

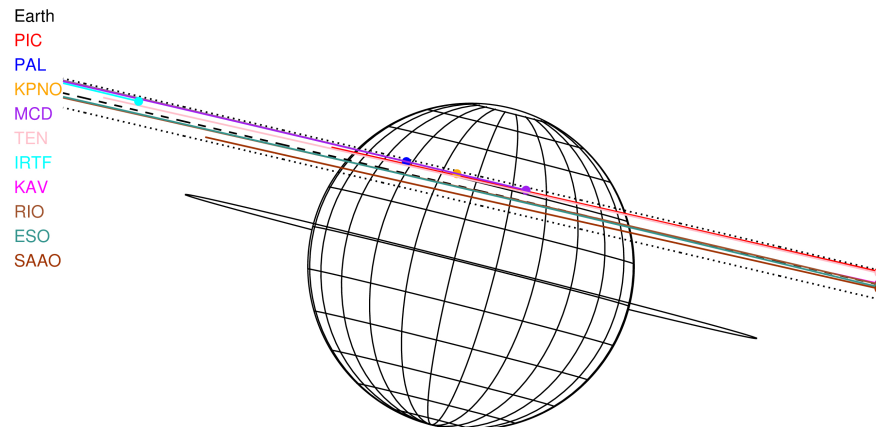
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2044-08-02T02:23:15.190  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 6854289486796823168  
 2Mass ID (if available) : 20102516-2040185

Jupiter 2044-08-02T02:23:15 K9.93 G12.40 Pgt

ICRS Star Coord at Epoch: 20h 10m 25.14810s -20:40:18.71491s  
 RUWE (>1.4 is poor) : 1.09  
 K magnitude : 9.931  
 G magnitude : 12.398  
 RP magnitude : 11.647  
 BP magnitude : 13.015  
 DUPflag : 0  
 Distance (au) : 4.117  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -15.67  
 Sun-Target sep (deg) : 170.41  
 Sun-Moon sep (deg) : 65.09  
 B (ring opening deg) : -0.75  
 PA of pole (deg) : -14.13  
 Pole direction: RA (deg): 268.05689  
 Dec (deg): 64.49728  
 C/A sky separation (") : 11.091  
 C/A sky separation (km) : 33120.4  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

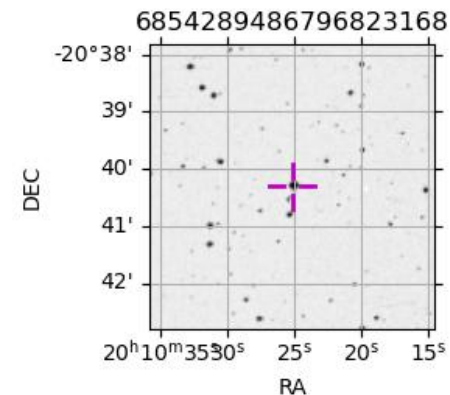


2044-08-02T02:23:15.1900 a: 20 10 25.1481 & -20 40 18.715 C/A \*\*\*\*\* PA 166.78 deg v\_sky -15.67 km/s D 04.12 AU  
 Credit: Styled after SORA/Lucky Star



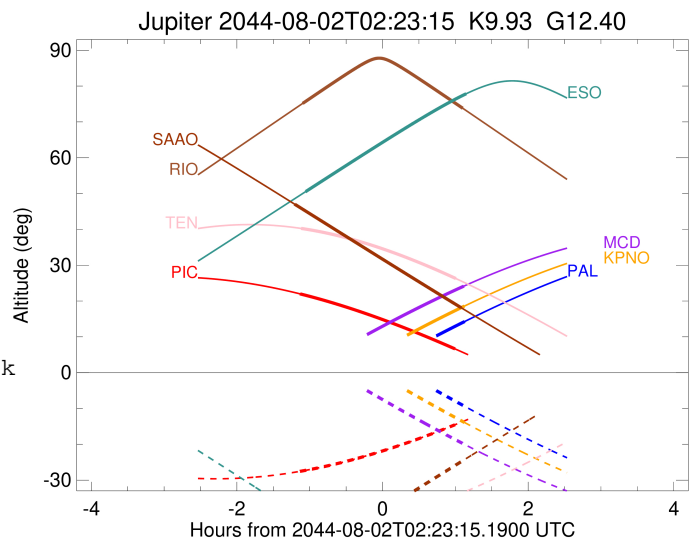
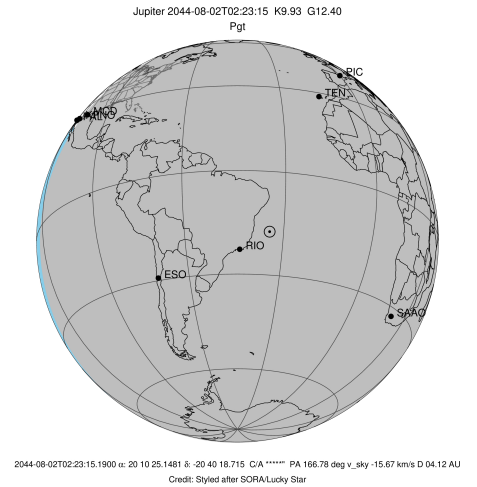
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+ +	AUG 02 01:15 - AUG 02 03:23	Pie
PAL	Palomar Mt (200")	33.4	243.1	+ +	AUG 02 03:30 - AUG 02 03:30	Pne
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+ +	AUG 02 03:30 - AUG 02 03:30	Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	AUG 02 03:30 - AUG 02 03:30	Pne
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	AUG 02 03:30 - AUG 02 03:30	Pne
TEN	Teide Obs./Tenerife	28.3	343.5	+ +	AUG 02 01:16 - AUG 02 03:23	Pie
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	AUG 02 01:16 - AUG 02 03:23	Pnn
KAV	Kavalur Observatory	12.6	78.8	+ +	AUG 02 01:16 - AUG 02 03:23	Pnn
RIO	Rio de Janeiro	-22.9	316.8	+ +	AUG 02 01:17 - AUG 02 03:29	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	AUG 02 01:19 - AUG 02 03:32	Pie
AAT	Siding Spring (AAT)	-31.3	149.1	+ +	AUG 02 01:19 - AUG 02 03:32	Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	AUG 02 01:10 - AUG 02 03:27	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	AUG 02 01:10 - AUG 02 03:27	Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2044-08-02T02:18:59.940
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        : 6854289486796823168
2Mass ID (if available) : 20102516-2040185
ICRS Star Coord at Epoch: 20h 10m 25.14810s -20:40:18.71491s
RUWE (>1.4 is poor) : 1.09
K magnitude           : 9.931
G magnitude           : 12.398
RP magnitude          : 11.647
BP magnitude          : 13.015
DUPflag              : 0
Distance (au)         : 4.117
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.67
Sun-Target sep (deg)  : 170.41
Sun-Moon sep (deg)   : 65.58
B (ring opening deg) : -0.75
PA of pole (deg)     : -14.13
Pole direction: RA (deg): 268.05689
Dec (deg): 64.49728
C/A sky separation (") : 12.553
C/A sky separation (km) : 37485.9
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
    
```

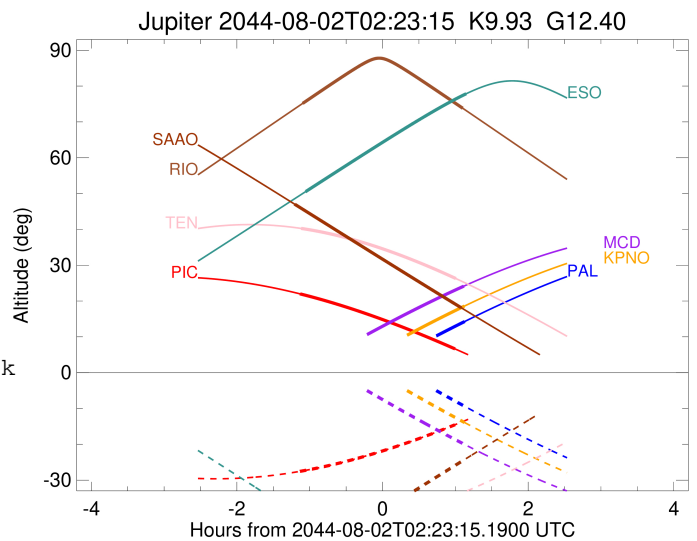
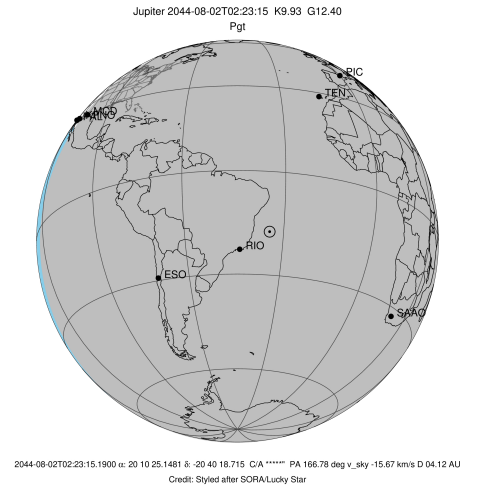


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2044-08-02T01:15:17.090	21.99	-27.54	71491.8	33.00	36.52
Jupiter	E	2044-08-02T03:22:59.711	6.64	-14.53	71491.8	30.20	33.59

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2044-08-02T02:27:17.790
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : PAL
Location             : Palomar Mt (200")
Latitude (deg)       : 33.35622
E. Longitude (deg)  : 243.13601
Altitude (km)       : 1.706
Gaia source ID      : 6854289486796823168
2Mass ID (if available) : 20102516-2040185
ICRS Star Coord at Epoch: 20h 10m 25.14810s -20:40:18.71491s
RUWE (>1.4 is poor) : 1.09
K magnitude          : 9.931
G magnitude          : 12.398
RP magnitude         : 11.647
BP magnitude         : 13.015
DUPflag             : 0
Distance (au)       : 4.117
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.67
Sun-Target sep (deg) : 170.41
Sun-Moon sep (deg)  : 64.90
B (ring opening deg) : -0.75
PA of pole (deg)    : -14.13
Pole direction: RA (deg): 268.05689
Dec (deg): 64.49728
C/A sky separation (") : 12.739
C/A sky separation (km) : 38041.7
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
    
```

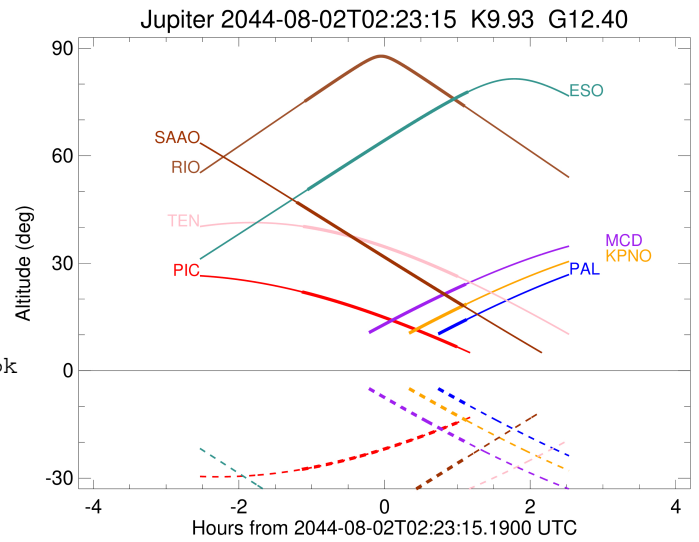
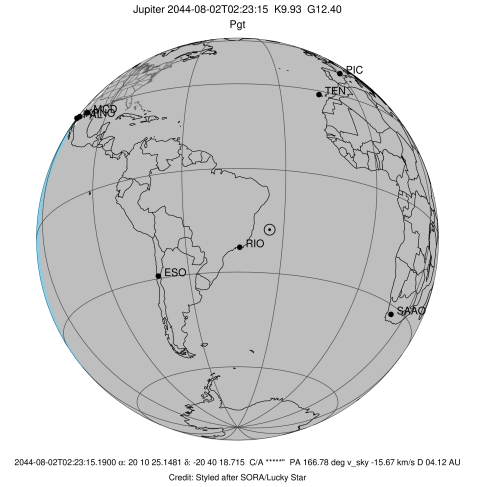


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2044-08-02T01:23:16.779	-9.47x	15.73x	71491.8	32.64	36.14
Jupiter	E	2044-08-02T03:30:56.643	14.27	-9.38	71491.8	31.52	34.97

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2044-08-02T02:27:12.780
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : KPNO
Location              : Kitt Peak Natl Obs
Latitude (deg)        : 31.96333
E. Longitude (deg)    : 248.40000
Altitude (km)         : 2.120
Gaia source ID        : 6854289486796823168
2Mass ID (if available) : 20102516-2040185
ICRS Star Coord at Epoch: 20h 10m 25.14810s -20:40:18.71491s
RUWE (>1.4 is poor) : 1.09
K magnitude           : 9.931
G magnitude           : 12.398
RP magnitude          : 11.647
BP magnitude          : 13.015
DUPflag              : 0
Distance (au)         : 4.117
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.67
Sun-Target sep (deg) : 170.41
Sun-Moon sep (deg)   : 64.97
B (ring opening deg) : -0.75
PA of pole (deg)     : -14.13
Pole direction: RA (deg): 268.05689
Dec (deg): 64.49728
C/A sky separation (") : 12.748
C/A sky separation (km) : 38068.2
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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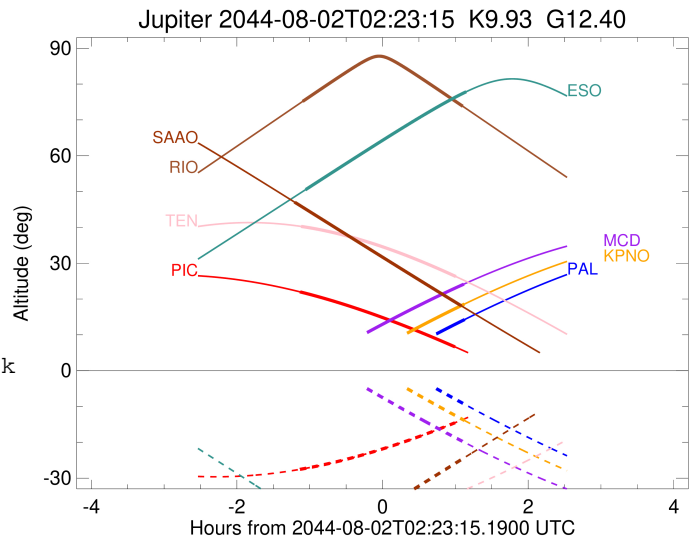
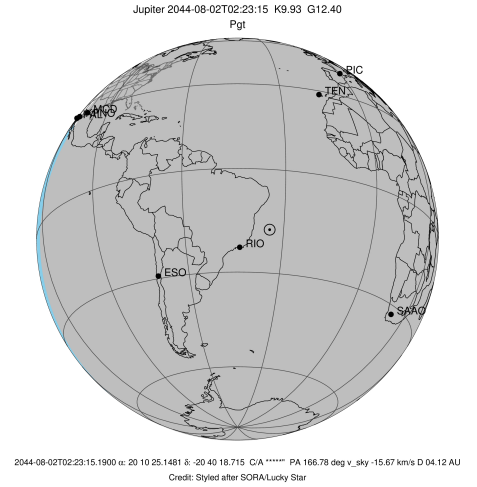


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2044-08-02T01:23:21.126	-4.81x	11.08x	71491.8	32.70	36.20
Jupiter	E	2044-08-02T03:30:43.022	18.57	-13.89	71491.8	31.50	34.95

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2044-08-02T02:26:57.650
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        : 6854289486796823168
2Mass ID (if available) : 20102516-2040185
ICRS Star Coord at Epoch: 20h 10m 25.14810s -20:40:18.71491s
RUWE (>1.4 is poor) : 1.09
K magnitude           : 9.931
G magnitude           : 12.398
RP magnitude          : 11.647
BP magnitude          : 13.015
DUPflag              : 0
Distance (au)         : 4.117
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.67
Sun-Target sep (deg) : 170.41
Sun-Moon sep (deg)   : 65.08
B (ring opening deg) : -0.75
PA of pole (deg)     : -14.13
Pole direction: RA (deg): 268.05689
Dec (deg): 64.49728
C/A sky separation (") : 12.767
C/A sky separation (km) : 38125.0
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
    
```

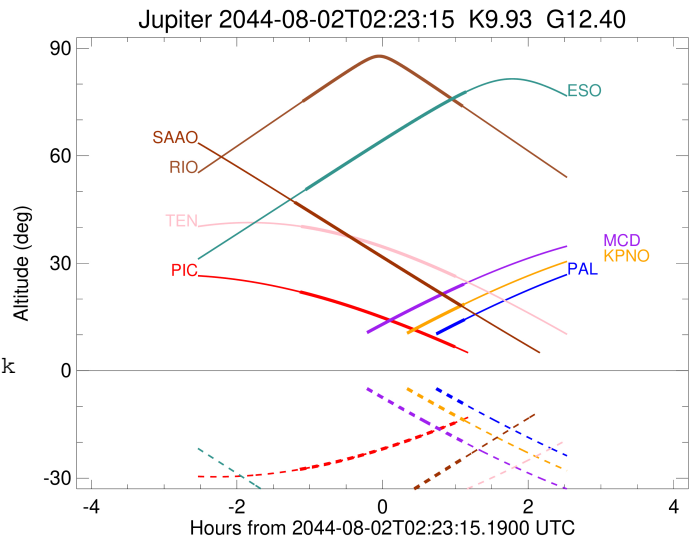
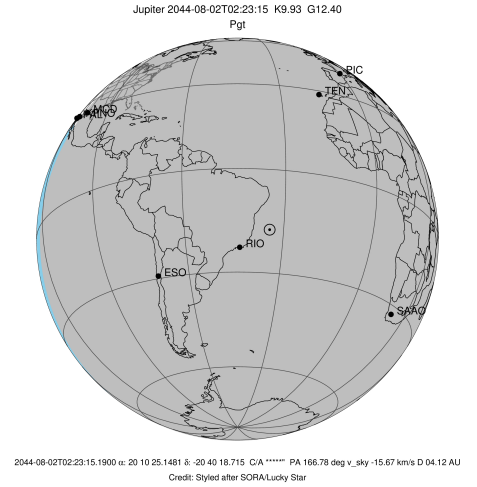


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2044-08-02T01:23:19.729	1.66x	4.50x	71491.8	32.81	36.32
Jupiter	E	2044-08-02T03:30:15.762	24.14	-19.92	71491.8	31.49	34.94

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2044-08-02T02:19:52.920
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      : 6854289486796823168
2Mass ID (if available) : 20102516-2040185
ICRS Star Coord at Epoch: 20h 10m 25.14810s -20:40:18.71491s
RUWE (>1.4 is poor) : 1.09
K magnitude          : 9.931
G magnitude          : 12.398
RP magnitude         : 11.647
BP magnitude         : 13.015
DUPflag             : 0
Distance (au)       : 4.117
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.67
Sun-Target sep (deg) : 170.41
Sun-Moon sep (deg)  : 65.79
B (ring opening deg) : -0.75
PA of pole (deg)    : -14.13
Pole direction: RA (deg): 268.05689
Dec (deg): 64.49728
C/A sky separation (") : 12.387
C/A sky separation (km) : 36990.7
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
    
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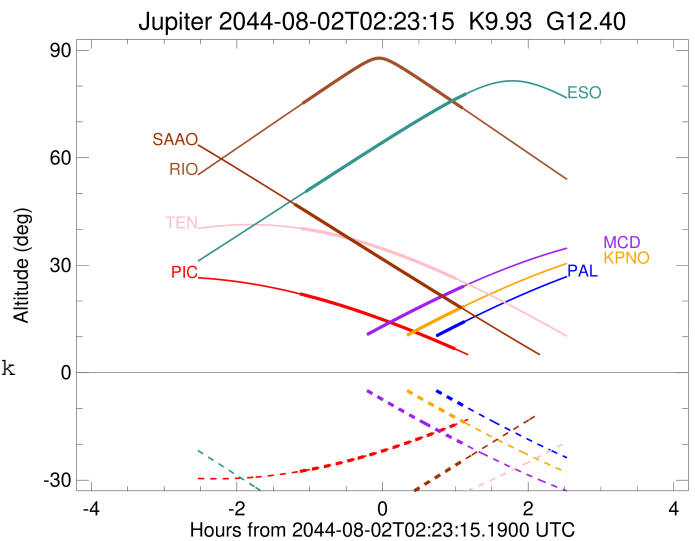
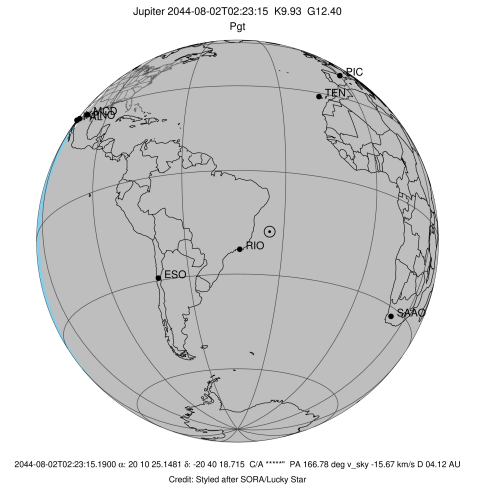


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2044-08-02T01:16:16.680	40.26	-44.24	71491.8	32.54	36.05
Jupiter	E	2044-08-02T03:23:43.306	26.27	-34.29	71491.8	29.68	33.03

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2044-08-02T02:23:27.380
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       : 6854289486796823168
2Mass ID (if available) : 20102516-2040185
ICRS Star Coord at Epoch: 20h 10m 25.14810s -20:40:18.71491s
RUWE (>1.4 is poor) : 1.09
K magnitude           : 9.931
G magnitude           : 12.398
RP magnitude          : 11.647
BP magnitude          : 13.015
DUPflag              : 0
Distance (au)        : 4.117
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.67
Sun-Target sep (deg) : 170.41
Sun-Moon sep (deg)   : 65.92
B (ring opening deg) : -0.75
PA of pole (deg)     : -14.13
Pole direction: RA (deg): 268.05689
Dec (deg): 64.49728
C/A sky separation (") : 11.005
C/A sky separation (km) : 32863.1
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
    
```

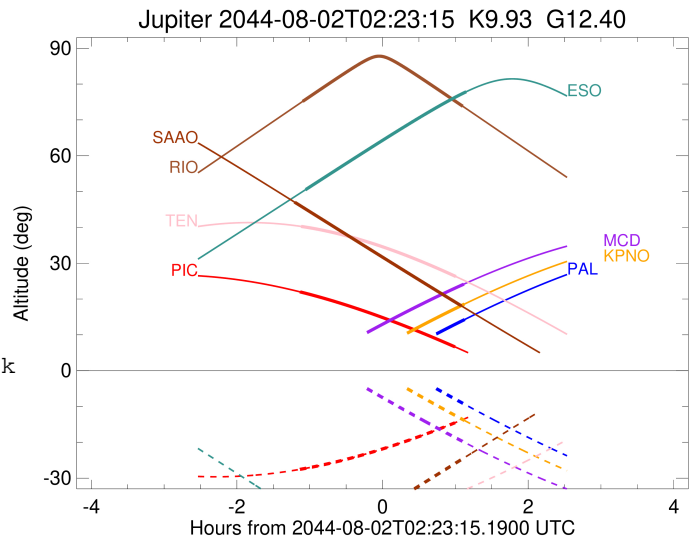
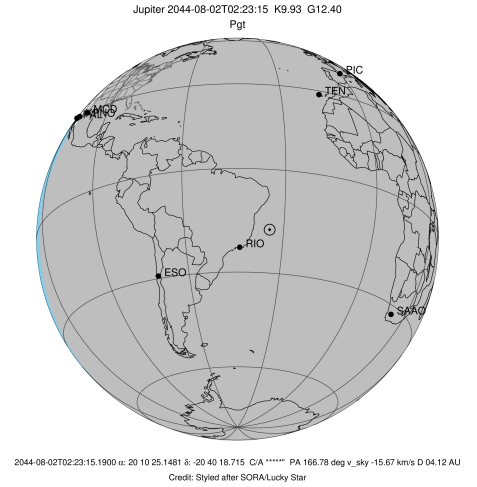


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2044-08-02T01:17:38.352	75.19	-65.68	71491.8	28.56	31.84
Jupiter	E	2044-08-02T03:29:19.823	73.81	-81.24	71491.9	26.02	29.13

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2044-08-02T02:26:07.430
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        : 6854289486796823168
2Mass ID (if available) : 20102516-2040185
ICRS Star Coord at Epoch: 20h 10m 25.14810s -20:40:18.71491s
RUWE (>1.4 is poor) : 1.09
K magnitude           : 9.931
G magnitude           : 12.398
RP magnitude          : 11.647
BP magnitude          : 13.015
DUPflag              : 0
Distance (au)         : 4.117
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.67
Sun-Target sep (deg)  : 170.41
Sun-Moon sep (deg)   : 65.68
B (ring opening deg) : -0.75
PA of pole (deg)     : -14.13
Pole direction: RA (deg): 268.05689
Dec (deg): 64.49728
C/A sky separation (") : 10.908
C/A sky separation (km) : 32573.8
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
    
```



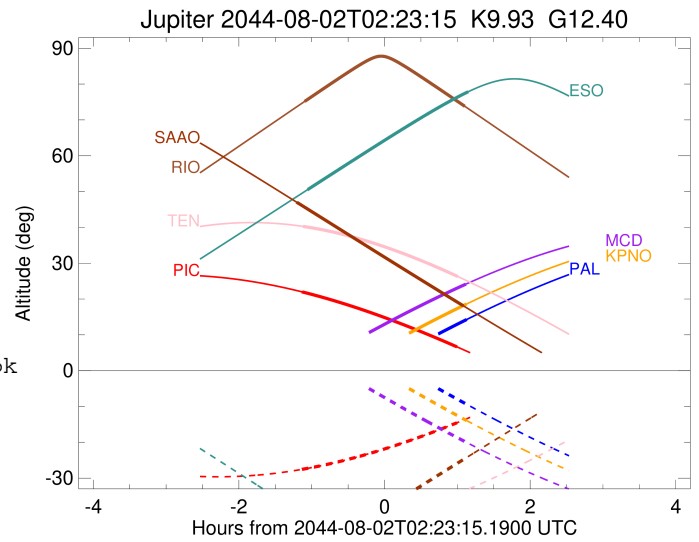
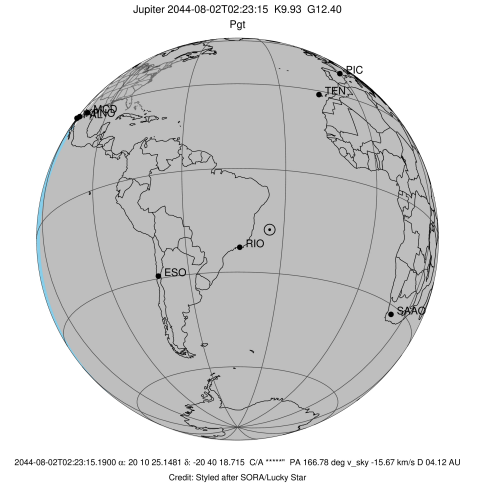
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2044-08-02T01:19:50.777	50.52	-41.01	71491.8	28.01	31.26
Jupiter	E	2044-08-02T03:32:14.695	77.86	-68.98	71491.9	26.02	29.13



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2044-08-02T02:19:09.190
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       : 6854289486796823168
2Mass ID (if available) : 20102516-2040185
ICRS Star Coord at Epoch: 20h 10m 25.14810s -20:40:18.71491s
RUWE (>1.4 is poor) : 1.09
K magnitude           : 9.931
G magnitude           : 12.398
RP magnitude          : 11.647
BP magnitude          : 13.015
DUPflag              : 0
Distance (au)        : 4.117
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.67
Sun-Target sep (deg) : 170.41
Sun-Moon sep (deg)   : 65.76
B (ring opening deg) : -0.75
PA of pole (deg)     : -14.13
Pole direction: RA (deg): 268.05689
Dec (deg): 64.49728
C/A sky separation (") : 9.952
C/A sky separation (km) : 29719.0
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	2044-08-02T01:10:50.829	47.03	-53.68	71491.9	26.05	29.16
Jupiter	E	2044-08-02T03:27:55.743	18.16	-24.87	71491.9	23.09	25.95