

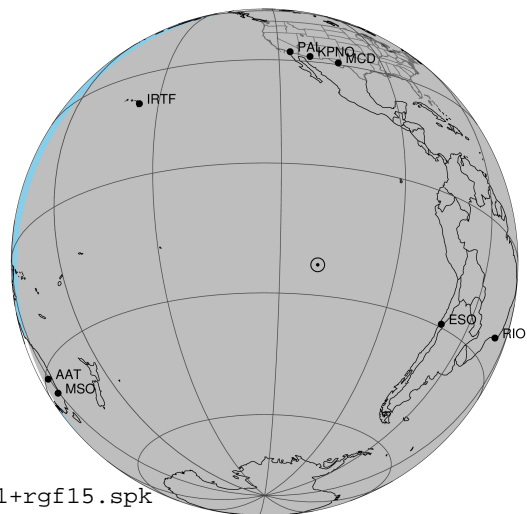
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-07-01T07:26:16.440
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068834381651929216
 2Mass ID (if available) : 17453616-2304196

Jupiter 2043-07-01T07:26:16 K8.45 G14.73 Pgt

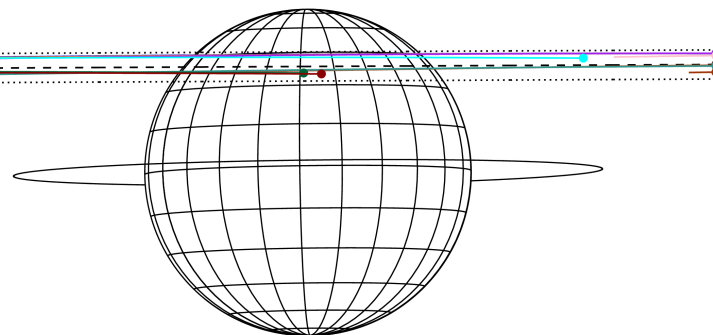
ICRS Star Coord at Epoch: 17h 45m 36.14976s -23:04:19.68008s

RUWE (>1.4 is poor) : 0.91
 K magnitude : 8.450
 G magnitude : 14.728
 RP magnitude : 13.204
 BP magnitude : 18.105
 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) : 117.57
 B (ring opening deg) : -2.42
 PA of pole (deg) : 0.71
 Pole direction: RA (deg): 268.05669
 Dec (deg): 64.49732
 C/A sky separation (") : 15.017
 C/A sky separation (km) : 46444.7
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-07-01T07:26:16 K8.45 G14.73
 Pgt



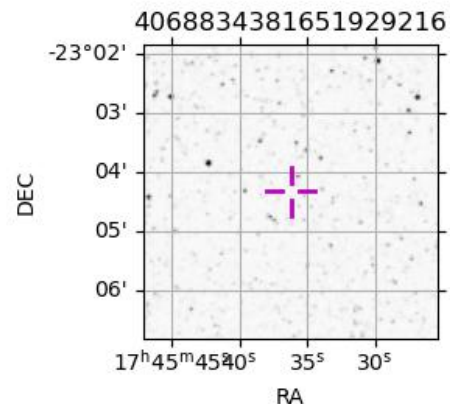
Earth
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 AAT
 SAAO
 MSO



2043-07-01T07:26:16.44000 a: 17 45 36.1498 d: -23 04 19.680 C/A ***** PA 180.28 deg v_sky -15.79 km/s D 04.26 AU
 Credit: Styled after SORA/Lucky Star

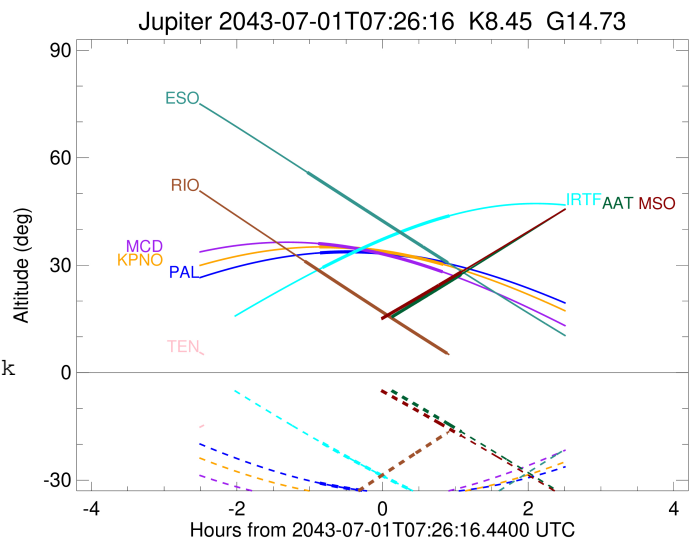
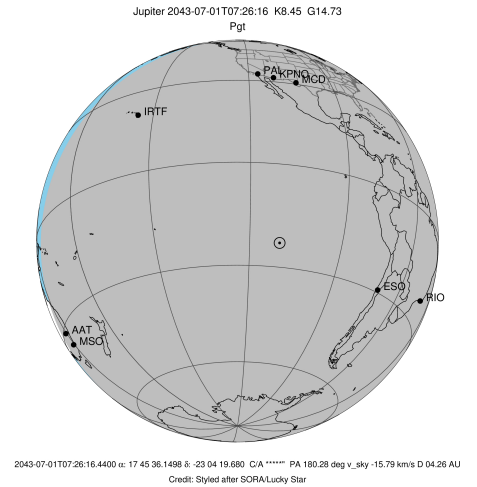
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1			Pnn
PAL	Palomar Mt (200")	33.4	243.1	+ +	JUL 01 06:34 - JUL 01 08:16	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JUL 01 06:34 - JUL 01 08:16	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JUL 01 06:33 - JUL 01 08:15	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	JUL 01 06:36 - JUL 01 08:21	Pie
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+ +	JUL 01 06:22 - JUL 01 08:19	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUL 01 06:24 - JUL 01 08:19	Pie
AAT	Siding Spring (AAT)	-31.3	149.1	+ +	JUL 01 08:31 - JUL 01 08:31	Pne
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	JUL 01 08:31 - JUL 01 08:31	Pne



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-01T07:25:40.370
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       : 4068834381651929216
2Mass ID (if available) : 17453616-2304196
ICRS Star Coord at Epoch: 17h 45m 36.14976s -23:04:19.68008s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 8.450
G magnitude           : 14.728
RP magnitude          : 13.204
BP magnitude          : 18.105
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)   : 118.10
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.71
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 16.726
C/A sky separation (km) : 51730.8
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
    
```

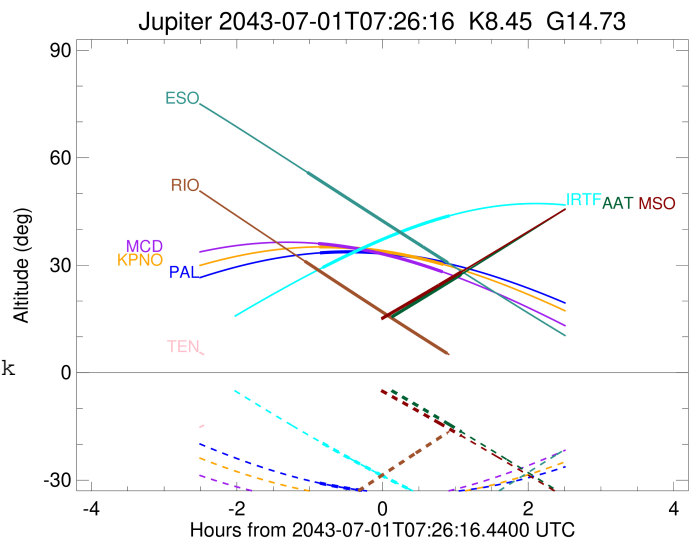
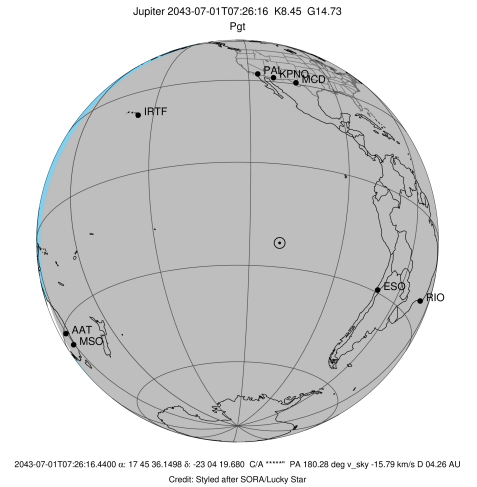


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-01T06:34:48.348	33.44	-30.84	71487.9	45.87	49.56
Jupiter	E	2043-07-01T08:16:34.926	30.72	-33.40	71487.8	46.61	50.29

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-01T07:25:12.170
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        : 4068834381651929216
2Mass ID (if available) : 17453616-2304196
ICRS Star Coord at Epoch: 17h 45m 36.14976s -23:04:19.68008s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 8.450
G magnitude           : 14.728
RP magnitude          : 13.204
BP magnitude          : 18.105
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)   : 118.15
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.71
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 16.688
C/A sky separation (km) : 51613.2
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
    
```

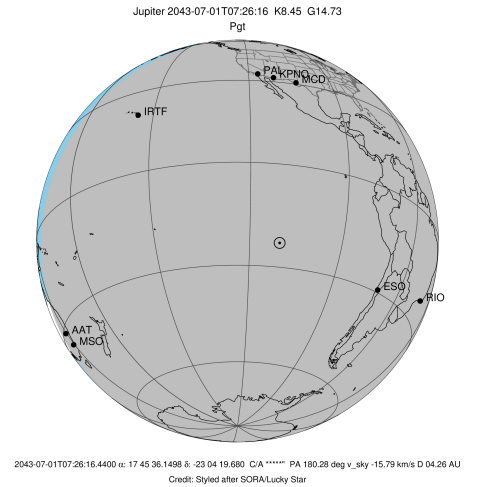


x: target alt < 5.0 deg or sun > -5.0 deg

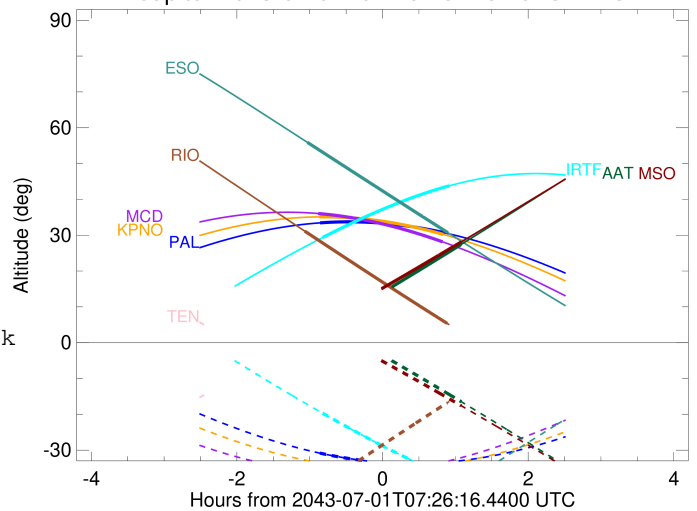
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-01T06:34:13.338	35.11	-33.50	71487.9	45.79	49.48
Jupiter	E	2043-07-01T08:16:15.010	30.24	-34.02	71487.8	46.42	50.10

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-01T07:24:31.920
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        : 4068834381651929216
2Mass ID (if available) : 17453616-2304196
ICRS Star Coord at Epoch: 17h 45m 36.14976s -23:04:19.68008s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 8.450
G magnitude           : 14.728
RP magnitude          : 13.204
BP magnitude          : 18.105
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)    : 118.19
B (ring opening deg) : -2.42
PA of pole (deg)      : 0.71
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 16.637
C/A sky separation (km) : 51454.6
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
    
```



Jupiter 2043-07-01T07:26:16 K8.45 G14.73

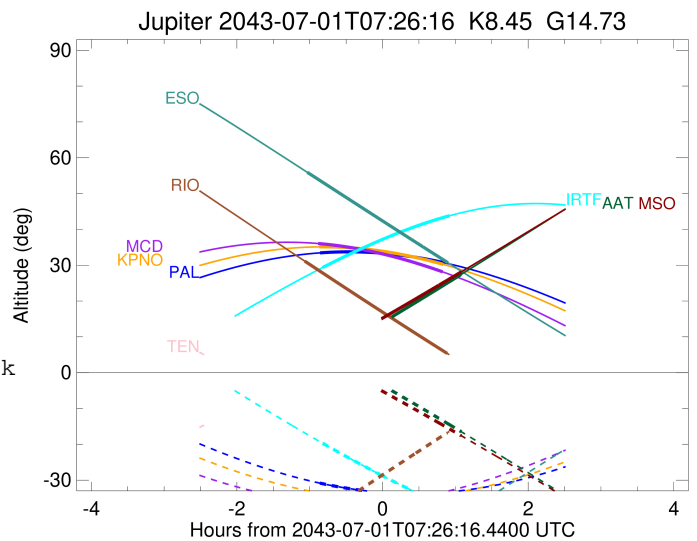
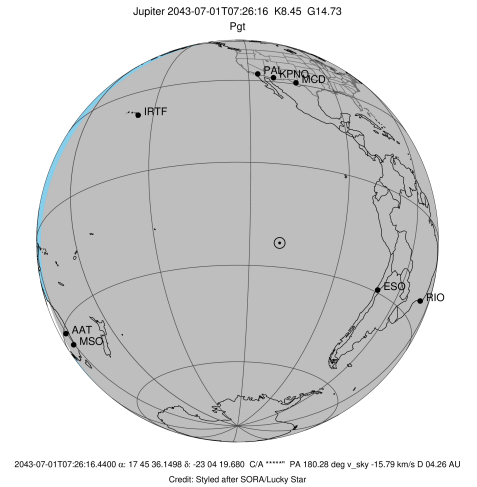


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-01T06:33:22.405	36.04	-36.02	71487.9	45.67	49.37
Jupiter	E	2043-07-01T08:15:47.575	28.15	-33.39	71487.8	46.17	49.86

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-01T07:29:14.610
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       : 4068834381651929216
2Mass ID (if available) : 17453616-2304196
ICRS Star Coord at Epoch: 17h 45m 36.14976s -23:04:19.68008s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 8.450
G magnitude           : 14.728
RP magnitude          : 13.204
BP magnitude          : 18.105
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)   : 117.88
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.71
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 16.310
C/A sky separation (km) : 50443.3
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
    
```

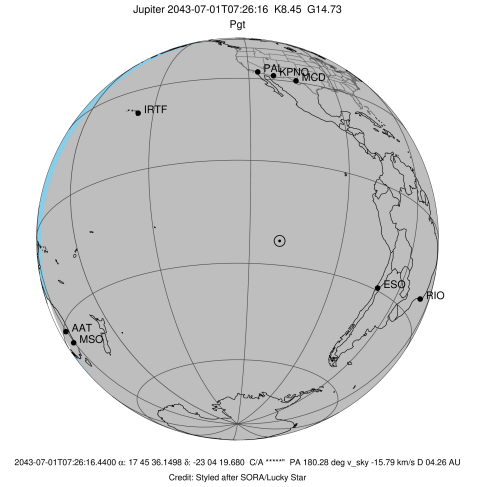


x: target alt < 5.0 deg or sun > -5.0 deg

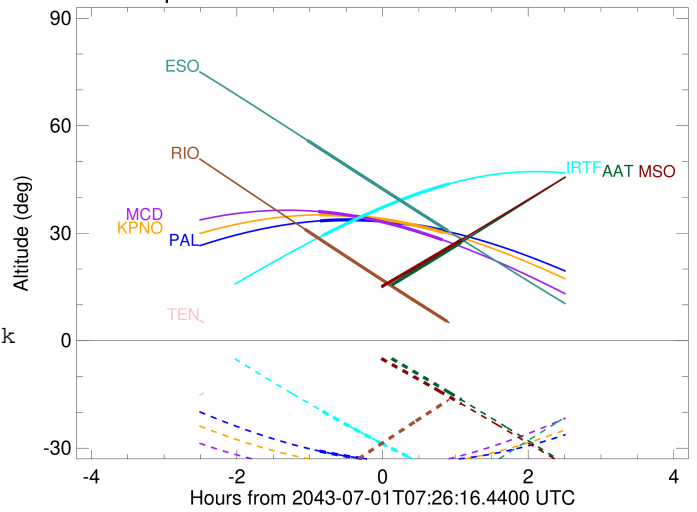
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-01T06:36:53.474	29.34	-19.68	71488.1	44.03	47.74
Jupiter	E	2043-07-01T08:21:26.801	43.79	-37.55	71487.9	45.51	49.20

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-01T07:20:40.230
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       : 4068834381651929216
2Mass ID (if available) : 17453616-2304196
ICRS Star Coord at Epoch: 17h 45m 36.14976s -23:04:19.68008s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 8.450
G magnitude           : 14.728
RP magnitude         : 13.204
BP magnitude         : 18.105
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)   : 118.25
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.71
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 14.425
C/A sky separation (km) : 44614.3
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
    
```



Jupiter 2043-07-01T07:26:16 K8.45 G14.73

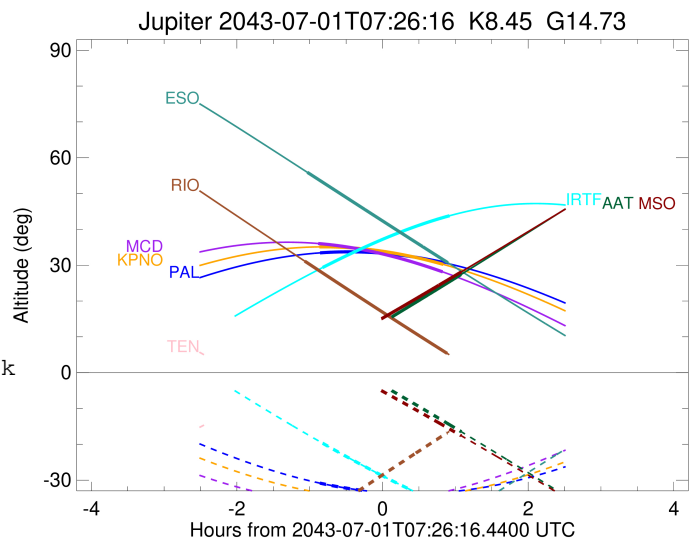
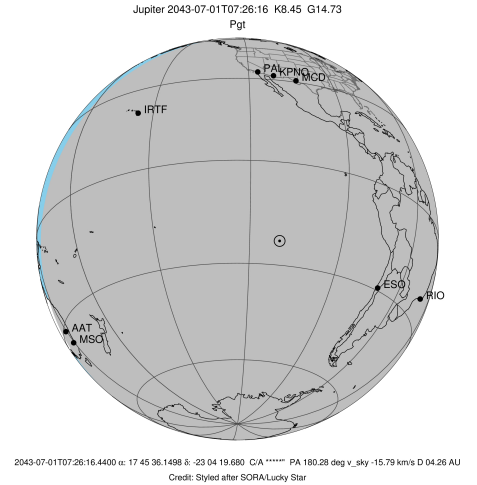


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-01T06:22:12.751	31.13	-42.94	71488.9	38.71	42.40
Jupiter	E	2043-07-01T08:19:31.833	5.38	-16.79	71488.9	38.40	42.08

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-01T07:22:00.790
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      : 4068834381651929216
2Mass ID (if available) : 17453616-2304196
ICRS Star Coord at Epoch: 17h 45m 36.14976s -23:04:19.68008s
RUWE (>1.4 is poor) : 0.91
K magnitude          : 8.450
G magnitude          : 14.728
RP magnitude         : 13.204
BP magnitude         : 18.105
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)  : 118.48
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.71
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 14.531
C/A sky separation (km) : 44941.0
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
    
```

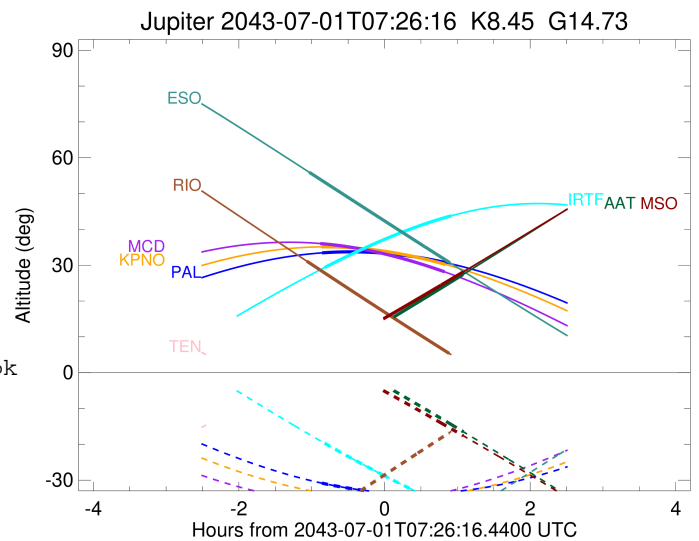
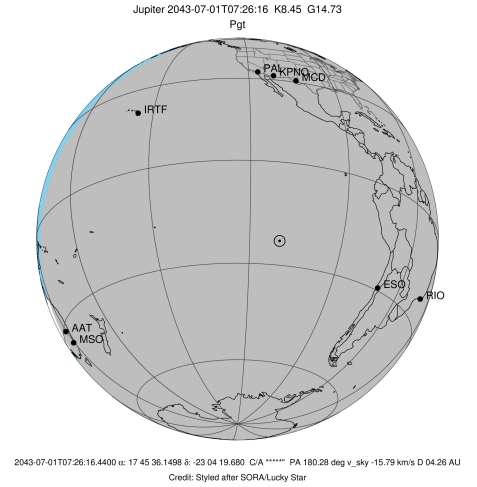


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-01T06:24:21.864	55.91	-67.33	71488.9	38.87	42.57
Jupiter	E	2043-07-01T08:19:57.537	30.73	-42.15	71488.9	38.85	42.54


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-01T07:31:33.840
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        : 4068834381651929216
2Mass ID (if available) : 17453616-2304196
ICRS Star Coord at Epoch: 17h 45m 36.14976s -23:04:19.68008s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 8.450
G magnitude           : 14.728
RP magnitude          : 13.204
BP magnitude          : 18.105
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)   : 117.39
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.71
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 14.088
C/A sky separation (km) : 43571.9
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
    
```

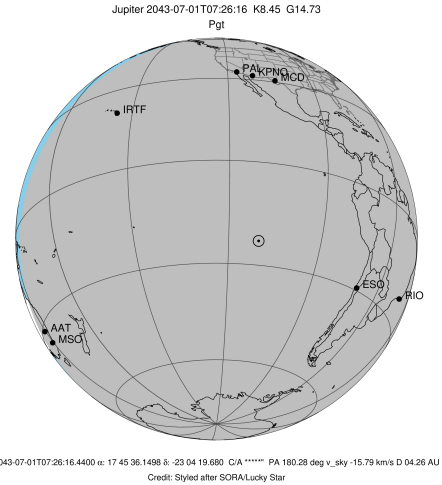


x: target alt < 5.0 deg or sun > -5.0 deg

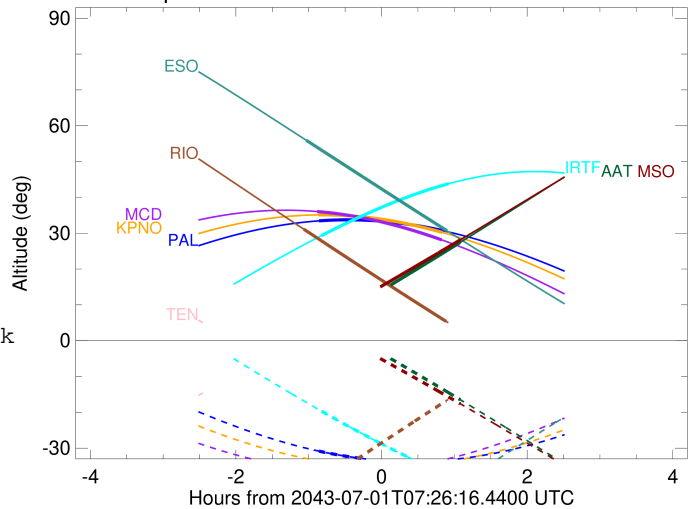
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-01T06:31:40.693	3.12x	6.72x	71489.2	36.52	40.16
Jupiter	E	2043-07-01T08:31:05.228	27.41	-16.47	71488.9	38.49	42.18


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-01T07:31:19.750
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       : 4068834381651929216
2Mass ID (if available) : 17453616-2304196
ICRS Star Coord at Epoch: 17h 45m 36.14976s -23:04:19.68008s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 8.450
G magnitude           : 14.728
RP magnitude          : 13.204
BP magnitude          : 18.105
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)   : 117.42
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.71
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 13.973
C/A sky separation (km) : 43216.0
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
    
```



Jupiter 2043-07-01T07:26:16 K8.45 G14.73



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	2043-07-01T06:31:09.376	4.69x	4.70x	71489.2	36.19	39.82
Jupiter	E	2043-07-01T08:31:09.170	28.13	-17.60	71489.0	38.11	41.79