

target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-06-30T04:20:23.780
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068833625738516608
 2Mass ID (if available) : 17461241-2304404

Jupiter 2043-06-30T04:20:23 K9.67 G14.77 Pgt

ICRS Star Coord at Epoch: 17h 46m 12.39771s -23°04:40.74284s

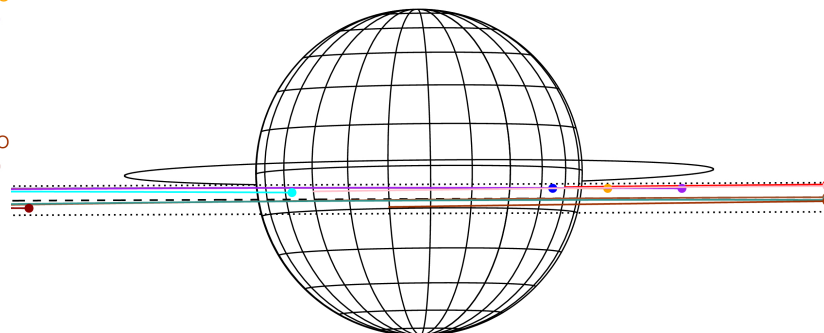
RUWE (>1.4 is poor) : 0.97
 K magnitude : 9.671
 G magnitude : 14.772
 RP magnitude : 13.465
 BP magnitude : 16.754
 DUPflag : 0
 Distance (au) : 4.261
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -15.91
 Sun-Target sep (deg) : 169.11
 Sun-Moon sep (deg) : 101.66
 B (ring opening deg) : -2.42
 PA of pole (deg) : 0.65
 Pole direction: RA (deg): 268.05669
 Dec (deg): 64.49732
 C/A sky separation (") : 3.750
 C/A sky separation (km) : 11589.8
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-06-30T04:20:23 K9.67 G14.77
 Pgt



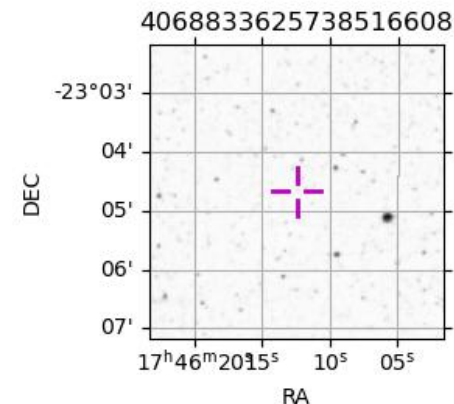
2043-06-30T04:20:23.7800 a: 17 46 12.3977 s -23 04 40.743 C/A 3.761" PA 0.24 deg v_sky -15.91 km/s D 04.26 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 SAAO
 MSO



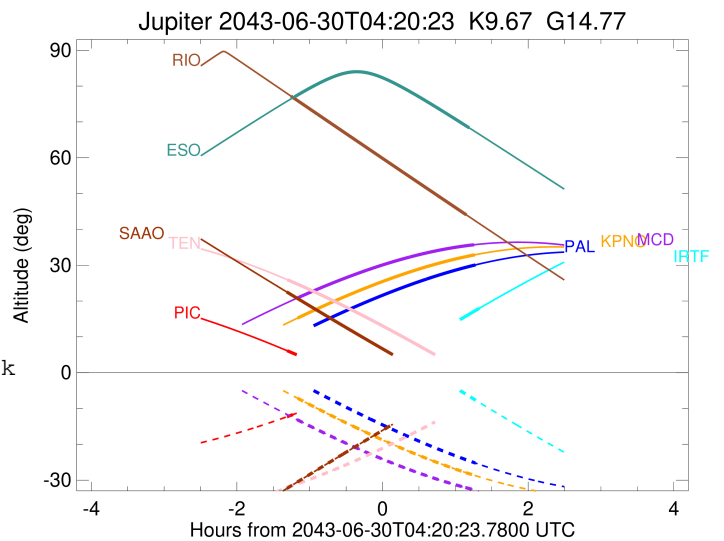
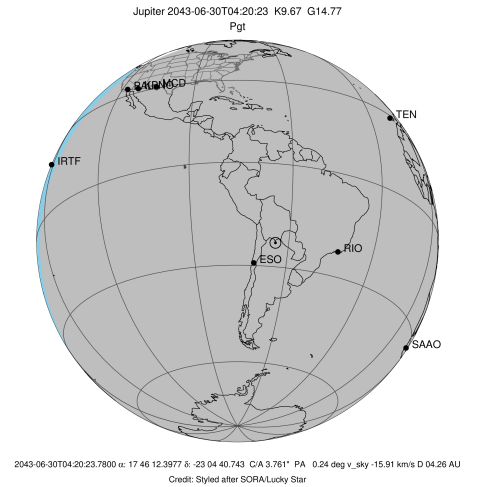
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events	Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	JUN 30 03:01 - JUN 30 03:01		Pin
PAL	Palomar Mt (200")	33.4	243.1	+	JUN 30 05:37 - JUN 30 05:37		Pne
PMO	Purple Mtn Obs. Nanking	32.1	118.8				Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	JUN 30 03:10 - JUN 30 05:36		Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+	JUN 30 03:10 - JUN 30 05:35		Pie
TEN	Teide Obs./Tenerife	28.3	343.5	+	JUN 30 03:02 - JUN 30 03:02		Pin
IRTF	Mauna Kea/IRTF	19.8	204.5	+	JUN 30 05:40 - JUN 30 05:40		Pne
KAV	Kavalur Observatory	12.6	78.8				Pnn
RIO	Rio de Janeiro	-22.9	316.8	+	JUN 30 03:05 - JUN 30 05:29		Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	JUN 30 03:07 - JUN 30 05:31		Pie
AAT	Siding Spring (AAT)	-31.3	149.1				Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	JUN 30 03:01 - JUN 30 03:01		Pin
MSO	Mt. Stromlo Observatory	-35.3	149.0				Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-30T04:15:36.080
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      : 4068833625738516608
2Mass ID (if available) : 17461241-2304404
ICRS Star Coord at Epoch: 17h 46m 12.39771s -23:04:40.74284s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 9.671
G magnitude          : 14.772
RP magnitude         : 13.465
BP magnitude         : 16.754
DUPflag             : 0
Distance (au)       : 4.261
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.91
Sun-Target sep (deg) : 169.11
Sun-Moon sep (deg)  : 101.70
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.65
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 2.310
C/A sky separation (km) : 7138.6
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
    
```

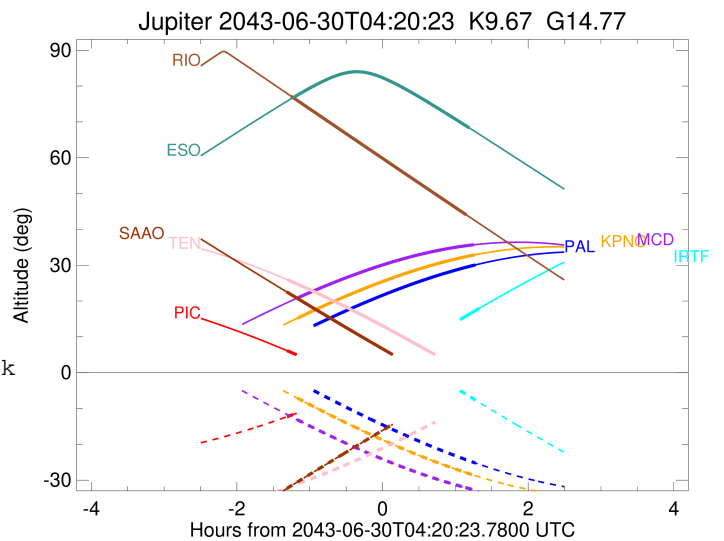
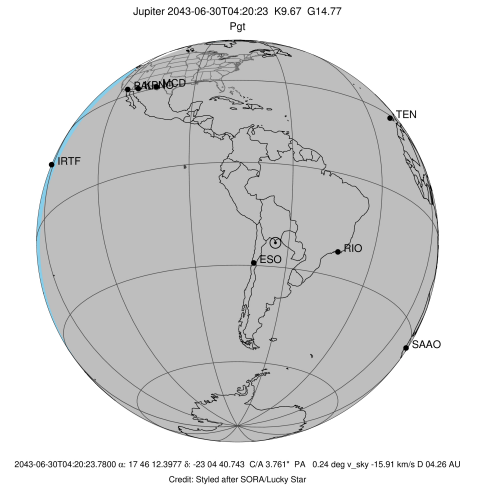


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-30T03:01:46.054	6.14	-12.29	71491.9	-5.70	-6.51
Jupiter	E	2043-06-30T05:29:56.897	-18.00x	9.78x	71491.9	-5.80	-6.62

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-30T04:24:01.280
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        : 4068833625738516608
2Mass ID (if available) : 17461241-2304404
ICRS Star Coord at Epoch: 17h 46m 12.39771s -23:04:40.74284s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 9.671
G magnitude           : 14.772
RP magnitude          : 13.465
BP magnitude          : 16.754
DUPflag              : 0
Distance (au)         : 4.261
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.91
Sun-Target sep (deg)  : 169.11
Sun-Moon sep (deg)    : 101.90
B (ring opening deg) : -2.42
PA of pole (deg)      : 0.65
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 2.192
C/A sky separation (km) : 6775.3
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
    
```

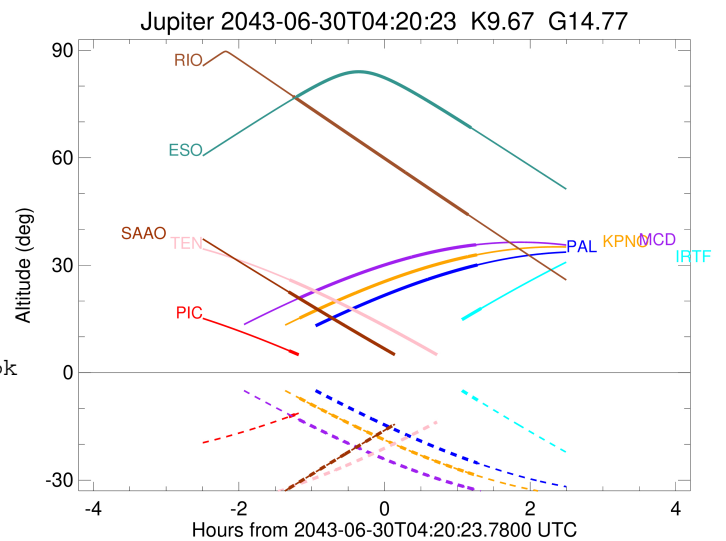
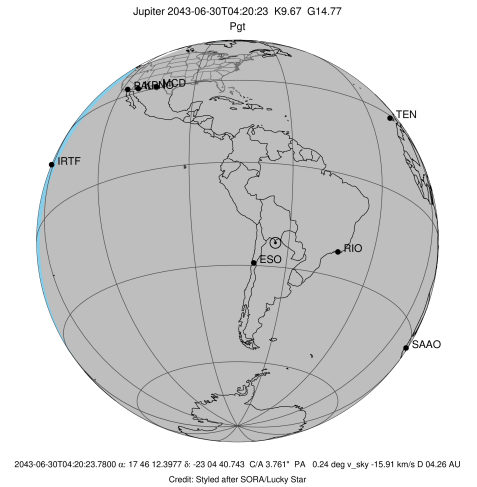


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-30T03:10:40.370	10.95	-2.67x	71491.9	-6.25	-7.13
Jupiter	E	2043-06-30T05:37:01.930	30.08	-25.23	71491.9	-4.76	-5.43

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-30T04:23:39.940
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        : 4068833625738516608
2Mass ID (if available) : 17461241-2304404
ICRS Star Coord at Epoch: 17h 46m 12.39771s -23:04:40.74284s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 9.671
G magnitude           : 14.772
RP magnitude          : 13.465
BP magnitude          : 16.754
DUPflag              : 0
Distance (au)         : 4.261
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.91
Sun-Target sep (deg)  : 169.11
Sun-Moon sep (deg)    : 101.97
B (ring opening deg) : -2.42
PA of pole (deg)      : 0.65
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 2.185
C/A sky separation (km) : 6753.3
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
    
```

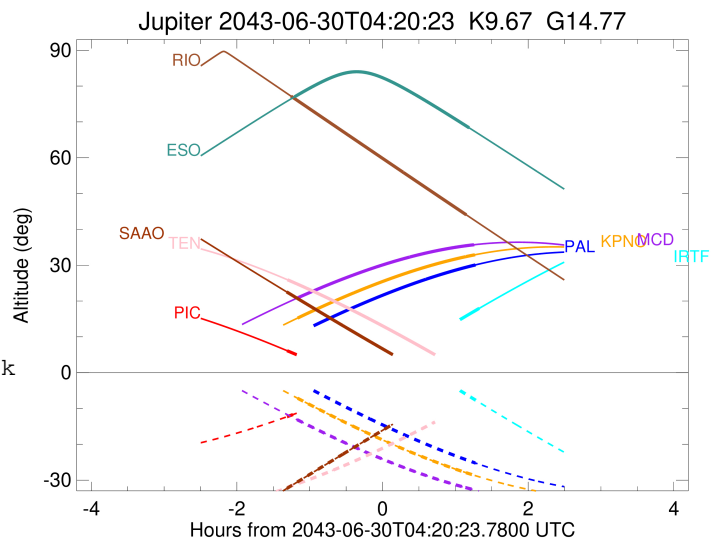
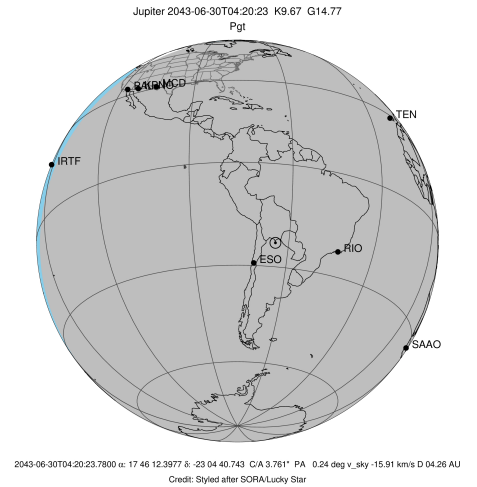


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-30T03:10:27.044	15.24	-7.14	71491.9	-6.20	-7.08
Jupiter	E	2043-06-30T05:36:34.784	32.91	-28.71	71491.9	-4.78	-5.46

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-30T04:23:03.850
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      : 4068833625738516608
2Mass ID (if available) : 17461241-2304404
ICRS Star Coord at Epoch: 17h 46m 12.39771s -23:04:40.74284s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 9.671
G magnitude          : 14.772
RP magnitude         : 13.465
BP magnitude         : 16.754
DUPflag             : 0
Distance (au)       : 4.261
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.91
Sun-Target sep (deg) : 169.11
Sun-Moon sep (deg)  : 102.05
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.65
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 2.167
C/A sky separation (km): 6698.3
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
    
```

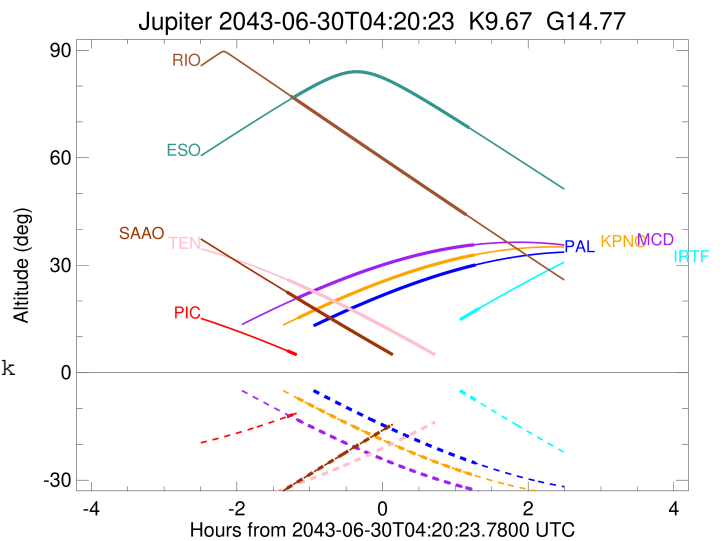
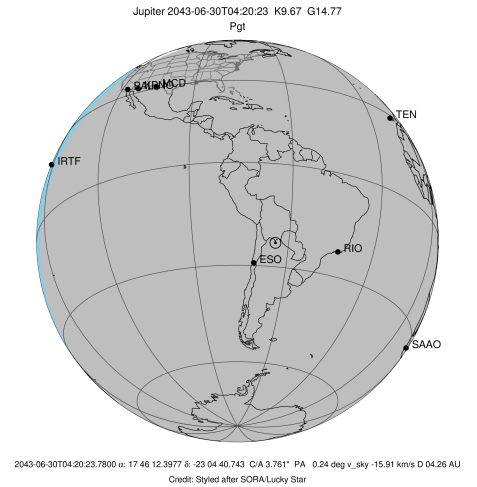


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-30T03:10:00.756	20.81	-13.11	71491.9	-6.10	-6.97
Jupiter	E	2043-06-30T05:35:52.506	35.71	-32.69	71491.9	-4.80	-5.48

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-30T04:15:19.070
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      : 4068833625738516608
2Mass ID (if available) : 17461241-2304404
ICRS Star Coord at Epoch: 17h 46m 12.39771s -23:04:40.74284s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 9.671
G magnitude          : 14.772
RP magnitude         : 13.465
BP magnitude         : 16.754
DUPflag             : 0
Distance (au)       : 4.261
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.91
Sun-Target sep (deg) : 169.11
Sun-Moon sep (deg)  : 102.03
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.65
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 2.481
C/A sky separation (km) : 7667.1
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
    
```

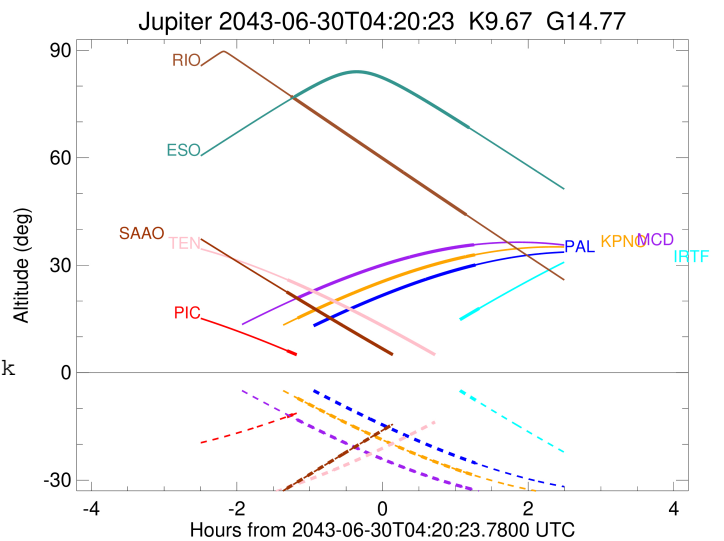
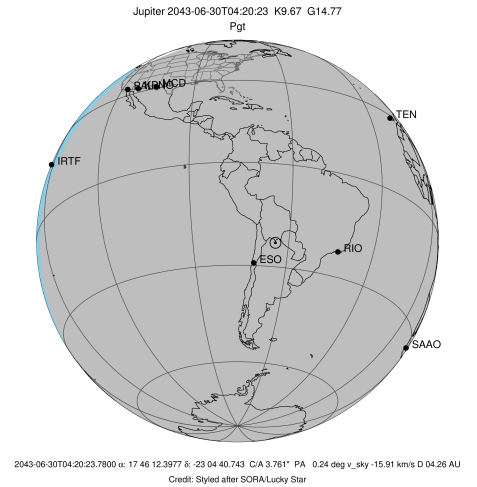


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-30T03:02:07.640	25.92	-31.96	71491.9	-6.13	-7.00
Jupiter	E	2043-06-30T05:29:02.198	0.04x	-9.14	71491.9	-6.27	-7.16

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-30T04:26:38.720
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      : 4068833625738516608
2Mass ID (if available) : 17461241-2304404
ICRS Star Coord at Epoch: 17h 46m 12.39771s -23:04:40.74284s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 9.671
G magnitude          : 14.772
RP magnitude         : 13.465
BP magnitude         : 16.754
DUPflag             : 0
Distance (au)       : 4.261
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.91
Sun-Target sep (deg) : 169.11
Sun-Moon sep (deg)  : 101.50
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.65
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 2.949
C/A sky separation (km) : 9114.0
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
    
```

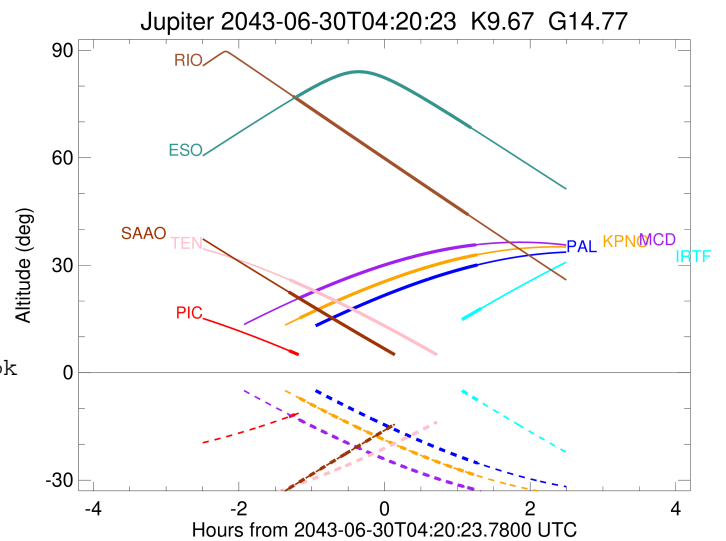
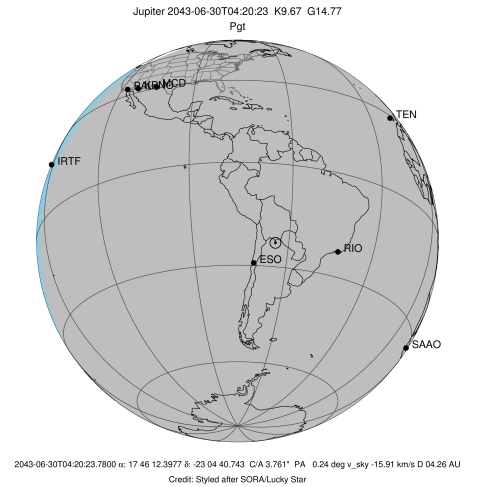


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-30T03:12:29.974	-13.27x	23.80x	71491.8	-8.34	-9.51
Jupiter	E	2043-06-30T05:40:10.596	17.96	-8.31	71491.9	-6.35	-7.25

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch              : 2043-06-30T04:17:03.980
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        : 4068833625738516608
2Mass ID (if available) : 17461241-2304404
ICRS Star Coord at Epoch: 17h 46m 12.39771s -23:04:40.74284s
RUWE (>1.4 is poor)  : 0.97
K magnitude           : 9.671
G magnitude           : 14.772
RP magnitude          : 13.465
BP magnitude          : 16.754
DUPflag              : 0
Distance (au)         : 4.261
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -15.91
Sun-Target sep (deg)  : 169.11
Sun-Moon sep (deg)    : 102.59
B (ring opening deg)  : -2.42
PA of pole (deg)      : 0.65
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 3.852
C/A sky separation (km) : 11903.9
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
    
```

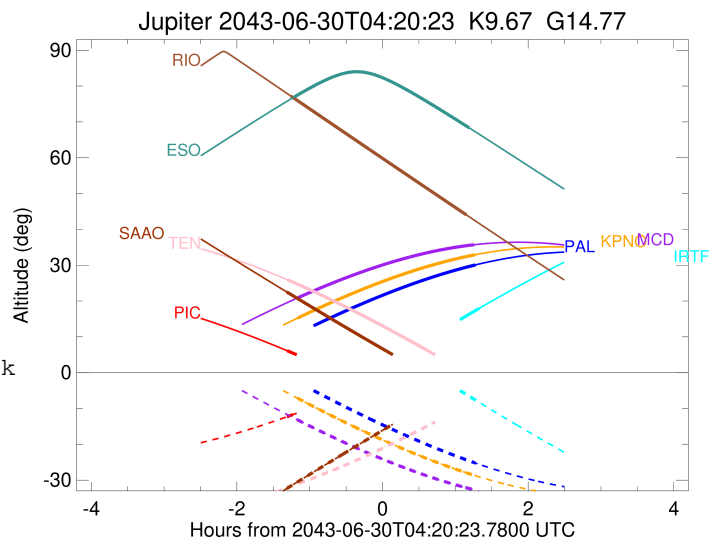
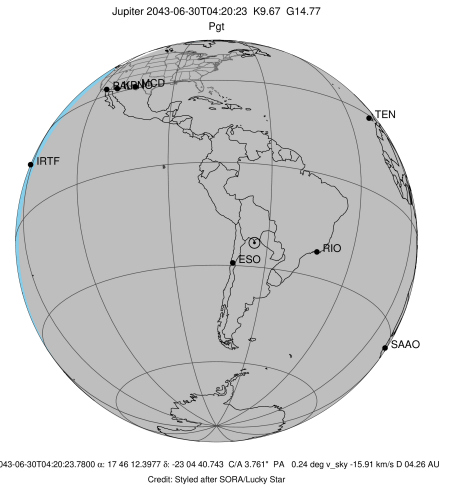


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-30T03:05:02.828	77.17	-87.98	71491.8	-9.75	-11.12
Jupiter	E	2043-06-30T05:29:25.336	44.06	-54.90	71491.8	-9.56	-10.90


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-30T04:19:51.490
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      : 4068833625738516608
2Mass ID (if available) : 17461241-2304404
ICRS Star Coord at Epoch: 17h 46m 12.39771s -23:04:40.74284s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 9.671
G magnitude          : 14.772
RP magnitude         : 13.465
BP magnitude         : 16.754
DUPflag             : 0
Distance (au)       : 4.261
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.91
Sun-Target sep (deg) : 169.11
Sun-Moon sep (deg)  : 102.62
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.65
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 3.969
C/A sky separation (km) : 12265.8
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
    
```

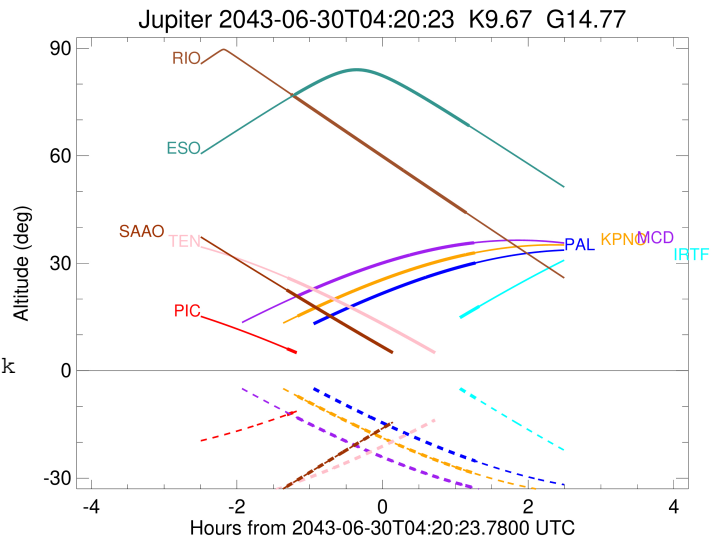
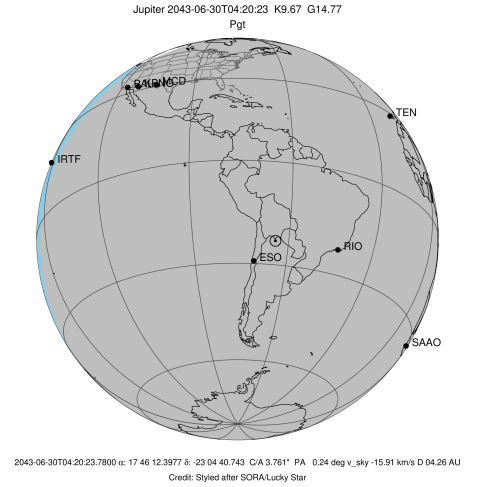


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-30T03:07:56.951	77.00	-67.15	71491.7	-10.31	-11.75
Jupiter	E	2043-06-30T05:31:50.257	68.33	-78.24	71491.8	-9.60	-10.95

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-30T04:14:37.410
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       : 4068833625738516608
2Mass ID (if available) : 17461241-2304404
ICRS Star Coord at Epoch: 17h 46m 12.39771s -23:04:40.74284s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 9.671
G magnitude          : 14.772
RP magnitude         : 13.465
BP magnitude         : 16.754
DUPflag             : 0
Distance (au)        : 4.261
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.91
Sun-Target sep (deg) : 169.11
Sun-Moon sep (deg)   : 101.94
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.65
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 4.827
C/A sky separation (km) : 14916.8
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	2043-06-30T03:01:31.926	22.52	-32.33	71491.7	-11.89	-13.53
Jupiter	E	2043-06-30T05:28:19.037	-6.10x	-2.76x	71491.6	-12.17	-13.84