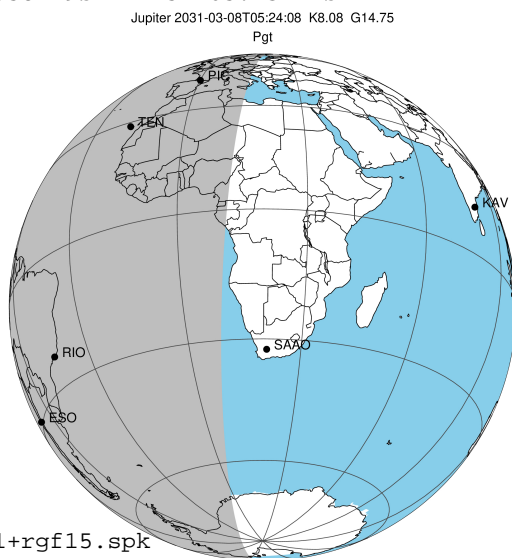


target : Jupiter  
target radius (km) : 71492.00  
C/A epoch : 2031-03-08T05:24:08.910  
Event type : Pgt  
: Jupiter occs: geocentric, topocentric  
: Not a ringed target  
Gaia source ID : 4116893077220241536  
2Mass ID (if available) : 17440857-2251048

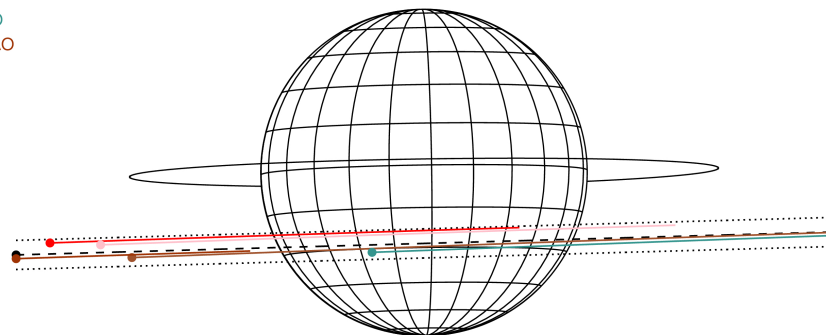
Jupiter 2031-03-08T05:24:08 K8.08 G14.75 Pgt

ICRS Star Coord at Epoch: 17h 44m 08.58429s -22:51:05.13442s

RUWE (>1.4 is poor) : 1.03  
K magnitude : 8.080  
G magnitude : 14.746  
RP magnitude : 13.376  
BP magnitude : 16.870  
DUPflag : 0  
Distance (au) : 5.383  
f0 (km) : 0.00  
g0 (km) : 0.00  
skyplane vel. (km/s) : 17.97  
Sun-Target sep (deg) : 80.66  
Sun-Moon sep (deg) : 110.83  
B (ring opening deg) : -2.64  
PA of pole (deg) : 0.87  
Pole direction: RA (deg): 268.05700  
Dec (deg): 64.49651  
C/A sky separation (") : 7.956  
C/A sky separation (km) : 31063.2  
NAIF SPICE kernels : RAJobs\_U111+rgf15.spk



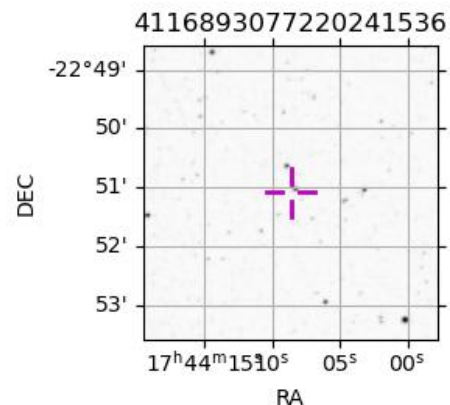
Earth  
PIC  
TEN  
RIO  
ESO  
SAAO



2031-03-08T05:24:08.91000000: 17 44 08.5843 8 -22 51 05.1344 C/A 7.966 PA 1.61 deg v\_sky +17.97 km/s D 05.38 AU  
Credit: Styled after SORA/Lucky Star

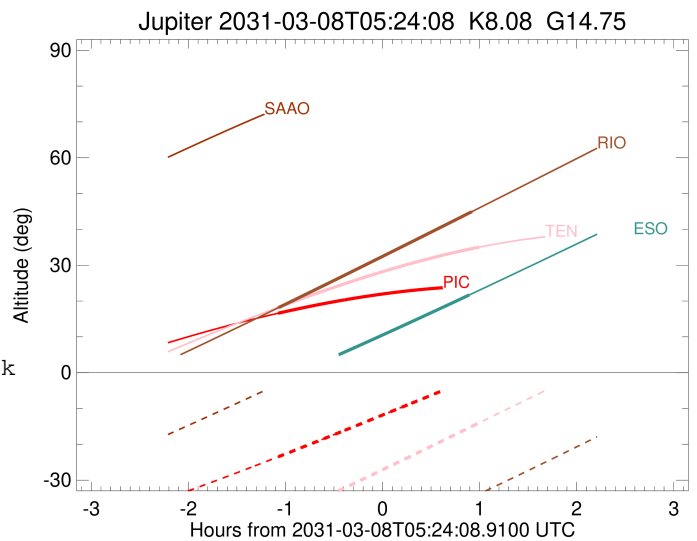
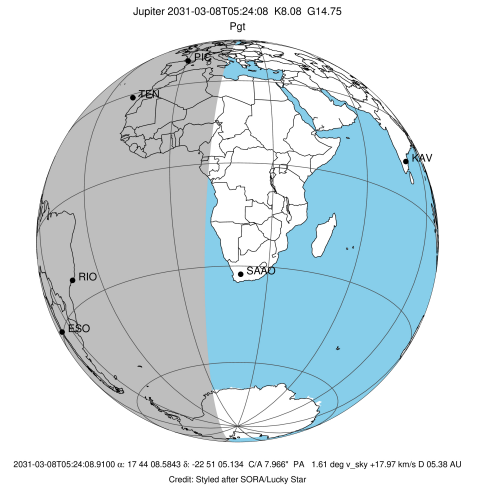
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	MAR 08 04:19 - MAR 08 04:19	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 08 04:18 - MAR 08 06:23	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 08 04:20 - MAR 08 06:19	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	MAR 08 06:17 - MAR 08 06:17	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             : 2031-03-08T05:22:36.340
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        : 4116893077220241536
2Mass ID (if available) : 17440857-2251048
ICRS Star Coord at Epoch: 17h 44m 08.58429s -22:51:05.13442s
RUWE (>1.4 is poor) : 1.03
K magnitude           : 8.080
G magnitude           : 14.746
RP magnitude          : 13.376
BP magnitude          : 16.870
DUPflag              : 0
Distance (au)         : 5.383
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 17.97
Sun-Target sep (deg) : 80.66
Sun-Moon sep (deg)   : 111.22
B (ring opening deg) : -2.64
PA of pole (deg)     : 0.87
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (") : 6.509
C/A sky separation (km) : 25411.8
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
    
```

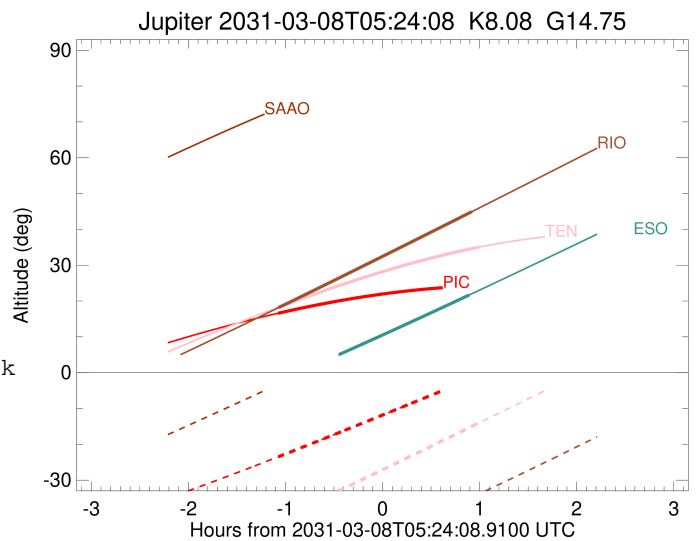
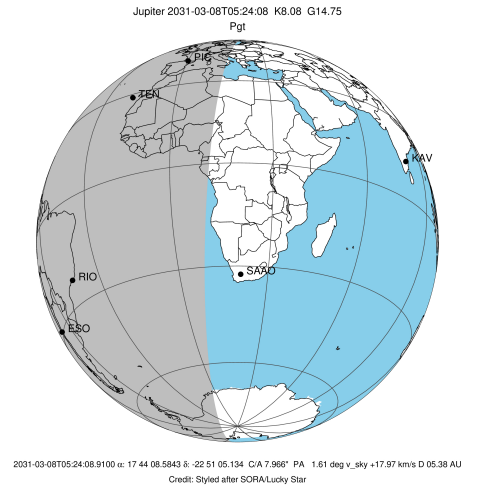


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-08T04:19:38.008	16.58	-23.49	71490.7	-21.76	-24.51
Jupiter	E	2031-03-08T06:25:46.419	24.28	-0.52x	71490.9	-19.94	-22.51

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-08T05:21:03.080
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        : 4116893077220241536
2Mass ID (if available) : 17440857-2251048
ICRS Star Coord at Epoch: 17h 44m 08.58429s -22:51:05.13442s
RUWE (>1.4 is poor) : 1.03
K magnitude           : 8.080
G magnitude           : 14.746
RP magnitude          : 13.376
BP magnitude          : 16.870
DUPflag              : 0
Distance (au)         : 5.383
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 17.97
Sun-Target sep (deg)  : 80.66
Sun-Moon sep (deg)    : 111.41
B (ring opening deg) : -2.64
PA of pole (deg)      : 0.87
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (") : 6.822
C/A sky separation (km) : 26634.7
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
    
```

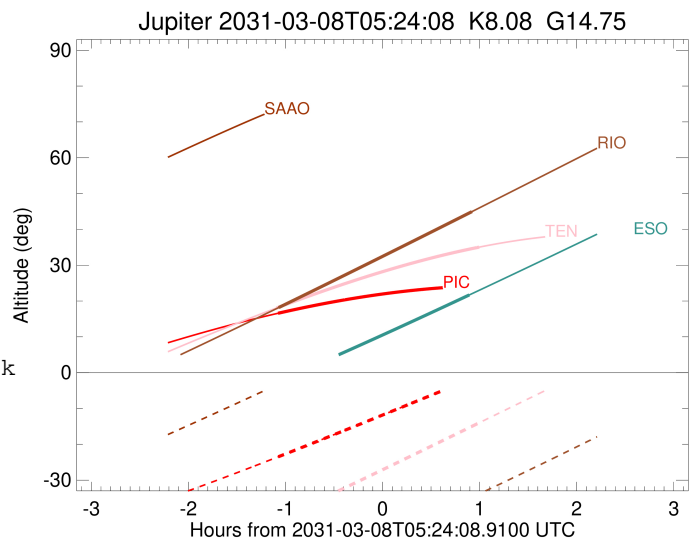
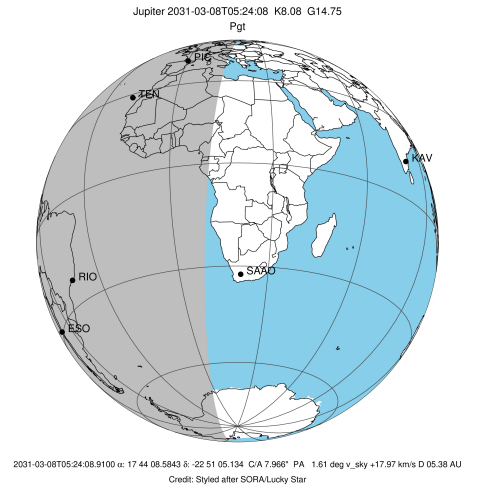


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-08T04:18:34.484	18.04	-41.11	71490.5	-22.97	-25.83
Jupiter	E	2031-03-08T06:23:50.716	35.03	-14.01	71490.8	-20.83	-23.49

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-08T05:19:32.070
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       : 4116893077220241536
2Mass ID (if available) : 17440857-2251048
ICRS Star Coord at Epoch: 17h 44m 08.58429s -22:51:05.13442s
RUWE (>1.4 is poor) : 1.03
K magnitude           : 8.080
G magnitude           : 14.746
RP magnitude          : 13.376
BP magnitude          : 16.870
DUPflag              : 0
Distance (au)         : 5.383
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 17.97
Sun-Target sep (deg) : 80.66
Sun-Moon sep (deg)   : 111.59
B (ring opening deg) : -2.64
PA of pole (deg)     : 0.87
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation ("): 8.316
C/A sky separation (km): 32470.5
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
    
```

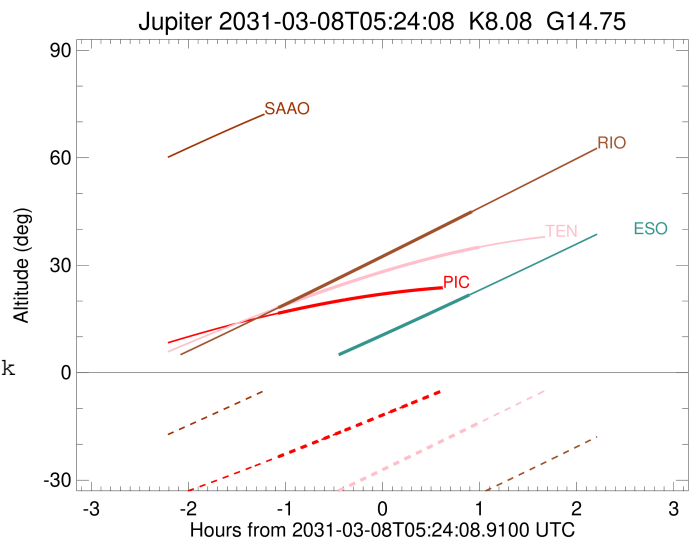
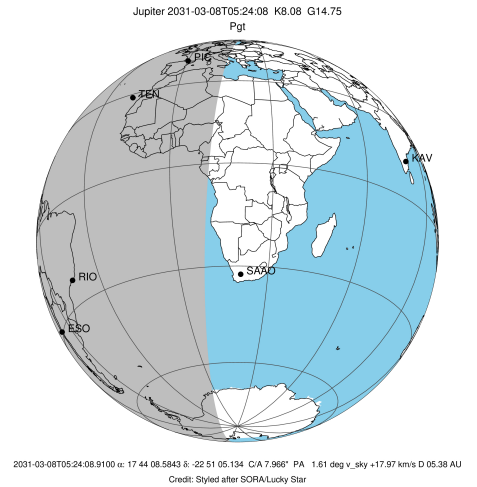


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-08T04:20:04.272	18.19	-56.58	71489.9	-28.24	-31.50
Jupiter	E	2031-03-08T06:19:24.046	44.95	-34.78	71490.2	-25.78	-28.87

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-08T05:19:19.730
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        : 4116893077220241536
2Mass ID (if available) : 17440857-2251048
ICRS Star Coord at Epoch: 17h 44m 08.58429s -22:51:05.13442s
RUWE (>1.4 is poor) : 1.03
K magnitude           : 8.080
G magnitude           : 14.746
RP magnitude          : 13.376
BP magnitude          : 16.870
DUPflag              : 0
Distance (au)         : 5.383
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 17.97
Sun-Target sep (deg)  : 80.66
Sun-Moon sep (deg)    : 111.30
B (ring opening deg) : -2.64
PA of pole (deg)      : 0.87
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (") : 8.739
C/A sky separation (km) : 34121.9
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	2031-03-08T04:21:18.199	-2.06x	-55.05	71489.7	-29.70	-33.06
Jupiter	E	2031-03-08T06:17:44.914	21.68	-50.43	71490.0	-27.23	-30.43