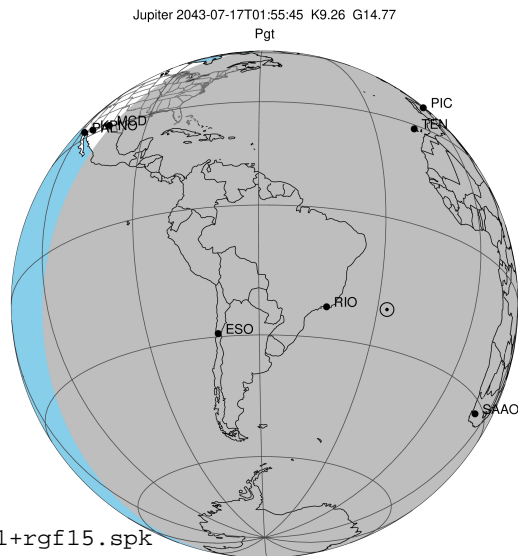


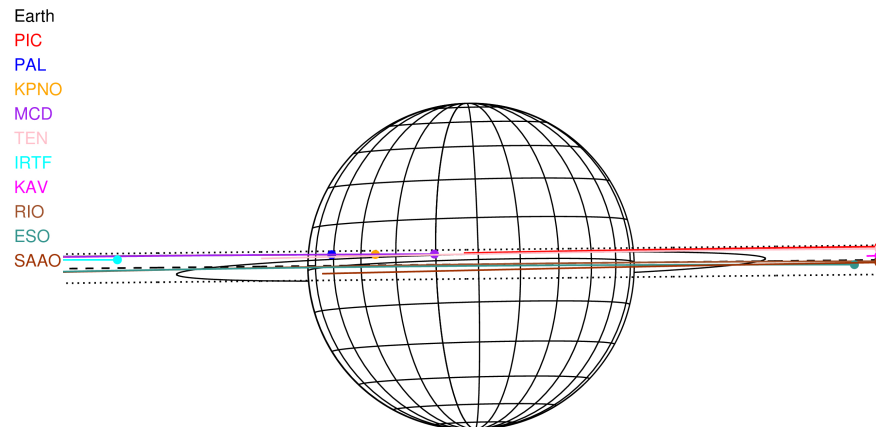
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-07-17T01:55:45.580
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116722549813288704
 2Mass ID (if available) : 17375693-2303406

Jupiter 2043-07-17T01:55:45 K9.26 G14.77 Pgt

ICRS Star Coord at Epoch: 17h 37m 56.91244s -23°03:40.94501s
 RUWE (>1.4 is poor) : 0.97
 K magnitude : 9.257
 G magnitude : 14.766
 RP magnitude : 13.374
 BP magnitude : 17.099
 DUPflag : 0
 Distance (au) : 4.344
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -12.80
 Sun-Target sep (deg) : 151.09
 Sun-Moon sep (deg) : 28.60
 B (ring opening deg) : -2.40
 PA of pole (deg) : 1.54
 Pole direction: RA (deg): 268.05670
 Dec (deg): 64.49732
 C/A sky separation (") : 0.309
 C/A sky separation (km) : 974.2
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

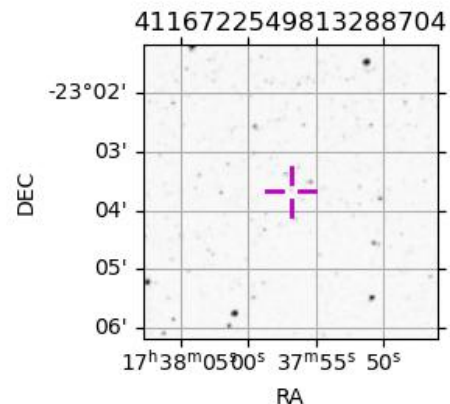


2043-07-17T01:55:45.5800 at: 17 37 56.9124 s: -23 03 40.945 C/A 0.298° PA 180.60 deg v_sky -12.80 km/s D 04.34 AU
 Credit: Styled after SORA/Lucky Star



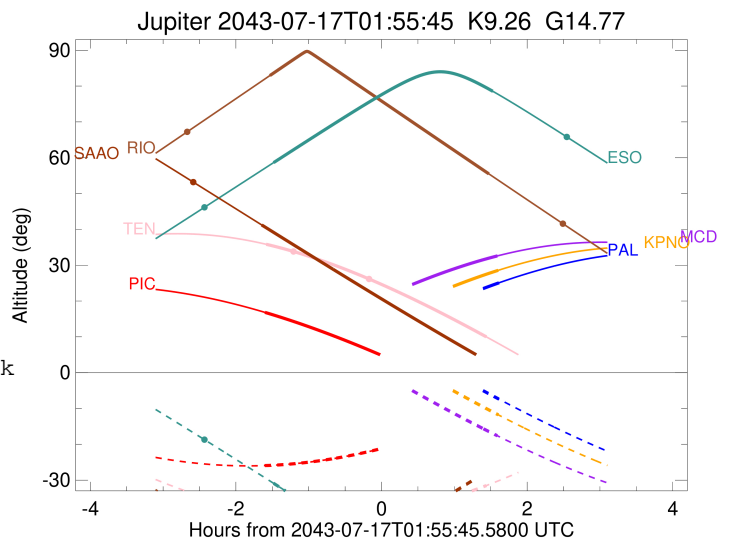
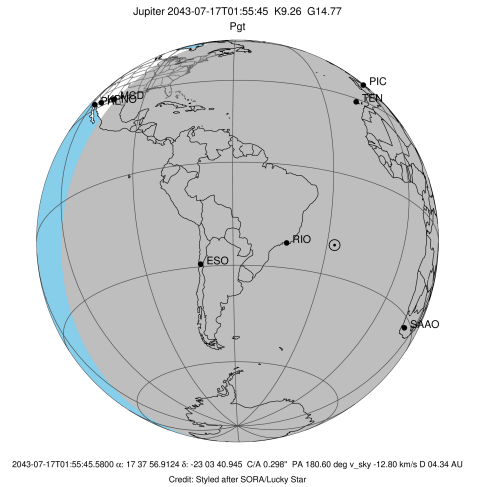
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	JUL 17 00:19 - JUL 17 00:19	Pin
PAL	Palomar Mt (200")	33.4	243.1	+	JUL 17 03:32 - JUL 17 03:32	Pne
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	JUL 17 03:32 - JUL 17 03:32	Pne
MCD	McDonald Obs. 2.7m	30.7	256.0	+	JUL 17 03:31 - JUL 17 03:31	Pne
TEN	Teide Obs./Tenerife	28.3	343.5	+	JUL 17 00:20 - JUL 17 03:22	Pie
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+	JUL 17 00:23 - JUL 17 03:24	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	JUL 17 00:26 - JUL 17 03:27	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	JUL 17 00:17 - JUL 17 00:17	Pin
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-17T01:50:43.770
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        : 4116722549813288704
2Mass ID (if available) : 17375693-2303406
ICRS Star Coord at Epoch: 17h 37m 56.91244s -23:03:40.94501s
RUWE (>1.4 is poor)  : 0.97
K magnitude           : 9.257
G magnitude           : 14.766
RP magnitude          : 13.374
BP magnitude          : 17.099
DUPflag              : 0
Distance (au)         : 4.344
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -12.80
Sun-Target sep (deg)  : 151.09
Sun-Moon sep (deg)    : 29.21
B (ring opening deg)  : -2.40
PA of pole (deg)      : 1.54
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 1.892
C/A sky separation (km) : 5962.6
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
    
```

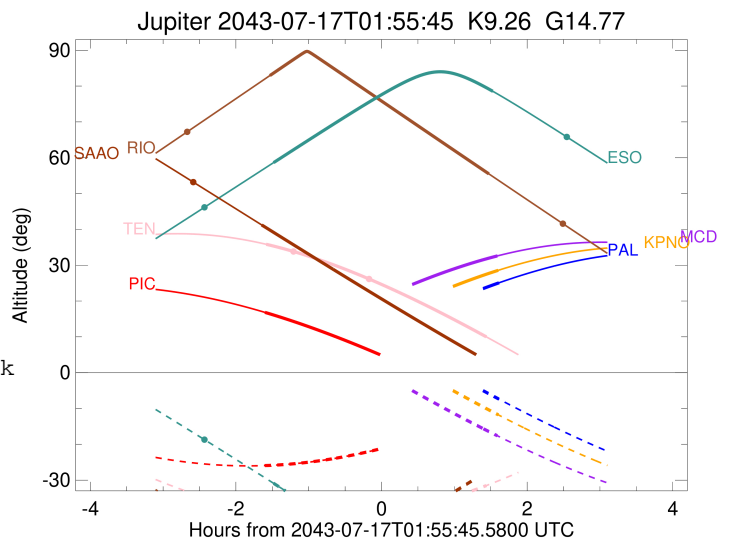
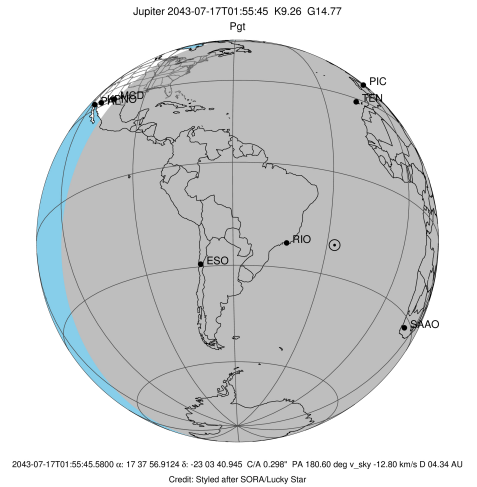


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-17T00:19:42.244	16.83	-25.94	71492.0	4.27	4.88
Jupiter	E	2043-07-17T03:22:39.474	-8.93x	-11.60	71491.9	5.15	5.89

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-17T02:01:32.270
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : PAL
Location             : Palomar Mt (200")
Latitude (deg)       : 33.35622
E. Longitude (deg)   : 243.13601
Altitude (km)        : 1.706
Gaia source ID       : 4116722549813288704
2Mass ID (if available) : 17375693-2303406
ICRS Star Coord at Epoch: 17h 37m 56.91244s -23:03:40.94501s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 9.257
G magnitude          : 14.766
RP magnitude         : 13.374
BP magnitude         : 17.099
DUPflag             : 0
Distance (au)        : 4.344
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.80
Sun-Target sep (deg) : 151.09
Sun-Moon sep (deg)   : 28.19
B (ring opening deg) : -2.40
PA of pole (deg)     : 1.54
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 1.682
C/A sky separation (km) : 5300.7
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
    
```

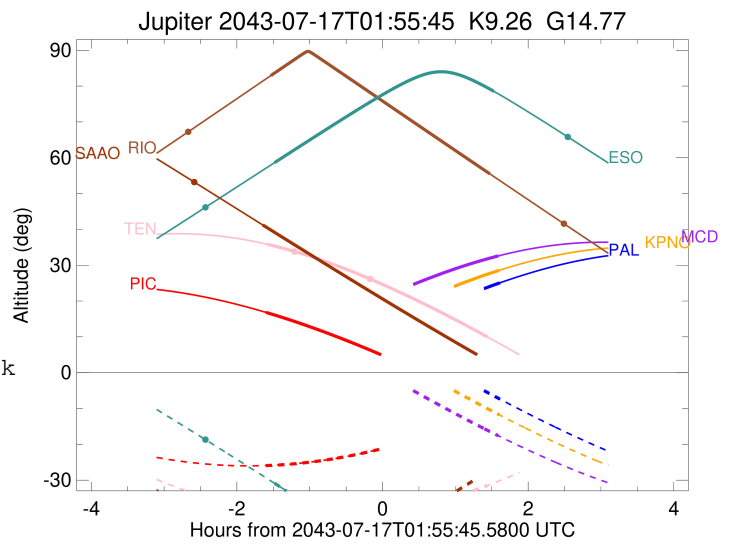
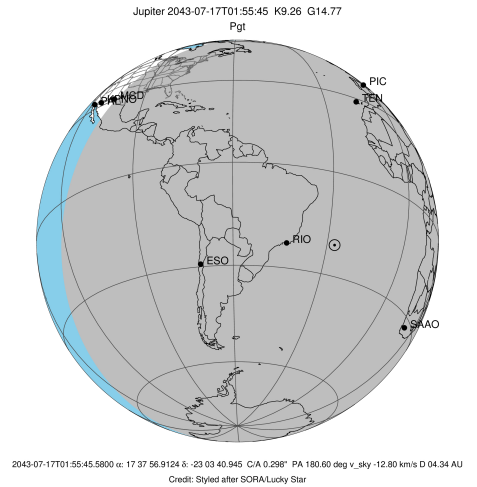


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-17T00:29:46.841	-4.50x	28.50x	71492.0	2.70	3.09
Jupiter	E	2043-07-17T03:32:30.251	25.07	-7.38	71491.9	5.65	6.45

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-17T02:01:15.500
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : KPNO
Location             : Kitt Peak Natl Obs
Latitude (deg)       : 31.96333
E. Longitude (deg)   : 248.40000
Altitude (km)        : 2.120
Gaia source ID       : 4116722549813288704
2Mass ID (if available) : 17375693-2303406
ICRS Star Coord at Epoch: 17h 37m 56.91244s -23:03:40.94501s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 9.257
G magnitude           : 14.766
RP magnitude         : 13.374
BP magnitude         : 17.099
DUPflag              : 0
Distance (au)        : 4.344
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.80
Sun-Target sep (deg) : 151.09
Sun-Moon sep (deg)   : 28.25
B (ring opening deg) : -2.40
PA of pole (deg)     : 1.54
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 1.700
C/A sky separation (km): 5356.7
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
    
```

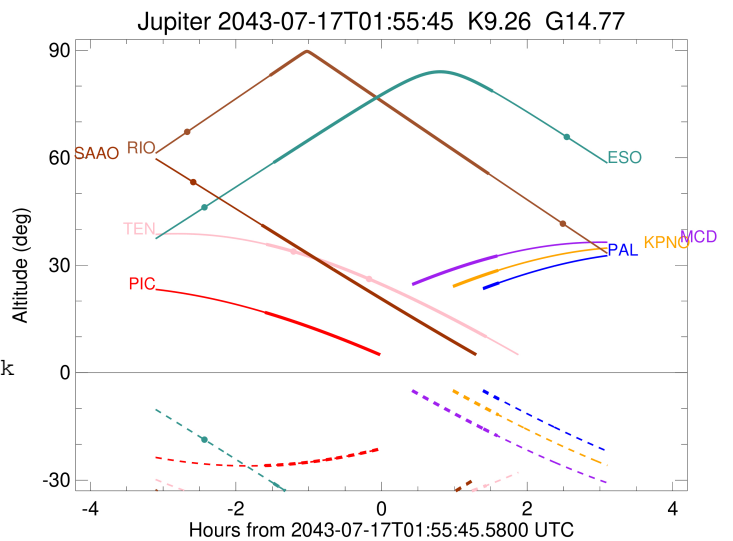
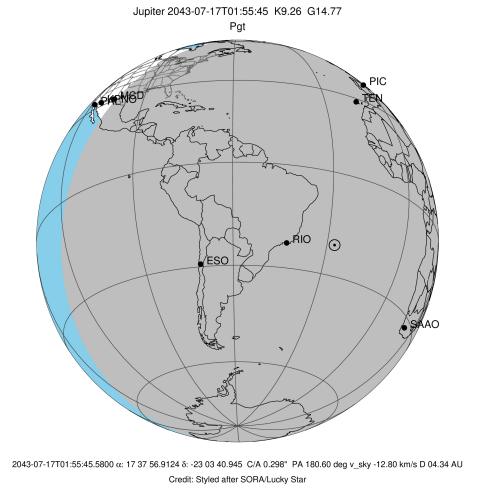


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-17T00:29:45.085	0.10x	23.90x	71492.0	2.76	3.16
Jupiter	E	2043-07-17T03:32:01.407	28.57	-11.77	71491.9	5.66	6.46

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-17T02:00:43.070
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : MCD
Location              : McDonald Obs. 2.7m
Latitude (deg)        : 30.67158
E. Longitude (deg)    : 255.97844
Altitude (km)         : 2.075
Gaia source ID        : 4116722549813288704
2Mass ID (if available) : 17375693-2303406
ICRS Star Coord at Epoch: 17h 37m 56.91244s -23:03:40.94501s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 9.257
G magnitude           : 14.766
RP magnitude          : 13.374
BP magnitude          : 17.099
DUPflag              : 0
Distance (au)         : 4.344
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -12.80
Sun-Target sep (deg)  : 151.09
Sun-Moon sep (deg)    : 28.35
B (ring opening deg) : -2.40
PA of pole (deg)      : 1.54
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 1.737
C/A sky separation (km) : 5472.2
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
    
```

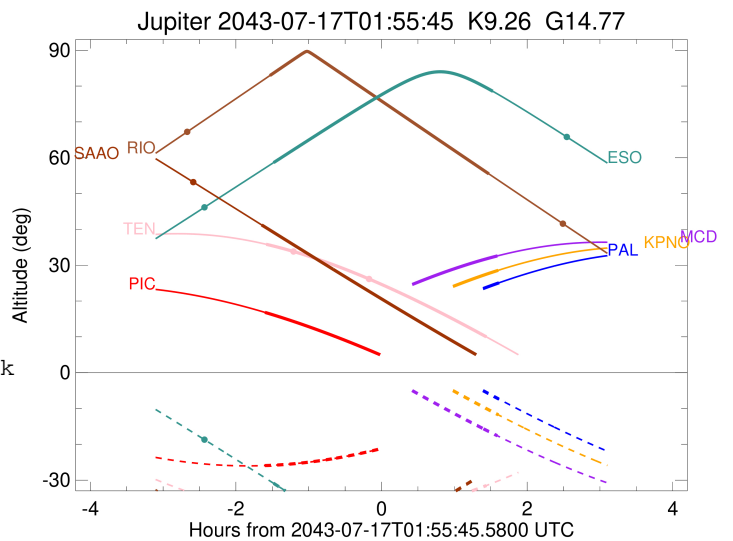
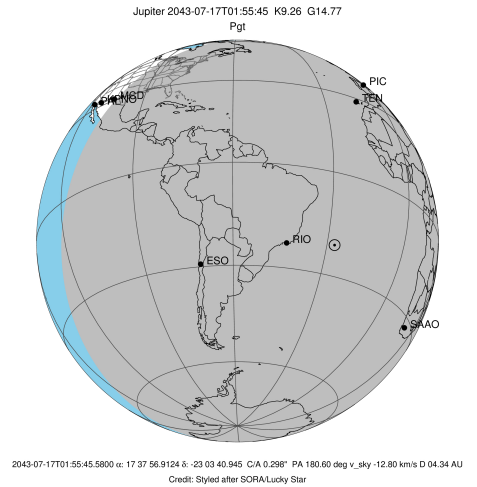


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-17T00:29:33.078	6.33	17.33x	71492.0	2.89	3.31
Jupiter	E	2043-07-17T03:31:13.960	32.59	-17.61	71491.9	5.68	6.49

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch              : 2043-07-17T01:51:03.300
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        : 4116722549813288704
2Mass ID (if available) : 17375693-2303406
ICRS Star Coord at Epoch: 17h 37m 56.91244s -23:03:40.94501s
RUWE (>1.4 is poor)  : 0.97
K magnitude            : 9.257
G magnitude            : 14.766
RP magnitude           : 13.374
BP magnitude           : 17.099
DUPflag               : 0
Distance (au)         : 4.344
f0 (km)                : 0.00
g0 (km)                : 0.00
skyplane vel. (km/s)  : -12.80
Sun-Target sep (deg)  : 151.09
Sun-Moon sep (deg)    : 29.32
B (ring opening deg)  : -2.40
PA of pole (deg)      : 1.54
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 1.723
C/A sky separation (km) : 5427.9
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
    
```

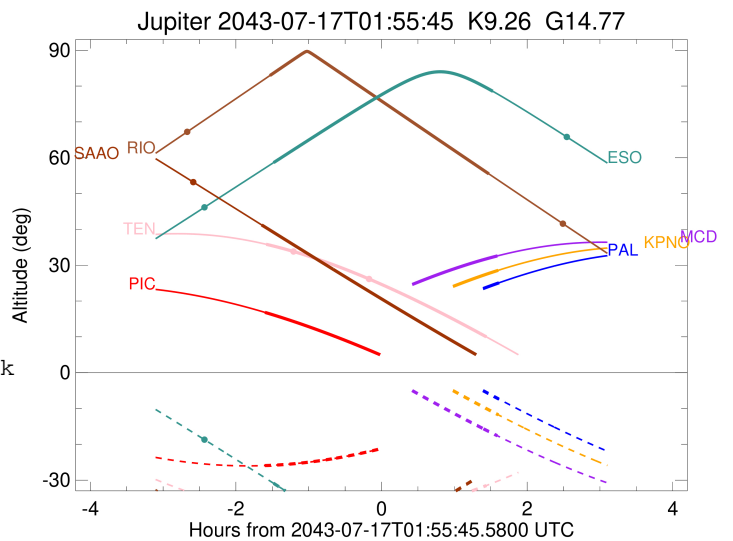
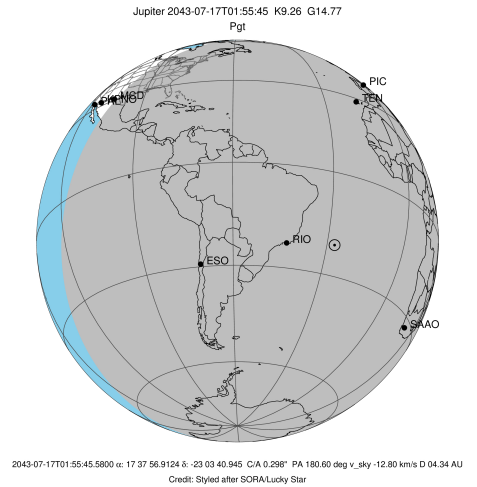


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-17T00:20:47.542	35.83	-39.10	71492.0	3.76	4.30
Jupiter	E	2043-07-17T03:22:08.668	9.99	-31.51	71491.9	4.72	5.40

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-17T01:53:47.750
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       : 4116722549813288704
2Mass ID (if available) : 17375693-2303406
ICRS Star Coord at Epoch: 17h 37m 56.91244s -23:03:40.94501s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 9.257
G magnitude           : 14.766
RP magnitude         : 13.374
BP magnitude         : 17.099
DUPflag             : 0
Distance (au)        : 4.344
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.80
Sun-Target sep (deg) : 151.09
Sun-Moon sep (deg)   : 29.21
B (ring opening deg) : -2.40
PA of pole (deg)     : 1.54
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 0.299
C/A sky separation (km): 942.6
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
    
```

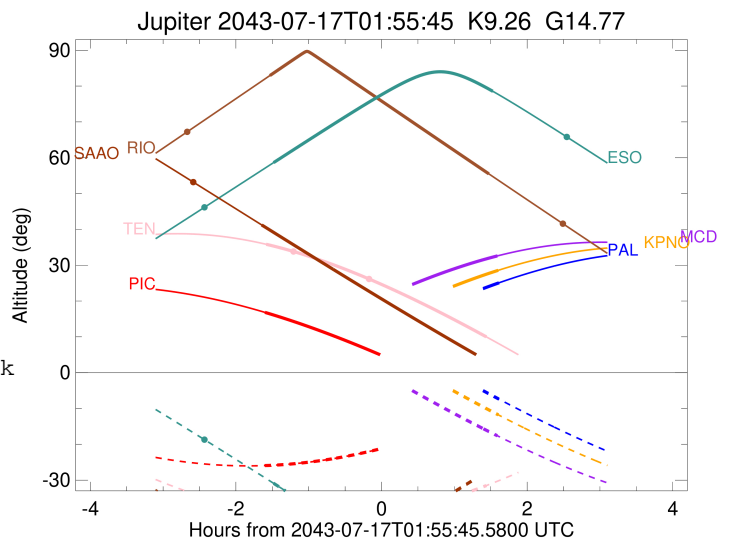
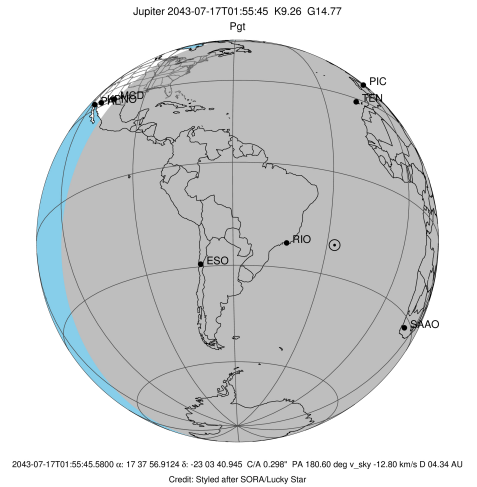


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-17T00:23:46.109	82.92	-54.09	71492.0	-0.13	-0.15
Jupiter	E	2043-07-17T03:24:12.978	55.49	-83.96	71492.0	1.36	1.56

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-17T01:57:13.830
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      : 4116722549813288704
2Mass ID (if available) : 17375693-2303406
ICRS Star Coord at Epoch: 17h 37m 56.91244s -23:03:40.94501s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 9.257
G magnitude          : 14.766
RP magnitude         : 13.374
BP magnitude         : 17.099
DUPflag             : 0
Distance (au)       : 4.344
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.80
Sun-Target sep (deg) : 151.09
Sun-Moon sep (deg)  : 28.87
B (ring opening deg) : -2.40
PA of pole (deg)    : 1.54
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 0.081
C/A sky separation (km) : 254.2
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
    
```

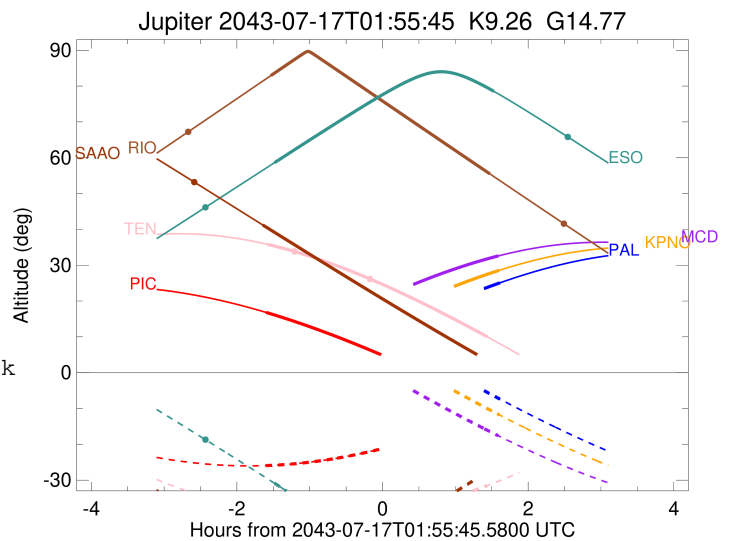
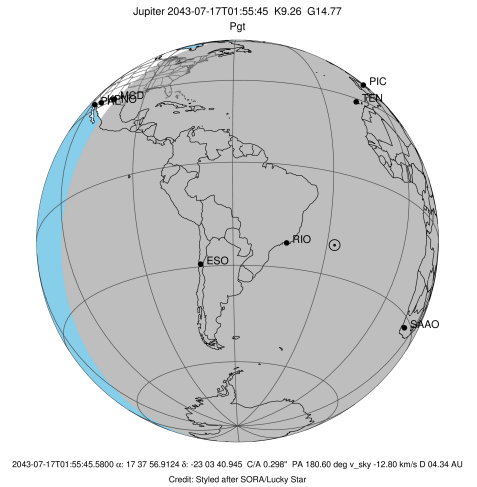


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-17T00:26:49.492	58.62	-30.88	71492.0	-1.00	-1.14
Jupiter	E	2043-07-17T03:27:31.011	78.53	-69.98	71492.0	1.14	1.30


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-17T01:48:51.200
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       : 4116722549813288704
2Mass ID (if available) : 17375693-2303406
ICRS Star Coord at Epoch: 17h 37m 56.91244s -23:03:40.94501s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 9.257
G magnitude           : 14.766
RP magnitude         : 13.374
BP magnitude         : 17.099
DUPflag             : 0
Distance (au)        : 4.344
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.80
Sun-Target sep (deg) : 151.09
Sun-Moon sep (deg)   : 29.36
B (ring opening deg) : -2.40
PA of pole (deg)     : 1.54
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 0.529
C/A sky separation (km) : 1667.5
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	2043-07-17T00:17:00.612	41.24	-66.37	71492.0	-1.64	-1.88
Jupiter	E	2043-07-17T03:21:54.453	3.45x	-27.77	71492.0	-1.10	-1.26