

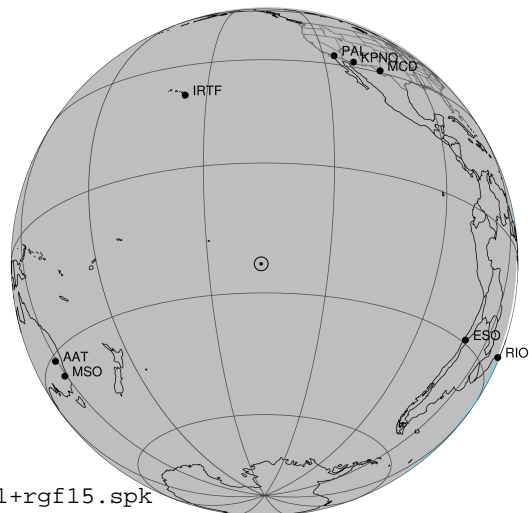
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-06-19T09:08:45.350
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068695710161370496
 2Mass ID (if available) : 17520876-2304189

Jupiter 2043-06-19T09:08:45 K8.42 G14.59 Pgt

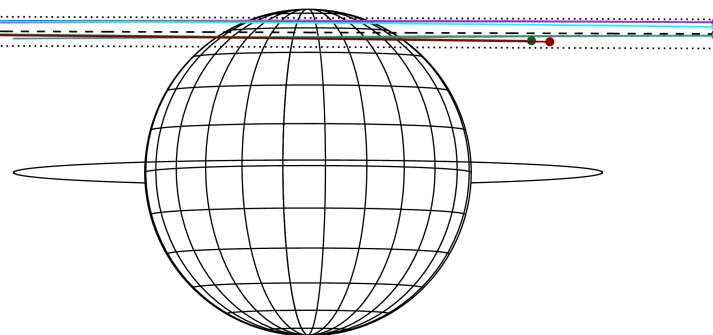
ICRS Star Coord at Epoch: 17h 52m 08.77479s -23:04:19.14571s

RUWE (>1.4 is poor) : 0.96
 K magnitude : 8.420
 G magnitude : 14.591
 RP magnitude : 13.118
 BP magnitude : 17.563
 DUPflag : 0
 Distance (au) : 4.251
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -16.41
 Sun-Target sep (deg) : 179.15
 Sun-Moon sep (deg) : 36.55
 B (ring opening deg) : -2.43
 PA of pole (deg) : 0.01
 Pole direction: RA (deg): 268.05668
 Dec (deg): 64.49732
 C/A sky separation (") : 19.899
 C/A sky separation (km) : 61348.5
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-06-19T09:08:45 K8.42 G14.59
 Pgt



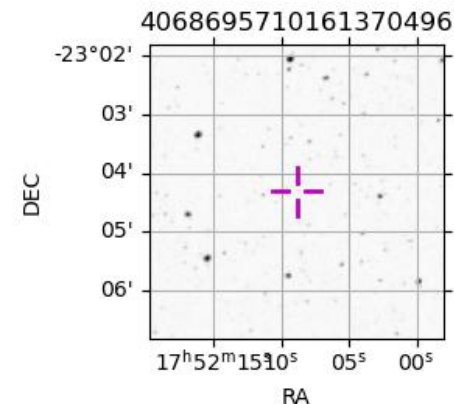
Earth
 PAL
 PMO
 KPNO
 MCD
 IRTF
 RIO
 ESO
 AAT
 MSO



2043-06-19T09:08:45.3500 a: 17 52 08.7748 d: -23 04 19.146 C/A ***** PA 179.79 deg v_sky -16.41 km/s D 04.25 AU
 Credit: Styled after SORA/Lucky Star

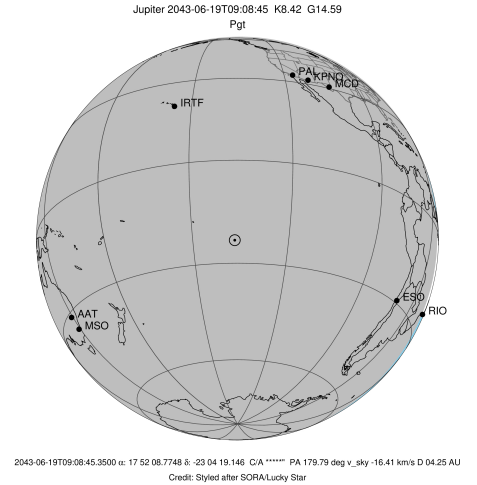
Observable events with sun below -5 deg and altitude above 5 deg

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 19 08:41 - JUN 19 09:33	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JUN 19 08:40 - JUN 19 09:33	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JUN 19 08:39 - JUN 19 09:33	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	JUN 19 08:42 - JUN 19 09:38	Pie
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+	JUN 19 08:22 - JUN 19 08:22	Pin
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUN 19 08:24 - JUN 19 09:44	Pie
AAT	Siding Spring (AAT)	-31.3	149.1	+ +	JUN 19 08:32 - JUN 19 09:54	Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	JUN 19 08:31 - JUN 19 09:54	Pie

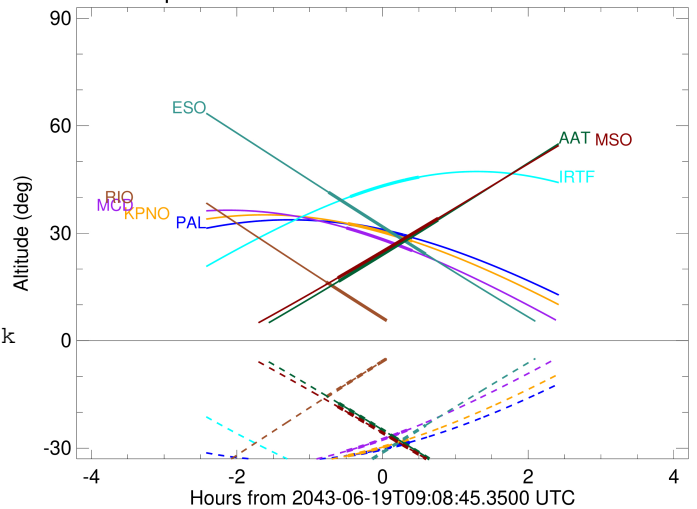


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-19T09:07:10.830
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      : 4068695710161370496
2Mass ID (if available) : 17520876-2304189
ICRS Star Coord at Epoch: 17h 52m 08.77479s -23:04:19.14571s
RUWE (>1.4 is poor) : 0.96
K magnitude         : 8.420
G magnitude         : 14.591
RP magnitude        : 13.118
BP magnitude        : 17.563
DUPflag            : 0
Distance (au)       : 4.251
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 179.15
Sun-Moon sep (deg)  : 37.09
B (ring opening deg) : -2.43
PA of pole (deg)    : 0.01
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 21.577
C/A sky separation (km) : 66523.5
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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Jupiter 2043-06-19T09:08:45 K8.42 G14.59

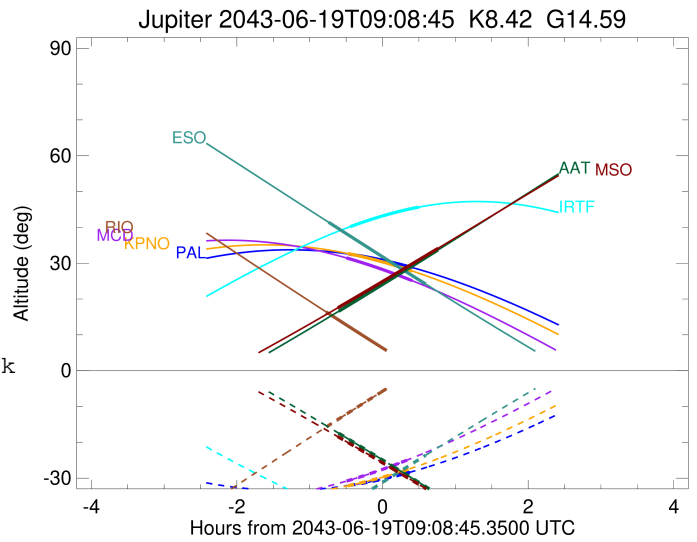
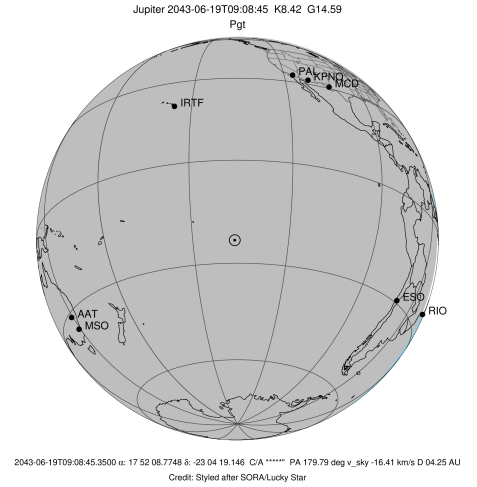


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-19T08:41:09.602	32.54	-32.04	71485.0	68.33	70.71
Jupiter	E	2043-06-19T09:33:13.337	28.79	-28.17	71485.0	68.41	70.78

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-19T09:06:44.880
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       : 4068695710161370496
2Mass ID (if available) : 17520876-2304189
ICRS Star Coord at Epoch: 17h 52m 08.77479s -23:04:19.14571s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 8.420
G magnitude           : 14.591
RP magnitude         : 13.118
BP magnitude         : 17.563
DUPflag              : 0
Distance (au)        : 4.251
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 179.15
Sun-Moon sep (deg)   : 37.14
B (ring opening deg) : -2.43
PA of pole (deg)     : 0.01
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 21.525
C/A sky separation (km) : 66361.9
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
    
```

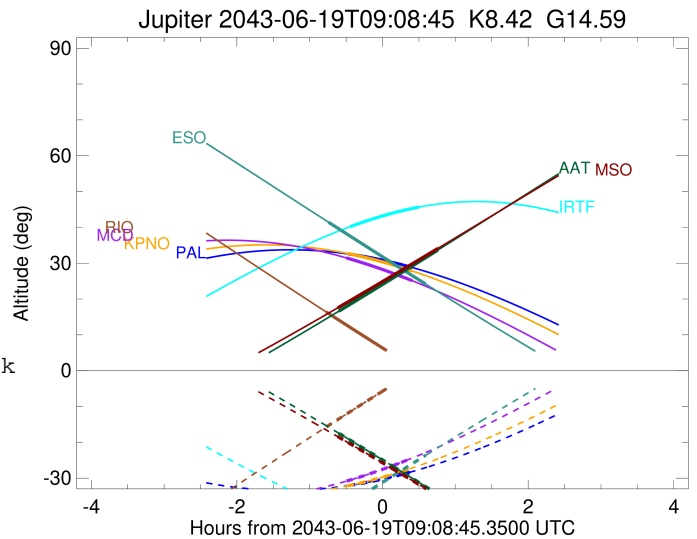
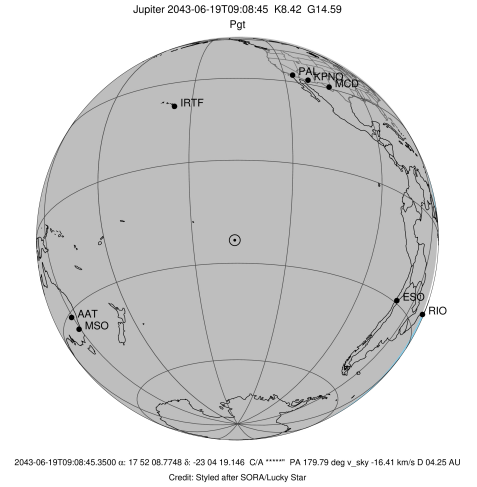


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-19T08:40:18.906	32.69	-32.12	71485.1	68.03	70.44
Jupiter	E	2043-06-19T09:33:12.543	27.83	-27.16	71485.1	68.01	70.42

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-19T09:06:09.190
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       : 4068695710161370496
2Mass ID (if available) : 17520876-2304189
ICRS Star Coord at Epoch: 17h 52m 08.77479s -23:04:19.14571s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 8.420
G magnitude           : 14.591
RP magnitude         : 13.118
BP magnitude         : 17.563
DUPflag              : 0
Distance (au)        : 4.251
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 179.15
Sun-Moon sep (deg)   : 37.19
B (ring opening deg) : -2.43
PA of pole (deg)     : 0.01
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 21.453
C/A sky separation (km) : 66141.5
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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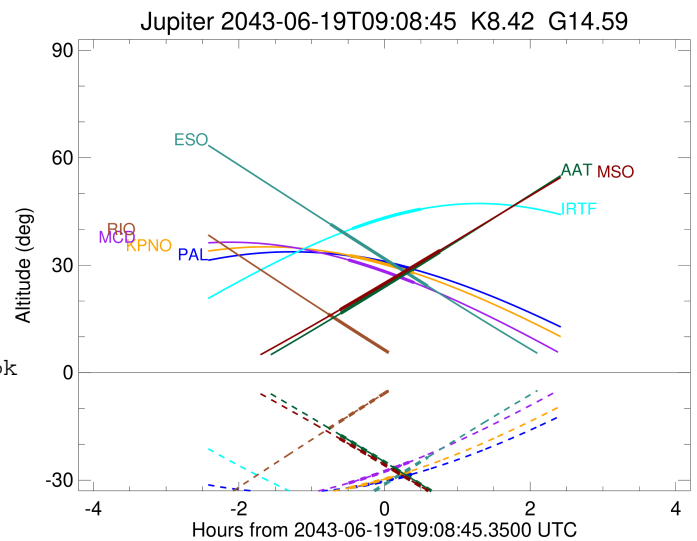
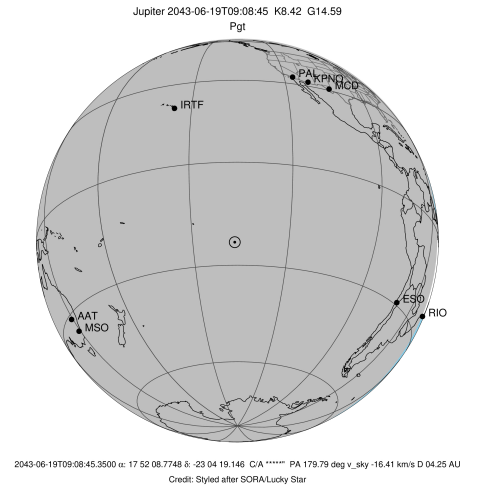


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-19T08:39:09.291	31.45	-30.81	71485.1	67.63	70.07
Jupiter	E	2043-06-19T09:33:11.389	25.12	-24.40	71485.1	67.48	69.94

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-19T09:10:30.080
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       : 4068695710161370496
2Mass ID (if available) : 17520876-2304189
ICRS Star Coord at Epoch: 17h 52m 08.77479s -23:04:19.14571s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 8.420
G magnitude           : 14.591
RP magnitude         : 13.118
BP magnitude         : 17.563
DUPflag              : 0
Distance (au)        : 4.251
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 179.15
Sun-Moon sep (deg)   : 36.75
B (ring opening deg) : -2.43
PA of pole (deg)     : 0.01
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation ("): 21.268
C/A sky separation (km): 65569.6
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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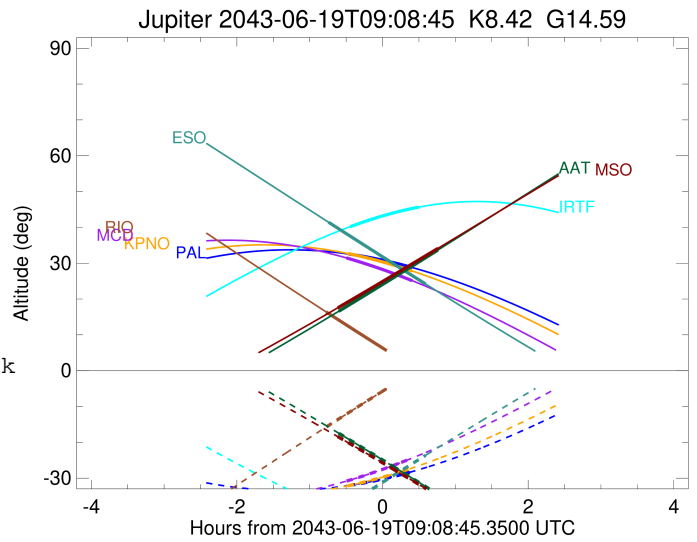
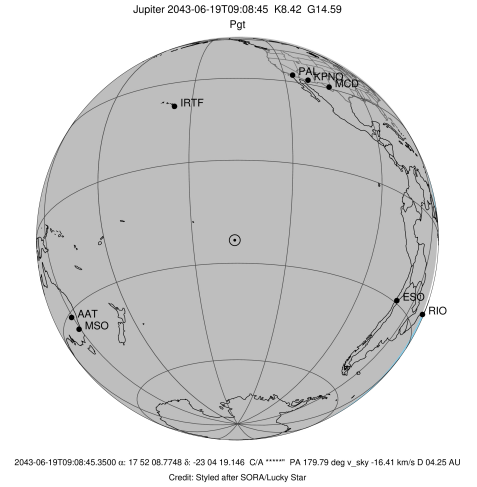


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-19T08:42:14.124	40.20	-40.35	71485.3	65.98	68.57
Jupiter	E	2043-06-19T09:38:44.326	45.65	-45.53	71485.2	66.77	69.29

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-19T09:03:25.170
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        : 4068695710161370496
2Mass ID (if available) : 17520876-2304189
ICRS Star Coord at Epoch: 17h 52m 08.77479s -23:04:19.14571s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 8.420
G magnitude           : 14.591
RP magnitude          : 13.118
BP magnitude          : 17.563
DUPflag               : 0
Distance (au)         : 4.251
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg)  : 179.15
Sun-Moon sep (deg)    : 37.24
B (ring opening deg) : -2.43
PA of pole (deg)      : 0.01
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 19.129
C/A sky separation (km) : 58976.5
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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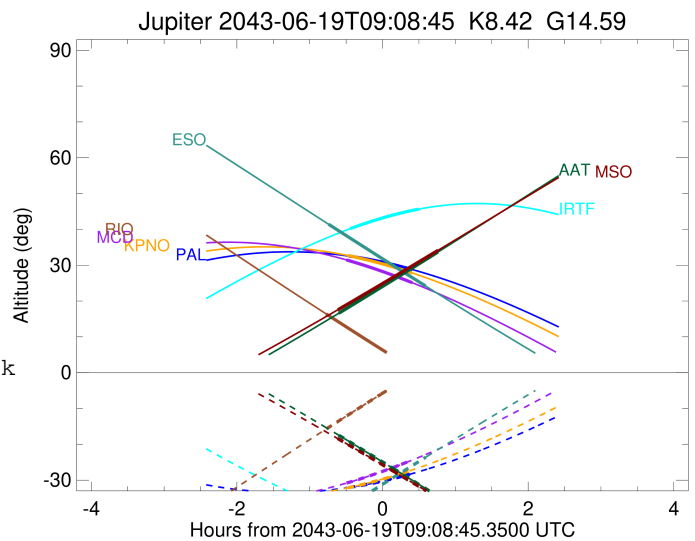
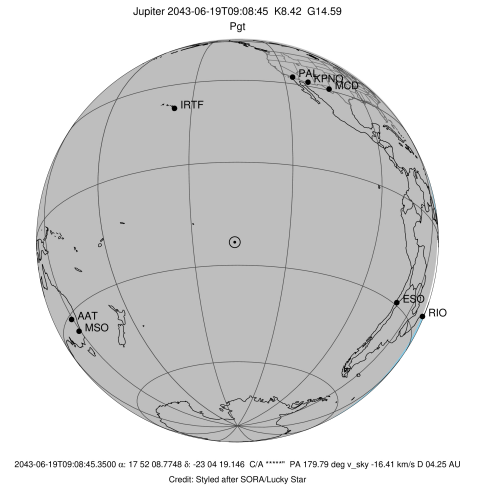


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-19T08:22:26.839	16.37	-15.70	71486.5	55.88	59.20
Jupiter	E	2043-06-19T09:44:34.632	-1.23x	1.76x	71486.6	55.15	58.51

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-19T09:04:12.410
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       : 4068695710161370496
2Mass ID (if available) : 17520876-2304189
ICRS Star Coord at Epoch: 17h 52m 08.77479s -23:04:19.14571s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 8.420
G magnitude           : 14.591
RP magnitude          : 13.118
BP magnitude          : 17.563
DUPflag              : 0
Distance (au)        : 4.251
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 179.15
Sun-Moon sep (deg)   : 37.38
B (ring opening deg) : -2.43
PA of pole (deg)     : 0.01
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 19.270
C/A sky separation (km) : 59410.1
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
    
```

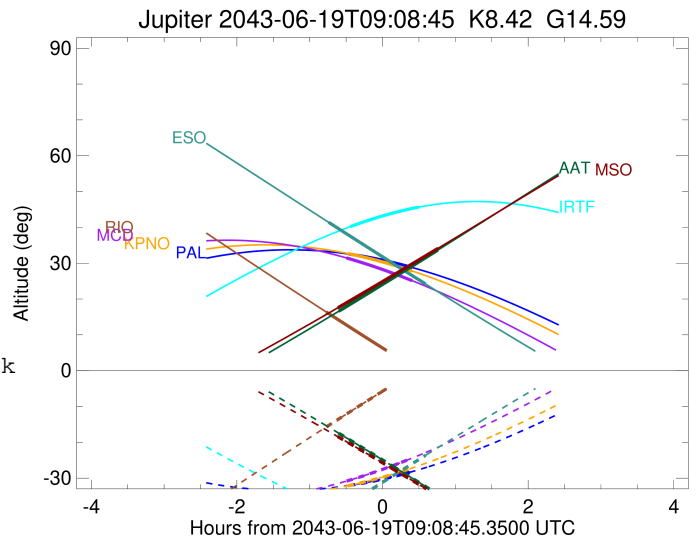
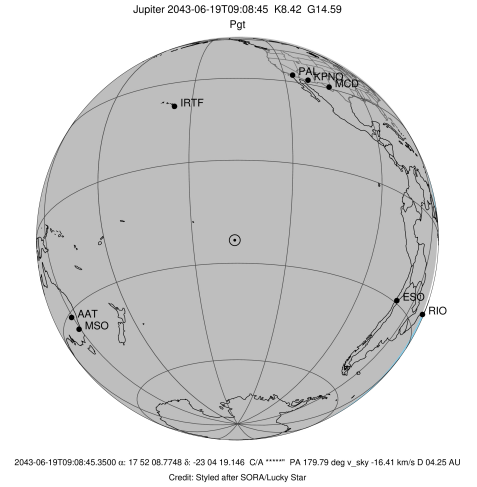


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-19T08:24:18.013	41.43	-40.77	71486.4	56.39	59.68
Jupiter	E	2043-06-19T09:44:15.700	24.19	-23.63	71486.5	55.83	59.15


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-19T09:13:33.440
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      : 4068695710161370496
2Mass ID (if available) : 17520876-2304189
ICRS Star Coord at Epoch: 17h 52m 08.77479s -23:04:19.14571s
RUWE (>1.4 is poor) : 0.96
K magnitude          : 8.420
G magnitude          : 14.591
RP magnitude         : 13.118
BP magnitude         : 17.563
DUPflag             : 0
Distance (au)       : 4.251
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 179.15
Sun-Moon sep (deg)  : 36.14
B (ring opening deg) : -2.43
PA of pole (deg)    : 0.01
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation ("): 19.126
C/A sky separation (km): 58964.5
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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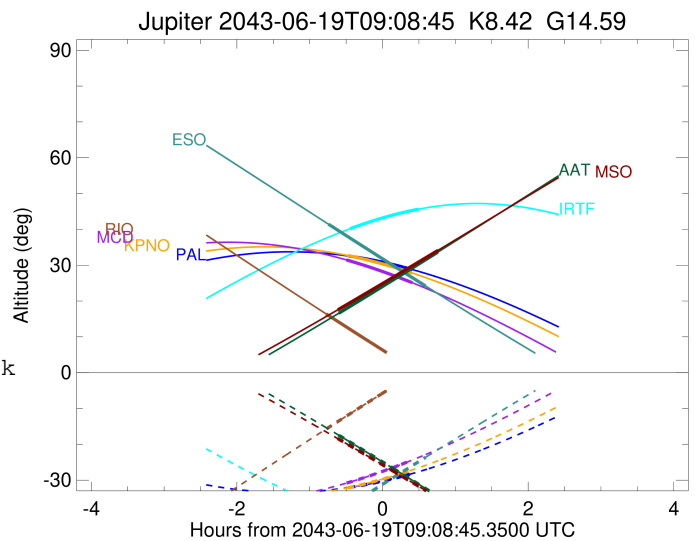
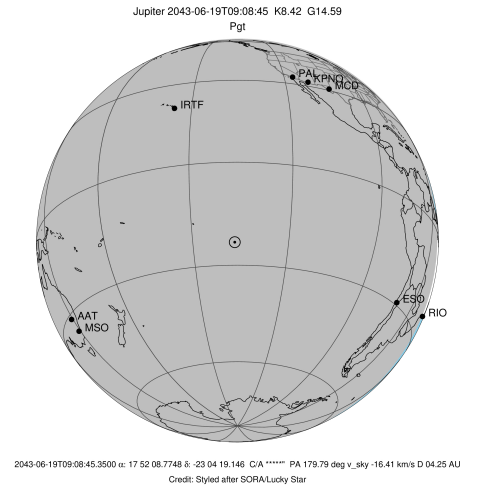


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-19T08:32:41.094	16.58	-17.45	71486.6	54.75	58.14
Jupiter	E	2043-06-19T09:54:16.020	33.64	-34.46	71486.4	56.21	59.51


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-19T09:13:21.010
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       : 4068695710161370496
2Mass ID (if available) : 17520876-2304189
ICRS Star Coord at Epoch: 17h 52m 08.77479s -23:04:19.14571s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 8.420
G magnitude           : 14.591
RP magnitude         : 13.118
BP magnitude         : 17.563
DUPflag              : 0
Distance (au)        : 4.251
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 179.15
Sun-Moon sep (deg)   : 36.17
B (ring opening deg) : -2.43
PA of pole (deg)     : 0.01
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 19.003
C/A sky separation (km) : 58587.0
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	2043-06-19T08:31:54.900	17.55	-18.41	71486.7	54.25	57.65
Jupiter	E	2043-06-19T09:54:37.523	34.17	-34.99	71486.5	55.66	58.99