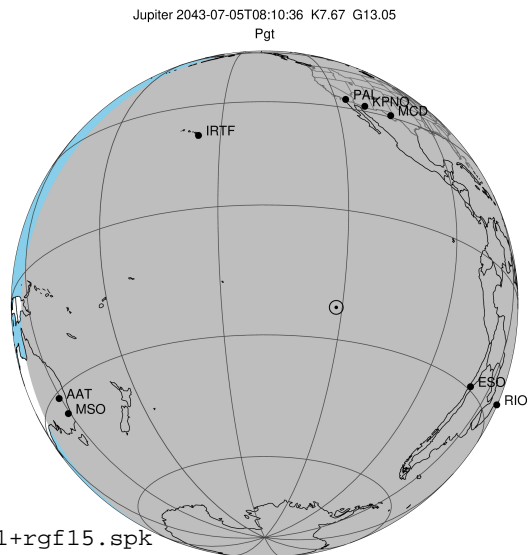


target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-07-05T08:10:36.360
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116863248572832512
 2Mass ID (if available) : 17432952-2304177

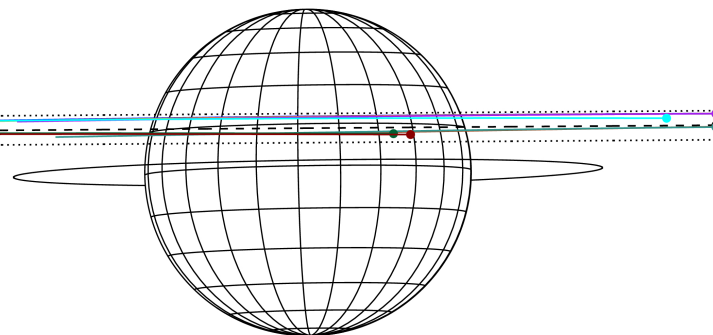
Jupiter 2043-07-05T08:10:36 K7.67 G13.05 Pgt

ICRS Star Coord at Epoch: 17h 43m 29.51619s -23:04:17.79051s

RUWE (>1.4 is poor) : 0.78
 K magnitude : 7.669
 G magnitude : 13.047
 RP magnitude : 11.720
 BP magnitude : 15.138
 DUPflag : 0
 Distance (au) : 4.278
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -15.26
 Sun-Target sep (deg) : 163.56
 Sun-Moon sep (deg) : 173.98
 B (ring opening deg) : -2.41
 PA of pole (deg) : 0.94
 Pole direction: RA (deg): 268.05669
 Dec (deg): 64.49732
 C/A sky separation (") : 6.261
 C/A sky separation (km) : 19427.9
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk



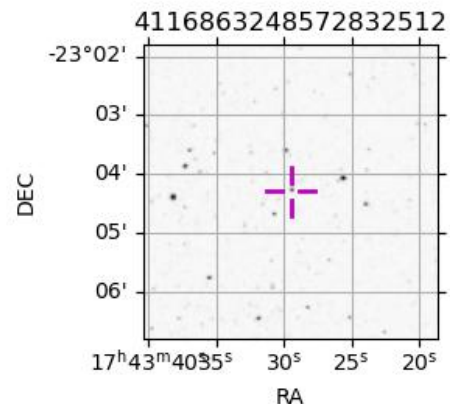
Earth
 PAL
 KPNO
 MCD
 IRTF
 RIO
 ESO
 AAT
 MSO



2043-07-05T08:10:36.3600 at: 17 43 29.5162 s: -23 04 17.791 C/A 6.260" PA 180.41 deg v_sky -15.26 km/s D 04.28 AU
 Credit: Styled after SORA/Lucky Star

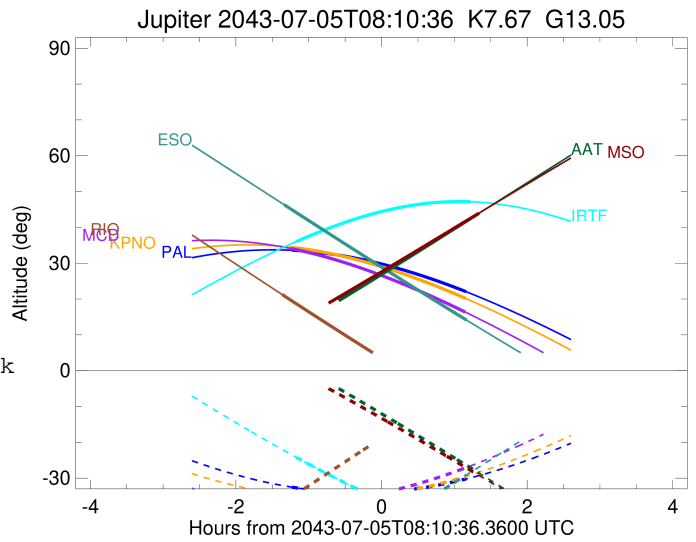
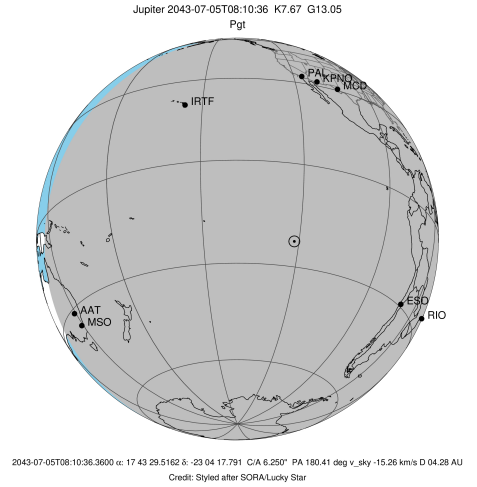
Observable events with sun below -5 deg and altitude above 5 deg

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	+ +	JUL 05 06:56 - JUL 05 09:20	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JUL 05 06:56 - JUL 05 09:19	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JUL 05 06:55 - JUL 05 09:19	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	JUL 05 07:00 - JUL 05 09:24	Pie
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+	JUL 05 06:48 - JUL 05 06:48	Pin
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUL 05 06:50 - JUL 05 09:20	Pie
AAT	Siding Spring (AAT)	-31.3	149.1	+	JUL 05 09:30 - JUL 05 09:30	Pne
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	JUL 05 09:30 - JUL 05 09:30	Pne



```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch              : 2043-07-05T08:08:32.200
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        : 4116863248572832512
2Mass ID (if available) : 17432952-2304177
ICRS Star Coord at Epoch: 17h 43m 29.51619s -23:04:17.79051s
RUWE (>1.4 is poor) : 0.78
K magnitude           : 7.669
G magnitude           : 13.047
RP magnitude          : 11.720
BP magnitude          : 15.138
DUPflag              : 0
Distance (au)         : 4.278
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.26
Sun-Target sep (deg)  : 163.56
Sun-Moon sep (deg)   : 174.88
B (ring opening deg) : -2.41
PA of pole (deg)     : 0.94
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 7.922
C/A sky separation (km) : 24581.6
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
    
```

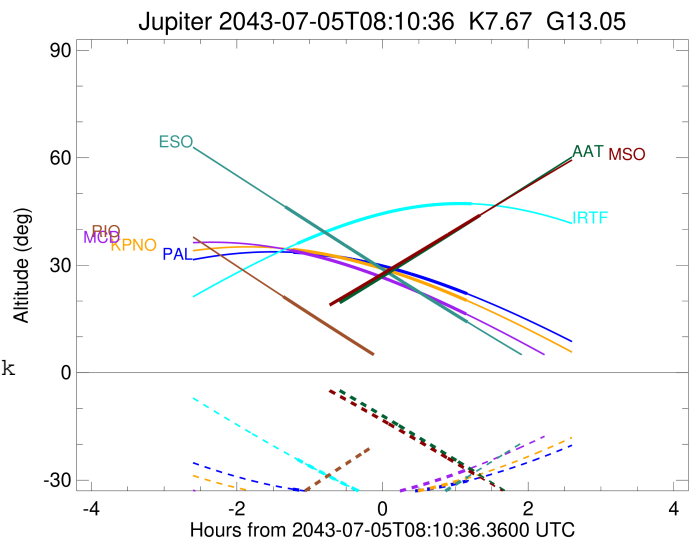
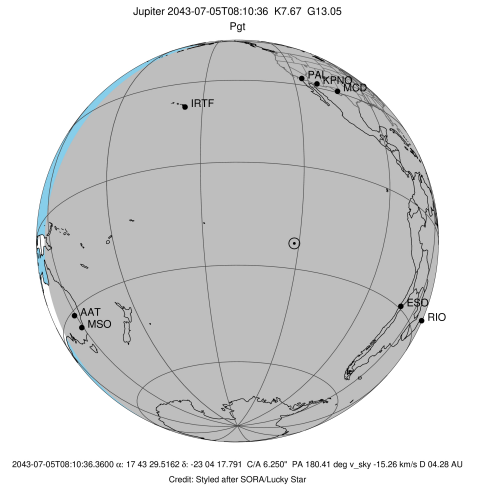


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-05T06:56:58.660	33.60	-32.52	71491.1	19.68	22.23
Jupiter	E	2043-07-05T09:20:19.855	22.04	-30.22	71491.0	20.34	22.95

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-05T08:08:02.520
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        : 4116863248572832512
2Mass ID (if available) : 17432952-2304177
ICRS Star Coord at Epoch: 17h 43m 29.51619s -23:04:17.79051s
RUWE (>1.4 is poor) : 0.78
K magnitude           : 7.669
G magnitude           : 13.047
RP magnitude          : 11.720
BP magnitude          : 15.138
DUPflag              : 0
Distance (au)         : 4.278
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.26
Sun-Target sep (deg) : 163.56
Sun-Moon sep (deg)   : 174.90
B (ring opening deg) : -2.41
PA of pole (deg)     : 0.94
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 7.868
C/A sky separation (km) : 24414.8
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
    
```

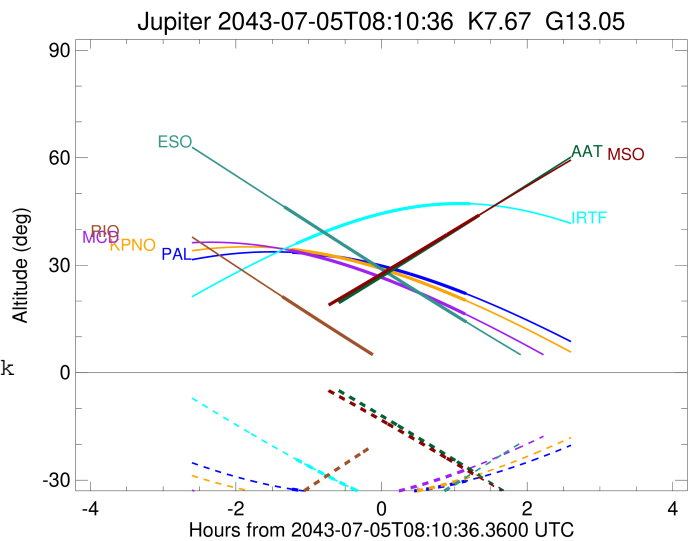
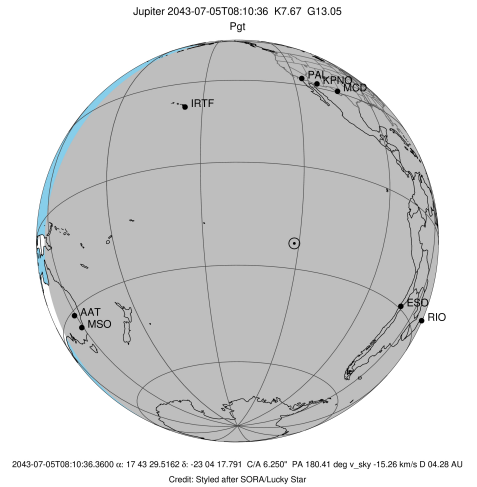


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-05T06:56:24.187	34.42	-34.81	71491.1	19.59	22.13
Jupiter	E	2043-07-05T09:19:57.930	20.16	-29.53	71491.1	20.15	22.74

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-05T08:07:22.140
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       : 4116863248572832512
2Mass ID (if available) : 17432952-2304177
ICRS Star Coord at Epoch: 17h 43m 29.51619s -23:04:17.79051s
RUWE (>1.4 is poor) : 0.78
K magnitude           : 7.669
G magnitude           : 13.047
RP magnitude          : 11.720
BP magnitude          : 15.138
DUPflag              : 0
Distance (au)        : 4.278
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.26
Sun-Target sep (deg) : 163.56
Sun-Moon sep (deg)   : 174.92
B (ring opening deg) : -2.41
PA of pole (deg)     : 0.94
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 7.795
C/A sky separation (km) : 24187.3
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
    
```

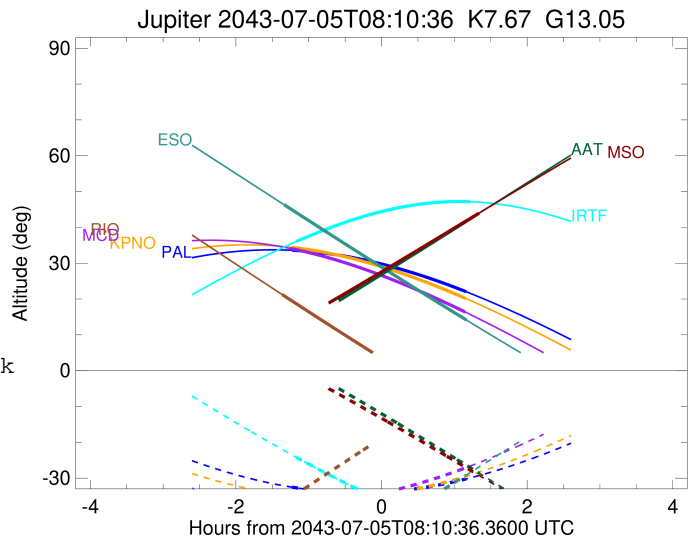
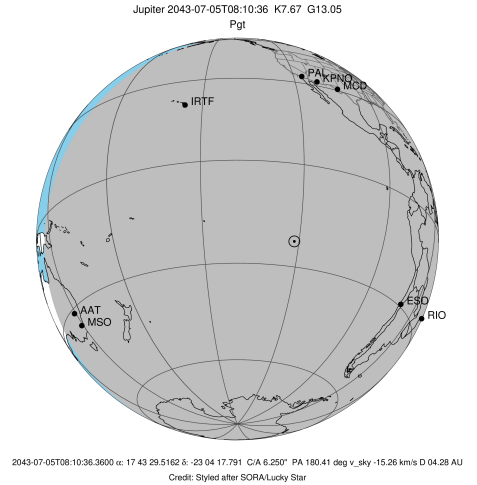


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-05T06:55:34.857	34.11	-36.70	71491.1	19.47	21.99
Jupiter	E	2043-07-05T09:19:30.614	16.38	-27.17	71491.1	19.89	22.45

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch              : 2043-07-05T08:12:18.730
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        : 4116863248572832512
2Mass ID (if available) : 17432952-2304177
ICRS Star Coord at Epoch: 17h 43m 29.51619s -23:04:17.79051s
RUWE (>1.4 is poor)  : 0.78
K magnitude            : 7.669
G magnitude            : 13.047
RP magnitude          : 11.720
BP magnitude          : 15.138
DUPflag               : 0
Distance (au)         : 4.278
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -15.26
Sun-Target sep (deg)  : 163.56
Sun-Moon sep (deg)    : 174.46
B (ring opening deg)  : -2.41
PA of pole (deg)      : 0.94
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 7.629
C/A sky separation (km) : 23670.5
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
    
```

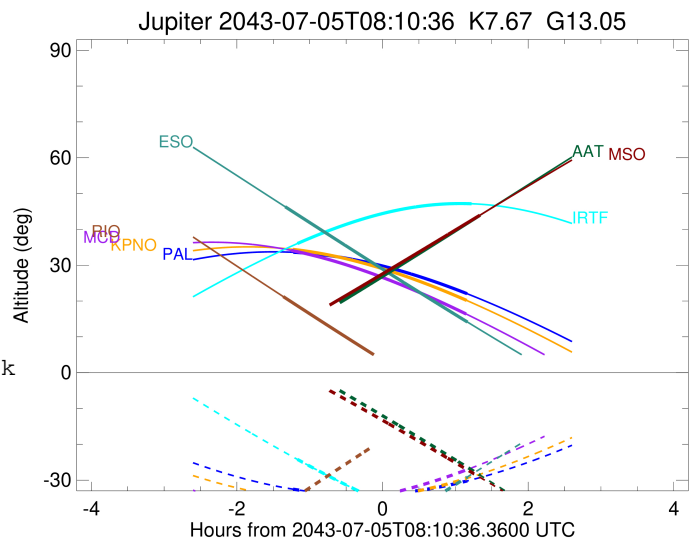
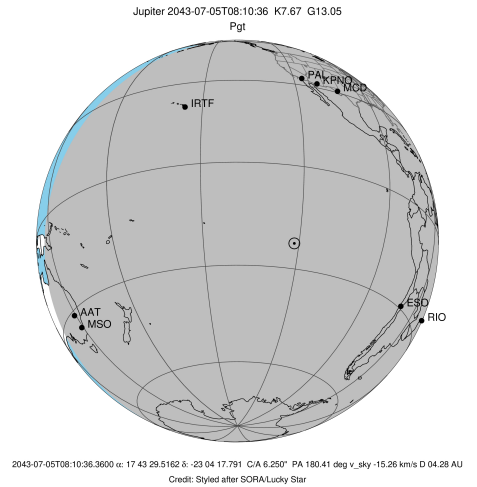


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-05T07:00:29.268	36.04	-24.20	71491.2	18.52	20.94
Jupiter	E	2043-07-05T09:24:00.073	47.15	-44.87	71491.1	19.92	22.49

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-05T08:04:24.290
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : RIO
Location            : Rio de Janeiro
Latitude (deg)      : -22.89506
E. Longitude (deg)  : 316.77708
Altitude (km)       : 0.033
Gaia source ID      : 4116863248572832512
2Mass ID (if available) : 17432952-2304177
ICRS Star Coord at Epoch: 17h 43m 29.51619s -23:04:17.79051s
RUWE (>1.4 is poor) : 0.78
K magnitude          : 7.669
G magnitude          : 13.047
RP magnitude         : 11.720
BP magnitude         : 15.138
DUPflag             : 0
Distance (au)       : 4.278
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.26
Sun-Target sep (deg) : 163.56
Sun-Moon sep (deg)  : 174.03
B (ring opening deg) : -2.41
PA of pole (deg)    : 0.94
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (" ) : 5.476
C/A sky separation (km) : 16991.2
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
    
```

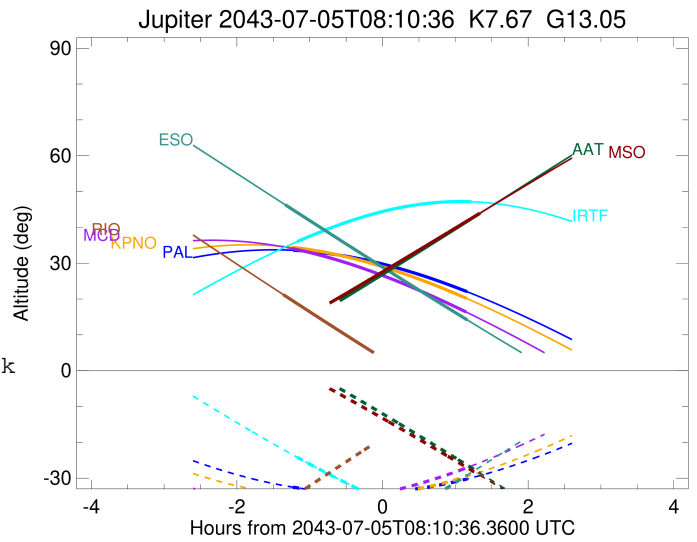
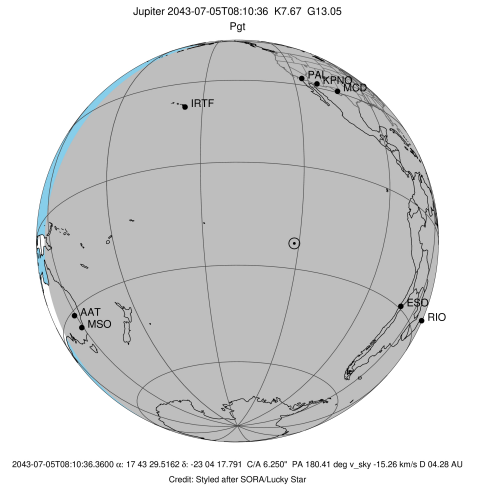


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-05T06:48:46.816	21.24	-37.04	71491.5	13.83	15.71
Jupiter	E	2043-07-05T09:20:45.626	-10.94x	-3.64x	71491.6	13.65	15.51

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-05T08:05:10.240
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      : 4116863248572832512
2Mass ID (if available) : 17432952-2304177
ICRS Star Coord at Epoch: 17h 43m 29.51619s -23:04:17.79051s
RUWE (>1.4 is poor) : 0.78
K magnitude          : 7.669
G magnitude          : 13.047
RP magnitude         : 11.720
BP magnitude         : 15.138
DUPflag             : 0
Distance (au)       : 4.278
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.26
Sun-Target sep (deg) : 163.56
Sun-Moon sep (deg)  : 174.10
B (ring opening deg) : -2.41
PA of pole (deg)    : 0.94
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 5.619
C/A sky separation (km) : 17434.1
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
    
```

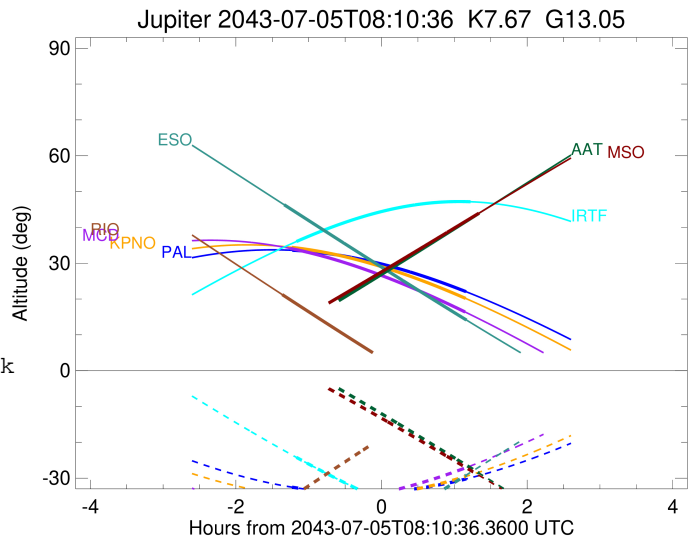
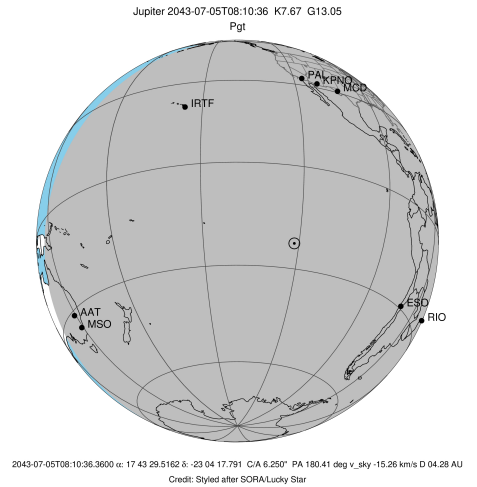


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-05T06:50:31.167	46.28	-61.71	71491.5	14.07	15.98
Jupiter	E	2043-07-05T09:20:26.494	14.16	-29.14	71491.5	14.06	15.97

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-05T08:16:01.680
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : AAT
Location              : Siding Spring (AAT)
Latitude (deg)        : -31.27703
E. Longitude (deg)    : 149.06608
Altitude (km)         : 1.164
Gaia source ID        : 4116863248572832512
2Mass ID (if available) : 17432952-2304177
ICRS Star Coord at Epoch: 17h 43m 29.51619s -23:04:17.79051s
RUWE (>1.4 is poor) : 0.78
K magnitude           : 7.669
G magnitude           : 13.047
RP magnitude          : 11.720
BP magnitude          : 15.138
DUPflag              : 0
Distance (au)         : 4.278
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.26
Sun-Target sep (deg)  : 163.56
Sun-Moon sep (deg)   : 173.28
B (ring opening deg) : -2.41
PA of pole (deg)     : 0.94
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 5.515
C/A sky separation (km) : 17111.2
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
    
```

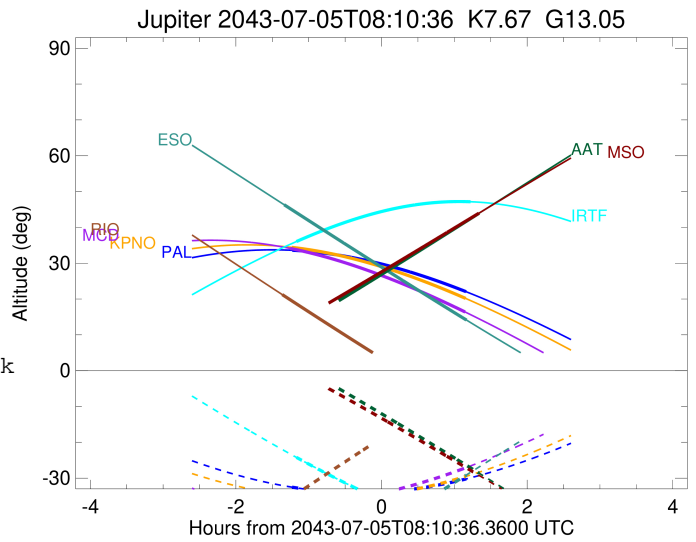
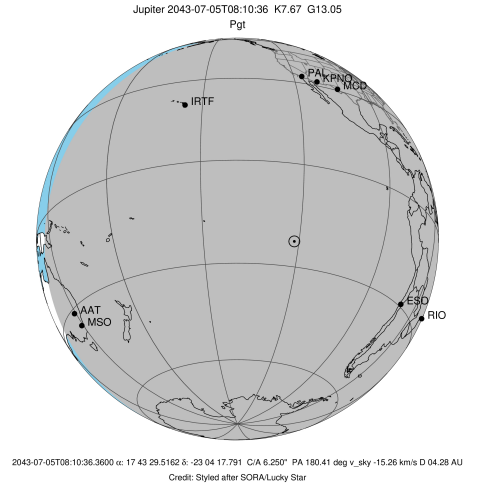


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-05T07:00:35.440	12.40	1.70x	71491.6	12.73	14.48
Jupiter	E	2043-07-05T09:30:54.663	43.92	-28.58	71491.5	14.87	16.88


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-05T08:15:47.360
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : MSO
Location             : Mt. Stromlo Observatory
Latitude (deg)       : -35.32000
E. Longitude (deg)   : 149.00833
Altitude (km)        : 0.770
Gaia source ID       : 4116863248572832512
2Mass ID (if available) : 17432952-2304177
ICRS Star Coord at Epoch: 17h 43m 29.51619s -23:04:17.79051s
RUWE (>1.4 is poor) : 0.78
K magnitude          : 7.669
G magnitude          : 13.047
RP magnitude         : 11.720
BP magnitude         : 15.138
DUPflag             : 0
Distance (au)        : 4.278
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.26
Sun-Target sep (deg) : 163.56
Sun-Moon sep (deg)   : 173.26
B (ring opening deg) : -2.41
PA of pole (deg)     : 0.94
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 5.392
C/A sky separation (km) : 16730.4
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	2043-07-05T07:00:13.893	13.61	-0.09x	71491.6	12.45	14.16
Jupiter	E	2043-07-05T09:30:49.000	43.94	-29.19	71491.5	14.53	16.50