

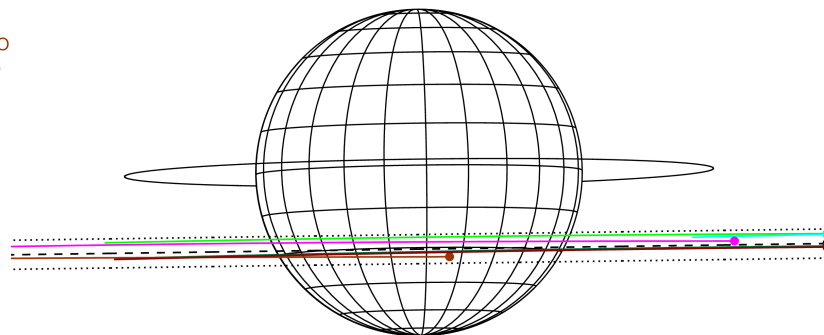
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-05-22T17:56:38.450
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116889190176877184
 2Mass ID (if available) : 17444382-2253146

Jupiter 2031-05-22T17:56:38 K9.55 G14.63 Pgt

ICRS Star Coord at Epoch: 17h 44m 43.82430s -22:53:14.90510s
 RUWE (>1.4 is poor) : 0.90
 K magnitude : 9.553
 G magnitude : 14.625
 RP magnitude : 13.353
 BP magnitude : 16.445
 DUPflag : 0
 Distance (au) : 4.357
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -13.59
 Sun-Target sep (deg) : 154.54
 Sun-Moon sep (deg) : 170.48
 B (ring opening deg) : -2.60
 PA of pole (deg) : 0.81
 Pole direction: RA (deg): 268.05694
 Dec (deg): 64.49651
 C/A sky separation (") : 10.626
 C/A sky separation (km) : 33575.4
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk



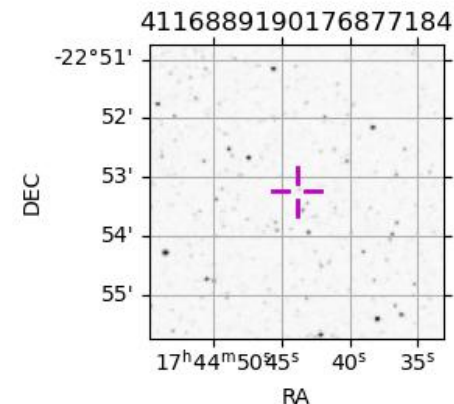
Earth
 PMO
 IRTF
 KAV
 AAT
 SAAO
 MSO



2031-05-22T17:56:38.4500 α: 17 44 43.8243 δ: -22 53 14.905 C/A ***** PA 0.79 deg v_sky -13.59 km/s D 04.36 AU
 Credit: Styled after SORA/Lucky Star

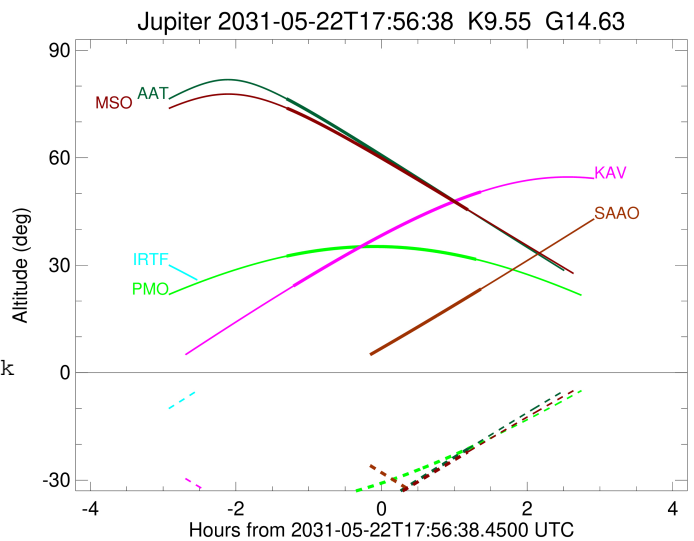
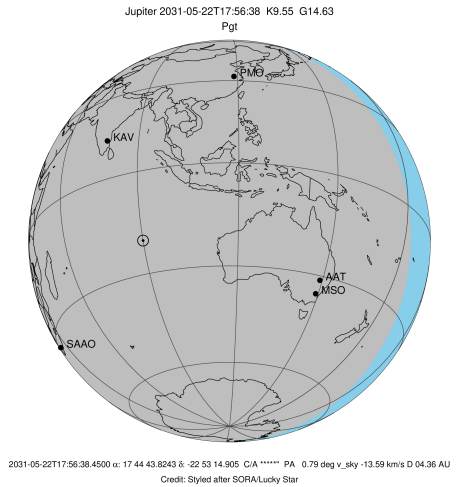
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OEcode
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 22 16:38 - MAY 22 19:14	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			Pnn
KAV	Kavalur Observatory	12.6	78.8	+ +	MAY 22 16:44 - MAY 22 19:18	Pie
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 22 16:38 - MAY 22 19:07	Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8		MAY 22 19:18 - MAY 22 19:18	Pne
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	MAY 22 16:38 - MAY 22 19:07	Pie



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-22T17:56:32.290
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      : 4116889190176877184
2Mass ID (if available) : 17444382-2253146
ICRS Star Coord at Epoch: 17h 44m 43.82430s -22:53:14.90510s
RUWE (>1.4 is poor) : 0.90
K magnitude          : 9.553
G magnitude          : 14.625
RP magnitude         : 13.353
BP magnitude         : 16.445
DUPflag             : 0
Distance (au)       : 4.357
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.59
Sun-Target sep (deg) : 154.54
Sun-Moon sep (deg)  : 170.44
B (ring opening deg) : -2.60
PA of pole (deg)    : 0.81
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (" ) : 8.978
C/A sky separation (km) : 28368.3
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
    
```

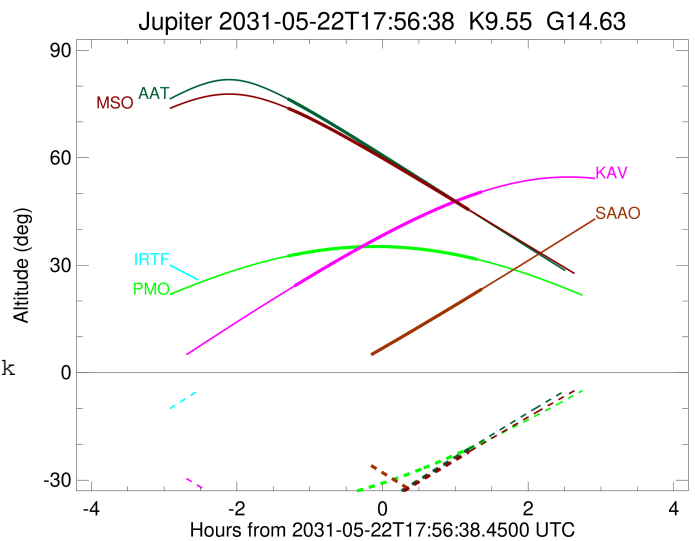


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-22T16:38:20.212	32.53	-36.93	71490.5	-23.48	-26.38
Jupiter	E	2031-05-22T19:14:41.486	31.62	-20.14	71490.5	-23.44	-26.34

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-22T18:01:35.980
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       : 4116889190176877184
2Mass ID (if available) : 17444382-2253146
ICRS Star Coord at Epoch: 17h 44m 43.82430s -22:53:14.90510s
RUWE (>1.4 is poor) : 0.90
K magnitude          : 9.553
G magnitude          : 14.625
RP magnitude         : 13.353
BP magnitude         : 16.445
DUPflag             : 0
Distance (au)        : 4.357
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.59
Sun-Target sep (deg) : 154.54
Sun-Moon sep (deg)   : 169.96
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.81
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation ("): 9.626
C/A sky separation (km): 30416.4
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
    
```

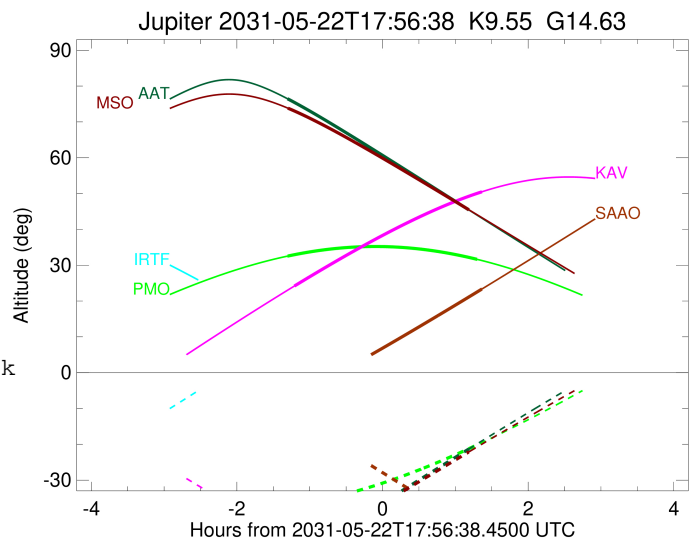
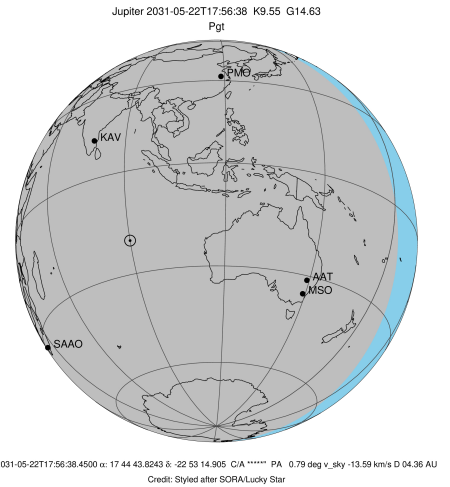


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-22T16:44:03.039	24.18	-46.22	71490.2	-25.71	-28.80
Jupiter	E	2031-05-22T19:18:33.906	50.49	-55.80	71490.4	-24.78	-27.79

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-22T17:52:57.950
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       : 4116889190176877184
2Mass ID (if available) : 17444382-2253146
ICRS Star Coord at Epoch: 17h 44m 43.82430s -22:53:14.90510s
RUWE (>1.4 is poor) : 0.90
K magnitude           : 9.553
G magnitude           : 14.625
RP magnitude          : 13.353
BP magnitude          : 16.445
DUPflag              : 0
Distance (au)        : 4.357
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.59
Sun-Target sep (deg) : 154.54
Sun-Moon sep (deg)   : 171.02
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.81
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 11.000
C/A sky separation (km) : 34756.6
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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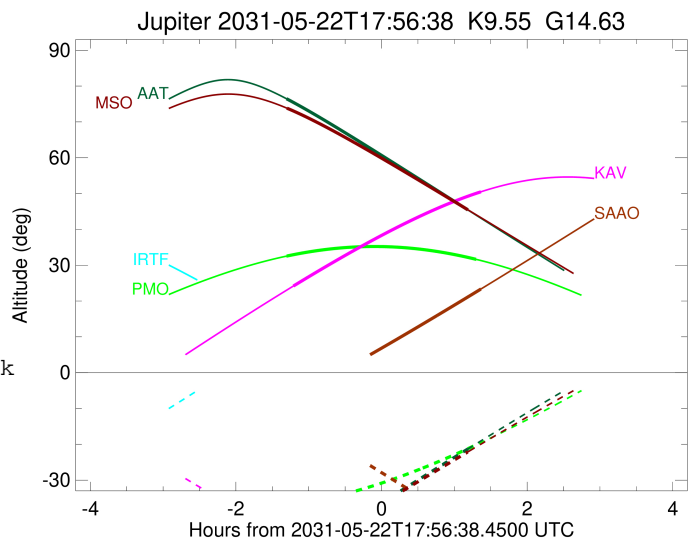
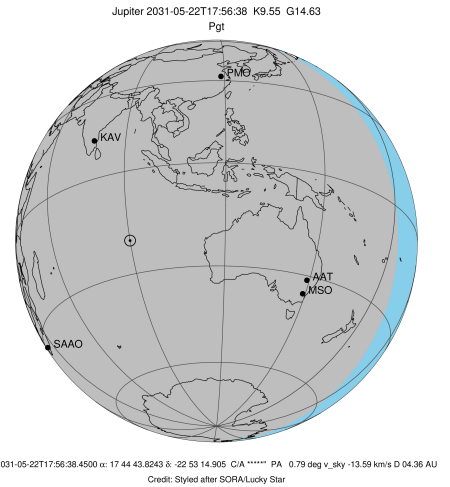


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-22T16:38:25.463	76.45	-53.09	71489.8	-28.86	-32.16
Jupiter	E	2031-05-22T19:07:48.383	45.43	-21.30	71489.8	-29.44	-32.77

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-22T18:03:41.810
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       : 4116889190176877184
2Mass ID (if available) : 17444382-2253146
ICRS Star Coord at Epoch: 17h 44m 43.82430s -22:53:14.90510s
RUWE (>1.4 is poor) : 0.90
K magnitude           : 9.553
G magnitude           : 14.625
RP magnitude          : 13.353
BP magnitude          : 16.445
DUPflag              : 0
Distance (au)         : 4.357
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -13.59
Sun-Target sep (deg)  : 154.54
Sun-Moon sep (deg)   : 169.81
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.81
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 11.690
C/A sky separation (km) : 36936.6
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
    
```

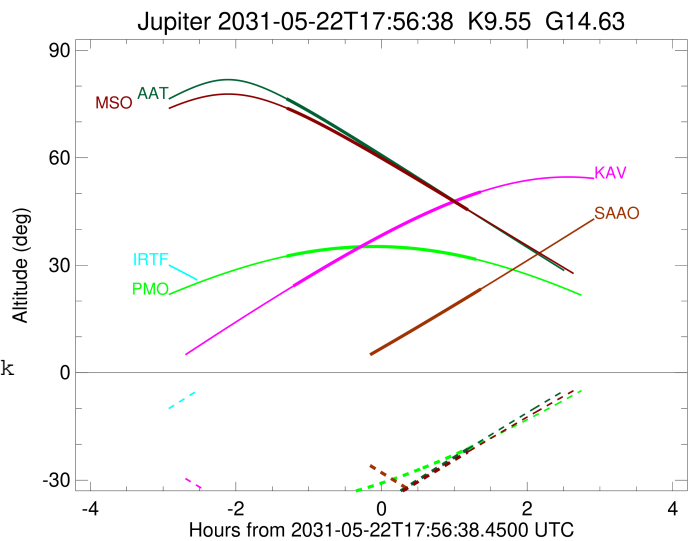
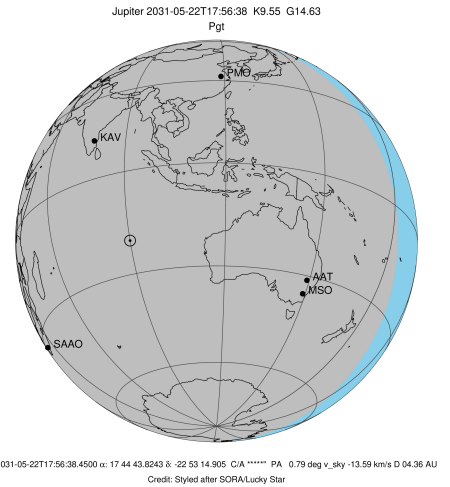


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-22T16:48:03.671	-6.09x	-13.69	71489.4	-31.71	-35.18
Jupiter	E	2031-05-22T19:18:32.615	23.34	-45.17	71489.6	-30.42	-33.81

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-22T17:53:07.480
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      : 4116889190176877184
2Mass ID (if available) : 17444382-2253146
ICRS Star Coord at Epoch: 17h 44m 43.82430s -22:53:14.90510s
RUWE (>1.4 is poor) : 0.90
K magnitude          : 9.553
G magnitude          : 14.625
RP magnitude         : 13.353
BP magnitude         : 16.445
DUPflag             : 0
Distance (au)       : 4.357
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -13.59
Sun-Target sep (deg) : 154.54
Sun-Moon sep (deg)  : 171.01
B (ring opening deg) : -2.60
PA of pole (deg)    : 0.81
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (" ) : 11.136
C/A sky separation (km) : 35184.9
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	2031-05-22T16:38:46.737	73.81	-52.38	71489.8	-29.26	-32.59
Jupiter	E	2031-05-22T19:07:45.112	45.48	-22.12	71489.7	-29.81	-33.17