

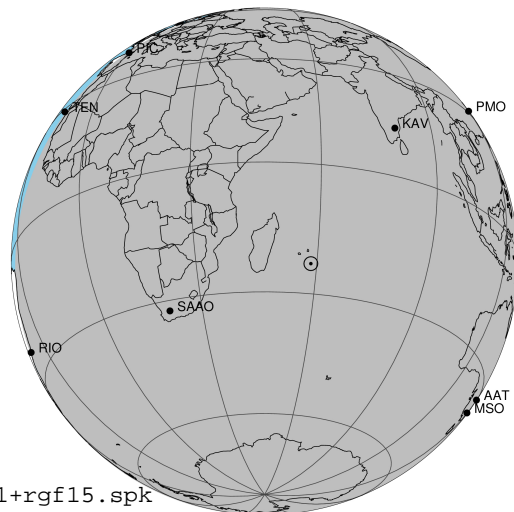
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-06-29T20:09:29.400
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068836516353974400
 2Mass ID (if available) : 17462340-2304430

Jupiter 2043-06-29T20:09:29 K9.90 G14.53 Pgt

ICRS Star Coord at Epoch: 17h 46m 23.40048s -23:04:43.05061s

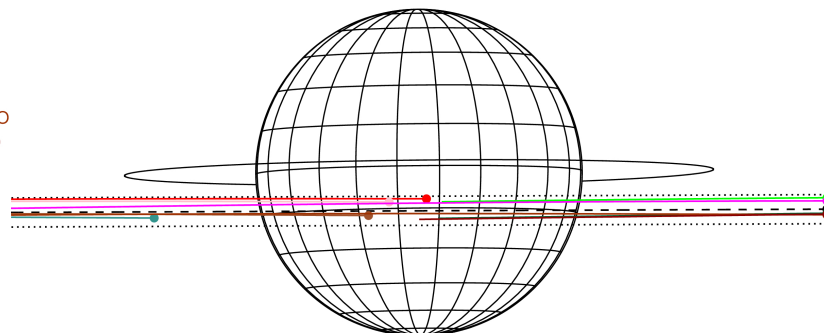
RUWE (>1.4 is poor) : 1.02
 K magnitude : 9.897
 G magnitude : 14.528
 RP magnitude : 13.311
 BP magnitude : 16.148
 DUPflag : 0
 Distance (au) : 4.260
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -15.95
 Sun-Target sep (deg) : 169.47
 Sun-Moon sep (deg) : 96.93
 B (ring opening deg) : -2.42
 PA of pole (deg) : 0.63
 Pole direction: RA (deg): 268.05669
 Dec (deg): 64.49732
 C/A sky separation (") : 5.431
 C/A sky separation (km) : 16782.9
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-06-29T20:09:29 K9.90 G14.53
 Pgt



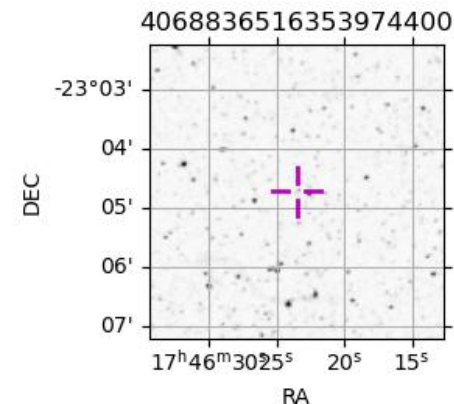
2043-06-29T20:09:29.4000 a: 17 46 23.4005 s: -23 04 43.051 C/A 5.443" PA 0.23 deg v_sky -15.95 km/s D 04.26 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 PMO
 TEN
 KAV
 RIO
 ESO
 AAT
 SAAO
 MSO



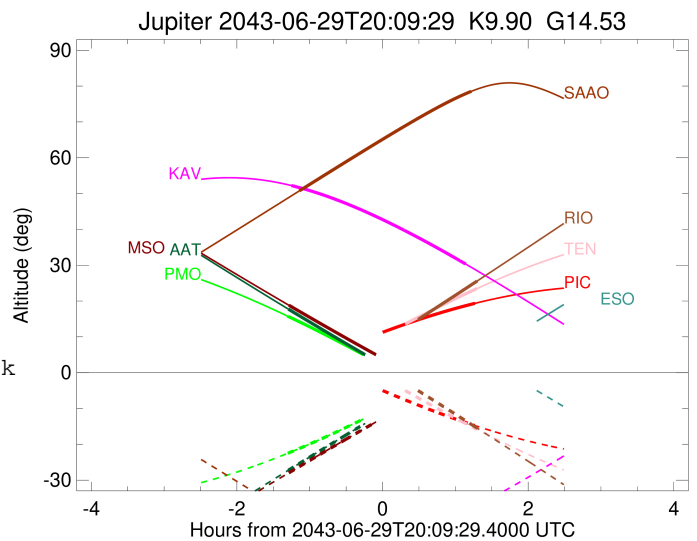
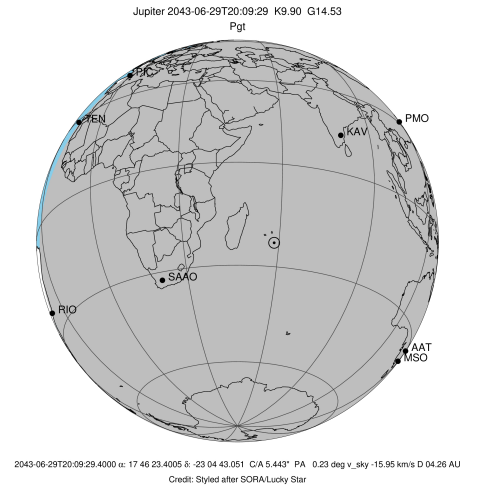
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	JUN 29 21:25 - JUN 29 21:25	Pne
PAL	Palomar Mt (200")	33.4	243.1			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+	JUN 29 18:51 - JUN 29 18:51	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 29 21:27 - JUN 29 21:27	Pne
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+ +	JUN 29 18:54 - JUN 29 21:17	Pie
RIO	Rio de Janeiro	-22.9	316.8	+ +	JUN 29 21:27 - JUN 29 21:27	Pne
ESO	European Southern Obs. (3.6m)	-29.3	289.3			Pnn
AAT	Siding Spring (AAT)	-31.3	149.1	+	JUN 29 18:51 - JUN 29 18:51	Pin
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	JUN 29 19:01 - JUN 29 21:22	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	JUN 29 18:52 - JUN 29 18:52	Pin



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T20:13:04.620
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      : 4068836516353974400
2Mass ID (if available) : 17462340-2304430
ICRS Star Coord at Epoch: 17h 46m 23.40048s -23:04:43.05061s
RUWE (>1.4 is poor) : 1.02
K magnitude          : 9.897
G magnitude          : 14.528
RP magnitude         : 13.311
BP magnitude         : 16.148
DUPflag             : 0
Distance (au)       : 4.260
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.95
Sun-Target sep (deg) : 169.47
Sun-Moon sep (deg)  : 97.05
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.63
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 3.731
C/A sky separation (km): 11528.9
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
    
```

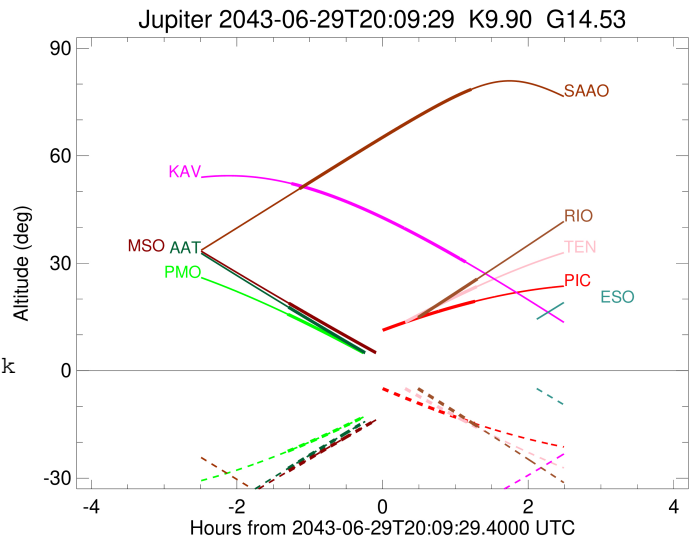
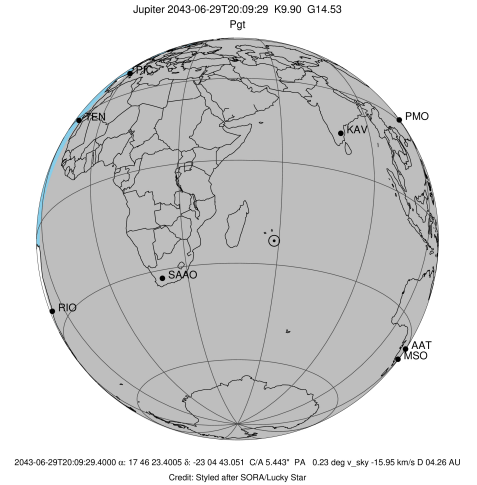


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T19:00:14.841	1.54x	5.76x	71491.8	-10.06	-11.46
Jupiter	E	2043-06-29T21:25:34.675	19.34	-14.76	71491.8	-8.59	-9.80

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T20:04:02.290
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      : 4068836516353974400
2Mass ID (if available) : 17462340-2304430
ICRS Star Coord at Epoch: 17h 46m 23.40048s -23:04:43.05061s
RUWE (>1.4 is poor) : 1.02
K magnitude          : 9.897
G magnitude          : 14.528
RP magnitude         : 13.311
BP magnitude         : 16.148
DUPflag             : 0
Distance (au)       : 4.260
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.95
Sun-Target sep (deg) : 169.47
Sun-Moon sep (deg)  : 97.06
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.63
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 4.200
C/A sky separation (km): 12977.2
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
    
```

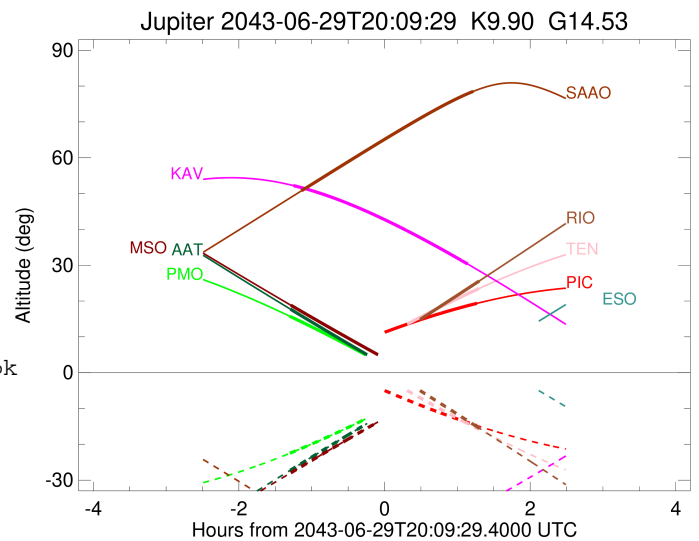
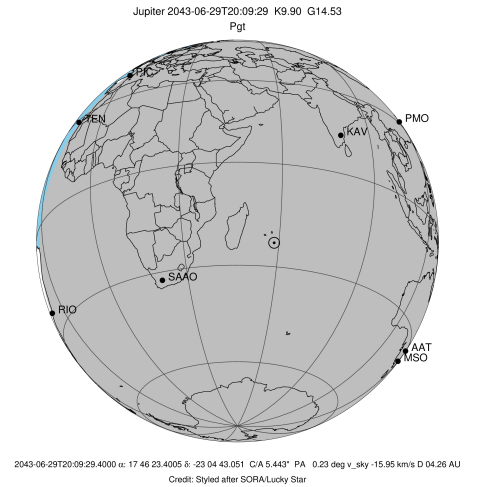


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T18:51:26.771	15.76	-22.50	71491.7	-10.37	-11.81
Jupiter	E	2043-06-29T21:17:11.192	-10.96x	2.04x	71491.7	-10.59	-12.07

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T20:14:48.390
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      : 4068836516353974400
2Mass ID (if available) : 17462340-2304430
ICRS Star Coord at Epoch: 17h 46m 23.40048s -23:04:43.05061s
RUWE (>1.4 is poor) : 1.02
K magnitude          : 9.897
G magnitude          : 14.528
RP magnitude         : 13.311
BP magnitude         : 16.148
DUPflag             : 0
Distance (au)       : 4.260
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.95
Sun-Target sep (deg) : 169.47
Sun-Moon sep (deg)  : 97.00
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.63
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (" ) : 4.203
C/A sky separation (km) : 12987.5
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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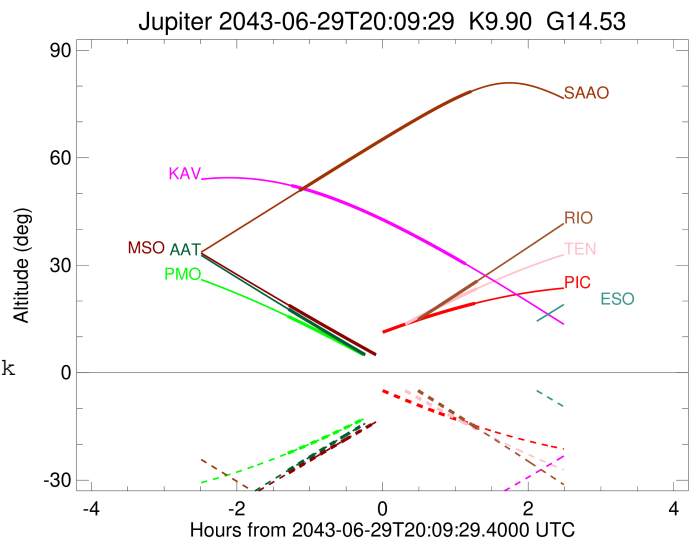
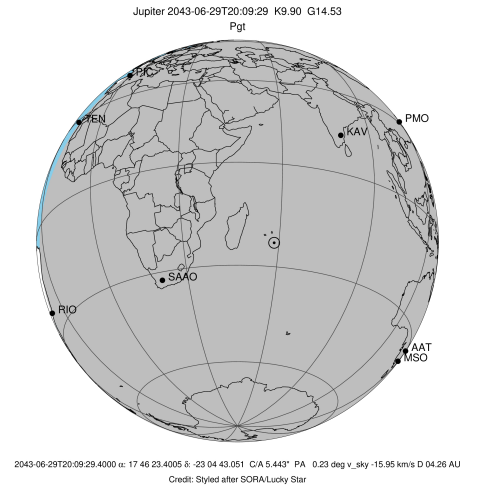


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T19:01:57.088	-2.92x	12.26x	71491.7	-11.40	-12.97
Jupiter	E	2043-06-29T21:27:09.877	23.44	-15.81	71491.8	-9.61	-10.95

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T20:06:03.960
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      : 4068836516353974400
2Mass ID (if available) : 17462340-2304430
ICRS Star Coord at Epoch: 17h 46m 23.40048s -23:04:43.05061s
RUWE (>1.4 is poor) : 1.02
K magnitude         : 9.897
G magnitude         : 14.528
RP magnitude        : 13.311
BP magnitude        : 16.148
DUPflag            : 0
Distance (au)       : 4.260
f0 (km)            : 0.00
g0 (km)            : 0.00
skyplane vel. (km/s) : -15.95
Sun-Target sep (deg) : 169.47
Sun-Moon sep (deg)  : 97.65
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.63
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 4.343
C/A sky separation (km) : 13420.3
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
    
```

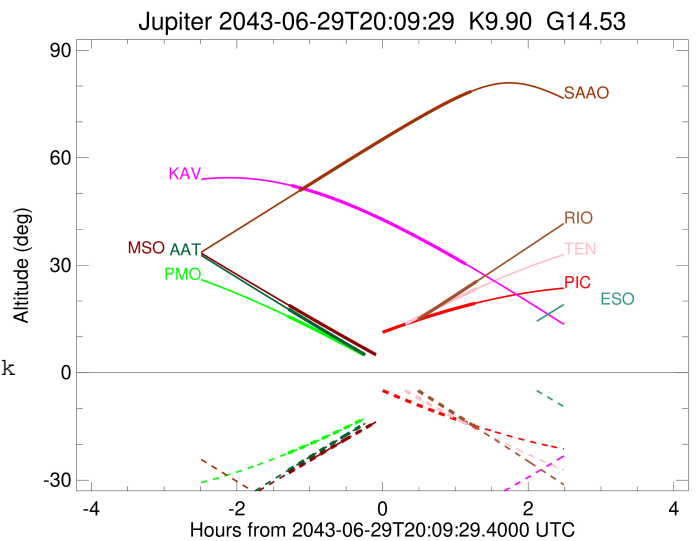
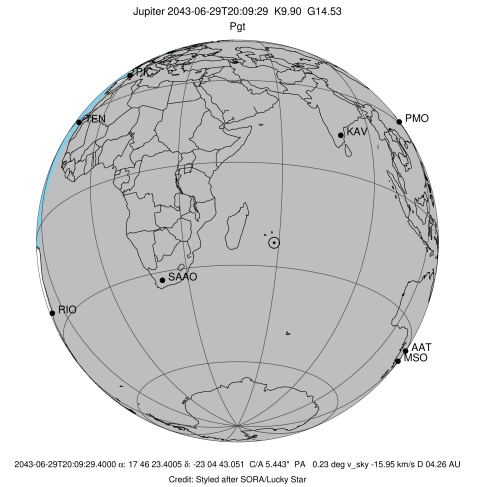


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T18:54:35.499	52.21	-54.28	71491.7	-10.98	-12.50
Jupiter	E	2043-06-29T21:17:52.773	30.35	-38.87	71491.7	-10.81	-12.32

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T20:15:50.570
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      : 4068836516353974400
2Mass ID (if available) : 17462340-2304430
ICRS Star Coord at Epoch: 17h 46m 23.40048s -23:04:43.05061s
RUWE (>1.4 is poor) : 1.02
K magnitude          : 9.897
G magnitude          : 14.528
RP magnitude         : 13.311
BP magnitude         : 16.148
DUPflag             : 0
Distance (au)       : 4.260
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.95
Sun-Target sep (deg) : 169.47
Sun-Moon sep (deg)  : 96.96
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.63
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 6.148
C/A sky separation (km): 18996.2
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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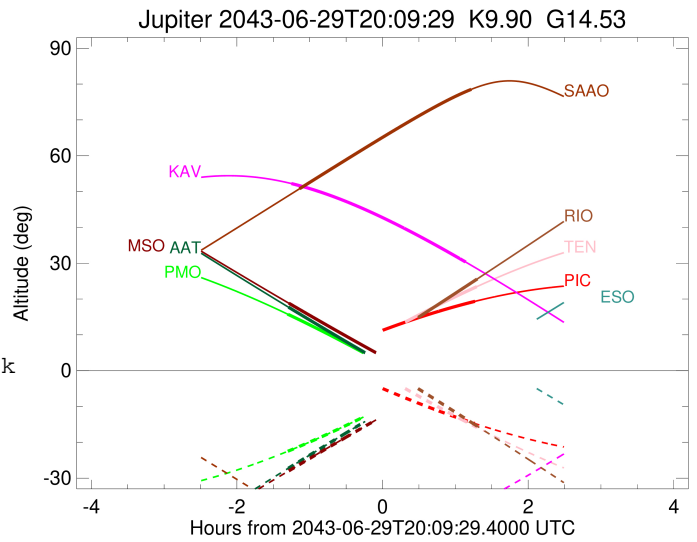
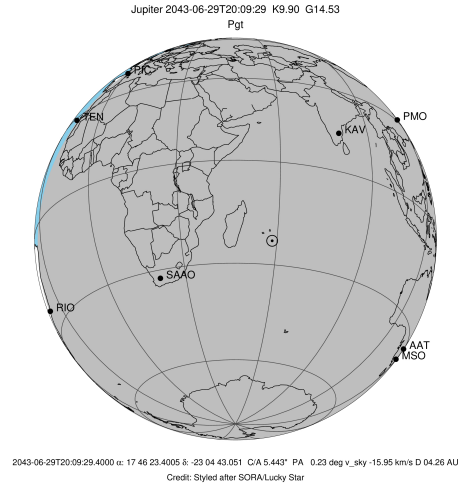


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T19:03:33.821	-5.37x	14.37x	71491.4	-16.39	-18.58
Jupiter	E	2043-06-29T21:27:31.893	25.59	-15.49	71491.5	-14.41	-16.36

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T20:03:40.880
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      : 4068836516353974400
2Mass ID (if available) : 17462340-2304430
ICRS Star Coord at Epoch: 17h 46m 23.40048s -23:04:43.05061s
RUWE (>1.4 is poor) : 1.02
K magnitude          : 9.897
G magnitude          : 14.528
RP magnitude         : 13.311
BP magnitude         : 16.148
DUPflag             : 0
Distance (au)       : 4.260
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -15.95
Sun-Target sep (deg) : 169.47
Sun-Moon sep (deg)  : 97.07
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.63
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 6.540
C/A sky separation (km) : 20207.8
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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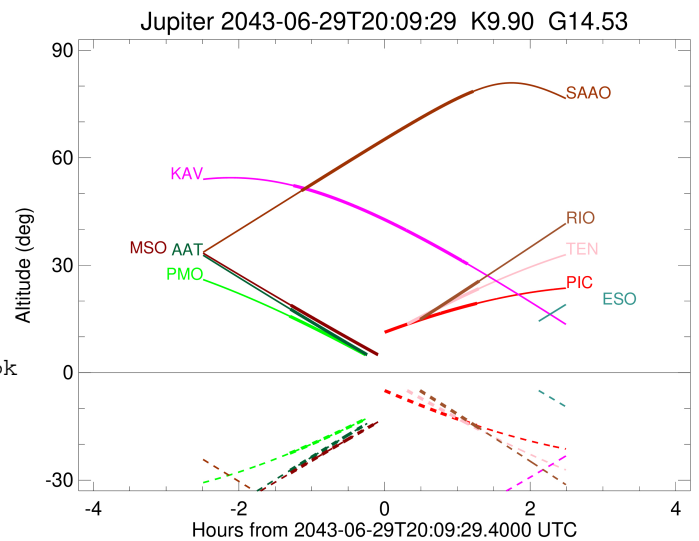
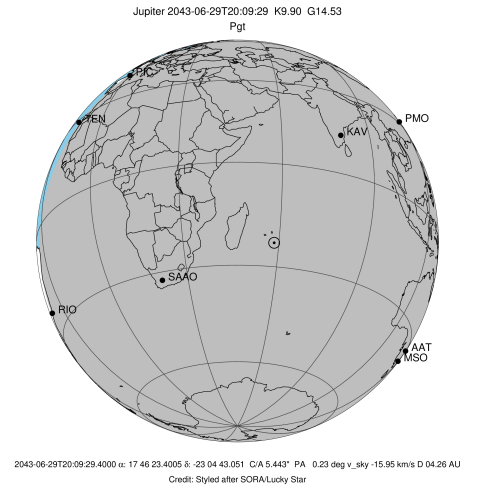


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T18:51:58.646	17.73	-27.22	71491.4	-16.25	-18.42
Jupiter	E	2043-06-29T21:15:58.001	-10.10x	1.66x	71491.4	-16.54	-18.74


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-29T20:12:00.280
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       : 4068836516353974400
2Mass ID (if available) : 17462340-2304430
ICRS Star Coord at Epoch: 17h 46m 23.40048s -23:04:43.05061s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 9.897
G magnitude           : 14.528
RP magnitude          : 13.311
BP magnitude          : 16.148
DUPflag              : 0
Distance (au)        : 4.260
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.95
Sun-Target sep (deg) : 169.47
Sun-Moon sep (deg)   : 97.75
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.63
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 5.825
C/A sky separation (km): 17999.0
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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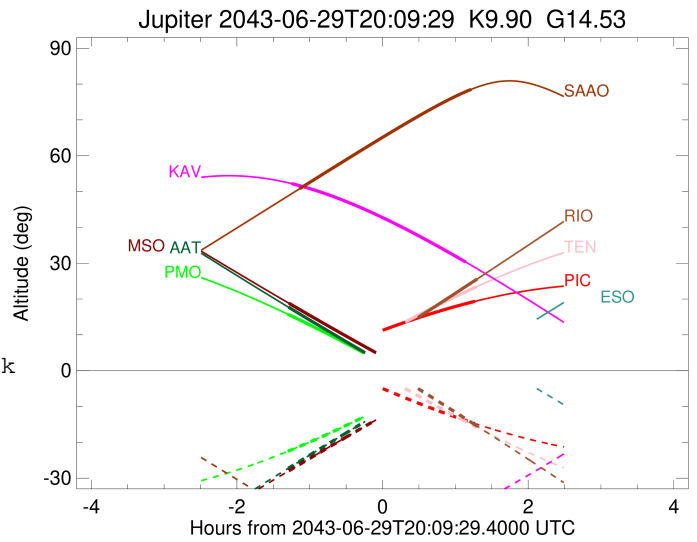
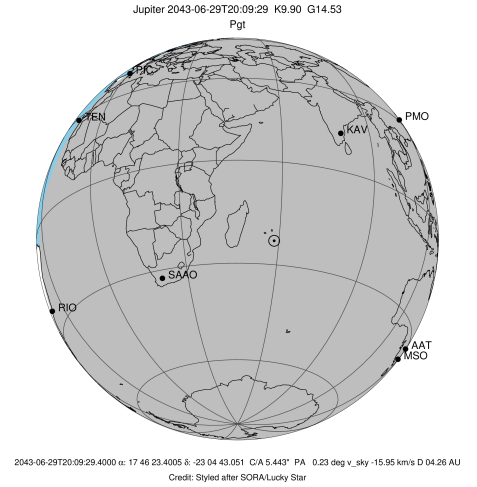


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T19:01:09.850	50.78	-41.19	71491.4	-15.27	-17.33
Jupiter	E	2043-06-29T21:22:38.163	78.52	-70.64	71491.5	-14.02	-15.92


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-29T20:03:56.460
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       : 4068836516353974400
2Mass ID (if available) : 17462340-2304430
ICRS Star Coord at Epoch: 17h 46m 23.40048s -23:04:43.05061s
RUWE (>1.4 is poor) : 1.02
K magnitude          : 9.897
G magnitude          : 14.528
RP magnitude         : 13.311
BP magnitude         : 16.148
DUPflag             : 0
Distance (au)        : 4.260
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.95
Sun-Target sep (deg) : 169.47
Sun-Moon sep (deg)   : 97.09
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.63
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 6.646
C/A sky separation (km): 20534.6
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	2043-06-29T18:52:20.399	18.82	-27.96	71491.4	-16.54	-18.75
Jupiter	E	2043-06-29T21:16:05.780	-7.76x	-0.29x	71491.3	-16.79	-19.02