

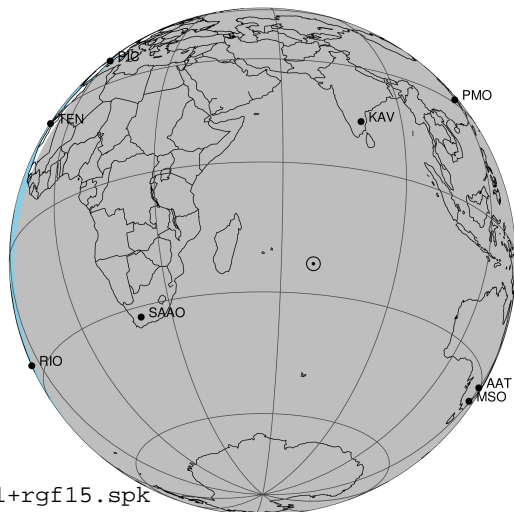
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-06-30T19:31:48.960
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068834209937559424
 2Mass ID (if available) : 17455205-2304220

Jupiter 2043-06-30T19:31:48 K9.60 G14.68 Pgt

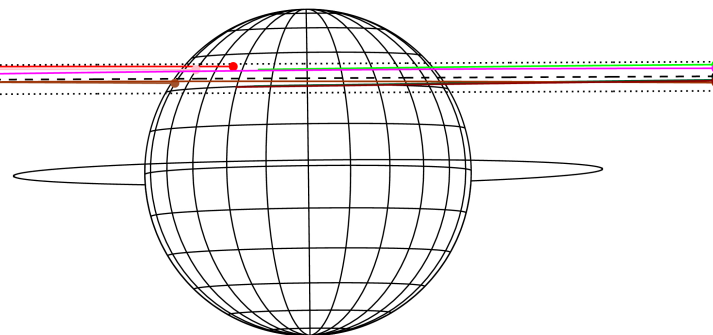
ICRS Star Coord at Epoch: 17h 45m 52.04312s -23:04:22.38554s

RUWE (>1.4 is poor) : 1.01
 K magnitude : 9.596
 G magnitude : 14.682
 RP magnitude : 13.368
 BP magnitude : 16.681
 DUPflag : 0
 Distance (au) : 4.263
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -15.85
 Sun-Target sep (deg) : 168.42
 Sun-Moon sep (deg) : 110.54
 B (ring opening deg) : -2.42
 PA of pole (deg) : 0.69
 Pole direction: RA (deg): 268.05669
 Dec (deg): 64.49732
 C/A sky separation (") : 13.361
 C/A sky separation (km) : 41309.8
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-06-30T19:31:48 K9.60 G14.68
 Pgt



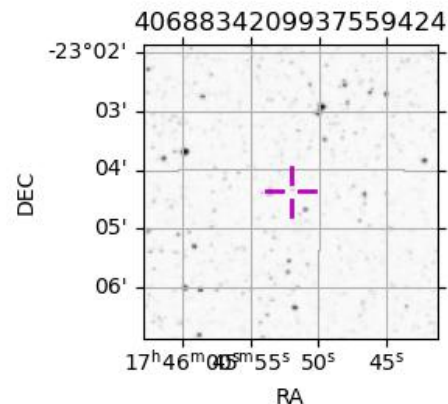
Earth
 PIC
 PMO
 TEN
 KAV
 RIO
 ESO
 AAT
 SAAO
 MSO



2043-06-30T19:31:48.9600 a: 17 45 52.0431 s: -23 04 22.386 C/A ***** PA 180.26 deg v_sky -15.85 km/s D 04.26 AU
 Credit: Styled after SORA/Lucky Star

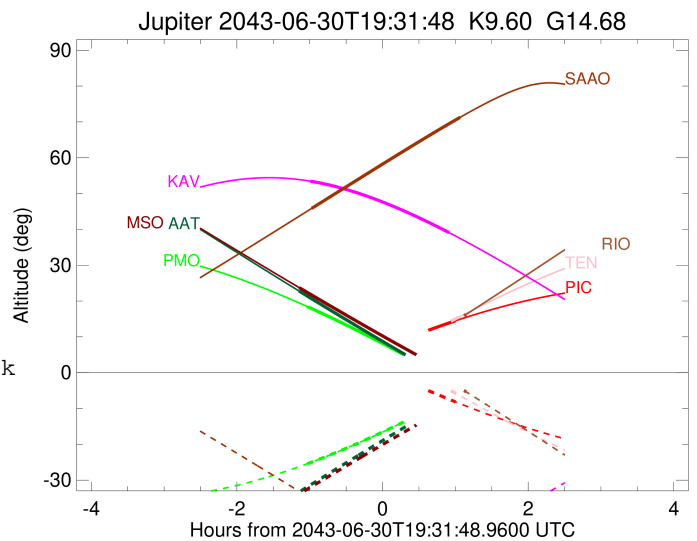
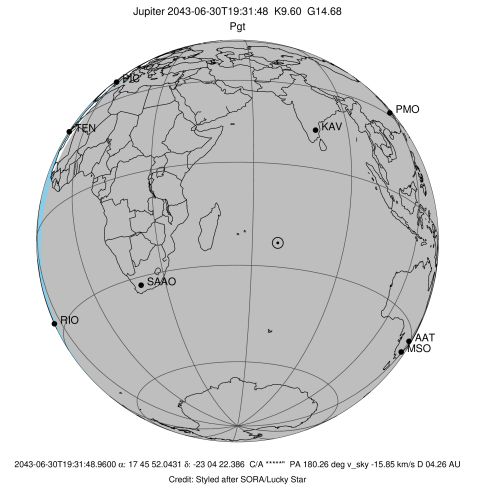
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	JUN 30 20:31 - JUN 30 20:31	Pne
PAL	Palomar Mt (200")	33.4	243.1			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+	JUN 30 18:29 - JUN 30 18:29	Pin
KPNO	Kitt Peak Natl Obs	32.0	248.4			Pnn
MCD	McDonald Obs. 2.7m	30.7	256.0			Pnn
TEN	Teide Obs./Tenerife	28.3	343.5	+	JUN 30 20:34 - JUN 30 20:34	Pne
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+ +	JUN 30 18:32 - JUN 30 20:26	Pie
RIO	Rio de Janeiro	-22.9	316.8	+ +	JUN 30 20:40 - JUN 30 20:40	Pne
ESO	European Southern Obs. (3.6m)	-29.3	289.3			Pnn
AAT	Siding Spring (AAT)	-31.3	149.1	+	JUN 30 18:23 - JUN 30 18:23	Pin
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	JUN 30 18:33 - JUN 30 20:35	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	JUN 30 18:23 - JUN 30 18:23	Pin



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-30T19:35:28.970
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : PIC
Location              : Pic du Midi
Latitude (deg)        : 42.93656
E. Longitude (deg)    : 0.14231
Altitude (km)         : 2.890
Gaia source ID       : 4068834209937559424
2Mass ID (if available) : 17455205-2304220
ICRS Star Coord at Epoch: 17h 45m 52.04312s -23:04:22.38554s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 9.596
G magnitude           : 14.682
RP magnitude          : 13.368
BP magnitude          : 16.681
DUPflag              : 0
Distance (au)        : 4.263
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.85
Sun-Target sep (deg) : 168.42
Sun-Moon sep (deg)   : 110.44
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.69
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 14.994
C/A sky separation (km): 46358.7
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
    
```

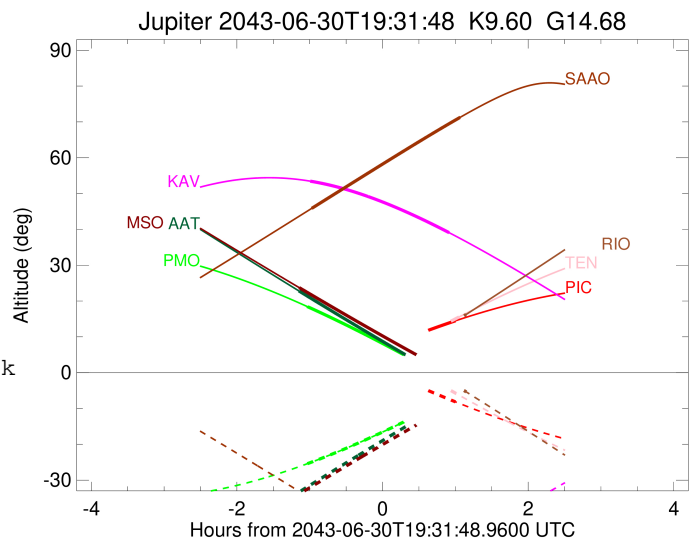
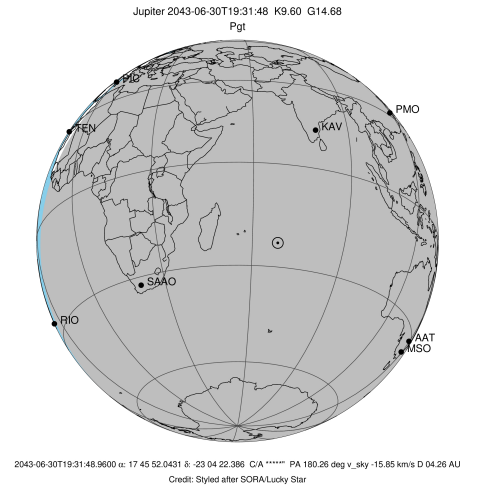


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-30T18:38:49.147	-1.09x	9.32x	71488.8	39.54	43.25
Jupiter	E	2043-06-30T20:31:55.552	14.48	-8.14	71488.5	41.15	44.87

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-30T19:27:11.270
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      : 4068834209937559424
2Mass ID (if available) : 17455205-2304220
ICRS Star Coord at Epoch: 17h 45m 52.04312s -23:04:22.38554s
RUWE (>1.4 is poor) : 1.01
K magnitude          : 9.596
G magnitude          : 14.682
RP magnitude         : 13.368
BP magnitude         : 16.681
DUPflag             : 0
Distance (au)       : 4.263
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.85
Sun-Target sep (deg) : 168.42
Sun-Moon sep (deg)  : 110.93
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.69
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 14.683
C/A sky separation (km) : 45395.8
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
    
```

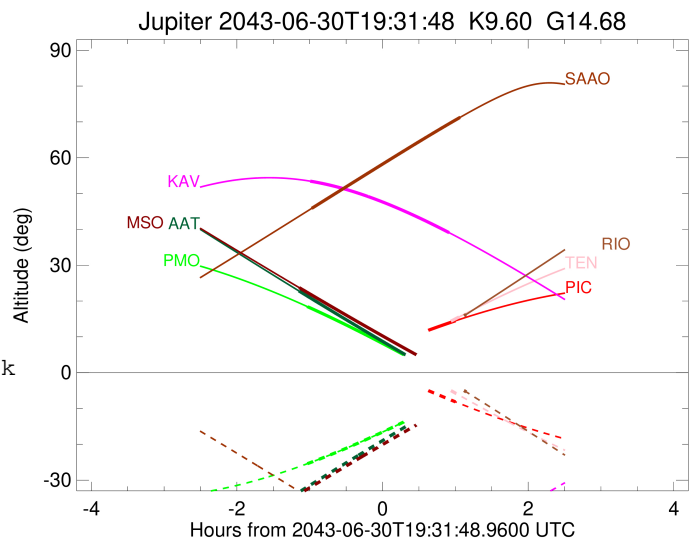
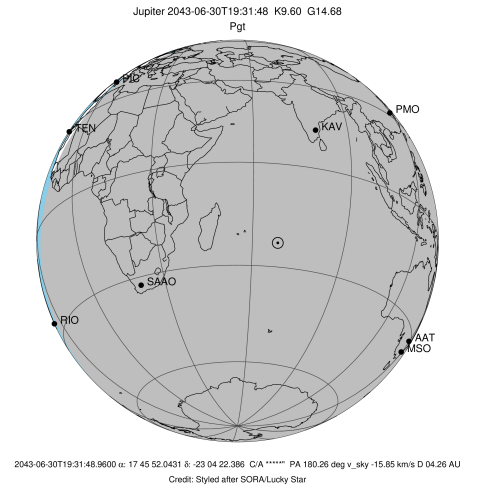


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-30T18:29:54.348	18.44	-25.41	71488.8	39.41	43.11
Jupiter	E	2043-06-30T20:24:47.279	-1.59x	-7.68	71488.8	39.28	42.98

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-30T19:36:56.750
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : TEN
Location              : Teide Obs./Tenerife
Latitude (deg)        : 28.30050
E. Longitude (deg)    : 343.48909
Altitude (km)         : 2.395
Gaia source ID        : 4068834209937559424
2Mass ID (if available) : 17455205-2304220
ICRS Star Coord at Epoch: 17h 45m 52.04312s -23:04:22.38554s
RUWE (>1.4 is poor)  : 1.01
K magnitude           : 9.596
G magnitude           : 14.682
RP magnitude          : 13.368
BP magnitude          : 16.681
DUPflag              : 0
Distance (au)         : 4.263
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -15.85
Sun-Target sep (deg)  : 168.42
Sun-Moon sep (deg)    : 110.31
B (ring opening deg)  : -2.42
PA of pole (deg)      : 0.69
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 14.493
C/A sky separation (km) : 44809.5
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
    
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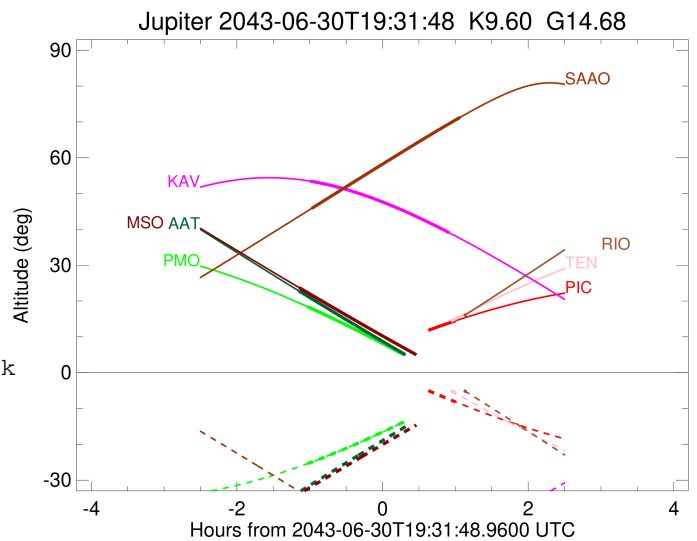
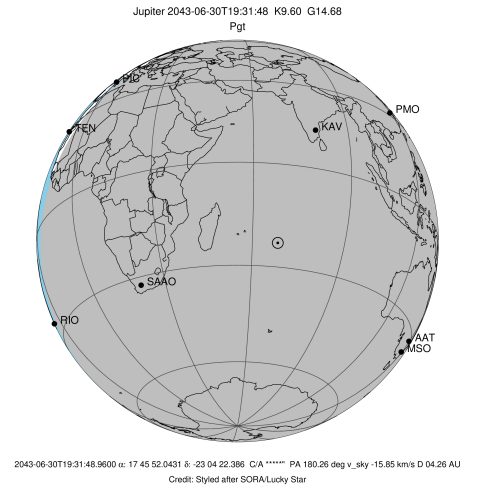


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-30T18:38:40.661	-6.73x	17.14x	71489.0	37.79	41.46
Jupiter	E	2043-06-30T20:34:52.922	15.54	-6.28	71488.7	39.70	43.41

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-30T19:29:28.390
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : KAV
Location             : Kavalur Observatory
Latitude (deg)       : 12.57556
E. Longitude (deg)   : 78.83167
Altitude (km)        : 0.722
Gaia source ID       : 4068834209937559424
2Mass ID (if available) : 17455205-2304220
ICRS Star Coord at Epoch: 17h 45m 52.04312s -23:04:22.38554s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 9.596
G magnitude           : 14.682
RP magnitude          : 13.368
BP magnitude          : 16.681
DUPflag              : 0
Distance (au)        : 4.263
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.85
Sun-Target sep (deg) : 168.42
Sun-Moon sep (deg)   : 111.35
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.69
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 14.500
C/A sky separation (km): 44829.6
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
    
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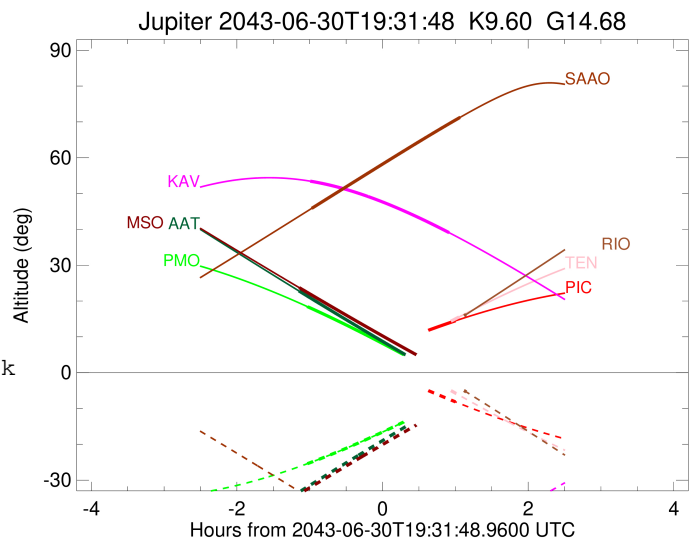
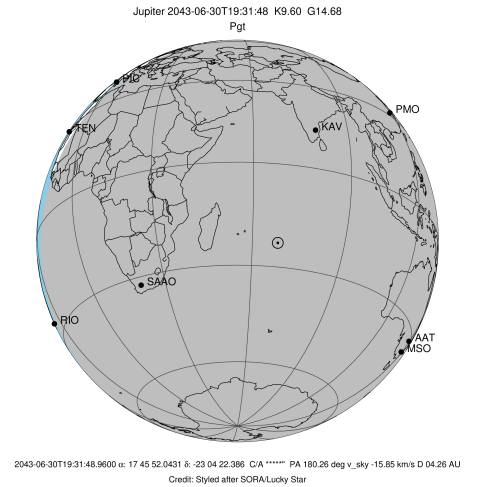


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-30T18:32:25.826	53.44	-54.16	71488.9	38.54	42.23
Jupiter	E	2043-06-30T20:26:40.757	39.08	-47.02	71488.8	38.90	42.59

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-30T19:37:31.140
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : RIO
Location             : Rio de Janeiro
Latitude (deg)       : -22.89506
E. Longitude (deg)   : 316.77708
Altitude (km)        : 0.033
Gaia source ID       : 4068834209937559424
2Mass ID (if available) : 17455205-2304220
ICRS Star Coord at Epoch: 17h 45m 52.04312s -23:04:22.38554s
RUWE (>1.4 is poor) : 1.01
K magnitude          : 9.596
G magnitude          : 14.682
RP magnitude         : 13.368
BP magnitude         : 16.681
DUPflag             : 0
Distance (au)        : 4.263
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.85
Sun-Target sep (deg) : 168.42
Sun-Moon sep (deg)   : 110.25
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.69
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 12.535
C/A sky separation (km) : 38755.2
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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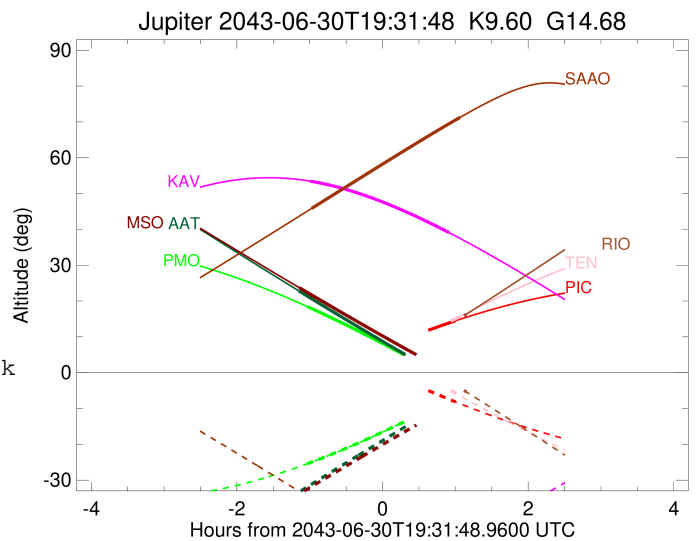
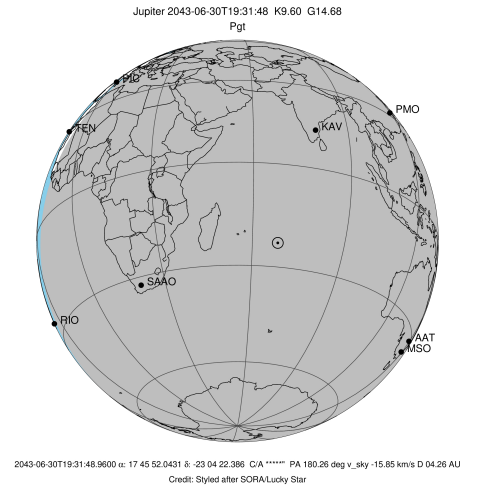


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-30T18:33:55.269	-10.45x	20.02x	71489.8	31.79	35.25
Jupiter	E	2043-06-30T20:40:40.472	16.23	-5.34	71489.5	33.82	37.37

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-30T19:26:28.680
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      : 4068834209937559424
2Mass ID (if available) : 17455205-2304220
ICRS Star Coord at Epoch: 17h 45m 52.04312s -23:04:22.38554s
RUWE (>1.4 is poor) : 1.01
K magnitude          : 9.596
G magnitude          : 14.682
RP magnitude         : 13.368
BP magnitude         : 16.681
DUPflag             : 0
Distance (au)       : 4.263
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -15.85
Sun-Target sep (deg) : 168.42
Sun-Moon sep (deg)  : 110.98
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.69
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (" ) : 12.354
C/A sky separation (km) : 38195.3
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
    
```

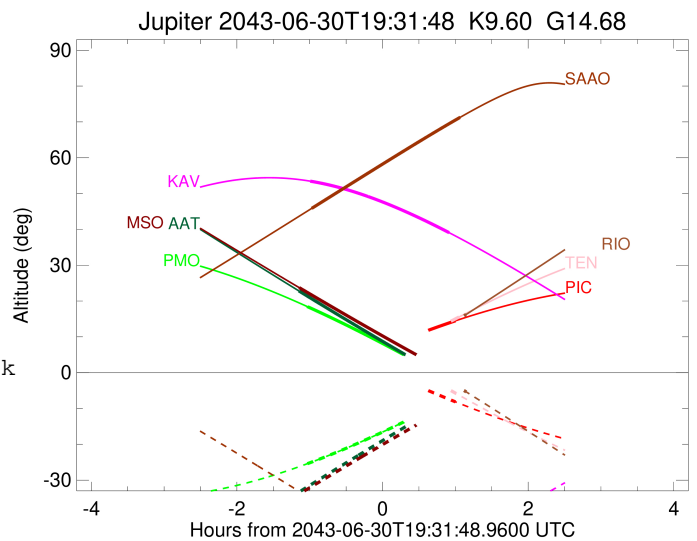
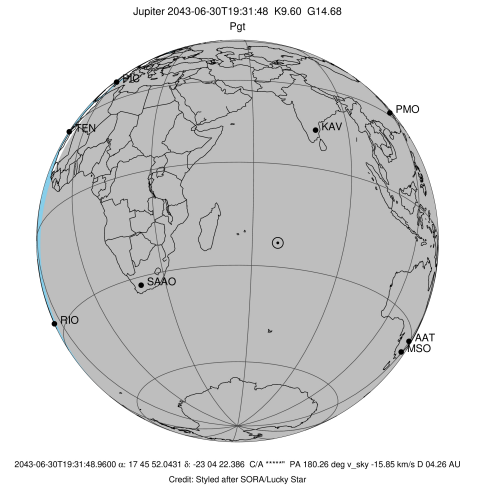


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-30T18:23:05.646	22.78	-33.32	71489.7	32.40	35.89
Jupiter	E	2043-06-30T20:30:18.628	-2.60x	-7.16	71489.7	32.13	35.61

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-30T19:34:45.080
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : SAAO
Location            : So. Afr. Astro. Obs. (Sutherland)
Latitude (deg)      : -32.37953
E. Longitude (deg)  : 20.81070
Altitude (km)       : 1.768
Gaia source ID      : 4068834209937559424
2Mass ID (if available) : 17455205-2304220
ICRS Star Coord at Epoch: 17h 45m 52.04312s -23:04:22.38554s
RUWE (>1.4 is poor) : 1.01
K magnitude          : 9.596
G magnitude          : 14.682
RP magnitude         : 13.368
BP magnitude         : 16.681
DUPflag             : 0
Distance (au)       : 4.263
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -15.85
Sun-Target sep (deg) : 168.42
Sun-Moon sep (deg)  : 111.14
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.69
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 12.919
C/A sky separation (km) : 39942.1
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
    
```

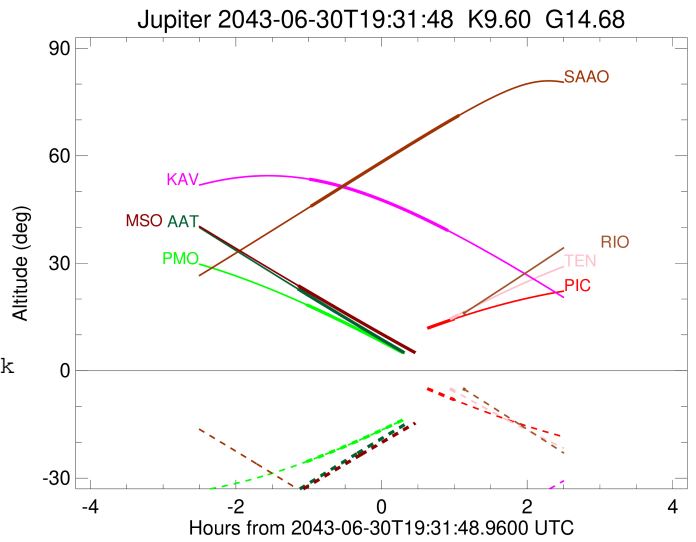
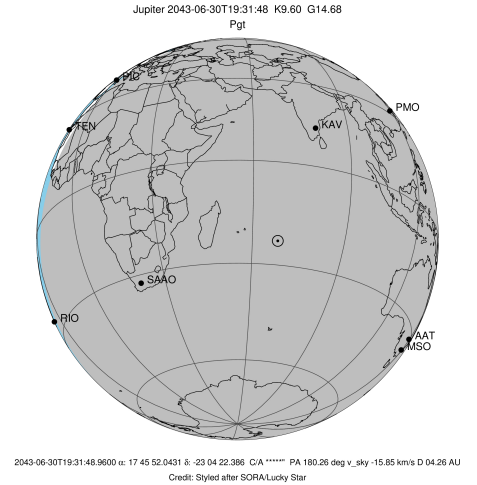


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-30T18:33:30.210	45.86	-35.30	71489.6	33.15	36.68
Jupiter	E	2043-06-30T20:35:47.974	71.27	-61.06	71489.4	34.59	38.18


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-30T19:26:42.940
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        : 4068834209937559424
2Mass ID (if available) : 17455205-2304220
ICRS Star Coord at Epoch: 17h 45m 52.04312s -23:04:22.38554s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 9.596
G magnitude           : 14.682
RP magnitude          : 13.368
BP magnitude          : 16.681
DUPflag              : 0
Distance (au)         : 4.263
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.85
Sun-Target sep (deg)  : 168.42
Sun-Moon sep (deg)    : 110.99
B (ring opening deg)  : -2.42
PA of pole (deg)      : 0.69
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 12.244
C/A sky separation (km) : 37854.4
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	2043-06-30T18:23:06.054	23.75	-33.88	71489.7	32.05	35.53
Jupiter	E	2043-06-30T20:30:45.761	-0.67x	-8.66	71489.8	31.83	35.30