

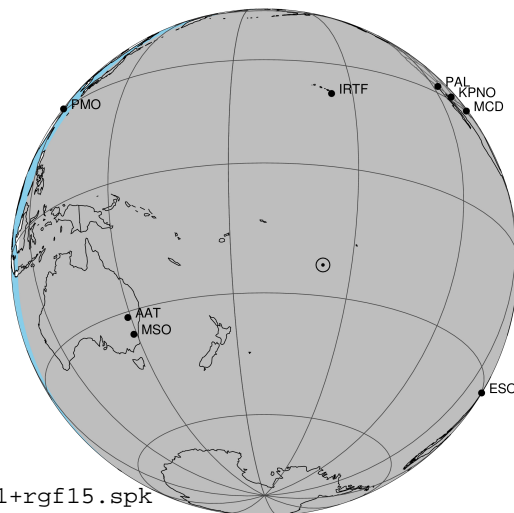
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-07-02T10:33:12.480
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068845346810361856
 2Mass ID (if available) : 17450018-2304337

Jupiter 2043-07-02T10:33:12 K9.12 G14.71 Pgt

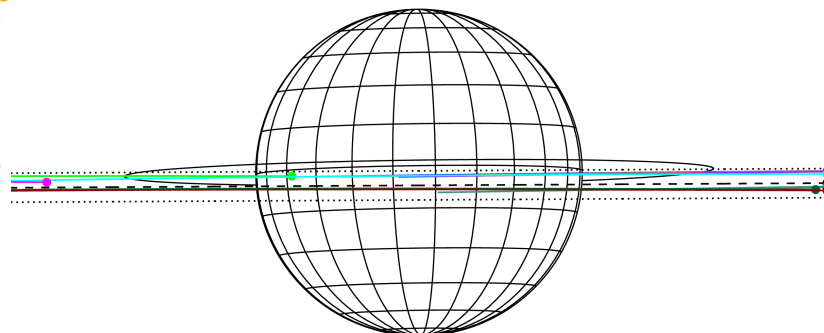
ICRS Star Coord at Epoch: 17h 45m 00.18304s -23°04'33.90295s

RUWE (>1.4 is poor) : 1.05
 K magnitude : 9.116
 G magnitude : 14.706
 RP magnitude : 13.282
 BP magnitude : 17.238
 DUPflag : 0
 Distance (au) : 4.268
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -15.66
 Sun-Target sep (deg) : 166.68
 Sun-Moon sep (deg) : 133.82
 B (ring opening deg) : -2.42
 PA of pole (deg) : 0.78
 Pole direction: RA (deg): 268.05669
 Dec (deg): 64.49732
 C/A sky separation (") : 1.826
 C/A sky separation (km) : 5652.4
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-07-02T10:33:12 K9.12 G14.71
 Pgt



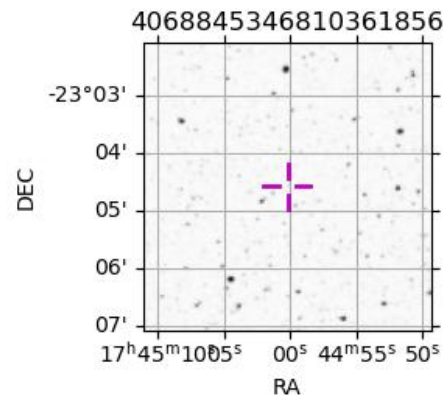
Earth
 PAL
 PMO
 KPNO
 MCD
 IRTF
 KAV
 RIO
 ESO
 AAT
 MSO



2043-07-02T10:33:12.4800 a: 17 45 00.1830 s: -23 04 33.903 C/A 1.827 PA 0.32 deg v_sky -15.66 km/s D 04.27 AU
 Credit: Styled after SORA/Lucky Star

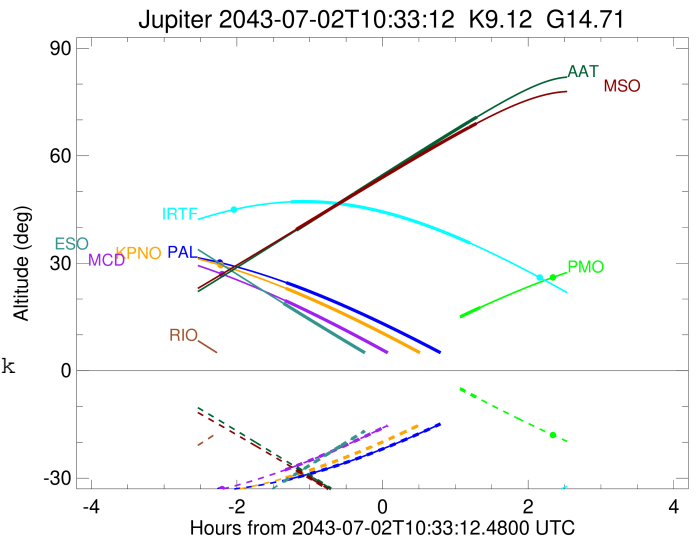
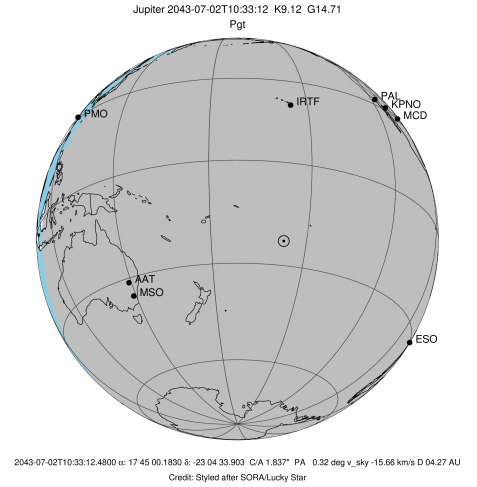
Observable events with sun below -5 deg and altitude above 5 deg

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 02 09:13 - JUL 02 09:13	Pin
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+	JUL 02 11:53 - JUL 02 11:53	Pne
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	JUL 02 09:13 - JUL 02 09:13	Pin
MCD	McDonald Obs. 2.7m	30.7	256.0	+	JUL 02 09:12 - JUL 02 09:12	Pin
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+	JUL 02 09:17 - JUL 02 11:45	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 02 09:11 - JUL 02 09:11	Pin
AAT	Siding Spring (AAT)	-31.3	149.1	+	JUL 02 09:22 - JUL 02 11:50	Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	JUL 02 09:22 - JUL 02 11:50	Pie



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-02T10:28:37.480
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      : 4068845346810361856
2Mass ID (if available) : 17450018-2304337
ICRS Star Coord at Epoch: 17h 45m 00.18304s -23:04:33.90295s
RUWE (>1.4 is poor) : 1.05
K magnitude         : 9.116
G magnitude         : 14.706
RP magnitude        : 13.282
BP magnitude        : 17.238
DUPflag            : 0
Distance (au)       : 4.268
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -15.66
Sun-Target sep (deg) : 166.68
Sun-Moon sep (deg)  : 134.49
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.78
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (" ) : 0.389
C/A sky separation (km) : 1203.1
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
    
```

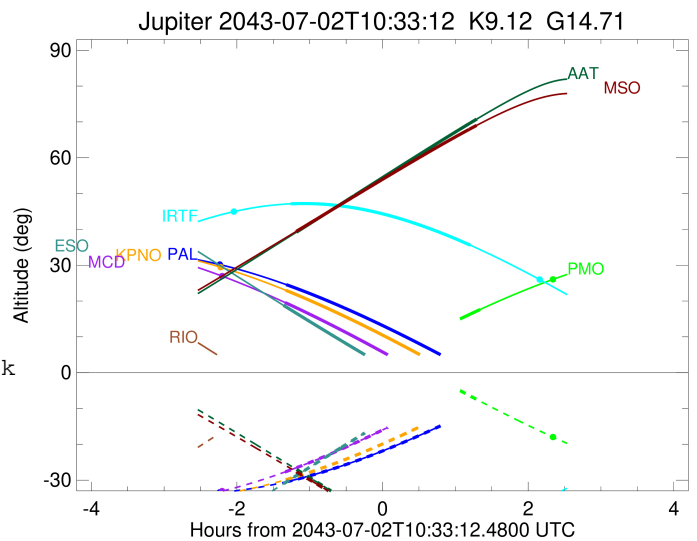
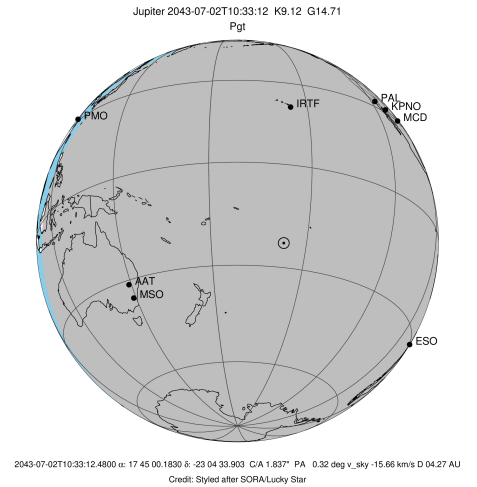


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-02T09:13:54.142	24.57	-30.46	71492.0	-1.04	-1.19
Jupiter	E	2043-07-02T11:43:51.265	0.87x	-11.14	71492.0	-1.00	-1.14

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-02T10:38:34.160
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       : 4068845346810361856
2Mass ID (if available) : 17450018-2304337
ICRS Star Coord at Epoch: 17h 45m 00.18304s -23:04:33.90295s
RUWE (>1.4 is poor) : 1.05
K magnitude           : 9.116
G magnitude           : 14.706
RP magnitude         : 13.282
BP magnitude         : 17.238
DUPflag              : 0
Distance (au)        : 4.268
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.66
Sun-Target sep (deg) : 166.68
Sun-Moon sep (deg)  : 133.35
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.78
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 0.571
C/A sky separation (km) : 1767.6
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
    
```

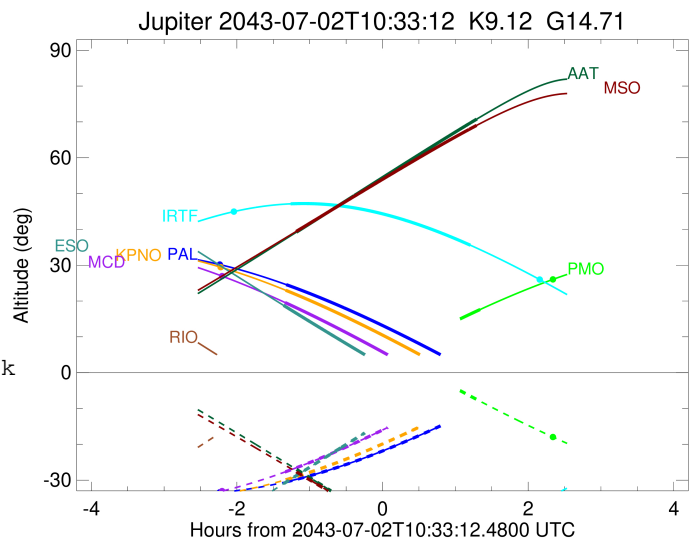
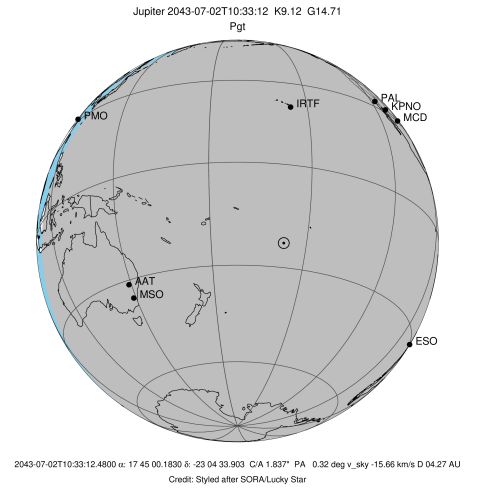


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-02T09:22:56.738	-9.59x	21.20x	71492.0	-2.42	-2.77
Jupiter	E	2043-07-02T11:53:39.017	17.63	-7.98	71492.0	-0.49	-0.55

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-02T10:28:15.670
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       : 4068845346810361856
2Mass ID (if available) : 17450018-2304337
ICRS Star Coord at Epoch: 17h 45m 00.18304s -23:04:33.90295s
RUWE (>1.4 is poor) : 1.05
K magnitude          : 9.116
G magnitude          : 14.706
RP magnitude         : 13.282
BP magnitude         : 17.238
DUPflag             : 0
Distance (au)        : 4.268
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.66
Sun-Target sep (deg) : 166.68
Sun-Moon sep (deg)   : 134.49
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.78
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 0.472
C/A sky separation (km) : 1462.3
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
    
```

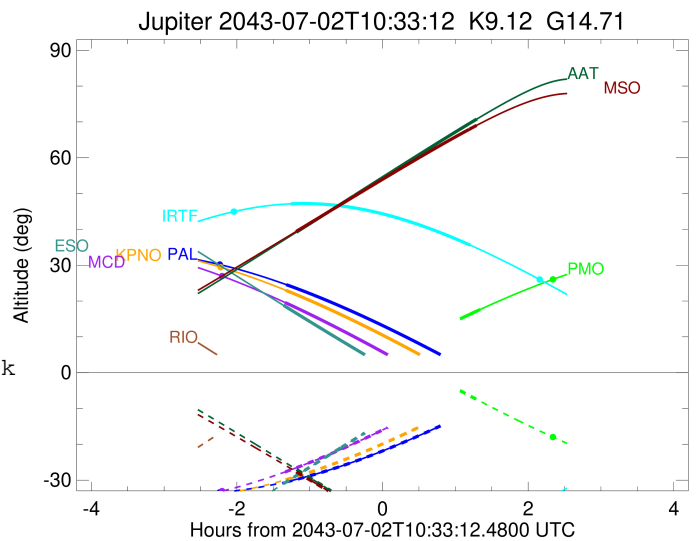
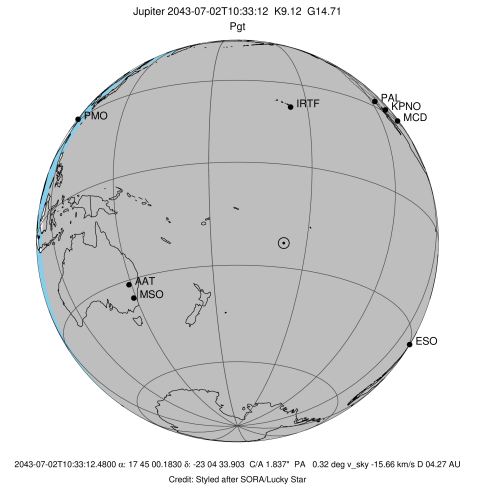


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-02T09:13:26.608	23.00	-29.90	71492.0	-1.21	-1.38
Jupiter	E	2043-07-02T11:43:37.608	-2.40x	-8.37	71492.0	-1.23	-1.41

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-02T10:27:50.330
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      : 4068845346810361856
2Mass ID (if available) : 17450018-2304337
ICRS Star Coord at Epoch: 17h 45m 00.18304s -23:04:33.90295s
RUWE (>1.4 is poor) : 1.05
K magnitude         : 9.116
G magnitude         : 14.706
RP magnitude        : 13.282
BP magnitude        : 17.238
DUPflag            : 0
Distance (au)       : 4.268
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -15.66
Sun-Target sep (deg) : 166.68
Sun-Moon sep (deg)  : 134.47
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.78
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 0.584
C/A sky separation (km) : 1808.9
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
    
```

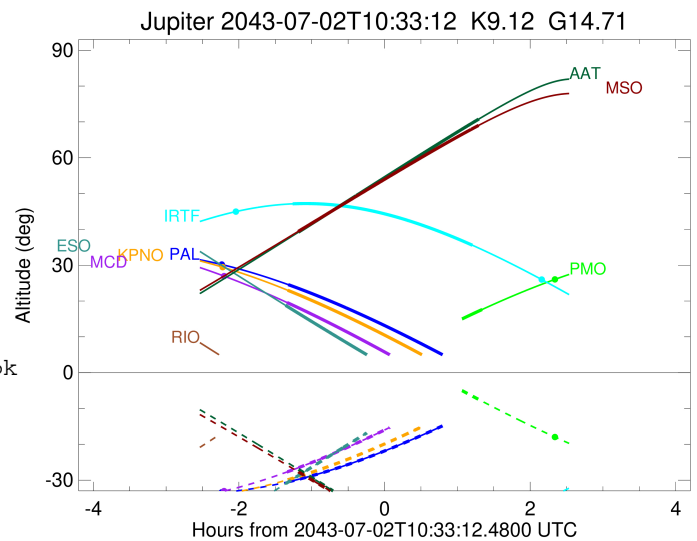
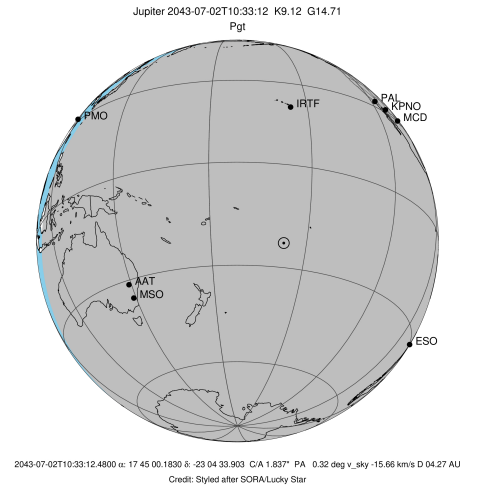


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-02T09:12:51.067	19.59	-27.72	71492.0	-1.43	-1.64
Jupiter	E	2043-07-02T11:43:25.410	-7.76x	-3.56x	71492.0	-1.54	-1.77

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-02T10:31:27.650
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      : 4068845346810361856
2Mass ID (if available) : 17450018-2304337
ICRS Star Coord at Epoch: 17h 45m 00.18304s -23:04:33.90295s
RUWE (>1.4 is poor) : 1.05
K magnitude          : 9.116
G magnitude          : 14.706
RP magnitude         : 13.282
BP magnitude         : 17.238
DUPflag             : 0
Distance (au)       : 4.268
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.66
Sun-Target sep (deg) : 166.68
Sun-Moon sep (deg)  : 134.53
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.78
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 0.454
C/A sky separation (km) : 1406.3
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
    
```

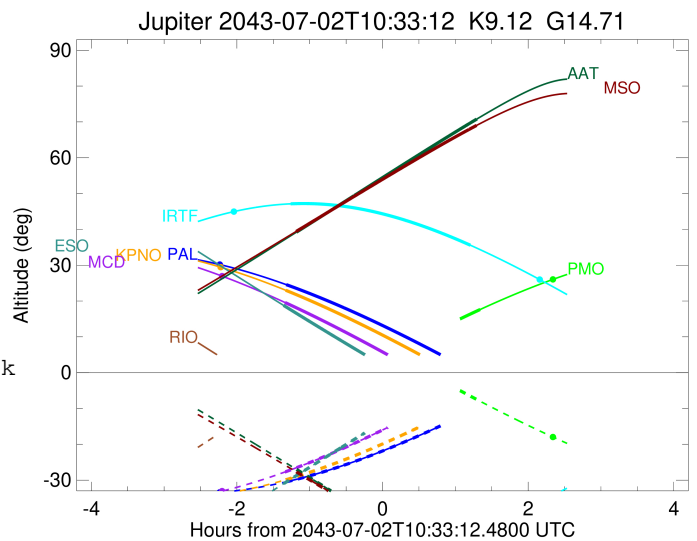
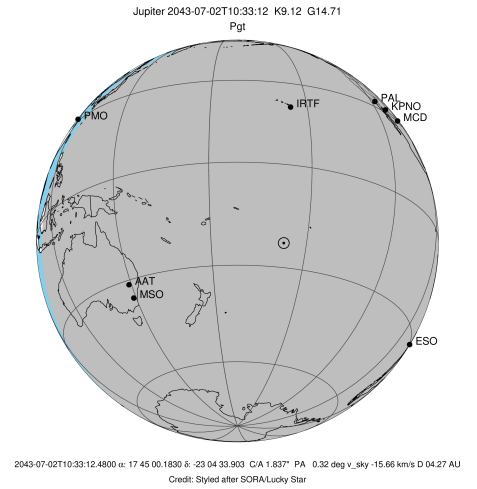


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-02T09:17:28.002	47.12	-44.13	71492.0	-1.51	-1.73
Jupiter	E	2043-07-02T11:45:39.440	35.57	-43.06	71492.0	-0.93	-1.06

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-02T10:27:15.850
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        : 4068845346810361856
2Mass ID (if available) : 17450018-2304337
ICRS Star Coord at Epoch: 17h 45m 00.18304s -23:04:33.90295s
RUWE (>1.4 is poor) : 1.05
K magnitude           : 9.116
G magnitude           : 14.706
RP magnitude          : 13.282
BP magnitude          : 17.238
DUPflag              : 0
Distance (au)         : 4.268
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.66
Sun-Target sep (deg) : 166.68
Sun-Moon sep (deg)   : 134.42
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.78
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 2.863
C/A sky separation (km): 8861.9
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
    
```

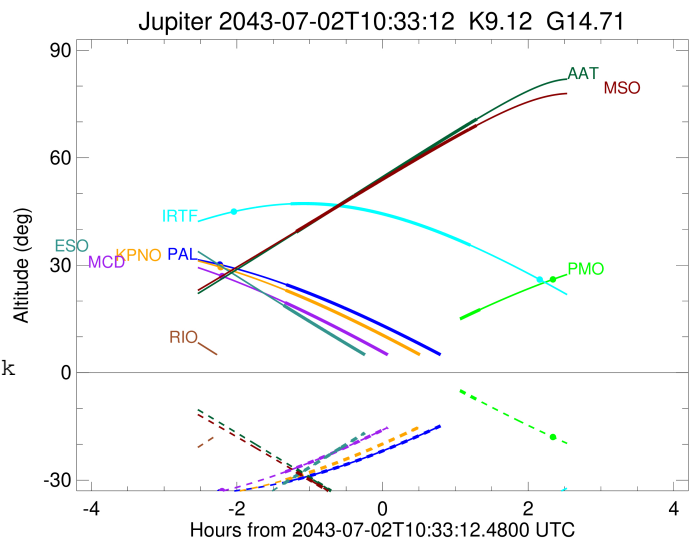
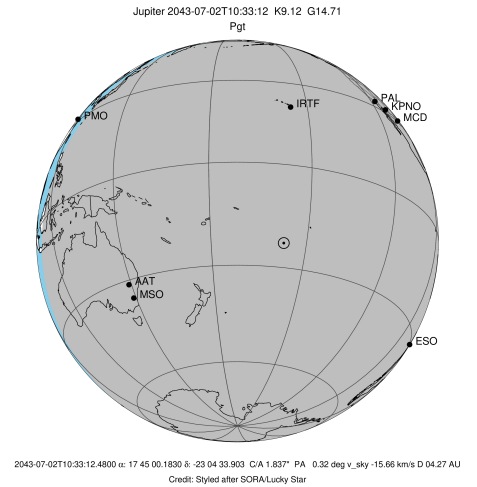


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-02T09:11:47.766	18.76	-30.97	71491.9	-6.99	-7.98
Jupiter	E	2043-07-02T11:43:24.212	-11.23x	0.34x	71491.9	-7.21	-8.23


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-02T10:36:50.770
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      : 4068845346810361856
2Mass ID (if available) : 17450018-2304337
ICRS Star Coord at Epoch: 17h 45m 00.18304s -23:04:33.90295s
RUWE (>1.4 is poor) : 1.05
K magnitude         : 9.116
G magnitude         : 14.706
RP magnitude        : 13.282
BP magnitude        : 17.238
DUPflag            : 0
Distance (au)       : 4.268
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -15.66
Sun-Target sep (deg) : 166.68
Sun-Moon sep (deg)  : 134.02
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.78
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 2.263
C/A sky separation (km) : 7003.9
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
    
```

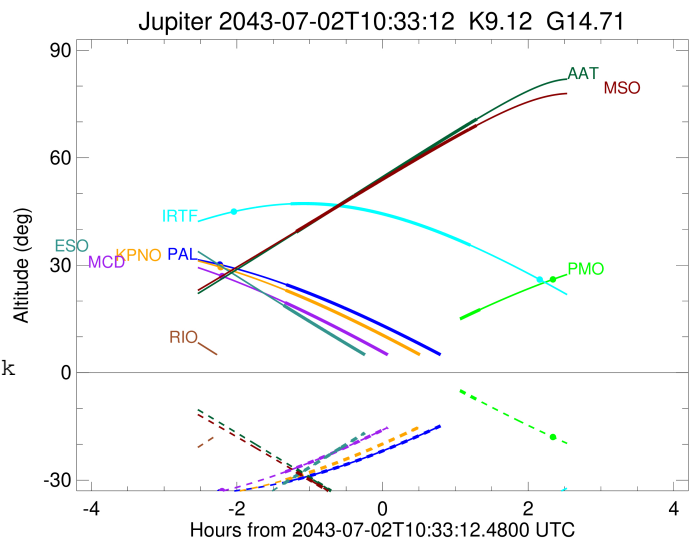
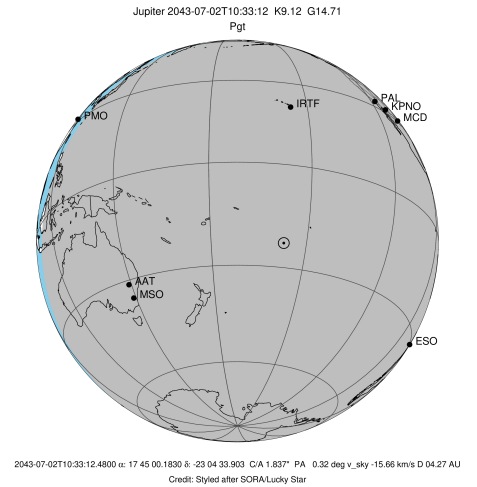


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-02T09:22:25.948	39.25	-27.02	71491.9	-6.49	-7.41
Jupiter	E	2043-07-02T11:50:54.988	70.79	-58.61	71491.9	-4.89	-5.59


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-02T10:36:41.480
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       : 4068845346810361856
2Mass ID (if available) : 17450018-2304337
ICRS Star Coord at Epoch: 17h 45m 00.18304s -23:04:33.90295s
RUWE (>1.4 is poor) : 1.05
K magnitude          : 9.116
G magnitude          : 14.706
RP magnitude         : 13.282
BP magnitude         : 17.238
DUPflag             : 0
Distance (au)        : 4.268
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.66
Sun-Target sep (deg) : 166.68
Sun-Moon sep (deg)   : 134.03
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.78
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 2.399
C/A sky separation (km) : 7426.3
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	2043-07-02T09:22:15.834	39.45	-27.70	71491.9	-6.81	-7.77
Jupiter	E	2043-07-02T11:50:47.448	69.02	-57.87	71491.9	-5.24	-5.99