

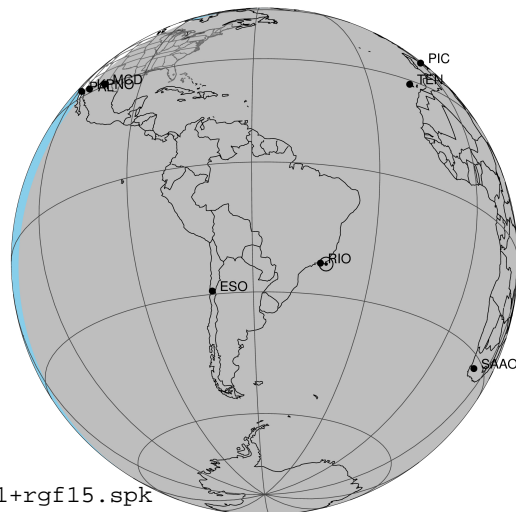
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-07-03T02:51:17.030
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068825001472551552
 2Mass ID (if available) : 17443871-2304223

Jupiter 2043-07-03T02:51:17 K7.13 G14.49 Pgt

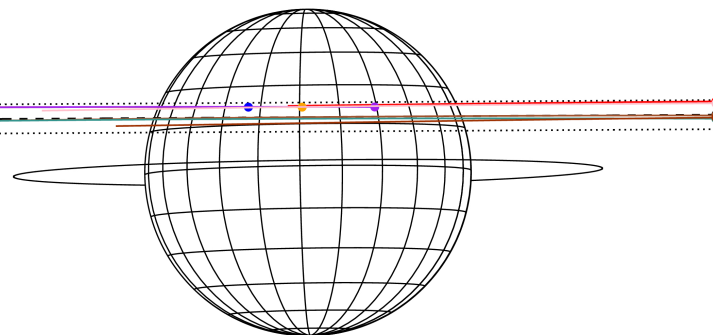
ICRS Star Coord at Epoch: 17h 44m 38.73183s -23:04:22.51642s

RUWE (>1.4 is poor) : 1.05
 K magnitude : 7.127
 G magnitude : 14.487
 RP magnitude : 12.853
 BP magnitude : 18.719
 DUPflag : 0
 Distance (au) : 4.270
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -15.58
 Sun-Target sep (deg) : 165.95
 Sun-Moon sep (deg) : 143.70
 B (ring opening deg) : -2.42
 PA of pole (deg) : 0.82
 Pole direction: RA (deg): 268.05669
 Dec (deg): 64.49732
 C/A sky separation (") : 7.841
 C/A sky separation (km) : 24281.5
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-07-03T02:51:17 K7.13 G14.49
 Pgt



Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 SAAO

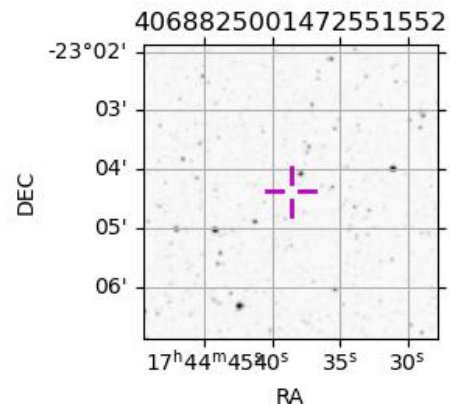


2043-07-03T02:51:17.0300 at: 17 44 38.7318 s: -23 04 22.516 C/A 7.829" PA 180.34 deg v_sky -15.58 km/s D 04.27 AU

Credit: Styled after SORA/Lucky Star

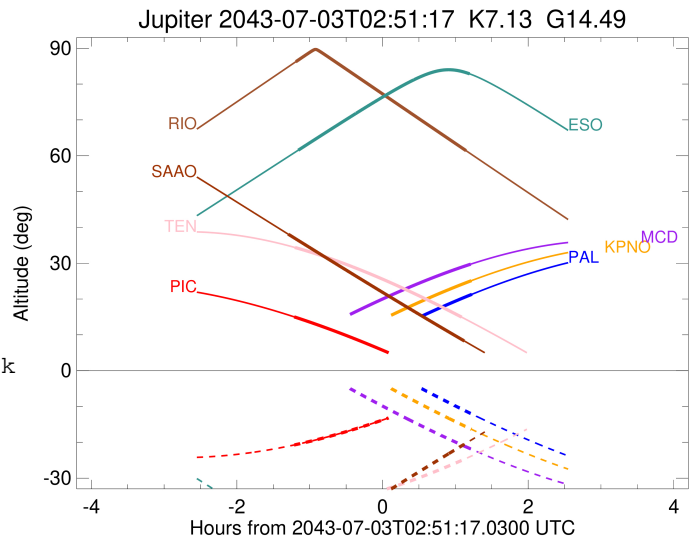
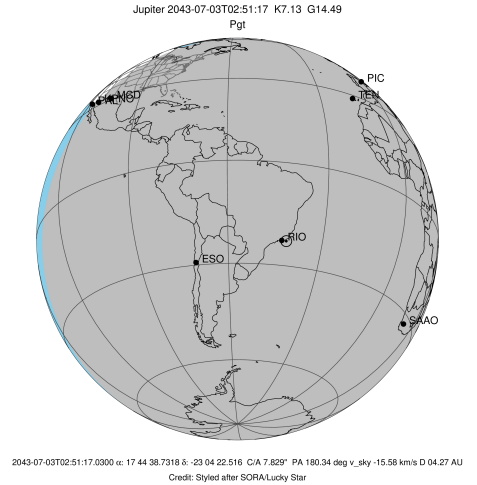
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	JUL 03 01:38 - JUL 03 01:38	Pin
PAL	Palomar Mt (200")	33.4	243.1	+	JUL 03 04:04 - JUL 03 04:04	Pne
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	JUL 03 04:04 - JUL 03 04:04	Pne
MCD	McDonald Obs. 2.7m	30.7	256.0	+	JUL 03 04:03 - JUL 03 04:03	Pne
TEN	Teide Obs./Tenerife	28.3	343.5	+	JUL 03 01:39 - JUL 03 03:56	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 03 01:39 - JUL 03 04:00	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	JUL 03 01:42 - JUL 03 04:03	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	JUL 03 01:33 - JUL 03 03:58	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target           : Jupiter
target radius (km) : 71492.00
C/A epoch       : 2043-07-03T02:47:21.070
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  : 4068825001472551552
2Mass ID (if available) : 17443871-2304223
ICRS Star Coord at Epoch: 17h 44m 38.73183s -23:04:22.51642s
RUWE (>1.4 is poor) : 1.05
K magnitude     : 7.127
G magnitude     : 14.487
RP magnitude    : 12.853
BP magnitude    : 18.719
DUPflag        : 0
Distance (au)   : 4.270
f0 (km)         : 0.00
g0 (km)         : 0.00
skyplane vel. (km/s) : -15.58
Sun-Target sep (deg) : 165.95
Sun-Moon sep (deg) : 144.32
B (ring opening deg) : -2.42
PA of pole (deg) : 0.82
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (" ) : 9.457
C/A sky separation (km) : 29285.9
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
    
```

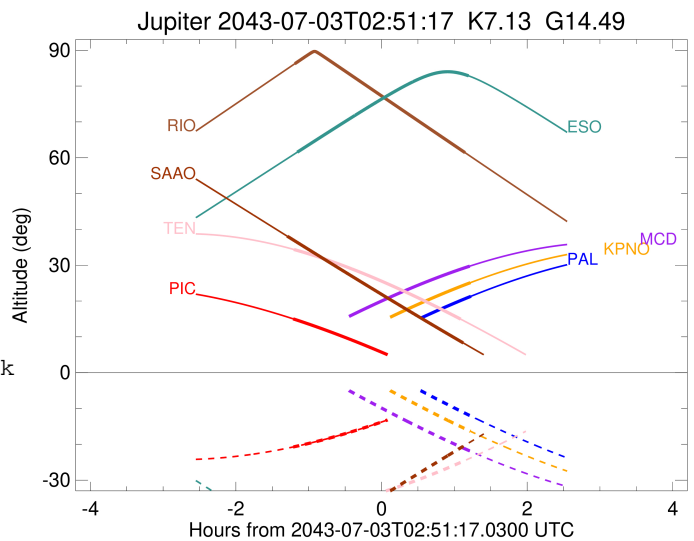
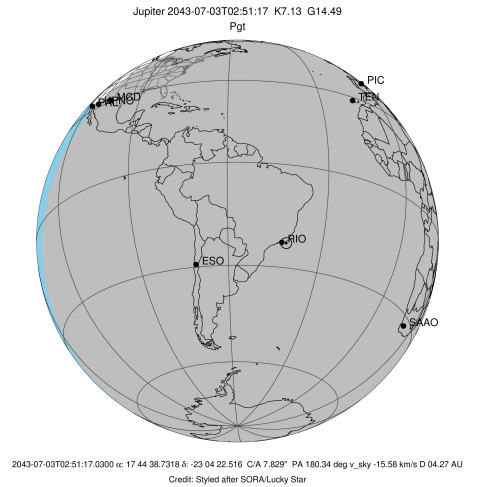


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-03T01:38:34.437	15.01	-20.73	71490.7	24.04	26.99
Jupiter	E	2043-07-03T03:56:31.083	-4.30x	-5.23	71490.7	24.19	27.15

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-03T02:55:54.680
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      : 4068825001472551552
2Mass ID (if available) : 17443871-2304223
ICRS Star Coord at Epoch: 17h 44m 38.73183s -23:04:22.51642s
RUWE (>1.4 is poor) : 1.05
K magnitude         : 7.127
G magnitude         : 14.487
RP magnitude        : 12.853
BP magnitude        : 18.719
DUPflag            : 0
Distance (au)       : 4.270
f0 (km)            : 0.00
g0 (km)            : 0.00
skyplane vel. (km/s) : -15.58
Sun-Target sep (deg) : 165.95
Sun-Moon sep (deg)  : 143.27
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.82
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (" ) : 9.226
C/A sky separation (km) : 28573.1
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
    
```

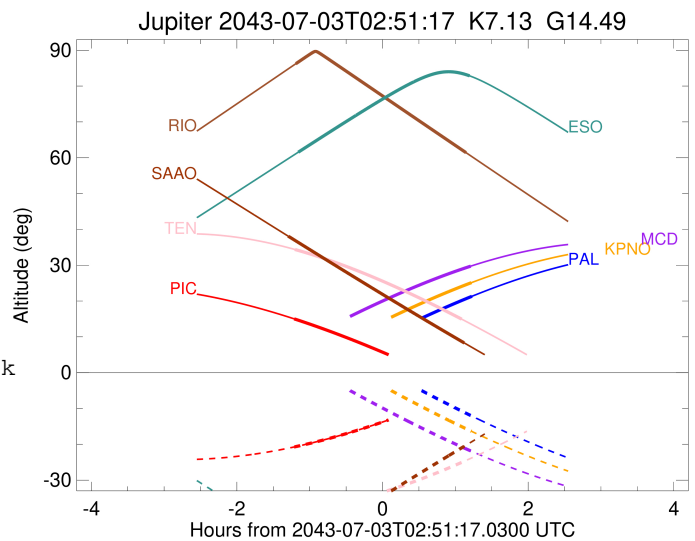
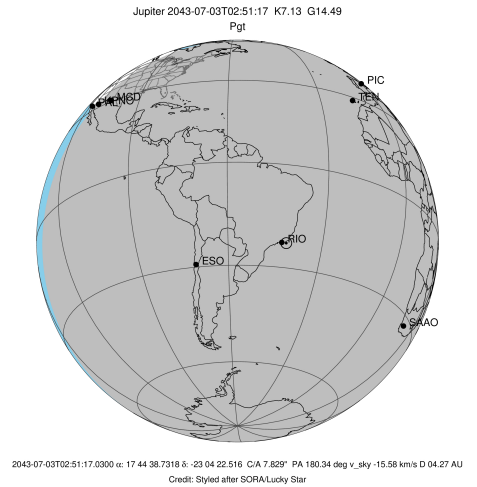


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-03T01:46:27.163	-1.67x	13.35x	71490.8	22.55	25.37
Jupiter	E	2043-07-03T04:04:57.860	21.32	-12.12	71490.6	24.43	27.41

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-03T02:55:42.280
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       : 4068825001472551552
2Mass ID (if available) : 17443871-2304223
ICRS Star Coord at Epoch: 17h 44m 38.73183s -23:04:22.51642s
RUWE (>1.4 is poor) : 1.05
K magnitude           : 7.127
G magnitude           : 14.487
RP magnitude         : 12.853
BP magnitude         : 18.719
DUPflag              : 0
Distance (au)        : 4.270
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.58
Sun-Target sep (deg) : 165.95
Sun-Moon sep (deg)   : 143.34
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.82
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 9.245
C/A sky separation (km): 28631.2
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
    
```

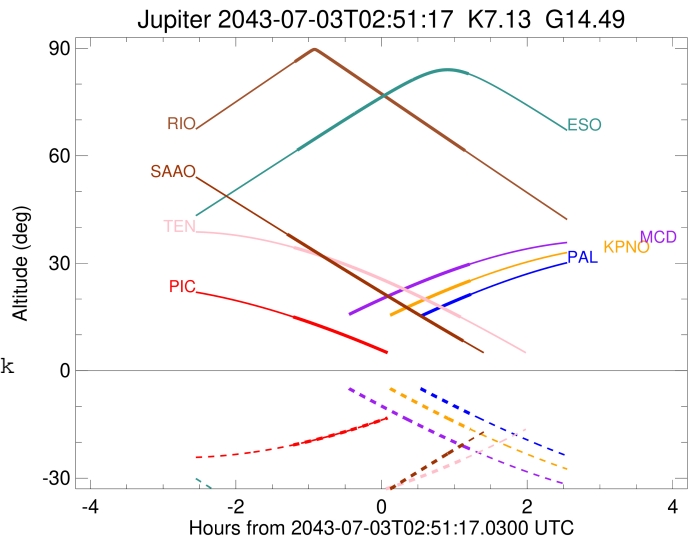
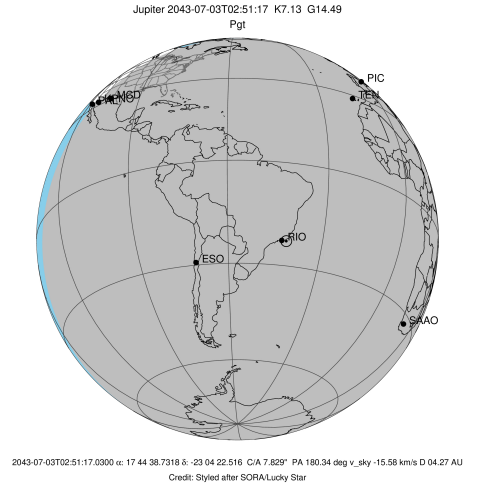


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-03T01:46:25.352	2.89x	8.71x	71490.8	22.62	25.44
Jupiter	E	2043-07-03T04:04:36.185	25.13	-16.37	71490.6	24.45	27.44

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-03T02:55:17.710
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       : 4068825001472551552
2Mass ID (if available) : 17443871-2304223
ICRS Star Coord at Epoch: 17h 44m 38.73183s -23:04:22.51642s
RUWE (>1.4 is poor) : 1.05
K magnitude           : 7.127
G magnitude           : 14.487
RP magnitude          : 12.853
BP magnitude          : 18.719
DUPflag              : 0
Distance (au)         : 4.270
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.58
Sun-Target sep (deg) : 165.95
Sun-Moon sep (deg)   : 143.45
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.82
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 9.284
C/A sky separation (km) : 28750.6
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
    
```

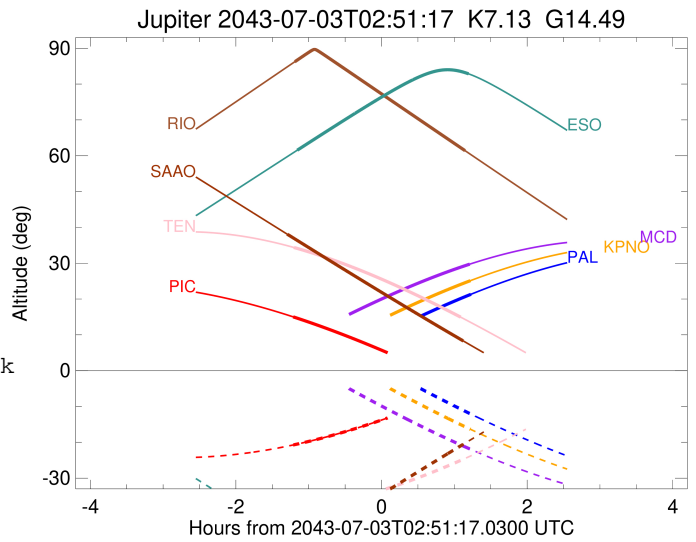
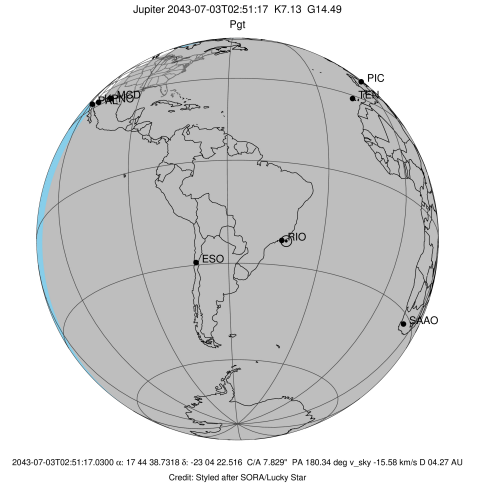


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-03T01:46:16.136	9.06	2.28x	71490.8	22.75	25.59
Jupiter	E	2043-07-03T04:03:58.724	29.73	-21.84	71490.6	24.51	27.49

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-03T02:47:38.980
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        : 4068825001472551552
2Mass ID (if available) : 17443871-2304223
ICRS Star Coord at Epoch: 17h 44m 38.73183s -23:04:22.51642s
RUWE (>1.4 is poor) : 1.05
K magnitude           : 7.127
G magnitude           : 14.487
RP magnitude          : 12.853
BP magnitude          : 18.719
DUPflag              : 0
Distance (au)         : 4.270
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.58
Sun-Target sep (deg) : 165.95
Sun-Moon sep (deg)   : 144.47
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.82
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 9.284
C/A sky separation (km) : 28750.2
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
    
```

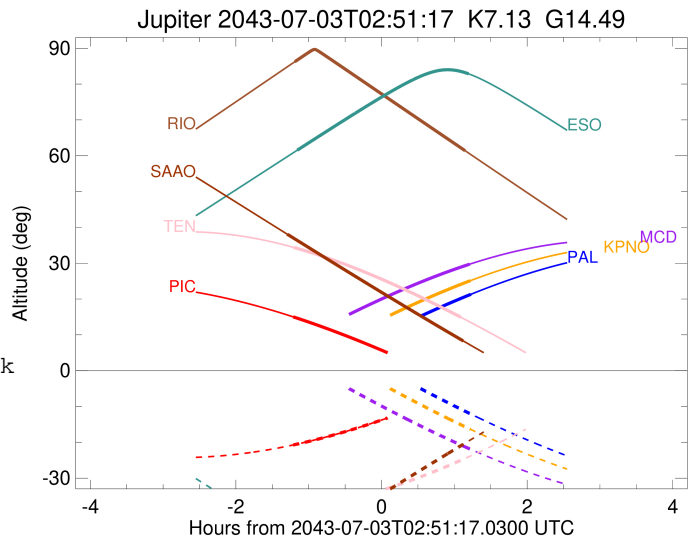
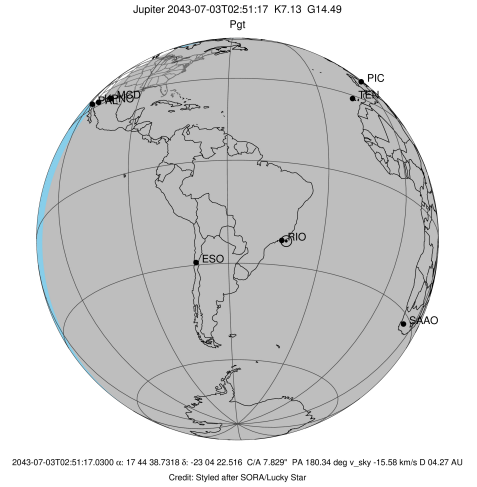


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-03T01:39:07.863	34.38	-38.42	71490.7	23.51	26.41
Jupiter	E	2043-07-03T03:56:31.440	14.94	-25.04	71490.7	23.73	26.65

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-03T02:49:52.810
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      : 4068825001472551552
2Mass ID (if available) : 17443871-2304223
ICRS Star Coord at Epoch: 17h 44m 38.73183s -23:04:22.51642s
RUWE (>1.4 is poor) : 1.05
K magnitude          : 7.127
G magnitude          : 14.487
RP magnitude         : 12.853
BP magnitude         : 18.719
DUPflag             : 0
Distance (au)        : 4.270
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.58
Sun-Target sep (deg) : 165.95
Sun-Moon sep (deg)  : 144.45
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.82
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 7.833
C/A sky separation (km) : 24256.9
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
    
```

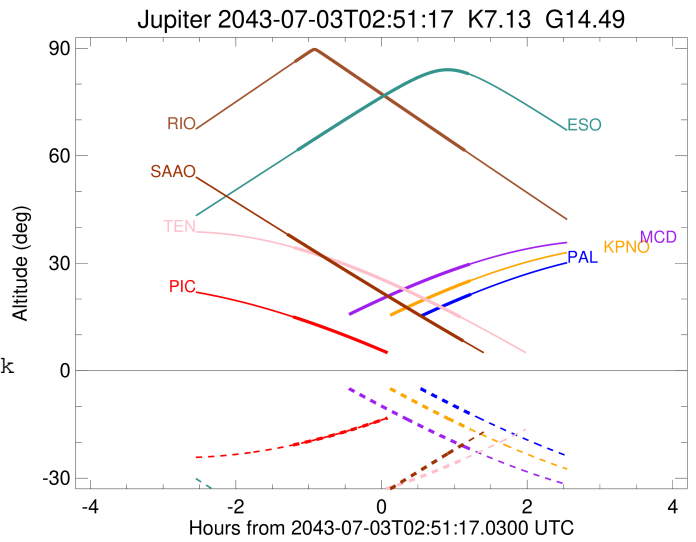
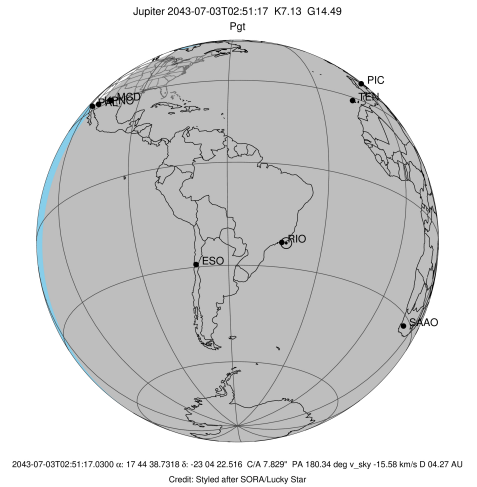


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-03T01:39:48.725	86.22	-72.22	71491.1	19.39	21.90
Jupiter	E	2043-07-03T04:00:06.288	61.41	-75.48	71491.1	20.06	22.64

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-03T02:52:35.980
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        : 4068825001472551552
2Mass ID (if available) : 17443871-2304223
ICRS Star Coord at Epoch: 17h 44m 38.73183s -23:04:22.51642s
RUWE (>1.4 is poor) : 1.05
K magnitude           : 7.127
G magnitude           : 14.487
RP magnitude          : 12.853
BP magnitude          : 18.719
DUPflag              : 0
Distance (au)         : 4.270
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.58
Sun-Target sep (deg)  : 165.95
Sun-Moon sep (deg)    : 144.10
B (ring opening deg)  : -2.42
PA of pole (deg)      : 0.82
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 7.606
C/A sky separation (km) : 23553.6
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
    
```

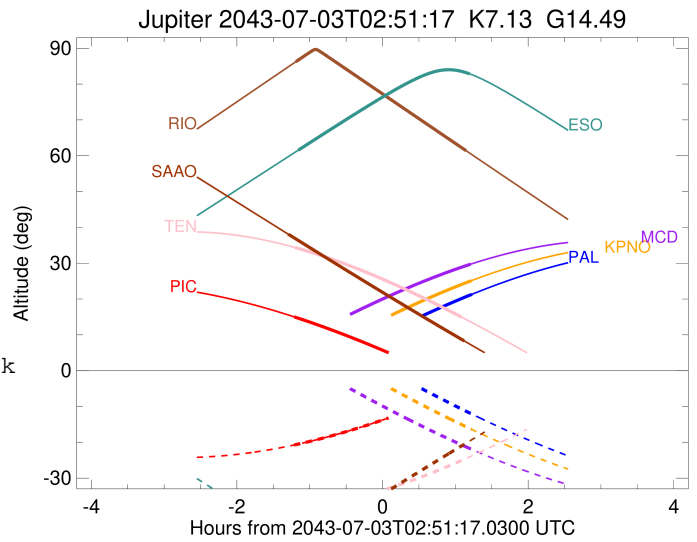
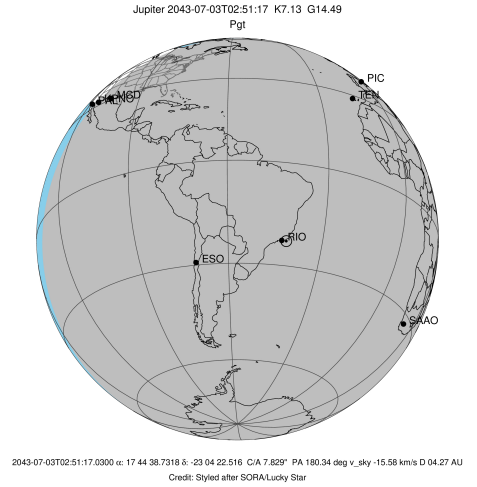


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-03T01:42:03.068	61.58	-48.25	71491.2	18.53	20.95
Jupiter	E	2043-07-03T04:03:02.947	82.85	-78.37	71491.1	19.74	22.29


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-03T02:45:53.420
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       : 4068825001472551552
2Mass ID (if available) : 17443871-2304223
ICRS Star Coord at Epoch: 17h 44m 38.73183s -23:04:22.51642s
RUWE (>1.4 is poor) : 1.05
K magnitude          : 7.127
G magnitude          : 14.487
RP magnitude         : 12.853
BP magnitude         : 18.719
DUPflag             : 0
Distance (au)        : 4.270
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.58
Sun-Target sep (deg) : 165.95
Sun-Moon sep (deg)   : 144.56
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.82
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 6.994
C/A sky separation (km): 21658.1
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	2043-07-03T01:33:41.705	38.08	-50.89	71491.3	17.66	19.99
Jupiter	E	2043-07-03T03:58:39.736	8.30	-20.54	71491.3	17.53	19.84