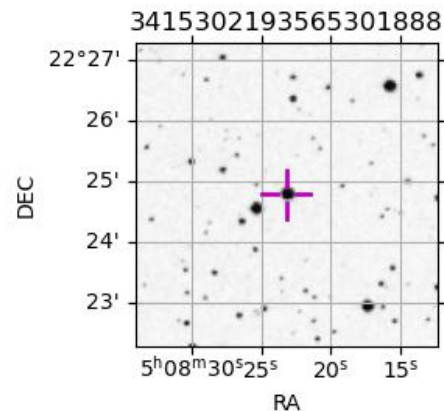


2037-01-01T08:30:30.6200 ex: 05 08 23.1808 s: +22 24 47.260 C/A 4.457" PA 176.40 deg v\_sky -14.61 km/s D 04.18 AU

Credit: Styled after SORA/Lucky Star

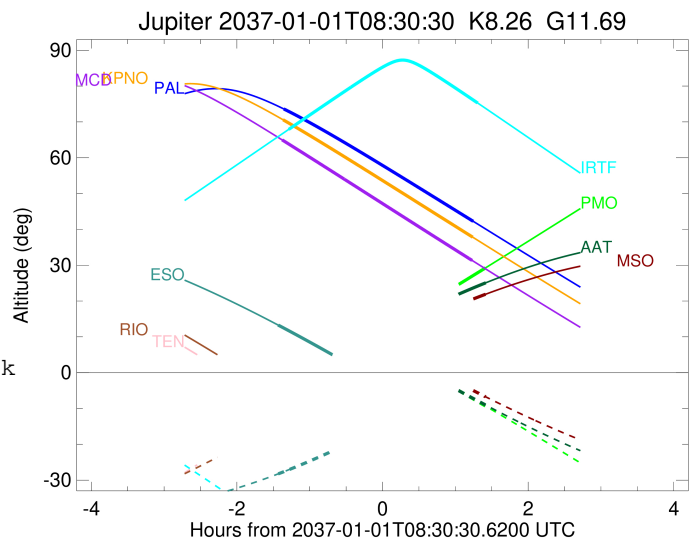
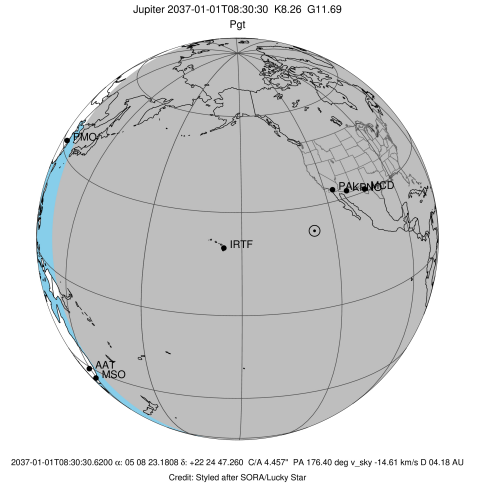
Observable events with sun below -5 deg and altitude above 5 deg

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	+ +	JAN 01 07:09 - JAN 01 09:45	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+ +	JAN 01 09:55 - JAN 01 09:55	Pne
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JAN 01 07:08 - JAN 01 09:44	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JAN 01 07:07 - JAN 01 09:44	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	JAN 01 07:13 - JAN 01 09:48	Pie
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8			Pnn
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JAN 01 07:04 - JAN 01 07:04	Pin
AAT	Siding Spring (AAT)	-31.3	149.1	+ +	JAN 01 09:55 - JAN 01 09:55	Pne
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	JAN 01 09:55 - JAN 01 09:55	Pne



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2037-01-01T08:26:58.660
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       : 3415302193565301888
2Mass ID (if available) : 05082318+2224472
ICRS Star Coord at Epoch: 05h 08m 23.18081s +22:24:47.26027s
RUWE (>1.4 is poor) : 1.22
K magnitude           : 8.263
G magnitude           : 11.694
RP magnitude          : 10.732
BP magnitude          : 12.658
DUPflag              : 0
Distance (au)        : 4.177
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.61
Sun-Target sep (deg) : 157.33
Sun-Moon sep (deg)   : 12.47
B (ring opening deg) : 2.67
PA of pole (deg)     : -4.70
Pole direction: RA (deg): 268.05631
Dec (deg): 64.49687
C/A sky separation ("): 4.891
C/A sky separation (km): 14816.5
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
    
```

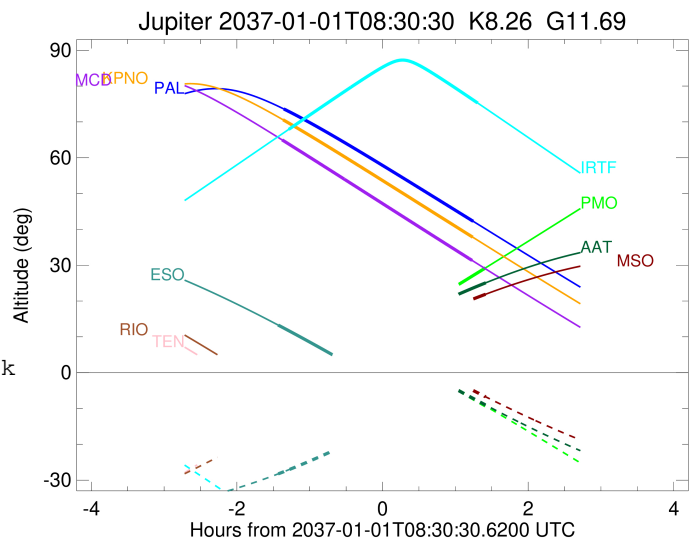
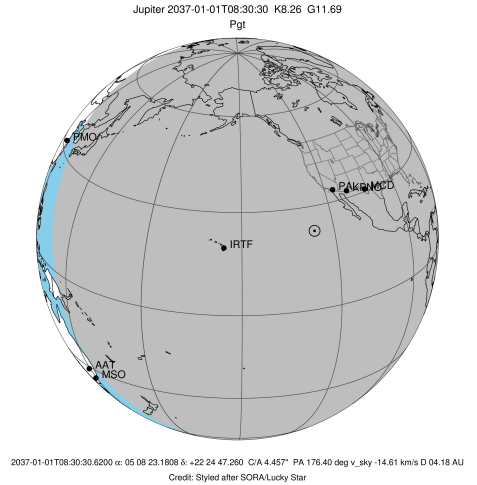


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2037-01-01T07:09:10.379	73.60	-76.24	71491.5	12.90	14.67
Jupiter	E	2037-01-01T09:45:12.477	42.25	-62.94	71491.6	11.18	12.73

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2037-01-01T08:36:39.640
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       : 3415302193565301888
2Mass ID (if available) : 05082318+2224472
ICRS Star Coord at Epoch: 05h 08m 23.18081s +22:24:47.26027s
RUWE (>1.4 is poor) : 1.22
K magnitude           : 8.263
G magnitude           : 11.694
RP magnitude         : 10.732
BP magnitude         : 12.658
DUPflag              : 0
Distance (au)        : 4.177
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.61
Sun-Target sep (deg) : 157.33
Sun-Moon sep (deg)   : 13.64
B (ring opening deg) : 2.67
PA of pole (deg)     : -4.70
Pole direction: RA (deg): 268.05631
Dec (deg): 64.49687
C/A sky separation ("): 5.556
C/A sky separation (km): 16832.7
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
    
```

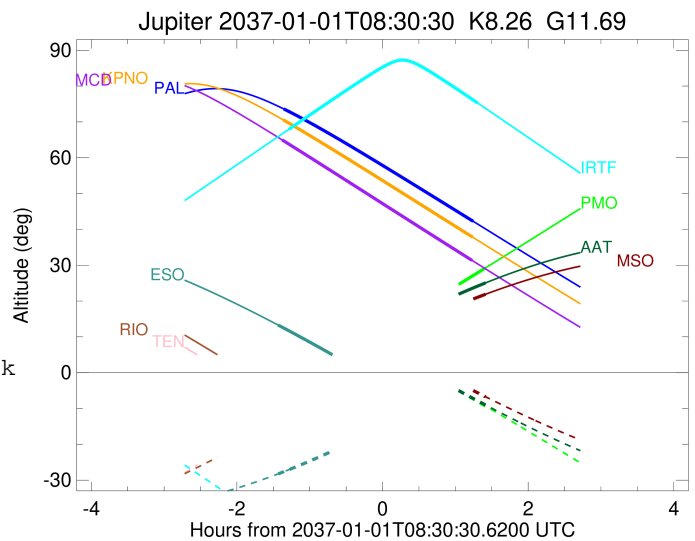
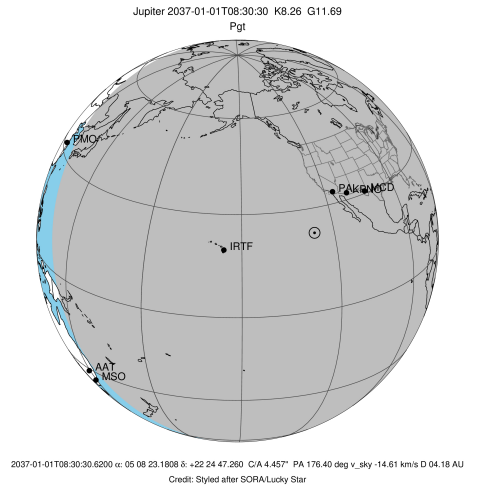


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2037-01-01T07:17:05.093	-2.53x	18.97x	71491.3	15.27	17.33
Jupiter	E	2037-01-01T09:55:33.362	29.28	-9.35	71491.6	11.92	13.56

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2037-01-01T08:26:28.000
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        : 3415302193565301888
2Mass ID (if available) : 05082318+2224472
ICRS Star Coord at Epoch: 05h 08m 23.18081s +22:24:47.26027s
RUWE (>1.4 is poor)  : 1.22
K magnitude           : 8.263
G magnitude           : 11.694
RP magnitude          : 10.732
BP magnitude          : 12.658
DUPflag              : 0
Distance (au)         : 4.177
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.61
Sun-Target sep (deg)  : 157.33
Sun-Moon sep (deg)    : 12.39
B (ring opening deg) : 2.67
PA of pole (deg)      : -4.70
Pole direction: RA (deg): 268.05631
Dec (deg): 64.49687
C/A sky separation (") : 4.870
C/A sky separation (km) : 14753.5
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
    
```

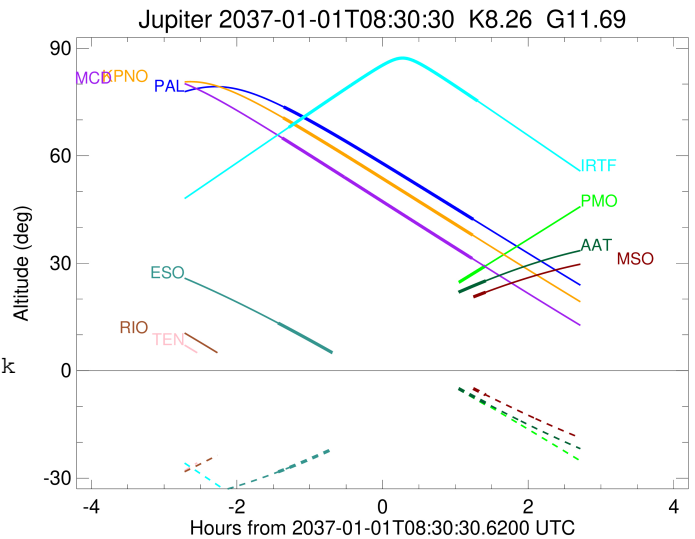
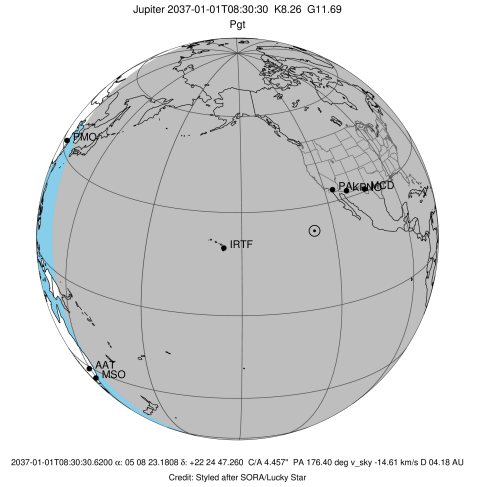


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2037-01-01T07:08:35.930	70.58	-79.98	71491.5	12.79	14.55
Jupiter	E	2037-01-01T09:44:49.131	37.82	-58.94	71491.6	11.17	12.72

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2037-01-01T08:25:47.620
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       : 3415302193565301888
2Mass ID (if available) : 05082318+2224472
ICRS Star Coord at Epoch: 05h 08m 23.18081s +22:24:47.26027s
RUWE (>1.4 is poor) : 1.22
K magnitude           : 8.263
G magnitude           : 11.694
RP magnitude         : 10.732
BP magnitude         : 12.658
DUPflag              : 0
Distance (au)        : 4.177
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.61
Sun-Target sep (deg) : 157.33
Sun-Moon sep (deg)   : 12.29
B (ring opening deg) : 2.67
PA of pole (deg)     : -4.70
Pole direction: RA (deg): 268.05631
Dec (deg): 64.49687
C/A sky separation ("): 4.874
C/A sky separation (km): 14767.4
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
    
```

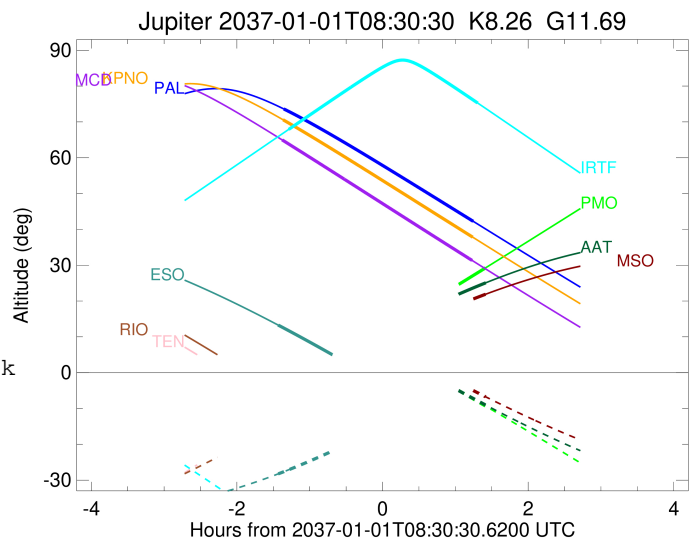
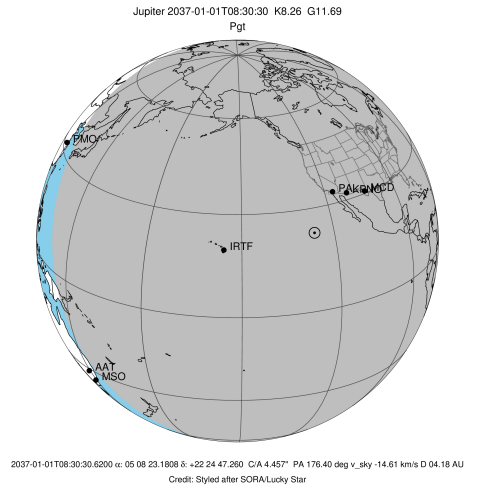


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2037-01-01T07:07:48.874	64.97	-82.24	71491.5	12.73	14.48
Jupiter	E	2037-01-01T09:44:20.141	31.33	-52.68	71491.6	11.25	12.80

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2037-01-01T08:31:02.780
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       : 3415302193565301888
2Mass ID (if available) : 05082318+2224472
ICRS Star Coord at Epoch: 05h 08m 23.18081s +22:24:47.26027s
RUWE (>1.4 is poor) : 1.22
K magnitude           : 8.263
G magnitude           : 11.694
RP magnitude         : 10.732
BP magnitude         : 12.658
DUPflag              : 0
Distance (au)        : 4.177
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.61
Sun-Target sep (deg) : 157.33
Sun-Moon sep (deg)   : 13.00
B (ring opening deg) : 2.67
PA of pole (deg)     : -4.70
Pole direction: RA (deg): 268.05631
Dec (deg): 64.49687
C/A sky separation ("): 4.354
C/A sky separation (km): 13191.9
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
    
```

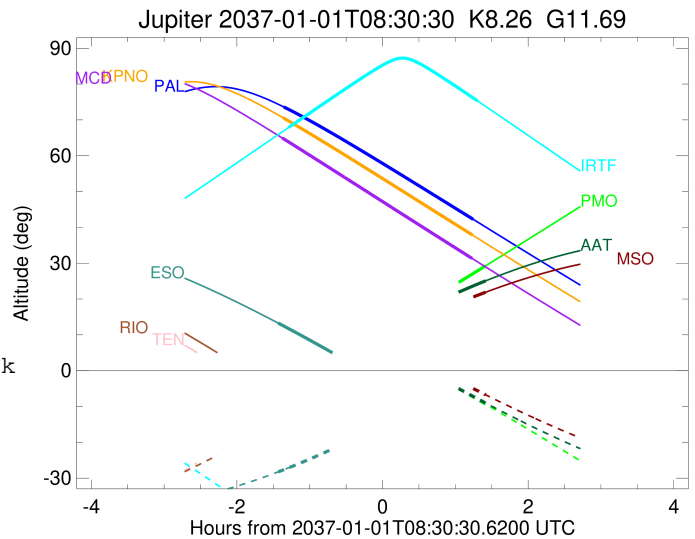
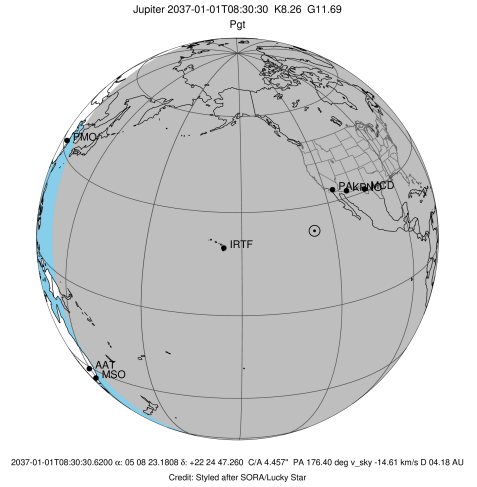


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2037-01-01T07:13:12.374	67.90	-45.31	71491.6	11.97	13.62
Jupiter	E	2037-01-01T09:48:52.326	75.28	-80.87	71491.7	9.49	10.82

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2037-01-01T08:24:23.410
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        : 3415302193565301888
2Mass ID (if available) : 05082318+2224472
ICRS Star Coord at Epoch: 05h 08m 23.18081s +22:24:47.26027s
RUWE (>1.4 is poor) : 1.22
K magnitude           : 8.263
G magnitude           : 11.694
RP magnitude          : 10.732
BP magnitude          : 12.658
DUPflag              : 0
Distance (au)         : 4.177
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.61
Sun-Target sep (deg)  : 157.33
Sun-Moon sep (deg)   : 11.81
B (ring opening deg) : 2.67
PA of pole (deg)     : -4.70
Pole direction: RA (deg): 268.05631
Dec (deg): 64.49687
C/A sky separation (") : 3.262
C/A sky separation (km) : 9881.6
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
    
```



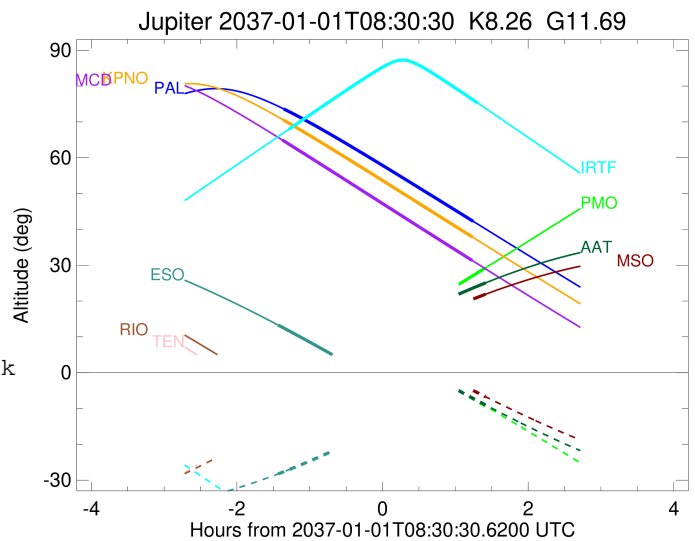
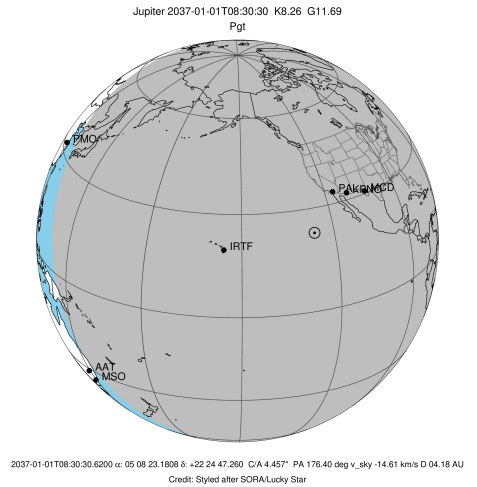
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2037-01-01T07:04:31.243	13.28	-28.25	71491.8	8.51	9.71
Jupiter	E	2037-01-01T09:45:04.662	-18.43x	-1.36x	71491.8	7.44	8.49



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2037-01-01T08:36:10.410
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      : 3415302193565301888
2Mass ID (if available) : 05082318+2224472
ICRS Star Coord at Epoch: 05h 08m 23.18081s +22:24:47.26027s
RUWE (>1.4 is poor) : 1.22
K magnitude          : 8.263
G magnitude          : 11.694
RP magnitude         : 10.732
BP magnitude         : 12.658
DUPflag             : 0
Distance (au)       : 4.177
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -14.61
Sun-Target sep (deg) : 157.33
Sun-Moon sep (deg)  : 13.41
B (ring opening deg) : 2.67
PA of pole (deg)    : -4.70
Pole direction: RA (deg): 268.05631
Dec (deg): 64.49687
C/A sky separation (" ) : 3.171
C/A sky separation (km) : 9606.7
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
    
```



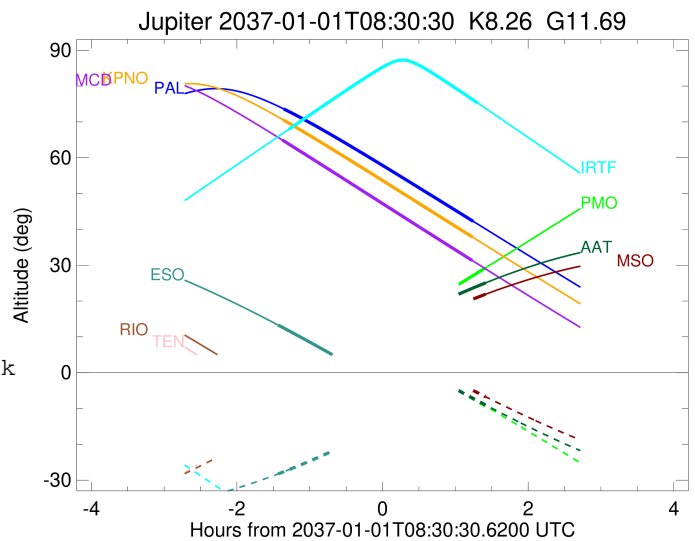
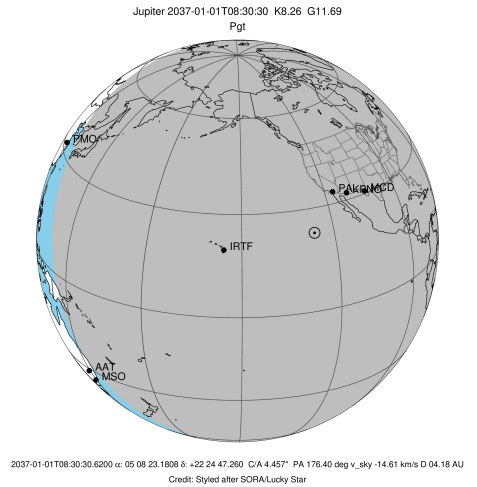
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2037-01-01T07:16:10.284	-2.07x	22.08x	71491.7	9.39	10.71
Jupiter	E	2037-01-01T09:55:35.807	25.08	-9.05	71491.9	6.12	6.99



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2037-01-01T08:35:57.180
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      : 3415302193565301888
2Mass ID (if available) : 05082318+2224472
ICRS Star Coord at Epoch: 05h 08m 23.18081s +22:24:47.26027s
RUWE (>1.4 is poor) : 1.22
K magnitude          : 8.263
G magnitude          : 11.694
RP magnitude         : 10.732
BP magnitude         : 12.658
DUPflag             : 0
Distance (au)       : 4.177
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.61
Sun-Target sep (deg) : 157.33
Sun-Moon sep (deg)  : 13.36
B (ring opening deg) : 2.67
PA of pole (deg)    : -4.70
Pole direction: RA (deg): 268.05631
Dec (deg): 64.49687
C/A sky separation (") : 3.070
C/A sky separation (km) : 9302.0
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	2037-01-01T07:15:51.984	-3.88x	23.13x	71491.8	9.12	10.40
Jupiter	E	2037-01-01T09:55:29.259	21.89	-6.73	71491.9	5.90	6.74