

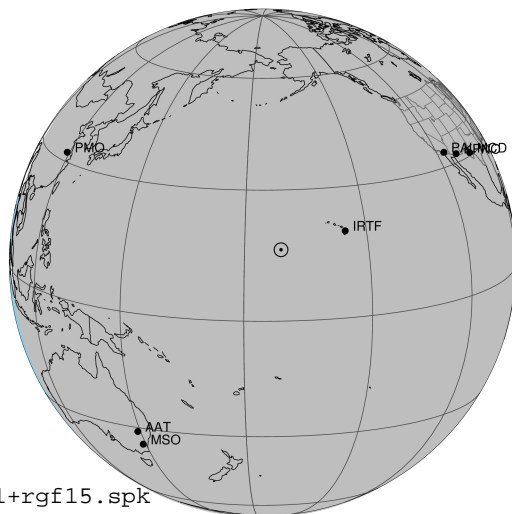
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2023-11-07T11:09:12.700
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 74512734783931264
 2Mass ID (if available) : 02303630+1321083

Jupiter 2023-11-07T11:09:12 K9.57 G12.29 Pgt

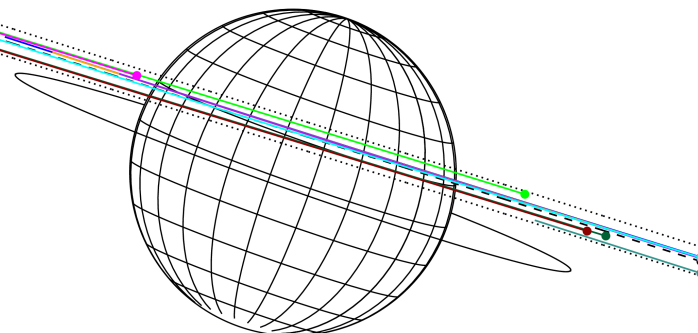
ICRS Star Coord at Epoch: 02h 30m 36.30475s +13:21:07.99232s

RUWE (>1.4 is poor) : 1.14
 K magnitude : 9.568
 G magnitude : 12.286
 RP magnitude : 11.494
 BP magnitude : 12.960
 DUPflag : 0
 Distance (au) : 3.987
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -16.27
 Sun-Target sep (deg) : 174.95
 Sun-Moon sep (deg) : 117.75
 B (ring opening deg) : 3.36
 PA of pole (deg) : -19.41
 Pole direction: RA (deg): 268.05802
 Dec (deg): 64.49677
 C/A sky separation (") : 5.819
 C/A sky separation (km) : 16827.7
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2023-11-07T11:09:12 K9.57 G12.29
 Pgt



Earth
 PAL
 PMO
 KPNO
 MCD
 IRTF
 KAV
 ESO
 AAT
 MSO

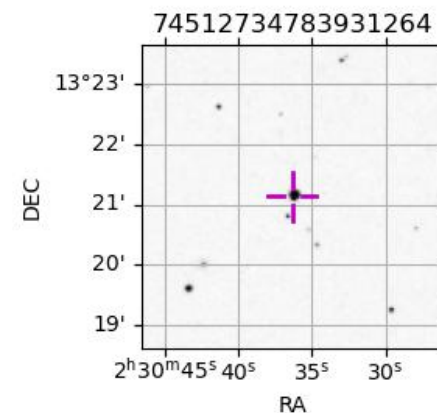


2023-11-07T11:09:12.7000 ex: 02 30 36.3048 s: +13 21 07.992 C/A 5.832" PA 162.43 deg v_sky -16.27 km/s D 03.99 AU

Credit: Styled after SORA/Lucky Star

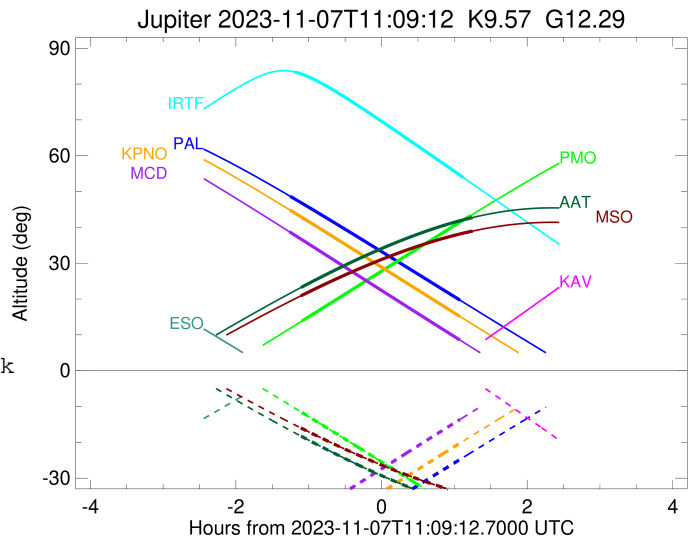
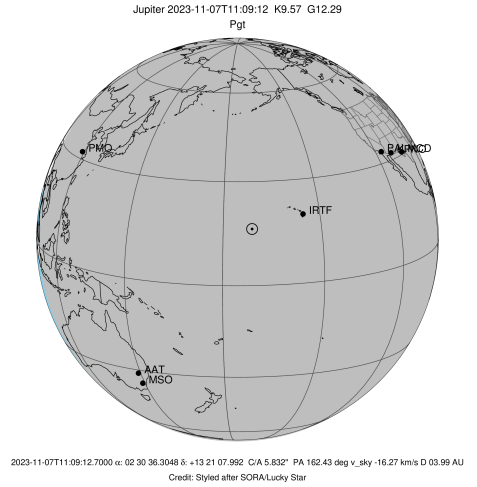
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1			Pnn
PAL	Palomar Mt (200")	33.4	243.1	+ +	NOV 07 09:54 - NOV 07 12:14	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+ +	NOV 07 10:03 - NOV 07 12:22	Pie
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	NOV 07 09:53 - NOV 07 12:13	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	NOV 07 09:53 - NOV 07 12:13	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	NOV 07 09:57 - NOV 07 12:16	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	+ +	NOV 07 10:02 - NOV 07 12:24	Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	NOV 07 10:02 - NOV 07 12:24	Pie



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2023-11-07T11:03:57.720
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        : 74512734783931264
2Mass ID (if available) : 02303630+1321083
ICRS Star Coord at Epoch: 02h 30m 36.30475s +13:21:07.99232s
RUWE (>1.4 is poor) : 1.14
K magnitude           : 9.568
G magnitude           : 12.286
RP magnitude          : 11.494
BP magnitude          : 12.960
DUPflag              : 0
Distance (au)         : 3.987
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.27
Sun-Target sep (deg)  : 174.95
Sun-Moon sep (deg)    : 118.55
B (ring opening deg) : 3.36
PA of pole (deg)      : -19.41
Pole direction: RA (deg): 268.05802
Dec (deg): 64.49677
C/A sky separation (" ) : 6.250
C/A sky separation (km) : 18074.7
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
    
```

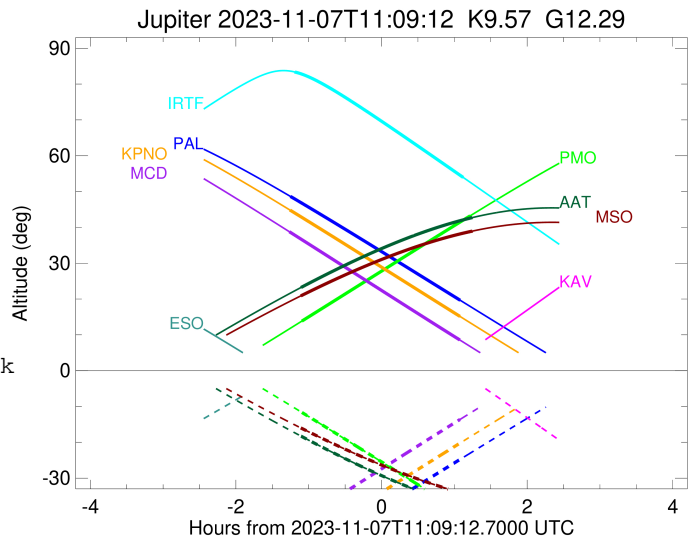
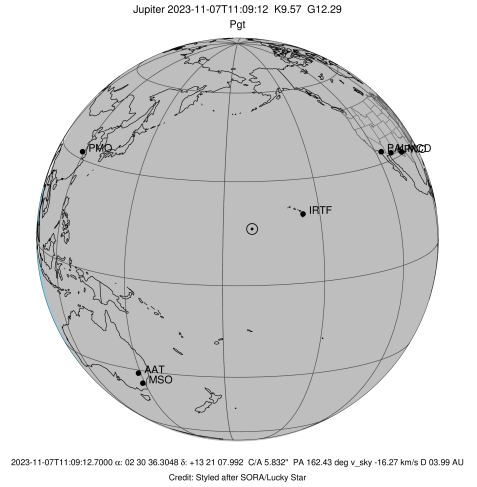


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2023-11-07T09:54:14.940	48.62	-53.61	71490.8	16.49	18.69
Jupiter	E	2023-11-07T12:14:04.029	19.65	-24.74	71491.2	12.90	14.66

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2023-11-07T11:13:18.600
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       : 74512734783931264
2Mass ID (if available) : 02303630+1321083
ICRS Star Coord at Epoch: 02h 30m 36.30475s +13:21:07.99232s
RUWE (>1.4 is poor) : 1.14
K magnitude           : 9.568
G magnitude           : 12.286
RP magnitude          : 11.494
BP magnitude          : 12.960
DUPflag              : 0
Distance (au)        : 3.987
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.27
Sun-Target sep (deg) : 174.95
Sun-Moon sep (deg)   : 117.89
B (ring opening deg) : 3.36
PA of pole (deg)     : -19.41
Pole direction: RA (deg): 268.05802
Dec (deg): 64.49677
C/A sky separation ("): 7.227
C/A sky separation (km): 20899.9
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
    
```

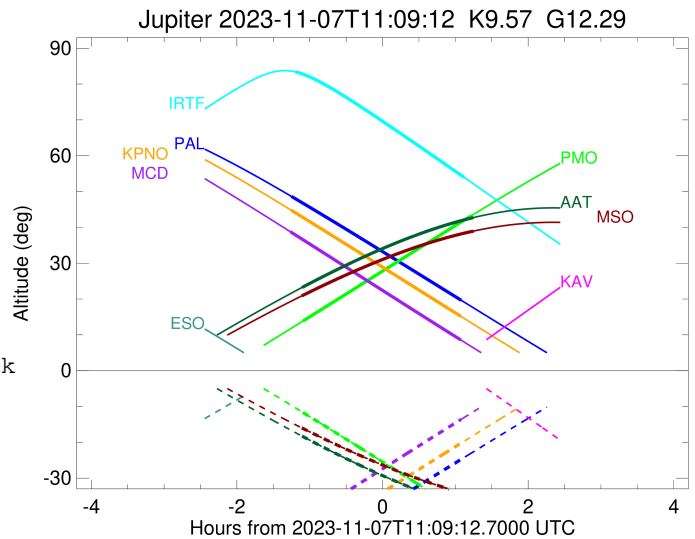
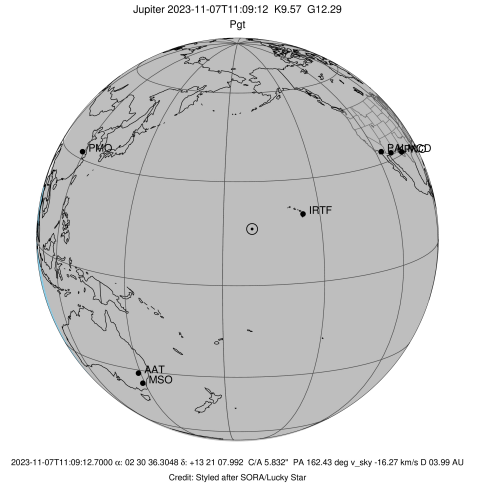


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2023-11-07T10:03:35.996	13.84	-11.66	71490.3	19.21	21.71
Jupiter	E	2023-11-07T12:22:34.392	43.27	-41.00	71491.0	14.65	16.64

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2023-11-07T11:03:39.060
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        : 74512734783931264
2Mass ID (if available) : 02303630+1321083
ICRS Star Coord at Epoch: 02h 30m 36.30475s +13:21:07.99232s
RUWE (>1.4 is poor) : 1.14
K magnitude           : 9.568
G magnitude           : 12.286
RP magnitude          : 11.494
BP magnitude          : 12.960
DUPflag              : 0
Distance (au)         : 3.987
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.27
Sun-Target sep (deg) : 174.95
Sun-Moon sep (deg)   : 118.51
B (ring opening deg) : 3.36
PA of pole (deg)     : -19.41
Pole direction: RA (deg): 268.05802
Dec (deg): 64.49677
C/A sky separation ("): 6.205
C/A sky separation (km): 17944.0
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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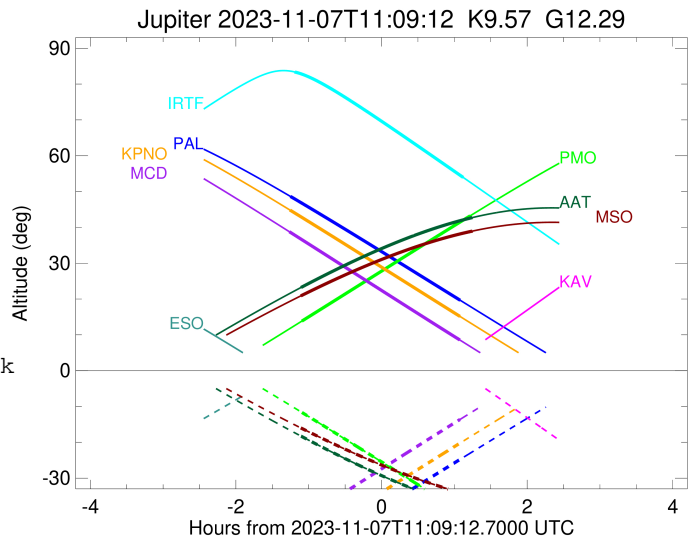
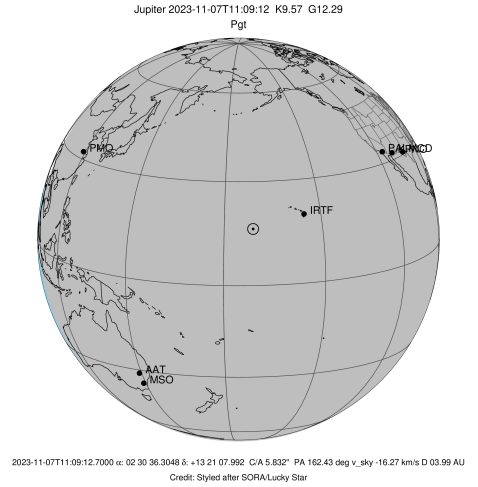


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2023-11-07T09:53:48.982	44.82	-49.81	71490.8	16.34	18.52
Jupiter	E	2023-11-07T12:13:54.675	15.14	-20.22	71491.2	12.83	14.60

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2023-11-07T11:03:16.630
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      : 74512734783931264
2Mass ID (if available) : 02303630+1321083
ICRS Star Coord at Epoch: 02h 30m 36.30475s +13:21:07.99232s
RUWE (>1.4 is poor) : 1.14
K magnitude          : 9.568
G magnitude          : 12.286
RP magnitude         : 11.494
BP magnitude         : 12.960
DUPflag             : 0
Distance (au)       : 3.987
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.27
Sun-Target sep (deg) : 174.95
Sun-Moon sep (deg)   : 118.45
B (ring opening deg) : 3.36
PA of pole (deg)    : -19.41
Pole direction: RA (deg): 268.05802
Dec (deg): 64.49677
C/A sky separation ("): 6.177
C/A sky separation (km): 17863.0
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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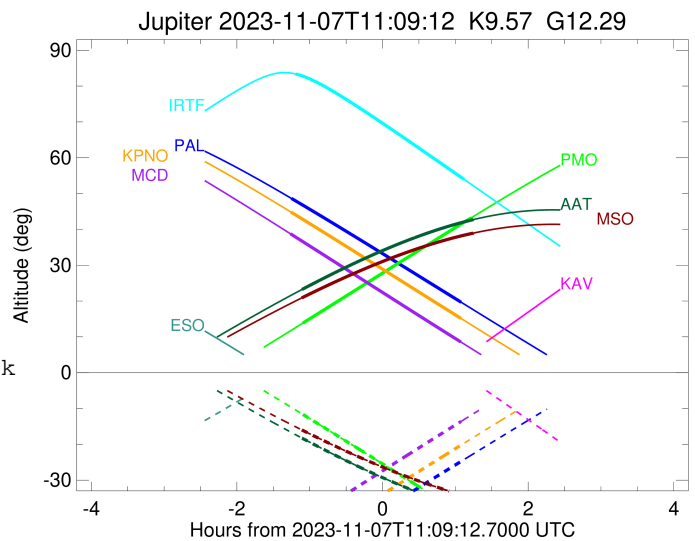
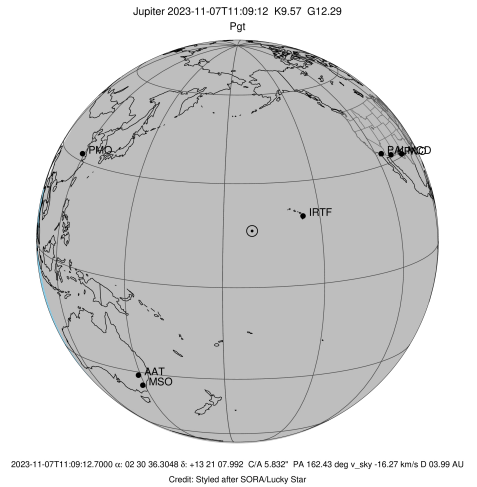


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2023-11-07T09:53:15.974	38.78	-43.75	71490.8	16.21	18.37
Jupiter	E	2023-11-07T12:13:45.211	8.57	-13.65	71491.2	12.83	14.59

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2023-11-07T11:07:05.220
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      : 74512734783931264
2Mass ID (if available) : 02303630+1321083
ICRS Star Coord at Epoch: 02h 30m 36.30475s +13:21:07.99232s
RUWE (>1.4 is poor) : 1.14
K magnitude          : 9.568
G magnitude          : 12.286
RP magnitude         : 11.494
BP magnitude         : 12.960
DUPflag             : 0
Distance (au)       : 3.987
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.27
Sun-Target sep (deg) : 174.95
Sun-Moon sep (deg)  : 118.65
B (ring opening deg) : 3.36
PA of pole (deg)    : -19.41
Pole direction: RA (deg): 268.05802
Dec (deg): 64.49677
C/A sky separation (") : 5.864
C/A sky separation (km) : 16958.9
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
    
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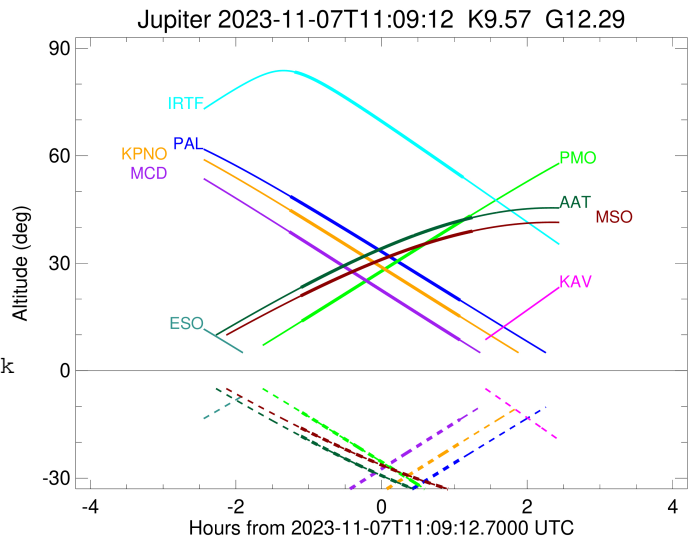
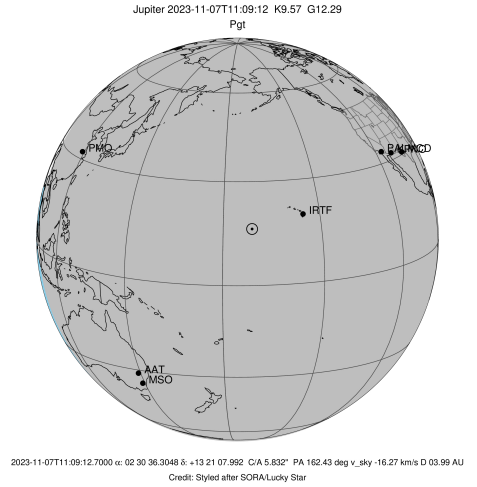


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2023-11-07T09:57:43.050	83.37	-86.08	71490.8	15.91	18.04
Jupiter	E	2023-11-07T12:16:36.207	53.92	-58.70	71491.4	11.63	13.23

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2023-11-07T11:13:38.250
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       : 74512734783931264
2Mass ID (if available) : 02303630+1321083
ICRS Star Coord at Epoch: 02h 30m 36.30475s +13:21:07.99232s
RUWE (>1.4 is poor) : 1.14
K magnitude          : 9.568
G magnitude          : 12.286
RP magnitude         : 11.494
BP magnitude         : 12.960
DUPflag             : 0
Distance (au)        : 3.987
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.27
Sun-Target sep (deg) : 174.95
Sun-Moon sep (deg)   : 117.90
B (ring opening deg) : 3.36
PA of pole (deg)     : -19.41
Pole direction: RA (deg): 268.05802
Dec (deg): 64.49677
C/A sky separation (") : 4.734
C/A sky separation (km) : 13690.5
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
    
```

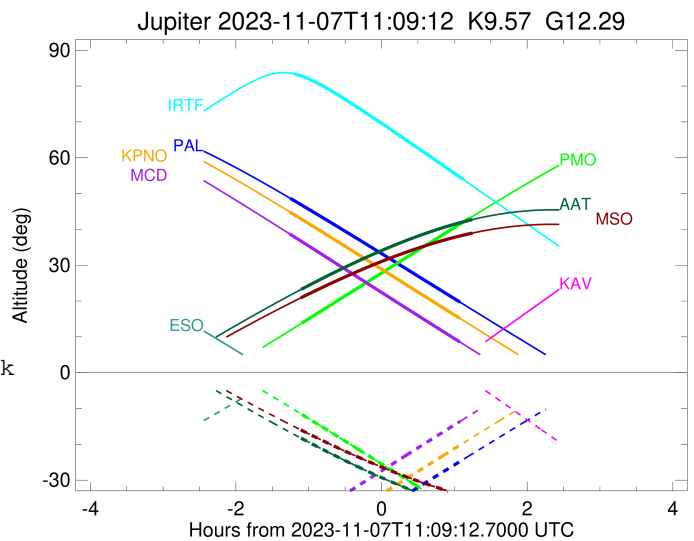
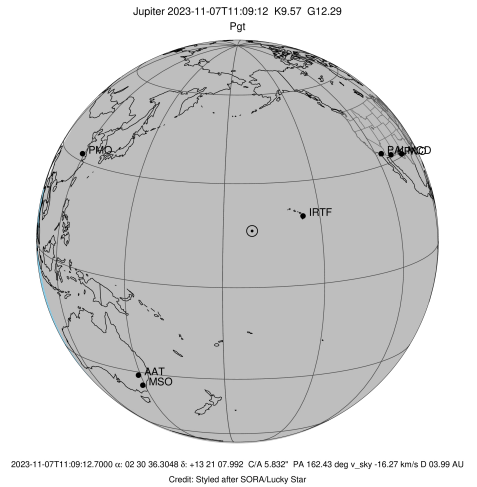


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2023-11-07T10:02:52.013	23.22	-18.27	71491.2	13.36	15.19
Jupiter	E	2023-11-07T12:24:06.247	42.73	-38.56	71491.6	8.69	9.91

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2023-11-07T11:13:35.770
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       : 74512734783931264
2Mass ID (if available) : 02303630+1321083
ICRS Star Coord at Epoch: 02h 30m 36.30475s +13:21:07.99232s
RUWE (>1.4 is poor) : 1.14
K magnitude          : 9.568
G magnitude          : 12.286
RP magnitude         : 11.494
BP magnitude         : 12.960
DUPflag             : 0
Distance (au)        : 3.987
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.27
Sun-Target sep (deg) : 174.95
Sun-Moon sep (deg)   : 117.87
B (ring opening deg) : 3.36
PA of pole (deg)     : -19.41
Pole direction: RA (deg): 268.05802
Dec (deg): 64.49677
C/A sky separation (") : 4.616
C/A sky separation (km) : 13349.1
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	2023-11-07T10:02:42.445	20.87	-15.98	71491.2	13.06	14.85
Jupiter	E	2023-11-07T12:24:11.606	38.96	-34.90	71491.7	8.43	9.62