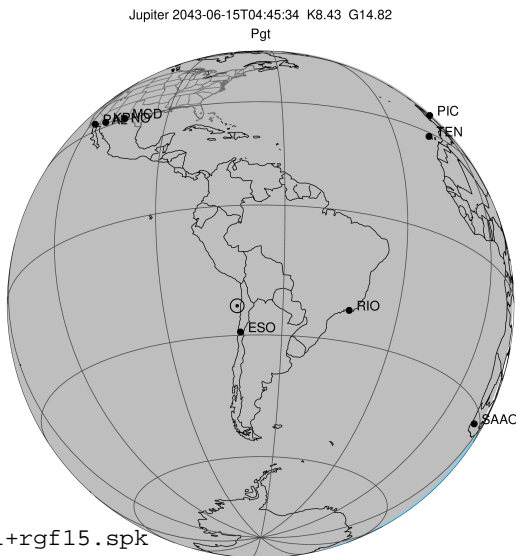


target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-06-15T04:45:34.910
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4070135589308350720
 2Mass ID (if available) : 17542769-2304298

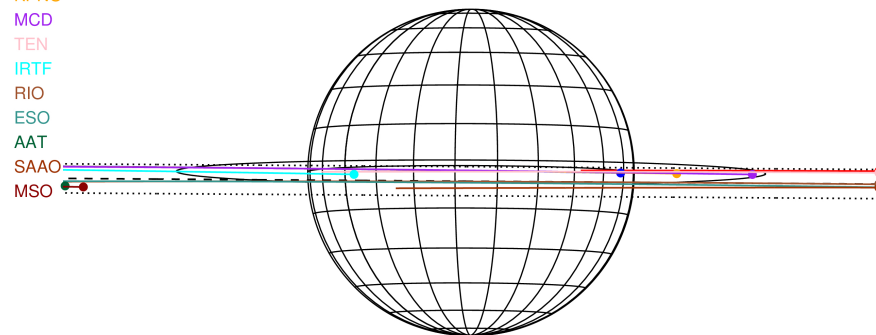
Jupiter 2043-06-15T04:45:34 K8.43 G14.82 Pgt

ICRS Star Coord at Epoch: 17h 54m 27.69661s -23:04:30.15832s
 RUWE (>1.4 is poor) : 1.06
 K magnitude : 8.428
 G magnitude : 14.822
 RP magnitude : 13.337
 BP magnitude : 17.903
 DUPflag : 0
 Distance (au) : 4.256
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -16.29
 Sun-Target sep (deg) : 174.69
 Sun-Moon sep (deg) : 86.62
 B (ring opening deg) : -2.43
 PA of pole (deg) : -0.24
 Pole direction: RA (deg): 268.05668
 Dec (deg): 64.49732
 C/A sky separation (") : 1.239
 C/A sky separation (km) : 3824.9
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLv1.spk
 naif0012.tls
 nep097.bsp
 nep101.bsp
 sat4401.bsp



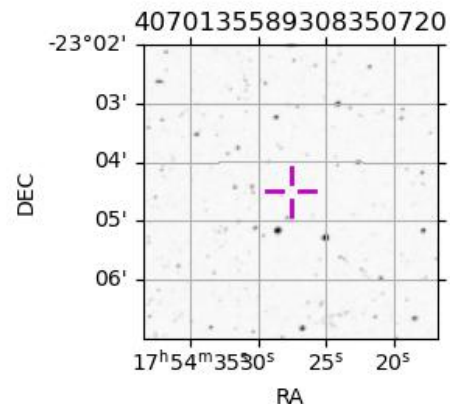
2043-06-15T04:45:34.9100 at: 17 54 27.6966 s: -23 04 30.1583 C/A 1.251" PA 359.60 deg v_sky -16.29 km/s D 04.26 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 AAT
 SAAO
 MSO



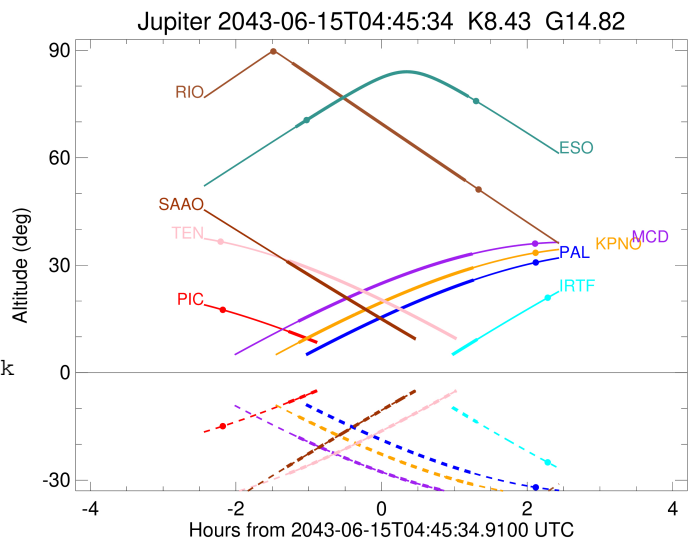
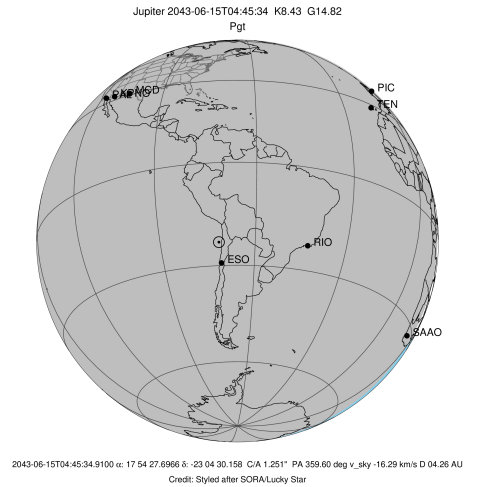
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	JUN 15 03:28 - JUN 15 03:28	Pin
PAL	Palomar Mt (200")	33.4	243.1	+	JUN 15 06:01 - JUN 15 06:01	Pne
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	JUN 15 03:37 - JUN 15 06:01	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+	JUN 15 03:37 - JUN 15 06:00	Pie
TEN	Teide Obs./Tenerife	28.3	343.5	+	JUN 15 03:29 - JUN 15 03:29	Pin
IRTF	Mauna Kea/IRTF	19.8	204.5	+	JUN 15 06:04 - JUN 15 06:04	Pne
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+	JUN 15 03:32 - JUN 15 05:54	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	JUN 15 03:34 - JUN 15 05:57	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	JUN 15 03:27 - JUN 15 03:27	Pin
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-15T04:41:12.570
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        : 4070135589308350720
2Mass ID (if available) : 17542769-2304298
ICRS Star Coord at Epoch: 17h 54m 27.69661s -23:04:30.15832s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 8.428
G magnitude           : 14.822
RP magnitude          : 13.337
BP magnitude          : 17.903
DUPflag              : 0
Distance (au)         : 4.256
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.29
Sun-Target sep (deg)  : 174.69
Sun-Moon sep (deg)    : 86.67
B (ring opening deg) : -2.43
PA of pole (deg)     : -0.24
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 0.289
C/A sky separation (km) : 892.1
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
    
```

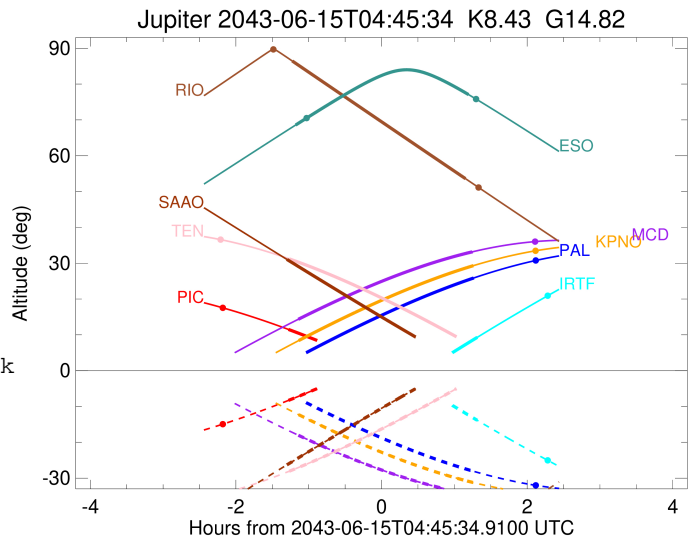
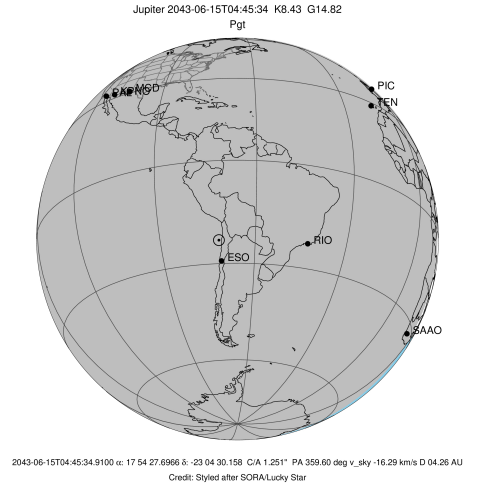


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-15T03:28:54.700	11.51	-8.30	71492.0	0.94	1.08
Jupiter	E	2043-06-15T05:53:55.575	-10.45x	14.54x	71492.0	0.42	0.48

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-15T04:49:43.340
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      : 4070135589308350720
2Mass ID (if available) : 17542769-2304298
ICRS Star Coord at Epoch: 17h 54m 27.69661s -23:04:30.15832s
RUWE (>1.4 is poor) : 1.06
K magnitude         : 8.428
G magnitude         : 14.822
RP magnitude        : 13.337
BP magnitude        : 17.903
DUPflag            : 0
Distance (au)       : 4.256
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -16.29
Sun-Target sep (deg) : 174.69
Sun-Moon sep (deg)  : 86.83
B (ring opening deg) : -2.43
PA of pole (deg)    : -0.24
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (" ) : 0.248
C/A sky separation (km) : 766.5
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
    
```

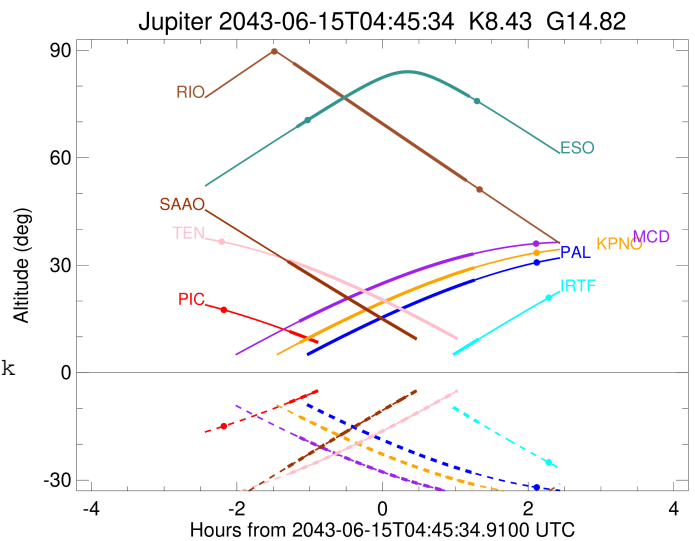
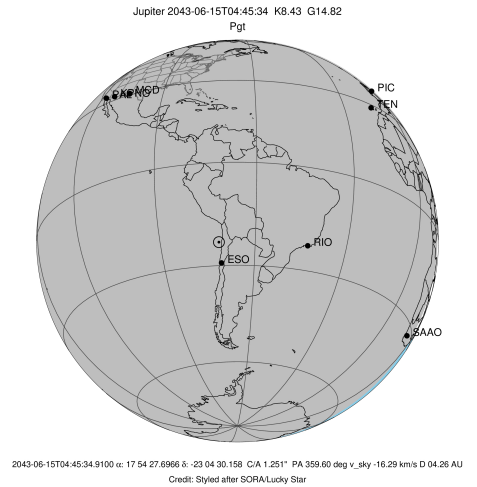


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-15T03:37:27.498	3.93x	-7.89	71492.0	0.01	0.01
Jupiter	E	2043-06-15T06:01:34.339	25.87	-28.10	71492.0	1.10	1.26

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch              : 2043-06-15T04:49:26.990
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        : 4070135589308350720
2Mass ID (if available) : 17542769-2304298
ICRS Star Coord at Epoch: 17h 54m 27.69661s -23:04:30.15832s
RUWE (>1.4 is poor)  : 1.06
K magnitude            : 8.428
G magnitude            : 14.822
RP magnitude           : 13.337
BP magnitude           : 17.903
DUPflag               : 0
Distance (au)         : 4.256
f0 (km)                : 0.00
g0 (km)                : 0.00
skyplane vel. (km/s)  : -16.29
Sun-Target sep (deg)  : 174.69
Sun-Moon sep (deg)    : 86.90
B (ring opening deg)  : -2.43
PA of pole (deg)      : -0.24
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 0.262
C/A sky separation (km) : 807.5
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
    
```

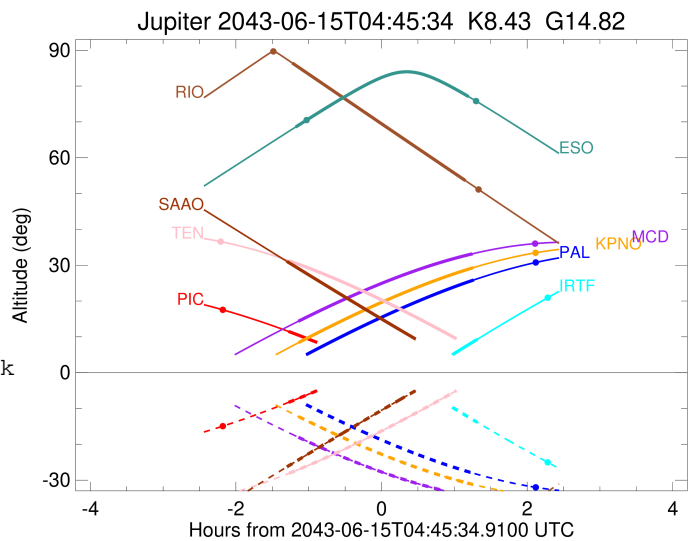
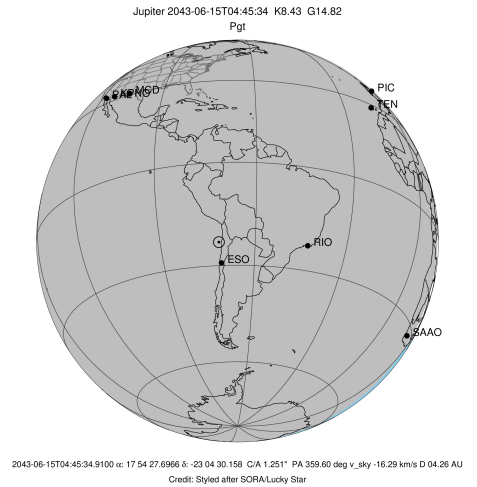


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-15T03:37:19.802	8.40	-12.28	71492.0	0.06	0.07
Jupiter	E	2043-06-15T06:01:11.049	29.30	-31.22	71492.0	1.10	1.26

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-15T04:48:57.290
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        : 4070135589308350720
2Mass ID (if available) : 17542769-2304298
ICRS Star Coord at Epoch: 17h 54m 27.69661s -23:04:30.15832s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 8.428
G magnitude           : 14.822
RP magnitude          : 13.337
BP magnitude          : 17.903
DUPflag              : 0
Distance (au)         : 4.256
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.29
Sun-Target sep (deg)  : 174.69
Sun-Moon sep (deg)    : 86.98
B (ring opening deg)  : -2.43
PA of pole (deg)      : -0.24
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 0.290
C/A sky separation (km) : 895.0
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
    
```

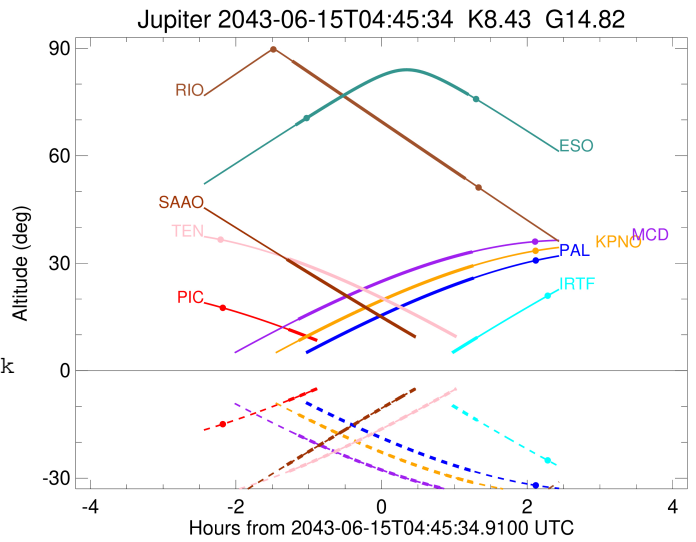
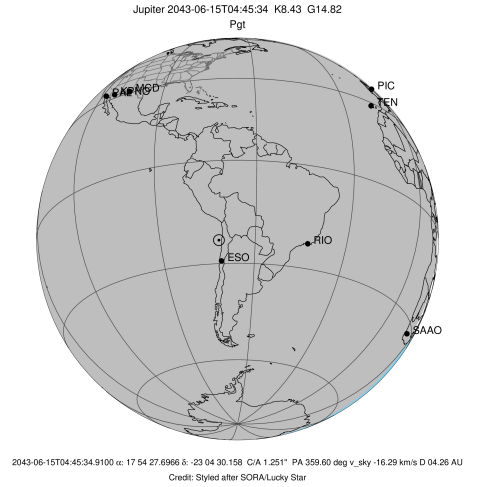


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-15T03:37:01.393	14.34	-18.02	71492.0	0.18	0.20
Jupiter	E	2043-06-15T06:00:33.068	33.18	-34.55	71492.0	1.12	1.28

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-15T04:41:15.830
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       : 4070135589308350720
2Mass ID (if available) : 17542769-2304298
ICRS Star Coord at Epoch: 17h 54m 27.69661s -23:04:30.15832s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 8.428
G magnitude           : 14.822
RP magnitude          : 13.337
BP magnitude          : 17.903
DUPflag              : 0
Distance (au)        : 4.256
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.29
Sun-Target sep (deg) : 174.69
Sun-Moon sep (deg)   : 86.97
B (ring opening deg) : -2.43
PA of pole (deg)     : -0.24
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation ("): 0.120
C/A sky separation (km): 368.9
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
    
```

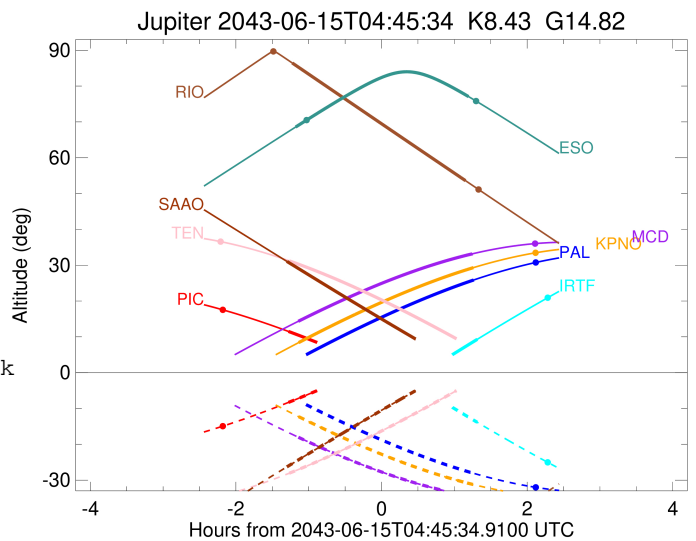
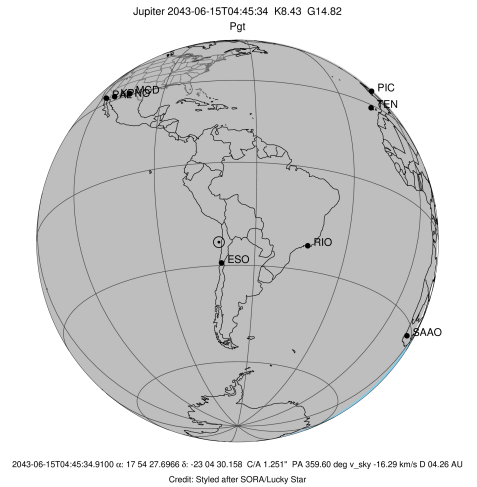


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-15T03:29:30.405	31.21	-28.08	71492.0	0.50	0.57
Jupiter	E	2043-06-15T05:53:25.568	8.32	-3.85x	71492.0	-0.02	-0.03

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-15T04:51:43.120
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : IRTF
Location            : Mauna Kea/IRTF
Latitude (deg)      : 19.82622
E. Longitude (deg)  : 204.52800
Altitude (km)       : 4.168
Gaia source ID      : 4070135589308350720
2Mass ID (if available) : 17542769-2304298
ICRS Star Coord at Epoch: 17h 54m 27.69661s -23:04:30.15832s
RUWE (>1.4 is poor) : 1.06
K magnitude          : 8.428
G magnitude          : 14.822
RP magnitude         : 13.337
BP magnitude         : 17.903
DUPflag             : 0
Distance (au)       : 4.256
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.29
Sun-Target sep (deg) : 174.69
Sun-Moon sep (deg)  : 86.45
B (ring opening deg) : -2.43
PA of pole (deg)    : -0.24
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (" ) : 0.555
C/A sky separation (km) : 1712.3
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
    
```

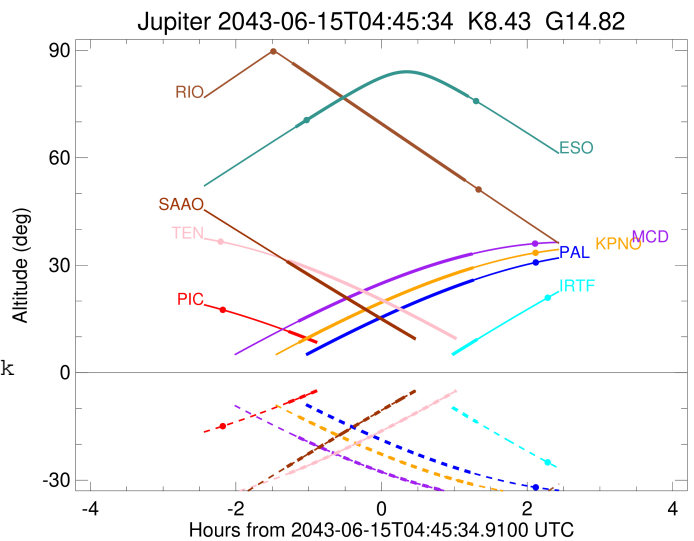
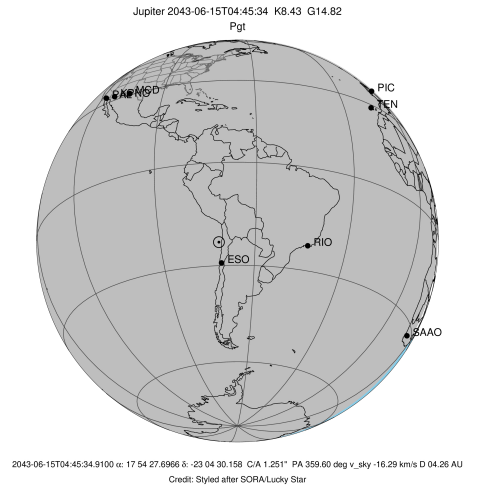


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-15T03:38:20.418	-22.51x	17.34x	71492.0	-2.13	-2.43
Jupiter	E	2043-06-15T06:04:27.954	9.30	-13.85	71492.0	-0.63	-0.72


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-15T04:43:20.420
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        : 4070135589308350720
2Mass ID (if available) : 17542769-2304298
ICRS Star Coord at Epoch: 17h 54m 27.69661s -23:04:30.15832s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 8.428
G magnitude           : 14.822
RP magnitude          : 13.337
BP magnitude          : 17.903
DUPflag              : 0
Distance (au)         : 4.256
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.29
Sun-Target sep (deg) : 174.69
Sun-Moon sep (deg)   : 87.49
B (ring opening deg) : -2.43
PA of pole (deg)     : -0.24
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 1.289
C/A sky separation (km) : 3977.8
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
    
```

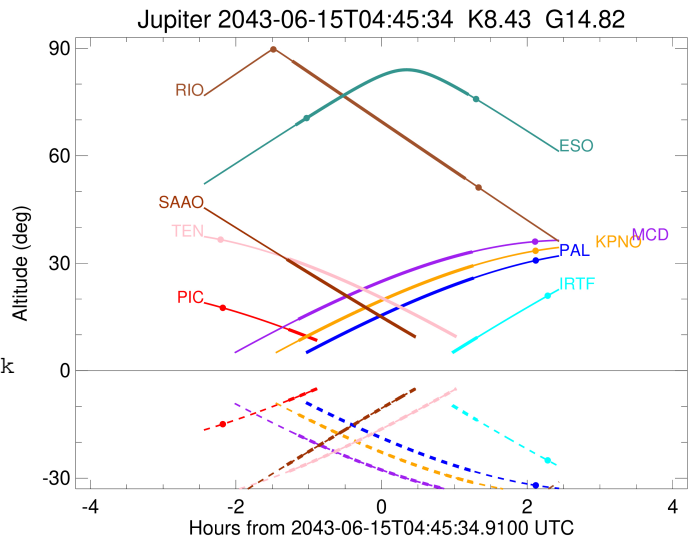
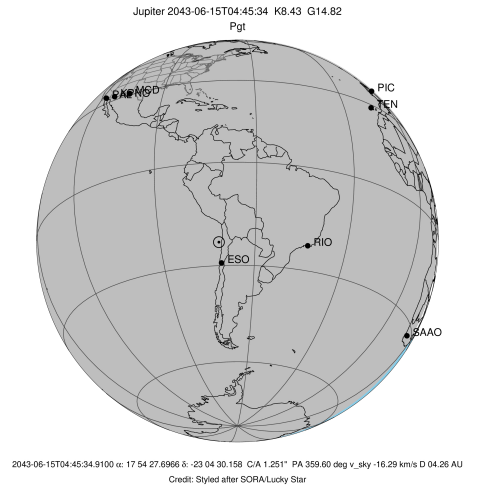


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-15T03:32:07.536	86.42	-81.05	71492.0	-3.20	-3.66
Jupiter	E	2043-06-15T05:54:45.529	53.60	-48.43	71492.0	-3.34	-3.82


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-15T04:46:05.870
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       : 4070135589308350720
2Mass ID (if available) : 17542769-2304298
ICRS Star Coord at Epoch: 17h 54m 27.69661s -23:04:30.15832s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 8.428
G magnitude           : 14.822
RP magnitude         : 13.337
BP magnitude         : 17.903
DUPflag              : 0
Distance (au)        : 4.256
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.29
Sun-Target sep (deg) : 174.69
Sun-Moon sep (deg)   : 87.53
B (ring opening deg) : -2.43
PA of pole (deg)     : -0.24
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 1.457
C/A sky separation (km) : 4495.9
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
    
```

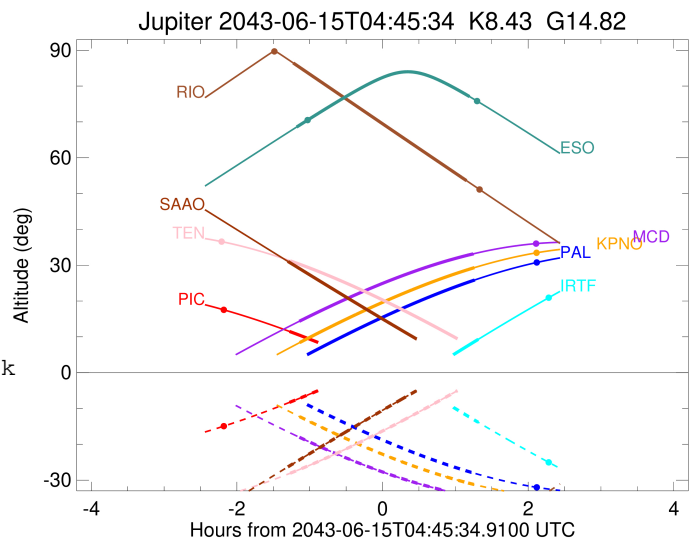
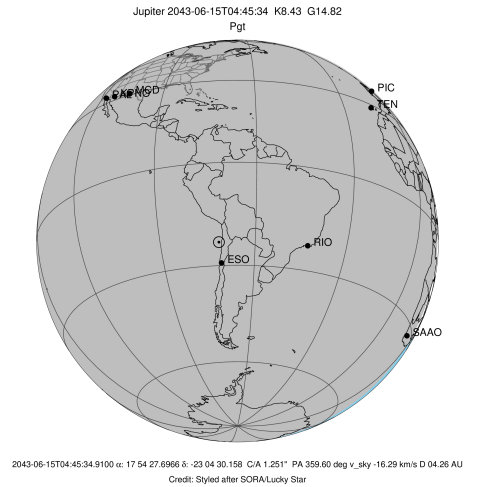


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-15T03:34:49.016	68.56	-73.60	71492.0	-3.88	-4.43
Jupiter	E	2043-06-15T05:57:19.517	77.06	-72.45	71492.0	-3.50	-4.00

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-15T04:40:03.270
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        : 4070135589308350720
2Mass ID (if available) : 17542769-2304298
ICRS Star Coord at Epoch: 17h 54m 27.69661s -23:04:30.15832s
RUWE (>1.4 is poor) : 1.06
K magnitude           : 8.428
G magnitude           : 14.822
RP magnitude          : 13.337
BP magnitude          : 17.903
DUPflag              : 0
Distance (au)         : 4.256
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.29
Sun-Target sep (deg)  : 174.69
Sun-Moon sep (deg)    : 86.90
B (ring opening deg) : -2.43
PA of pole (deg)      : -0.24
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 2.211
C/A sky separation (km) : 6825.7
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	2043-06-15T03:27:39.480	31.05	-26.29	71491.9	-5.11	-5.84
Jupiter	E	2043-06-15T05:52:59.641	1.76x	2.38x	71491.9	-5.86	-6.69