

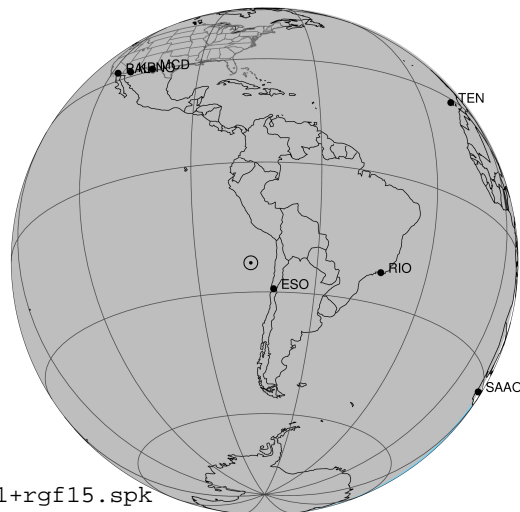
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-06-17T05:06:43.960
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4070147202902390272
 2Mass ID (if available) : 17532092-2304158

Jupiter 2043-06-17T05:06:43 K9.36 G14.97 Pgt

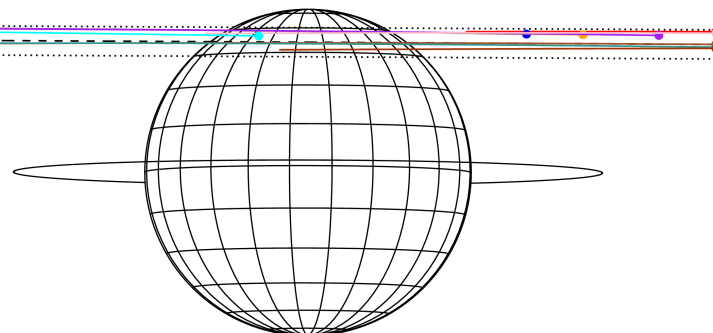
ICRS Star Coord at Epoch: 17h 53m 20.92755s -23:04:16.08012s

RUWE (>1.4 is poor) : 0.98
 K magnitude : 9.355
 G magnitude : 14.971
 RP magnitude : 13.596
 BP magnitude : 17.217
 DUPflag : 0
 Distance (au) : 4.253
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -16.37
 Sun-Target sep (deg) : 176.86
 Sun-Moon sep (deg) : 62.28
 B (ring opening deg) : -2.43
 PA of pole (deg) : -0.12
 Pole direction: RA (deg): 268.05668
 Dec (deg): 64.49732
 C/A sky separation (") : 18.503
 C/A sky separation (km) : 57071.7
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-06-17T05:06:43 K9.36 G14.97
 Pgt



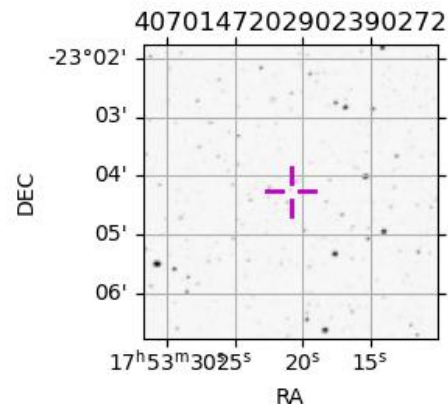
Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 AAT
 SAAO
 MSO



2043-06-17T05:06:43.9600 a: 17 53 20.92755 s: -23 04 16.080 C/A ***** PA 179.69 deg v_sky -16.37 km/s D 04.25 AU
 Credit: Styled after SORA/Lucky Star

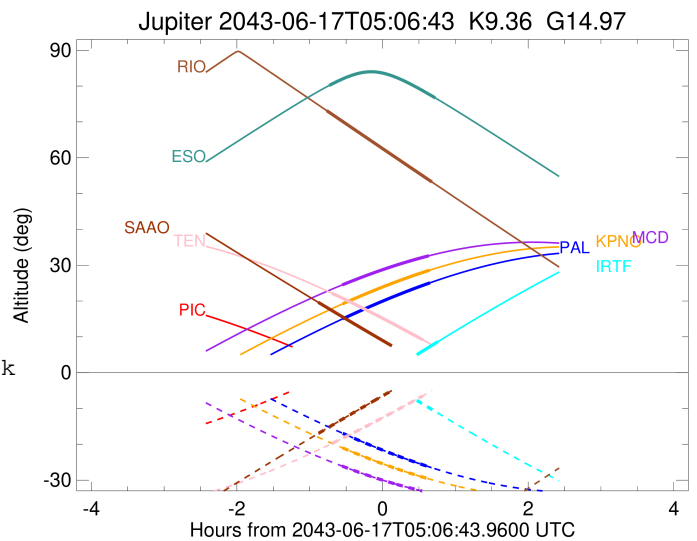
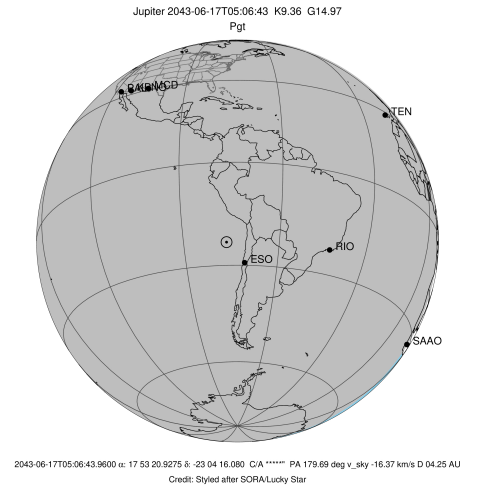
Observable events with sun below -5 deg and altitude above 5 deg

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	+ +	JUN 17 04:34 - JUN 17 05:45	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JUN 17 04:33 - JUN 17 05:45	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JUN 17 04:33 - JUN 17 05:44	Pie
TEN	Teide Obs./Tenerife	28.3	343.5	+ +	JUN 17 04:25 - JUN 17 05:39	Pie
IRTF	Mauna Kea/IRTF	19.8	204.5		JUN 17 05:52 - JUN 17 05:52	Pne
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+ +	JUN 17 04:20 - JUN 17 05:47	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUN 17 04:22 - JUN 17 05:50	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8		JUN 17 04:13 - JUN 17 04:13	Pin
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-17T05:10:00.310
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        : 4070147202902390272
2Mass ID (if available) : 17532092-2304158
ICRS Star Coord at Epoch: 17h 53m 20.92755s -23:04:16.08012s
RUWE (>1.4 is poor) : 0.98
K magnitude           : 9.355
G magnitude           : 14.971
RP magnitude          : 13.596
BP magnitude          : 17.217
DUPflag              : 0
Distance (au)         : 4.253
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.37
Sun-Target sep (deg)  : 176.86
Sun-Moon sep (deg)   : 62.32
B (ring opening deg) : -2.43
PA of pole (deg)     : -0.12
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 20.051
C/A sky separation (km) : 61847.4
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
    
```

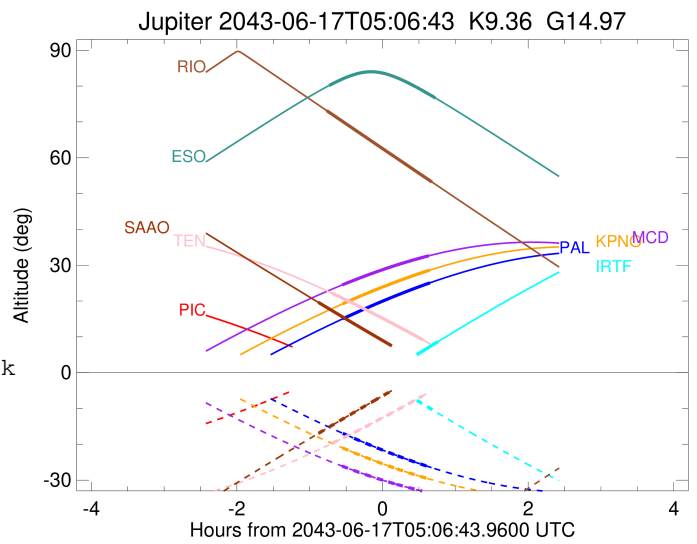
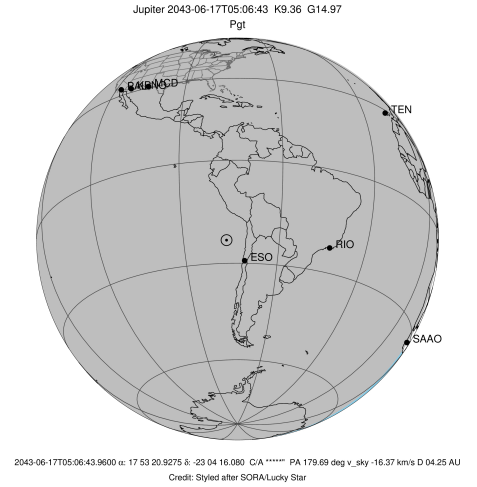


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-17T04:34:02.735	15.04	-16.94	71486.0	59.25	62.37
Jupiter	E	2043-06-17T05:45:52.627	25.08	-26.37	71485.9	60.31	63.35

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-17T05:09:43.080
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        : 4070147202902390272
2Mass ID (if available) : 17532092-2304158
ICRS Star Coord at Epoch: 17h 53m 20.92755s -23:04:16.08012s
RUWE (>1.4 is poor) : 0.98
K magnitude            : 9.355
G magnitude           : 14.971
RP magnitude          : 13.596
BP magnitude          : 17.217
DUPflag              : 0
Distance (au)         : 4.253
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.37
Sun-Target sep (deg)  : 176.86
Sun-Moon sep (deg)    : 62.39
B (ring opening deg) : -2.43
PA of pole (deg)      : -0.12
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 20.059
C/A sky separation (km) : 61873.3
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
    
```

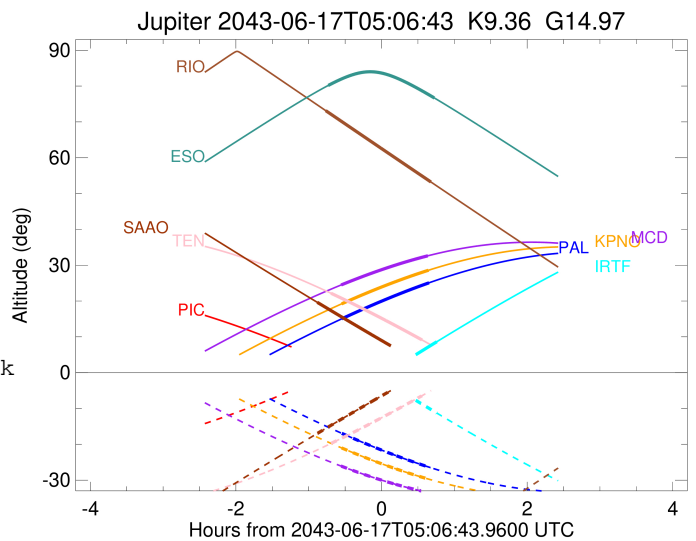
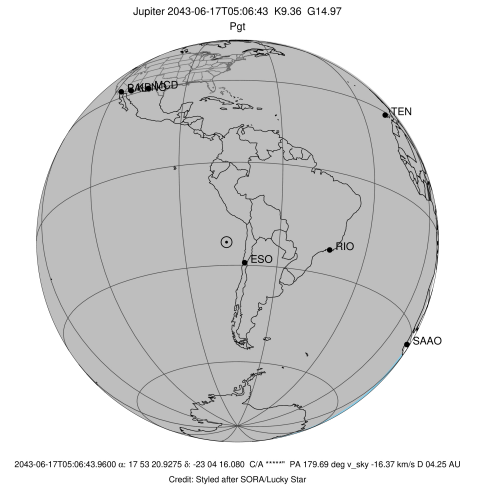


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-17T04:33:51.797	19.20	-21.01	71486.0	59.32	62.43
Jupiter	E	2043-06-17T05:45:29.598	28.59	-29.71	71485.9	60.32	63.36

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-17T05:09:13.320
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       : 4070147202902390272
2Mass ID (if available) : 17532092-2304158
ICRS Star Coord at Epoch: 17h 53m 20.92755s -23:04:16.08012s
RUWE (>1.4 is poor) : 0.98
K magnitude          : 9.355
G magnitude          : 14.971
RP magnitude         : 13.596
BP magnitude         : 17.217
DUPflag             : 0
Distance (au)        : 4.253
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.37
Sun-Target sep (deg) : 176.86
Sun-Moon sep (deg)   : 62.49
B (ring opening deg) : -2.43
PA of pole (deg)     : -0.12
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation ("): 20.079
C/A sky separation (km): 61934.8
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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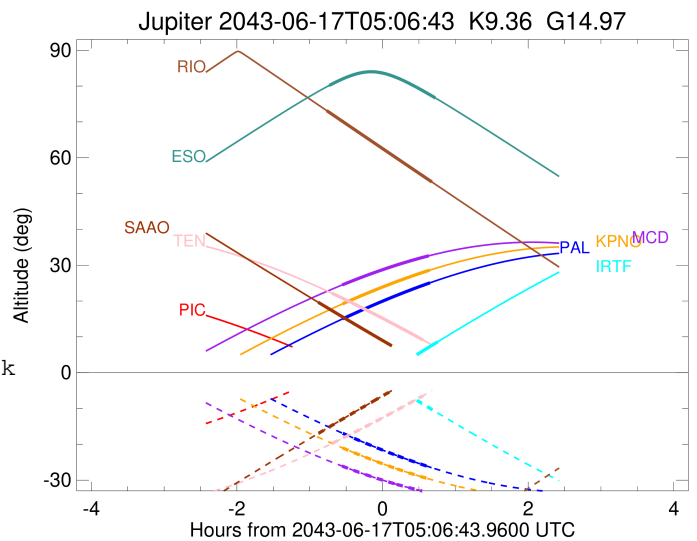
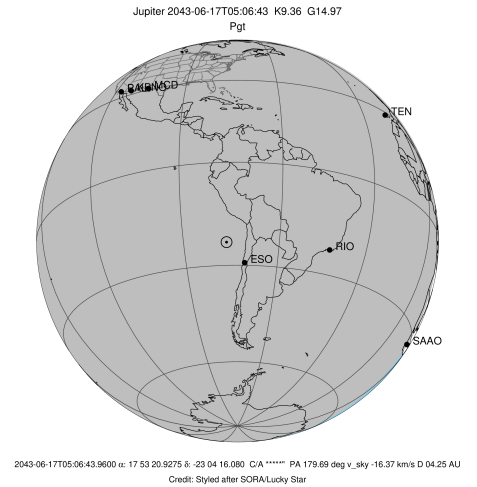


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-17T04:33:32.869	24.49	-26.09	71486.0	59.47	62.57
Jupiter	E	2043-06-17T05:44:49.815	32.61	-33.42	71485.9	60.36	63.39

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-17T05:02:28.700
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        : 4070147202902390272
2Mass ID (if available) : 17532092-2304158
ICRS Star Coord at Epoch: 17h 53m 20.92755s -23:04:16.08012s
RUWE (>1.4 is poor) : 0.98
K magnitude           : 9.355
G magnitude           : 14.971
RP magnitude          : 13.596
BP magnitude          : 17.217
DUPflag              : 0
Distance (au)         : 4.253
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.37
Sun-Target sep (deg) : 176.86
Sun-Moon sep (deg)   : 62.80
B (ring opening deg) : -2.43
PA of pole (deg)     : -0.12
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 19.790
C/A sky separation (km) : 61041.4
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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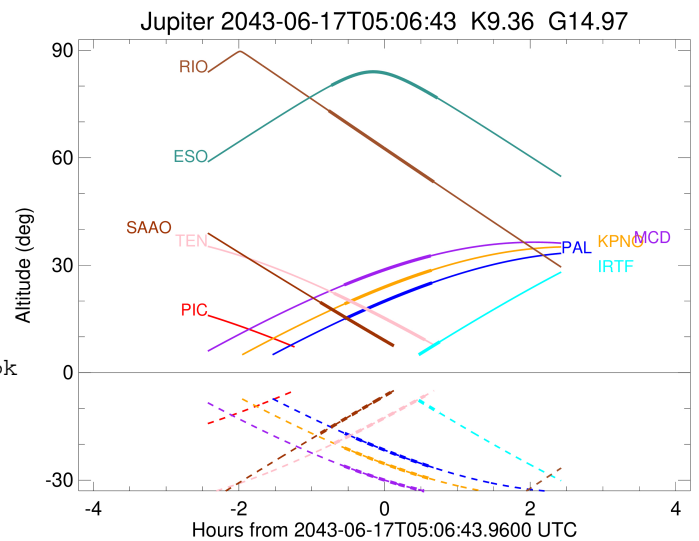
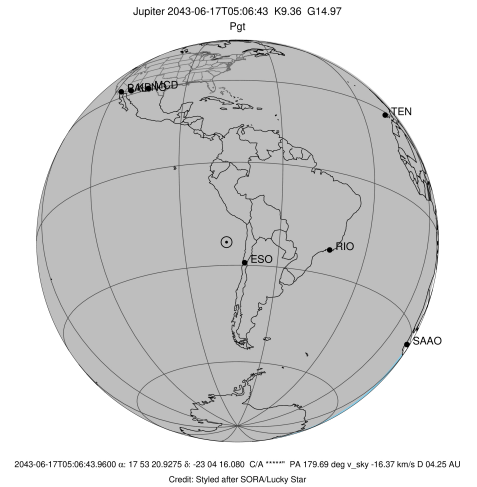


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-17T04:25:08.930	22.16	-19.75	71486.1	58.80	61.95
Jupiter	E	2043-06-17T05:39:55.602	9.17	-6.47	71486.2	58.25	61.43

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-17T05:12:07.690
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      : 4070147202902390272
2Mass ID (if available) : 17532092-2304158
ICRS Star Coord at Epoch: 17h 53m 20.92755s -23:04:16.08012s
RUWE (>1.4 is poor) : 0.98
K magnitude          : 9.355
G magnitude          : 14.971
RP magnitude         : 13.596
BP magnitude         : 17.217
DUPflag             : 0
Distance (au)       : 4.253
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.37
Sun-Target sep (deg) : 176.86
Sun-Moon sep (deg)  : 61.87
B (ring opening deg) : -2.43
PA of pole (deg)    : -0.12
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation ("): 19.283
C/A sky separation (km): 59478.7
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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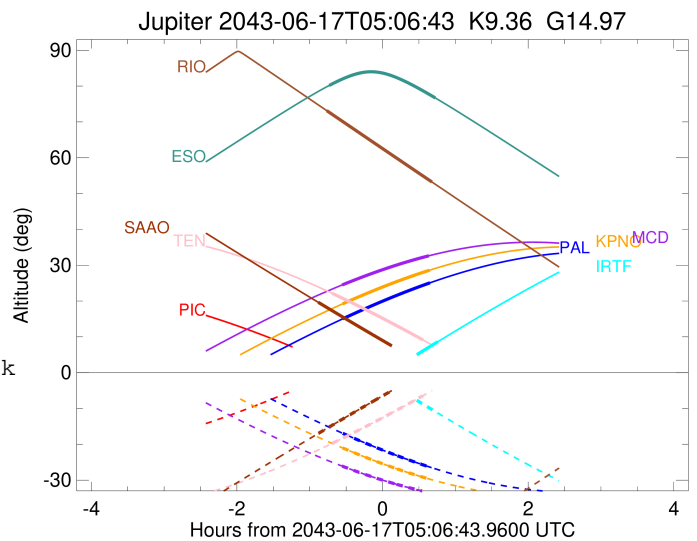
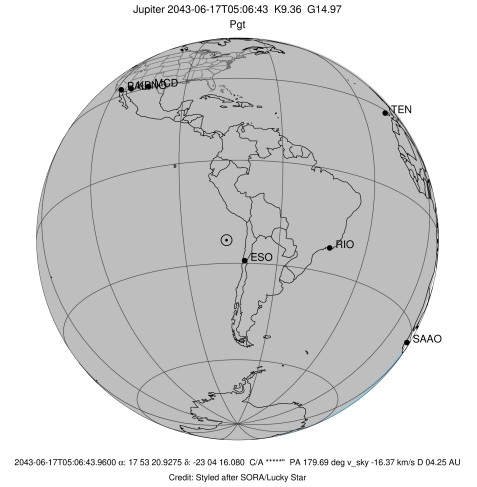


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-17T04:31:48.931	-8.61x	5.71x	71486.5	55.45	58.80
Jupiter	E	2043-06-17T05:52:15.572	8.62	-11.26	71486.3	56.99	60.25

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-17T05:04:06.730
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      : 4070147202902390272
2Mass ID (if available) : 17532092-2304158
ICRS Star Coord at Epoch: 17h 53m 20.92755s -23:04:16.08012s
RUWE (>1.4 is poor) : 0.98
K magnitude         : 9.355
G magnitude         : 14.971
RP magnitude        : 13.596
BP magnitude        : 17.217
DUPflag            : 0
Distance (au)       : 4.253
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -16.37
Sun-Target sep (deg) : 176.86
Sun-Moon sep (deg)  : 63.18
B (ring opening deg) : -2.43
PA of pole (deg)    : -0.12
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 18.410
C/A sky separation (km) : 56787.3
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
    
```

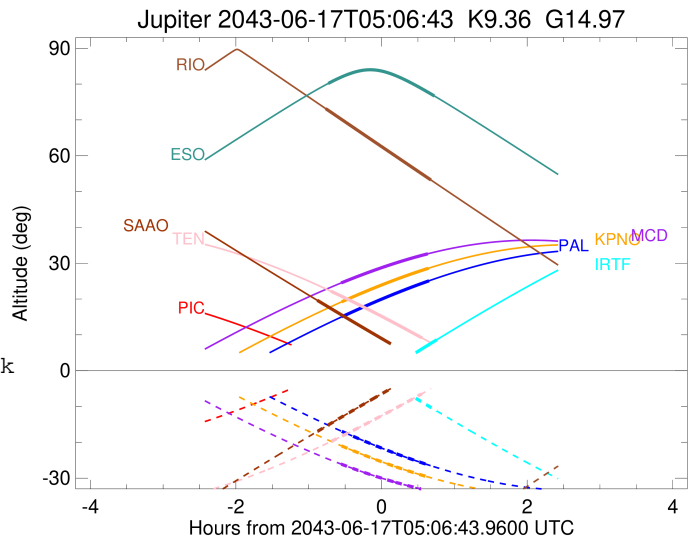
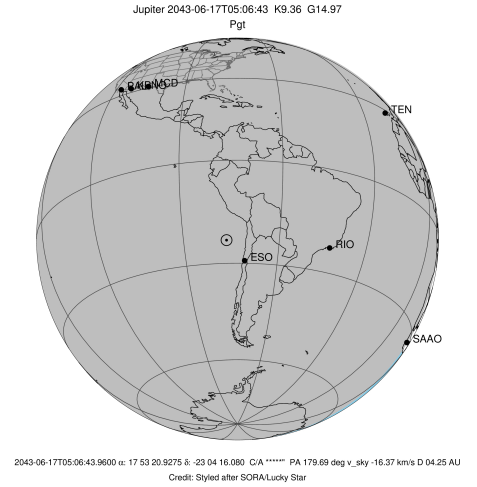


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-17T04:20:52.553	73.11	-69.97	71486.9	52.59	56.07
Jupiter	E	2043-06-17T05:47:26.760	53.22	-50.20	71487.0	52.37	55.87

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-17T05:06:32.920
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        : 4070147202902390272
2Mass ID (if available) : 17532092-2304158
ICRS Star Coord at Epoch: 17h 53m 20.92755s -23:04:16.08012s
RUWE (>1.4 is poor) : 0.98
K magnitude           : 9.355
G magnitude           : 14.971
RP magnitude          : 13.596
BP magnitude          : 17.217
DUPflag              : 0
Distance (au)         : 4.253
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.37
Sun-Target sep (deg)  : 176.86
Sun-Moon sep (deg)    : 63.09
B (ring opening deg) : -2.43
PA of pole (deg)      : -0.12
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (" ) : 18.285
C/A sky separation (km) : 56399.4
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
    
```

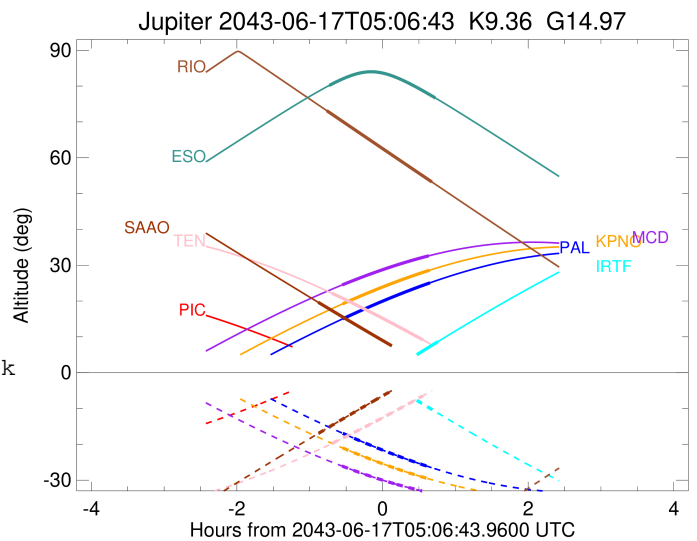
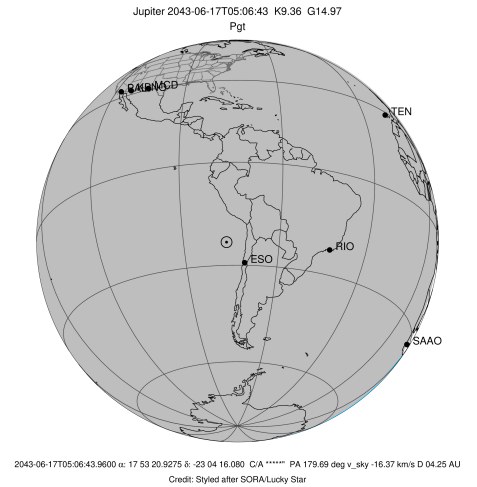


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-17T04:22:50.741	80.17	-82.60	71487.0	51.82	55.34
Jupiter	E	2043-06-17T05:50:15.486	76.68	-74.05	71487.0	52.12	55.62


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-17T05:01:47.690
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       : 4070147202902390272
2Mass ID (if available) : 17532092-2304158
ICRS Star Coord at Epoch: 17h 53m 20.92755s -23:04:16.08012s
RUWE (>1.4 is poor) : 0.98
K magnitude           : 9.355
G magnitude           : 14.971
RP magnitude          : 13.596
BP magnitude          : 17.217
DUPflag              : 0
Distance (au)        : 4.253
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.37
Sun-Target sep (deg) : 176.86
Sun-Moon sep (deg)   : 62.75
B (ring opening deg) : -2.43
PA of pole (deg)     : -0.12
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 17.441
C/A sky separation (km) : 53798.3
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	2043-06-17T04:13:55.073	19.61	-16.95	71487.4	49.11	52.72
Jupiter	E	2043-06-17T05:49:54.220	0.65x	1.69x	71487.5	48.41	52.04