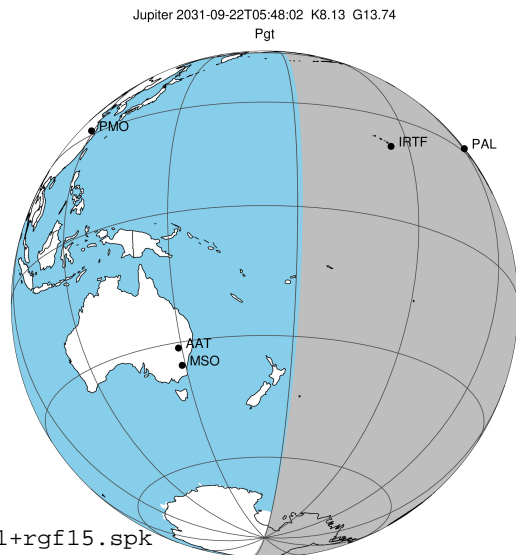


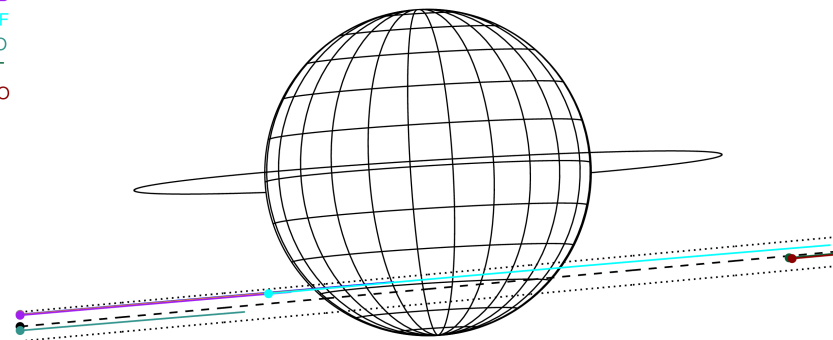
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-09-22T05:48:02.330
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4114626640120155136
 2Mass ID (if available) : 17194829-2255191

Jupiter 2031-09-22T05:48:02 K8.13 G13.74 Pgt

ICRS Star Coord at Epoch: 17h 19m 48.27147s -22:55:19.14282s
 RUWE (>1.4 is poor) : 1.11
 K magnitude : 8.132
 G magnitude : 13.743
 RP magnitude : 12.304
 BP magnitude : 16.491
 DUPflag : 0
 Distance (au) : 5.288
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : 17.13
 Sun-Target sep (deg) : 82.15
 Sun-Moon sep (deg) : 15.60
 B (ring opening deg) : -2.35
 PA of pole (deg) : 3.48
 Pole direction: RA (deg): 268.05684
 Dec (deg): 64.49652
 C/A sky separation (") : 13.256
 C/A sky separation (km) : 50840.2
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk



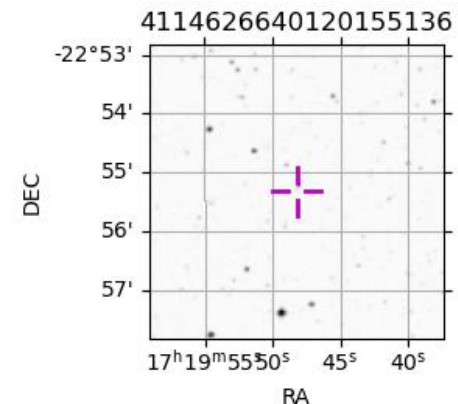
Earth
 PAL
 KPNO
 MCD
 IRTF
 ESO
 AAT
 MSO



2031-09-22T05:48:02.3300 α: 17 19 48.2715 δ: -22 55 19.143 C/A ***** PA 5.25 deg v_sky +17.13 km/s D 05.29 AU
 Credit: Styled after SORA/Lucky Star

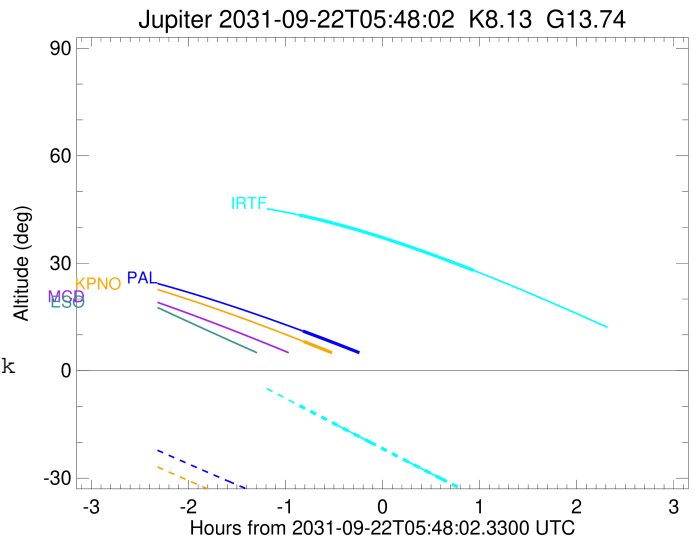
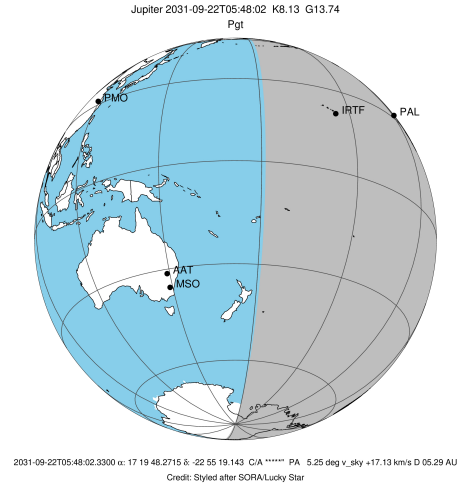
Observable events with sun below -5 deg and altitude above 5 deg

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 22 04:58 - SEP 22 04:58	Pin
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	SEP 22 04:59 - SEP 22 04:59	Pin
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	+ +	SEP 22 04:56 - SEP 22 06:44	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			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



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-09-22T05:52:15.630
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      : 4114626640120155136
2Mass ID (if available) : 17194829-2255191
ICRS Star Coord at Epoch: 17h 19m 48.27147s -22:55:19.14282s
RUWE (>1.4 is poor) : 1.11
K magnitude          : 8.132
G magnitude          : 13.743
RP magnitude         : 12.304
BP magnitude         : 16.491
DUPflag             : 0
Distance (au)       : 5.288
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 17.13
Sun-Target sep (deg) : 82.15
Sun-Moon sep (deg)  : 16.28
B (ring opening deg) : -2.35
PA of pole (deg)    : 3.48
Pole direction: RA (deg): 268.05684
Dec (deg): 64.49652
C/A sky separation ("): 12.136
C/A sky separation (km): 46544.6
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
    
```

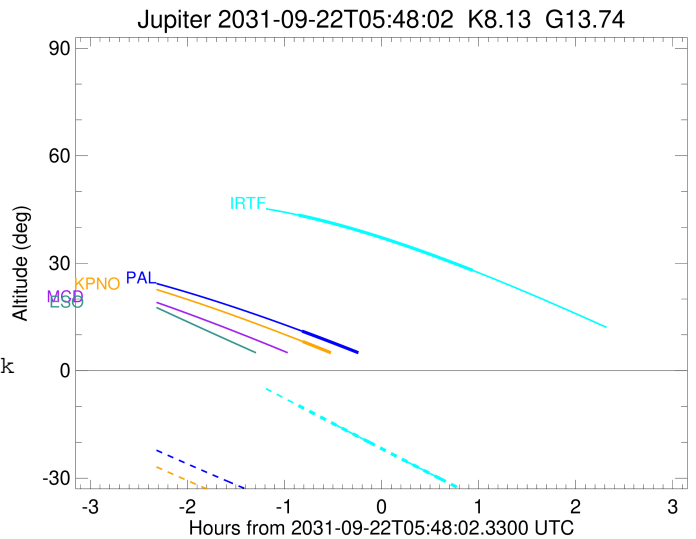
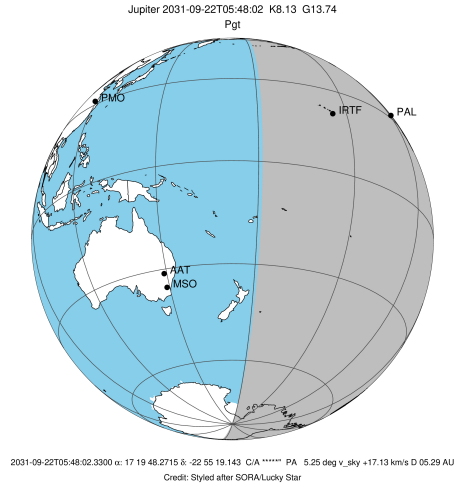


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-09-22T04:58:56.286	11.04	-39.36	71488.6	-41.93	-45.65
Jupiter	E	2031-09-22T06:45:16.141	-8.38x	-54.04	71488.9	-39.29	-42.99

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-09-22T05:52:28.140
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      : 4114626640120155136
2Mass ID (if available) : 17194829-2255191
ICRS Star Coord at Epoch: 17h 19m 48.27147s -22:55:19.14282s
RUWE (>1.4 is poor) : 1.11
K magnitude          : 8.132
G magnitude          : 13.743
RP magnitude         : 12.304
BP magnitude         : 16.491
DUPflag             : 0
Distance (au)       : 5.288
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 17.13
Sun-Target sep (deg) : 82.15
Sun-Moon sep (deg)  : 16.30
B (ring opening deg) : -2.35
PA of pole (deg)    : 3.48
Pole direction: RA (deg): 268.05684
Dec (deg): 64.49652
C/A sky separation (" ) : 12.208
C/A sky separation (km) : 46822.6
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
    
```

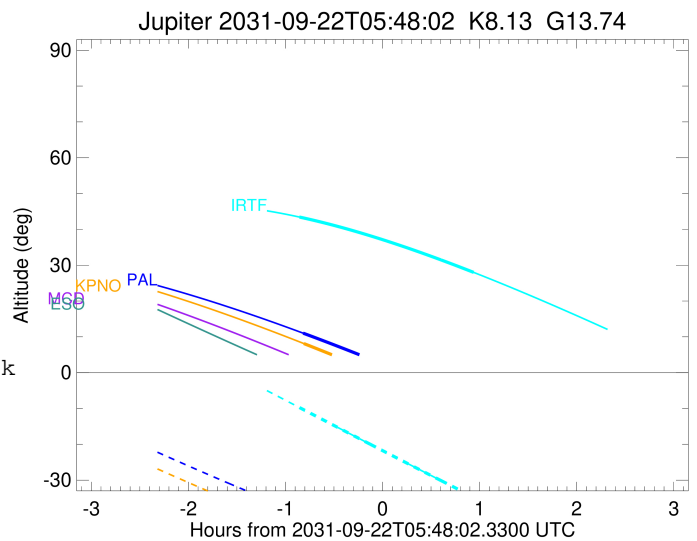
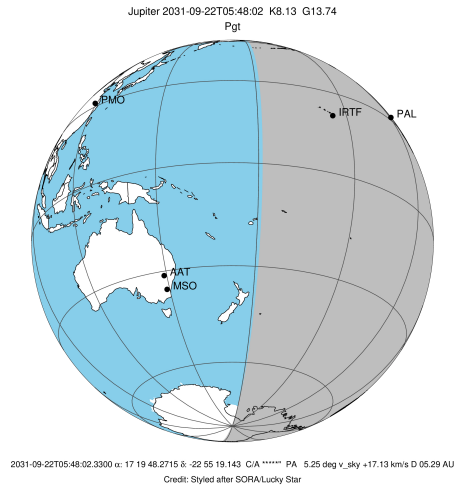


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-09-22T04:59:28.524	8.12	-43.88	71488.6	-42.19	-45.91
Jupiter	E	2031-09-22T06:45:08.493	-12.01x	-56.85	71488.9	-39.61	-43.31

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-09-22T05:50:40.870
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       : 4114626640120155136
2Mass ID (if available) : 17194829-2255191
ICRS Star Coord at Epoch: 17h 19m 48.27147s -22:55:19.14282s
RUWE (>1.4 is poor) : 1.11
K magnitude          : 8.132
G magnitude          : 13.743
RP magnitude         : 12.304
BP magnitude         : 16.491
DUPflag             : 0
Distance (au)        : 5.288
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 17.13
Sun-Target sep (deg) : 82.15
Sun-Moon sep (deg)   : 16.16
B (ring opening deg) : -2.35
PA of pole (deg)     : 3.48
Pole direction: RA (deg): 268.05684
Dec (deg): 64.49652
C/A sky separation ("): 12.155
C/A sky separation (km): 46617.8
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	2031-09-22T04:56:44.144	43.43	-9.74	71488.6	-42.29	-46.01
Jupiter	E	2031-09-22T06:44:24.169	27.99	-34.74	71489.0	-39.16	-42.86