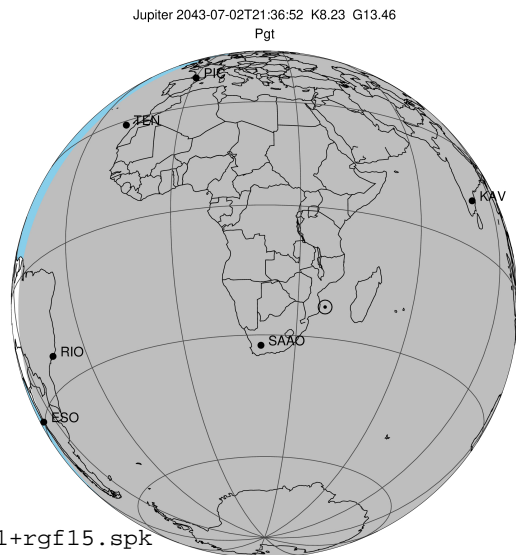


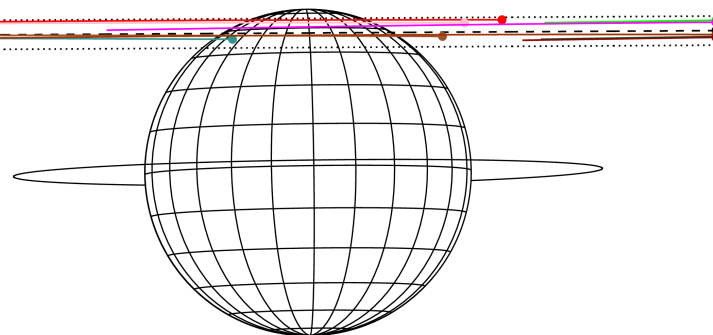
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-07-02T21:36:52.200
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068824898364150400
 2Mass ID (if available) : 17444562-2304108

Jupiter 2043-07-02T21:36:52 K8.23 G13.46 Pgt

ICRS Star Coord at Epoch: 17h 44m 45.61961s -23:04:11.18513s
 RUWE (>1.4 is poor) : 0.94
 K magnitude : 8.229
 G magnitude : 13.457
 RP magnitude : 12.134
 BP magnitude : 15.515
 DUPflag : 0
 Distance (au) : 4.269
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -15.61
 Sun-Target sep (deg) : 166.18
 Sun-Moon sep (deg) : 140.52
 B (ring opening deg) : -2.42
 PA of pole (deg) : 0.80
 Pole direction: RA (deg): 268.05669
 Dec (deg): 64.49732
 C/A sky separation (") : 19.736
 C/A sky separation (km) : 61110.4
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk



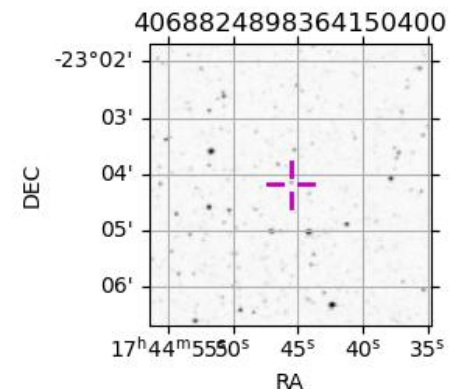
Earth
 PIC
 PMO
 TEN
 KAV
 RIO
 ESO
 AAT
 SAAO
 MSO



2043-07-02T21:36:52.2000 a: 17 44 45.61961 s: -23 04 11.185 C/A ***** PA 180.33 deg v_sky -15.61 km/s D 0.427 AU
 Credit: Styled after SORA/Lucky Star

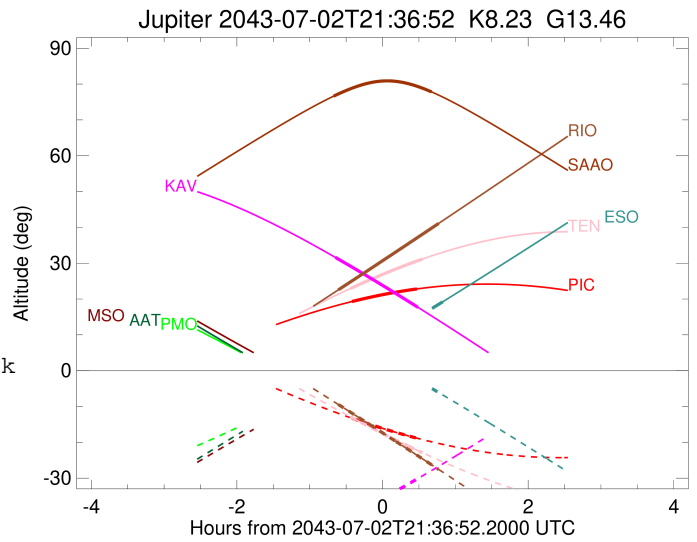
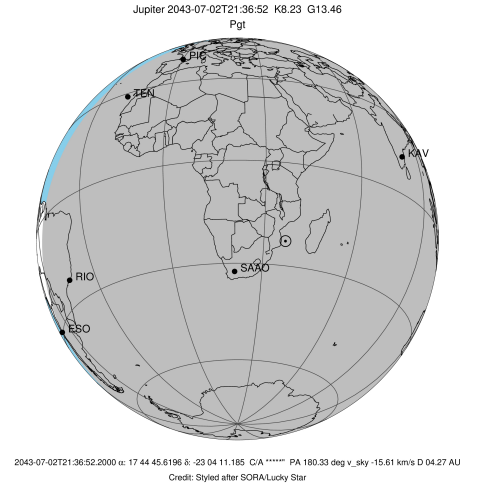
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+ +	JUL 02 21:11 - JUL 02 22:05	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	+ +	JUL 02 21:10 - JUL 02 22:09	Pie
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+ +	JUL 02 20:58 - JUL 02 22:06	Pie
RIO	Rio de Janeiro	-22.9	316.8	+ +	JUL 02 21:00 - JUL 02 22:23	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	JUL 02 22:26 - JUL 02 22:26	Pne
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	JUL 02 20:56 - JUL 02 22:17	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-02T21:38:28.160
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        : 4068824898364150400
2Mass ID (if available) : 17444562-2304108
ICRS Star Coord at Epoch: 17h 44m 45.61961s -23:04:11.18513s
RUWE (>1.4 is poor)  : 0.94
K magnitude           : 8.229
G magnitude           : 13.457
RP magnitude          : 12.134
BP magnitude          : 15.515
DUPflag              : 0
Distance (au)         : 4.269
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.61
Sun-Target sep (deg)  : 166.18
Sun-Moon sep (deg)    : 140.59
B (ring opening deg)  : -2.42
PA of pole (deg)      : 0.80
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 21.573
C/A sky separation (km) : 66796.6
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
    
```

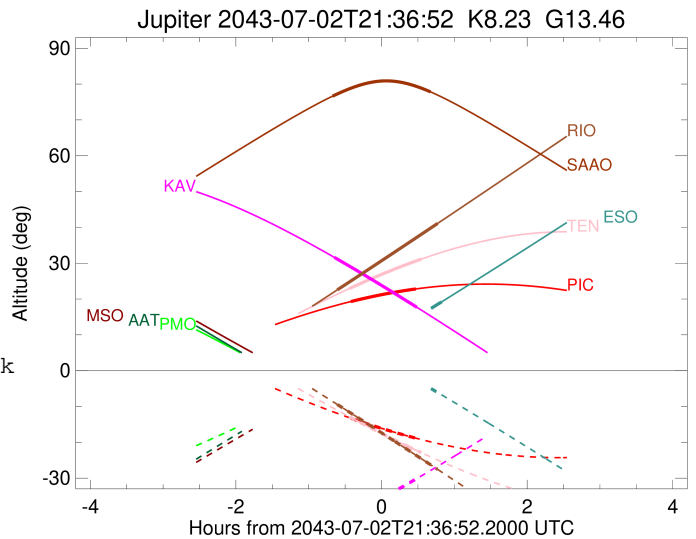
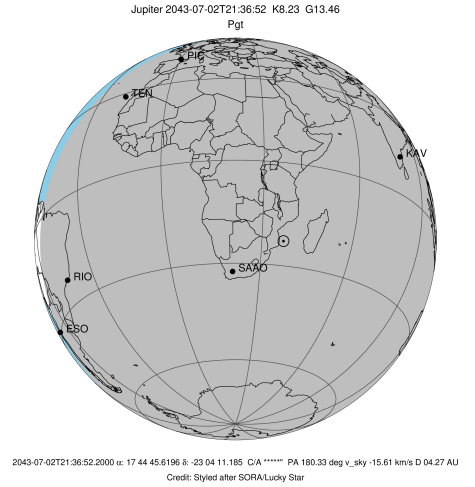


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-02T21:11:46.519	19.30	-13.29	71485.1	68.33	70.71
Jupiter	E	2043-07-02T22:05:08.616	22.81	-18.83	71485.0	69.61	71.87

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-02T21:40:05.850
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        : 4068824898364150400
2Mass ID (if available) : 17444562-2304108
ICRS Star Coord at Epoch: 17h 44m 45.61961s -23:04:11.18513s
RUWE (>1.4 is poor)  : 0.94
K magnitude           : 8.229
G magnitude           : 13.457
RP magnitude          : 12.134
BP magnitude          : 15.515
DUPflag              : 0
Distance (au)         : 4.269
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.61
Sun-Target sep (deg)  : 166.18
Sun-Moon sep (deg)    : 140.43
B (ring opening deg) : -2.42
PA of pole (deg)      : 0.80
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 21.193
C/A sky separation (km) : 65622.5
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
    
```

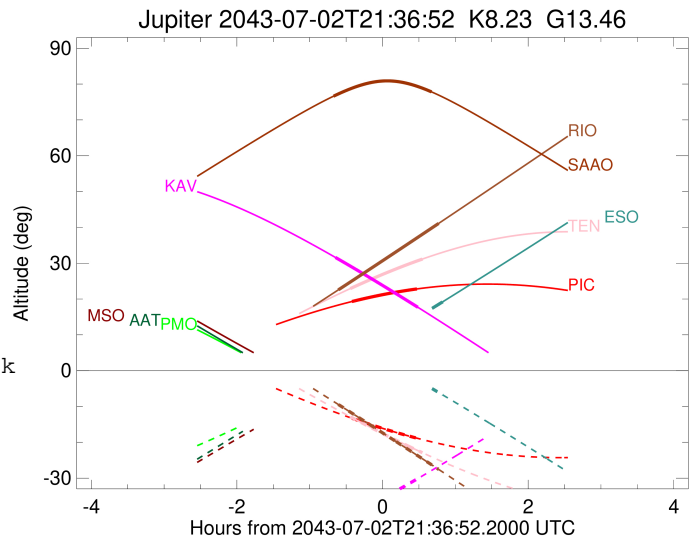
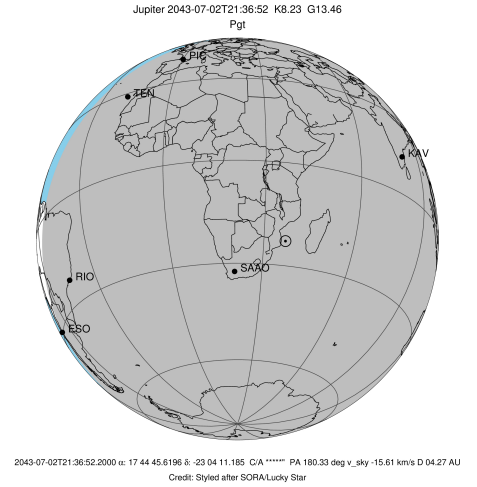


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-02T21:10:22.258	22.92	-12.86	71485.4	65.67	68.29
Jupiter	E	2043-07-02T22:09:46.211	31.15	-22.90	71485.2	67.30	69.78

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-02T21:32:00.190
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        : 4068824898364150400
2Mass ID (if available) : 17444562-2304108
ICRS Star Coord at Epoch: 17h 44m 45.61961s -23:04:11.18513s
RUWE (>1.4 is poor)  : 0.94
K magnitude           : 8.229
G magnitude           : 13.457
RP magnitude          : 12.134
BP magnitude          : 15.515
DUPflag              : 0
Distance (au)         : 4.269
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.61
Sun-Target sep (deg)  : 166.18
Sun-Moon sep (deg)    : 141.44
B (ring opening deg)  : -2.42
PA of pole (deg)      : 0.80
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 20.592
C/A sky separation (km) : 63760.5
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
    
```

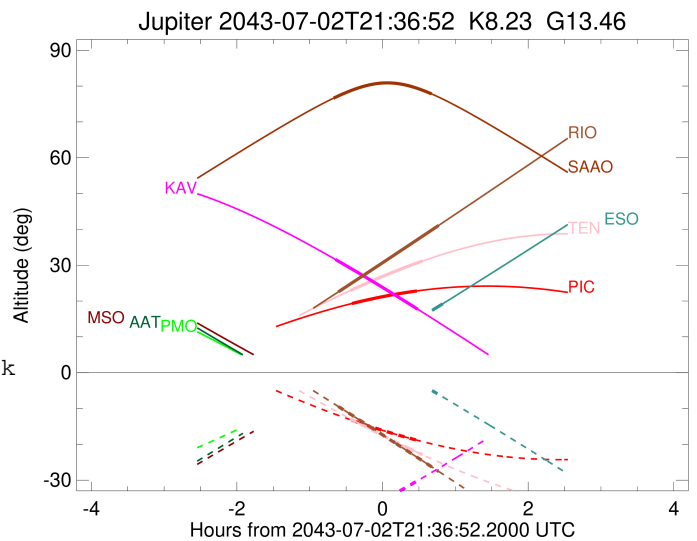
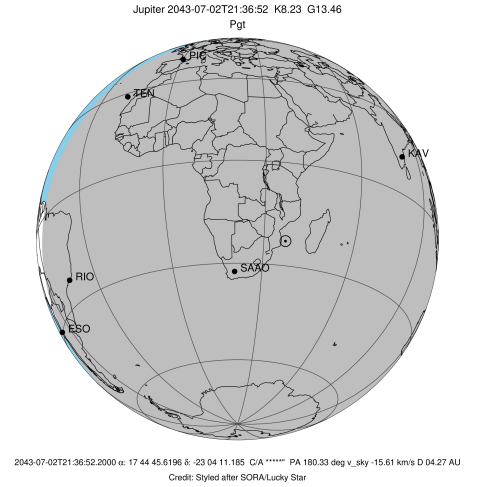


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-02T20:58:03.906	31.60	-42.46	71485.7	63.05	65.88
Jupiter	E	2043-07-02T22:06:03.718	17.68	-30.10	71485.7	62.93	65.77

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-02T21:41:53.300
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     : 4068824898364150400
2Mass ID (if available) : 17444562-2304108
ICRS Star Coord at Epoch: 17h 44m 45.61961s -23:04:11.18513s
RUWE (>1.4 is poor) : 0.94
K magnitude        : 8.229
G magnitude        : 13.457
RP magnitude       : 12.134
BP magnitude       : 15.515
DUPflag           : 0
Distance (au)     : 4.269
f0 (km)           : 0.00
g0 (km)           : 0.00
skyplane vel. (km/s) : -15.61
Sun-Target sep (deg) : 166.18
Sun-Moon sep (deg) : 140.19
B (ring opening deg) : -2.42
PA of pole (deg)   : 0.80
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 19.331
C/A sky separation (km) : 59857.4
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
    
```

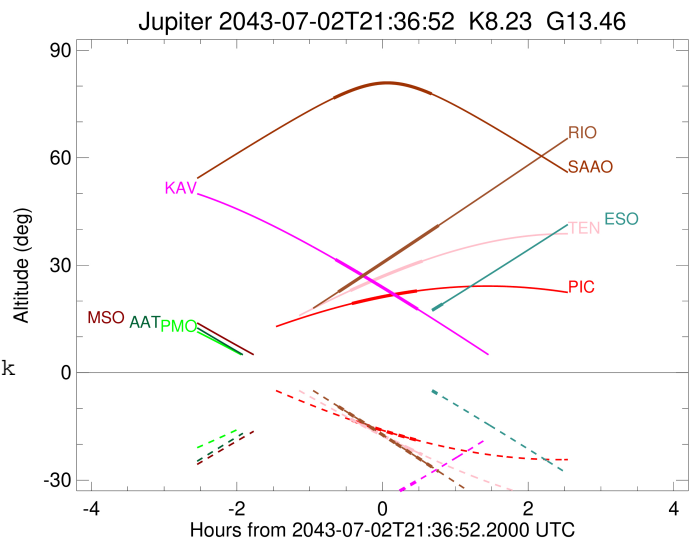
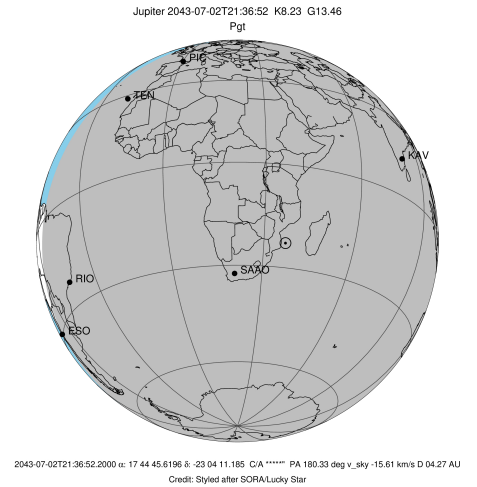


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-02T21:00:32.162	22.57	-9.45	71486.6	55.74	59.07
Jupiter	E	2043-07-02T22:23:04.471	41.09	-27.54	71486.3	57.77	60.98

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-02T21:42:10.780
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       : 4068824898364150400
2Mass ID (if available) : 17444562-2304108
ICRS Star Coord at Epoch: 17h 44m 45.61961s -23:04:11.18513s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 8.229
G magnitude           : 13.457
RP magnitude          : 12.134
BP magnitude          : 15.515
DUPflag              : 0
Distance (au)        : 4.269
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.61
Sun-Target sep (deg) : 166.18
Sun-Moon sep (deg)   : 139.92
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.80
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 18.799
C/A sky separation (km): 58209.1
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
    
```

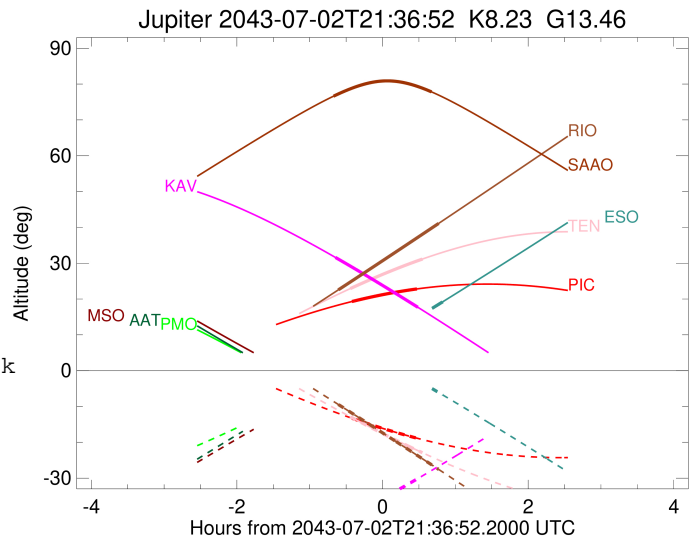
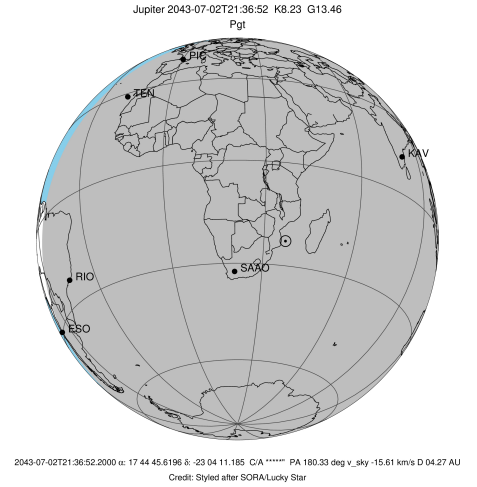


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-02T20:57:44.007	1.09x	10.33x	71486.9	53.39	56.84
Jupiter	E	2043-07-02T22:26:25.224	19.21	-6.76	71486.6	55.49	58.83

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-02T21:36:57.170
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        : 4068824898364150400
2Mass ID (if available) : 17444562-2304108
ICRS Star Coord at Epoch: 17h 44m 45.61961s -23:04:11.18513s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 8.229
G magnitude           : 13.457
RP magnitude          : 12.134
BP magnitude          : 15.515
DUPflag              : 0
Distance (au)         : 4.269
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.61
Sun-Target sep (deg) : 166.18
Sun-Moon sep (deg)   : 141.12
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.80
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 19.410
C/A sky separation (km): 60099.9
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	2043-07-02T20:56:34.368	76.62	-65.21	71486.4	56.61	59.89
Jupiter	E	2043-07-02T22:17:20.277	77.80	-79.41	71486.3	57.57	60.79