

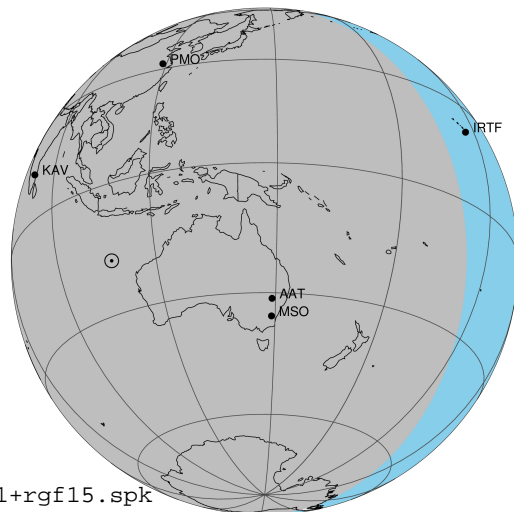
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-05-11T16:45:25.830
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068890117501641600
 2Mass ID (if available) : 17490595-2253500

Jupiter 2031-05-11T16:45:25 K8.68 G13.19 Pgt

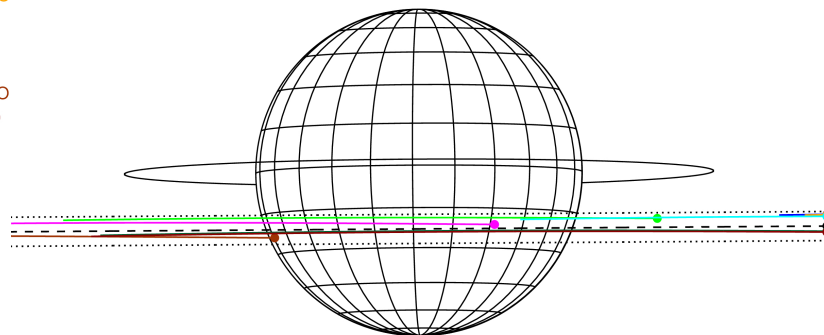
ICRS Star Coord at Epoch: 17h 49m 05.96681s -22:53:49.97745s

RUWE (>1.4 is poor) : 0.80
 K magnitude : 8.680
 G magnitude : 13.189
 RP magnitude : 12.026
 BP magnitude : 14.630
 DUPflag : 0
 Distance (au) : 4.452
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -10.46
 Sun-Target sep (deg) : 142.88
 Sun-Moon sep (deg) : 25.34
 B (ring opening deg) : -2.60
 PA of pole (deg) : 0.34
 Pole direction: RA (deg): 268.05695
 Dec (deg): 64.49651
 C/A sky separation (") : 7.654
 C/A sky separation (km) : 24711.8
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-05-11T16:45:25 K8.68 G13.19 Pgt



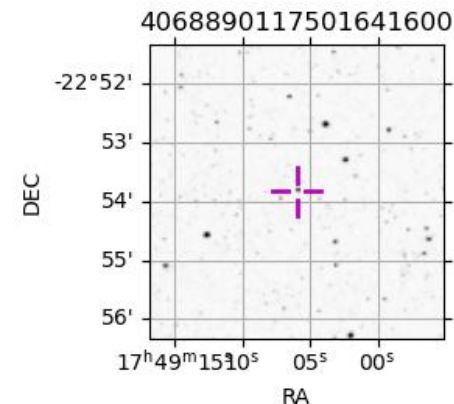
Earth
 PAL
 PMO
 KPNO
 IRTF
 KAV
 AAT
 SAAO
 MSO



2031-05-11T16:45:25.8300 a: 17 49 05.9668 s: -22 53 49.977 C/A 7.666" PA 0.40 deg v_sky -10.46 km/s D 04.45 AU
 Credit: Styled after SORA/Lucky Star

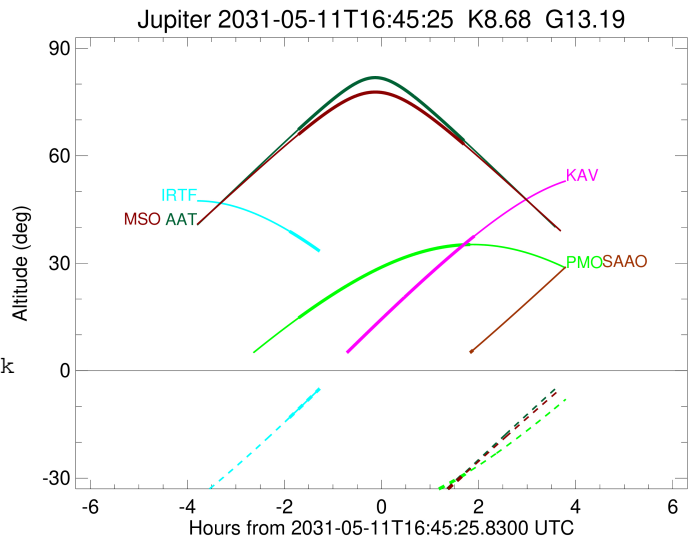
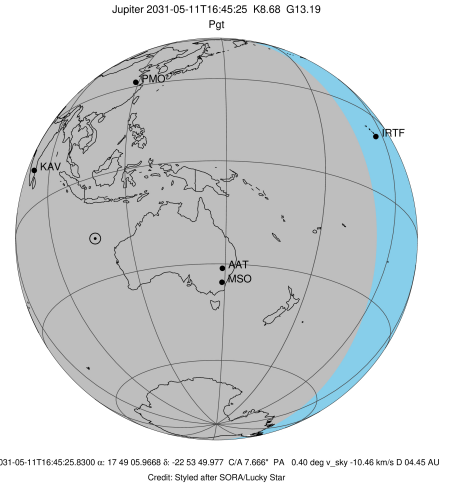
Observable events with sun below -5 deg and altitude above 5 deg

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			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+ +	MAY 11 15:03 - MAY 11 18:35	Pie
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			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+	MAY 11 14:51 - MAY 11 14:51	Pin
KAV	Kavalur Observatory	12.6	78.8	+	MAY 11 18:40 - MAY 11 18:40	Pne
RIO	Rio de Janeiro	-22.9	316.8			Pnn
ESO	European Southern Obs. (3.6m)	-29.3	289.3			Pnn
AAT	Siding Spring (AAT)	-31.3	149.1	+ +	MAY 11 15:02 - MAY 11 18:27	Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	MAY 11 18:38 - MAY 11 18:38	Pne
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	MAY 11 15:02 - MAY 11 18:27	Pie



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target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-11T16:49:36.950
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        : 4068890117501641600
2Mass ID (if available) : 17490595-2253500
ICRS Star Coord at Epoch: 17h 49m 05.96681s -22:53:49.97745s
RUWE (>1.4 is poor) : 0.80
K magnitude           : 8.680
G magnitude           : 13.189
RP magnitude          : 12.026
BP magnitude          : 14.630
DUPflag              : 0
Distance (au)         : 4.452
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -10.46
Sun-Target sep (deg)  : 142.88
Sun-Moon sep (deg)    : 25.82
B (ring opening deg) : -2.60
PA of pole (deg)      : 0.34
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 6.116
C/A sky separation (km) : 19747.9
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
    
```

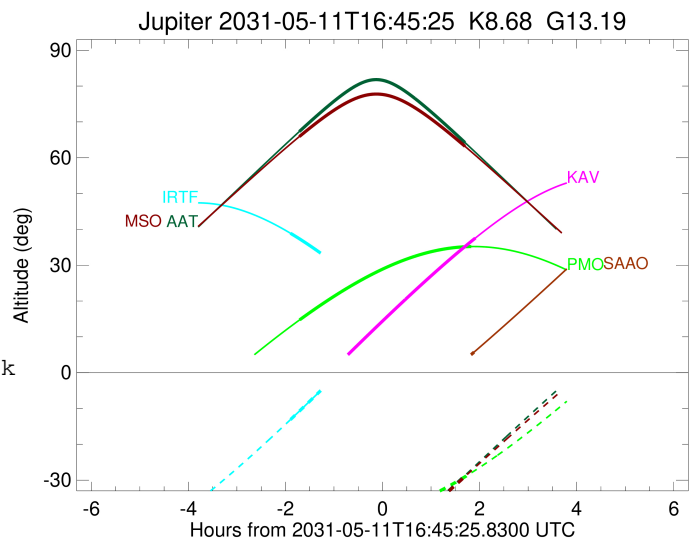
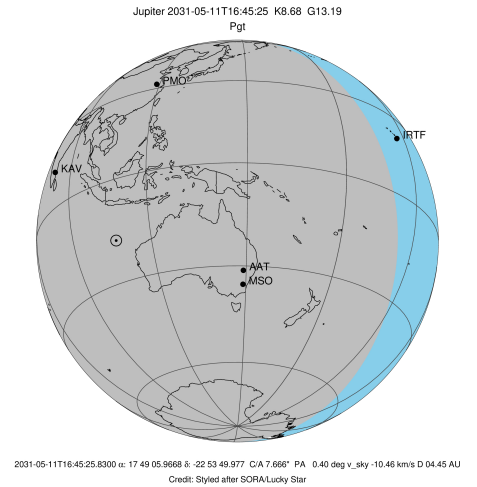


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-11T15:03:06.458	14.75	-38.27	71491.3	-16.49	-18.68
Jupiter	E	2031-05-11T18:35:05.185	35.20	-27.97	71491.3	-15.88	-18.01

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-11T16:37:07.930
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       : 4068890117501641600
2Mass ID (if available) : 17490595-2253500
ICRS Star Coord at Epoch: 17h 49m 05.96681s -22:53:49.97745s
RUWE (>1.4 is poor) : 0.80
K magnitude           : 8.680
G magnitude           : 13.189
RP magnitude          : 12.026
BP magnitude          : 14.630
DUPflag              : 0
Distance (au)         : 4.452
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -10.46
Sun-Target sep (deg) : 142.88
Sun-Moon sep (deg)   : 24.71
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.34
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation ("): 6.623
C/A sky separation (km): 21384.3
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
    
```

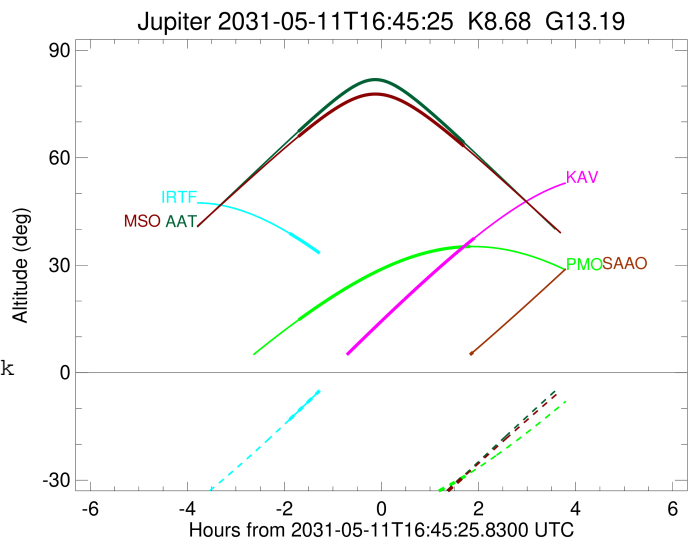
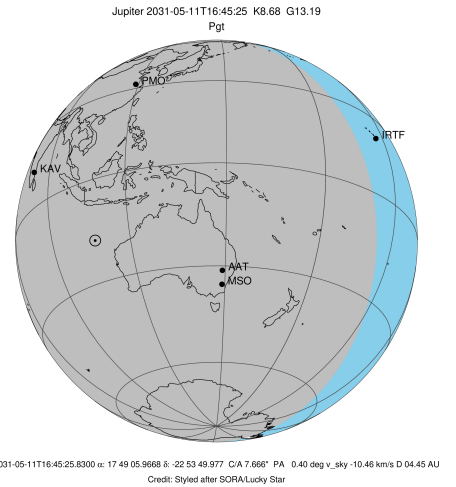


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-11T14:51:37.307	38.92	-13.11	71491.2	-16.72	-18.95
Jupiter	E	2031-05-11T18:24:04.704	-0.73x	34.84x	71491.1	-18.30	-20.70

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-11T16:55:02.730
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        : 4068890117501641600
2Mass ID (if available) : 17490595-2253500
ICRS Star Coord at Epoch: 17h 49m 05.96681s -22:53:49.97745s
RUWE (>1.4 is poor) : 0.80
K magnitude           : 8.680
G magnitude           : 13.189
RP magnitude          : 12.026
BP magnitude          : 14.630
DUPflag              : 0
Distance (au)         : 4.452
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -10.46
Sun-Target sep (deg)  : 142.88
Sun-Moon sep (deg)    : 26.22
B (ring opening deg) : -2.60
PA of pole (deg)      : 0.34
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 6.961
C/A sky separation (km) : 22473.8
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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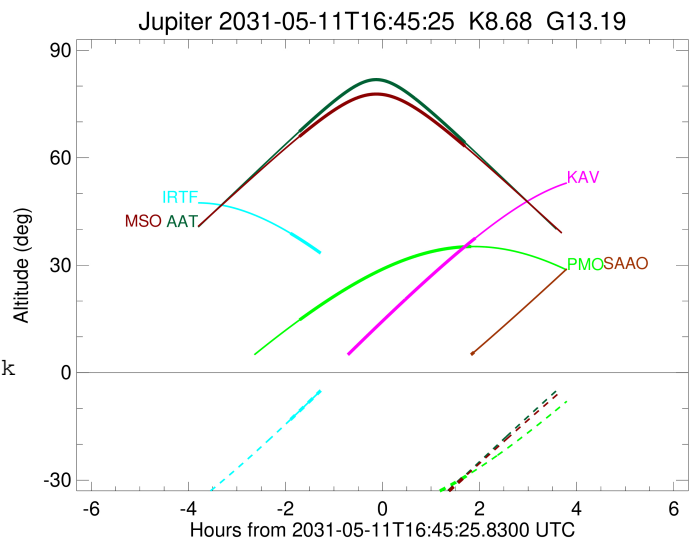
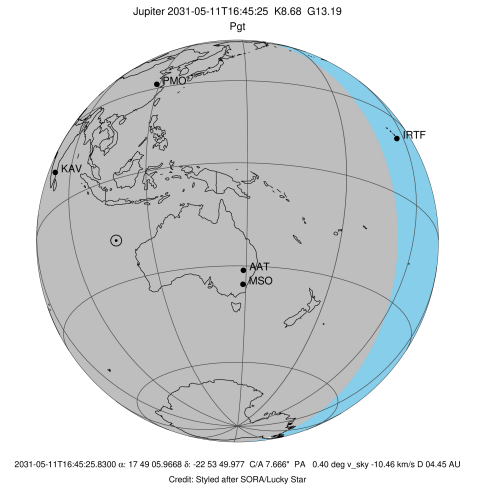


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-11T15:07:41.142	-7.35x	-29.20	71491.0	-19.17	-21.66
Jupiter	E	2031-05-11T18:40:15.528	37.58	-59.53	71491.1	-17.62	-19.95

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-11T16:45:07.620
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        : 4068890117501641600
2Mass ID (if available) : 17490595-2253500
ICRS Star Coord at Epoch: 17h 49m 05.96681s -22:53:49.97745s
RUWE (>1.4 is poor) : 0.80
K magnitude           : 8.680
G magnitude           : 13.189
RP magnitude          : 12.026
BP magnitude          : 14.630
DUPflag              : 0
Distance (au)         : 4.452
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -10.46
Sun-Target sep (deg) : 142.88
Sun-Moon sep (deg)   : 25.77
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.34
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 7.936
C/A sky separation (km) : 25621.6
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
    
```

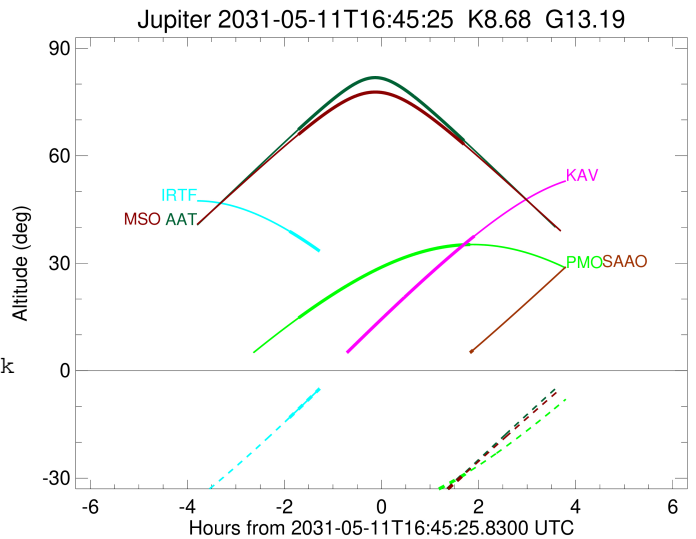
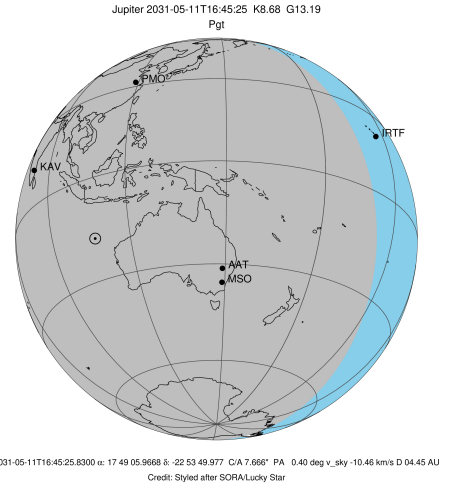


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-11T15:02:34.335	67.29	-70.67	71490.8	-21.08	-23.76
Jupiter	E	2031-05-11T18:27:31.917	64.20	-28.66	71490.8	-21.24	-23.94

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-11T16:53:03.920
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       : 4068890117501641600
2Mass ID (if available) : 17490595-2253500
ICRS Star Coord at Epoch: 17h 49m 05.96681s -22:53:49.97745s
RUWE (>1.4 is poor) : 0.80
K magnitude           : 8.680
G magnitude           : 13.189
RP magnitude          : 12.026
BP magnitude          : 14.630
DUPflag              : 0
Distance (au)        : 4.452
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -10.46
Sun-Target sep (deg) : 142.88
Sun-Moon sep (deg)   : 25.93
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.34
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 8.996
C/A sky separation (km) : 29045.1
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
    
```

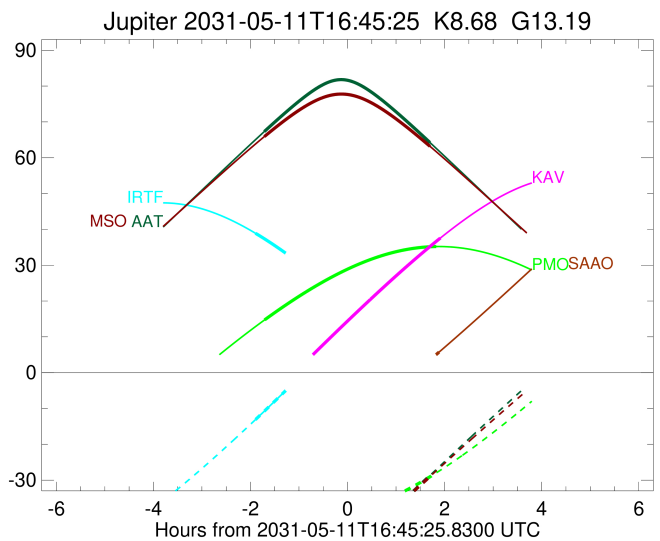
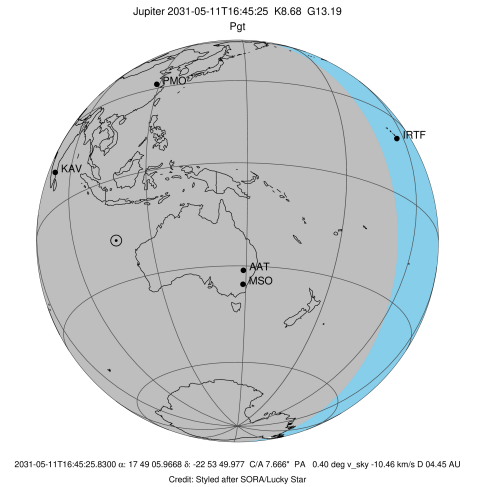


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-11T15:05:46.714	-28.44x	7.78x	71490.4	-24.45	-27.43
Jupiter	E	2031-05-11T18:38:32.141	5.72	-35.68	71490.6	-23.23	-26.11

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-11T16:45:08.750
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      : 4068890117501641600
2Mass ID (if available) : 17490595-2253500
ICRS Star Coord at Epoch: 17h 49m 05.96681s -22:53:49.97745s
RUWE (>1.4 is poor) : 0.80
K magnitude          : 8.680
G magnitude          : 13.189
RP magnitude         : 12.026
BP magnitude         : 14.630
DUPflag             : 0
Distance (au)       : 4.452
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -10.46
Sun-Target sep (deg) : 142.88
Sun-Moon sep (deg)  : 25.77
B (ring opening deg) : -2.60
PA of pole (deg)    : 0.34
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (" ) : 8.072
C/A sky separation (km) : 26062.5
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
    
```



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	2031-05-11T15:02:41.090	65.90	-67.92	71490.8	-21.45	-24.16
Jupiter	E	2031-05-11T18:27:27.195	63.16	-28.97	71490.7	-21.61	-24.35