

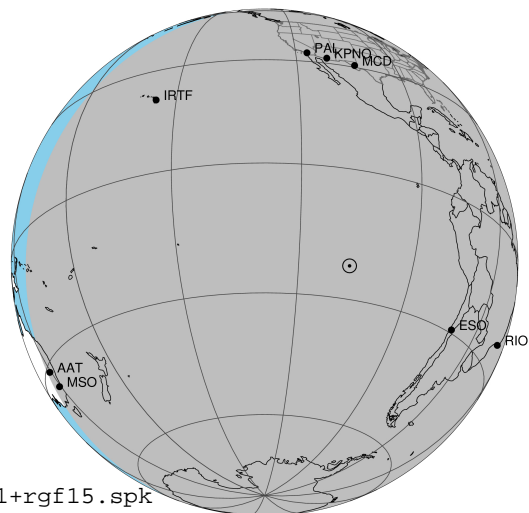
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-07-08T07:13:34.520
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116499756909202048
 2Mass ID (if available) : 17415992-2304049

Jupiter 2043-07-08T07:13:34 K8.47 G13.66 Pgt

ICRS Star Coord at Epoch: 17h 41m 59.92477s -23:04:05.13234s

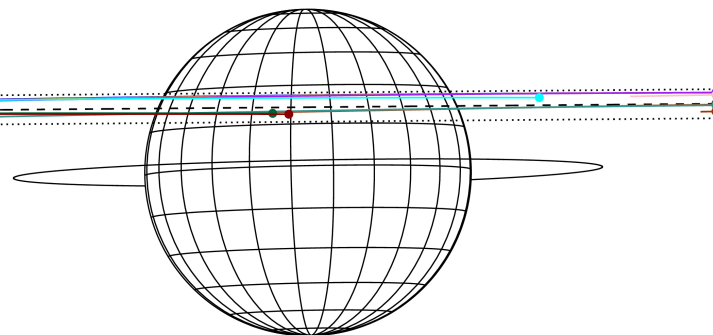
RUWE (>1.4 is poor) : 0.94
 K magnitude : 8.467
 G magnitude : 13.660
 RP magnitude : 12.330
 BP magnitude : 15.837
 DUPflag : 0
 Distance (au) : 4.291
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -14.76
 Sun-Target sep (deg) : 160.40
 Sun-Moon sep (deg) : 139.27
 B (ring opening deg) : -2.41
 PA of pole (deg) : 1.10
 Pole direction: RA (deg): 268.05669
 Dec (deg): 64.49732
 C/A sky separation (") : 9.190
 C/A sky separation (km) : 28603.4
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-07-08T07:13:34 K8.47 G13.66
 Pgt



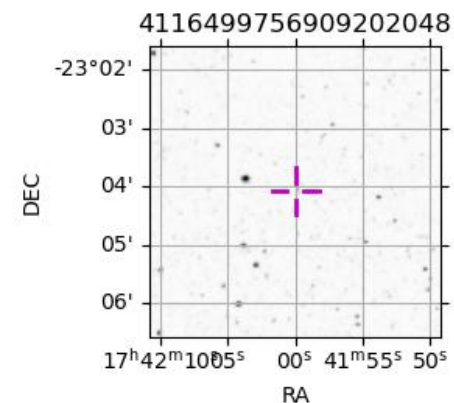
2043-07-08T07:13:34.5200 at: 17 41 59.9248 s: -23 04 05.132 C/A 9.179" PA 180.49 deg v_sky -14.76 km/s D 04.29 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 AAT
 SAAO
 MSO



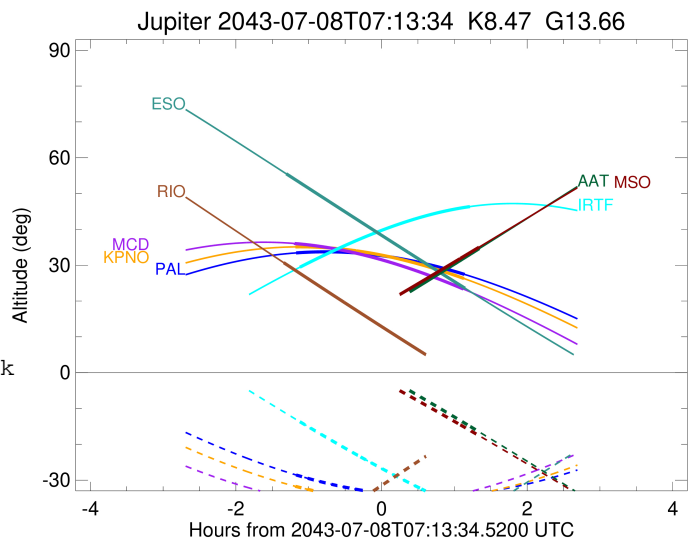
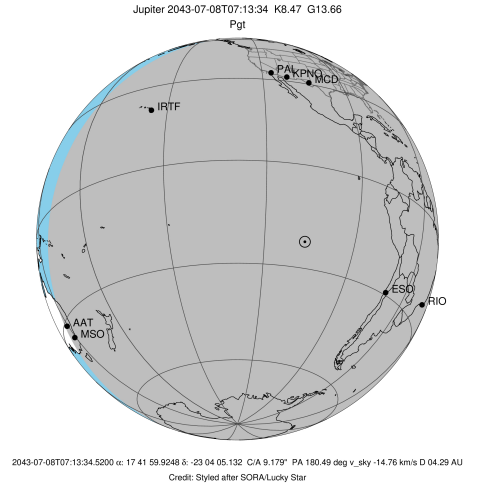
Observable events with sun below -5 deg and altitude above 5 deg

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 08 06:03 - JUL 08 08:21	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JUL 08 06:02 - JUL 08 08:21	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JUL 08 06:01 - JUL 08 08:20	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	JUL 08 06:06 - JUL 08 08:26	Pie
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+	JUL 08 05:53 - JUL 08 05:53	Pin
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUL 08 05:55 - JUL 08 08:22	Pie
AAT	Siding Spring (AAT)	-31.3	149.1	+	JUL 08 08:33 - JUL 08 08:33	Pne
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	JUL 08 08:33 - JUL 08 08:33	Pne



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-08T07:12:29.630
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        : 4116499756909202048
2Mass ID (if available) : 17415992-2304049
ICRS Star Coord at Epoch: 17h 41m 59.92477s -23:04:05.13234s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 8.467
G magnitude           : 13.660
RP magnitude          : 12.330
BP magnitude          : 15.837
DUPflag              : 0
Distance (au)         : 4.291
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.76
Sun-Target sep (deg) : 160.40
Sun-Moon sep (deg)   : 139.57
B (ring opening deg) : -2.41
PA of pole (deg)     : 1.10
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 10.881
C/A sky separation (km): 33867.6
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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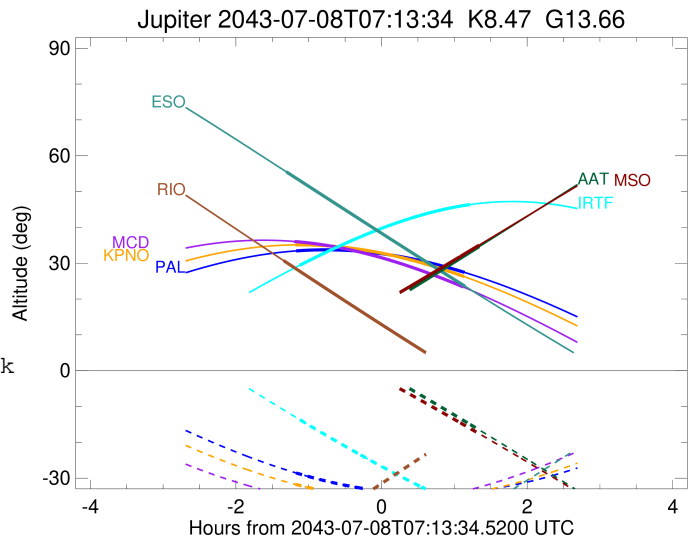
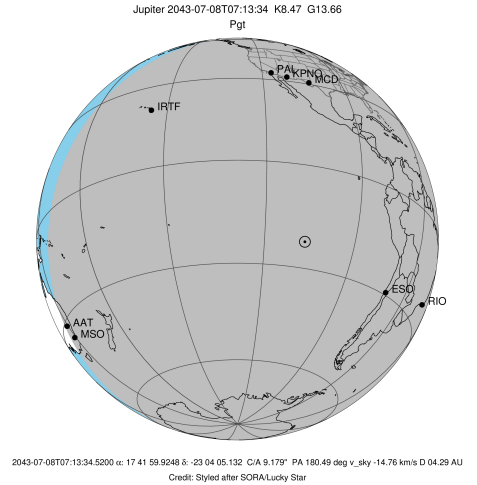


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-08T06:03:11.858	33.43	-28.55	71490.3	27.66	30.88
Jupiter	E	2043-07-08T08:21:55.760	27.44	-33.92	71490.2	28.67	31.96

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-08T07:11:58.660
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       : 4116499756909202048
2Mass ID (if available) : 17415992-2304049
ICRS Star Coord at Epoch: 17h 41m 59.92477s -23:04:05.13234s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 8.467
G magnitude           : 13.660
RP magnitude         : 12.330
BP magnitude         : 15.837
DUPflag              : 0
Distance (au)        : 4.291
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.76
Sun-Target sep (deg) : 160.40
Sun-Moon sep (deg)   : 139.52
B (ring opening deg) : -2.41
PA of pole (deg)     : 1.10
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 10.839
C/A sky separation (km) : 33736.9
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
    
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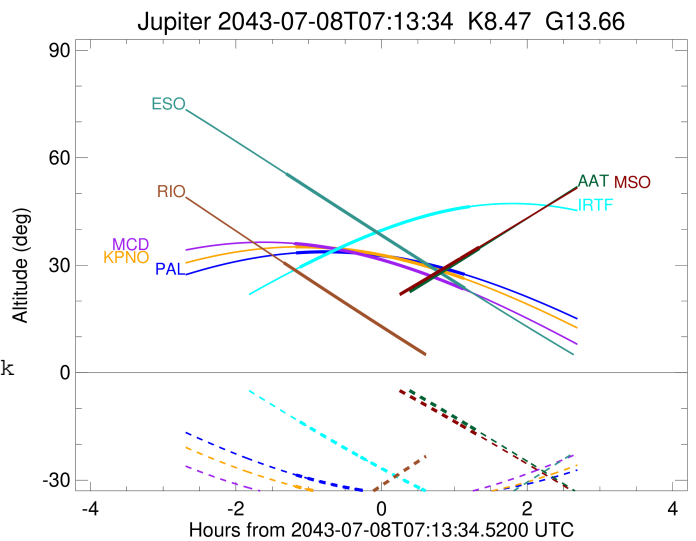
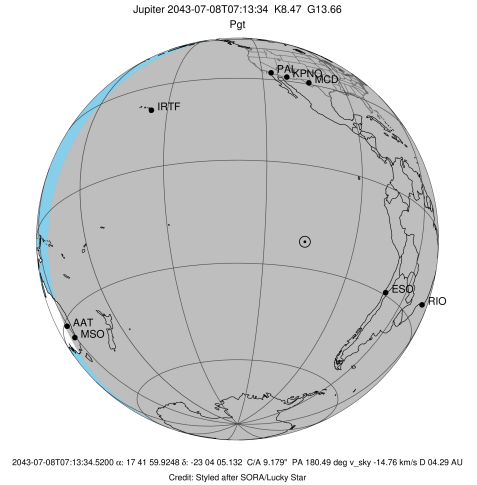


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-08T06:02:37.083	35.11	-31.72	71490.3	27.59	30.81
Jupiter	E	2043-07-08T08:21:31.495	26.28	-34.44	71490.2	28.50	31.78

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-08T07:11:15.040
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       : 4116499756909202048
2Mass ID (if available) : 17415992-2304049
ICRS Star Coord at Epoch: 17h 41m 59.92477s -23:04:05.13234s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 8.467
G magnitude           : 13.660
RP magnitude          : 12.330
BP magnitude          : 15.837
DUPflag              : 0
Distance (au)        : 4.291
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.76
Sun-Target sep (deg) : 160.40
Sun-Moon sep (deg)   : 139.42
B (ring opening deg) : -2.41
PA of pole (deg)     : 1.10
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 10.782
C/A sky separation (km): 33559.6
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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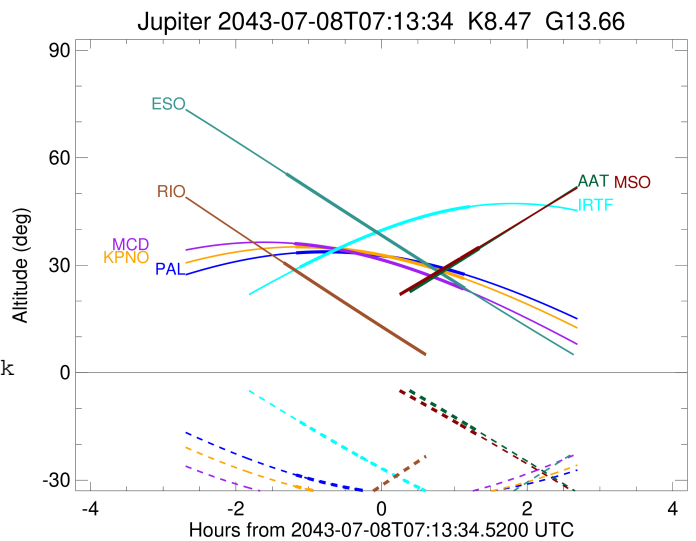
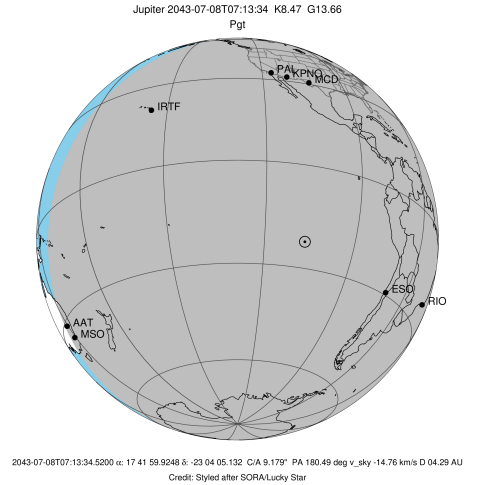


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-08T06:01:46.037	36.06	-35.14	71490.3	27.50	30.72
Jupiter	E	2043-07-08T08:20:59.468	23.36	-33.67	71490.2	28.27	31.53

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-08T07:16:24.890
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        : 4116499756909202048
2Mass ID (if available) : 17415992-2304049
ICRS Star Coord at Epoch: 17h 41m 59.92477s -23:04:05.13234s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 8.467
G magnitude           : 13.660
RP magnitude          : 12.330
BP magnitude          : 15.837
DUPflag              : 0
Distance (au)         : 4.291
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.76
Sun-Target sep (deg) : 160.40
Sun-Moon sep (deg)   : 140.06
B (ring opening deg) : -2.41
PA of pole (deg)     : 1.10
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 10.501
C/A sky separation (km) : 32682.6
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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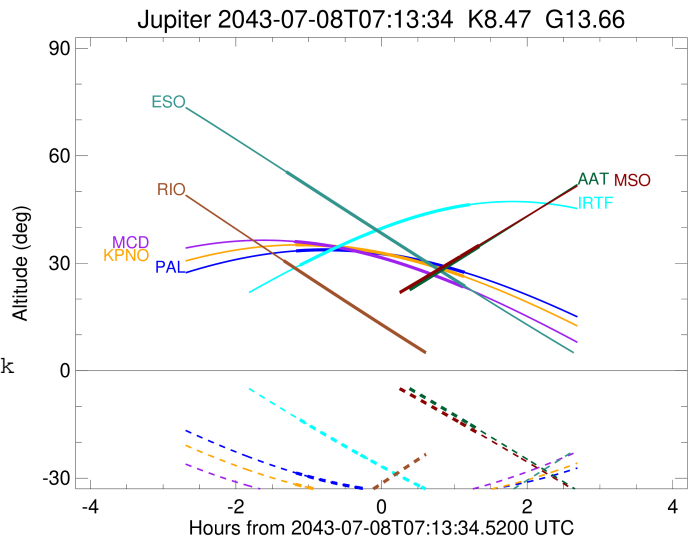
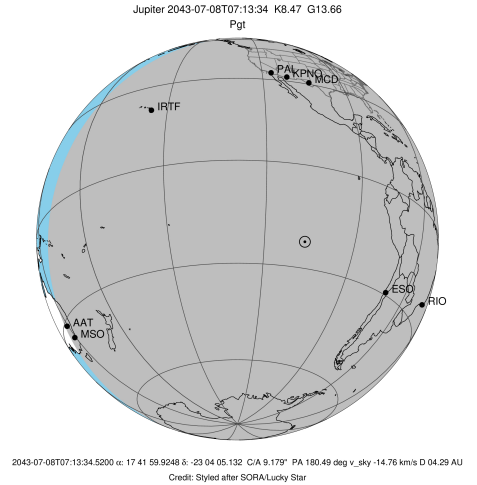


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-08T06:06:17.624	29.43	-13.69	71490.5	26.19	29.30
Jupiter	E	2043-07-08T08:26:18.359	46.35	-38.57	71490.3	27.99	31.24

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-08T07:07:18.610
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        : 4116499756909202048
2Mass ID (if available) : 17415992-2304049
ICRS Star Coord at Epoch: 17h 41m 59.92477s -23:04:05.13234s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 8.467
G magnitude           : 13.660
RP magnitude          : 12.330
BP magnitude          : 15.837
DUPflag              : 0
Distance (au)         : 4.291
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.76
Sun-Target sep (deg)  : 160.40
Sun-Moon sep (deg)    : 138.71
B (ring opening deg) : -2.41
PA of pole (deg)      : 1.10
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 8.552
C/A sky separation (km) : 26616.2
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
    
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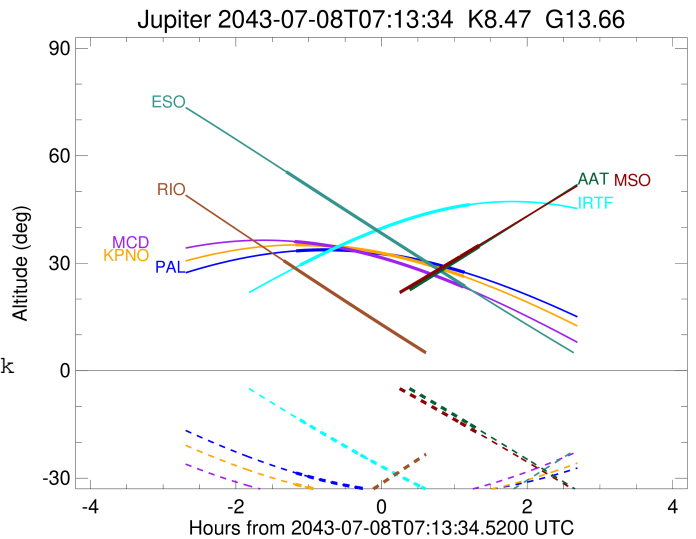
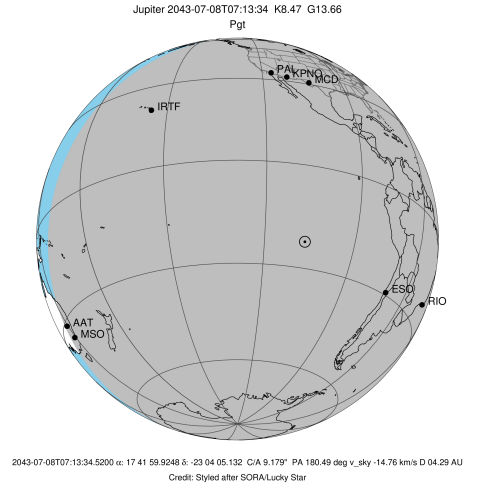


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-08T05:53:00.368	30.70	-49.75	71490.9	21.84	24.59
Jupiter	E	2043-07-08T08:22:20.506	-1.76x	-16.24	71490.9	21.80	24.55

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-08T07:08:35.810
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      : 4116499756909202048
2Mass ID (if available) : 17415992-2304049
ICRS Star Coord at Epoch: 17h 41m 59.92477s -23:04:05.13234s
RUWE (>1.4 is poor) : 0.94
K magnitude          : 8.467
G magnitude          : 13.660
RP magnitude         : 12.330
BP magnitude         : 15.837
DUPflag             : 0
Distance (au)        : 4.291
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.76
Sun-Target sep (deg) : 160.40
Sun-Moon sep (deg)  : 139.10
B (ring opening deg) : -2.41
PA of pole (deg)    : 1.10
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (" ) : 8.668
C/A sky separation (km) : 26978.9
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
    
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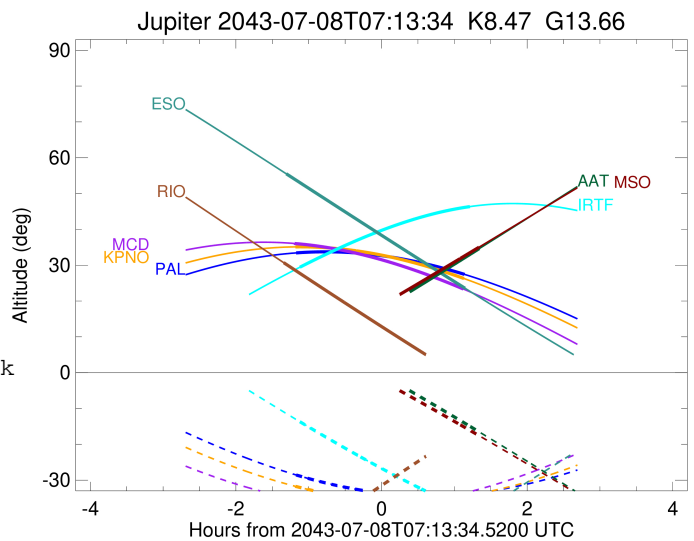
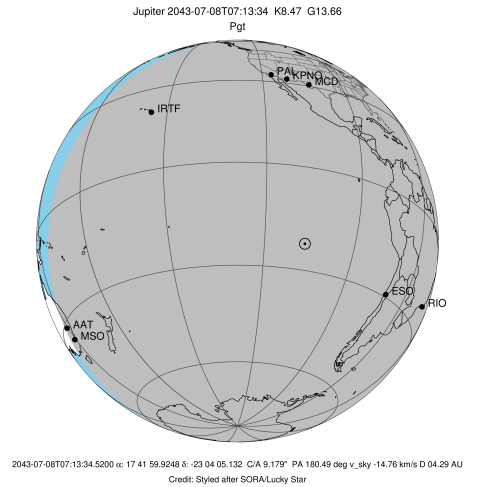


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-08T05:55:13.062	55.48	-73.50	71490.9	21.97	24.74
Jupiter	E	2043-07-08T08:22:32.419	23.53	-41.65	71490.9	22.21	25.00


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-08T07:19:20.720
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        : 4116499756909202048
2Mass ID (if available) : 17415992-2304049
ICRS Star Coord at Epoch: 17h 41m 59.92477s -23:04:05.13234s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 8.467
G magnitude           : 13.660
RP magnitude          : 12.330
BP magnitude          : 15.837
DUPflag              : 0
Distance (au)         : 4.291
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.76
Sun-Target sep (deg)  : 160.40
Sun-Moon sep (deg)    : 140.05
B (ring opening deg) : -2.41
PA of pole (deg)      : 1.10
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 8.317
C/A sky separation (km) : 25886.3
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
    
```

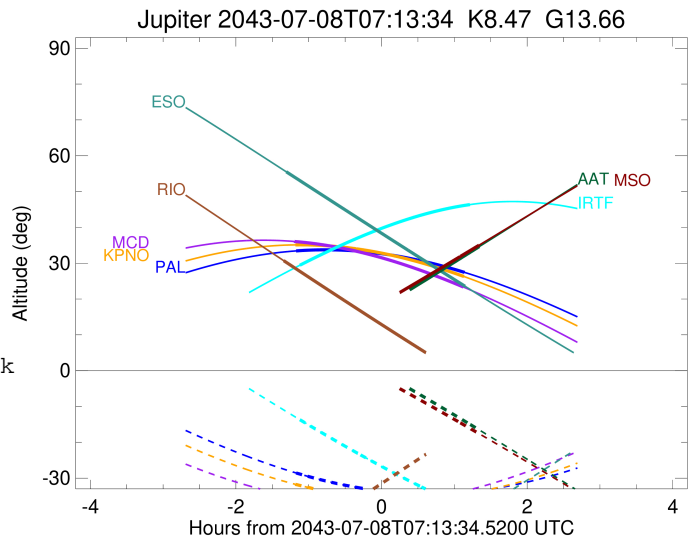
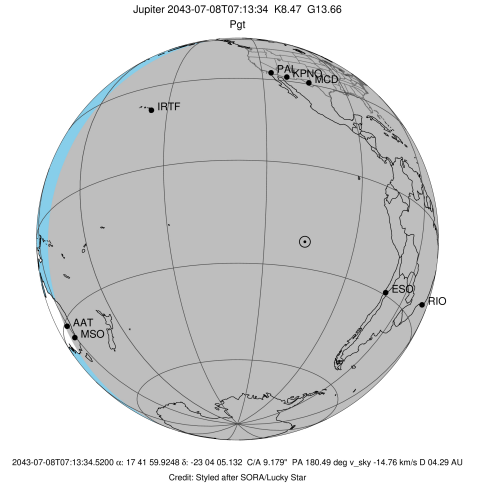


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-08T06:04:06.846	3.81x	12.23x	71491.1	19.99	22.57
Jupiter	E	2043-07-08T08:33:59.171	34.60	-16.51	71490.8	22.39	25.20


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-08T07:19:05.310
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       : 4116499756909202048
2Mass ID (if available) : 17415992-2304049
ICRS Star Coord at Epoch: 17h 41m 59.92477s -23:04:05.13234s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 8.467
G magnitude           : 13.660
RP magnitude         : 12.330
BP magnitude         : 15.837
DUPflag              : 0
Distance (au)        : 4.291
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.76
Sun-Target sep (deg) : 160.40
Sun-Moon sep (deg)   : 140.02
B (ring opening deg) : -2.41
PA of pole (deg)     : 1.10
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 8.200
C/A sky separation (km): 25523.3
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	2043-07-08T06:03:41.735	5.37	9.95x	71491.1	19.71	22.25
Jupiter	E	2043-07-08T08:33:54.988	35.01	-17.57	71490.9	22.06	24.83