

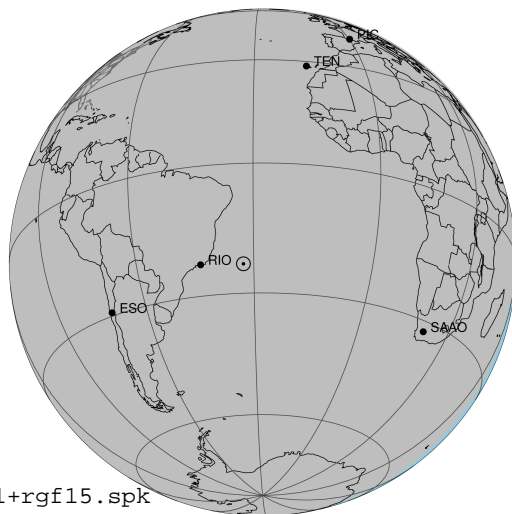
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-06-16T02:10:48.880
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4070146476978877952
 2Mass ID (if available) : 17535817-2304193

Jupiter 2043-06-16T02:10:48 K9.18 G12.70 Pgt

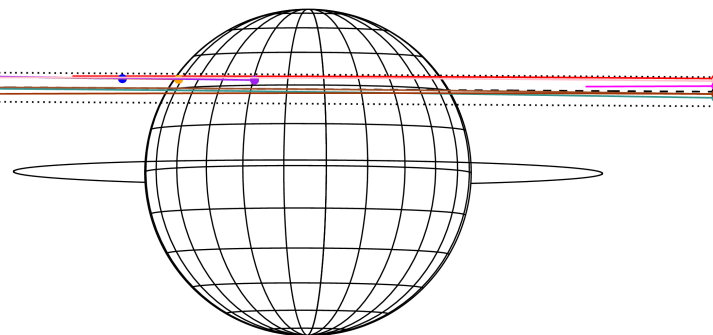
ICRS Star Coord at Epoch: 17h 53m 58.16163s -23:04:19.77563s

RUWE (>1.4 is poor) : 4.25
 K magnitude : 9.176
 G magnitude : 12.697
 RP magnitude : 11.699
 BP magnitude : 13.695
 DUPflag : 0
 Distance (au) : 4.255
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -16.33
 Sun-Target sep (deg) : 175.65
 Sun-Moon sep (deg) : 75.75
 B (ring opening deg) : -2.43
 PA of pole (deg) : -0.19
 Pole direction: RA (deg): 268.05668
 Dec (deg): 64.49732
 C/A sky separation (") : 11.832
 C/A sky separation (km) : 36508.7
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-06-16T02:10:48 K9.18 G12.70
 Pgt



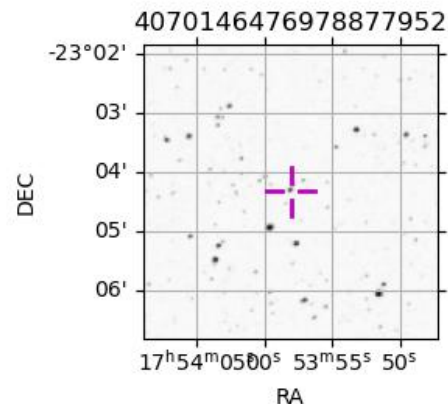
Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 KAV
 RIO
 ESO
 SAAO



2043-06-16T02:10:48.8800 a: 17 53 58.1616 ð -23 04 19.776 C/A ***** PA 179.64 deg v_sky -16.33 km/s D 04.25 AU
 Credit: Styled after SORA/Lucky Star

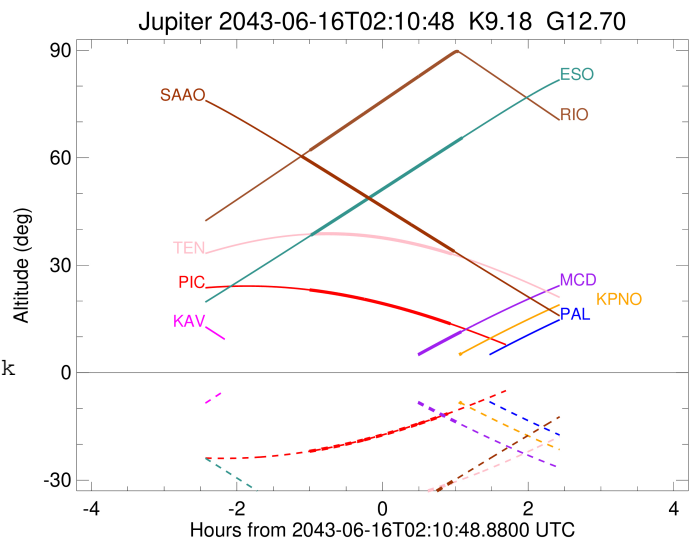
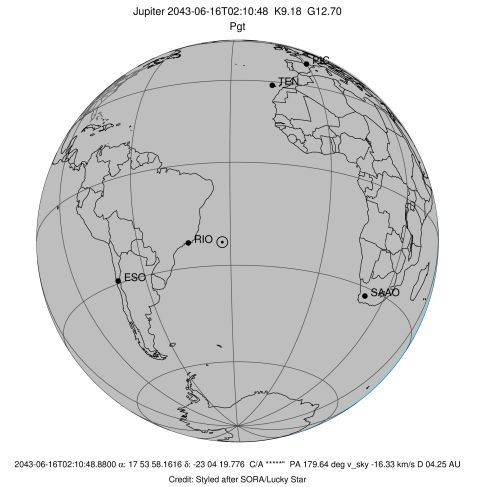
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+ +	JUN 16 01:10 - JUN 16 03:06	Pie
PAL	Palomar Mt (200")	33.4	243.1			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	JUN 16 03:16 - JUN 16 03:16	Pne
MCD	McDonald Obs. 2.7m	30.7	256.0	+	JUN 16 03:15 - JUN 16 03:15	Pne
TEN	Teide Obs./Tenerife	28.3	343.5	+ +	JUN 16 01:11 - JUN 16 03:07	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 16 01:10 - JUN 16 03:13	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUN 16 01:11 - JUN 16 03:16	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	JUN 16 01:04 - JUN 16 03:09	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-16T02:08:43.180
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     : 4070146476978877952
2Mass ID (if available) : 17535817-2304193
ICRS Star Coord at Epoch: 17h 53m 58.16163s -23:04:19.77563s
RUWE (>1.4 is poor) : 4.25
K magnitude        : 9.176
G magnitude        : 12.697
RP magnitude       : 11.699
BP magnitude       : 13.695
DUPflag           : 0
Distance (au)     : 4.255
f0 (km)           : 0.00
g0 (km)           : 0.00
skyplane vel. (km/s) : -16.33
Sun-Target sep (deg) : 175.65
Sun-Moon sep (deg) : 76.12
B (ring opening deg) : -2.43
PA of pole (deg)  : -0.19
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (" ) : 13.641
C/A sky separation (km) : 42091.4
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
    
```

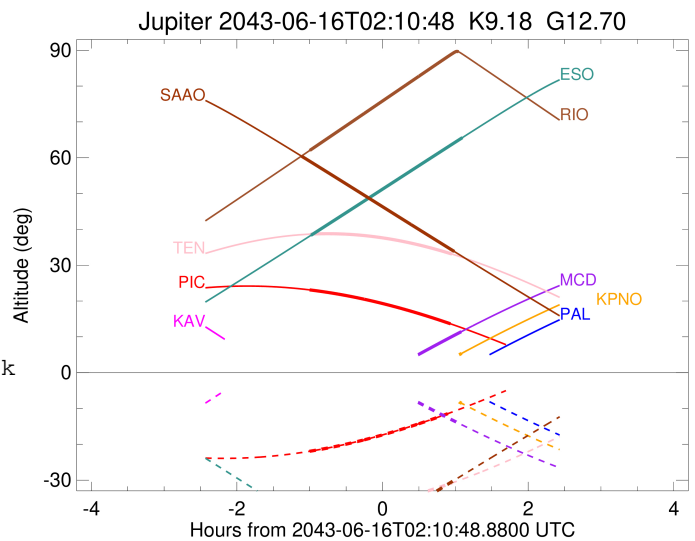
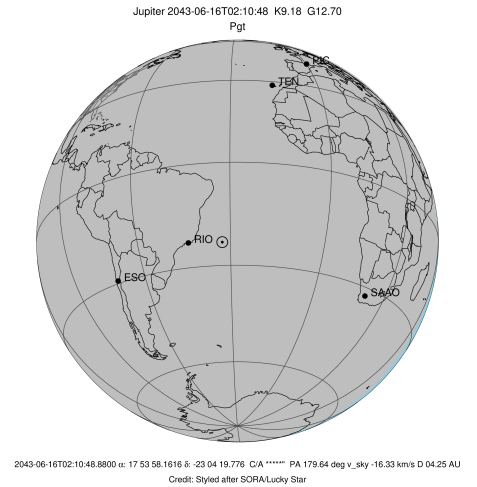


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-16T01:10:49.491	23.10	-21.94	71489.2	36.03	39.66
Jupiter	E	2043-06-16T03:06:44.710	13.65	-11.17	71489.2	35.93	39.56

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-16T02:15:52.770
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       : 4070146476978877952
2Mass ID (if available) : 17535817-2304193
ICRS Star Coord at Epoch: 17h 53m 58.16163s -23:04:19.77563s
RUWE (>1.4 is poor) : 4.25
K magnitude           : 9.176
G magnitude           : 12.697
RP magnitude         : 11.699
BP magnitude         : 13.695
DUPflag              : 0
Distance (au)        : 4.255
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.33
Sun-Target sep (deg) : 175.65
Sun-Moon sep (deg)   : 75.45
B (ring opening deg) : -2.43
PA of pole (deg)     : -0.19
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation ("): 12.942
C/A sky separation (km): 39934.8
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
    
```

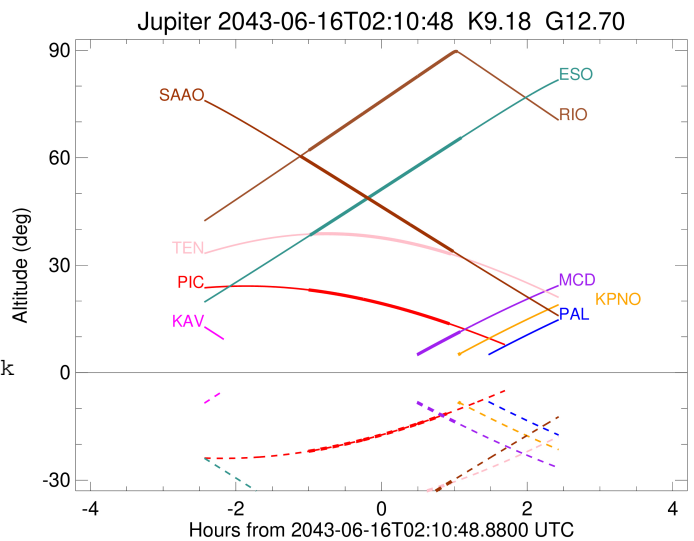
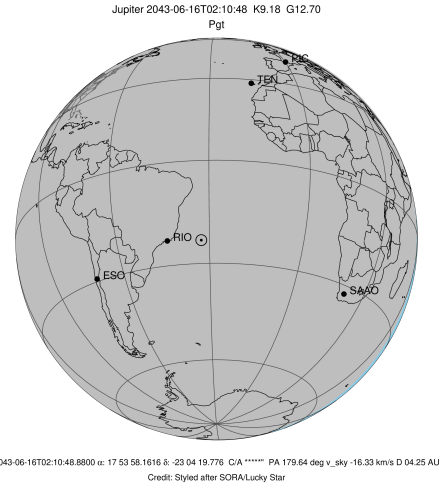


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-16T01:15:21.210	-18.12x	14.38x	71489.6	33.21	36.74
Jupiter	E	2043-06-16T03:16:01.819	5.38	-8.55	71489.4	34.61	38.19

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-16T02:15:48.860
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       : 4070146476978877952
2Mass ID (if available) : 17535817-2304193
ICRS Star Coord at Epoch: 17h 53m 58.16163s -23:04:19.77563s
RUWE (>1.4 is poor) : 4.25
K magnitude           : 9.176
G magnitude           : 12.697
RP magnitude          : 11.699
BP magnitude          : 13.695
DUPflag              : 0
Distance (au)        : 4.255
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.33
Sun-Target sep (deg) : 175.65
Sun-Moon sep (deg)   : 75.55
B (ring opening deg) : -2.43
PA of pole (deg)     : -0.19
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation ("): 12.997
C/A sky separation (km): 40103.7
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
    
```

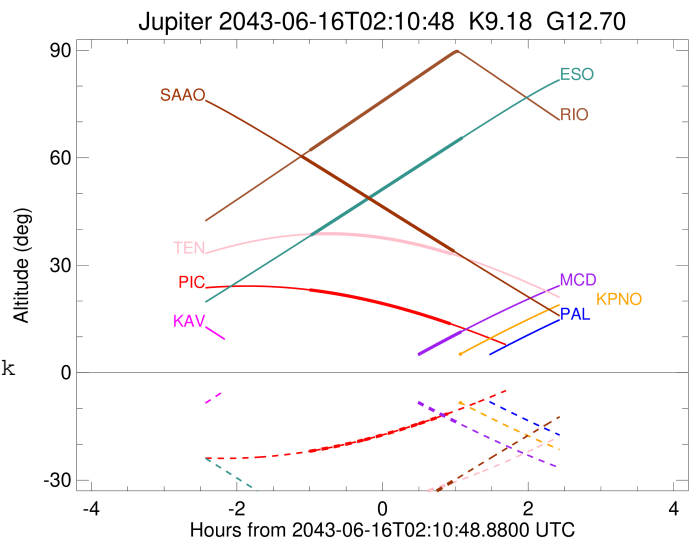
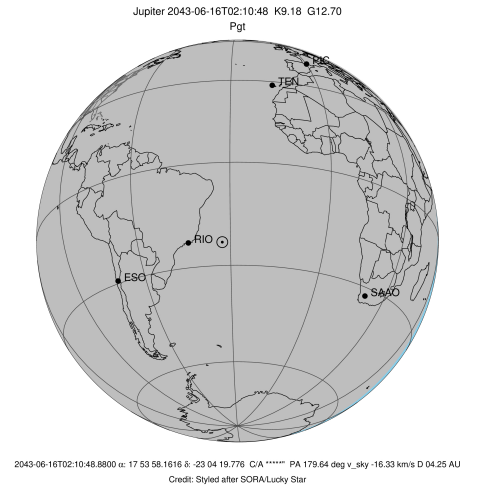


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-16T01:15:35.564	-11.51x	7.81x	71489.6	33.38	36.92
Jupiter	E	2043-06-16T03:15:40.216	11.43	-14.47	71489.4	34.75	38.34

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-16T02:09:44.890
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      : 4070146476978877952
2Mass ID (if available) : 17535817-2304193
ICRS Star Coord at Epoch: 17h 53m 58.16163s -23:04:19.77563s
RUWE (>1.4 is poor) : 4.25
K magnitude          : 9.176
G magnitude          : 12.697
RP magnitude         : 11.699
BP magnitude         : 13.695
DUPflag             : 0
Distance (au)       : 4.255
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.33
Sun-Target sep (deg) : 175.65
Sun-Moon sep (deg)  : 76.33
B (ring opening deg) : -2.43
PA of pole (deg)    : -0.19
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (" ) : 13.425
C/A sky separation (km) : 41425.6
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
    
```

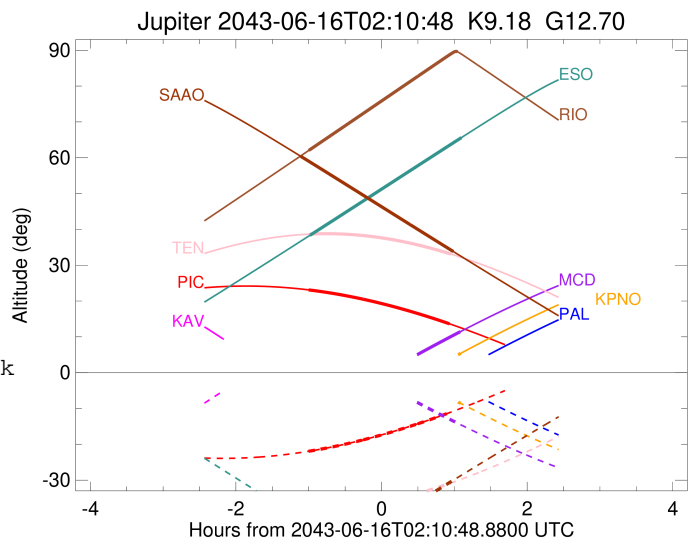
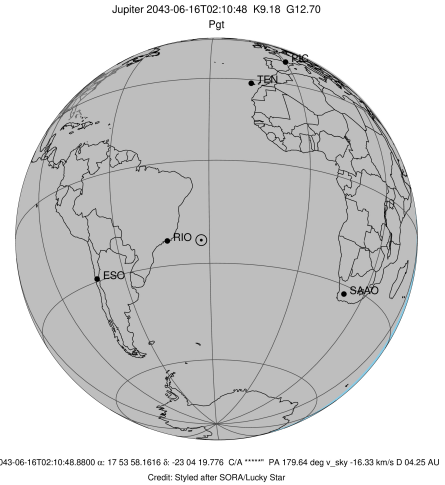


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-16T01:11:40.383	38.67	-38.52	71489.3	35.26	38.86
Jupiter	E	2043-06-16T03:07:53.216	33.13	-30.81	71489.3	35.36	38.97

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-16T02:12:17.050
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        : 4070146476978877952
2Mass ID (if available) : 17535817-2304193
ICRS Star Coord at Epoch: 17h 53m 58.16163s -23:04:19.77563s
RUWE (>1.4 is poor)  : 4.25
K magnitude           : 9.176
G magnitude           : 12.697
RP magnitude          : 11.699
BP magnitude          : 13.695
DUPflag              : 0
Distance (au)         : 4.255
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.33
Sun-Target sep (deg)  : 175.65
Sun-Moon sep (deg)    : 76.56
B (ring opening deg)  : -2.43
PA of pole (deg)      : -0.19
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 11.823
C/A sky separation (km) : 36482.4
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
    
```

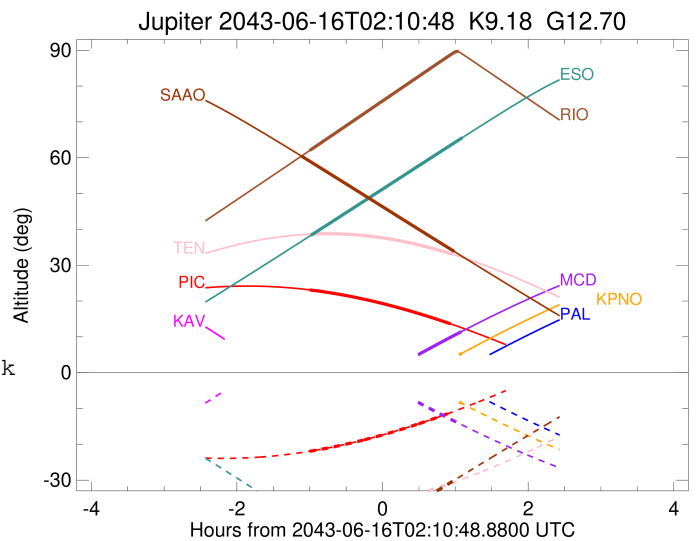
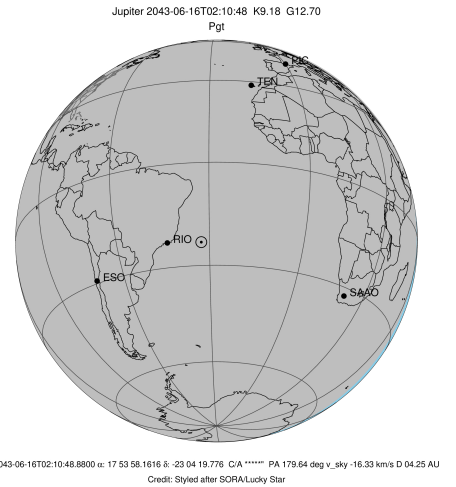


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-16T01:10:57.708	62.04	-66.44	71490.0	30.28	33.66
Jupiter	E	2043-06-16T03:13:29.784	89.56	-85.36	71489.9	30.88	34.30

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-16T02:14:24.570
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        : 4070146476978877952
2Mass ID (if available) : 17535817-2304193
ICRS Star Coord at Epoch: 17h 53m 58.16163s -23:04:19.77563s
RUWE (>1.4 is poor)  : 4.25
K magnitude           : 9.176
G magnitude           : 12.697
RP magnitude          : 11.699
BP magnitude          : 13.695
DUPflag              : 0
Distance (au)         : 4.255
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -16.33
Sun-Target sep (deg)  : 175.65
Sun-Moon sep (deg)    : 76.31
B (ring opening deg)  : -2.43
PA of pole (deg)      : -0.19
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 11.447
C/A sky separation (km) : 35320.4
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
    
```

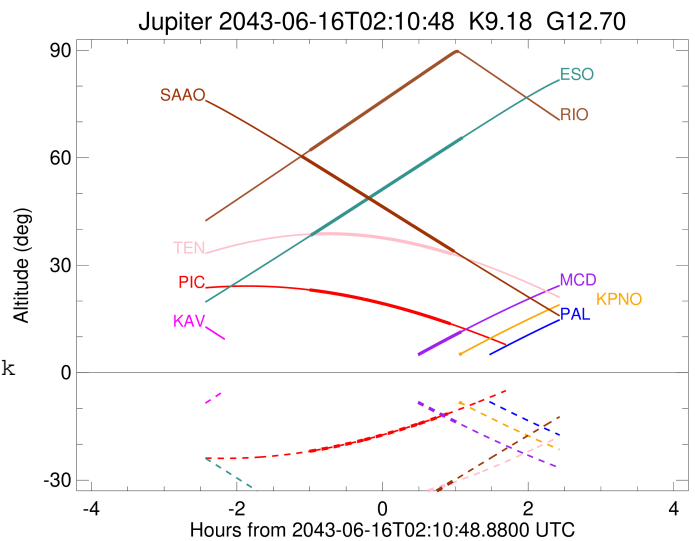
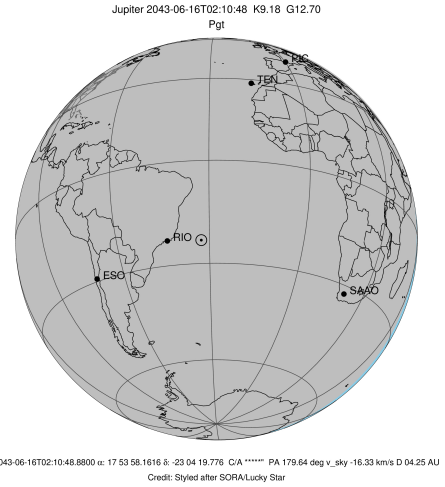


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-16T01:11:56.080	38.36	-42.58	71490.1	29.00	32.31
Jupiter	E	2043-06-16T03:16:36.547	65.59	-69.71	71490.0	30.04	33.41


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-16T02:07:00.790
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      : 4070146476978877952
2Mass ID (if available) : 17535817-2304193
ICRS Star Coord at Epoch: 17h 53m 58.16163s -23:04:19.77563s
RUWE (>1.4 is poor) : 4.25
K magnitude          : 9.176
G magnitude          : 12.697
RP magnitude         : 11.699
BP magnitude         : 13.695
DUPflag             : 0
Distance (au)       : 4.255
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -16.33
Sun-Target sep (deg) : 175.65
Sun-Moon sep (deg)  : 76.53
B (ring opening deg) : -2.43
PA of pole (deg)    : -0.19
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (" ) : 11.266
C/A sky separation (km) : 34764.7
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	2043-06-16T01:04:21.934	60.37	-56.47	71490.1	29.25	32.57
Jupiter	E	2043-06-16T03:09:57.016	33.82	-30.03	71490.1	28.79	32.09