

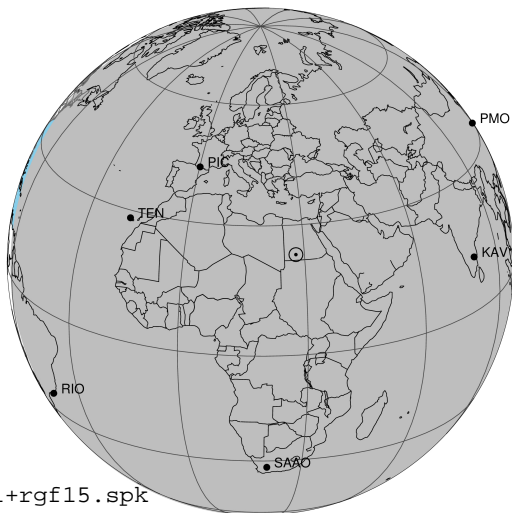
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2024-12-14T22:03:30.510
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 3412355571121140224
 2Mass ID (if available) : 04545830+2156353

Jupiter 2024-12-14T22:03:30 K9.75 G12.66 Pgt

ICRS Star Coord at Epoch: 04h 54m 58.29743s +21:56:35.15772s

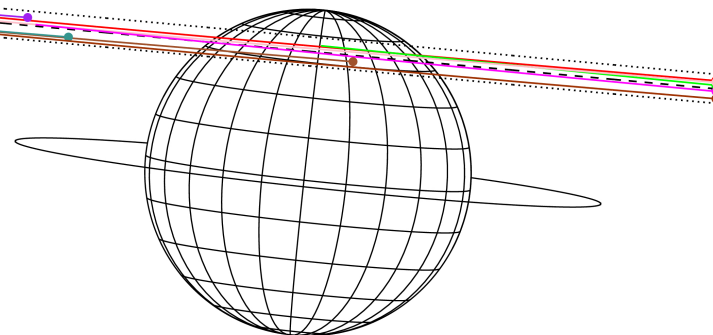
RUWE (>1.4 is poor) : 0.97
 K magnitude : 9.754
 G magnitude : 12.664
 RP magnitude : 11.799
 BP magnitude : 13.444
 DUPflag : 0
 Distance (au) : 4.101
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -16.54
 Sun-Target sep (deg) : 171.85
 Sun-Moon sep (deg) : 5.84
 B (ring opening deg) : 2.85
 PA of pole (deg) : -6.12
 Pole direction: RA (deg): 268.05784
 Dec (deg): 64.49672
 C/A sky separation (") : 17.782
 C/A sky separation (km) : 52886.1
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2024-12-14T22:03:30 K9.75 G12.66
 Pgt



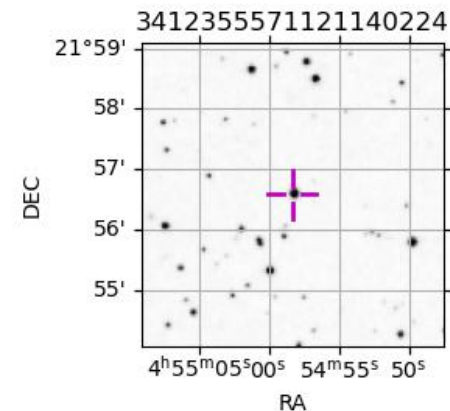
2024-12-14T22:03:30.5100 a: 04 54 58.2974 s: +21 56 35.158 C/A ***** PA 174.73 deg v_sky -16.54 km/s D 04.10 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 PAL
 PMO
 KPNO
 MCD
 TEN
 KAV
 RIO
 ESO
 SAAO



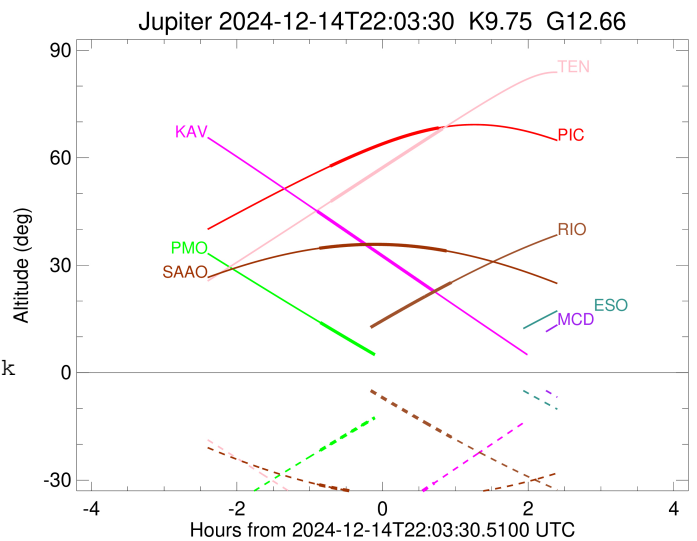
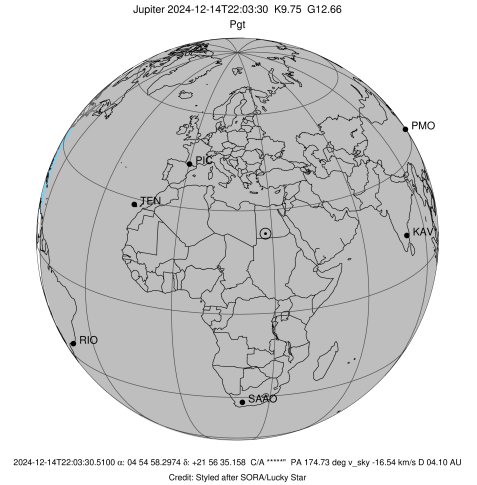
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+ +	DEC 14 21:20 - DEC 14 22:49	Pie
PAL	Palomar Mt (200")	33.4	243.1			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+	DEC 14 21:12 - DEC 14 21:12	Pin
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	+ +	DEC 14 21:20 - DEC 14 22:52	Pie
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+ +	DEC 14 21:09 - DEC 14 22:46	Pie
RIO	Rio de Janeiro	-22.9	316.8	+	DEC 14 23:00 - DEC 14 23:00	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	+ +	DEC 14 21:11 - DEC 14 22:56	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2024-12-14T22:05:01.760
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        : 3412355571121140224
2Mass ID (if available) : 04545830+2156353
ICRS Star Coord at Epoch: 04h 54m 58.29743s +21:56:35.15772s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 9.754
G magnitude           : 12.664
RP magnitude          : 11.799
BP magnitude          : 13.444
DUPflag              : 0
Distance (au)         : 4.101
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.54
Sun-Target sep (deg) : 171.85
Sun-Moon sep (deg)   : 5.64
B (ring opening deg) : 2.85
PA of pole (deg)     : -6.12
Pole direction: RA (deg): 268.05784
Dec (deg): 64.49672
C/A sky separation (") : 18.614
C/A sky separation (km) : 55361.2
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
    
```

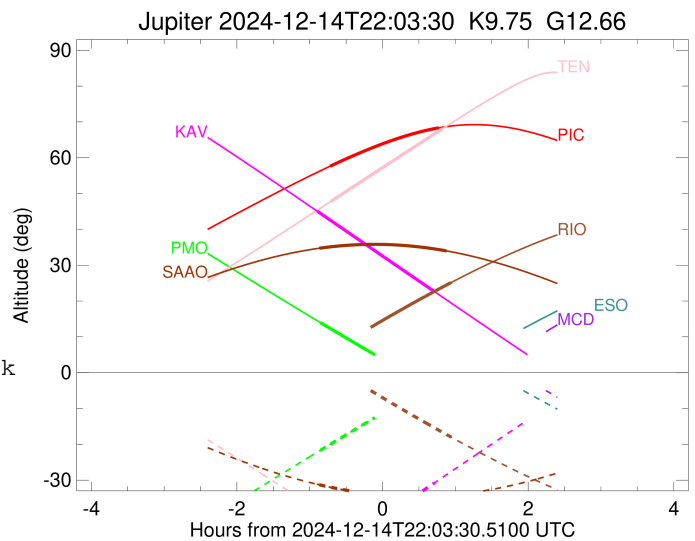
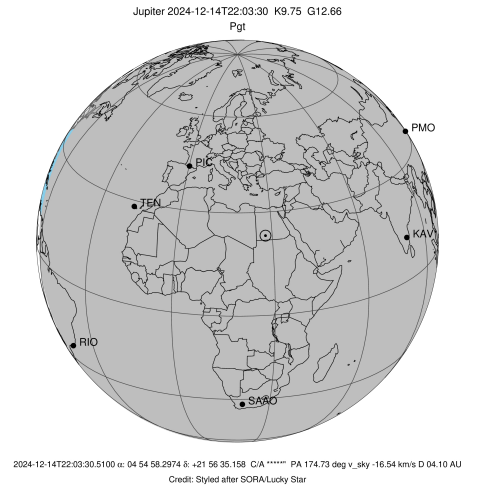


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2024-12-14T21:20:19.283	57.63	-52.73	71485.1	51.79	55.31
Jupiter	E	2024-12-14T22:49:40.766	68.32	-66.35	71485.5	49.62	53.22

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2024-12-14T21:57:18.780
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : PMO
Location            : Purple Mtn Obs. Nanking
Latitude (deg)      : 32.06667
E. Longitude (deg)  : 118.82089
Altitude (km)       : 0.364
Gaia source ID      : 3412355571121140224
2Mass ID (if available) : 04545830+2156353
ICRS Star Coord at Epoch: 04h 54m 58.29743s +21:56:35.15772s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 9.754
G magnitude          : 12.664
RP magnitude         : 11.799
BP magnitude         : 13.444
DUPflag             : 0
Distance (au)       : 4.101
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.54
Sun-Target sep (deg) : 171.85
Sun-Moon sep (deg)  : 5.17
B (ring opening deg) : 2.85
PA of pole (deg)    : -6.12
Pole direction: RA (deg): 268.05784
Dec (deg): 64.49672
C/A sky separation ("): 18.763
C/A sky separation (km): 55803.8
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
    
```

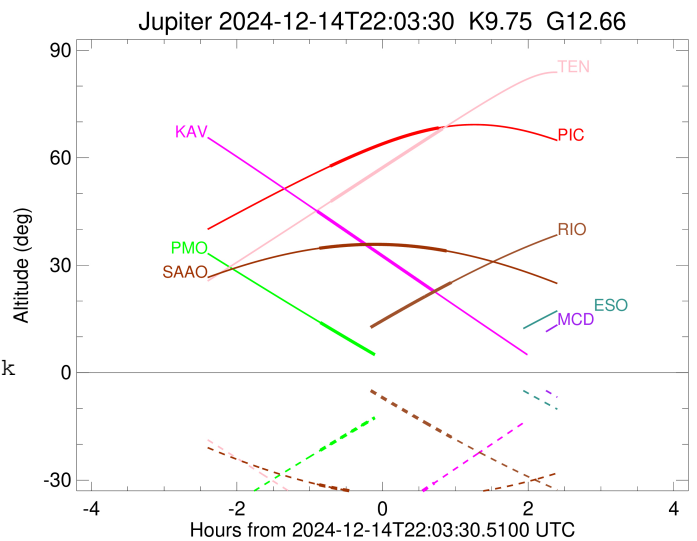
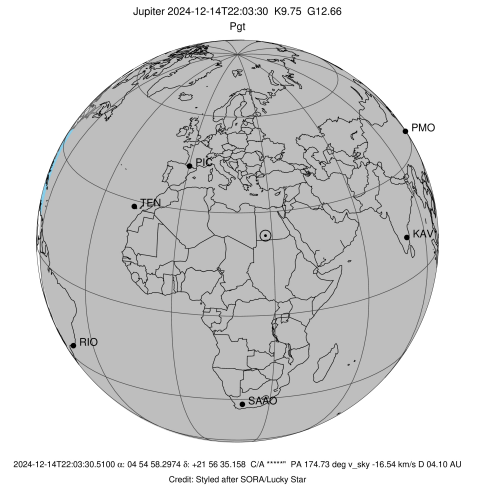


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2024-12-14T21:12:18.021	13.98	-21.67	71485.2	51.57	55.10
Jupiter	E	2024-12-14T22:42:32.926	-3.68x	-3.68x	71485.3	50.90	54.46

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2024-12-14T22:07:00.810
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        : 3412355571121140224
2Mass ID (if available) : 04545830+2156353
ICRS Star Coord at Epoch: 04h 54m 58.29743s +21:56:35.15772s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 9.754
G magnitude           : 12.664
RP magnitude          : 11.799
BP magnitude          : 13.444
DUPflag              : 0
Distance (au)         : 4.101
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.54
Sun-Target sep (deg) : 171.85
Sun-Moon sep (deg)   : 5.91
B (ring opening deg) : 2.85
PA of pole (deg)     : -6.12
Pole direction: RA (deg): 268.05784
Dec (deg): 64.49672
C/A sky separation (") : 18.233
C/A sky separation (km) : 54228.7
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
    
```

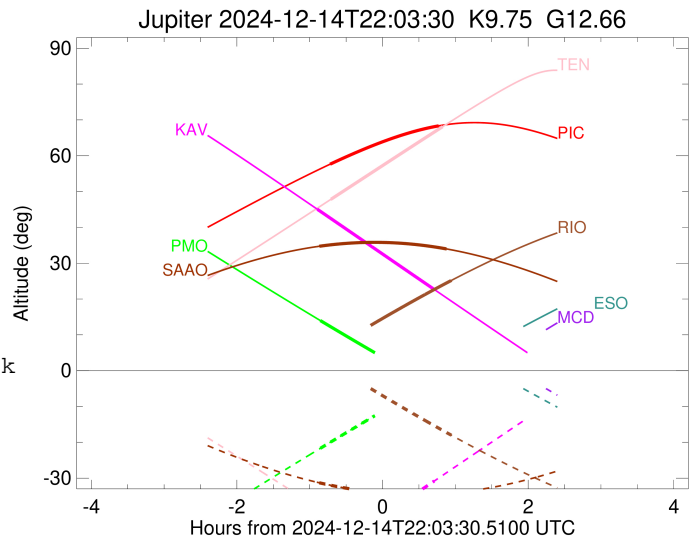
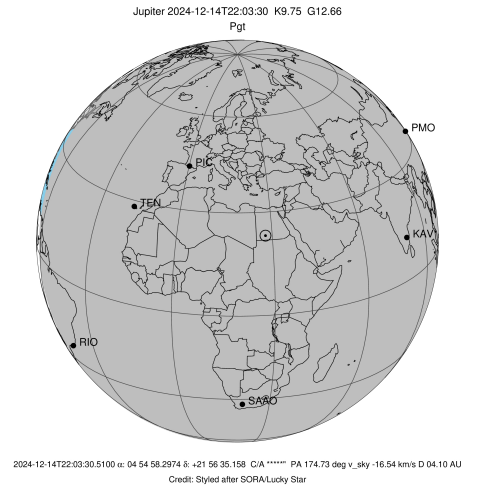


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2024-12-14T21:20:57.327	47.82	-40.59	71485.4	50.54	54.11
Jupiter	E	2024-12-14T22:52:56.423	68.08	-60.81	71485.8	48.05	51.69

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2024-12-14T21:57:48.320
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : KAV
Location             : Kavalur Observatory
Latitude (deg)       : 12.57556
E. Longitude (deg)  : 78.83167
Altitude (km)        : 0.722
Gaia source ID       : 3412355571121140224
2Mass ID (if available) : 04545830+2156353
ICRS Star Coord at Epoch: 04h 54m 58.29743s +21:56:35.15772s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 9.754
G magnitude           : 12.664
RP magnitude          : 11.799
BP magnitude          : 13.444
DUPflag              : 0
Distance (au)         : 4.101
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.54
Sun-Target sep (deg) : 171.85
Sun-Moon sep (deg)   : 5.73
B (ring opening deg) : 2.85
PA of pole (deg)     : -6.12
Pole direction: RA (deg): 268.05784
Dec (deg): 64.49672
C/A sky separation ("): 17.641
C/A sky separation (km): 52466.7
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
    
```

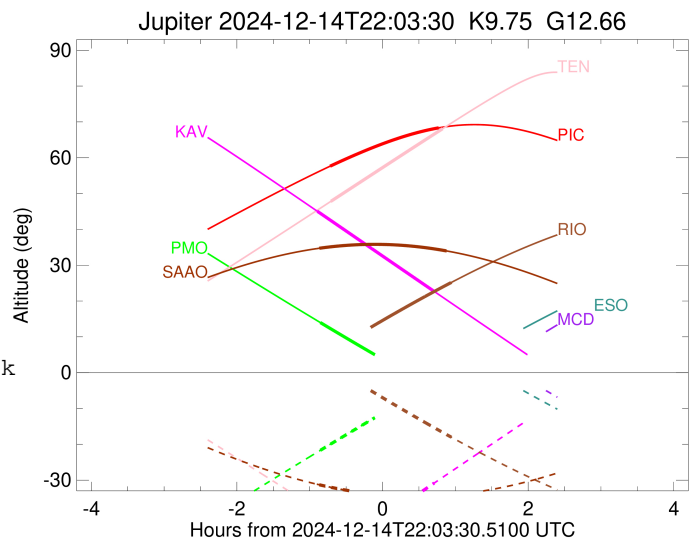
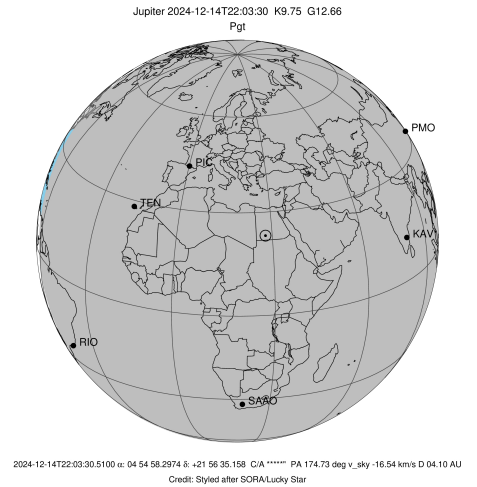


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2024-12-14T21:09:46.164	45.06	-52.84	71485.9	47.62	51.28
Jupiter	E	2024-12-14T22:46:04.778	22.69	-30.83	71486.1	46.75	50.42

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2024-12-14T22:09:26.580
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       : 3412355571121140224
2Mass ID (if available) : 04545830+2156353
ICRS Star Coord at Epoch: 04h 54m 58.29743s +21:56:35.15772s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 9.754
G magnitude          : 12.664
RP magnitude         : 11.799
BP magnitude         : 13.444
DUPflag             : 0
Distance (au)        : 4.101
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.54
Sun-Target sep (deg) : 171.85
Sun-Moon sep (deg)   : 6.59
B (ring opening deg) : 2.85
PA of pole (deg)     : -6.12
Pole direction: RA (deg): 268.05784
Dec (deg): 64.49672
C/A sky separation (") : 16.813
C/A sky separation (km) : 50003.8
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
    
```

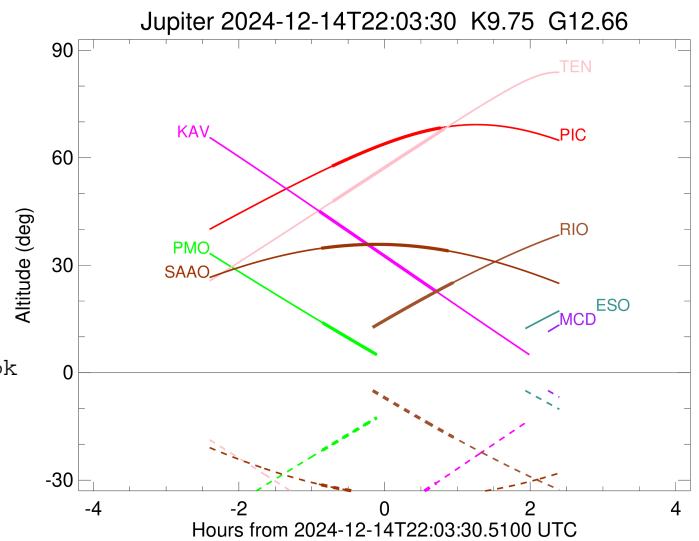
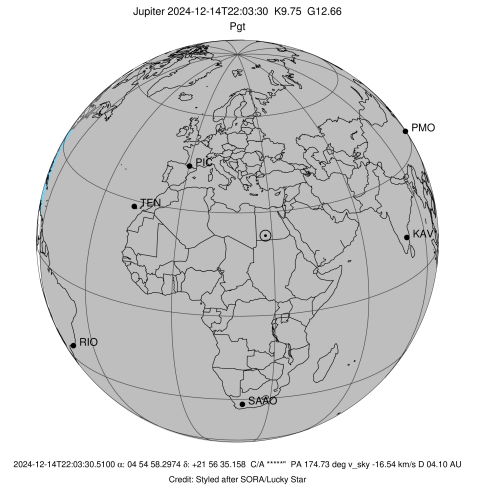


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2024-12-14T21:18:27.002	5.47	2.32x	71486.3	45.72	49.41
Jupiter	E	2024-12-14T23:00:10.848	25.17	-18.00	71486.8	42.95	46.66

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2024-12-14T22:03:53.820
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      : 3412355571121140224
2Mass ID (if available) : 04545830+2156353
ICRS Star Coord at Epoch: 04h 54m 58.29743s +21:56:35.15772s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 9.754
G magnitude          : 12.664
RP magnitude         : 11.799
BP magnitude         : 13.444
DUPflag             : 0
Distance (au)       : 4.101
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.54
Sun-Target sep (deg) : 171.85
Sun-Moon sep (deg)  : 6.68
B (ring opening deg) : 2.85
PA of pole (deg)    : -6.12
Pole direction: RA (deg): 268.05784
Dec (deg): 64.49672
C/A sky separation (") : 16.046
C/A sky separation (km) : 47724.3
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	2024-12-14T21:11:32.892	34.73	-31.30	71486.8	42.83	46.55
Jupiter	E	2024-12-14T22:56:15.128	33.98	-34.21	71487.2	40.92	44.64