

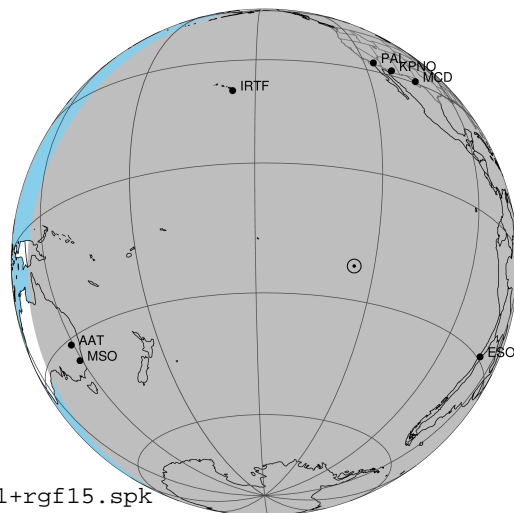
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2043-07-09T08:26:23.040  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4116500375384483840  
 2Mass ID (if available) : 17412894-2304144

Jupiter 2043-07-09T08:26:23 K8.28 G12.87 Pgt

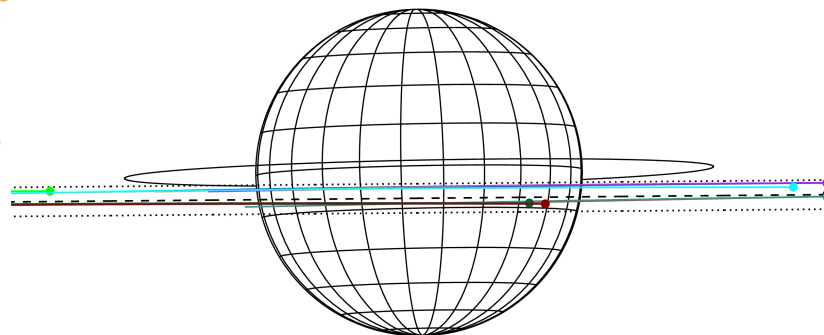
ICRS Star Coord at Epoch: 17h 41m 28.94669s -23:04:14.21236s

RUWE (>1.4 is poor) : 0.88  
 K magnitude : 8.278  
 G magnitude : 12.867  
 RP magnitude : 11.719  
 BP magnitude : 14.239  
 DUPflag : 0  
 Distance (au) : 4.297  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -14.57  
 Sun-Target sep (deg) : 159.28  
 Sun-Moon sep (deg) : 124.70  
 B (ring opening deg) : -2.41  
 PA of pole (deg) : 1.16  
 Pole direction: RA (deg): 268.05670  
 Dec (deg): 64.49732  
 C/A sky separation (") : 3.623  
 C/A sky separation (km) : 11291.1  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2043-07-09T08:26:23 K8.28 G12.87  
 Pgt



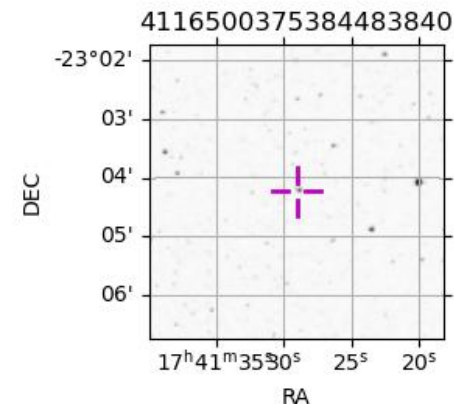
Earth  
 PAL  
 PMO  
 KPNO  
 MCD  
 IRTF  
 RIO  
 ESO  
 AAT  
 MSO



2043-07-09T08:26:23.0400 a: 17 41 28.9467 δ: -23 04 14.212 C/A 3.623" PA 0.52 deg v\_sky -14.57 km/s D 04.30 AU  
 Credit: Styled after SORA/Lucky Star

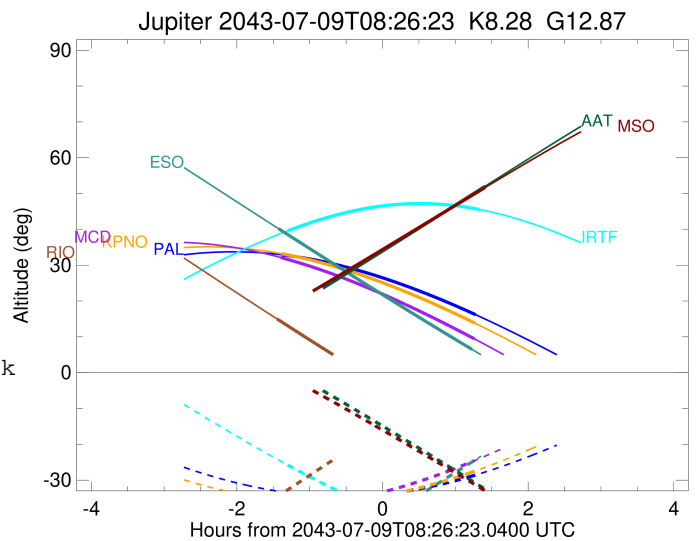
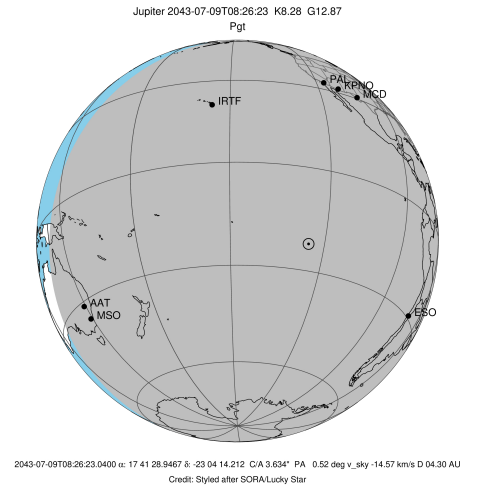
Observable events with sun below -5 deg and altitude above 5 deg

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 07:03 - JUL 09 09:43	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JUL 09 07:03 - JUL 09 09:42	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JUL 09 07:02 - JUL 09 09:42	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	JUL 09 07:08 - JUL 09 09:46	Pie
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+	JUL 09 06:59 - JUL 09 06:59	Pin
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUL 09 07:00 - JUL 09 09:40	Pie
AAT	Siding Spring (AAT)	-31.3	149.1	+	JUL 09 09:51 - JUL 09 09:51	Pne
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	JUL 09 09:50 - JUL 09 09:50	Pne



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-09T08:23:18.540
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      : 4116500375384483840
2Mass ID (if available) : 17412894-2304144
ICRS Star Coord at Epoch: 17h 41m 28.94669s -23:04:14.21236s
RUWE (>1.4 is poor) : 0.88
K magnitude         : 8.278
G magnitude         : 12.867
RP magnitude        : 11.719
BP magnitude        : 14.239
DUPflag            : 0
Distance (au)      : 4.297
f0 (km)            : 0.00
g0 (km)            : 0.00
skyplane vel. (km/s) : -14.57
Sun-Target sep (deg) : 159.28
Sun-Moon sep (deg)  : 124.86
B (ring opening deg) : -2.41
PA of pole (deg)    : 1.16
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 2.009
C/A sky separation (km) : 6261.6
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
    
```

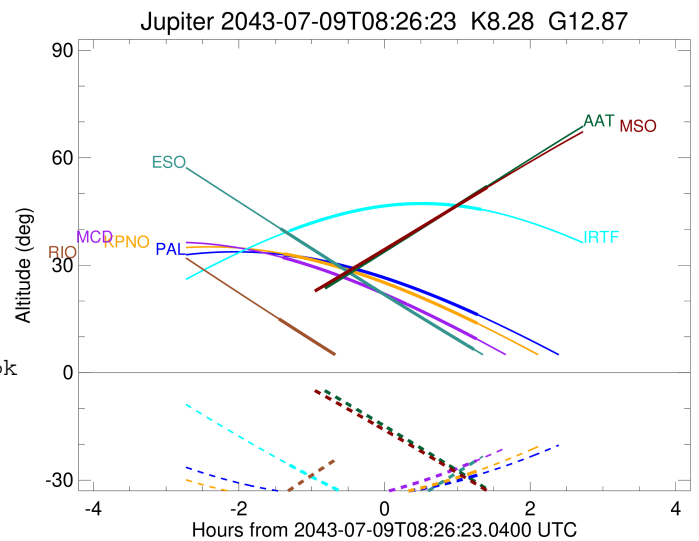
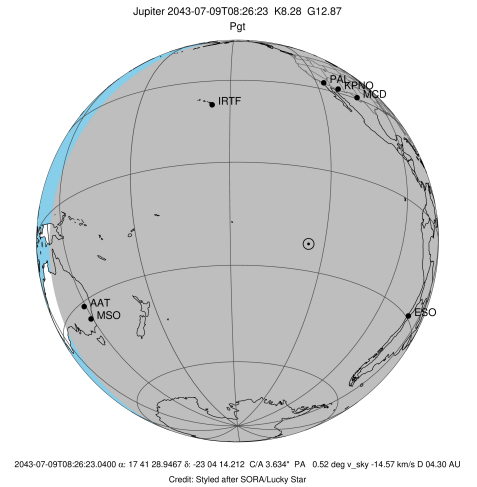


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-09T07:03:50.592	32.89	-33.26	71491.9	-5.47	-6.25
Jupiter	E	2043-07-09T09:43:11.150	16.17	-28.55	71491.9	-4.75	-5.43

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-09T08:22:47.120
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       : 4116500375384483840
2Mass ID (if available) : 17412894-2304144
ICRS Star Coord at Epoch: 17h 41m 28.94669s -23:04:14.21236s
RUWE (>1.4 is poor) : 0.88
K magnitude           : 8.278
G magnitude           : 12.867
RP magnitude         : 11.719
BP magnitude         : 14.239
DUPflag              : 0
Distance (au)        : 4.297
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.57
Sun-Target sep (deg) : 159.28
Sun-Moon sep (deg)   : 124.80
B (ring opening deg) : -2.41
PA of pole (deg)     : 1.16
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 2.071
C/A sky separation (km) : 6453.5
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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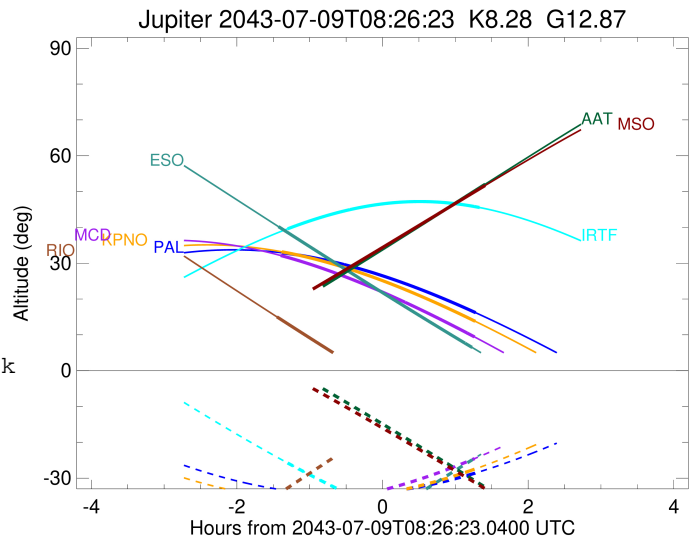
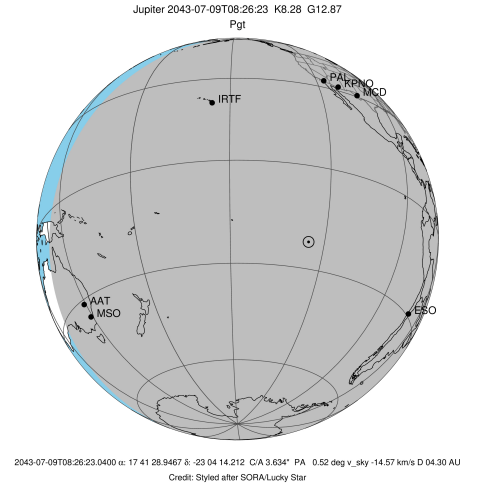


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-09T07:03:17.850	33.19	-35.44	71491.9	-5.57	-6.37
Jupiter	E	2043-07-09T09:42:44.746	13.79	-27.44	71491.9	-4.95	-5.66

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-09T08:22:05.580
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      : 4116500375384483840
2Mass ID (if available) : 17412894-2304144
ICRS Star Coord at Epoch: 17h 41m 28.94669s -23:04:14.21236s
RUWE (>1.4 is poor) : 0.88
K magnitude          : 8.278
G magnitude          : 12.867
RP magnitude         : 11.719
BP magnitude         : 14.239
DUPflag             : 0
Distance (au)       : 4.297
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.57
Sun-Target sep (deg) : 159.28
Sun-Moon sep (deg)  : 124.71
B (ring opening deg) : -2.41
PA of pole (deg)    : 1.16
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 2.155
C/A sky separation (km): 6714.7
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
    
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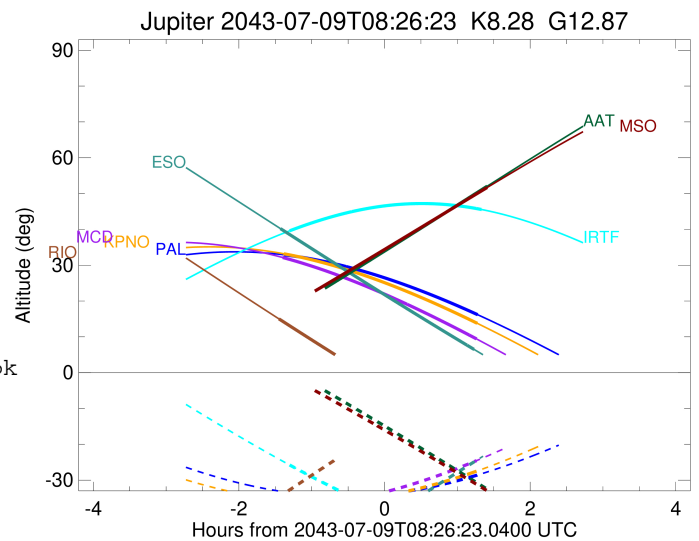
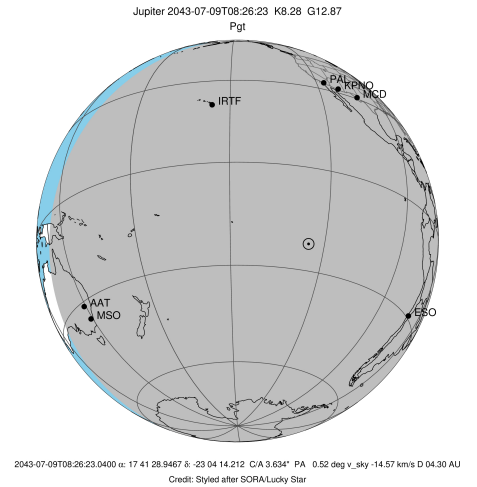


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-09T07:02:31.596	32.14	-37.14	71491.9	-5.71	-6.52
Jupiter	E	2043-07-09T09:42:12.925	9.42	-24.55	71491.9	-5.22	-5.96

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-09T08:27:18.740
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       : 4116500375384483840
2Mass ID (if available) : 17412894-2304144
ICRS Star Coord at Epoch: 17h 41m 28.94669s -23:04:14.21236s
RUWE (>1.4 is poor) : 0.88
K magnitude           : 8.278
G magnitude           : 12.867
RP magnitude         : 11.719
BP magnitude         : 14.239
DUPflag              : 0
Distance (au)        : 4.297
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.57
Sun-Target sep (deg) : 159.28
Sun-Moon sep (deg)   : 125.38
B (ring opening deg) : -2.41
PA of pole (deg)     : 1.16
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 2.240
C/A sky separation (km) : 6980.2
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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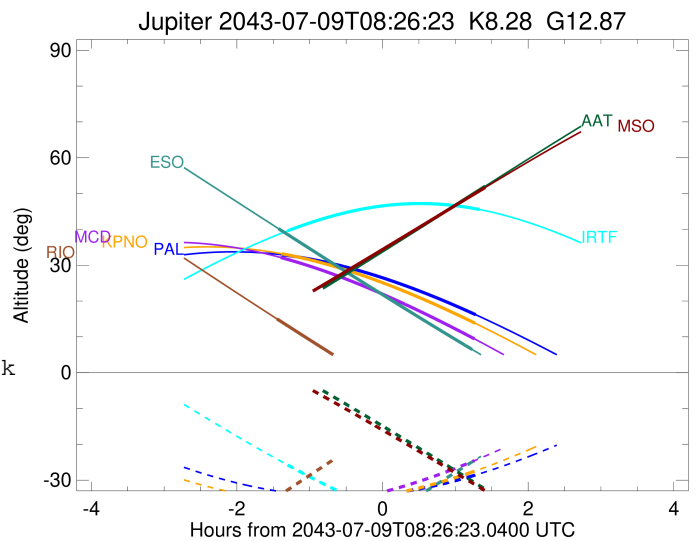
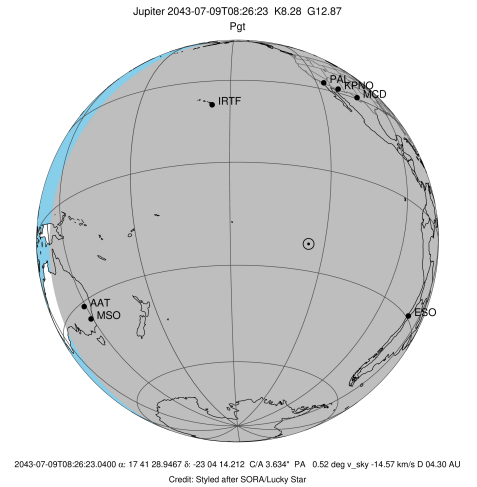


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-09T07:08:11.889	39.59	-25.77	71491.9	-6.44	-7.36
Jupiter	E	2043-07-09T09:46:22.340	45.54	-46.80	71491.9	-4.98	-5.69

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-09T08:19:37.780
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        : 4116500375384483840
2Mass ID (if available) : 17412894-2304144
ICRS Star Coord at Epoch: 17h 41m 28.94669s -23:04:14.21236s
RUWE (>1.4 is poor) : 0.88
K magnitude           : 8.278
G magnitude           : 12.867
RP magnitude          : 11.719
BP magnitude          : 14.239
DUPflag              : 0
Distance (au)         : 4.297
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.57
Sun-Target sep (deg)  : 159.28
Sun-Moon sep (deg)    : 124.14
B (ring opening deg) : -2.41
PA of pole (deg)     : 1.16
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 4.508
C/A sky separation (km) : 14048.2
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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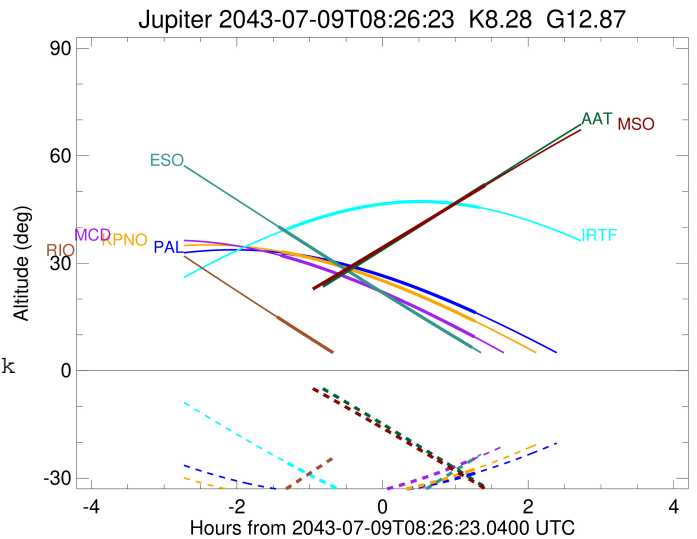
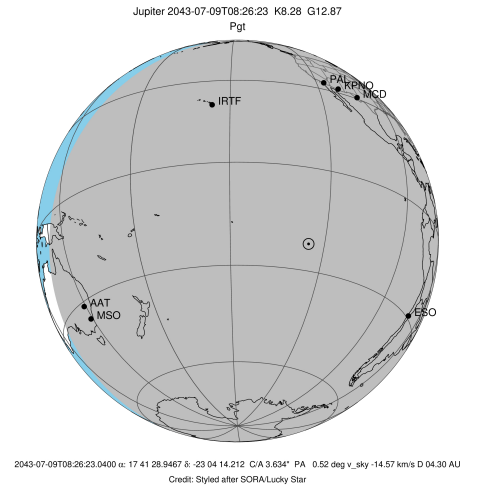


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-09T06:59:20.707	15.02	-34.72	71491.7	-11.31	-12.88
Jupiter	E	2043-07-09T09:40:47.491	-18.23x	0.62x	71491.7	-11.29	-12.86

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-09T08:20:02.410
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        : 4116500375384483840
2Mass ID (if available) : 17412894-2304144
ICRS Star Coord at Epoch: 17h 41m 28.94669s -23:04:14.21236s
RUWE (>1.4 is poor) : 0.88
K magnitude           : 8.278
G magnitude           : 12.867
RP magnitude          : 11.719
BP magnitude          : 14.239
DUPflag              : 0
Distance (au)         : 4.297
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.57
Sun-Target sep (deg)  : 159.28
Sun-Moon sep (deg)    : 124.51
B (ring opening deg)  : -2.41
PA of pole (deg)      : 1.16
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 4.355
C/A sky separation (km) : 13571.1
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
    
```



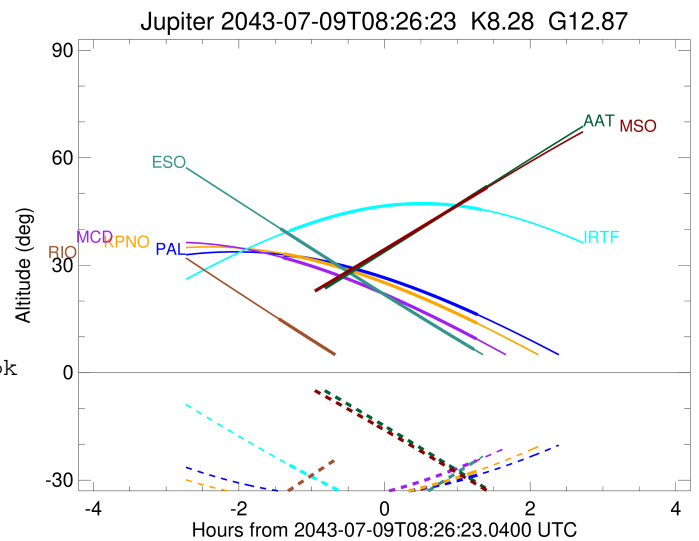
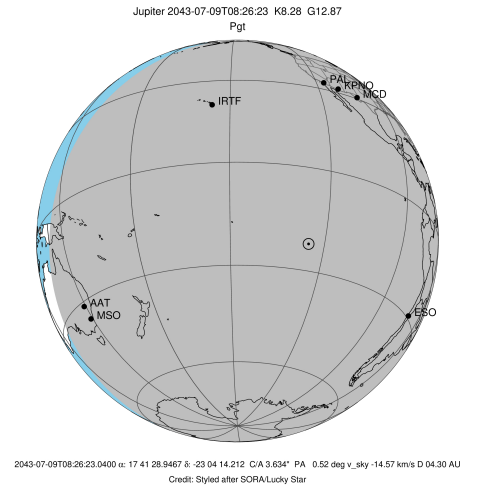
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-09T07:00:41.181	40.20	-59.50	71491.7	-11.02	-12.55
Jupiter	E	2043-07-09T09:40:11.391	6.49	-24.90	71491.7	-10.91	-12.43



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-09T08:32:01.070
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      : 4116500375384483840
2Mass ID (if available) : 17412894-2304144
ICRS Star Coord at Epoch: 17h 41m 28.94669s -23:04:14.21236s
RUWE (>1.4 is poor) : 0.88
K magnitude          : 8.278
G magnitude          : 12.867
RP magnitude         : 11.719
BP magnitude         : 14.239
DUPflag             : 0
Distance (au)       : 4.297
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.57
Sun-Target sep (deg) : 159.28
Sun-Moon sep (deg)  : 125.55
B (ring opening deg) : -2.41
PA of pole (deg)    : 1.16
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 4.277
C/A sky separation (km): 13328.7
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
    
```



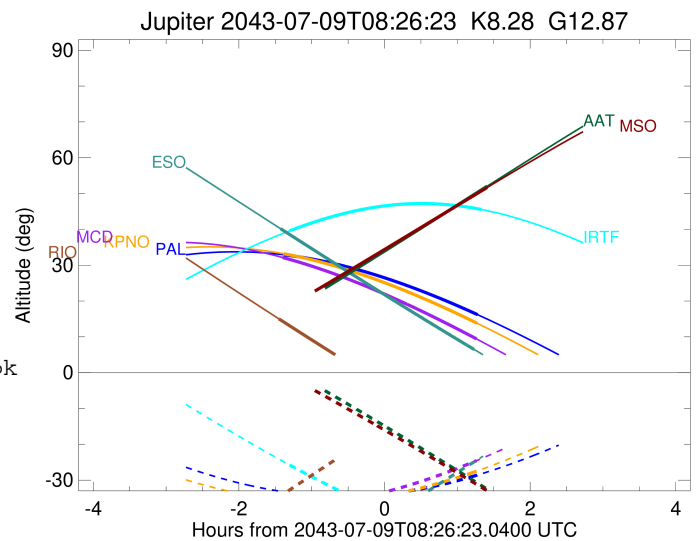
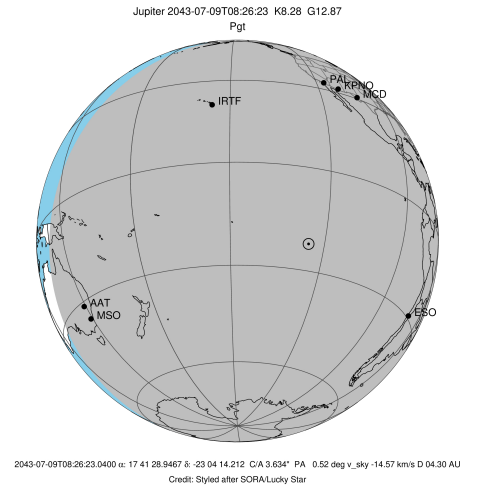
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-09T07:12:21.650	18.42	-0.17x	71491.7	-11.96	-13.61
Jupiter	E	2043-07-09T09:51:04.373	52.05	-32.53	71491.8	-9.62	-10.96



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-09T08:31:46.260
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        : 4116500375384483840
2Mass ID (if available) : 17412894-2304144
ICRS Star Coord at Epoch: 17h 41m 28.94669s -23:04:14.21236s
RUWE (>1.4 is poor) : 0.88
K magnitude           : 8.278
G magnitude           : 12.867
RP magnitude          : 11.719
BP magnitude          : 14.239
DUPflag              : 0
Distance (au)         : 4.297
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.57
Sun-Target sep (deg) : 159.28
Sun-Moon sep (deg)   : 125.53
B (ring opening deg) : -2.41
PA of pole (deg)     : 1.16
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 4.403
C/A sky separation (km): 13721.8
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	2043-07-09T07:12:09.930	19.42	-1.88x	71491.6	-12.25	-13.94
Jupiter	E	2043-07-09T09:50:48.209	51.65	-32.91	71491.8	-9.96	-11.35