

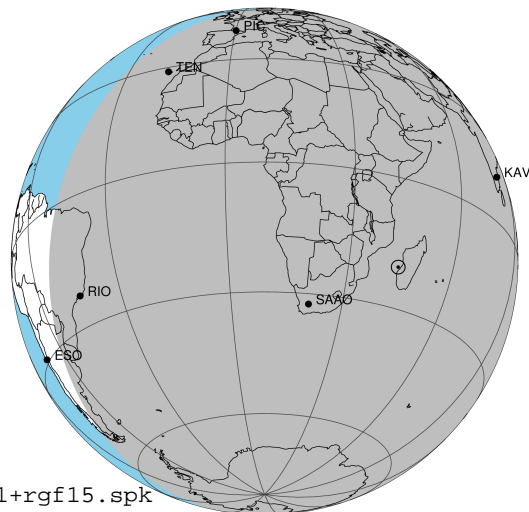
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-07-19T21:13:10.520
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116731513335821824
 2Mass ID (if available) : 17364783-2303283

Jupiter 2043-07-19T21:13:10 K9.10 G13.76 Pgt

ICRS Star Coord at Epoch: 17h 36m 47.85826s -23°03'28.60202s

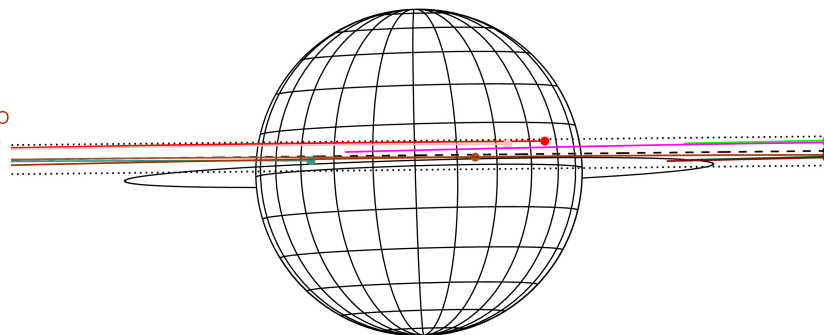
RUWE (>1.4 is poor) : 0.88
 K magnitude : 9.103
 G magnitude : 13.761
 RP magnitude : 12.576
 BP magnitude : 15.268
 DUPflag : 0
 Distance (au) : 4.366
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -12.04
 Sun-Target sep (deg) : 148.16
 Sun-Moon sep (deg) : 7.82
 B (ring opening deg) : -2.39
 PA of pole (deg) : 1.66
 Pole direction: RA (deg): 268.05670
 Dec (deg): 64.49732
 C/A sky separation (") : 2.384
 C/A sky separation (km) : 7547.2
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-07-19T21:13:10 K9.10 G13.76
 Pgt



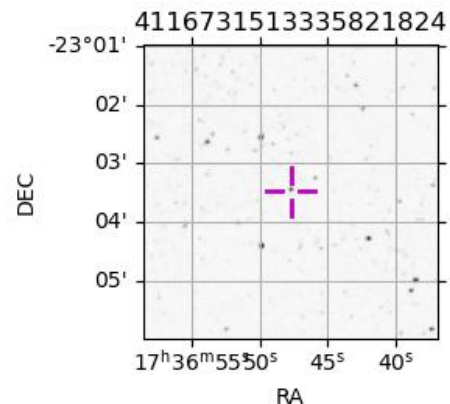
2043-07-19T21:13:10.5200 at: 17 36 47.8583 s: -23 03 28.602 C/A 2.373" PA 180.62 deg v_sky -12.04 km/s D 04.37 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 PMO
 TEN
 KAV
 RIO
 ESO
 AAT
 SAAO
 MSO



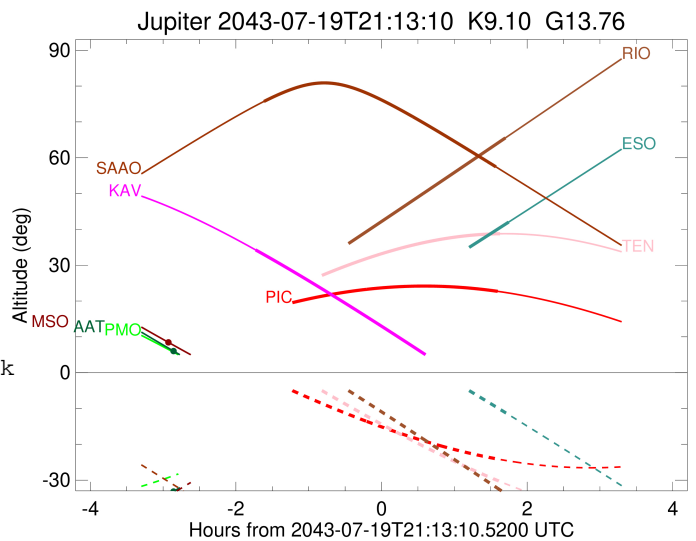
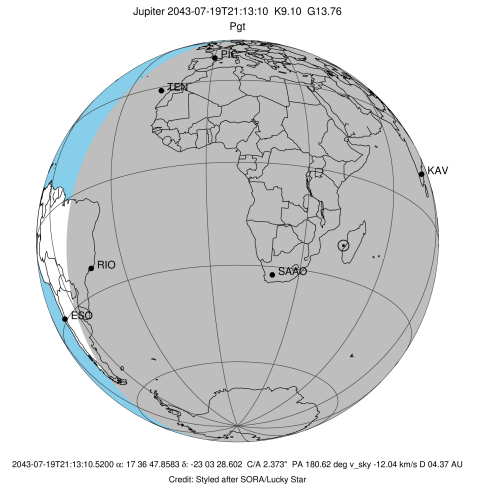
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+	JUL 19 22:48 - JUL 19 22:48	Pne
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 19 22:50 - JUL 19 22:50	Pne
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+	JUL 19 19:29 - JUL 19 19:29	Pin
RIO	Rio de Janeiro	-22.9	316.8	+	JUL 19 22:55 - JUL 19 22:55	Pne
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	JUL 19 22:58 - JUL 19 22:58	Pne
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	JUL 19 19:36 - JUL 19 22:47	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-19T21:14:09.560
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     : 4116731513335821824
2Mass ID (if available) : 17364783-2303283
ICRS Star Coord at Epoch: 17h 36m 47.85826s -23:03:28.60202s
RUWE (>1.4 is poor) : 0.88
K magnitude        : 9.103
G magnitude        : 13.761
RP magnitude       : 12.576
BP magnitude       : 15.268
DUPflag           : 0
Distance (au)     : 4.366
f0 (km)           : 0.00
g0 (km)           : 0.00
skyplane vel. (km/s) : -12.04
Sun-Target sep (deg) : 148.16
Sun-Moon sep (deg) : 8.54
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 (" ) : 4.212
C/A sky separation (km) : 13334.8
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
    
```

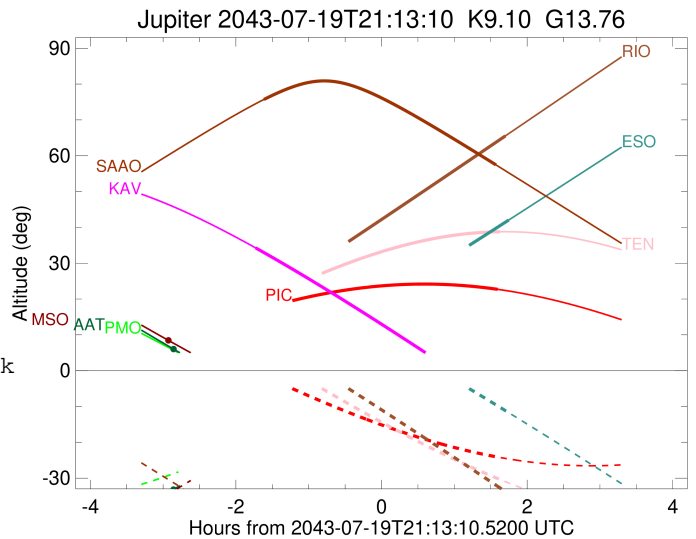
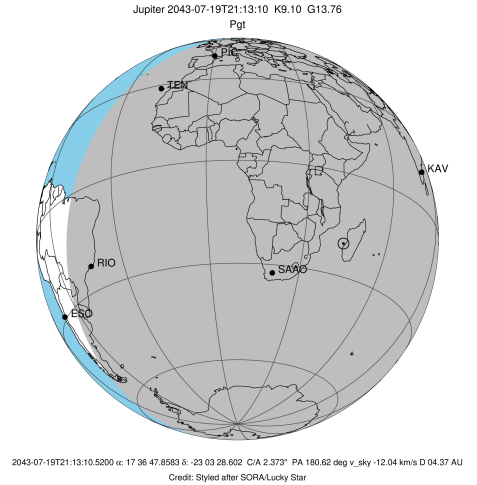


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-19T19:39:28.556	17.74	-1.87x	71491.8	9.47	10.80
Jupiter	E	2043-07-19T22:48:48.700	22.71	-24.11	71491.7	11.76	13.39

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-19T21:16:22.180
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       : 4116731513335821824
2Mass ID (if available) : 17364783-2303283
ICRS Star Coord at Epoch: 17h 36m 47.85826s -23:03:28.60202s
RUWE (>1.4 is poor) : 0.88
K magnitude           : 9.103
G magnitude           : 13.761
RP magnitude          : 12.576
BP magnitude          : 15.268
DUPflag              : 0
Distance (au)         : 4.366
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.04
Sun-Target sep (deg) : 148.16
Sun-Moon sep (deg)   : 8.62
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 ("): 3.885
C/A sky separation (km): 12301.5
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
    
```

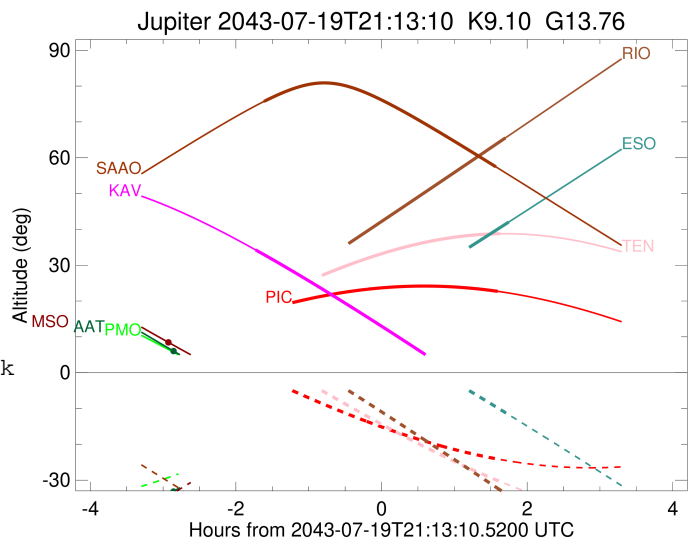
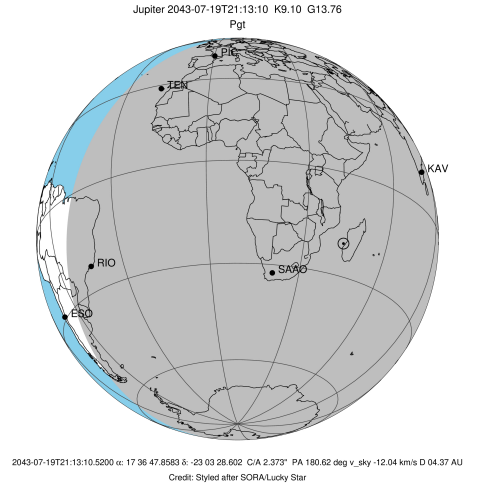


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-19T19:41:30.218	20.67	3.57x	71491.8	8.40	9.59
Jupiter	E	2043-07-19T22:50:50.047	38.78	-30.38	71491.7	11.12	12.66

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-19T21:05:23.520
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       : 4116731513335821824
2Mass ID (if available) : 17364783-2303283
ICRS Star Coord at Epoch: 17h 36m 47.85826s -23:03:28.60202s
RUWE (>1.4 is poor) : 0.88
K magnitude           : 9.103
G magnitude           : 13.761
RP magnitude         : 12.576
BP magnitude         : 15.268
DUPflag              : 0
Distance (au)        : 4.366
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.04
Sun-Target sep (deg) : 148.16
Sun-Moon sep (deg)  : 7.51
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 (" ) : 3.086
C/A sky separation (km) : 9771.3
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
    
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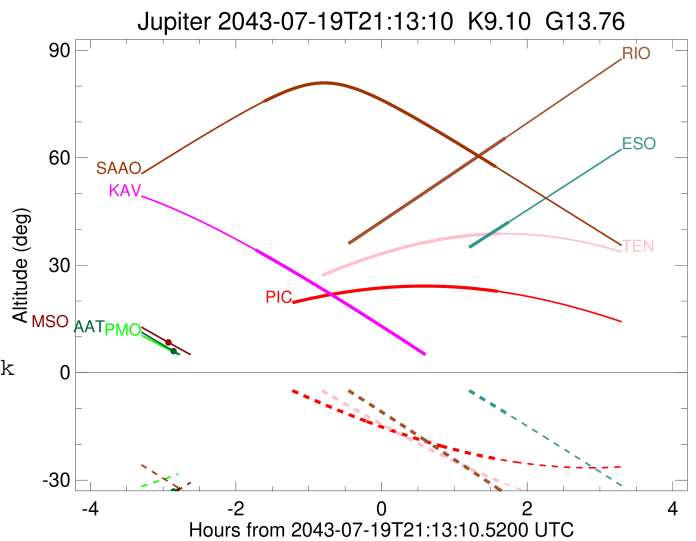
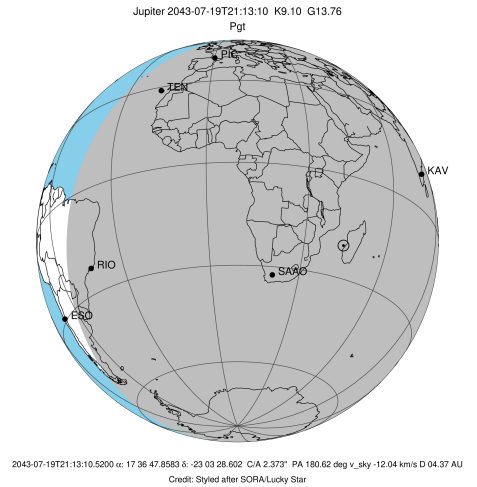


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-19T19:29:27.967	34.26	-55.44	71491.9	7.48	8.53
Jupiter	E	2043-07-19T22:42:49.709	-6.97x	-24.08	71491.8	8.08	9.21

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-19T21:19:21.670
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      : 4116731513335821824
2Mass ID (if available) : 17364783-2303283
ICRS Star Coord at Epoch: 17h 36m 47.85826s -23:03:28.60202s
RUWE (>1.4 is poor) : 0.88
K magnitude          : 9.103
G magnitude          : 13.761
RP magnitude         : 12.576
BP magnitude         : 15.268
DUPflag             : 0
Distance (au)       : 4.366
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.04
Sun-Target sep (deg) : 148.16
Sun-Moon sep (deg)   : 8.31
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 ("): 2.120
C/A sky separation (km): 6712.5
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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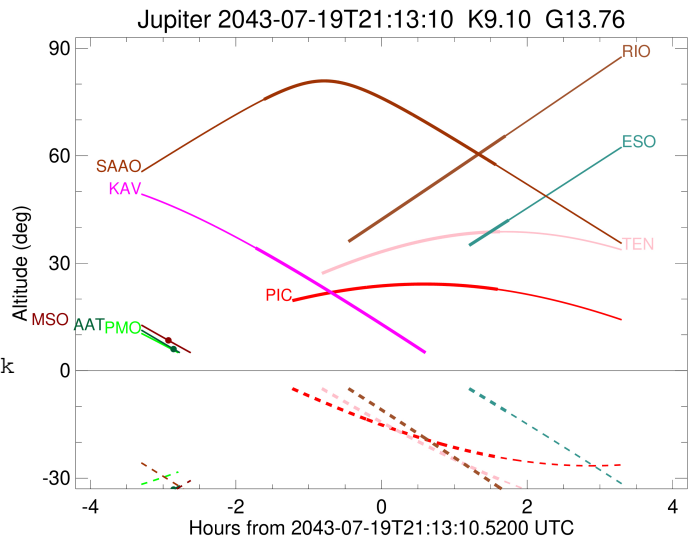
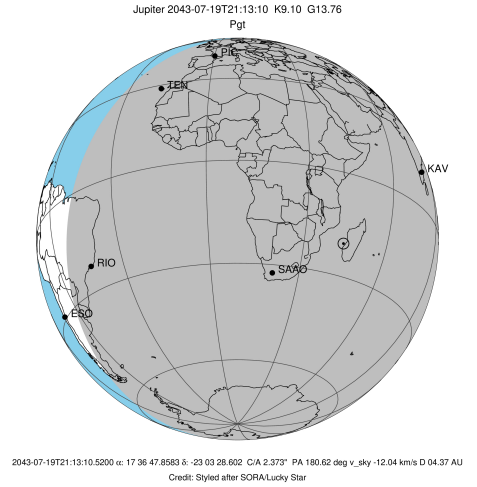


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-19T19:42:28.205	21.84	8.42x	71492.0	3.64	4.16
Jupiter	E	2043-07-19T22:55:18.728	65.54	-33.73	71491.9	6.92	7.90

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-19T21:20:36.070
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      : 4116731513335821824
2Mass ID (if available) : 17364783-2303283
ICRS Star Coord at Epoch: 17h 36m 47.85826s -23:03:28.60202s
RUWE (>1.4 is poor) : 0.88
K magnitude          : 9.103
G magnitude          : 13.761
RP magnitude         : 12.576
BP magnitude         : 15.268
DUPflag             : 0
Distance (au)       : 4.366
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.04
Sun-Target sep (deg) : 148.16
Sun-Moon sep (deg)  : 8.21
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 (" ) : 1.618
C/A sky separation (km) : 5121.9
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
    
```

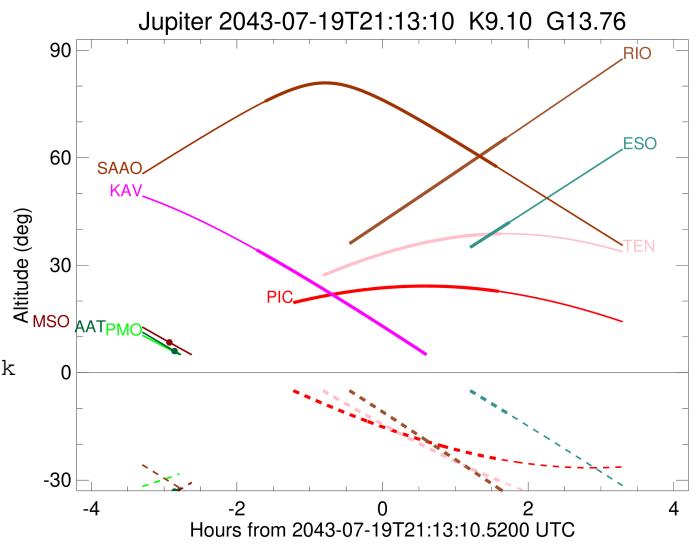
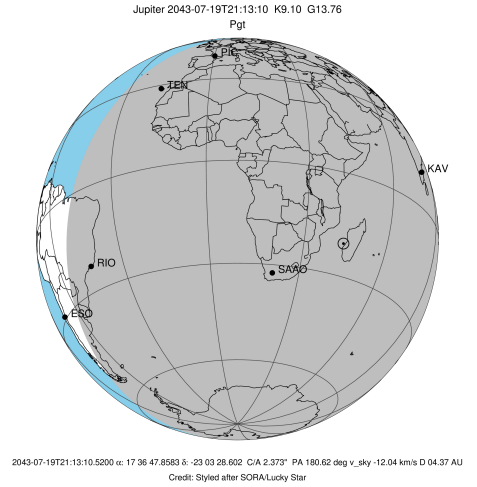


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-19T19:41:57.817	0.89x	25.06x	71492.0	2.31	2.64
Jupiter	E	2043-07-19T22:58:01.717	42.04	-11.73	71491.9	5.83	6.66

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-19T21:11:42.270
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       : 4116731513335821824
2Mass ID (if available) : 17364783-2303283
ICRS Star Coord at Epoch: 17h 36m 47.85826s -23:03:28.60202s
RUWE (>1.4 is poor) : 0.88
K magnitude           : 9.103
G magnitude           : 13.761
RP magnitude         : 12.576
BP magnitude         : 15.268
DUPflag              : 0
Distance (au)        : 4.366
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -12.04
Sun-Target sep (deg) : 148.16
Sun-Moon sep (deg)   : 7.72
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 ("): 2.053
C/A sky separation (km): 6501.2
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	2043-07-19T19:36:18.814	75.70	-47.02	71492.0	4.15	4.74
Jupiter	E	2043-07-19T22:47:28.162	57.44	-78.47	71491.9	5.99	6.84