

target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-06-28T03:07:45.700
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068789477856396416
 2Mass ID (if available) : 17471893-2304544

Jupiter 2043-06-28T03:07:45 K9.24 G13.82 Pgt

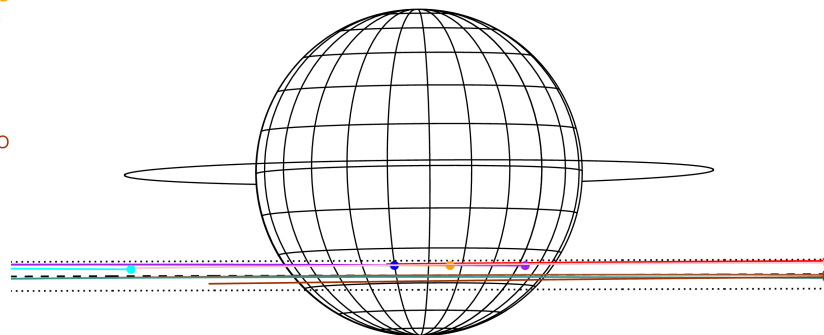
ICRS Star Coord at Epoch: 17h 47m 18.93661s -23:04:54.84845s

RUWE (>1.4 is poor) : 0.99
 K magnitude : 9.242
 G magnitude : 13.816
 RP magnitude : 12.657
 BP magnitude : 15.270
 DUPflag : 0
 Distance (au) : 4.257
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -16.10
 Sun-Target sep (deg) : 171.31
 Sun-Moon sep (deg) : 73.69
 B (ring opening deg) : -2.42
 PA of pole (deg) : 0.53
 Pole direction: RA (deg): 268.05669
 Dec (deg): 64.49732
 C/A sky separation (") : 14.581
 C/A sky separation (km) : 45014.4
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-06-28T03:07:45 K9.24 G13.82
 Pgt



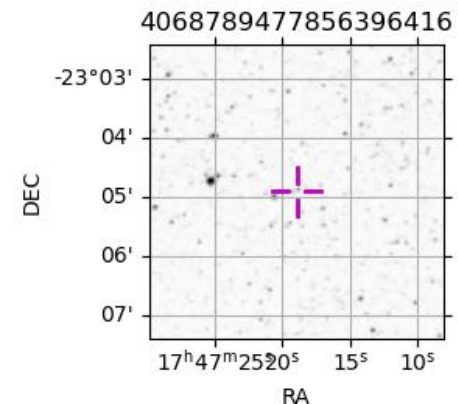
Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 SAAO



2043-06-28T03:07:45.7000 α: 17 47 18.9366 δ: -23 04 54.848 C/A ***** PA 0.17 deg v_sky -16.10 km/s D 04.26 AU
 Credit: Styled after SORA/Lucky Star

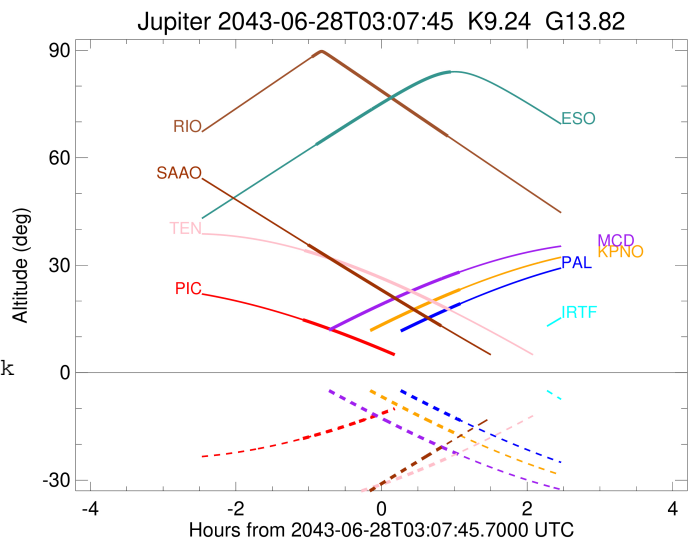
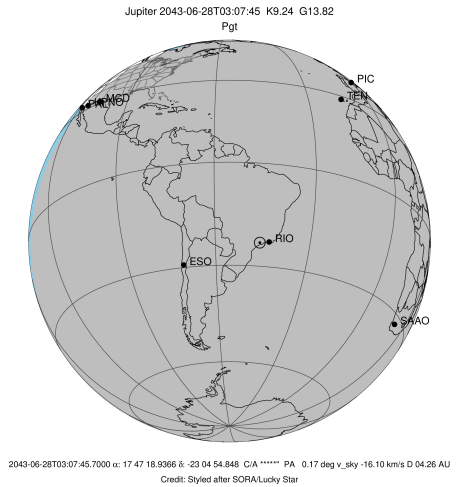
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	JUN 28 02:03 - JUN 28 02:03	Pin
PAL	Palomar Mt (200")	33.4	243.1	+	JUN 28 04:12 - JUN 28 04:12	Pne
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	JUN 28 04:12 - JUN 28 04:12	Pne
MCD	McDonald Obs. 2.7m	30.7	256.0	+	JUN 28 04:12 - JUN 28 04:12	Pne
TEN	Teide Obs./Tenerife	28.3	343.5	+	JUN 28 02:04 - JUN 28 04:03	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 28 02:10 - JUN 28 04:02	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	JUN 28 02:13 - JUN 28 04:04	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	JUN 28 02:07 - JUN 28 03:56	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-28T03:03:31.330
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       : 4068789477856396416
2Mass ID (if available) : 17471893-2304544
ICRS Star Coord at Epoch: 17h 47m 18.93661s -23:04:54.84845s
RUWE (>1.4 is poor) : 0.99
K magnitude           : 9.242
G magnitude           : 13.816
RP magnitude          : 12.657
BP magnitude          : 15.270
DUPflag              : 0
Distance (au)         : 4.257
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.10
Sun-Target sep (deg)  : 171.31
Sun-Moon sep (deg)   : 73.64
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.53
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 12.951
C/A sky separation (km) : 39982.7
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
    
```

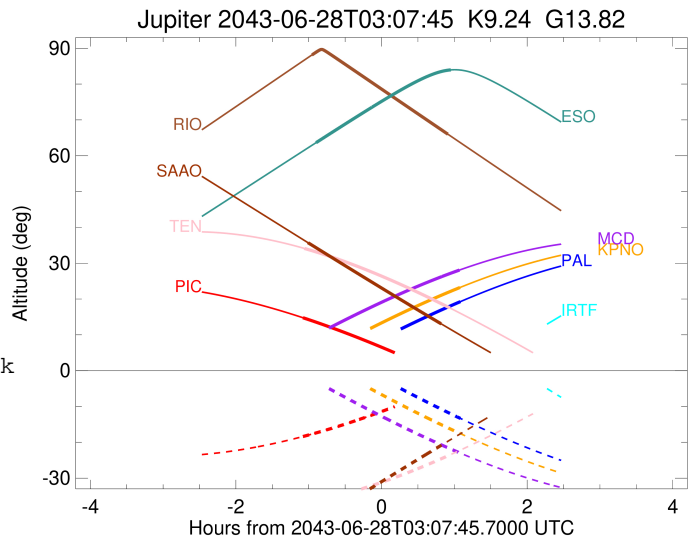
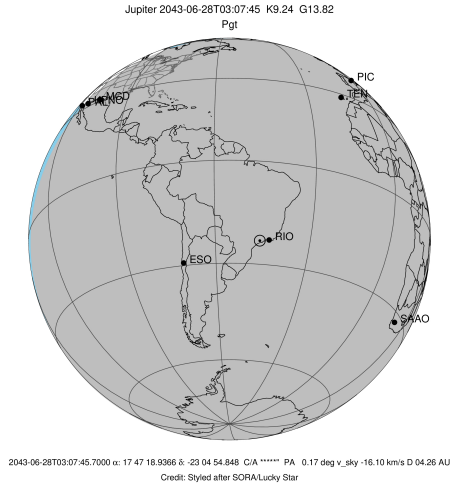


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-28T02:03:04.087	14.77	-18.38	71489.5	-33.99	-37.55
Jupiter	E	2043-06-28T04:04:15.958	-1.96x	-3.72x	71489.5	-34.03	-37.59

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-28T03:12:52.690
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       : 4068789477856396416
2Mass ID (if available) : 17471893-2304544
ICRS Star Coord at Epoch: 17h 47m 18.93661s -23:04:54.84845s
RUWE (>1.4 is poor) : 0.99
K magnitude           : 9.242
G magnitude           : 13.816
RP magnitude          : 12.657
BP magnitude          : 15.270
DUPflag              : 0
Distance (au)        : 4.257
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.10
Sun-Target sep (deg) : 171.31
Sun-Moon sep (deg)   : 74.03
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.53
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 13.200
C/A sky separation (km) : 40752.9
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
    
```

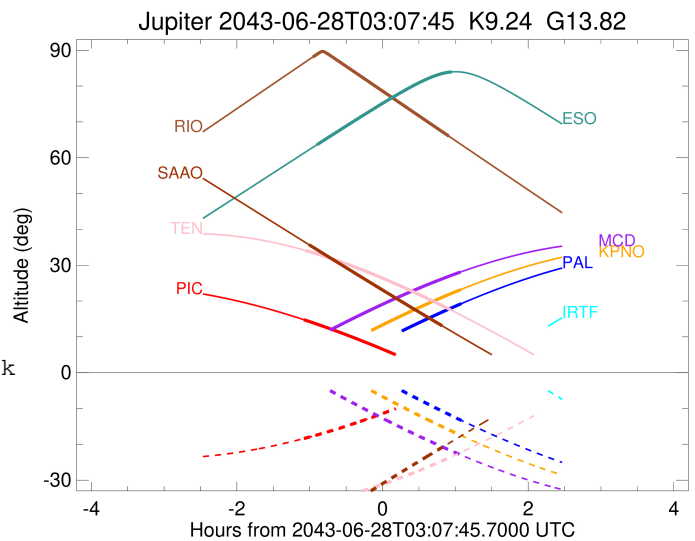
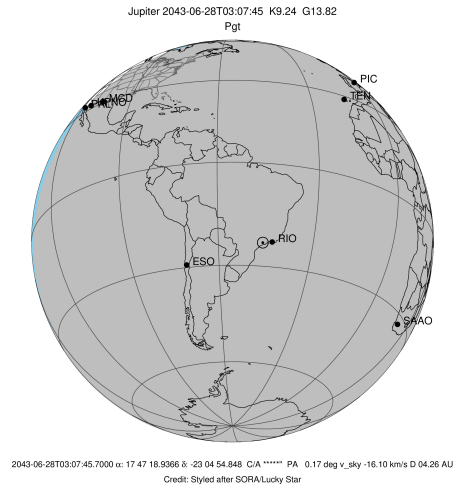


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-28T02:12:38.954	-0.95x	8.19x	71489.3	-35.58	-39.19
Jupiter	E	2043-06-28T04:12:47.222	19.27	-13.33	71489.5	-33.94	-37.50

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-28T03:12:39.760
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       : 4068789477856396416
2Mass ID (if available) : 17471893-2304544
ICRS Star Coord at Epoch: 17h 47m 18.93661s -23:04:54.84845s
RUWE (>1.4 is poor) : 0.99
K magnitude           : 9.242
G magnitude           : 13.816
RP magnitude         : 12.657
BP magnitude         : 15.270
DUPflag              : 0
Distance (au)        : 4.257
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.10
Sun-Target sep (deg) : 171.31
Sun-Moon sep (deg)   : 74.09
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.53
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 13.181
C/A sky separation (km): 40693.4
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
    
```

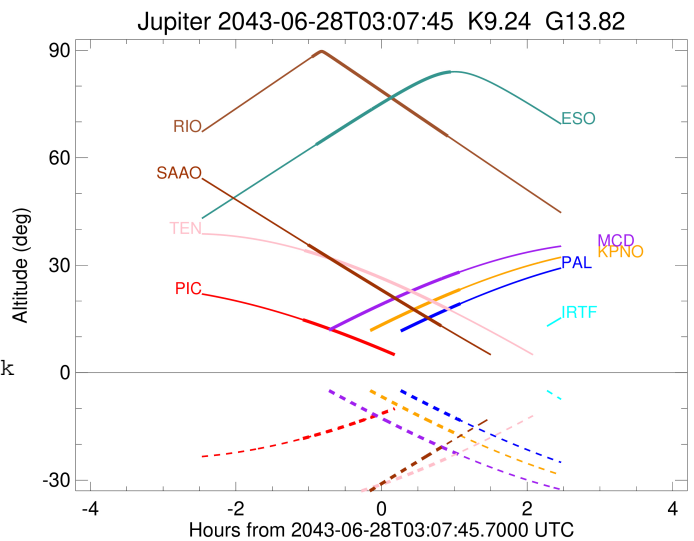
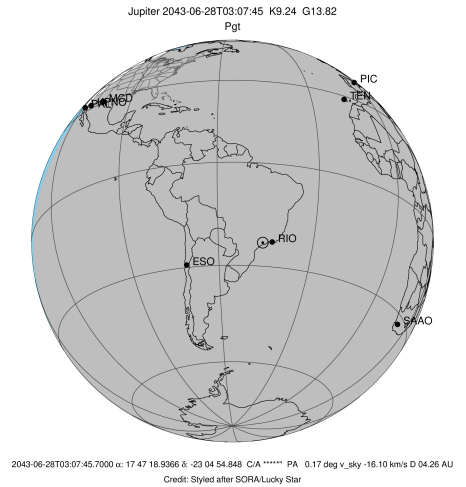


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-28T02:12:31.478	3.59x	3.60x	71489.3	-35.50	-39.12
Jupiter	E	2043-06-28T04:12:29.771	23.22	-17.53	71489.5	-33.90	-37.46

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-28T03:12:13.740
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        : 4068789477856396416
2Mass ID (if available) : 17471893-2304544
ICRS Star Coord at Epoch: 17h 47m 18.93661s -23:04:54.84845s
RUWE (>1.4 is poor) : 0.99
K magnitude           : 9.242
G magnitude           : 13.816
RP magnitude          : 12.657
BP magnitude          : 15.270
DUPflag              : 0
Distance (au)         : 4.257
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.10
Sun-Target sep (deg)  : 171.31
Sun-Moon sep (deg)   : 74.17
B (ring opening deg)  : -2.42
PA of pole (deg)     : 0.53
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 13.142
C/A sky separation (km) : 40571.3
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
    
```

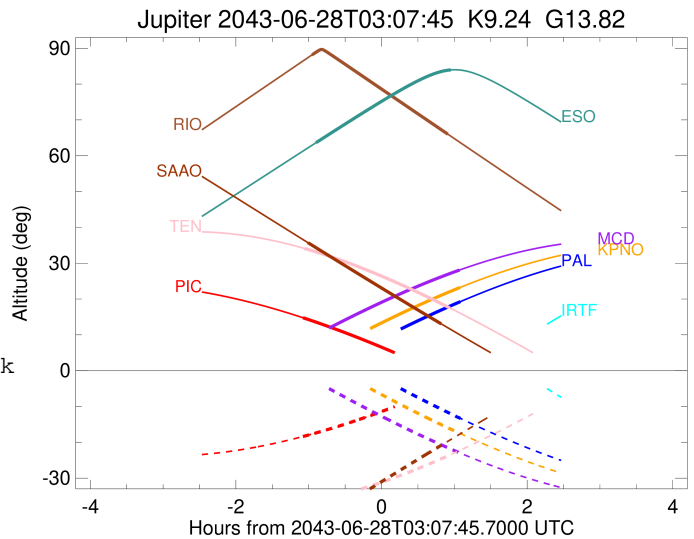
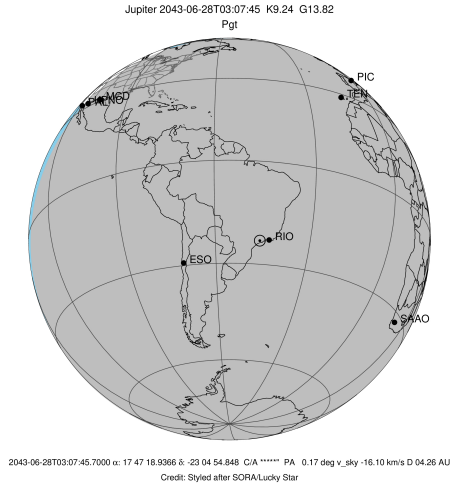


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-28T02:12:10.999	9.70	-2.69x	71489.3	-35.35	-38.96
Jupiter	E	2043-06-28T04:11:59.976	28.08	-22.91	71489.5	-33.83	-37.39

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-28T03:03:54.250
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      : 4068789477856396416
2Mass ID (if available) : 17471893-2304544
ICRS Star Coord at Epoch: 17h 47m 18.93661s -23:04:54.84845s
RUWE (>1.4 is poor) : 0.99
K magnitude          : 9.242
G magnitude          : 13.816
RP magnitude         : 12.657
BP magnitude         : 15.270
DUPflag             : 0
Distance (au)       : 4.257
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.10
Sun-Target sep (deg) : 171.31
Sun-Moon sep (deg)  : 73.96
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.53
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 13.125
C/A sky separation (km) : 40520.8
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
    
```

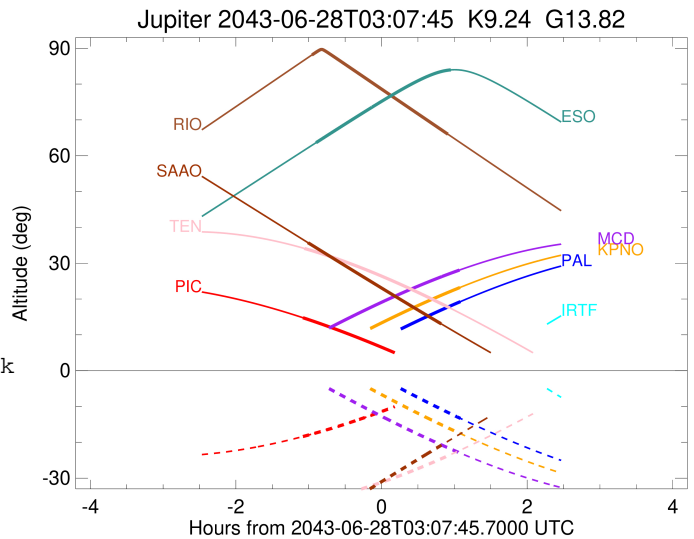
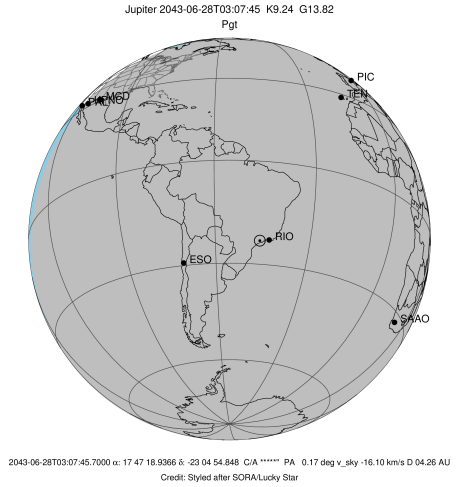


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-28T02:04:16.679	34.11	-36.90	71489.4	-34.57	-38.15
Jupiter	E	2043-06-28T04:03:47.130	17.55	-23.56	71489.4	-34.53	-38.11

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-28T03:06:23.550
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       : 4068789477856396416
2Mass ID (if available) : 17471893-2304544
ICRS Star Coord at Epoch: 17h 47m 18.93661s -23:04:54.84845s
RUWE (>1.4 is poor) : 0.99
K magnitude          : 9.242
G magnitude          : 13.816
RP magnitude         : 12.657
BP magnitude         : 15.270
DUPflag             : 0
Distance (au)        : 4.257
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.10
Sun-Target sep (deg) : 171.31
Sun-Moon sep (deg)   : 74.54
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.53
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 14.586
C/A sky separation (km): 45029.4
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
    
```

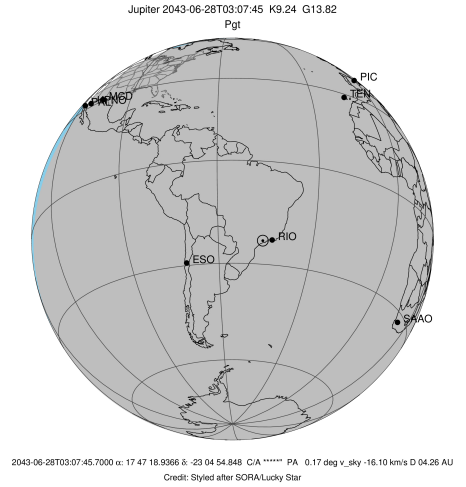


x: target alt < 5.0 deg or sun > -5.0 deg

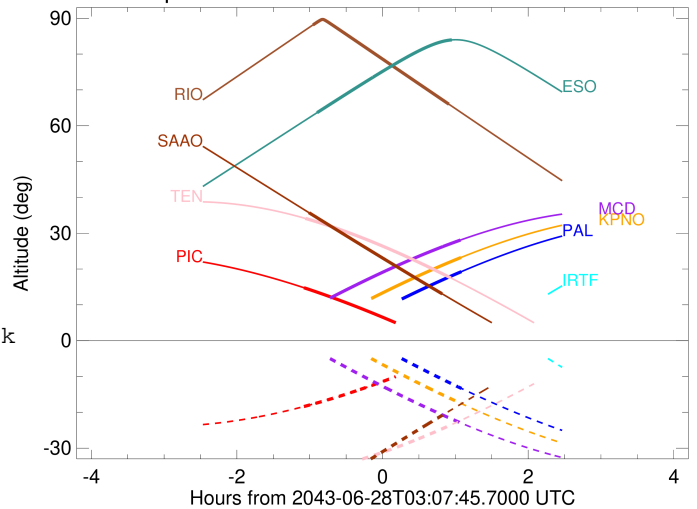
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-28T02:10:26.774	88.13	-79.49	71488.8	-39.31	-43.01
Jupiter	E	2043-06-28T04:02:25.435	66.01	-74.73	71488.9	-38.83	-42.52


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-28T03:09:20.720
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      : 4068789477856396416
2Mass ID (if available) : 17471893-2304544
ICRS Star Coord at Epoch: 17h 47m 18.93661s -23:04:54.84845s
RUWE (>1.4 is poor) : 0.99
K magnitude          : 9.242
G magnitude          : 13.816
RP magnitude         : 12.657
BP magnitude         : 15.270
DUPflag             : 0
Distance (au)       : 4.257
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.10
Sun-Target sep (deg) : 171.31
Sun-Moon sep (deg)  : 74.63
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.53
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 14.819
C/A sky separation (km): 45750.5
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
    
```



Jupiter 2043-06-28T03:07:45 K9.24 G13.82

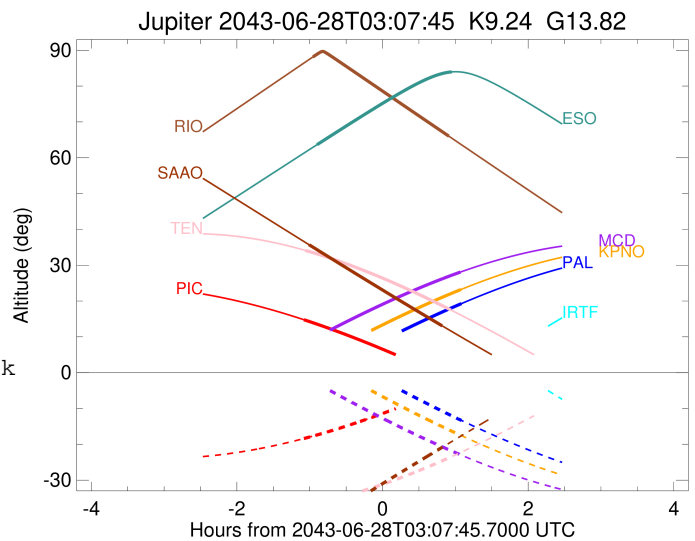
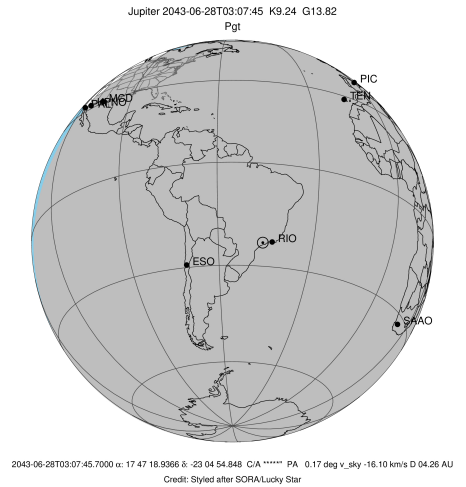


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-28T02:13:49.573	63.64	-55.50	71488.6	-40.31	-44.02
Jupiter	E	2043-06-28T04:04:47.304	83.95	-79.06	71488.8	-39.31	-43.01


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-28T03:01:55.210
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        : 4068789477856396416
2Mass ID (if available) : 17471893-2304544
ICRS Star Coord at Epoch: 17h 47m 18.93661s -23:04:54.84845s
RUWE (>1.4 is poor)  : 0.99
K magnitude           : 9.242
G magnitude           : 13.816
RP magnitude          : 12.657
BP magnitude          : 15.270
DUPflag              : 0
Distance (au)         : 4.257
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -16.10
Sun-Target sep (deg)  : 171.31
Sun-Moon sep (deg)    : 73.82
B (ring opening deg)  : -2.42
PA of pole (deg)      : 0.53
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 15.418
C/A sky separation (km) : 47600.2
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	2043-06-28T02:07:13.236	35.71	-43.72	71488.5	-41.56	-45.28
Jupiter	E	2043-06-28T03:56:56.668	13.07	-20.83	71488.4	-41.88	-45.60