

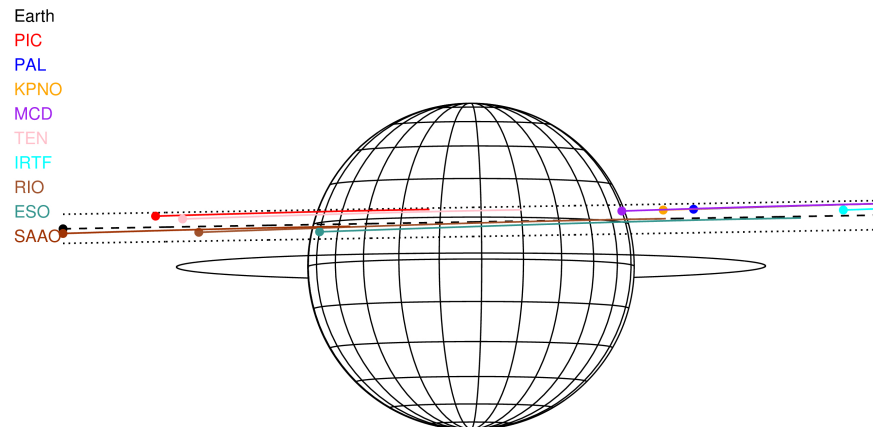
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-03-27T06:01:21.980
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068716497806428672
 2Mass ID (if available) : 17511162-2253010

Jupiter 2031-03-27T06:01:21 K8.79 G13.42 Pgt

ICRS Star Coord at Epoch: 17h 51m 11.62761s -22:53:01.06117s
 RUWE (>1.4 is poor) : 0.90
 K magnitude : 8.795
 G magnitude : 13.418
 RP magnitude : 12.227
 BP magnitude : 14.953
 DUPflag : 0
 Distance (au) : 5.076
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : 9.01
 Sun-Target sep (deg) : 97.97
 Sun-Moon sep (deg) : 146.63
 B (ring opening deg) : -2.62
 PA of pole (deg) : 0.11
 Pole direction: RA (deg): 268.05699
 Dec (deg): 64.49651
 C/A sky separation (") : 5.298
 C/A sky separation (km) : 19505.5
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

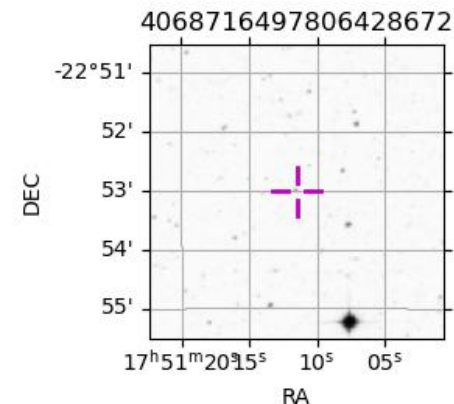


2031-03-27T06:01:21.9800 at: 17 51 11.6276 s: -22 53 01.0611 C/A 5.288" PA 180.96 deg v_sky + 9.01 km/s D 05.08 AU
 Credit: Styled after SORA/Lucky Star



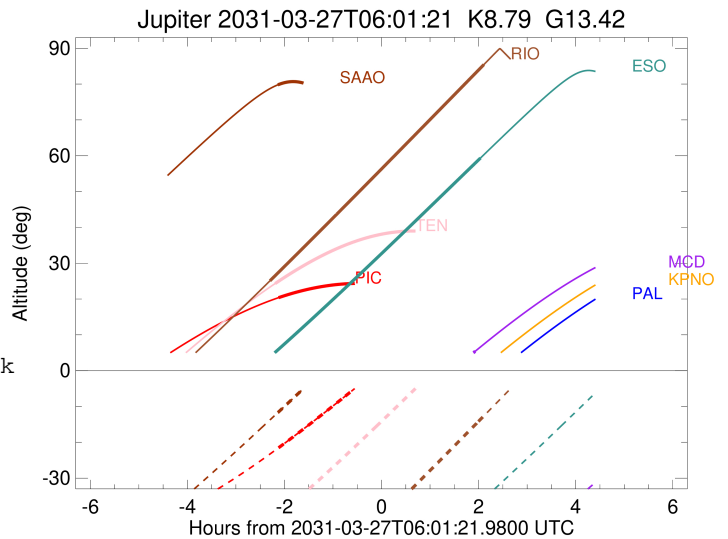
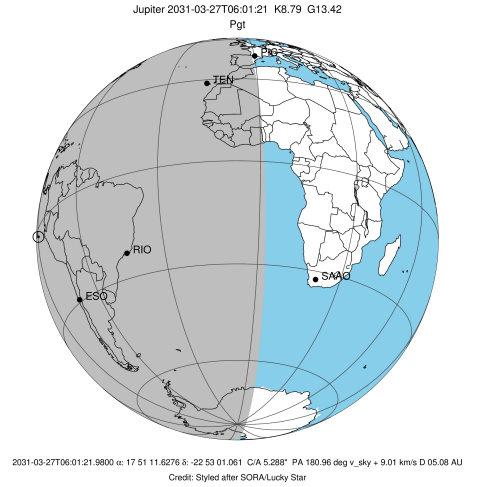
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+	MAR 27 03:54 - MAR 27 03:54	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			Pnn
MCD	McDonald Obs. 2.7m	30.7	256.0	+	MAR 27 07:57 - MAR 27 07:57	Pne
TEN	Teide Obs./Tenerife	28.3	343.5	+	MAR 27 03:49 - MAR 27 03:49	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	+	MAR 27 03:43 - MAR 27 08:07	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	MAR 27 08:03 - MAR 27 08:03	Pne
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	MAR 27 03:53 - MAR 27 03:53	Pin
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-27T06:02:19.760
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        : 4068716497806428672
2Mass ID (if available) : 17511162-2253010
ICRS Star Coord at Epoch: 17h 51m 11.62761s -22:53:01.06117s
RUWE (>1.4 is poor) : 0.90
K magnitude           : 8.795
G magnitude           : 13.418
RP magnitude          : 12.227
BP magnitude          : 14.953
DUPflag              : 0
Distance (au)         : 5.076
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 9.01
Sun-Target sep (deg)  : 97.97
Sun-Moon sep (deg)   : 146.91
B (ring opening deg) : -2.62
PA of pole (deg)     : 0.11
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 6.873
C/A sky separation (km) : 25302.9
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
    
```

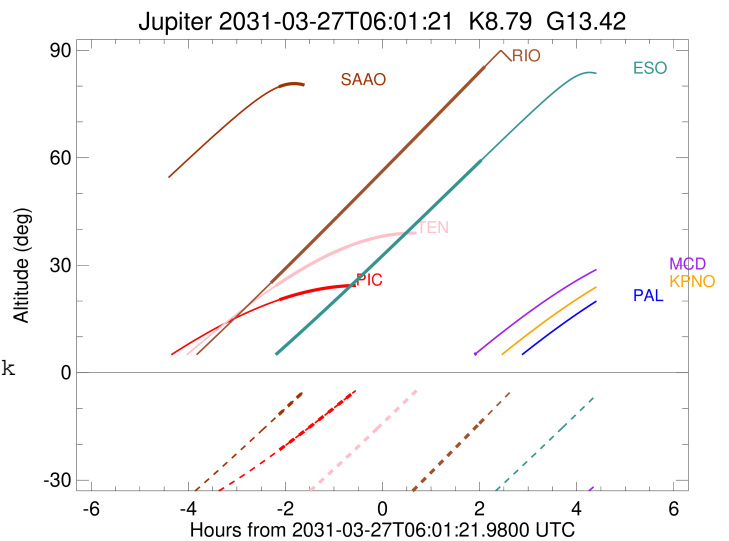
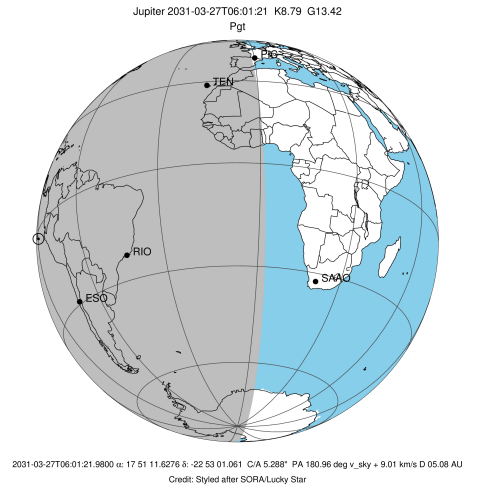


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-27T03:54:03.075	20.37	-21.53	71490.9	19.69	22.23
Jupiter	E	2031-03-27T08:10:56.845	15.10	24.45x	71490.8	21.24	23.94

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-27T05:50:37.340
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       : 4068716497806428672
2Mass ID (if available) : 17511162-2253010
ICRS Star Coord at Epoch: 17h 51m 11.62761s -22:53:01.06117s
RUWE (>1.4 is poor) : 0.90
K magnitude          : 8.795
G magnitude          : 13.418
RP magnitude         : 12.227
BP magnitude         : 14.953
DUPflag             : 0
Distance (au)        : 5.076
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 9.01
Sun-Target sep (deg) : 97.97
Sun-Moon sep (deg)   : 145.83
B (ring opening deg) : -2.62
PA of pole (deg)     : 0.11
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 5.987
C/A sky separation (km) : 22039.7
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
    
```

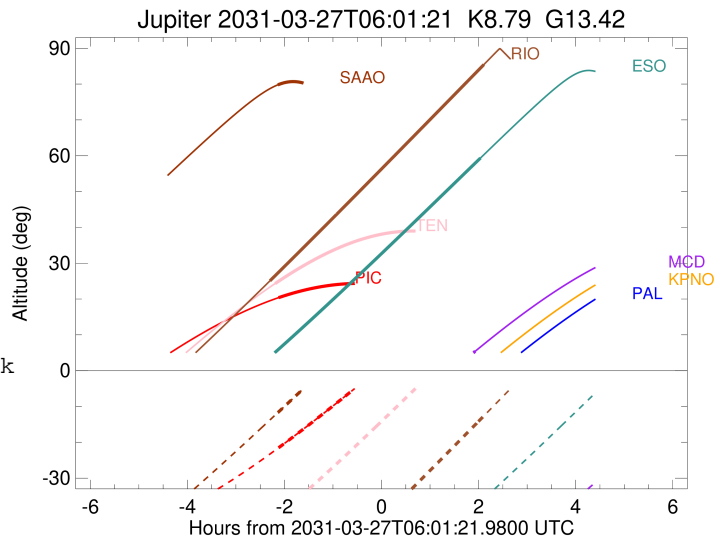
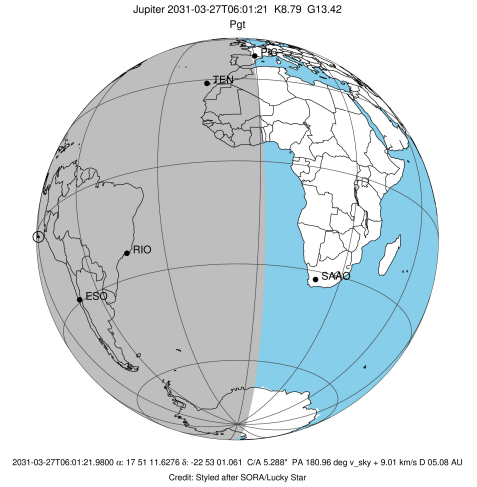


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-27T03:47:37.870	-45.89x	-33.25	71491.3	16.24	18.41
Jupiter	E	2031-03-27T07:57:09.437	5.40	-54.37	71490.9	19.77	22.32

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-27T05:59:10.160
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       : 4068716497806428672
2Mass ID (if available) : 17511162-2253010
ICRS Star Coord at Epoch: 17h 51m 11.62761s -22:53:01.06117s
RUWE (>1.4 is poor) : 0.90
K magnitude           : 8.795
G magnitude           : 13.418
RP magnitude         : 12.227
BP magnitude         : 14.953
DUPflag              : 0
Distance (au)        : 5.076
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 9.01
Sun-Target sep (deg) : 97.97
Sun-Moon sep (deg)   : 146.83
B (ring opening deg) : -2.62
PA of pole (deg)     : 0.11
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 6.631
C/A sky separation (km) : 24411.2
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
    
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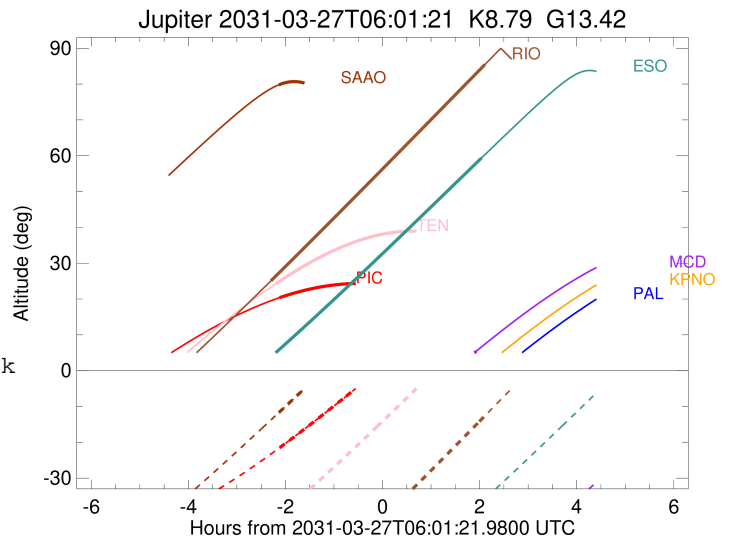
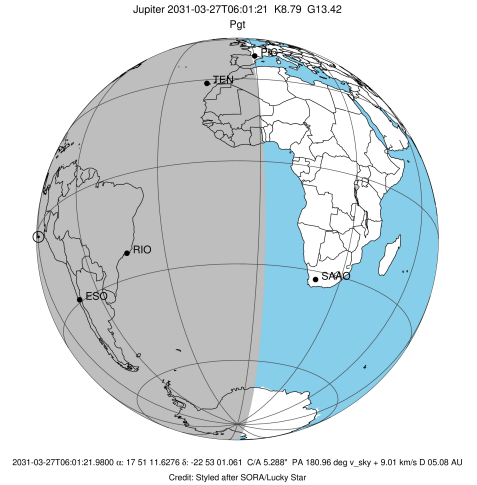


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-27T03:49:50.741	24.31	-41.18	71491.0	18.60	21.03
Jupiter	E	2031-03-27T08:09:50.738	34.64	14.07x	71490.8	20.72	23.37

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-27T05:54:10.670
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      : 4068716497806428672
2Mass ID (if available) : 17511162-2253010
ICRS Star Coord at Epoch: 17h 51m 11.62761s -22:53:01.06117s
RUWE (>1.4 is poor) : 0.90
K magnitude          : 8.795
G magnitude          : 13.418
RP magnitude         : 12.227
BP magnitude         : 14.953
DUPflag             : 0
Distance (au)       : 5.076
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 9.01
Sun-Target sep (deg) : 97.97
Sun-Moon sep (deg)  : 146.63
B (ring opening deg) : -2.62
PA of pole (deg)    : 0.11
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 5.154
C/A sky separation (km) : 18976.1
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
    
```

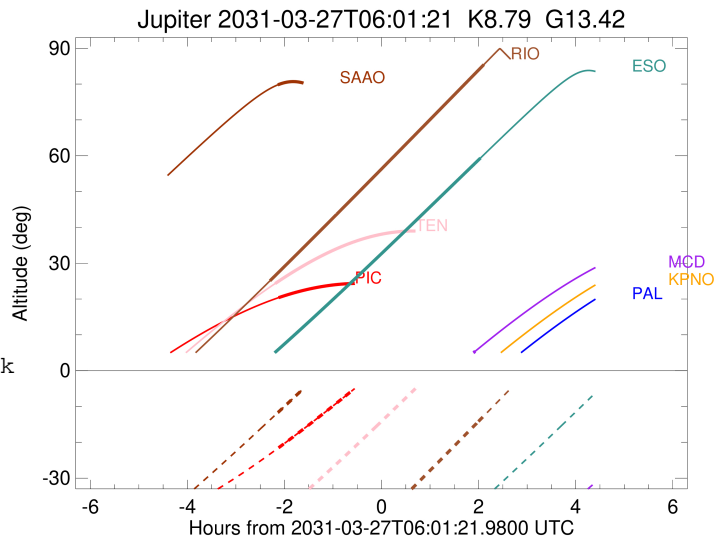
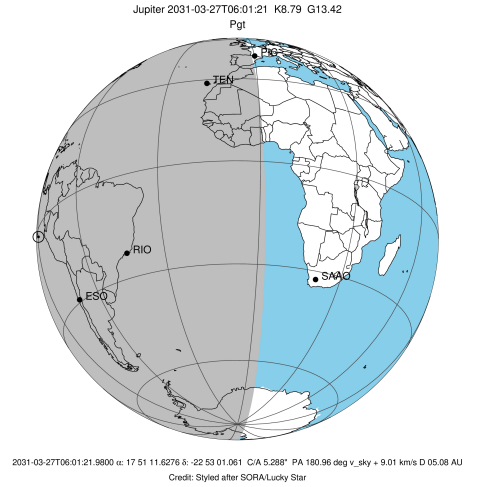


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-27T03:43:27.701	25.07	-66.99	71491.5	13.63	15.49
Jupiter	E	2031-03-27T08:07:57.302	85.45	-12.61	71491.2	16.66	18.88

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch              : 2031-03-27T05:51:25.270
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        : 4068716497806428672
2Mass ID (if available) : 17511162-2253010
ICRS Star Coord at Epoch: 17h 51m 11.62761s -22:53:01.06117s
RUWE (>1.4 is poor)  : 0.90
K magnitude            : 8.795
G magnitude            : 13.418
RP magnitude           : 12.227
BP magnitude           : 14.953
DUPflag               : 0
Distance (au)         : 5.076
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : 9.01
Sun-Target sep (deg)  : 97.97
Sun-Moon sep (deg)    : 146.30
B (ring opening deg)  : -2.62
PA of pole (deg)      : 0.11
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 4.737
C/A sky separation (km) : 17441.1
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
    
```

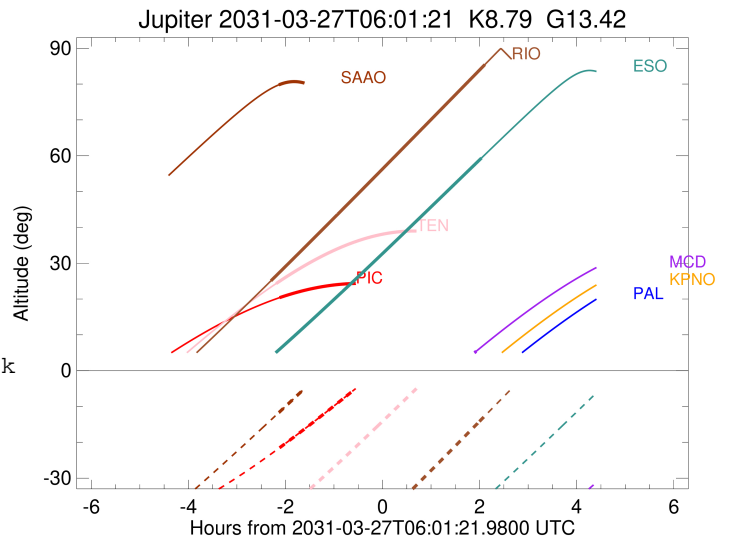
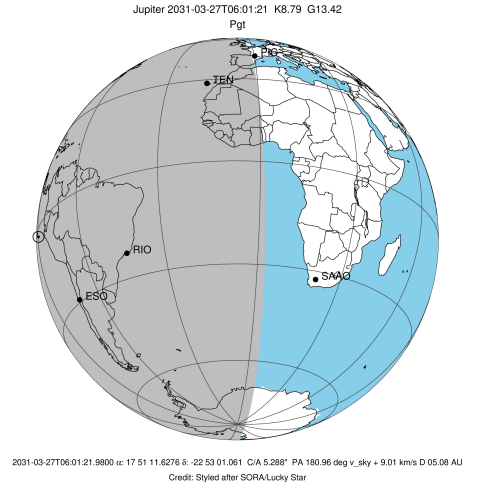


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-27T03:42:52.175	3.71x	-59.17	71491.6	12.27	13.96
Jupiter	E	2031-03-27T08:03:45.916	59.36	-36.61	71491.3	15.76	17.87

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-27T06:06:26.790
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       : 4068716497806428672
2Mass ID (if available) : 17511162-2253010
ICRS Star Coord at Epoch: 17h 51m 11.62761s -22:53:01.06117s
RUWE (>1.4 is poor) : 0.90
K magnitude          : 8.795
G magnitude          : 13.418
RP magnitude         : 12.227
BP magnitude         : 14.953
DUPflag             : 0
Distance (au)        : 5.076
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 9.01
Sun-Target sep (deg) : 97.97
Sun-Moon sep (deg)   : 147.38
B (ring opening deg) : -2.62
PA of pole (deg)     : 0.11
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 4.958
C/A sky separation (km) : 18252.4
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	2031-03-27T03:53:08.240	79.77	-11.72	71491.4	14.10	16.02
Jupiter	E	2031-03-27T08:18:49.075	35.13	41.39x	71491.4	14.94	16.96