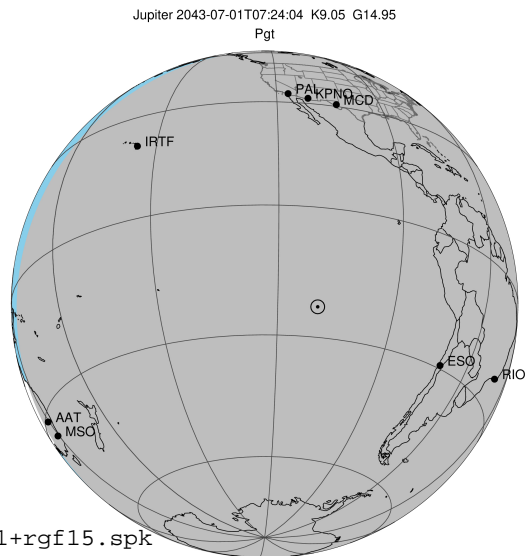


target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-07-01T07:24:04.110
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068832908579260672
 2Mass ID (if available) : 17453619-2304477

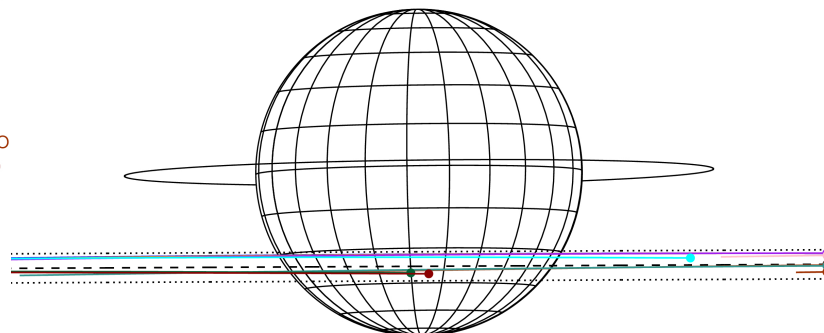
Jupiter 2043-07-01T07:24:04 K9.05 G14.95 Pgt

ICRS Star Coord at Epoch: 17h 45m 36.18861s -23:04:47.99012s

RUWE (>1.4 is poor) : 0.97
 K magnitude : 9.048
 G magnitude : 14.952
 RP magnitude : 13.470
 BP magnitude : 17.652
 DUPflag : 0
 Distance (au) : 4.264
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -15.79
 Sun-Target sep (deg) : 167.89
 Sun-Moon sep (deg) : 117.55
 B (ring opening deg) : -2.41
 PA of pole (deg) : 0.71
 Pole direction: RA (deg): 268.05669
 Dec (deg): 64.49732
 C/A sky separation (") : 13.290
 C/A sky separation (km) : 41102.8
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk



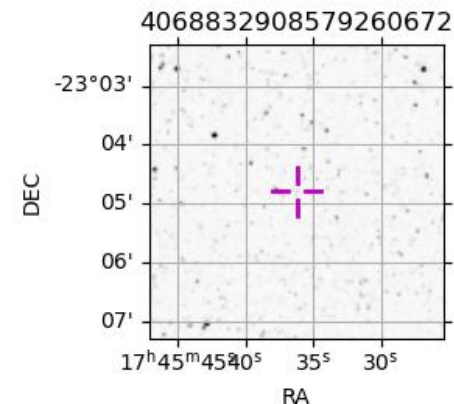
Earth
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 AAT
 SAAO
 MSO



2043-07-01T07:24:04.1100 α: 17 45 36.1886 δ: -23 04 47.990 C/A ***** PA 0.28 deg v_sky -15.79 km/s D 04.26 AU
 Credit: Styled after SORA/Lucky Star

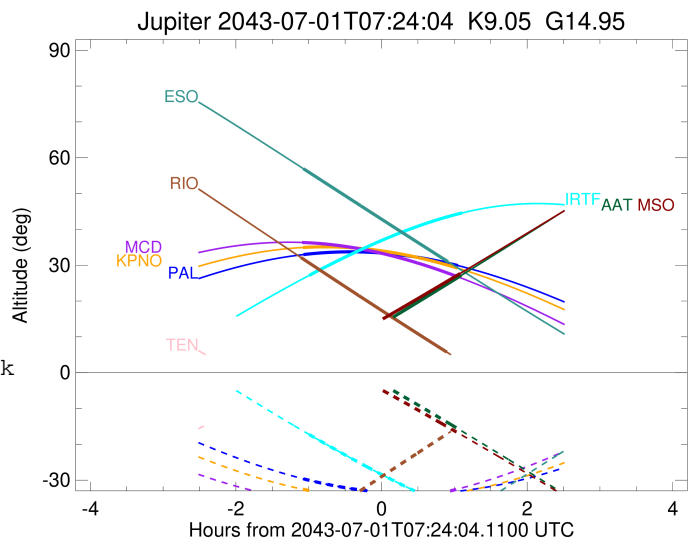
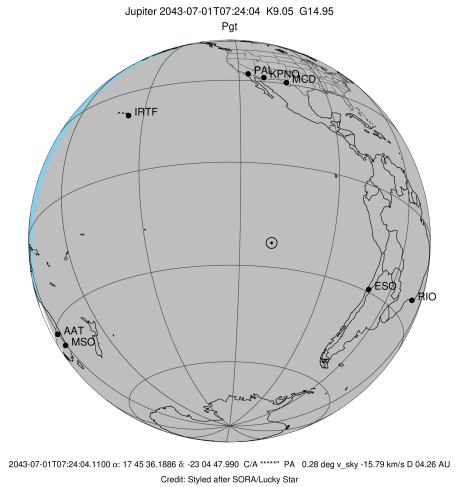
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1			Pnn
PAL	Palomar Mt (200")	33.4	243.1	+ +	JUL 01 06:19 - JUL 01 08:27	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JUL 01 06:19 - JUL 01 08:26	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JUL 01 06:18 - JUL 01 08:25	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	JUL 01 06:24 - JUL 01 08:30	Pie
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+ +	JUL 01 06:17 - JUL 01 08:17	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUL 01 06:19 - JUL 01 08:18	Pie
AAT	Siding Spring (AAT)	-31.3	149.1	+ +	JUL 01 08:29 - JUL 01 08:29	Pne
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	JUL 01 08:28 - JUL 01 08:28	Pne



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-01T07:23:25.450
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       : 4068832908579260672
2Mass ID (if available) : 17453619-2304477
ICRS Star Coord at Epoch: 17h 45m 36.18861s -23:04:47.99012s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 9.048
G magnitude           : 14.952
RP magnitude         : 13.470
BP magnitude         : 17.652
DUPflag              : 0
Distance (au)        : 4.264
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.79
Sun-Target sep (deg) : 167.89
Sun-Moon sep (deg)   : 118.08
B (ring opening deg) : -2.41
PA of pole (deg)     : 0.71
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 11.580
C/A sky separation (km): 35814.0
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
    
```

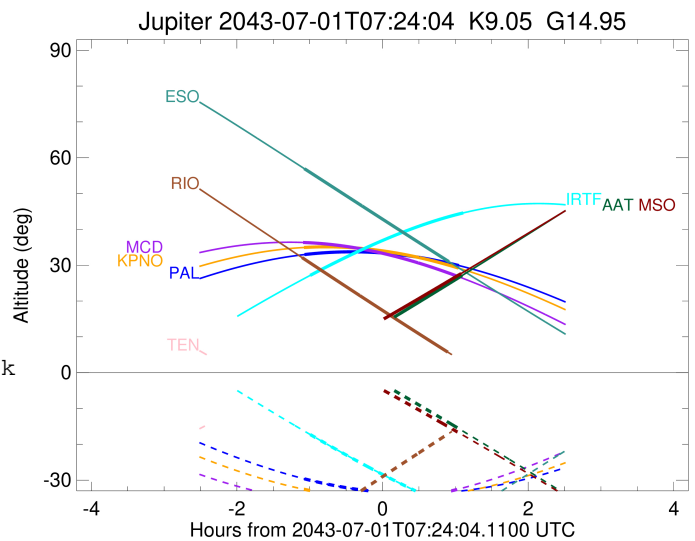
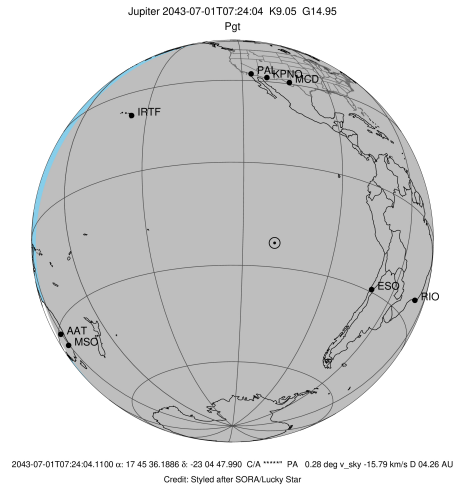


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-01T06:19:45.401	32.96	-29.64	71489.9	-30.48	-33.88
Jupiter	E	2043-07-01T08:27:09.371	29.88	-33.08	71490.0	-29.74	-33.09

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-01T07:22:52.580
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       : 4068832908579260672
2Mass ID (if available) : 17453619-2304477
ICRS Star Coord at Epoch: 17h 45m 36.18861s -23:04:47.99012s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 9.048
G magnitude           : 14.952
RP magnitude          : 13.470
BP magnitude          : 17.652
DUPflag              : 0
Distance (au)         : 4.264
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.79
Sun-Target sep (deg) : 167.89
Sun-Moon sep (deg)   : 118.12
B (ring opening deg) : -2.41
PA of pole (deg)     : 0.71
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 11.617
C/A sky separation (km): 35929.6
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
    
```

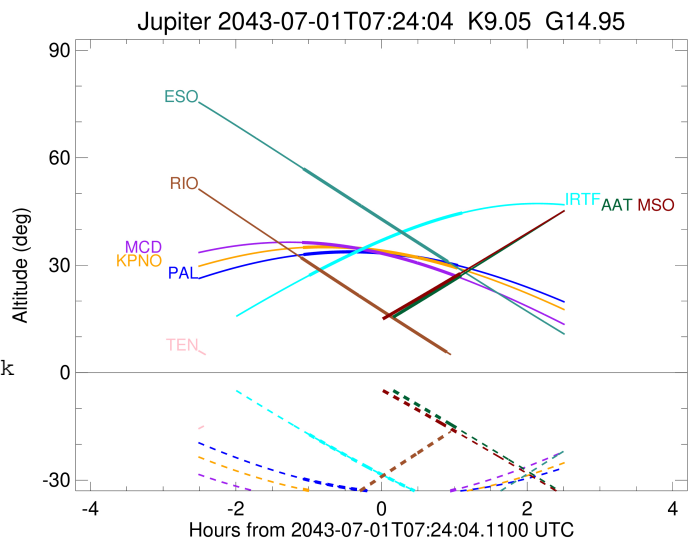
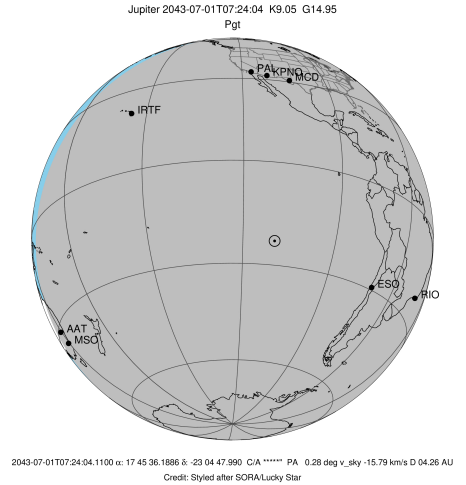


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-01T06:19:18.042	34.94	-32.55	71489.9	-30.54	-33.94
Jupiter	E	2043-07-01T08:26:33.341	29.22	-33.48	71490.0	-29.89	-33.26

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-01T07:22:05.570
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        : 4068832908579260672
2Mass ID (if available) : 17453619-2304477
ICRS Star Coord at Epoch: 17h 45m 36.18861s -23:04:47.99012s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 9.048
G magnitude           : 14.952
RP magnitude          : 13.470
BP magnitude          : 17.652
DUPflag              : 0
Distance (au)         : 4.264
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.79
Sun-Target sep (deg)  : 167.89
Sun-Moon sep (deg)    : 118.17
B (ring opening deg) : -2.41
PA of pole (deg)      : 0.71
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 11.668
C/A sky separation (km) : 36085.3
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
    
```

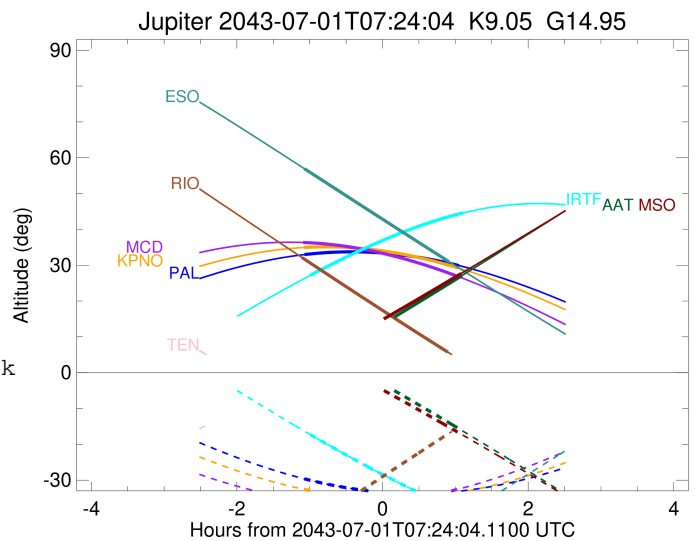
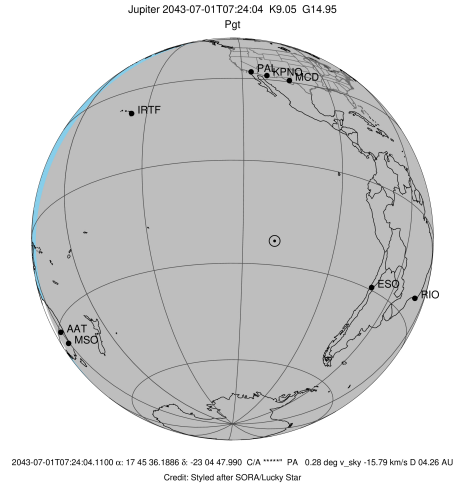


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-01T06:18:36.430	36.34	-35.49	71489.9	-30.61	-34.02
Jupiter	E	2043-07-01T08:25:44.289	26.92	-32.58	71490.0	-30.11	-33.48

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-01T07:27:35.130
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      : 4068832908579260672
2Mass ID (if available) : 17453619-2304477
ICRS Star Coord at Epoch: 17h 45m 36.18861s -23:04:47.99012s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 9.048
G magnitude          : 14.952
RP magnitude         : 13.470
BP magnitude         : 17.652
DUPflag             : 0
Distance (au)        : 4.264
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.79
Sun-Target sep (deg) : 167.89
Sun-Moon sep (deg)  : 117.85
B (ring opening deg) : -2.41
PA of pole (deg)    : 0.71
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 12.000
C/A sky separation (km) : 37114.0
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
    
```

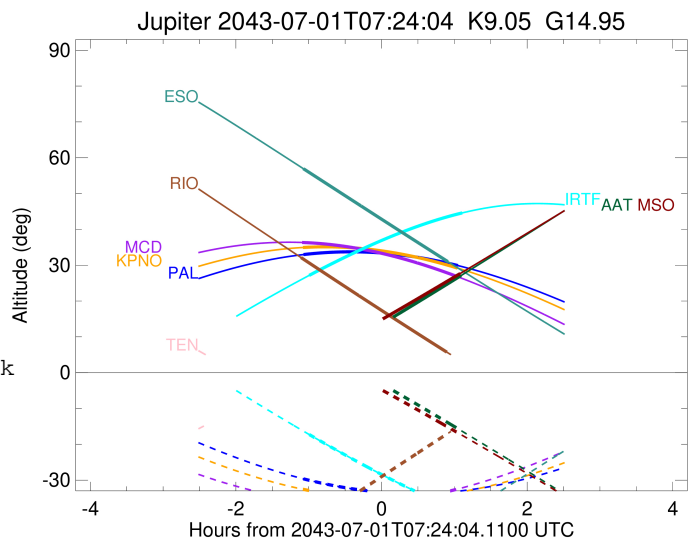
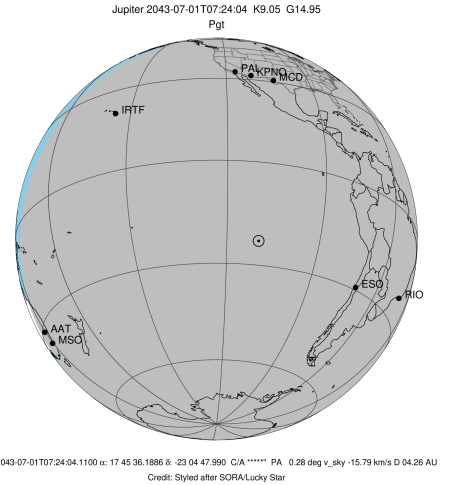


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-01T06:24:30.983	27.16	-17.27	71489.7	-32.06	-35.54
Jupiter	E	2043-07-01T08:30:25.521	44.58	-38.79	71489.9	-30.57	-33.98

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-01T07:17:31.360
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       : 4068832908579260672
2Mass ID (if available) : 17453619-2304477
ICRS Star Coord at Epoch: 17h 45m 36.18861s -23:04:47.99012s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 9.048
G magnitude           : 14.952
RP magnitude          : 13.470
BP magnitude          : 17.652
DUPflag              : 0
Distance (au)         : 4.264
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.79
Sun-Target sep (deg) : 167.89
Sun-Moon sep (deg)   : 118.23
B (ring opening deg) : -2.41
PA of pole (deg)     : 0.71
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 13.873
C/A sky separation (km) : 42906.3
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
    
```

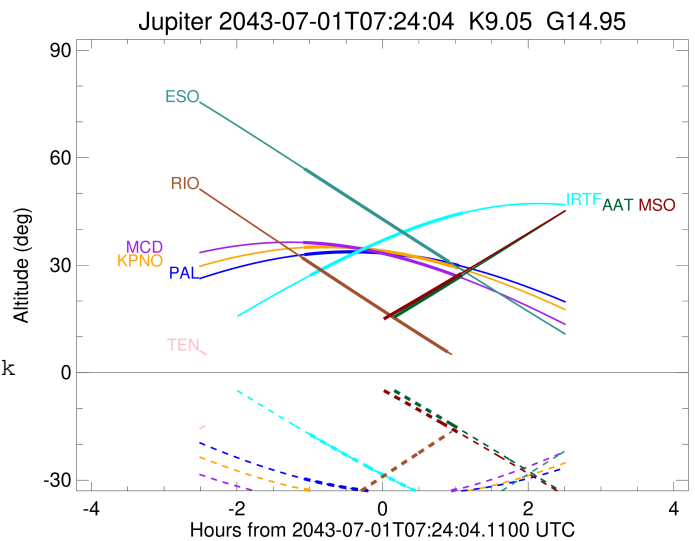
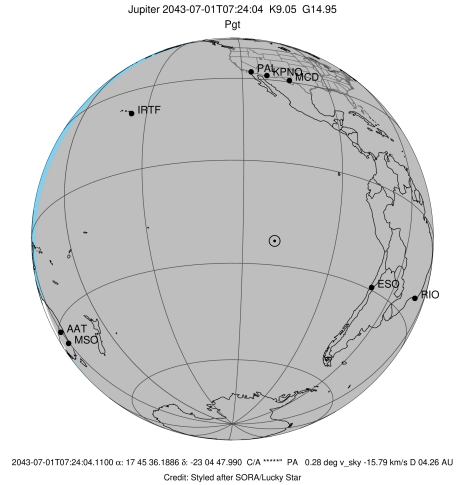


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-01T06:17:44.788	32.13	-43.95	71489.1	-36.71	-40.35
Jupiter	E	2043-07-01T08:17:44.344	5.76	-17.18	71489.1	-37.02	-40.68

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-01T07:19:08.100
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        : 4068832908579260672
2Mass ID (if available) : 17453619-2304477
ICRS Star Coord at Epoch: 17h 45m 36.18861s -23:04:47.99012s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 9.048
G magnitude           : 14.952
RP magnitude          : 13.470
BP magnitude          : 17.652
DUPflag              : 0
Distance (au)         : 4.264
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.79
Sun-Target sep (deg)  : 167.89
Sun-Moon sep (deg)    : 118.47
B (ring opening deg)  : -2.41
PA of pole (deg)      : 0.71
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 13.770
C/A sky separation (km) : 42586.8
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
    
```

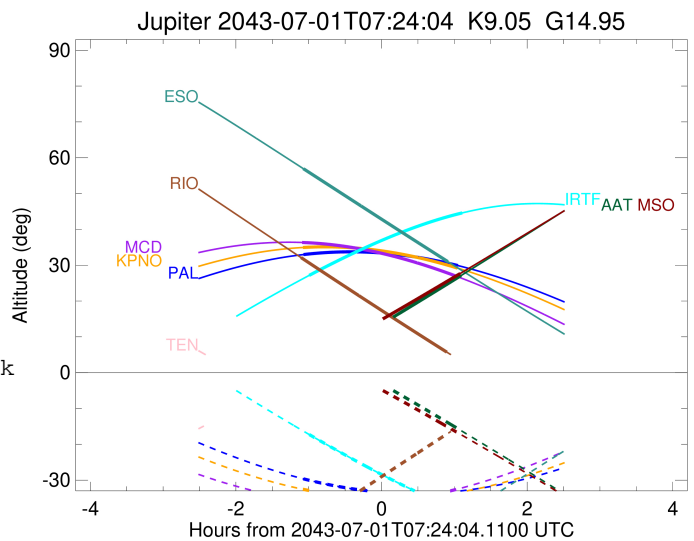
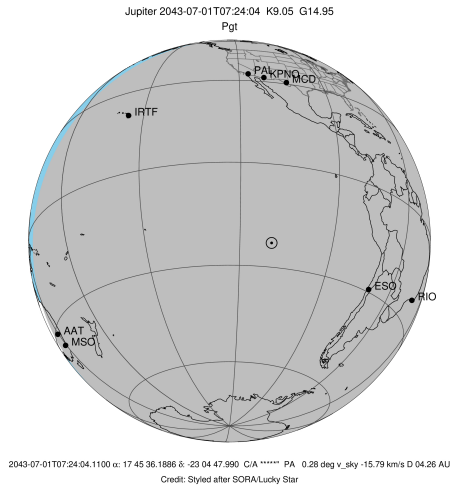


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-01T06:19:41.785	56.93	-68.33	71489.2	-36.56	-40.21
Jupiter	E	2043-07-01T08:18:54.073	30.96	-42.38	71489.2	-36.58	-40.23


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-01T07:30:16.200
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       : 4068832908579260672
2Mass ID (if available) : 17453619-2304477
ICRS Star Coord at Epoch: 17h 45m 36.18861s -23:04:47.99012s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 9.048
G magnitude          : 14.952
RP magnitude         : 13.470
BP magnitude         : 17.652
DUPflag             : 0
Distance (au)        : 4.264
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.79
Sun-Target sep (deg) : 167.89
Sun-Moon sep (deg)  : 117.36
B (ring opening deg) : -2.41
PA of pole (deg)    : 0.71
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (" ) : 14.224
C/A sky separation (km) : 43992.0
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
    
```

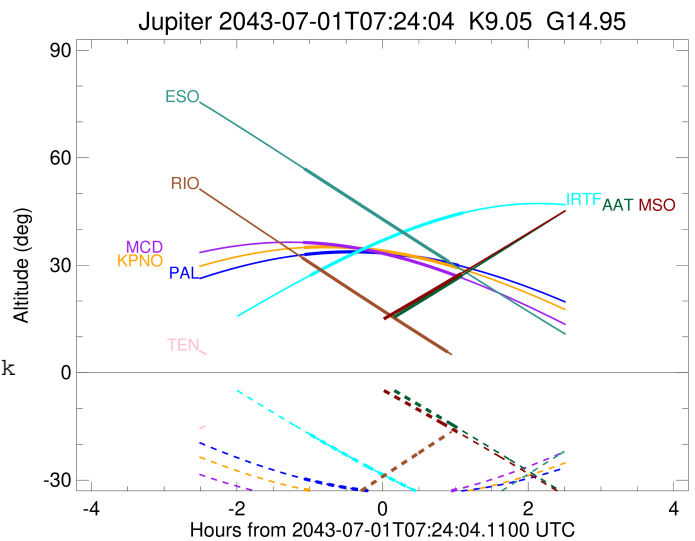
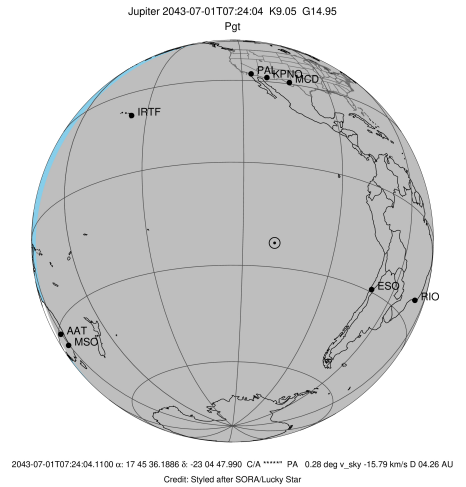


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-01T06:30:43.407	2.94x	6.90x	71488.8	-38.93	-42.63
Jupiter	E	2043-07-01T08:29:26.300	27.07	-16.13	71489.1	-36.96	-40.62


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-01T07:29:59.660
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      : 4068832908579260672
2Mass ID (if available) : 17453619-2304477
ICRS Star Coord at Epoch: 17h 45m 36.18861s -23:04:47.99012s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 9.048
G magnitude          : 14.952
RP magnitude         : 13.470
BP magnitude         : 17.652
DUPflag             : 0
Distance (au)       : 4.264
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -15.79
Sun-Target sep (deg) : 167.89
Sun-Moon sep (deg)  : 117.40
B (ring opening deg) : -2.41
PA of pole (deg)    : 0.71
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 14.339
C/A sky separation (km) : 44347.3
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	2043-07-01T06:30:44.658	4.62x	4.77x	71488.8	-39.27	-42.97
Jupiter	E	2043-07-01T08:28:53.211	27.67	-17.16	71489.1	-37.35	-41.01