

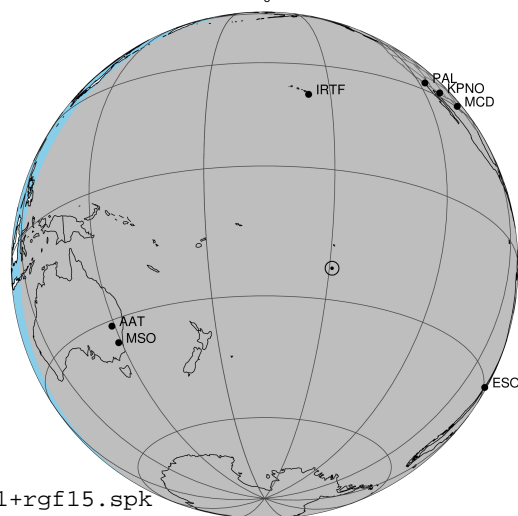
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-07-04T10:01:41.160
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116862664457270912
 2Mass ID (if available) : 17435809-2304190

Jupiter 2043-07-04T10:01:41 K8.63 G14.94 Pgt

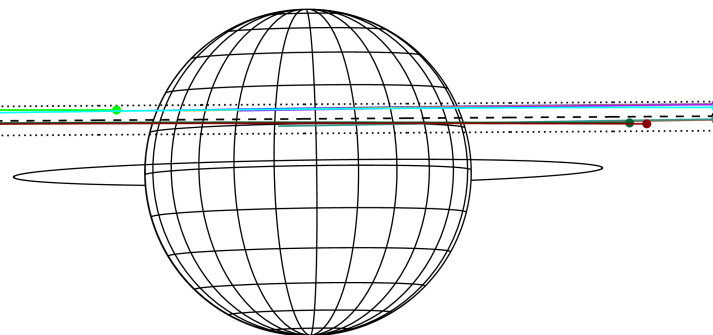
ICRS Star Coord at Epoch: 17h 43m 58.07890s -23°04'19.21079s

RUWE (>1.4 is poor) : 1.08
 K magnitude : 8.627
 G magnitude : 14.941
 RP magnitude : 13.415
 BP magnitude : 18.279
 DUPflag : 0
 Distance (au) : 4.275
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -15.40
 Sun-Target sep (deg) : 164.55
 Sun-Moon sep (deg) : 162.54
 B (ring opening deg) : -2.42
 PA of pole (deg) : 0.89
 Pole direction: RA (deg): 268.05669
 Dec (deg): 64.49732
 C/A sky separation (") : 7.579
 C/A sky separation (km) : 23495.5
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-07-04T10:01:41 K8.63 G14.94
 Pgt



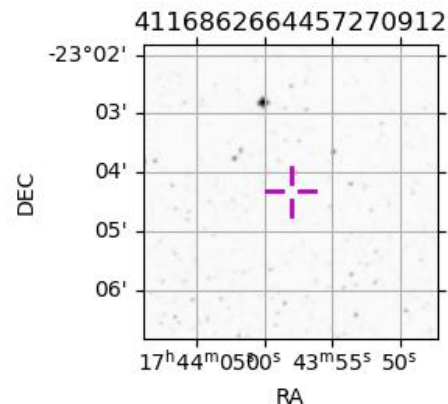
Earth
 PAL
 PMO
 KPNO
 MCD
 IRTF
 RIO
 ESO
 AAT
 MSO



2043-07-04T10:01:41.1600 at: 17 43 58.0789 s: -23 04 19.2111 C/A 7.5677 PA 180.38 deg v_sky -15.40 km/s D 04.27 AU
 Credit: Styled after SORA/Lucky Star

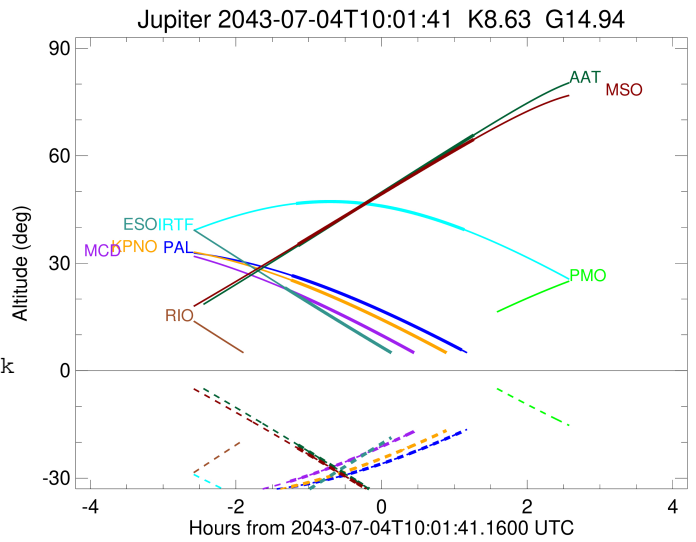
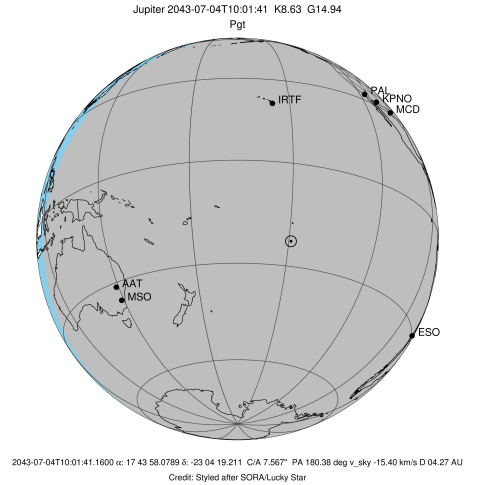
Observable events with sun below -5 deg and altitude above 5 deg

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 04 08:47 - JUL 04 11:07	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	JUL 04 08:47 - JUL 04 08:47	Pin
MCD	McDonald Obs. 2.7m	30.7	256.0	+	JUL 04 08:46 - JUL 04 08:46	Pin
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	JUL 04 08:51 - JUL 04 11:10	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 04 08:41 - JUL 04 08:41	Pin
AAT	Siding Spring (AAT)	-31.3	149.1	+ +	JUL 04 08:53 - JUL 04 11:17	Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	JUL 04 08:52 - JUL 04 11:17	Pie



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-04T09:57:36.700
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        : 4116862664457270912
2Mass ID (if available) : 17435809-2304190
ICRS Star Coord at Epoch: 17h 43m 58.07890s -23:04:19.21079s
RUWE (>1.4 is poor) : 1.08
K magnitude           : 8.627
G magnitude           : 14.941
RP magnitude          : 13.415
BP magnitude          : 18.279
DUPflag              : 0
Distance (au)         : 4.275
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.40
Sun-Target sep (deg) : 164.55
Sun-Moon sep (deg)   : 163.39
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.89
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 9.066
C/A sky separation (km): 28106.9
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
    
```

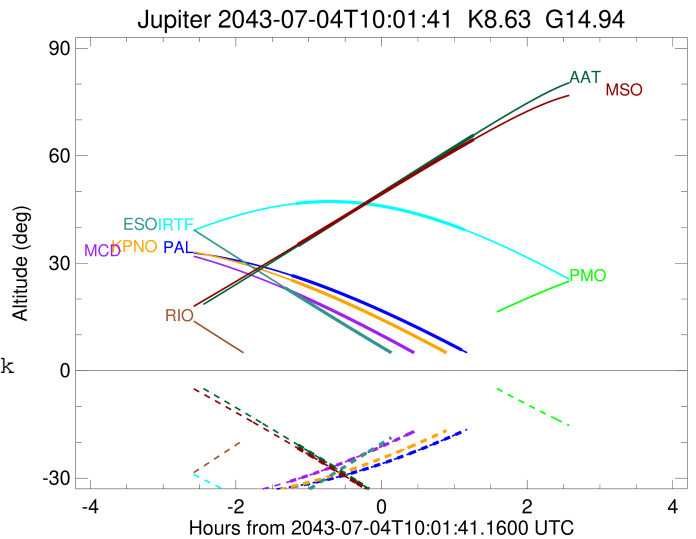
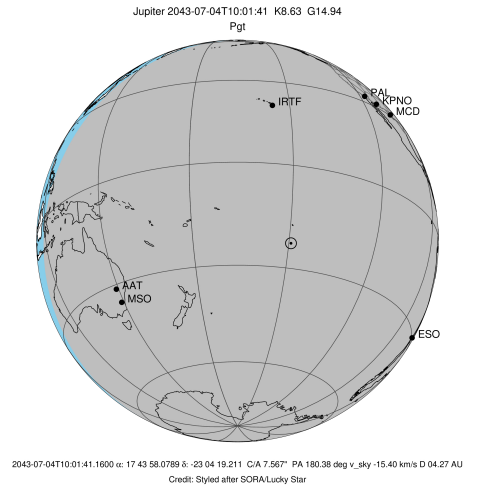


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-04T08:47:48.869	26.56	-32.39	71490.8	22.97	25.83
Jupiter	E	2043-07-04T11:07:49.428	5.77	-17.07	71490.8	23.17	26.04

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-04T09:57:13.700
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        : 4116862664457270912
2Mass ID (if available) : 17435809-2304190
ICRS Star Coord at Epoch: 17h 43m 58.07890s -23:04:19.21079s
RUWE (>1.4 is poor) : 1.08
K magnitude           : 8.627
G magnitude           : 14.941
RP magnitude          : 13.415
BP magnitude          : 18.279
DUPflag              : 0
Distance (au)         : 4.275
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.40
Sun-Target sep (deg)  : 164.55
Sun-Moon sep (deg)   : 163.43
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.89
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 8.987
C/A sky separation (km) : 27861.8
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
    
```

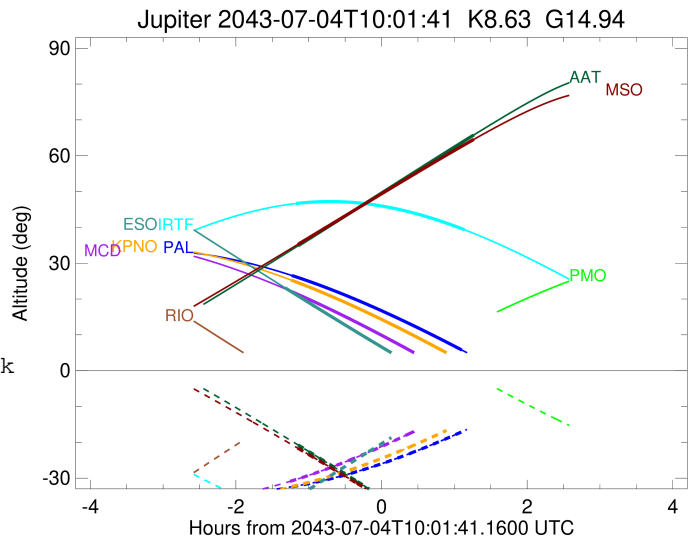
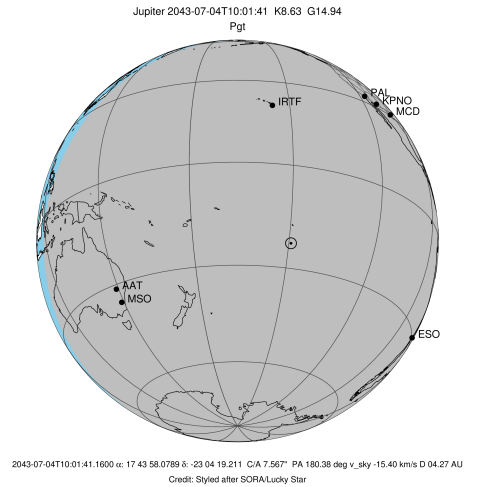


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-04T08:47:14.341	25.29	-32.37	71490.8	22.80	25.64
Jupiter	E	2043-07-04T11:07:40.343	2.70x	-14.68	71490.8	22.92	25.77

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch              : 2043-07-04T09:56:45.930
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        : 4116862664457270912
2Mass ID (if available) : 17435809-2304190
ICRS Star Coord at Epoch: 17h 43m 58.07890s -23:04:19.21079s
RUWE (>1.4 is poor)  : 1.08
K magnitude            : 8.627
G magnitude            : 14.941
RP magnitude          : 13.415
BP magnitude          : 18.279
DUPflag               : 0
Distance (au)         : 4.275
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -15.40
Sun-Target sep (deg)  : 164.55
Sun-Moon sep (deg)    : 163.46
B (ring opening deg)  : -2.42
PA of pole (deg)      : 0.89
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 8.881
C/A sky separation (km) : 27532.3
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
    
```

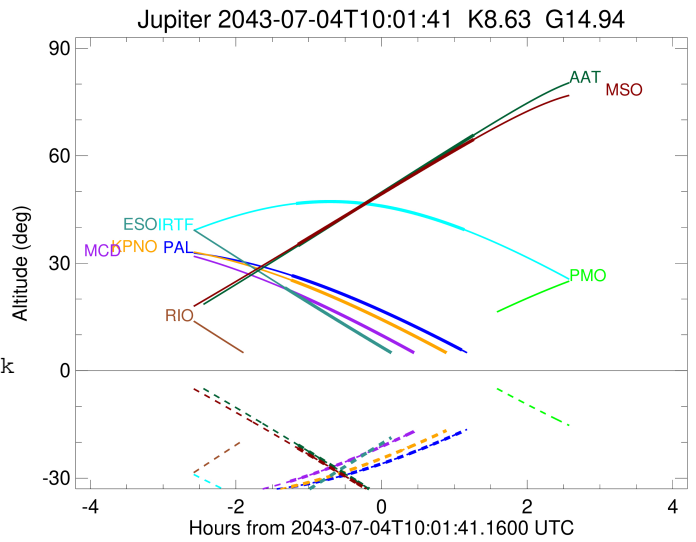
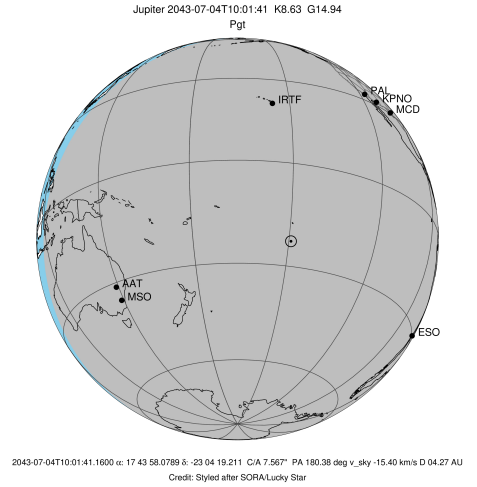


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-04T08:46:28.691	22.24	-30.88	71490.8	22.57	25.39
Jupiter	E	2043-07-04T11:07:33.435	-2.44x	-10.28	71490.8	22.60	25.42

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-04T10:00:35.040
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        : 4116862664457270912
2Mass ID (if available) : 17435809-2304190
ICRS Star Coord at Epoch: 17h 43m 58.07890s -23:04:19.21079s
RUWE (>1.4 is poor) : 1.08
K magnitude           : 8.627
G magnitude           : 14.941
RP magnitude          : 13.415
BP magnitude          : 18.279
DUPflag              : 0
Distance (au)         : 4.275
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.40
Sun-Target sep (deg)  : 164.55
Sun-Moon sep (deg)   : 163.08
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.89
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 8.965
C/A sky separation (km) : 27793.7
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
    
```

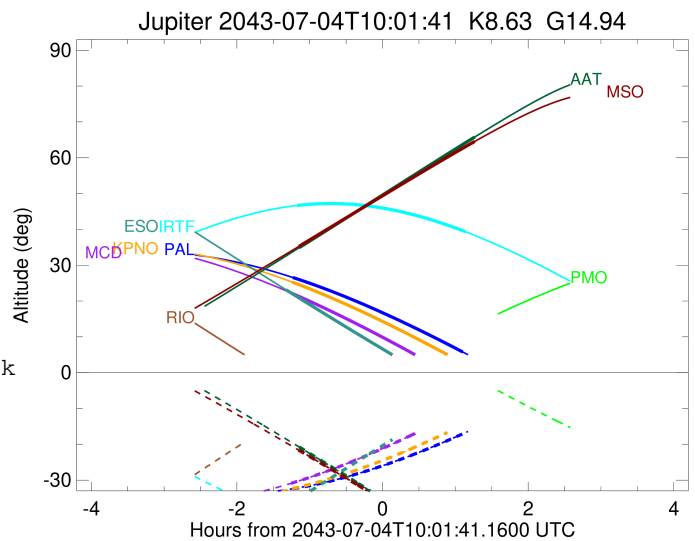
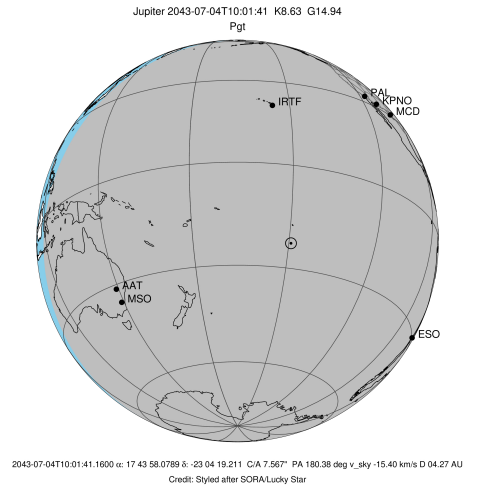


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-04T08:51:13.941	46.66	-41.53	71490.8	22.36	25.17
Jupiter	E	2043-07-04T11:10:03.898	39.34	-46.12	71490.8	23.16	26.04

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-04T09:55:53.660
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        : 4116862664457270912
2Mass ID (if available) : 17435809-2304190
ICRS Star Coord at Epoch: 17h 43m 58.07890s -23:04:19.21079s
RUWE (>1.4 is poor) : 1.08
K magnitude           : 8.627
G magnitude           : 14.941
RP magnitude          : 13.415
BP magnitude          : 18.279
DUPflag              : 0
Distance (au)         : 4.275
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.40
Sun-Target sep (deg)  : 164.55
Sun-Moon sep (deg)    : 163.25
B (ring opening deg) : -2.42
PA of pole (deg)      : 0.89
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 6.615
C/A sky separation (km) : 20506.8
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
    
```

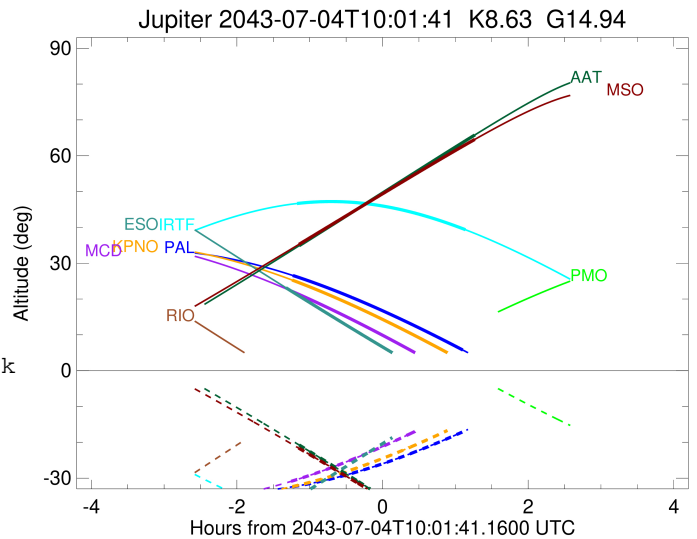
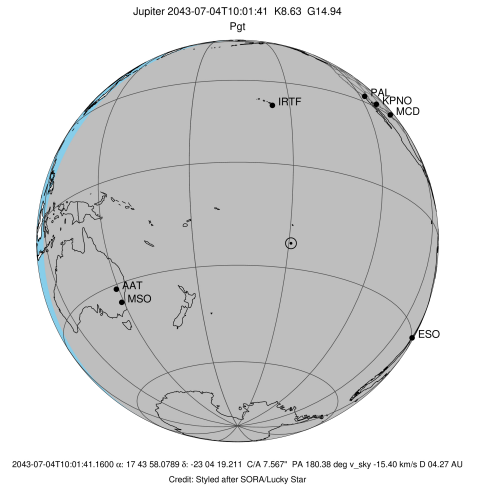


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-04T08:41:58.799	23.17	-37.42	71491.3	16.73	18.96
Jupiter	E	2043-07-04T11:10:27.787	-6.81x	-6.19	71491.4	16.58	18.79

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-04T10:05:36.510
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        : 4116862664457270912
2Mass ID (if available) : 17435809-2304190
ICRS Star Coord at Epoch: 17h 43m 58.07890s -23:04:19.21079s
RUWE (>1.4 is poor) : 1.08
K magnitude           : 8.627
G magnitude           : 14.941
RP magnitude          : 13.415
BP magnitude          : 18.279
DUPflag              : 0
Distance (au)         : 4.275
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.40
Sun-Target sep (deg)  : 164.55
Sun-Moon sep (deg)    : 162.16
B (ring opening deg) : -2.42
PA of pole (deg)      : 0.89
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 7.097
C/A sky separation (km) : 22002.7
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
    
```

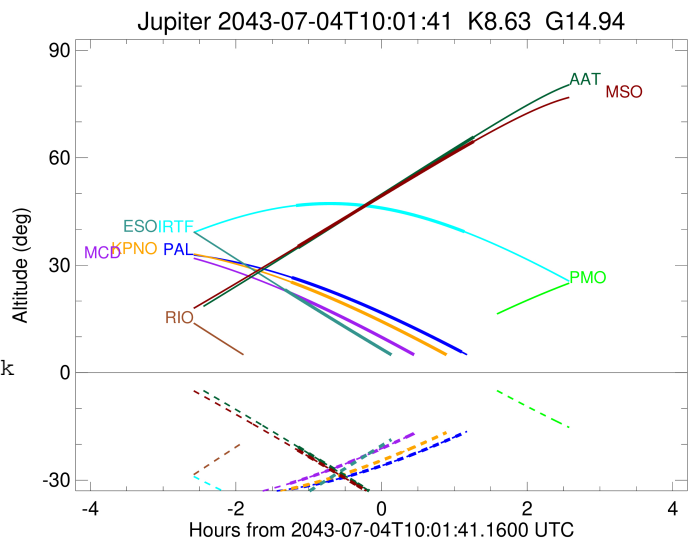
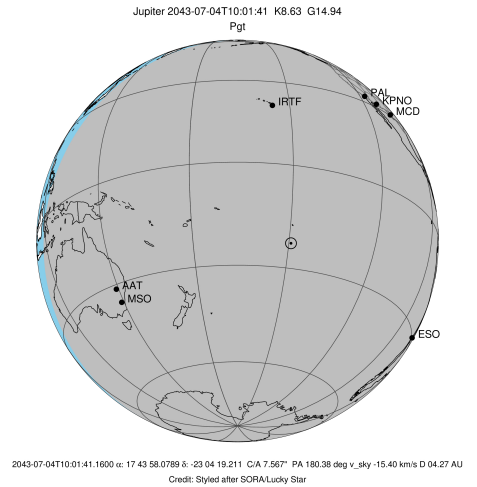


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-04T08:53:06.661	34.90	-20.77	71491.3	16.95	19.20
Jupiter	E	2043-07-04T11:17:44.562	65.78	-51.39	71491.2	18.74	21.18

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-04T10:05:26.390
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      : 4116862664457270912
2Mass ID (if available) : 17435809-2304190
ICRS Star Coord at Epoch: 17h 43m 58.07890s -23:04:19.21079s
RUWE (>1.4 is poor) : 1.08
K magnitude          : 8.627
G magnitude          : 14.941
RP magnitude         : 13.415
BP magnitude         : 18.279
DUPflag             : 0
Distance (au)       : 4.275
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.40
Sun-Target sep (deg) : 164.55
Sun-Moon sep (deg)  : 162.17
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.89
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 6.963
C/A sky separation (km) : 21586.2
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	2043-07-04T08:52:44.919	35.23	-21.64	71491.3	16.62	18.83
Jupiter	E	2043-07-04T11:17:46.957	64.55	-51.06	71491.2	18.37	20.78