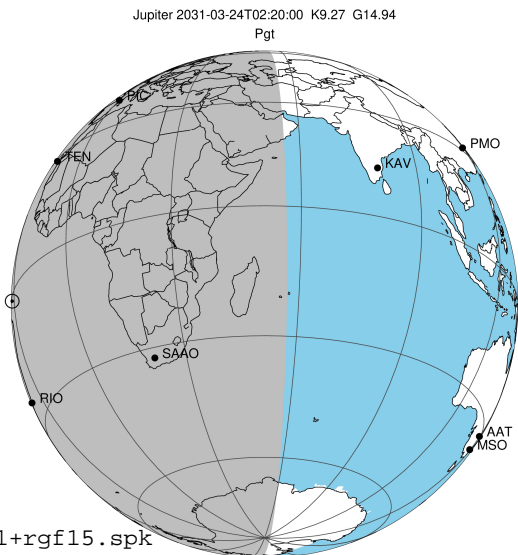


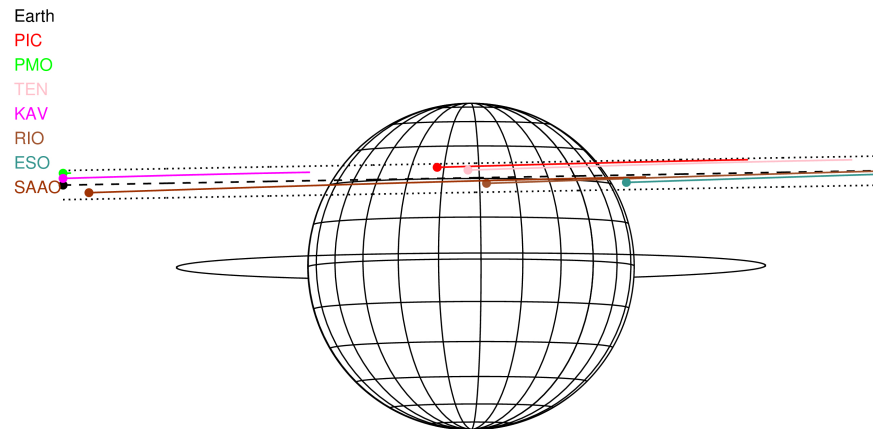
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-03-24T02:20:00.080
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068897779726928256
 2Mass ID (if available) : 17501960-2252434

Jupiter 2031-03-24T02:20:00 K9.27 G14.94 Pgt

ICRS Star Coord at Epoch: 17h 50m 19.60415s -22:52:43.44050s
 RUWE (>1.4 is poor) : 0.93
 K magnitude : 9.270
 G magnitude : 14.942
 RP magnitude : 13.588
 BP magnitude : 17.131
 DUPflag : 0
 Distance (au) : 5.127
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : 10.52
 Sun-Target sep (deg) : 95.05
 Sun-Moon sep (deg) : 106.62
 B (ring opening deg) : -2.62
 PA of pole (deg) : 0.20
 Pole direction: RA (deg): 268.05699
 Dec (deg): 64.49651
 C/A sky separation (") : 10.443
 C/A sky separation (km) : 38828.7
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

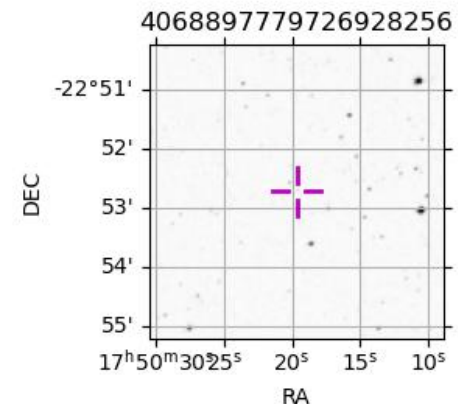


2031-03-24T02:20:00.0800 a: 17 50 19.6042 s: -22 52 43.440 C/A ***** PA 181.02 deg v_sky +10.52 km/s D 05.13 AU
 Credit: Styled after SORA/Lucky Star



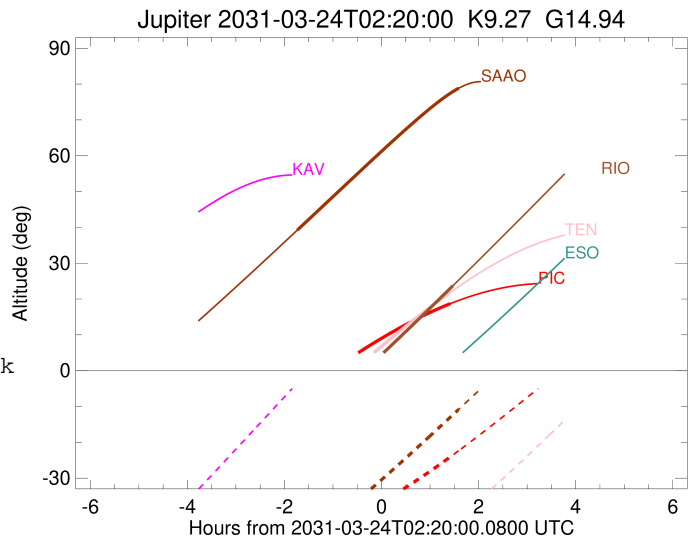
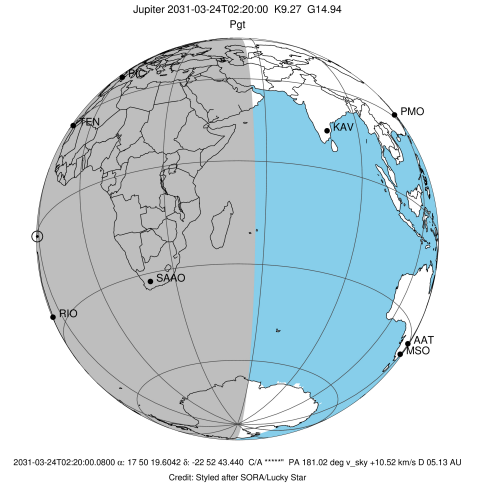
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	MAR 24 03:45 - MAR 24 03:45	Pne
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 24 03:43 - MAR 24 03:43	Pne
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 24 03:48 - MAR 24 03:48	Pne
ESO	European Southern Obs. (3.6m)	-29.3	289.3			Pnn
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	MAR 24 00:35 - MAR 24 03:55	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-24T02:13:12.920
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       : 4068897779726928256
2Mass ID (if available) : 17501960-2252434
ICRS Star Coord at Epoch: 17h 50m 19.60415s -22:52:43.44049s
RUWE (>1.4 is poor) : 0.93
K magnitude           : 9.270
G magnitude           : 14.942
RP magnitude          : 13.588
BP magnitude          : 17.131
DUPflag              : 0
Distance (au)        : 5.127
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 10.52
Sun-Target sep (deg) : 95.05
Sun-Moon sep (deg)   : 106.62
B (ring opening deg) : -2.62
PA of pole (deg)     : 0.20
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 11.793
C/A sky separation (km) : 43849.5
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
    
```

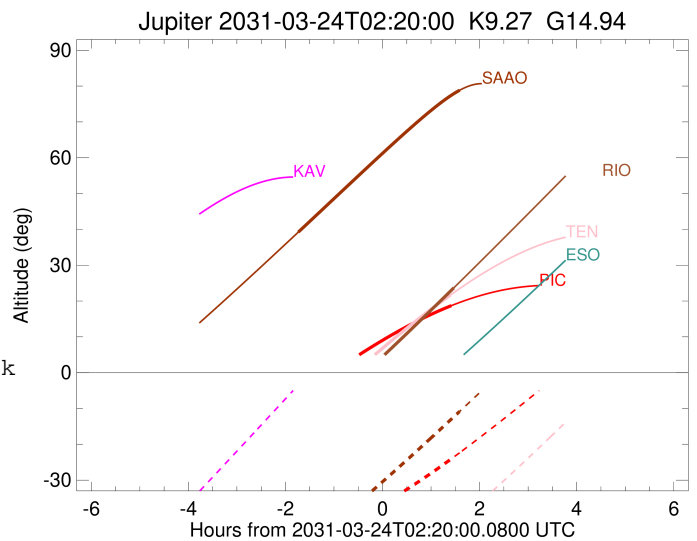
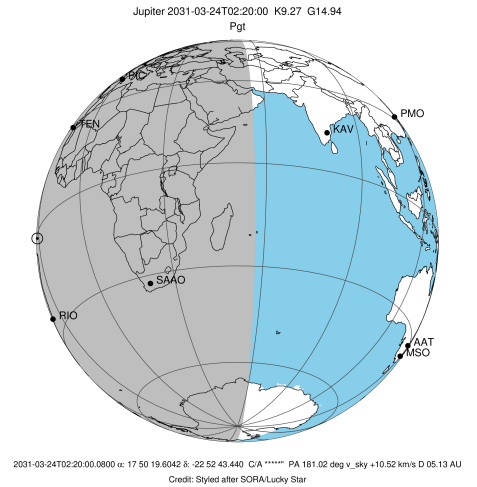


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-24T00:42:38.673	-5.71x	-45.22	71488.7	36.31	39.95
Jupiter	E	2031-03-24T03:45:04.347	18.70	-24.05	71488.3	39.11	42.80

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-24T02:10:32.780
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       : 4068897779726928256
2Mass ID (if available) : 17501960-2252434
ICRS Star Coord at Epoch: 17h 50m 19.60415s -22:52:43.44049s
RUWE (>1.4 is poor) : 0.93
K magnitude           : 9.270
G magnitude           : 14.942
RP magnitude         : 13.588
BP magnitude         : 17.131
DUPflag              : 0
Distance (au)        : 5.127
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 10.52
Sun-Target sep (deg) : 95.05
Sun-Moon sep (deg)   : 106.52
B (ring opening deg) : -2.62
PA of pole (deg)     : 0.20
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 11.364
C/A sky separation (km) : 42254.2
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
    
```

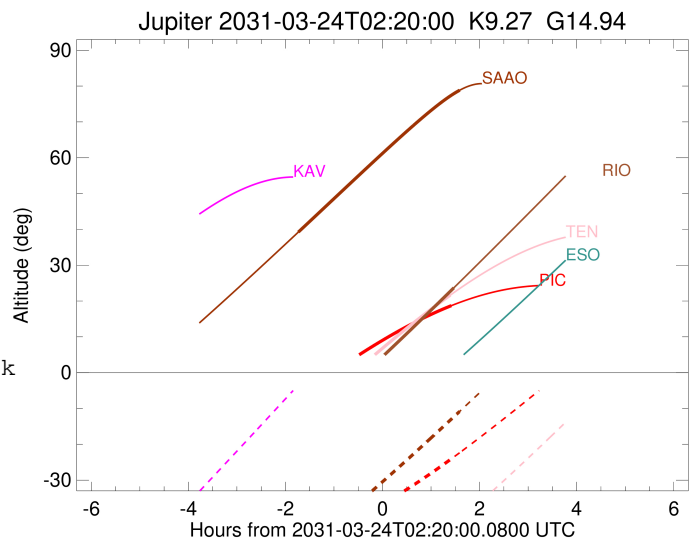
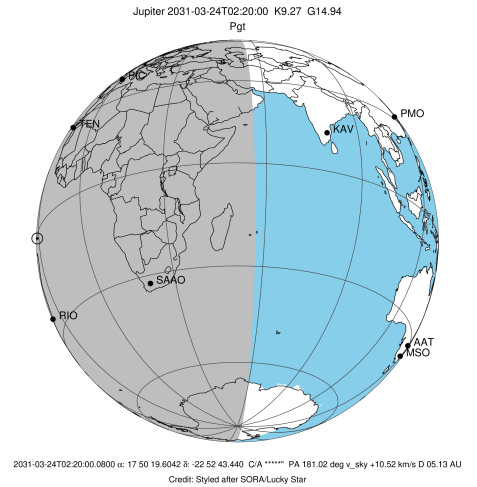


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-24T00:38:53.958	-13.48x	-59.52	71489.0	34.52	38.10
Jupiter	E	2031-03-24T03:43:55.264	21.67	-43.24	71488.5	37.77	41.44

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-24T02:09:56.360
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        : 4068897779726928256
2Mass ID (if available) : 17501960-2252434
ICRS Star Coord at Epoch: 17h 50m 19.60415s -22:52:43.44049s
RUWE (>1.4 is poor) : 0.93
K magnitude           : 9.270
G magnitude           : 14.942
RP magnitude          : 13.588
BP magnitude          : 17.131
DUPflag               : 0
Distance (au)         : 5.127
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 10.52
Sun-Target sep (deg)  : 95.05
Sun-Moon sep (deg)    : 106.44
B (ring opening deg) : -2.62
PA of pole (deg)      : 0.20
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 9.731
C/A sky separation (km) : 36182.0
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
    
```

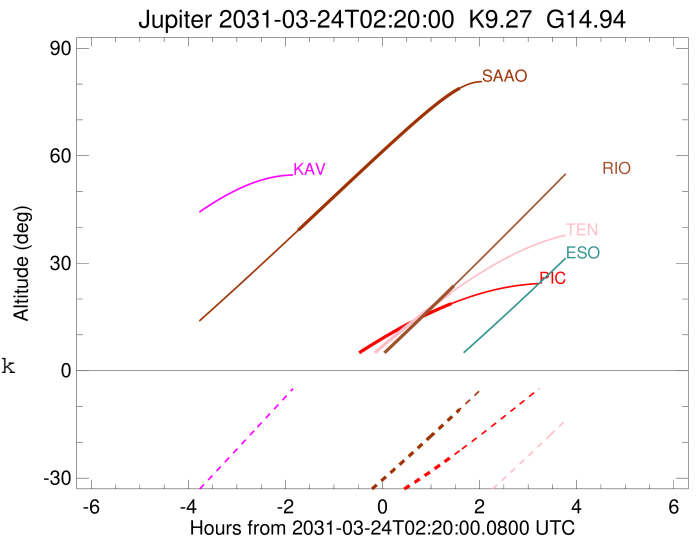
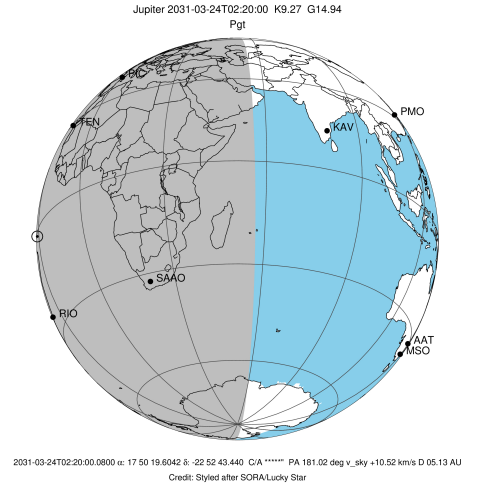


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-24T00:33:51.802	-17.07x	-48.67	71489.8	28.73	32.03
Jupiter	E	2031-03-24T03:48:00.800	23.64	-65.52	71489.3	32.08	35.56

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-24T02:14:59.390
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        : 4068897779726928256
2Mass ID (if available) : 17501960-2252434
ICRS Star Coord at Epoch: 17h 50m 19.60415s -22:52:43.44049s
RUWE (>1.4 is poor)  : 0.93
K magnitude           : 9.270
G magnitude           : 14.942
RP magnitude          : 13.588
BP magnitude          : 17.131
DUPflag              : 0
Distance (au)         : 5.127
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 10.52
Sun-Target sep (deg)  : 95.05
Sun-Moon sep (deg)   : 107.29
B (ring opening deg) : -2.62
PA of pole (deg)     : 0.20
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 10.068
C/A sky separation (km) : 37435.4
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	2031-03-24T00:35:58.566	39.24	-49.24	71489.6	30.11	33.49
Jupiter	E	2031-03-24T03:55:16.489	78.82	-10.83	71489.3	32.67	36.17