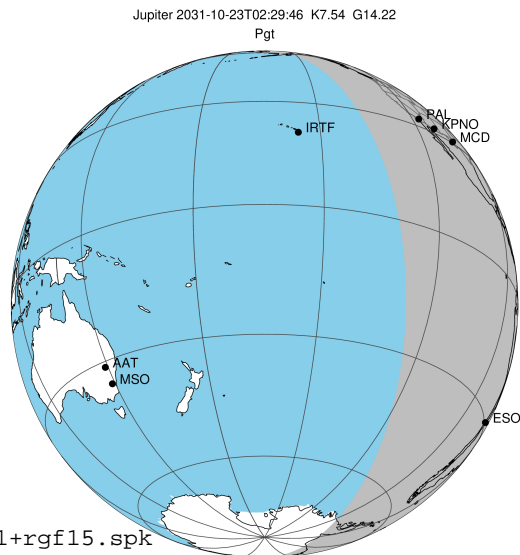


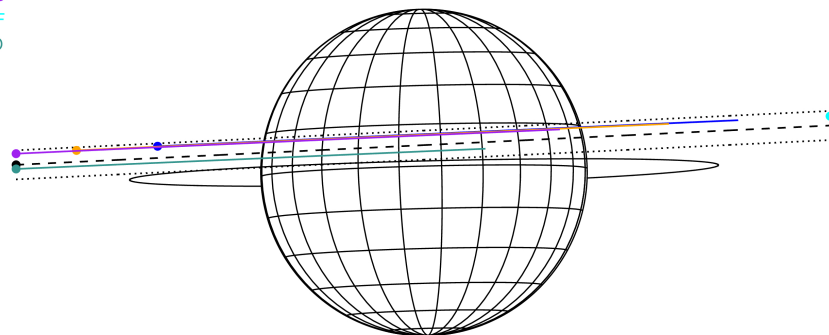
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-10-23T02:29:46.670
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116529100119753600
 2Mass ID (if available) : 17384740-2313014

Jupiter 2031-10-23T02:29:46 K7.54 G14.22 Pgt

ICRS Star Coord at Epoch: 17h 38m 47.38586s -23:13:01.69604s
 RUWE (>1.4 is poor) : 0.70
 K magnitude : 7.537
 G magnitude : 14.223
 RP magnitude : 12.640
 BP magnitude : 17.202
 DUPflag : 0
 Distance (au) : 5.725
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : 29.81
 Sun-Target sep (deg) : 56.08
 Sun-Moon sep (deg) : 31.42
 B (ring opening deg) : -2.25
 PA of pole (deg) : 1.45
 Pole direction: RA (deg): 268.05681
 Dec (deg): 64.49652
 C/A sky separation (") : 2.886
 C/A sky separation (km) : 11983.4
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk



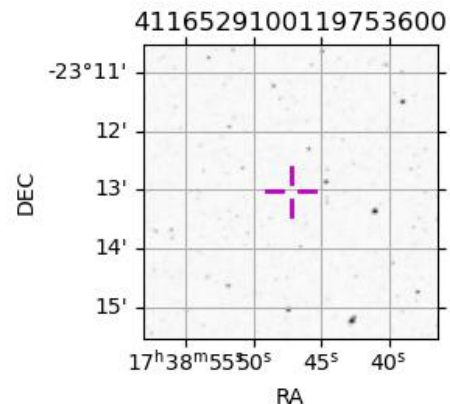
Earth
 PAL
 KPNO
 MCD
 IRTF
 ESO



2031-10-23T02:29:46.6700 cc: 17 38 47.3859 s: -23 13 01.696 C/A 2.878" PA 182.77 deg v_sky +29.81 km/s D 05.72 AU
 Credit: Styled after SORA/Lucky Star

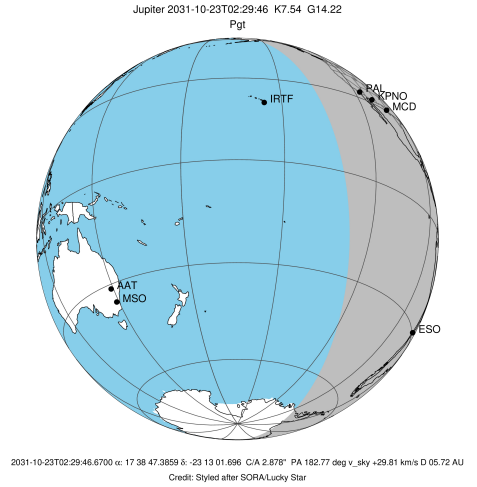
Observable events with sun below -5 deg and altitude above 5 deg

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	+ +	OCT 23 01:52 - OCT 23 03:11	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	OCT 23 01:52 - OCT 23 03:11	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+	OCT 23 01:53 - OCT 23 01:53	Pin
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			Pnn
RIO	Rio de Janeiro	-22.9	316.8			Pnn
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	OCT 23 01:53 - OCT 23 01:53	Pin
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

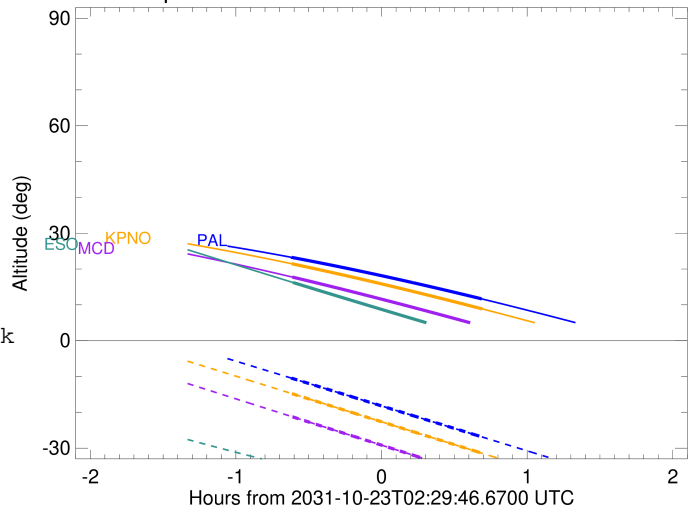


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-10-23T02:31:52.860
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     : 4116529100119753600
2Mass ID (if available) : 17384740-2313014
ICRS Star Coord at Epoch: 17h 38m 47.38586s -23:13:01.69604s
RUWE (>1.4 is poor) : 0.70
K magnitude         : 7.537
G magnitude         : 14.223
RP magnitude        : 12.640
BP magnitude        : 17.202
DUPflag            : 0
Distance (au)      : 5.725
f0 (km)            : 0.00
g0 (km)            : 0.00
skyplane vel. (km/s) : 29.81
Sun-Target sep (deg) : 56.08
Sun-Moon sep (deg)  : 31.00
B (ring opening deg) : -2.25
PA of pole (deg)   : 1.45
Pole direction: RA (deg): 268.05681
Dec (deg): 64.49652
C/A sky separation (" ) : 4.043
C/A sky separation (km) : 16788.0
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 2031-10-23T02:29:46 K7.54 G14.22

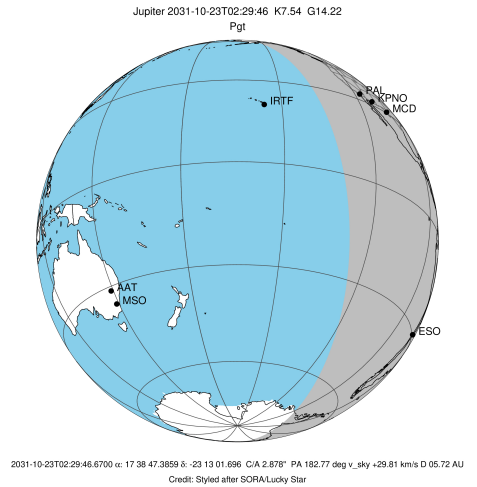


x: target alt < 5.0 deg or sun > -5.0 deg

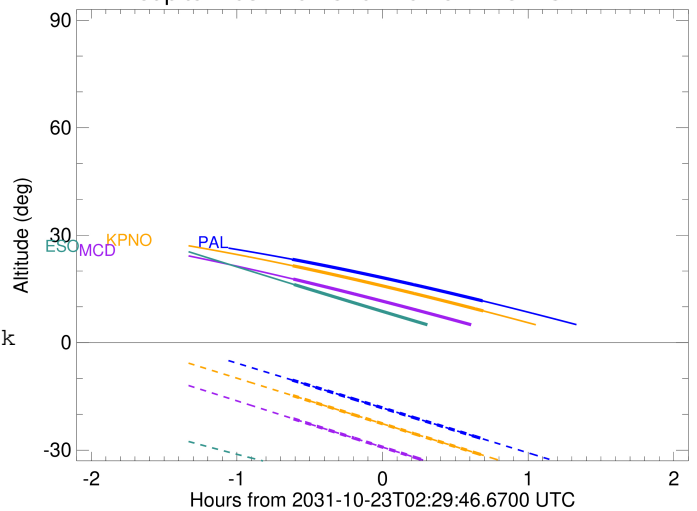
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-10-23T01:52:38.410	23.26	-10.45	71491.7	12.43	14.14
Jupiter	E	2031-10-23T03:11:02.544	11.67	-26.84	71491.6	14.67	16.66

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-10-23T02:32:06.350
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     : 4116529100119753600
2Mass ID (if available) : 17384740-2313014
ICRS Star Coord at Epoch: 17h 38m 47.38586s -23:13:01.69604s
RUWE (>1.4 is poor) : 0.70
K magnitude         : 7.537
G magnitude         : 14.223
RP magnitude        : 12.640
BP magnitude        : 17.202
DUPflag            : 0
Distance (au)      : 5.725
f0 (km)            : 0.00
g0 (km)            : 0.00
skyplane vel. (km/s) : 29.81
Sun-Target sep (deg) : 56.08
Sun-Moon sep (deg)  : 30.93
B (ring opening deg) : -2.25
PA of pole (deg)   : 1.45
Pole direction: RA (deg): 268.05681
Dec (deg): 64.49652
C/A sky separation (" ) : 3.988
C/A sky separation (km) : 16556.9
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
    
```



Jupiter 2031-10-23T02:29:46 K7.54 G14.22

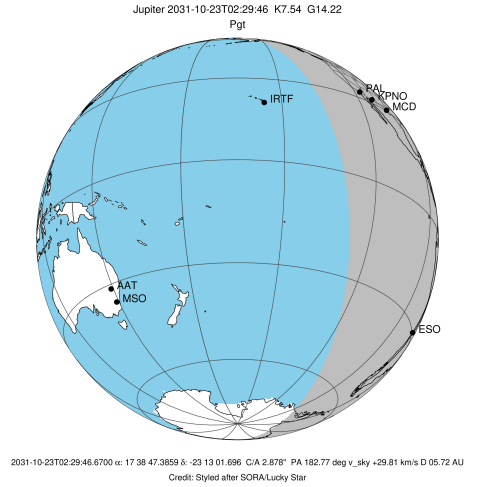


x: target alt < 5.0 deg or sun > -5.0 deg

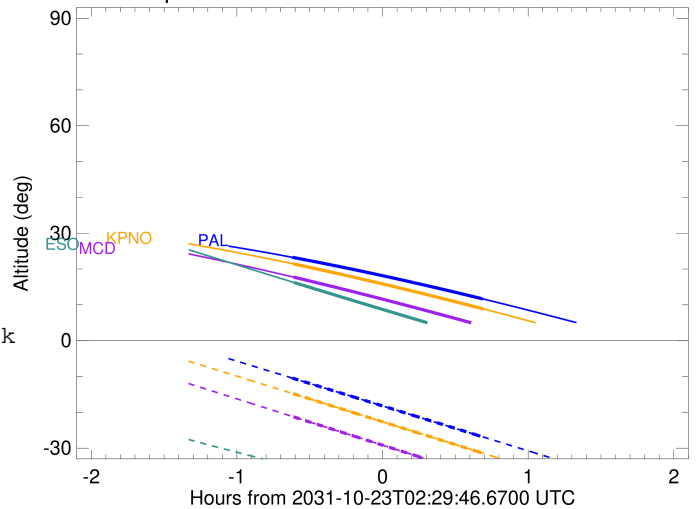
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-10-23T01:52:51.704	21.46	-14.79	71491.7	12.26	13.95
Jupiter	E	2031-10-23T03:11:15.835	8.87	-31.43	71491.6	14.46	16.42

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-10-23T02:32:22.650
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       : 4116529100119753600
2Mass ID (if available) : 17384740-2313014
ICRS Star Coord at Epoch: 17h 38m 47.38586s -23:13:01.69604s
RUWE (>1.4 is poor) : 0.70
K magnitude          : 7.537
G magnitude          : 14.223
RP magnitude         : 12.640
BP magnitude         : 17.202
DUPflag              : 0
Distance (au)        : 5.725
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 29.81
Sun-Target sep (deg) : 56.08
Sun-Moon sep (deg)  : 30.83
B (ring opening deg) : -2.25
PA of pole (deg)    : 1.45
Pole direction: RA (deg): 268.05681
Dec (deg): 64.49652
C/A sky separation (") : 3.912
C/A sky separation (km) : 16242.8
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
    
```



Jupiter 2031-10-23T02:29:46 K7.54 G14.22

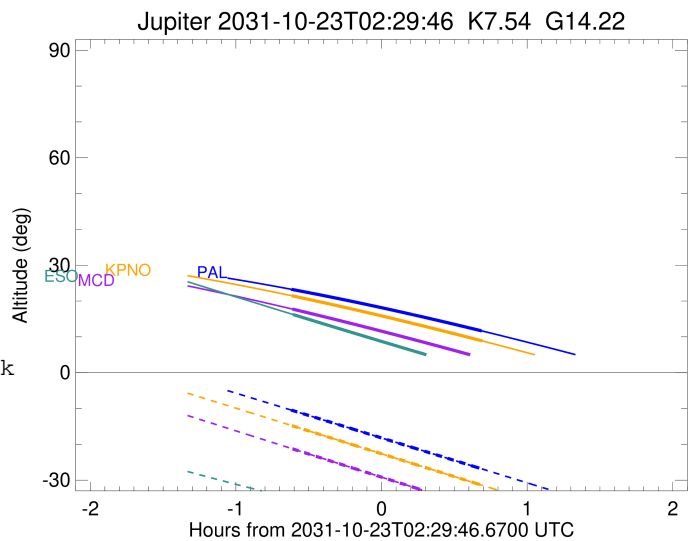
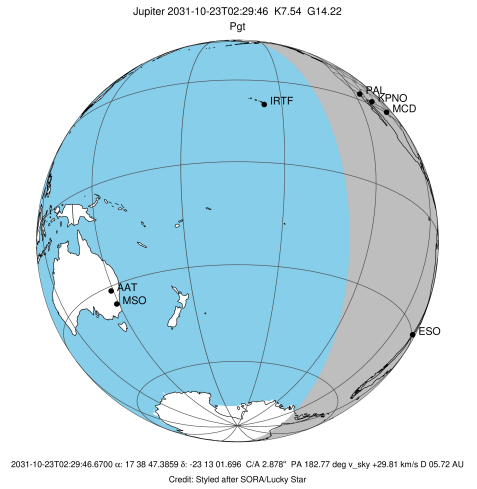


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-10-23T01:53:08.520	17.73	-21.27	71491.7	12.03	13.69
Jupiter	E	2031-10-23T03:11:31.167	4.03x	-38.09	71491.6	14.18	16.10

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-10-23T02:32:59.120
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       : 4116529100119753600
2Mass ID (if available) : 17384740-2313014
ICRS Star Coord at Epoch: 17h 38m 47.38586s -23:13:01.69604s
RUWE (>1.4 is poor) : 0.70
K magnitude          : 7.537
G magnitude           : 14.223
RP magnitude         : 12.640
BP magnitude         : 17.202
DUPflag             : 0
Distance (au)        : 5.725
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 29.81
Sun-Target sep (deg) : 56.08
Sun-Moon sep (deg)   : 30.82
B (ring opening deg) : -2.25
PA of pole (deg)     : 1.45
Pole direction: RA (deg): 268.05681
Dec (deg): 64.49652
C/A sky separation ("): 2.227
C/A sky separation (km): 9246.8
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	2031-10-23T01:53:19.687	16.23	-35.14	71491.9	6.41	7.32
Jupiter	E	2031-10-23T03:12:32.013	0.19x	-45.76	71491.9	8.43	9.62