

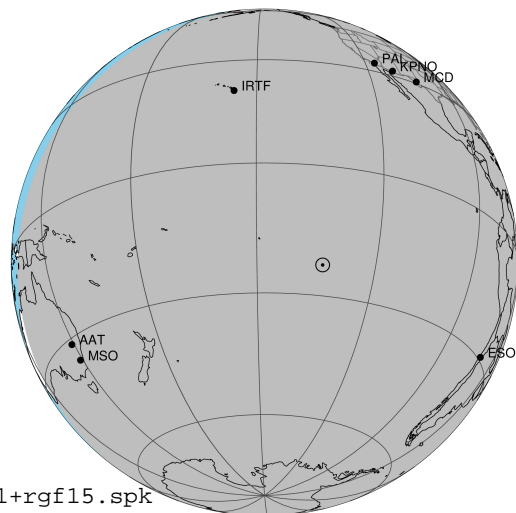
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-07-02T08:58:48.030
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068845136250849408
 2Mass ID (if available) : 17450224-2304505

Jupiter 2043-07-02T08:58:48 K7.26 G12.48 Pgt

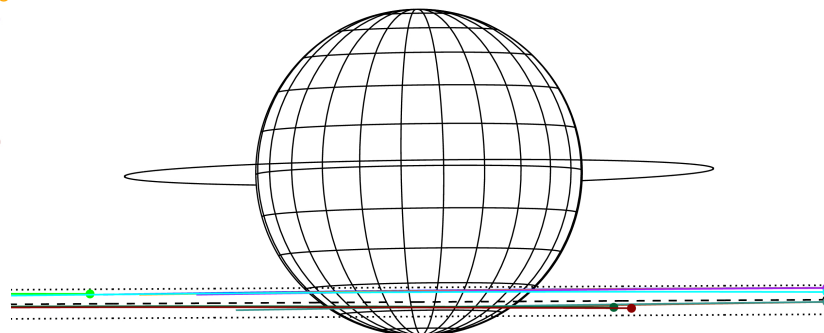
ICRS Star Coord at Epoch: 17h 45m 02.25403s -23:04:50.56714s

RUWE (>1.4 is poor) : 0.77
 K magnitude : 7.263
 G magnitude : 12.483
 RP magnitude : 11.134
 BP magnitude : 14.663
 DUPflag : 0
 Distance (au) : 4.268
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -15.67
 Sun-Target sep (deg) : 166.75
 Sun-Moon sep (deg) : 132.87
 B (ring opening deg) : -2.41
 PA of pole (deg) : 0.77
 Pole direction: RA (deg): 268.05669
 Dec (deg): 64.49732
 C/A sky separation (") : 18.330
 C/A sky separation (km) : 56733.8
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-07-02T08:58:48 K7.26 G12.48 Pgt



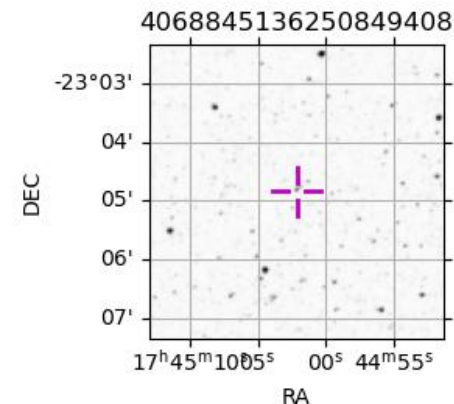
Earth
 PAL
 PMO
 KPNO
 MCD
 IRTF
 RIO
 ESO
 AAT
 MSO



2043-07-02T08:58:48.0300 α: 17 45 02.2540 δ: -23 04 50.567 C/A ***** PA 0.32 deg v_sky -15.67 km/s D 04.27 AU
 Credit: Styled after SORA/Lucky Star

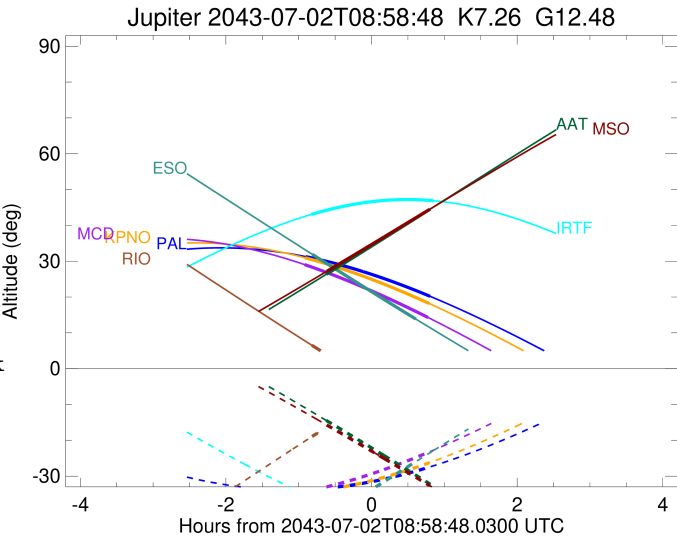
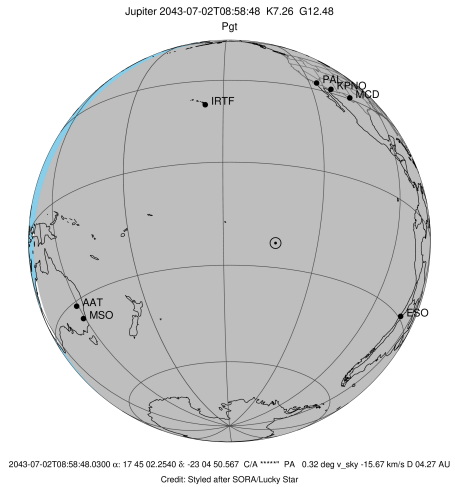
Observable events with sun below -5 deg and altitude above 5 deg

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 02 08:04 - JUL 02 09:47	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JUL 02 08:04 - JUL 02 09:46	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JUL 02 08:03 - JUL 02 09:45	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	JUL 02 08:09 - JUL 02 09:49	Pie
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+	JUL 02 08:09 - JUL 02 08:09	Pin
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUL 02 08:09 - JUL 02 09:35	Pie
AAT	Siding Spring (AAT)	-31.3	149.1	+ +	JUL 02 08:21 - JUL 02 09:47	Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	JUL 02 08:21 - JUL 02 09:46	Pie



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-02T08:55:39.950
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     : 4068845136250849408
2Mass ID (if available) : 17450224-2304505
ICRS Star Coord at Epoch: 17h 45m 02.25403s -23:04:50.56714s
RUWE (>1.4 is poor) : 0.77
K magnitude         : 7.263
G magnitude         : 12.483
RP magnitude        : 11.134
BP magnitude        : 14.663
DUPflag            : 0
Distance (au)      : 4.268
f0 (km)            : 0.00
g0 (km)            : 0.00
skyplane vel. (km/s) : -15.67
Sun-Target sep (deg) : 166.75
Sun-Moon sep (deg)  : 133.52
B (ring opening deg) : -2.41
PA of pole (deg)   : 0.77
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (" ) : 16.710
C/A sky separation (km) : 51719.4
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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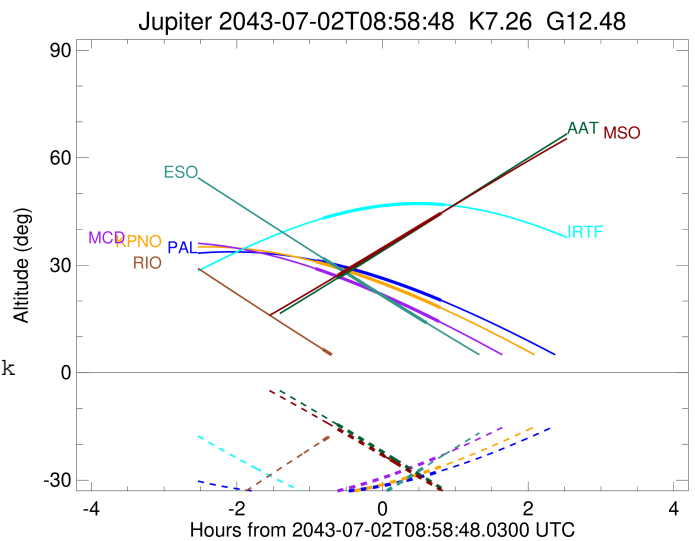
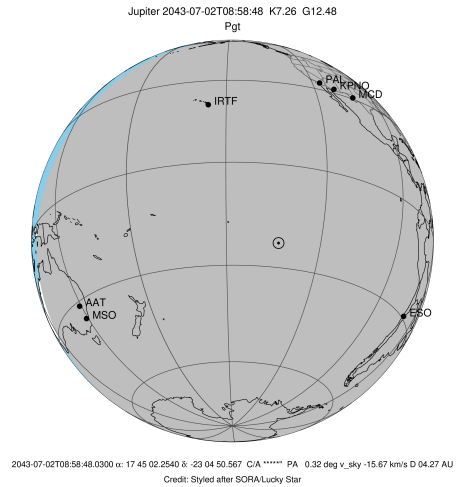


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-02T08:04:24.001	31.28	-33.71	71487.8	-46.52	-50.20
Jupiter	E	2043-07-02T09:47:05.353	20.19	-27.41	71487.8	-46.16	-49.85

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-02T08:55:08.540
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       : 4068845136250849408
2Mass ID (if available) : 17450224-2304505
ICRS Star Coord at Epoch: 17h 45m 02.25403s -23:04:50.56714s
RUWE (>1.4 is poor) : 0.77
K magnitude          : 7.263
G magnitude          : 12.483
RP magnitude         : 11.134
BP magnitude         : 14.663
DUPflag             : 0
Distance (au)        : 4.268
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.67
Sun-Target sep (deg) : 166.75
Sun-Moon sep (deg)  : 133.55
B (ring opening deg) : -2.41
PA of pole (deg)    : 0.77
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 16.773
C/A sky separation (km) : 51914.0
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
    
```

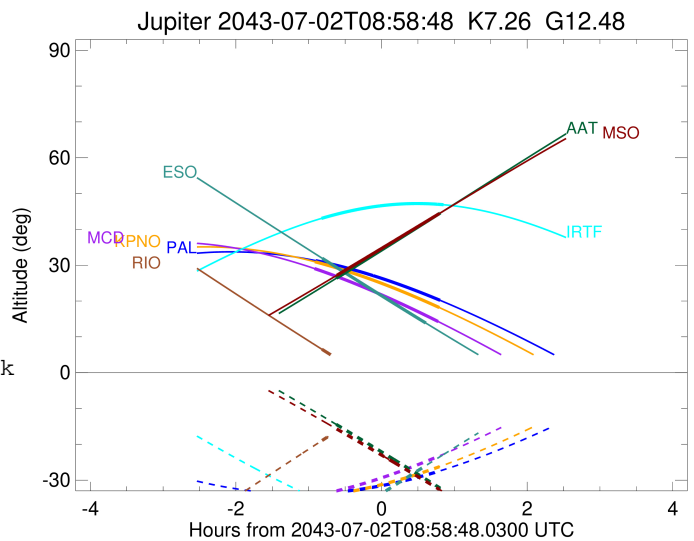
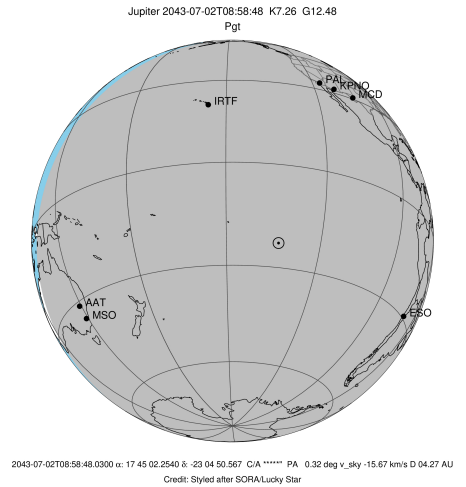


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-02T08:04:03.317	30.95	-34.59	71487.8	-46.70	-50.37
Jupiter	E	2043-07-02T09:46:24.586	18.18	-26.27	71487.8	-46.43	-50.11

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-02T08:54:27.060
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        : 4068845136250849408
2Mass ID (if available) : 17450224-2304505
ICRS Star Coord at Epoch: 17h 45m 02.25403s -23:04:50.56714s
RUWE (>1.4 is poor) : 0.77
K magnitude           : 7.263
G magnitude           : 12.483
RP magnitude          : 11.134
BP magnitude          : 14.663
DUPflag              : 0
Distance (au)         : 4.268
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.67
Sun-Target sep (deg)  : 166.75
Sun-Moon sep (deg)    : 133.57
B (ring opening deg) : -2.41
PA of pole (deg)      : 0.77
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 16.858
C/A sky separation (km) : 52178.9
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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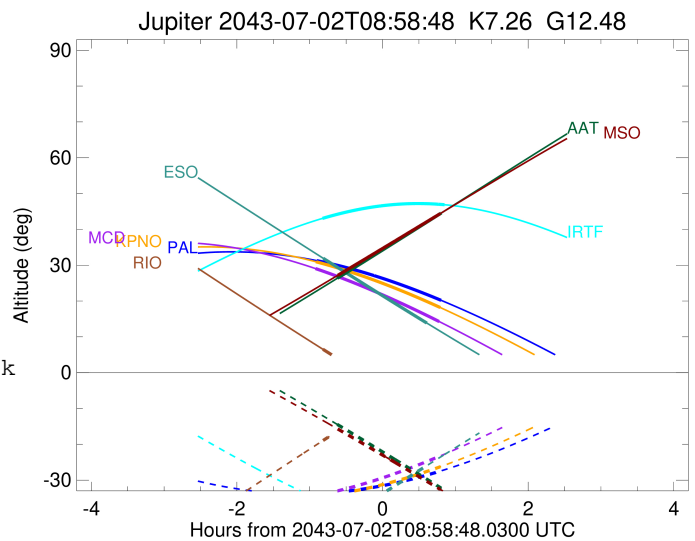
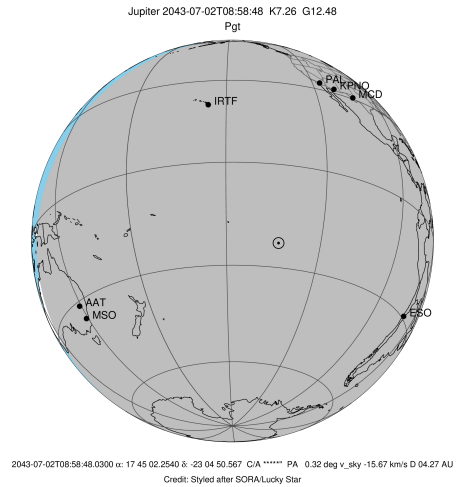


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-02T08:03:34.763	29.05	-34.34	71487.7	-46.94	-50.61
Jupiter	E	2043-07-02T09:45:32.001	14.26	-23.37	71487.8	-46.80	-50.47

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-02T08:59:40.540
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        : 4068845136250849408
2Mass ID (if available) : 17450224-2304505
ICRS Star Coord at Epoch: 17h 45m 02.25403s -23:04:50.56714s
RUWE (>1.4 is poor) : 0.77
K magnitude           : 7.263
G magnitude           : 12.483
RP magnitude          : 11.134
BP magnitude          : 14.663
DUPflag              : 0
Distance (au)         : 4.268
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.67
Sun-Target sep (deg)  : 166.75
Sun-Moon sep (deg)    : 133.34
B (ring opening deg)  : -2.41
PA of pole (deg)      : 0.77
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 16.936
C/A sky separation (km) : 52418.1
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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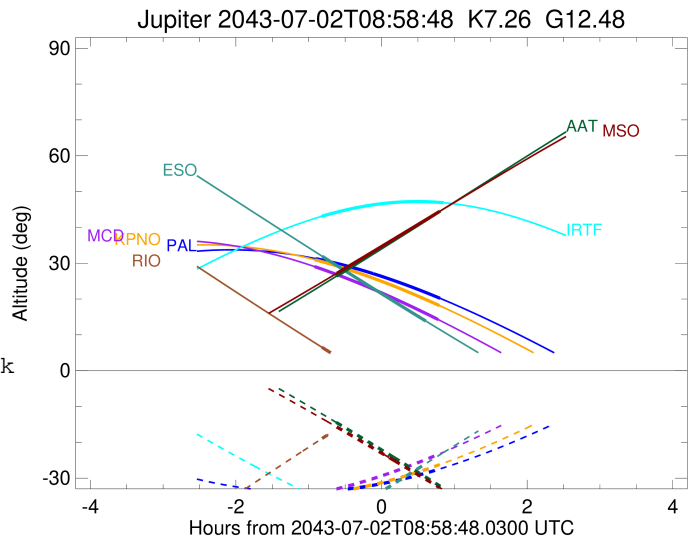
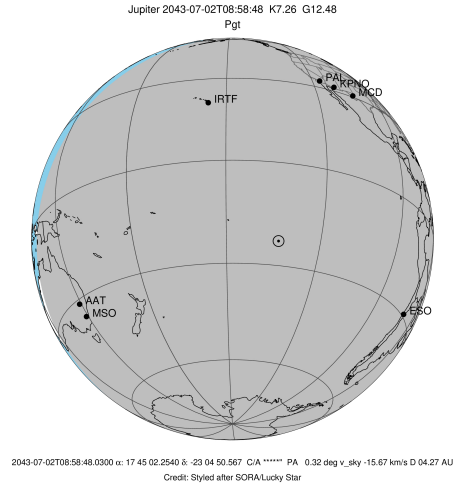


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-02T08:09:24.775	43.06	-35.83	71487.6	-47.70	-51.35
Jupiter	E	2043-07-02T09:49:54.731	46.87	-46.38	71487.8	-46.64	-50.32

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-02T08:52:02.660
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       : 4068845136250849408
2Mass ID (if available) : 17450224-2304505
ICRS Star Coord at Epoch: 17h 45m 02.25403s -23:04:50.56714s
RUWE (>1.4 is poor) : 0.77
K magnitude           : 7.263
G magnitude           : 12.483
RP magnitude         : 11.134
BP magnitude         : 14.663
DUPflag              : 0
Distance (au)        : 4.268
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.67
Sun-Target sep (deg) : 166.75
Sun-Moon sep (deg)   : 133.41
B (ring opening deg) : -2.41
PA of pole (deg)     : 0.77
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 19.232
C/A sky separation (km) : 59525.8
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
    
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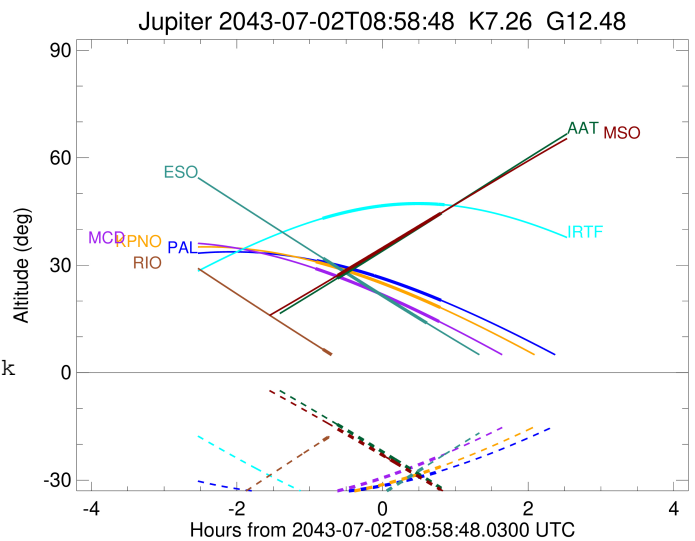
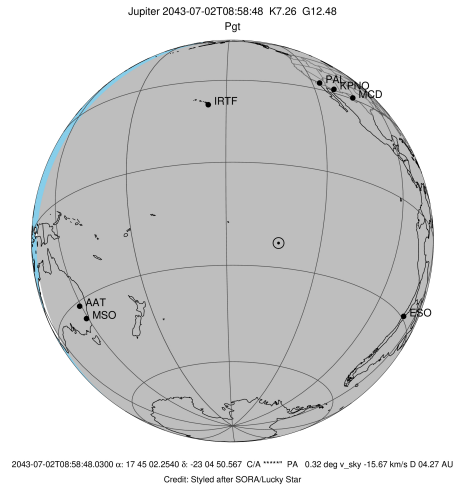


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-02T08:09:47.178	6.51	-18.94	71486.5	-56.14	-59.45
Jupiter	E	2043-07-02T09:34:31.740	-11.02x	-0.73x	71486.5	-56.43	-59.72

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-02T08:52:26.420
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      : 4068845136250849408
2Mass ID (if available) : 17450224-2304505
ICRS Star Coord at Epoch: 17h 45m 02.25403s -23:04:50.56714s
RUWE (>1.4 is poor) : 0.77
K magnitude          : 7.263
G magnitude          : 12.483
RP magnitude         : 11.134
BP magnitude         : 14.663
DUPflag             : 0
Distance (au)       : 4.268
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -15.67
Sun-Target sep (deg) : 166.75
Sun-Moon sep (deg)  : 133.71
B (ring opening deg) : -2.41
PA of pole (deg)    : 0.77
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 19.077
C/A sky separation (km) : 59046.1
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
    
```

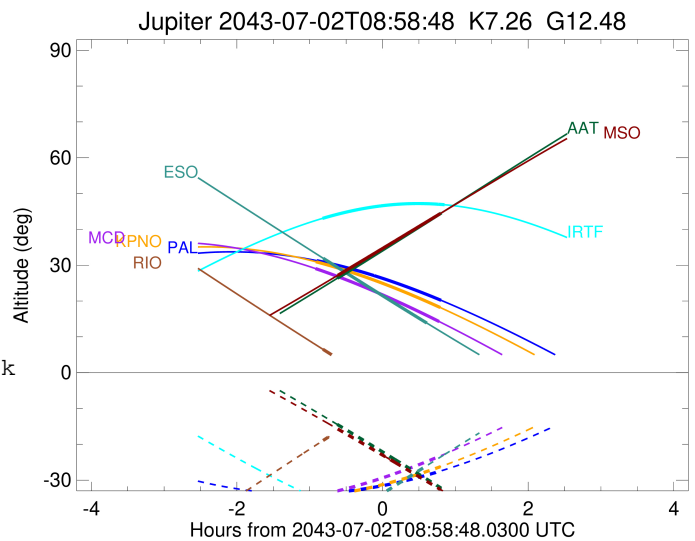
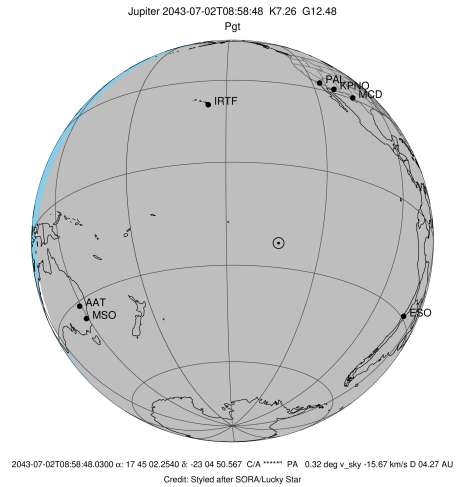


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-02T08:09:58.714	31.92	-44.34	71486.6	-55.52	-58.87
Jupiter	E	2043-07-02T09:35:06.876	13.89	-25.99	71486.5	-55.73	-59.06

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-02T09:04:26.140
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        : 4068845136250849408
2Mass ID (if available) : 17450224-2304505
ICRS Star Coord at Epoch: 17h 45m 02.25403s -23:04:50.56714s
RUWE (>1.4 is poor) : 0.77
K magnitude           : 7.263
G magnitude           : 12.483
RP magnitude          : 11.134
BP magnitude          : 14.663
DUPflag              : 0
Distance (au)         : 4.268
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.67
Sun-Target sep (deg)  : 166.75
Sun-Moon sep (deg)    : 132.75
B (ring opening deg)  : -2.41
PA of pole (deg)      : 0.77
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 18.980
C/A sky separation (km) : 58745.5
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
    
```

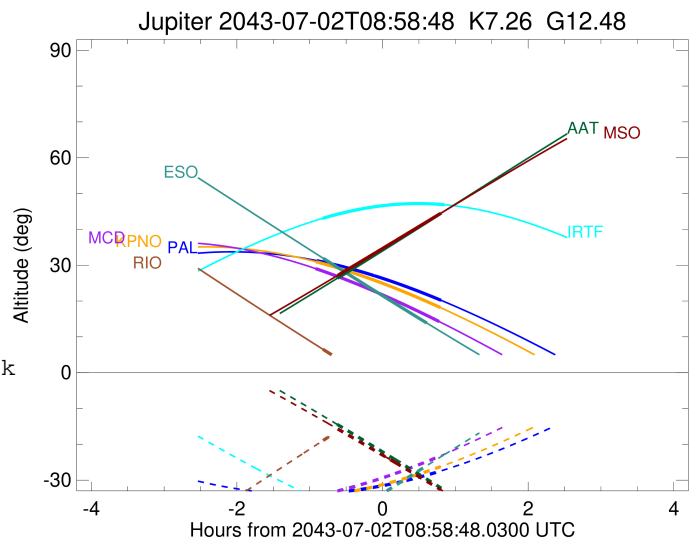
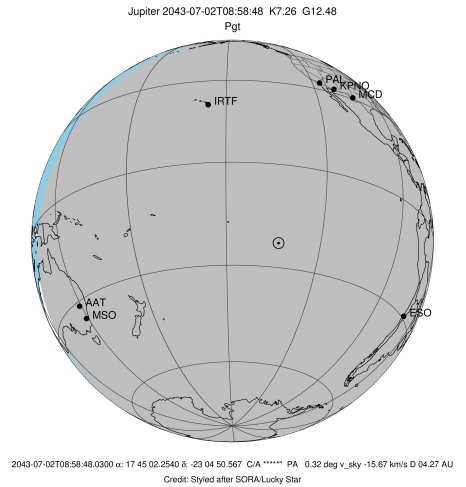


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-02T08:21:34.357	26.35	-14.46	71486.5	-56.16	-59.47
Jupiter	E	2043-07-02T09:47:07.584	44.54	-32.22	71486.7	-54.27	-57.68


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-02T09:04:11.430
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        : 4068845136250849408
2Mass ID (if available) : 17450224-2304505
ICRS Star Coord at Epoch: 17h 45m 02.25403s -23:04:50.56714s
RUWE (>1.4 is poor) : 0.77
K magnitude           : 7.263
G magnitude           : 12.483
RP magnitude          : 11.134
BP magnitude          : 14.663
DUPflag              : 0
Distance (au)         : 4.268
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.67
Sun-Target sep (deg) : 166.75
Sun-Moon sep (deg)   : 132.78
B (ring opening deg) : -2.41
PA of pole (deg)     : 0.77
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 19.107
C/A sky separation (km) : 59139.7
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	2043-07-02T08:21:54.667	27.16	-15.72	71486.4	-56.69	-59.97
Jupiter	E	2043-07-02T09:46:18.585	44.38	-32.56	71486.7	-54.85	-58.23