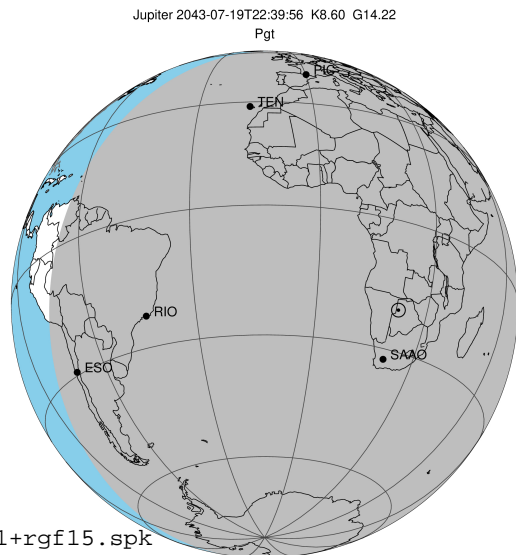


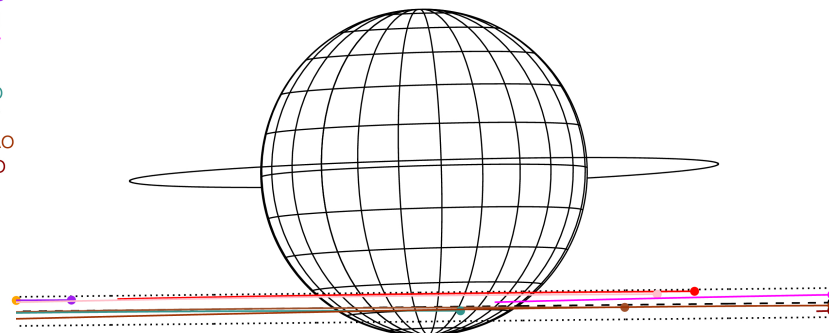
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2043-07-19T22:39:56.140  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4116731513335780992  
 2Mass ID (if available) : 17364642-2303489

Jupiter 2043-07-19T22:39:56 K8.60 G14.22 Pgt

ICRS Star Coord at Epoch: 17h 36m 46.40835s -23°03:49.37875s  
 RUWE (>1.4 is poor) : 0.84  
 K magnitude : 8.600  
 G magnitude : 14.220  
 RP magnitude : 12.455  
 BP magnitude : 17.379  
 DUPflag : 0  
 Distance (au) : 4.366  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -12.03  
 Sun-Target sep (deg) : 148.09  
 Sun-Moon sep (deg) : 8.38  
 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 (") : 18.606  
 C/A sky separation (km) : 58917.9  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk



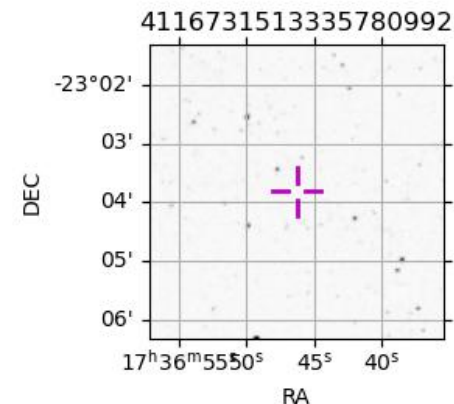
Earth  
 PIC  
 KPNO  
 MCD  
 TEN  
 KAV  
 RIO  
 ESO  
 AAT  
 SAAO  
 MSO



2043-07-19T22:39:56.1400 α: 17 36 46.4084 δ: -23 03 49.379 C/A \*\*\*\*\* PA 0.62 deg v\_sky -12.03 km/s D 04.37 AU  
 Credit: Styled after SORA/Lucky Star

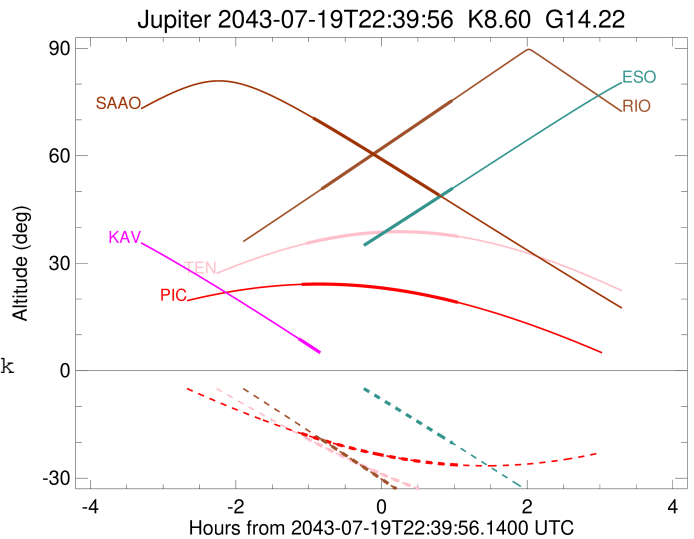
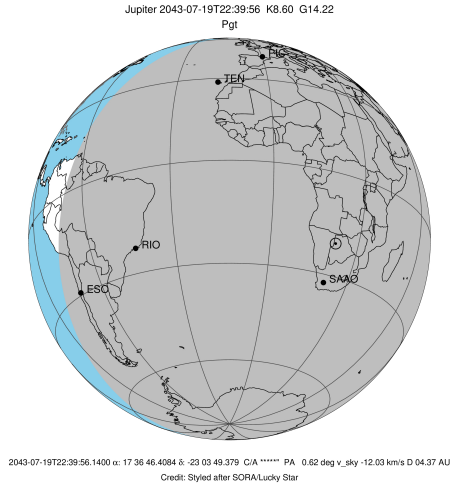
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+ +	JUL 19 21:34 - JUL 19 23:42	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 19 21:37 - JUL 19 23:43	Pie
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+	JUL 19 21:31 - JUL 19 21:31	Pin
RIO	Rio de Janeiro	-22.9	316.8	+ +	JUL 19 21:50 - JUL 19 23:38	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	JUL 19 23:38 - JUL 19 23:38	Pne
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	JUL 19 21:43 - JUL 19 23:27	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-19T22:38:25.050
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       : 4116731513335780992
2Mass ID (if available) : 17364642-2303489
ICRS Star Coord at Epoch: 17h 36m 46.40835s -23:03:49.37875s
RUWE (>1.4 is poor) : 0.84
K magnitude           : 8.600
G magnitude           : 14.220
RP magnitude         : 12.455
BP magnitude         : 17.379
DUPflag              : 0
Distance (au)        : 4.366
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.03
Sun-Target sep (deg) : 148.09
Sun-Moon sep (deg)   : 8.90
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 (") : 16.783
C/A sky separation (km) : 53142.7
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
    
```

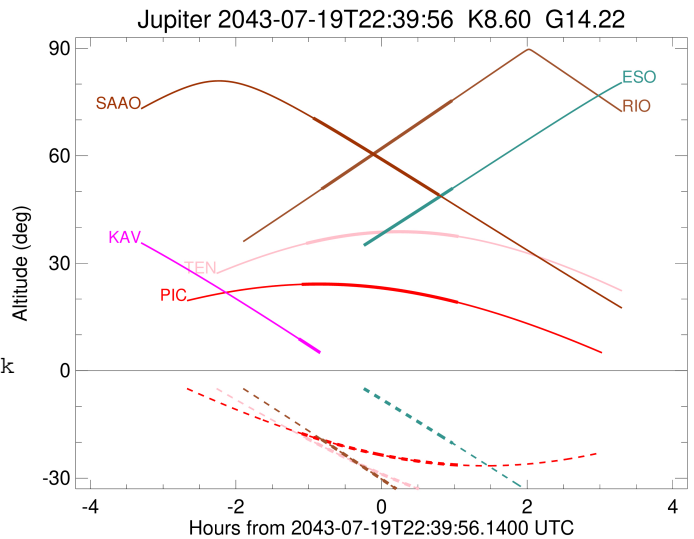
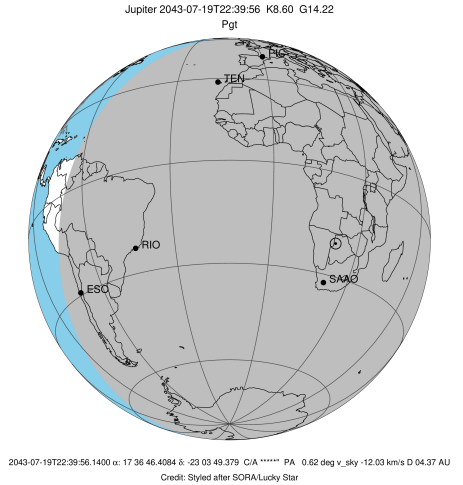


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-19T21:34:06.550	24.09	-17.56	71487.5	-48.97	-52.59
Jupiter	E	2043-07-19T23:42:53.772	19.05	-26.33	71487.8	-47.13	-50.80

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-19T22:40:32.390
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       : 4116731513335780992
2Mass ID (if available) : 17364642-2303489
ICRS Star Coord at Epoch: 17h 36m 46.40835s -23:03:49.37875s
RUWE (>1.4 is poor) : 0.84
K magnitude           : 8.600
G magnitude           : 14.220
RP magnitude         : 12.455
BP magnitude         : 17.379
DUPflag              : 0
Distance (au)        : 4.366
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.03
Sun-Target sep (deg) : 148.09
Sun-Moon sep (deg)   : 8.99
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 ("): 17.039
C/A sky separation (km): 53954.2
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
    
```

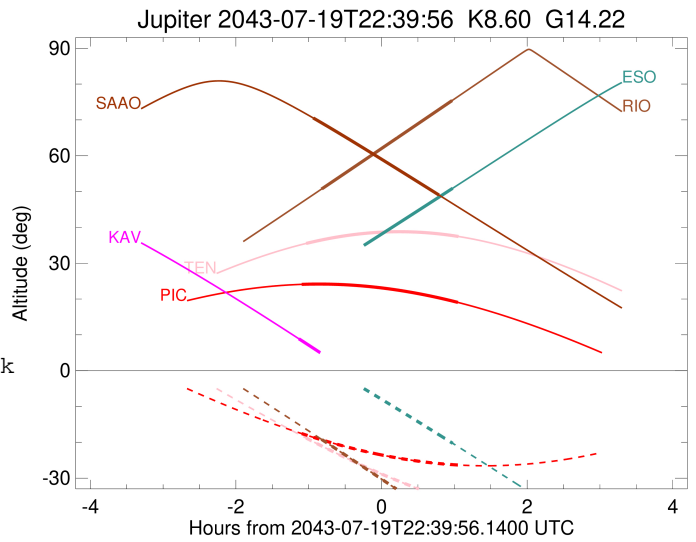
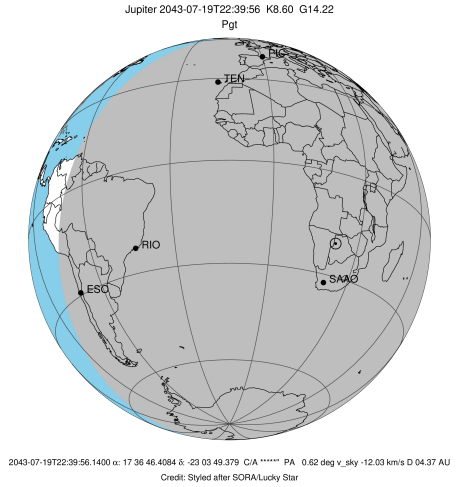


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-19T21:37:47.700	35.50	-18.80	71487.4	-50.14	-53.73
Jupiter	E	2043-07-19T23:43:18.197	37.46	-36.63	71487.7	-47.95	-51.59

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-19T22:30:08.330
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       : 4116731513335780992
2Mass ID (if available) : 17364642-2303489
ICRS Star Coord at Epoch: 17h 36m 46.40835s -23:03:49.37875s
RUWE (>1.4 is poor) : 0.84
K magnitude           : 8.600
G magnitude           : 14.220
RP magnitude         : 12.455
BP magnitude         : 17.379
DUPflag              : 0
Distance (au)        : 4.366
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.03
Sun-Target sep (deg) : 148.09
Sun-Moon sep (deg)   : 7.85
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 ("): 18.184
C/A sky separation (km): 57579.9
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
    
```

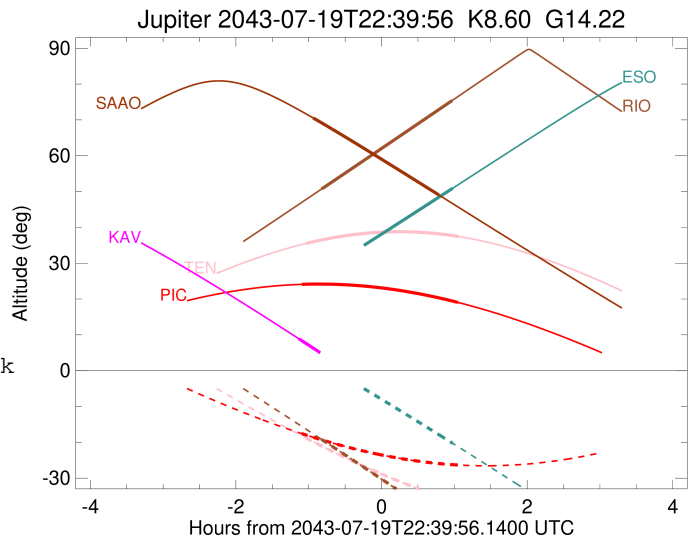
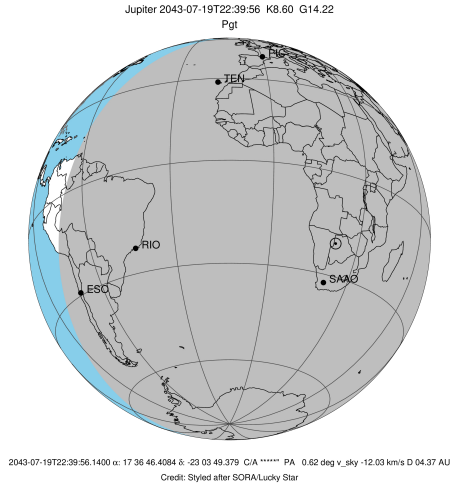


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-19T21:31:48.332	8.91	-38.38	71486.9	-53.80	-57.23
Jupiter	E	2043-07-19T23:29:06.791	-17.53x	-14.06	71487.0	-53.39	-56.84

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-19T22:44:28.920
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     : 4116731513335780992
2Mass ID (if available) : 17364642-2303489
ICRS Star Coord at Epoch: 17h 36m 46.40835s -23:03:49.37875s
RUWE (>1.4 is poor) : 0.84
K magnitude        : 8.600
G magnitude        : 14.220
RP magnitude       : 12.455
BP magnitude       : 17.379
DUPflag           : 0
Distance (au)     : 4.366
f0 (km)           : 0.00
g0 (km)           : 0.00
skyplane vel. (km/s) : -12.03
Sun-Target sep (deg) : 148.09
Sun-Moon sep (deg) : 8.80
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 (") : 18.694
C/A sky separation (km) : 59195.4
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
    
```

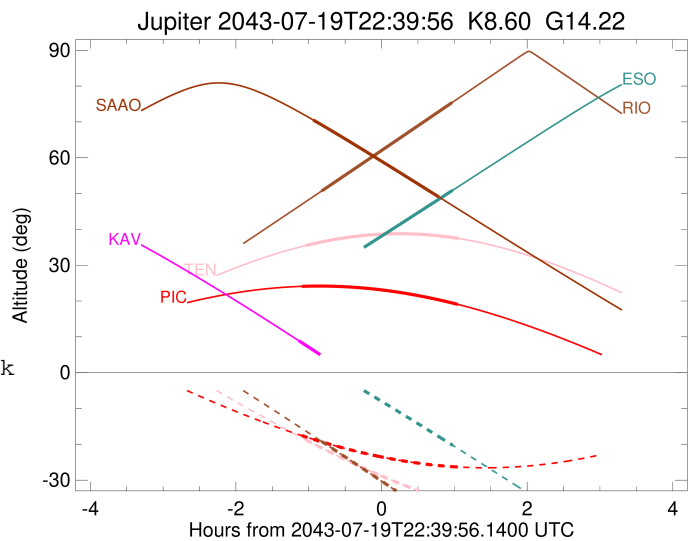
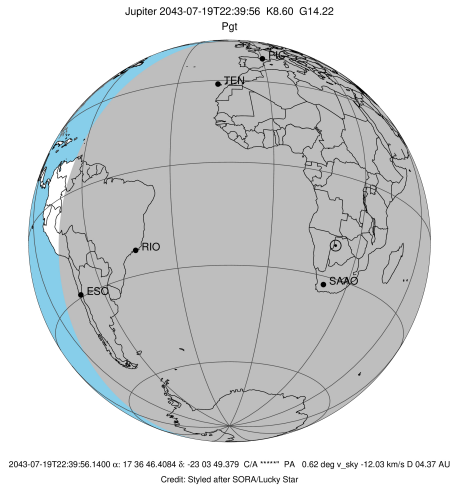


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-19T21:50:36.884	50.71	-19.19	71486.5	-57.33	-60.57
Jupiter	E	2043-07-19T23:38:10.162	75.41	-43.49	71486.8	-54.48	-57.87

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-19T22:47:14.890
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        : 4116731513335780992
2Mass ID (if available) : 17364642-2303489
ICRS Star Coord at Epoch: 17h 36m 46.40835s -23:03:49.37875s
RUWE (>1.4 is poor) : 0.84
K magnitude           : 8.600
G magnitude           : 14.220
RP magnitude          : 12.455
BP magnitude          : 17.379
DUPflag              : 0
Distance (au)         : 4.366
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -12.03
Sun-Target sep (deg) : 148.09
Sun-Moon sep (deg)   : 8.84
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 ("): 19.132
C/A sky separation (km): 60584.6
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
    
```

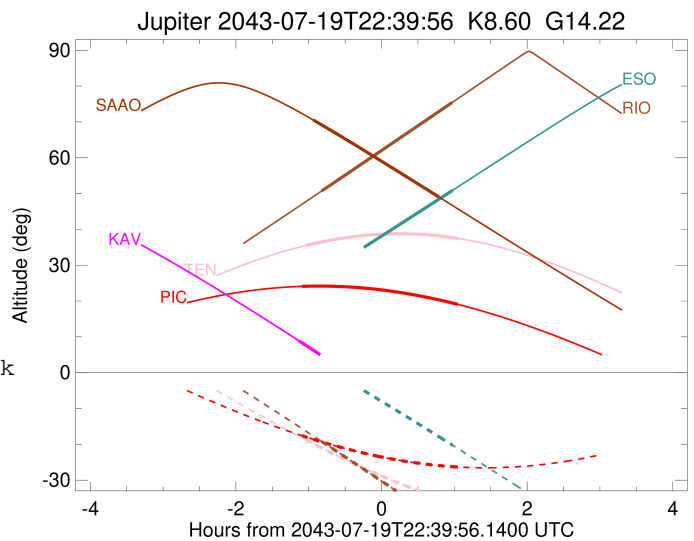
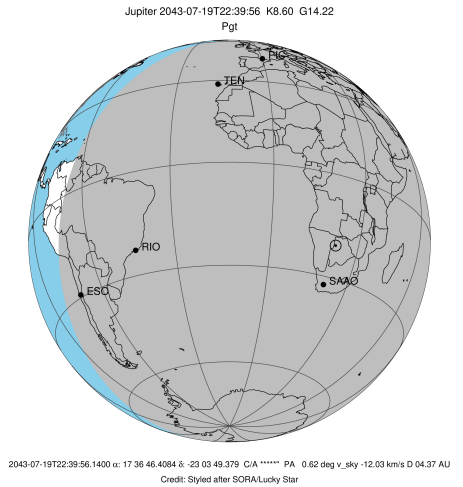


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-19T21:55:32.444	28.53	1.01x	71486.2	-59.57	-62.66
Jupiter	E	2043-07-19T23:38:39.751	50.93	-20.29	71486.6	-56.25	-59.55

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-19T22:35:22.220
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      : 4116731513335780992
2Mass ID (if available) : 17364642-2303489
ICRS Star Coord at Epoch: 17h 36m 46.40835s -23:03:49.37875s
RUWE (>1.4 is poor) : 0.84
K magnitude          : 8.600
G magnitude          : 14.220
RP magnitude         : 12.455
BP magnitude         : 17.379
DUPflag             : 0
Distance (au)       : 4.366
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -12.03
Sun-Target sep (deg) : 148.09
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 (") : 19.024
C/A sky separation (km) : 60241.0
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	2043-07-19T21:43:40.787	70.53	-72.47	71486.4	-58.09	-61.28
Jupiter	E	2043-07-19T23:27:18.366	49.02	-74.86	71486.5	-56.75	-60.02