

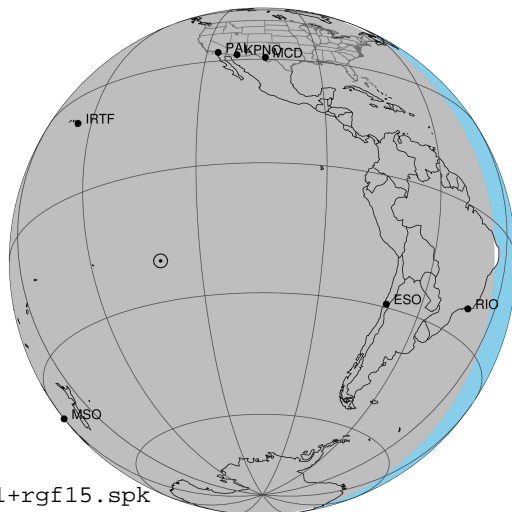
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-05-24T08:37:48.660
 Event type : Pt
 : Jupiter occs: topocentric, not geocentric
 : Not a ringed target
 Gaia source ID : 4116869472072911488
 2Mass ID (if available) : 17435982-2253179

Jupiter 2031-05-24T08:37:48 K8.53 G14.78 Pt

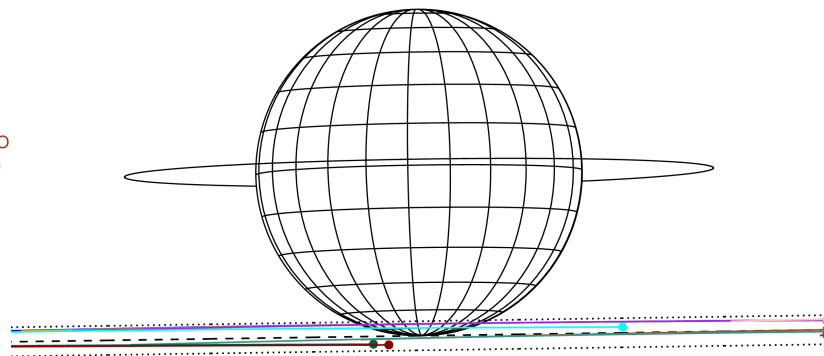
ICRS Star Coord at Epoch: 17h 43m 59.81260s -22:53:18.23116s

RUWE (>1.4 is poor) : 0.96
 K magnitude : 8.527
 G magnitude : 14.779
 RP magnitude : 13.276
 BP magnitude : 17.870
 DUPflag : 0
 Distance (au) : 4.345
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -13.96
 Sun-Target sep (deg) : 156.26
 Sun-Moon sep (deg) : 169.73
 B (ring opening deg) : -2.60
 PA of pole (deg) : 0.89
 Pole direction: RA (deg): 268.05694
 Dec (deg): 64.49651
 C/A sky separation (") : 22.693
 C/A sky separation (km) : 71515.8
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-05-24T08:37:48 K8.53 G14.78 Pt



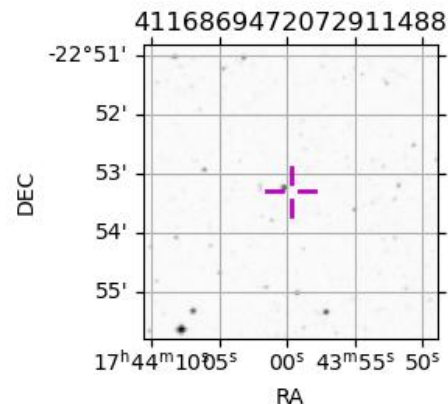
Earth
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 AAT
 SAAO
 MSO



2031-05-24T08:37:48.6600 α: 17 43 59.8126 δ: -22 53 18.231 C/A ***** PA 0.85 deg v_sky -13.96 km/s D 04.35 AU
 Credit: Styled after SORA/Lucky Star

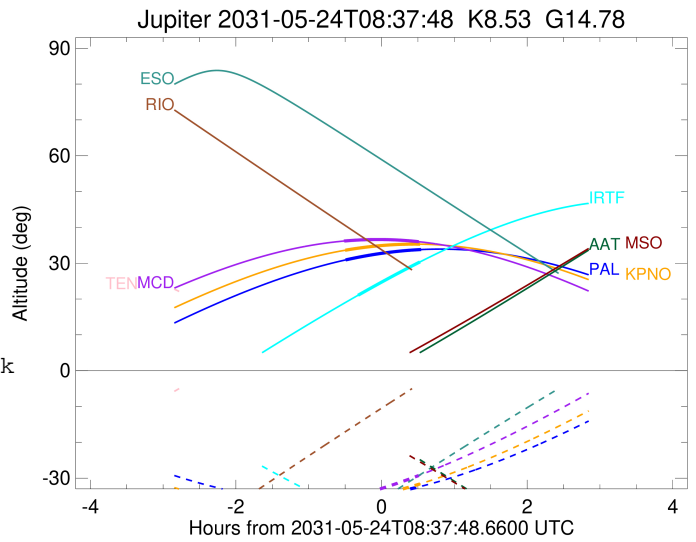
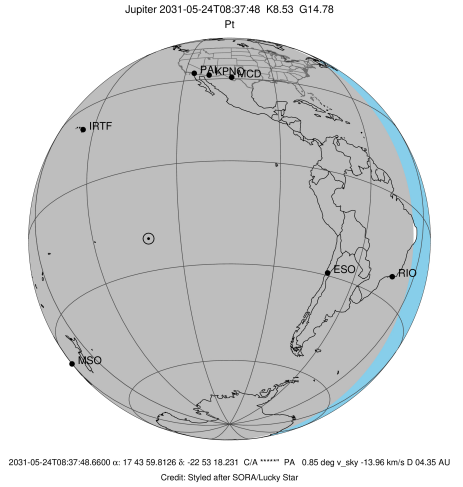
Observable events with sun below -5 deg and altitude above 5 deg

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	+ +	MAY 24 08:08 - MAY 24 09:10	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	MAY 24 08:07 - MAY 24 09:09	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	MAY 24 08:07 - MAY 24 09:08	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	MAY 24 08:18 - MAY 24 09:09	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



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target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-24T08:39:22.340
Event type          : Pt
                    : Jupiter occs: topocentric, not geocentric
                    : 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      : 4116869472072911488
2Mass ID (if available) : 17435982-2253179
ICRS Star Coord at Epoch: 17h 43m 59.81260s -22:53:18.23116s
RUWE (>1.4 is poor) : 0.96
K magnitude         : 8.527
G magnitude         : 14.779
RP magnitude        : 13.276
BP magnitude        : 17.870
DUPflag            : 0
Distance (au)       : 4.345
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -13.96
Sun-Target sep (deg) : 156.26
Sun-Moon sep (deg)  : 169.75
B (ring opening deg) : -2.60
PA of pole (deg)    : 0.89
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 21.032
C/A sky separation (km) : 66283.6
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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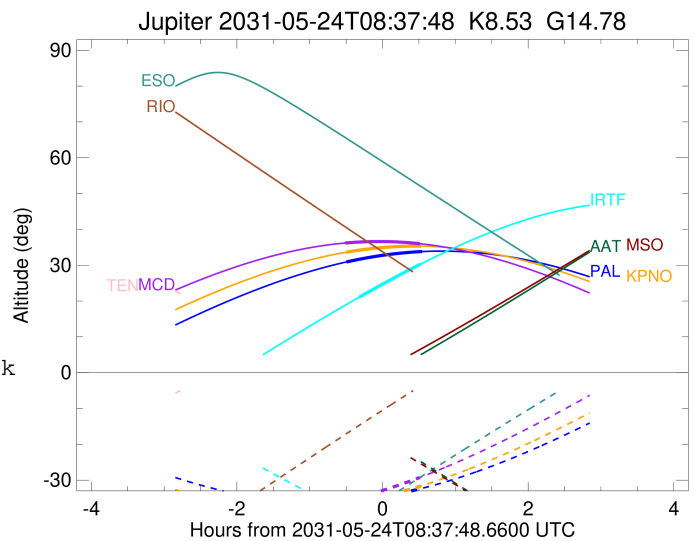
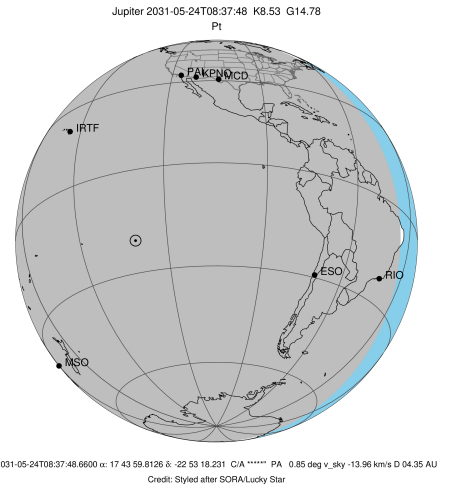


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-24T08:08:17.860	30.92	-35.77	71484.0	-68.08	-70.48
Jupiter	E	2031-05-24T09:10:24.807	33.80	-32.28	71484.0	-67.73	-70.16

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-24T08:38:45.100
Event type            : Pt
: Jupiter occs: topocentric, not geocentric
: 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        : 4116869472072911488
2Mass ID (if available) : 17435982-2253179
ICRS Star Coord at Epoch: 17h 43m 59.81260s -22:53:18.23116s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 8.527
G magnitude           : 14.779
RP magnitude          : 13.276
BP magnitude          : 17.870
DUPflag              : 0
Distance (au)         : 4.345
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -13.96
Sun-Target sep (deg) : 156.26
Sun-Moon sep (deg)   : 169.70
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.89
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 21.049
C/A sky separation (km) : 66335.9
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
    
```

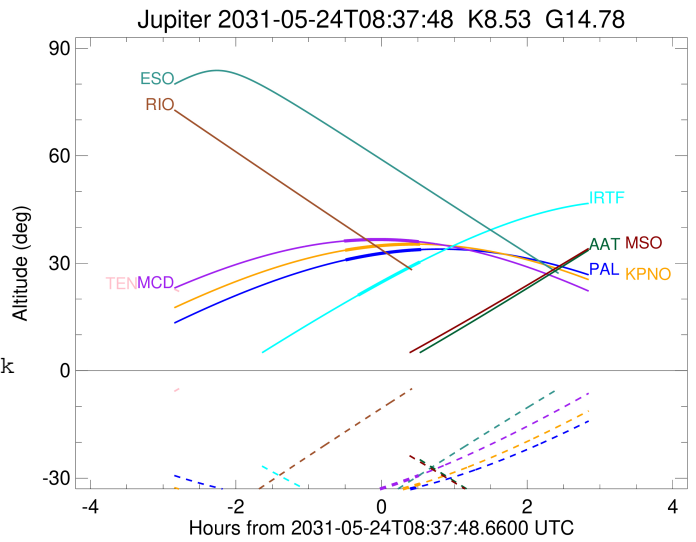
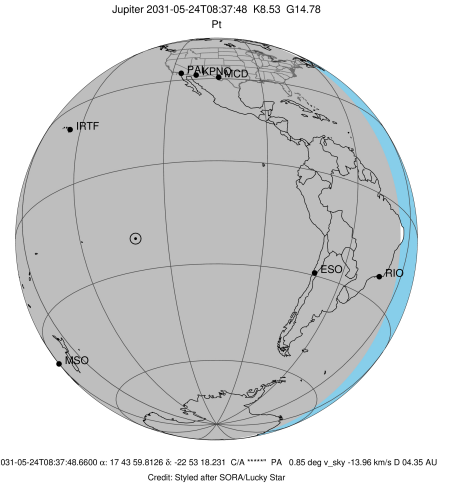


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-24T08:07:51.577	33.61	-36.38	71484.0	-68.14	-70.54
Jupiter	E	2031-05-24T09:09:37.218	35.31	-31.60	71484.0	-67.89	-70.31

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-24T08:37:48.850
Event type            : Pt
: Jupiter occs: topocentric, not geocentric
: 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        : 4116869472072911488
2Mass ID (if available) : 17435982-2253179
ICRS Star Coord at Epoch: 17h 43m 59.81260s -22:53:18.23116s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 8.527
G magnitude           : 14.779
RP magnitude          : 13.276
BP magnitude          : 17.870
DUPflag              : 0
Distance (au)         : 4.345
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -13.96
Sun-Target sep (deg) : 156.26
Sun-Moon sep (deg)   : 169.61
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.89
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 21.069
C/A sky separation (km) : 66397.7
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
    
```

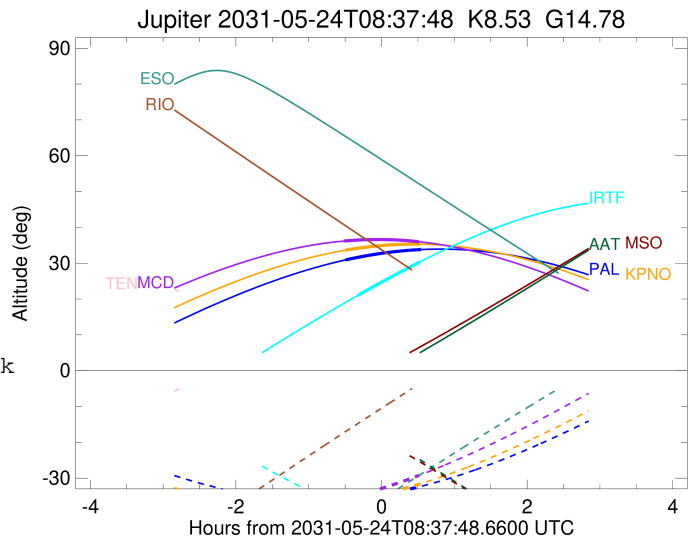
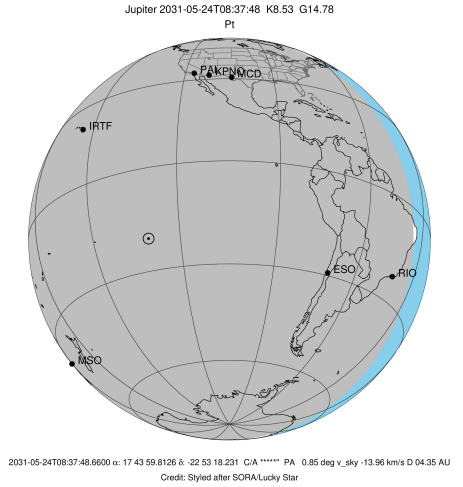


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-24T08:07:07.649	36.19	-35.73	71484.0	-68.20	-70.59
Jupiter	E	2031-05-24T09:08:29.554	36.00	-29.27	71484.0	-68.10	-70.50

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-24T08:44:02.370
Event type            : Pt
: Jupiter occs: topocentric, not geocentric
: 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        : 4116869472072911488
2Mass ID (if available) : 17435982-2253179
ICRS Star Coord at Epoch: 17h 43m 59.81260s -22:53:18.23116s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 8.527
G magnitude           : 14.779
RP magnitude          : 13.276
BP magnitude          : 17.870
DUPflag              : 0
Distance (au)         : 4.345
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -13.96
Sun-Target sep (deg)  : 156.26
Sun-Moon sep (deg)   : 170.28
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.89
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 21.597
C/A sky separation (km) : 68061.8
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	2031-05-24T08:18:28.227	21.04	-39.98	71483.5	-72.60	-74.57
Jupiter	E	2031-05-24T09:09:32.013	30.36	-46.14	71483.6	-71.48	-73.56