

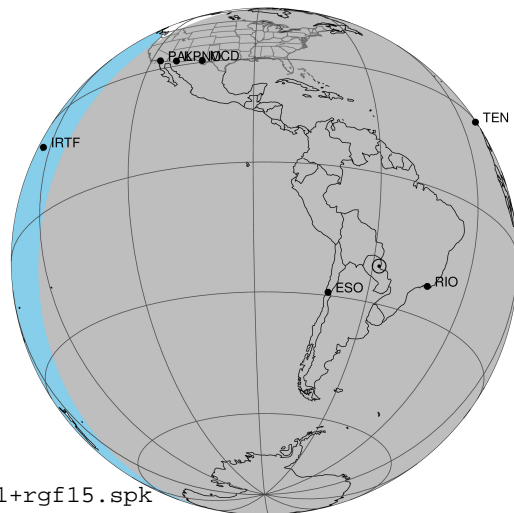
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-07-15T03:59:16.360
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116535697194964224
 2Mass ID (if available) : 17384662-2303326

Jupiter 2043-07-15T03:59:16 K8.79 G14.78 Pgt

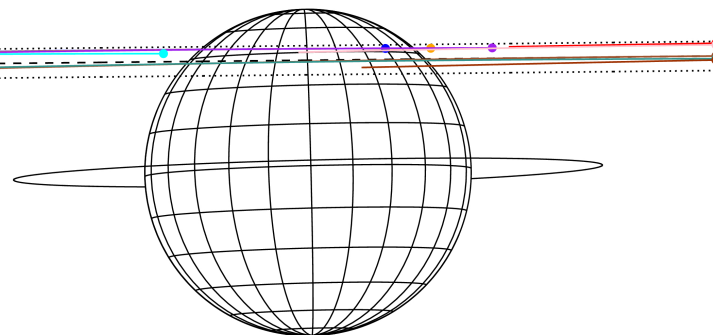
ICRS Star Coord at Epoch: 17h 38m 46.61335s -23°03'32.91074s

RUWE (>1.4 is poor) : 0.92
 K magnitude : 8.790
 G magnitude : 14.778
 RP magnitude : 13.311
 BP magnitude : 17.706
 DUPflag : 0
 Distance (au) : 4.331
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -13.29
 Sun-Target sep (deg) : 153.11
 Sun-Moon sep (deg) : 51.21
 B (ring opening deg) : -2.40
 PA of pole (deg) : 1.45
 Pole direction: RA (deg): 268.05670
 Dec (deg): 64.49732
 C/A sky separation (") : 15.653
 C/A sky separation (km) : 49170.9
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-07-15T03:59:16 K8.79 G14.78
 Pgt



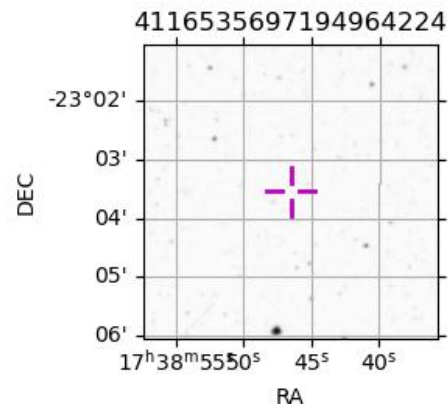
Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 AAT
 SAAO
 MSO



2043-07-15T03:59:16.3600 a: 17 38 46.6134 s: -23 03 32.911 C/A ***** PA 180.60 deg v_sky -13.29 km/s D 04.33 AU
 Credit: Styled after SORA/Lucky Star

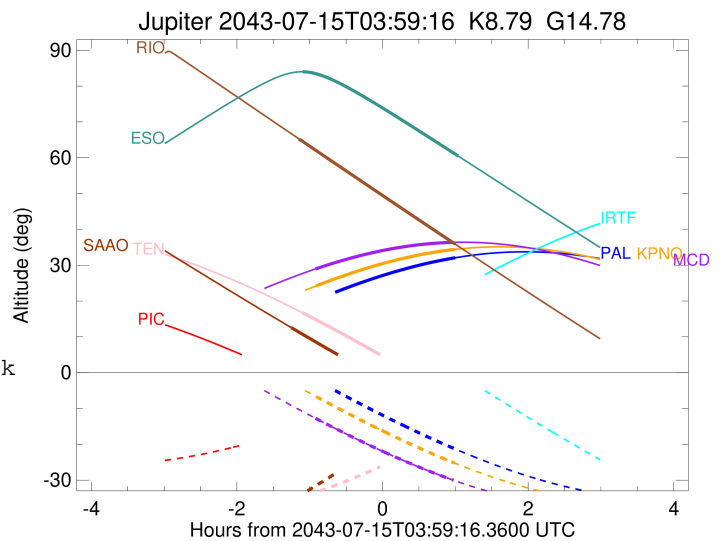
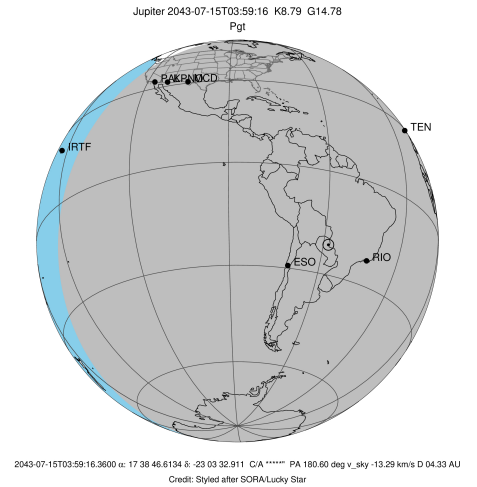
Observable events with sun below -5 deg and altitude above 5 deg

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 15 04:59 - JUL 15 04:59	Pne
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JUL 15 03:04 - JUL 15 04:58	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JUL 15 03:04 - JUL 15 04:57	Pie
TEN	Teide Obs./Tenerife	28.3	343.5	+	JUL 15 02:53 - JUL 15 02:53	Pin
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+ +	JUL 15 02:50 - JUL 15 04:59	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUL 15 02:53 - JUL 15 05:01	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	JUL 15 02:43 - JUL 15 02:43	Pin
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-15T04:02:09.130
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        : 4116535697194964224
2Mass ID (if available) : 17384662-2303326
ICRS Star Coord at Epoch: 17h 38m 46.61335s -23:03:32.91074s
RUWE (>1.4 is poor) : 0.92
K magnitude           : 8.790
G magnitude           : 14.778
RP magnitude          : 13.311
BP magnitude          : 17.706
DUPflag              : 0
Distance (au)         : 4.331
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -13.29
Sun-Target sep (deg)  : 153.11
Sun-Moon sep (deg)    : 51.31
B (ring opening deg) : -2.40
PA of pole (deg)      : 1.45
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (" ) : 17.254
C/A sky separation (km) : 54198.9
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
    
```

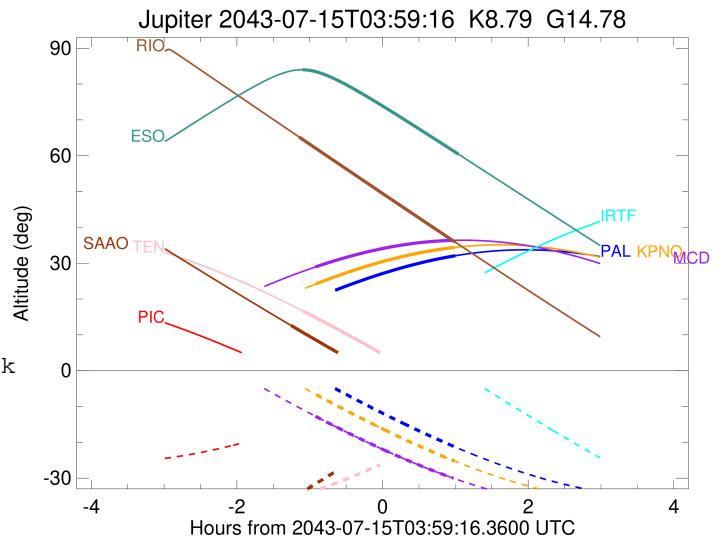
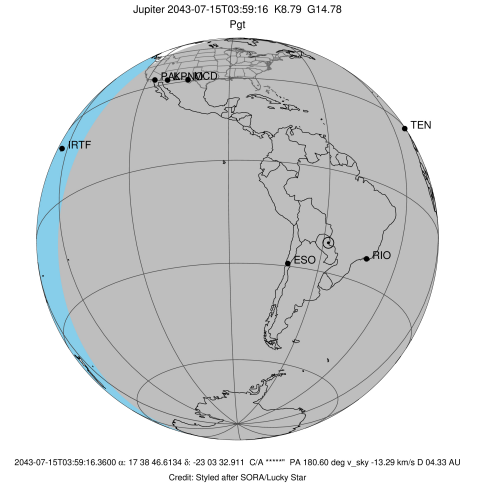


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-15T03:04:57.813	20.35	-2.19x	71487.6	48.01	51.66
Jupiter	E	2043-07-15T04:59:11.396	32.07	-21.31	71487.3	50.33	53.91

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-15T04:01:42.640
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       : 4116535697194964224
2Mass ID (if available) : 17384662-2303326
ICRS Star Coord at Epoch: 17h 38m 46.61335s -23:03:32.91074s
RUWE (>1.4 is poor) : 0.92
K magnitude           : 8.790
G magnitude           : 14.778
RP magnitude         : 13.311
BP magnitude         : 17.706
DUPflag              : 0
Distance (au)        : 4.331
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.29
Sun-Target sep (deg) : 153.11
Sun-Moon sep (deg)  : 51.39
B (ring opening deg) : -2.40
PA of pole (deg)    : 1.45
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 17.252
C/A sky separation (km): 54194.6
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
    
```

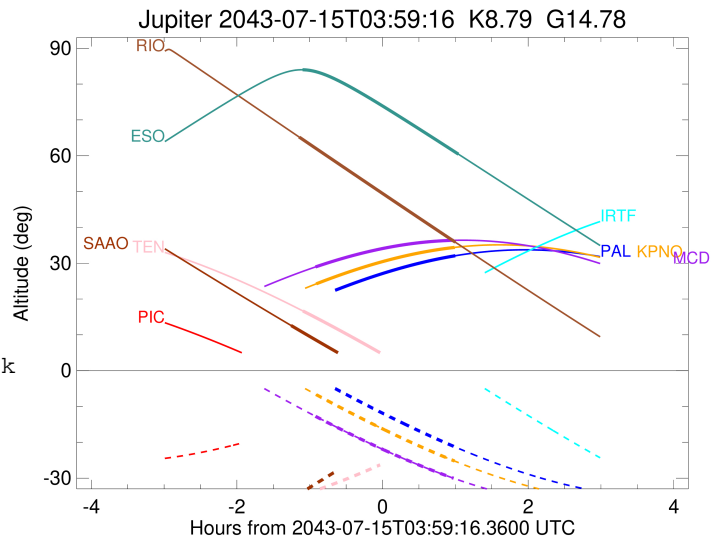
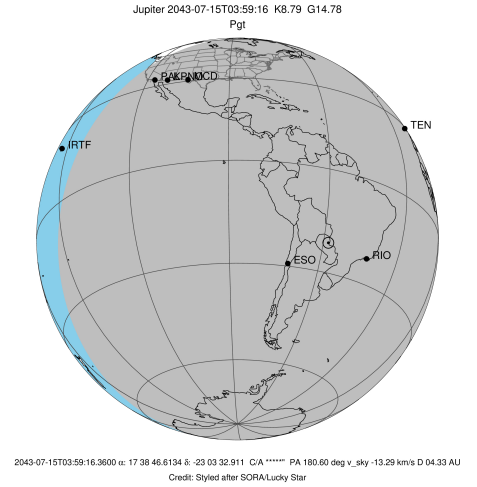


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-15T03:04:36.810	24.23	-6.68	71487.6	48.05	51.70
Jupiter	E	2043-07-15T04:58:41.194	34.40	-25.22	71487.3	50.28	53.85

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-15T04:01:00.140
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       : 4116535697194964224
2Mass ID (if available) : 17384662-2303326
ICRS Star Coord at Epoch: 17h 38m 46.61335s -23:03:32.91074s
RUWE (>1.4 is poor) : 0.92
K magnitude           : 8.790
G magnitude           : 14.778
RP magnitude         : 13.311
BP magnitude         : 17.706
DUPflag              : 0
Distance (au)        : 4.331
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.29
Sun-Target sep (deg) : 153.11
Sun-Moon sep (deg)   : 51.48
B (ring opening deg) : -2.40
PA of pole (deg)     : 1.45
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 17.256
C/A sky separation (km) : 54206.7
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
    
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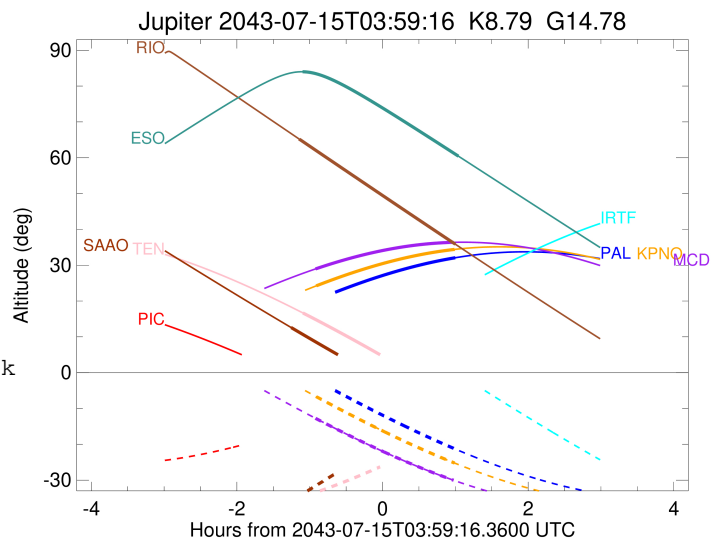
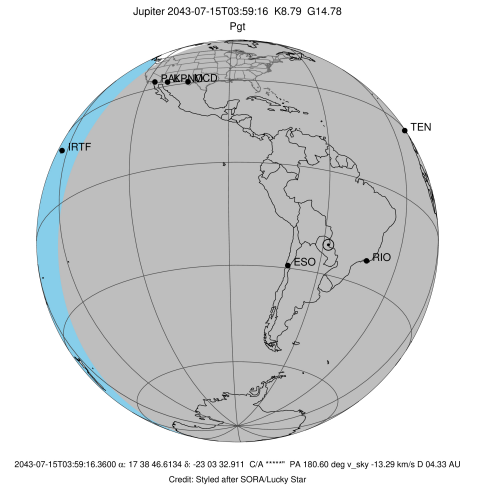


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-15T03:04:02.076	28.95	-12.73	71487.6	48.14	51.78
Jupiter	E	2043-07-15T04:57:53.717	36.38	-30.03	71487.3	50.21	53.79

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-15T03:53:25.950
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : TEN
Location             : Teide Obs./Tenerife
Latitude (deg)       : 28.30050
E. Longitude (deg)   : 343.48909
Altitude (km)        : 2.395
Gaia source ID       : 4116535697194964224
2Mass ID (if available) : 17384662-2303326
ICRS Star Coord at Epoch: 17h 38m 46.61335s -23:03:32.91074s
RUWE (>1.4 is poor) : 0.92
K magnitude           : 8.790
G magnitude           : 14.778
RP magnitude         : 13.311
BP magnitude         : 17.706
DUPflag              : 0
Distance (au)        : 4.331
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.29
Sun-Target sep (deg) : 153.11
Sun-Moon sep (deg)   : 51.74
B (ring opening deg) : -2.40
PA of pole (deg)     : 1.45
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 16.791
C/A sky separation (km): 52744.9
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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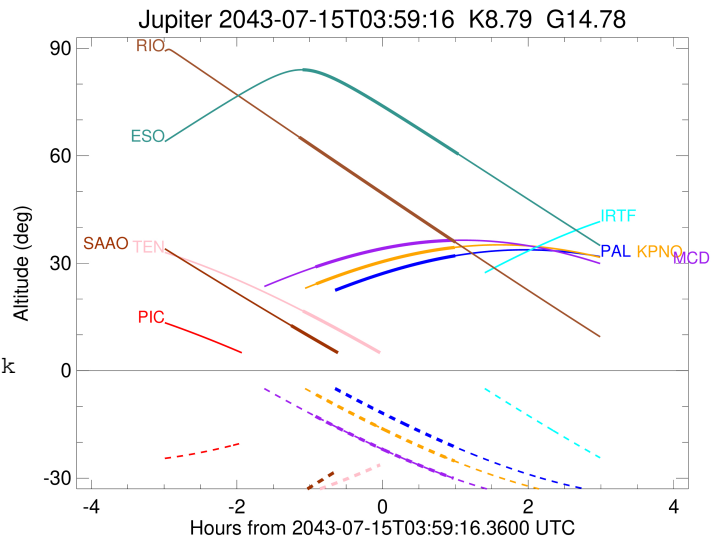
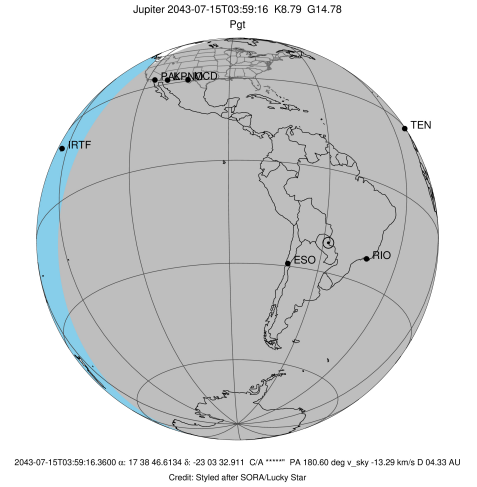


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-15T02:53:44.698	16.65	-34.58	71487.8	47.24	50.90
Jupiter	E	2043-07-15T04:53:35.506	-6.17x	-17.02	71487.7	47.67	51.33

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-15T03:54:44.510
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        : 4116535697194964224
2Mass ID (if available) : 17384662-2303326
ICRS Star Coord at Epoch: 17h 38m 46.61335s -23:03:32.91074s
RUWE (>1.4 is poor) : 0.92
K magnitude           : 8.790
G magnitude           : 14.778
RP magnitude          : 13.311
BP magnitude          : 17.706
DUPflag              : 0
Distance (au)         : 4.331
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -13.29
Sun-Target sep (deg)  : 153.11
Sun-Moon sep (deg)   : 52.10
B (ring opening deg) : -2.40
PA of pole (deg)     : 1.45
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 15.475
C/A sky separation (km) : 48612.2
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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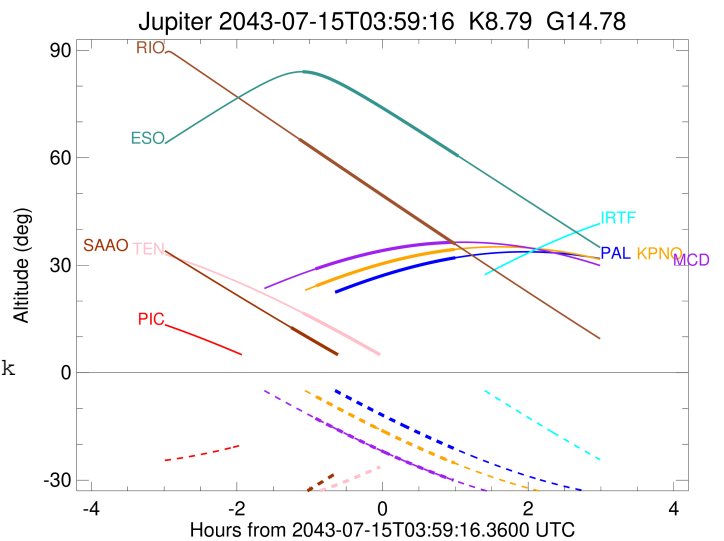
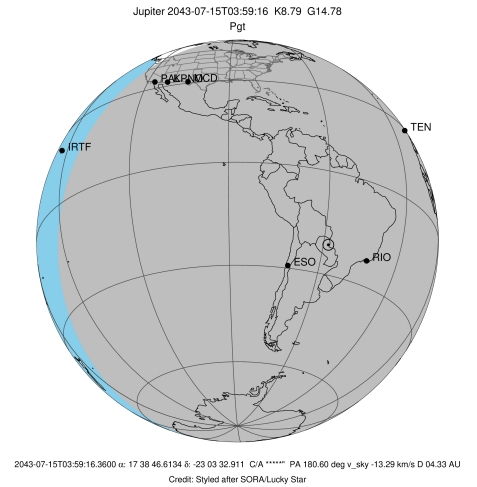


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-15T02:50:37.291	65.20	-87.75	71488.4	42.34	46.06
Jupiter	E	2043-07-15T04:59:16.995	35.86	-62.13	71488.3	43.10	46.82

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-15T03:57:30.160
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      : 4116535697194964224
2Mass ID (if available) : 17384662-2303326
ICRS Star Coord at Epoch: 17h 38m 46.61335s -23:03:32.91074s
RUWE (>1.4 is poor) : 0.92
K magnitude          : 8.790
G magnitude          : 14.778
RP magnitude         : 13.311
BP magnitude         : 17.706
DUPflag             : 0
Distance (au)       : 4.331
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -13.29
Sun-Target sep (deg) : 153.11
Sun-Moon sep (deg)  : 52.03
B (ring opening deg) : -2.40
PA of pole (deg)    : 1.45
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 15.416
C/A sky separation (km): 48425.4
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
    
```

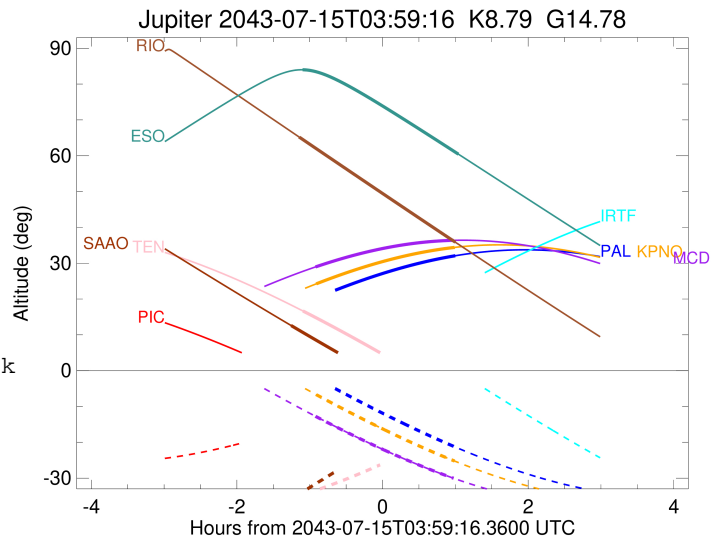
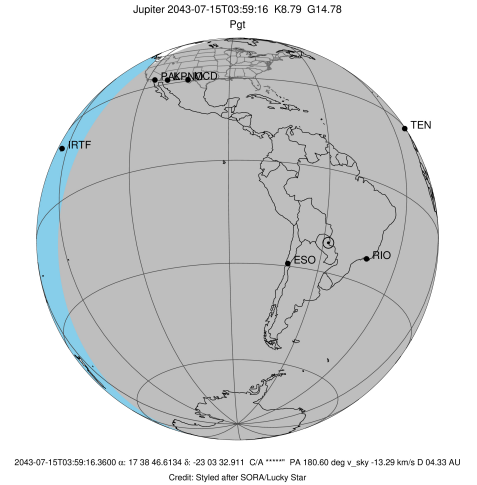


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-15T02:53:23.565	83.99	-62.92	71488.5	41.83	45.55
Jupiter	E	2043-07-15T05:01:48.167	60.43	-81.89	71488.3	43.18	46.89


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-15T03:53:24.520
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : SAAO
Location              : So. Afr. Astro. Obs. (Sutherland)
Latitude (deg)        : -32.37953
E. Longitude (deg)    : 20.81070
Altitude (km)         : 1.768
Gaia source ID        : 4116535697194964224
2Mass ID (if available) : 17384662-2303326
ICRS Star Coord at Epoch: 17h 38m 46.61335s -23:03:32.91074s
RUWE (>1.4 is poor) : 0.92
K magnitude           : 8.790
G magnitude           : 14.778
RP magnitude          : 13.311
BP magnitude          : 17.706
DUPflag              : 0
Distance (au)         : 4.331
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -13.29
Sun-Target sep (deg)  : 153.11
Sun-Moon sep (deg)    : 51.62
B (ring opening deg) : -2.40
PA of pole (deg)      : 1.45
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 14.475
C/A sky separation (km) : 45470.3
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	2043-07-15T02:43:58.585	12.60	-35.84	71488.8	39.27	42.97
Jupiter	E	2043-07-15T05:03:29.003	-13.28x	-7.15	71488.8	39.69	43.40