

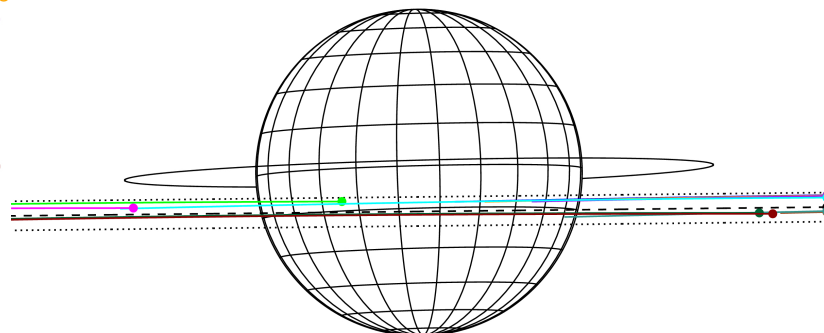
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-07-16T10:45:31.580
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116722721611787392
 2Mass ID (if available) : 17381310-2303491

Jupiter 2043-07-16T10:45:31 K9.80 G14.13 Pgt

ICRS Star Coord at Epoch: 17h 38m 13.09568s -23°03:49.07595s
 RUWE (>1.4 is poor) : 0.90
 K magnitude : 9.797
 G magnitude : 14.127
 RP magnitude : 12.997
 BP magnitude : 15.470
 DUPflag : 0
 Distance (au) : 4.340
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -12.96
 Sun-Target sep (deg) : 151.76
 Sun-Moon sep (deg) : 36.03
 B (ring opening deg) : -2.40
 PA of pole (deg) : 1.51
 Pole direction: RA (deg): 268.05670
 Dec (deg): 64.49732
 C/A sky separation (") : 5.425
 C/A sky separation (km) : 17075.1
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk



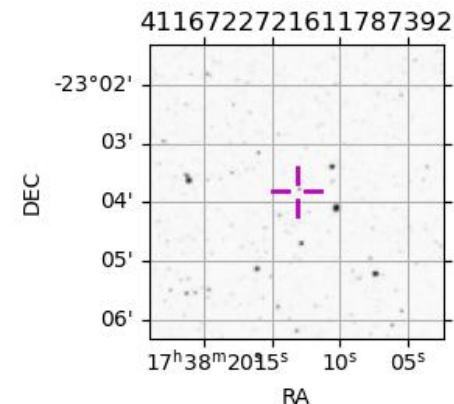
Earth
 PAL
 PMO
 KPNO
 MCD
 IRTF
 KAV
 RIO
 ESO
 AAT
 MSO



2043-07-16T10:45:31.5800 a: 17 38 13.0957 δ: -23 03 49.076 C/A 5.436" PA 0.61 deg v_sky -12.96 km/s D 04.34 AU
 Credit: Styled after SORA/Lucky Star

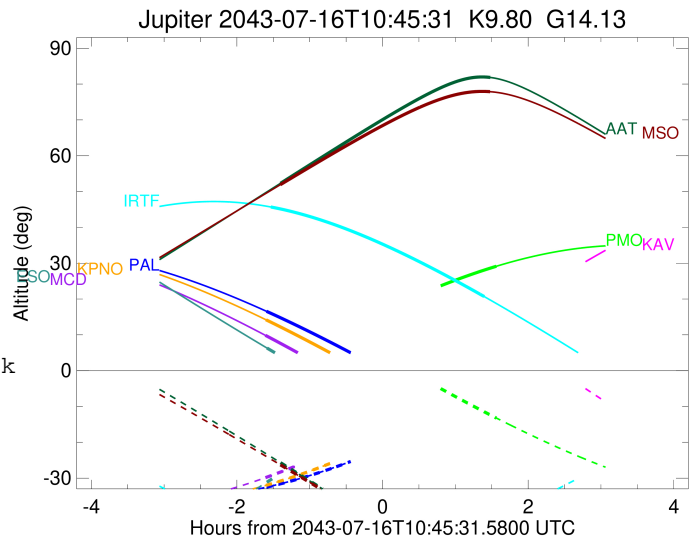
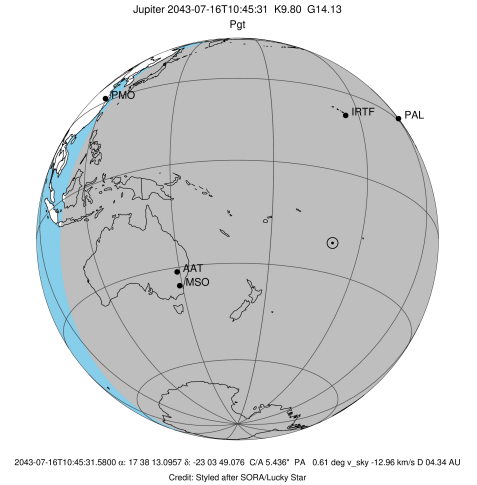
Observable events with sun below -5 deg and altitude above 5 deg

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	+	JUL 16 09:09 - JUL 16 09:09	Pin
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+	JUL 16 12:19 - JUL 16 12:19	Pne
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	JUL 16 09:09 - JUL 16 09:09	Pin
MCD	McDonald Obs. 2.7m	30.7	256.0	+	JUL 16 09:09 - JUL 16 09:09	Pin
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+	JUL 16 09:13 - JUL 16 12:09	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	+	JUL 16 09:10 - JUL 16 09:10	Pin
AAT	Siding Spring (AAT)	-31.3	149.1	+	JUL 16 09:21 - JUL 16 12:14	Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	JUL 16 09:21 - JUL 16 12:14	Pie



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-16T10:38:51.290
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        : 4116722721611787392
2Mass ID (if available) : 17381310-2303491
ICRS Star Coord at Epoch: 17h 38m 13.09568s -23:03:49.07595s
RUWE (>1.4 is poor) : 0.90
K magnitude           : 9.797
G magnitude           : 14.127
RP magnitude          : 12.997
BP magnitude          : 15.470
DUPflag              : 0
Distance (au)         : 4.340
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -12.96
Sun-Target sep (deg) : 151.76
Sun-Moon sep (deg)   : 36.65
B (ring opening deg) : -2.40
PA of pole (deg)     : 1.51
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 4.188
C/A sky separation (km): 13183.8
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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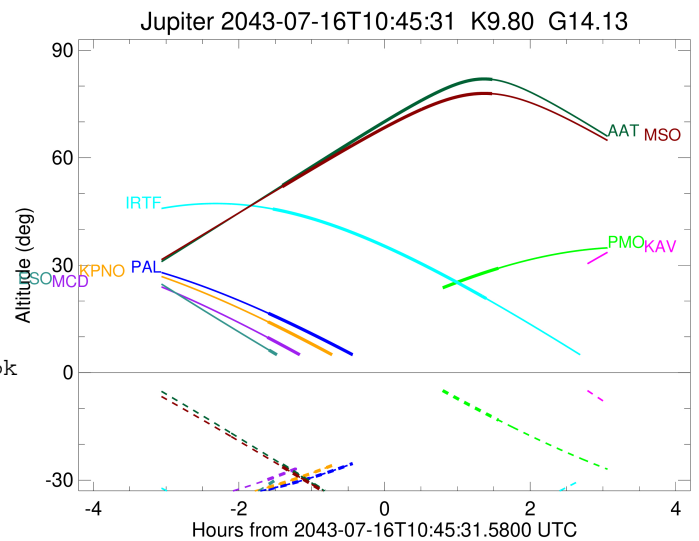
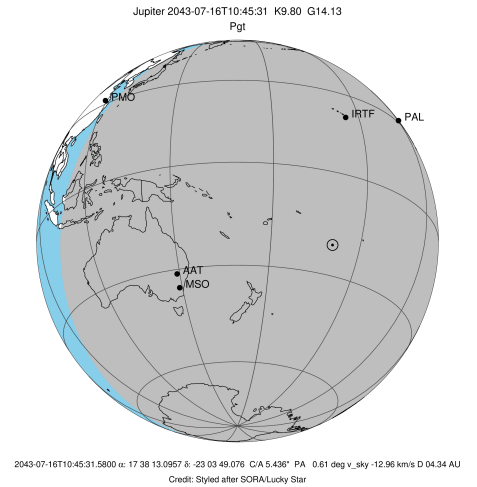


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-16T09:09:54.329	16.57	-32.51	71491.7	-10.94	-12.46
Jupiter	E	2043-07-16T12:08:53.207	-15.89x	-8.32	71491.7	-10.39	-11.83

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-16T10:50:59.570
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      : 4116722721611787392
2Mass ID (if available) : 17381310-2303491
ICRS Star Coord at Epoch: 17h 38m 13.09568s -23:03:49.07595s
RUWE (>1.4 is poor) : 0.90
K magnitude          : 9.797
G magnitude          : 14.127
RP magnitude         : 12.997
BP magnitude         : 15.470
DUPflag             : 0
Distance (au)       : 4.340
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -12.96
Sun-Target sep (deg) : 151.76
Sun-Moon sep (deg)  : 35.75
B (ring opening deg) : -2.40
PA of pole (deg)    : 1.51
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 4.011
C/A sky separation (km): 12624.3
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
    
```

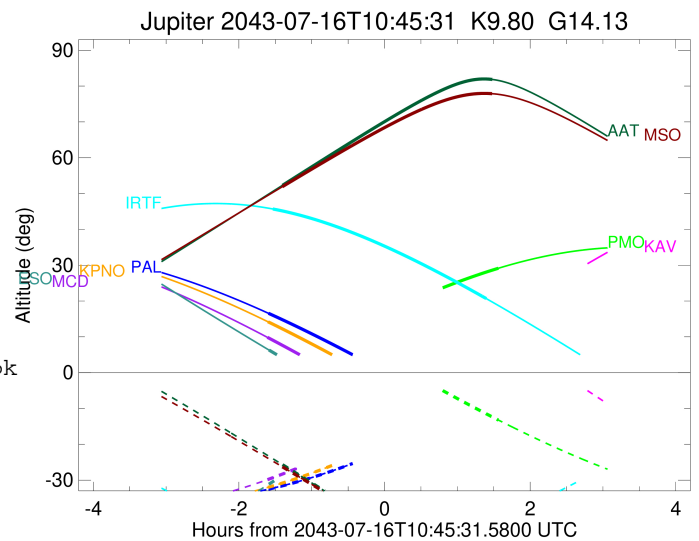
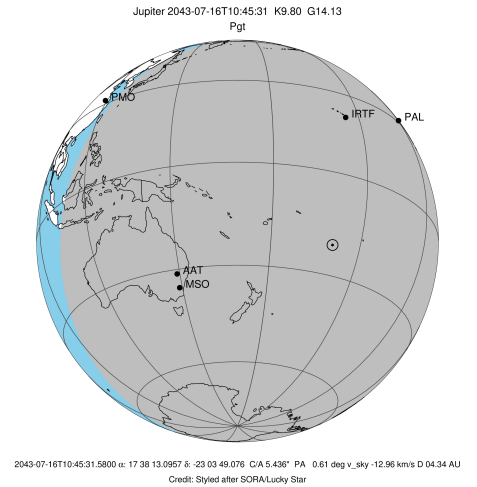


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-16T09:21:54.770	2.12x	21.08x	71491.7	-11.64	-13.25
Jupiter	E	2043-07-16T12:19:23.415	29.14	-13.23	71491.8	-8.85	-10.09

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-16T10:38:34.070
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       : 4116722721611787392
2Mass ID (if available) : 17381310-2303491
ICRS Star Coord at Epoch: 17h 38m 13.09568s -23:03:49.07595s
RUWE (>1.4 is poor) : 0.90
K magnitude          : 9.797
G magnitude          : 14.127
RP magnitude         : 12.997
BP magnitude         : 15.470
DUPflag             : 0
Distance (au)        : 4.340
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.96
Sun-Target sep (deg) : 151.76
Sun-Moon sep (deg)   : 36.64
B (ring opening deg) : -2.40
PA of pole (deg)     : 1.51
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 4.282
C/A sky separation (km) : 13477.2
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
    
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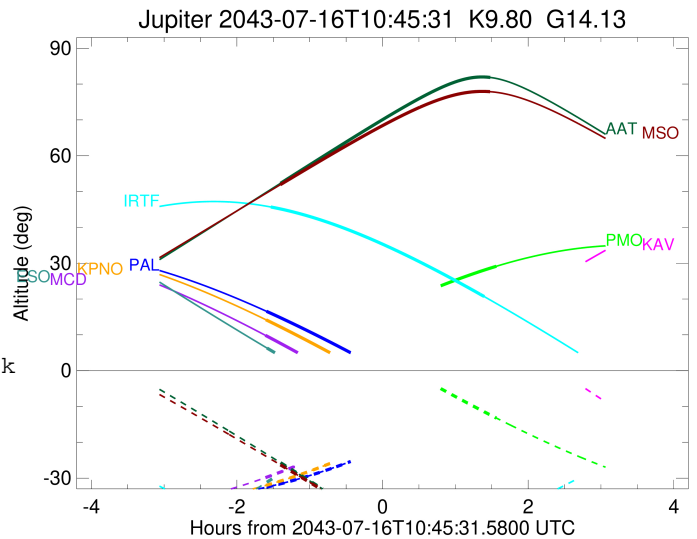
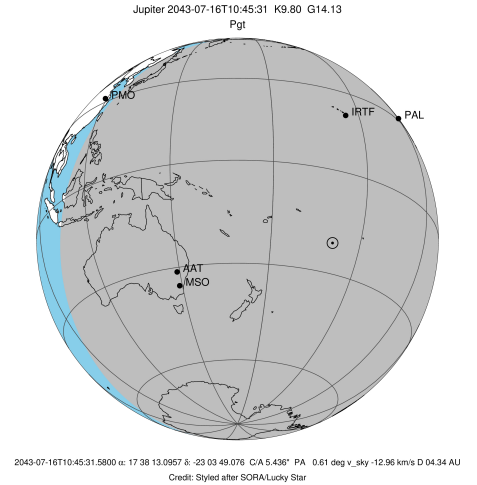


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-16T09:09:29.628	14.21	-32.01	71491.7	-11.14	-12.69
Jupiter	E	2043-07-16T12:08:46.372	-19.73x	-5.24	71491.7	-10.64	-12.12

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-16T10:38:18.540
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        : 4116722721611787392
2Mass ID (if available) : 17381310-2303491
ICRS Star Coord at Epoch: 17h 38m 13.09568s -23:03:49.07595s
RUWE (>1.4 is poor) : 0.90
K magnitude           : 9.797
G magnitude           : 14.127
RP magnitude          : 12.997
BP magnitude          : 15.470
DUPflag              : 0
Distance (au)         : 4.340
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -12.96
Sun-Target sep (deg)  : 151.76
Sun-Moon sep (deg)    : 36.60
B (ring opening deg) : -2.40
PA of pole (deg)      : 1.51
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (" ) : 4.404
C/A sky separation (km) : 13860.7
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
    
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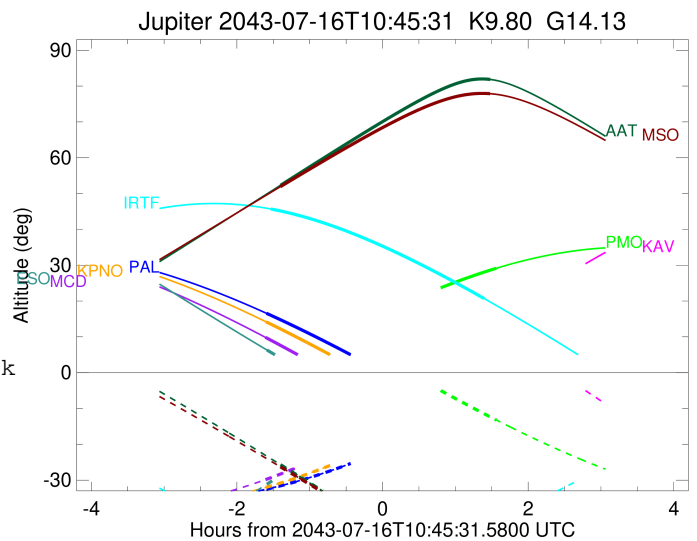
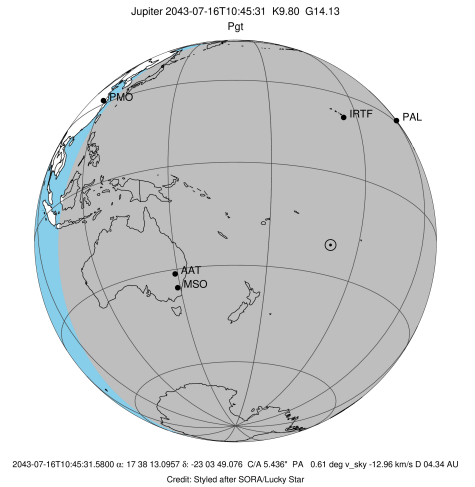


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-16T09:09:00.654	9.87	-29.86	71491.7	-11.41	-12.99
Jupiter	E	2043-07-16T12:08:47.213	-25.70x	-0.04x	71491.7	-10.97	-12.49

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-16T10:41:08.700
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       : 4116722721611787392
2Mass ID (if available) : 17381310-2303491
ICRS Star Coord at Epoch: 17h 38m 13.09568s -23:03:49.07595s
RUWE (>1.4 is poor) : 0.90
K magnitude          : 9.797
G magnitude          : 14.127
RP magnitude         : 12.997
BP magnitude         : 15.470
DUPflag             : 0
Distance (au)        : 4.340
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.96
Sun-Target sep (deg) : 151.76
Sun-Moon sep (deg)   : 36.77
B (ring opening deg) : -2.40
PA of pole (deg)     : 1.51
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 4.168
C/A sky separation (km) : 13118.8
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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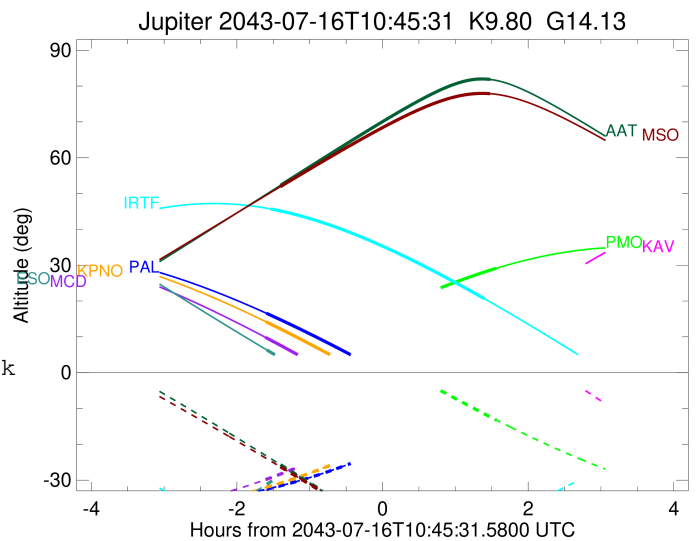
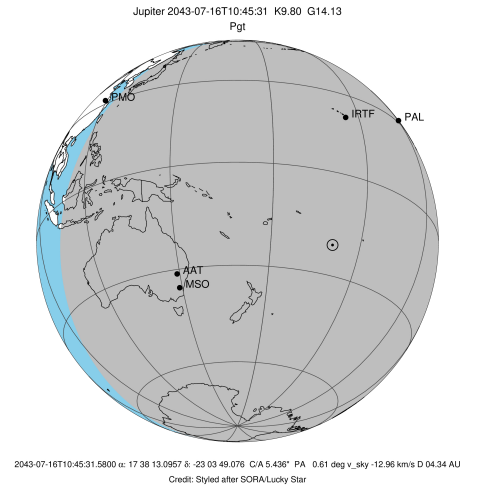


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-16T09:13:35.991	45.68	-45.11	71491.7	-11.18	-12.74
Jupiter	E	2043-07-16T12:09:23.693	20.67	-42.06	71491.8	-10.18	-11.60

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-16T10:38:52.290
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      : 4116722721611787392
2Mass ID (if available) : 17381310-2303491
ICRS Star Coord at Epoch: 17h 38m 13.09568s -23:03:49.07595s
RUWE (>1.4 is poor) : 0.90
K magnitude          : 9.797
G magnitude          : 14.127
RP magnitude         : 12.997
BP magnitude         : 15.470
DUPflag             : 0
Distance (au)       : 4.340
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.96
Sun-Target sep (deg) : 151.76
Sun-Moon sep (deg)  : 36.43
B (ring opening deg) : -2.40
PA of pole (deg)    : 1.51
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 6.647
C/A sky separation (km) : 20922.4
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
    
```

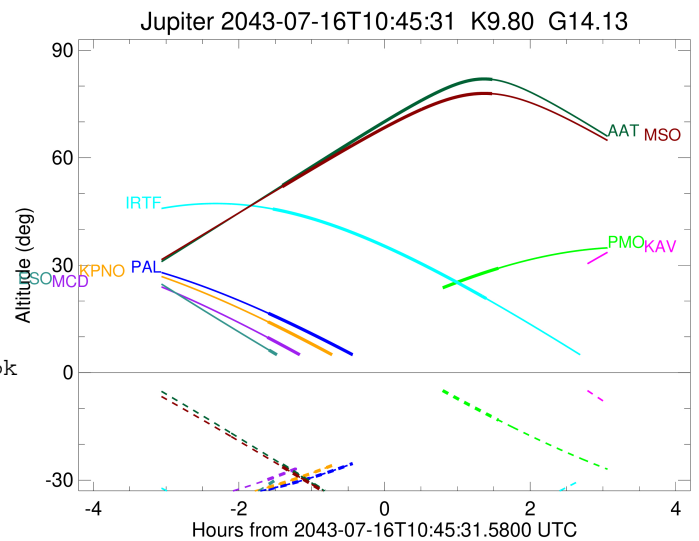
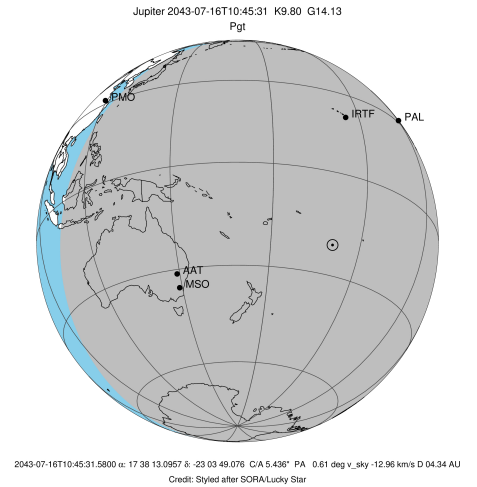


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-16T09:10:14.148	6.33	-31.13	71491.3	-17.22	-19.50
Jupiter	E	2043-07-16T12:08:35.426	-25.42x	5.75x	71491.4	-16.67	-18.89

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-16T10:48:00.530
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      : 4116722721611787392
2Mass ID (if available) : 17381310-2303491
ICRS Star Coord at Epoch: 17h 38m 13.09568s -23:03:49.07595s
RUWE (>1.4 is poor) : 0.90
K magnitude          : 9.797
G magnitude          : 14.127
RP magnitude         : 12.997
BP magnitude         : 15.470
DUPflag             : 0
Distance (au)       : 4.340
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.96
Sun-Target sep (deg) : 151.76
Sun-Moon sep (deg)  : 36.30
B (ring opening deg) : -2.40
PA of pole (deg)    : 1.51
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 5.752
C/A sky separation (km) : 18104.2
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
    
```

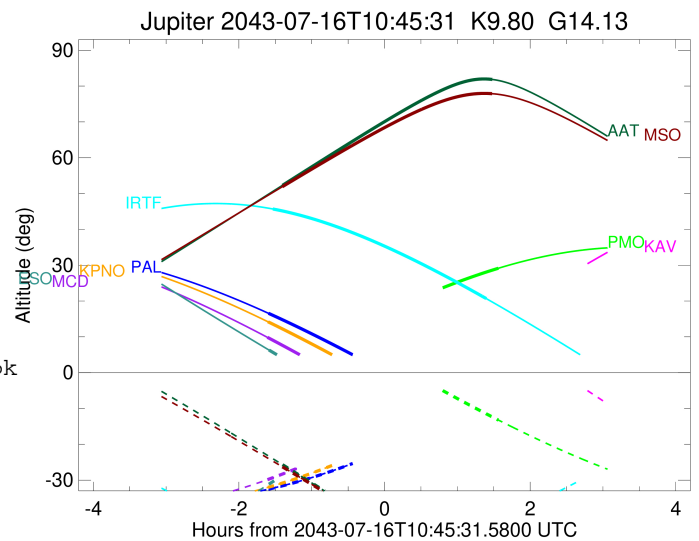
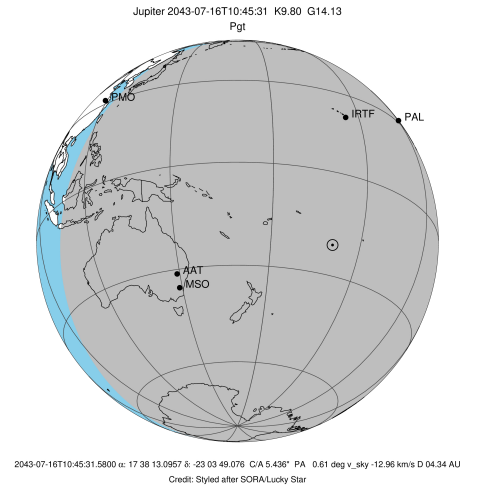


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-16T09:21:27.149	52.29	-25.68	71491.4	-15.90	-18.03
Jupiter	E	2043-07-16T12:14:19.277	81.84	-62.41	71491.6	-13.65	-15.51


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-16T10:47:54.290
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        : 4116722721611787392
2Mass ID (if available) : 17381310-2303491
ICRS Star Coord at Epoch: 17h 38m 13.09568s -23:03:49.07595s
RUWE (>1.4 is poor) : 0.90
K magnitude           : 9.797
G magnitude           : 14.127
RP magnitude          : 12.997
BP magnitude          : 15.470
DUPflag              : 0
Distance (au)         : 4.340
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -12.96
Sun-Target sep (deg)  : 151.76
Sun-Moon sep (deg)    : 36.30
B (ring opening deg) : -2.40
PA of pole (deg)      : 1.51
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 5.890
C/A sky separation (km) : 18540.1
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	2043-07-16T09:21:23.452	51.92	-26.29	71491.4	-16.25	-18.42
Jupiter	E	2043-07-16T12:14:11.306	77.87	-61.14	71491.5	-14.01	-15.92