

target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-07-16T03:13:44.200
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116722034417731968
 2Mass ID (if available) : 17382120-2303396

Jupiter 2043-07-16T03:13:44 K6.92 G11.61 Pgt

ICRS Star Coord at Epoch: 17h 38m 21.21972s -23°03'39.78670s

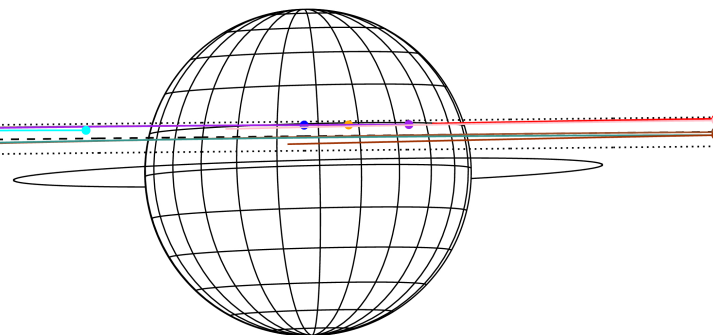
RUWE (>1.4 is poor) : 0.87
 K magnitude : 6.921
 G magnitude : 11.610
 RP magnitude : 10.423
 BP magnitude : 13.115
 DUPflag : 0
 Distance (au) : 4.338
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -13.04
 Sun-Target sep (deg) : 152.09
 Sun-Moon sep (deg) : 39.73
 B (ring opening deg) : -2.40
 PA of pole (deg) : 1.49
 Pole direction: RA (deg): 268.05670
 Dec (deg): 64.49732
 C/A sky separation (") : 5.062
 C/A sky separation (km) : 15926.1
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-07-16T03:13:44 K6.92 G11.61
 Pgt



Earth

PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 SAAO

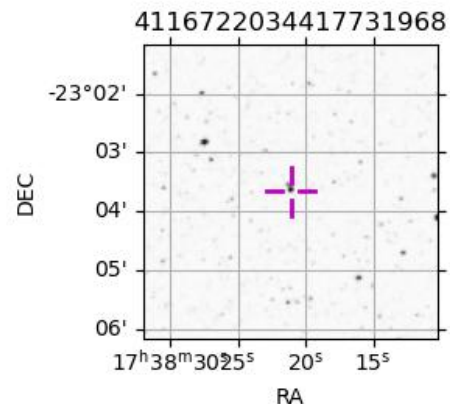


2043-07-16T03:13:44.2000 at: 17 38 21.2197 s: -23 03 39.787 C/A 5.051" PA 180.61 deg v_sky -13.04 km/s D 04.34 AU

Credit: Styled after SORA/Lucky Star

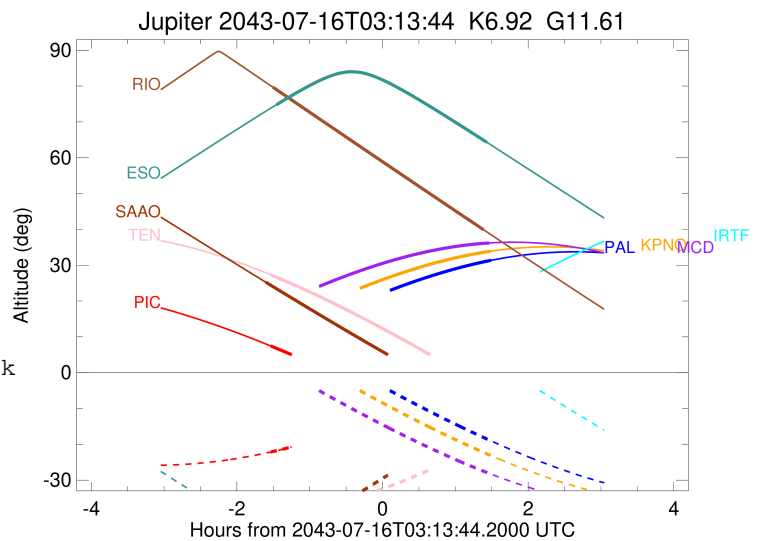
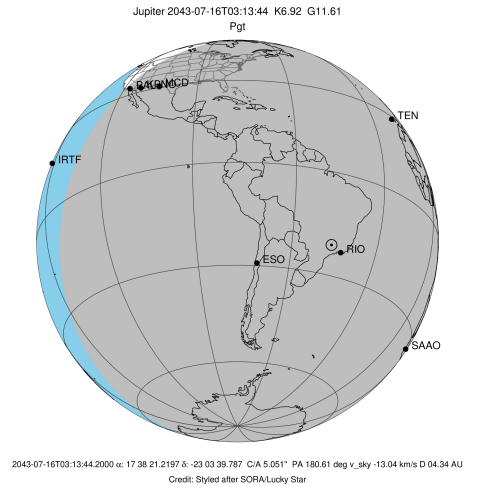
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	JUL 16 01:41 - JUL 16 01:41	Pin
PAL	Palomar Mt (200")	33.4	243.1	+	JUL 16 04:43 - JUL 16 04:43	Pne
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	JUL 16 04:42 - JUL 16 04:42	Pne
MCD	McDonald Obs. 2.7m	30.7	256.0	+	JUL 16 04:41 - JUL 16 04:41	Pne
TEN	Teide Obs./Tenerife	28.3	343.5	+	JUL 16 01:41 - JUL 16 01:41	Pin
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 16 01:43 - JUL 16 04:36	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	JUL 16 01:46 - JUL 16 04:39	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	JUL 16 01:37 - JUL 16 01:37	Pin
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-16T03:08:13.840
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       : 4116722034417731968
2Mass ID (if available) : 17382120-2303396
ICRS Star Coord at Epoch: 17h 38m 21.21972s -23:03:39.78670s
RUWE (>1.4 is poor) : 0.87
K magnitude           : 6.921
G magnitude           : 11.610
RP magnitude          : 10.423
BP magnitude          : 13.115
DUPflag              : 0
Distance (au)         : 4.338
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -13.04
Sun-Target sep (deg) : 152.09
Sun-Moon sep (deg)   : 40.19
B (ring opening deg) : -2.40
PA of pole (deg)     : 1.49
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 6.478
C/A sky separation (km) : 20381.5
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
    
```

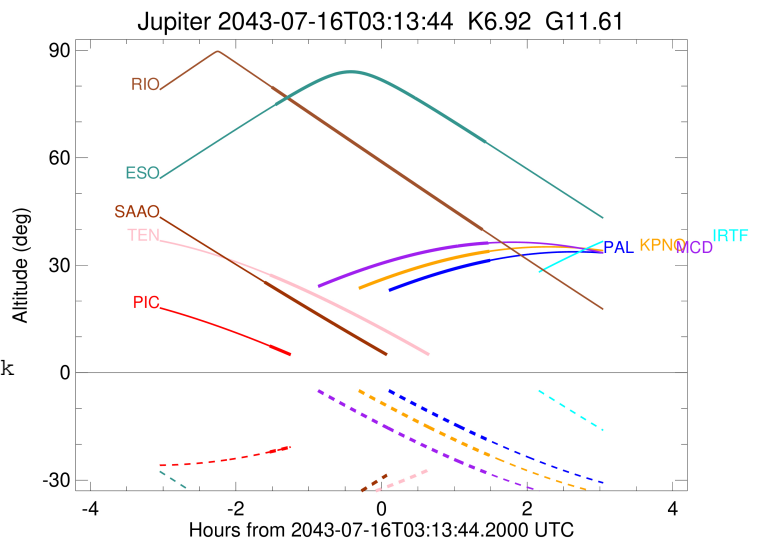
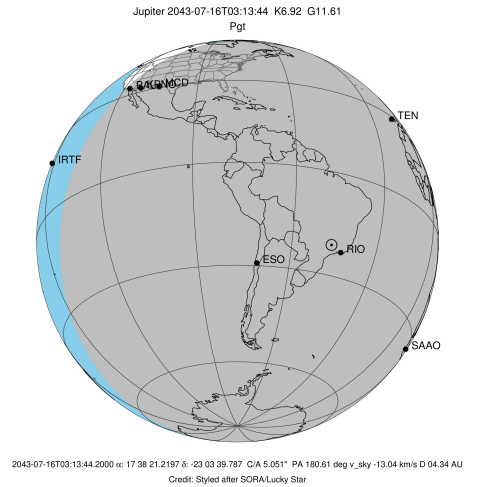


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-16T01:41:39.586	7.45	-22.14	71491.4	16.18	18.35
Jupiter	E	2043-07-16T04:35:42.316	-20.95x	-0.79x	71491.3	16.85	19.09

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-16T03:17:50.900
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       : 4116722034417731968
2Mass ID (if available) : 17382120-2303396
ICRS Star Coord at Epoch: 17h 38m 21.21972s -23:03:39.78670s
RUWE (>1.4 is poor) : 0.87
K magnitude           : 6.921
G magnitude           : 11.610
RP magnitude         : 10.423
BP magnitude         : 13.115
DUPflag              : 0
Distance (au)        : 4.338
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.04
Sun-Target sep (deg) : 152.09
Sun-Moon sep (deg)   : 39.62
B (ring opening deg) : -2.40
PA of pole (deg)     : 1.49
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 6.594
C/A sky separation (km): 20745.9
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
    
```

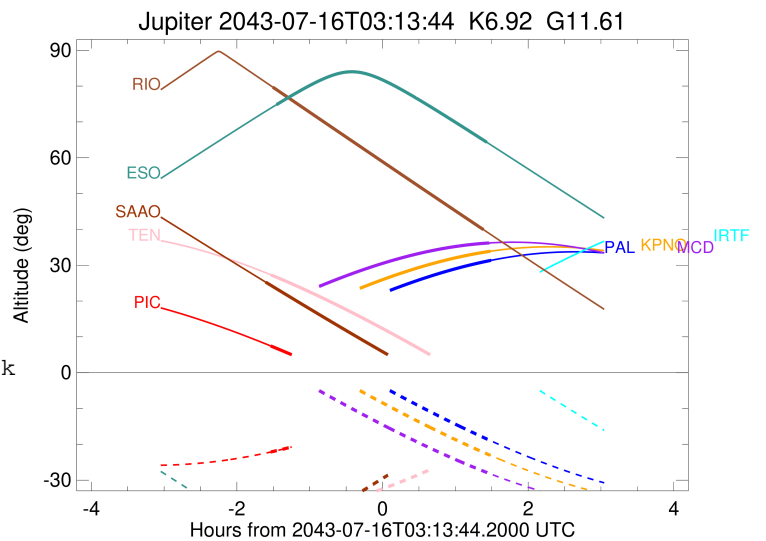
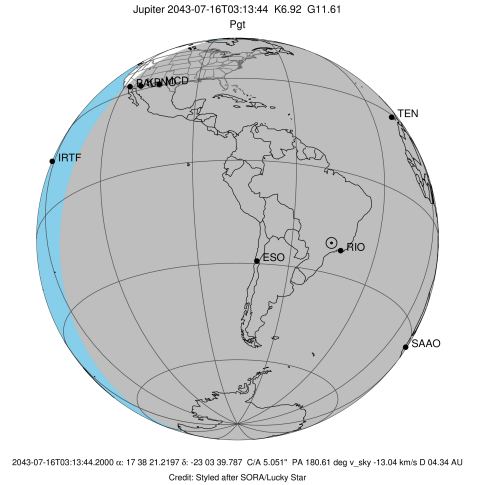


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-16T01:52:04.584	9.63	11.79x	71491.4	15.47	17.55
Jupiter	E	2043-07-16T04:43:08.259	31.35	-19.04	71491.2	18.05	20.42

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-16T03:17:25.900
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      : 4116722034417731968
2Mass ID (if available) : 17382120-2303396
ICRS Star Coord at Epoch: 17h 38m 21.21972s -23:03:39.78670s
RUWE (>1.4 is poor) : 0.87
K magnitude          : 6.921
G magnitude          : 11.610
RP magnitude         : 10.423
BP magnitude         : 13.115
DUPflag             : 0
Distance (au)       : 4.338
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.04
Sun-Target sep (deg) : 152.09
Sun-Moon sep (deg)  : 39.69
B (ring opening deg) : -2.40
PA of pole (deg)    : 1.49
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 6.601
C/A sky separation (km): 20766.9
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
    
```

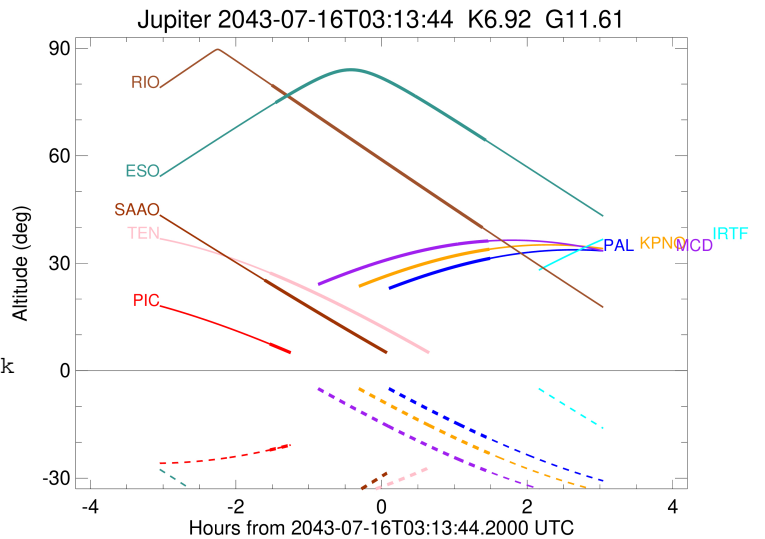
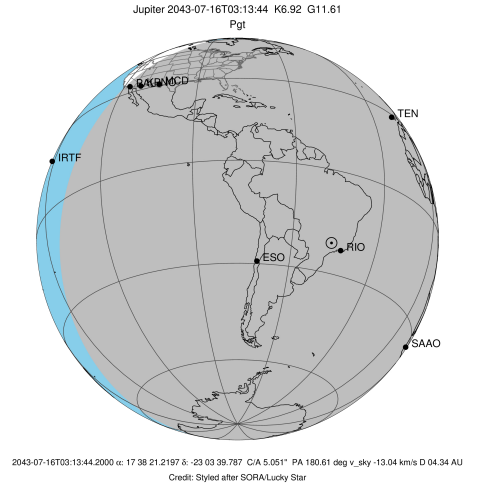


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-16T01:51:51.383	13.96	7.19x	71491.4	15.52	17.60
Jupiter	E	2043-07-16T04:42:35.085	33.89	-23.07	71491.2	18.02	20.39

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-16T03:16:43.880
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       : 4116722034417731968
2Mass ID (if available) : 17382120-2303396
ICRS Star Coord at Epoch: 17h 38m 21.21972s -23:03:39.78670s
RUWE (>1.4 is poor) : 0.87
K magnitude           : 6.921
G magnitude           : 11.610
RP magnitude          : 10.423
BP magnitude          : 13.115
DUPflag              : 0
Distance (au)        : 4.338
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.04
Sun-Target sep (deg) : 152.09
Sun-Moon sep (deg)   : 39.79
B (ring opening deg) : -2.40
PA of pole (deg)     : 1.49
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 6.618
C/A sky separation (km) : 20820.5
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
    
```

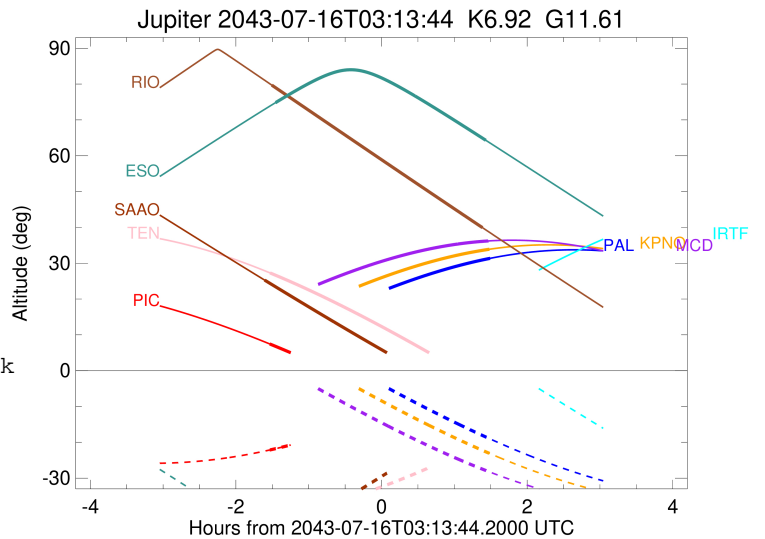
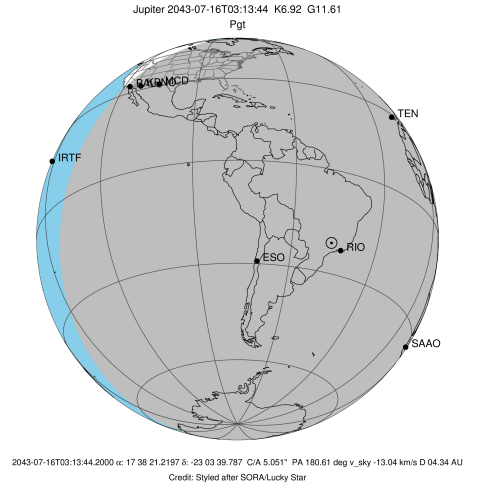


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-16T01:51:24.713	19.60	0.80x	71491.4	15.62	17.72
Jupiter	E	2043-07-16T04:41:43.660	36.21	-28.13	71491.2	17.99	20.35

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-16T03:07:51.820
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      : 4116722034417731968
2Mass ID (if available) : 17382120-2303396
ICRS Star Coord at Epoch: 17h 38m 21.21972s -23:03:39.78670s
RUWE (>1.4 is poor) : 0.87
K magnitude          : 6.921
G magnitude          : 11.610
RP magnitude         : 10.423
BP magnitude         : 13.115
DUPflag             : 0
Distance (au)        : 4.338
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.04
Sun-Target sep (deg) : 152.09
Sun-Moon sep (deg)   : 40.41
B (ring opening deg) : -2.40
PA of pole (deg)     : 1.49
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 6.311
C/A sky separation (km): 19853.8
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
    
```

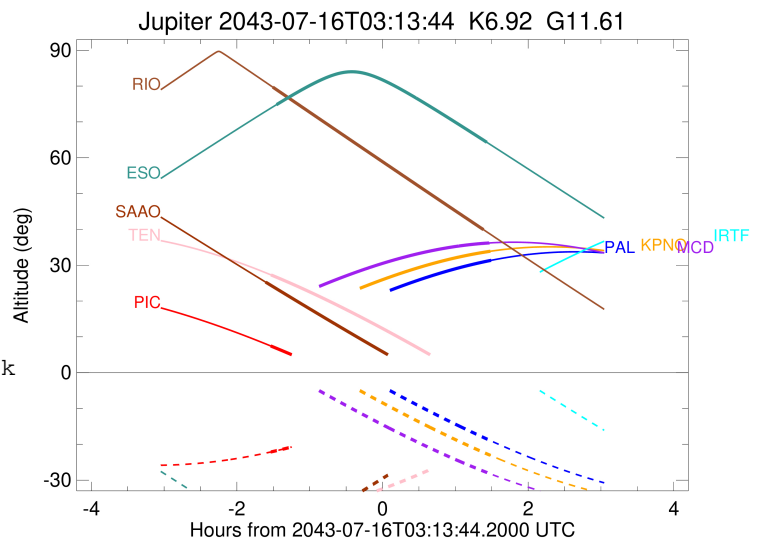
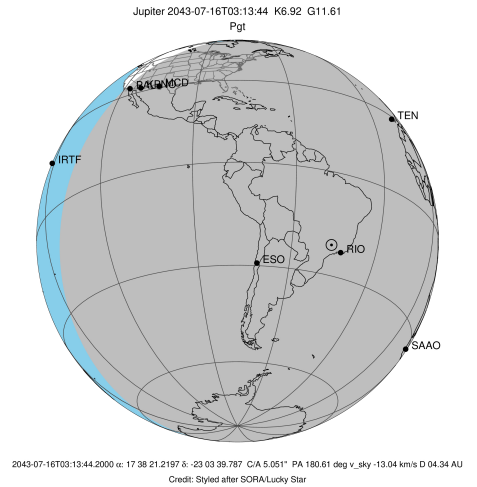


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-16T01:41:54.667	27.28	-39.95	71491.4	15.73	17.84
Jupiter	E	2043-07-16T04:34:44.954	-3.24x	-20.40	71491.4	16.34	18.52

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-16T03:09:47.460
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      : 4116722034417731968
2Mass ID (if available) : 17382120-2303396
ICRS Star Coord at Epoch: 17h 38m 21.21972s -23:03:39.78670s
RUWE (>1.4 is poor) : 0.87
K magnitude          : 6.921
G magnitude          : 11.610
RP magnitude         : 10.423
BP magnitude         : 13.115
DUPflag             : 0
Distance (au)       : 4.338
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.04
Sun-Target sep (deg) : 152.09
Sun-Moon sep (deg)  : 40.58
B (ring opening deg) : -2.40
PA of pole (deg)    : 1.49
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 4.963
C/A sky separation (km) : 15613.5
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
    
```

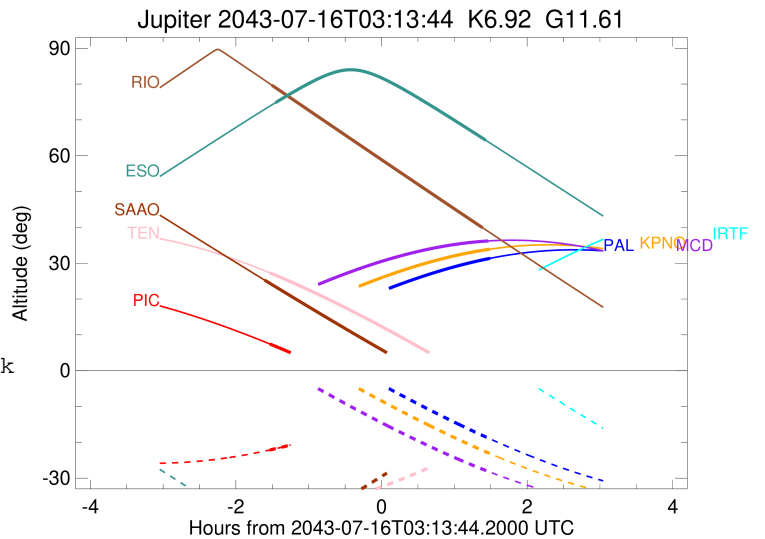
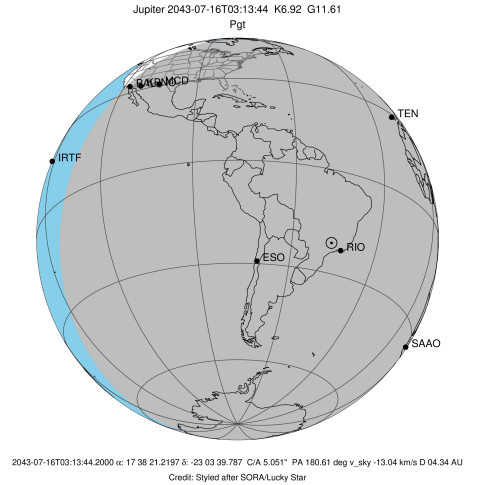


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-16T01:43:16.367	79.71	-72.43	71491.7	11.98	13.63
Jupiter	E	2043-07-16T04:36:57.351	39.91	-67.27	71491.6	13.00	14.78

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-16T03:12:59.380
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      : 4116722034417731968
2Mass ID (if available) : 17382120-2303396
ICRS Star Coord at Epoch: 17h 38m 21.21972s -23:03:39.78670s
RUWE (>1.4 is poor) : 0.87
K magnitude          : 6.921
G magnitude          : 11.610
RP magnitude         : 10.423
BP magnitude         : 13.115
DUPflag             : 0
Distance (au)       : 4.338
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.04
Sun-Target sep (deg) : 152.09
Sun-Moon sep (deg)  : 40.37
B (ring opening deg) : -2.40
PA of pole (deg)    : 1.49
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 4.847
C/A sky separation (km): 15249.4
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
    
```

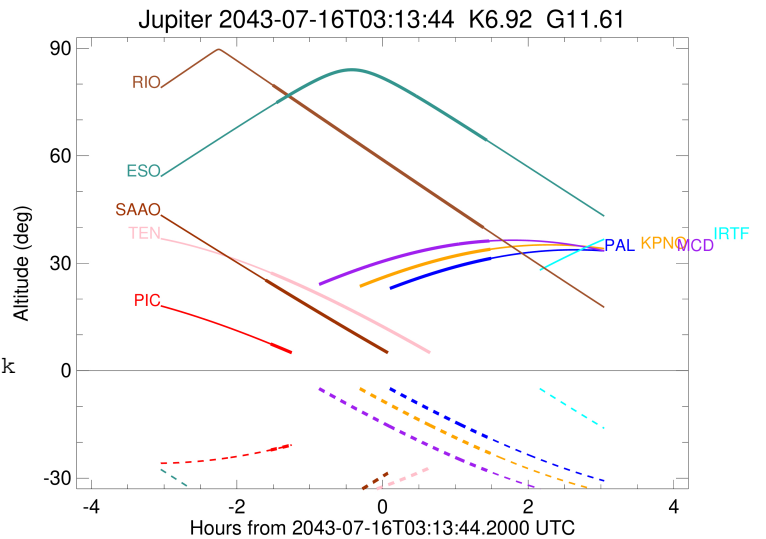
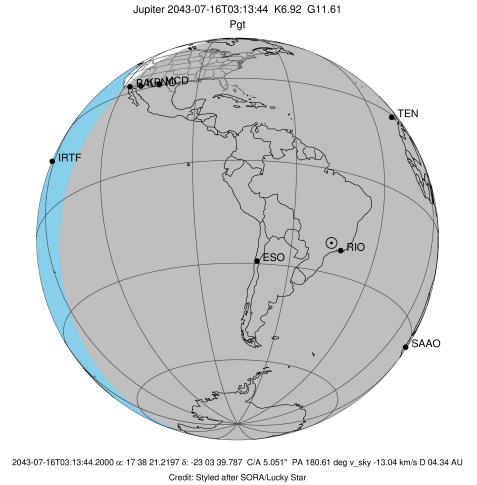


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-16T01:46:24.716	74.81	-48.27	71491.7	11.36	12.93
Jupiter	E	2043-07-16T04:39:45.502	64.29	-82.00	71491.6	13.00	14.78


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-16T03:07:03.020
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        : 4116722034417731968
2Mass ID (if available) : 17382120-2303396
ICRS Star Coord at Epoch: 17h 38m 21.21972s -23:03:39.78670s
RUWE (>1.4 is poor) : 0.87
K magnitude           : 6.921
G magnitude           : 11.610
RP magnitude          : 10.423
BP magnitude          : 13.115
DUPflag              : 0
Distance (au)         : 4.338
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -13.04
Sun-Target sep (deg) : 152.09
Sun-Moon sep (deg)   : 40.34
B (ring opening deg) : -2.40
PA of pole (deg)     : 1.49
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 4.007
C/A sky separation (km): 12605.9
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	2043-07-16T01:37:25.737	25.28	-49.85	71491.8	9.93	11.32
Jupiter	E	2043-07-16T04:37:49.081	-9.67x	-12.21	71491.7	10.38	11.83