

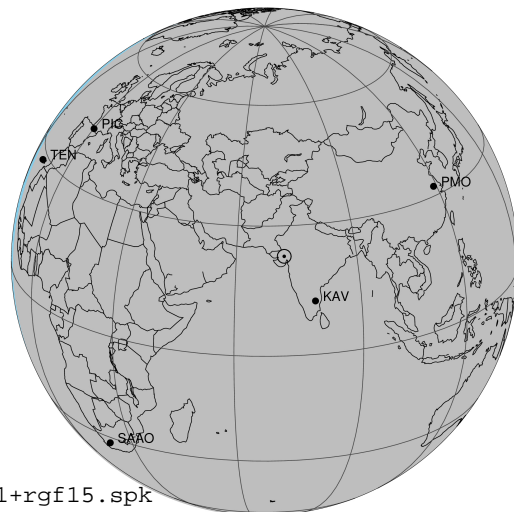
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2024-12-11T19:06:25.900  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 3412364715108144896  
 2Mass ID (if available) : 04564672+2158261

Jupiter 2024-12-11T19:06:25 K7.53 G10.29 Pgt

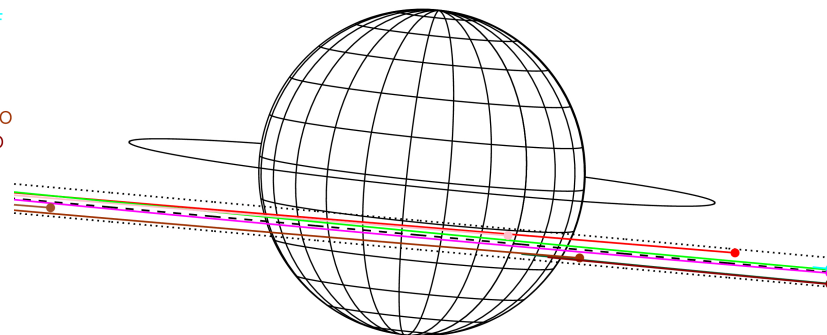
ICRS Star Coord at Epoch: 04h 56m 46.73754s +21:58:25.76671s

RUWE (>1.4 is poor) : 0.93  
 K magnitude : 7.527  
 G magnitude : 10.289  
 RP magnitude : 9.469  
 BP magnitude : 10.997  
 DUPflag : 1  
 Distance (au) : 4.094  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -16.75  
 Sun-Target sep (deg) : 175.42  
 Sun-Moon sep (deg) : 43.89  
 B (ring opening deg) : 2.86  
 PA of pole (deg) : -5.93  
 Pole direction: RA (deg): 268.05785  
 Dec (deg): 64.49672  
 C/A sky separation (") : 9.240  
 C/A sky separation (km) : 27434.5  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2024-12-11T19:06:25 K7.53 G10.29  
 Pgt



Earth  
 PIC  
 PMO  
 TEN  
 IRTF  
 KAV  
 RIO  
 AAT  
 SAAO  
 MSO

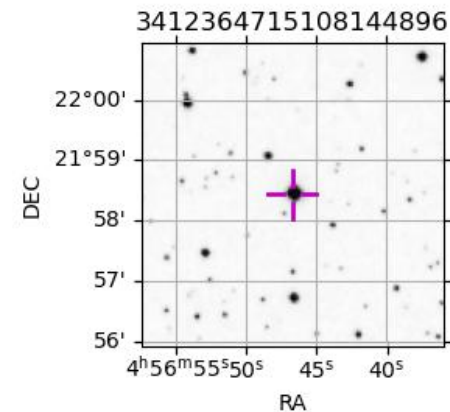


2024-12-11T19:06:25.9000 cc: 04 56 46.7375 s: +21 58 25.767 C/A 9.227" PA 354.83 deg v\_sky -16.75 km/s D 04.09 AU

Credit: Styled after SORA/Lucky Star

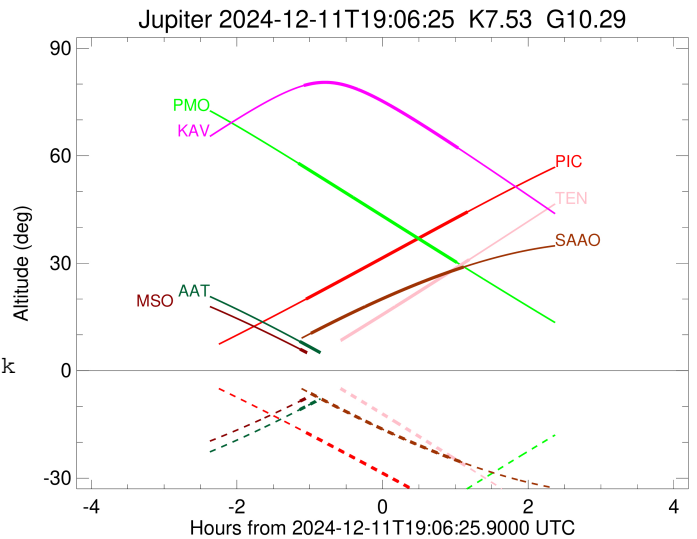
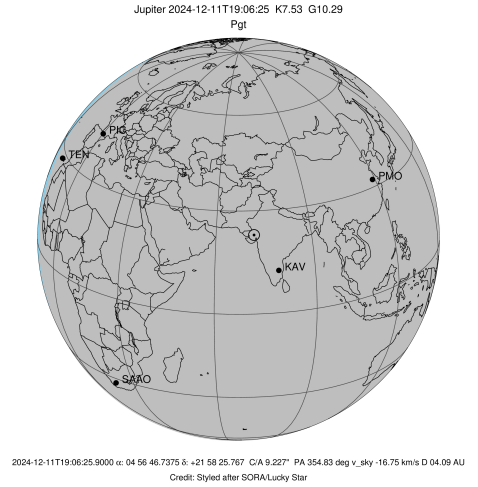
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+ +	DEC 11 18:03 - DEC 11 20:16	Pie
PAL	Palomar Mt (200")	33.4	243.1			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+ +	DEC 11 17:57 - DEC 11 20:07	Pie
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 11 20:17 - DEC 11 20:17	Pne
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+ +	DEC 11 18:01 - DEC 11 20:08	Pie
RIO	Rio de Janeiro	-22.9	316.8			Pnn
ESO	European Southern Obs. (3.6m)	-29.3	289.3			Pnn
AAT	Siding Spring (AAT)	-31.3	149.1	+ +	DEC 11 17:58 - DEC 11 17:58	Pin
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	DEC 11 18:07 - DEC 11 20:13	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	DEC 11 17:58 - DEC 11 17:58	Pin



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2024-12-11T19:10:11.810
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        : 3412364715108144896
2Mass ID (if available) : 04564672+2158261
ICRS Star Coord at Epoch: 04h 56m 46.73754s +21:58:25.76671s
RUWE (>1.4 is poor)  : 0.93
K magnitude           : 7.527
G magnitude           : 10.289
RP magnitude          : 9.469
BP magnitude          : 10.997
DUPflag              : 1
Distance (au)         : 4.094
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.75
Sun-Target sep (deg)  : 175.42
Sun-Moon sep (deg)    : 43.78
B (ring opening deg)  : 2.86
PA of pole (deg)      : -5.93
Pole direction: RA (deg): 268.05785
Dec (deg): 64.49672
C/A sky separation (") : 8.009
C/A sky separation (km) : 23781.2
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
    
```

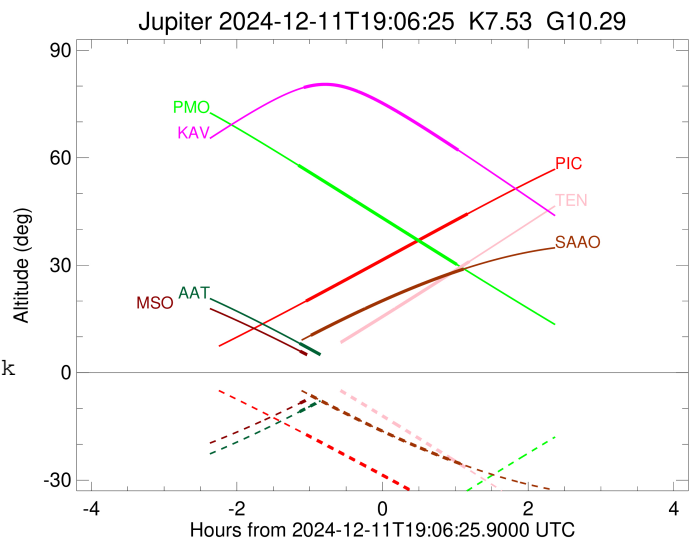
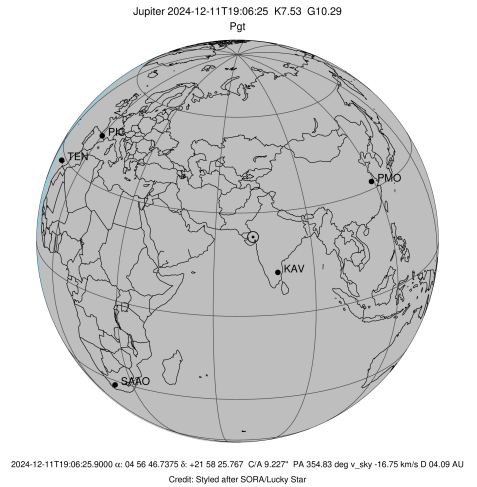


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2024-12-11T18:03:27.248	19.99	-17.27	71490.9	-18.20	-20.59
Jupiter	E	2024-12-11T20:16:35.573	44.34	-41.46	71490.6	-20.58	-23.21

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2024-12-11T19:02:15.410
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      : 3412364715108144896
2Mass ID (if available) : 04564672+2158261
ICRS Star Coord at Epoch: 04h 56m 46.73754s +21:58:25.76671s
RUWE (>1.4 is poor) : 0.93
K magnitude          : 7.527
G magnitude          : 10.289
RP magnitude         : 9.469
BP magnitude         : 10.997
DUPflag             : 1
Distance (au)       : 4.094
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -16.75
Sun-Target sep (deg) : 175.42
Sun-Moon sep (deg)  : 44.85
B (ring opening deg) : 2.86
PA of pole (deg)    : -5.93
Pole direction: RA (deg): 268.05785
Dec (deg): 64.49672
C/A sky separation (") : 8.746
C/A sky separation (km) : 25969.6
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
    
```

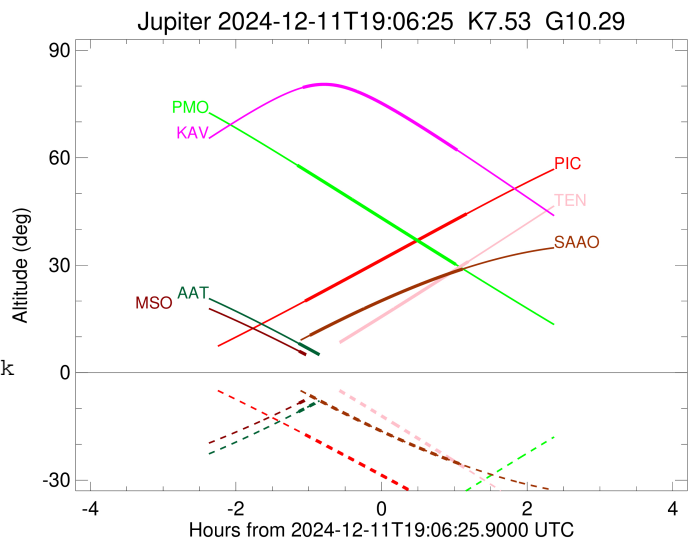
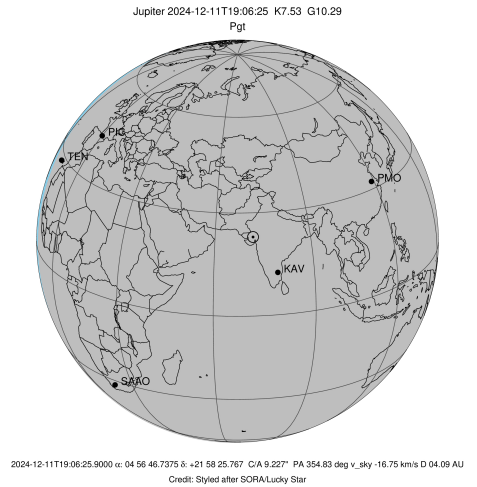


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2024-12-11T17:57:07.672	57.89	-62.32	71490.6	-20.76	-23.41
Jupiter	E	2024-12-11T20:07:42.701	30.19	-34.73	71490.5	-21.67	-24.40

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2024-12-11T19:11:30.430
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       : 3412364715108144896
2Mass ID (if available) : 04564672+2158261
ICRS Star Coord at Epoch: 04h 56m 46.73754s +21:58:25.76671s
RUWE (>1.4 is poor) : 0.93
K magnitude           : 7.527
G magnitude           : 10.289
RP magnitude         : 9.469
BP magnitude         : 10.997
DUPflag              : 1
Distance (au)        : 4.094
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.75
Sun-Target sep (deg) : 175.42
Sun-Moon sep (deg)  : 43.45
B (ring opening deg) : 2.86
PA of pole (deg)    : -5.93
Pole direction: RA (deg): 268.05785
Dec (deg): 64.49672
C/A sky separation (") : 8.237
C/A sky separation (km) : 24456.3
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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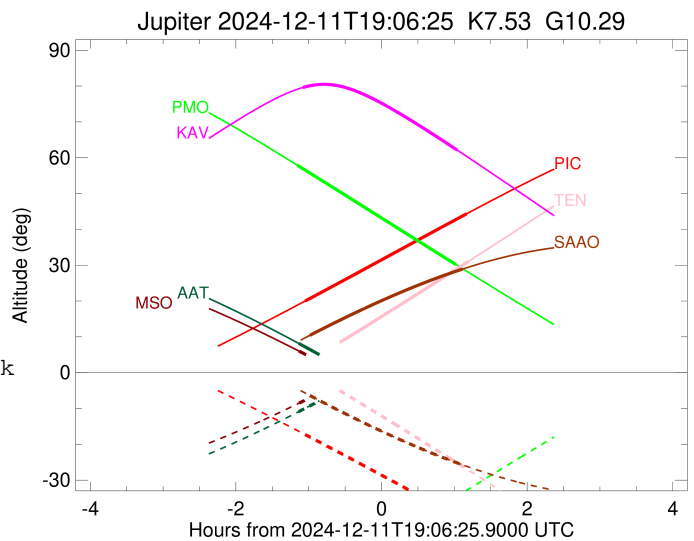
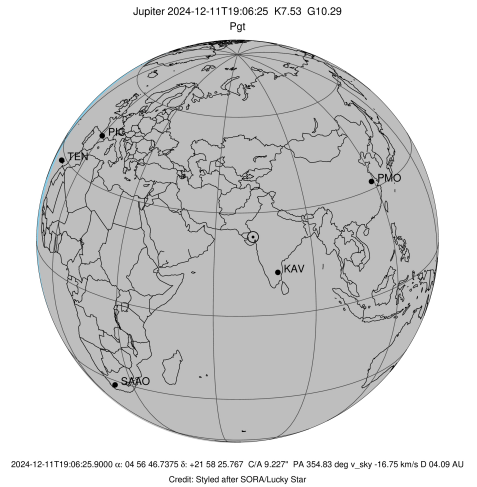


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2024-12-11T18:04:37.262	2.82x	0.45x	71490.9	-18.70	-21.14
Jupiter	E	2024-12-11T20:17:56.385	31.02	-27.18	71490.5	-21.27	-23.97

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2024-12-11T19:05:16.450
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        : 3412364715108144896
2Mass ID (if available) : 04564672+2158261
ICRS Star Coord at Epoch: 04h 56m 46.73754s +21:58:25.76671s
RUWE (>1.4 is poor) : 0.93
K magnitude           : 7.527
G magnitude           : 10.289
RP magnitude          : 9.469
BP magnitude          : 10.997
DUPflag              : 1
Distance (au)         : 4.094
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.75
Sun-Target sep (deg) : 175.42
Sun-Moon sep (deg)   : 44.71
B (ring opening deg) : 2.86
PA of pole (deg)     : -5.93
Pole direction: RA (deg): 268.05785
Dec (deg): 64.49672
C/A sky separation (") : 9.614
C/A sky separation (km) : 28547.4
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
    
```

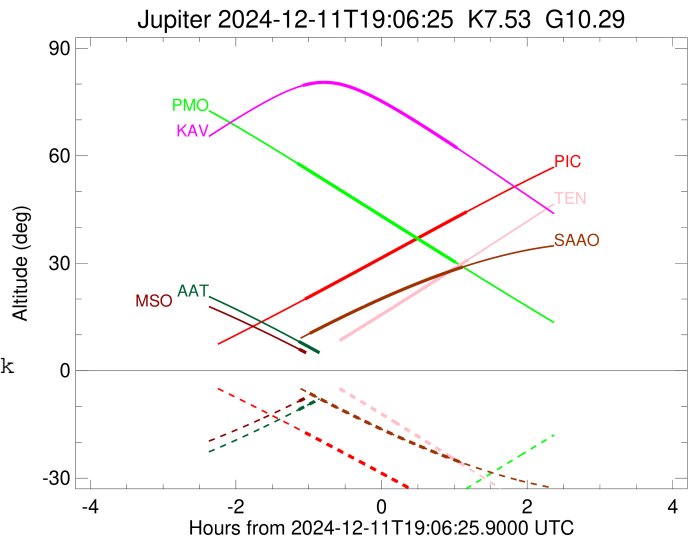
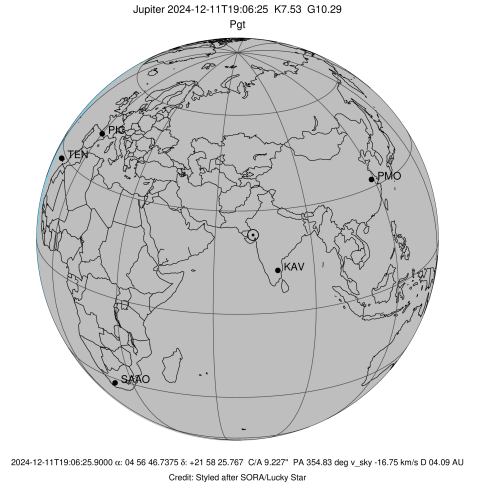


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2024-12-11T18:01:44.774	79.61	-76.32	71490.3	-22.65	-25.48
Jupiter	E	2024-12-11T20:08:53.209	62.10	-66.03	71490.1	-24.20	-27.16

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2024-12-11T19:01:38.840
Event type          : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code       : AAT
Location            : Siding Spring (AAT)
Latitude (deg)      : -31.27703
E. Longitude (deg)  : 149.06608
Altitude (km)       : 1.164
Gaia source ID      : 3412364715108144896
2Mass ID (if available) : 04564672+2158261
ICRS Star Coord at Epoch: 04h 56m 46.73754s +21:58:25.76671s
RUWE (>1.4 is poor) : 0.93
K magnitude          : 7.527
G magnitude          : 10.289
RP magnitude         : 9.469
BP magnitude         : 10.997
DUPflag             : 1
Distance (au)       : 4.094
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -16.75
Sun-Target sep (deg) : 175.42
Sun-Moon sep (deg)  : 44.42
B (ring opening deg) : 2.86
PA of pole (deg)    : -5.93
Pole direction: RA (deg): 268.05785
Dec (deg): 64.49672
C/A sky separation (" ) : 10.532
C/A sky separation (km) : 31271.1
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
    
```



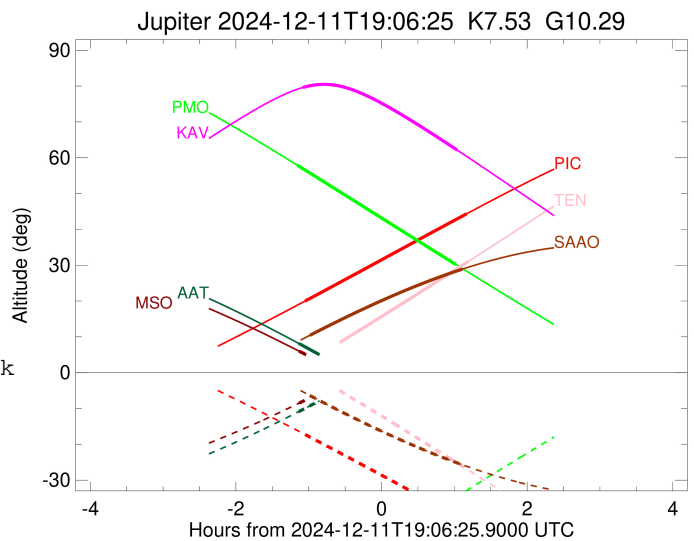
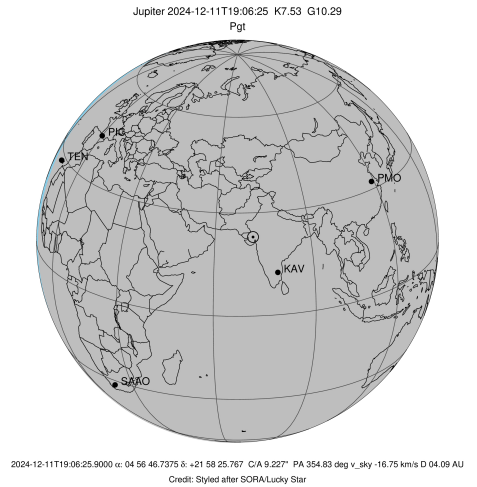
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2024-12-11T17:58:10.072	8.17	-10.89	71489.9	-25.59	-28.66
Jupiter	E	2024-12-11T20:05:32.065	-16.81x	13.33x	71489.8	-26.16	-29.28



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2024-12-11T19:10:22.990
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        : 3412364715108144896
2Mass ID (if available) : 04564672+2158261
ICRS Star Coord at Epoch: 04h 56m 46.73754s +21:58:25.76671s
RUWE (>1.4 is poor) : 0.93
K magnitude           : 7.527
G magnitude           : 10.289
RP magnitude          : 9.469
BP magnitude          : 10.997
DUPflag              : 1
Distance (au)         : 4.094
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.75
Sun-Target sep (deg) : 175.42
Sun-Moon sep (deg)   : 43.67
B (ring opening deg) : 2.86
PA of pole (deg)     : -5.93
Pole direction: RA (deg): 268.05785
Dec (deg): 64.49672
C/A sky separation (") : 10.662
C/A sky separation (km) : 31657.2
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
    
```

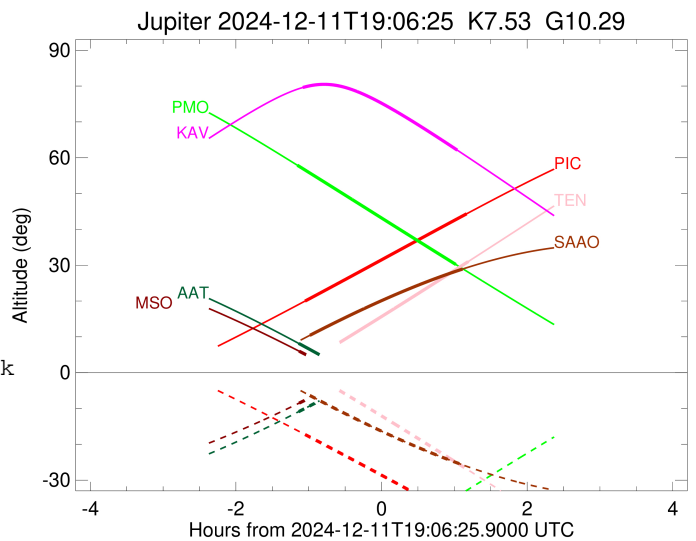
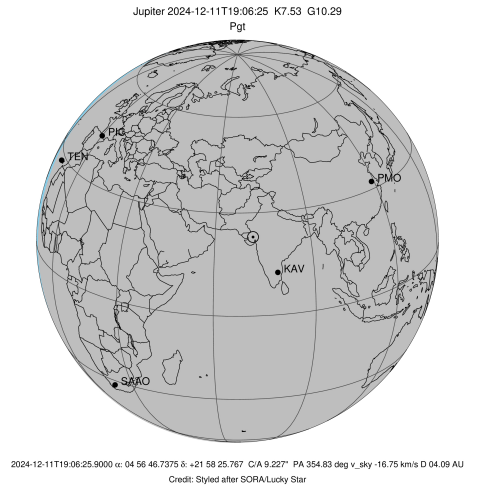


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2024-12-11T18:07:26.917	10.43	-6.38	71490.0	-25.03	-28.05
Jupiter	E	2024-12-11T20:13:02.459	28.90	-25.71	71489.6	-27.40	-30.60

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2024-12-11T19:01:54.480
Event type          : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code       : MSO
Location           : Mt. Stromlo Observatory
Latitude (deg)     : -35.32000
E. Longitude (deg) : 149.00833
Altitude (km)      : 0.770
Gaia source ID     : 3412364715108144896
2Mass ID (if available) : 04564672+2158261
ICRS Star Coord at Epoch: 04h 56m 46.73754s +21:58:25.76671s
RUWE (>1.4 is poor) : 0.93
K magnitude         : 7.527
G magnitude         : 10.289
RP magnitude        : 9.469
BP magnitude        : 10.997
DUPflag            : 1
Distance (au)      : 4.094
f0 (km)            : 0.00
g0 (km)            : 0.00
skyplane vel. (km/s) : -16.75
Sun-Target sep (deg) : 175.42
Sun-Moon sep (deg)  : 44.38
B (ring opening deg) : 2.86
PA of pole (deg)   : -5.93
Pole direction: RA (deg): 268.05785
Dec (deg): 64.49672
C/A sky separation (") : 10.636
C/A sky separation (km) : 31580.8
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	2024-12-11T17:58:33.392	6.00	-8.50	71489.9	-25.85	-28.94
Jupiter	E	2024-12-11T20:05:38.854	-17.86x	14.60x	71489.8	-26.46	-29.60