

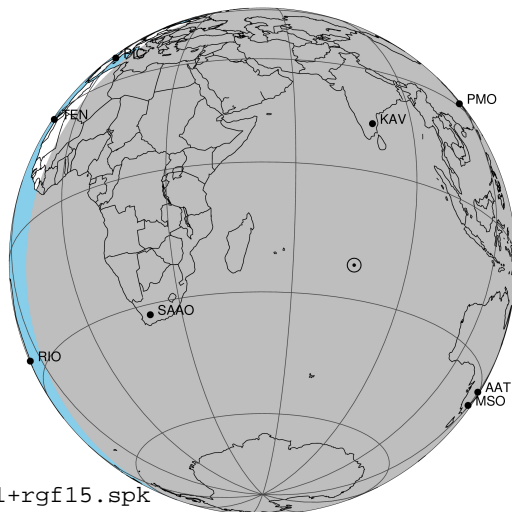
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-07-09T19:03:30.220
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116545940836028928
 2Mass ID (if available) : 17411602-2304164

Jupiter 2043-07-09T19:03:30 K7.20 G14.00 Pgt

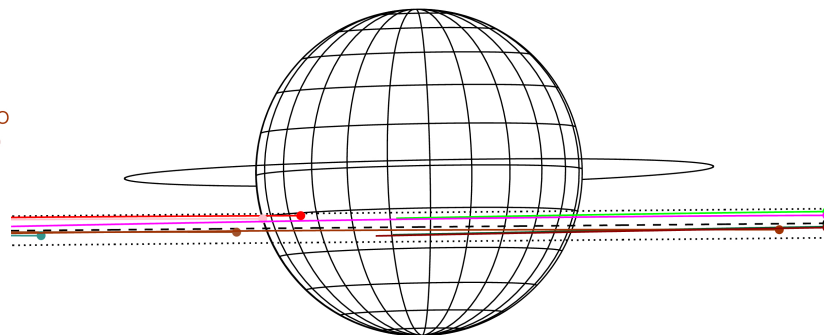
ICRS Star Coord at Epoch: 17h 41m 16.03854s -23:04:16.63906s

RUWE (>1.4 is poor) : 0.80
 K magnitude : 7.199
 G magnitude : 14.003
 RP magnitude : 12.436
 BP magnitude : 17.737
 DUPflag : 0
 Distance (au) : 4.299
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -14.48
 Sun-Target sep (deg) : 158.80
 Sun-Moon sep (deg) : 118.69
 B (ring opening deg) : -2.41
 PA of pole (deg) : 1.18
 Pole direction: RA (deg): 268.05670
 Dec (deg): 64.49732
 C/A sky separation (") : 7.657
 C/A sky separation (km) : 23875.2
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-07-09T19:03:30 K7.20 G14.00
 Pgt



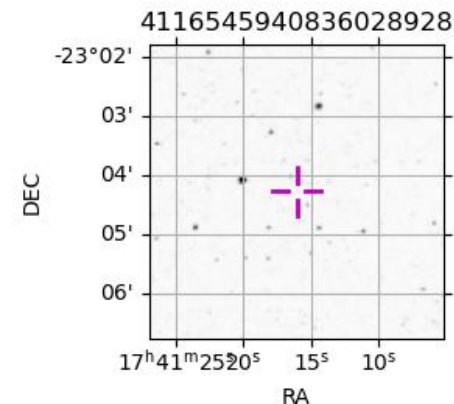
Earth
 PIC
 PMO
 TEN
 KAV
 RIO
 ESO
 AAT
 SAAO
 MSO



2043-07-09T19:03:30.2200 a: 17 41 16.0385 s -23 04 16.639 PA 0.52 deg v_sky -14.48 km/s D 04.30 AU
 Credit: Styled after SORA/Lucky Star

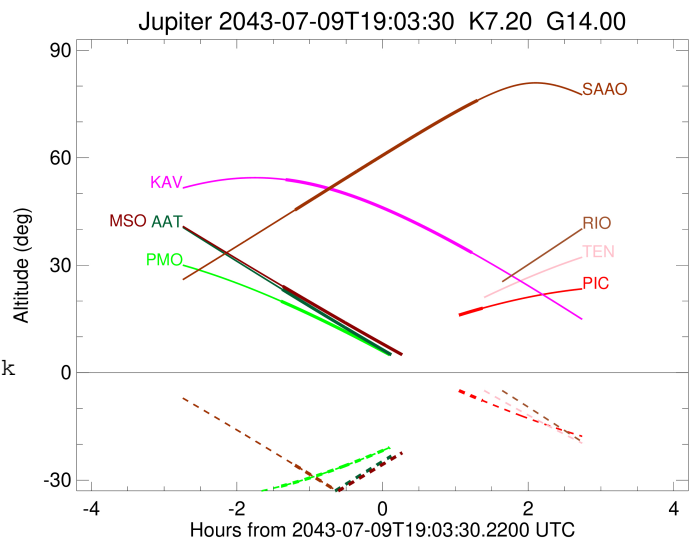
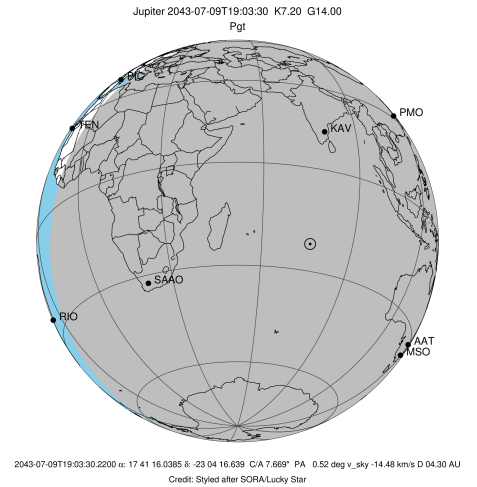
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+	JUL 09 20:25 - JUL 09 20:25	Pne
PAL	Palomar Mt (200")	33.4	243.1			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+	JUL 09 17:39 - JUL 09 17:39	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 09 20:27 - JUL 09 20:27	Pne
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+	JUL 09 17:43 - JUL 09 20:17	Pie
RIO	Rio de Janeiro	-22.9	316.8			Pnn
ESO	European Southern Obs. (3.6m)	-29.3	289.3			Pnn
AAT	Siding Spring (AAT)	-31.3	149.1	+	JUL 09 17:40 - JUL 09 17:40	Pin
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	JUL 09 17:51 - JUL 09 20:21	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	JUL 09 17:41 - JUL 09 17:41	Pin



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-09T19:07:53.030
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        : 4116545940836028928
2Mass ID (if available) : 17411602-2304164
ICRS Star Coord at Epoch: 17h 41m 16.03854s -23:04:16.63906s
RUWE (>1.4 is poor) : 0.80
K magnitude           : 7.199
G magnitude           : 14.003
RP magnitude          : 12.436
BP magnitude          : 17.737
DUPflag              : 0
Distance (au)         : 4.299
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.48
Sun-Target sep (deg) : 158.80
Sun-Moon sep (deg)   : 119.11
B (ring opening deg) : -2.41
PA of pole (deg)     : 1.18
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 6.018
C/A sky separation (km): 18765.1
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
    
```

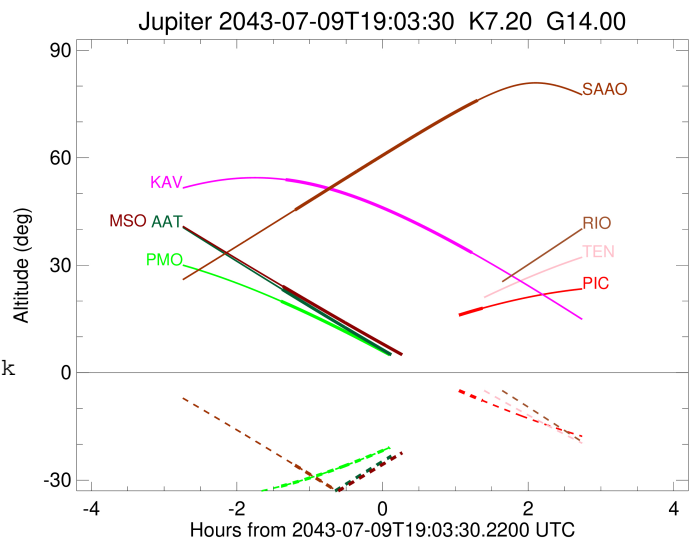
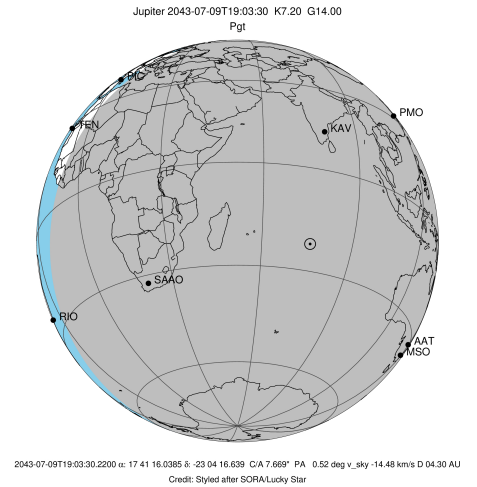


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-09T17:49:24.745	-2.59x	17.62x	71491.4	-16.32	-18.50
Jupiter	E	2043-07-09T20:25:55.312	17.99	-7.78	71491.5	-14.20	-16.13

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-09T18:57:40.090
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       : 4116545940836028928
2Mass ID (if available) : 17411602-2304164
ICRS Star Coord at Epoch: 17h 41m 16.03854s -23:04:16.63906s
RUWE (>1.4 is poor) : 0.80
K magnitude           : 7.199
G magnitude           : 14.003
RP magnitude         : 12.436
BP magnitude         : 17.737
DUPflag              : 0
Distance (au)        : 4.299
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.48
Sun-Target sep (deg) : 158.80
Sun-Moon sep (deg)   : 118.45
B (ring opening deg) : -2.41
PA of pole (deg)     : 1.18
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 6.369
C/A sky separation (km): 19856.4
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
    
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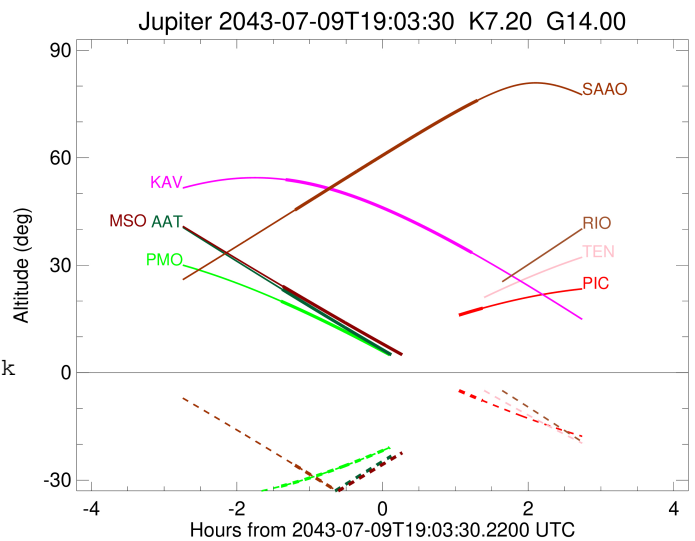
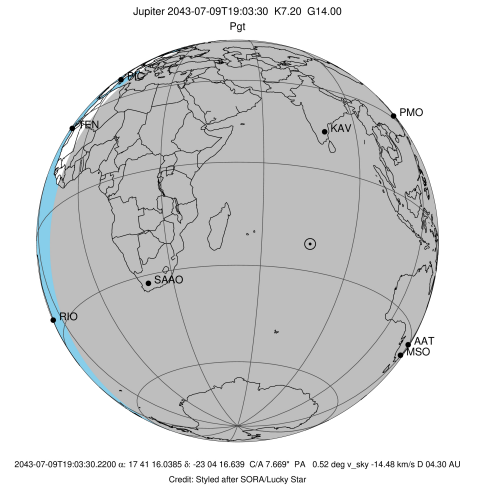


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-09T17:39:52.886	19.96	-31.70	71491.4	-16.28	-18.45
Jupiter	E	2043-07-09T20:16:09.532	-7.67x	-10.02	71491.4	-16.04	-18.18

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-09T19:09:44.130
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      : 4116545940836028928
2Mass ID (if available) : 17411602-2304164
ICRS Star Coord at Epoch: 17h 41m 16.03854s -23:04:16.63906s
RUWE (>1.4 is poor) : 0.80
K magnitude          : 7.199
G magnitude          : 14.003
RP magnitude         : 12.436
BP magnitude         : 17.737
DUPflag             : 0
Distance (au)       : 4.299
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -14.48
Sun-Target sep (deg) : 158.80
Sun-Moon sep (deg)  : 119.18
B (ring opening deg) : -2.41
PA of pole (deg)    : 1.18
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (" ) : 6.507
C/A sky separation (km) : 20287.0
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
    
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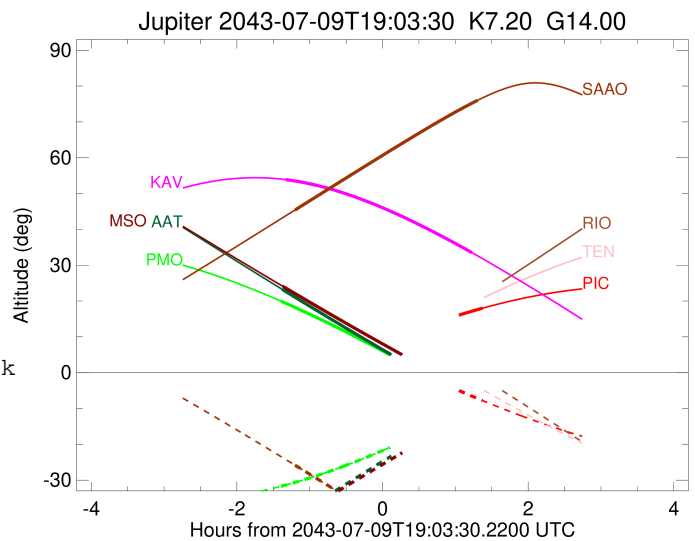
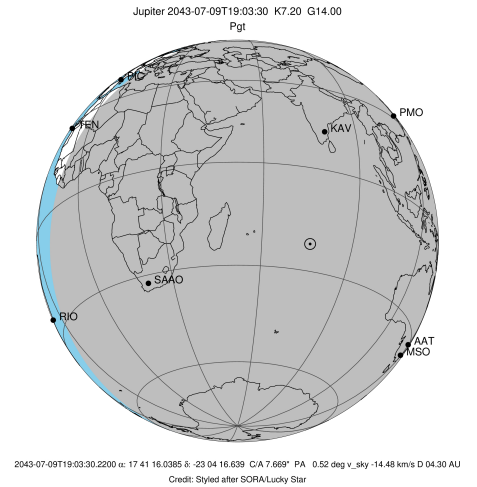


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-09T17:51:21.234	-8.23x	27.23x	71491.3	-17.74	-20.08
Jupiter	E	2043-07-09T20:27:28.688	21.04	-5.03	71491.5	-15.28	-17.34

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-09T19:00:18.630
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      : 4116545940836028928
2Mass ID (if available) : 17411602-2304164
ICRS Star Coord at Epoch: 17h 41m 16.03854s -23:04:16.63906s
RUWE (>1.4 is poor) : 0.80
K magnitude          : 7.199
G magnitude          : 14.003
RP magnitude         : 12.436
BP magnitude         : 17.737
DUPflag             : 0
Distance (au)       : 4.299
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.48
Sun-Target sep (deg) : 158.80
Sun-Moon sep (deg)  : 119.11
B (ring opening deg) : -2.41
PA of pole (deg)    : 1.18
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 6.540
C/A sky separation (km): 20391.0
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
    
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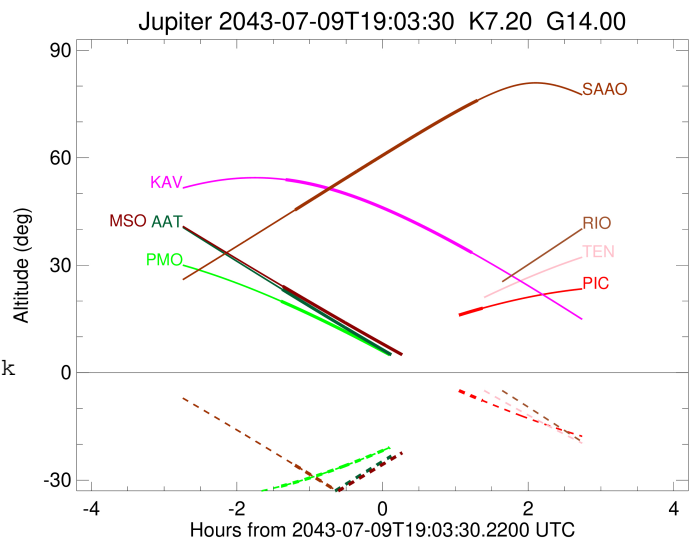
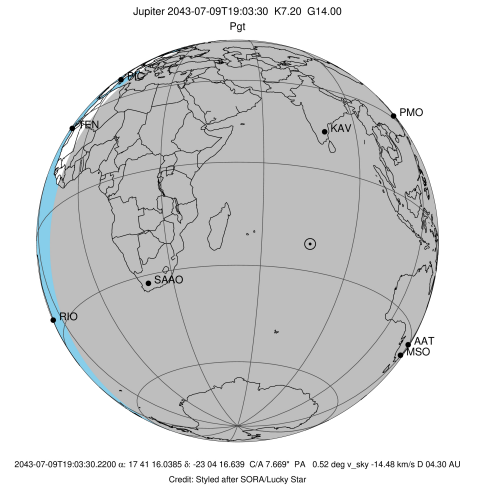


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-09T17:43:48.561	53.87	-51.62	71491.3	-17.03	-19.29
Jupiter	E	2043-07-09T20:17:11.918	33.50	-49.17	71491.4	-16.29	-18.46

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-09T18:56:53.620
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : AAT
Location              : Siding Spring (AAT)
Latitude (deg)       : -31.27703
E. Longitude (deg)   : 149.06608
Altitude (km)        : 1.164
Gaia source ID       : 4116545940836028928
2Mass ID (if available) : 17411602-2304164
ICRS Star Coord at Epoch: 17h 41m 16.03854s -23:04:16.63906s
RUWE (>1.4 is poor) : 0.80
K magnitude           : 7.199
G magnitude           : 14.003
RP magnitude          : 12.436
BP magnitude          : 17.737
DUPflag              : 0
Distance (au)        : 4.299
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.48
Sun-Target sep (deg) : 158.80
Sun-Moon sep (deg)   : 118.37
B (ring opening deg) : -2.41
PA of pole (deg)     : 1.18
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 8.681
C/A sky separation (km): 27065.5
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
    
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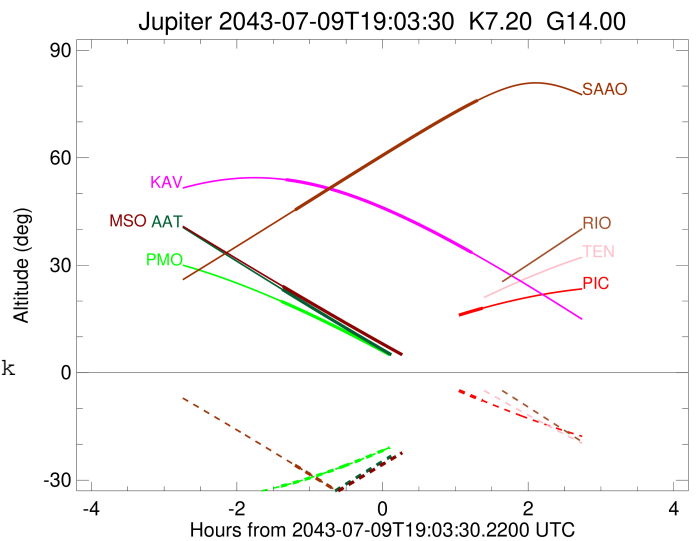
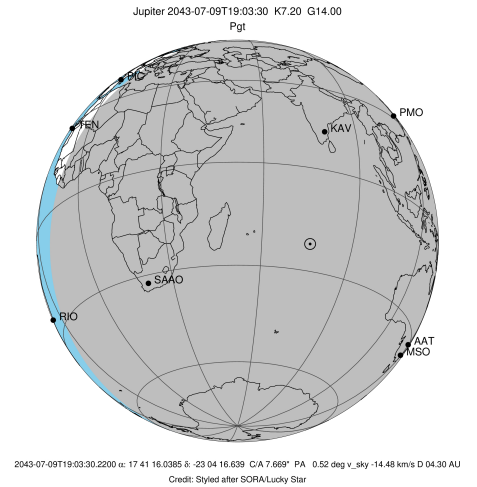


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-09T17:40:56.250	23.23	-42.30	71490.9	-22.27	-25.07
Jupiter	E	2043-07-09T20:13:36.367	-6.90x	-10.38	71490.9	-22.17	-24.95

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-09T19:06:50.100
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      : 4116545940836028928
2Mass ID (if available) : 17411602-2304164
ICRS Star Coord at Epoch: 17h 41m 16.03854s -23:04:16.63906s
RUWE (>1.4 is poor) : 0.80
K magnitude          : 7.199
G magnitude          : 14.003
RP magnitude         : 12.436
BP magnitude         : 17.737
DUPflag             : 0
Distance (au)       : 4.299
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -14.48
Sun-Target sep (deg) : 158.80
Sun-Moon sep (deg)  : 119.62
B (ring opening deg) : -2.41
PA of pole (deg)    : 1.18
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 8.081
C/A sky separation (km) : 25196.3
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
    
```

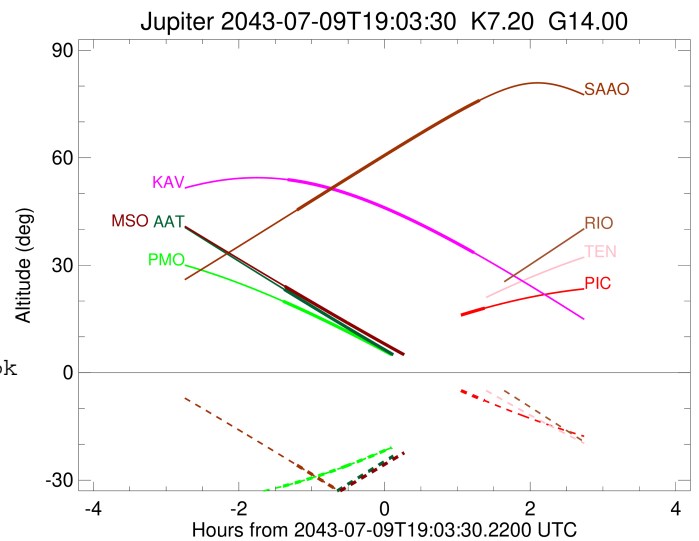
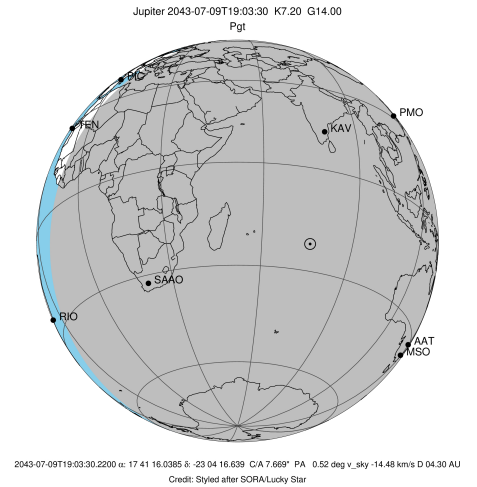


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-09T17:51:26.638	45.42	-25.83	71490.9	-21.66	-24.40
Jupiter	E	2043-07-09T20:21:56.103	76.03	-57.49	71491.1	-19.74	-22.29


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-09T18:57:11.150
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      : 4116545940836028928
2Mass ID (if available) : 17411602-2304164
ICRS Star Coord at Epoch: 17h 41m 16.03854s -23:04:16.63906s
RUWE (>1.4 is poor) : 0.80
K magnitude          : 7.199
G magnitude          : 14.003
RP magnitude        : 12.436
BP magnitude        : 17.737
DUPflag            : 0
Distance (au)       : 4.299
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -14.48
Sun-Target sep (deg) : 158.80
Sun-Moon sep (deg)  : 118.41
B (ring opening deg) : -2.41
PA of pole (deg)    : 1.18
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (" ) : 8.789
C/A sky separation (km) : 27403.3
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	2043-07-09T17:41:22.793	24.10	-42.33	71490.8	-22.59	-25.41
Jupiter	E	2043-07-09T20:13:42.794	-4.71x	-11.75	71490.8	-22.43	-25.24