

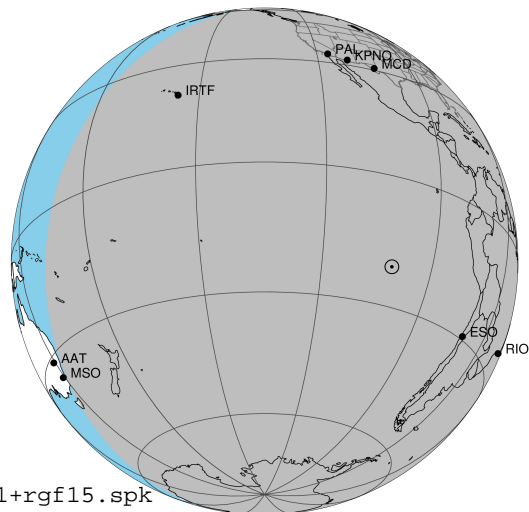
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2043-07-18T06:52:49.240  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4116720213349800704  
 2Mass ID (if available) : 17372666-2303419

Jupiter 2043-07-18T06:52:49 K9.06 G14.75 Pgt

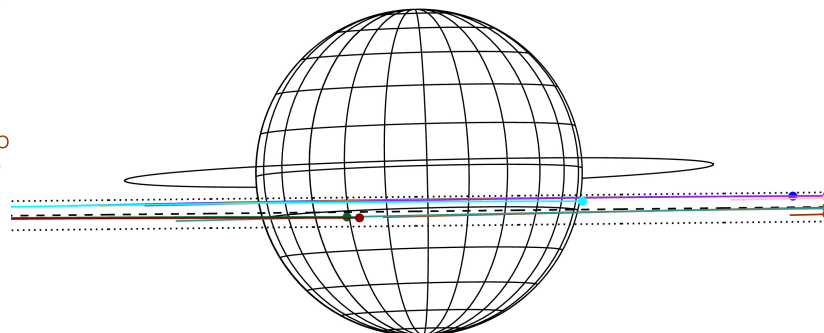
ICRS Star Coord at Epoch: 17h 37m 26.64071s -23°03'42.13662s

RUWE (>1.4 is poor) : 0.86  
 K magnitude : 9.057  
 G magnitude : 14.752  
 RP magnitude : 13.342  
 BP magnitude : 17.337  
 DUPflag : 0  
 Distance (au) : 4.353  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -12.48  
 Sun-Target sep (deg) : 149.83  
 Sun-Moon sep (deg) : 14.64  
 B (ring opening deg) : -2.39  
 PA of pole (deg) : 1.59  
 Pole direction: RA (deg): 268.05670  
 Dec (deg): 64.49732  
 C/A sky separation (") : 5.386  
 C/A sky separation (km) : 17005.9  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2043-07-18T06:52:49 K9.06 G14.75  
 Pgt



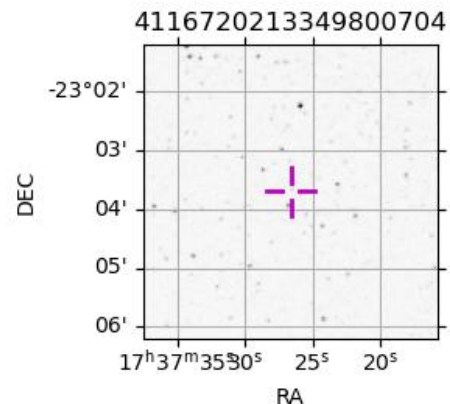
Earth  
 PAL  
 KPNO  
 MCD  
 TEN  
 IRTF  
 RIO  
 ESO  
 AAT  
 SAAO  
 MSO



2043-07-18T06:52:49.2400 a: 17 37 26.6407 s: -23 03 42.137 C/A 5.397" PA 0.62 deg v\_sky -12.48 km/s D 04.35 AU  
 Credit: Styled after SORA/Lucky Star

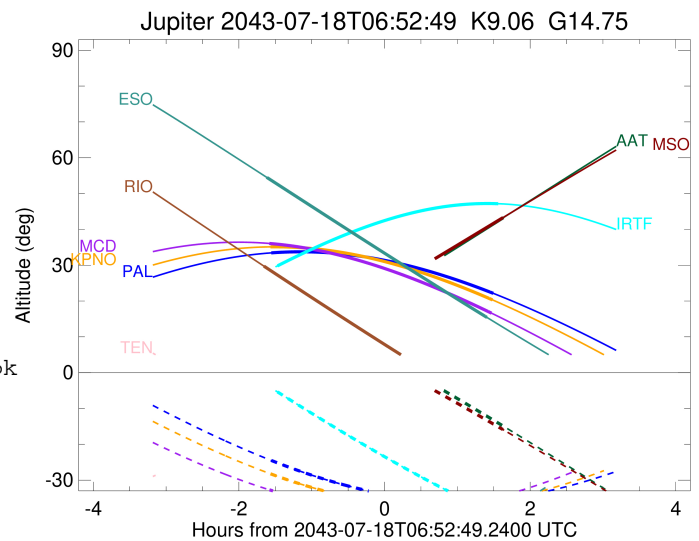
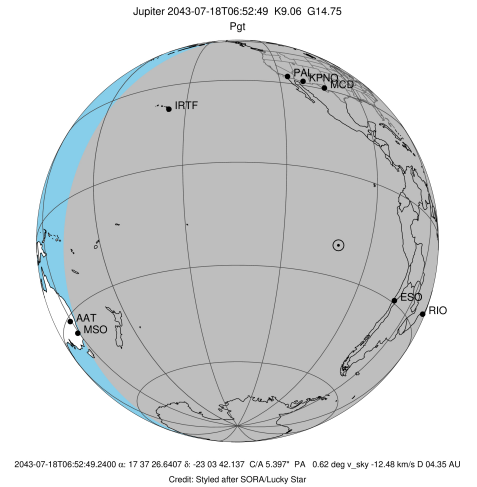
Observable events with sun below -5 deg and altitude above 5 deg

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 18 05:19 - JUL 18 08:22	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JUL 18 05:18 - JUL 18 08:21	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JUL 18 05:17 - JUL 18 08:21	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	JUL 18 05:24 - JUL 18 08:26	Pie
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+	JUL 18 05:13 - JUL 18 05:13	Pin
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUL 18 05:15 - JUL 18 08:17	Pie
AAT	Siding Spring (AAT)	-31.3	149.1	+	JUL 18 08:30 - JUL 18 08:30	Pne
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	JUL 18 08:30 - JUL 18 08:30	Pne



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-18T06:50:45.200
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      : 4116720213349800704
2Mass ID (if available) : 17372666-2303419
ICRS Star Coord at Epoch: 17h 37m 26.64071s -23:03:42.13662s
RUWE (>1.4 is poor) : 0.86
K magnitude          : 9.057
G magnitude          : 14.752
RP magnitude         : 13.342
BP magnitude         : 17.337
DUPflag             : 0
Distance (au)       : 4.353
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.48
Sun-Target sep (deg) : 149.83
Sun-Moon sep (deg)  : 15.21
B (ring opening deg) : -2.39
PA of pole (deg)    : 1.59
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 3.733
C/A sky separation (km): 11785.4
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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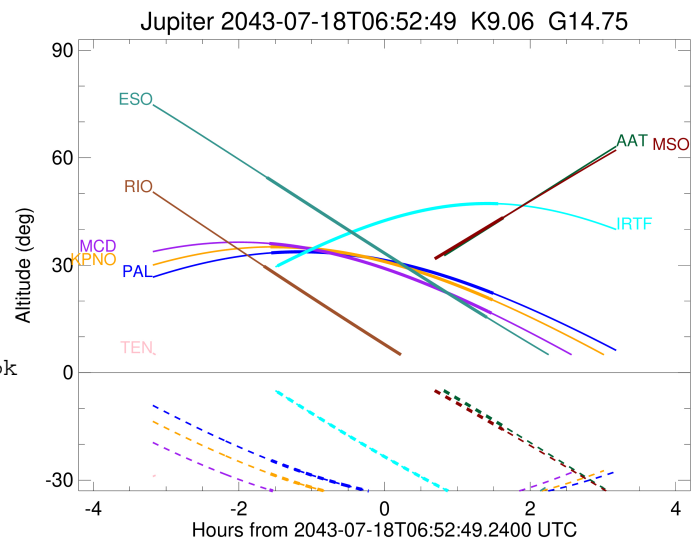
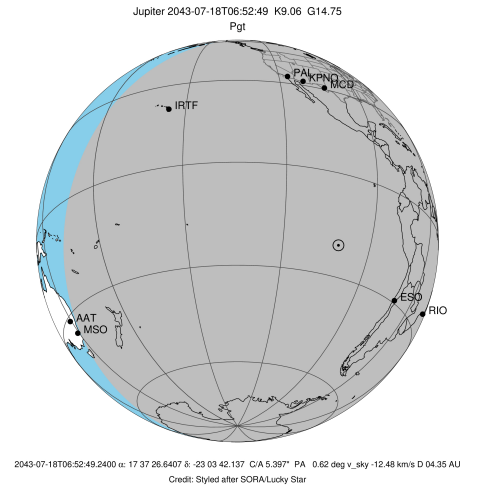


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-18T05:19:30.734	33.44	-24.50	71491.7	-10.40	-11.85
Jupiter	E	2043-07-18T08:22:25.248	22.15	-35.38	71491.8	-8.82	-10.06

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-18T06:50:05.690
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       : 4116720213349800704
2Mass ID (if available) : 17372666-2303419
ICRS Star Coord at Epoch: 17h 37m 26.64071s -23:03:42.13662s
RUWE (>1.4 is poor) : 0.86
K magnitude           : 9.057
G magnitude           : 14.752
RP magnitude         : 13.342
BP magnitude         : 17.337
DUPflag              : 0
Distance (au)        : 4.353
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.48
Sun-Target sep (deg) : 149.83
Sun-Moon sep (deg)  : 15.26
B (ring opening deg) : -2.39
PA of pole (deg)    : 1.59
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 3.780
C/A sky separation (km) : 11933.2
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
    
```

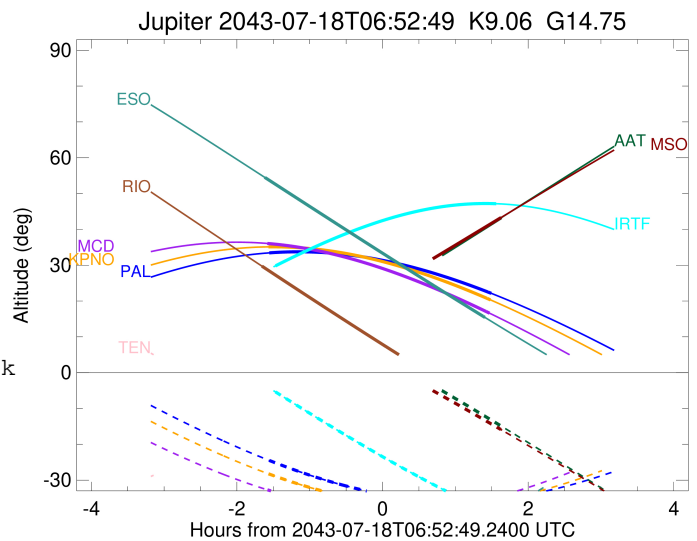
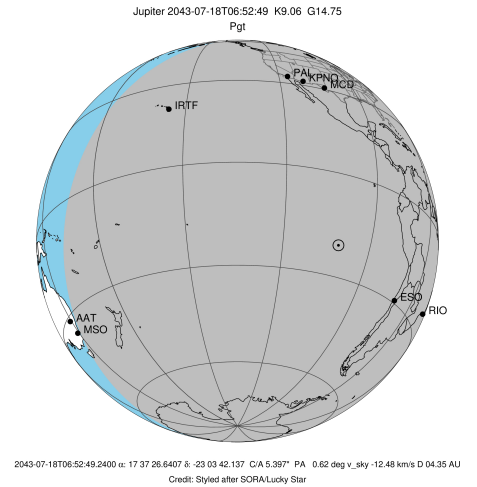


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-18T05:18:53.795	35.12	-28.23	71491.7	-10.46	-11.91
Jupiter	E	2043-07-18T08:21:49.118	20.32	-35.90	71491.8	-9.00	-10.26

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch             : 2043-07-18T06:49:10.980
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        : 4116720213349800704
2Mass ID (if available) : 17372666-2303419
ICRS Star Coord at Epoch: 17h 37m 26.64071s -23:03:42.13662s
RUWE (>1.4 is poor) : 0.86
K magnitude           : 9.057
G magnitude           : 14.752
RP magnitude          : 13.342
BP magnitude          : 17.337
DUPflag              : 0
Distance (au)         : 4.353
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -12.48
Sun-Target sep (deg)  : 149.83
Sun-Moon sep (deg)    : 15.33
B (ring opening deg) : -2.39
PA of pole (deg)      : 1.59
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 3.843
C/A sky separation (km) : 12133.9
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
    
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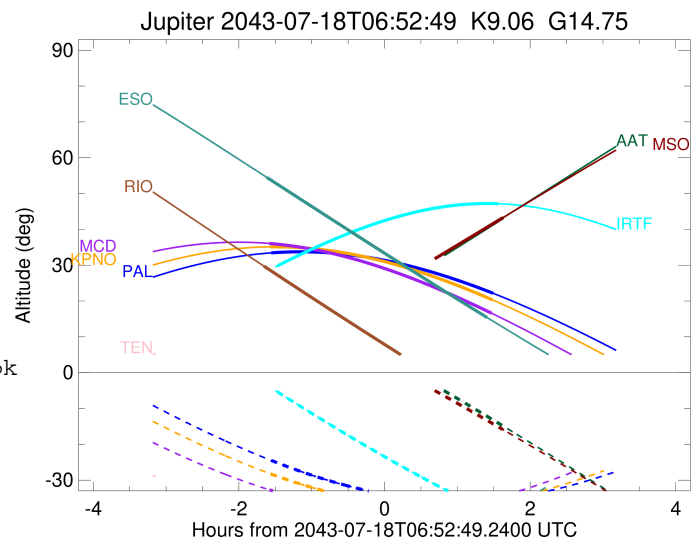
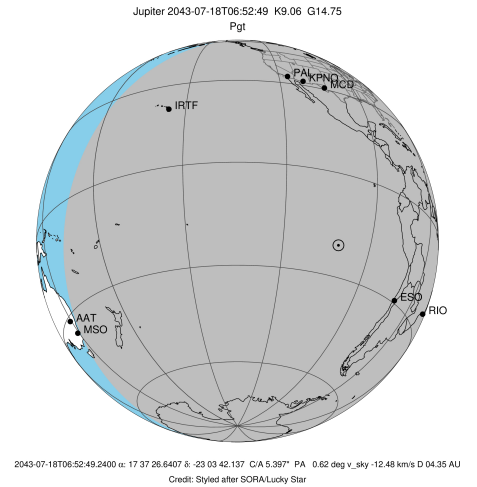


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-18T05:17:58.824	36.06	-32.70	71491.7	-10.53	-12.00
Jupiter	E	2043-07-18T08:21:02.980	16.60	-35.13	71491.8	-9.24	-10.54

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-18T06:55:45.210
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       : 4116720213349800704
2Mass ID (if available) : 17372666-2303419
ICRS Star Coord at Epoch: 17h 37m 26.64071s -23:03:42.13662s
RUWE (>1.4 is poor) : 0.86
K magnitude           : 9.057
G magnitude           : 14.752
RP magnitude          : 13.342
BP magnitude          : 17.337
DUPflag              : 0
Distance (au)        : 4.353
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.48
Sun-Target sep (deg) : 149.83
Sun-Moon sep (deg)   : 14.71
B (ring opening deg) : -2.39
PA of pole (deg)     : 1.59
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 4.065
C/A sky separation (km) : 12835.1
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
    
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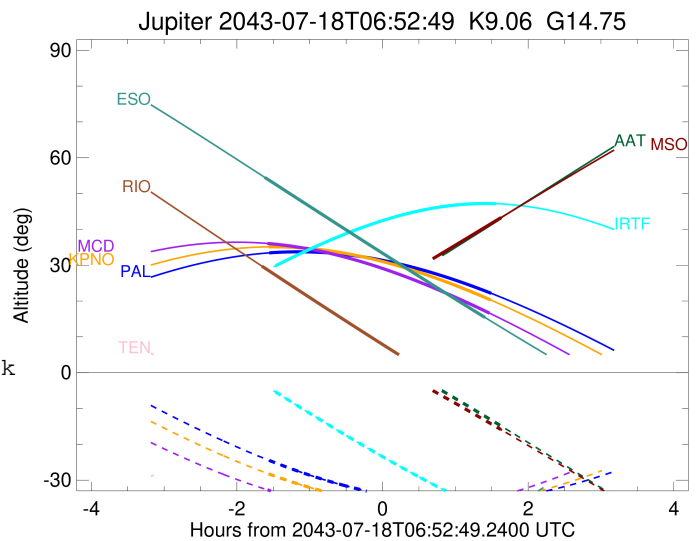
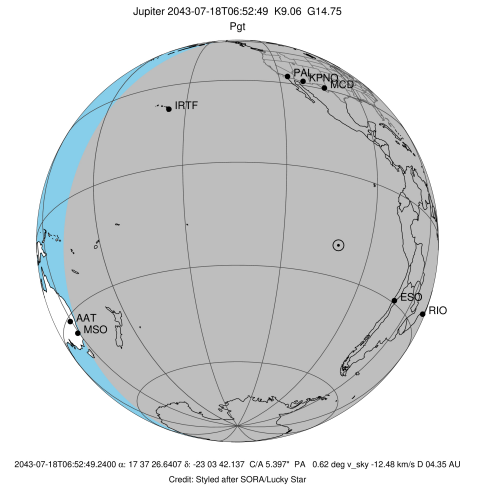


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-18T05:24:38.066	29.81	-5.37	71491.7	-11.72	-13.34
Jupiter	E	2043-07-18T08:26:33.071	47.16	-39.59	71491.8	-9.23	-10.52

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-18T06:44:36.610
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      : 4116720213349800704
2Mass ID (if available) : 17372666-2303419
ICRS Star Coord at Epoch: 17h 37m 26.64071s -23:03:42.13662s
RUWE (>1.4 is poor) : 0.86
K magnitude          : 9.057
G magnitude          : 14.752
RP magnitude         : 13.342
BP magnitude         : 17.337
DUPflag             : 0
Distance (au)       : 4.353
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -12.48
Sun-Target sep (deg) : 149.83
Sun-Moon sep (deg)  : 15.35
B (ring opening deg) : -2.39
PA of pole (deg)    : 1.59
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 6.080
C/A sky separation (km) : 19195.6
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
    
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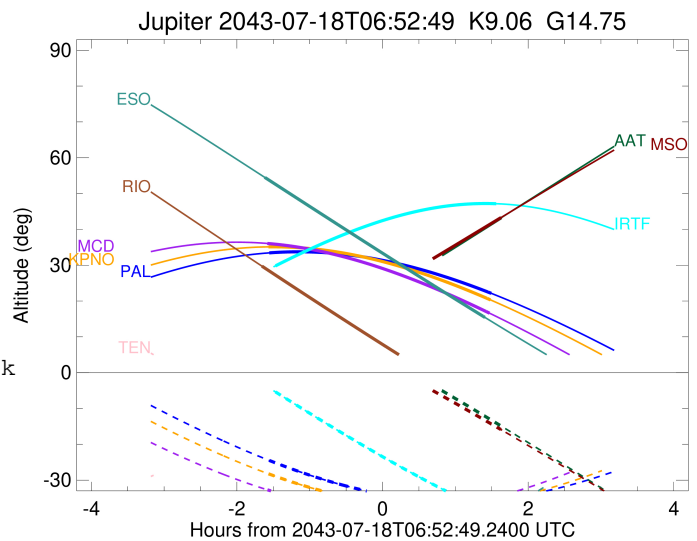
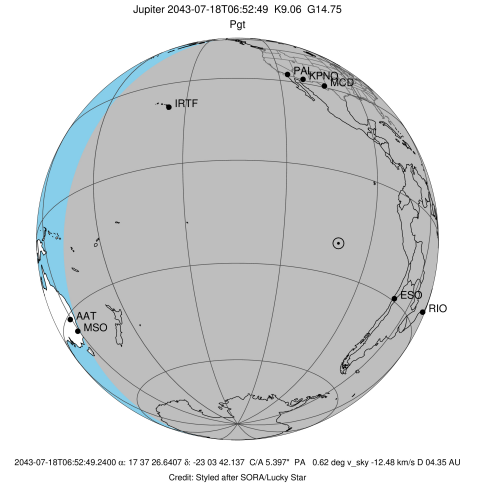


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-18T05:13:25.811	29.74	-58.86	71491.4	-15.79	-17.91
Jupiter	E	2043-07-18T08:17:10.405	-9.66x	-17.18	71491.5	-15.35	-17.42

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-18T06:45:58.720
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       : 4116720213349800704
2Mass ID (if available) : 17372666-2303419
ICRS Star Coord at Epoch: 17h 37m 26.64071s -23:03:42.13662s
RUWE (>1.4 is poor) : 0.86
K magnitude           : 9.057
G magnitude           : 14.752
RP magnitude          : 13.342
BP magnitude          : 17.337
DUPflag              : 0
Distance (au)         : 4.353
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -12.48
Sun-Target sep (deg) : 149.83
Sun-Moon sep (deg)   : 15.35
B (ring opening deg) : -2.39
PA of pole (deg)     : 1.59
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 5.953
C/A sky separation (km) : 18794.3
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
    
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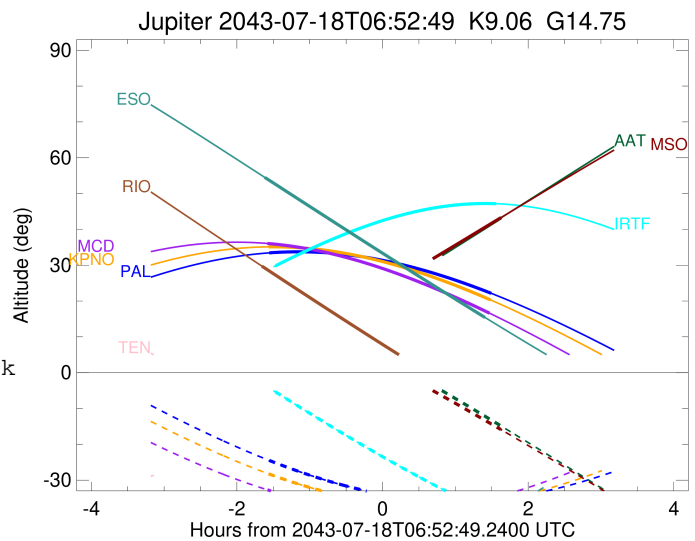
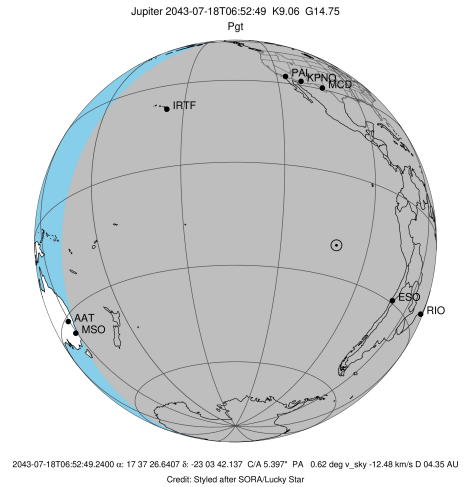


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-18T05:15:50.899	54.50	-79.93	71491.4	-15.66	-17.76
Jupiter	E	2043-07-18T08:17:13.984	15.42	-42.56	71491.5	-14.94	-16.96

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-18T07:00:08.910
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      : 4116720213349800704
2Mass ID (if available) : 17372666-2303419
ICRS Star Coord at Epoch: 17h 37m 26.64071s -23:03:42.13662s
RUWE (>1.4 is poor) : 0.86
K magnitude          : 9.057
G magnitude          : 14.752
RP magnitude         : 13.342
BP magnitude         : 17.337
DUPflag             : 0
Distance (au)        : 4.353
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.48
Sun-Target sep (deg) : 149.83
Sun-Moon sep (deg)  : 13.92
B (ring opening deg) : -2.39
PA of pole (deg)    : 1.59
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 6.180
C/A sky separation (km): 19511.9
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
    
```



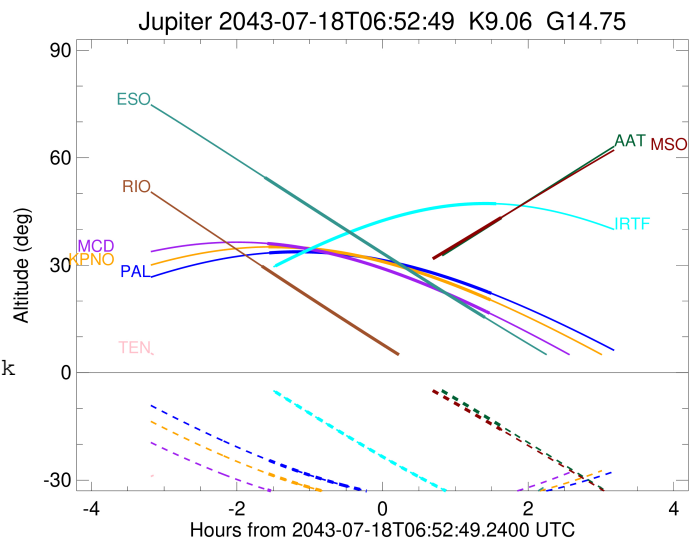
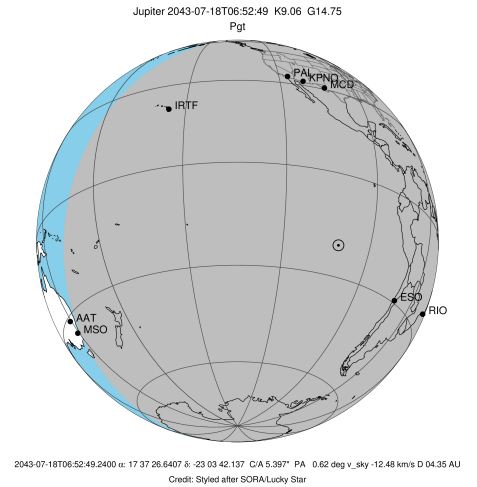
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-18T05:28:33.439	5.43	19.39x	71491.3	-17.50	-19.81
Jupiter	E	2043-07-18T08:30:44.582	43.27	-14.93	71491.5	-14.22	-16.15



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-18T06:59:49.440
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      : 4116720213349800704
2Mass ID (if available) : 17372666-2303419
ICRS Star Coord at Epoch: 17h 37m 26.64071s -23:03:42.13662s
RUWE (>1.4 is poor) : 0.86
K magnitude          : 9.057
G magnitude          : 14.752
RP magnitude         : 13.342
BP magnitude         : 17.337
DUPflag             : 0
Distance (au)       : 4.353
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -12.48
Sun-Target sep (deg) : 149.83
Sun-Moon sep (deg)  : 13.94
B (ring opening deg) : -2.39
PA of pole (deg)    : 1.59
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (" ) : 6.298
C/A sky separation (km) : 19884.9
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	2043-07-18T05:28:21.630	6.97	16.78x	71491.3	-17.78	-20.12
Jupiter	E	2043-07-18T08:30:20.482	43.26	-15.87	71491.5	-14.56	-16.53