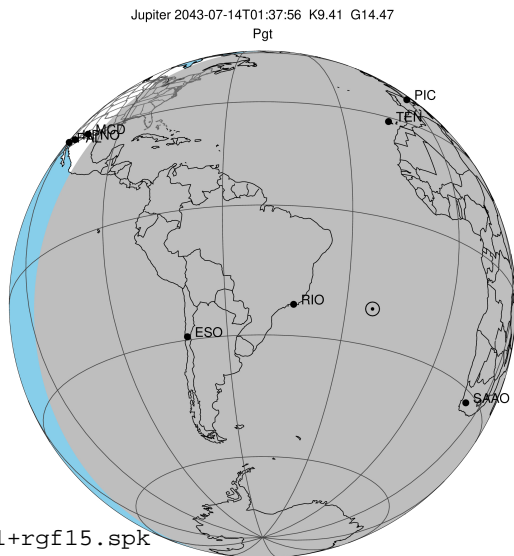


target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2043-07-14T01:37:56.110  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4116558344703183232  
 2Mass ID (if available) : 17391601-2303477

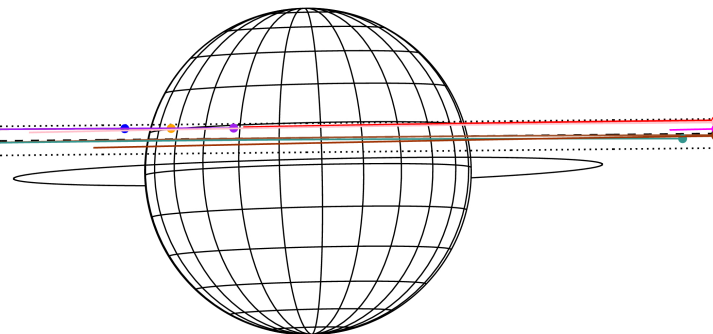
Jupiter 2043-07-14T01:37:56 K9.41 G14.47 Pgt

ICRS Star Coord at Epoch: 17h 39m 15.99606s -23°03:48.07993s  
 RUWE (>1.4 is poor) : 1.00  
 K magnitude : 9.413  
 G magnitude : 14.469  
 RP magnitude : 13.217  
 BP magnitude : 16.239  
 DUPflag : 0  
 Distance (au) : 4.324  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -13.55  
 Sun-Target sep (deg) : 154.27  
 Sun-Moon sep (deg) : 64.37  
 B (ring opening deg) : -2.40  
 PA of pole (deg) : 1.40  
 Pole direction: RA (deg): 268.05670  
 Dec (deg): 64.49732  
 C/A sky separation (") : 4.717  
 C/A sky separation (km) : 14793.7  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk



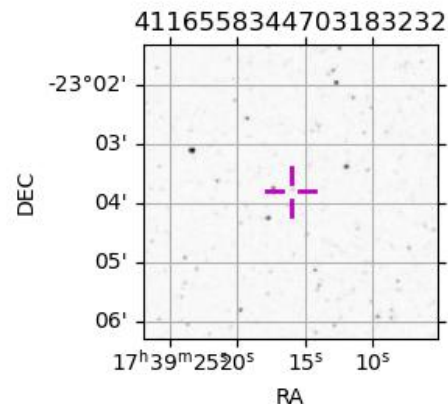
2043-07-14T01:37:56.1100 at: 17 39 15.9961 s: -23 03 48.080 C/A 4.706° PA 180.59 deg v\_sky -13.55 km/s D 04.32 AU  
 Credit: Styled after SORA/Lucky Star

Earth  
 PIC  
 PAL  
 KPNO  
 MCD  
 TEN  
 KAV  
 RIO  
 ESO  
 SAAO



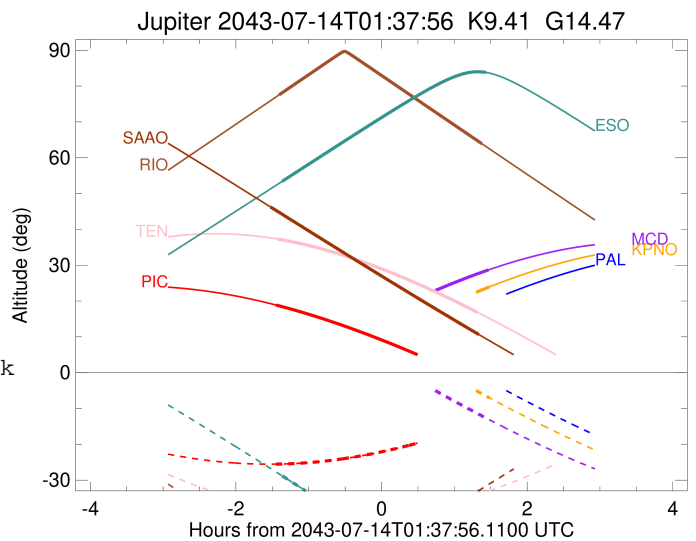
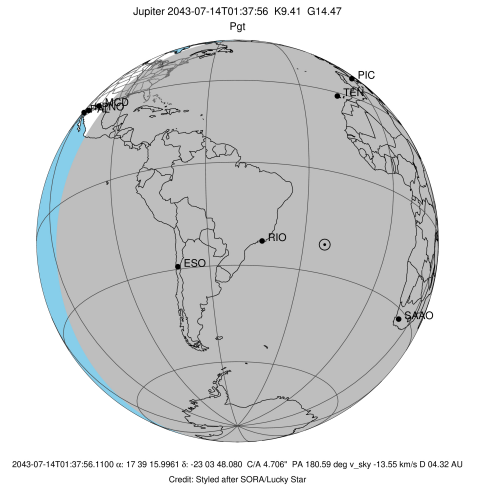
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	JUL 14 00:10 - JUL 14 00:10	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 14 03:06 - JUL 14 03:06	Pne
MCD	McDonald Obs. 2.7m	30.7	256.0	+	JUL 14 03:06 - JUL 14 03:06	Pne
TEN	Teide Obs./Tenerife	28.3	343.5	+ +	JUL 14 00:11 - JUL 14 02:57	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 14 00:13 - JUL 14 03:00	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUL 14 00:16 - JUL 14 03:03	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	JUL 14 00:06 - JUL 14 02:58	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-14T01:33:44.800
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        : 4116558344703183232
2Mass ID (if available) : 17391601-2303477
ICRS Star Coord at Epoch: 17h 39m 15.99606s -23:03:48.07993s
RUWE (>1.4 is poor) : 1.00
K magnitude           : 9.413
G magnitude           : 14.469
RP magnitude          : 13.217
BP magnitude          : 16.239
DUPflag              : 0
Distance (au)         : 4.324
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -13.55
Sun-Target sep (deg) : 154.27
Sun-Moon sep (deg)   : 64.72
B (ring opening deg) : -2.40
PA of pole (deg)     : 1.40
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 6.369
C/A sky separation (km) : 19973.2
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
    
```

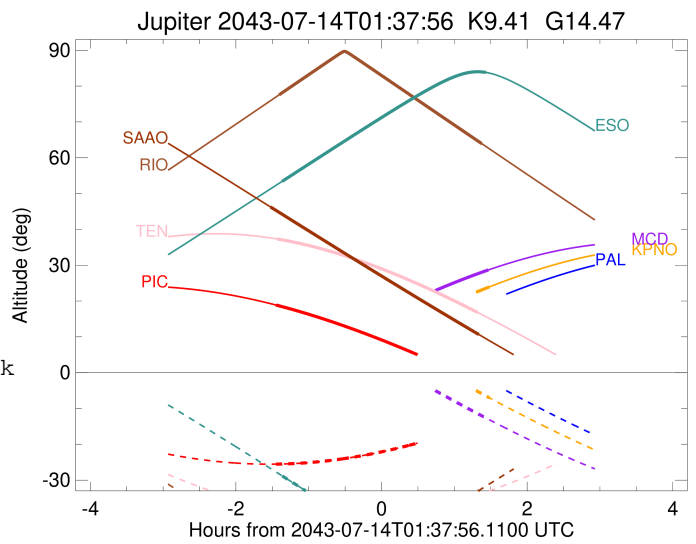
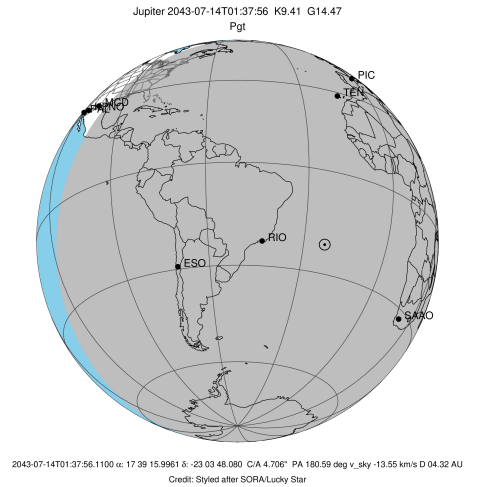


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-14T00:10:55.489	18.88	-25.53	71491.4	15.75	17.86
Jupiter	E	2043-07-14T02:57:12.149	-2.57x	-14.37	71491.4	16.53	18.74

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-14T01:43:28.220
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       : 4116558344703183232
2Mass ID (if available) : 17391601-2303477
ICRS Star Coord at Epoch: 17h 39m 15.99606s -23:03:48.07993s
RUWE (>1.4 is poor) : 1.00
K magnitude           : 9.413
G magnitude           : 14.469
RP magnitude         : 13.217
BP magnitude         : 16.239
DUPflag              : 0
Distance (au)        : 4.324
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -13.55
Sun-Target sep (deg) : 154.27
Sun-Moon sep (deg)   : 64.22
B (ring opening deg) : -2.40
PA of pole (deg)     : 1.40
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 6.039
C/A sky separation (km) : 18939.9
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
    
```

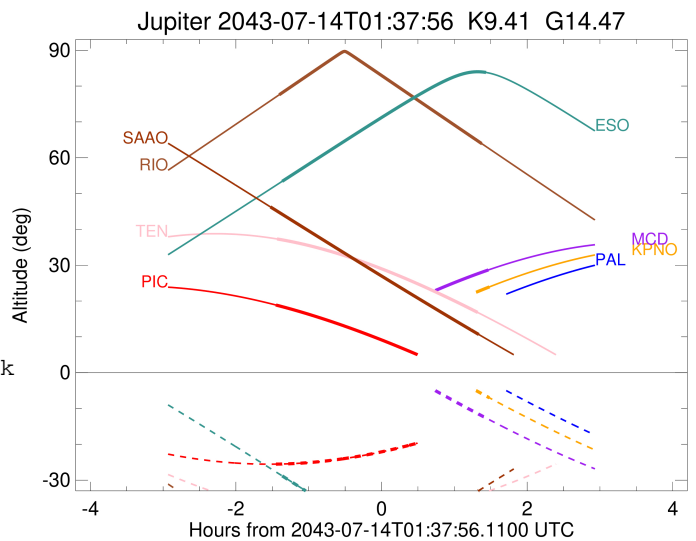
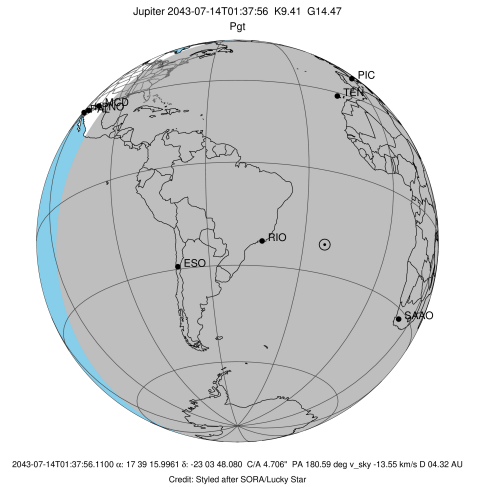


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-14T00:19:31.633	-4.37x	26.18x	71491.5	13.94	15.83
Jupiter	E	2043-07-14T03:06:45.102	23.93	-7.00	71491.4	16.64	18.85

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-14T01:43:04.060
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        : 4116558344703183232
2Mass ID (if available) : 17391601-2303477
ICRS Star Coord at Epoch: 17h 39m 15.99606s -23:03:48.07993s
RUWE (>1.4 is poor) : 1.00
K magnitude           : 9.413
G magnitude           : 14.469
RP magnitude          : 13.217
BP magnitude          : 16.239
DUPflag              : 0
Distance (au)         : 4.324
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -13.55
Sun-Target sep (deg)  : 154.27
Sun-Moon sep (deg)   : 64.32
B (ring opening deg) : -2.40
PA of pole (deg)     : 1.40
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 6.083
C/A sky separation (km) : 19075.8
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
    
```

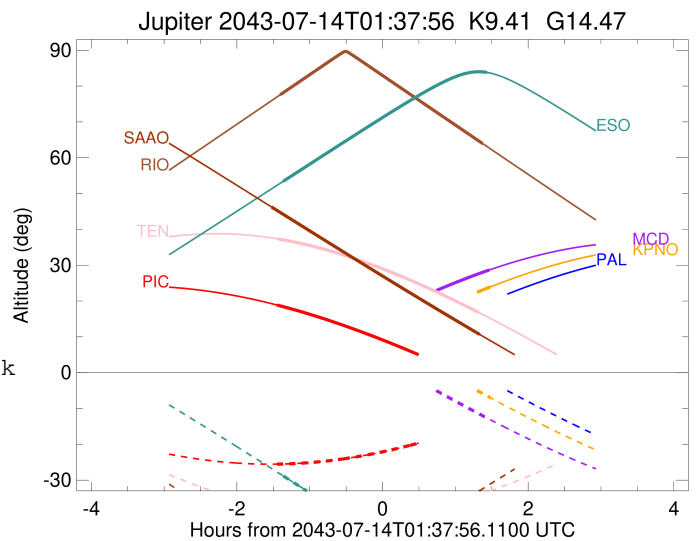
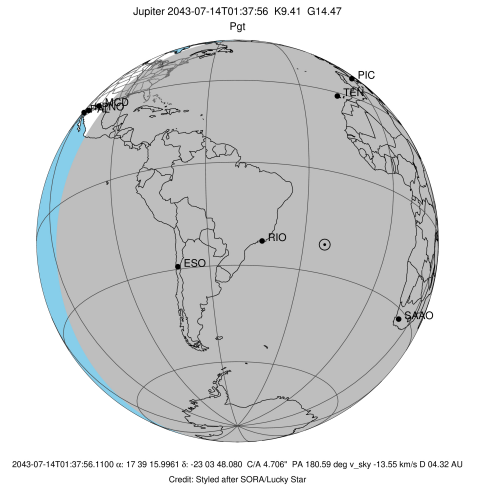


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-14T00:19:28.054	1.99x	19.58x	71491.5	14.08	15.99
Jupiter	E	2043-07-14T03:06:03.987	28.68	-13.01	71491.3	16.70	18.92

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-14T01:34:18.280
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       : 4116558344703183232
2Mass ID (if available) : 17391601-2303477
ICRS Star Coord at Epoch: 17h 39m 15.99606s -23:03:48.07993s
RUWE (>1.4 is poor) : 1.00
K magnitude           : 9.413
G magnitude           : 14.469
RP magnitude          : 13.217
BP magnitude          : 16.239
DUPflag              : 0
Distance (au)         : 4.324
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -13.55
Sun-Target sep (deg) : 154.27
Sun-Moon sep (deg)   : 64.96
B (ring opening deg) : -2.40
PA of pole (deg)     : 1.40
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 6.192
C/A sky separation (km) : 19416.7
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
    
```

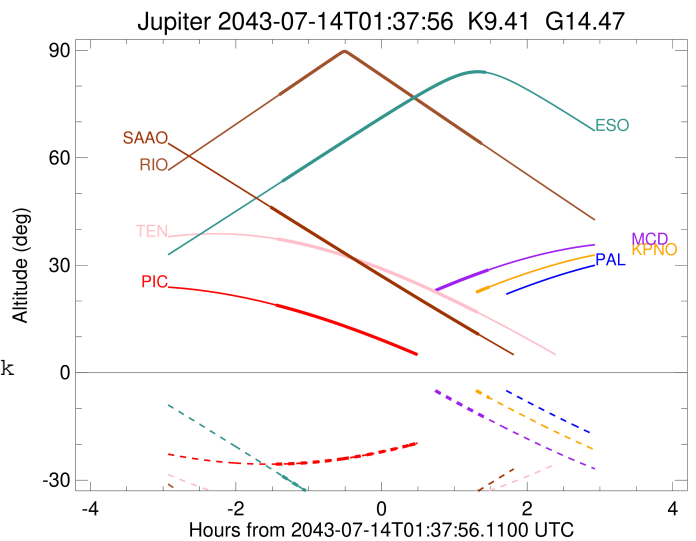
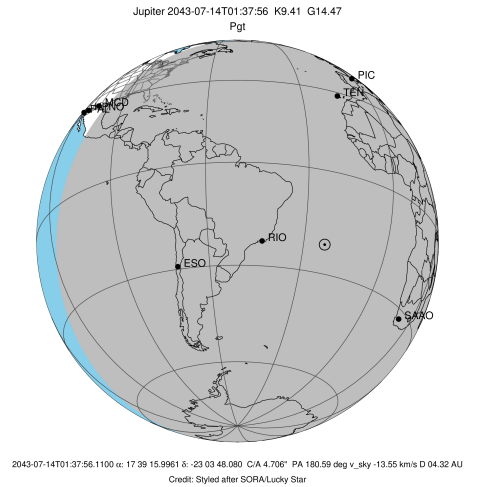


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-14T00:11:57.112	37.31	-38.10	71491.5	15.19	17.24
Jupiter	E	2043-07-14T02:57:12.233	16.81	-34.05	71491.4	16.10	18.25

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-14T01:37:01.700
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      : 4116558344703183232
2Mass ID (if available) : 17391601-2303477
ICRS Star Coord at Epoch: 17h 39m 15.99606s -23:03:48.07993s
RUWE (>1.4 is poor) : 1.00
K magnitude          : 9.413
G magnitude          : 14.469
RP magnitude         : 13.217
BP magnitude         : 16.239
DUPflag             : 0
Distance (au)       : 4.324
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.55
Sun-Target sep (deg) : 154.27
Sun-Moon sep (deg)  : 65.23
B (ring opening deg) : -2.40
PA of pole (deg)    : 1.40
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 4.724
C/A sky separation (km): 14815.5
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
    
```

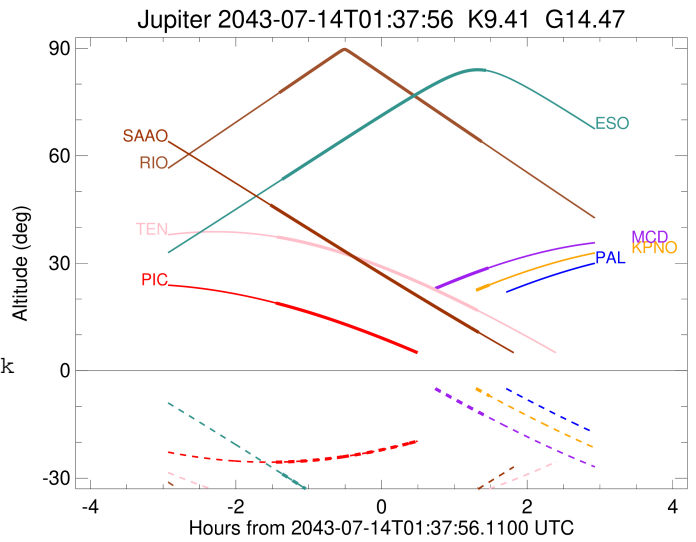
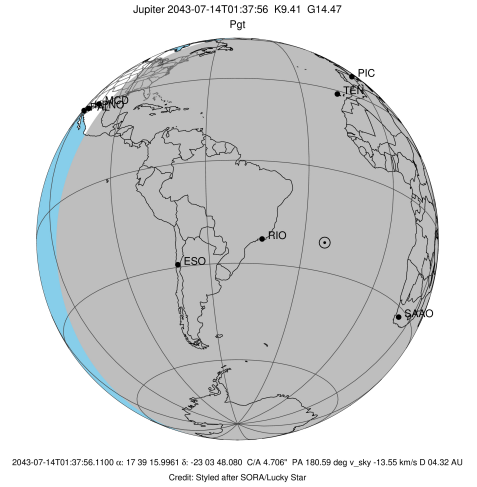


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-14T00:13:37.227	77.56	-51.91	71491.7	11.10	12.64
Jupiter	E	2043-07-14T03:00:37.659	63.91	-88.85	71491.6	12.55	14.28

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-14T01:40:07.760
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       : 4116558344703183232
2Mass ID (if available) : 17391601-2303477
ICRS Star Coord at Epoch: 17h 39m 15.99606s -23:03:48.07993s
RUWE (>1.4 is poor) : 1.00
K magnitude           : 9.413
G magnitude           : 14.469
RP magnitude         : 13.217
BP magnitude         : 16.239
DUPflag              : 0
Distance (au)        : 4.324
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.55
Sun-Target sep (deg) : 154.27
Sun-Moon sep (deg)   : 65.03
B (ring opening deg) : -2.40
PA of pole (deg)     : 1.40
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 4.462
C/A sky separation (km): 13992.6
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
    
```

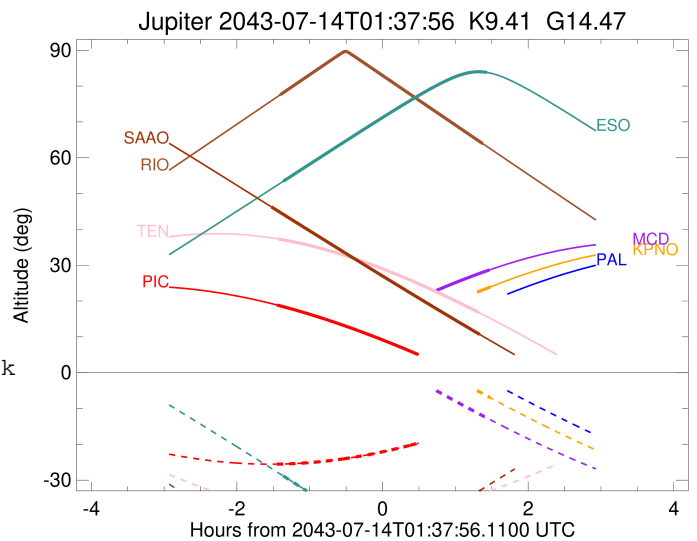
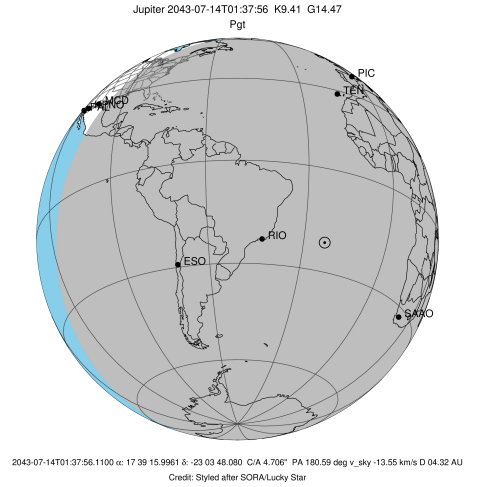


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-14T00:16:04.217	53.40	-28.81	71491.8	10.14	11.55
Jupiter	E	2043-07-14T03:03:58.330	83.80	-65.27	71491.6	12.19	13.87

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-14T01:31:50.430
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      : 4116558344703183232
2Mass ID (if available) : 17391601-2303477
ICRS Star Coord at Epoch: 17h 39m 15.99606s -23:03:48.07993s
RUWE (>1.4 is poor) : 1.00
K magnitude          : 9.413
G magnitude          : 14.469
RP magnitude         : 13.217
BP magnitude         : 16.239
DUPflag             : 0
Distance (au)       : 4.324
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.55
Sun-Target sep (deg) : 154.27
Sun-Moon sep (deg)  : 65.05
B (ring opening deg) : -2.40
PA of pole (deg)    : 1.40
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 3.959
C/A sky separation (km) : 12417.0
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	2043-07-14T00:06:31.852	46.24	-68.61	71491.8	9.73	11.09
Jupiter	E	2043-07-14T02:58:04.944	10.66	-32.91	71491.8	10.16	11.58