

target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2043-07-16T03:04:09.370  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4116722034343949824  
 2Mass ID (if available) : 17382140-2303339

Jupiter 2043-07-16T03:04:09 K7.04 G12.50 Pgt

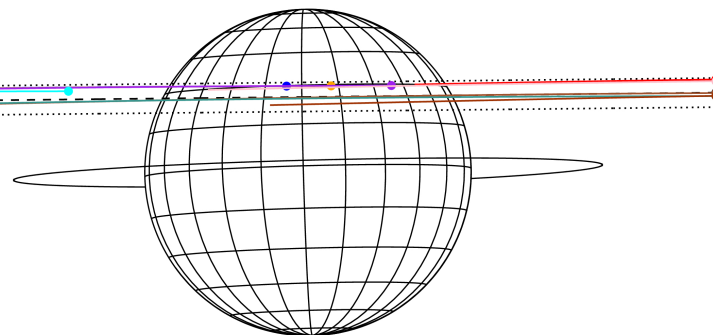
ICRS Star Coord at Epoch: 17h 38m 21.39659s -23°03'34.35137s

RUWE (>1.4 is poor) : 0.77  
 K magnitude : 7.035  
 G magnitude : 12.499  
 RP magnitude : 11.121  
 BP magnitude : 14.818  
 DUPflag : 0  
 Distance (au) : 4.338  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -13.04  
 Sun-Target sep (deg) : 152.10  
 Sun-Moon sep (deg) : 39.81  
 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 (") : 10.523  
 C/A sky separation (km) : 33106.5  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2043-07-16T03:04:09 K7.04 G12.50  
 Pgt



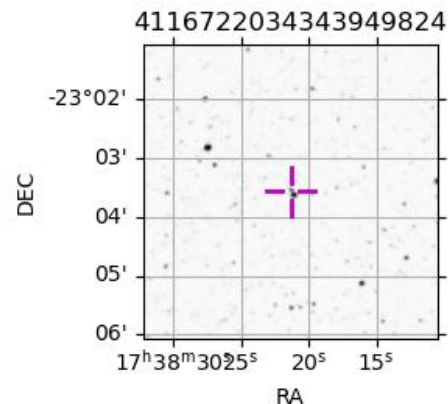
Earth  
 PIC  
 PAL  
 KPNO  
 MCD  
 TEN  
 IRTF  
 RIO  
 ESO  
 SAAO



2043-07-16T03:04:09.3700 a: 17 38 21.3966 ð -23 03 34.351 C/A \*\*\*\*\* PA 180.61 deg v\_sky -13.04 km/s D 04.34 AU  
 Credit: Styled after SORA/Lucky Star

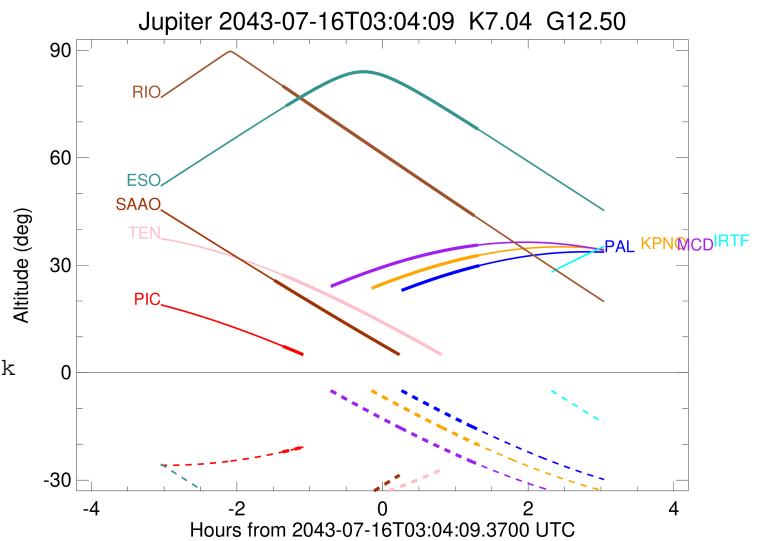
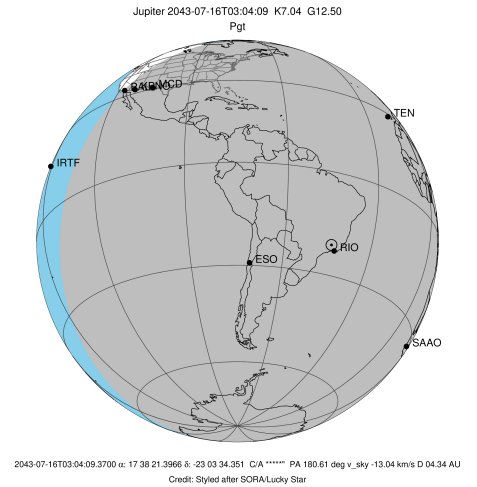
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	JUL 16 01:42 - JUL 16 01:42	Pin
PAL	Palomar Mt (200")	33.4	243.1	+	JUL 16 04:23 - JUL 16 04:23	Pne
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	JUL 16 04:23 - JUL 16 04:23	Pne
MCD	McDonald Obs. 2.7m	30.7	256.0	+	JUL 16 04:22 - JUL 16 04:22	Pne
TEN	Teide Obs./Tenerife	28.3	343.5	+	JUL 16 01:42 - JUL 16 01:42	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 01:41 - JUL 16 04:19	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	JUL 16 01:44 - JUL 16 04:22	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	JUL 16 01:35 - JUL 16 01:35	Pin
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-16T02:58:55.590
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      : 4116722034343949824
2Mass ID (if available) : 17382140-2303339
ICRS Star Coord at Epoch: 17h 38m 21.39659s -23:03:34.35137s
RUWE (>1.4 is poor) : 0.77
K magnitude          : 7.035
G magnitude          : 12.499
RP magnitude         : 11.121
BP magnitude         : 14.818
DUPflag             : 0
Distance (au)       : 4.338
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.04
Sun-Target sep (deg) : 152.10
Sun-Moon sep (deg)  : 40.28
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 ("): 11.963
C/A sky separation (km): 37634.3
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
    
```

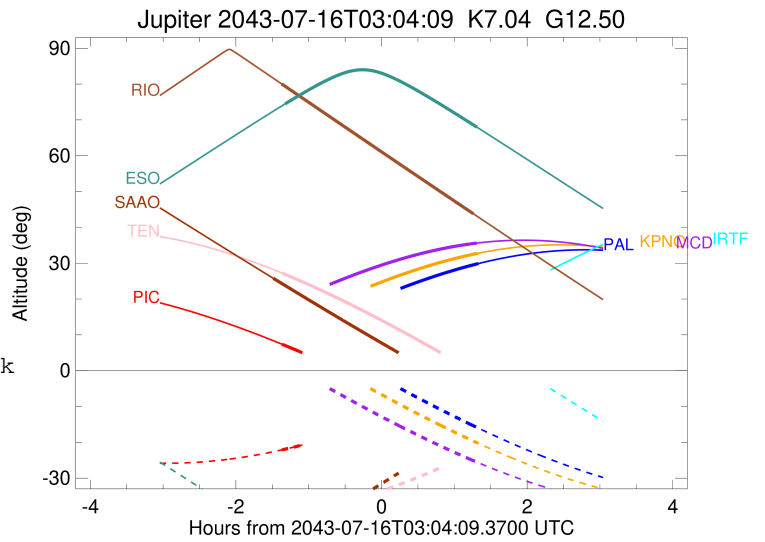
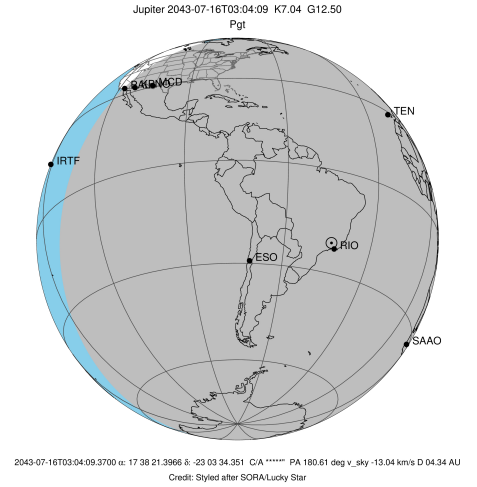


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-16T01:42:09.618	7.38	-22.10	71489.9	31.36	34.81
Jupiter	E	2043-07-16T04:16:23.281	-17.50x	-3.78x	71489.8	32.04	35.52

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-16T03:08:18.450
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        : 4116722034343949824
2Mass ID (if available) : 17382140-2303339
ICRS Star Coord at Epoch: 17h 38m 21.39659s -23:03:34.35137s
RUWE (>1.4 is poor) : 0.77
K magnitude           : 7.035
G magnitude           : 12.499
RP magnitude          : 11.121
BP magnitude          : 14.818
DUPflag              : 0
Distance (au)         : 4.338
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -13.04
Sun-Target sep (deg) : 152.10
Sun-Moon sep (deg)   : 39.66
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 (") : 12.037
C/A sky separation (km) : 37869.8
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
    
```

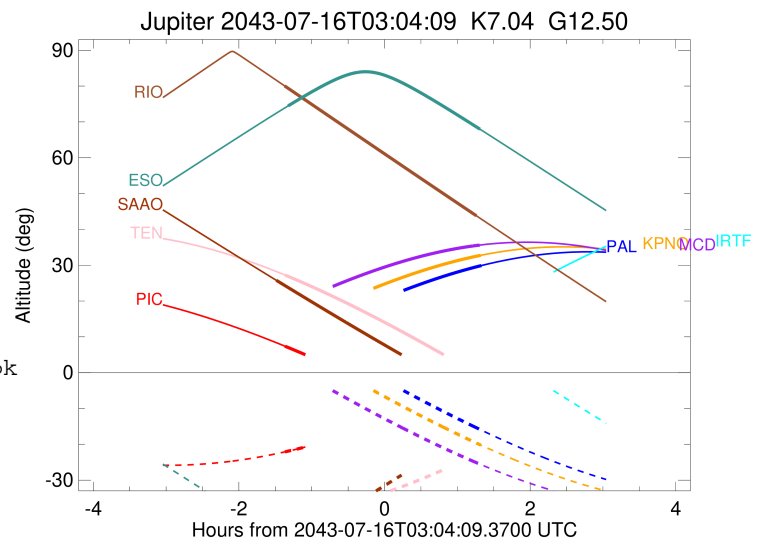
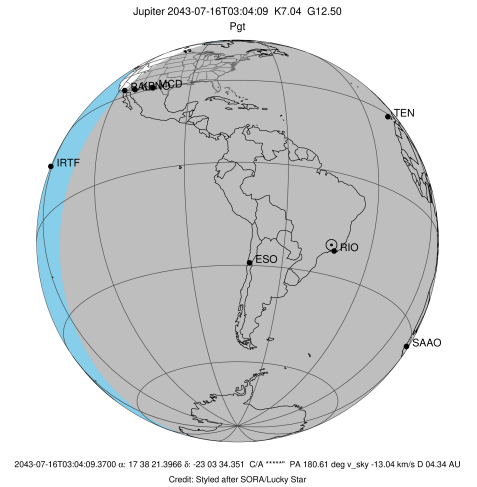


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-16T01:52:14.029	9.65	11.76x	71490.0	30.56	33.96
Jupiter	E	2043-07-16T04:23:58.957	29.89	-16.04	71489.6	33.19	36.72

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-16T03:07:55.430
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        : 4116722034343949824
2Mass ID (if available) : 17382140-2303339
ICRS Star Coord at Epoch: 17h 38m 21.39659s -23:03:34.35137s
RUWE (>1.4 is poor) : 0.77
K magnitude           : 7.035
G magnitude           : 12.499
RP magnitude          : 11.121
BP magnitude          : 14.818
DUPflag              : 0
Distance (au)         : 4.338
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -13.04
Sun-Target sep (deg) : 152.10
Sun-Moon sep (deg)   : 39.74
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 (") : 12.046
C/A sky separation (km) : 37896.2
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
    
```

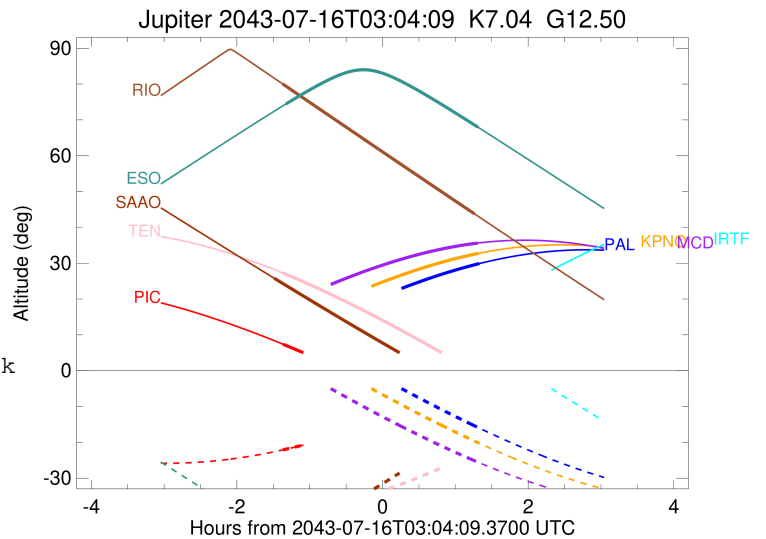
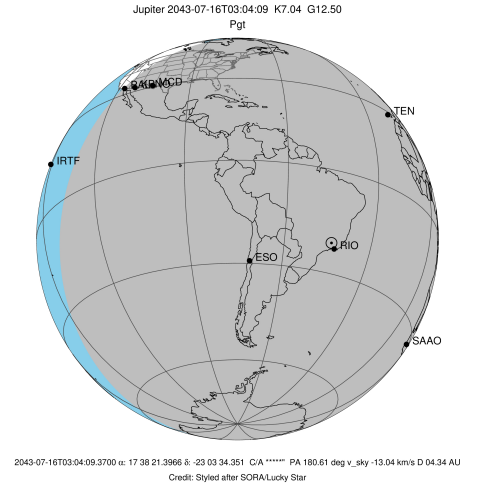


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-16T01:52:02.276	13.99	7.15x	71490.0	30.62	34.02
Jupiter	E	2043-07-16T04:23:27.406	32.75	-20.20	71489.6	33.17	36.70

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-16T03:07:16.210
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       : 4116722034343949824
2Mass ID (if available) : 17382140-2303339
ICRS Star Coord at Epoch: 17h 38m 21.39659s -23:03:34.35137s
RUWE (>1.4 is poor) : 0.77
K magnitude           : 7.035
G magnitude           : 12.499
RP magnitude          : 11.121
BP magnitude          : 14.818
DUPflag              : 0
Distance (au)        : 4.338
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -13.04
Sun-Target sep (deg) : 152.10
Sun-Moon sep (deg)   : 39.84
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 (") : 12.066
C/A sky separation (km) : 37959.0
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
    
```

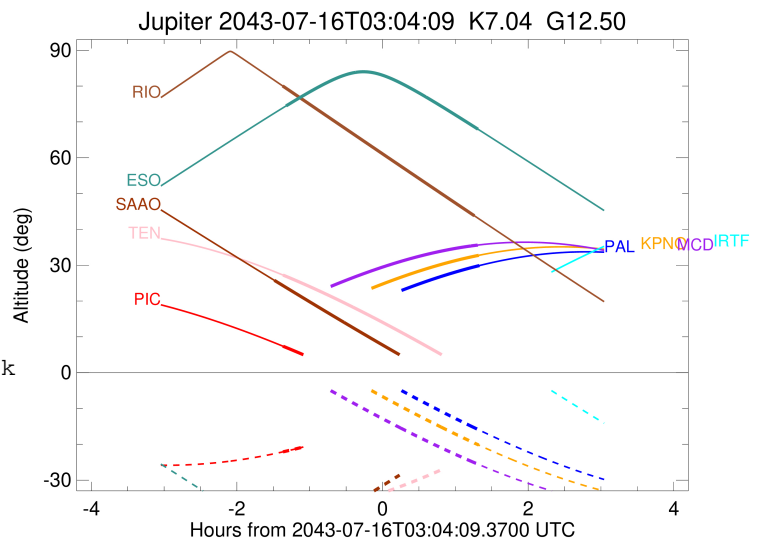
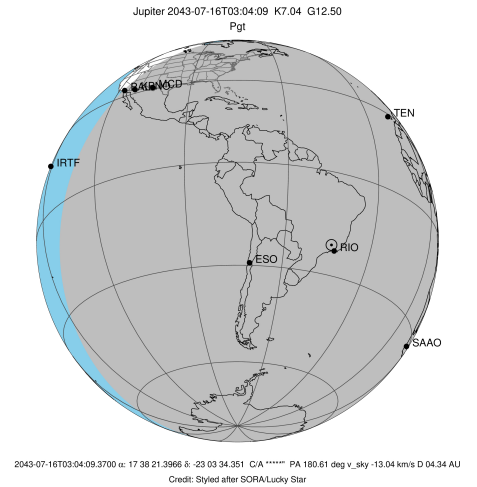


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-16T01:51:38.588	19.64	0.75x	71489.9	30.73	34.15
Jupiter	E	2043-07-16T04:22:37.187	35.61	-25.51	71489.6	33.15	36.68

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-16T02:58:39.130
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       : 4116722034343949824
2Mass ID (if available) : 17382140-2303339
ICRS Star Coord at Epoch: 17h 38m 21.39659s -23:03:34.35137s
RUWE (>1.4 is poor) : 0.77
K magnitude           : 7.035
G magnitude           : 12.499
RP magnitude          : 11.121
BP magnitude          : 14.818
DUPflag              : 0
Distance (au)         : 4.338
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -13.04
Sun-Target sep (deg) : 152.10
Sun-Moon sep (deg)   : 40.49
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 (") : 11.796
C/A sky separation (km) : 37109.4
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
    
```

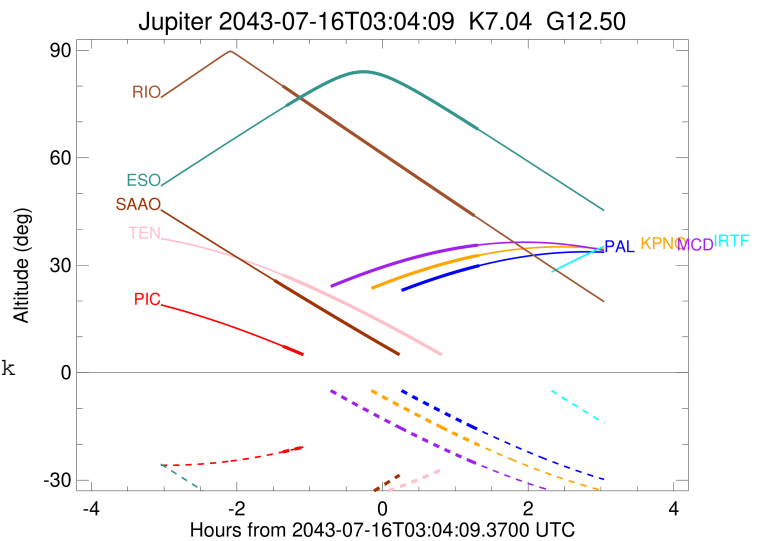
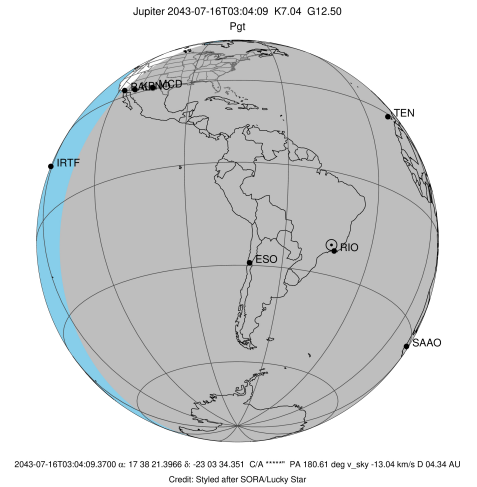


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-16T01:42:11.431	27.24	-39.94	71489.9	30.85	34.27
Jupiter	E	2043-07-16T04:15:49.644	0.54x	-23.52	71489.9	31.49	34.94

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-16T03:00:35.780
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        : 4116722034343949824
2Mass ID (if available) : 17382140-2303339
ICRS Star Coord at Epoch: 17h 38m 21.39659s -23:03:34.35137s
RUWE (>1.4 is poor)  : 0.77
K magnitude           : 7.035
G magnitude           : 12.499
RP magnitude          : 11.121
BP magnitude          : 14.818
DUPflag              : 0
Distance (au)         : 4.338
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -13.04
Sun-Target sep (deg)  : 152.10
Sun-Moon sep (deg)    : 40.65
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 (") : 10.439
C/A sky separation (km) : 32841.4
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
    
```



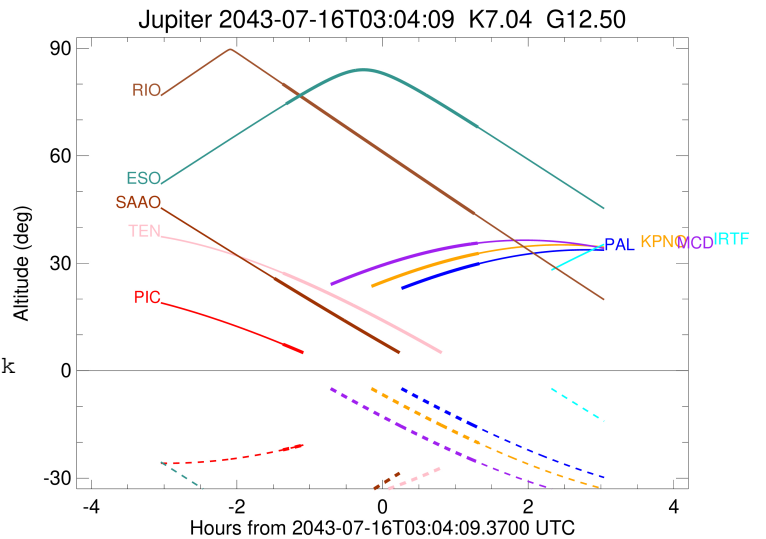
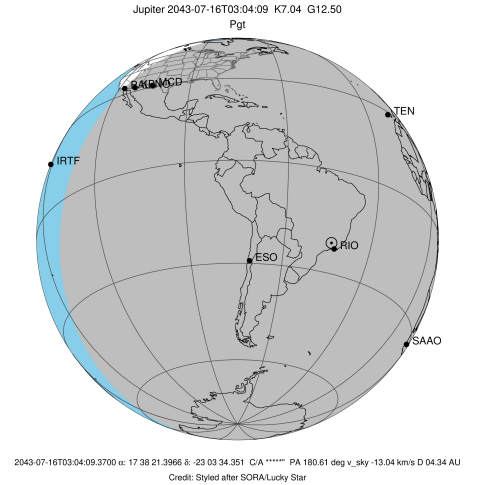
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-16T01:41:50.031	80.04	-72.10	71490.4	26.68	29.83
Jupiter	E	2043-07-16T04:19:51.626	43.79	-71.22	71490.3	27.75	30.98



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-16T03:03:42.100
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      : 4116722034343949824
2Mass ID (if available) : 17382140-2303339
ICRS Star Coord at Epoch: 17h 38m 21.39659s -23:03:34.35137s
RUWE (>1.4 is poor) : 0.77
K magnitude          : 7.035
G magnitude          : 12.499
RP magnitude         : 11.121
BP magnitude         : 14.818
DUPflag             : 0
Distance (au)       : 4.338
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.04
Sun-Target sep (deg) : 152.10
Sun-Moon sep (deg)  : 40.43
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 (") : 10.310
C/A sky separation (km) : 32436.0
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
    
```



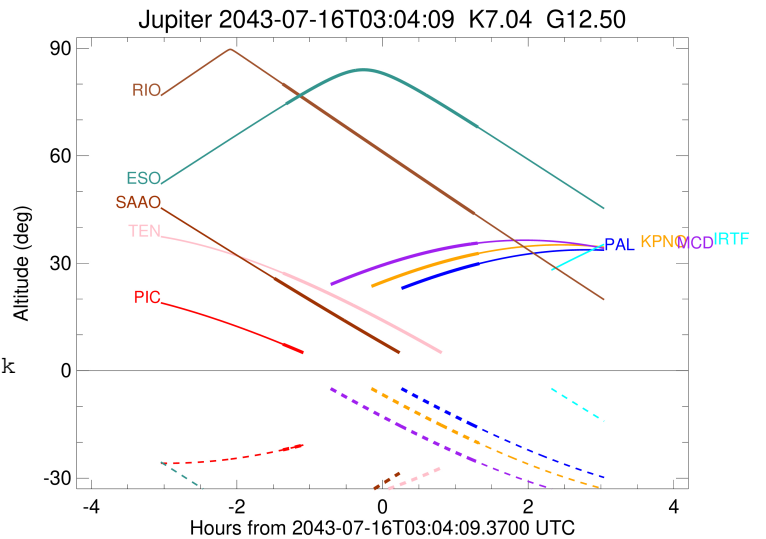
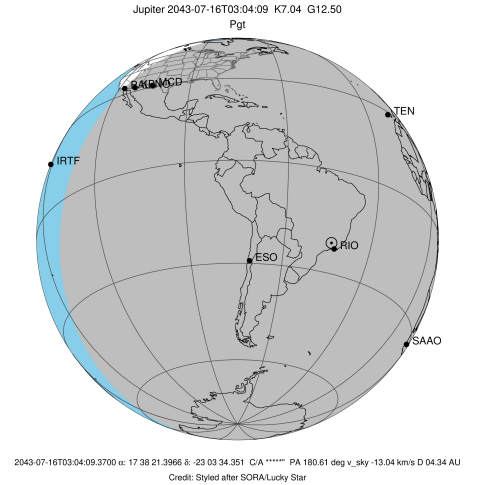
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-16T01:44:41.470	74.45	-47.89	71490.5	25.99	29.09
Jupiter	E	2043-07-16T04:22:50.262	67.95	-80.28	71490.3	27.69	30.92



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-16T02:57:42.480
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        : 4116722034343949824
2Mass ID (if available) : 17382140-2303339
ICRS Star Coord at Epoch: 17h 38m 21.39659s -23:03:34.35137s
RUWE (>1.4 is poor)  : 0.77
K magnitude           : 7.035
G magnitude           : 12.499
RP magnitude          : 11.121
BP magnitude          : 14.818
DUPflag              : 0
Distance (au)         : 4.338
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -13.04
Sun-Target sep (deg)  : 152.10
Sun-Moon sep (deg)    : 40.44
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 (") : 9.496
C/A sky separation (km) : 29873.6
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	2043-07-16T01:35:03.333	25.77	-50.35	71490.6	24.46	27.44
Jupiter	E	2043-07-16T04:21:19.577	-6.77x	-15.55	71490.6	24.90	27.92