

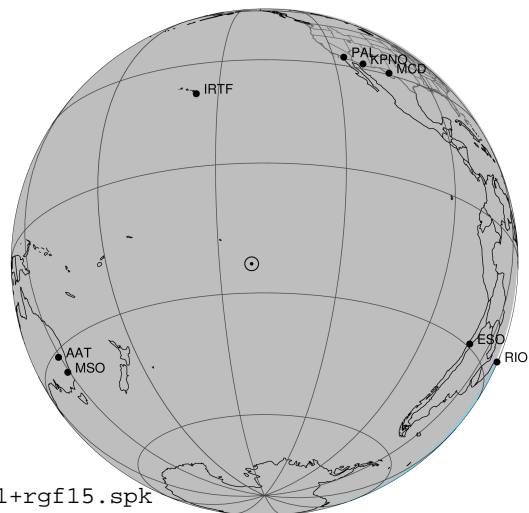
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-06-17T09:28:56.100
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068648942142327296
 2Mass ID (if available) : 17531490-2304289

Jupiter 2043-06-17T09:28:56 K8.46 G14.48 Pgt

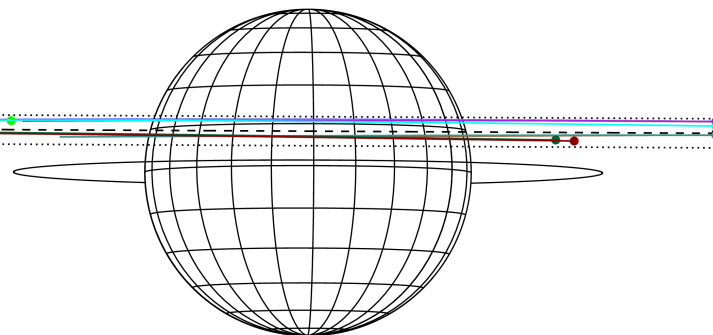
ICRS Star Coord at Epoch: 17h 53m 14.88238s -23:04:29.15449s

RUWE (>1.4 is poor) : 0.97
 K magnitude : 8.458
 G magnitude : 14.483
 RP magnitude : 13.051
 BP magnitude : 17.102
 DUPflag : 0
 Distance (au) : 4.253
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -16.37
 Sun-Target sep (deg) : 177.05
 Sun-Moon sep (deg) : 60.11
 B (ring opening deg) : -2.43
 PA of pole (deg) : -0.11
 Pole direction: RA (deg): 268.05668
 Dec (deg): 64.49732
 C/A sky separation (") : 5.868
 C/A sky separation (km) : 18099.8
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-06-17T09:28:56 K8.46 G14.48
 Pgt



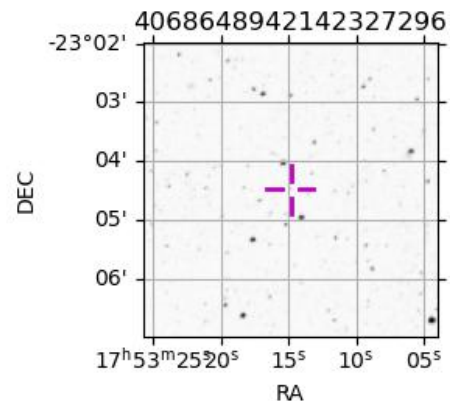
Earth
 PAL
 PMO
 KPNO
 MCD
 IRTF
 RIO
 ESO
 AAT
 MSO



2043-06-17T09:28:56.1000 at: 17 53 14.8824 s: -23 04 29.1545 C/A 5.8687 PA 179.70 deg v_sky -16.37 km/s D 04.25 AU
 Credit: Styled after SORA/Lucky Star

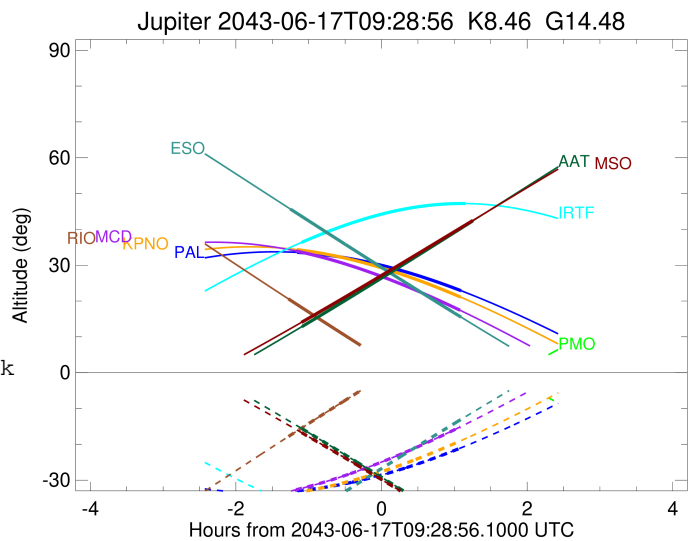
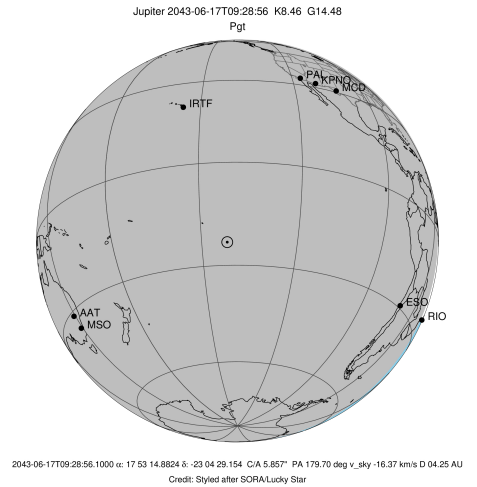
Observable events with sun below -5 deg and altitude above 5 deg

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	+ +	JUN 17 08:19 - JUN 17 10:34	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JUN 17 08:19 - JUN 17 10:34	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JUN 17 08:18 - JUN 17 10:33	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	JUN 17 08:23 - JUN 17 10:37	Pie
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+	JUN 17 08:12 - JUN 17 08:12	Pin
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUN 17 08:13 - JUN 17 10:34	Pie
AAT	Siding Spring (AAT)	-31.3	149.1	+ +	JUN 17 08:23 - JUN 17 10:44	Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	JUN 17 08:23 - JUN 17 10:44	Pie



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-17T09:26:58.820
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        : 4068648942142327296
2Mass ID (if available) : 17531490-2304289
ICRS Star Coord at Epoch: 17h 53m 14.88238s -23:04:29.15449s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 8.458
G magnitude           : 14.483
RP magnitude          : 13.051
BP magnitude          : 17.102
DUPflag              : 0
Distance (au)         : 4.253
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.37
Sun-Target sep (deg) : 177.05
Sun-Moon sep (deg)   : 60.65
B (ring opening deg) : -2.43
PA of pole (deg)     : -0.11
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation ("): 7.533
C/A sky separation (km): 23235.6
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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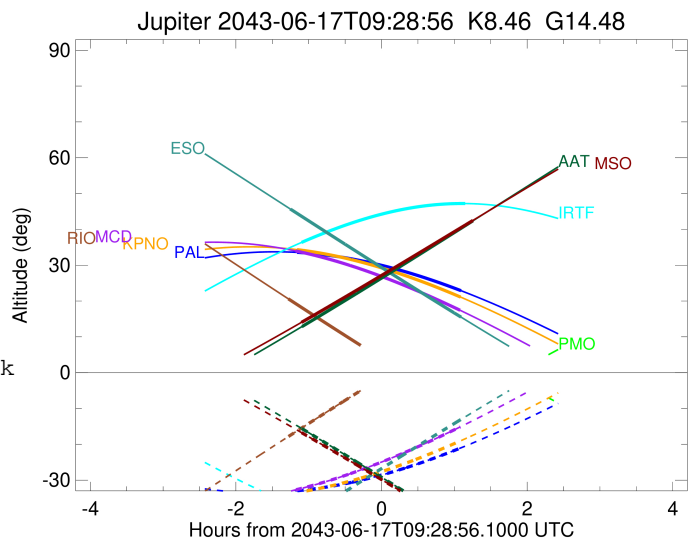
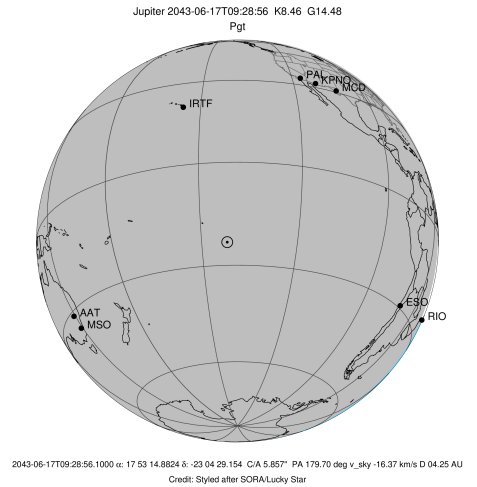


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-17T08:19:40.212	33.57	-32.95	71491.2	18.89	21.35
Jupiter	E	2043-06-17T10:34:27.196	22.89	-20.98	71491.2	18.86	21.32

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-17T09:26:31.010
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      : 4068648942142327296
2Mass ID (if available) : 17531490-2304289
ICRS Star Coord at Epoch: 17h 53m 14.88238s -23:04:29.15449s
RUWE (>1.4 is poor) : 0.97
K magnitude         : 8.458
G magnitude         : 14.483
RP magnitude        : 13.051
BP magnitude        : 17.102
DUPflag            : 0
Distance (au)       : 4.253
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -16.37
Sun-Target sep (deg) : 177.05
Sun-Moon sep (deg)  : 60.68
B (ring opening deg) : -2.43
PA of pole (deg)    : -0.11
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (" ) : 7.478
C/A sky separation (km) : 23064.4
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
    
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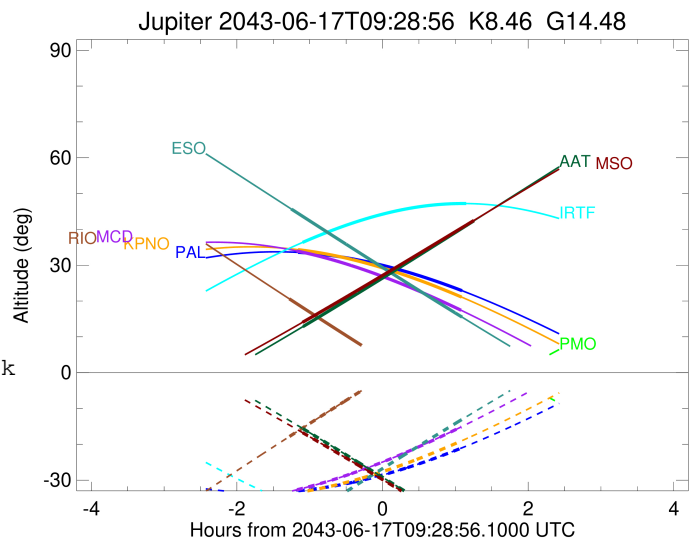
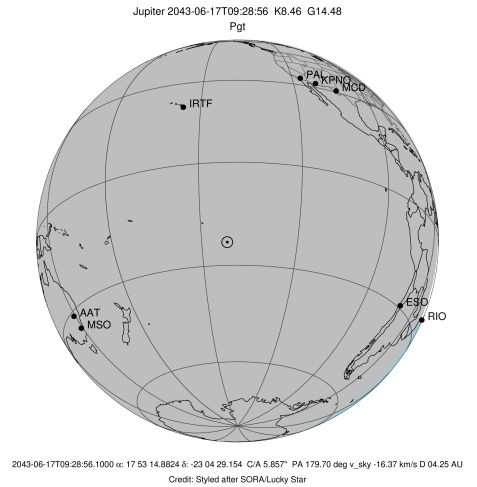


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-17T08:19:08.050	34.34	-33.46	71491.2	18.79	21.24
Jupiter	E	2043-06-17T10:34:06.185	21.10	-19.03	71491.2	18.68	21.11

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-17T09:25:53.100
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        : 4068648942142327296
2Mass ID (if available) : 17531490-2304289
ICRS Star Coord at Epoch: 17h 53m 14.88238s -23:04:29.15449s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 8.458
G magnitude           : 14.483
RP magnitude          : 13.051
BP magnitude          : 17.102
DUPflag              : 0
Distance (au)         : 4.253
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.37
Sun-Target sep (deg) : 177.05
Sun-Moon sep (deg)   : 60.69
B (ring opening deg) : -2.43
PA of pole (deg)     : -0.11
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation ("): 7.402
C/A sky separation (km): 22831.0
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
    
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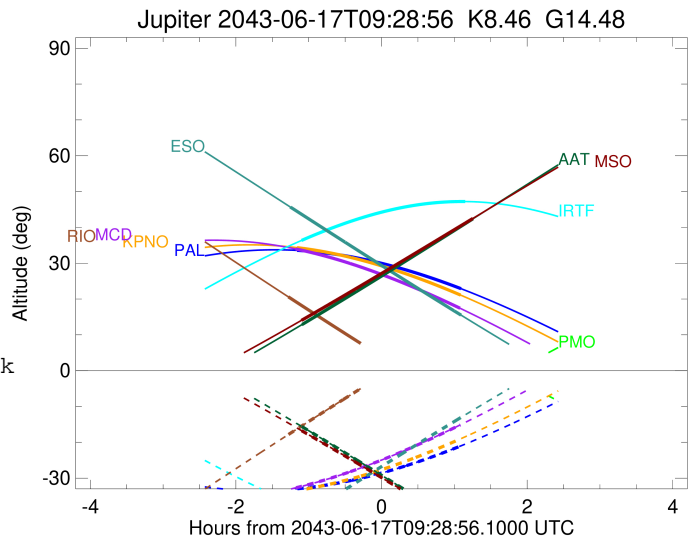
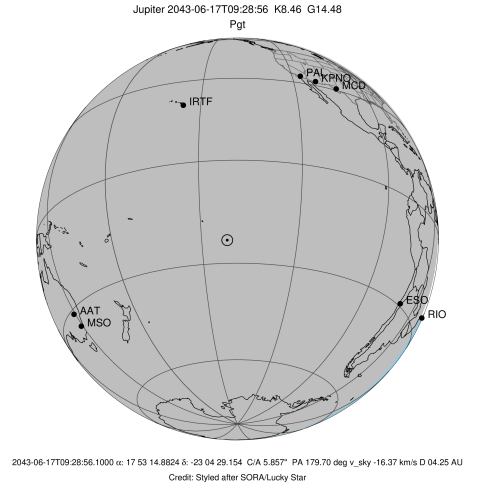


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-17T08:18:22.080	33.95	-32.69	71491.2	18.66	21.10
Jupiter	E	2043-06-17T10:33:39.741	17.42	-15.16	71491.2	18.42	20.83

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch              : 2043-06-17T09:30:32.640
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        : 4068648942142327296
2Mass ID (if available) : 17531490-2304289
ICRS Star Coord at Epoch: 17h 53m 14.88238s -23:04:29.15449s
RUWE (>1.4 is poor)  : 0.97
K magnitude           : 8.458
G magnitude           : 14.483
RP magnitude          : 13.051
BP magnitude          : 17.102
DUPflag              : 0
Distance (au)         : 4.253
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -16.37
Sun-Target sep (deg)  : 177.05
Sun-Moon sep (deg)    : 60.55
B (ring opening deg)  : -2.43
PA of pole (deg)      : -0.11
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 7.248
C/A sky separation (km) : 22355.8
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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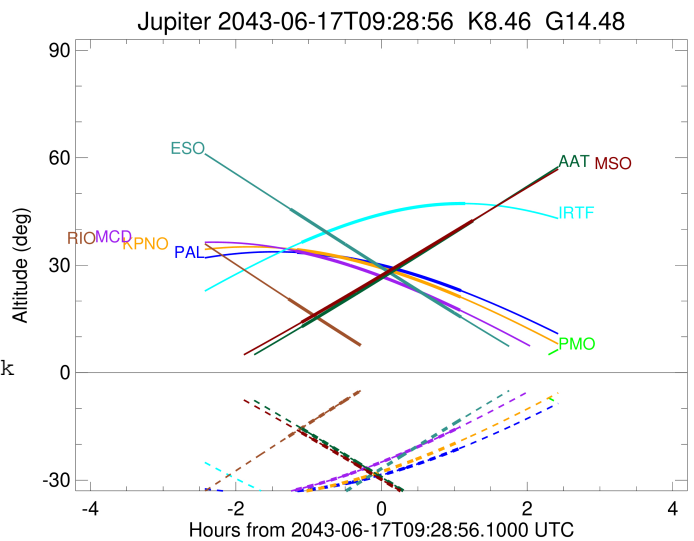
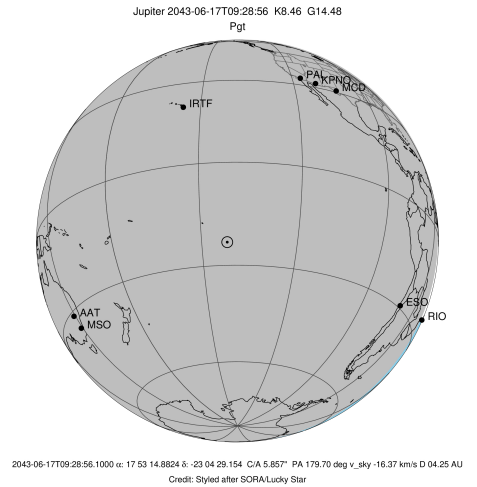


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-17T08:23:01.078	36.35	-37.96	71491.2	17.79	20.13
Jupiter	E	2043-06-17T10:37:55.525	47.21	-46.76	71491.2	18.46	20.87

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-17T09:23:09.200
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       : 4068648942142327296
2Mass ID (if available) : 17531490-2304289
ICRS Star Coord at Epoch: 17h 53m 14.88238s -23:04:29.15449s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 8.458
G magnitude           : 14.483
RP magnitude         : 13.051
BP magnitude         : 17.102
DUPflag              : 0
Distance (au)        : 4.253
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.37
Sun-Target sep (deg) : 177.05
Sun-Moon sep (deg)   : 60.56
B (ring opening deg) : -2.43
PA of pole (deg)     : -0.11
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 5.060
C/A sky separation (km) : 15608.0
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
    
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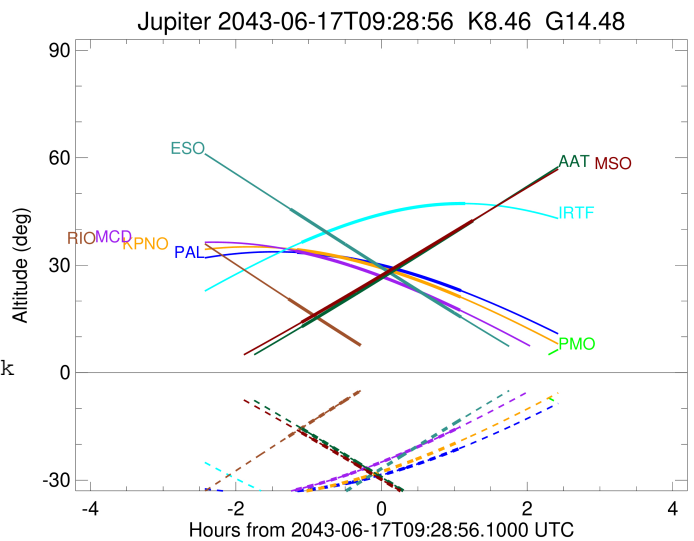
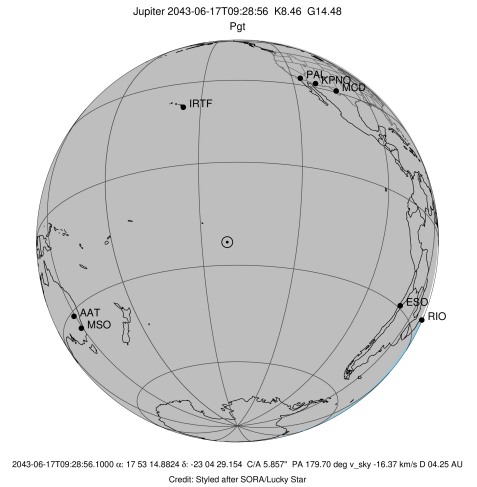


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-17T08:12:16.464	20.58	-17.81	71491.6	12.99	14.77
Jupiter	E	2043-06-17T10:34:35.855	-9.62x	11.94x	71491.6	12.22	13.90

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-17T09:23:53.280
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      : 4068648942142327296
2Mass ID (if available) : 17531490-2304289
ICRS Star Coord at Epoch: 17h 53m 14.88238s -23:04:29.15449s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 8.458
G magnitude          : 14.483
RP magnitude         : 13.051
BP magnitude         : 17.102
DUPflag             : 0
Distance (au)       : 4.253
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.37
Sun-Target sep (deg) : 177.05
Sun-Moon sep (deg)  : 60.84
B (ring opening deg) : -2.43
PA of pole (deg)    : -0.11
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation ("): 5.206
C/A sky separation (km): 16057.8
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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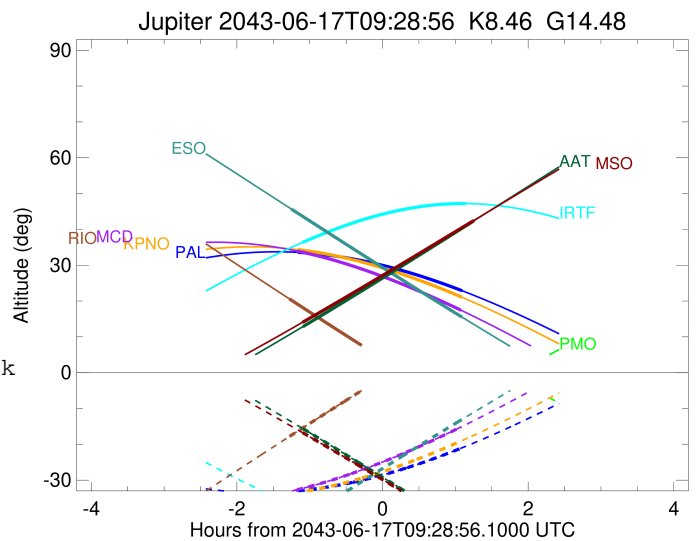
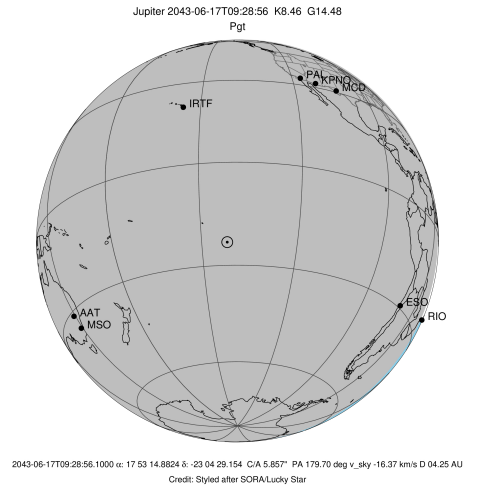


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-17T08:13:51.943	45.66	-42.93	71491.6	13.25	15.06
Jupiter	E	2043-06-17T10:34:23.146	15.52	-13.06	71491.6	12.62	14.35


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-17T09:34:03.760
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      : 4068648942142327296
2Mass ID (if available) : 17531490-2304289
ICRS Star Coord at Epoch: 17h 53m 14.88238s -23:04:29.15449s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 8.458
G magnitude          : 14.483
RP magnitude         : 13.051
BP magnitude         : 17.102
DUPflag             : 0
Distance (au)       : 4.253
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.37
Sun-Target sep (deg) : 177.05
Sun-Moon sep (deg)  : 60.08
B (ring opening deg) : -2.43
PA of pole (deg)    : -0.11
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 5.131
C/A sky separation (km) : 15824.5
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
    
```

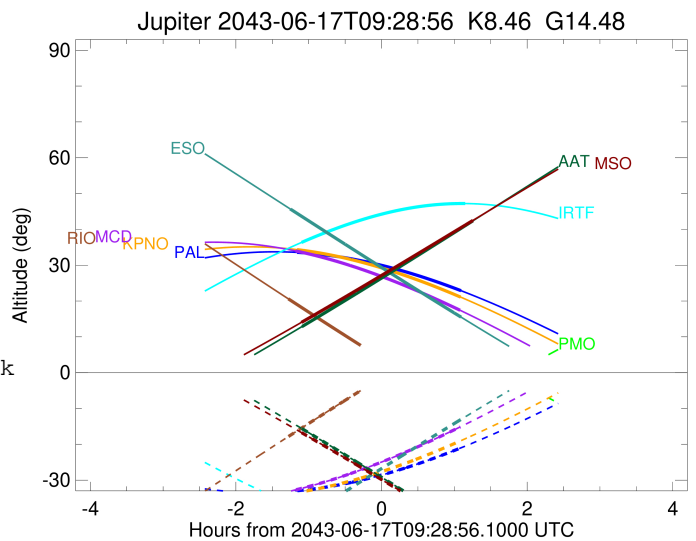
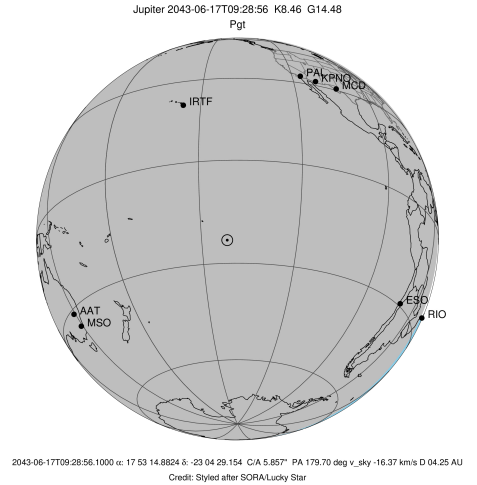


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-17T08:23:23.701	12.86	-15.63	71491.6	12.06	13.72
Jupiter	E	2043-06-17T10:44:14.465	42.38	-45.17	71491.6	13.43	15.27


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-17T09:33:50.550
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        : 4068648942142327296
2Mass ID (if available) : 17531490-2304289
ICRS Star Coord at Epoch: 17h 53m 14.88238s -23:04:29.15449s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 8.458
G magnitude           : 14.483
RP magnitude          : 13.051
BP magnitude          : 17.102
DUPflag              : 0
Distance (au)         : 4.253
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.37
Sun-Target sep (deg) : 177.05
Sun-Moon sep (deg)   : 60.11
B (ring opening deg) : -2.43
PA of pole (deg)     : -0.11
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation ("): 5.007
C/A sky separation (km): 15442.1
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	2043-06-17T08:23:04.232	14.06	-16.74	71491.7	11.77	13.39
Jupiter	E	2043-06-17T10:44:08.695	42.47	-45.16	71491.6	13.10	14.89