

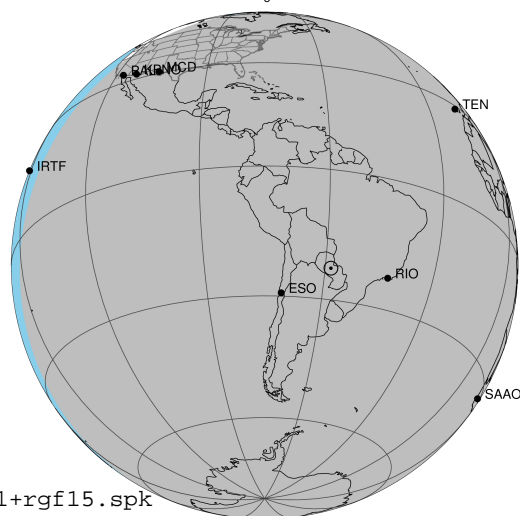
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-07-04T03:58:31.680
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116862600040359680
 2Mass ID (if available) : 17440590-2304172

Jupiter 2043-07-04T03:58:31 K8.35 G14.95 Pgt

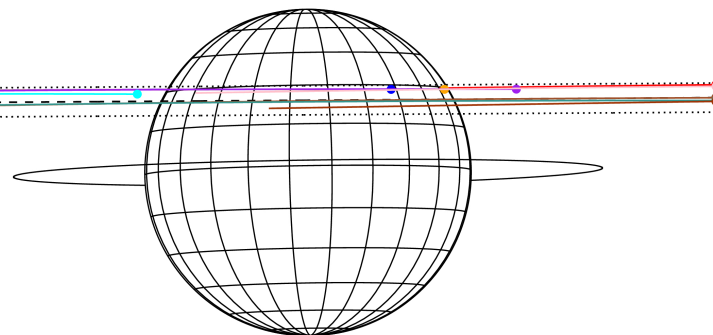
ICRS Star Coord at Epoch: 17h 44m 05.93348s -23:04:17.30214s

RUWE (>1.4 is poor) : 1.06
 K magnitude : 8.353
 G magnitude : 14.954
 RP magnitude : 13.412
 BP magnitude : 18.088
 DUPflag : 0
 Distance (au) : 4.274
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -15.44
 Sun-Target sep (deg) : 164.82
 Sun-Moon sep (deg) : 158.93
 B (ring opening deg) : -2.42
 PA of pole (deg) : 0.88
 Pole direction: RA (deg): 268.05669
 Dec (deg): 64.49732
 C/A sky separation (") : 10.207
 C/A sky separation (km) : 31638.0
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-07-04T03:58:31 K8.35 G14.95
 Pgt



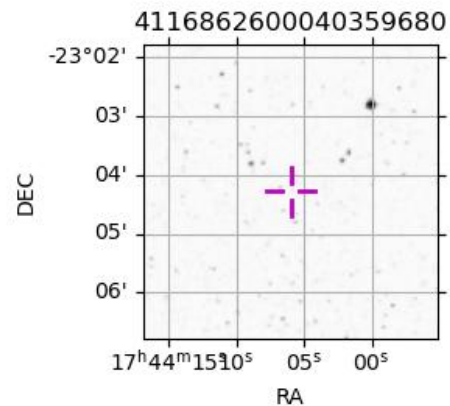
Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 SAAO



2043-07-04T03:58:31.6800 a: 17 44 05.9335 ð -23 04 17.302 C/A ***** PA 180.38 deg v_sky -15.44 km/s D 04.27 AU
 Credit: Styled after SORA/Lucky Star

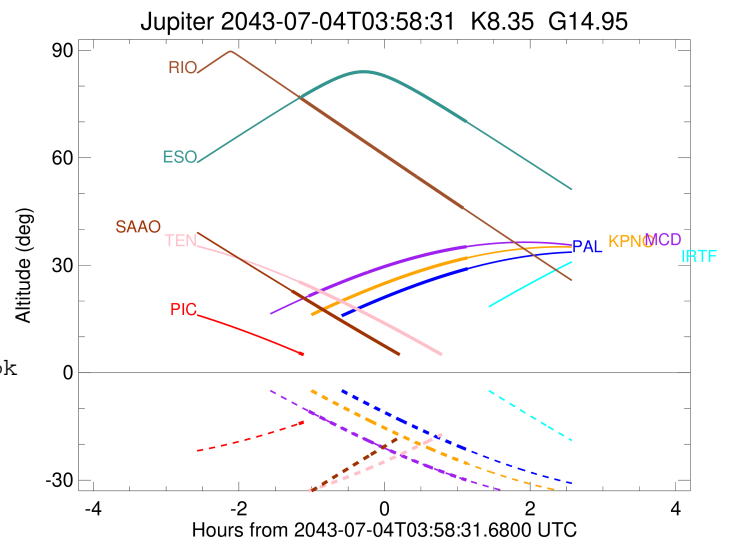
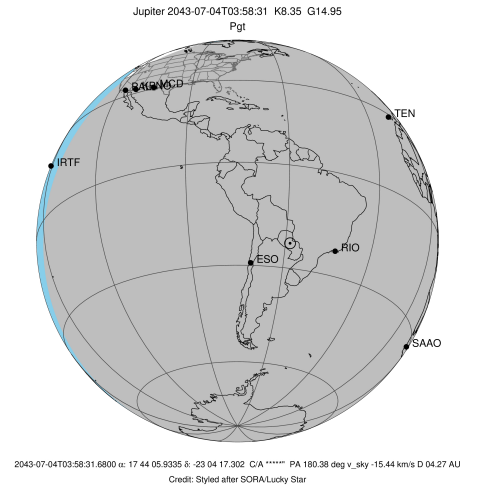
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	JUL 04 02:48 - JUL 04 02:48	Pin
PAL	Palomar Mt (200")	33.4	243.1	+	JUL 04 05:07 - JUL 04 05:07	Pne
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	JUL 04 05:06 - JUL 04 05:06	Pne
MCD	McDonald Obs. 2.7m	30.7	256.0	+	JUL 04 02:56 - JUL 04 05:06	Pie
TEN	Teide Obs./Tenerife	28.3	343.5	+	JUL 04 02:47 - JUL 04 02:47	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 04 02:47 - JUL 04 05:03	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	JUL 04 02:50 - JUL 04 05:06	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	JUL 04 02:42 - JUL 04 02:42	Pin
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-04T03:54:00.200
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        : 4116862600040359680
2Mass ID (if available) : 17440590-2304172
ICRS Star Coord at Epoch: 17h 44m 05.93348s -23:04:17.30214s
RUWE (>1.4 is poor)  : 1.06
K magnitude           : 8.353
G magnitude           : 14.954
RP magnitude          : 13.412
BP magnitude          : 18.088
DUPflag              : 0
Distance (au)         : 4.274
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -15.44
Sun-Target sep (deg)  : 164.82
Sun-Moon sep (deg)    : 159.69
B (ring opening deg)  : -2.42
PA of pole (deg)      : 0.88
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 11.657
C/A sky separation (km) : 36130.4
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
    
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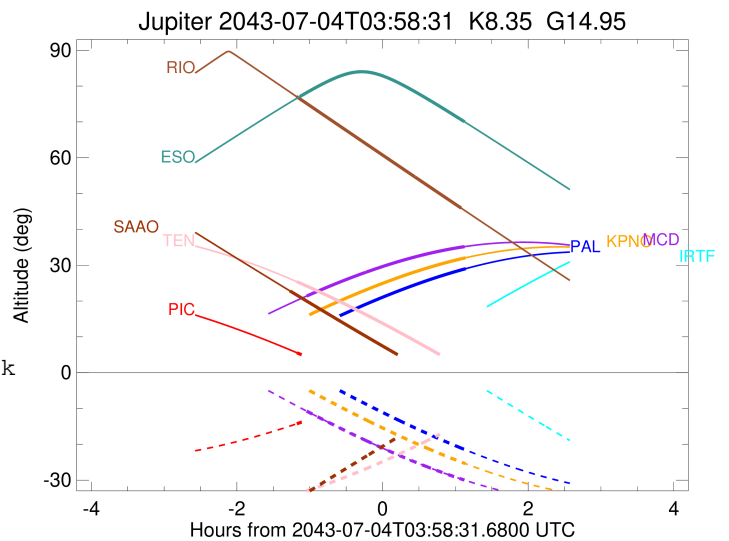
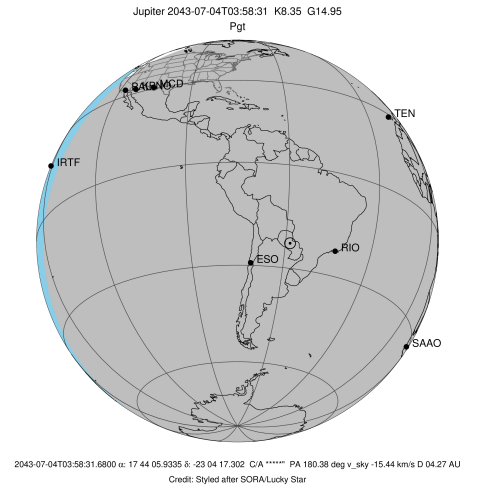


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-04T02:47:59.604	5.56	-14.26	71490.0	30.27	33.66
Jupiter	E	2043-07-04T05:00:25.856	-15.93x	4.54x	71490.0	30.34	33.73

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-04T04:02:03.660
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      : 4116862600040359680
2Mass ID (if available) : 17440590-2304172
ICRS Star Coord at Epoch: 17h 44m 05.93348s -23:04:17.30214s
RUWE (>1.4 is poor) : 1.06
K magnitude          : 8.353
G magnitude          : 14.954
RP magnitude         : 13.412
BP magnitude         : 18.088
DUPflag             : 0
Distance (au)       : 4.274
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.44
Sun-Target sep (deg) : 164.82
Sun-Moon sep (deg)  : 158.68
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.88
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 11.750
C/A sky separation (km): 36420.7
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
    
```

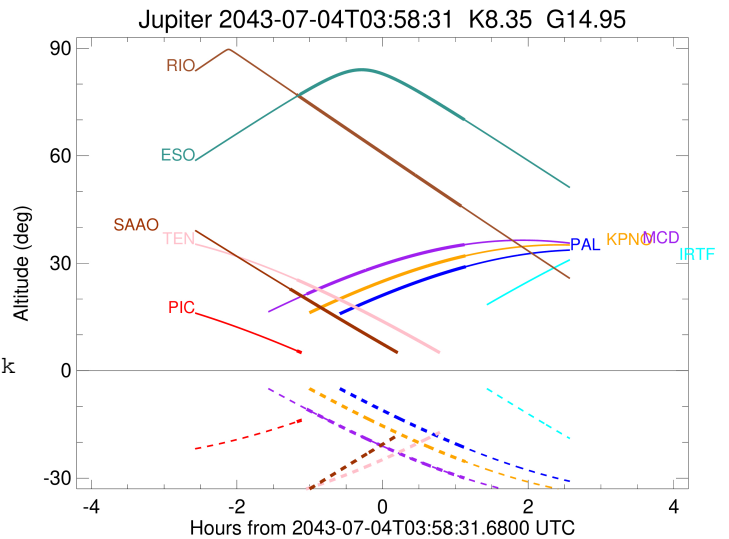
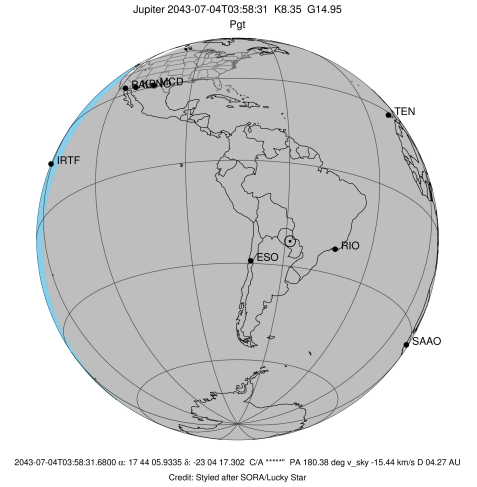


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-04T02:56:41.311	11.59	-0.15x	71490.0	29.68	33.03
Jupiter	E	2043-07-04T05:07:09.823	29.03	-21.58	71489.8	31.40	34.84

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-04T04:01:43.760
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       : 4116862600040359680
2Mass ID (if available) : 17440590-2304172
ICRS Star Coord at Epoch: 17h 44m 05.93348s -23:04:17.30214s
RUWE (>1.4 is poor) : 1.06
K magnitude          : 8.353
G magnitude          : 14.954
RP magnitude         : 13.412
BP magnitude         : 18.088
DUPflag             : 0
Distance (au)        : 4.274
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.44
Sun-Target sep (deg) : 164.82
Sun-Moon sep (deg)   : 158.75
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.88
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 11.758
C/A sky separation (km) : 36445.7
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
    
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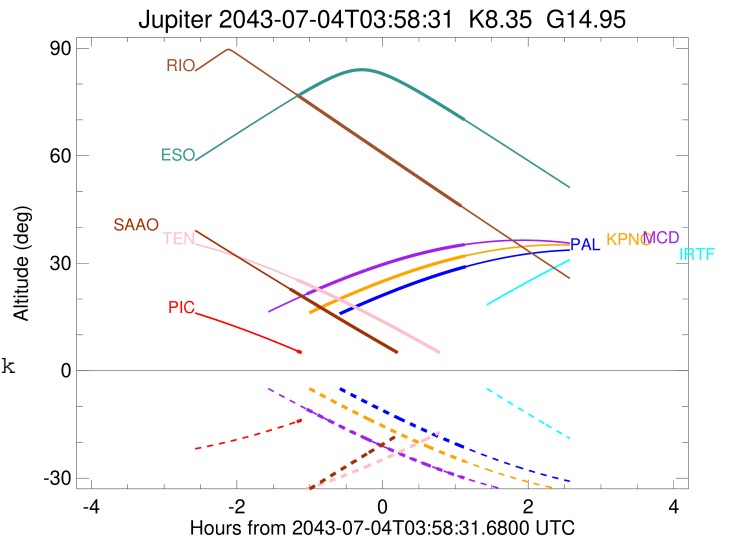
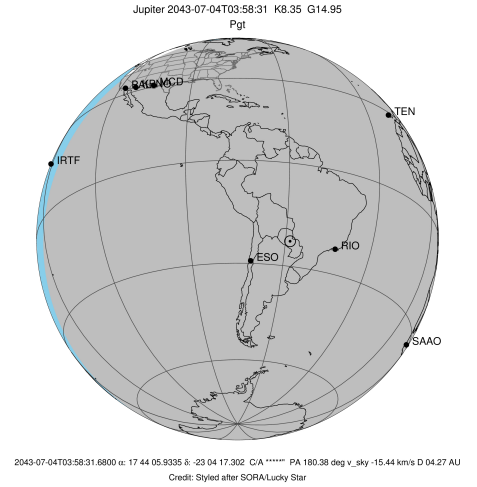


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-04T02:56:29.579	15.87	-4.67x	71490.0	29.73	33.08
Jupiter	E	2043-07-04T05:06:43.479	32.04	-25.38	71489.8	31.38	34.83

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-04T04:01:09.860
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      : 4116862600040359680
2Mass ID (if available) : 17440590-2304172
ICRS Star Coord at Epoch: 17h 44m 05.93348s -23:04:17.30214s
RUWE (>1.4 is poor) : 1.06
K magnitude          : 8.353
G magnitude          : 14.954
RP magnitude         : 13.412
BP magnitude         : 18.088
DUPflag             : 0
Distance (au)       : 4.274
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.44
Sun-Target sep (deg) : 164.82
Sun-Moon sep (deg)  : 158.86
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.88
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 11.778
C/A sky separation (km) : 36505.9
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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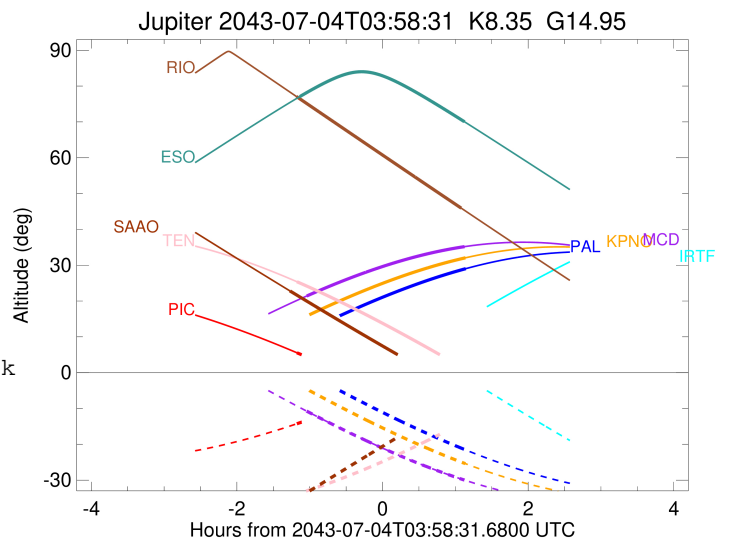
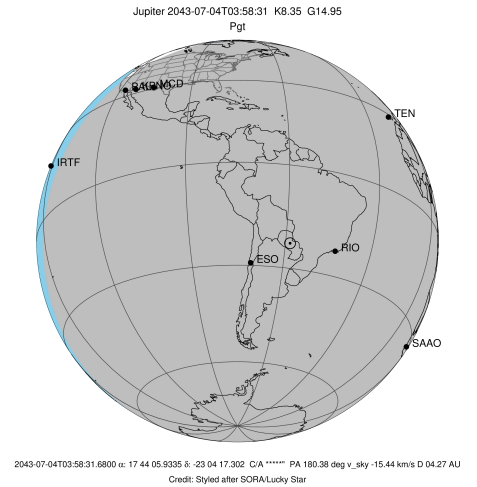


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-04T02:56:06.962	21.40	-10.75	71490.0	29.84	33.20
Jupiter	E	2043-07-04T05:06:01.184	35.17	-29.97	71489.8	31.37	34.82

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-04T03:53:45.410
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        : 4116862600040359680
2Mass ID (if available) : 17440590-2304172
ICRS Star Coord at Epoch: 17h 44m 05.93348s -23:04:17.30214s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 8.353
G magnitude           : 14.954
RP magnitude          : 13.412
BP magnitude          : 18.088
DUPflag              : 0
Distance (au)         : 4.274
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.44
Sun-Target sep (deg)  : 164.82
Sun-Moon sep (deg)   : 159.83
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.88
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 11.487
C/A sky separation (km) : 35603.8
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
    
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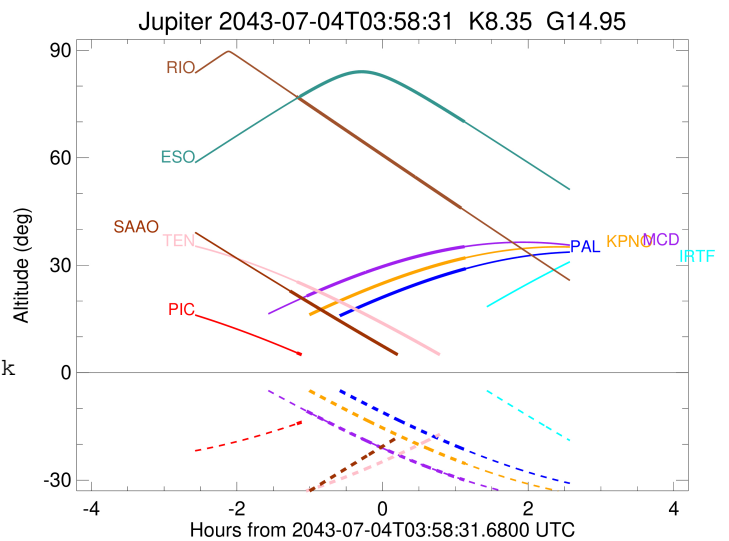
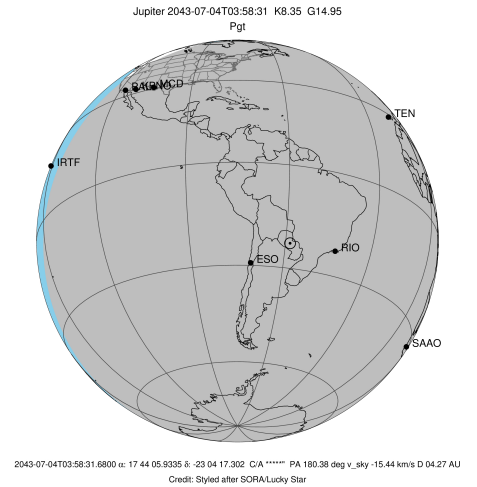


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-04T02:47:56.631	25.39	-33.81	71490.0	29.78	33.14
Jupiter	E	2043-07-04T05:00:00.136	2.25x	-14.73	71490.0	29.80	33.16

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-04T03:55:26.340
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       : 4116862600040359680
2Mass ID (if available) : 17440590-2304172
ICRS Star Coord at Epoch: 17h 44m 05.93348s -23:04:17.30214s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 8.353
G magnitude           : 14.954
RP magnitude          : 13.412
BP magnitude          : 18.088
DUPflag              : 0
Distance (au)         : 4.274
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.44
Sun-Target sep (deg) : 164.82
Sun-Moon sep (deg)   : 159.68
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.88
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 10.115
C/A sky separation (km) : 31351.3
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
    
```

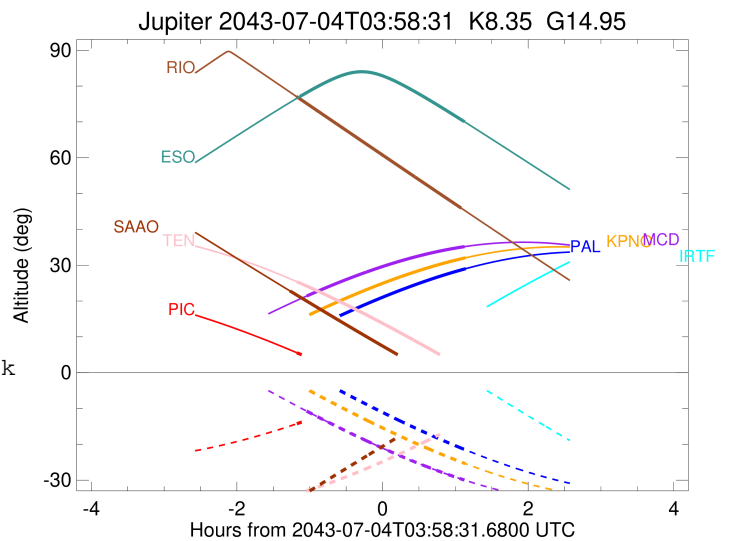
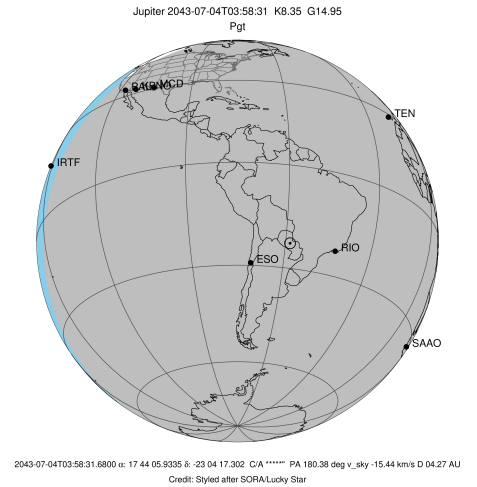


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-04T02:47:45.891	77.04	-87.82	71490.5	25.72	28.80
Jupiter	E	2043-07-04T05:03:24.719	45.92	-60.98	71490.5	26.10	29.21


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-04T03:58:06.550
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      : 4116862600040359680
2Mass ID (if available) : 17440590-2304172
ICRS Star Coord at Epoch: 17h 44m 05.93348s -23:04:17.30214s
RUWE (>1.4 is poor) : 1.06
K magnitude          : 8.353
G magnitude          : 14.954
RP magnitude         : 13.412
BP magnitude         : 18.088
DUPflag             : 0
Distance (au)        : 4.274
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.44
Sun-Target sep (deg) : 164.82
Sun-Moon sep (deg)  : 159.33
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.88
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 9.990
C/A sky separation (km) : 30965.7
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
    
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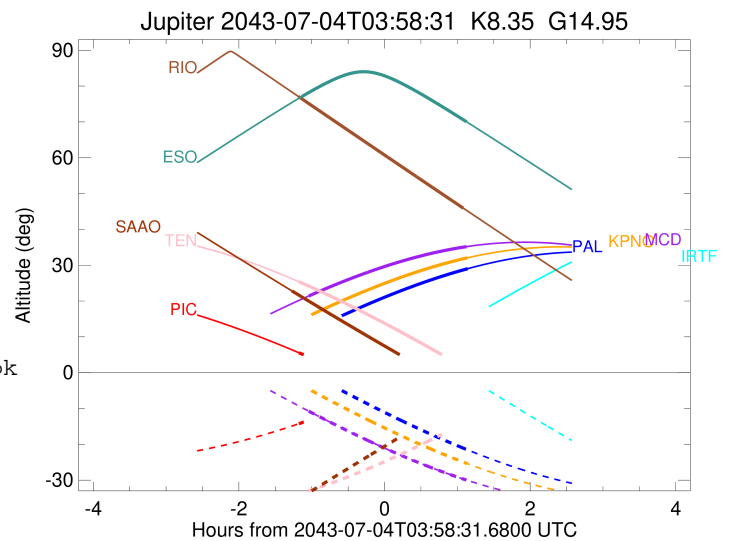
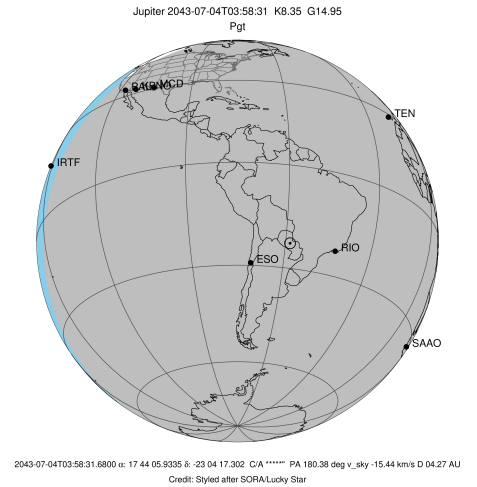


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-04T02:50:16.458	77.04	-63.06	71490.6	25.10	28.13
Jupiter	E	2043-07-04T05:06:00.350	70.05	-82.49	71490.5	26.02	29.12


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-04T03:53:01.310
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     : 4116862600040359680
2Mass ID (if available) : 17440590-2304172
ICRS Star Coord at Epoch: 17h 44m 05.93348s -23:04:17.30214s
RUWE (>1.4 is poor) : 1.06
K magnitude         : 8.353
G magnitude         : 14.954
RP magnitude        : 13.412
BP magnitude        : 18.088
DUPflag            : 0
Distance (au)      : 4.274
f0 (km)            : 0.00
g0 (km)            : 0.00
skyplane vel. (km/s) : -15.44
Sun-Target sep (deg) : 164.82
Sun-Moon sep (deg)  : 159.64
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.88
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 9.150
C/A sky separation (km) : 28360.4
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	2043-07-04T02:42:19.357	22.80	-36.40	71490.7	23.42	26.31
Jupiter	E	2043-07-04T05:04:17.768	-4.98x	-7.38	71490.8	23.29	26.17