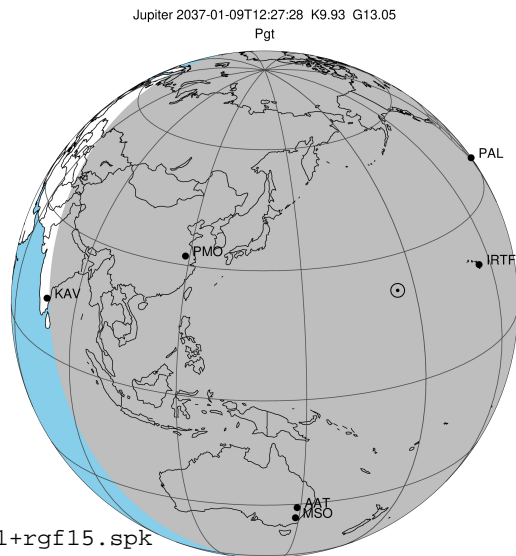


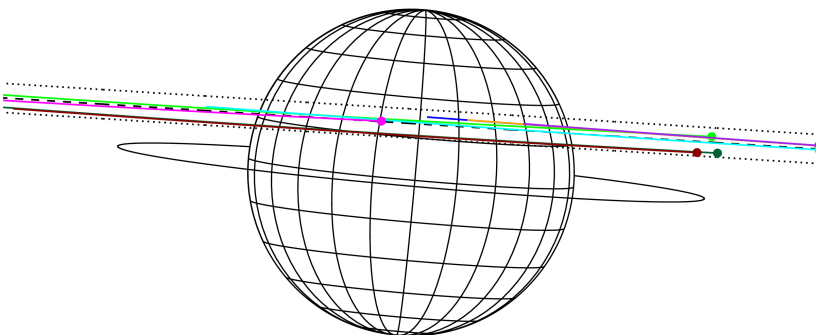
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2037-01-09T12:27:28.380
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 3418244628416855680
 2Mass ID (if available) : 05043698+2221319

Jupiter 2037-01-09T12:27:28 K9.93 G13.05 Pgt

ICRS Star Coord at Epoch: 05h 04m 36.99296s +22:21:31.79190s
 RUWE (>1.4 is poor) : 1.04
 K magnitude : 9.932
 G magnitude : 13.053
 RP magnitude : 12.152
 BP magnitude : 13.901
 DUPflag : 0
 Distance (au) : 4.240
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -12.47
 Sun-Target sep (deg) : 148.14
 Sun-Moon sep (deg) : 131.18
 B (ring opening deg) : 2.65
 PA of pole (deg) : -5.10
 Pole direction: RA (deg): 268.05631
 Dec (deg): 64.49687
 C/A sky separation (") : 6.973
 C/A sky separation (km) : 21442.0
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk



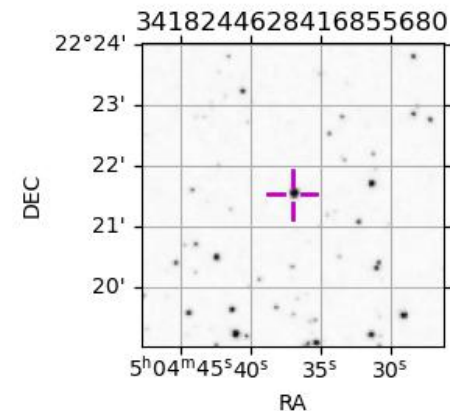
Earth
 PAL
 PMO
 KPNO
 MCD
 IRTF
 KAV
 AAT
 MSO



2037-01-09T12:27:28.3800 ex: 05 04 36.9930 s: +22 21 31.792 C/A 6.985" PA 176.41 deg v_sky -12.47 km/s D 04.24 AU
 Credit: Styled after SORA/Lucky Star

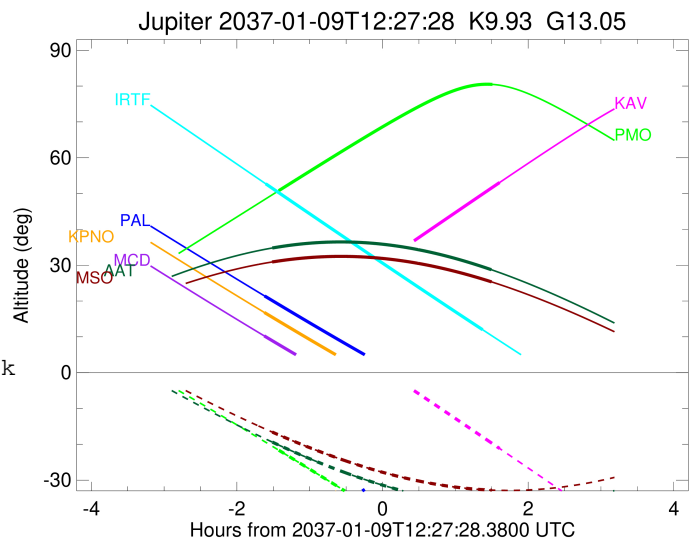
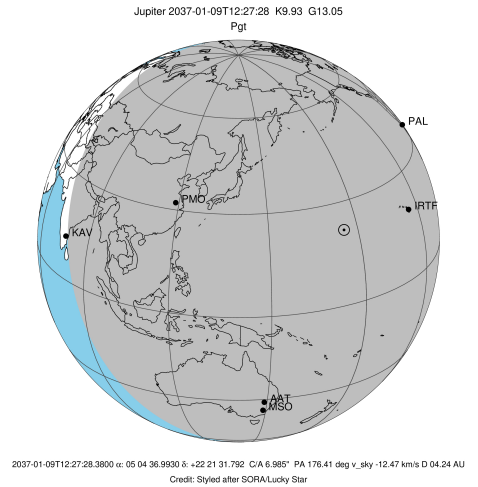
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OEncode
PIC	Pic du Midi	42.9	0.1			Pnn
PAL	Palomar Mt (200")	33.4	243.1	+	JAN 09 10:50 - JAN 09 10:50	Pin
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+ +	JAN 09 11:01 - JAN 09 13:58	Pie
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	JAN 09 10:50 - JAN 09 10:50	Pin
MCD	McDonald Obs. 2.7m	30.7	256.0	+	JAN 09 10:50 - JAN 09 10:50	Pin
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	JAN 09 10:51 - JAN 09 13:49	Pie
KAV	Kavalur Observatory	12.6	78.8	+	JAN 09 14:03 - JAN 09 14:03	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	+ +	JAN 09 10:56 - JAN 09 13:57	Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	JAN 09 10:56 - JAN 09 13:57	Pie



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2037-01-09T12:19:47.820
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      : 3418244628416855680
2Mass ID (if available) : 05043698+2221319
ICRS Star Coord at Epoch: 05h 04m 36.99296s +22:21:31.79190s
RUWE (>1.4 is poor) : 1.04
K magnitude          : 9.932
G magnitude          : 13.053
RP magnitude         : 12.152
BP magnitude         : 13.901
DUPflag             : 0
Distance (au)       : 4.240
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.47
Sun-Target sep (deg) : 148.14
Sun-Moon sep (deg)  : 131.80
B (ring opening deg) : 2.65
PA of pole (deg)    : -5.10
Pole direction: RA (deg): 268.05631
Dec (deg): 64.49687
C/A sky separation (" ) : 8.044
C/A sky separation (km) : 24734.0
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
    
```

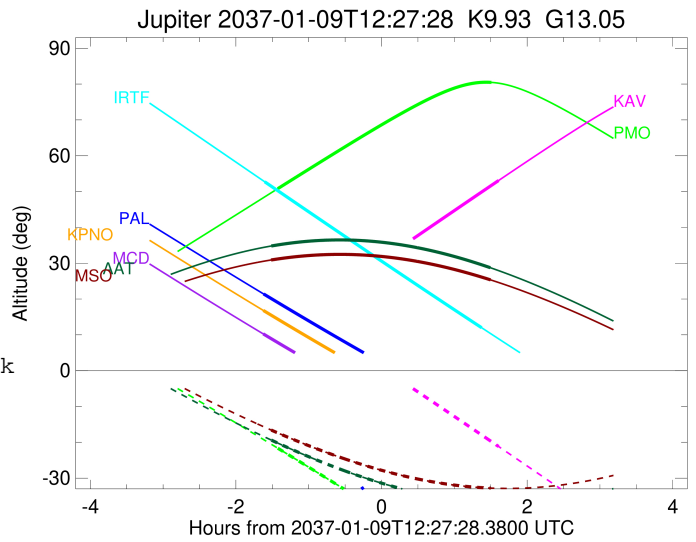
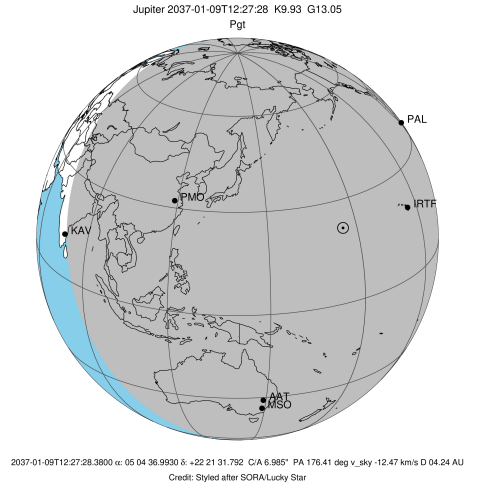


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2037-01-09T10:50:17.488	21.42	-49.83	71490.8	21.06	23.73
Jupiter	E	2037-01-09T13:50:31.819	-12.64x	-12.65	71490.9	19.38	21.89

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2037-01-09T12:30:08.440
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       : 3418244628416855680
2Mass ID (if available) : 05043698+2221319
ICRS Star Coord at Epoch: 05h 04m 36.99296s +22:21:31.79190s
RUWE (>1.4 is poor) : 1.04
K magnitude           : 9.932
G magnitude           : 13.053
RP magnitude          : 12.152
BP magnitude          : 13.901
DUPflag              : 0
Distance (au)        : 4.240
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.47
Sun-Target sep (deg) : 148.14
Sun-Moon sep (deg)   : 131.68
B (ring opening deg) : 2.65
PA of pole (deg)     : -5.10
Pole direction: RA (deg): 268.05631
Dec (deg): 64.49687
C/A sky separation (") : 7.396
C/A sky separation (km) : 22741.0
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
    
```

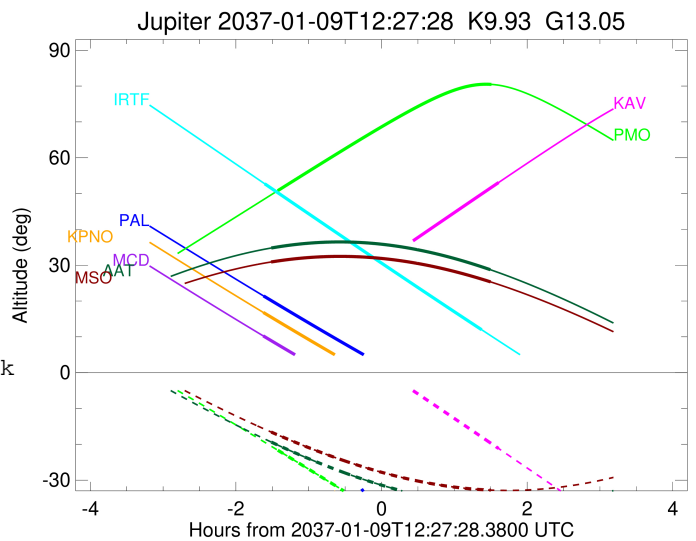
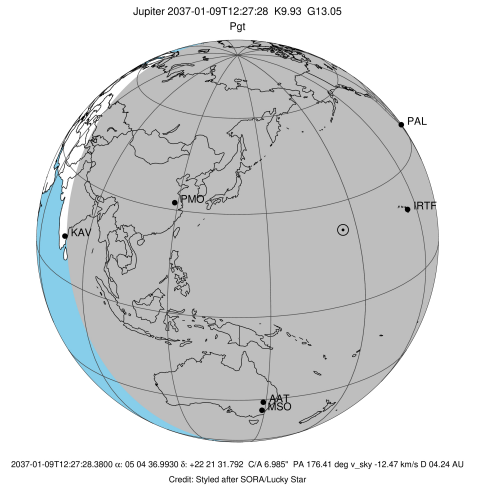


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2037-01-09T11:01:57.262	50.79	-21.63	71490.8	20.48	23.10
Jupiter	E	2037-01-09T13:58:02.754	80.46	-58.71	71491.2	16.80	19.03

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2037-01-09T12:19:49.810
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       : 3418244628416855680
2Mass ID (if available) : 05043698+2221319
ICRS Star Coord at Epoch: 05h 04m 36.99296s +22:21:31.79190s
RUWE (>1.4 is poor) : 1.04
K magnitude           : 9.932
G magnitude           : 13.053
RP magnitude          : 12.152
BP magnitude          : 13.901
DUPflag              : 0
Distance (au)        : 4.240
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -12.47
Sun-Target sep (deg) : 148.14
Sun-Moon sep (deg)   : 131.74
B (ring opening deg) : 2.65
PA of pole (deg)     : -5.10
Pole direction: RA (deg): 268.05631
Dec (deg): 64.49687
C/A sky separation (") : 8.068
C/A sky separation (km) : 24806.6
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
    
```

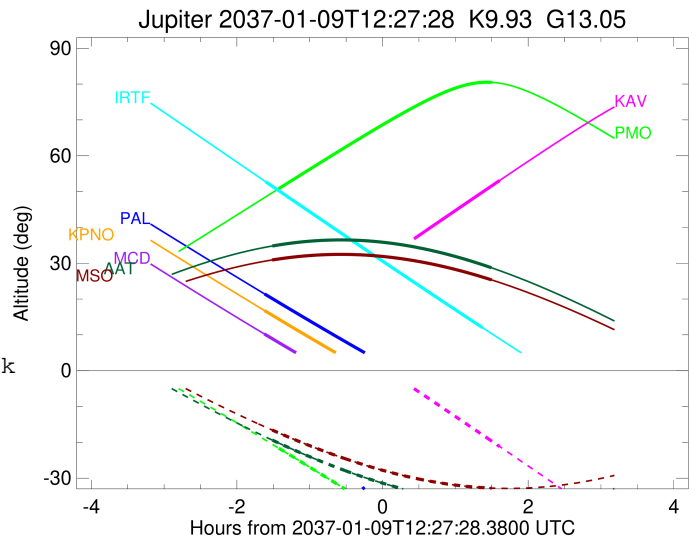
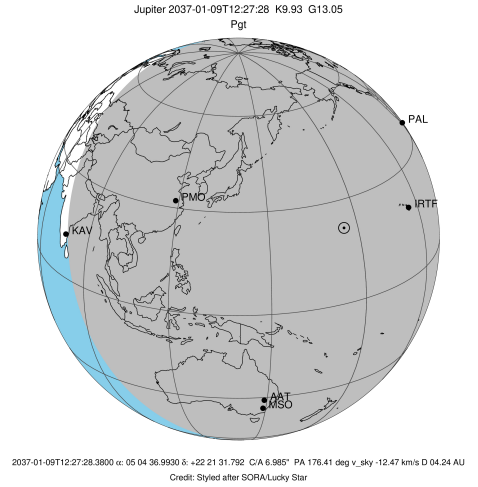


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2037-01-09T10:50:05.857	16.81	-45.49	71490.8	21.10	23.78
Jupiter	E	2037-01-09T13:50:47.798	-16.99x	-7.95	71490.9	19.44	21.95

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2037-01-09T12:20:03.270
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      : 3418244628416855680
2Mass ID (if available) : 05043698+2221319
ICRS Star Coord at Epoch: 05h 04m 36.99296s +22:21:31.79190s
RUWE (>1.4 is poor) : 1.04
K magnitude          : 9.932
G magnitude          : 13.053
RP magnitude         : 12.152
BP magnitude         : 13.901
DUPflag             : 0
Distance (au)       : 4.240
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -12.47
Sun-Target sep (deg) : 148.14
Sun-Moon sep (deg)  : 131.64
B (ring opening deg) : 2.65
PA of pole (deg)    : -5.10
Pole direction: RA (deg): 268.05631
Dec (deg): 64.49687
C/A sky separation (" ) : 8.122
C/A sky separation (km) : 24973.5
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
    
```

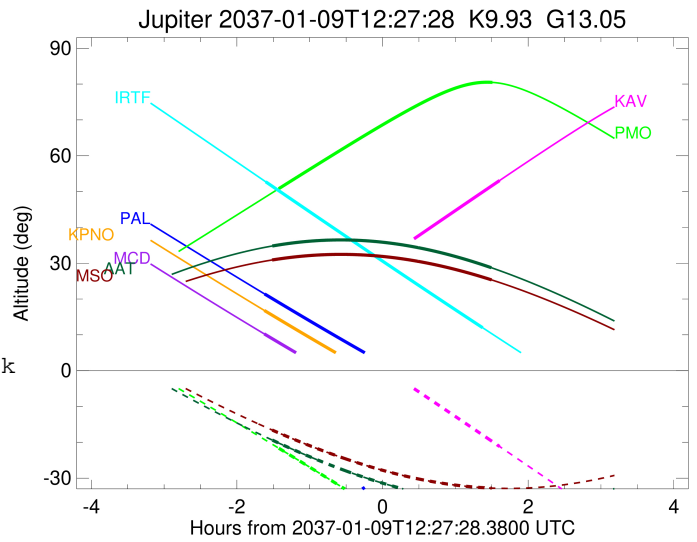
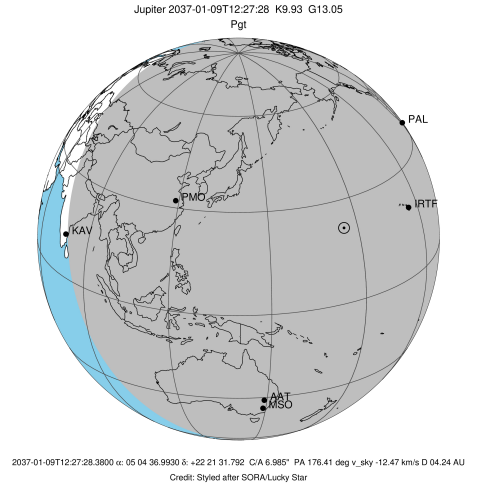


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2037-01-09T10:50:00.865	10.26	-38.97	71490.7	21.23	23.92
Jupiter	E	2037-01-09T13:51:18.525	-22.64x	-1.38x	71490.9	19.55	22.08

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch              : 2037-01-09T12:19:59.660
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        : 3418244628416855680
2Mass ID (if available) : 05043698+2221319
ICRS Star Coord at Epoch: 05h 04m 36.99296s +22:21:31.79190s
RUWE (>1.4 is poor)  : 1.04
K magnitude            : 9.932
G magnitude            : 13.053
RP magnitude           : 12.152
BP magnitude           : 13.901
DUPflag               : 0
Distance (au)         : 4.240
f0 (km)                : 0.00
g0 (km)                : 0.00
skyplane vel. (km/s)  : -12.47
Sun-Target sep (deg)  : 148.14
Sun-Moon sep (deg)    : 132.10
B (ring opening deg)  : 2.65
PA of pole (deg)      : -5.10
Pole direction: RA (deg): 268.05631
Dec (deg): 64.49687
C/A sky separation (") : 7.171
C/A sky separation (km) : 22050.5
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
    
```

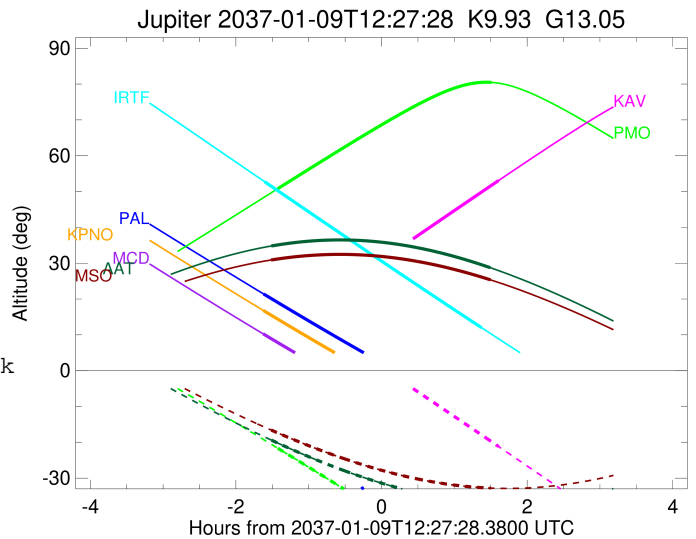
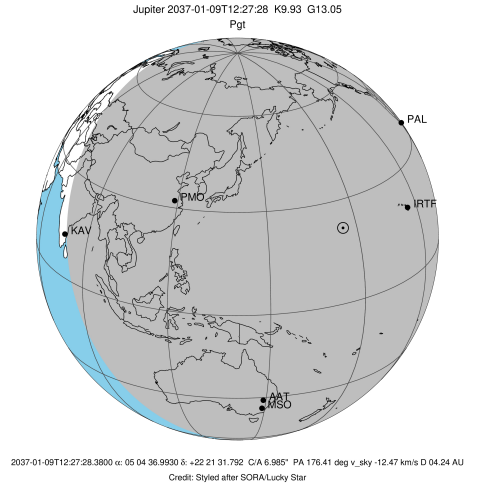


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2037-01-09T10:51:12.030	52.73	-84.33	71491.0	18.95	21.42
Jupiter	E	2037-01-09T13:49:57.644	11.99	-43.23	71491.2	17.12	19.39

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2037-01-09T12:35:01.110
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        : 3418244628416855680
2Mass ID (if available) : 05043698+2221319
ICRS Star Coord at Epoch: 05h 04m 36.99296s +22:21:31.79190s
RUWE (>1.4 is poor) : 1.04
K magnitude           : 9.932
G magnitude           : 13.053
RP magnitude          : 12.152
BP magnitude          : 13.901
DUPflag              : 0
Distance (au)         : 4.240
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -12.47
Sun-Target sep (deg)  : 148.14
Sun-Moon sep (deg)    : 131.02
B (ring opening deg) : 2.65
PA of pole (deg)      : -5.10
Pole direction: RA (deg): 268.05631
Dec (deg): 64.49687
C/A sky separation (") : 7.102
C/A sky separation (km) : 21838.8
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
    
```

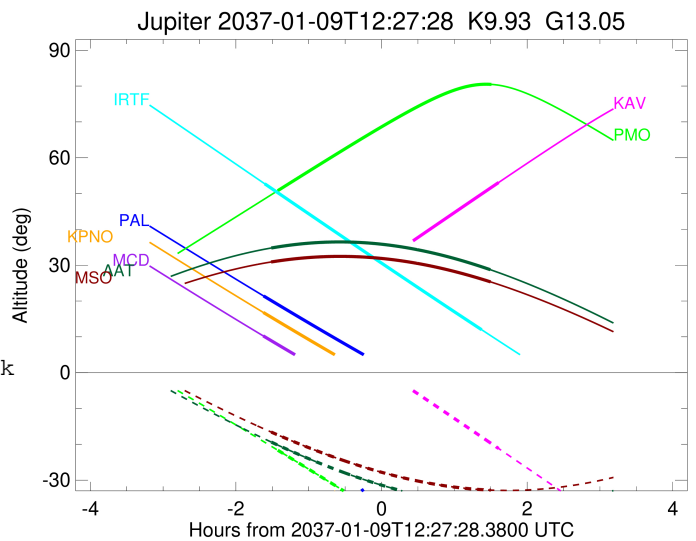
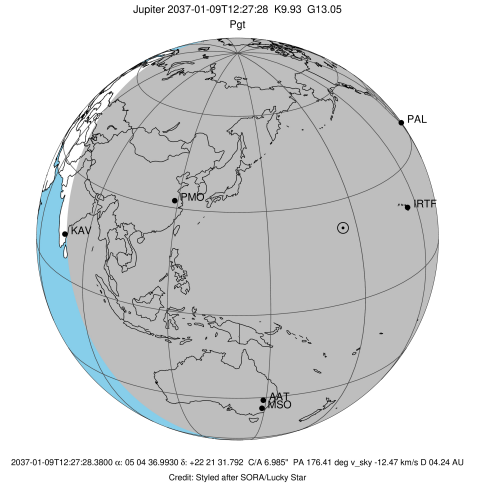


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2037-01-09T11:05:04.652	11.76	18.99x	71490.9	20.05	22.63
Jupiter	E	2037-01-09T14:03:58.924	53.08	-21.17	71491.3	15.60	17.70

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2037-01-09T12:26:48.280
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      : 3418244628416855680
2Mass ID (if available) : 05043698+2221319
ICRS Star Coord at Epoch: 05h 04m 36.99296s +22:21:31.79190s
RUWE (>1.4 is poor) : 1.04
K magnitude          : 9.932
G magnitude          : 13.053
RP magnitude         : 12.152
BP magnitude         : 13.901
DUPflag             : 0
Distance (au)       : 4.240
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -12.47
Sun-Target sep (deg) : 148.14
Sun-Moon sep (deg)  : 131.58
B (ring opening deg) : 2.65
PA of pole (deg)    : -5.10
Pole direction: RA (deg): 268.05631
Dec (deg): 64.49687
C/A sky separation ("): 5.302
C/A sky separation (km) : 16302.1
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
    
```

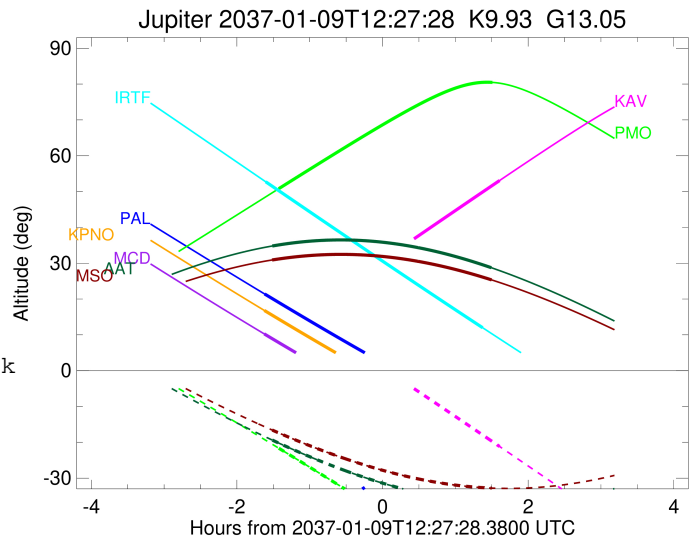
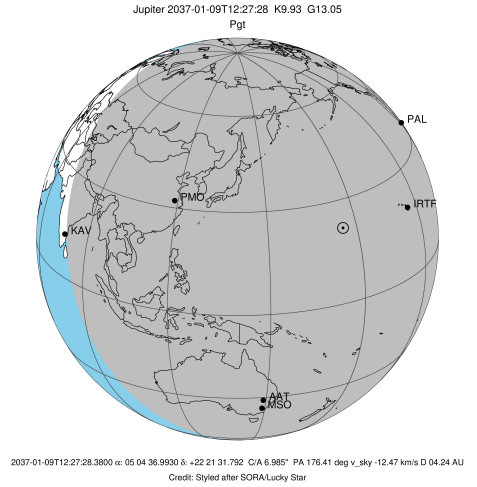


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2037-01-09T10:56:42.101	34.80	-19.38	71491.4	14.81	16.82
Jupiter	E	2037-01-09T13:57:09.815	28.74	-36.80	71491.6	11.79	13.41


```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch              : 2037-01-09T12:26:52.660
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        : 3418244628416855680
2Mass ID (if available) : 05043698+2221319
ICRS Star Coord at Epoch: 05h 04m 36.99296s +22:21:31.79190s
RUWE (>1.4 is poor)  : 1.04
K magnitude            : 9.932
G magnitude            : 13.053
RP magnitude           : 12.152
BP magnitude           : 13.901
DUPflag               : 0
Distance (au)         : 4.240
f0 (km)                : 0.00
g0 (km)                : 0.00
skyplane vel. (km/s)  : -12.47
Sun-Target sep (deg)  : 148.14
Sun-Moon sep (deg)    : 131.52
B (ring opening deg)  : 2.65
PA of pole (deg)      : -5.10
Pole direction: RA (deg): 268.05631
Dec (deg): 64.49687
C/A sky separation (") : 5.220
C/A sky separation (km) : 16051.3
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	2037-01-09T10:56:34.288	30.90	-16.58	71491.4	14.60	16.58
Jupiter	E	2037-01-09T13:57:26.077	25.33	-32.78	71491.6	11.57	13.18