

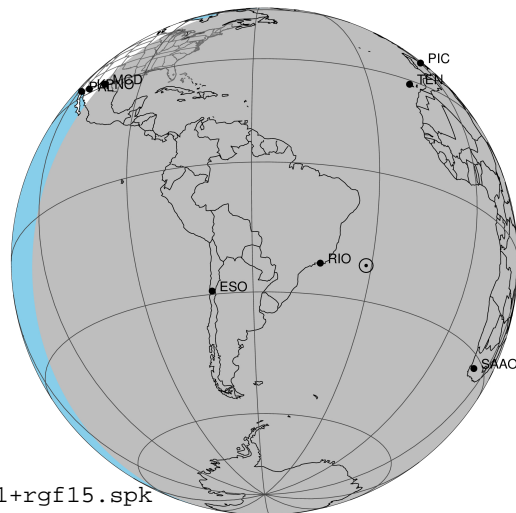
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-07-12T02:11:17.570
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116544257207330304
 2Mass ID (if available) : 17401043-2304144

Jupiter 2043-07-12T02:11:17 K7.91 G13.66 Pgt

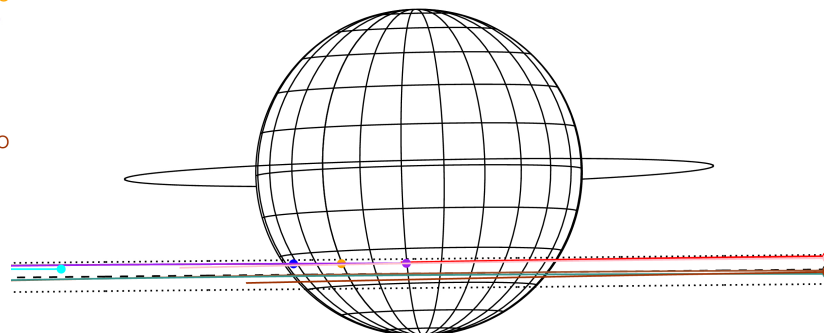
ICRS Star Coord at Epoch: 17h 40m 10.43341s -23:04:14.53091s

RUWE (>1.4 is poor) : 0.93
 K magnitude : 7.913
 G magnitude : 13.655
 RP magnitude : 12.249
 BP magnitude : 16.166
 DUPflag : 0
 Distance (au) : 4.312
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -14.00
 Sun-Target sep (deg) : 156.36
 Sun-Moon sep (deg) : 88.73
 B (ring opening deg) : -2.40
 PA of pole (deg) : 1.30
 Pole direction: RA (deg): 268.05670
 Dec (deg): 64.49732
 C/A sky separation (") : 14.141
 C/A sky separation (km) : 44223.1
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-07-12T02:11:17 K7.91 G13.66
 Pgt



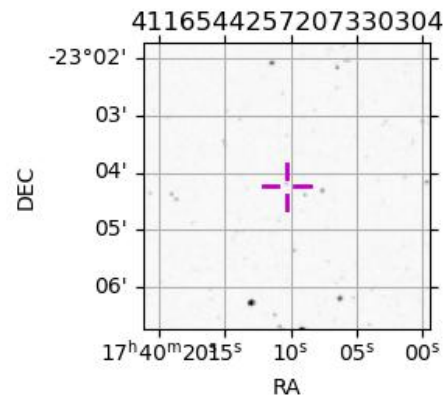
Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 SAAO



2043-07-12T02:11:17.5700 α: 17 40 10.4334 δ: -23 04 14.531 C/A ***** PA 0.57 deg v_sky -14.00 km/s D 04.31 AU
 Credit: Styled after SORA/Lucky Star

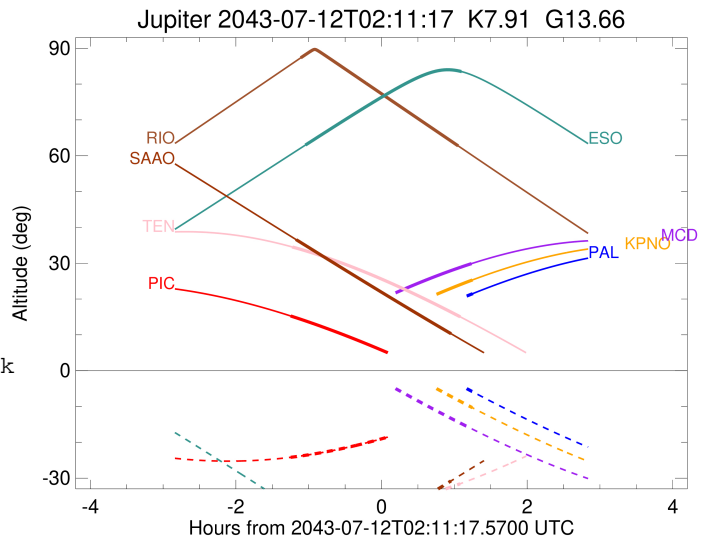
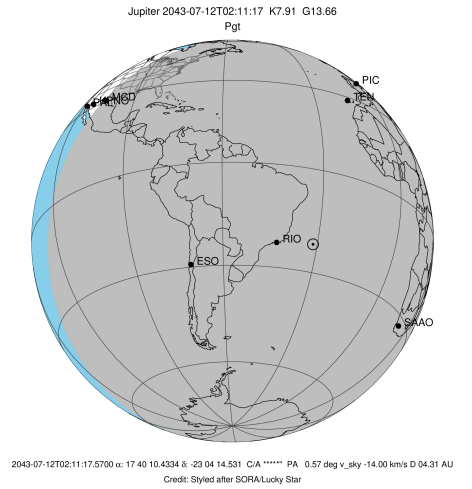
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+	JUL 12 00:56 - JUL 12 00:56	Pin
PAL	Palomar Mt (200")	33.4	243.1	+	JUL 12 03:26 - JUL 12 03:26	Pne
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	JUL 12 03:26 - JUL 12 03:26	Pne
MCD	McDonald Obs. 2.7m	30.7	256.0	+	JUL 12 03:25 - JUL 12 03:25	Pne
TEN	Teide Obs./Tenerife	28.3	343.5	+	JUL 12 00:57 - JUL 12 03:16	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 12 01:04 - JUL 12 03:14	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	JUL 12 01:08 - JUL 12 03:17	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	JUL 12 01:00 - JUL 12 03:08	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-12T02:06:20.990
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      : 4116544257207330304
2Mass ID (if available) : 17401043-2304144
ICRS Star Coord at Epoch: 17h 40m 10.43341s -23:04:14.53091s
RUWE (>1.4 is poor) : 0.93
K magnitude          : 7.913
G magnitude          : 13.655
RP magnitude         : 12.249
BP magnitude         : 16.166
DUPflag             : 0
Distance (au)        : 4.312
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.00
Sun-Target sep (deg) : 156.36
Sun-Moon sep (deg)  : 88.83
B (ring opening deg) : -2.40
PA of pole (deg)    : 1.30
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 12.534
C/A sky separation (km) : 39197.7
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
    
```

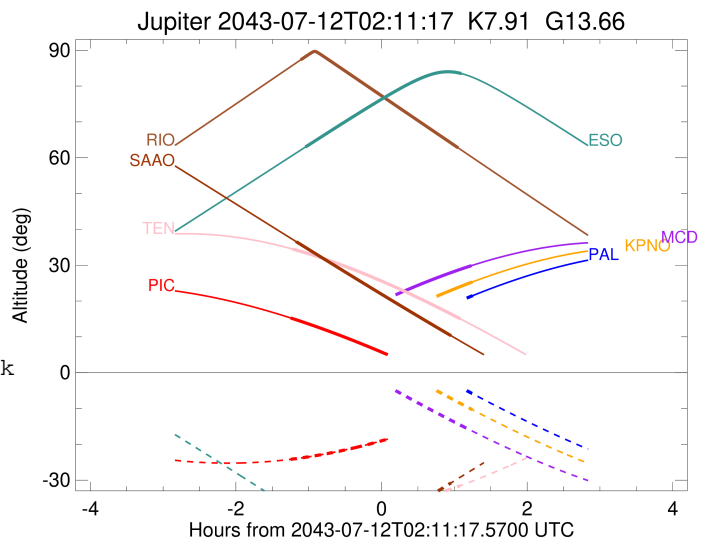
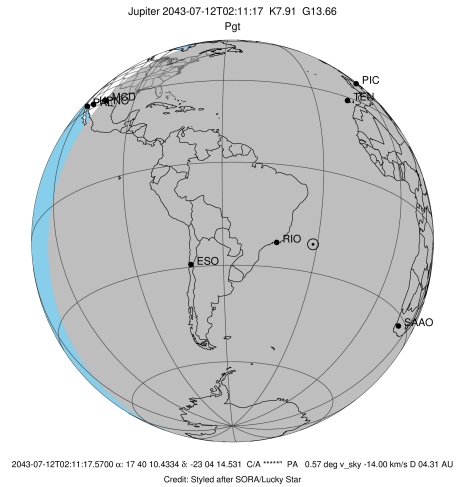


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-12T00:56:24.492	15.27	-24.18	71489.6	-33.56	-37.10
Jupiter	E	2043-07-12T03:16:46.502	-4.32x	-11.66	71489.7	-32.97	-36.49

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-12T02:17:09.950
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      : 4116544257207330304
2Mass ID (if available) : 17401043-2304144
ICRS Star Coord at Epoch: 17h 40m 10.43341s -23:04:14.53091s
RUWE (>1.4 is poor) : 0.93
K magnitude          : 7.913
G magnitude          : 13.655
RP magnitude         : 12.249
BP magnitude         : 16.166
DUPflag             : 0
Distance (au)       : 4.312
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.00
Sun-Target sep (deg) : 156.36
Sun-Moon sep (deg)  : 88.87
B (ring opening deg) : -2.40
PA of pole (deg)    : 1.30
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 12.773
C/A sky separation (km) : 39943.2
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
    
```

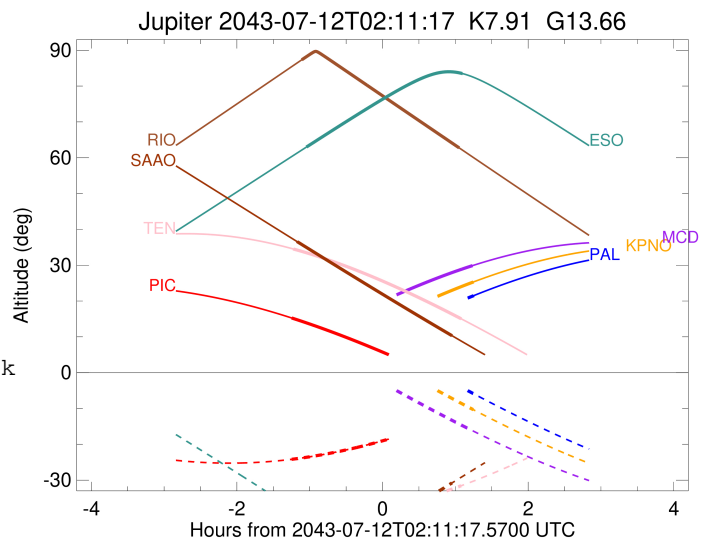
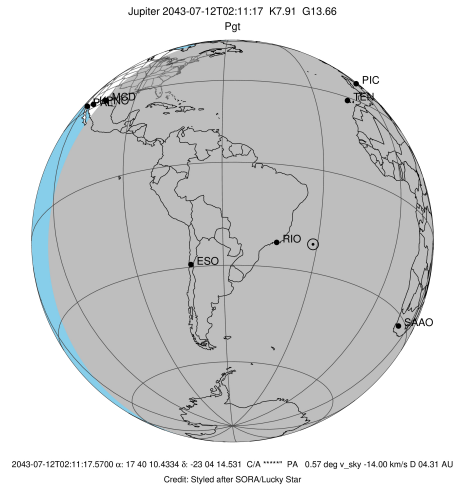


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-12T01:07:23.309	-1.53x	21.01x	71489.4	-35.23	-38.84
Jupiter	E	2043-07-12T03:26:29.346	21.50	-5.90	71489.7	-32.73	-36.24

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-12T02:16:54.080
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       : 4116544257207330304
2Mass ID (if available) : 17401043-2304144
ICRS Star Coord at Epoch: 17h 40m 10.43341s -23:04:14.53091s
RUWE (>1.4 is poor) : 0.93
K magnitude          : 7.913
G magnitude          : 13.655
RP magnitude         : 12.249
BP magnitude         : 16.166
DUPflag             : 0
Distance (au)        : 4.312
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.00
Sun-Target sep (deg) : 156.36
Sun-Moon sep (deg)   : 88.94
B (ring opening deg) : -2.40
PA of pole (deg)     : 1.30
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 12.754
C/A sky separation (km) : 39884.9
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
    
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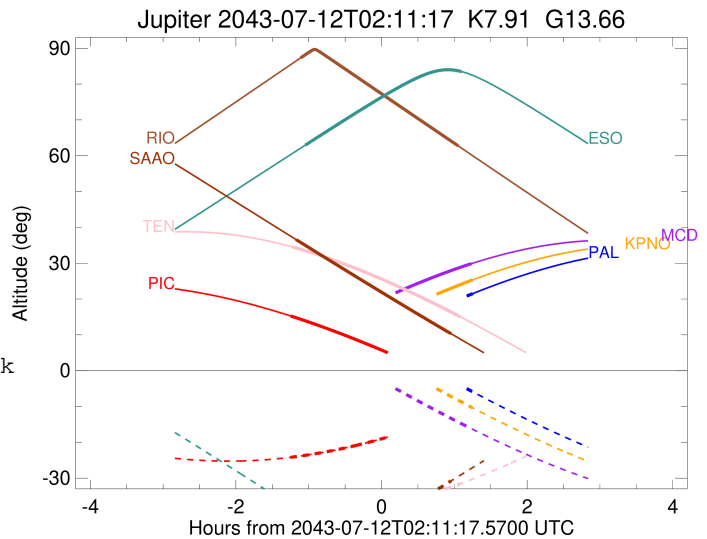
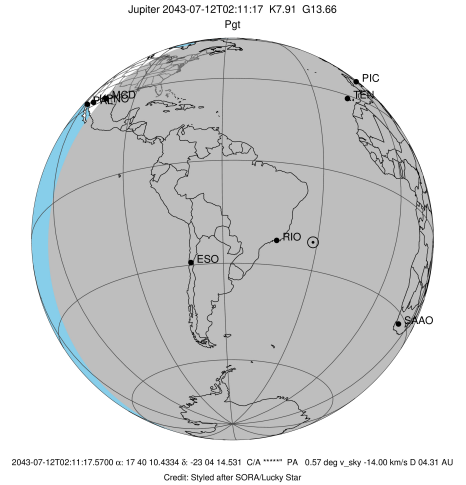


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-12T01:07:15.300	3.02x	16.39x	71489.4	-35.16	-38.76
Jupiter	E	2043-07-12T03:26:07.138	25.31	-10.33	71489.7	-32.71	-36.22

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-12T02:16:22.850
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        : 4116544257207330304
2Mass ID (if available) : 17401043-2304144
ICRS Star Coord at Epoch: 17h 40m 10.43341s -23:04:14.53091s
RUWE (>1.4 is poor) : 0.93
K magnitude           : 7.913
G magnitude           : 13.655
RP magnitude          : 12.249
BP magnitude          : 16.166
DUPflag              : 0
Distance (au)         : 4.312
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.00
Sun-Target sep (deg) : 156.36
Sun-Moon sep (deg)   : 89.03
B (ring opening deg) : -2.40
PA of pole (deg)     : 1.30
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 12.716
C/A sky separation (km) : 39765.0
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
    
```

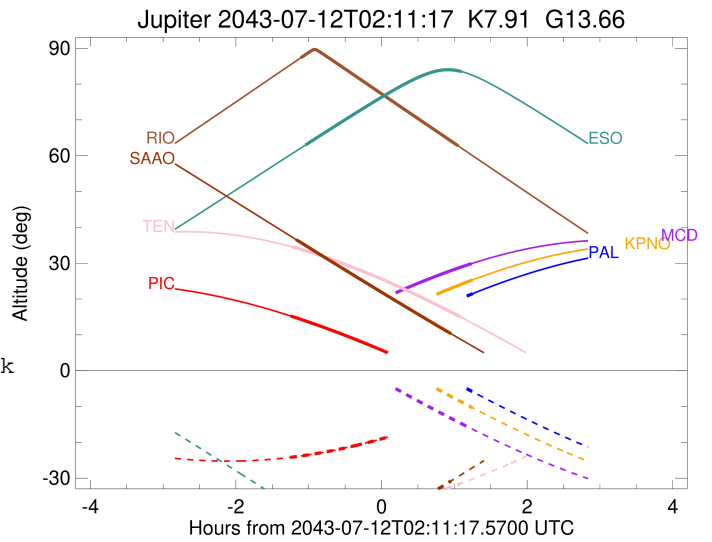
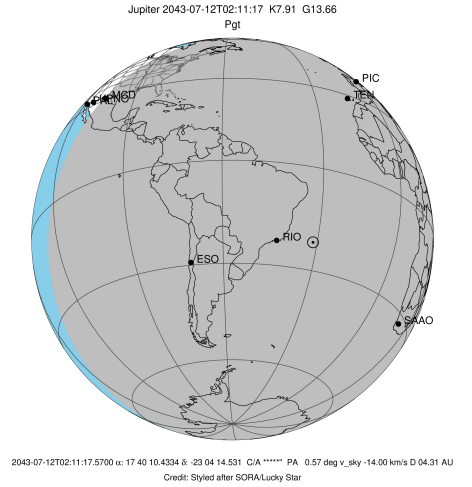


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-12T01:06:52.624	9.14	9.90x	71489.4	-35.01	-38.61
Jupiter	E	2043-07-12T03:25:30.157	29.88	-16.21	71489.7	-32.65	-36.15

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-12T02:06:44.550
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        : 4116544257207330304
2Mass ID (if available) : 17401043-2304144
ICRS Star Coord at Epoch: 17h 40m 10.43341s -23:04:14.53091s
RUWE (>1.4 is poor) : 0.93
K magnitude           : 7.913
G magnitude           : 13.655
RP magnitude          : 12.249
BP magnitude          : 16.166
DUPflag              : 0
Distance (au)         : 4.312
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.00
Sun-Target sep (deg) : 156.36
Sun-Moon sep (deg)   : 89.13
B (ring opening deg) : -2.40
PA of pole (deg)     : 1.30
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 12.706
C/A sky separation (km) : 39735.4
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
    
```

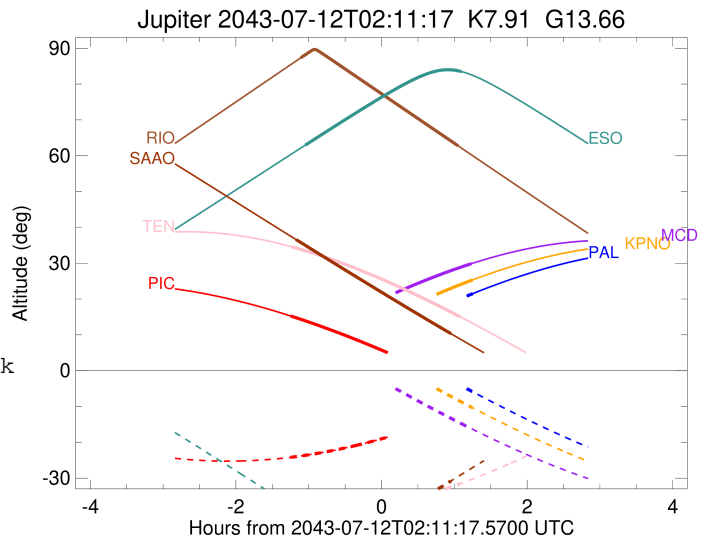
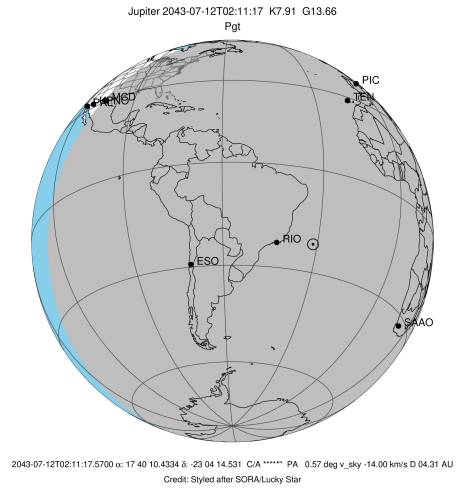


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-12T00:57:49.177	34.52	-39.76	71489.5	-34.14	-37.71
Jupiter	E	2043-07-12T03:16:05.786	15.04	-31.57	71489.6	-33.48	-37.02

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-12T02:09:32.520
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       : 4116544257207330304
2Mass ID (if available) : 17401043-2304144
ICRS Star Coord at Epoch: 17h 40m 10.43341s -23:04:14.53091s
RUWE (>1.4 is poor) : 0.93
K magnitude          : 7.913
G magnitude          : 13.655
RP magnitude         : 12.249
BP magnitude         : 16.166
DUPflag             : 0
Distance (au)        : 4.312
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.00
Sun-Target sep (deg) : 156.36
Sun-Moon sep (deg)   : 89.63
B (ring opening deg) : -2.40
PA of pole (deg)     : 1.30
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 14.147
C/A sky separation (km) : 44241.1
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
    
```

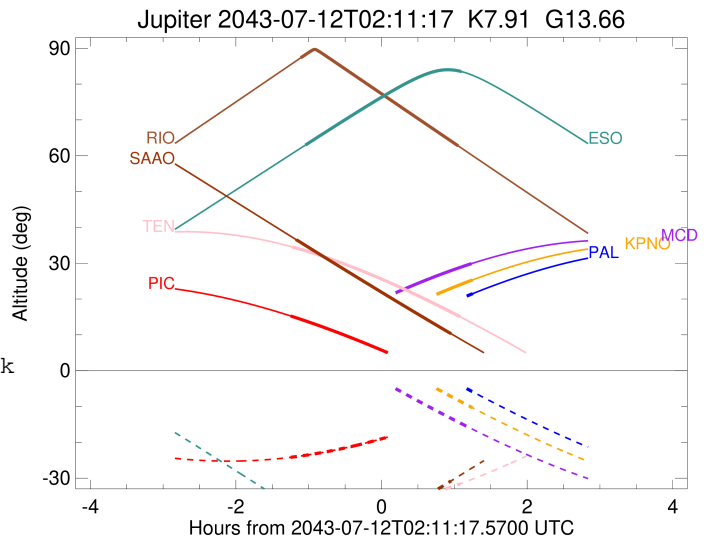
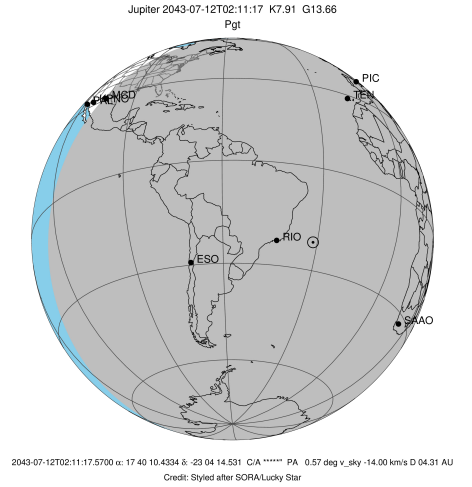


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-12T01:04:46.082	87.32	-63.74	71488.9	-38.87	-42.56
Jupiter	E	2043-07-12T03:14:29.040	62.74	-86.22	71489.0	-37.70	-41.37

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-12T02:12:57.440
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      : 4116544257207330304
2Mass ID (if available) : 17401043-2304144
ICRS Star Coord at Epoch: 17h 40m 10.43341s -23:04:14.53091s
RUWE (>1.4 is poor) : 0.93
K magnitude          : 7.913
G magnitude          : 13.655
RP magnitude         : 12.249
BP magnitude         : 16.166
DUPflag             : 0
Distance (au)       : 4.312
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.00
Sun-Target sep (deg) : 156.36
Sun-Moon sep (deg)  : 89.63
B (ring opening deg) : -2.40
PA of pole (deg)    : 1.30
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 14.376
C/A sky separation (km) : 44955.5
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
    
```

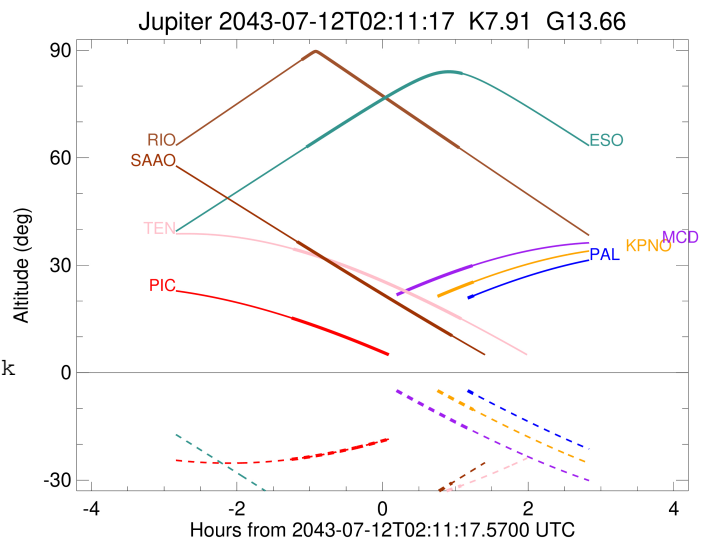
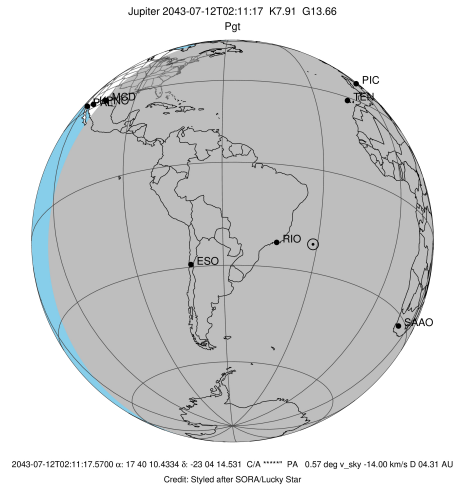


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-12T01:08:36.948	62.97	-40.33	71488.7	-39.89	-43.60
Jupiter	E	2043-07-12T03:17:13.127	83.48	-68.26	71489.0	-38.13	-41.81


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-12T02:04:27.220
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       : 4116544257207330304
2Mass ID (if available) : 17401043-2304144
ICRS Star Coord at Epoch: 17h 40m 10.43341s -23:04:14.53091s
RUWE (>1.4 is poor) : 0.93
K magnitude          : 7.913
G magnitude          : 13.655
RP magnitude         : 12.249
BP magnitude         : 16.166
DUPflag             : 0
Distance (au)        : 4.312
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.00
Sun-Target sep (deg) : 156.36
Sun-Moon sep (deg)  : 89.08
B (ring opening deg) : -2.40
PA of pole (deg)    : 1.30
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 14.970
C/A sky separation (km) : 46815.1
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	2043-07-12T01:00:51.638	36.60	-57.69	71488.6	-41.02	-44.74
Jupiter	E	2043-07-12T03:08:34.878	10.32	-30.78	71488.6	-40.76	-44.47