

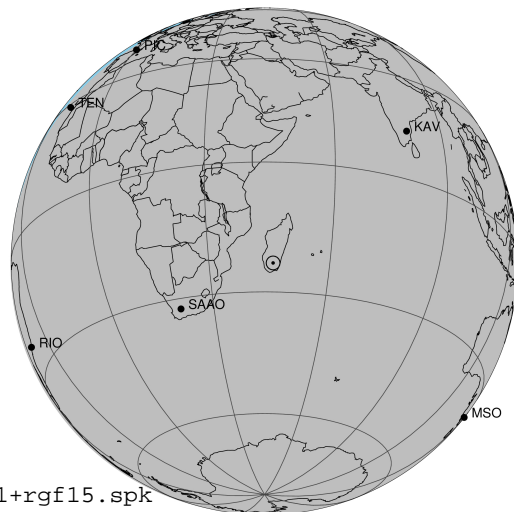
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-06-21T20:58:17.170
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068704506256037120
 2Mass ID (if available) : 17504570-2304247

Jupiter 2043-06-21T20:58:17 K9.17 G14.49 Pgt

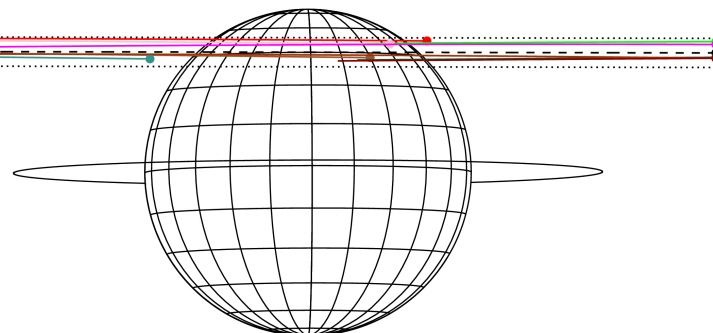
ICRS Star Coord at Epoch: 17h 50m 45.70508s -23:04:24.99018s

RUWE (>1.4 is poor) : 0.92
 K magnitude : 9.174
 G magnitude : 14.492
 RP magnitude : 13.173
 BP magnitude : 16.565
 DUPflag : 0
 Distance (au) : 4.250
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -16.40
 Sun-Target sep (deg) : 178.05
 Sun-Moon sep (deg) : 8.11
 B (ring opening deg) : -2.43
 PA of pole (deg) : 0.16
 Pole direction: RA (deg): 268.05669
 Dec (deg): 64.49732
 C/A sky separation (") : 17.093
 C/A sky separation (km) : 52691.0
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-06-21T20:58:17 K9.17 G14.49
 Pgt



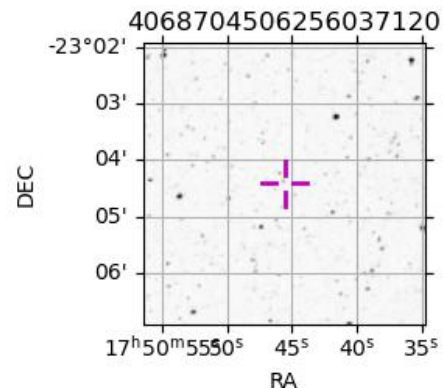
Earth
 PIC
 PMO
 TEN
 KAV
 RIO
 ESO
 AAT
 SAAO
 MSO



2043-06-21T20:58:17.1700 a: 17 50 45.7051 d: -23 04 24.990 C/A ***** PA 179.90 deg v_sky -16.40 km/s D 04.25 AU
 Credit: Styled after SORA/Lucky Star

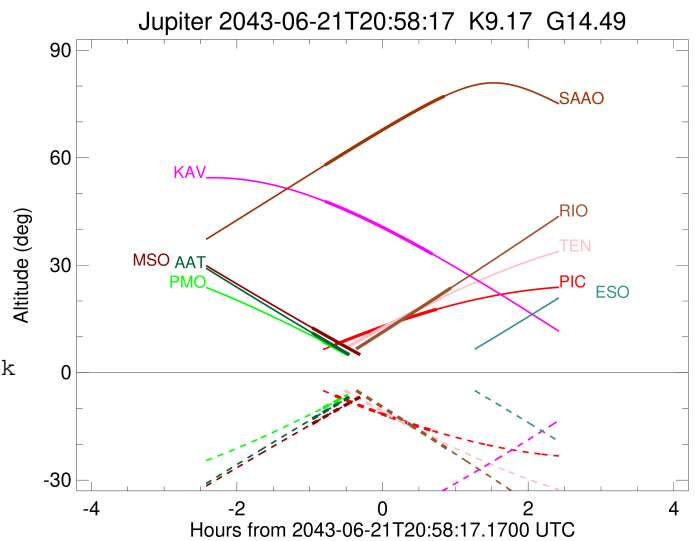
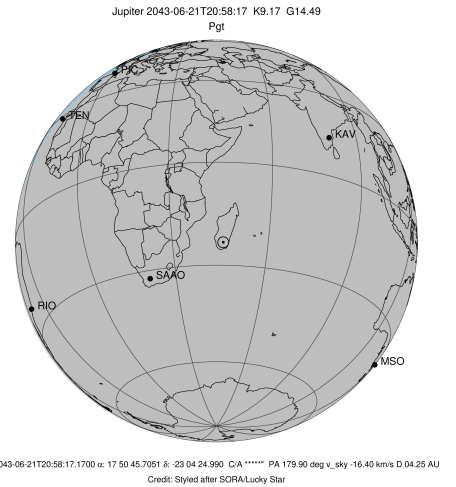
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+ +	JUN 21 20:19 - JUN 21 21:42	Pie
PAL	Palomar Mt (200")	33.4	243.1			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+	JUN 21 20:09 - JUN 21 20:09	Pin
KPNO	Kitt Peak Natl Obs	32.0	248.4			Pnn
MCD	McDonald Obs. 2.7m	30.7	256.0			Pnn
TEN	Teide Obs./Tenerife	28.3	343.5	+	JUN 21 21:46 - JUN 21 21:46	Pne
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+ +	JUN 21 20:10 - JUN 21 21:39	Pie
RIO	Rio de Janeiro	-22.9	316.8	+	JUN 21 21:54 - JUN 21 21:54	Pne
ESO	European Southern Obs. (3.6m)	-29.3	289.3			Pnn
AAT	Siding Spring (AAT)	-31.3	149.1	+	JUN 21 20:00 - JUN 21 20:00	Pin
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	JUN 21 20:10 - JUN 21 21:49	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	JUN 21 20:00 - JUN 21 20:00	Pin



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-21T21:01:10.460
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : PIC
Location              : Pic du Midi
Latitude (deg)        : 42.93656
E. Longitude (deg)    : 0.14231
Altitude (km)         : 2.890
Gaia source ID        : 4068704506256037120
2Mass ID (if available) : 17504570-2304247
ICRS Star Coord at Epoch: 17h 50m 45.70508s -23:04:24.99018s
RUWE (>1.4 is poor)  : 0.92
K magnitude           : 9.174
G magnitude           : 14.492
RP magnitude          : 13.173
BP magnitude          : 16.565
DUPflag              : 0
Distance (au)         : 4.250
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.40
Sun-Target sep (deg)  : 178.05
Sun-Moon sep (deg)    : 8.31
B (ring opening deg) : -2.43
PA of pole (deg)      : 0.16
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 18.826
C/A sky separation (km) : 58032.9
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
    
```

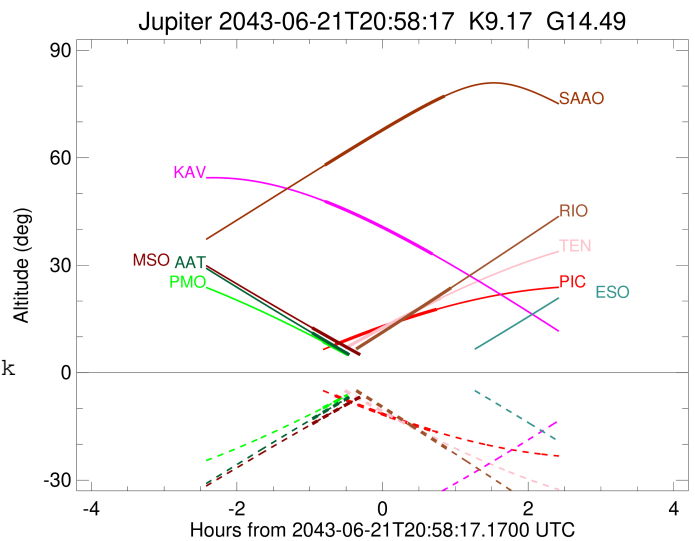
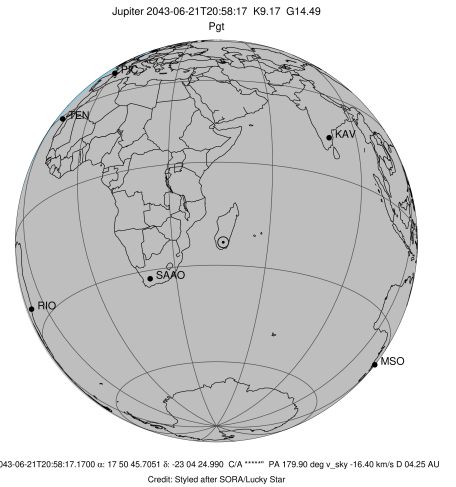


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-21T20:19:17.999	7.83	-6.42	71486.8	53.61	57.05
Jupiter	E	2043-06-21T21:42:56.798	17.69	-16.55	71486.6	54.73	58.11

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-21T20:53:29.980
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : PMO
Location             : Purple Mtn Obs. Nanking
Latitude (deg)       : 32.06667
E. Longitude (deg)  : 118.82089
Altitude (km)       : 0.364
Gaia source ID      : 4068704506256037120
2Mass ID (if available) : 17504570-2304247
ICRS Star Coord at Epoch: 17h 50m 45.70508s -23:04:24.99018s
RUWE (>1.4 is poor) : 0.92
K magnitude          : 9.174
G magnitude          : 14.492
RP magnitude         : 13.173
BP magnitude         : 16.565
DUPflag             : 0
Distance (au)       : 4.250
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -16.40
Sun-Target sep (deg) : 178.05
Sun-Moon sep (deg)  : 9.00
B (ring opening deg) : -2.43
PA of pole (deg)    : 0.16
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (" ) : 18.280
C/A sky separation (km) : 56349.1
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
    
```

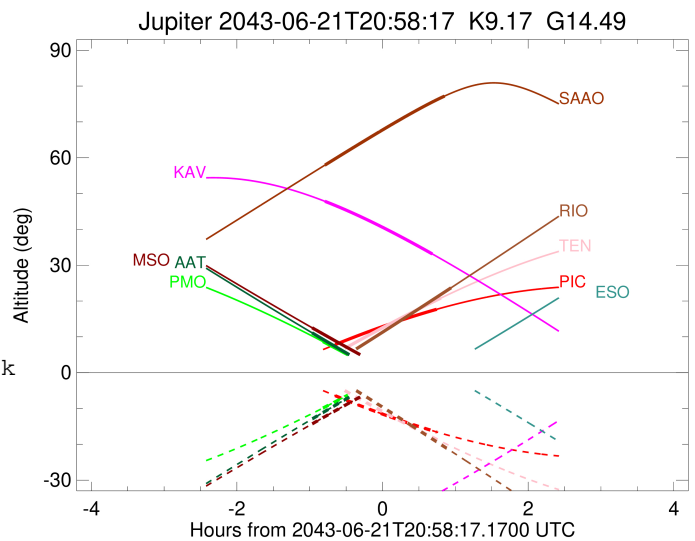
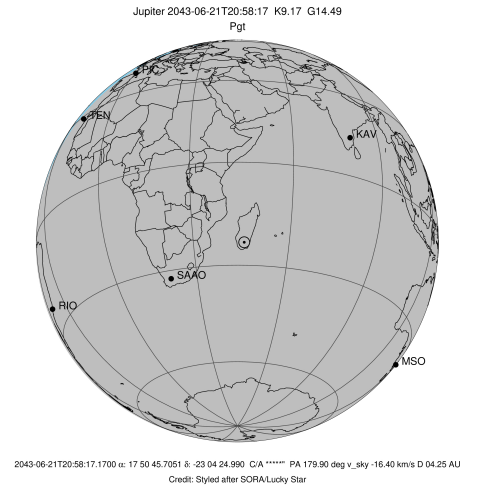


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-21T20:09:09.995	8.69	-9.89	71487.0	52.20	55.70
Jupiter	E	2043-06-21T21:38:01.526	-7.99x	6.51x	71487.1	51.68	55.21

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-21T21:02:41.740
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : TEN
Location            : Teide Obs./Tenerife
Latitude (deg)      : 28.30050
E. Longitude (deg)  : 343.48909
Altitude (km)       : 2.395
Gaia source ID      : 4068704506256037120
2Mass ID (if available) : 17504570-2304247
ICRS Star Coord at Epoch: 17h 50m 45.70508s -23:04:24.99018s
RUWE (>1.4 is poor) : 0.92
K magnitude          : 9.174
G magnitude          : 14.492
RP magnitude         : 13.173
BP magnitude         : 16.565
DUPflag             : 0
Distance (au)       : 4.250
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.40
Sun-Target sep (deg) : 178.05
Sun-Moon sep (deg)  : 8.00
B (ring opening deg) : -2.43
PA of pole (deg)    : 0.16
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (" ) : 18.367
C/A sky separation (km) : 56617.6
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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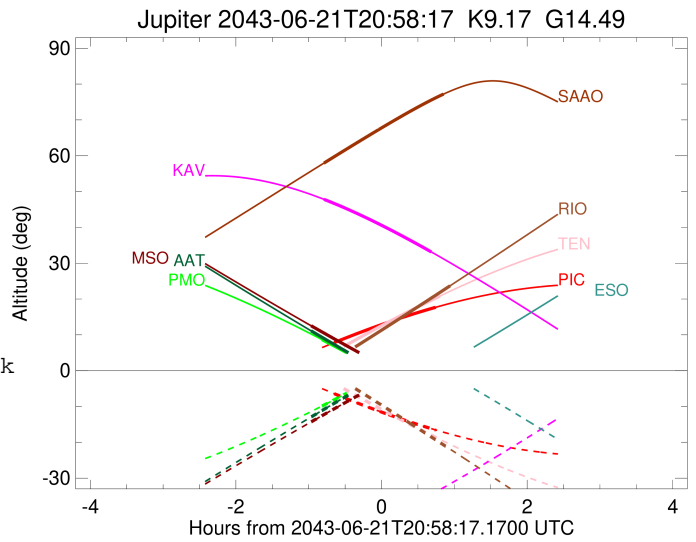
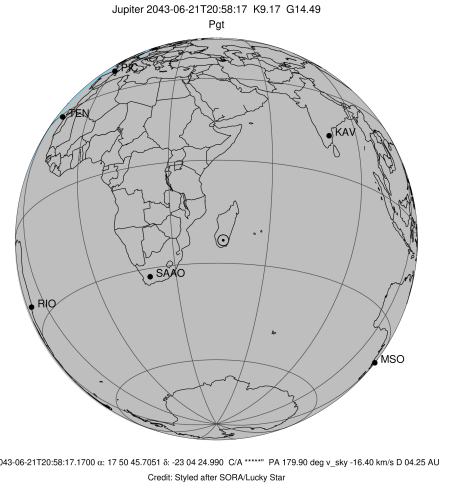


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-21T20:18:47.072	5.15	-3.38x	71487.1	51.56	55.08
Jupiter	E	2043-06-21T21:46:26.170	20.83	-19.20	71486.9	53.00	56.47

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-21T20:55:03.250
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : KAV
Location             : Kavalur Observatory
Latitude (deg)       : 12.57556
E. Longitude (deg)  : 78.83167
Altitude (km)        : 0.722
Gaia source ID      : 4068704506256037120
2Mass ID (if available) : 17504570-2304247
ICRS Star Coord at Epoch: 17h 50m 45.70508s -23:04:24.99018s
RUWE (>1.4 is poor) : 0.92
K magnitude          : 9.174
G magnitude          : 14.492
RP magnitude         : 13.173
BP magnitude         : 16.565
DUPflag             : 0
Distance (au)       : 4.250
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -16.40
Sun-Target sep (deg) : 178.05
Sun-Moon sep (deg)  : 8.88
B (ring opening deg) : -2.43
PA of pole (deg)    : 0.16
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (" ) : 18.153
C/A sky separation (km) : 55958.1
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
    
```

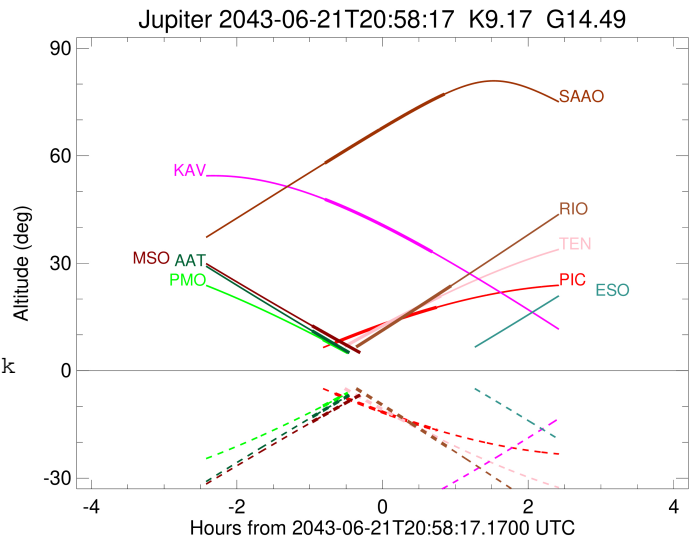
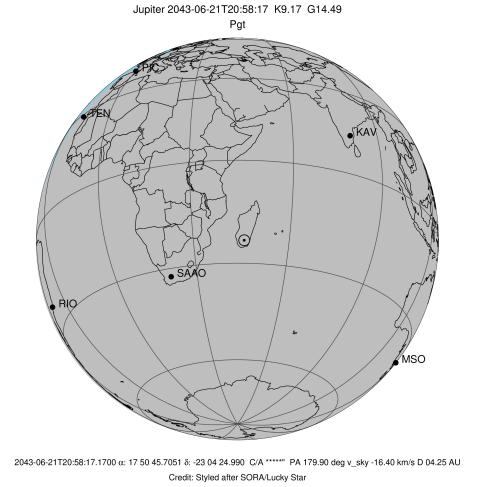


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-21T20:10:51.692	47.82	-48.57	71487.1	51.49	55.03
Jupiter	E	2043-06-21T21:39:22.453	33.13	-34.53	71487.1	51.31	54.85

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-21T21:03:43.970
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      : 4068704506256037120
2Mass ID (if available) : 17504570-2304247
ICRS Star Coord at Epoch: 17h 50m 45.70508s -23:04:24.99018s
RUWE (>1.4 is poor) : 0.92
K magnitude          : 9.174
G magnitude          : 14.492
RP magnitude         : 13.173
BP magnitude         : 16.565
DUPflag             : 0
Distance (au)       : 4.250
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.40
Sun-Target sep (deg) : 178.05
Sun-Moon sep (deg)  : 7.30
B (ring opening deg) : -2.43
PA of pole (deg)    : 0.16
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (" ) : 16.427
C/A sky separation (km) : 50636.3
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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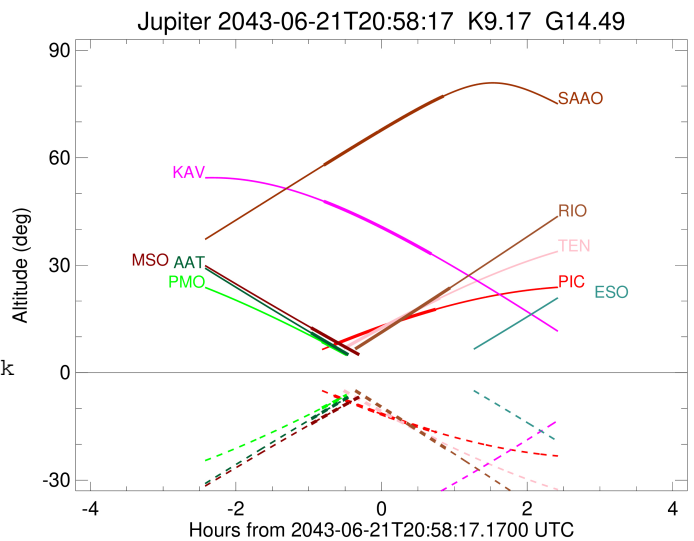
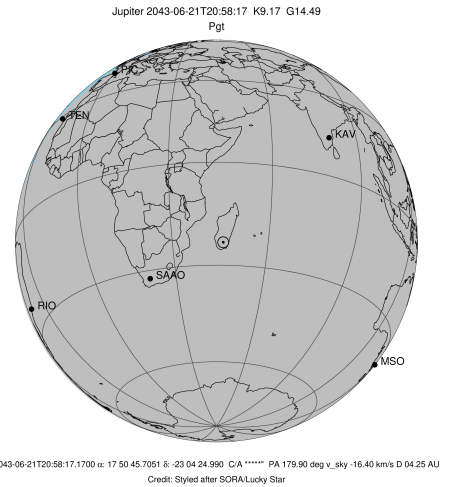


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-21T20:12:24.007	1.48x	0.09x	71488.1	44.21	47.92
Jupiter	E	2043-06-21T21:54:46.722	23.69	-21.90	71487.9	45.87	49.56

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-21T20:53:23.400
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        : 4068704506256037120
2Mass ID (if available) : 17504570-2304247
ICRS Star Coord at Epoch: 17h 50m 45.70508s -23:04:24.99018s
RUWE (>1.4 is poor) : 0.92
K magnitude           : 9.174
G magnitude           : 14.492
RP magnitude          : 13.173
BP magnitude          : 16.565
DUPflag              : 0
Distance (au)         : 4.250
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.40
Sun-Target sep (deg) : 178.05
Sun-Moon sep (deg)   : 8.40
B (ring opening deg) : -2.43
PA of pole (deg)     : 0.16
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 15.932
C/A sky separation (km) : 49111.9
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
    
```

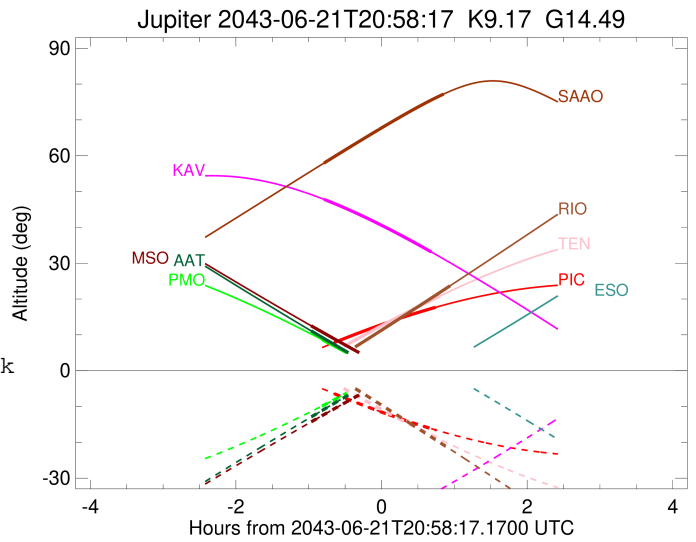
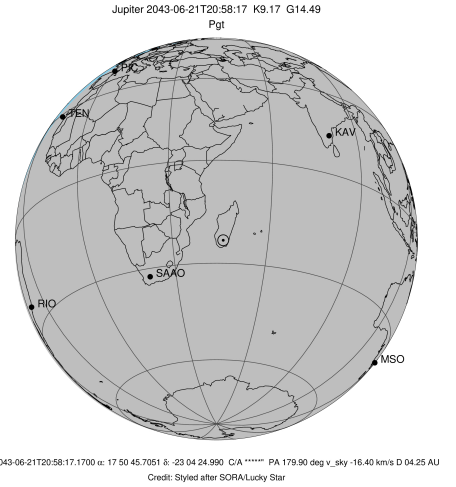


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-21T20:00:26.223	11.08	-12.89	71488.2	43.63	47.34
Jupiter	E	2043-06-21T21:46:37.626	-9.19x	7.45x	71488.3	43.09	46.81

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-21T21:00:12.890
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : SAAO
Location            : So. Afr. Astro. Obs. (Sutherland)
Latitude (deg)      : -32.37953
E. Longitude (deg)  : 20.81070
Altitude (km)       : 1.768
Gaia source ID      : 4068704506256037120
2Mass ID (if available) : 17504570-2304247
ICRS Star Coord at Epoch: 17h 50m 45.70508s -23:04:24.99018s
RUWE (>1.4 is poor) : 0.92
K magnitude          : 9.174
G magnitude          : 14.492
RP magnitude         : 13.173
BP magnitude         : 16.565
DUPflag             : 0
Distance (au)       : 4.250
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.40
Sun-Target sep (deg) : 178.05
Sun-Moon sep (deg)  : 7.89
B (ring opening deg) : -2.43
PA of pole (deg)    : 0.16
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (" ) : 16.718
C/A sky separation (km) : 51532.8
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
    
```

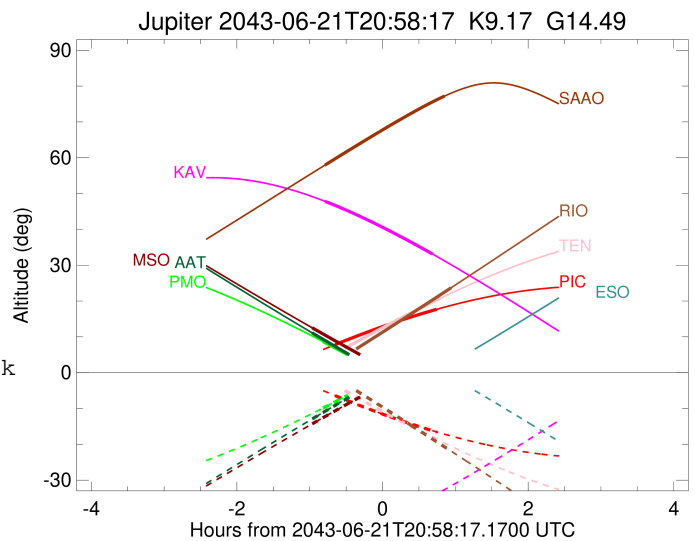
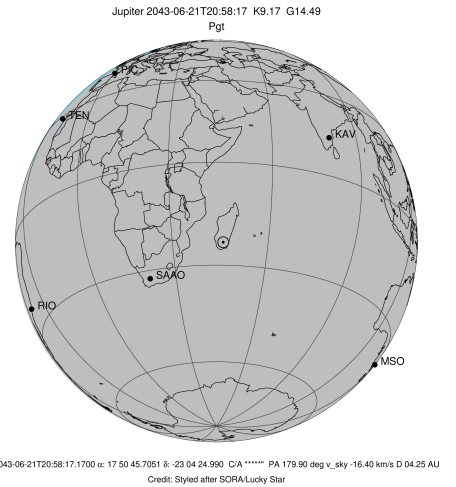


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-21T20:10:51.002	57.94	-56.36	71487.9	45.57	49.27
Jupiter	E	2043-06-21T21:49:29.352	77.21	-76.06	71487.8	46.46	50.14


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-21T20:53:36.670
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       : 4068704506256037120
2Mass ID (if available) : 17504570-2304247
ICRS Star Coord at Epoch: 17h 50m 45.70508s -23:04:24.99018s
RUWE (>1.4 is poor) : 0.92
K magnitude           : 9.174
G magnitude           : 14.492
RP magnitude          : 13.173
BP magnitude          : 16.565
DUPflag              : 0
Distance (au)        : 4.250
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.40
Sun-Target sep (deg) : 178.05
Sun-Moon sep (deg)   : 8.35
B (ring opening deg) : -2.43
PA of pole (deg)     : 0.16
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 15.828
C/A sky separation (km): 48792.2
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
    
```



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	2043-06-21T20:00:21.590	12.52	-14.29	71488.2	43.25	46.97
Jupiter	E	2043-06-21T21:47:08.217	-6.96x	5.28x	71488.3	42.76	46.48