

target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-06-29T04:38:06.050
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068835996560483328
 2Mass ID (if available) : 17464435-2304239

Jupiter 2043-06-29T04:38:06 K9.68 G13.44 Pgt

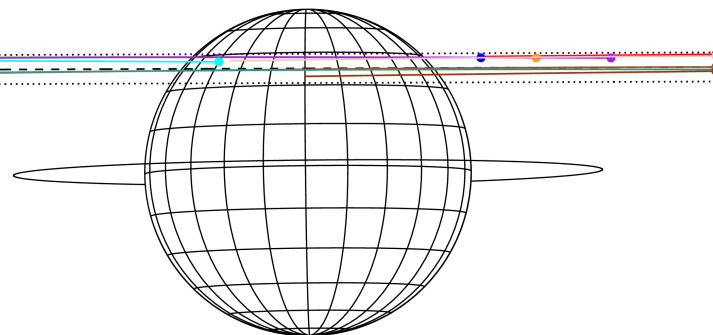
ICRS Star Coord at Epoch: 17h 46m 44.35107s -23:04:23.95897s

RUWE (>1.4 is poor) : 1.02
 K magnitude : 9.681
 G magnitude : 13.435
 RP magnitude : 12.397
 BP magnitude : 14.549
 DUPflag : 0
 Distance (au) : 4.259
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -16.01
 Sun-Target sep (deg) : 170.17
 Sun-Moon sep (deg) : 88.04
 B (ring opening deg) : -2.42
 PA of pole (deg) : 0.59
 Pole direction: RA (deg): 268.05669
 Dec (deg): 64.49732
 C/A sky separation (") : 14.760
 C/A sky separation (km) : 45591.9
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-06-29T04:38:06 K9.68 G13.44
 Pgt



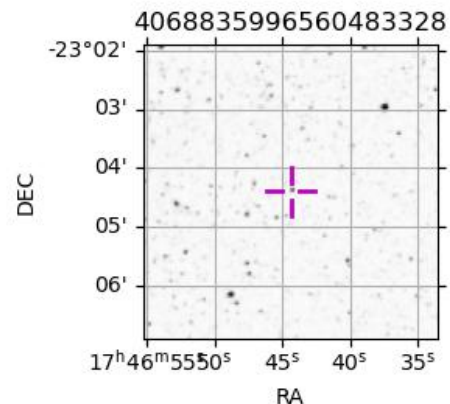
Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 AAT
 SAAO
 MSO



2043-06-29T04:38:06.0500 a: 17 46 44.3511 d: -23 04 23.959 C/A ***** PA 180.20 deg v_sky -16.01 km/s D 04.26 AU
 Credit: Styled after SORA/Lucky Star

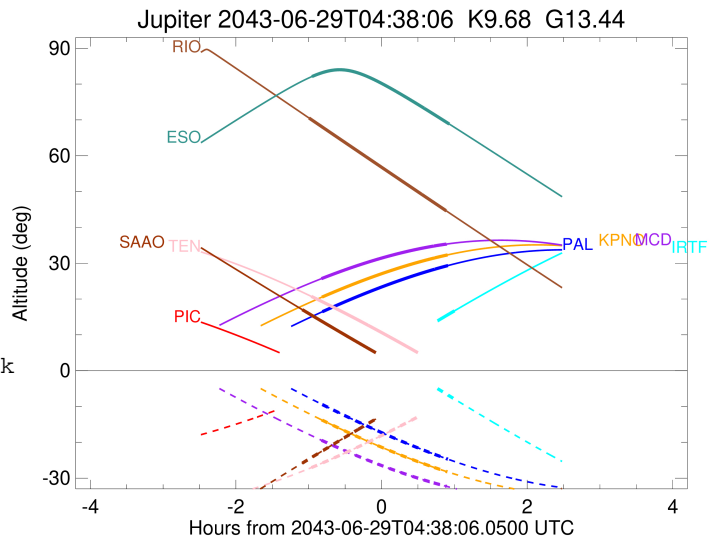
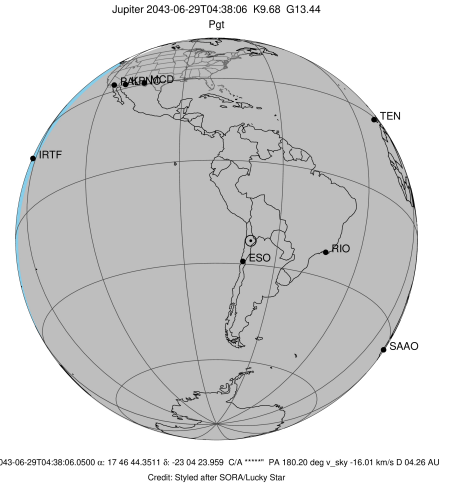
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events	Interval	OEcode
PIC	Pic du Midi	42.9	0.1				Pnn
PAL	Palomar Mt (200")	33.4	243.1	+ +	JUN 29 03:49	- JUN 29 05:32	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8				Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JUN 29 03:49	- JUN 29 05:32	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JUN 29 03:48	- JUN 29 05:31	Pie
TEN	Teide Obs./Tenerife	28.3	343.5	+	JUN 29 03:40	- JUN 29 03:40	Pin
IRTF	Mauna Kea/IRTF	19.8	204.5	+	JUN 29 05:38	- JUN 29 05:38	Pne
KAV	Kavalur Observatory	12.6	78.8				Pnn
RIO	Rio de Janeiro	-22.9	316.8	+ +	JUN 29 03:38	- JUN 29 05:31	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUN 29 03:40	- JUN 29 05:33	Pie
AAT	Siding Spring (AAT)	-31.3	149.1				Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	JUN 29 03:32	- JUN 29 03:32	Pin
MSO	Mt. Stromlo Observatory	-35.3	149.0				Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T04:41:07.470
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      : 4068835996560483328
2Mass ID (if available) : 17464435-2304239
ICRS Star Coord at Epoch: 17h 46m 44.35107s -23:04:23.95897s
RUWE (>1.4 is poor) : 1.02
K magnitude         : 9.681
G magnitude         : 13.435
RP magnitude        : 12.397
BP magnitude        : 14.549
DUPflag            : 0
Distance (au)       : 4.259
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -16.01
Sun-Target sep (deg) : 170.17
Sun-Moon sep (deg)  : 88.43
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.59
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 16.343
C/A sky separation (km) : 50480.9
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
    
```

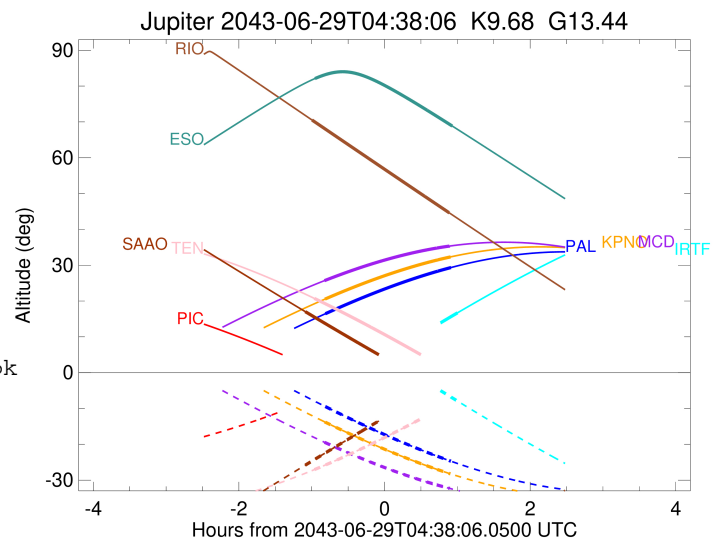
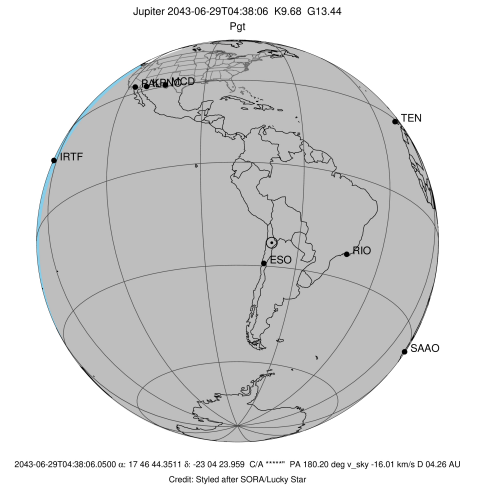


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T03:49:18.342	16.44	-9.45	71488.1	44.12	47.83
Jupiter	E	2043-06-29T05:32:47.477	29.33	-24.70	71487.9	45.52	49.22

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T04:40:47.270
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       : 4068835996560483328
2Mass ID (if available) : 17464435-2304239
ICRS Star Coord at Epoch: 17h 46m 44.35107s -23:04:23.95897s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 9.681
G magnitude           : 13.435
RP magnitude         : 12.397
BP magnitude         : 14.549
DUPflag              : 0
Distance (au)        : 4.259
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.01
Sun-Target sep (deg) : 170.17
Sun-Moon sep (deg)  : 88.49
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.59
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 16.348
C/A sky separation (km) : 50495.0
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
    
```

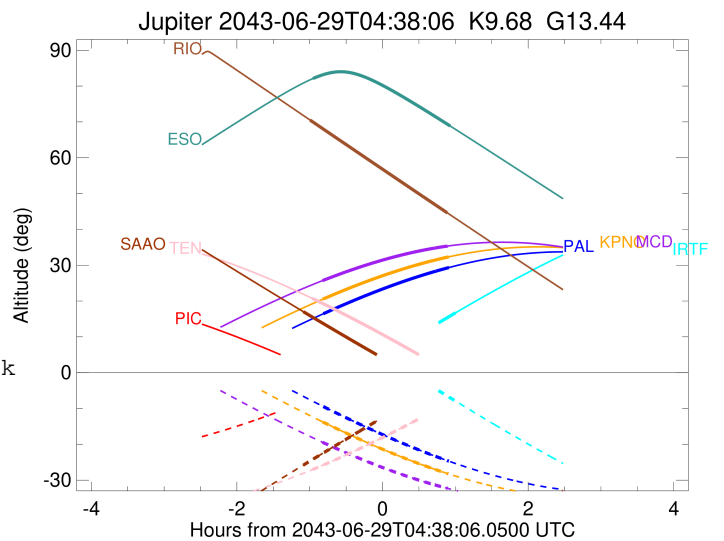
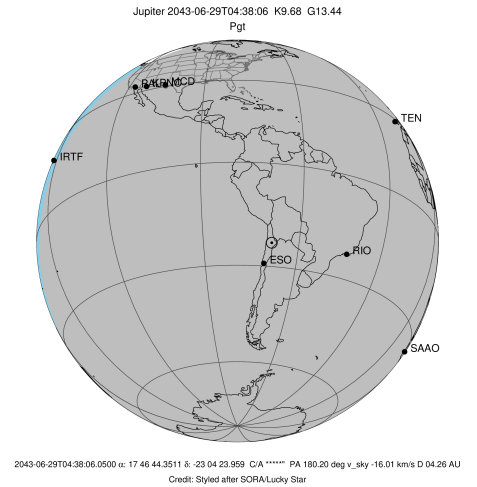


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T03:49:04.065	20.54	-13.78	71488.1	44.17	47.88
Jupiter	E	2043-06-29T05:32:22.479	32.30	-28.23	71487.9	45.50	49.19

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch              : 2043-06-29T04:40:13.630
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        : 4068835996560483328
2Mass ID (if available) : 17464435-2304239
ICRS Star Coord at Epoch: 17h 46m 44.35107s -23:04:23.95897s
RUWE (>1.4 is poor)  : 1.02
K magnitude           : 9.681
G magnitude           : 13.435
RP magnitude          : 12.397
BP magnitude          : 14.549
DUPflag              : 0
Distance (au)         : 4.259
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -16.01
Sun-Target sep (deg)  : 170.17
Sun-Moon sep (deg)    : 88.55
B (ring opening deg)  : -2.42
PA of pole (deg)      : 0.59
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 16.361
C/A sky separation (km) : 50536.9
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
    
```

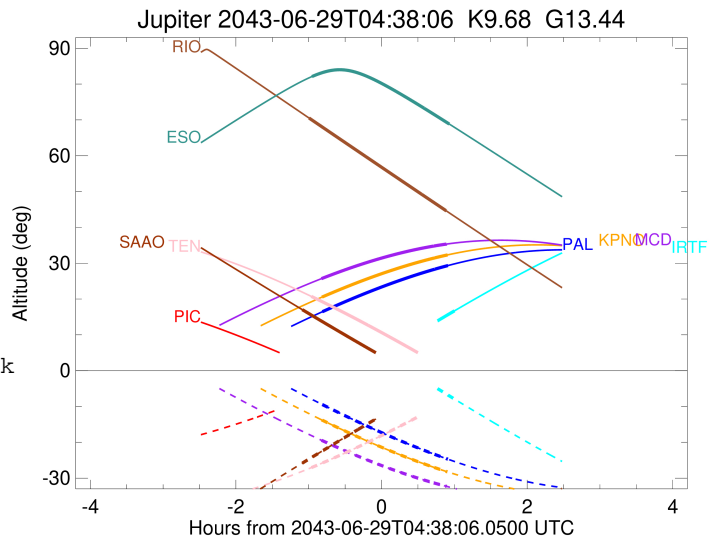
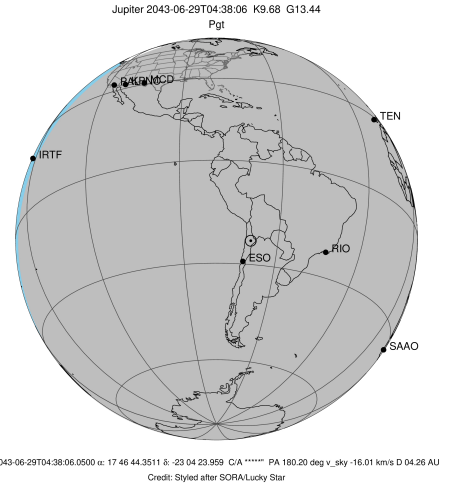


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T03:48:39.087	25.69	-19.43	71488.1	44.27	47.98
Jupiter	E	2043-06-29T05:31:41.994	35.33	-32.29	71487.9	45.48	49.18

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T04:33:23.600
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      : 4068835996560483328
2Mass ID (if available) : 17464435-2304239
ICRS Star Coord at Epoch: 17h 46m 44.35107s -23:04:23.95897s
RUWE (>1.4 is poor) : 1.02
K magnitude          : 9.681
G magnitude          : 13.435
RP magnitude         : 12.397
BP magnitude         : 14.549
DUPflag             : 0
Distance (au)       : 4.259
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -16.01
Sun-Target sep (deg) : 170.17
Sun-Moon sep (deg)  : 88.19
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.59
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (" ) : 15.993
C/A sky separation (km) : 49399.7
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
    
```

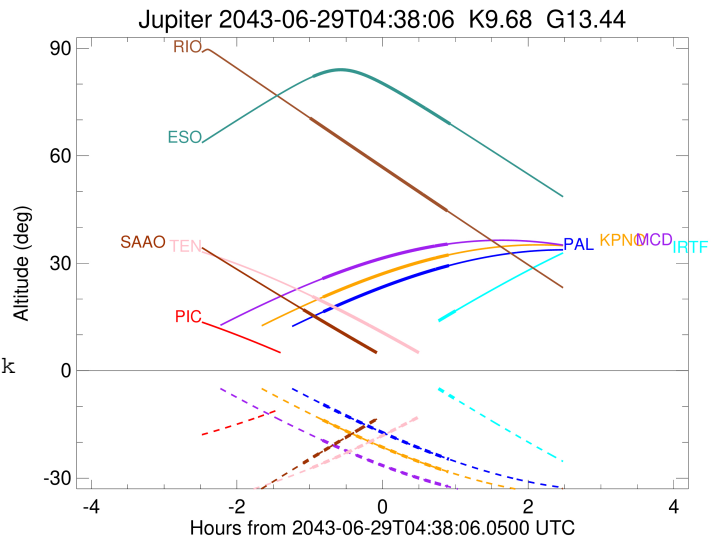
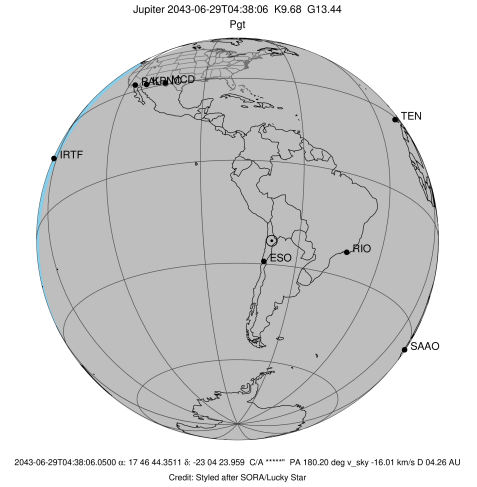


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T03:40:20.876	20.72	-27.05	71488.2	43.74	47.45
Jupiter	E	2043-06-29T05:26:42.915	1.38x	-9.50	71488.2	43.52	47.23

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-29T04:43:36.880
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        : 4068835996560483328
2Mass ID (if available) : 17464435-2304239
ICRS Star Coord at Epoch: 17h 46m 44.35107s -23:04:23.95897s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 9.681
G magnitude           : 13.435
RP magnitude          : 12.397
BP magnitude          : 14.549
DUPflag              : 0
Distance (au)         : 4.259
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.01
Sun-Target sep (deg)  : 170.17
Sun-Moon sep (deg)    : 88.14
B (ring opening deg) : -2.42
PA of pole (deg)      : 0.59
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 15.604
C/A sky separation (km) : 48199.8
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
    
```

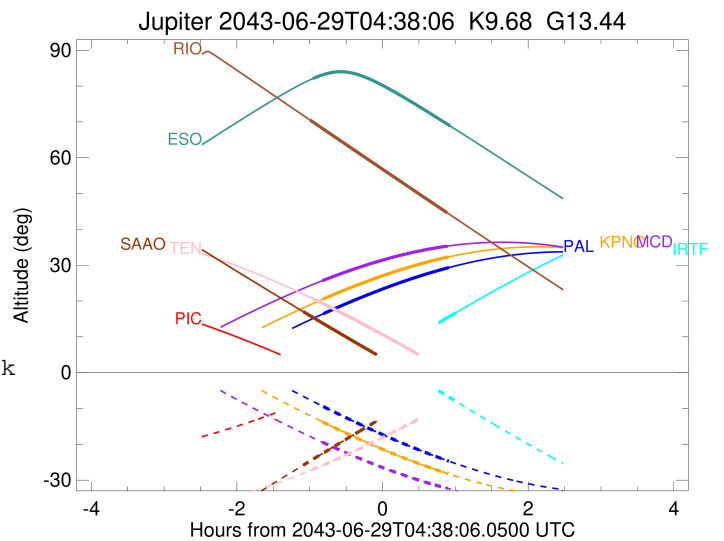
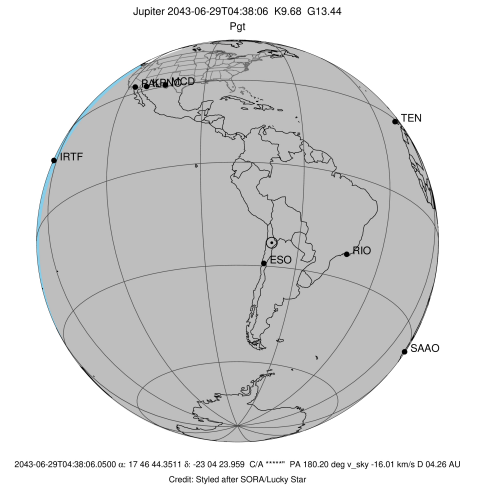


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T03:48:51.827	-6.25x	15.65x	71488.5	41.36	45.08
Jupiter	E	2043-06-29T05:38:02.738	16.66	-7.88	71488.2	43.29	47.01

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-29T04:34:50.580
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        : 4068835996560483328
2Mass ID (if available) : 17464435-2304239
ICRS Star Coord at Epoch: 17h 46m 44.35107s -23:04:23.95897s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 9.681
G magnitude           : 13.435
RP magnitude          : 12.397
BP magnitude          : 14.549
DUPflag              : 0
Distance (au)         : 4.259
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.01
Sun-Target sep (deg) : 170.17
Sun-Moon sep (deg)   : 88.84
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.59
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 14.634
C/A sky separation (km) : 45201.5
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
    
```

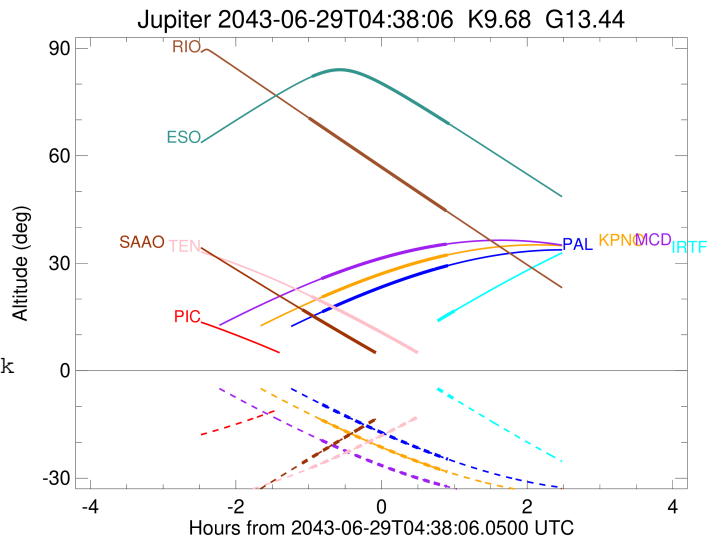
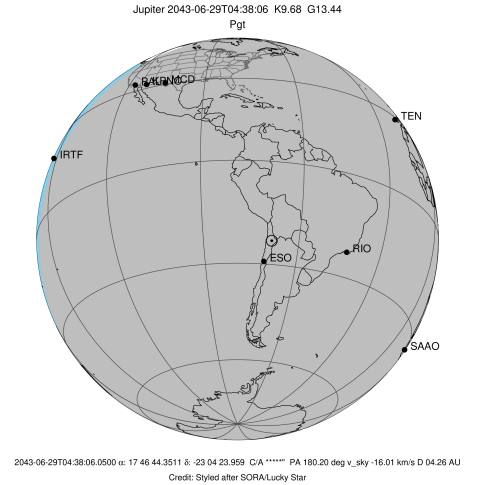


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T03:38:27.912	70.50	-80.28	71488.8	39.07	42.77
Jupiter	E	2043-06-29T05:31:26.207	44.62	-54.40	71488.8	39.16	42.86


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-29T04:37:19.090
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       : 4068835996560483328
2Mass ID (if available) : 17464435-2304239
ICRS Star Coord at Epoch: 17h 46m 44.35107s -23:04:23.95897s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 9.681
G magnitude           : 13.435
RP magnitude          : 12.397
BP magnitude          : 14.549
DUPflag              : 0
Distance (au)        : 4.259
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.01
Sun-Target sep (deg) : 170.17
Sun-Moon sep (deg)   : 88.99
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.59
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 14.536
C/A sky separation (km): 44900.1
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
    
```

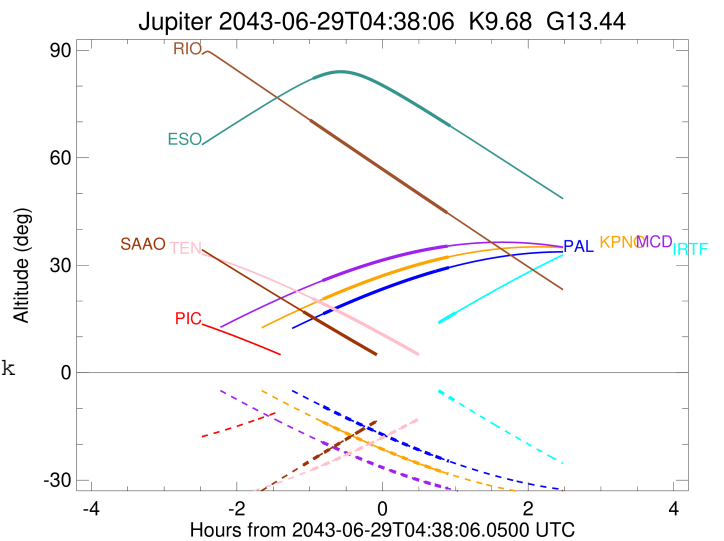
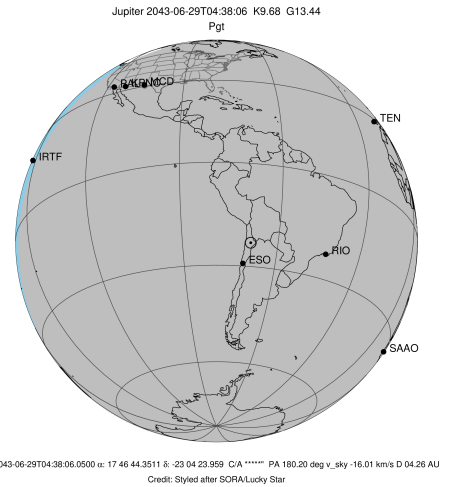


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T03:40:47.068	82.09	-74.19	71488.9	38.49	42.18
Jupiter	E	2043-06-29T05:33:54.730	68.84	-77.83	71488.8	39.10	42.80


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-29T04:32:58.590
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        : 4068835996560483328
2Mass ID (if available) : 17464435-2304239
ICRS Star Coord at Epoch: 17h 46m 44.35107s -23:04:23.95897s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 9.681
G magnitude           : 13.435
RP magnitude          : 12.397
BP magnitude          : 14.549
DUPflag              : 0
Distance (au)         : 4.259
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.01
Sun-Target sep (deg)  : 170.17
Sun-Moon sep (deg)    : 88.08
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.59
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 13.642
C/A sky separation (km) : 42136.5
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	2043-06-29T03:32:49.853	17.03	-25.81	71489.2	36.24	39.88
Jupiter	E	2043-06-29T05:33:30.672	-6.23x	-1.77x	71489.2	35.93	39.56