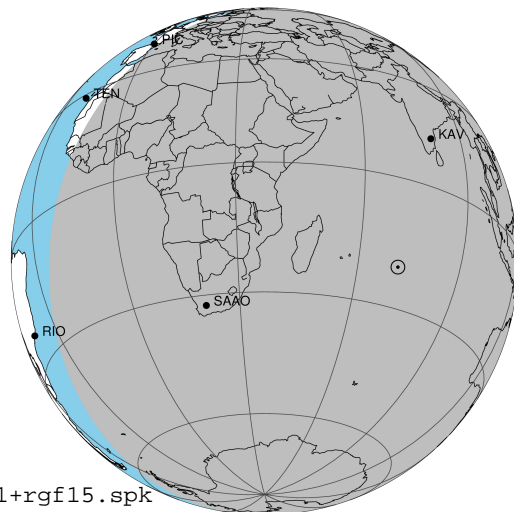


target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-07-19T19:23:01.000
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116731517706763520
 2Mass ID (if available) : 17364967-2303504

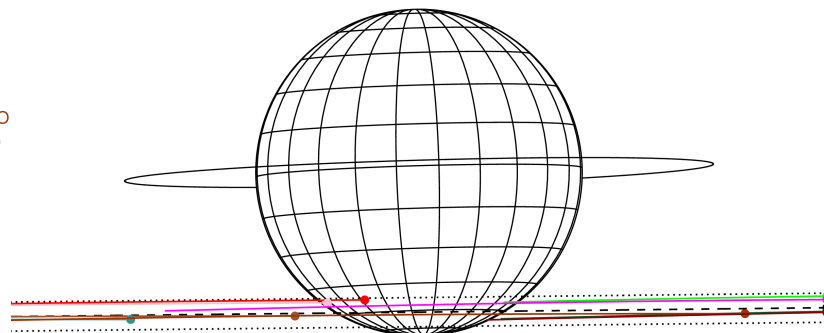
Jupiter 2043-07-19T19:23:01 K7.90 G14.74 Pgt

ICRS Star Coord at Epoch: 17h 36m 49.66442s -23:03:50.57706s
 RUWE (>1.4 is poor) : 0.92
 K magnitude : 7.904
 G magnitude : 14.742
 RP magnitude : 13.134
 BP magnitude : 18.710
 DUPflag : 0
 Distance (au) : 4.365
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -12.06
 Sun-Target sep (deg) : 148.24
 Sun-Moon sep (deg) : 7.16
 B (ring opening deg) : -2.39
 PA of pole (deg) : 1.66
 Pole direction: RA (deg): 268.05670
 Dec (deg): 64.49732
 C/A sky separation (") : 19.323
 C/A sky separation (km) : 61171.5
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLv1.spk
 naif0012.tls
 nep097.bsp
 nep101.bsp
 sat4401.bsp



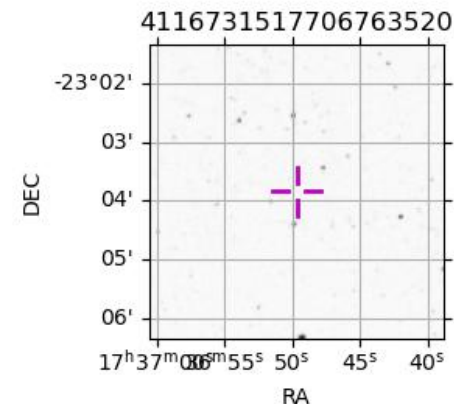
2043-07-19T19:23:01.0000 α: 17 36 49.6644 δ: -23 03 50.577 C/A ***** PA 0.62 deg v_sky -12.06 km/s D 04.37 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 PMO
 TEN
 KAV
 RIO
 ESO
 AAT
 SAAO
 MSO



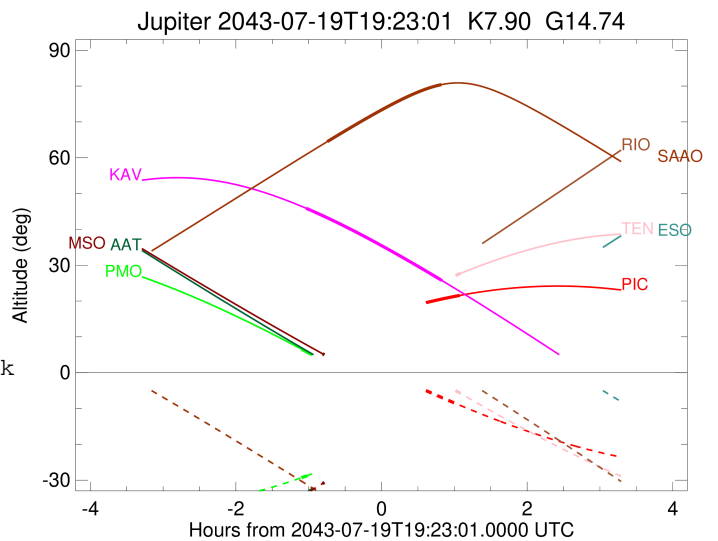
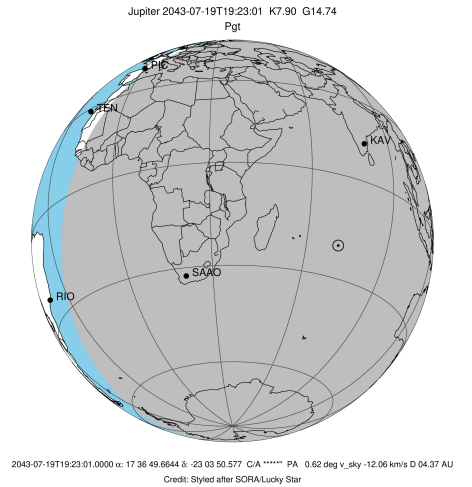
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+	JUL 19 20:27 - JUL 19 20:27	Pne
PAL	Palomar Mt (200")	33.4	243.1			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+	JUL 19 18:16 - JUL 19 18:16	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	+	JUL 19 20:27 - JUL 19 20:27	Pne
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+ +	JUL 19 18:20 - JUL 19 20:12	Pie
RIO	Rio de Janeiro	-22.9	316.8			Pnn
ESO	European Southern Obs. (3.6m)	-29.3	289.3			Pnn
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	JUL 19 18:38 - JUL 19 20:12	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	JUL 19 18:34 - JUL 19 18:34	Pin



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-19T19:27:18.090
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      : 4116731517706763520
2Mass ID (if available) : 17364967-2303504
ICRS Star Coord at Epoch: 17h 36m 49.66442s -23:03:50.57706s
RUWE (>1.4 is poor) : 0.92
K magnitude          : 7.904
G magnitude          : 14.742
RP magnitude         : 13.134
BP magnitude         : 18.710
DUPflag             : 0
Distance (au)        : 4.365
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.06
Sun-Target sep (deg) : 148.24
Sun-Moon sep (deg)  : 8.04
B (ring opening deg) : -2.39
PA of pole (deg)    : 1.66
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 17.599
C/A sky separation (km): 55715.9
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
    
```

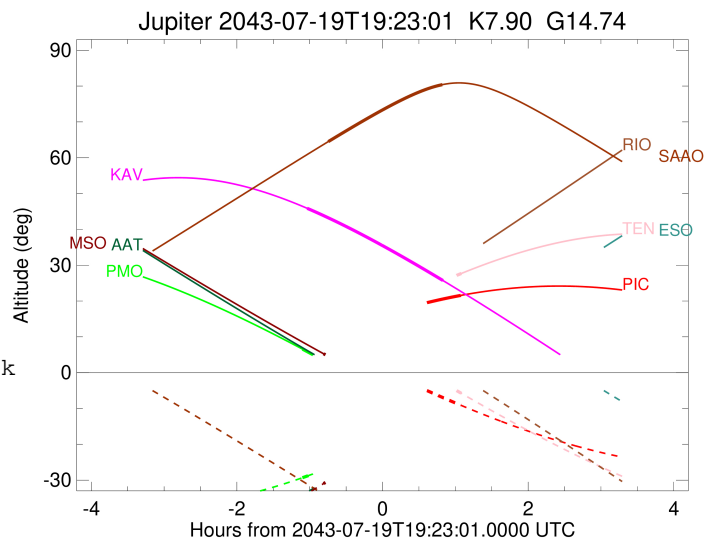
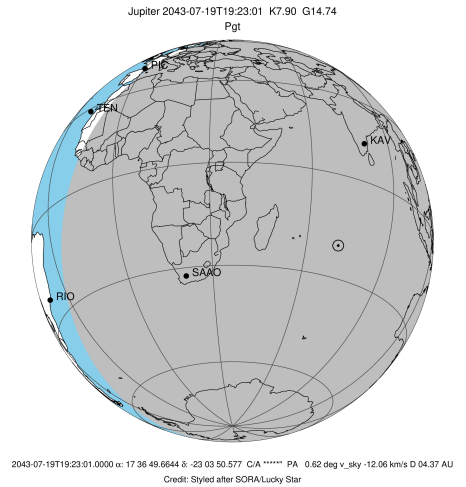


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-19T18:26:46.760	9.38	10.23x	71487.1	-52.61	-56.09
Jupiter	E	2043-07-19T20:27:36.740	21.57	-9.10	71487.4	-49.81	-53.40

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch              : 2043-07-19T19:14:41.100
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        : 4116731517706763520
2Mass ID (if available) : 17364967-2303504
ICRS Star Coord at Epoch: 17h 36m 49.66442s -23:03:50.57706s
RUWE (>1.4 is poor)  : 0.92
K magnitude            : 7.904
G magnitude            : 14.742
RP magnitude           : 13.134
BP magnitude           : 18.710
DUPflag                : 0
Distance (au)         : 4.365
f0 (km)                : 0.00
g0 (km)                : 0.00
skyplane vel. (km/s)  : -12.06
Sun-Target sep (deg)  : 148.24
Sun-Moon sep (deg)    : 7.08
B (ring opening deg)  : -2.39
PA of pole (deg)      : 1.66
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 18.221
C/A sky separation (km) : 57681.8
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
    
```

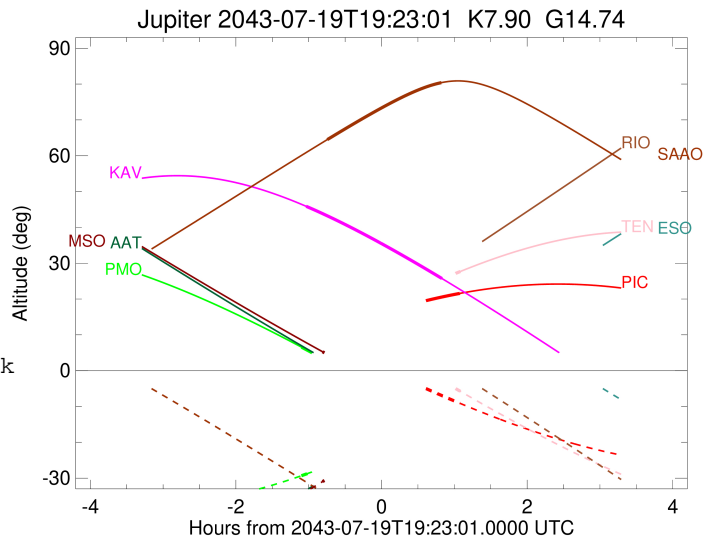
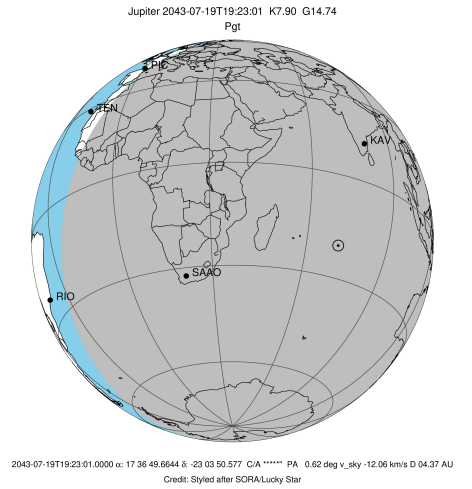


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-19T18:16:58.812	6.59	-29.33	71486.9	-54.07	-57.49
Jupiter	E	2043-07-19T20:12:55.641	-15.76x	-11.79	71486.9	-53.42	-56.87

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-19T19:29:56.080
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      : 4116731517706763520
2Mass ID (if available) : 17364967-2303504
ICRS Star Coord at Epoch: 17h 36m 49.66442s -23:03:50.57706s
RUWE (>1.4 is poor) : 0.92
K magnitude          : 7.904
G magnitude          : 14.742
RP magnitude         : 13.134
BP magnitude         : 18.710
DUPflag             : 0
Distance (au)       : 4.365
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.06
Sun-Target sep (deg) : 148.24
Sun-Moon sep (deg)  : 8.05
B (ring opening deg) : -2.39
PA of pole (deg)    : 1.66
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (" ) : 18.024
C/A sky separation (km) : 57060.1
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
    
```

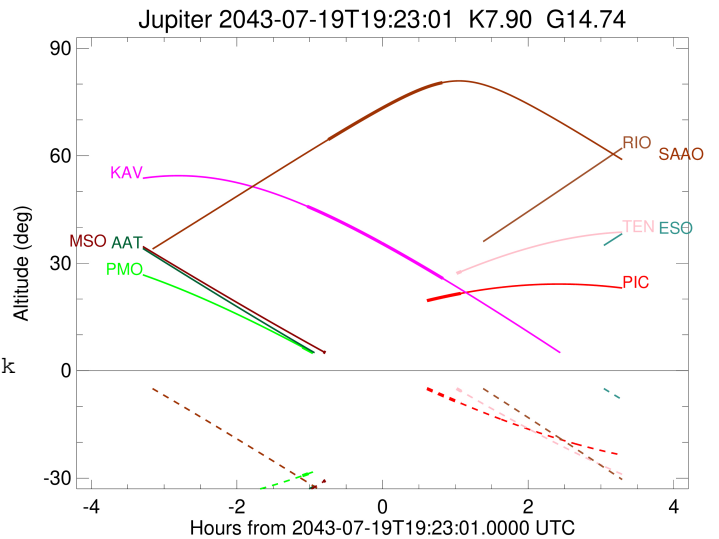
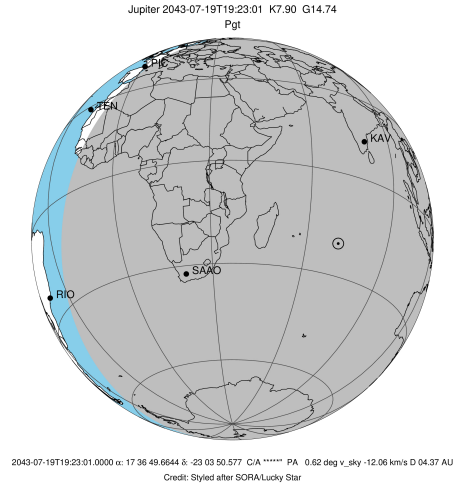


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-19T18:31:33.789	8.34	18.23x	71486.8	-54.57	-57.96
Jupiter	E	2043-07-19T20:27:57.420	27.68	-5.76	71487.2	-51.33	-54.87

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-19T19:16:42.330
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      : 4116731517706763520
2Mass ID (if available) : 17364967-2303504
ICRS Star Coord at Epoch: 17h 36m 49.66442s -23:03:50.57706s
RUWE (>1.4 is poor) : 0.92
K magnitude          : 7.904
G magnitude          : 14.742
RP magnitude         : 13.134
BP magnitude         : 18.710
DUPflag             : 0
Distance (au)       : 4.365
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -12.06
Sun-Target sep (deg) : 148.24
Sun-Moon sep (deg)  : 7.21
B (ring opening deg) : -2.39
PA of pole (deg)    : 1.66
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 18.329
C/A sky separation (km) : 58026.5
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
    
```

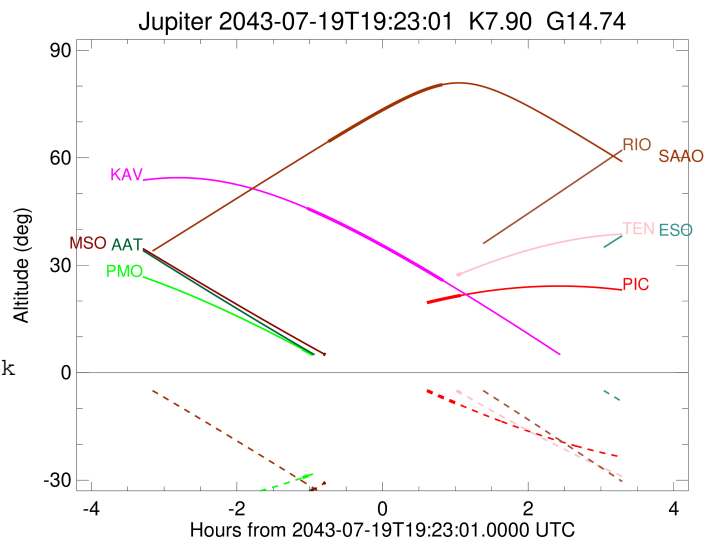
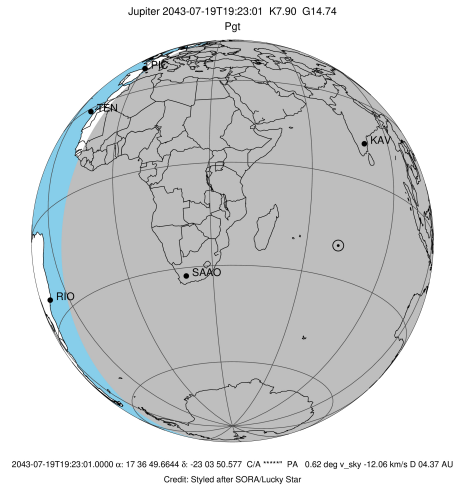


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-19T18:20:55.041	45.88	-55.94	71486.8	-54.79	-58.17
Jupiter	E	2043-07-19T20:12:52.448	25.71	-51.15	71486.9	-53.76	-57.19

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-19T19:25:15.690
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      : 4116731517706763520
2Mass ID (if available) : 17364967-2303504
ICRS Star Coord at Epoch: 17h 36m 49.66442s -23:03:50.57706s
RUWE (>1.4 is poor) : 0.92
K magnitude          : 7.904
G magnitude          : 14.742
RP magnitude         : 13.134
BP magnitude         : 18.710
DUPflag             : 0
Distance (au)       : 4.365
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -12.06
Sun-Target sep (deg) : 148.24
Sun-Moon sep (deg)  : 7.29
B (ring opening deg) : -2.39
PA of pole (deg)    : 1.66
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 19.668
C/A sky separation (km) : 62264.9
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
    
```

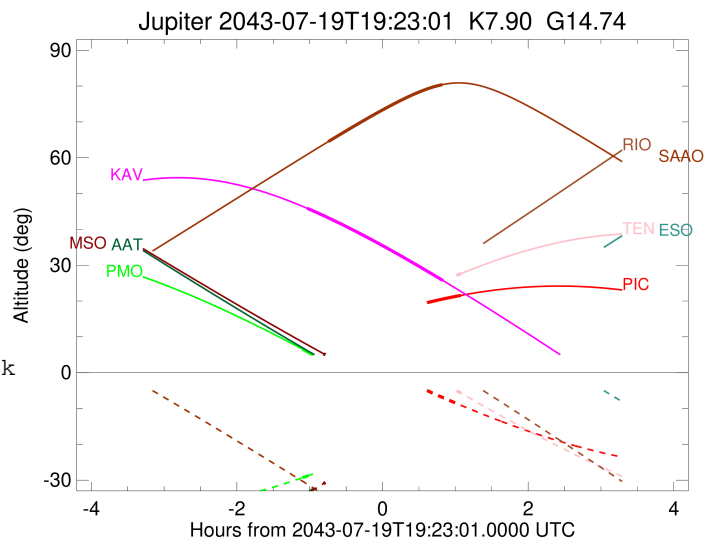
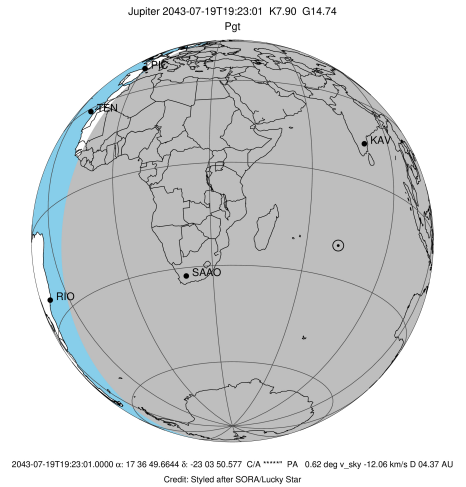


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-19T18:38:17.290	64.48	-34.76	71485.9	-61.79	-64.72
Jupiter	E	2043-07-19T20:12:10.991	80.38	-54.55	71486.2	-59.33	-62.44

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-19T19:15:10.540
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       : 4116731517706763520
2Mass ID (if available) : 17364967-2303504
ICRS Star Coord at Epoch: 17h 36m 49.66442s -23:03:50.57706s
RUWE (>1.4 is poor) : 0.92
K magnitude          : 7.904
G magnitude          : 14.742
RP magnitude         : 13.134
BP magnitude         : 18.710
DUPflag             : 0
Distance (au)        : 4.365
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.06
Sun-Target sep (deg) : 148.24
Sun-Moon sep (deg)   : 6.26
B (ring opening deg) : -2.39
PA of pole (deg)     : 1.66
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 20.606
C/A sky separation (km): 65232.5
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	2043-07-19T18:34:26.560	5.29	-30.97	71485.5	-66.09	-68.67
Jupiter	E	2043-07-19T19:56:09.811	-9.13x	-14.54	71485.5	-65.36	-68.01