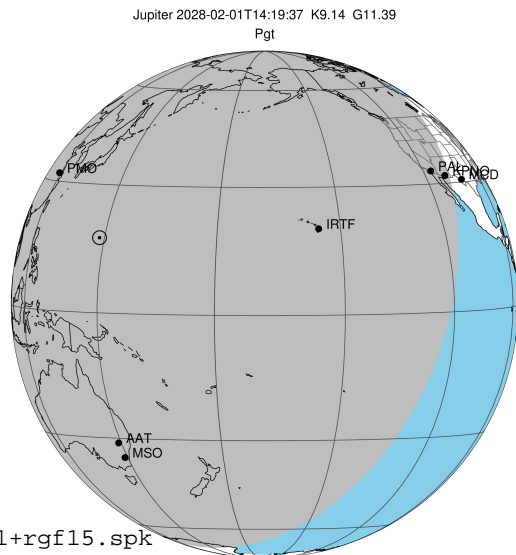


target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2028-02-01T14:19:37.020
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 3895627735104307456
 2Mass ID (if available) : 11491418+0241425

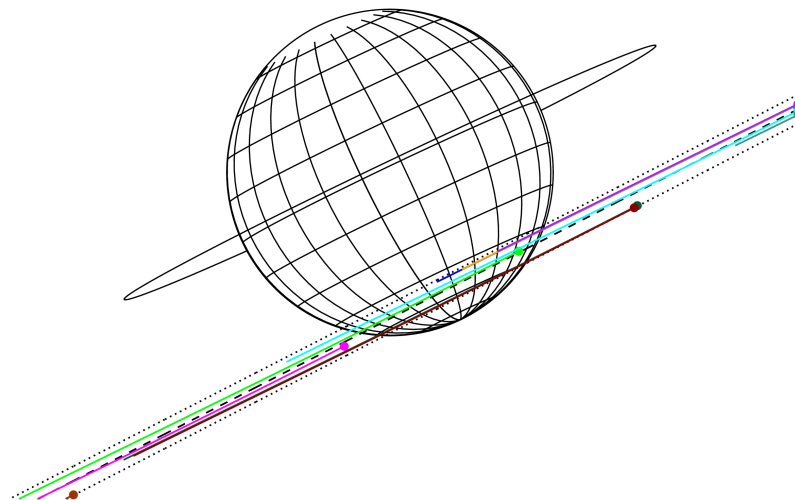
Jupiter 2028-02-01T14:19:37 K9.14 G11.39 Pgt

ICRS Star Coord at Epoch: 11h 49m 14.13066s +02:41:42.78280s

RUWE (>1.4 is poor) : 1.02
 K magnitude : 9.136
 G magnitude : 11.385
 RP magnitude : 10.690
 BP magnitude : 11.932
 DUPflag : 0
 Distance (au) : 4.682
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -9.01
 Sun-Target sep (deg) : 135.38
 Sun-Moon sep (deg) : 158.81
 B (ring opening deg) : -2.11
 PA of pole (deg) : 25.52
 Pole direction: RA (deg): 268.05762
 Dec (deg): 64.49661
 C/A sky separation (") : 16.772
 C/A sky separation (km) : 56956.9
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk



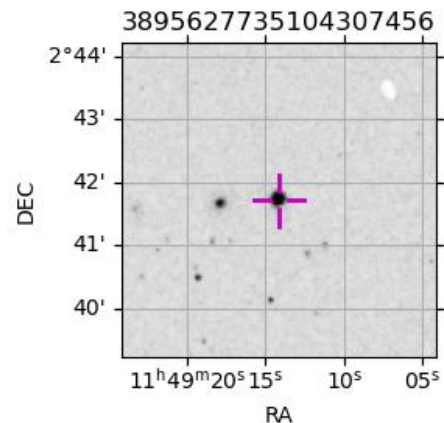
Earth
 PAL
 PMO
 KPNO
 MCD
 IRTF
 KAV
 ESO
 AAT
 SAAO
 MSO



2028-02-01T14:19:37.0200 α: 11 49 14.1307 δ: +02 41 42.783 C/A ***** PA 27.15 deg v_sky - 9.01 km/s D 04.68 AU
 Credit: Styled after SORA/Lucky Star

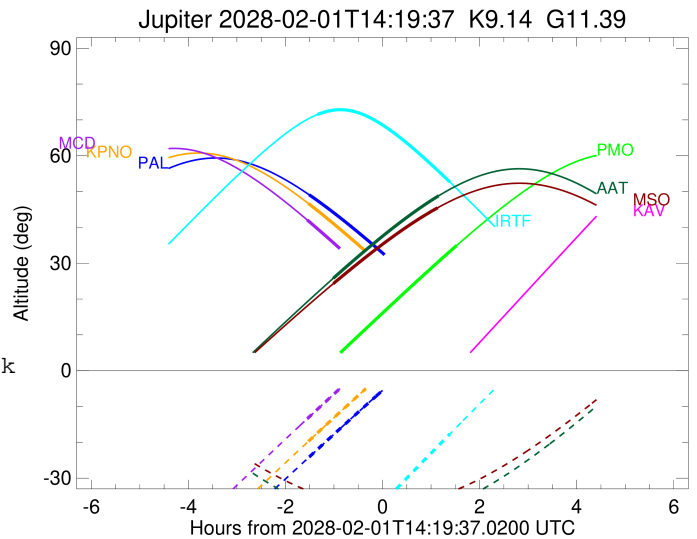
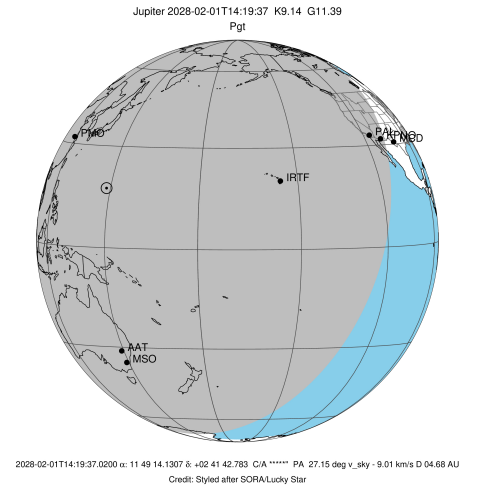
Observable events with sun below -5 deg and altitude above 5 deg

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	+	FEB 01 12:48 - FEB 01 12:48	Pin
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+	FEB 01 15:51 - FEB 01 15:51	Pne
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	FEB 01 12:47 - FEB 01 12:47	Pin
MCD	McDonald Obs. 2.7m	30.7	256.0	+	FEB 01 12:46 - FEB 01 12:46	Pin
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+	FEB 01 12:59 - FEB 01 15:42	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			Pnn
AAT	Siding Spring (AAT)	-31.3	149.1	+	FEB 01 13:18 - FEB 01 15:28	Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	FEB 01 13:18 - FEB 01 15:27	Pie



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2028-02-01T14:16:54.040
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       : 3895627735104307456
2Mass ID (if available) : 11491418+0241425
ICRS Star Coord at Epoch: 11h 49m 14.13066s +02:41:42.78280s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 9.136
G magnitude           : 11.385
RP magnitude          : 10.690
BP magnitude          : 11.932
DUPflag              : 0
Distance (au)        : 4.682
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -9.01
Sun-Target sep (deg) : 135.38
Sun-Moon sep (deg)   : 158.85
B (ring opening deg) : -2.11
PA of pole (deg)     : 25.52
Pole direction: RA (deg): 268.05762
Dec (deg): 64.49661
C/A sky separation ("): 15.341
C/A sky separation (km): 52100.6
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
    
```

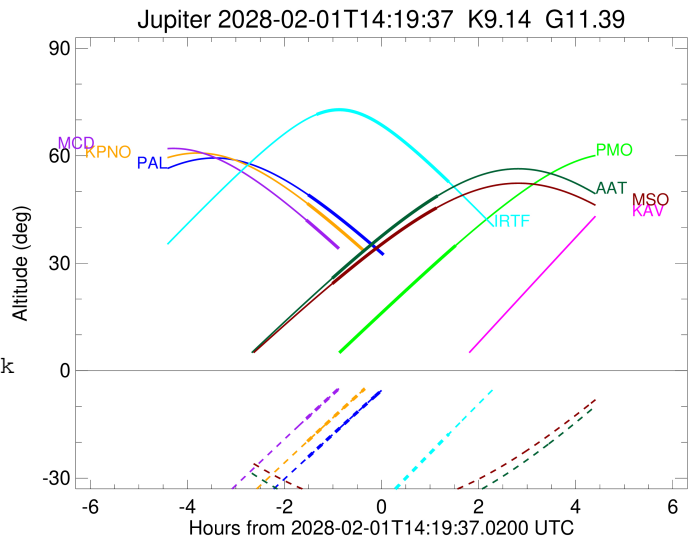
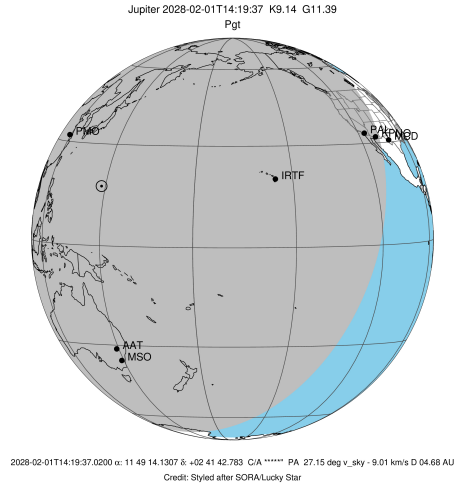


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2028-02-01T12:48:57.385	49.09	-24.11	71488.8	-46.00	-49.69
Jupiter	E	2028-02-01T15:45:34.282	15.38	11.04x	71488.7	-47.77	-51.42

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2028-02-01T14:31:17.320
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       : 3895627735104307456
2Mass ID (if available) : 11491418+0241425
ICRS Star Coord at Epoch: 11h 49m 14.13066s +02:41:42.78280s
RUWE (>1.4 is poor) : 1.02
K magnitude          : 9.136
G magnitude          : 11.385
RP magnitude         : 10.690
BP magnitude         : 11.932
DUPflag             : 0
Distance (au)        : 4.682
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -9.01
Sun-Target sep (deg) : 135.38
Sun-Moon sep (deg)   : 159.71
B (ring opening deg) : -2.11
PA of pole (deg)     : 25.52
Pole direction: RA (deg): 268.05762
Dec (deg): 64.49661
C/A sky separation (") : 16.595
C/A sky separation (km) : 56355.2
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
    
```

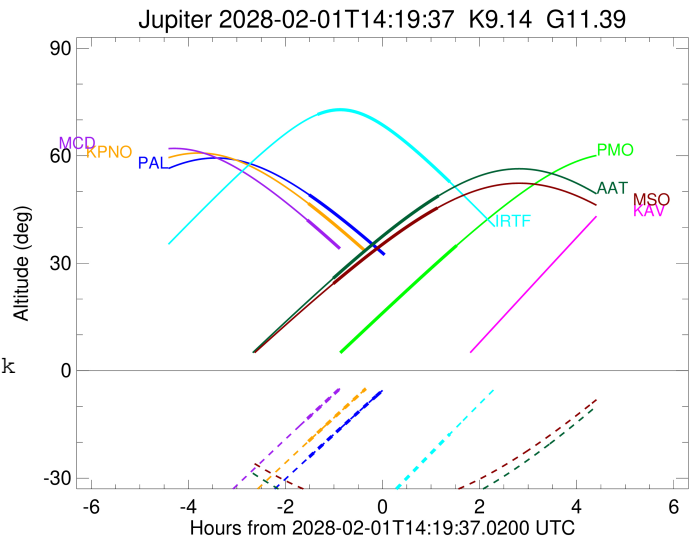
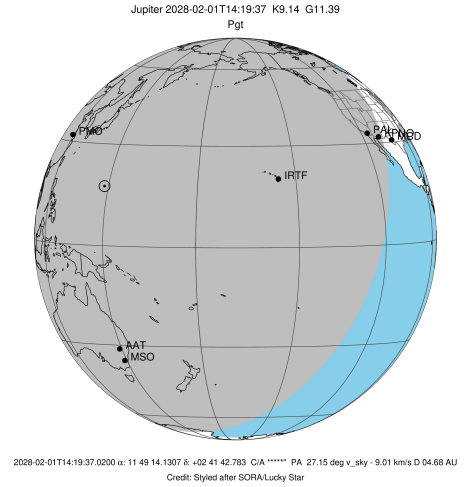


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2028-02-01T13:10:05.657	1.30x	-45.13	71488.4	-50.45	-54.02
Jupiter	E	2028-02-01T15:51:15.600	34.94	-74.00	71488.1	-53.12	-56.58

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2028-02-01T14:16:07.420
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     : 3895627735104307456
2Mass ID (if available) : 11491418+0241425
ICRS Star Coord at Epoch: 11h 49m 14.13066s +02:41:42.78280s
RUWE (>1.4 is poor) : 1.02
K magnitude        : 9.136
G magnitude        : 11.385
RP magnitude       : 10.690
BP magnitude       : 11.932
DUPflag           : 0
Distance (au)     : 4.682
f0 (km)           : 0.00
g0 (km)           : 0.00
skyplane vel. (km/s) : -9.01
Sun-Target sep (deg) : 135.38
Sun-Moon sep (deg) : 158.79
B (ring opening deg) : -2.11
PA of pole (deg)  : 25.52
Pole direction: RA (deg): 268.05762
Dec (deg): 64.49661
C/A sky separation (") : 15.324
C/A sky separation (km) : 52042.5
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
    
```

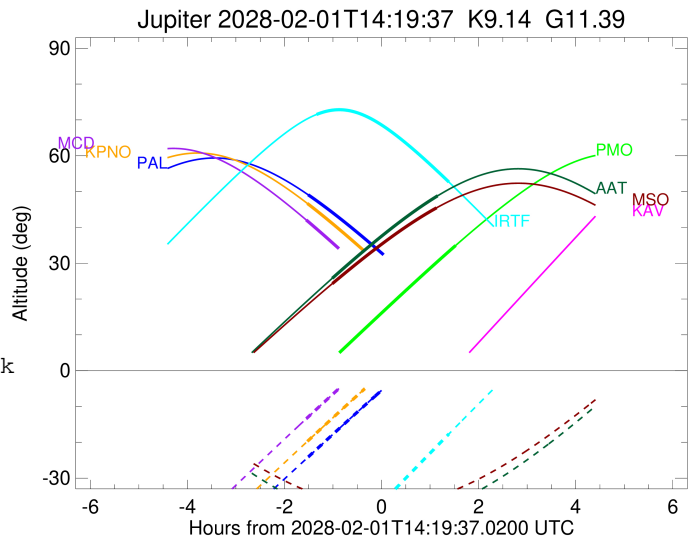
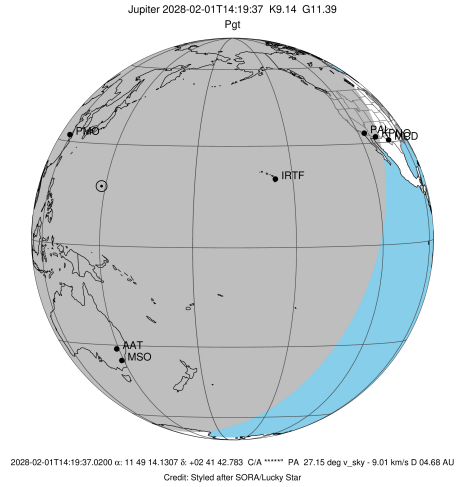


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2028-02-01T12:47:55.692	46.68	-19.75	71488.9	-45.89	-49.58
Jupiter	E	2028-02-01T15:45:08.289	11.19	15.49x	71488.6	-47.78	-51.43

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2028-02-01T14:15:10.430
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       : 3895627735104307456
2Mass ID (if available) : 11491418+0241425
ICRS Star Coord at Epoch: 11h 49m 14.13066s +02:41:42.78280s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 9.136
G magnitude           : 11.385
RP magnitude         : 10.690
BP magnitude         : 11.932
DUPflag              : 0
Distance (au)        : 4.682
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -9.01
Sun-Target sep (deg) : 135.38
Sun-Moon sep (deg)   : 158.71
B (ring opening deg) : -2.11
PA of pole (deg)     : 25.52
Pole direction: RA (deg): 268.05762
Dec (deg): 64.49661
C/A sky separation (") : 15.294
C/A sky separation (km) : 51938.0
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
    
```

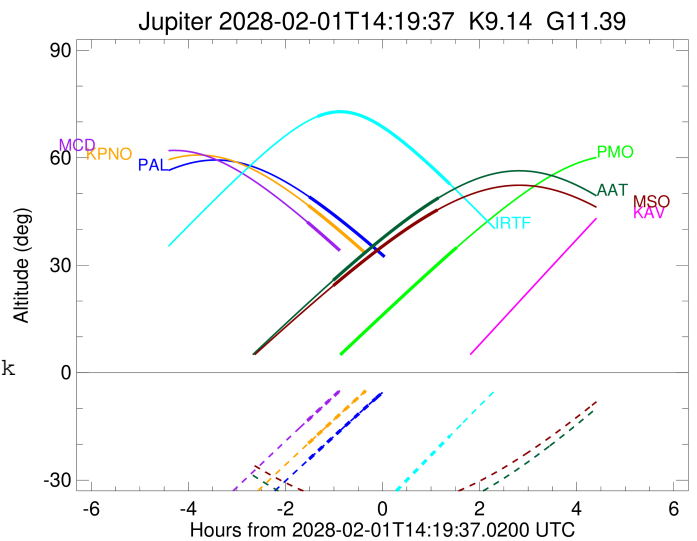
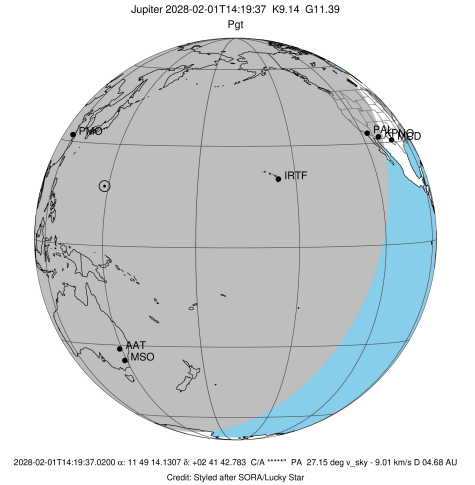


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2028-02-01T12:46:30.656	42.08	-13.44	71488.9	-45.68	-49.38
Jupiter	E	2028-02-01T15:44:46.424	4.83x	21.50x	71488.6	-47.78	-51.43

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2028-02-01T14:21:03.120
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      : 3895627735104307456
2Mass ID (if available) : 11491418+0241425
ICRS Star Coord at Epoch: 11h 49m 14.13066s +02:41:42.78280s
RUWE (>1.4 is poor) : 1.02
K magnitude         : 9.136
G magnitude         : 11.385
RP magnitude        : 10.690
BP magnitude        : 11.932
DUPflag            : 0
Distance (au)       : 4.682
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -9.01
Sun-Target sep (deg) : 135.38
Sun-Moon sep (deg)  : 159.14
B (ring opening deg) : -2.11
PA of pole (deg)    : 25.52
Pole direction: RA (deg): 268.05762
Dec (deg): 64.49661
C/A sky separation (") : 16.092
C/A sky separation (km) : 54649.5
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
    
```

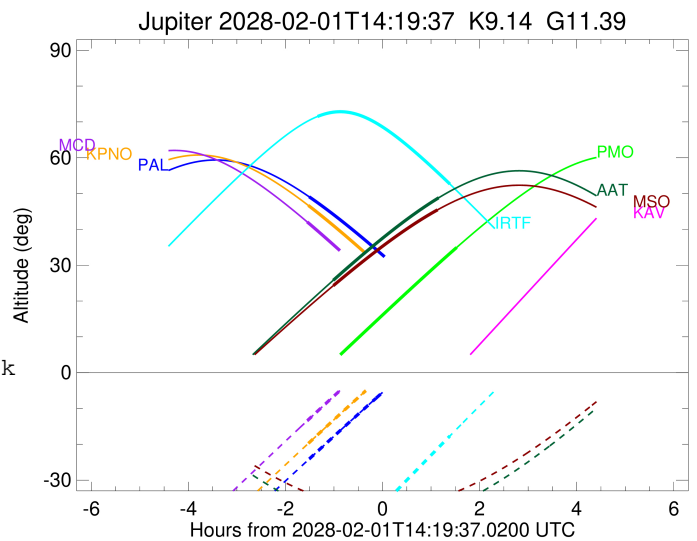
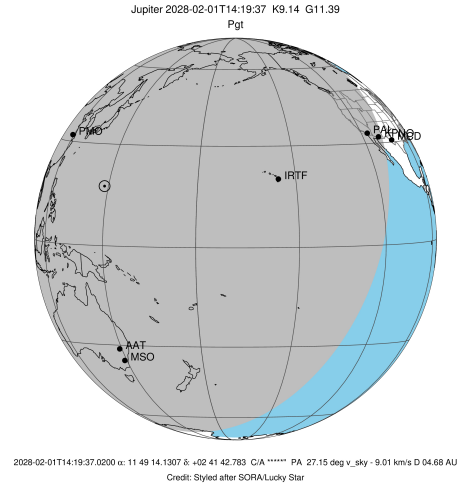


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2028-02-01T12:59:13.278	71.50	-55.85	71488.5	-49.39	-53.00
Jupiter	E	2028-02-01T15:42:55.463	52.65	-17.67	71488.4	-50.28	-53.86

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2028-02-01T14:24:09.620
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     : 3895627735104307456
2Mass ID (if available) : 11491418+0241425
ICRS Star Coord at Epoch: 11h 49m 14.13066s +02:41:42.78280s
RUWE (>1.4 is poor) : 1.02
K magnitude         : 9.136
G magnitude         : 11.385
RP magnitude        : 10.690
BP magnitude        : 11.932
DUPflag            : 0
Distance (au)      : 4.682
f0 (km)            : 0.00
g0 (km)            : 0.00
skyplane vel. (km/s) : -9.01
Sun-Target sep (deg) : 135.38
Sun-Moon sep (deg)  : 159.06
B (ring opening deg) : -2.11
PA of pole (deg)    : 25.52
Pole direction: RA (deg): 268.05762
Dec (deg): 64.49661
C/A sky separation (") : 18.166
C/A sky separation (km) : 61693.0
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
    
```

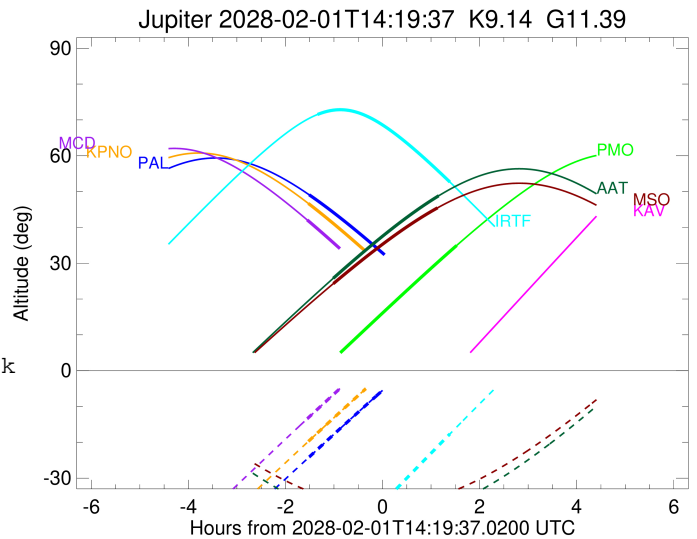
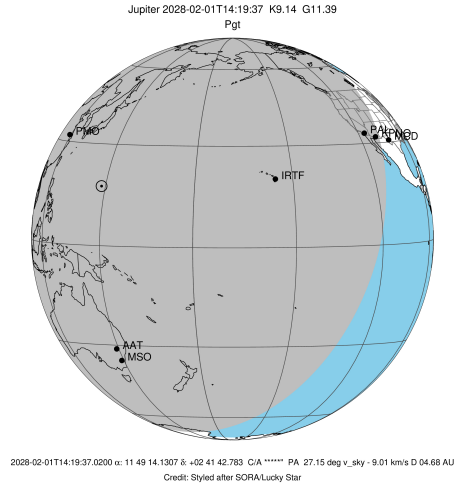


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2028-02-01T13:18:44.685	25.79	-39.76	71487.5	-58.61	-61.77
Jupiter	E	2028-02-01T15:28:57.558	48.80	-38.80	71487.4	-60.33	-63.37

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2028-02-01T14:23:32.430
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       : 3895627735104307456
2Mass ID (if available) : 11491418+0241425
ICRS Star Coord at Epoch: 11h 49m 14.13066s +02:41:42.78280s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 9.136
G magnitude           : 11.385
RP magnitude          : 10.690
BP magnitude          : 11.932
DUPflag              : 0
Distance (au)        : 4.682
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -9.01
Sun-Target sep (deg) : 135.38
Sun-Moon sep (deg)   : 159.00
B (ring opening deg) : -2.11
PA of pole (deg)     : 25.52
Pole direction: RA (deg): 268.05762
Dec (deg): 64.49661
C/A sky separation (") : 18.242
C/A sky separation (km) : 61950.1
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	2028-02-01T13:18:51.385	24.30	-35.91	71487.5	-58.99	-62.12
Jupiter	E	2028-02-01T15:27:38.449	45.45	-35.17	71487.3	-60.78	-63.79