

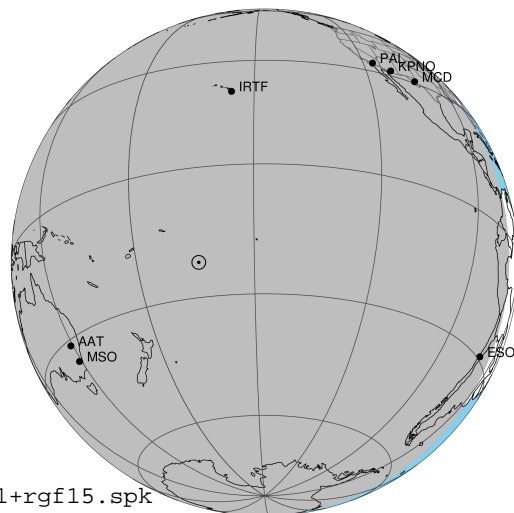
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2031-06-01T10:52:55.090  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4116567346956112512  
 2Mass ID (if available) : 17400169-2252073

Jupiter 2031-06-01T10:52:55 K8.12 G14.23 Pgt

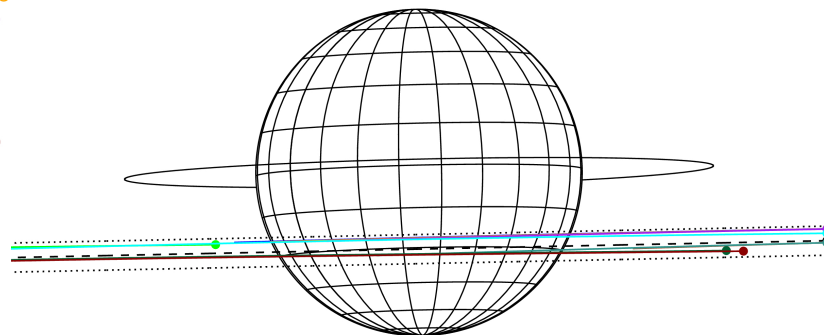
ICRS Star Coord at Epoch: 17h 40m 01.67820s -22:52:07.52423s

RUWE (>1.4 is poor) : 9.24  
 K magnitude : 8.124  
 G magnitude : 14.229  
 RP magnitude : 12.719  
 BP magnitude : 16.519  
 DUPflag : 0  
 Distance (au) : 4.300  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -15.43  
 Sun-Target sep (deg) : 164.94  
 Sun-Moon sep (deg) : 69.40  
 B (ring opening deg) : -2.60  
 PA of pole (deg) : 1.31  
 Pole direction: RA (deg): 268.05693  
 Dec (deg): 64.49651  
 C/A sky separation (") : 10.760  
 C/A sky separation (km) : 33553.1  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2031-06-01T10:52:55 K8.12 G14.23  
 Pgt



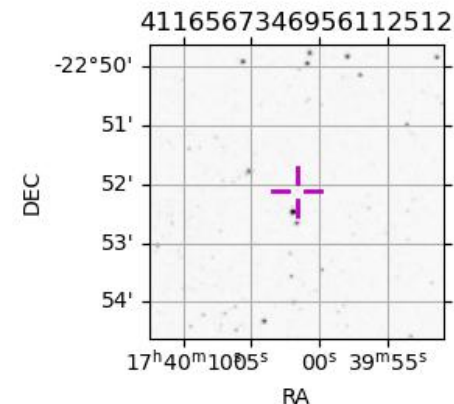
Earth  
 PAL  
 PMO  
 KPNO  
 MCD  
 IRTF  
 RIO  
 ESO  
 AAT  
 MSO



2031-06-01T10:52:55.0900 α: 17 40 01.6782 δ: -22 52 07.524 C/A \*\*\*\*\* PA 1.19 deg v\_sky -15.43 km/s D 04.30 AU  
 Credit: Styled after SORA/Lucky Star

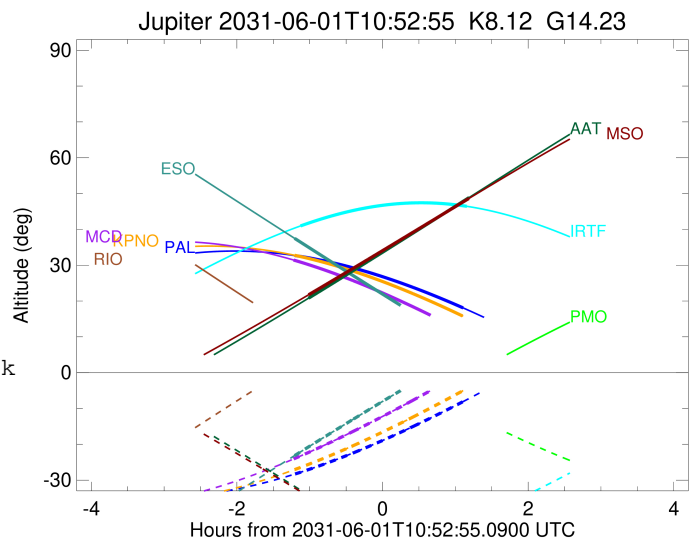
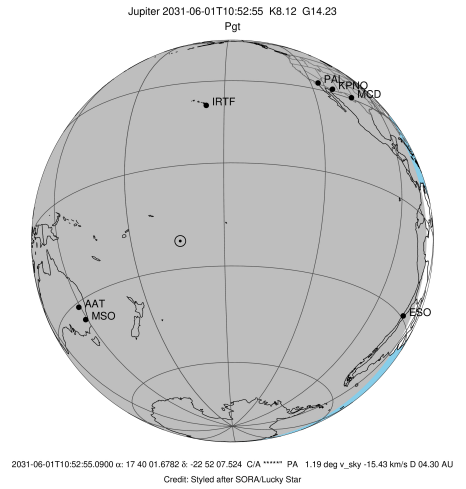
Observable events with sun below -5 deg and altitude above 5 deg

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	+ +	JUN 01 09:40 - JUN 01 11:59	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JUN 01 09:40 - JUN 01 11:58	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+	JUN 01 09:39 - JUN 01 09:39	Pin
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	JUN 01 09:45 - JUN 01 12:02	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	+	JUN 01 09:40 - JUN 01 09:40	Pin
AAT	Siding Spring (AAT)	-31.3	149.1	+ +	JUN 01 09:52 - JUN 01 12:04	Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	JUN 01 09:52 - JUN 01 12:03	Pie



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-06-01T10:50:00.390
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        : 4116567346956112512
2Mass ID (if available) : 17400169-2252073
ICRS Star Coord at Epoch: 17h 40m 01.67820s -22:52:07.52423s
RUWE (>1.4 is poor) : 9.24
K magnitude           : 8.124
G magnitude           : 14.229
RP magnitude          : 12.719
BP magnitude          : 16.519
DUPflag              : 0
Distance (au)         : 4.300
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.43
Sun-Target sep (deg) : 164.94
Sun-Moon sep (deg)   : 69.96
B (ring opening deg) : -2.60
PA of pole (deg)     : 1.31
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 9.138
C/A sky separation (km) : 28496.2
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
    
```

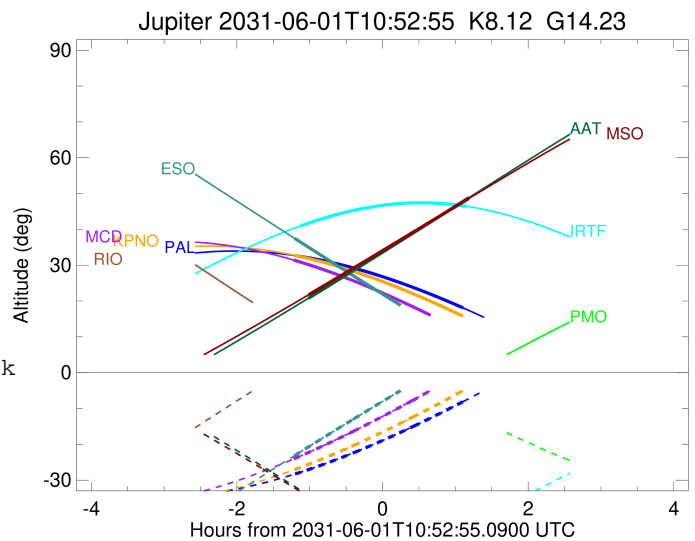
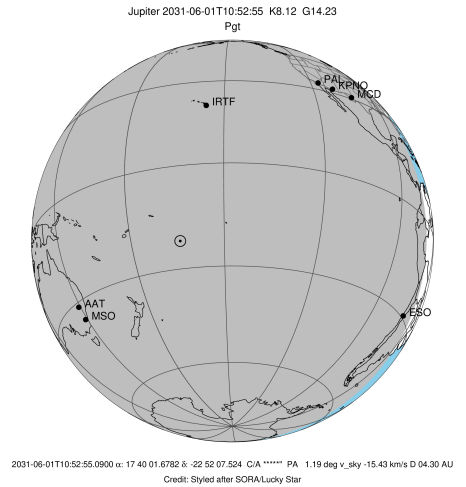


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-01T09:40:50.899	32.68	-28.28	71490.5	-23.42	-26.31
Jupiter	E	2031-06-01T11:59:23.613	18.07	-8.07	71490.5	-23.66	-26.58

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-06-01T10:49:29.340
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      : 4116567346956112512
2Mass ID (if available) : 17400169-2252073
ICRS Star Coord at Epoch: 17h 40m 01.67820s -22:52:07.52423s
RUWE (>1.4 is poor) : 9.24
K magnitude         : 8.124
G magnitude         : 14.229
RP magnitude        : 12.719
BP magnitude        : 16.519
DUPflag            : 0
Distance (au)       : 4.300
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -15.43
Sun-Target sep (deg) : 164.94
Sun-Moon sep (deg)  : 69.96
B (ring opening deg) : -2.60
PA of pole (deg)    : 1.31
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 9.198
C/A sky separation (km) : 28681.1
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
    
```

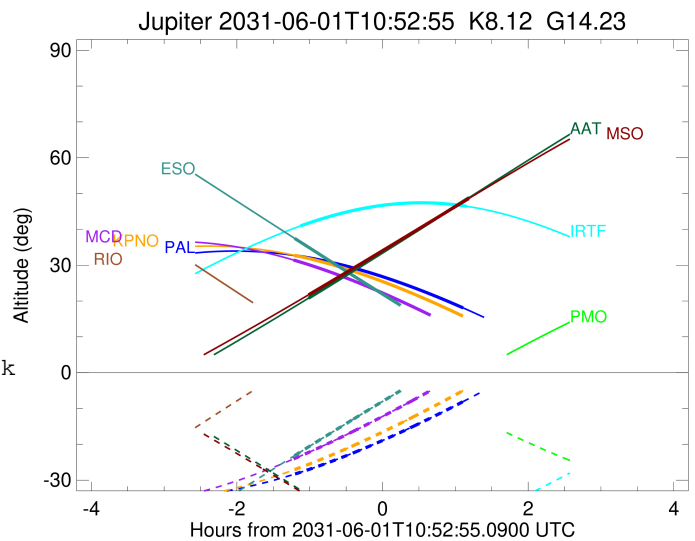
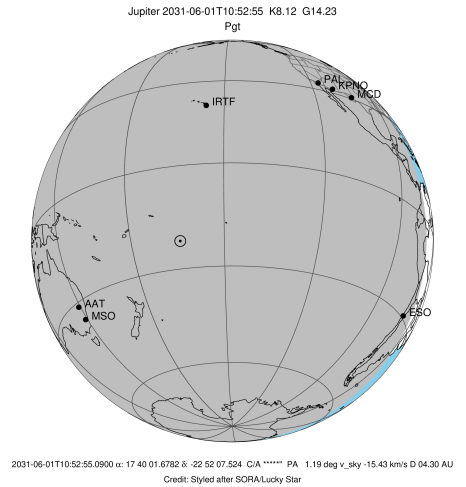


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-01T09:40:22.733	32.77	-27.07	71490.5	-23.53	-26.44
Jupiter	E	2031-06-01T11:58:52.333	15.83	-5.10	71490.5	-23.87	-26.80

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-06-01T10:48:48.230
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       : 4116567346956112512
2Mass ID (if available) : 17400169-2252073
ICRS Star Coord at Epoch: 17h 40m 01.67820s -22:52:07.52423s
RUWE (>1.4 is poor) : 9.24
K magnitude           : 8.124
G magnitude           : 14.229
RP magnitude         : 12.719
BP magnitude         : 16.519
DUPflag              : 0
Distance (au)        : 4.300
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.43
Sun-Target sep (deg) : 164.94
Sun-Moon sep (deg)   : 69.95
B (ring opening deg) : -2.60
PA of pole (deg)     : 1.31
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation ("): 9.278
C/A sky separation (km): 28932.6
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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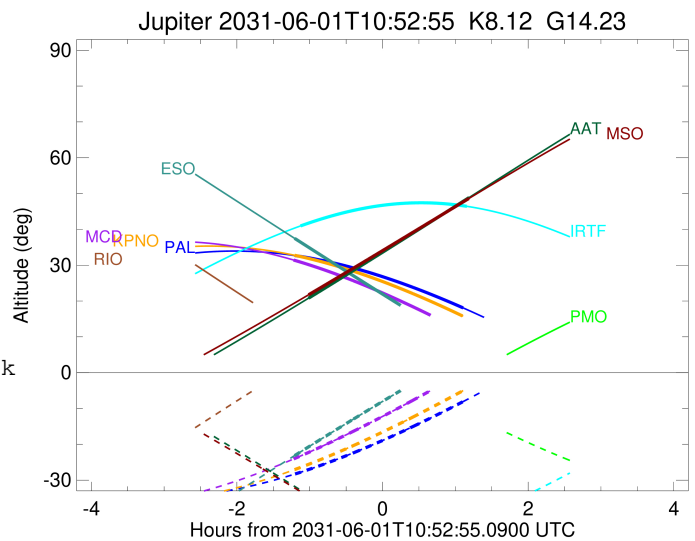
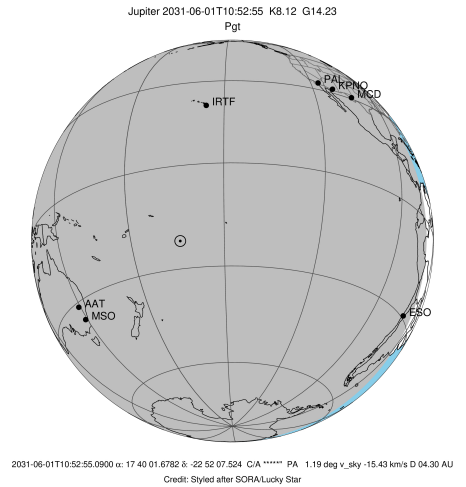


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-01T09:39:43.114	31.43	-24.08	71490.5	-23.68	-26.60
Jupiter	E	2031-06-01T11:58:13.307	11.62	-0.09x	71490.4	-24.15	-27.10

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-06-01T10:53:55.950
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       : 4116567346956112512
2Mass ID (if available) : 17400169-2252073
ICRS Star Coord at Epoch: 17h 40m 01.67820s -22:52:07.52423s
RUWE (>1.4 is poor) : 9.24
K magnitude           : 8.124
G magnitude           : 14.229
RP magnitude         : 12.719
BP magnitude         : 16.519
DUPflag              : 0
Distance (au)        : 4.300
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.43
Sun-Target sep (deg) : 164.94
Sun-Moon sep (deg)  : 70.03
B (ring opening deg) : -2.60
PA of pole (deg)    : 1.31
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 9.387
C/A sky separation (km) : 29271.9
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
    
```

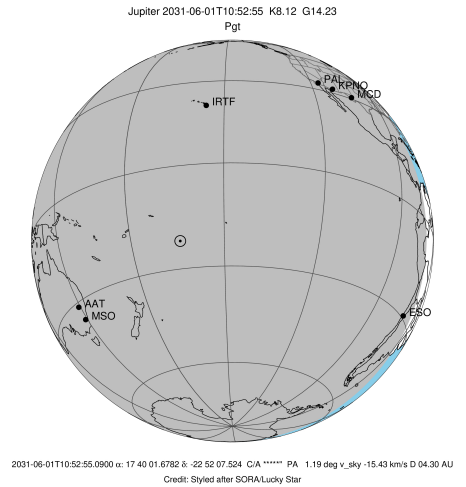


x: target alt < 5.0 deg or sun > -5.0 deg

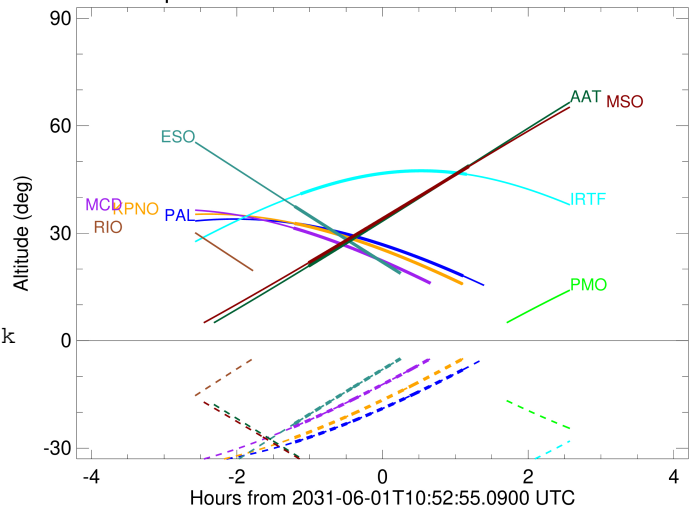
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-01T09:45:23.225	40.96	-47.41	71490.4	-24.47	-27.45
Jupiter	E	2031-06-01T12:02:22.260	46.43	-41.29	71490.5	-24.00	-26.94

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-06-01T10:46:41.070
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       : 4116567346956112512
2Mass ID (if available) : 17400169-2252073
ICRS Star Coord at Epoch: 17h 40m 01.67820s -22:52:07.52423s
RUWE (>1.4 is poor) : 9.24
K magnitude           : 8.124
G magnitude           : 14.229
RP magnitude          : 12.719
BP magnitude          : 16.519
DUPflag              : 0
Distance (au)        : 4.300
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.43
Sun-Target sep (deg) : 164.94
Sun-Moon sep (deg)   : 70.01
B (ring opening deg) : -2.60
PA of pole (deg)     : 1.31
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 11.469
C/A sky separation (km) : 35763.4
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
    
```



Jupiter 2031-06-01T10:52:55 K8.12 G14.23

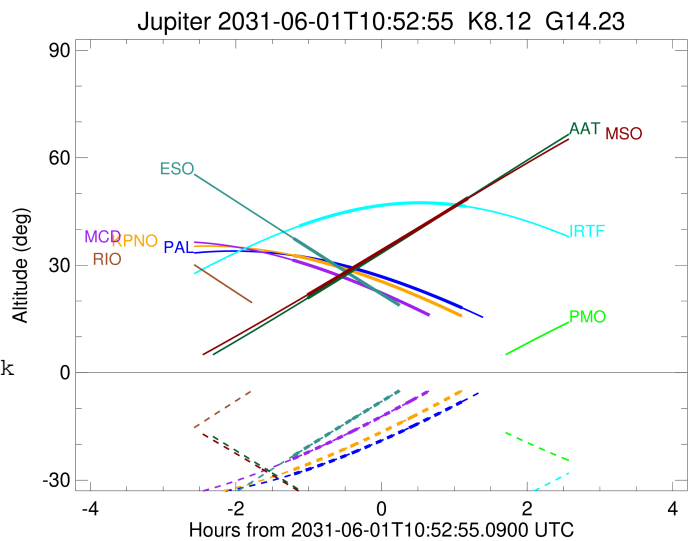
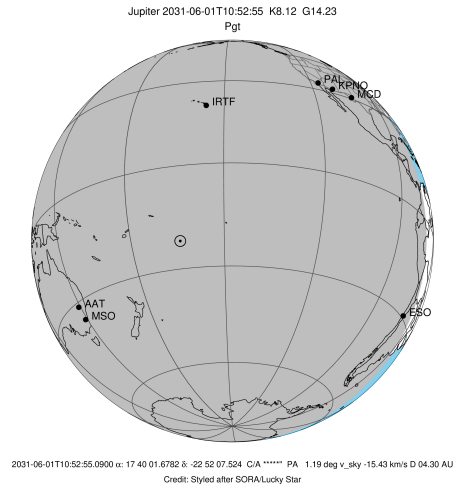


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-01T09:40:32.209	37.48	-23.14	71489.7	-29.59	-32.94
Jupiter	E	2031-06-01T11:53:17.952	9.35	3.97x	71489.6	-30.43	-33.83

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch              : 2031-06-01T10:58:25.880
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        : 4116567346956112512
2Mass ID (if available) : 17400169-2252073
ICRS Star Coord at Epoch: 17h 40m 01.67820s -22:52:07.52423s
RUWE (>1.4 is poor)  : 9.24
K magnitude           : 8.124
G magnitude           : 14.229
RP magnitude          : 12.719
BP magnitude          : 16.519
DUPflag              : 0
Distance (au)         : 4.299
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -15.43
Sun-Target sep (deg)  : 164.94
Sun-Moon sep (deg)    : 69.64
B (ring opening deg)  : -2.60
PA of pole (deg)      : 1.31
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 11.441
C/A sky separation (km) : 35677.7
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
    
```



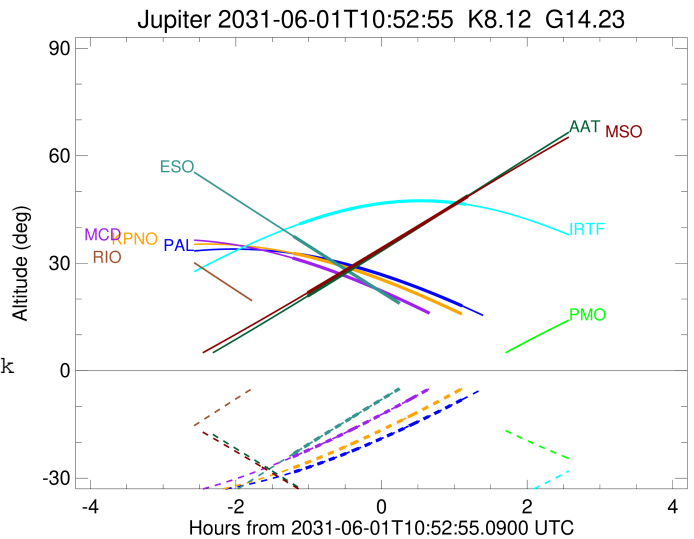
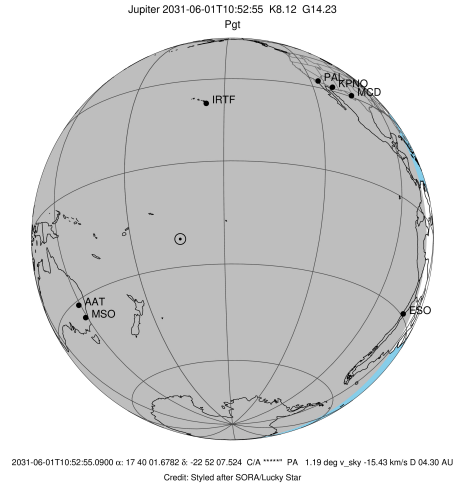
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-01T09:52:06.104	20.82	-34.20	71489.6	-30.57	-33.98
Jupiter	E	2031-06-01T12:04:17.937	48.88	-62.36	71489.8	-29.31	-32.64



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-06-01T10:58:10.970
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        : 4116567346956112512
2Mass ID (if available) : 17400169-2252073
ICRS Star Coord at Epoch: 17h 40m 01.67820s -22:52:07.52423s
RUWE (>1.4 is poor)  : 9.24
K magnitude           : 8.124
G magnitude           : 14.229
RP magnitude          : 12.719
BP magnitude          : 16.519
DUPflag              : 0
Distance (au)         : 4.299
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.43
Sun-Target sep (deg)  : 164.94
Sun-Moon sep (deg)   : 69.66
B (ring opening deg) : -2.60
PA of pole (deg)     : 1.31
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 11.566
C/A sky separation (km) : 36067.6
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	2031-06-01T09:52:04.008	21.75	-34.53	71489.5	-30.91	-34.33
Jupiter	E	2031-06-01T12:03:51.508	48.57	-61.15	71489.7	-29.69	-33.04