

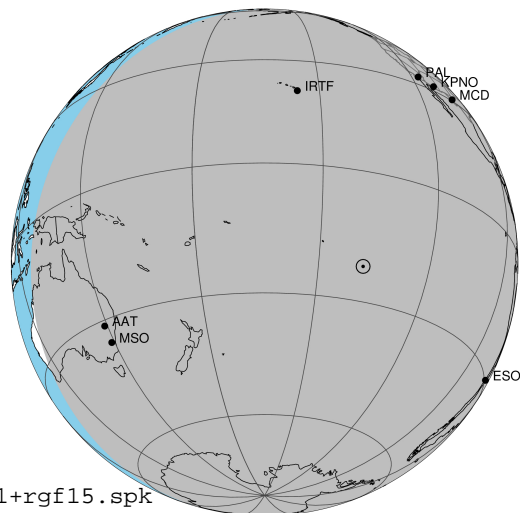
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2043-07-11T09:19:43.140  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4116543913610216320  
 2Mass ID (if available) : 17403027-2304006

Jupiter 2043-07-11T09:19:43 K9.06 G14.72 Pgt

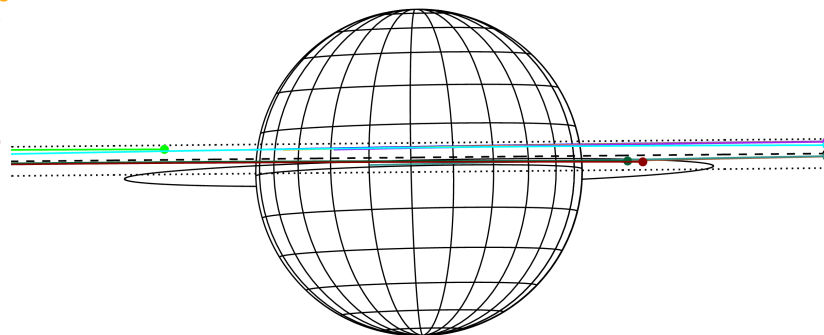
ICRS Star Coord at Epoch: 17h 40m 30.25038s -23:04:00.94297s

RUWE (>1.4 is poor) : 0.91  
 K magnitude : 9.063  
 G magnitude : 14.719  
 RP magnitude : 13.389  
 BP magnitude : 16.813  
 DUPflag : 0  
 Distance (au) : 4.308  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -14.15  
 Sun-Target sep (deg) : 157.11  
 Sun-Moon sep (deg) : 97.67  
 B (ring opening deg) : -2.41  
 PA of pole (deg) : 1.26  
 Pole direction: RA (deg): 268.05670  
 Dec (deg): 64.49732  
 C/A sky separation (") : 2.111  
 C/A sky separation (km) : 6596.3  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2043-07-11T09:19:43 K9.06 G14.72  
 Pgt



Earth  
 PAL  
 PMO  
 KPNO  
 MCD  
 IRTF  
 RIO  
 ESO  
 AAT  
 MSO

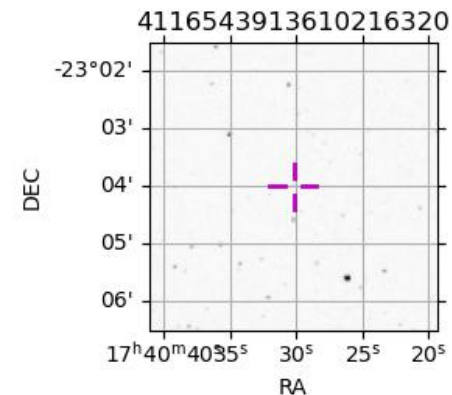


2043-07-11T09:19:43.1400 at: 17 40 30.2504 s: -23 04 00.943 C/A 2.100" PA 180.55 deg v\_sky -14.15 km/s D 04.31 AU

Credit: Styled after SORA/Lucky Star

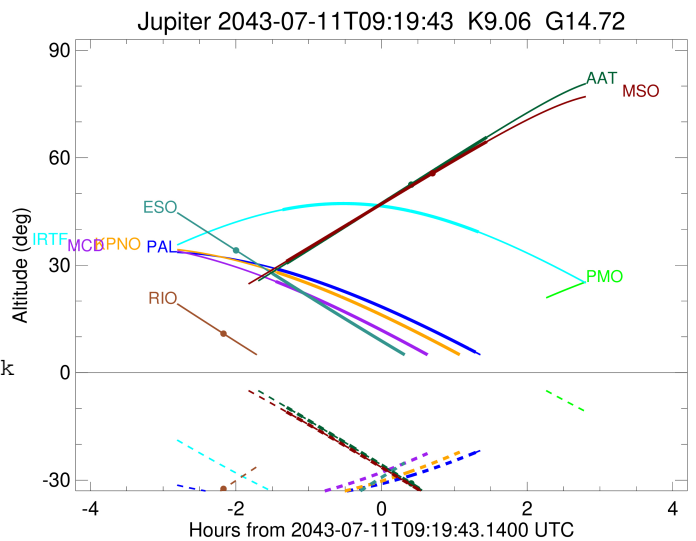
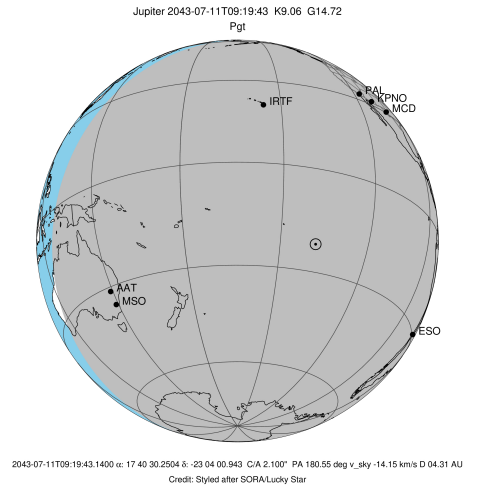
Observable events with sun below -5 deg and altitude above 5 deg

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 11 07:54 - JUL 11 10:37	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	JUL 11 07:53 - JUL 11 07:53	Pin
MCD	McDonald Obs. 2.7m	30.7	256.0	+	JUL 11 07:52 - JUL 11 07:52	Pin
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	JUL 11 07:58 - JUL 11 10:39	Pie
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8			Pnn
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	JUL 11 07:49 - JUL 11 07:49	Pin
AAT	Siding Spring (AAT)	-31.3	149.1	+ +	JUL 11 08:01 - JUL 11 10:46	Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	JUL 11 08:01 - JUL 11 10:46	Pie



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-11T09:15:22.380
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       : 4116543913610216320
2Mass ID (if available) : 17403027-2304006
ICRS Star Coord at Epoch: 17h 40m 30.25038s -23:04:00.94297s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 9.063
G magnitude           : 14.719
RP magnitude         : 13.389
BP magnitude         : 16.813
DUPflag              : 0
Distance (au)        : 4.308
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.15
Sun-Target sep (deg) : 157.11
Sun-Moon sep (deg)   : 97.89
B (ring opening deg) : -2.41
PA of pole (deg)     : 1.26
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 3.615
C/A sky separation (km) : 11293.2
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
    
```

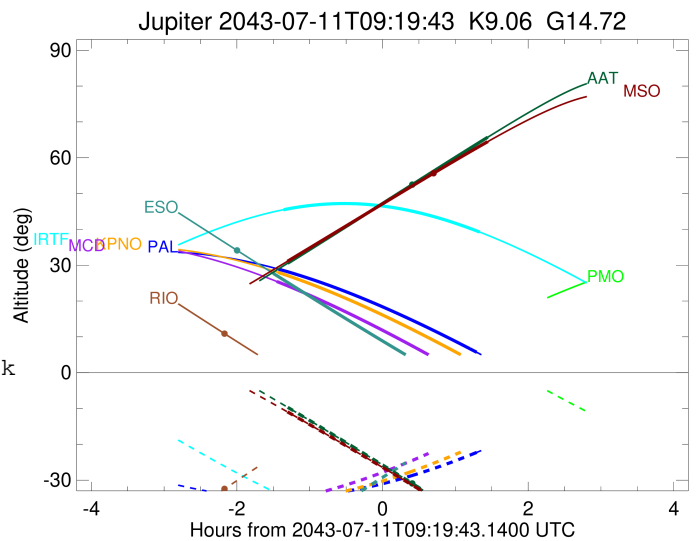
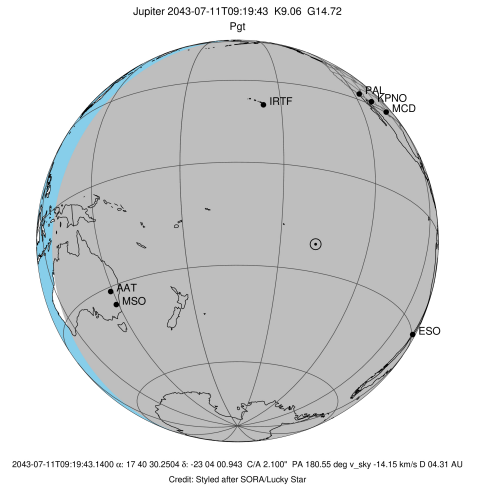


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-11T07:54:04.426	28.89	-34.73	71491.8	8.71	9.93
Jupiter	E	2043-07-11T10:37:16.915	5.70	-22.27	71491.8	9.30	10.60

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-11T09:14:55.540
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       : 4116543913610216320
2Mass ID (if available) : 17403027-2304006
ICRS Star Coord at Epoch: 17h 40m 30.25038s -23:04:00.94297s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 9.063
G magnitude           : 14.719
RP magnitude          : 13.389
BP magnitude          : 16.813
DUPflag              : 0
Distance (au)        : 4.308
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.15
Sun-Target sep (deg) : 157.11
Sun-Moon sep (deg)   : 97.85
B (ring opening deg) : -2.41
PA of pole (deg)     : 1.26
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 3.539
C/A sky separation (km) : 11056.9
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
    
```

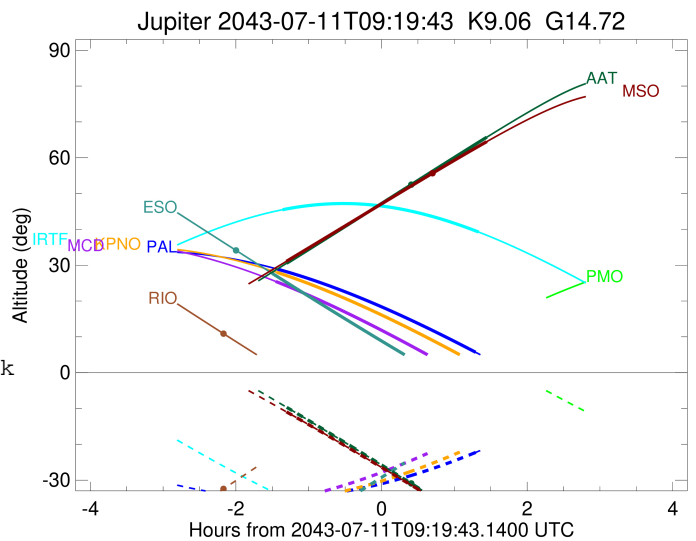
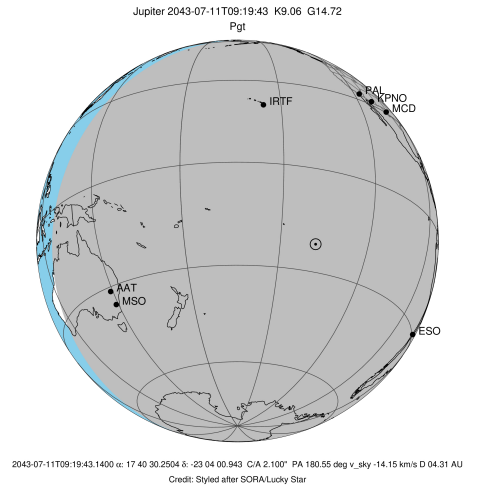


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-11T07:53:29.547	28.01	-35.87	71491.8	8.57	9.77
Jupiter	E	2043-07-11T10:37:01.682	2.64x	-20.26	71491.8	9.07	10.34

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-11T09:14:22.510
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       : 4116543913610216320
2Mass ID (if available) : 17403027-2304006
ICRS Star Coord at Epoch: 17h 40m 30.25038s -23:04:00.94297s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 9.063
G magnitude           : 14.719
RP magnitude          : 13.389
BP magnitude          : 16.813
DUPflag              : 0
Distance (au)        : 4.308
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.15
Sun-Target sep (deg) : 157.11
Sun-Moon sep (deg)   : 97.77
B (ring opening deg) : -2.41
PA of pole (deg)     : 1.26
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 3.437
C/A sky separation (km) : 10738.4
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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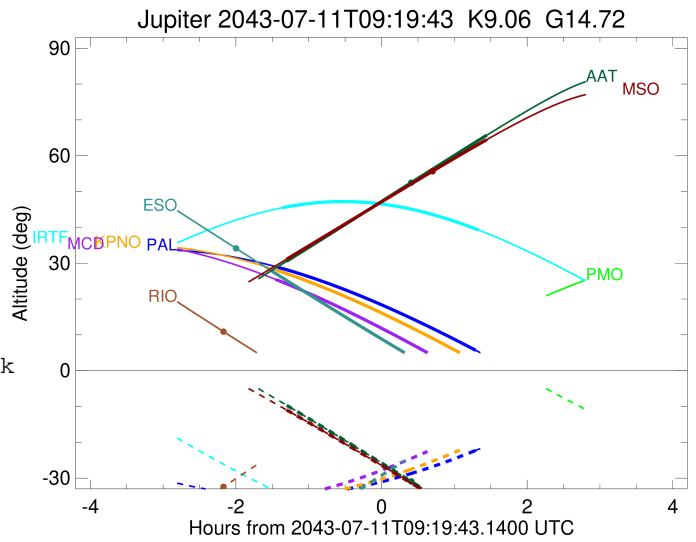
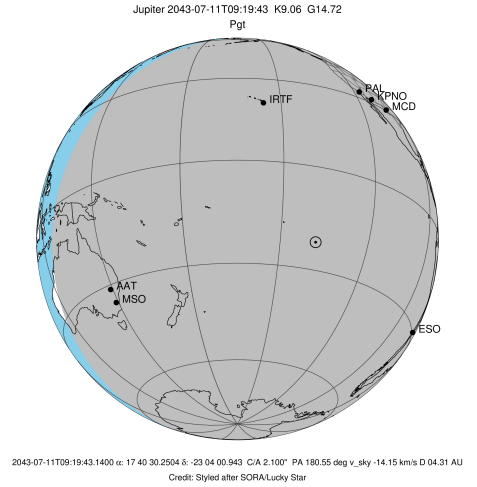


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-11T07:52:42.621	25.44	-35.99	71491.8	8.37	9.55
Jupiter	E	2043-07-11T10:36:47.117	-2.48x	-16.31	71491.8	8.76	9.99

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-11T09:18:49.240
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      : 4116543913610216320
2Mass ID (if available) : 17403027-2304006
ICRS Star Coord at Epoch: 17h 40m 30.25038s -23:04:00.94297s
RUWE (>1.4 is poor) : 0.91
K magnitude          : 9.063
G magnitude          : 14.719
RP magnitude         : 13.389
BP magnitude         : 16.813
DUPflag             : 0
Distance (au)       : 4.308
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.15
Sun-Target sep (deg) : 157.11
Sun-Moon sep (deg)  : 98.33
B (ring opening deg) : -2.41
PA of pole (deg)    : 1.26
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 3.493
C/A sky separation (km) : 10913.5
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
    
```

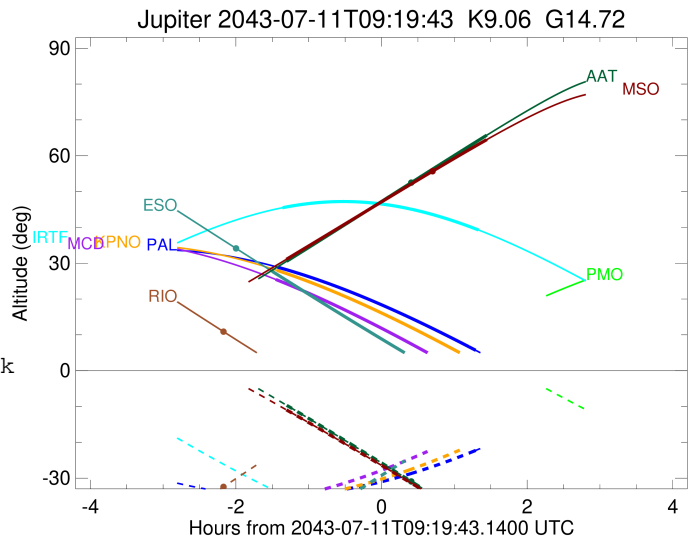
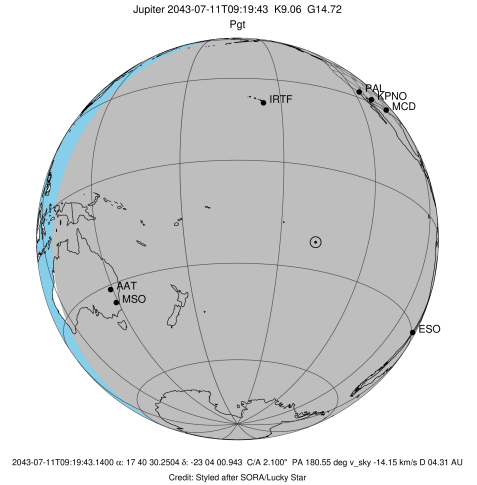


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-11T07:58:06.219	45.48	-34.54	71491.8	8.03	9.16
Jupiter	E	2043-07-11T10:39:42.499	39.26	-48.11	71491.8	9.29	10.59

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-11T09:13:11.530
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       : 4116543913610216320
2Mass ID (if available) : 17403027-2304006
ICRS Star Coord at Epoch: 17h 40m 30.25038s -23:04:00.94297s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 9.063
G magnitude           : 14.719
RP magnitude         : 13.389
BP magnitude         : 16.813
DUPflag              : 0
Distance (au)        : 4.308
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.15
Sun-Target sep (deg) : 157.11
Sun-Moon sep (deg)  : 97.70
B (ring opening deg) : -2.41
PA of pole (deg)    : 1.26
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 1.196
C/A sky separation (km) : 3735.2
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
    
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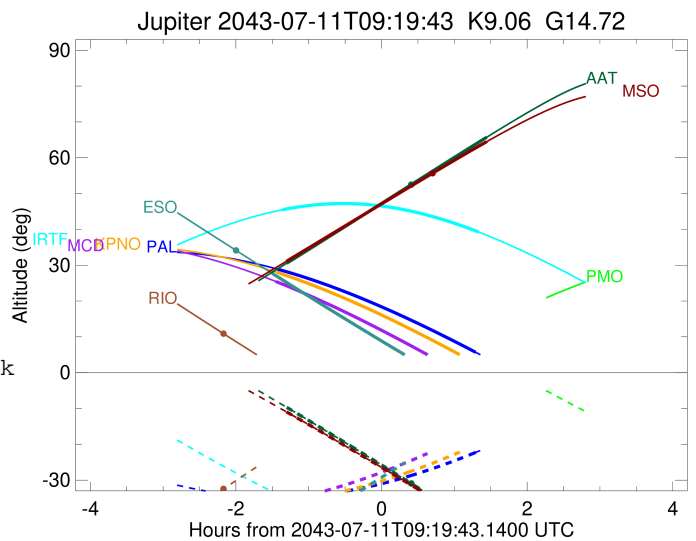
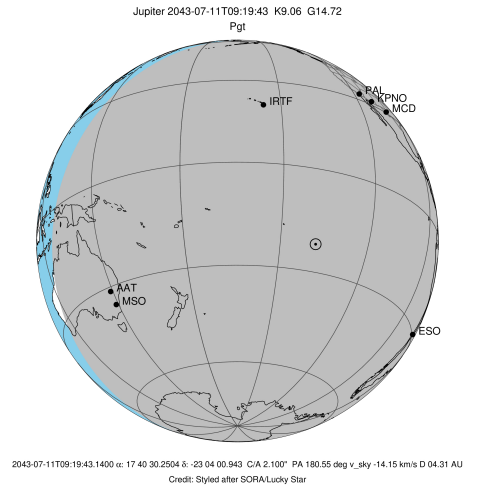


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-11T07:49:33.395	27.74	-48.81	71492.0	2.91	3.33
Jupiter	E	2043-07-11T10:37:46.268	-6.49x	-12.74	71492.0	3.07	3.51

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-11T09:24:19.140
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        : 4116543913610216320
2Mass ID (if available) : 17403027-2304006
ICRS Star Coord at Epoch: 17h 40m 30.25038s -23:04:00.94297s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 9.063
G magnitude           : 14.719
RP magnitude          : 13.389
BP magnitude          : 16.813
DUPflag              : 0
Distance (au)         : 4.308
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.15
Sun-Target sep (deg) : 157.11
Sun-Moon sep (deg)   : 98.44
B (ring opening deg) : -2.41
PA of pole (deg)     : 1.26
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 1.608
C/A sky separation (km) : 5022.6
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
    
```



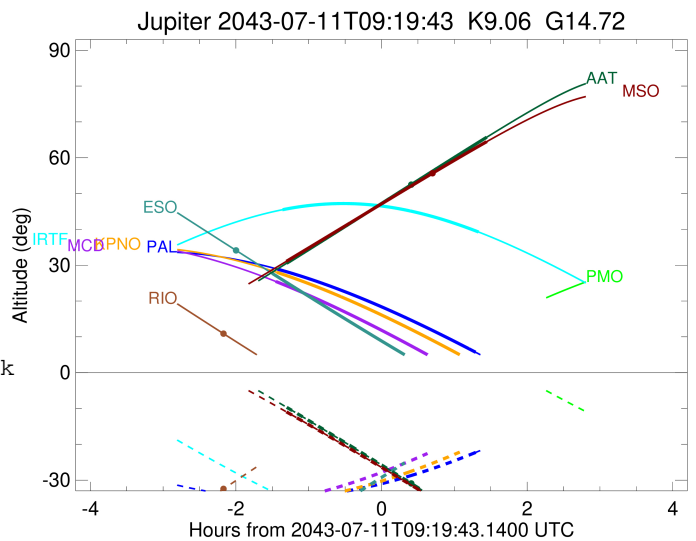
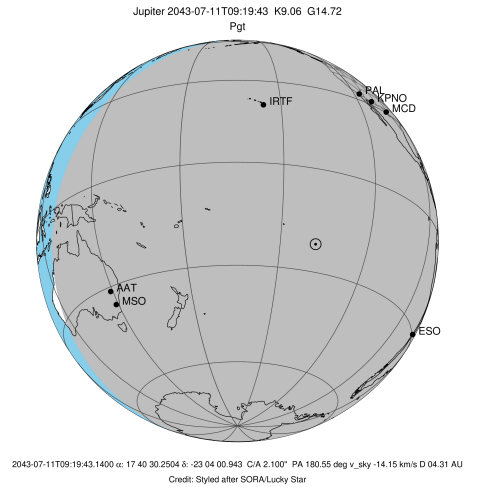
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-11T08:01:37.419	30.55	-9.67	71492.0	2.79	3.19
Jupiter	E	2043-07-11T10:46:29.487	65.73	-44.18	71491.9	5.10	5.83



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-11T09:24:07.190
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       : 4116543913610216320
2Mass ID (if available) : 17403027-2304006
ICRS Star Coord at Epoch: 17h 40m 30.25038s -23:04:00.94297s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 9.063
G magnitude           : 14.719
RP magnitude         : 13.389
BP magnitude         : 16.813
DUPflag              : 0
Distance (au)        : 4.308
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.15
Sun-Target sep (deg) : 157.11
Sun-Moon sep (deg)   : 98.43
B (ring opening deg) : -2.41
PA of pole (deg)     : 1.26
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 1.475
C/A sky separation (km) : 4609.5
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
    
```



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	2043-07-11T08:01:19.974	31.07	-10.93	71492.0	2.48	2.84
Jupiter	E	2043-07-11T10:46:24.451	64.48	-44.08	71491.9	4.76	5.43