

target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-06-29T02:47:32.440
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068836000957470464
 2Mass ID (if available) : 17464685-2304406

Jupiter 2043-06-29T02:47:32 K9.88 G14.59 Pgt

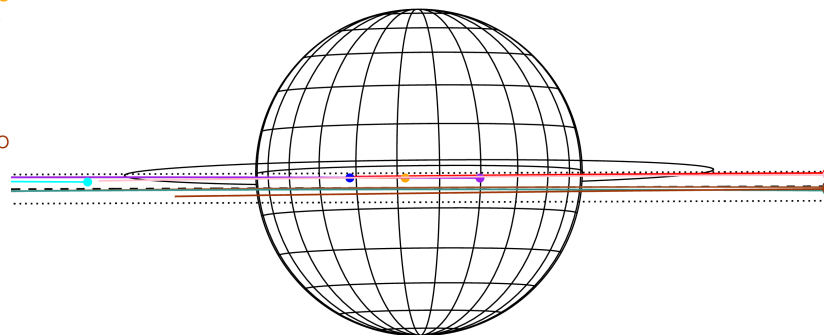
ICRS Star Coord at Epoch: 17h 46m 46.83876s -23°04'40.99152s

RUWE (>1.4 is poor) : 0.94
 K magnitude : 9.875
 G magnitude : 14.590
 RP magnitude : 13.376
 BP magnitude : 16.228
 DUPflag : 0
 Distance (au) : 4.259
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -16.02
 Sun-Target sep (deg) : 170.25
 Sun-Moon sep (deg) : 86.99
 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 (") : 2.150
 C/A sky separation (km) : 6639.7
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-06-29T02:47:32 K9.88 G14.59
 Pgt



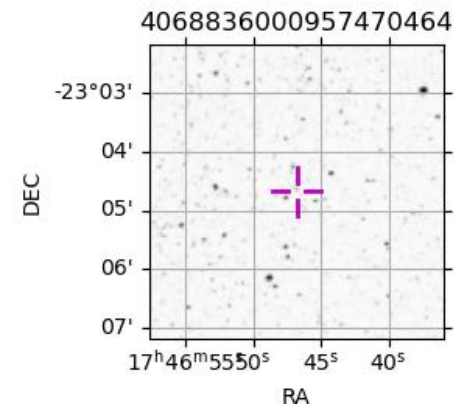
Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 SAAO



2043-06-29T02:47:32.4400 a: 17 46 46.8388 δ: -23 04 40.992 C/A 2.161" PA 0.21 deg v_sky -16.02 km/s D 04.26 AU
 Credit: Styled after SORA/Lucky Star

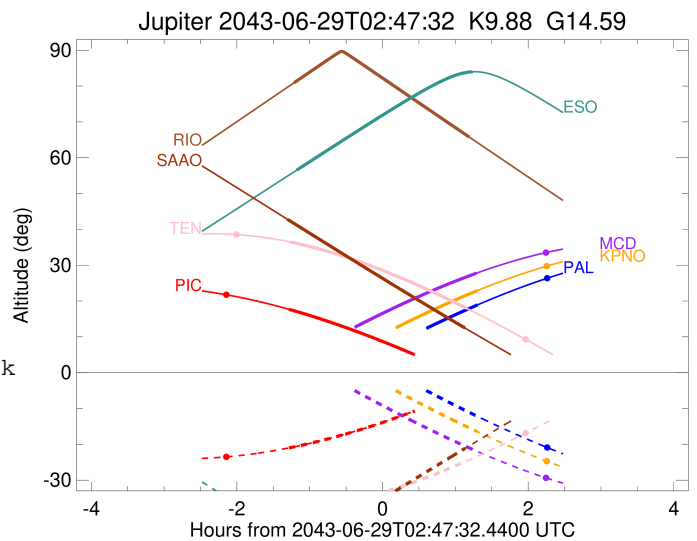
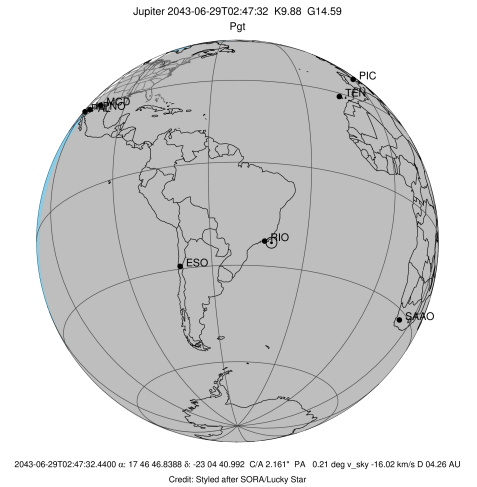
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	JUN 29 01:30 - JUN 29 01:30	Pin
PAL	Palomar Mt (200")	33.4	243.1	+	JUN 29 04:05 - JUN 29 04:05	Pne
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	JUN 29 04:05 - JUN 29 04:05	Pne
MCD	McDonald Obs. 2.7m	30.7	256.0	+	JUN 29 04:05 - JUN 29 04:05	Pne
TEN	Teide Obs./Tenerife	28.3	343.5	+ +	JUN 29 01:31 - JUN 29 03:57	Pie
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	+ +	JUN 29 01:34 - JUN 29 03:58	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUN 29 01:37 - JUN 29 04:01	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	JUN 29 01:29 - JUN 29 03:55	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T02:43:45.010
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      : 4068836000957470464
2Mass ID (if available) : 17464685-2304406
ICRS Star Coord at Epoch: 17h 46m 46.83876s -23:04:40.99152s
RUWE (>1.4 is poor) : 0.94
K magnitude          : 9.875
G magnitude          : 14.590
RP magnitude         : 13.376
BP magnitude         : 16.228
DUPflag             : 0
Distance (au)        : 4.259
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.02
Sun-Target sep (deg) : 170.25
Sun-Moon sep (deg)  : 87.11
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 ("): 0.488
C/A sky separation (km): 1507.0
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
    
```

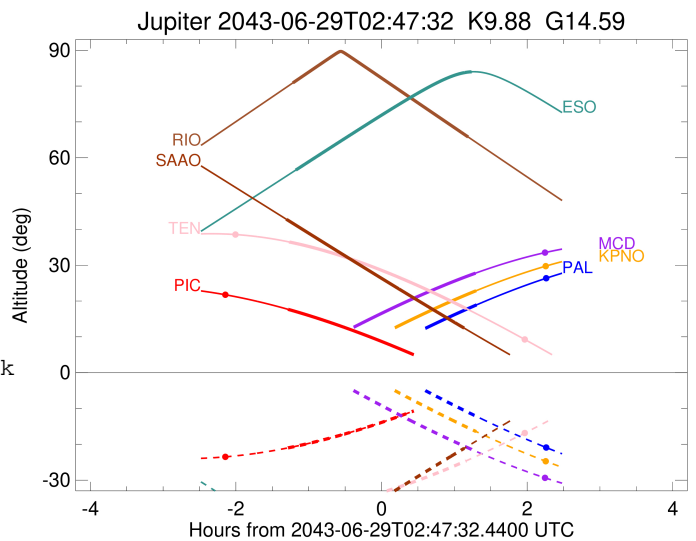
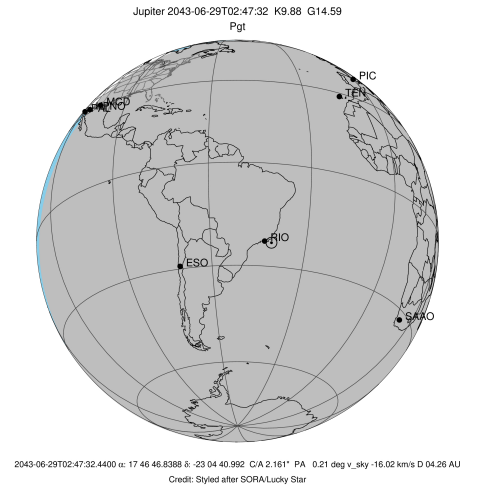


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T01:30:32.662	17.68	-20.99	71492.0	-1.28	-1.46
Jupiter	E	2043-06-29T03:57:21.320	-1.57x	-4.79x	71492.0	-1.23	-1.41

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T02:52:32.760
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      : 4068836000957470464
2Mass ID (if available) : 17464685-2304406
ICRS Star Coord at Epoch: 17h 46m 46.83876s -23:04:40.99152s
RUWE (>1.4 is poor) : 0.94
K magnitude          : 9.875
G magnitude          : 14.590
RP magnitude         : 13.376
BP magnitude         : 16.228
DUPflag             : 0
Distance (au)       : 4.259
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -16.02
Sun-Target sep (deg) : 170.25
Sun-Moon sep (deg)  : 87.13
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 (" ) : 0.812
C/A sky separation (km) : 2508.1
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
    
```

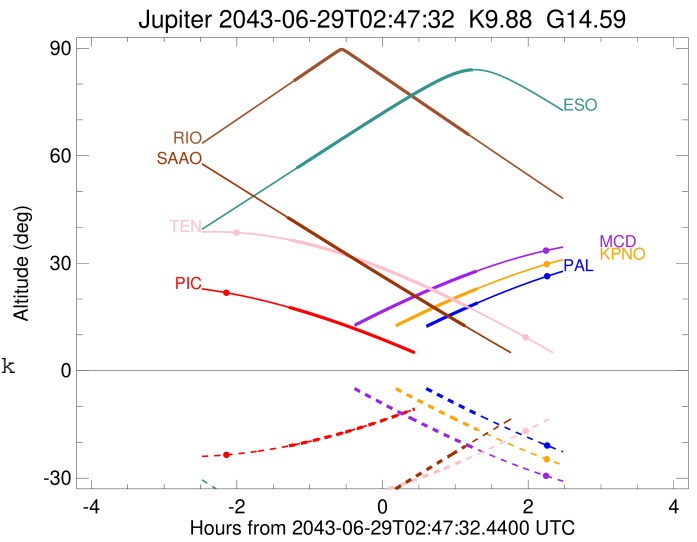
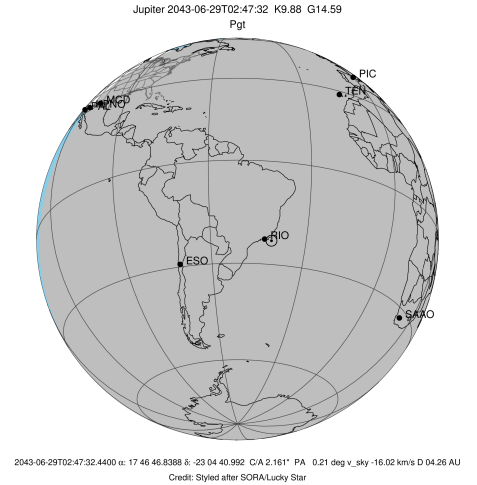


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T01:38:43.540	-6.54x	14.86x	71492.0	-2.91	-3.32
Jupiter	E	2043-06-29T04:05:52.684	18.92	-12.21	71492.0	-1.19	-1.36

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T02:52:22.600
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       : 4068836000957470464
2Mass ID (if available) : 17464685-2304406
ICRS Star Coord at Epoch: 17h 46m 46.83876s -23:04:40.99152s
RUWE (>1.4 is poor) : 0.94
K magnitude          : 9.875
G magnitude          : 14.590
RP magnitude         : 13.376
BP magnitude         : 16.228
DUPflag             : 0
Distance (au)        : 4.259
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.02
Sun-Target sep (deg) : 170.25
Sun-Moon sep (deg)   : 87.20
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 ("): 0.791
C/A sky separation (km): 2443.5
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
    
```

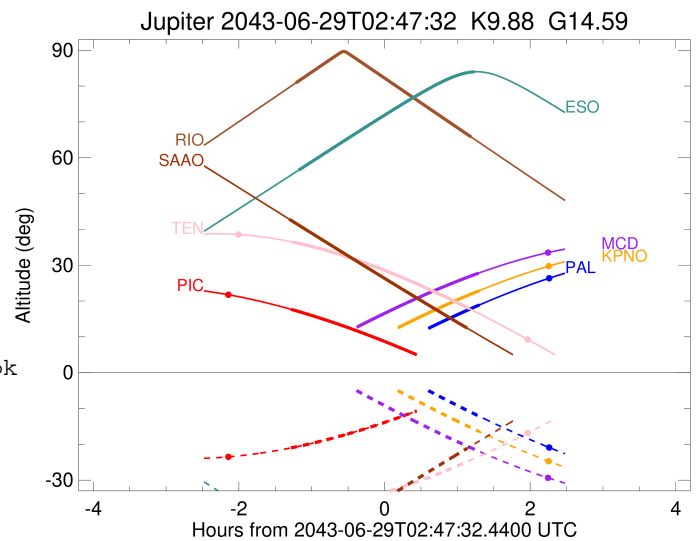
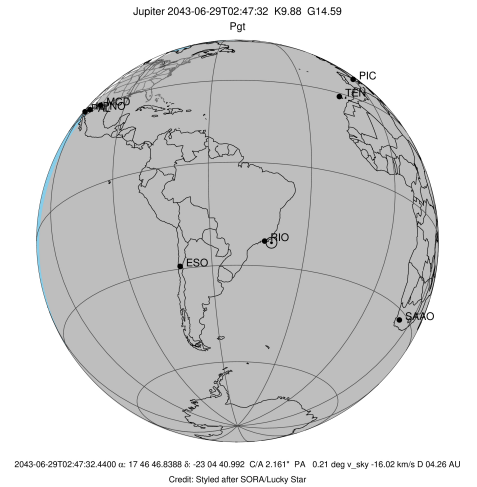


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T01:38:43.031	-1.93x	10.21x	71492.0	-2.85	-3.25
Jupiter	E	2043-06-29T04:05:34.080	22.89	-16.45	71492.0	-1.16	-1.33

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch              : 2043-06-29T02:52:00.720
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        : 4068836000957470464
2Mass ID (if available) : 17464685-2304406
ICRS Star Coord at Epoch: 17h 46m 46.83876s -23:04:40.99152s
RUWE (>1.4 is poor)  : 0.94
K magnitude           : 9.875
G magnitude           : 14.590
RP magnitude          : 13.376
BP magnitude          : 16.228
DUPflag              : 0
Distance (au)         : 4.259
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -16.02
Sun-Target sep (deg)  : 170.25
Sun-Moon sep (deg)    : 87.30
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 (") : 0.748
C/A sky separation (km) : 2310.9
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
    
```

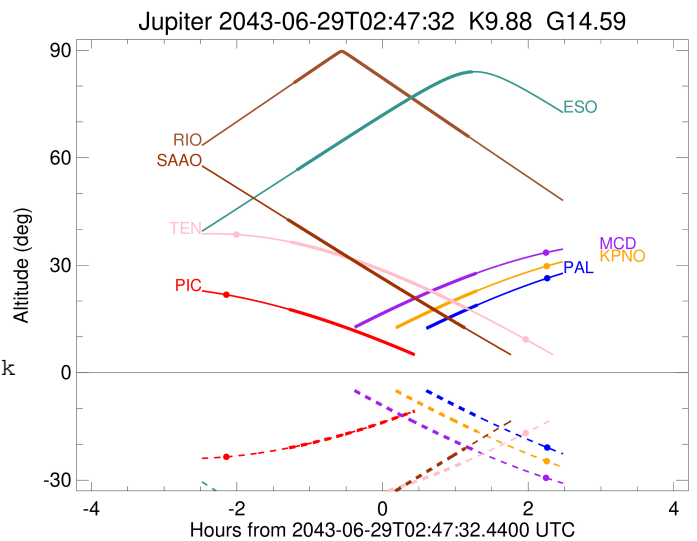
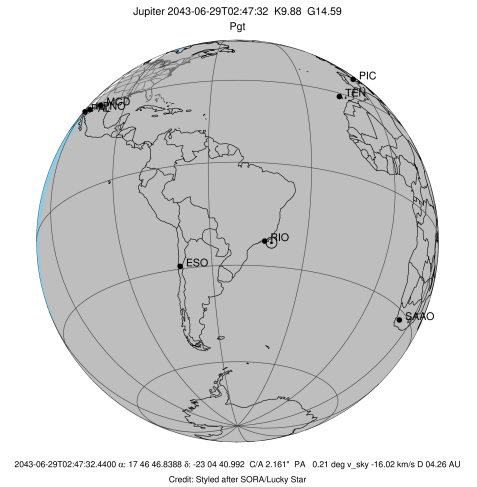


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T01:38:34.266	4.37x	3.77x	71492.0	-2.71	-3.10
Jupiter	E	2043-06-29T04:05:01.503	27.78	-21.90	71492.0	-1.10	-1.26

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T02:44:13.530
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       : 4068836000957470464
2Mass ID (if available) : 17464685-2304406
ICRS Star Coord at Epoch: 17h 46m 46.83876s -23:04:40.99152s
RUWE (>1.4 is poor) : 0.94
K magnitude          : 9.875
G magnitude          : 14.590
RP magnitude         : 13.376
BP magnitude         : 16.228
DUPflag             : 0
Distance (au)        : 4.259
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.02
Sun-Target sep (deg) : 170.25
Sun-Moon sep (deg)  : 87.43
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 ("): 0.666
C/A sky separation (km): 2056.4
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
    
```

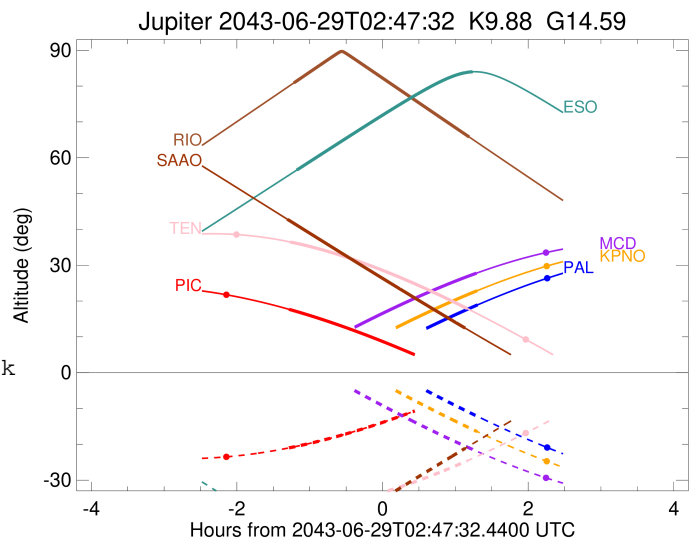
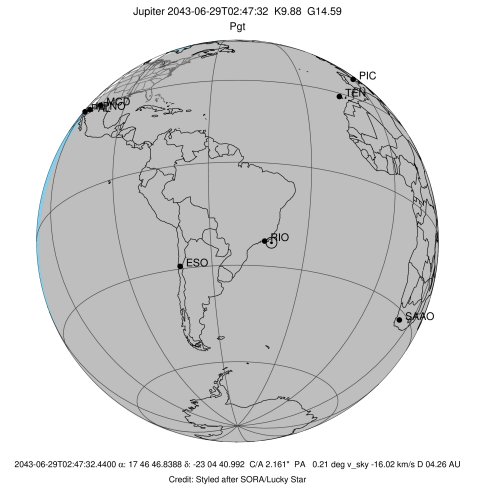


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T01:31:33.053	36.48	-38.36	71492.0	-1.79	-2.05
Jupiter	E	2043-06-29T03:57:14.606	17.91	-24.62	71492.0	-1.65	-1.89

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T02:46:39.490
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      : 4068836000957470464
2Mass ID (if available) : 17464685-2304406
ICRS Star Coord at Epoch: 17h 46m 46.83876s -23:04:40.99152s
RUWE (>1.4 is poor) : 0.94
K magnitude         : 9.875
G magnitude         : 14.590
RP magnitude        : 13.376
BP magnitude        : 16.228
DUPflag            : 0
Distance (au)       : 4.259
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -16.02
Sun-Target sep (deg) : 170.25
Sun-Moon sep (deg)  : 87.94
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 (" ) : 2.146
C/A sky separation (km) : 6626.9
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
    
```

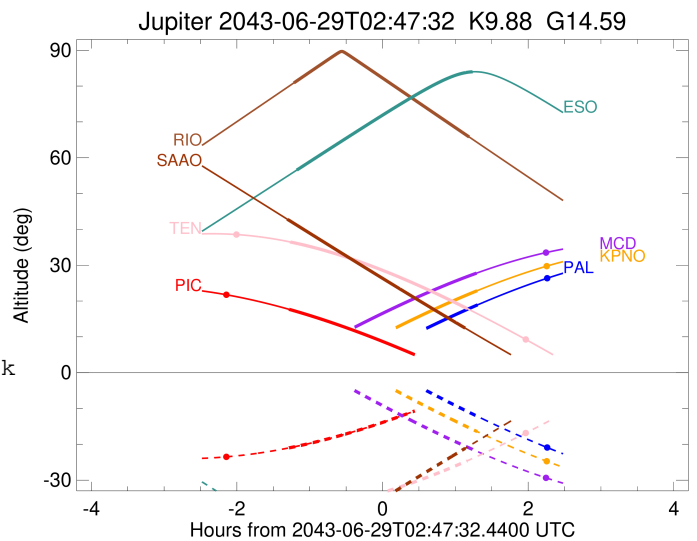
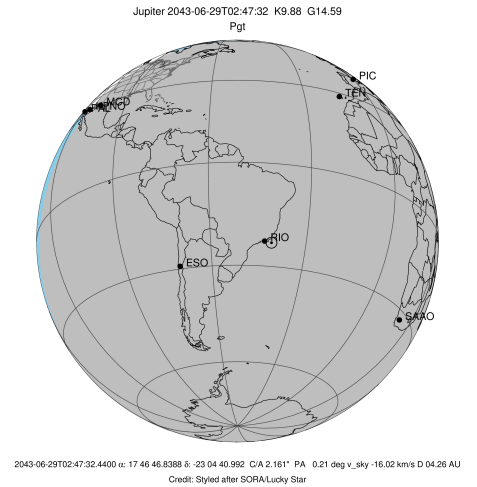


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T01:34:31.593	80.89	-71.20	71491.9	-5.70	-6.52
Jupiter	E	2043-06-29T03:58:53.517	65.79	-75.59	71491.9	-5.11	-5.83


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-29T02:49:24.970
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        : 4068836000957470464
2Mass ID (if available) : 17464685-2304406
ICRS Star Coord at Epoch: 17h 46m 46.83876s -23:04:40.99152s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 9.875
G magnitude           : 14.590
RP magnitude          : 13.376
BP magnitude          : 16.228
DUPflag              : 0
Distance (au)         : 4.259
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.02
Sun-Target sep (deg)  : 170.25
Sun-Moon sep (deg)    : 87.92
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 (" ) : 2.402
C/A sky separation (km) : 7419.2
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
    
```

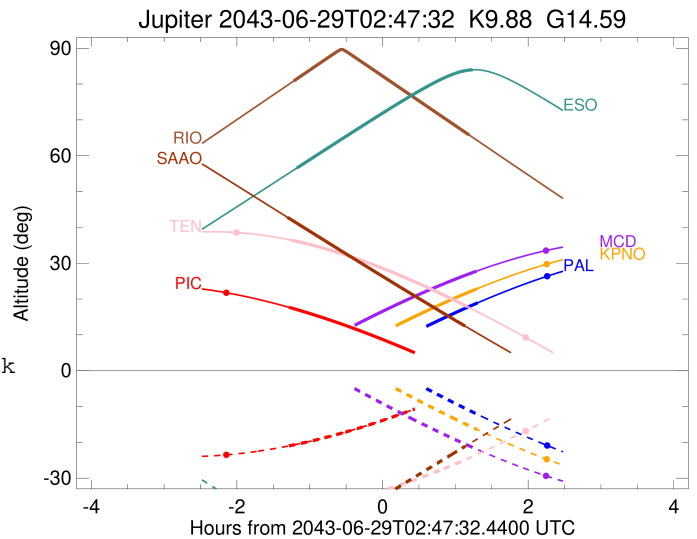
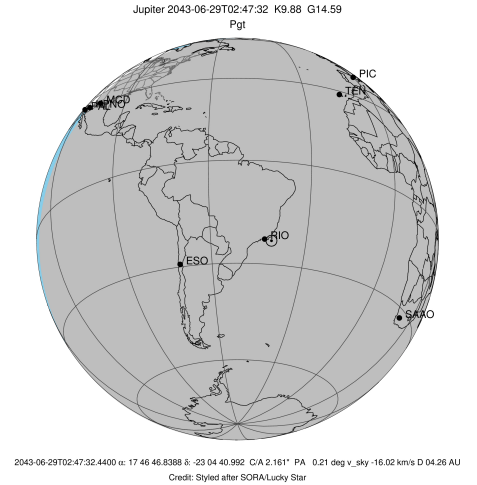


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T01:37:03.723	56.58	-47.42	71491.9	-6.59	-7.53
Jupiter	E	2043-06-29T04:01:36.542	83.98	-78.39	71491.9	-5.48	-6.26


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T02:42:08.900
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      : 4068836000957470464
2Mass ID (if available) : 17464685-2304406
ICRS Star Coord at Epoch: 17h 46m 46.83876s -23:04:40.99152s
RUWE (>1.4 is poor) : 0.94
K magnitude          : 9.875
G magnitude          : 14.590
RP magnitude         : 13.376
BP magnitude         : 16.228
DUPflag             : 0
Distance (au)       : 4.259
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.02
Sun-Target sep (deg) : 170.25
Sun-Moon sep (deg)  : 87.38
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 ("): 2.941
C/A sky separation (km): 9085.1
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	2043-06-29T01:29:12.843	42.80	-51.78	71491.9	-7.20	-8.22
Jupiter	E	2043-06-29T03:55:38.367	12.44	-21.12	71491.9	-7.45	-8.50