

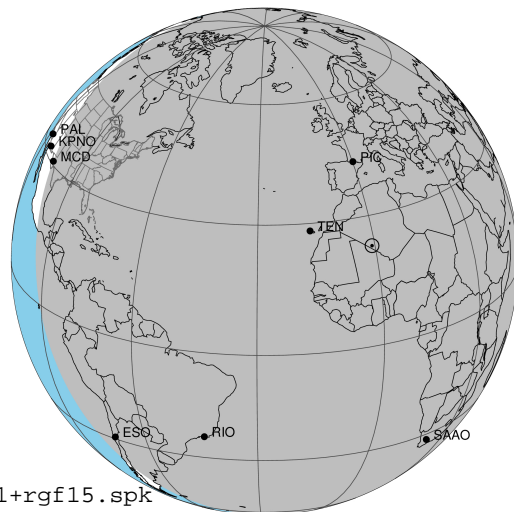
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2024-12-30T00:05:41.460  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 3412735005712139264  
 2Mass ID (if available) : 04465675+2145497

Jupiter 2024-12-30T00:05:41 K8.92 G11.69 Pgt

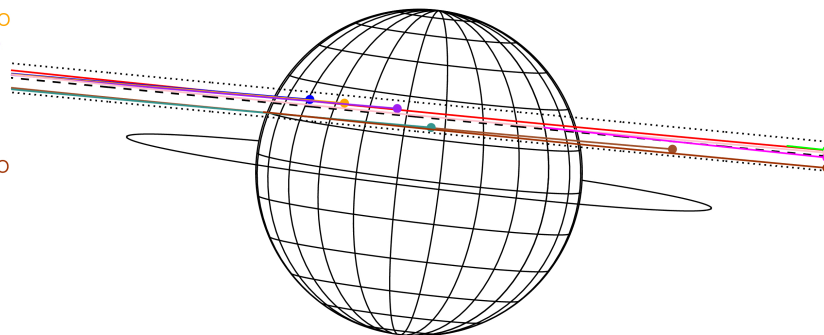
ICRS Star Coord at Epoch: 04h 46m 56.75040s +21:45:49.58908s

RUWE (>1.4 is poor) : 1.38  
 K magnitude : 8.919  
 G magnitude : 11.688  
 RP magnitude : 10.856  
 BP magnitude : 12.416  
 DUPflag : 0  
 Distance (au) : 4.176  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -14.01  
 Sun-Target sep (deg) : 154.64  
 Sun-Moon sep (deg) : 164.81  
 B (ring opening deg) : 2.81  
 PA of pole (deg) : -6.96  
 Pole direction: RA (deg): 268.05784  
 Dec (deg): 64.49672  
 C/A sky separation (") : 7.984  
 C/A sky separation (km) : 24179.3  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2024-12-30T00:05:41 K8.92 G11.69  
 Pgt



Earth  
 PIC  
 PAL  
 PMO  
 KPNO  
 MCD  
 TEN  
 KAV  
 RIO  
 ESO  
 SAAO

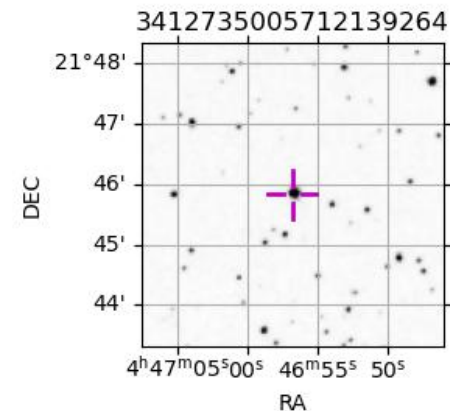


2024-12-30T00:05:41.4600 cc: 04 46 56.7504 s: +21 45 49.589 C/A 7.996" PA 174.50 deg v\_sky -14.01 km/s D 04.18 AU

Credit: Styled after SORA/Lucky Star

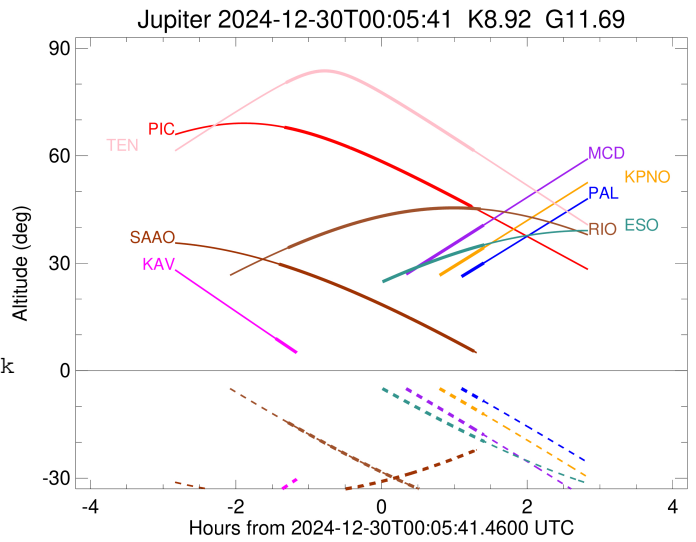
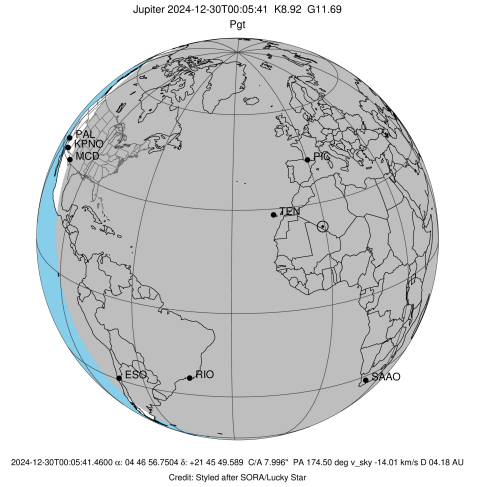
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events	Interval	OCode
PIC	Pic du Midi	42.9	0.1	+ +	DEC 29 22:45 - DEC 30 01:20		Pie
PAL	Palomar Mt (200")	33.4	243.1	+ +	DEC 30 01:29 - DEC 30 01:29		Pne
PMO	Purple Mtn Obs. Nanking	32.1	118.8				Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	DEC 30 01:30 - DEC 30 01:30		Pne
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	DEC 30 01:29 - DEC 30 01:29		Pne
TEN	Teide Obs./Tenerife	28.3	343.5	+ +	DEC 29 22:46 - DEC 30 01:21		Pie
IRTF	Mauna Kea/IRTF	19.8	204.5				Pnn
KAV	Kavalur Observatory	12.6	78.8	+ +	DEC 29 22:38 - DEC 29 22:38		Pin
RIO	Rio de Janeiro	-22.9	316.8	+ +	DEC 29 22:48 - DEC 30 01:27		Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	DEC 30 01:30 - DEC 30 01:30		Pne
AAT	Siding Spring (AAT)	-31.3	149.1				Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	DEC 29 22:41 - DEC 30 01:21		Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0				Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2024-12-30T00:02:46.660
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        : 3412735005712139264
2Mass ID (if available) : 04465675+2145497
ICRS Star Coord at Epoch: 04h 46m 56.75040s +21:45:49.58908s
RUWE (>1.4 is poor) : 1.38
K magnitude           : 8.919
G magnitude           : 11.688
RP magnitude          : 10.856
BP magnitude          : 12.416
DUPflag              : 0
Distance (au)         : 4.176
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.01
Sun-Target sep (deg)  : 154.64
Sun-Moon sep (deg)    : 164.58
B (ring opening deg) : 2.81
PA of pole (deg)      : -6.96
Pole direction: RA (deg): 268.05784
Dec (deg): 64.49672
C/A sky separation (") : 8.730
C/A sky separation (km) : 26441.1
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
    
```

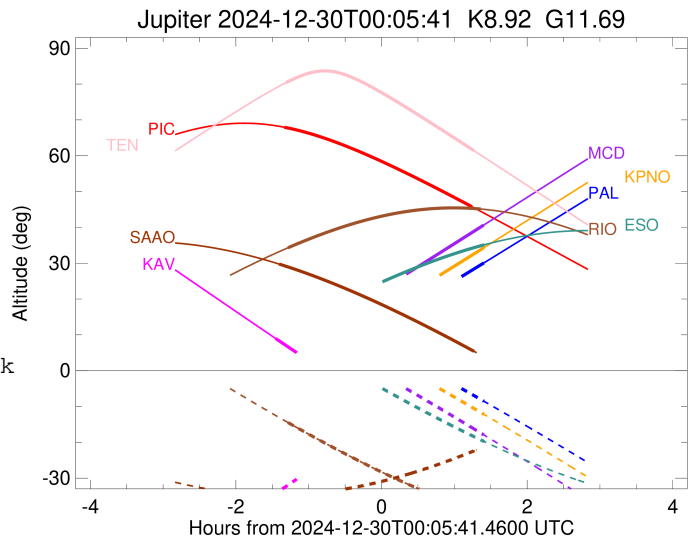
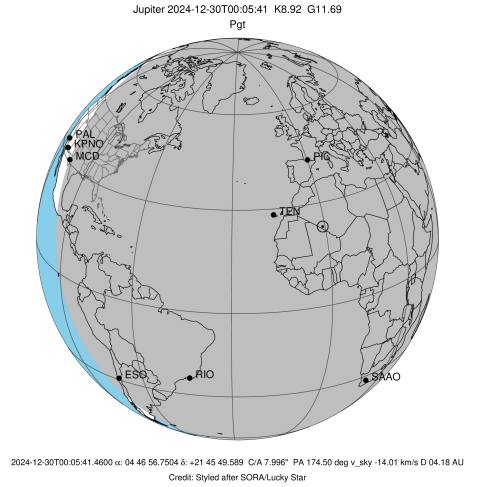


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2024-12-29T22:45:38.559	67.94	-64.83	71490.3	23.11	25.97
Jupiter	E	2024-12-30T01:20:14.849	45.76	-64.56	71490.7	20.42	23.04

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2024-12-30T00:11:59.760
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        : 3412735005712139264
2Mass ID (if available) : 04465675+2145497
ICRS Star Coord at Epoch: 04h 46m 56.75040s +21:45:49.58908s
RUWE (>1.4 is poor) : 1.38
K magnitude           : 8.919
G magnitude           : 11.688
RP magnitude          : 10.856
BP magnitude          : 12.416
DUPflag              : 0
Distance (au)         : 4.176
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.01
Sun-Target sep (deg)  : 154.64
Sun-Moon sep (deg)   : 165.29
B (ring opening deg) : 2.81
PA of pole (deg)     : -6.96
Pole direction: RA (deg): 268.05784
Dec (deg): 64.49672
C/A sky separation ("): 9.179
C/A sky separation (km): 27800.0
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
    
```

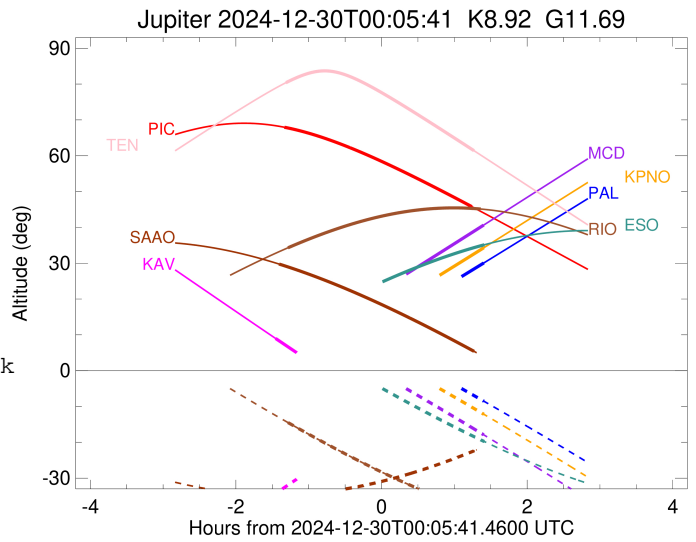
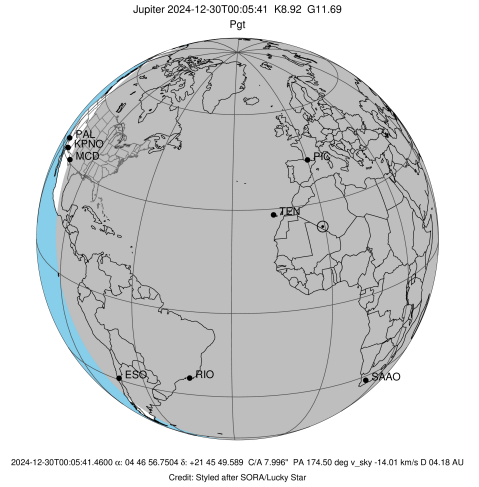


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2024-12-29T22:53:19.883	-1.19x	18.71x	71490.1	24.88	27.90
Jupiter	E	2024-12-30T01:29:58.920	30.06	-8.51	71490.6	20.79	23.45

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2024-12-30T00:12:04.610
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      : 3412735005712139264
2Mass ID (if available) : 04465675+2145497
ICRS Star Coord at Epoch: 04h 46m 56.75040s +21:45:49.58908s
RUWE (>1.4 is poor) : 1.38
K magnitude          : 8.919
G magnitude          : 11.688
RP magnitude         : 10.856
BP magnitude         : 12.416
DUPflag             : 0
Distance (au)       : 4.176
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -14.01
Sun-Target sep (deg) : 154.64
Sun-Moon sep (deg)  : 165.34
B (ring opening deg) : 2.81
PA of pole (deg)    : -6.96
Pole direction: RA (deg): 268.05784
Dec (deg): 64.49672
C/A sky separation (" ) : 9.079
C/A sky separation (km) : 27497.8
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
    
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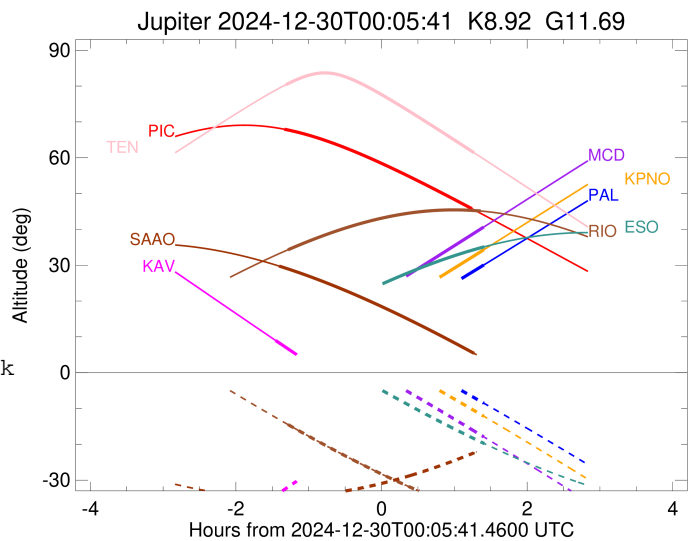
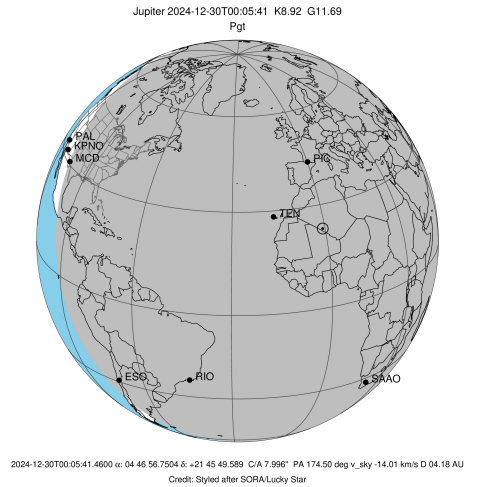


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2024-12-29T22:53:27.821	2.22x	16.45x	71490.1	24.64	27.64
Jupiter	E	2024-12-30T01:30:00.417	34.31	-12.17	71490.7	20.52	23.15

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2024-12-30T00:12:01.670
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        : 3412735005712139264
2Mass ID (if available) : 04465675+2145497
ICRS Star Coord at Epoch: 04h 46m 56.75040s +21:45:49.58908s
RUWE (>1.4 is poor) : 1.38
K magnitude           : 8.919
G magnitude           : 11.688
RP magnitude          : 10.856
BP magnitude          : 12.416
DUPflag               : 0
Distance (au)         : 4.176
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.01
Sun-Target sep (deg) : 154.64
Sun-Moon sep (deg)   : 165.38
B (ring opening deg) : 2.81
PA of pole (deg)     : -6.96
Pole direction: RA (deg): 268.05784
Dec (deg): 64.49672
C/A sky separation (") : 8.952
C/A sky separation (km) : 27111.3
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
    
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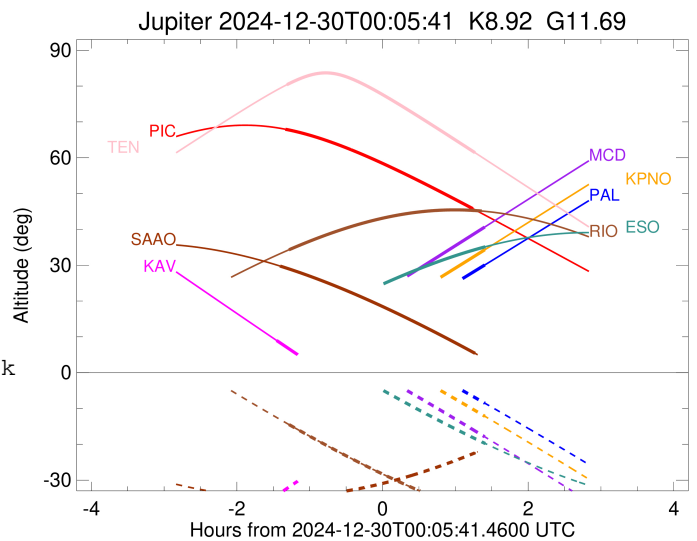
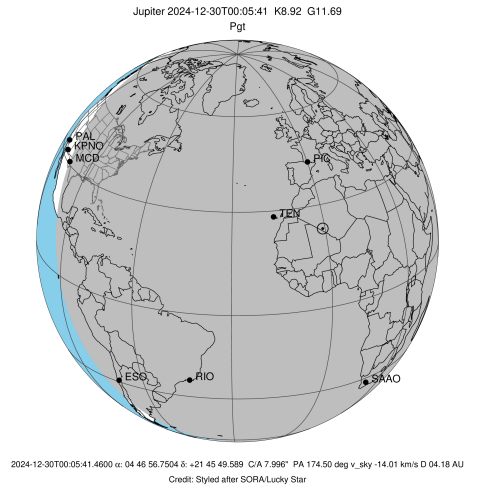


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2024-12-29T22:53:31.507	7.73	12.21x	71490.2	24.33	27.30
Jupiter	E	2024-12-30T01:29:51.550	40.63	-17.89	71490.7	20.19	22.79

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2024-12-30T00:04:18.460
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      : 3412735005712139264
2Mass ID (if available) : 04465675+2145497
ICRS Star Coord at Epoch: 04h 46m 56.75040s +21:45:49.58908s
RUWE (>1.4 is poor) : 1.38
K magnitude          : 8.919
G magnitude          : 11.688
RP magnitude         : 10.856
BP magnitude         : 12.416
DUPflag             : 0
Distance (au)       : 4.176
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -14.01
Sun-Target sep (deg) : 154.64
Sun-Moon sep (deg)  : 164.86
B (ring opening deg) : 2.81
PA of pole (deg)    : -6.96
Pole direction: RA (deg): 268.05784
Dec (deg): 64.49672
C/A sky separation ("): 8.194
C/A sky separation (km) : 24815.7
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
    
```



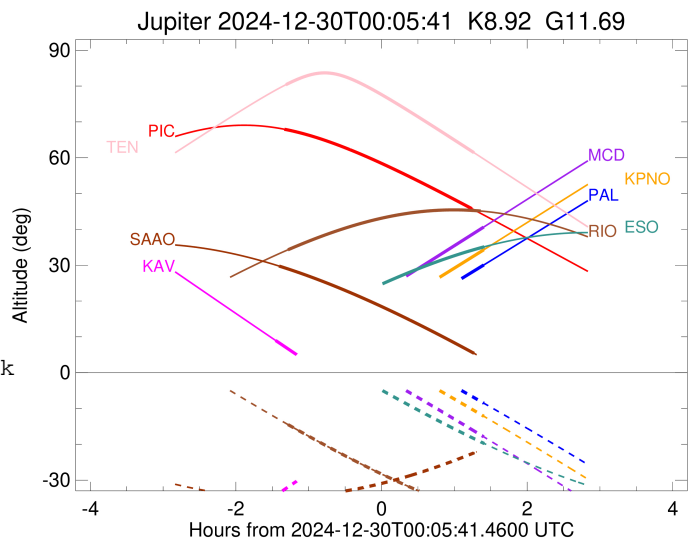
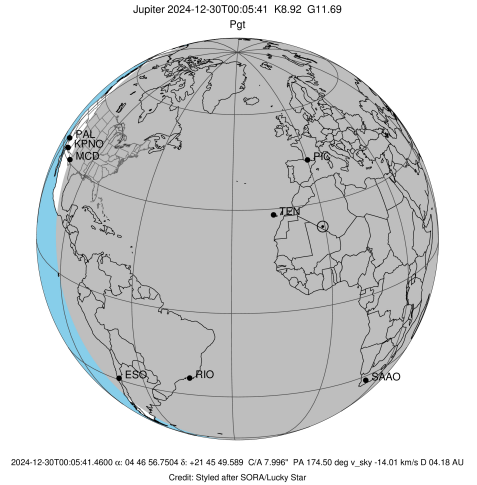
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2024-12-29T22:46:53.431	80.38	-57.82	71490.5	21.88	24.64
Jupiter	E	2024-12-30T01:21:54.707	61.40	-84.17	71490.9	18.90	21.36



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2024-12-29T23:57:59.150
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        : 3412735005712139264
2Mass ID (if available) : 04465675+2145497
ICRS Star Coord at Epoch: 04h 46m 56.75040s +21:45:49.58908s
RUWE (>1.4 is poor) : 1.38
K magnitude           : 8.919
G magnitude           : 11.688
RP magnitude          : 10.856
BP magnitude          : 12.416
DUPflag              : 0
Distance (au)         : 4.176
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.01
Sun-Target sep (deg) : 154.64
Sun-Moon sep (deg)   : 163.89
B (ring opening deg) : 2.81
PA of pole (deg)     : -6.96
Pole direction: RA (deg): 268.05784
Dec (deg): 64.49672
C/A sky separation (") : 8.419
C/A sky separation (km) : 25497.7
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
    
```

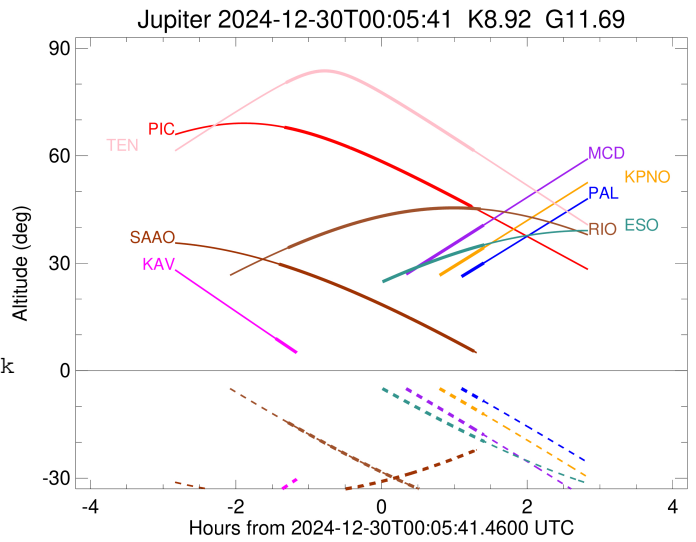
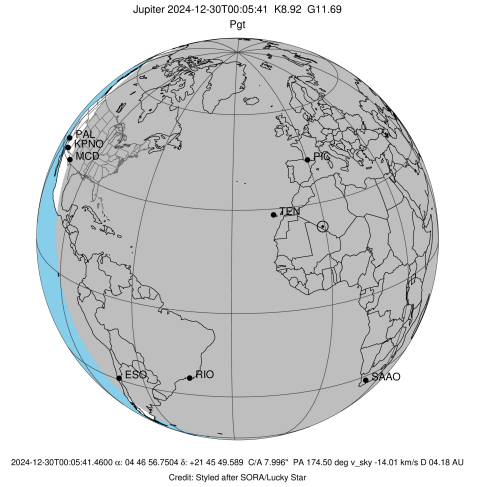


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2024-12-29T22:38:27.259	8.99	-34.27	71490.5	21.63	24.37
Jupiter	E	2024-12-30T01:18:29.030	-26.35x	2.12x	71490.7	20.11	22.69

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2024-12-30T00:08:02.320
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        : 3412735005712139264
2Mass ID (if available) : 04465675+2145497
ICRS Star Coord at Epoch: 04h 46m 56.75040s +21:45:49.58908s
RUWE (>1.4 is poor) : 1.38
K magnitude           : 8.919
G magnitude           : 11.688
RP magnitude          : 10.856
BP magnitude          : 12.416
DUPflag              : 0
Distance (au)         : 4.176
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.01
Sun-Target sep (deg)  : 154.64
Sun-Moon sep (deg)   : 165.46
B (ring opening deg) : 2.81
PA of pole (deg)     : -6.96
Pole direction: RA (deg): 268.05784
Dec (deg): 64.49672
C/A sky separation (") : 6.581
C/A sky separation (km) : 19930.0
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
    
```



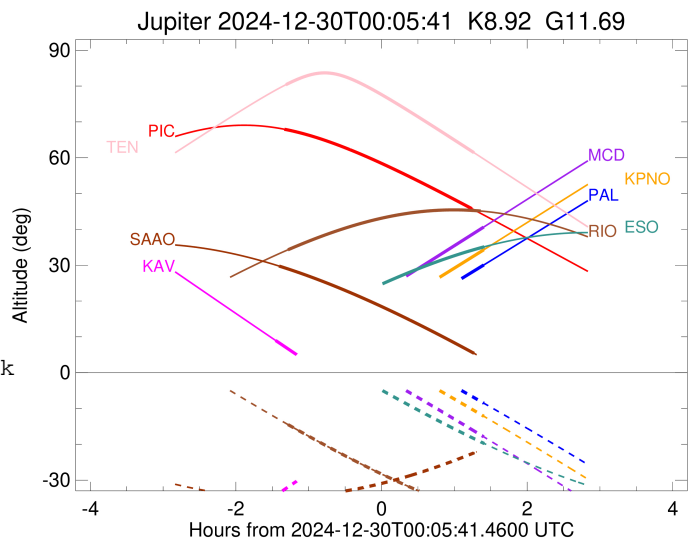
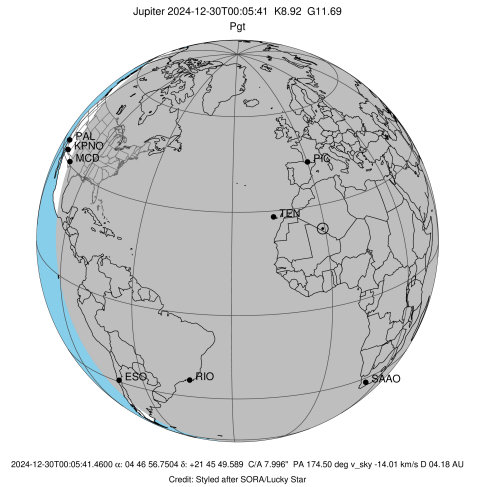
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2024-12-29T22:48:36.162	34.30	-14.48	71491.0	18.03	20.40
Jupiter	E	2024-12-30T01:27:18.784	45.12	-39.35	71491.3	14.50	16.46



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2024-12-30T00:10:44.660
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       : 3412735005712139264
2Mass ID (if available) : 04465675+2145497
ICRS Star Coord at Epoch: 04h 46m 56.75040s +21:45:49.58908s
RUWE (>1.4 is poor) : 1.38
K magnitude           : 8.919
G magnitude           : 11.688
RP magnitude          : 10.856
BP magnitude          : 12.416
DUPflag              : 0
Distance (au)        : 4.176
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.01
Sun-Target sep (deg) : 154.64
Sun-Moon sep (deg)   : 165.68
B (ring opening deg) : 2.81
PA of pole (deg)     : -6.96
Pole direction: RA (deg): 268.05784
Dec (deg): 64.49672
C/A sky separation ("): 6.639
C/A sky separation (km): 20106.7
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
    
```

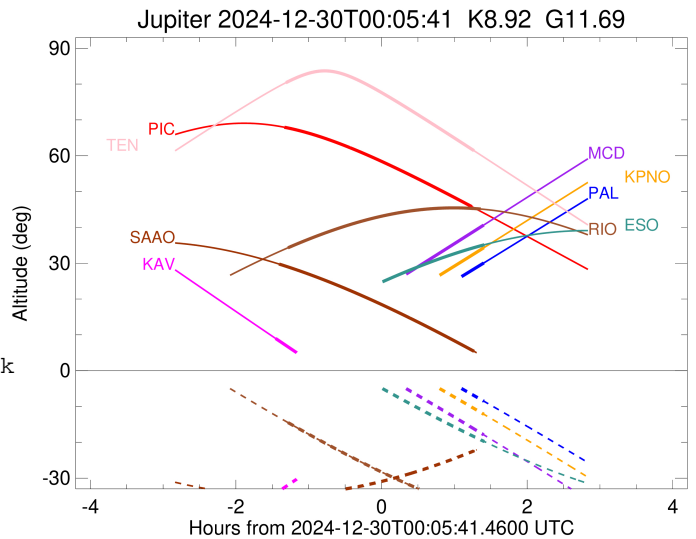
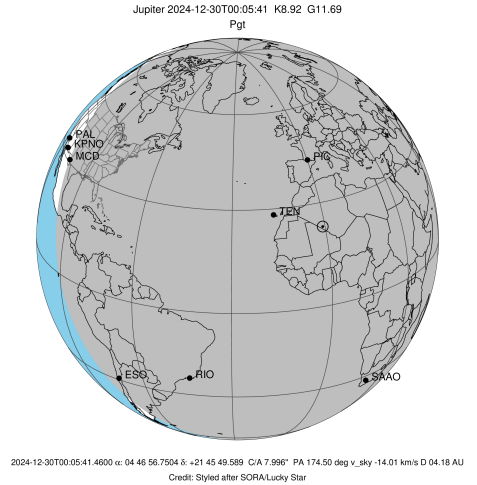


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2024-12-29T22:50:34.347	12.04	9.97x	71490.9	18.34	20.74
Jupiter	E	2024-12-30T01:30:26.661	35.14	-19.79	71491.3	14.41	16.37

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2024-12-30T00:01:18.730
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      : 3412735005712139264
2Mass ID (if available) : 04465675+2145497
ICRS Star Coord at Epoch: 04h 46m 56.75040s +21:45:49.58908s
RUWE (>1.4 is poor) : 1.38
K magnitude          : 8.919
G magnitude          : 11.688
RP magnitude         : 10.856
BP magnitude         : 12.416
DUPflag             : 0
Distance (au)       : 4.176
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.01
Sun-Target sep (deg) : 154.64
Sun-Moon sep (deg)  : 164.67
B (ring opening deg) : 2.81
PA of pole (deg)    : -6.96
Pole direction: RA (deg): 268.05784
Dec (deg): 64.49672
C/A sky separation ("): 6.382
C/A sky separation (km): 19329.9
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	2024-12-29T22:41:19.190	29.75	-34.64	71491.1	16.89	19.13
Jupiter	E	2024-12-30T01:21:55.862	5.40	-22.38	71491.3	14.62	16.60