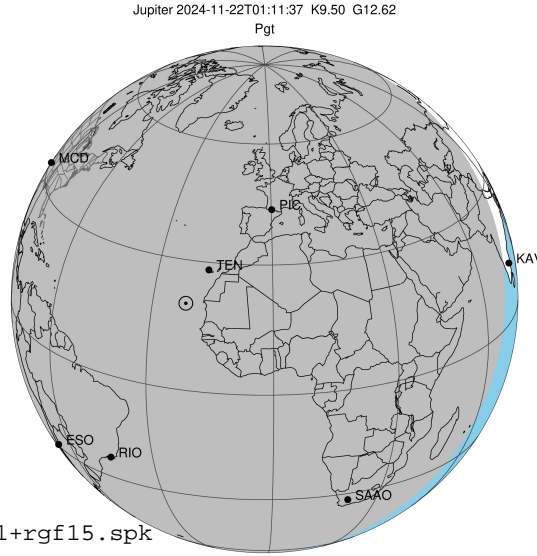


target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2024-11-22T01:11:37.970  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 3415201145870743424  
 2Mass ID (if available) : 05080496+2211340

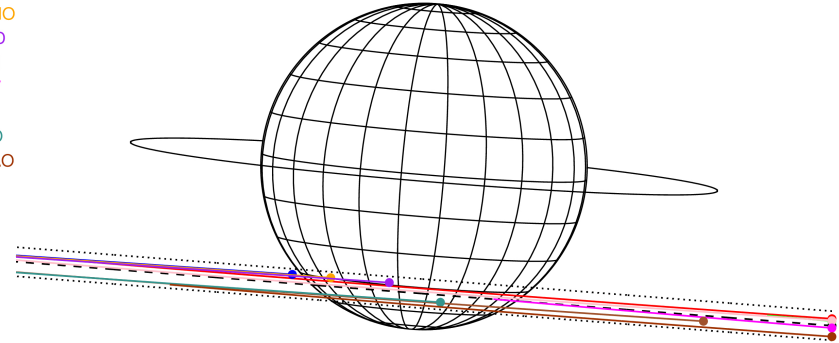
Jupiter 2024-11-22T01:11:37 K9.50 G12.62 Pgt

ICRS Star Coord at Epoch: 05h 08m 04.96360s +22:11:34.00330s

RUWE (>1.4 is poor) : 1.12  
 K magnitude : 9.504  
 G magnitude : 12.620  
 RP magnitude : 11.720  
 BP magnitude : 13.462  
 DUPflag : 0  
 Distance (au) : 4.122  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -15.43  
 Sun-Target sep (deg) : 161.87  
 Sun-Moon sep (deg) : 60.57  
 B (ring opening deg) : 2.89  
 PA of pole (deg) : -4.73  
 Pole direction: RA (deg): 268.05785  
 Dec (deg): 64.49672  
 C/A sky separation (") : 18.589  
 C/A sky separation (km) : 55568.7  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk



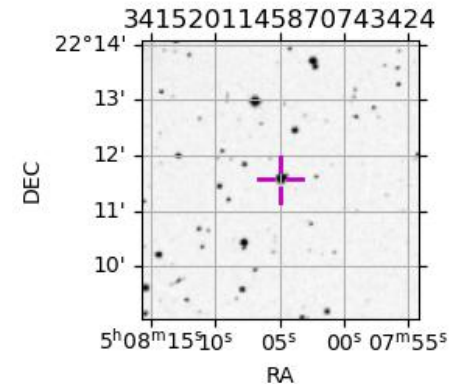
Earth  
 PIC  
 PAL  
 PMO  
 KPNO  
 MCD  
 TEN  
 KAV  
 RIO  
 ESO  
 SAAO



2024-11-22T01:11:37.9700 a: 05 08 04.9636 s: +22 11 34.003 C/A \*\*\*\*\* PA 355.52 deg v\_sky -15.43 km/s D 04.12 AU  
 Credit: Styled after SORA/Lucky Star

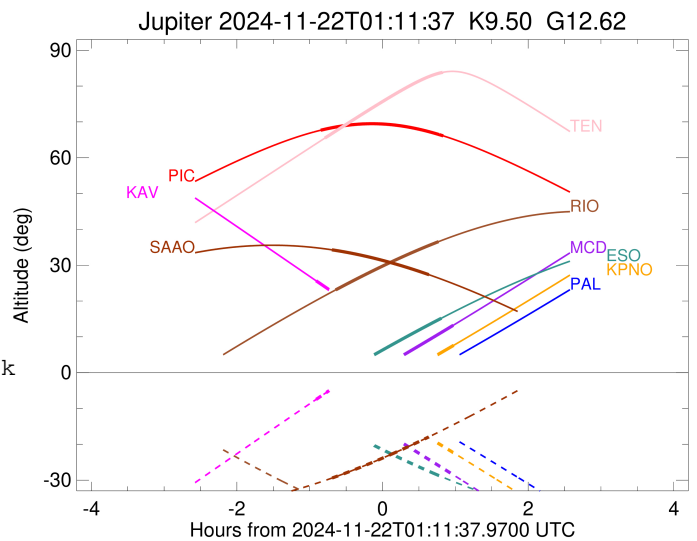
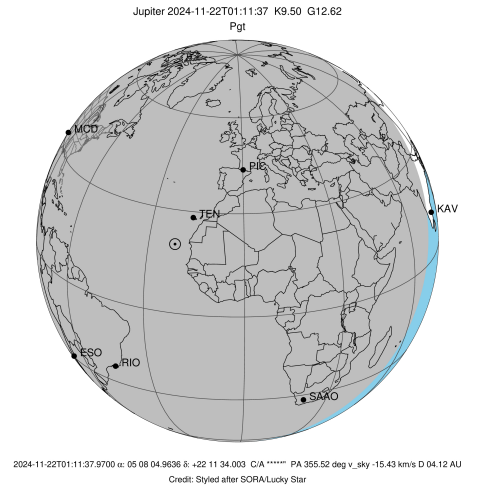
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+ +	NOV 22 00:20 - NOV 22 02:01	Pie
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	+ +	NOV 22 02:10 - NOV 22 02:10	Pne
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	NOV 22 02:09 - NOV 22 02:09	Pne
TEN	Teide Obs./Tenerife	28.3	343.5	+ +	NOV 22 00:24 - NOV 22 02:01	Pie
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+ +	NOV 22 00:16 - NOV 22 00:16	Pin
RIO	Rio de Janeiro	-22.9	316.8	+ +	NOV 22 00:33 - NOV 22 01:57	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	NOV 22 02:00 - NOV 22 02:00	Pne
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	NOV 22 00:30 - NOV 22 01:49	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2024-11-22T01:11:11.480
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        : 3415201145870743424
2Mass ID (if available) : 05080496+2211340
ICRS Star Coord at Epoch: 05h 08m 04.96360s +22:11:34.00330s
RUWE (>1.4 is poor) : 1.12
K magnitude           : 9.504
G magnitude           : 12.620
RP magnitude          : 11.720
BP magnitude          : 13.462
DUPflag              : 0
Distance (au)         : 4.122
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.43
Sun-Target sep (deg) : 161.87
Sun-Moon sep (deg)   : 61.29
B (ring opening deg) : 2.89
PA of pole (deg)     : -4.73
Pole direction: RA (deg): 268.05785
Dec (deg): 64.49672
C/A sky separation ("): 17.848
C/A sky separation (km): 53353.6
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
    
```

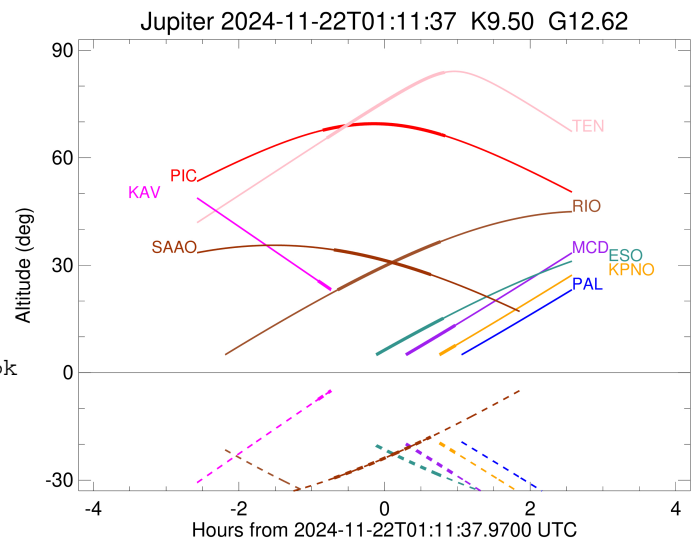
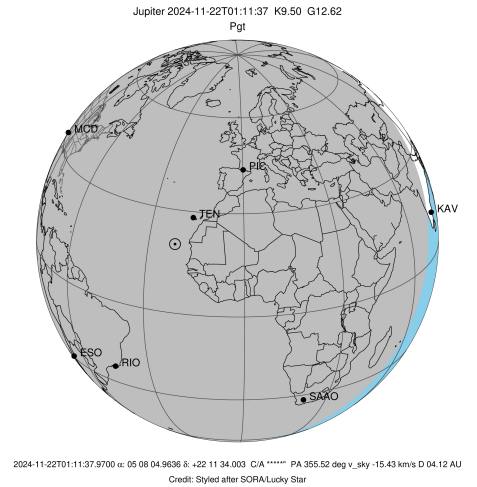


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2024-11-22T00:20:50.100	67.68	-66.26	71485.8	-47.82	-51.46
Jupiter	E	2024-11-22T02:01:31.904	66.11	-53.69	71485.6	-48.47	-52.10

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2024-11-22T01:16:23.100
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        : 3415201145870743424
2Mass ID (if available) : 05080496+2211340
ICRS Star Coord at Epoch: 05h 08m 04.96360s +22:11:34.00330s
RUWE (>1.4 is poor) : 1.12
K magnitude           : 9.504
G magnitude           : 12.620
RP magnitude          : 11.720
BP magnitude          : 13.462
DUPflag              : 0
Distance (au)         : 4.122
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.43
Sun-Target sep (deg) : 161.87
Sun-Moon sep (deg)   : 60.83
B (ring opening deg) : 2.89
PA of pole (deg)     : -4.73
Pole direction: RA (deg): 268.05785
Dec (deg): 64.49672
C/A sky separation ("): 17.207
C/A sky separation (km): 51437.9
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
    
```

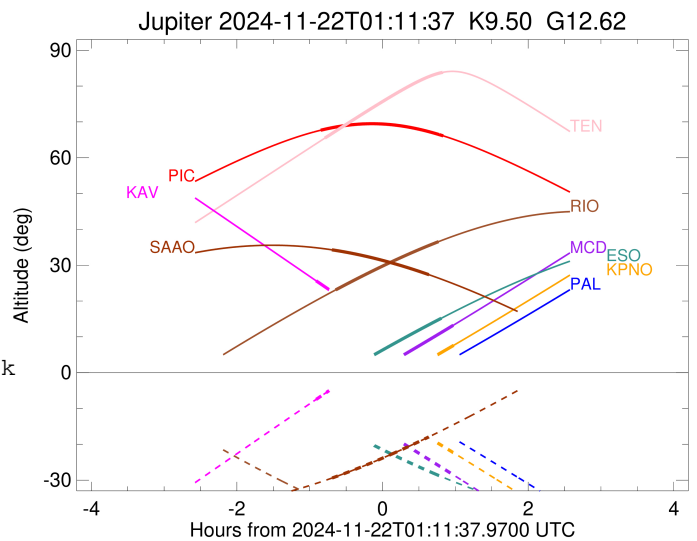
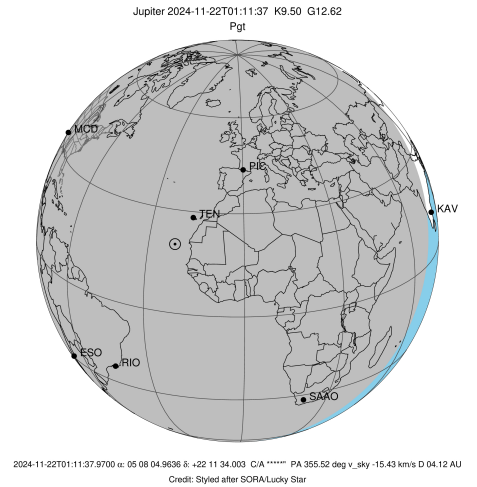


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2024-11-22T00:22:09.605	-12.55x	-0.46x	71486.3	-45.23	-48.93
Jupiter	E	2024-11-22T02:10:17.282	7.63	-22.39	71486.0	-46.71	-50.39

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2024-11-22T01:16:38.920
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       : 3415201145870743424
2Mass ID (if available) : 05080496+2211340
ICRS Star Coord at Epoch: 05h 08m 04.96360s +22:11:34.00330s
RUWE (>1.4 is poor) : 1.12
K magnitude           : 9.504
G magnitude           : 12.620
RP magnitude         : 11.720
BP magnitude         : 13.462
DUPflag              : 0
Distance (au)        : 4.122
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.43
Sun-Target sep (deg) : 161.87
Sun-Moon sep (deg)  : 60.93
B (ring opening deg) : 2.89
PA of pole (deg)    : -4.73
Pole direction: RA (deg): 268.05785
Dec (deg): 64.49672
C/A sky separation ("): 17.325
C/A sky separation (km): 51790.5
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
    
```

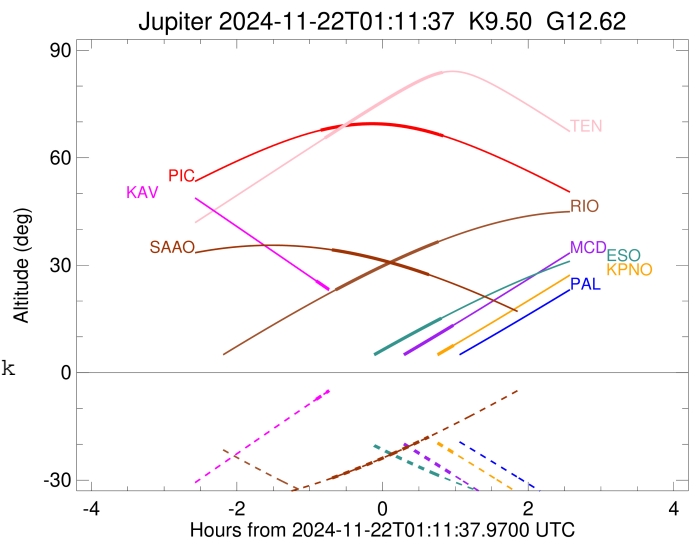
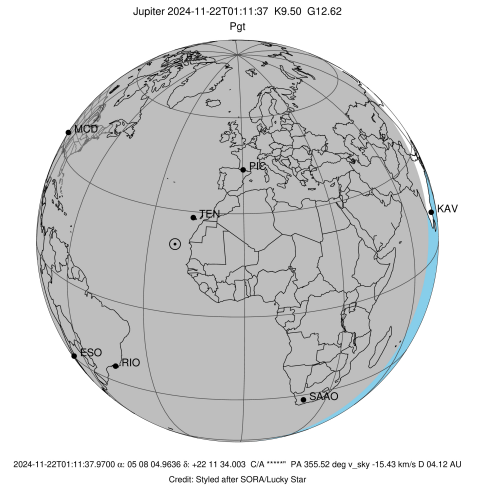


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2024-11-22T00:22:59.047	-7.74x	-6.17	71486.2	-45.59	-49.29
Jupiter	E	2024-11-22T02:09:59.008	13.23	-28.52	71485.9	-47.15	-50.82

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2024-11-22T01:12:48.160
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      : 3415201145870743424
2Mass ID (if available) : 05080496+2211340
ICRS Star Coord at Epoch: 05h 08m 04.96360s +22:11:34.00330s
RUWE (>1.4 is poor) : 1.12
K magnitude          : 9.504
G magnitude          : 12.620
RP magnitude         : 11.720
BP magnitude         : 13.462
DUPflag             : 0
Distance (au)       : 4.122
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.43
Sun-Target sep (deg) : 161.87
Sun-Moon sep (deg)  : 61.45
B (ring opening deg) : 2.89
PA of pole (deg)    : -4.73
Pole direction: RA (deg): 268.05785
Dec (deg): 64.49672
C/A sky separation ("): 18.314
C/A sky separation (km): 54746.5
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
    
```

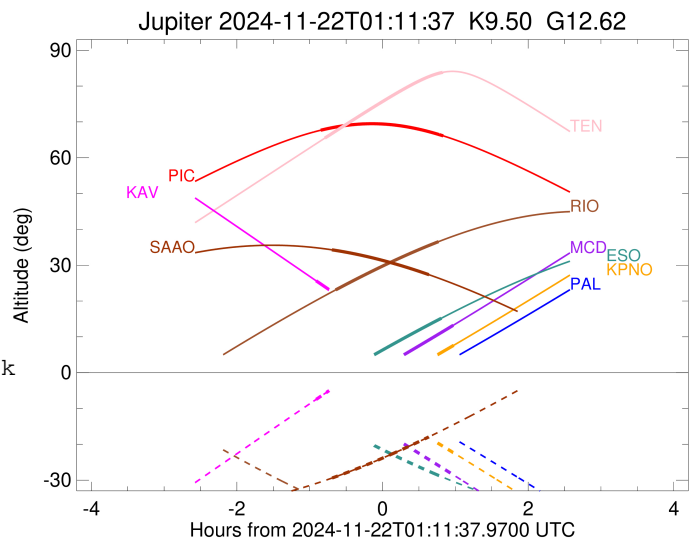
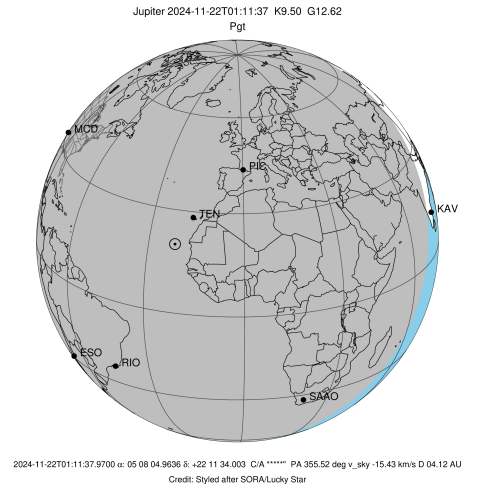


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2024-11-22T00:24:16.374	65.50	-79.84	71485.5	-49.35	-52.95
Jupiter	E	2024-11-22T02:01:14.779	83.82	-72.38	71485.3	-50.33	-53.91

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2024-11-22T01:05:35.640
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        : 3415201145870743424
2Mass ID (if available) : 05080496+2211340
ICRS Star Coord at Epoch: 05h 08m 04.96360s +22:11:34.00330s
RUWE (>1.4 is poor) : 1.12
K magnitude           : 9.504
G magnitude           : 12.620
RP magnitude          : 11.720
BP magnitude          : 13.462
DUPflag              : 0
Distance (au)         : 4.122
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.43
Sun-Target sep (deg) : 161.87
Sun-Moon sep (deg)   : 60.30
B (ring opening deg) : 2.89
PA of pole (deg)     : -4.73
Pole direction: RA (deg): 268.05785
Dec (deg): 64.49672
C/A sky separation (") : 18.464
C/A sky separation (km) : 55194.8
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
    
```

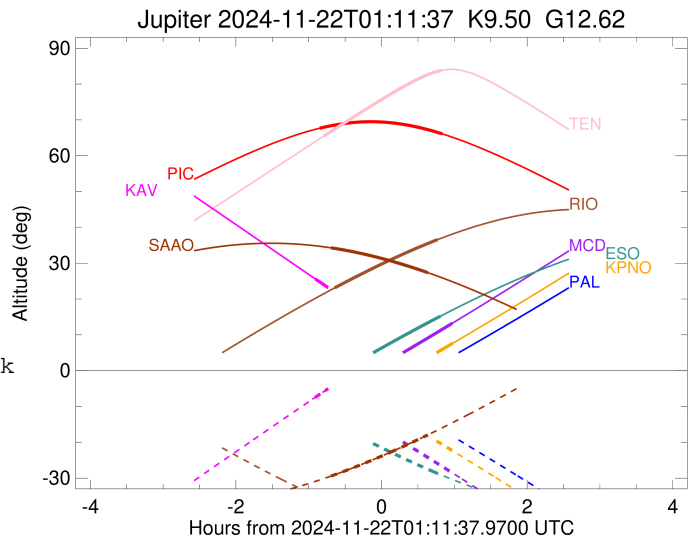
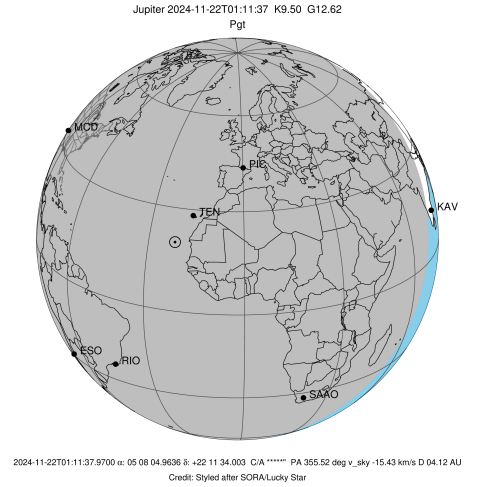


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2024-11-22T00:16:55.599	25.64	-7.48	71485.2	-50.77	-54.33
Jupiter	E	2024-11-22T01:54:31.816	3.22x	14.63x	71485.3	-50.09	-53.67

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2024-11-22T01:15:31.290
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      : 3415201145870743424
2Mass ID (if available) : 05080496+2211340
ICRS Star Coord at Epoch: 05h 08m 04.96360s +22:11:34.00330s
RUWE (>1.4 is poor) : 1.12
K magnitude          : 9.504
G magnitude          : 12.620
RP magnitude         : 11.720
BP magnitude         : 13.462
DUPflag             : 0
Distance (au)       : 4.122
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.43
Sun-Target sep (deg) : 161.87
Sun-Moon sep (deg)  : 61.29
B (ring opening deg) : 2.89
PA of pole (deg)    : -4.73
Pole direction: RA (deg): 268.05785
Dec (deg): 64.49672
C/A sky separation ("): 19.821
C/A sky separation (km): 59253.2
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
    
```

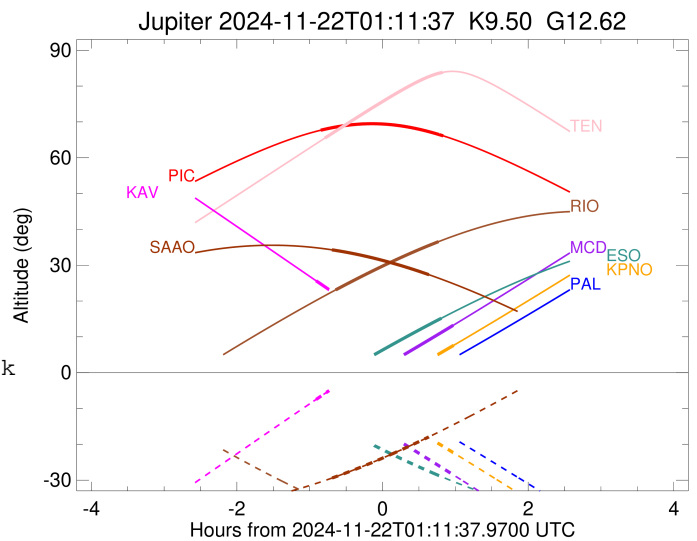
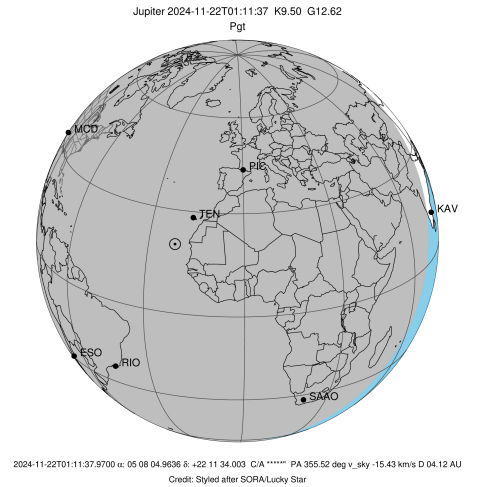


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2024-11-22T00:33:04.779	23.11	-37.20	71484.3	-55.13	-58.49
Jupiter	E	2024-11-22T01:57:48.810	36.57	-45.88	71484.1	-56.56	-59.84

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2024-11-22T01:16:50.840
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       : 3415201145870743424
2Mass ID (if available) : 05080496+2211340
ICRS Star Coord at Epoch: 05h 08m 04.96360s +22:11:34.00330s
RUWE (>1.4 is poor) : 1.12
K magnitude          : 9.504
G magnitude           : 12.620
RP magnitude         : 11.720
BP magnitude         : 13.462
DUPflag             : 0
Distance (au)        : 4.122
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.43
Sun-Target sep (deg) : 161.87
Sun-Moon sep (deg)   : 61.06
B (ring opening deg) : 2.89
PA of pole (deg)     : -4.73
Pole direction: RA (deg): 268.05785
Dec (deg): 64.49672
C/A sky separation ("): 19.687
C/A sky separation (km): 58852.2
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
    
```



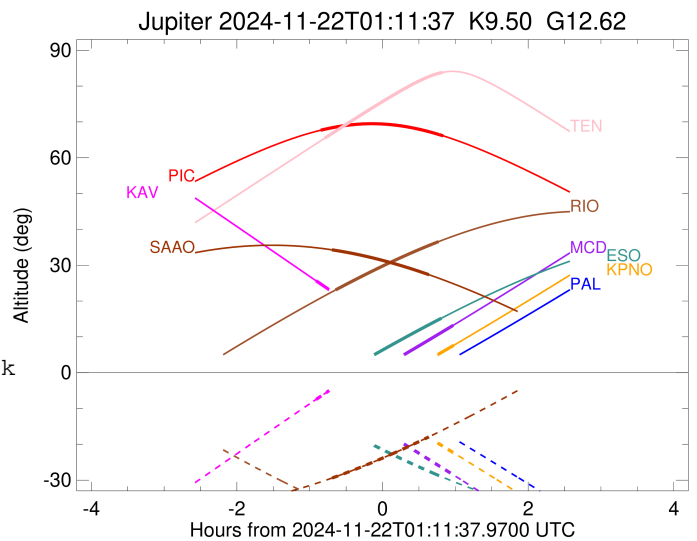
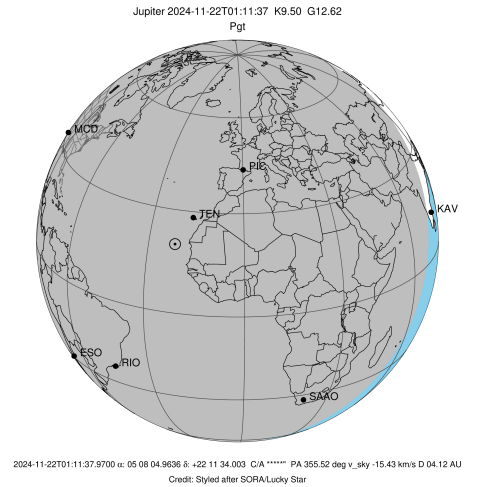
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2024-11-22T00:33:18.292	-1.15x	-14.79	71484.5	-54.49	-57.89
Jupiter	E	2024-11-22T02:00:10.954	15.20	-29.02	71484.2	-56.11	-59.42



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2024-11-22T01:09:56.920
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       : 3415201145870743424
2Mass ID (if available) : 05080496+2211340
ICRS Star Coord at Epoch: 05h 08m 04.96360s +22:11:34.00330s
RUWE (>1.4 is poor) : 1.12
K magnitude           : 9.504
G magnitude           : 12.620
RP magnitude          : 11.720
BP magnitude          : 13.462
DUPflag              : 0
Distance (au)         : 4.122
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.43
Sun-Target sep (deg) : 161.87
Sun-Moon sep (deg)   : 60.91
B (ring opening deg) : 2.89
PA of pole (deg)     : -4.73
Pole direction: RA (deg): 268.05785
Dec (deg): 64.49672
C/A sky separation ("): 20.319
C/A sky separation (km): 60740.3
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	2024-11-22T00:30:08.625	34.28	-29.40	71483.8	-57.87	-61.07
Jupiter	E	2024-11-22T01:49:48.103	27.36	-17.93	71483.8	-58.16	-61.35