

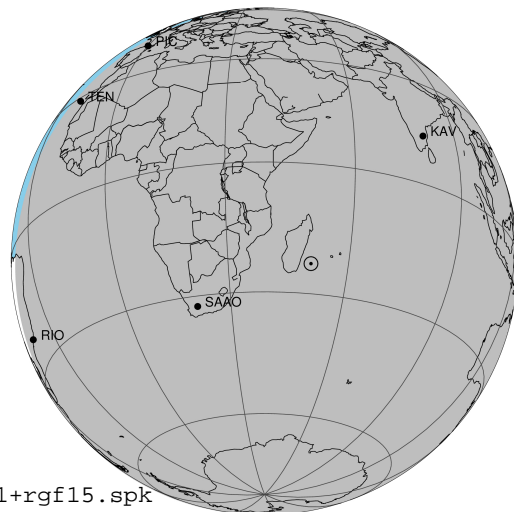
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-06-29T20:41:30.320
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068836516353982848
 2Mass ID (if available) : 17462268-2304464

Jupiter 2043-06-29T20:41:30 K9.56 G13.11 Pgt

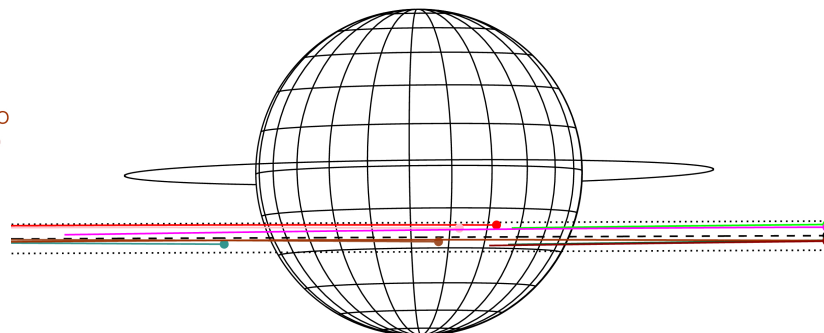
ICRS Star Coord at Epoch: 17h 46m 22.68100s -23:04:46.76168s

RUWE (>1.4 is poor) : 1.23
 K magnitude : 9.561
 G magnitude : 13.112
 RP magnitude : 12.100
 BP magnitude : 14.124
 DUPflag : 0
 Distance (au) : 4.260
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -15.95
 Sun-Target sep (deg) : 169.45
 Sun-Moon sep (deg) : 97.23
 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 (") : 9.182
 C/A sky separation (km) : 28373.6
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-06-29T20:41:30 K9.56 G13.11
 Pgt



Earth
 PIC
 PMO
 TEN
 KAV
 RIO
 ESO
 AAT
 SAAO
 MSO

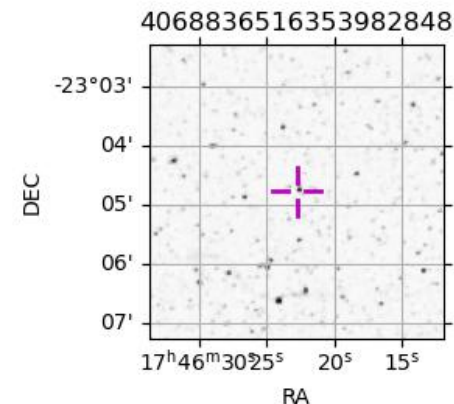


2043-06-29T20:41:30.3200 a: 17 46 22.6810 d: -23 04 46.762 C/A 9.194" PA 0.23 deg v_sky -15.95 km/s D 04.26 AU

Credit: Styled after SORA/Lucky Star

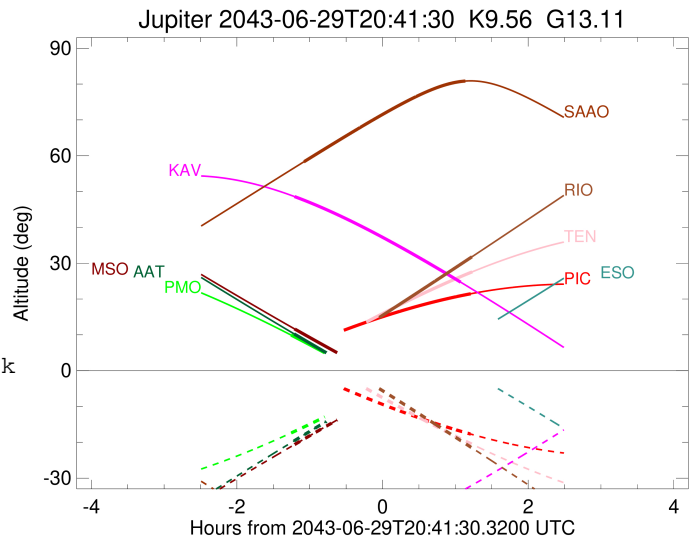
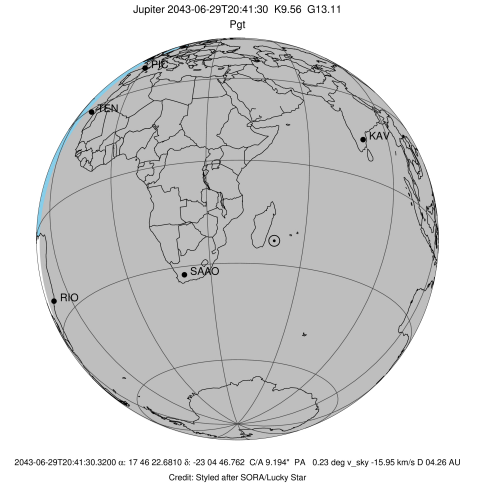
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+	JUN 29 21:54 - JUN 29 21:54	Pne
PAL	Palomar Mt (200")	33.4	243.1			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+	JUN 29 19:26 - JUN 29 19:26	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 21:55 - JUN 29 21:55	Pne
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+ +	JUN 29 19:29 - JUN 29 21:45	Pie
RIO	Rio de Janeiro	-22.9	316.8	+	JUN 29 21:55 - JUN 29 21:55	Pne
ESO	European Southern Obs. (3.6m)	-29.3	289.3			Pnn
AAT	Siding Spring (AAT)	-31.3	149.1	+	JUN 29 19:28 - JUN 29 19:28	Pin
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	JUN 29 19:36 - JUN 29 21:49	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	JUN 29 19:29 - JUN 29 19:29	Pin



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T20:44:38.520
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      : 4068836516353982848
2Mass ID (if available) : 17462268-2304464
ICRS Star Coord at Epoch: 17h 46m 22.68100s -23:04:46.76168s
RUWE (>1.4 is poor) : 1.23
K magnitude          : 9.561
G magnitude          : 13.112
RP magnitude         : 12.100
BP magnitude         : 14.124
DUPflag             : 0
Distance (au)       : 4.260
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.95
Sun-Target sep (deg) : 169.45
Sun-Moon sep (deg)  : 97.42
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 (" ) : 7.427
C/A sky separation (km) : 22950.3
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
    
```

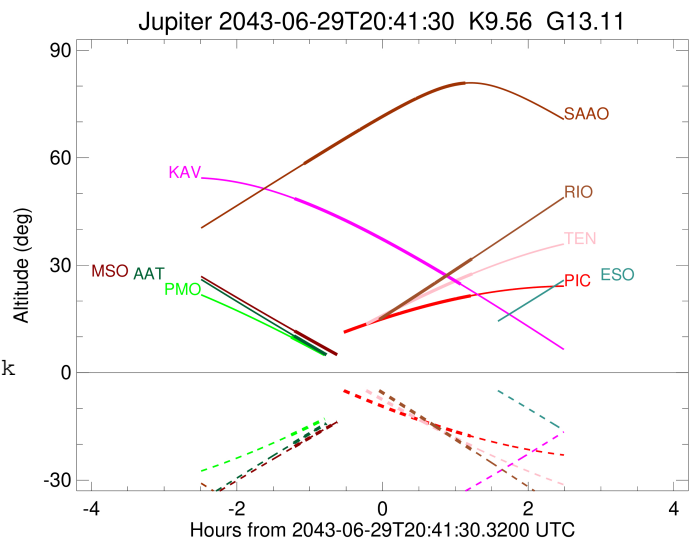
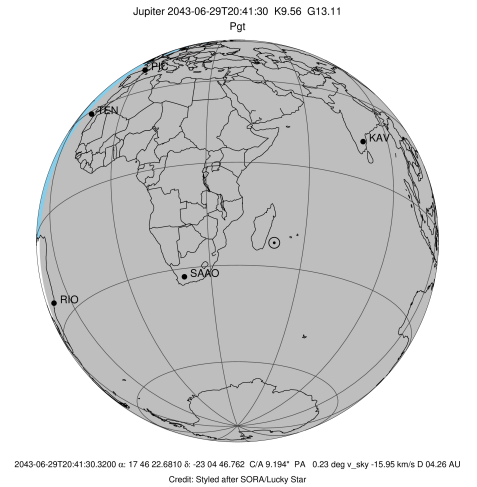


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T19:34:55.251	6.64	0.21x	71491.1	-19.45	-21.97
Jupiter	E	2043-06-29T21:54:06.352	21.46	-17.69	71491.2	-18.08	-20.45

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-29T20:35:43.150
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        : 4068836516353982848
2Mass ID (if available) : 17462268-2304464
ICRS Star Coord at Epoch: 17h 46m 22.68100s -23:04:46.76168s
RUWE (>1.4 is poor) : 1.23
K magnitude           : 9.561
G magnitude           : 13.112
RP magnitude          : 12.100
BP magnitude          : 14.124
DUPflag              : 0
Distance (au)         : 4.260
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.95
Sun-Target sep (deg) : 169.45
Sun-Moon sep (deg)   : 97.27
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 ("): 8.043
C/A sky separation (km): 24851.6
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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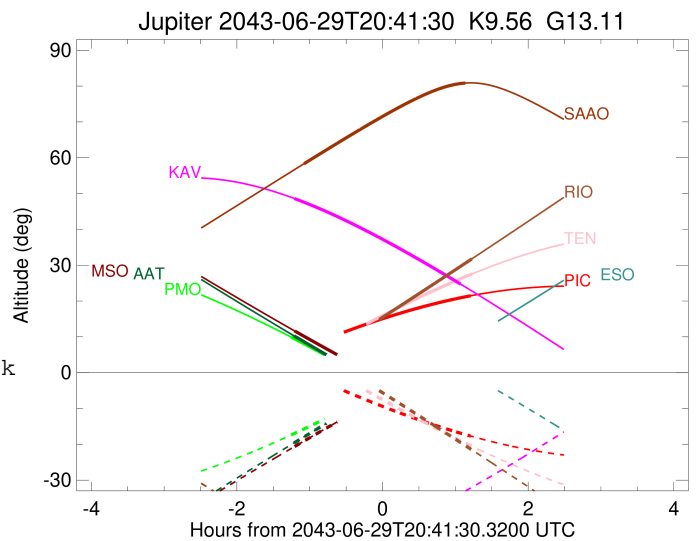
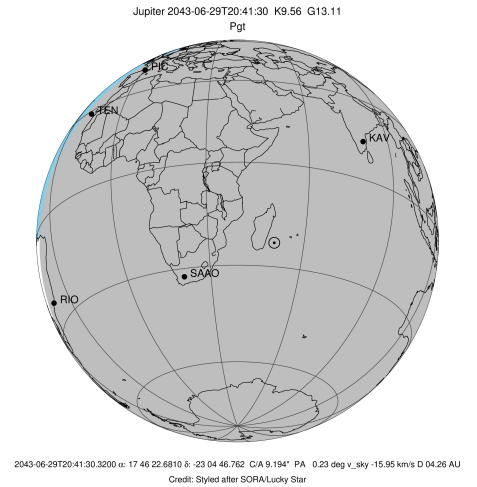


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T19:26:16.546	9.92	-17.38	71491.0	-20.21	-22.80
Jupiter	E	2043-06-29T21:45:41.820	-16.70x	7.55x	71491.0	-20.48	-23.10

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T20:46:28.760
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      : 4068836516353982848
2Mass ID (if available) : 17462268-2304464
ICRS Star Coord at Epoch: 17h 46m 22.68100s -23:04:46.76168s
RUWE (>1.4 is poor) : 1.23
K magnitude         : 9.561
G magnitude         : 13.112
RP magnitude        : 12.100
BP magnitude        : 14.124
DUPflag            : 0
Distance (au)       : 4.260
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -15.95
Sun-Target sep (deg) : 169.45
Sun-Moon sep (deg)  : 97.41
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 (" ) : 7.870
C/A sky separation (km) : 24319.0
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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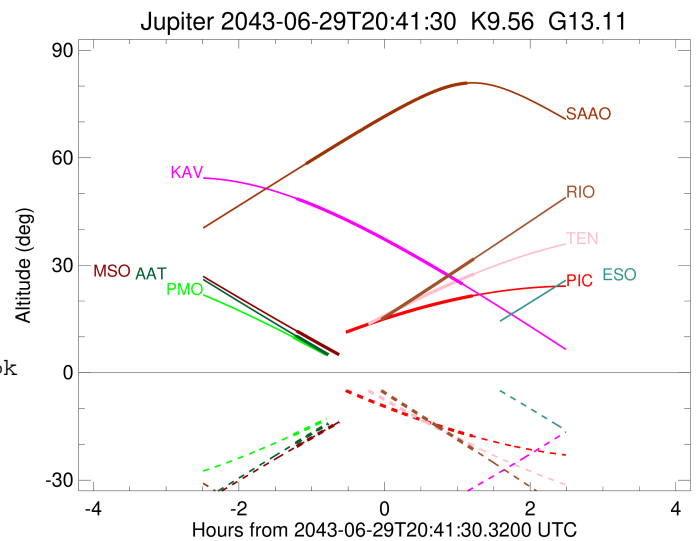
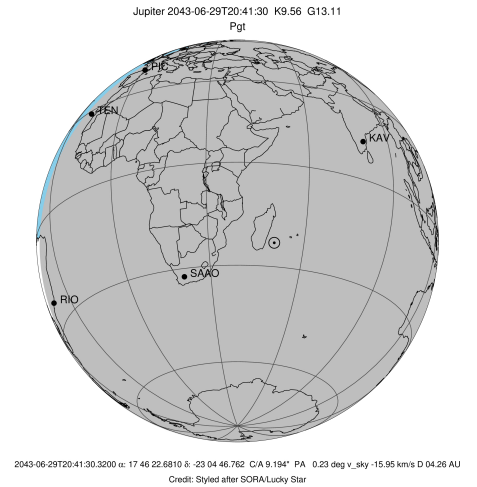


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T19:37:02.982	4.01x	5.08x	71491.0	-20.77	-23.42
Jupiter	E	2043-06-29T21:55:29.676	27.59	-20.57	71491.1	-19.07	-21.55

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-29T20:37:15.040
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        : 4068836516353982848
2Mass ID (if available) : 17462268-2304464
ICRS Star Coord at Epoch: 17h 46m 22.68100s -23:04:46.76168s
RUWE (>1.4 is poor)  : 1.23
K magnitude           : 9.561
G magnitude           : 13.112
RP magnitude          : 12.100
BP magnitude          : 14.124
DUPflag              : 0
Distance (au)         : 4.260
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.95
Sun-Target sep (deg)  : 169.45
Sun-Moon sep (deg)    : 97.90
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 (") : 8.156
C/A sky separation (km) : 25201.8
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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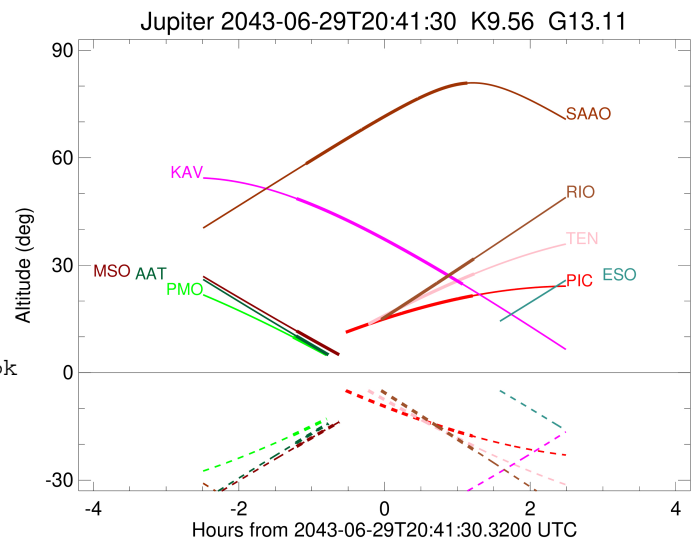
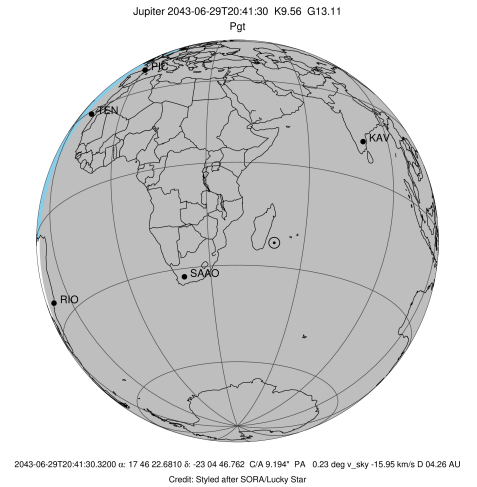


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T19:29:02.573	48.59	-52.94	71491.0	-20.71	-23.35
Jupiter	E	2043-06-29T21:45:50.067	24.72	-33.78	71491.0	-20.69	-23.33

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T20:47:53.840
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      : 4068836516353982848
2Mass ID (if available) : 17462268-2304464
ICRS Star Coord at Epoch: 17h 46m 22.68100s -23:04:46.76168s
RUWE (>1.4 is poor) : 1.23
K magnitude          : 9.561
G magnitude          : 13.112
RP magnitude         : 12.100
BP magnitude         : 14.124
DUPflag             : 0
Distance (au)        : 4.260
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.95
Sun-Target sep (deg) : 169.45
Sun-Moon sep (deg)  : 97.38
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 (" ) : 9.795
C/A sky separation (km) : 30265.8
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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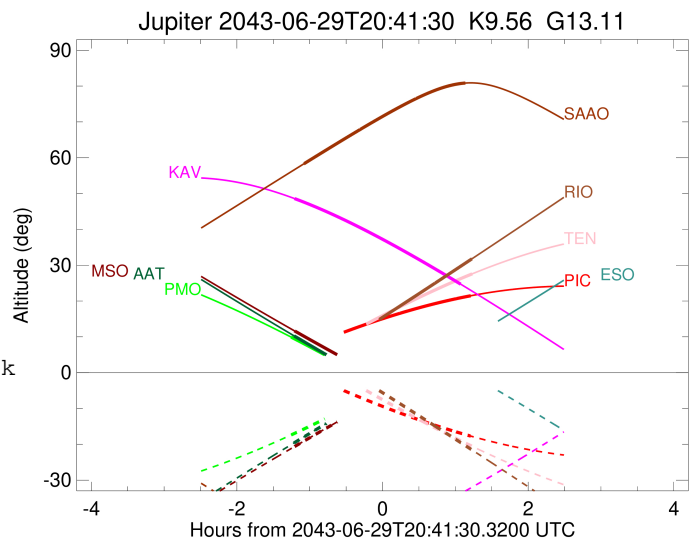
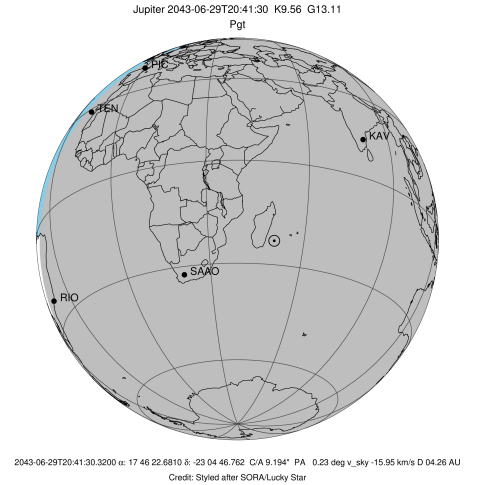


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T19:40:14.595	2.25x	7.13x	71490.5	-26.02	-29.13
Jupiter	E	2043-06-29T21:55:02.344	31.74	-21.52	71490.7	-24.06	-27.01

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-29T20:35:47.290
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        : 4068836516353982848
2Mass ID (if available) : 17462268-2304464
ICRS Star Coord at Epoch: 17h 46m 22.68100s -23:04:46.76168s
RUWE (>1.4 is poor) : 1.23
K magnitude           : 9.561
G magnitude           : 13.112
RP magnitude          : 12.100
BP magnitude          : 14.124
DUPflag              : 0
Distance (au)         : 4.260
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.95
Sun-Target sep (deg) : 169.45
Sun-Moon sep (deg)   : 97.27
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 ("): 10.385
C/A sky separation (km): 32089.6
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
    
```

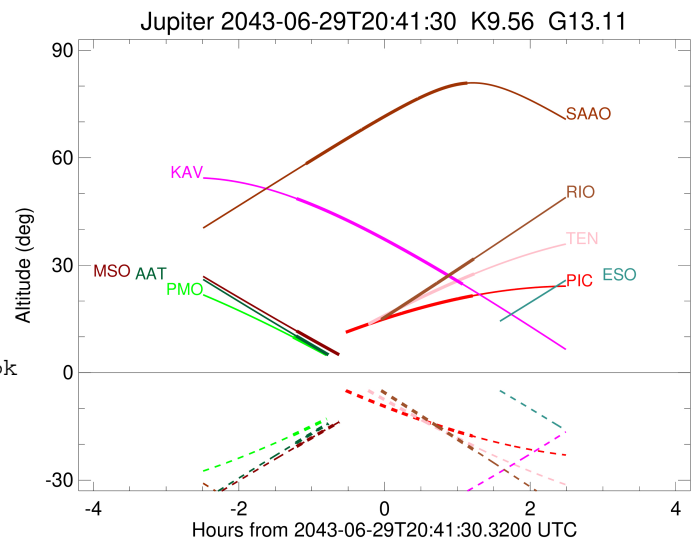
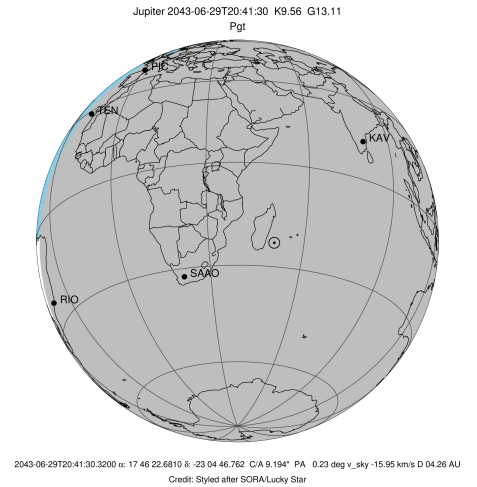


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T19:28:43.366	10.26	-19.59	71490.4	-26.49	-29.63
Jupiter	E	2043-06-29T21:43:21.002	-14.79x	6.71x	71490.4	-26.75	-29.91

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-29T20:43:18.880
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       : 4068836516353982848
2Mass ID (if available) : 17462268-2304464
ICRS Star Coord at Epoch: 17h 46m 22.68100s -23:04:46.76168s
RUWE (>1.4 is poor) : 1.23
K magnitude          : 9.561
G magnitude          : 13.112
RP magnitude         : 12.100
BP magnitude         : 14.124
DUPflag             : 0
Distance (au)        : 4.260
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.95
Sun-Target sep (deg) : 169.45
Sun-Moon sep (deg)   : 98.11
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 ("): 9.541
C/A sky separation (km): 29482.9
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
    
```

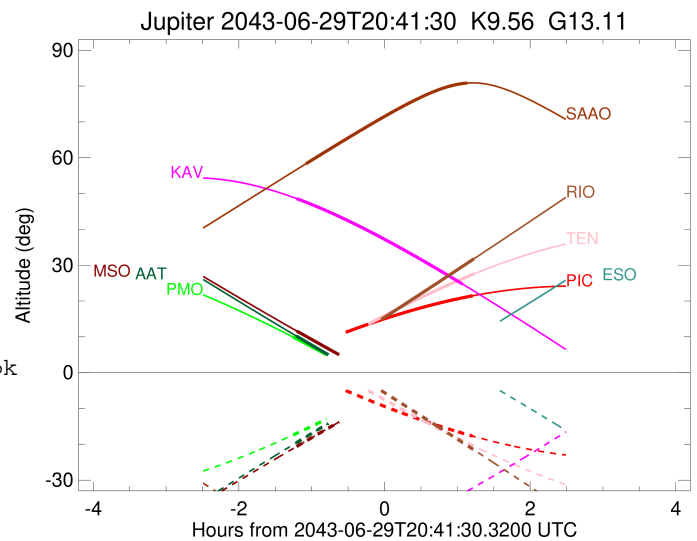
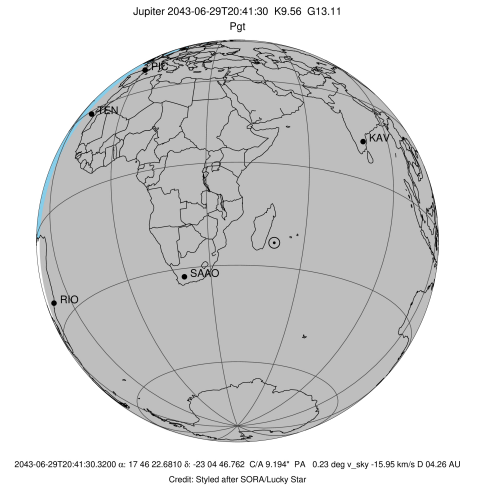


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T19:36:45.455	58.30	-48.71	71490.6	-24.97	-27.99
Jupiter	E	2043-06-29T21:49:44.742	80.83	-75.65	71490.7	-23.85	-26.78


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T20:36:02.640
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      : 4068836516353982848
2Mass ID (if available) : 17462268-2304464
ICRS Star Coord at Epoch: 17h 46m 22.68100s -23:04:46.76168s
RUWE (>1.4 is poor) : 1.23
K magnitude          : 9.561
G magnitude          : 13.112
RP magnitude         : 12.100
BP magnitude         : 14.124
DUPflag             : 0
Distance (au)       : 4.260
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.95
Sun-Target sep (deg) : 169.45
Sun-Moon sep (deg)  : 97.30
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 (" ) : 10.487
C/A sky separation (km) : 32403.3
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	2043-06-29T19:29:09.459	11.63	-20.60	71490.4	-26.80	-29.96
Jupiter	E	2043-06-29T21:43:24.153	-12.19x	4.52x	71490.4	-27.01	-30.19