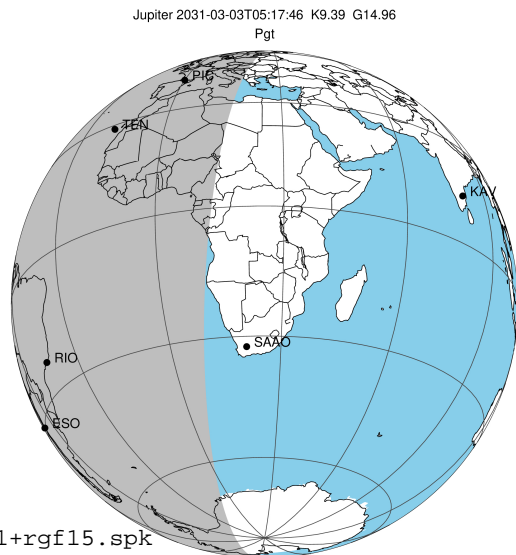


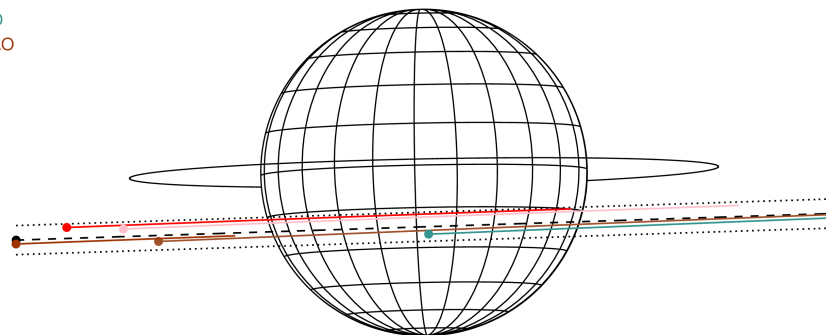
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-03-03T05:17:46.870
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116928536478117376
 2Mass ID (if available) : 17413682-2249595

Jupiter 2031-03-03T05:17:46 K9.39 G14.96 Pgt

ICRS Star Coord at Epoch: 17h 41m 36.82643s -22:49:59.56213s
 RUWE (>1.4 is poor) : 0.91
 K magnitude : 9.386
 G magnitude : 14.964
 RP magnitude : 13.558
 BP magnitude : 17.393
 DUPflag : 0
 Distance (au) : 5.463
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : 20.21
 Sun-Target sep (deg) : 76.23
 Sun-Moon sep (deg) : 171.31
 B (ring opening deg) : -2.65
 PA of pole (deg) : 1.14
 Pole direction: RA (deg): 268.05701
 Dec (deg): 64.49651
 C/A sky separation (") : 6.001
 C/A sky separation (km) : 23775.3
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk



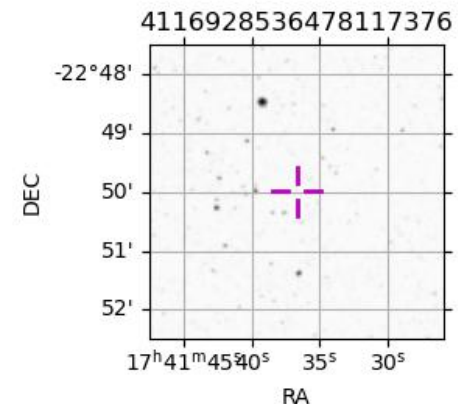
Earth
 PIC
 TEN
 RIO
 ESO
 SAAO



2031-03-03T05:17:46.8700 az: 17 41 36.8264 δ: -22 49 59.562 C/A 6.011" PA 1.87 deg v_sky +20.21 km/s D 05.46 AU
 Credit: Styled after SORA/Lucky Star

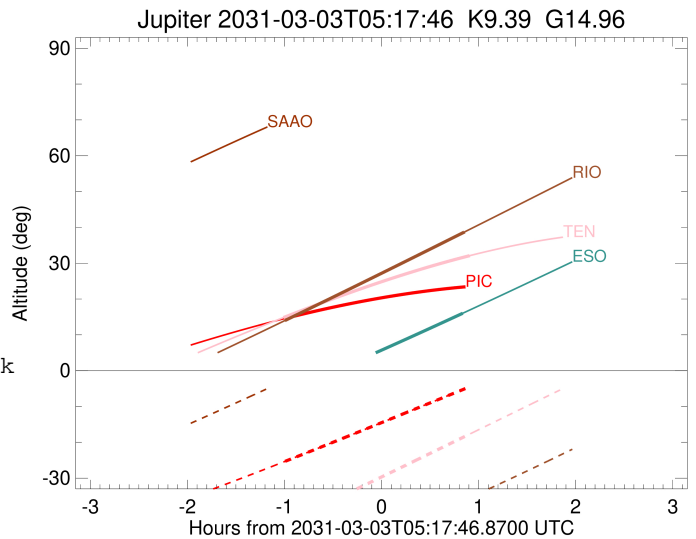
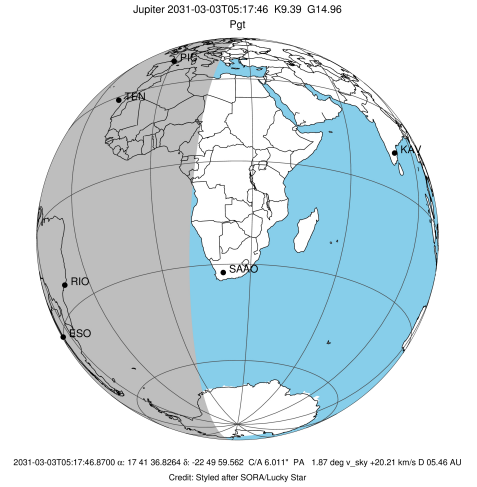
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	MAR 03 04:18 - MAR 03 04:18	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			Pnn
TEN	Teide Obs./Tenerife	28.3	343.5	+ +	MAR 03 04:17 - MAR 03 06:12	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	+ +	MAR 03 04:18 - MAR 03 06:09	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	MAR 03 06:08 - MAR 03 06:08	Pne
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-03T05:16:00.580
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      : 4116928536478117376
2Mass ID (if available) : 17413682-2249595
ICRS Star Coord at Epoch: 17h 41m 36.82643s -22:49:59.56213s
RUWE (>1.4 is poor) : 0.91
K magnitude          : 9.386
G magnitude          : 14.964
RP magnitude         : 13.558
BP magnitude         : 17.393
DUPflag             : 0
Distance (au)       : 5.463
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 20.21
Sun-Target sep (deg) : 76.23
Sun-Moon sep (deg)  : 171.41
B (ring opening deg) : -2.65
PA of pole (deg)    : 1.14
Pole direction: RA (deg): 268.05701
Dec (deg): 64.49651
C/A sky separation (" ) : 4.598
C/A sky separation (km) : 18219.0
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
    
```

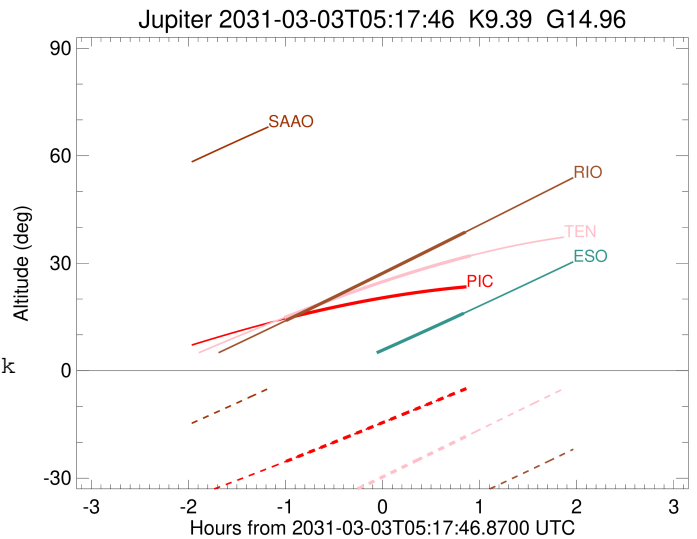
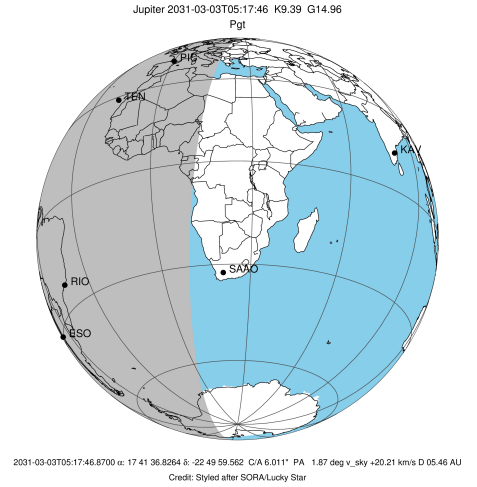


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-03T04:18:14.780	14.59	-25.30	71491.3	-15.70	-17.81
Jupiter	E	2031-03-03T06:13:56.567	23.57	-4.20x	71491.4	-13.88	-15.77

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-03T05:14:36.890
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      : 4116928536478117376
2Mass ID (if available) : 17413682-2249595
ICRS Star Coord at Epoch: 17h 41m 36.82643s -22:49:59.56213s
RUWE (>1.4 is poor) : 0.91
K magnitude          : 9.386
G magnitude          : 14.964
RP magnitude         : 13.558
BP magnitude         : 17.393
DUPflag             : 0
Distance (au)       : 5.463
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 20.21
Sun-Target sep (deg) : 76.23
Sun-Moon sep (deg)   : 171.71
B (ring opening deg) : -2.65
PA of pole (deg)     : 1.14
Pole direction: RA (deg): 268.05701
Dec (deg): 64.49651
C/A sky separation ("): 4.927
C/A sky separation (km): 19520.8
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
    
```

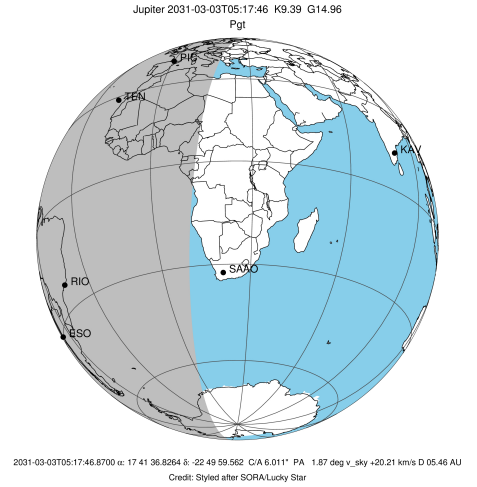


x: target alt < 5.0 deg or sun > -5.0 deg

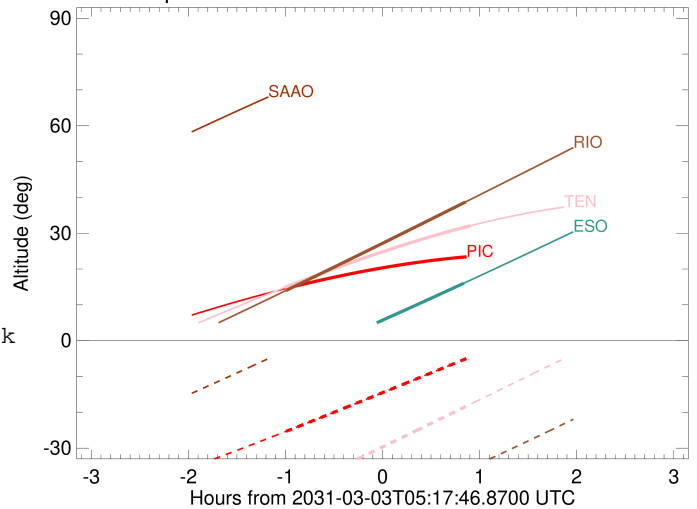
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-03T04:17:13.195	14.83	-42.68	71491.2	-16.92	-19.17
Jupiter	E	2031-03-03T06:12:16.237	32.10	-17.70	71491.4	-14.81	-16.81

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-03T05:13:26.040
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      : 4116928536478117376
2Mass ID (if available) : 17413682-2249595
ICRS Star Coord at Epoch: 17h 41m 36.82643s -22:49:59.56213s
RUWE (>1.4 is poor) : 0.91
K magnitude          : 9.386
G magnitude          : 14.964
RP magnitude         : 13.558
BP magnitude         : 17.393
DUPflag             : 0
Distance (au)        : 5.463
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 20.21
Sun-Target sep (deg) : 76.23
Sun-Moon sep (deg)  : 172.16
B (ring opening deg) : -2.65
PA of pole (deg)    : 1.14
Pole direction: RA (deg): 268.05701
Dec (deg): 64.49651
C/A sky separation (") : 6.418
C/A sky separation (km) : 25427.1
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
    
```



Jupiter 2031-03-03T05:17:46 K9.39 G14.96

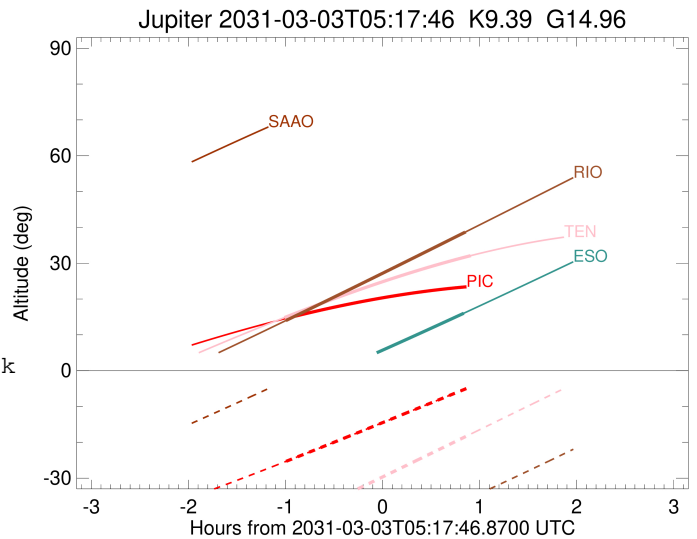
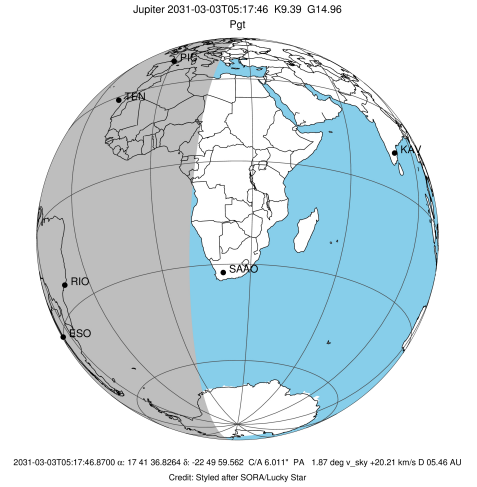


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-03T04:18:07.731	14.00	-55.35	71490.7	-22.00	-24.77
Jupiter	E	2031-03-03T06:09:03.571	38.71	-36.10	71490.9	-19.65	-22.19

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-03T05:13:28.500
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        : 4116928536478117376
2Mass ID (if available) : 17413682-2249595
ICRS Star Coord at Epoch: 17h 41m 36.82643s -22:49:59.56213s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 9.386
G magnitude           : 14.964
RP magnitude          : 13.558
BP magnitude          : 17.393
DUPflag              : 0
Distance (au)         : 5.463
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 20.21
Sun-Target sep (deg)  : 76.23
Sun-Moon sep (deg)   : 172.17
B (ring opening deg) : -2.65
PA of pole (deg)     : 1.14
Pole direction: RA (deg): 268.05701
Dec (deg): 64.49651
C/A sky separation (") : 6.833
C/A sky separation (km) : 27073.8
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	2031-03-03T04:19:13.615	-5.75x	-52.98	71490.5	-23.37	-26.27
Jupiter	E	2031-03-03T06:08:01.618	16.03	-49.95	71490.8	-21.06	-23.74