

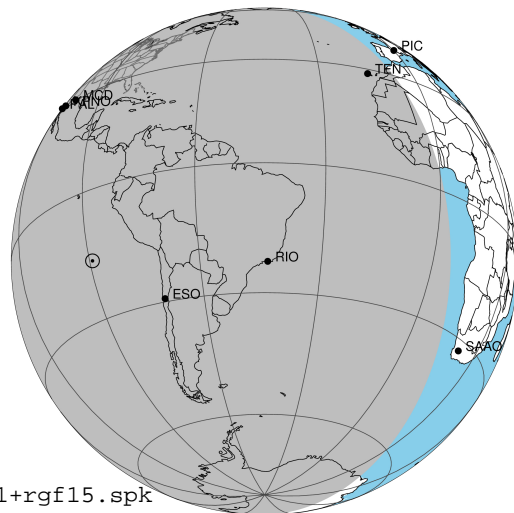
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-05-06T05:52:57.780
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068711137686084224
 2Mass ID (if available) : 17504608-2253400

Jupiter 2031-05-06T05:52:57 K8.95 G14.99 Pgt

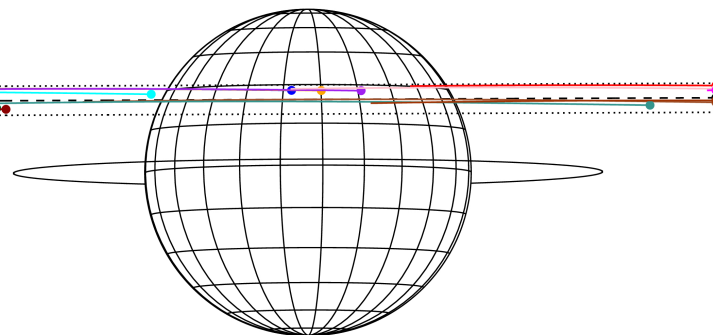
ICRS Star Coord at Epoch: 17h 50m 46.08046s -22:53:40.37383s

RUWE (>1.4 is poor) : 0.96
 K magnitude : 8.945
 G magnitude : 14.993
 RP magnitude : 13.529
 BP magnitude : 17.915
 DUPflag : 0
 Distance (au) : 4.509
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -8.59
 Sun-Target sep (deg) : 137.22
 Sun-Moon sep (deg) : 55.00
 B (ring opening deg) : -2.61
 PA of pole (deg) : 0.16
 Pole direction: RA (deg): 268.05695
 Dec (deg): 64.49651
 C/A sky separation (") : 9.784
 C/A sky separation (km) : 31998.4
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-05-06T05:52:57 K8.95 G14.99
 Pgt



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

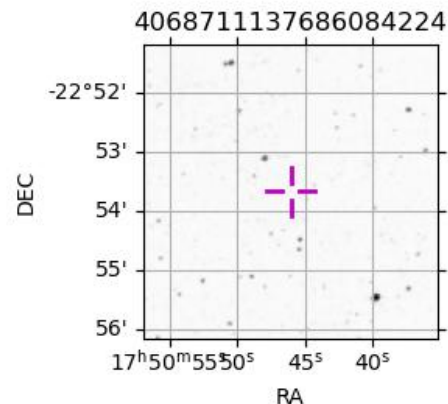


2031-05-06T05:52:57.7800 at: 17 50 46.0805 s -22 53 40.374 C/A 9.773" PA 180.24 deg v_sky - 8.59 km/s D 04.51 AU

Credit: Styled after SORA/Lucky Star

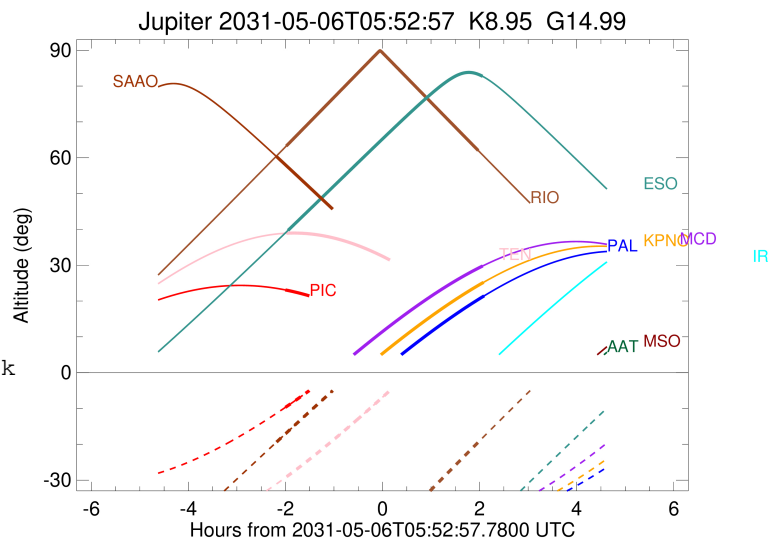
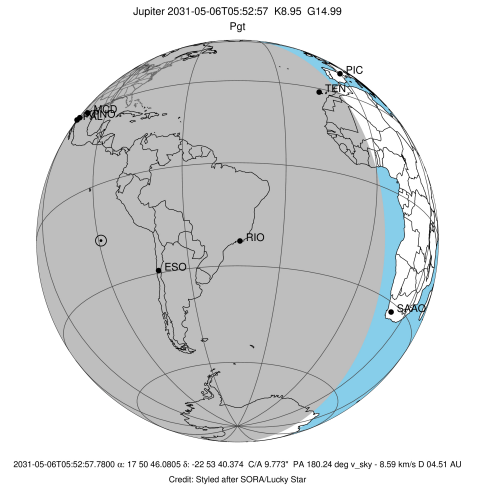
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	MAY 06 03:52 - MAY 06 03:52	Pin
PAL	Palomar Mt (200")	33.4	243.1	+	MAY 06 07:58 - MAY 06 07:58	Pne
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	MAY 06 07:57 - MAY 06 07:57	Pne
MCD	McDonald Obs. 2.7m	30.7	256.0	+	MAY 06 07:56 - MAY 06 07:56	Pne
TEN	Teide Obs./Tenerife	28.3	343.5	+	MAY 06 03:54 - MAY 06 03:54	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	+	MAY 06 03:54 - MAY 06 07:51	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	MAY 06 03:56 - MAY 06 07:56	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	MAY 06 03:41 - MAY 06 03:41	Pin
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-06T05:47:32.700
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     : 4068711137686084224
2Mass ID (if available) : 17504608-2253400
ICRS Star Coord at Epoch: 17h 50m 46.08046s -22:53:40.37383s
RUWE (>1.4 is poor) : 0.96
K magnitude        : 8.945
G magnitude        : 14.993
RP magnitude       : 13.529
BP magnitude       : 17.915
DUPflag           : 0
Distance (au)     : 4.509
f0 (km)           : 0.00
g0 (km)           : 0.00
skyplane vel. (km/s) : -8.59
Sun-Target sep (deg) : 137.22
Sun-Moon sep (deg) : 55.49
B (ring opening deg) : -2.61
PA of pole (deg)  : 0.16
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 11.413
C/A sky separation (km) : 37323.3
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
    
```

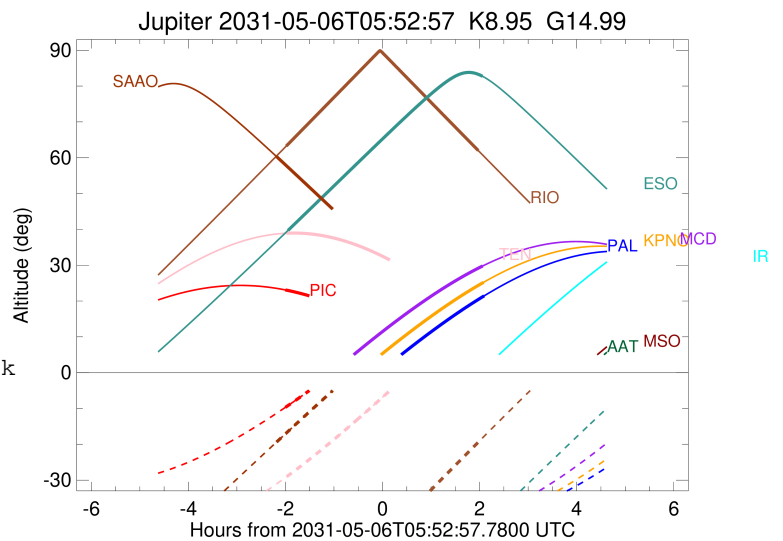
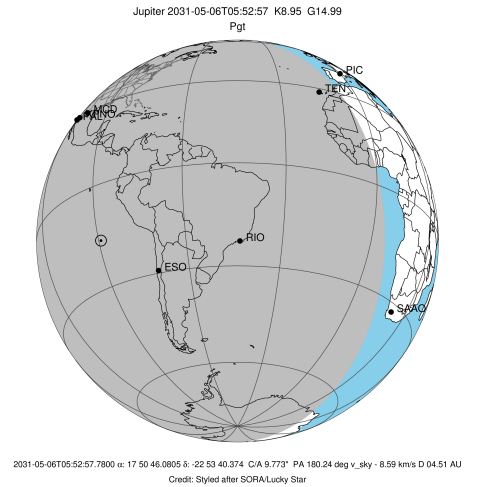


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-06T03:52:47.669	23.10	-9.70	71489.4	31.92	35.39
Jupiter	E	2031-05-06T07:43:22.775	-3.03x	30.70x	71489.6	30.63	34.04

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-06T06:01:35.750
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       : 4068711137686084224
2Mass ID (if available) : 17504608-2253400
ICRS Star Coord at Epoch: 17h 50m 46.08046s -22:53:40.37383s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 8.945
G magnitude           : 14.993
RP magnitude         : 13.529
BP magnitude         : 17.915
DUPflag              : 0
Distance (au)        : 4.509
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -8.59
Sun-Target sep (deg) : 137.22
Sun-Moon sep (deg)  : 54.57
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.16
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation ("): 10.977
C/A sky separation (km): 35897.2
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
    
```

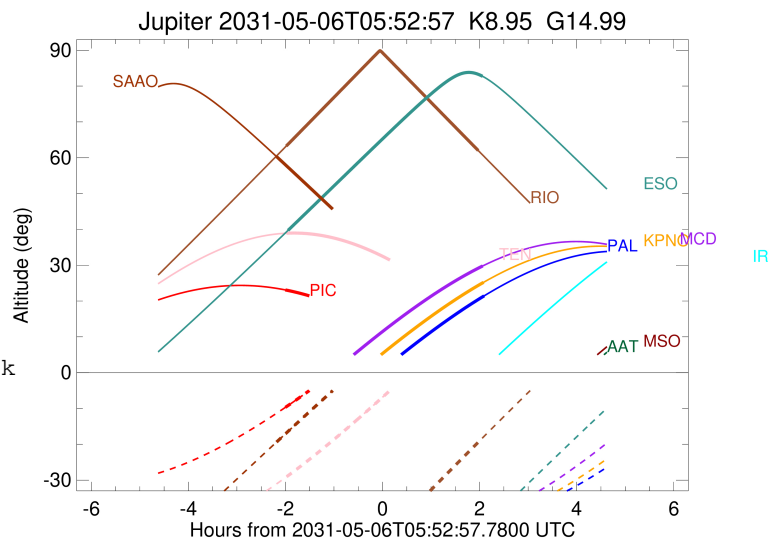
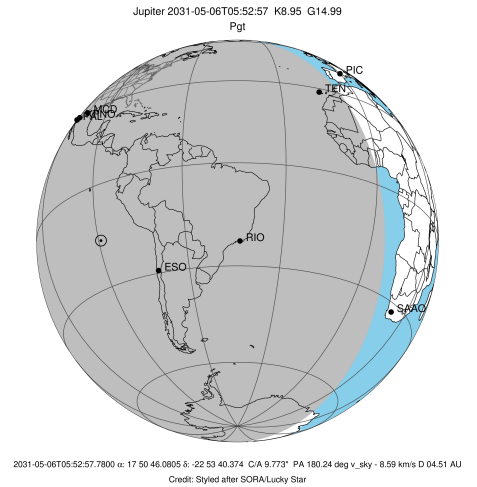


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-06T04:01:49.843	-20.90x	-17.37	71489.8	29.20	32.52
Jupiter	E	2031-05-06T07:58:33.299	21.43	-40.19	71489.6	30.83	34.24

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-06T06:01:25.100
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        : 4068711137686084224
2Mass ID (if available) : 17504608-2253400
ICRS Star Coord at Epoch: 17h 50m 46.08046s -22:53:40.37383s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 8.945
G magnitude           : 14.993
RP magnitude          : 13.529
BP magnitude          : 17.915
DUPflag              : 0
Distance (au)         : 4.509
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -8.59
Sun-Target sep (deg)  : 137.22
Sun-Moon sep (deg)   : 54.64
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.16
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 10.998
C/A sky separation (km) : 35966.4
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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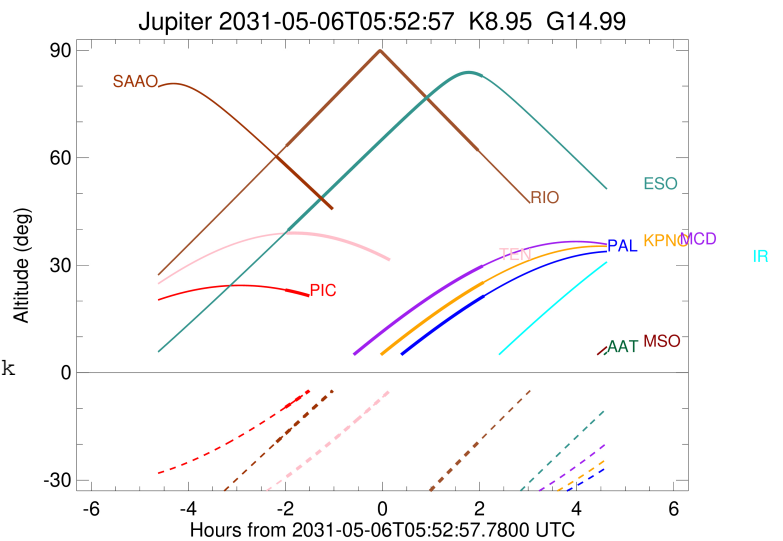
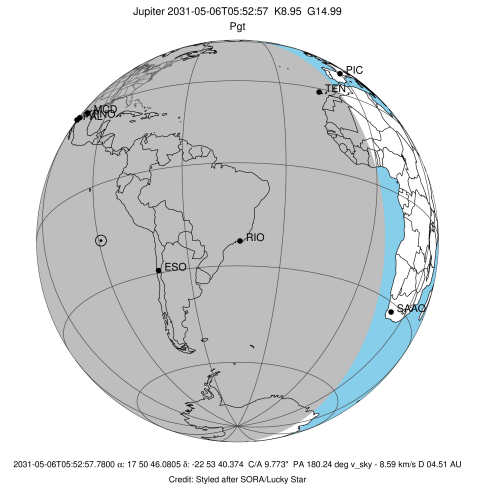


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-06T04:02:12.272	-16.18x	-21.85	71489.8	29.26	32.59
Jupiter	E	2031-05-06T07:57:54.561	25.22	-40.98	71489.6	30.85	34.27

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-06T06:00:57.390
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        : 4068711137686084224
2Mass ID (if available) : 17504608-2253400
ICRS Star Coord at Epoch: 17h 50m 46.08046s -22:53:40.37383s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 8.945
G magnitude           : 14.993
RP magnitude          : 13.529
BP magnitude          : 17.915
DUPflag              : 0
Distance (au)         : 4.509
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -8.59
Sun-Target sep (deg) : 137.22
Sun-Moon sep (deg)   : 54.75
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.16
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 11.042
C/A sky separation (km) : 36110.4
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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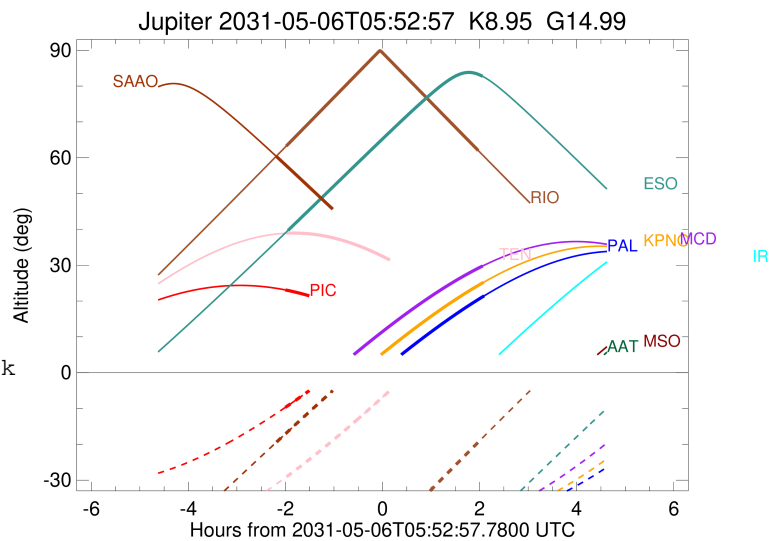
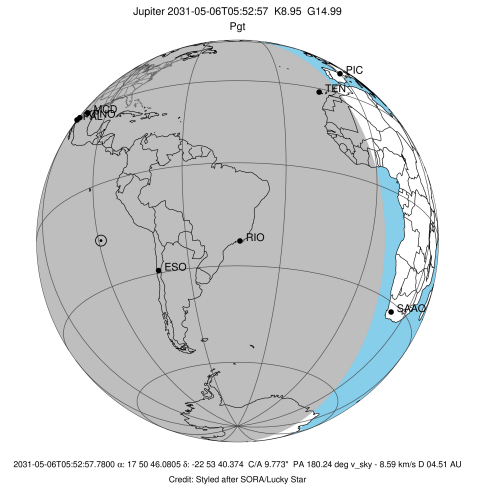


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-06T04:02:34.420	-9.55x	-27.70	71489.8	29.42	32.75
Jupiter	E	2031-05-06T07:56:47.360	29.78	-40.52	71489.5	30.90	34.32

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-06T05:48:40.880
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      : 4068711137686084224
2Mass ID (if available) : 17504608-2253400
ICRS Star Coord at Epoch: 17h 50m 46.08046s -22:53:40.37383s
RUWE (>1.4 is poor) : 0.96
K magnitude         : 8.945
G magnitude         : 14.993
RP magnitude        : 13.529
BP magnitude        : 17.915
DUPflag            : 0
Distance (au)       : 4.509
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -8.59
Sun-Target sep (deg) : 137.22
Sun-Moon sep (deg)  : 55.68
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.16
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 11.231
C/A sky separation (km) : 36730.5
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
    
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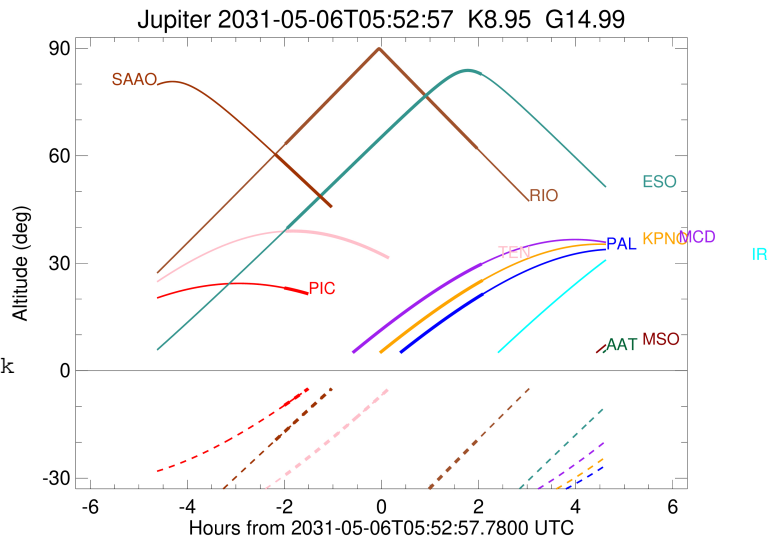
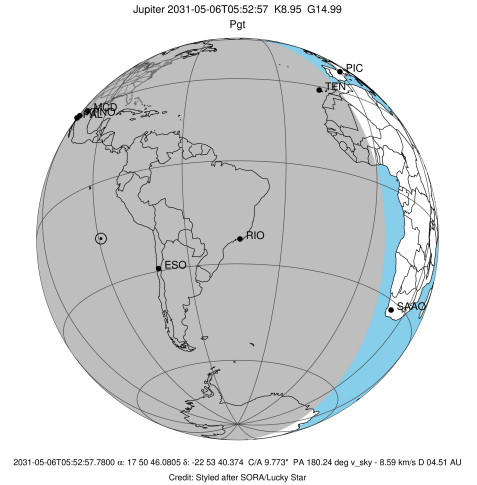


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-06T03:54:28.250	38.92	-29.04	71489.5	31.17	34.61
Jupiter	E	2031-05-06T07:43:39.145	16.24	16.52x	71489.7	30.13	33.51

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-06T05:52:49.890
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      : 4068711137686084224
2Mass ID (if available) : 17504608-2253400
ICRS Star Coord at Epoch: 17h 50m 46.08046s -22:53:40.37383s
RUWE (>1.4 is poor) : 0.96
K magnitude          : 8.945
G magnitude          : 14.993
RP magnitude         : 13.529
BP magnitude         : 17.915
DUPflag             : 0
Distance (au)       : 4.509
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -8.59
Sun-Target sep (deg) : 137.22
Sun-Moon sep (deg)  : 55.82
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.16
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation ("): 9.789
C/A sky separation (km): 32014.1
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
    
```

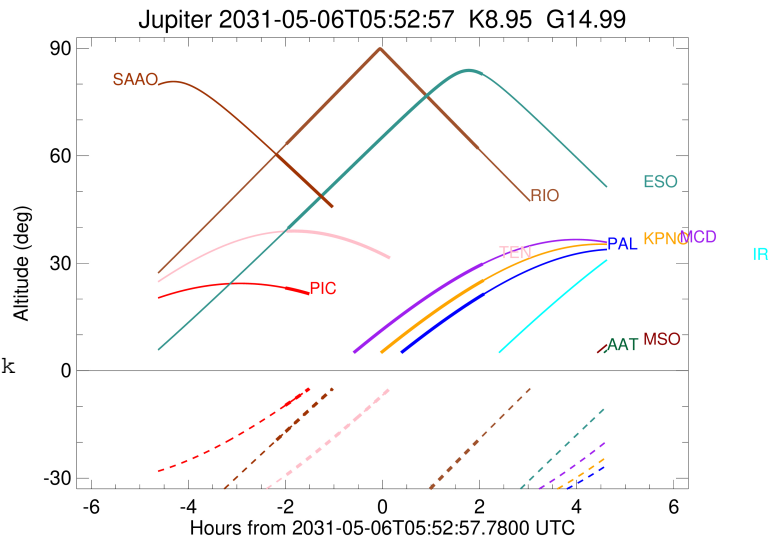
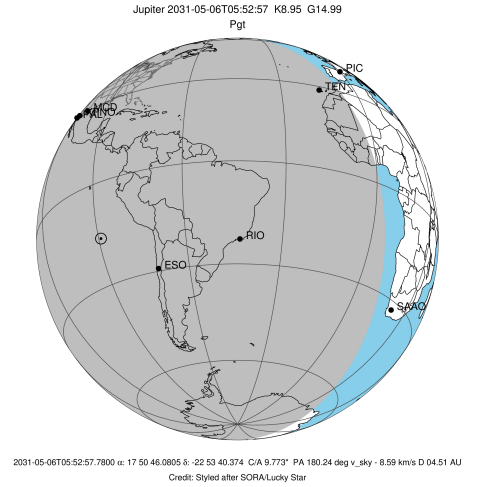


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-06T03:54:00.819	63.25	-73.59	71490.2	26.40	29.53
Jupiter	E	2031-05-06T07:51:18.951	62.00	-19.41	71490.2	26.21	29.33

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-06T05:57:11.050
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      : 4068711137686084224
2Mass ID (if available) : 17504608-2253400
ICRS Star Coord at Epoch: 17h 50m 46.08046s -22:53:40.37383s
RUWE (>1.4 is poor) : 0.96
K magnitude          : 8.945
G magnitude          : 14.993
RP magnitude         : 13.529
BP magnitude         : 17.915
DUPflag             : 0
Distance (au)       : 4.509
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -8.59
Sun-Target sep (deg) : 137.22
Sun-Moon sep (deg)  : 55.51
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.16
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation ("): 9.508
C/A sky separation (km): 31094.6
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
    
```

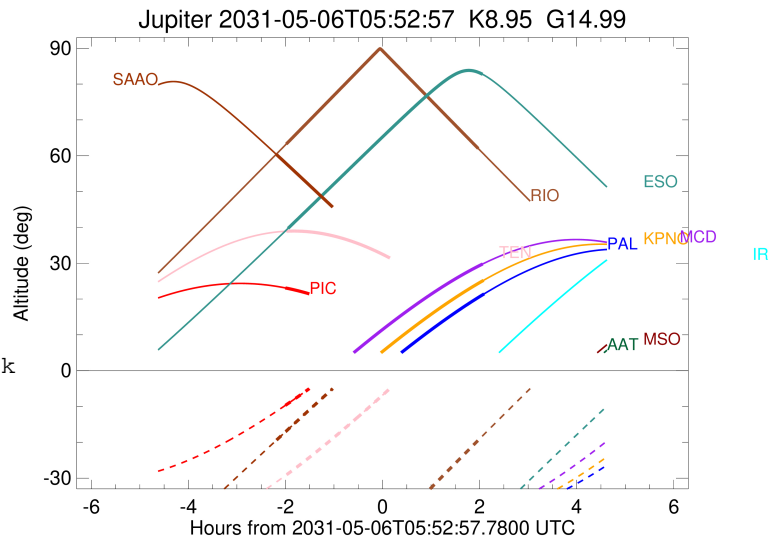
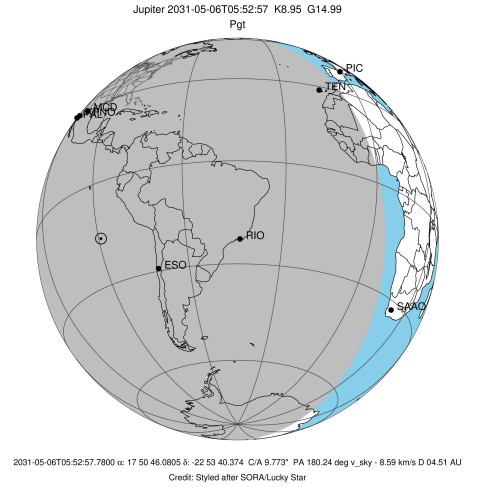


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-06T03:56:09.384	39.71	-73.90	71490.3	25.18	28.22
Jupiter	E	2031-05-06T07:56:39.025	82.72	-43.23	71490.2	25.85	28.95


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-06T05:44:33.520
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       : 4068711137686084224
2Mass ID (if available) : 17504608-2253400
ICRS Star Coord at Epoch: 17h 50m 46.08046s -22:53:40.37383s
RUWE (>1.4 is poor) : 0.96
K magnitude          : 8.945
G magnitude          : 14.993
RP magnitude         : 13.529
BP magnitude         : 17.915
DUPflag             : 0
Distance (au)        : 4.509
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -8.59
Sun-Target sep (deg) : 137.22
Sun-Moon sep (deg)   : 55.86
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.16
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation ("): 9.124
C/A sky separation (km): 29840.0
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	2031-05-06T03:41:53.304	60.34	-19.39	71490.3	25.44	28.51
Jupiter	E	2031-05-06T07:49:20.735	8.83	27.42x	71490.5	23.58	26.49