

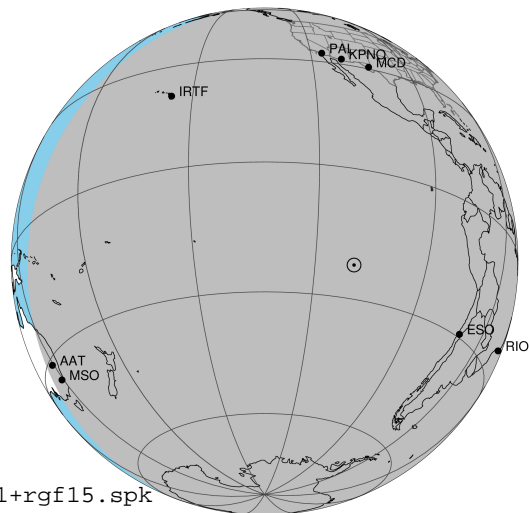
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-07-09T07:25:32.450
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116500379819907200
 2Mass ID (if available) : 17413017-2304192

Jupiter 2043-07-09T07:25:32 K8.73 G14.54 Pgt

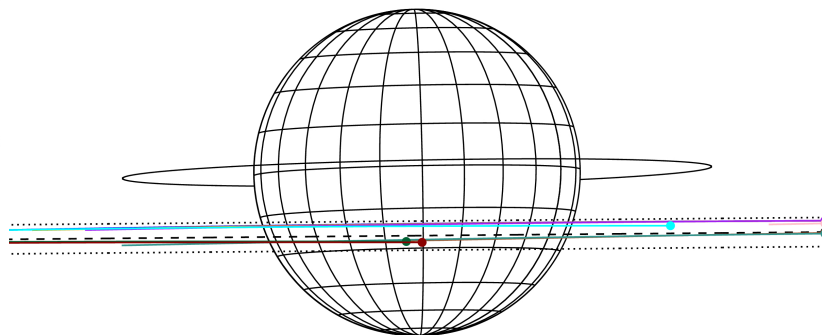
ICRS Star Coord at Epoch: 17h 41m 30.18004s -23:04:19.62160s

RUWE (>1.4 is poor) : 0.96
 K magnitude : 8.735
 G magnitude : 14.540
 RP magnitude : 13.108
 BP magnitude : 17.152
 DUPflag : 0
 Distance (au) : 4.296
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -14.57
 Sun-Target sep (deg) : 159.32
 Sun-Moon sep (deg) : 125.28
 B (ring opening deg) : -2.41
 PA of pole (deg) : 1.15
 Pole direction: RA (deg): 268.05670
 Dec (deg): 64.49732
 C/A sky separation (") : 8.880
 C/A sky separation (km) : 27671.6
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-07-09T07:25:32 K8.73 G14.54
 Pgt



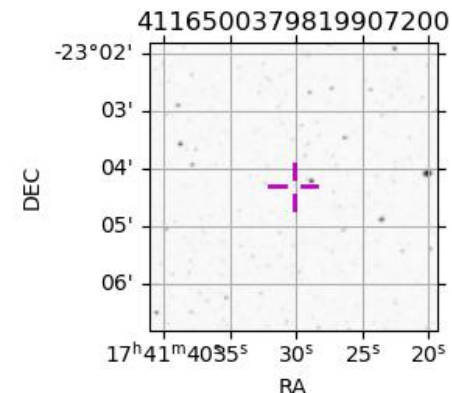
Earth
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 AAT
 MSO



2043-07-09T07:25:32.4500 a: 17 41 30.18004 -23 04 19.622 C/A 8.891" PA 0.51 deg v_sky -14.57 km/s D 04.30 AU
 Credit: Styled after SORA/Lucky Star

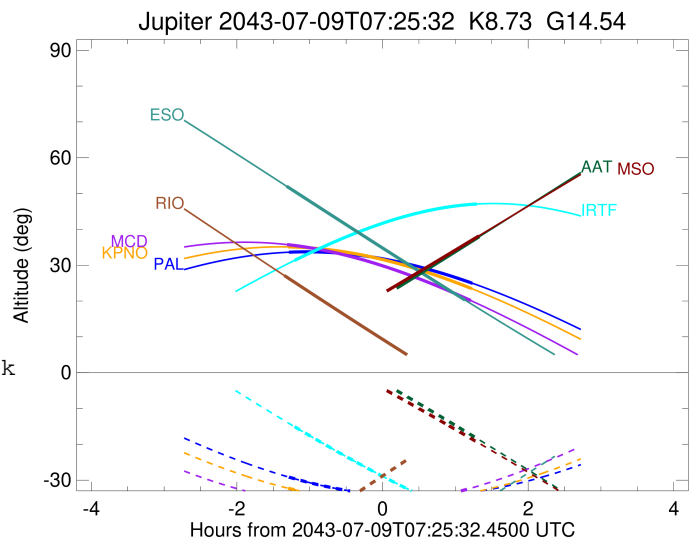
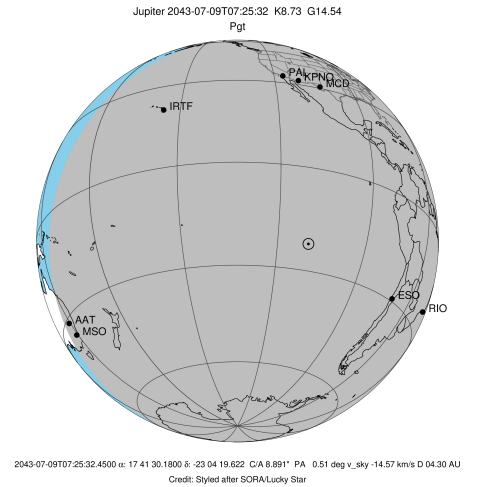
Observable events with sun below -5 deg and altitude above 5 deg

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 09 06:08 - JUL 09 08:39	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JUL 09 06:07 - JUL 09 08:39	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JUL 09 06:07 - JUL 09 08:38	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	JUL 09 06:13 - JUL 09 08:43	Pie
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+	JUL 09 06:04 - JUL 09 06:04	Pin
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUL 09 06:06 - JUL 09 08:33	Pie
AAT	Siding Spring (AAT)	-31.3	149.1	+	JUL 09 08:45 - JUL 09 08:45	Pne
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	JUL 09 08:44 - JUL 09 08:44	Pne



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-09T07:23:53.890
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       : 4116500379819907200
2Mass ID (if available) : 17413017-2304192
ICRS Star Coord at Epoch: 17h 41m 30.18004s -23:04:19.62160s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 8.735
G magnitude           : 14.540
RP magnitude         : 13.108
BP magnitude         : 17.152
DUPflag              : 0
Distance (au)        : 4.296
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.57
Sun-Target sep (deg) : 159.32
Sun-Moon sep (deg)  : 125.61
B (ring opening deg) : -2.41
PA of pole (deg)    : 1.15
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 7.201
C/A sky separation (km) : 22438.4
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
    
```

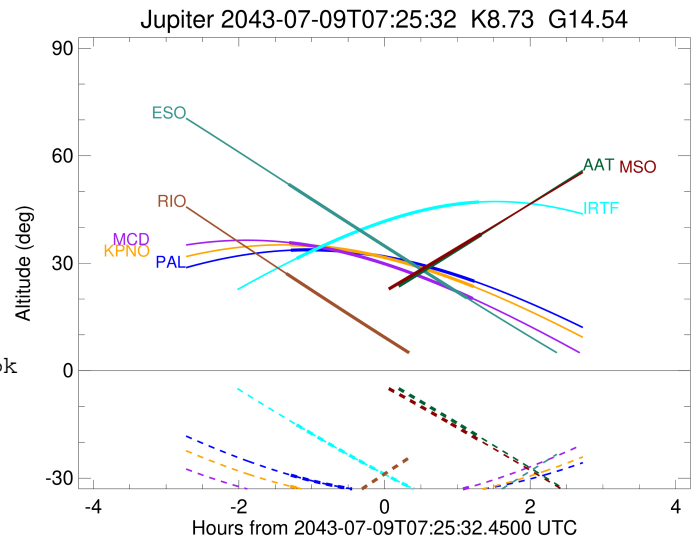
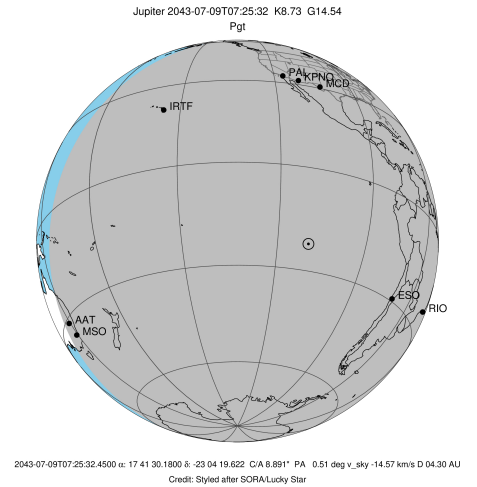


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-09T06:08:20.217	33.62	-29.15	71491.2	-18.87	-21.32
Jupiter	E	2043-07-09T08:39:40.538	24.95	-33.36	71491.3	-17.87	-20.22

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-09T07:23:19.260
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      : 4116500379819907200
2Mass ID (if available) : 17413017-2304192
ICRS Star Coord at Epoch: 17h 41m 30.18004s -23:04:19.62160s
RUWE (>1.4 is poor) : 0.96
K magnitude          : 8.735
G magnitude          : 14.540
RP magnitude         : 13.108
BP magnitude         : 17.152
DUPflag             : 0
Distance (au)       : 4.296
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -14.57
Sun-Target sep (deg) : 159.32
Sun-Moon sep (deg)  : 125.56
B (ring opening deg) : -2.41
PA of pole (deg)    : 1.15
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 7.247
C/A sky separation (km) : 22582.1
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
    
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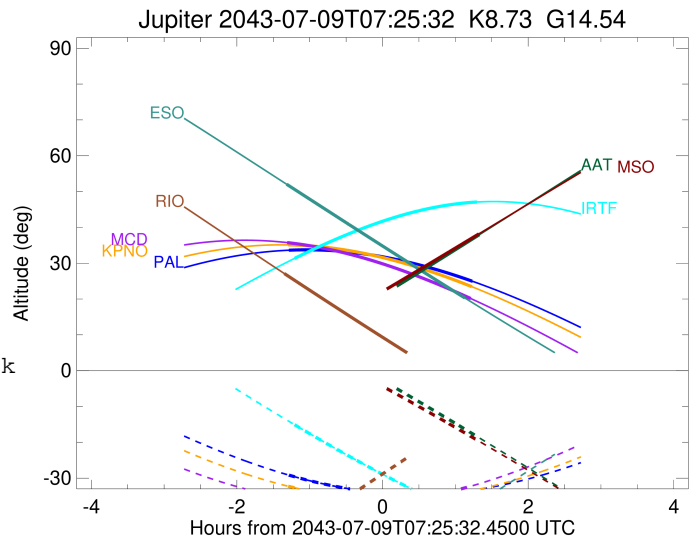
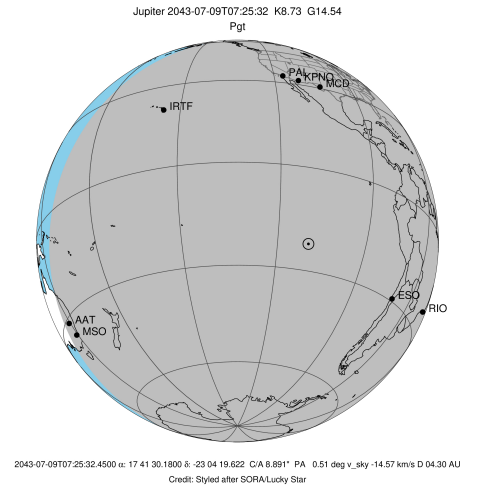


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-09T06:07:49.120	35.10	-32.26	71491.2	-18.93	-21.40
Jupiter	E	2043-07-09T08:39:05.913	23.45	-33.51	71491.2	-18.04	-20.42

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-09T07:22:31.070
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        : 4116500379819907200
2Mass ID (if available) : 17413017-2304192
ICRS Star Coord at Epoch: 17h 41m 30.18004s -23:04:19.62160s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 8.735
G magnitude           : 14.540
RP magnitude          : 13.108
BP magnitude          : 17.152
DUPflag              : 0
Distance (au)         : 4.296
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.57
Sun-Target sep (deg) : 159.32
Sun-Moon sep (deg)   : 125.48
B (ring opening deg) : -2.41
PA of pole (deg)     : 1.15
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 7.310
C/A sky separation (km): 22777.5
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
    
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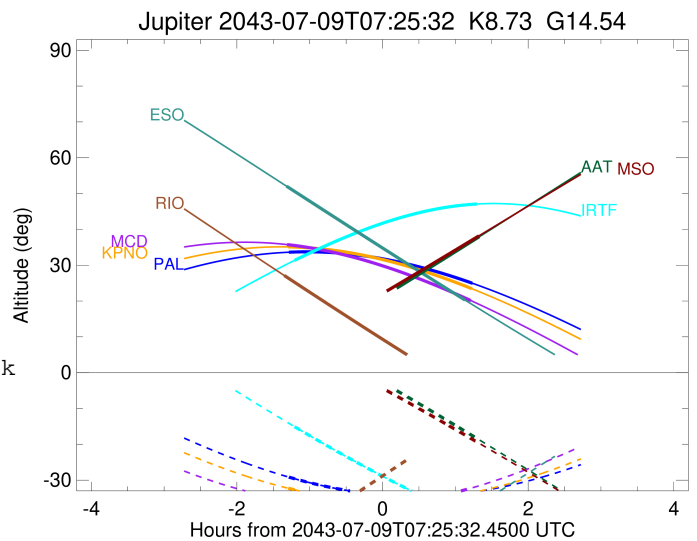
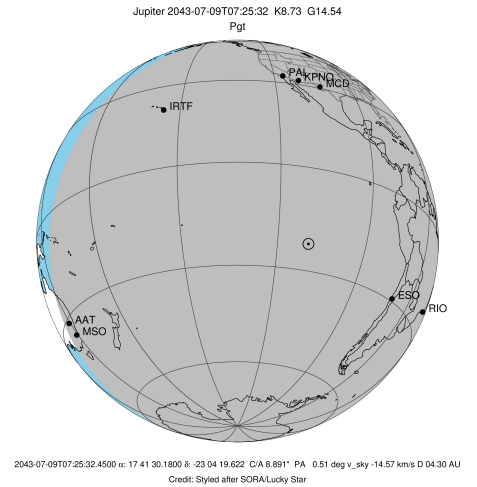


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-09T06:07:03.029	35.74	-35.56	71491.2	-19.02	-21.50
Jupiter	E	2043-07-09T08:38:20.586	20.12	-32.25	71491.2	-18.28	-20.67

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-09T07:28:17.130
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       : 4116500379819907200
2Mass ID (if available) : 17413017-2304192
ICRS Star Coord at Epoch: 17h 41m 30.18004s -23:04:19.62160s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 8.735
G magnitude           : 14.540
RP magnitude         : 13.108
BP magnitude         : 17.152
DUPflag              : 0
Distance (au)        : 4.296
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.57
Sun-Target sep (deg) : 159.32
Sun-Moon sep (deg)   : 126.04
B (ring opening deg) : -2.41
PA of pole (deg)     : 1.15
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 7.549
C/A sky separation (km): 23523.1
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
    
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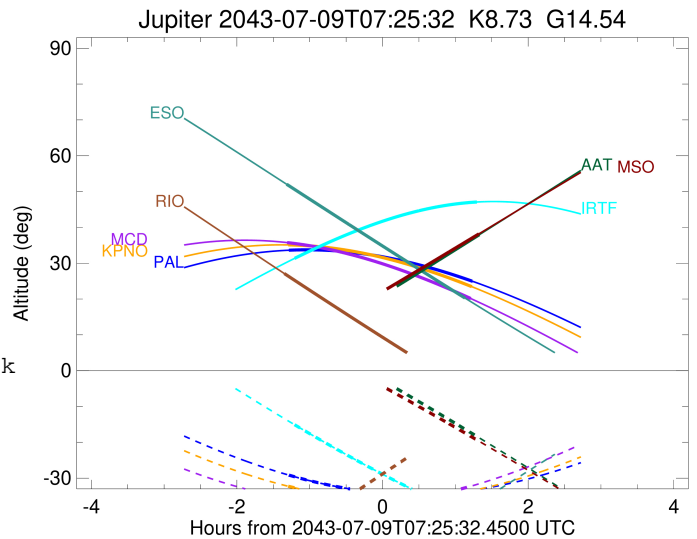
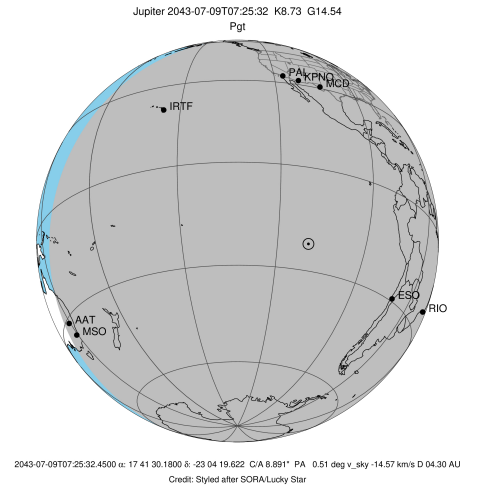


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-09T06:13:03.642	31.33	-15.08	71491.1	-20.18	-22.78
Jupiter	E	2043-07-09T08:43:16.815	47.07	-40.90	71491.2	-18.40	-20.81

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-09T07:18:25.290
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      : 4116500379819907200
2Mass ID (if available) : 17413017-2304192
ICRS Star Coord at Epoch: 17h 41m 30.18004s -23:04:19.62160s
RUWE (>1.4 is poor) : 0.96
K magnitude          : 8.735
G magnitude          : 14.540
RP magnitude         : 13.108
BP magnitude         : 17.152
DUPflag             : 0
Distance (au)        : 4.296
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.57
Sun-Target sep (deg) : 159.32
Sun-Moon sep (deg)   : 124.88
B (ring opening deg) : -2.41
PA of pole (deg)     : 1.15
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 9.568
C/A sky separation (km): 29815.8
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
    
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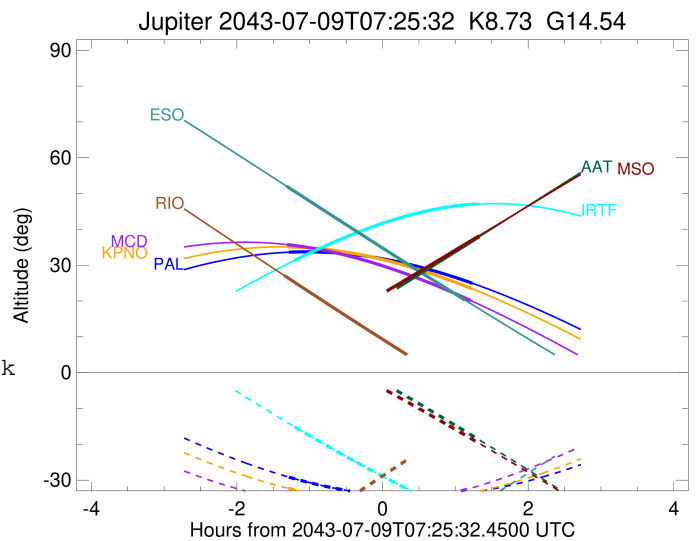
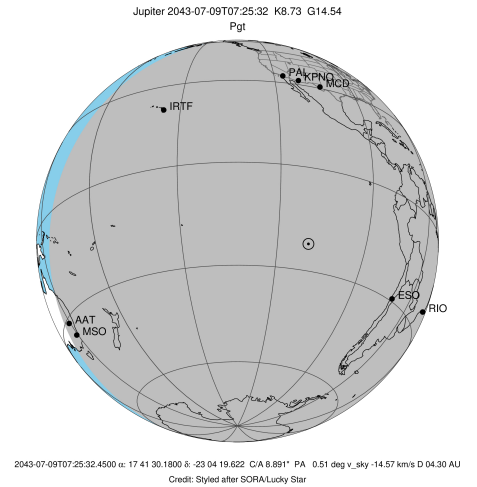


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-09T06:04:36.107	27.12	-47.12	71490.6	-24.63	-27.63
Jupiter	E	2043-07-09T08:33:00.020	-4.88x	-13.91	71490.6	-24.64	-27.64

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-09T07:19:41.070
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       : 4116500379819907200
2Mass ID (if available) : 17413017-2304192
ICRS Star Coord at Epoch: 17h 41m 30.18004s -23:04:19.62160s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 8.735
G magnitude           : 14.540
RP magnitude         : 13.108
BP magnitude         : 17.152
DUPflag              : 0
Distance (au)        : 4.296
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.57
Sun-Target sep (deg) : 159.32
Sun-Moon sep (deg)   : 125.28
B (ring opening deg) : -2.41
PA of pole (deg)     : 1.15
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 9.442
C/A sky separation (km): 29421.3
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
    
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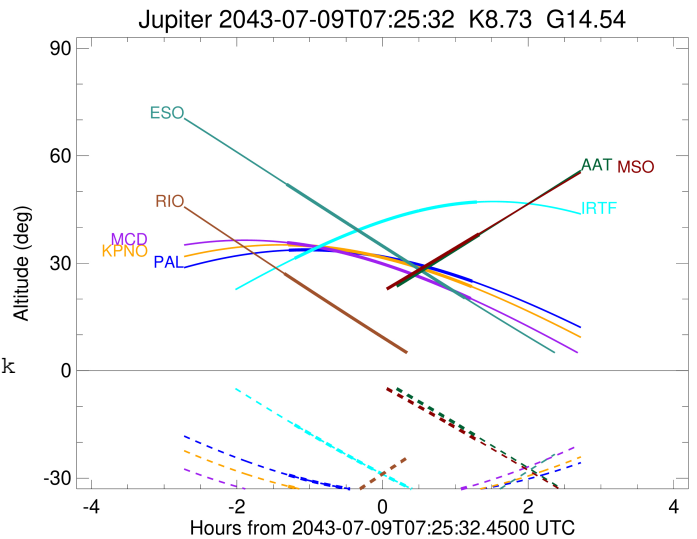
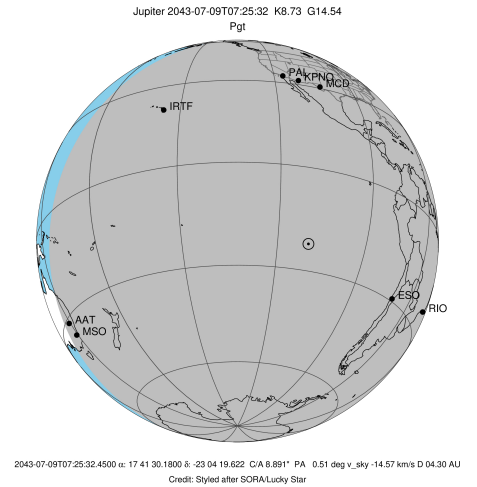


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-09T06:06:30.760	52.04	-71.13	71490.6	-24.45	-27.43
Jupiter	E	2043-07-09T08:33:28.093	20.28	-39.27	71490.7	-24.21	-27.18

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-09T07:31:57.830
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        : 4116500379819907200
2Mass ID (if available) : 17413017-2304192
ICRS Star Coord at Epoch: 17h 41m 30.18004s -23:04:19.62160s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 8.735
G magnitude           : 14.540
RP magnitude          : 13.108
BP magnitude          : 17.152
DUPflag              : 0
Distance (au)         : 4.296
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.57
Sun-Target sep (deg)  : 159.32
Sun-Moon sep (deg)   : 126.01
B (ring opening deg) : -2.41
PA of pole (deg)     : 1.15
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 9.704
C/A sky separation (km) : 30237.1
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
    
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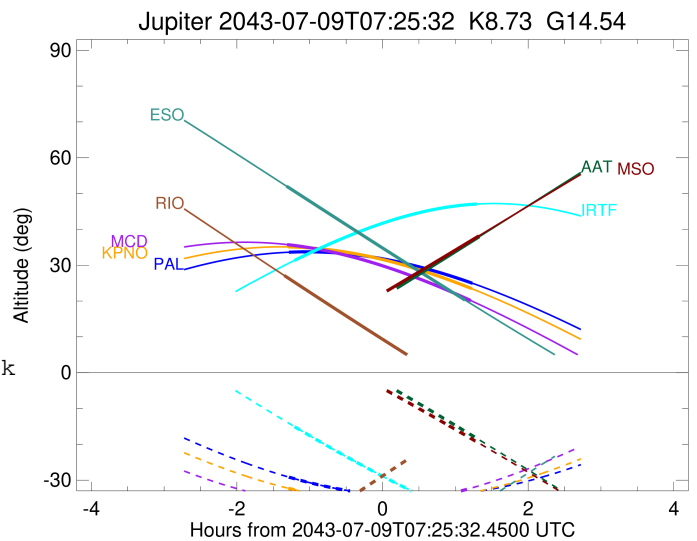
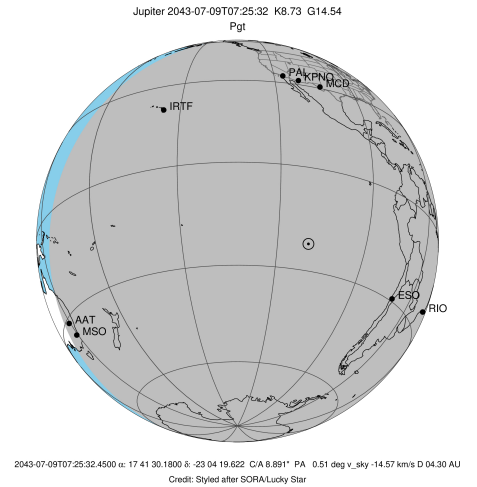


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-09T06:18:02.684	7.42	9.89x	71490.4	-26.25	-29.37
Jupiter	E	2043-07-09T08:45:17.676	37.95	-18.75	71490.7	-23.80	-26.72


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-09T07:31:40.730
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       : 4116500379819907200
2Mass ID (if available) : 17413017-2304192
ICRS Star Coord at Epoch: 17h 41m 30.18004s -23:04:19.62160s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 8.735
G magnitude           : 14.540
RP magnitude         : 13.108
BP magnitude         : 17.152
DUPflag              : 0
Distance (au)        : 4.296
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.57
Sun-Target sep (deg) : 159.32
Sun-Moon sep (deg)   : 126.00
B (ring opening deg) : -2.41
PA of pole (deg)     : 1.15
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 9.822
C/A sky separation (km) : 30607.0
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
    
```



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	2043-07-09T06:17:56.882	8.89	7.69x	71490.4	-26.55	-29.69
Jupiter	E	2043-07-09T08:44:51.107	38.15	-19.64	71490.7	-24.15	-27.10