

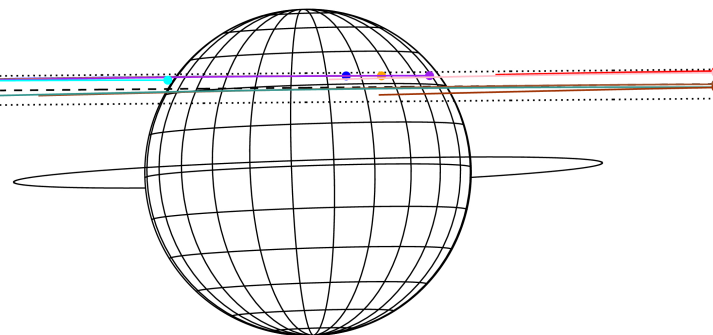
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2043-07-25T03:37:38.230  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4116684749737773952  
 2Mass ID (if available) : 17345109-2303028

Jupiter 2043-07-25T03:37:38 K9.54 G14.50 Pgt

ICRS Star Coord at Epoch: 17h 34m 51.08367s -23°03'03.04696s  
 RUWE (>1.4 is poor) : 1.01  
 K magnitude : 9.543  
 G magnitude : 14.495  
 RP magnitude : 13.240  
 BP magnitude : 16.192  
 DUPflag : 0  
 Distance (au) : 4.410  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -10.47  
 Sun-Target sep (deg) : 142.68  
 Sun-Moon sep (deg) : 73.73  
 B (ring opening deg) : -2.39  
 PA of pole (deg) : 1.87  
 Pole direction: RA (deg): 268.05670  
 Dec (deg): 64.49731  
 C/A sky separation (") : 11.612  
 C/A sky separation (km) : 37142.9  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk



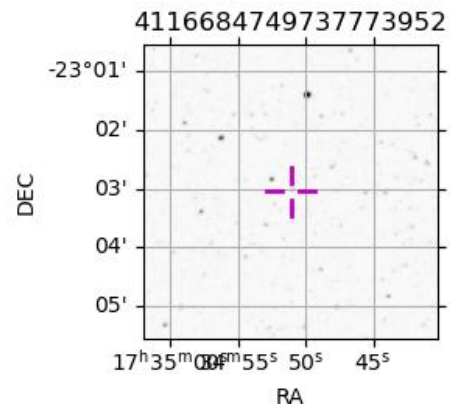
Earth  
 PIC  
 PAL  
 KPNO  
 MCD  
 TEN  
 IRTF  
 RIO  
 ESO  
 AAT  
 SAAO  
 MSO



2043-07-25T03:37:38.2300 a: 17 34 51.0837 & -23 03 03.047 C/A \*\*\*\*\* PA 180.52 deg v\_sky -10.47 km/s D 04.41 AU  
 Credit: Styled after SORA/Lucky Star

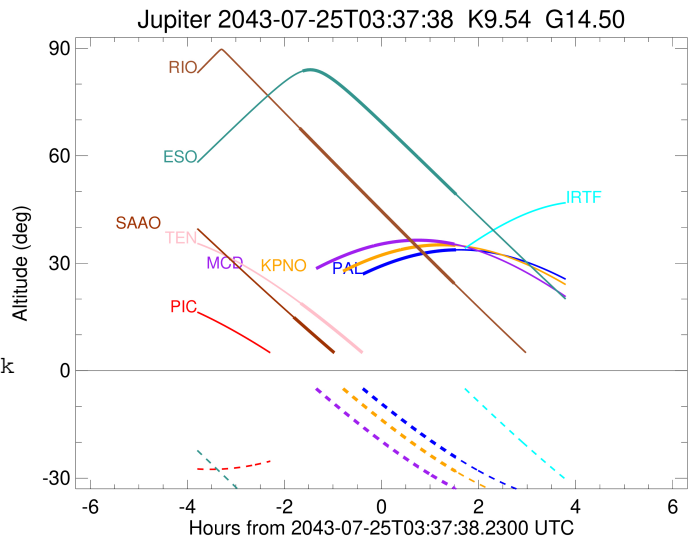
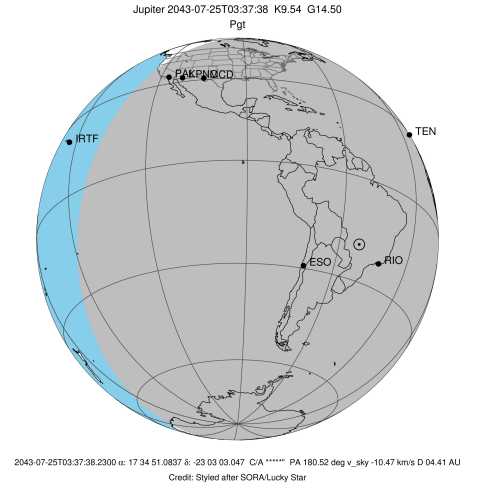
Observable events with sun below -5 deg and altitude above 5 deg

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 25 05:09 - JUL 25 05:09	Pne
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	JUL 25 05:08 - JUL 25 05:08	Pne
MCD	McDonald Obs. 2.7m	30.7	256.0	+	JUL 25 05:07 - JUL 25 05:07	Pne
TEN	Teide Obs./Tenerife	28.3	343.5	+	JUL 25 01:57 - JUL 25 01:57	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 25 01:56 - JUL 25 05:07	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	JUL 25 02:00 - JUL 25 05:09	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	JUL 25 01:49 - JUL 25 01:49	Pin
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-25T03:40:38.920
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       : 4116684749737773952
2Mass ID (if available) : 17345109-2303028
ICRS Star Coord at Epoch: 17h 34m 51.08367s -23:03:03.04696s
RUWE (>1.4 is poor) : 1.01
K magnitude          : 9.543
G magnitude          : 14.495
RP magnitude         : 13.240
BP magnitude         : 16.192
DUPflag             : 0
Distance (au)        : 4.410
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -10.47
Sun-Target sep (deg) : 142.68
Sun-Moon sep (deg)  : 74.29
B (ring opening deg) : -2.39
PA of pole (deg)    : 1.87
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49731
C/A sky separation ("): 13.213
C/A sky separation (km): 42263.4
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
    
```

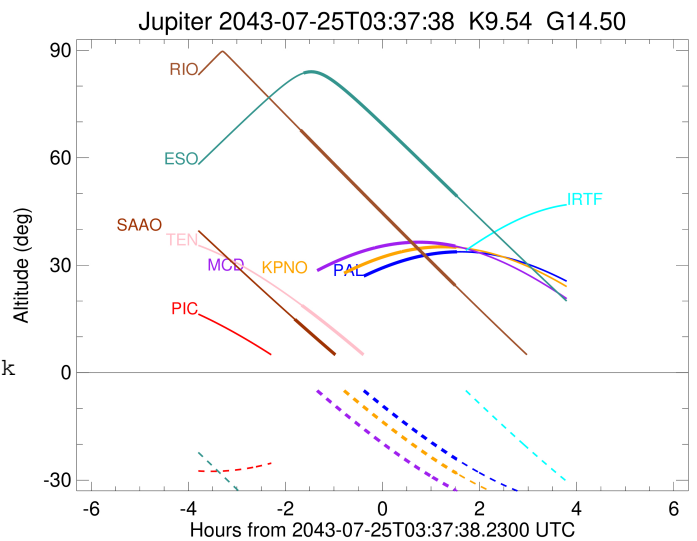
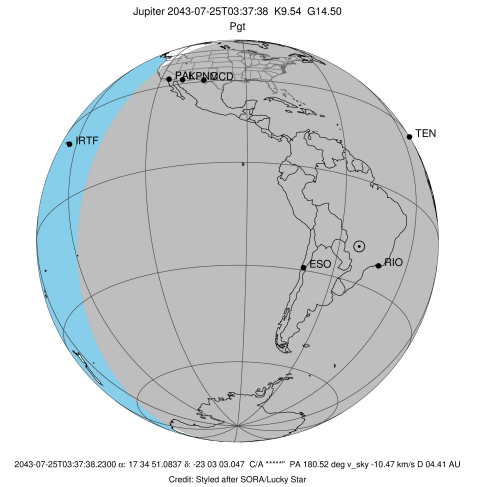


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-25T02:11:27.126	18.88	7.14x	71489.5	34.39	37.97
Jupiter	E	2043-07-25T05:09:31.384	33.73	-24.18	71489.1	37.73	41.41

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-25T03:40:03.350
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       : 4116684749737773952
2Mass ID (if available) : 17345109-2303028
ICRS Star Coord at Epoch: 17h 34m 51.08367s -23:03:03.04696s
RUWE (>1.4 is poor) : 1.01
K magnitude          : 9.543
G magnitude          : 14.495
RP magnitude         : 13.240
BP magnitude         : 16.192
DUPflag             : 0
Distance (au)        : 4.410
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -10.47
Sun-Target sep (deg) : 142.68
Sun-Moon sep (deg)  : 74.31
B (ring opening deg) : -2.39
PA of pole (deg)    : 1.87
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49731
C/A sky separation ("): 13.206
C/A sky separation (km): 42242.9
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
    
```

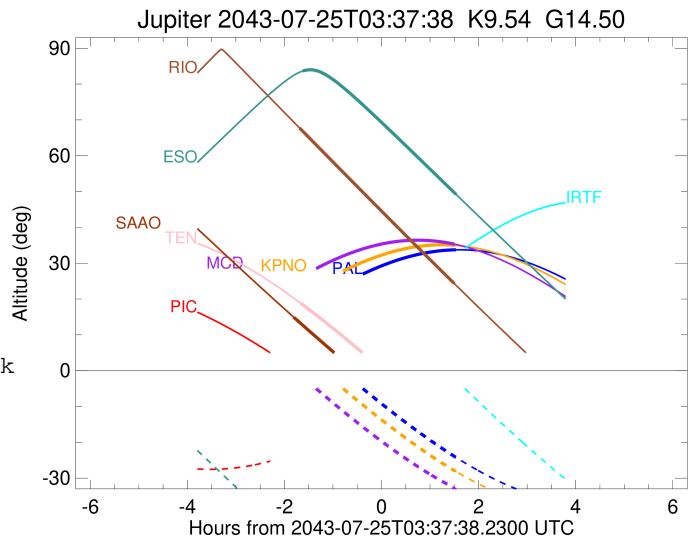
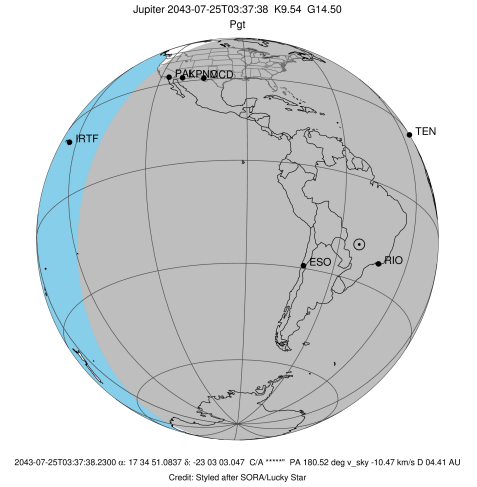


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-25T02:11:01.323	22.83	2.58x	71489.5	34.43	38.00
Jupiter	E	2043-07-25T05:08:51.689	34.99	-28.04	71489.1	37.65	41.32

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-25T03:39:07.470
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       : 4116684749737773952
2Mass ID (if available) : 17345109-2303028
ICRS Star Coord at Epoch: 17h 34m 51.08367s -23:03:03.04696s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 9.543
G magnitude           : 14.495
RP magnitude          : 13.240
BP magnitude          : 16.192
DUPflag              : 0
Distance (au)        : 4.410
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -10.47
Sun-Target sep (deg) : 142.68
Sun-Moon sep (deg)   : 74.33
B (ring opening deg) : -2.39
PA of pole (deg)     : 1.87
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49731
C/A sky separation (") : 13.202
C/A sky separation (km) : 42229.7
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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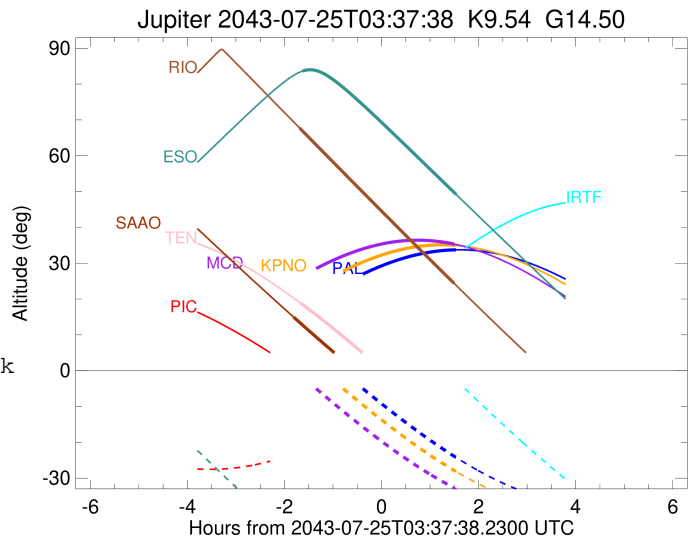
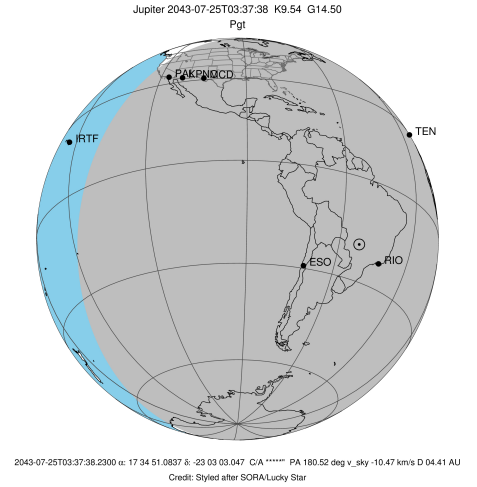


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-25T02:10:17.262	27.70	-3.73x	71489.5	34.50	38.08
Jupiter	E	2043-07-25T05:07:52.767	35.31	-32.75	71489.1	37.53	41.20

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-25T03:29:58.760
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       : 4116684749737773952
2Mass ID (if available) : 17345109-2303028
ICRS Star Coord at Epoch: 17h 34m 51.08367s -23:03:03.04696s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 9.543
G magnitude           : 14.495
RP magnitude         : 13.240
BP magnitude         : 16.192
DUPflag              : 0
Distance (au)        : 4.410
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -10.47
Sun-Target sep (deg) : 142.68
Sun-Moon sep (deg)  : 73.52
B (ring opening deg) : -2.39
PA of pole (deg)    : 1.87
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49731
C/A sky separation (") : 12.671
C/A sky separation (km) : 40529.8
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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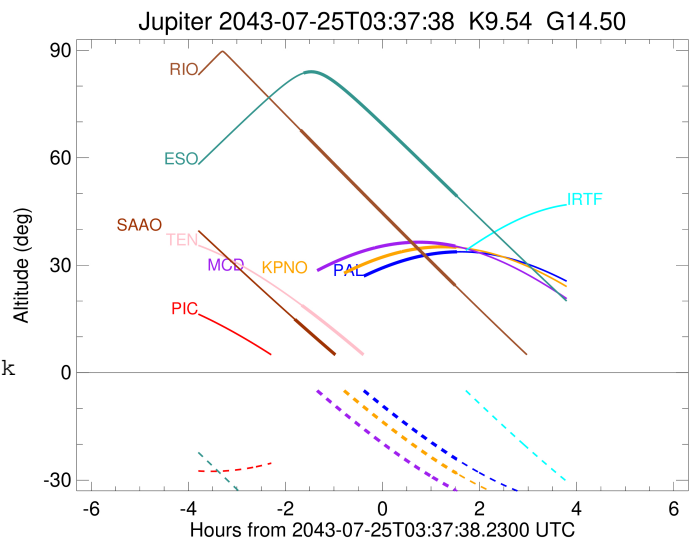
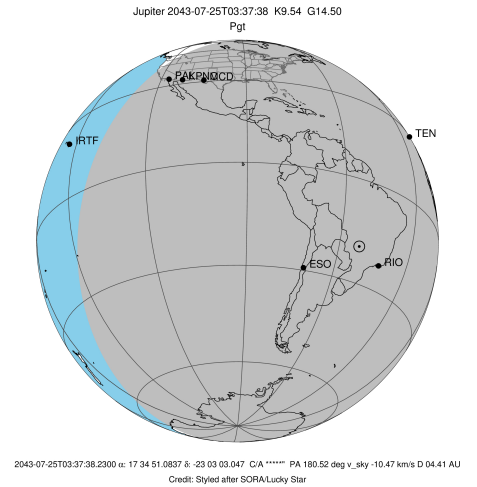


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-25T01:57:51.131	18.81	-40.94	71489.6	33.91	37.47
Jupiter	E	2043-07-25T05:03:36.686	-17.22x	-16.51	71489.4	34.99	38.58

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-25T03:31:20.490
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      : 4116684749737773952
2Mass ID (if available) : 17345109-2303028
ICRS Star Coord at Epoch: 17h 34m 51.08367s -23:03:03.04696s
RUWE (>1.4 is poor) : 1.01
K magnitude          : 9.543
G magnitude          : 14.495
RP magnitude         : 13.240
BP magnitude         : 16.192
DUPflag             : 0
Distance (au)       : 4.410
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -10.47
Sun-Target sep (deg) : 142.68
Sun-Moon sep (deg)  : 74.20
B (ring opening deg) : -2.39
PA of pole (deg)    : 1.87
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49731
C/A sky separation (") : 11.392
C/A sky separation (km) : 36437.8
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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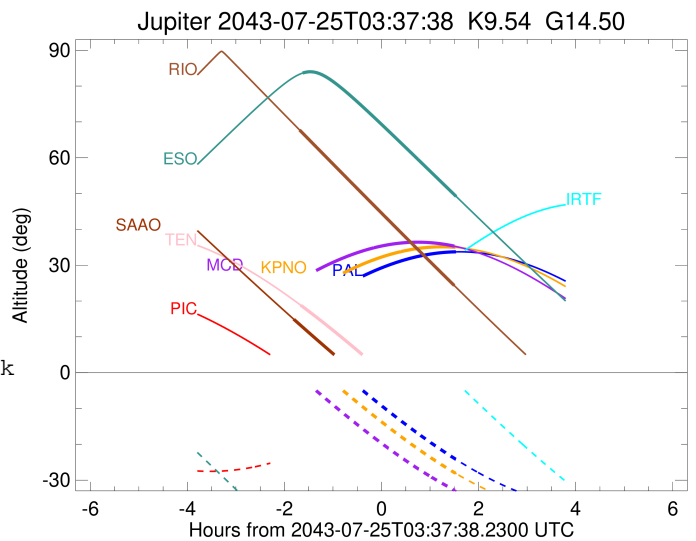
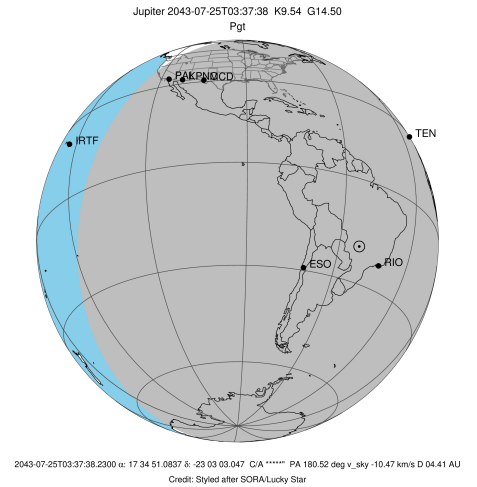


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-25T01:56:27.832	67.72	-75.02	71490.1	29.78	33.13
Jupiter	E	2043-07-25T05:07:31.221	24.33	-60.04	71489.9	31.20	34.63

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-25T03:34:42.190
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       : 4116684749737773952
2Mass ID (if available) : 17345109-2303028
ICRS Star Coord at Epoch: 17h 34m 51.08367s -23:03:03.04696s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 9.543
G magnitude           : 14.495
RP magnitude         : 13.240
BP magnitude         : 16.192
DUPflag              : 0
Distance (au)        : 4.410
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -10.47
Sun-Target sep (deg) : 142.68
Sun-Moon sep (deg)  : 74.51
B (ring opening deg) : -2.39
PA of pole (deg)    : 1.87
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49731
C/A sky separation ("): 11.359
C/A sky separation (km): 36334.2
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
    
```

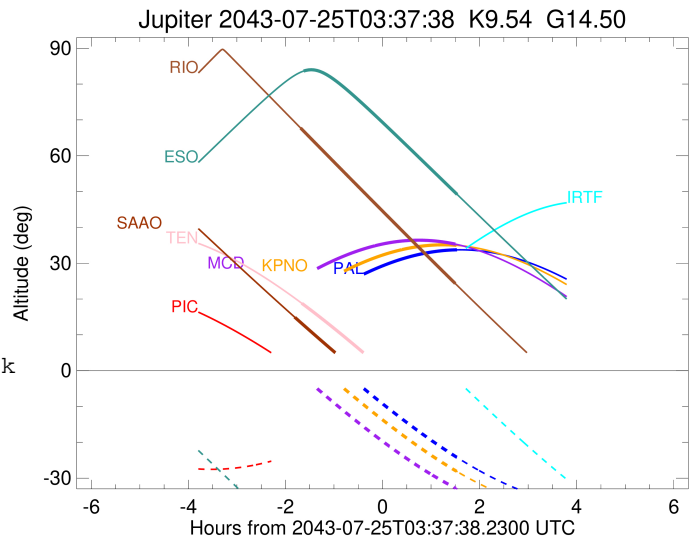
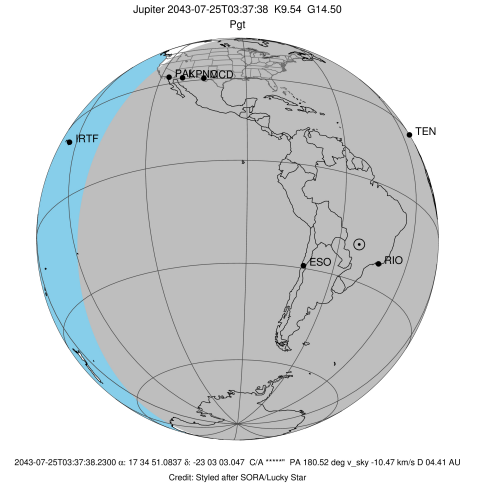


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-25T02:00:10.073	83.62	-50.55	71490.1	29.30	32.62
Jupiter	E	2043-07-25T05:09:55.144	49.19	-79.48	71489.9	31.42	34.86

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-25T03:30:22.410
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      : 4116684749737773952
2Mass ID (if available) : 17345109-2303028
ICRS Star Coord at Epoch: 17h 34m 51.08367s -23:03:03.04696s
RUWE (>1.4 is poor) : 1.01
K magnitude          : 9.543
G magnitude          : 14.495
RP magnitude         : 13.240
BP magnitude         : 16.192
DUPflag             : 0
Distance (au)       : 4.410
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -10.47
Sun-Target sep (deg) : 142.68
Sun-Moon sep (deg)  : 73.42
B (ring opening deg) : -2.39
PA of pole (deg)    : 1.87
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49731
C/A sky separation ("): 10.398
C/A sky separation (km): 33258.2
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	2043-07-25T01:49:09.362	14.92	-46.74	71490.4	27.18	30.37
Jupiter	E	2043-07-25T05:13:19.935	-21.47x	-4.31x	71490.3	28.34	31.61