

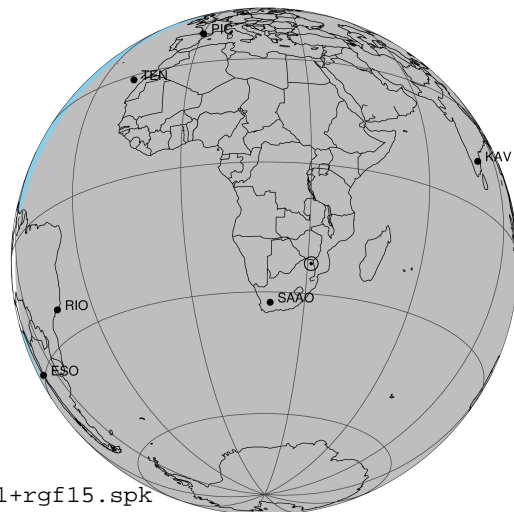
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-06-29T22:00:02.750
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068836580760289408
 2Mass ID (if available) : 17462093-2304209

Jupiter 2043-06-29T22:00:02 K7.37 G14.13 Pgt

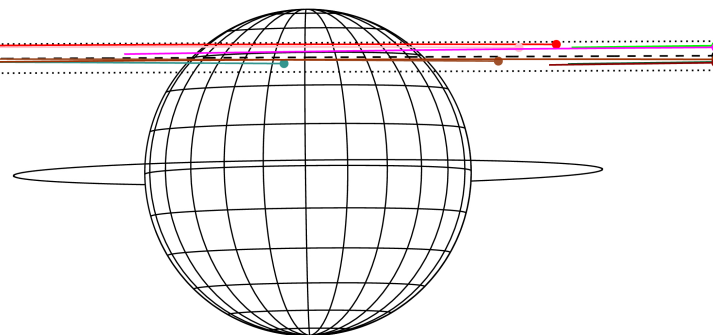
ICRS Star Coord at Epoch: 17h 46m 20.92662s -23°04'21.15689s

RUWE (>1.4 is poor) : 0.84
 K magnitude : 7.372
 G magnitude : 14.133
 RP magnitude : 12.508
 BP magnitude : 17.461
 DUPflag : 0
 Distance (au) : 4.261
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -15.94
 Sun-Target sep (deg) : 169.39
 Sun-Moon sep (deg) : 97.99
 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 (") : 16.324
 C/A sky separation (km) : 50443.1
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-06-29T22:00:02 K7.37 G14.13
 Pgt



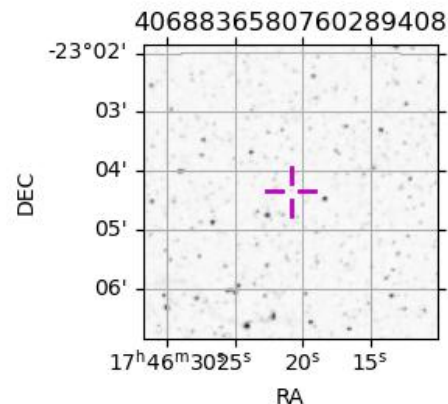
Earth
 PIC
 PMO
 TEN
 KAV
 RIO
 ESO
 AAT
 SAAO
 MSO



2043-06-29T22:00:02.7500 a: 17 46 20.9266 s: -23 04 21.157 C/A ***** PA 180.23 deg v_sky -15.94 km/s D 04.26 AU
 Credit: Styled after SORA/Lucky Star

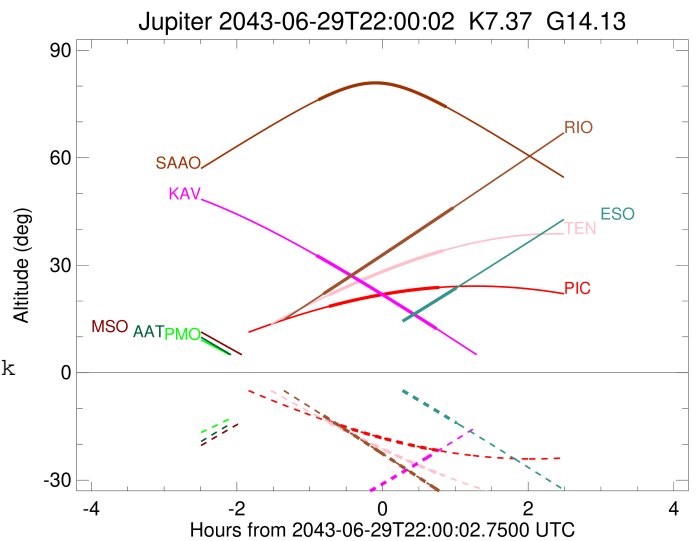
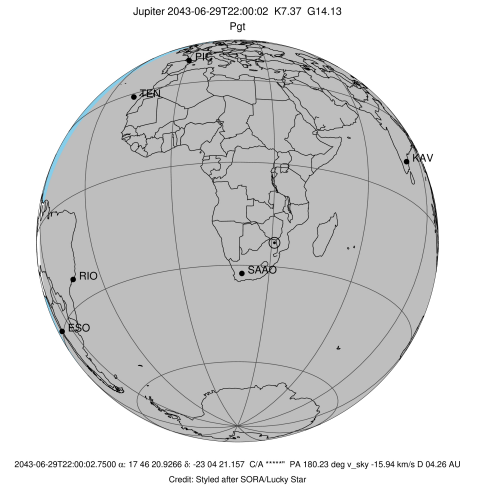
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+ +	JUN 29 21:16 - JUN 29 22:46	Pie
PAL	Palomar Mt (200")	33.4	243.1			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
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 21:16 - JUN 29 22:49	Pie
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+ +	JUN 29 21:05 - JUN 29 22:44	Pie
RIO	Rio de Janeiro	-22.9	316.8	+ +	JUN 29 21:11 - JUN 29 22:58	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3		JUN 29 23:00 - JUN 29 23:00	Pne
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	JUN 29 21:07 - JUN 29 22:52	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-29T22:01:28.010
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        : 4068836580760289408
2Mass ID (if available) : 17462093-2304209
ICRS Star Coord at Epoch: 17h 46m 20.92662s -23:04:21.15689s
RUWE (>1.4 is poor) : 0.84
K magnitude           : 7.372
G magnitude           : 14.133
RP magnitude          : 12.508
BP magnitude          : 17.461
DUPflag              : 0
Distance (au)         : 4.261
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.94
Sun-Target sep (deg)  : 169.39
Sun-Moon sep (deg)    : 98.31
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 (") : 18.174
C/A sky separation (km) : 56158.6
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
    
```

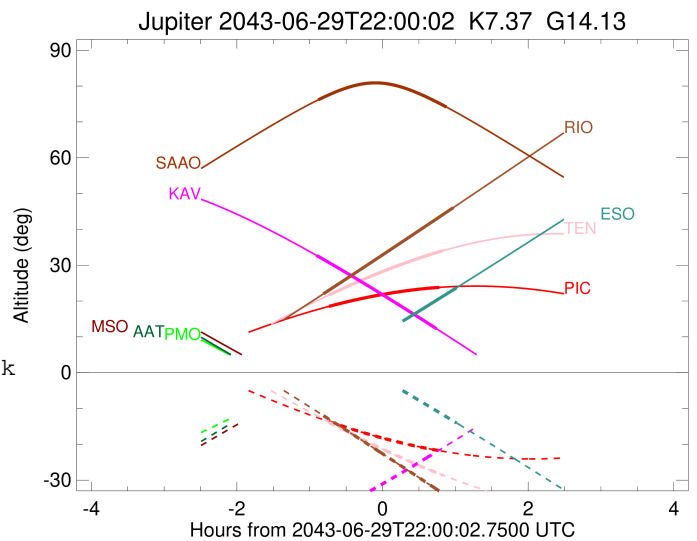
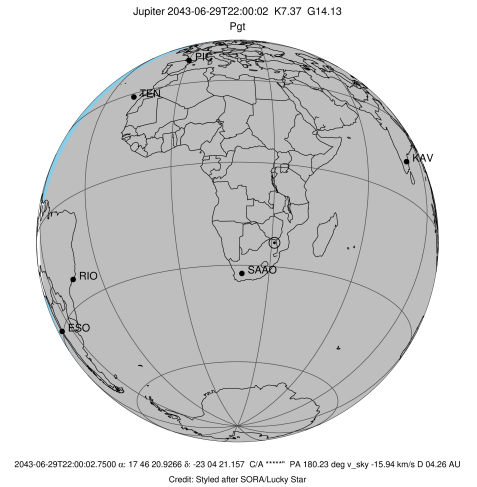


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T21:16:03.493	18.51	-13.68	71487.2	51.11	54.66
Jupiter	E	2043-06-29T22:46:49.446	23.80	-21.77	71487.0	52.22	55.72

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-29T22:03:05.700
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       : 4068836580760289408
2Mass ID (if available) : 17462093-2304209
ICRS Star Coord at Epoch: 17h 46m 20.92662s -23:04:21.15689s
RUWE (>1.4 is poor) : 0.84
K magnitude           : 7.372
G magnitude           : 14.133
RP magnitude         : 12.508
BP magnitude         : 17.461
DUPflag              : 0
Distance (au)        : 4.261
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.94
Sun-Target sep (deg) : 169.39
Sun-Moon sep (deg)   : 98.37
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 ("): 17.804
C/A sky separation (km): 55015.8
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
    
```

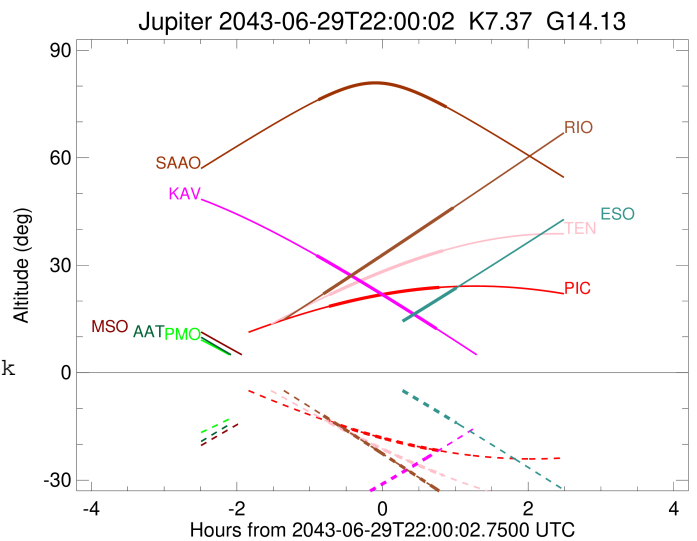
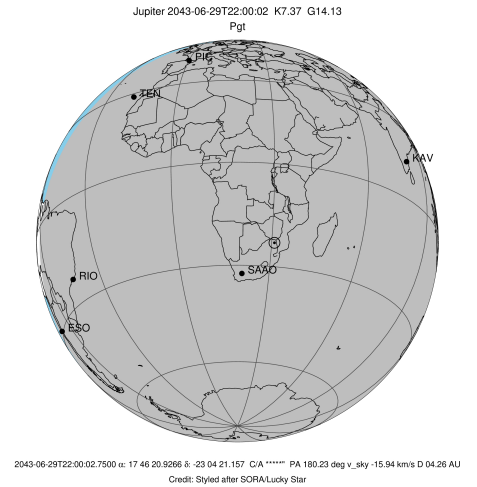


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T21:16:14.014	21.73	-13.89	71487.4	49.48	53.09
Jupiter	E	2043-06-29T22:49:49.852	34.05	-28.62	71487.2	50.93	54.48

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-29T21:55:01.670
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        : 4068836580760289408
2Mass ID (if available) : 17462093-2304209
ICRS Star Coord at Epoch: 17h 46m 20.92662s -23:04:21.15689s
RUWE (>1.4 is poor) : 0.84
K magnitude           : 7.372
G magnitude           : 14.133
RP magnitude          : 12.508
BP magnitude          : 17.461
DUPflag              : 0
Distance (au)         : 4.261
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.94
Sun-Target sep (deg) : 169.39
Sun-Moon sep (deg)   : 98.47
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 ("): 17.151
C/A sky separation (km): 52997.0
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
    
```

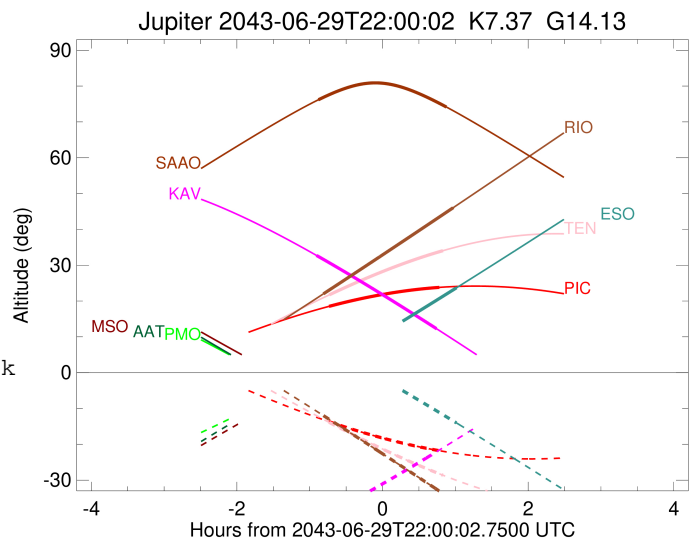
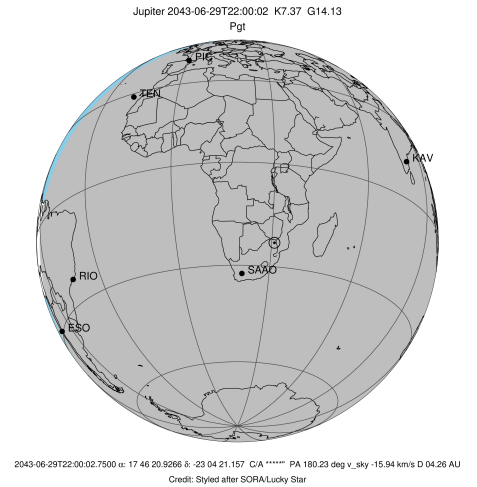


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T21:05:41.579	32.72	-40.96	71487.6	47.88	51.53
Jupiter	E	2043-06-29T22:44:37.107	12.26	-22.07	71487.6	47.62	51.28

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T22:04:58.140
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      : 4068836580760289408
2Mass ID (if available) : 17462093-2304209
ICRS Star Coord at Epoch: 17h 46m 20.92662s -23:04:21.15689s
RUWE (>1.4 is poor) : 0.84
K magnitude          : 7.372
G magnitude          : 14.133
RP magnitude         : 12.508
BP magnitude         : 17.461
DUPflag             : 0
Distance (au)       : 4.261
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.94
Sun-Target sep (deg) : 169.39
Sun-Moon sep (deg)  : 98.40
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 (" ) : 15.950
C/A sky separation (km) : 49285.7
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
    
```

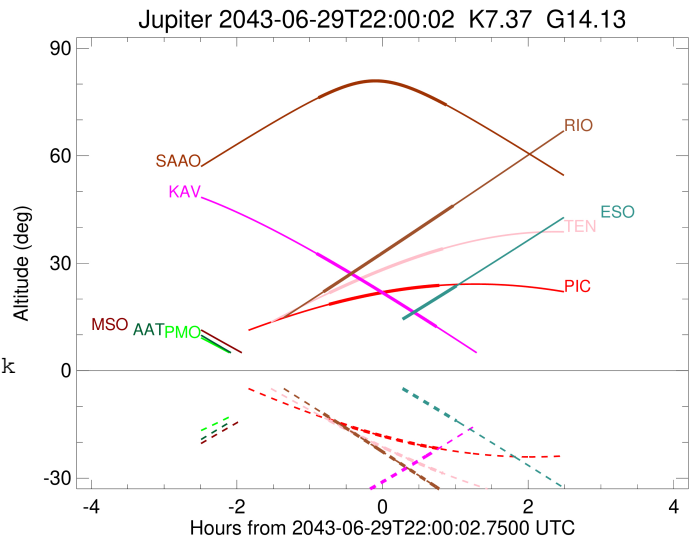
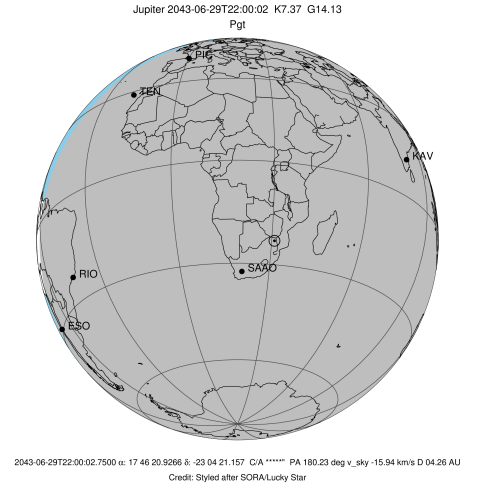


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T21:11:20.548	22.00	-11.98	71488.3	42.58	46.30
Jupiter	E	2043-06-29T22:58:19.462	46.05	-35.61	71488.1	44.42	48.13

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T22:05:22.410
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      : 4068836580760289408
2Mass ID (if available) : 17462093-2304209
ICRS Star Coord at Epoch: 17h 46m 20.92662s -23:04:21.15689s
RUWE (>1.4 is poor) : 0.84
K magnitude          : 7.372
G magnitude          : 14.133
RP magnitude         : 12.508
BP magnitude         : 17.461
DUPflag             : 0
Distance (au)       : 4.261
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -15.94
Sun-Target sep (deg) : 169.39
Sun-Moon sep (deg)  : 98.05
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 (" ) : 15.419
C/A sky separation (km) : 47644.9
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
    
```

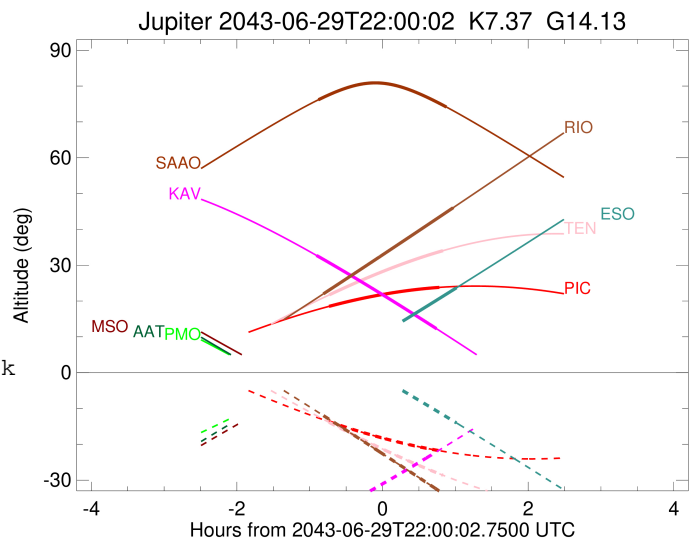
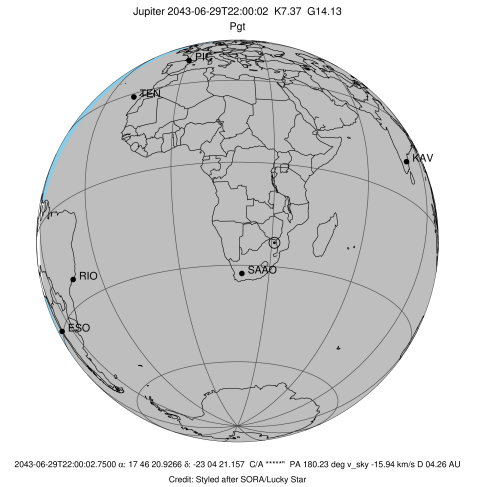


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T21:09:30.847	0.77x	7.94x	71488.6	40.78	44.49
Jupiter	E	2043-06-29T23:00:54.626	23.67	-14.01	71488.3	42.71	46.43

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-29T21:59:55.040
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       : 4068836580760289408
2Mass ID (if available) : 17462093-2304209
ICRS Star Coord at Epoch: 17h 46m 20.92662s -23:04:21.15689s
RUWE (>1.4 is poor) : 0.84
K magnitude           : 7.372
G magnitude           : 14.133
RP magnitude          : 12.508
BP magnitude          : 17.461
DUPflag              : 0
Distance (au)        : 4.261
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.94
Sun-Target sep (deg) : 169.39
Sun-Moon sep (deg)   : 98.94
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 ("): 15.997
C/A sky separation (km): 49432.3
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	2043-06-29T21:07:09.714	76.16	-67.57	71488.2	43.25	46.97
Jupiter	E	2043-06-29T22:52:41.434	74.15	-80.58	71488.1	44.02	47.73