

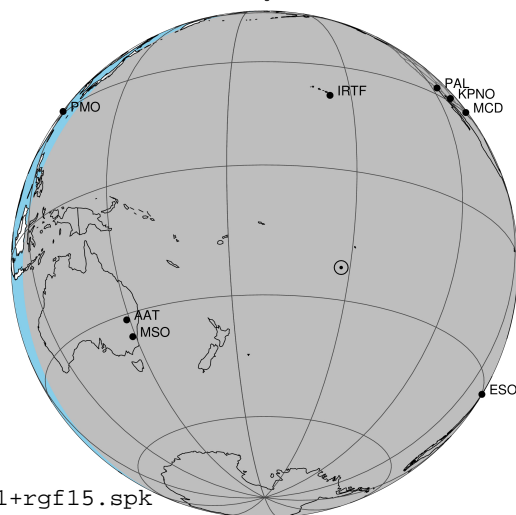
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-07-06T10:13:51.570
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116861015189821696
 2Mass ID (if available) : 17425629-2304323

Jupiter 2043-07-06T10:13:51 K8.16 G13.78 Pgt

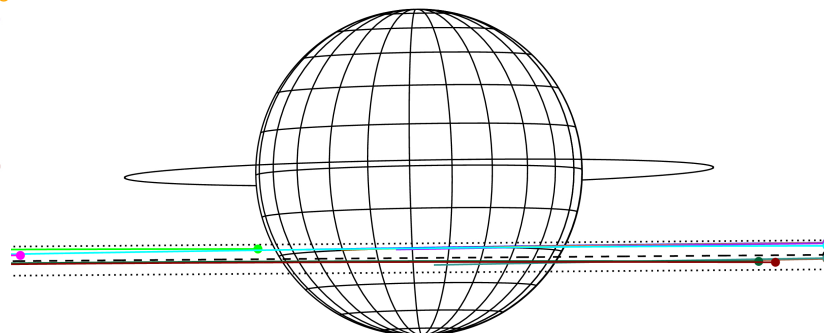
ICRS Star Coord at Epoch: 17h 42m 56.27546s -23:04:32.69100s

RUWE (>1.4 is poor) : 0.80
 K magnitude : 8.163
 G magnitude : 13.776
 RP magnitude : 12.378
 BP magnitude : 16.257
 DUPflag : 0
 Distance (au) : 4.283
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -15.09
 Sun-Target sep (deg) : 162.40
 Sun-Moon sep (deg) : 165.76
 B (ring opening deg) : -2.41
 PA of pole (deg) : 1.00
 Pole direction: RA (deg): 268.05669
 Dec (deg): 64.49732
 C/A sky separation (") : 12.054
 C/A sky separation (km) : 37442.7
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-07-06T10:13:51 K8.16 G13.78
 Pgt



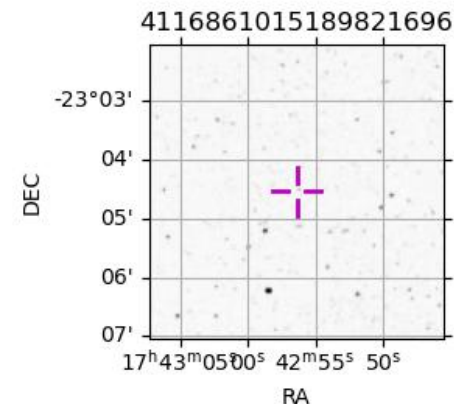
Earth
 PAL
 PMO
 KPNO
 MCD
 IRTF
 KAV
 RIO
 ESO
 AAT
 MSO



2043-07-06T10:13:51.5700 α: 17 42 56.2755 δ: -23 04 32.691 C/A ***** PA 0.44 deg v_sky -15.09 km/s D 04.28 AU
 Credit: Styled after SORA/Lucky Star

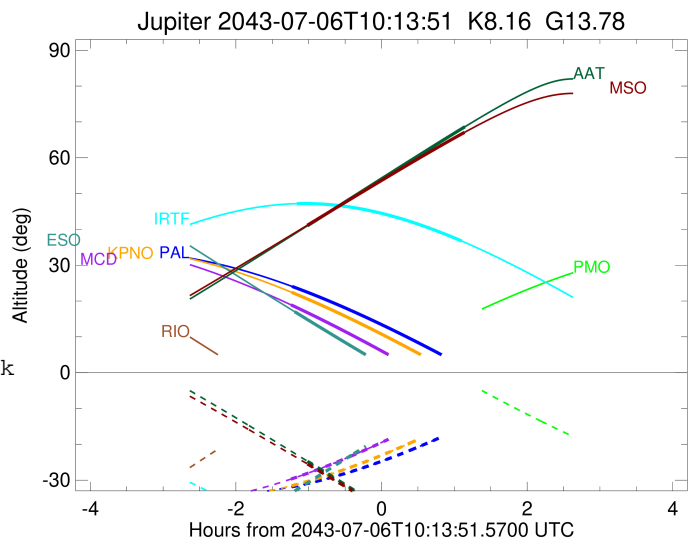
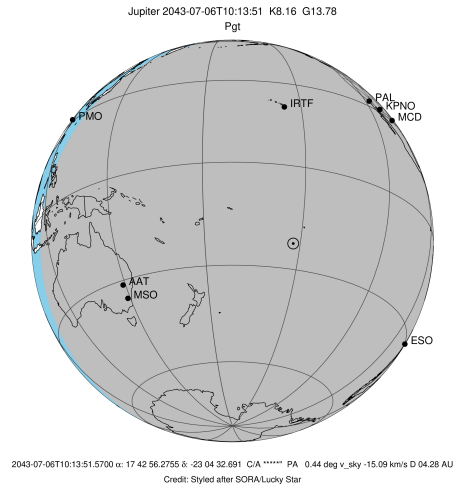
Observable events with sun below -5 deg and altitude above 5 deg

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 06 09:00 - JUL 06 09:00	Pin
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	JUL 06 08:59 - JUL 06 08:59	Pin
MCD	McDonald Obs. 2.7m	30.7	256.0	+	JUL 06 08:59 - JUL 06 08:59	Pin
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	JUL 06 09:04 - JUL 06 11:20	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 06 09:02 - JUL 06 09:02	Pin
AAT	Siding Spring (AAT)	-31.3	149.1	+ +	JUL 06 09:12 - JUL 06 11:22	Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	JUL 06 09:12 - JUL 06 11:22	Pie



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-06T10:08:51.890
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        : 4116861015189821696
2Mass ID (if available) : 17425629-2304323
ICRS Star Coord at Epoch: 17h 42m 56.27546s -23:04:32.69100s
RUWE (>1.4 is poor) : 0.80
K magnitude           : 8.163
G magnitude           : 13.776
RP magnitude          : 12.378
BP magnitude          : 16.257
DUPflag              : 0
Distance (au)         : 4.283
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.09
Sun-Target sep (deg)  : 162.40
Sun-Moon sep (deg)    : 165.45
B (ring opening deg) : -2.41
PA of pole (deg)      : 1.00
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 10.615
C/A sky separation (km) : 32970.6
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
    
```

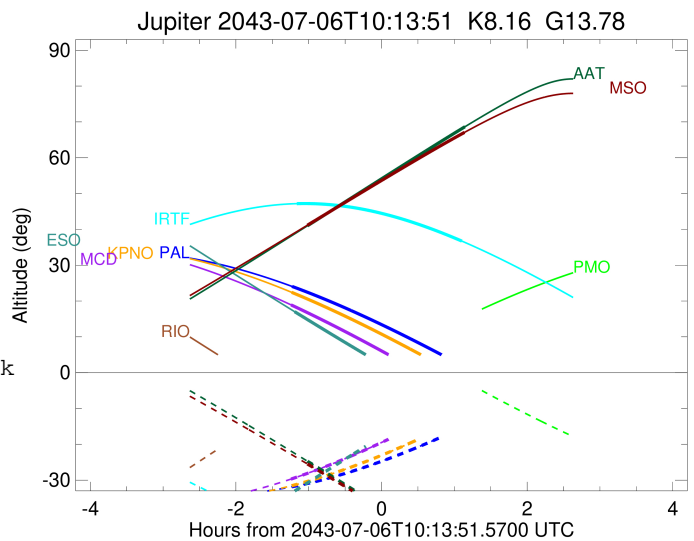
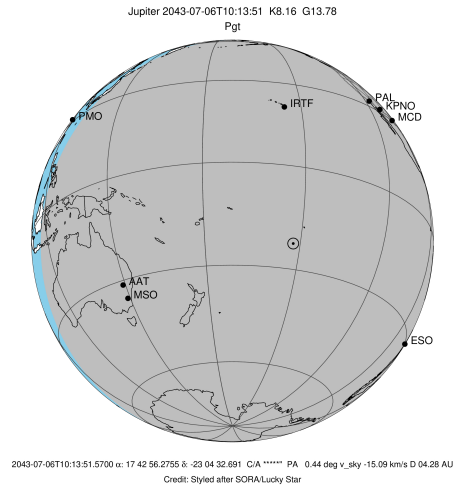


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-06T09:00:07.751	24.07	-31.85	71490.3	-27.60	-30.82
Jupiter	E	2043-07-06T11:18:03.617	2.34x	-15.68	71490.3	-27.38	-30.59

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-06T10:08:27.660
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      : 4116861015189821696
2Mass ID (if available) : 17425629-2304323
ICRS Star Coord at Epoch: 17h 42m 56.27546s -23:04:32.69100s
RUWE (>1.4 is poor) : 0.80
K magnitude          : 8.163
G magnitude          : 13.776
RP magnitude         : 12.378
BP magnitude         : 16.257
DUPflag             : 0
Distance (au)       : 4.283
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -15.09
Sun-Target sep (deg) : 162.40
Sun-Moon sep (deg)  : 165.38
B (ring opening deg) : -2.41
PA of pole (deg)    : 1.00
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 10.697
C/A sky separation (km) : 33228.0
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
    
```

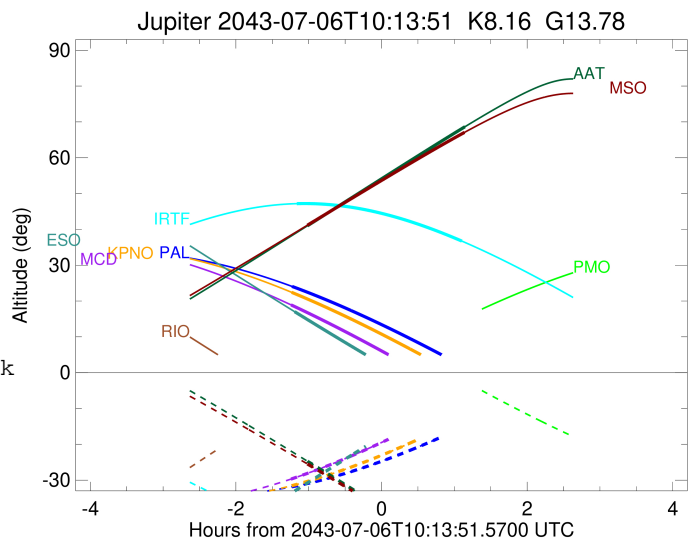
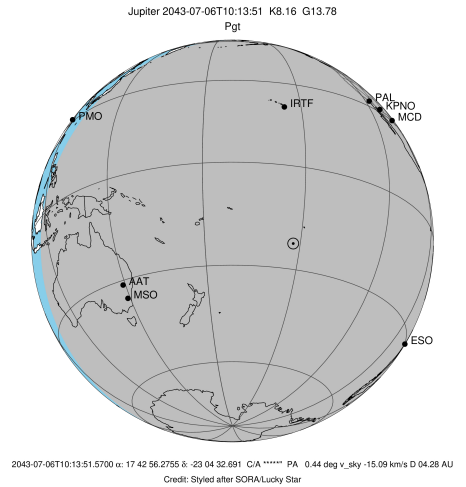


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-06T08:59:46.320	22.43	-31.55	71490.3	-27.79	-31.02
Jupiter	E	2043-07-06T11:17:38.671	-0.84x	-13.21	71490.3	-27.65	-30.87

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-06T10:07:59.350
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       : 4116861015189821696
2Mass ID (if available) : 17425629-2304323
ICRS Star Coord at Epoch: 17h 42m 56.27546s -23:04:32.69100s
RUWE (>1.4 is poor) : 0.80
K magnitude           : 8.163
G magnitude           : 13.776
RP magnitude          : 12.378
BP magnitude          : 16.257
DUPflag              : 0
Distance (au)        : 4.283
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.09
Sun-Target sep (deg) : 162.40
Sun-Moon sep (deg)   : 165.28
B (ring opening deg) : -2.41
PA of pole (deg)     : 1.00
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 10.808
C/A sky separation (km) : 33572.2
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
    
```

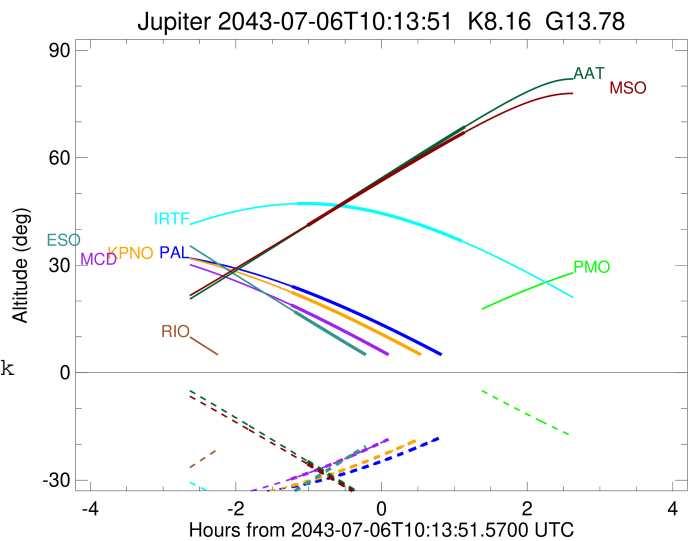
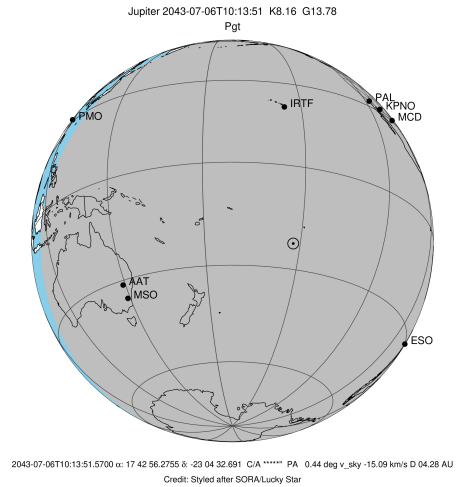


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-06T08:59:19.344	18.92	-29.70	71490.2	-28.05	-31.30
Jupiter	E	2043-07-06T11:17:11.532	-6.08x	-8.73	71490.2	-27.99	-31.24

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-06T10:12:00.130
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       : 4116861015189821696
2Mass ID (if available) : 17425629-2304323
ICRS Star Coord at Epoch: 17h 42m 56.27546s -23:04:32.69100s
RUWE (>1.4 is poor) : 0.80
K magnitude           : 8.163
G magnitude           : 13.776
RP magnitude         : 12.378
BP magnitude         : 16.257
DUPflag              : 0
Distance (au)        : 4.283
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.09
Sun-Target sep (deg) : 162.40
Sun-Moon sep (deg)  : 165.94
B (ring opening deg) : -2.41
PA of pole (deg)    : 1.00
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 10.685
C/A sky separation (km) : 33188.3
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
    
```

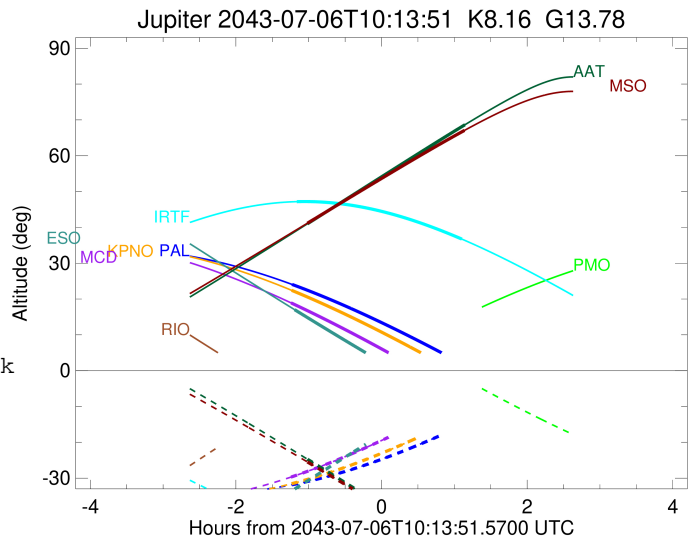
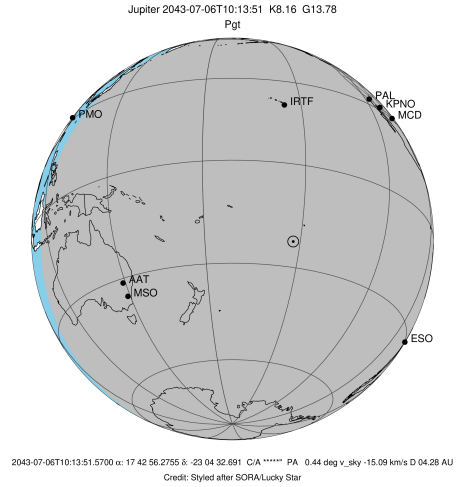


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-06T09:04:06.144	47.18	-43.08	71490.2	-28.12	-31.38
Jupiter	E	2043-07-06T11:20:05.164	36.72	-45.67	71490.3	-27.33	-30.53

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-06T10:07:18.130
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      : 4116861015189821696
2Mass ID (if available) : 17425629-2304323
ICRS Star Coord at Epoch: 17h 42m 56.27546s -23:04:32.69100s
RUWE (>1.4 is poor) : 0.80
K magnitude          : 8.163
G magnitude          : 13.776
RP magnitude         : 12.378
BP magnitude         : 16.257
DUPflag             : 0
Distance (au)       : 4.283
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.09
Sun-Target sep (deg) : 162.40
Sun-Moon sep (deg)  : 164.81
B (ring opening deg) : -2.41
PA of pole (deg)    : 1.00
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 13.078
C/A sky separation (km): 40621.8
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
    
```

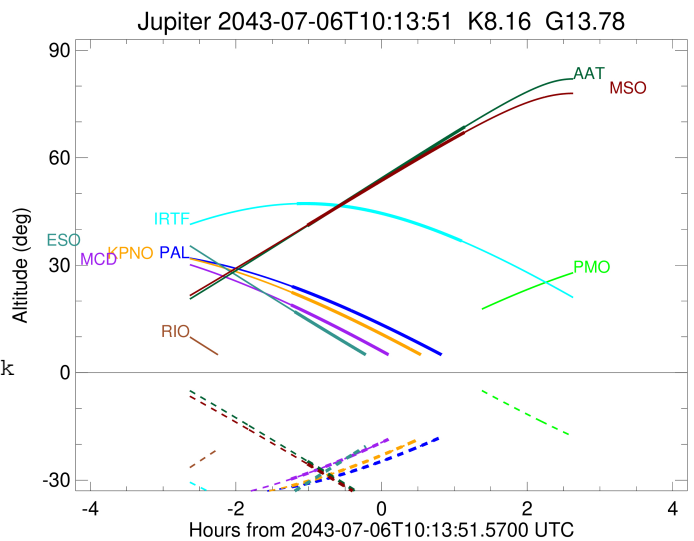
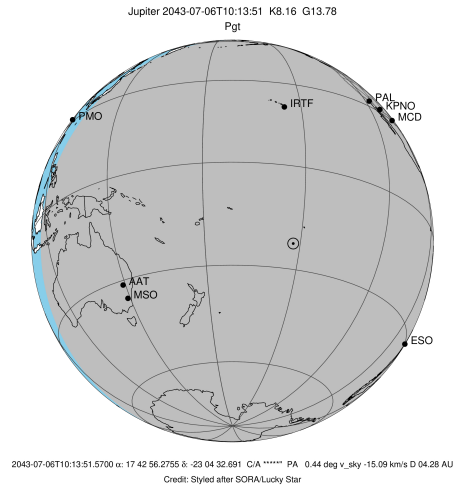


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-06T09:02:20.011	17.01	-33.03	71489.4	-34.55	-38.13
Jupiter	E	2043-07-06T11:12:48.443	-8.89x	-5.69	71489.4	-34.62	-38.20

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-06T10:17:52.970
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      : 4116861015189821696
2Mass ID (if available) : 17425629-2304323
ICRS Star Coord at Epoch: 17h 42m 56.27546s -23:04:32.69100s
RUWE (>1.4 is poor) : 0.80
K magnitude          : 8.163
G magnitude          : 13.776
RP magnitude         : 12.378
BP magnitude         : 16.257
DUPflag             : 0
Distance (au)       : 4.283
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.09
Sun-Target sep (deg) : 162.40
Sun-Moon sep (deg)  : 166.35
B (ring opening deg) : -2.41
PA of pole (deg)    : 1.00
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 12.494
C/A sky separation (km) : 38808.7
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
    
```

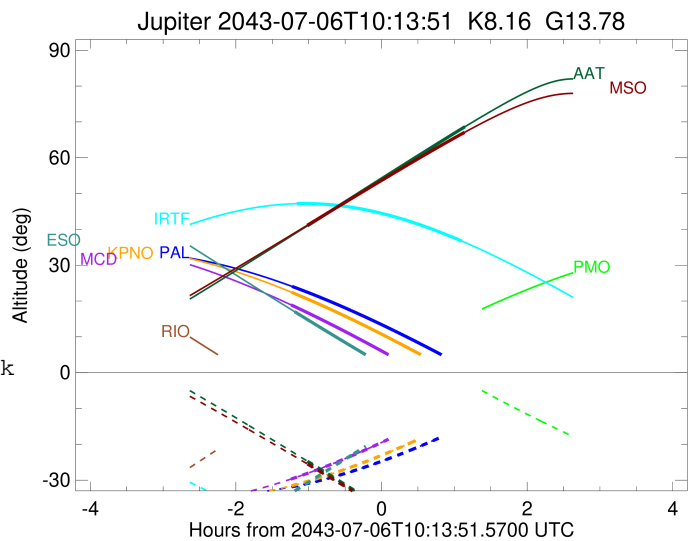
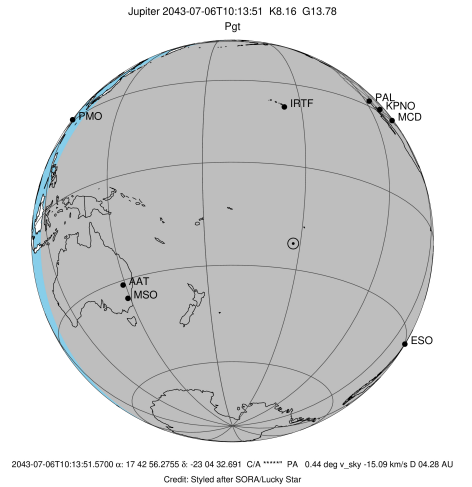


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-06T09:12:48.705	41.00	-24.71	71489.5	-33.83	-37.38
Jupiter	E	2043-07-06T11:22:40.903	68.65	-52.31	71489.8	-31.99	-35.47


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-06T10:17:42.660
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       : 4116861015189821696
2Mass ID (if available) : 17425629-2304323
ICRS Star Coord at Epoch: 17h 42m 56.27546s -23:04:32.69100s
RUWE (>1.4 is poor) : 0.80
K magnitude          : 8.163
G magnitude          : 13.776
RP magnitude         : 12.378
BP magnitude         : 16.257
DUPflag             : 0
Distance (au)        : 4.283
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.09
Sun-Target sep (deg) : 162.40
Sun-Moon sep (deg)  : 166.30
B (ring opening deg) : -2.41
PA of pole (deg)    : 1.00
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 12.630
C/A sky separation (km) : 39230.6
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	2043-07-06T09:12:52.980	41.17	-25.50	71489.5	-34.21	-37.78
Jupiter	E	2043-07-06T11:22:16.876	67.07	-51.82	71489.7	-32.41	-35.90