

target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-06-20T03:17:18.770
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068693060050350080
 2Mass ID (if available) : 17514358-2304349

Jupiter 2043-06-20T03:17:18 K8.11 G12.64 Pgt

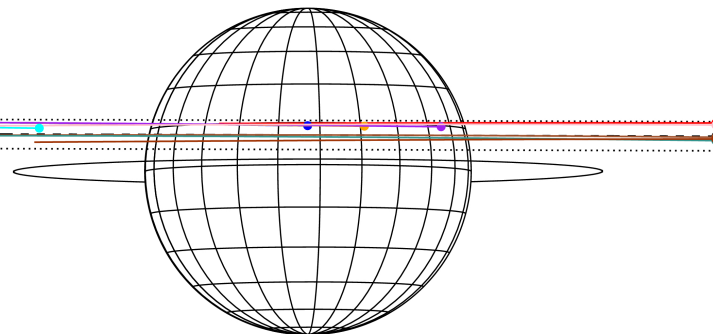
ICRS Star Coord at Epoch: 17h 51m 43.58455s -23°04'35.01455s

RUWE (>1.4 is poor) : 0.90
 K magnitude : 8.105
 G magnitude : 12.642
 RP magnitude : 11.468
 BP magnitude : 14.124
 DUPflag : 0
 Distance (au) : 4.250
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -16.41
 Sun-Target sep (deg) : 179.66
 Sun-Moon sep (deg) : 27.63
 B (ring opening deg) : -2.43
 PA of pole (deg) : 0.05
 Pole direction: RA (deg): 268.05669
 Dec (deg): 64.49732
 C/A sky separation (") : 5.186
 C/A sky separation (km) : 15988.5
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-06-20T03:17:18 K8.11 G12.64
 Pgt



Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 SAAO

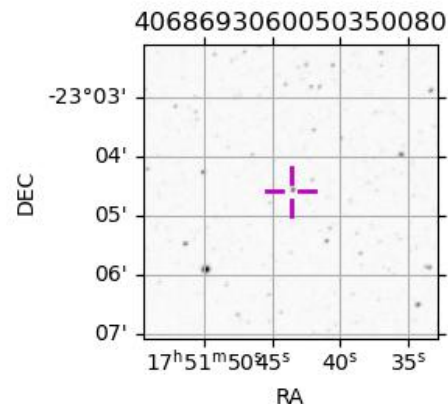


2043-06-20T03:17:18.7700 at: 17 51 43.5845 s: -23 04 35.015 C/A 5.175" PA 179.83 deg v_sky -16.41 km/s D 04.25 AU

Credit: Styled after SORA/Lucky Star

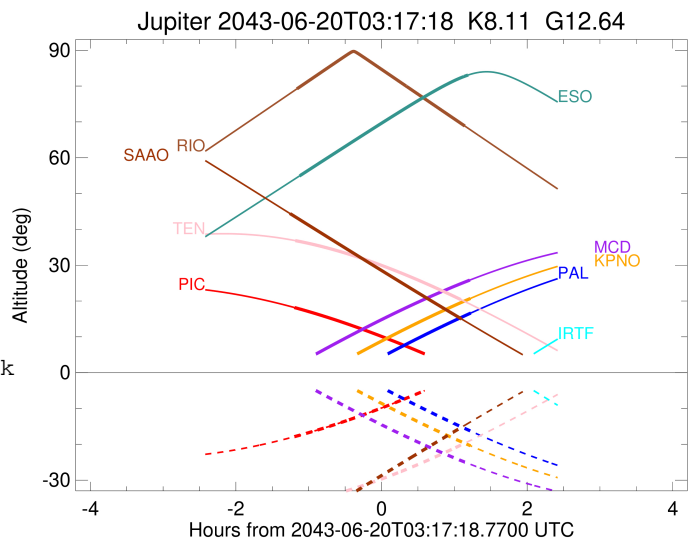
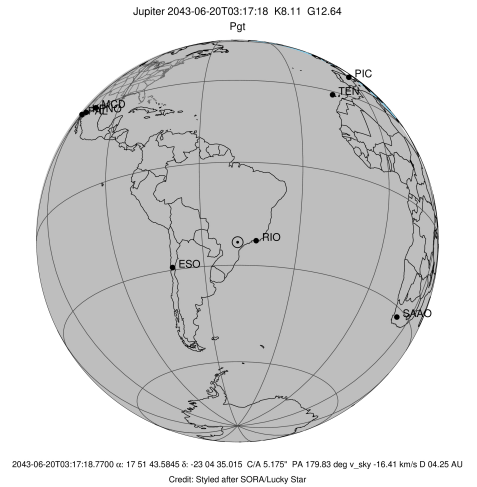
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	JUN 20 02:05 - JUN 20 02:05	Pin
PAL	Palomar Mt (200")	33.4	243.1	+	JUN 20 04:30 - JUN 20 04:30	Pne
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	JUN 20 04:30 - JUN 20 04:30	Pne
MCD	McDonald Obs. 2.7m	30.7	256.0	+	JUN 20 04:30 - JUN 20 04:30	Pne
TEN	Teide Obs./Tenerife	28.3	343.5	+	JUN 20 02:06 - JUN 20 04:22	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 20 02:07 - JUN 20 04:25	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	JUN 20 02:09 - JUN 20 04:28	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	JUN 20 02:01 - JUN 20 04:23	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-20T03:13:51.460
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       : 4068693060050350080
2Mass ID (if available) : 17514358-2304349
ICRS Star Coord at Epoch: 17h 51m 43.58455s -23:04:35.01455s
RUWE (>1.4 is poor) : 0.90
K magnitude          : 8.105
G magnitude          : 12.642
RP magnitude         : 11.468
BP magnitude         : 14.124
DUPflag             : 0
Distance (au)        : 4.250
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 179.66
Sun-Moon sep (deg)   : 28.25
B (ring opening deg) : -2.43
PA of pole (deg)     : 0.05
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 6.864
C/A sky separation (km) : 21161.2
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
    
```

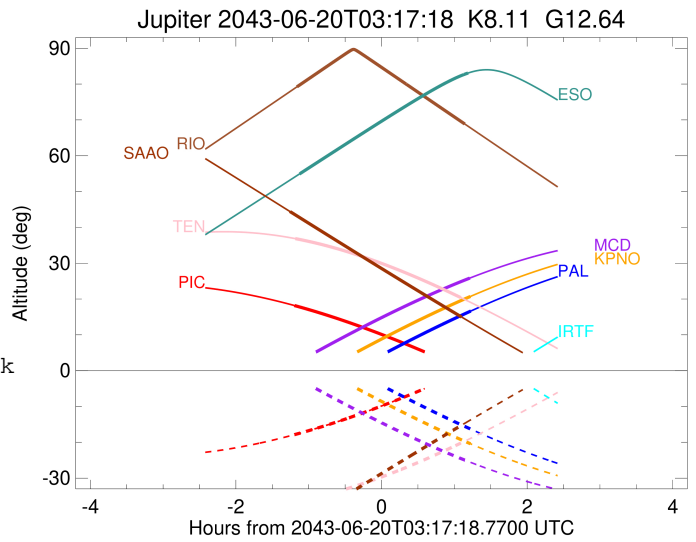
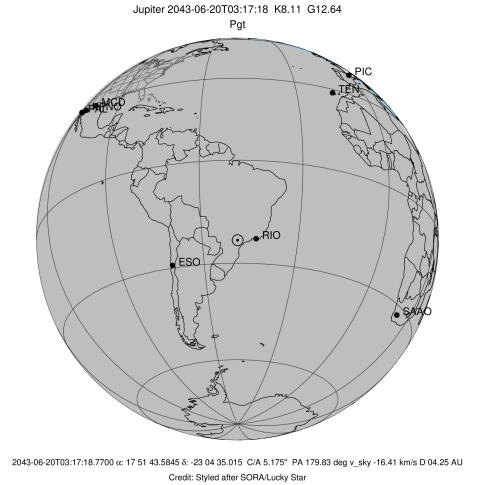


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-20T02:05:34.768	18.18	-17.86	71491.3	17.27	19.56
Jupiter	E	2043-06-20T04:22:26.638	0.82x	-0.62x	71491.3	17.04	19.30

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-20T03:22:05.070
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       : 4068693060050350080
2Mass ID (if available) : 17514358-2304349
ICRS Star Coord at Epoch: 17h 51m 43.58455s -23:04:35.01455s
RUWE (>1.4 is poor) : 0.90
K magnitude          : 8.105
G magnitude           : 12.642
RP magnitude         : 11.468
BP magnitude         : 14.124
DUPflag             : 0
Distance (au)        : 4.250
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 179.66
Sun-Moon sep (deg)   : 27.13
B (ring opening deg) : -2.43
PA of pole (deg)     : 0.05
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 6.508
C/A sky separation (km) : 20063.5
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
    
```

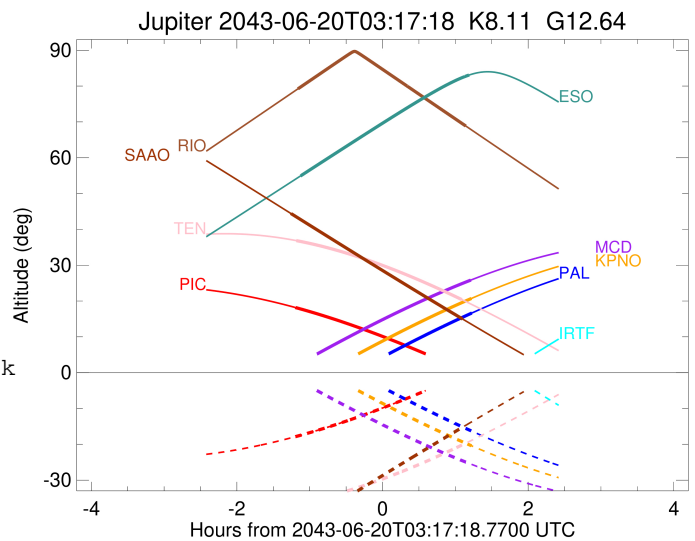
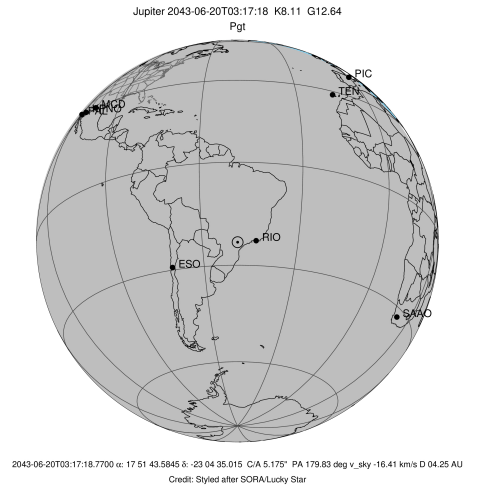


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-20T02:12:48.887	-7.74x	7.91x	71491.4	15.55	17.64
Jupiter	E	2043-06-20T04:30:54.840	16.64	-16.33	71491.3	16.95	19.20

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-20T03:21:56.850
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        : 4068693060050350080
2Mass ID (if available) : 17514358-2304349
ICRS Star Coord at Epoch: 17h 51m 43.58455s -23:04:35.01455s
RUWE (>1.4 is poor) : 0.90
K magnitude           : 8.105
G magnitude           : 12.642
RP magnitude          : 11.468
BP magnitude          : 14.124
DUPflag              : 0
Distance (au)         : 4.250
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg)  : 179.66
Sun-Moon sep (deg)   : 27.18
B (ring opening deg) : -2.43
PA of pole (deg)     : 0.05
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 6.530
C/A sky separation (km) : 20130.3
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
    
```

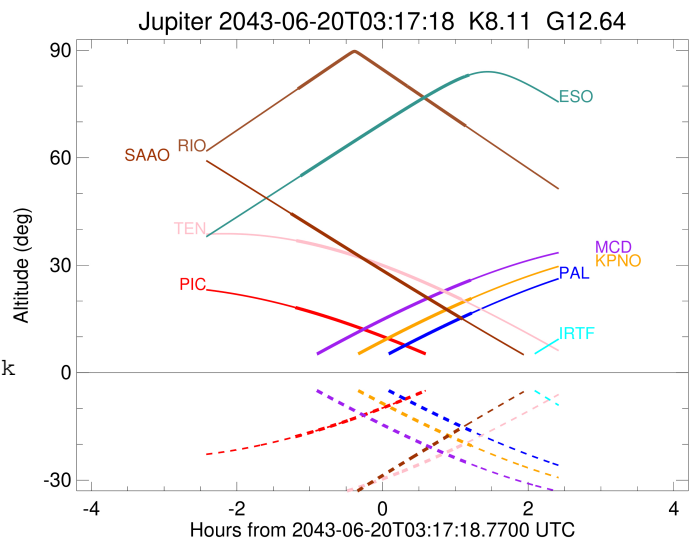
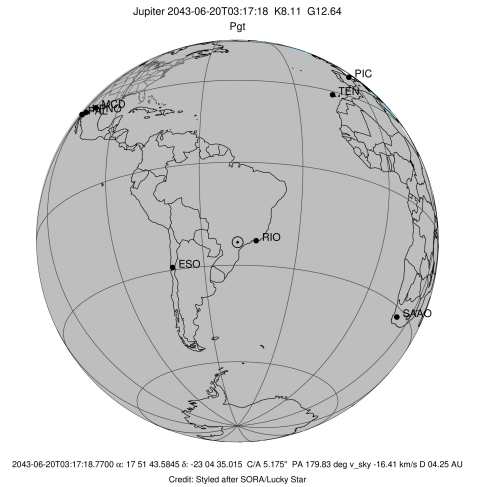


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-20T02:12:50.718	-3.11x	3.29x	71491.4	15.61	17.71
Jupiter	E	2043-06-20T04:30:37.498	20.72	-20.40	71491.3	16.98	19.24

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-20T03:21:38.040
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        : 4068693060050350080
2Mass ID (if available) : 17514358-2304349
ICRS Star Coord at Epoch: 17h 51m 43.58455s -23:04:35.01455s
RUWE (>1.4 is poor) : 0.90
K magnitude           : 8.105
G magnitude           : 12.642
RP magnitude          : 11.468
BP magnitude          : 14.124
DUPflag              : 0
Distance (au)         : 4.250
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg)  : 179.66
Sun-Moon sep (deg)    : 27.27
B (ring opening deg) : -2.43
PA of pole (deg)      : 0.05
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 6.574
C/A sky separation (km) : 20267.2
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
    
```

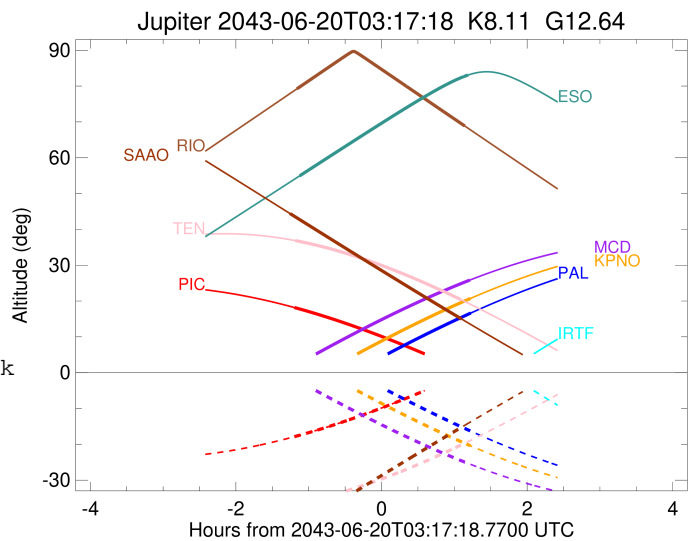
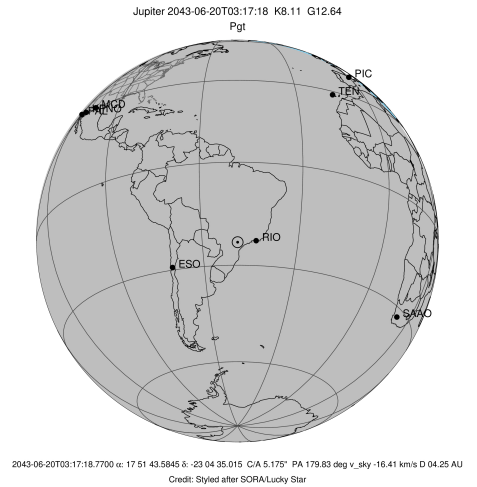


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-20T02:12:46.549	3.23x	-3.04x	71491.4	15.75	17.86
Jupiter	E	2043-06-20T04:30:05.982	25.84	-25.51	71491.3	17.05	19.32

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-20T03:14:22.800
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      : 4068693060050350080
2Mass ID (if available) : 17514358-2304349
ICRS Star Coord at Epoch: 17h 51m 43.58455s -23:04:35.01455s
RUWE (>1.4 is poor) : 0.90
K magnitude          : 8.105
G magnitude          : 12.642
RP magnitude         : 11.468
BP magnitude         : 14.124
DUPflag             : 0
Distance (au)        : 4.250
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 179.66
Sun-Moon sep (deg)  : 28.31
B (ring opening deg) : -2.43
PA of pole (deg)    : 0.05
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (" ) : 6.684
C/A sky separation (km) : 20605.9
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
    
```

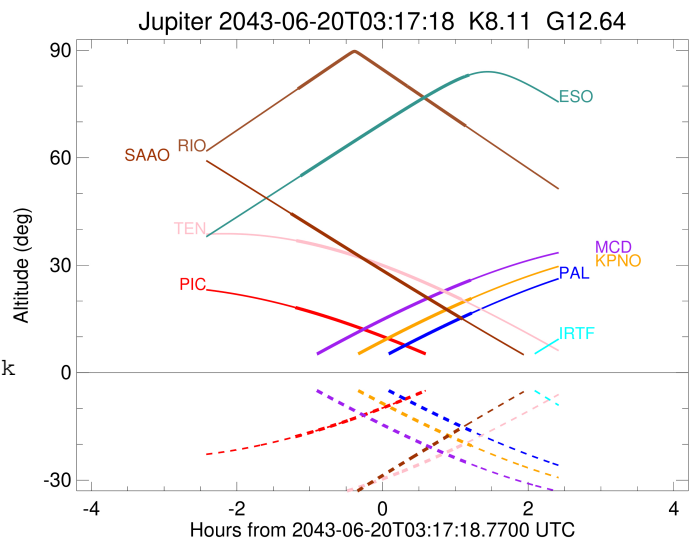
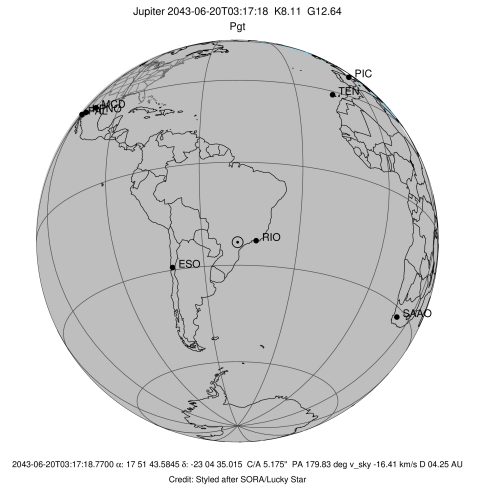


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-20T02:06:23.350	36.85	-36.52	71491.3	16.73	18.96
Jupiter	E	2043-06-20T04:22:37.697	20.40	-20.22	71491.3	16.60	18.81

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-20T03:16:44.740
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      : 4068693060050350080
2Mass ID (if available) : 17514358-2304349
ICRS Star Coord at Epoch: 17h 51m 43.58455s -23:04:35.01455s
RUWE (>1.4 is poor) : 0.90
K magnitude         : 8.105
G magnitude         : 12.642
RP magnitude        : 11.468
BP magnitude        : 14.124
DUPflag            : 0
Distance (au)       : 4.250
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 179.66
Sun-Moon sep (deg)  : 28.12
B (ring opening deg) : -2.43
PA of pole (deg)    : 0.05
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 5.193
C/A sky separation (km) : 16009.6
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
    
```

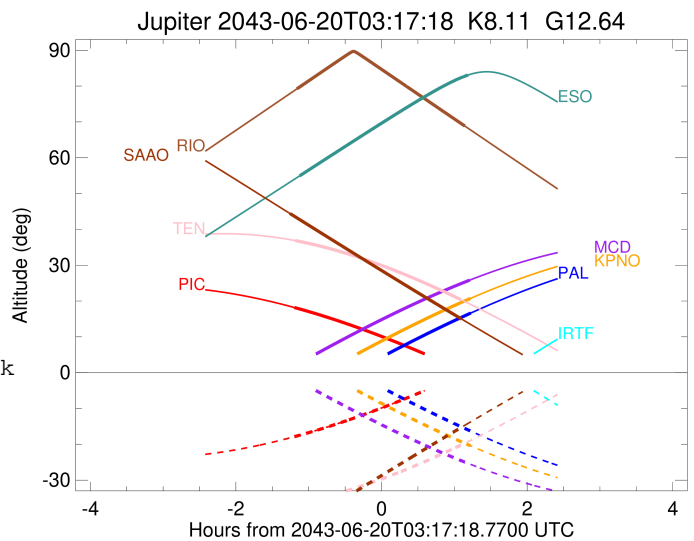
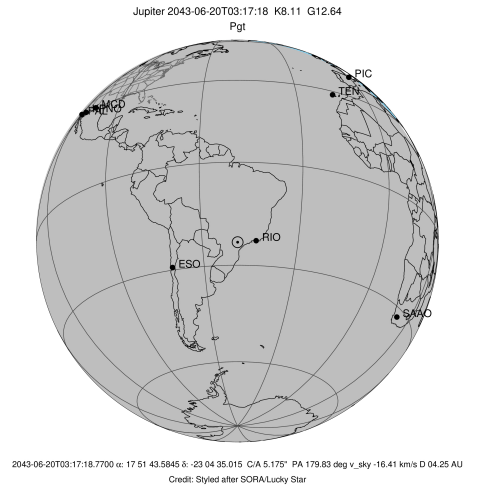


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-20T02:07:45.541	79.25	-79.27	71491.6	12.68	14.42
Jupiter	E	2043-06-20T04:25:47.103	68.88	-68.99	71491.6	13.00	14.79


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-20T03:19:19.040
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       : 4068693060050350080
2Mass ID (if available) : 17514358-2304349
ICRS Star Coord at Epoch: 17h 51m 43.58455s -23:04:35.01455s
RUWE (>1.4 is poor) : 0.90
K magnitude          : 8.105
G magnitude           : 12.642
RP magnitude         : 11.468
BP magnitude         : 14.124
DUPflag             : 0
Distance (au)        : 4.250
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 179.66
Sun-Moon sep (deg)   : 27.75
B (ring opening deg) : -2.43
PA of pole (deg)     : 0.05
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 4.927
C/A sky separation (km): 15188.2
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
    
```

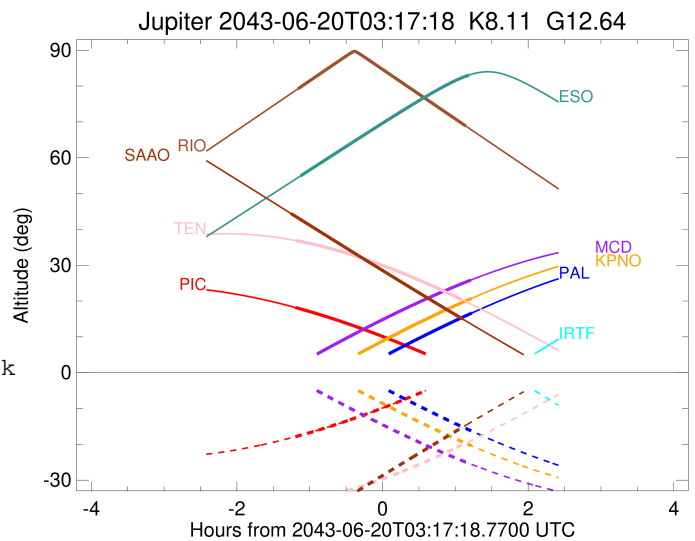
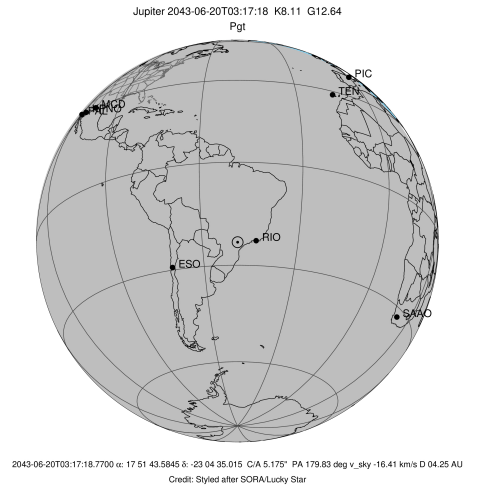


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-20T02:09:50.599	54.93	-55.05	71491.7	11.76	13.39
Jupiter	E	2043-06-20T04:28:36.690	83.07	-83.32	71491.6	12.59	14.32


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-20T03:12:21.240
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       : 4068693060050350080
2Mass ID (if available) : 17514358-2304349
ICRS Star Coord at Epoch: 17h 51m 43.58455s -23:04:35.01455s
RUWE (>1.4 is poor) : 0.90
K magnitude           : 8.105
G magnitude           : 12.642
RP magnitude          : 11.468
BP magnitude          : 14.124
DUPflag              : 0
Distance (au)         : 4.250
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 179.66
Sun-Moon sep (deg)   : 28.41
B (ring opening deg) : -2.43
PA of pole (deg)     : 0.05
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 4.411
C/A sky separation (km) : 13598.7
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	2043-06-20T02:01:55.001	44.41	-44.53	71491.7	11.19	12.74
Jupiter	E	2043-06-20T04:23:16.033	14.98	-15.23	71491.7	10.66	12.14