

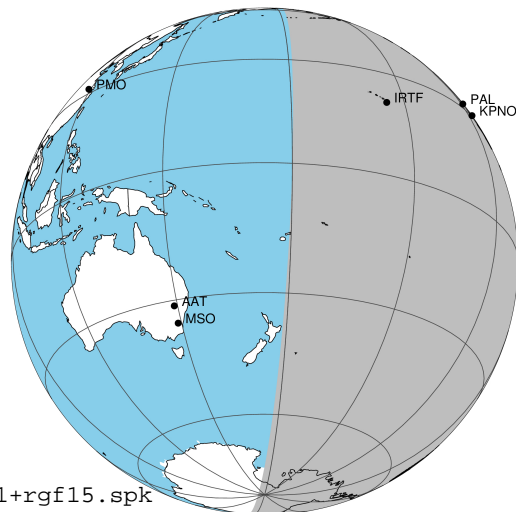
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-09-19T05:53:40.320
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4114301665720226816
 2Mass ID (if available) : 17182798-2253241

Jupiter 2031-09-19T05:53:40 K8.99 G12.34 Pgt

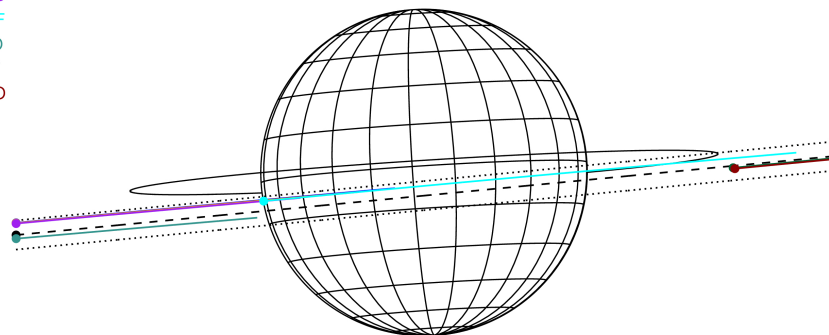
ICRS Star Coord at Epoch: 17h 18m 27.98599s -22:53:24.04136s

RUWE (>1.4 is poor) : 0.91
 K magnitude : 8.992
 G magnitude : 12.344
 RP magnitude : 11.387
 BP magnitude : 13.288
 DUPflag : 0
 Distance (au) : 5.242
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : 15.77
 Sun-Target sep (deg) : 84.77
 Sun-Moon sep (deg) : 55.46
 B (ring opening deg) : -2.37
 PA of pole (deg) : 3.63
 Pole direction: RA (deg): 268.05684
 Dec (deg): 64.49652
 C/A sky separation (") : 2.655
 C/A sky separation (km) : 10095.8
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-09-19T05:53:40 K8.99 G12.34
 Pgt



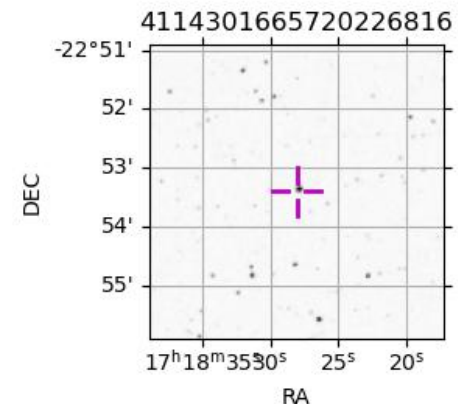
Earth
 PAL
 KPNO
 MCD
 IRTF
 ESO
 AAT
 MSO



2031-09-19T05:53:40.3200 a: 17 18 27.9860 d: -22 53 24.041 C/A 2.655 PA 5.51 deg v_sky +15.77 km/s D 05.24 AU
 Credit: Styled after SORA/Lucky Star

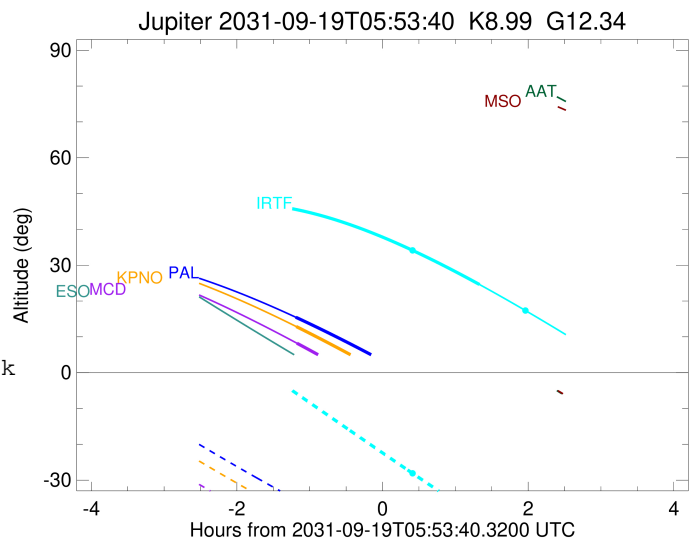
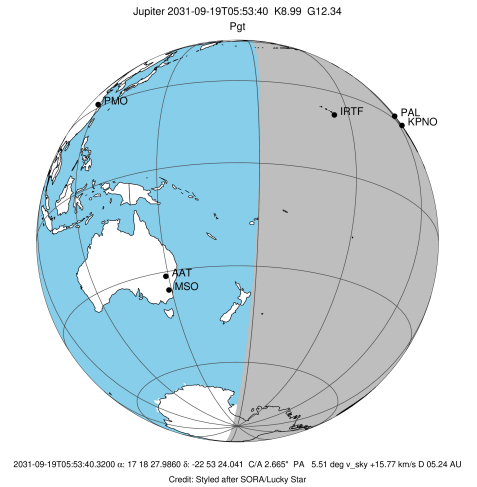
Observable events with sun below -5 deg and altitude above 5 deg

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	+	SEP 19 04:42 - SEP 19 04:42	Pin
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	SEP 19 04:42 - SEP 19 04:42	Pin
MCD	McDonald Obs. 2.7m	30.7	256.0	+	SEP 19 04:43 - SEP 19 04:43	Pin
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+	SEP 19 07:13 - SEP 19 07:13	Pne
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			Pnn
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



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target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-09-19T05:58:32.110
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        : 4114301665720226816
2Mass ID (if available) : 17182798-2253241
ICRS Star Coord at Epoch: 17h 18m 27.98599s -22:53:24.04136s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 8.992
G magnitude           : 12.344
RP magnitude          : 11.387
BP magnitude          : 13.288
DUPflag              : 0
Distance (au)         : 5.243
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 15.77
Sun-Target sep (deg) : 84.77
Sun-Moon sep (deg)   : 55.92
B (ring opening deg) : -2.37
PA of pole (deg)     : 3.63
Pole direction: RA (deg): 268.05684
Dec (deg): 64.49652
C/A sky separation ("): 1.511
C/A sky separation (km): 5744.9
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
    
```

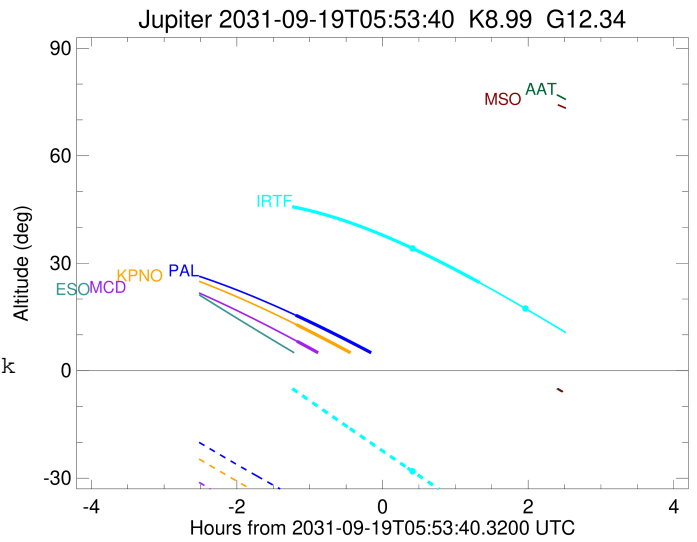
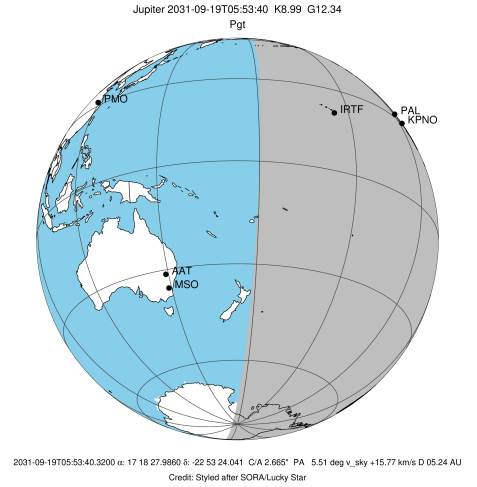


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-09-19T04:42:12.174	15.47	-35.37	71491.9	-6.07	-6.93
Jupiter	E	2031-09-19T07:14:09.739	-11.98x	-54.71	71492.0	-3.24	-3.71

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-09-19T05:58:47.620
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        : 4114301665720226816
2Mass ID (if available) : 17182798-2253241
ICRS Star Coord at Epoch: 17h 18m 27.98599s -22:53:24.04136s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 8.992
G magnitude           : 12.344
RP magnitude          : 11.387
BP magnitude          : 13.288
DUPflag              : 0
Distance (au)         : 5.243
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 15.77
Sun-Target sep (deg)  : 84.77
Sun-Moon sep (deg)    : 55.90
B (ring opening deg) : -2.37
PA of pole (deg)      : 3.63
Pole direction: RA (deg): 268.05684
Dec (deg): 64.49652
C/A sky separation (") : 1.583
C/A sky separation (km) : 6019.6
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
    
```

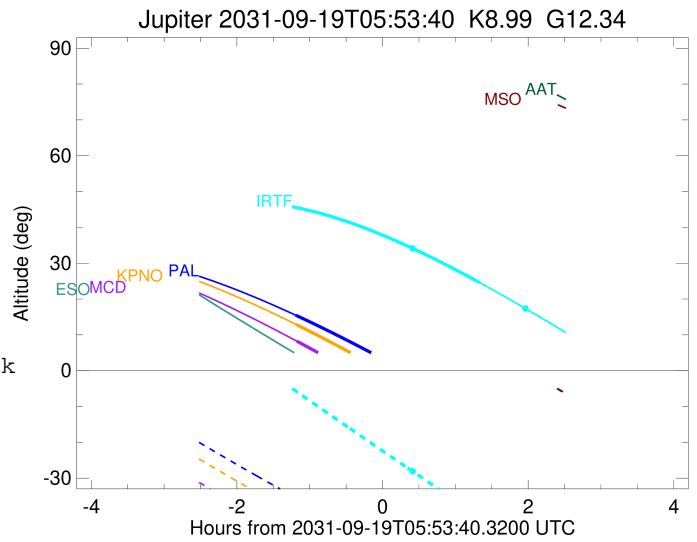
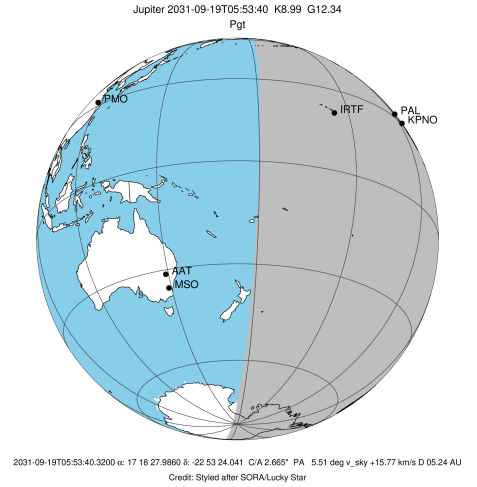


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-09-19T04:42:37.708	12.87	-39.94	71491.9	-6.25	-7.14
Jupiter	E	2031-09-19T07:14:13.851	-15.76x	-56.66	71492.0	-3.49	-3.99

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-09-19T05:59:02.180
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        : 4114301665720226816
2Mass ID (if available) : 17182798-2253241
ICRS Star Coord at Epoch: 17h 18m 27.98599s -22:53:24.04136s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 8.992
G magnitude           : 12.344
RP magnitude          : 11.387
BP magnitude          : 13.288
DUPflag              : 0
Distance (au)         : 5.243
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 15.77
Sun-Target sep (deg)  : 84.77
Sun-Moon sep (deg)    : 55.84
B (ring opening deg) : -2.37
PA of pole (deg)      : 3.63
Pole direction: RA (deg): 268.05684
Dec (deg): 64.49652
C/A sky separation (" ) : 1.679
C/A sky separation (km) : 6385.4
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
    
```

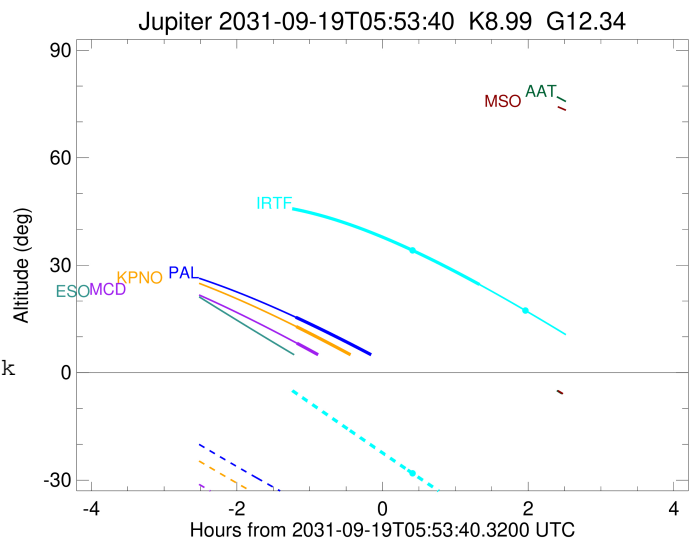
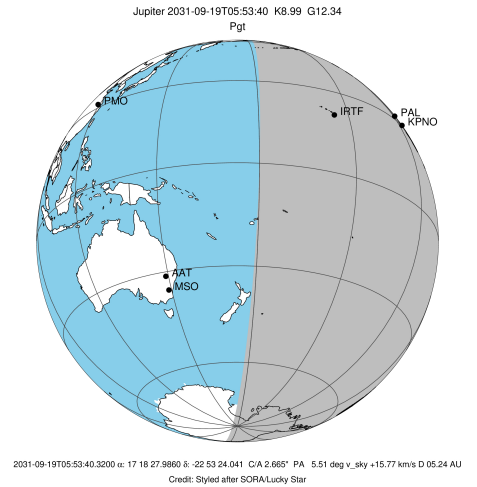


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-09-19T04:43:08.061	8.22	-45.95	71491.9	-6.49	-7.42
Jupiter	E	2031-09-19T07:14:11.534	-21.63x	-57.46	71492.0	-3.81	-4.35

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-09-19T05:56:33.970
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      : 4114301665720226816
2Mass ID (if available) : 17182798-2253241
ICRS Star Coord at Epoch: 17h 18m 27.98599s -22:53:24.04136s
RUWE (>1.4 is poor) : 0.91
K magnitude          : 8.992
G magnitude          : 12.344
RP magnitude         : 11.387
BP magnitude         : 13.288
DUPflag             : 0
Distance (au)       : 5.243
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 15.77
Sun-Target sep (deg) : 84.77
Sun-Moon sep (deg)  : 56.20
B (ring opening deg) : -2.37
PA of pole (deg)    : 3.63
Pole direction: RA (deg): 268.05684
Dec (deg): 64.49652
C/A sky separation (" ) : 1.538
C/A sky separation (km) : 5846.9
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	2031-09-19T04:39:11.871	45.76	-4.97x	71491.9	-6.47	-7.39
Jupiter	E	2031-09-19T07:13:26.476	24.63	-40.52	71492.0	-3.11	-3.55