

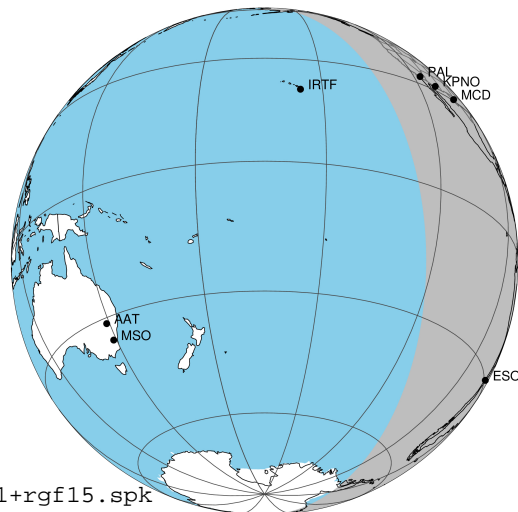
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2031-10-30T02:09:44.120  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4068812803734208128  
 2Mass ID (if available) : 17441190-2316325

Jupiter 2031-10-30T02:09:44 K8.84 G13.77 Pgt

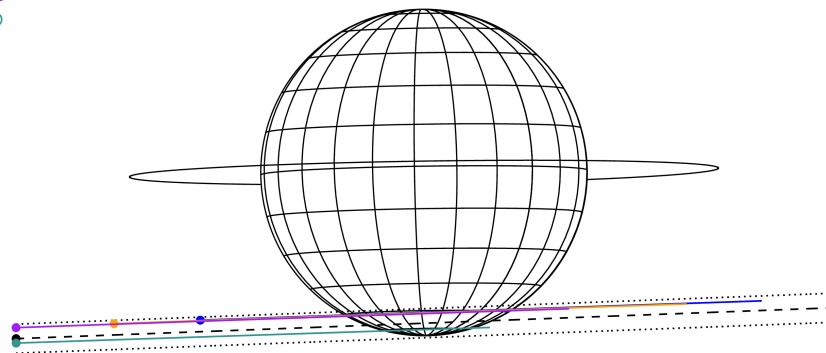
ICRS Star Coord at Epoch: 17h 44m 11.88476s -23:16:32.85824s

RUWE (>1.4 is poor) : 0.89  
 K magnitude : 8.841  
 G magnitude : 13.769  
 RP magnitude : 12.525  
 BP magnitude : 15.493  
 DUPflag : 0  
 Distance (au) : 5.810  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : 32.22  
 Sun-Target sep (deg) : 50.36  
 Sun-Moon sep (deg) : 126.88  
 B (ring opening deg) : -2.21  
 PA of pole (deg) : 0.86  
 Pole direction: RA (deg): 268.05681  
 Dec (deg): 64.49652  
 C/A sky separation (") : 15.659  
 C/A sky separation (km) : 65982.1  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2031-10-30T02:09:44 K8.84 G13.77  
 Pgt



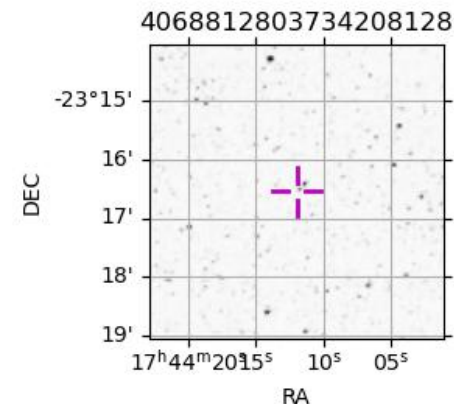
Earth  
 PAL  
 KPNO  
 MCD  
 ESO



2031-10-30T02:09:44.1200 α: 17 44 11.8848 δ: -23 16 32.858 C/A \*\*\*\*\* PA 2.17 deg v\_sky +32.22 km/s D 05.81 AU  
 Credit: Styled after SORA/Lucky Star

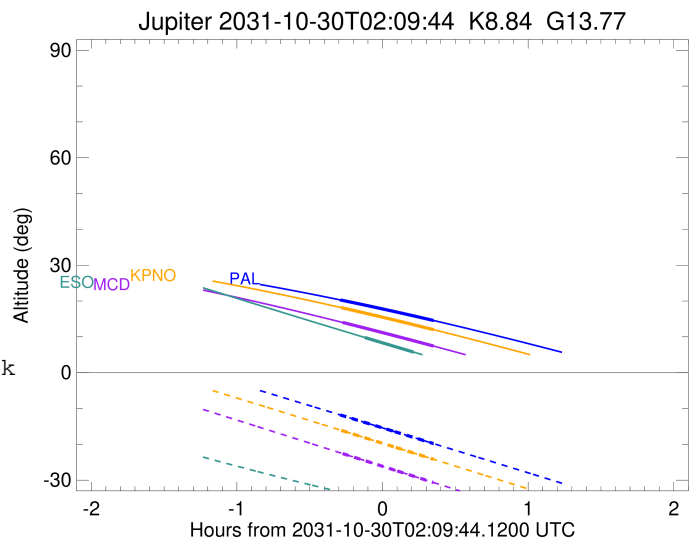
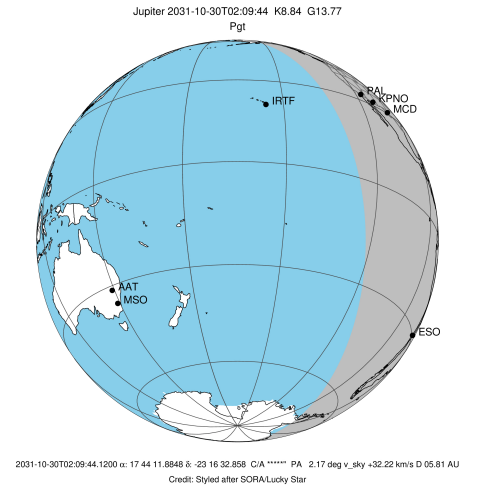
Observable events with sun below -5 deg and altitude above 5 deg

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 30 01:52 - OCT 30 02:30	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	OCT 30 01:52 - OCT 30 02:30	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	OCT 30 01:53 - OCT 30 02:30	Pie
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 30 02:02 - OCT 30 02:22	Pie
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             : 2031-10-30T02:11:35.370
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       : 4068812803734208128
2Mass ID (if available) : 17441190-2316325
ICRS Star Coord at Epoch: 17h 44m 11.88476s -23:16:32.85824s
RUWE (>1.4 is poor) : 0.89
K magnitude           : 8.841
G magnitude           : 13.769
RP magnitude         : 12.525
BP magnitude         : 15.493
DUPflag              : 0
Distance (au)        : 5.810
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 32.22
Sun-Target sep (deg) : 50.36
Sun-Moon sep (deg)   : 127.46
B (ring opening deg) : -2.21
PA of pole (deg)     : 0.86
Pole direction: RA (deg): 268.05681
Dec (deg): 64.49652
C/A sky separation (") : 14.530
C/A sky separation (km) : 61226.7
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
    
```

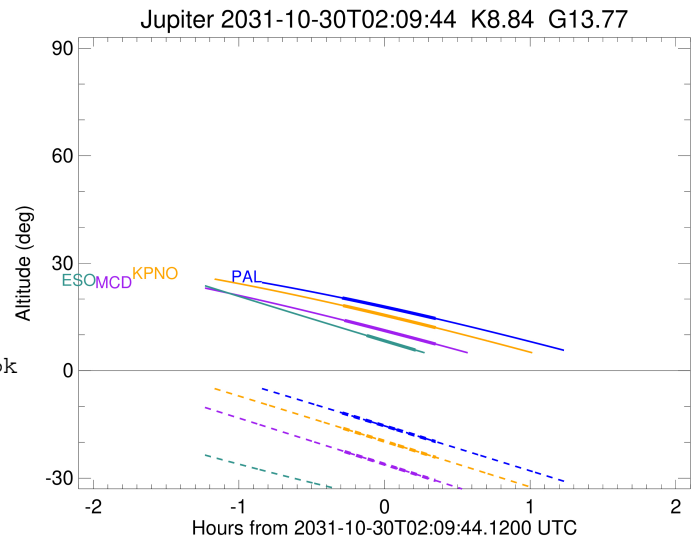
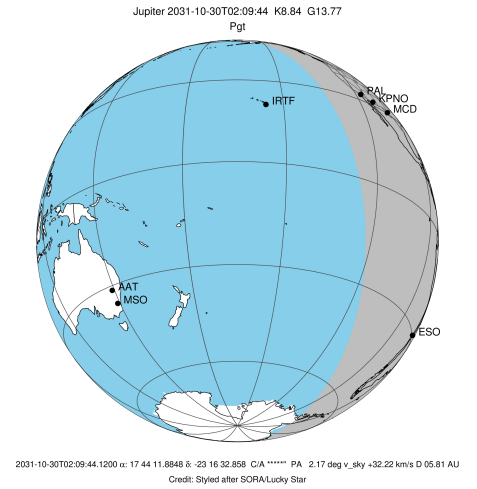


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-10-30T01:52:20.272	20.30	-11.80	71487.0	-59.97	-63.04
Jupiter	E	2031-10-30T02:30:49.439	14.56	-19.81	71487.2	-57.75	-60.96

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target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-10-30T02:11:46.770
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        : 4068812803734208128
2Mass ID (if available) : 17441190-2316325
ICRS Star Coord at Epoch: 17h 44m 11.88476s -23:16:32.85824s
RUWE (>1.4 is poor)  : 0.89
K magnitude           : 8.841
G magnitude           : 13.769
RP magnitude          : 12.525
BP magnitude          : 15.493
DUPflag              : 0
Distance (au)         : 5.810
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 32.22
Sun-Target sep (deg)  : 50.36
Sun-Moon sep (deg)    : 127.47
B (ring opening deg)  : -2.21
PA of pole (deg)      : 0.86
Pole direction: RA (deg): 268.05681
Dec (deg): 64.49652
C/A sky separation (" ) : 14.586
C/A sky separation (km) : 61463.3
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
    
```

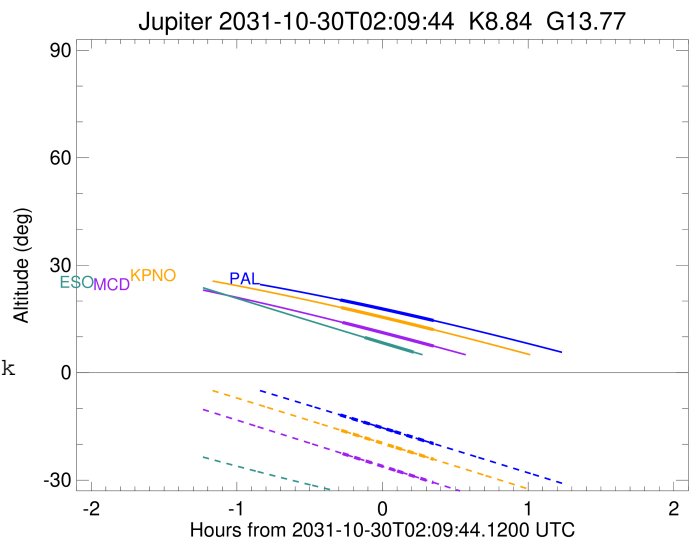
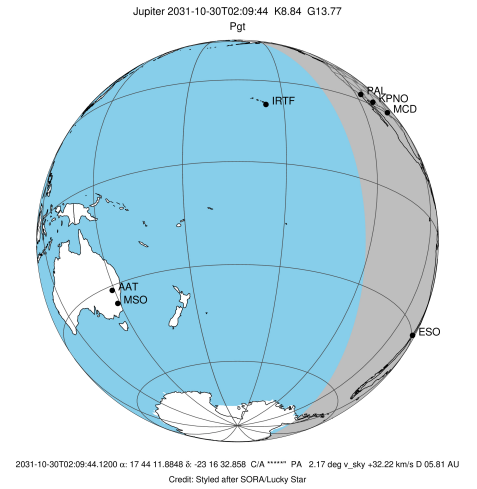


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-10-30T01:52:44.847	18.16	-16.11	71486.9	-60.32	-63.36
Jupiter	E	2031-10-30T02:30:47.602	12.00	-24.17	71487.1	-58.14	-61.33

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-10-30T02:12:00.470
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       : 4068812803734208128
2Mass ID (if available) : 17441190-2316325
ICRS Star Coord at Epoch: 17h 44m 11.88476s -23:16:32.85824s
RUWE (>1.4 is poor) : 0.89
K magnitude          : 8.841
G magnitude          : 13.769
RP magnitude         : 12.525
BP magnitude         : 15.493
DUPflag             : 0
Distance (au)        : 5.810
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 32.22
Sun-Target sep (deg) : 50.36
Sun-Moon sep (deg)   : 127.45
B (ring opening deg) : -2.21
PA of pole (deg)     : 0.86
Pole direction: RA (deg): 268.05681
Dec (deg): 64.49652
C/A sky separation ("): 14.662
C/A sky separation (km) : 61784.2
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
    
```

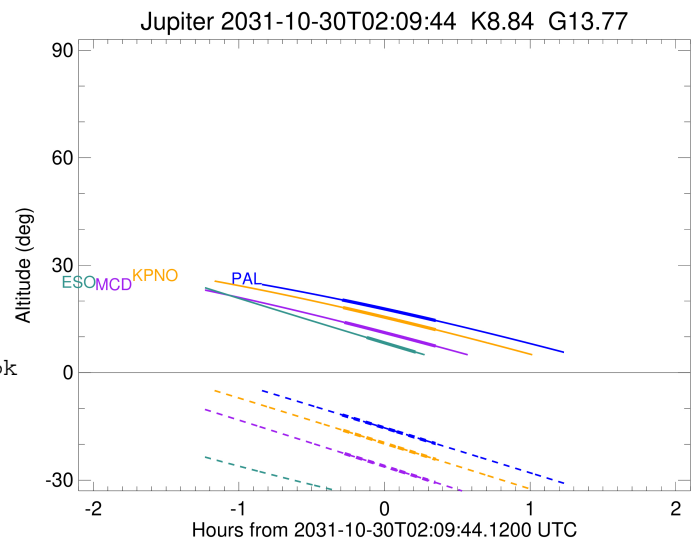
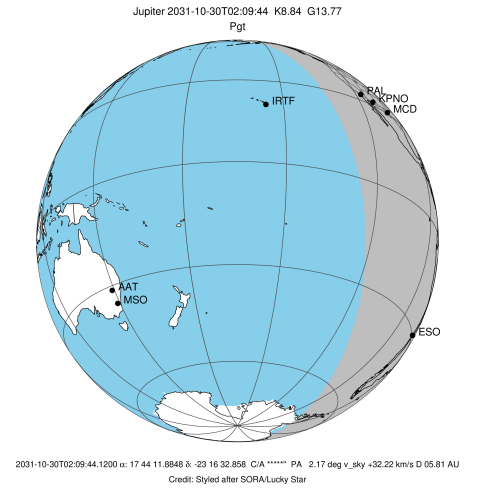


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-10-30T01:53:16.995	14.02	-22.58	71486.9	-60.80	-63.80
Jupiter	E	2031-10-30T02:30:42.811	7.44	-30.64	71487.1	-58.67	-61.82

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-10-30T02:12:29.030
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        : 4068812803734208128
2Mass ID (if available) : 17441190-2316325
ICRS Star Coord at Epoch: 17h 44m 11.88476s -23:16:32.85824s
RUWE (>1.4 is poor) : 0.89
K magnitude           : 8.841
G magnitude           : 13.769
RP magnitude          : 12.525
BP magnitude          : 15.493
DUPflag              : 0
Distance (au)         : 5.810
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 32.22
Sun-Target sep (deg)  : 50.36
Sun-Moon sep (deg)    : 127.49
B (ring opening deg) : -2.21
PA of pole (deg)      : 0.86
Pole direction: RA (deg): 268.05681
Dec (deg): 64.49652
C/A sky separation (") : 16.326
C/A sky separation (km) : 68794.1
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	2031-10-30T02:02:26.163	9.81	-34.87	71485.7	-75.08	-76.79
Jupiter	E	2031-10-30T02:22:31.540	5.75	-37.79	71485.8	-73.07	-74.99