

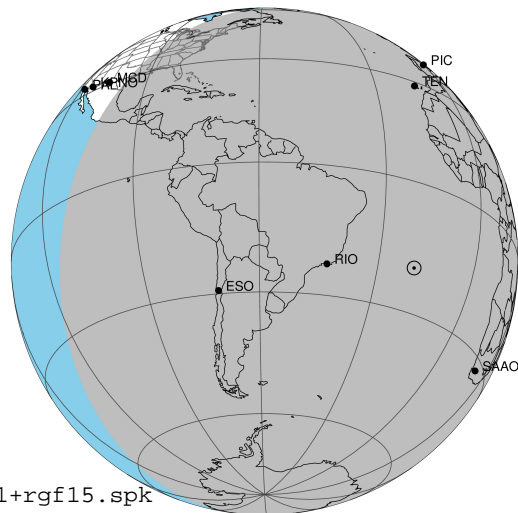
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-07-24T01:25:53.560
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116687395437582336
 2Mass ID (if available) : 17351381-2303314

Jupiter 2043-07-24T01:25:53 K9.02 G13.45 Pgt

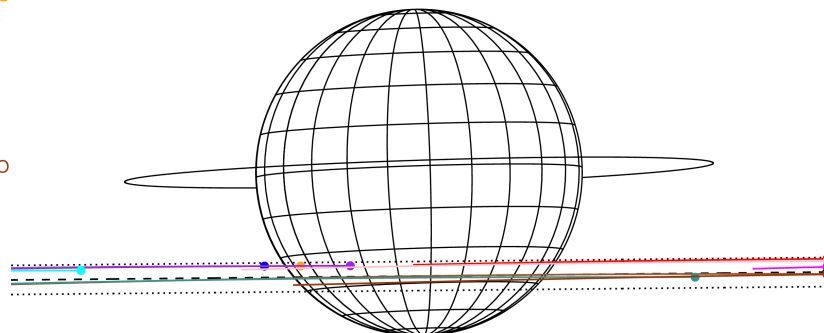
ICRS Star Coord at Epoch: 17h 35m 13.81128s -23°03'31.81782s

RUWE (>1.4 is poor) : 0.80
 K magnitude : 9.019
 G magnitude : 13.453
 RP magnitude : 12.282
 BP magnitude : 14.930
 DUPflag : 0
 Distance (au) : 4.401
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -10.81
 Sun-Target sep (deg) : 143.81
 Sun-Moon sep (deg) : 59.24
 B (ring opening deg) : -2.38
 PA of pole (deg) : 1.83
 Pole direction: RA (deg): 268.05670
 Dec (deg): 64.49731
 C/A sky separation (") : 14.211
 C/A sky separation (km) : 45354.4
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-07-24T01:25:53 K9.02 G13.45
 Pgt



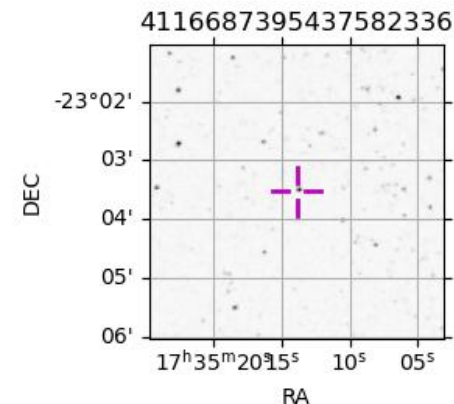
Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 KAV
 RIO
 ESO
 SAAO



2043-07-24T01:25:53.5600 α: 17 35 13.81113 δ: -23 03 31.818 C/A ***** PA 0.56 deg v_sky -10.81 km/s D 04.40 AU
 Credit: Styled after SORA/Lucky Star

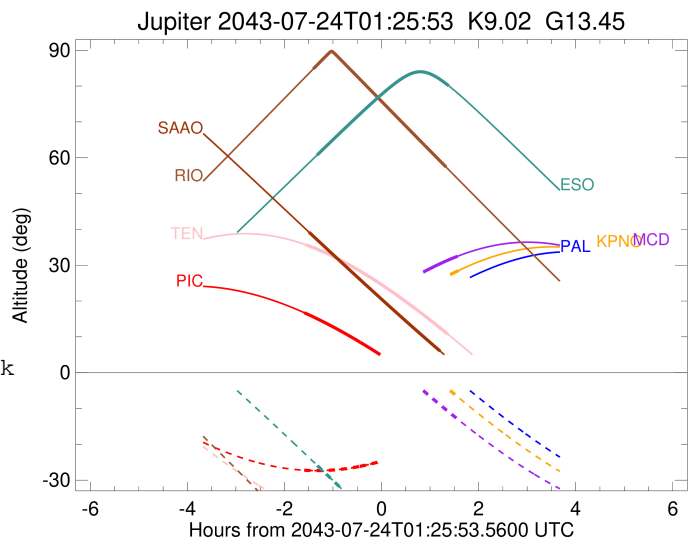
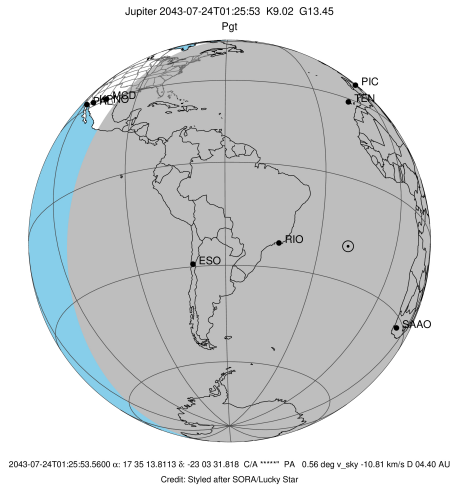
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	JUL 23 23:50 - JUL 23 23:50	Pin
PAL	Palomar Mt (200")	33.4	243.1			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	JUL 24 03:01 - JUL 24 03:01	Pne
MCD	McDonald Obs. 2.7m	30.7	256.0	+	JUL 24 03:00 - JUL 24 03:00	Pne
TEN	Teide Obs./Tenerife	28.3	343.5	+ +	JUL 23 23:52 - JUL 24 02:47	Pie
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 24 00:01 - JUL 24 02:45	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUL 24 00:06 - JUL 24 02:48	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	JUL 23 23:56 - JUL 24 02:38	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-24T01:19:14.290
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : PIC
Location              : Pic du Midi
Latitude (deg)        : 42.93656
E. Longitude (deg)    : 0.14231
Altitude (km)         : 2.890
Gaia source ID        : 4116687395437582336
2Mass ID (if available) : 17351381-2303314
ICRS Star Coord at Epoch: 17h 35m 13.81128s -23:03:31.81782s
RUWE (>1.4 is poor) : 0.80
K magnitude           : 9.019
G magnitude           : 13.453
RP magnitude          : 12.282
BP magnitude          : 14.930
DUPflag              : 0
Distance (au)         : 4.400
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -10.81
Sun-Target sep (deg)  : 143.81
Sun-Moon sep (deg)    : 59.05
B (ring opening deg) : -2.38
PA of pole (deg)      : 1.83
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49731
C/A sky separation (") : 12.647
C/A sky separation (km) : 40363.8
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
    
```

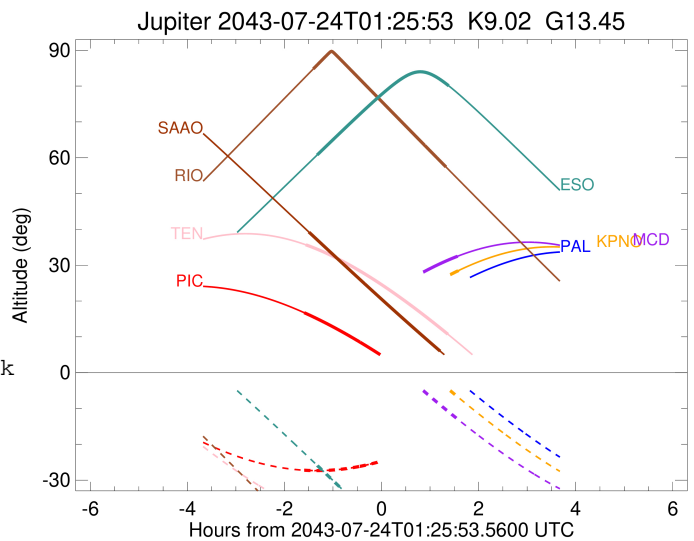
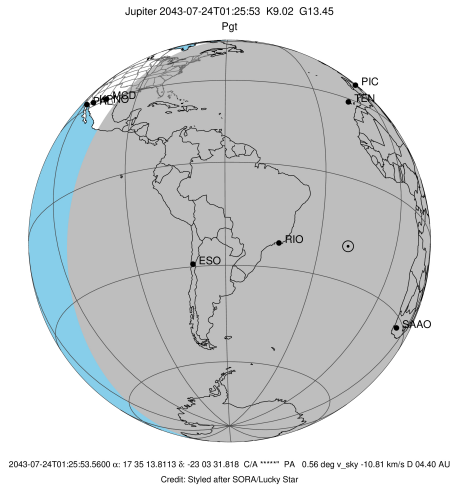


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-23T23:50:22.347	16.74	-27.23	71489.4	-35.12	-38.72
Jupiter	E	2043-07-24T02:49:10.664	-8.38x	-16.96	71489.6	-33.72	-37.27

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-24T01:33:07.540
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        : 4116687395437582336
2Mass ID (if available) : 17351381-2303314
ICRS Star Coord at Epoch: 17h 35m 13.81128s -23:03:31.81782s
RUWE (>1.4 is poor) : 0.80
K magnitude           : 9.019
G magnitude           : 13.453
RP magnitude          : 12.282
BP magnitude          : 14.930
DUPflag              : 0
Distance (au)         : 4.401
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -10.81
Sun-Target sep (deg)  : 143.81
Sun-Moon sep (deg)   : 59.81
B (ring opening deg) : -2.38
PA of pole (deg)     : 1.83
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49731
C/A sky separation (") : 12.832
C/A sky separation (km) : 40955.0
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
    
```

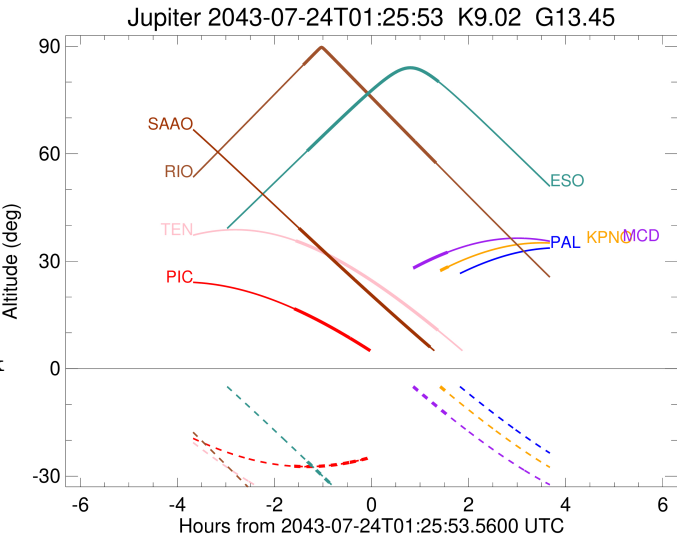
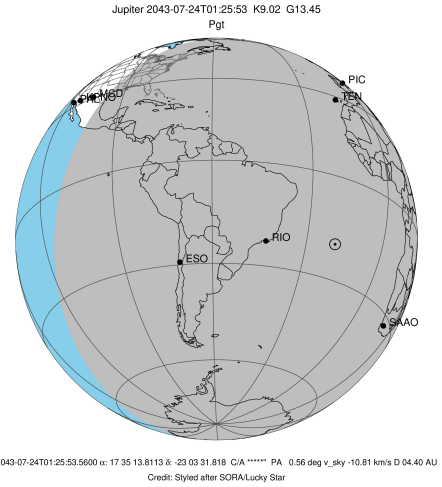


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-24T00:04:25.279	1.02x	28.71x	71489.2	-36.90	-40.55
Jupiter	E	2043-07-24T03:01:00.324	28.49	-6.92	71489.7	-33.13	-36.65

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-24T01:32:24.250
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       : 4116687395437582336
2Mass ID (if available) : 17351381-2303314
ICRS Star Coord at Epoch: 17h 35m 13.81128s -23:03:31.81782s
RUWE (>1.4 is poor) : 0.80
K magnitude          : 9.019
G magnitude          : 13.453
RP magnitude         : 12.282
BP magnitude         : 14.930
DUPflag             : 0
Distance (au)        : 4.401
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -10.81
Sun-Target sep (deg) : 143.81
Sun-Moon sep (deg)   : 59.86
B (ring opening deg) : -2.38
PA of pole (deg)     : 1.83
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49731
C/A sky separation (") : 12.797
C/A sky separation (km) : 40842.1
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
    
```

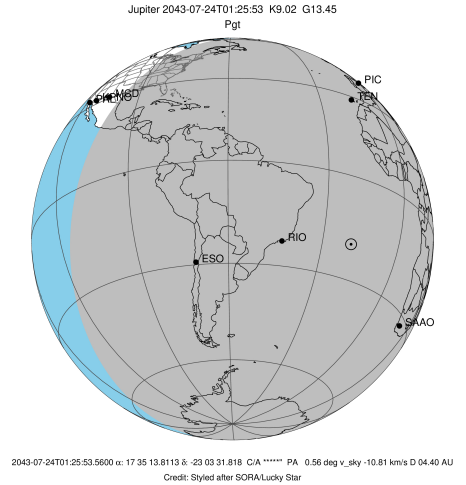


x: target alt < 5.0 deg or sun > -5.0 deg

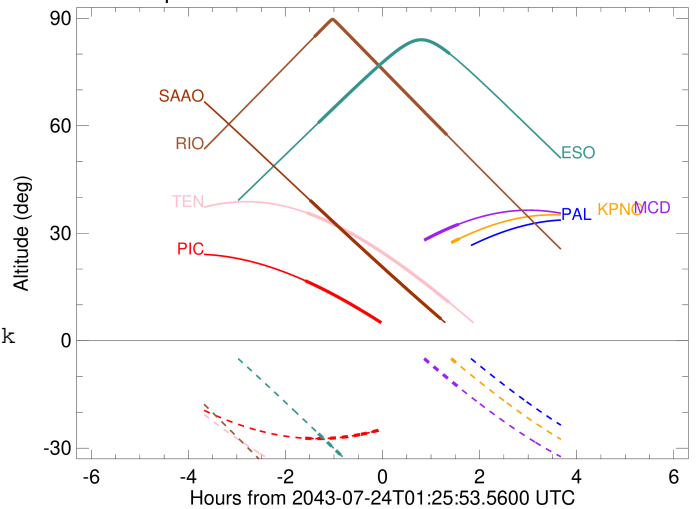
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-24T00:03:58.349	7.19	22.20x	71489.2	-36.74	-40.39
Jupiter	E	2043-07-24T03:00:06.866	32.51	-12.99	71489.7	-33.09	-36.62

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-24T01:19:41.690
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        : 4116687395437582336
2Mass ID (if available) : 17351381-2303314
ICRS Star Coord at Epoch: 17h 35m 13.81128s -23:03:31.81782s
RUWE (>1.4 is poor) : 0.80
K magnitude           : 9.019
G magnitude           : 13.453
RP magnitude          : 12.282
BP magnitude          : 14.930
DUPflag              : 0
Distance (au)         : 4.400
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -10.81
Sun-Target sep (deg)  : 143.81
Sun-Moon sep (deg)   : 59.33
B (ring opening deg) : -2.38
PA of pole (deg)     : 1.83
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49731
C/A sky separation (" ) : 12.815
C/A sky separation (km) : 40899.3
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
    
```



Jupiter 2043-07-24T01:25:53 K9.02 G13.45

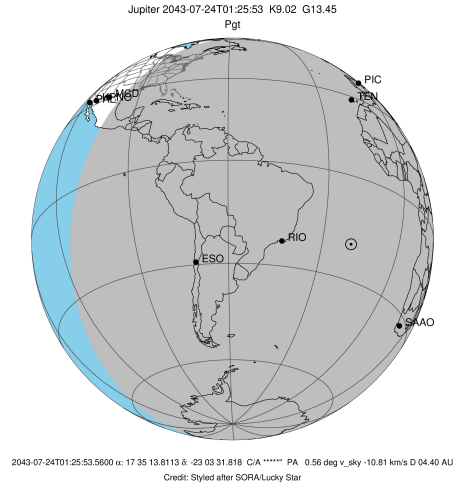


x: target alt < 5.0 deg or sun > -5.0 deg

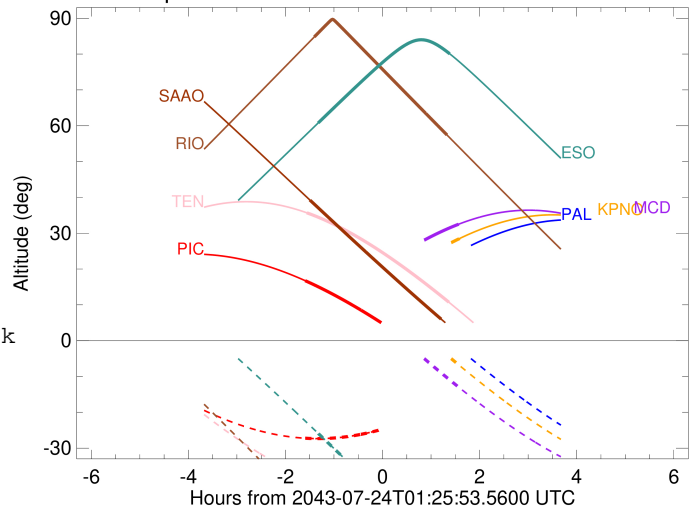
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-23T23:52:22.090	35.68	-38.19	71489.3	-35.73	-39.36
Jupiter	E	2043-07-24T02:47:58.955	10.72	-36.71	71489.5	-34.23	-37.81

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-24T01:23:19.000
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      : 4116687395437582336
2Mass ID (if available) : 17351381-2303314
ICRS Star Coord at Epoch: 17h 35m 13.81128s -23:03:31.81782s
RUWE (>1.4 is poor) : 0.80
K magnitude          : 9.019
G magnitude          : 13.453
RP magnitude         : 12.282
BP magnitude         : 14.930
DUPflag             : 0
Distance (au)        : 4.401
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -10.81
Sun-Target sep (deg) : 143.81
Sun-Moon sep (deg)   : 59.92
B (ring opening deg) : -2.38
PA of pole (deg)     : 1.83
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49731
C/A sky separation ("): 14.221
C/A sky separation (km): 45387.2
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
    
```



Jupiter 2043-07-24T01:25:53 K9.02 G13.45

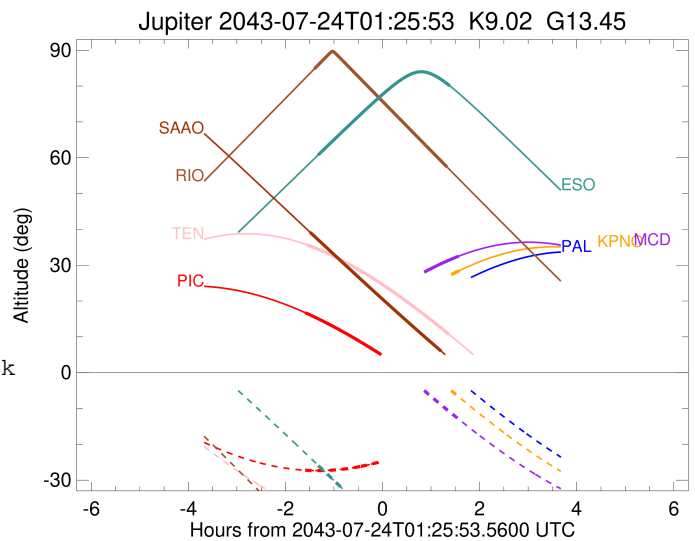
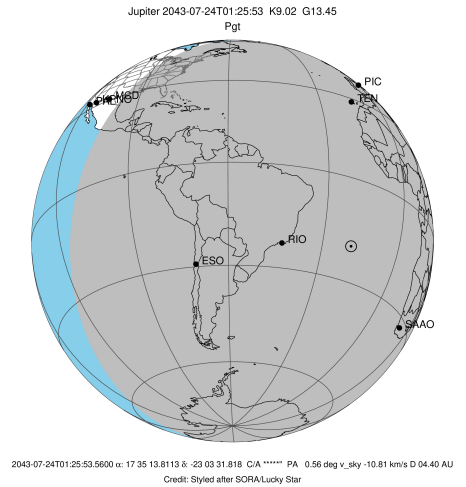


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-24T00:01:36.376	84.78	-48.66	71488.7	-40.58	-44.29
Jupiter	E	2043-07-24T02:45:26.245	57.45	-85.67	71489.0	-38.45	-42.14

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-24T01:27:49.310
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      : 4116687395437582336
2Mass ID (if available) : 17351381-2303314
ICRS Star Coord at Epoch: 17h 35m 13.81128s -23:03:31.81782s
RUWE (>1.4 is poor) : 0.80
K magnitude          : 9.019
G magnitude          : 13.453
RP magnitude         : 12.282
BP magnitude         : 14.930
DUPflag             : 0
Distance (au)       : 4.401
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -10.81
Sun-Target sep (deg) : 143.81
Sun-Moon sep (deg)  : 60.12
B (ring opening deg) : -2.38
PA of pole (deg)    : 1.83
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49731
C/A sky separation (" ) : 14.436
C/A sky separation (km) : 46072.2
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
    
```

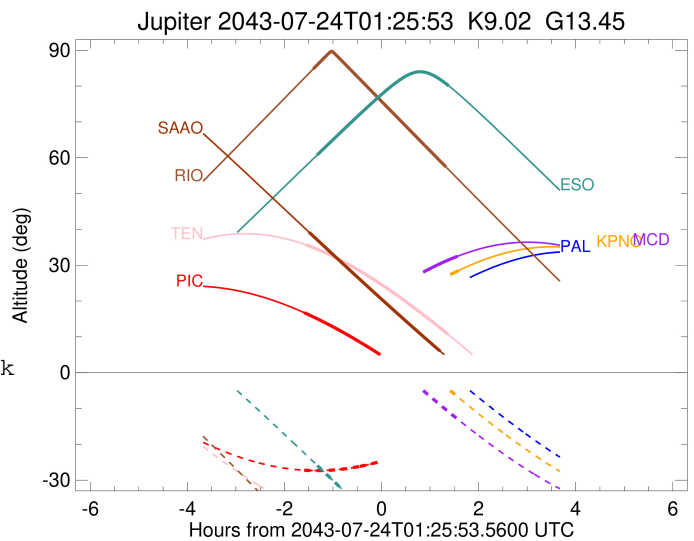
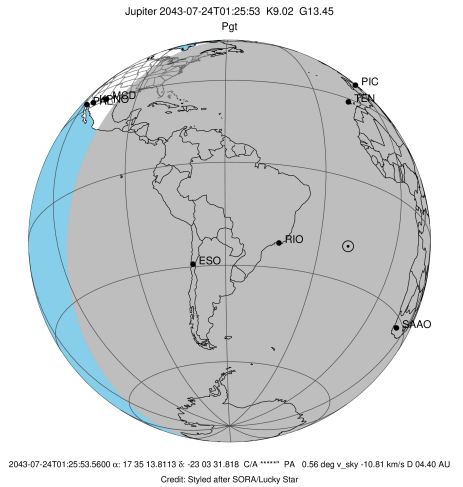


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-24T00:06:34.483	60.81	-25.92	71488.6	-41.66	-45.38
Jupiter	E	2043-07-24T02:48:58.328	80.07	-61.19	71488.9	-38.78	-42.48

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-24T01:16:44.600
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        : 4116687395437582336
2Mass ID (if available) : 17351381-2303314
ICRS Star Coord at Epoch: 17h 35m 13.81128s -23:03:31.81782s
RUWE (>1.4 is poor) : 0.80
K magnitude           : 9.019
G magnitude           : 13.453
RP magnitude          : 12.282
BP magnitude          : 14.930
DUPflag              : 0
Distance (au)         : 4.400
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -10.81
Sun-Target sep (deg) : 143.81
Sun-Moon sep (deg)   : 59.10
B (ring opening deg) : -2.38
PA of pole (deg)     : 1.83
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49731
C/A sky separation (") : 15.036
C/A sky separation (km) : 47988.9
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	2043-07-23T23:56:19.030	39.22	-69.56	71488.4	-42.66	-46.38
Jupiter	E	2043-07-24T02:38:19.791	6.02	-36.44	71488.6	-41.66	-45.38