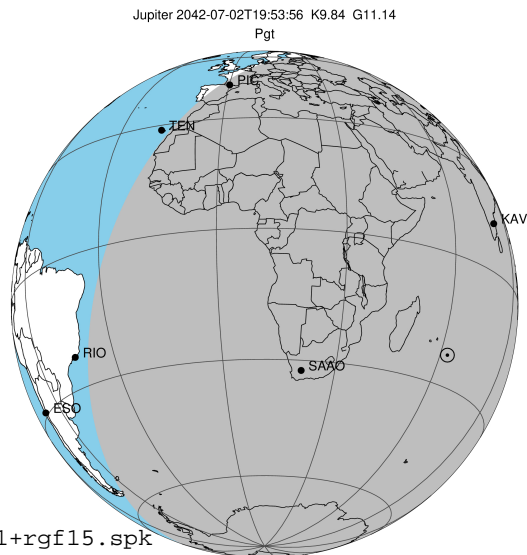


target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2042-07-02T19:53:56.120
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 6259026467181138176
 2Mass ID (if available) : 15193085-1719435

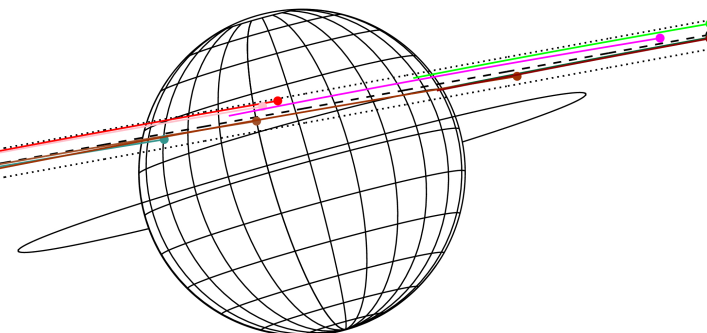
Jupiter 2042-07-02T19:53:56 K9.84 G11.14 Pgt

ICRS Star Coord at Epoch: 15h 19m 30.80840s -17:19:45.18456s
 RUWE (>1.4 is poor) : 0.95
 K magnitude : 9.841
 G magnitude : 11.145
 RP magnitude : 10.681
 BP magnitude : 11.441
 DUPflag : 0
 Distance (au) : 4.646
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -7.01
 Sun-Target sep (deg) : 131.54
 Sun-Moon sep (deg) : 42.43
 B (ring opening deg) : -3.11
 PA of pole (deg) : 15.46
 Pole direction: RA (deg): 268.05649
 Dec (deg): 64.49730
 C/A sky separation (") : 8.144
 C/A sky separation (km) : 27440.1
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk



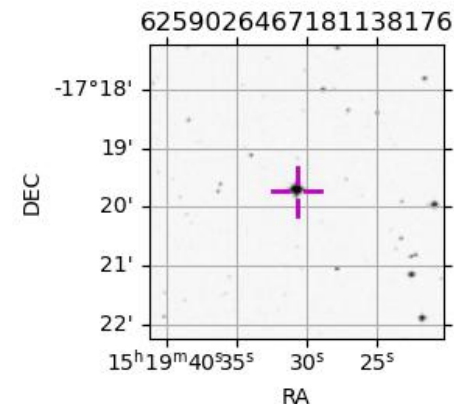
2042-07-02T19:53:56.1200 a: 15 19 30.8084 s: -17 19 45.185 C/A 8.132" PA 190.27 deg v_sky - 7.01 km/s D 04.65 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 PMO
 KPNO
 MCD
 TEN
 KAV
 RIO
 ESO
 AAT
 SAAO
 MSO



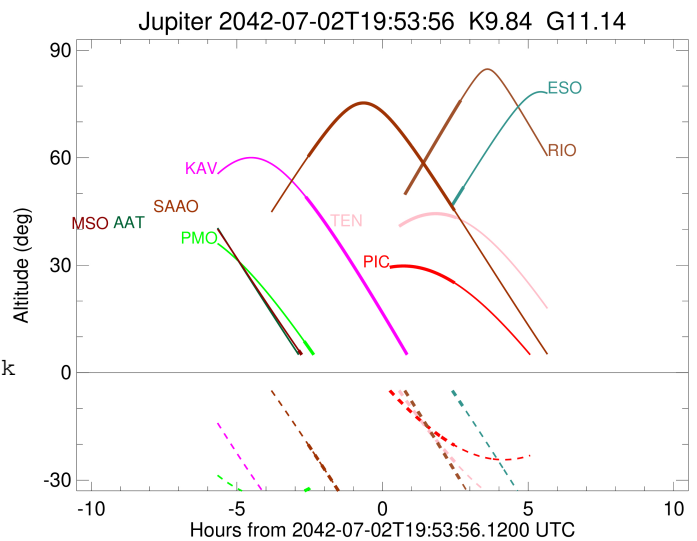
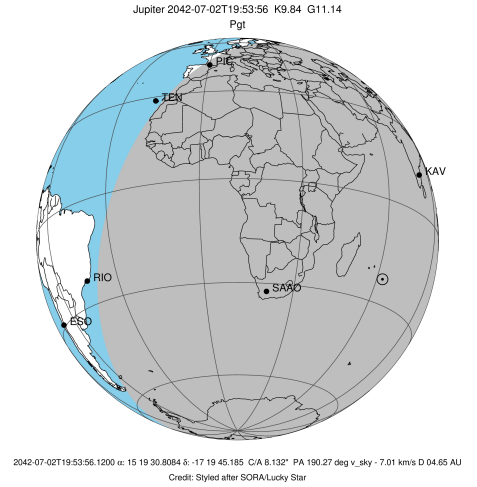
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	JUL 02 22:22 - JUL 02 22:22	Pne
PAL	Palomar Mt (200")	33.4	243.1			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+	JUL 02 17:12 - JUL 02 17:12	Pin
KPNO	Kitt Peak Natl Obs	32.0	248.4			Pnn
MCD	McDonald Obs. 2.7m	30.7	256.0			Pnn
TEN	Teide Obs./Tenerife	28.3	343.5	+	JUL 02 22:25 - JUL 02 22:25	Pne
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+	JUL 02 17:15 - JUL 02 17:15	Pin
RIO	Rio de Janeiro	-22.9	316.8	+	JUL 02 22:35 - JUL 02 22:35	Pne
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	JUL 02 22:41 - JUL 02 22:41	Pne
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	JUL 02 17:20 - JUL 02 22:22	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	JUL 02 17:01 - JUL 02 17:01	Pin



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2042-07-02T19:57:19.030
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       : 6259026467181138176
2Mass ID (if available) : 15193085-1719435
ICRS Star Coord at Epoch: 15h 19m 30.80840s -17:19:45.18456s
RUWE (>1.4 is poor) : 0.95
K magnitude           : 9.841
G magnitude           : 11.145
RP magnitude          : 10.681
BP magnitude          : 11.441
DUPflag              : 0
Distance (au)        : 4.646
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -7.01
Sun-Target sep (deg) : 131.54
Sun-Moon sep (deg)   : 43.07
B (ring opening deg) : -3.11
PA of pole (deg)     : 15.46
Pole direction: RA (deg): 268.05649
Dec (deg): 64.49730
C/A sky separation (") : 9.712
C/A sky separation (km) : 32723.6
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
    
```

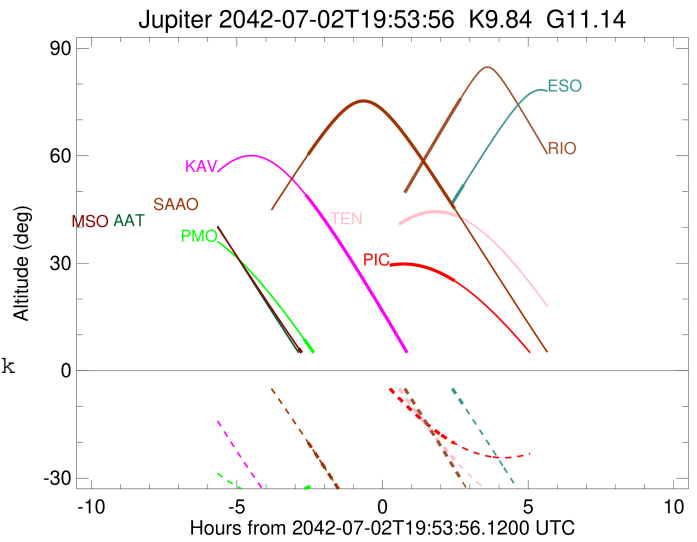
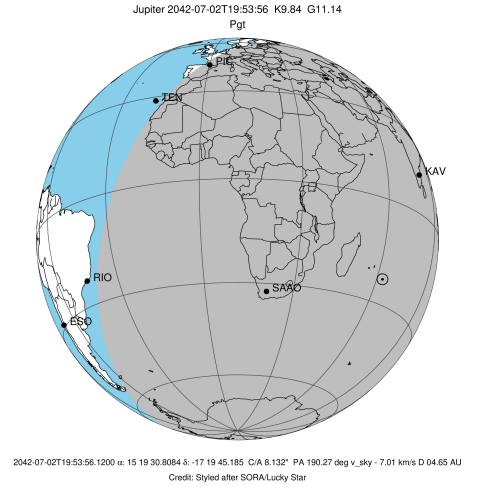


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2042-07-02T17:32:17.886	16.23	20.91x	71490.3	21.26	23.96
Jupiter	E	2042-07-02T22:22:14.277	25.08	-20.26	71488.1	32.73	36.24

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2042-07-02T19:44:17.280
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : PMO
Location             : Purple Mtn Obs. Nanking
Latitude (deg)       : 32.06667
E. Longitude (deg)   : 118.82089
Altitude (km)        : 0.364
Gaia source ID       : 6259026467181138176
2Mass ID (if available) : 15193085-1719435
ICRS Star Coord at Epoch: 15h 19m 30.80840s -17:19:45.18456s
RUWE (>1.4 is poor) : 0.95
K magnitude           : 9.841
G magnitude           : 11.145
RP magnitude         : 10.681
BP magnitude         : 11.441
DUPflag              : 0
Distance (au)        : 4.646
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -7.01
Sun-Target sep (deg) : 131.54
Sun-Moon sep (deg)   : 41.77
B (ring opening deg) : -3.11
PA of pole (deg)     : 15.46
Pole direction: RA (deg): 268.05649
Dec (deg): 64.49730
C/A sky separation ("): 9.229
C/A sky separation (km): 31095.0
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
    
```

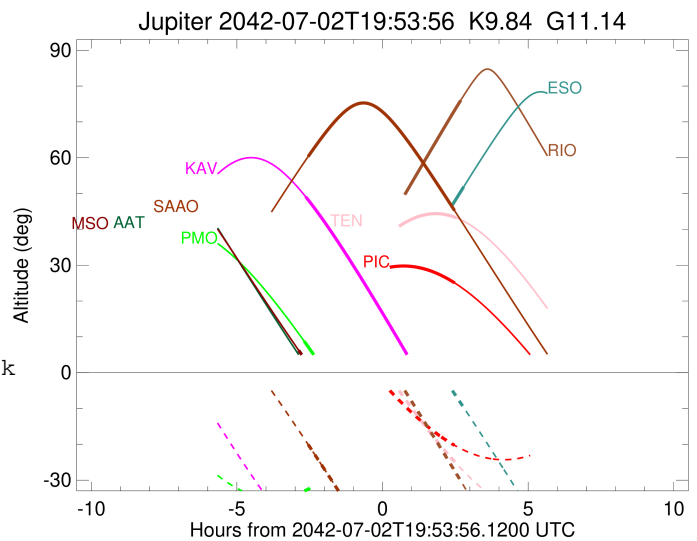
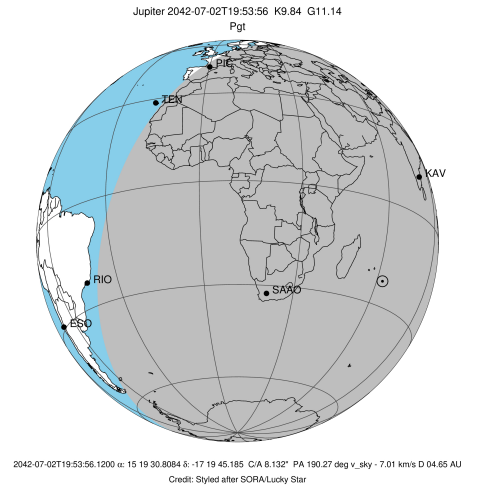


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2042-07-02T17:12:33.354	8.79	-33.05	71490.2	21.47	24.18
Jupiter	E	2042-07-02T22:22:11.450	-55.30x	14.56x	71488.7	29.82	33.18

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch              : 2042-07-02T20:00:18.810
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         : 6259026467181138176
2Mass ID (if available) : 15193085-1719435
ICRS Star Coord at Epoch: 15h 19m 30.80840s -17:19:45.18456s
RUWE (>1.4 is poor)  : 0.95
K magnitude             : 9.841
G magnitude             : 11.145
RP magnitude           : 10.681
BP magnitude           : 11.441
DUPflag                : 0
Distance (au)          : 4.646
f0 (km)                : 0.00
g0 (km)                : 0.00
skyplane vel. (km/s)   : -7.01
Sun-Target sep (deg)   : 131.54
Sun-Moon sep (deg)     : 43.27
B (ring opening deg)   : -3.11
PA of pole (deg)       : 15.46
Pole direction: RA (deg): 268.05649
Dec (deg): 64.49730
C/A sky separation (") : 9.299
C/A sky separation (km) : 31333.8
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
    
```

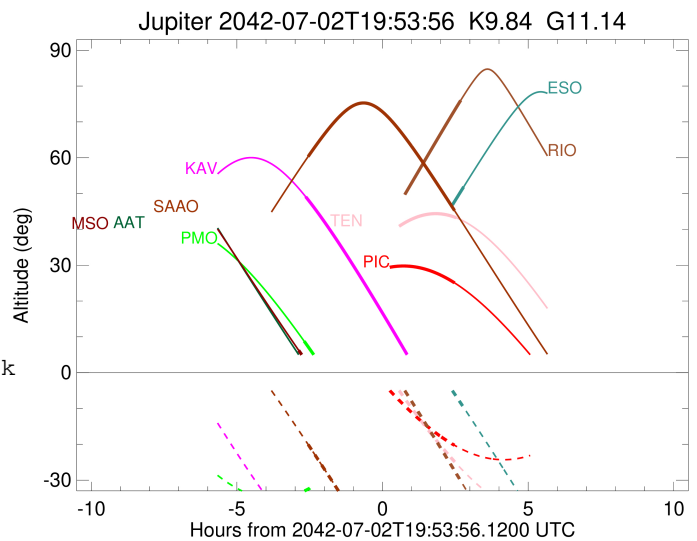
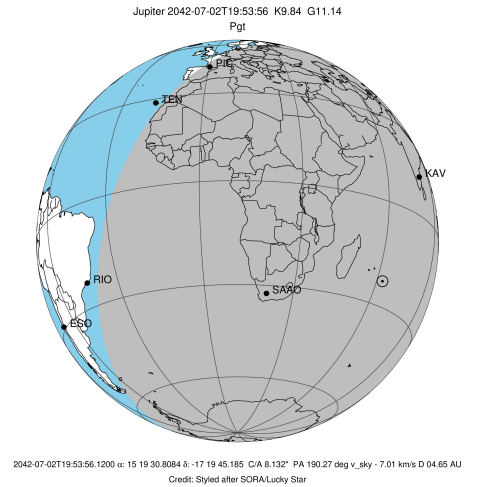


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2042-07-02T17:33:29.695	14.14	31.08x	71490.5	19.74	22.29
Jupiter	E	2042-07-02T22:25:35.976	43.26	-25.31	71488.3	31.81	35.28

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2042-07-02T19:42:30.030
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : KAV
Location            : Kavalur Observatory
Latitude (deg)      : 12.57556
E. Longitude (deg)  : 78.83167
Altitude (km)       : 0.722
Gaia source ID      : 6259026467181138176
2Mass ID (if available) : 15193085-1719435
ICRS Star Coord at Epoch: 15h 19m 30.80840s -17:19:45.18456s
RUWE (>1.4 is poor) : 0.95
K magnitude         : 9.841
G magnitude         : 11.145
RP magnitude        : 10.681
BP magnitude        : 11.441
DUPflag            : 0
Distance (au)      : 4.646
f0 (km)            : 0.00
g0 (km)            : 0.00
skyplane vel. (km/s) : -7.01
Sun-Target sep (deg) : 131.54
Sun-Moon sep (deg)  : 42.12
B (ring opening deg) : -3.11
PA of pole (deg)    : 15.46
Pole direction: RA (deg): 268.05649
Dec (deg): 64.49730
C/A sky separation (" ) : 9.053
C/A sky separation (km) : 30504.7
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
    
```

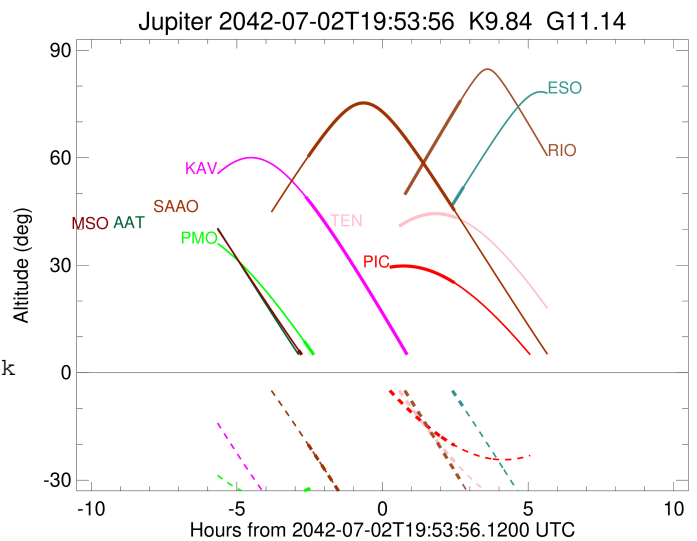
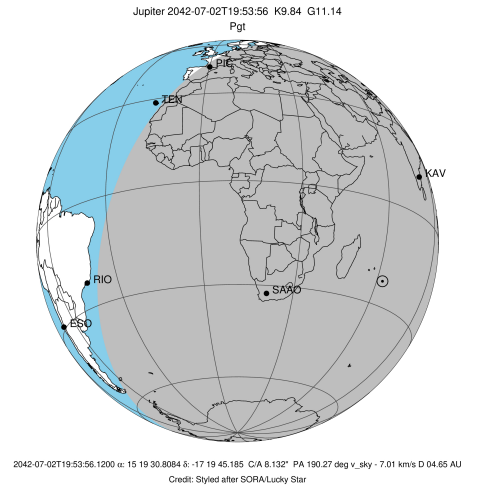


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2042-07-02T17:15:34.020	49.12	-47.82	71490.4	20.38	22.99
Jupiter	E	2042-07-02T22:15:19.535	-16.21x	-28.28	71488.8	29.41	32.75

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2042-07-02T20:03:01.300
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      : 6259026467181138176
2Mass ID (if available) : 15193085-1719435
ICRS Star Coord at Epoch: 15h 19m 30.80840s -17:19:45.18456s
RUWE (>1.4 is poor) : 0.95
K magnitude          : 9.841
G magnitude          : 11.145
RP magnitude         : 10.681
BP magnitude         : 11.441
DUPflag             : 0
Distance (au)       : 4.646
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -7.01
Sun-Target sep (deg) : 131.54
Sun-Moon sep (deg)  : 43.27
B (ring opening deg) : -3.11
PA of pole (deg)    : 15.46
Pole direction: RA (deg): 268.05649
Dec (deg): 64.49730
C/A sky separation (" ) : 7.536
C/A sky separation (km) : 25391.7
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
    
```

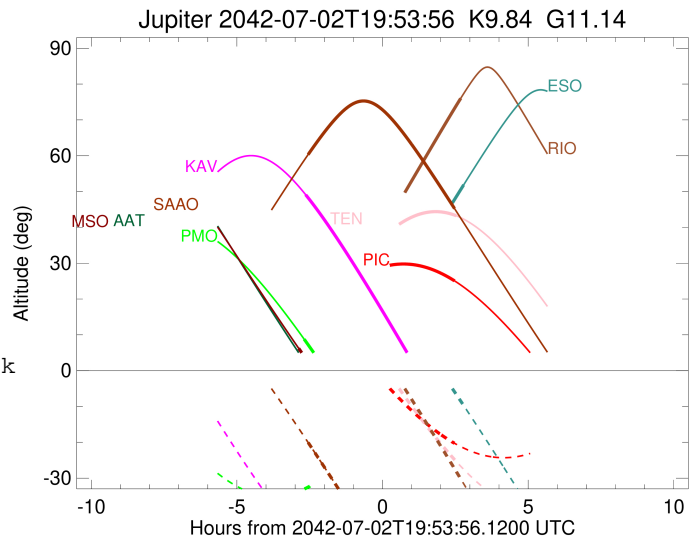
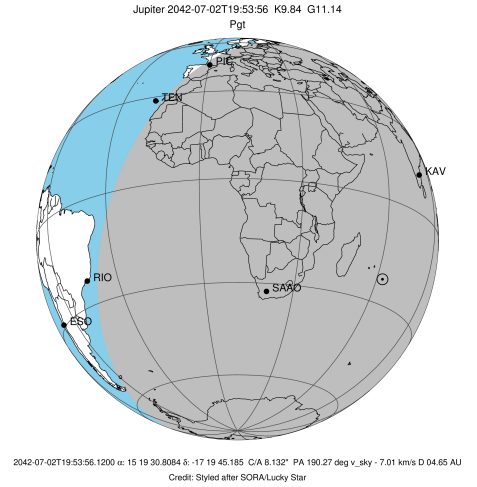


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2042-07-02T17:27:08.837	5.78	31.48x	71491.2	14.47	16.44
Jupiter	E	2042-07-02T22:35:05.539	76.02	-30.21	71489.3	26.98	30.15

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2042-07-02T20:04:34.600
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      : 6259026467181138176
2Mass ID (if available) : 15193085-1719435
ICRS Star Coord at Epoch: 15h 19m 30.80840s -17:19:45.18456s
RUWE (>1.4 is poor) : 0.95
K magnitude         : 9.841
G magnitude         : 11.145
RP magnitude        : 10.681
BP magnitude        : 11.441
DUPflag            : 0
Distance (au)      : 4.646
f0 (km)            : 0.00
g0 (km)            : 0.00
skyplane vel. (km/s) : -7.01
Sun-Target sep (deg) : 131.54
Sun-Moon sep (deg)  : 43.05
B (ring opening deg) : -3.11
PA of pole (deg)    : 15.46
Pole direction: RA (deg): 268.05649
Dec (deg): 64.49730
C/A sky separation (" ) : 7.090
C/A sky separation (km) : 23888.6
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
    
```

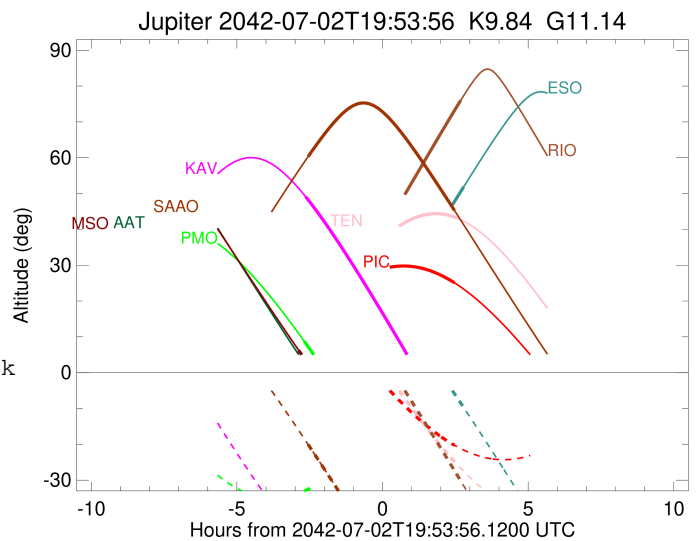
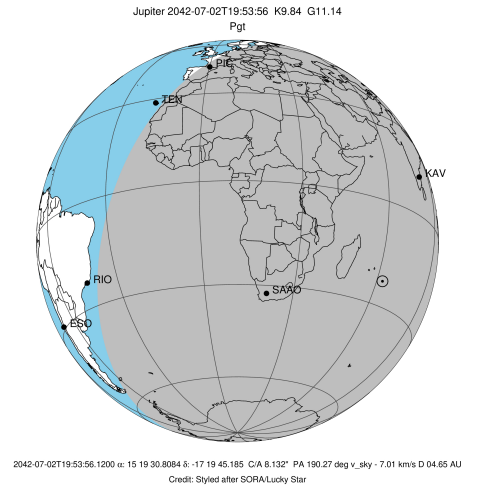


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2042-07-02T17:23:11.426	-15.33x	37.20x	71491.3	13.46	15.30
Jupiter	E	2042-07-02T22:41:03.005	51.84	-9.70	71489.5	25.78	28.87


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2042-07-02T19:50:51.310
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       : 6259026467181138176
2Mass ID (if available) : 15193085-1719435
ICRS Star Coord at Epoch: 15h 19m 30.80840s -17:19:45.18456s
RUWE (>1.4 is poor) : 0.95
K magnitude           : 9.841
G magnitude           : 11.145
RP magnitude         : 10.681
BP magnitude         : 11.441
DUPflag              : 0
Distance (au)        : 4.646
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -7.01
Sun-Target sep (deg) : 131.54
Sun-Moon sep (deg)   : 42.89
B (ring opening deg) : -3.11
PA of pole (deg)     : 15.46
Pole direction: RA (deg): 268.05649
Dec (deg): 64.49730
C/A sky separation (") : 7.709
C/A sky separation (km) : 25974.4
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
    
```

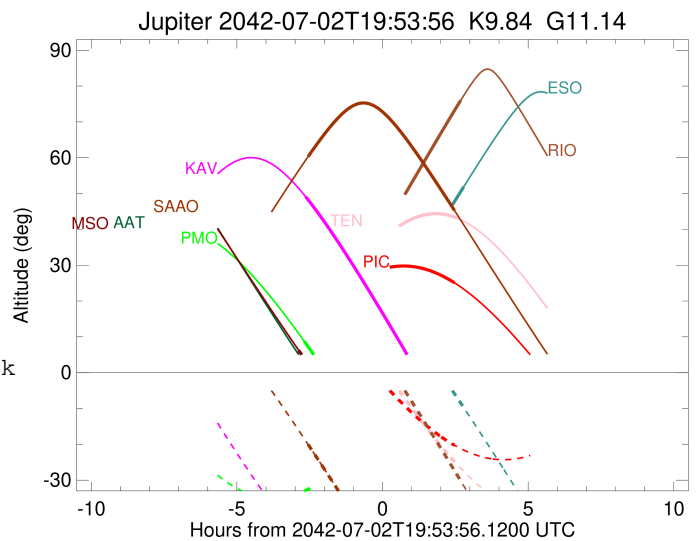
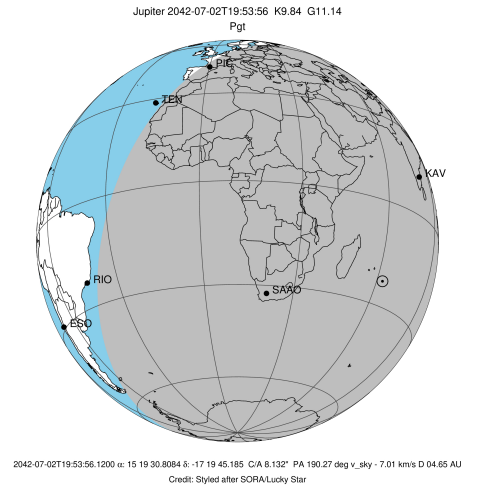


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2042-07-02T17:20:41.764	60.31	-20.05	71491.1	15.44	17.52
Jupiter	E	2042-07-02T22:22:23.585	45.24	-79.89	71489.4	26.51	29.65


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2042-07-02T19:44:32.590
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : MSO
Location             : Mt. Stromlo Observatory
Latitude (deg)       : -35.32000
E. Longitude (deg)   : 149.00833
Altitude (km)        : 0.770
Gaia source ID       : 6259026467181138176
2Mass ID (if available) : 15193085-1719435
ICRS Star Coord at Epoch: 15h 19m 30.80840s -17:19:45.18456s
RUWE (>1.4 is poor) : 0.95
K magnitude           : 9.841
G magnitude           : 11.145
RP magnitude         : 10.681
BP magnitude         : 11.441
DUPflag              : 0
Distance (au)        : 4.646
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -7.01
Sun-Target sep (deg) : 131.54
Sun-Moon sep (deg)   : 41.62
B (ring opening deg) : -3.11
PA of pole (deg)     : 15.46
Pole direction: RA (deg): 268.05649
Dec (deg): 64.49730
C/A sky separation ("): 6.985
C/A sky separation (km): 23535.2
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	2042-07-02T17:01:30.006	6.19	-50.55	71491.1	15.08	17.12
Jupiter	E	2042-07-02T22:33:03.575	-37.34x	12.73x	71489.9	23.50	26.40