

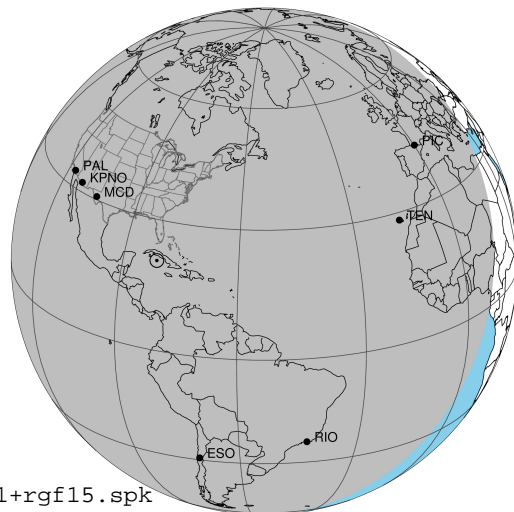
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2048-11-25T05:09:51.110
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 3427388545070888576
 2Mass ID (if available) : 05513956+2257352

Jupiter 2048-11-25T05:09:51 K9.44 G13.31 Pgt

ICRS Star Coord at Epoch: 05h 51m 39.55719s +22:57:35.15780s

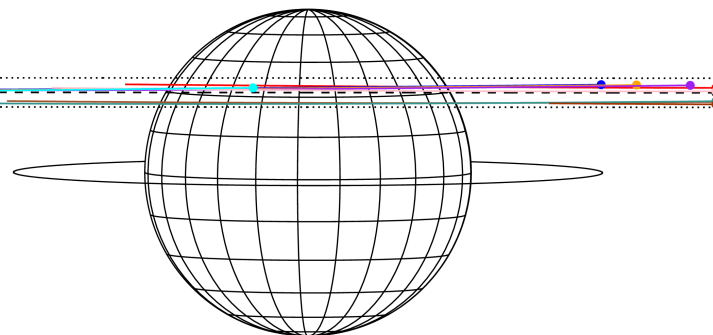
RUWE (>1.4 is poor) : 3.03
 K magnitude : 9.443
 G magnitude : 13.313
 RP magnitude : 12.208
 BP magnitude : 14.482
 DUPflag : 0
 Distance (au) : 4.188
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -14.21
 Sun-Target sep (deg) : 154.84
 Sun-Moon sep (deg) : 26.41
 B (ring opening deg) : 2.54
 PA of pole (deg) : -0.06
 Pole direction: RA (deg): 268.05736
 Dec (deg): 64.49721
 C/A sky separation (") : 11.527
 C/A sky separation (km) : 35008.1
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2048-11-25T05:09:51 K9.44 G13.31
 Pgt



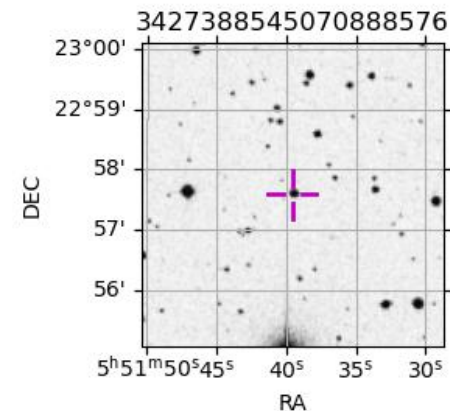
2048-11-25T05:09:51.1100 a: 05 51 39.5572 & +22 57 35.158 C/A ***** PA 179.97 deg v_sky -14.21 km/s D 04.19 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 SAAO



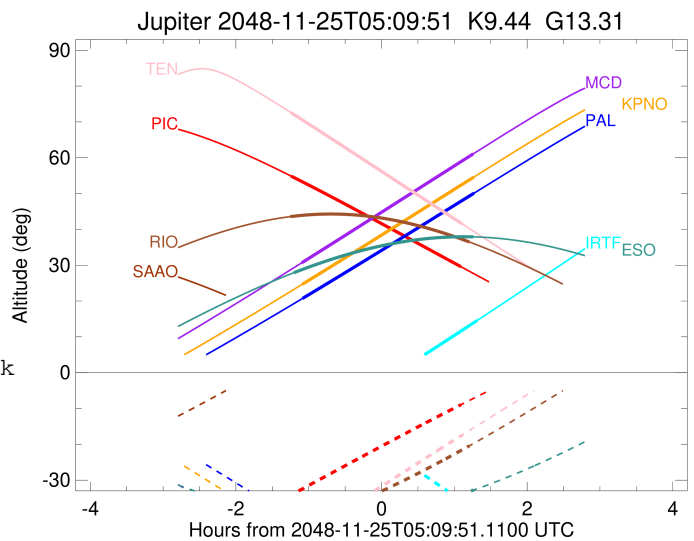
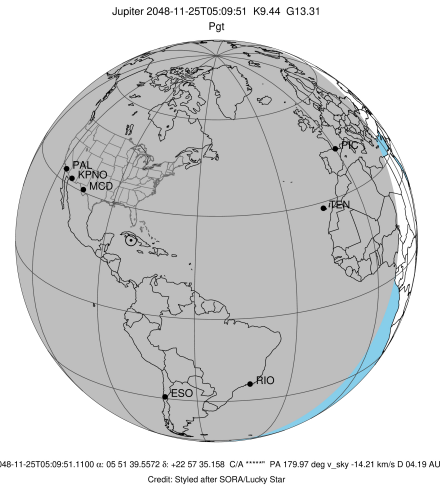
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events	Interval	OCode
PIC	Pic du Midi	42.9	0.1	+ +	NOV 25 03:55 - NOV 25 06:15	Pie	
PAL	Palomar Mt (200")	33.4	243.1	+ +	NOV 25 04:04 - NOV 25 06:26	Pie	
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn	
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	NOV 25 04:04 - NOV 25 06:25	Pie	
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	NOV 25 04:04 - NOV 25 06:25	Pie	
TEN	Teide Obs./Tenerife	28.3	343.5	+ +	NOV 25 03:55 - NOV 25 06:16	Pie	
IRTF	Mauna Kea/IRTF	19.8	204.5		NOV 25 06:28 - NOV 25 06:28	Pne	
KAV	Kavalur Observatory	12.6	78.8			Pnn	
RIO	Rio de Janeiro	-22.9	316.8	+ +	NOV 25 03:54 - NOV 25 06:22	Pie	
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	NOV 25 03:57 - NOV 25 06:25	Pie	
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn	
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn	
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn	



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2048-11-25T05:05:10.670
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        : 3427388545070888576
2Mass ID (if available) : 05513956+2257352
ICRS Star Coord at Epoch: 05h 51m 39.55719s +22:57:35.15780s
RUWE (>1.4 is poor)  : 3.03
K magnitude           : 9.443
G magnitude           : 13.313
RP magnitude          : 12.208
BP magnitude          : 14.482
DUPflag              : 0
Distance (au)         : 4.188
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -14.21
Sun-Target sep (deg)  : 154.84
Sun-Moon sep (deg)    : 26.24
B (ring opening deg)  : 2.54
PA of pole (deg)      : -0.06
Pole direction: RA (deg): 268.05736
Dec (deg): 64.49721
C/A sky separation (") : 12.479
C/A sky separation (km) : 37899.8
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
    
```

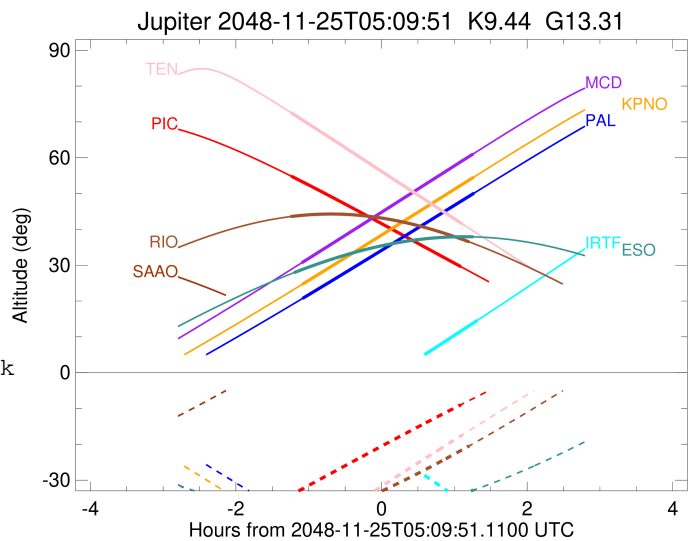
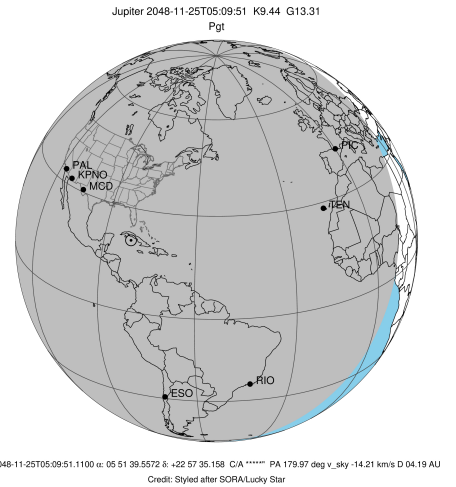


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2048-11-25T03:55:19.011	54.88	-34.15	71489.6	31.64	35.10
Jupiter	E	2048-11-25T06:15:23.735	29.56	-8.93	71489.5	32.42	35.91

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2048-11-25T05:15:46.450
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       : 3427388545070888576
2Mass ID (if available) : 05513956+2257352
ICRS Star Coord at Epoch: 05h 51m 39.55719s +22:57:35.15780s
RUWE (>1.4 is poor) : 3.03
K magnitude           : 9.443
G magnitude           : 13.313
RP magnitude          : 12.208
BP magnitude          : 14.482
DUPflag              : 0
Distance (au)        : 4.188
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.21
Sun-Target sep (deg) : 154.84
Sun-Moon sep (deg)   : 27.26
B (ring opening deg) : 2.54
PA of pole (deg)     : -0.06
Pole direction: RA (deg): 268.05736
Dec (deg): 64.49721
C/A sky separation ("): 12.253
C/A sky separation (km): 37213.2
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
    
```

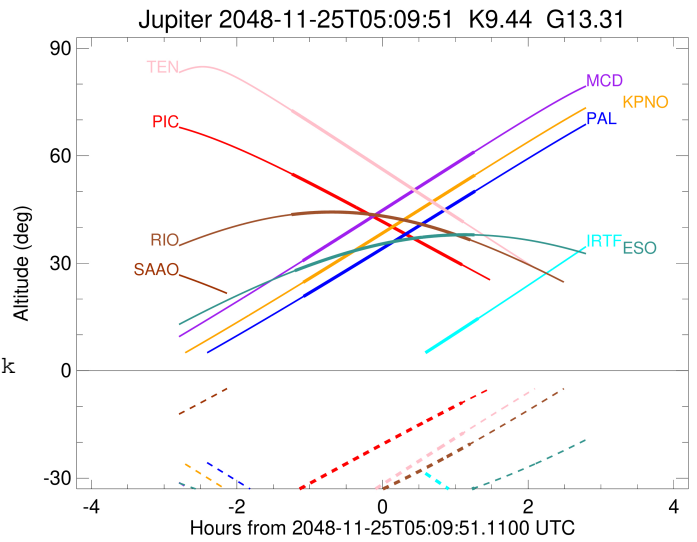
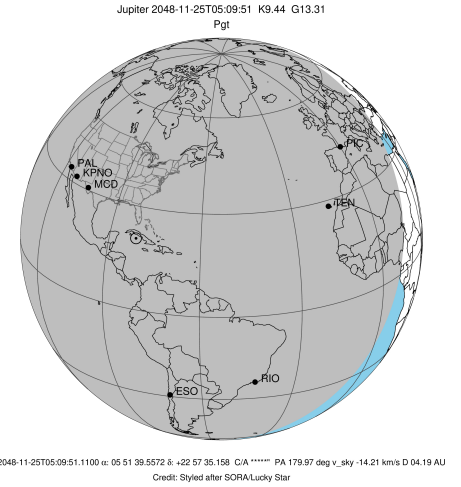


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2048-11-25T04:04:51.331	20.73	-42.25	71489.5	31.93	35.40
Jupiter	E	2048-11-25T06:26:06.798	50.10	-70.49	71489.7	30.83	34.25

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2048-11-25T05:15:32.580
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      : 3427388545070888576
2Mass ID (if available) : 05513956+2257352
ICRS Star Coord at Epoch: 05h 51m 39.55719s +22:57:35.15780s
RUWE (>1.4 is poor) : 3.03
K magnitude          : 9.443
G magnitude          : 13.313
RP magnitude         : 12.208
BP magnitude         : 14.482
DUPflag             : 0
Distance (au)       : 4.188
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.21
Sun-Target sep (deg) : 154.84
Sun-Moon sep (deg)  : 27.26
B (ring opening deg) : 2.54
PA of pole (deg)    : -0.06
Pole direction: RA (deg): 268.05736
Dec (deg): 64.49721
C/A sky separation (" ) : 12.154
C/A sky separation (km) : 36914.0
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
    
```

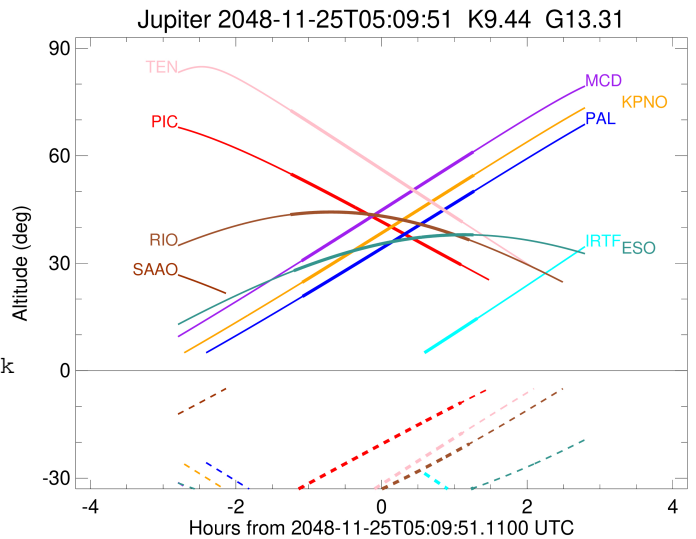
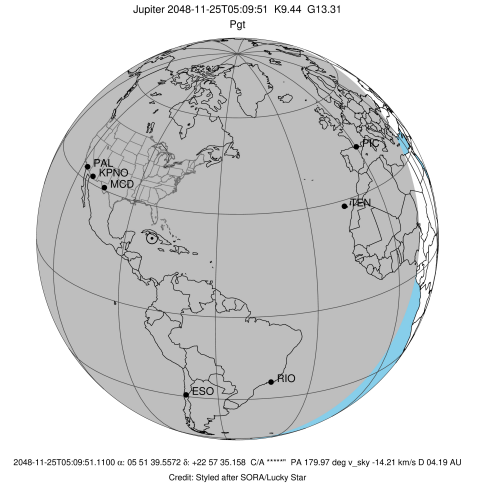


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2048-11-25T04:04:35.559	24.67	-46.68	71489.6	31.64	35.09
Jupiter	E	2048-11-25T06:25:56.085	54.59	-74.79	71489.7	30.58	33.99

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2048-11-25T05:15:04.220
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      : 3427388545070888576
2Mass ID (if available) : 05513956+2257352
ICRS Star Coord at Epoch: 05h 51m 39.55719s +22:57:35.15780s
RUWE (>1.4 is poor) : 3.03
K magnitude          : 9.443
G magnitude          : 13.313
RP magnitude         : 12.208
BP magnitude         : 14.482
DUPflag             : 0
Distance (au)       : 4.188
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.21
Sun-Target sep (deg) : 154.84
Sun-Moon sep (deg)  : 27.25
B (ring opening deg) : 2.54
PA of pole (deg)    : -0.06
Pole direction: RA (deg): 268.05736
Dec (deg): 64.49721
C/A sky separation ("): 12.039
C/A sky separation (km): 36564.7
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
    
```

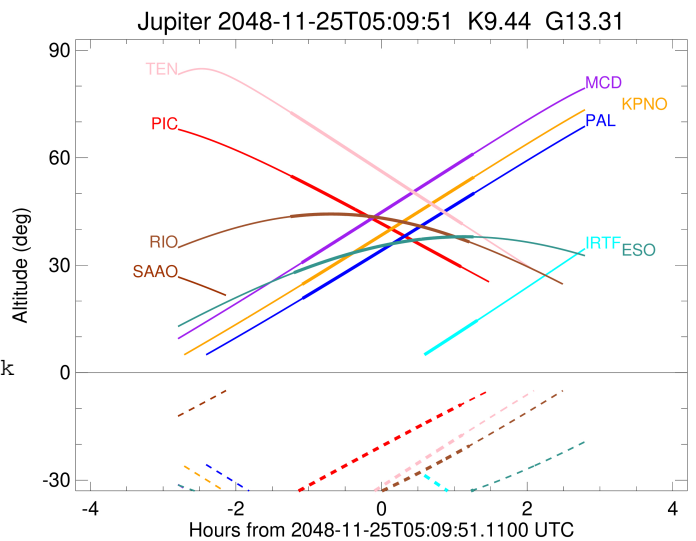
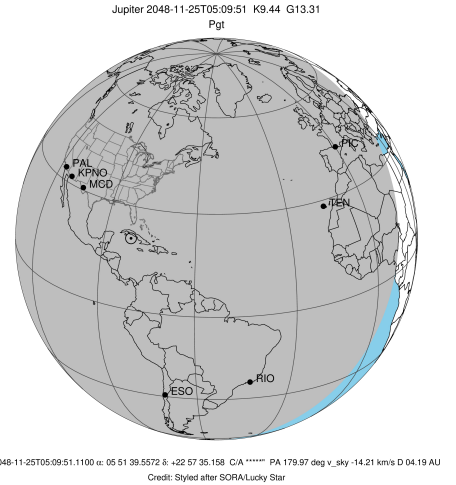


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2048-11-25T04:04:07.244	30.67	-53.14	71489.6	31.28	34.72
Jupiter	E	2048-11-25T06:25:30.288	61.08	-79.60	71489.7	30.31	33.70

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2048-11-25T05:05:41.520
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        : 3427388545070888576
2Mass ID (if available) : 05513956+2257352
ICRS Star Coord at Epoch: 05h 51m 39.55719s +22:57:35.15780s
RUWE (>1.4 is poor) : 3.03
K magnitude           : 9.443
G magnitude           : 13.313
RP magnitude          : 12.208
BP magnitude          : 14.482
DUPflag              : 0
Distance (au)         : 4.188
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.21
Sun-Target sep (deg) : 154.84
Sun-Moon sep (deg)   : 26.32
B (ring opening deg) : 2.54
PA of pole (deg)     : -0.06
Pole direction: RA (deg): 268.05736
Dec (deg): 64.49721
C/A sky separation (") : 11.860
C/A sky separation (km) : 36019.9
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
    
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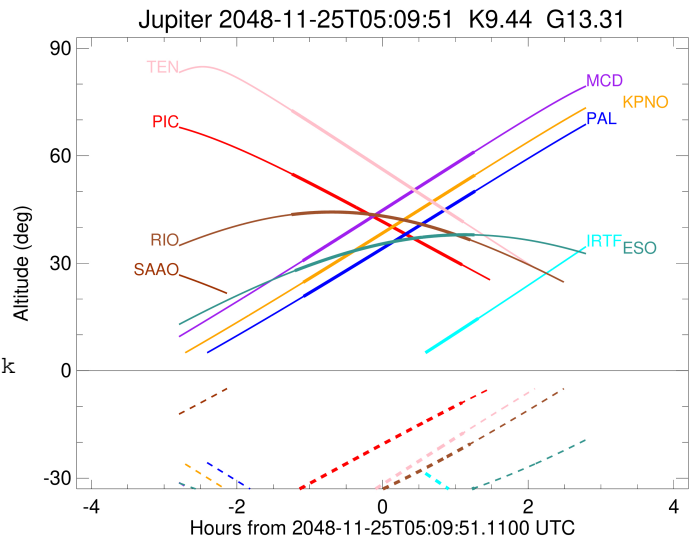
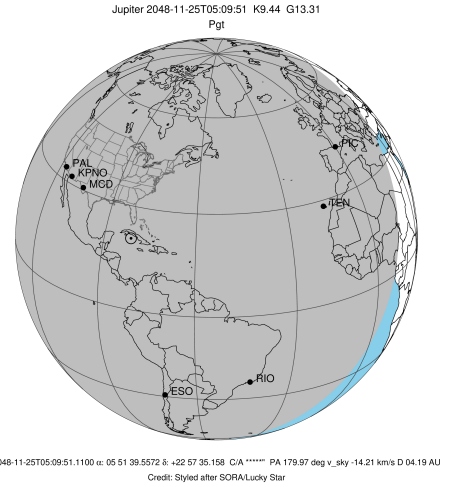


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2048-11-25T03:55:06.950	72.61	-48.15	71489.8	29.96	33.33
Jupiter	E	2048-11-25T06:16:34.999	41.48	-17.35	71489.7	30.64	34.05

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2048-11-25T05:17:19.460
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : IRTF
Location              : Mauna Kea/IRTF
Latitude (deg)        : 19.82622
E. Longitude (deg)    : 204.52800
Altitude (km)         : 4.168
Gaia source ID        : 3427388545070888576
2Mass ID (if available) : 05513956+2257352
ICRS Star Coord at Epoch: 05h 51m 39.55719s +22:57:35.15780s
RUWE (>1.4 is poor) : 3.03
K magnitude           : 9.443
G magnitude           : 13.313
RP magnitude          : 12.208
BP magnitude          : 14.482
DUPflag              : 0
Distance (au)         : 4.188
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.21
Sun-Target sep (deg) : 154.84
Sun-Moon sep (deg)   : 27.16
B (ring opening deg) : 2.54
PA of pole (deg)     : -0.06
Pole direction: RA (deg): 268.05736
Dec (deg): 64.49721
C/A sky separation (") : 12.304
C/A sky separation (km) : 37368.3
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
    
```

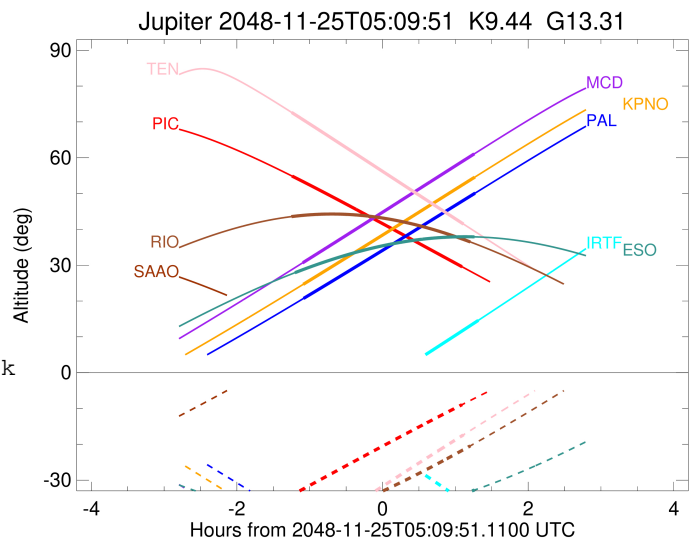
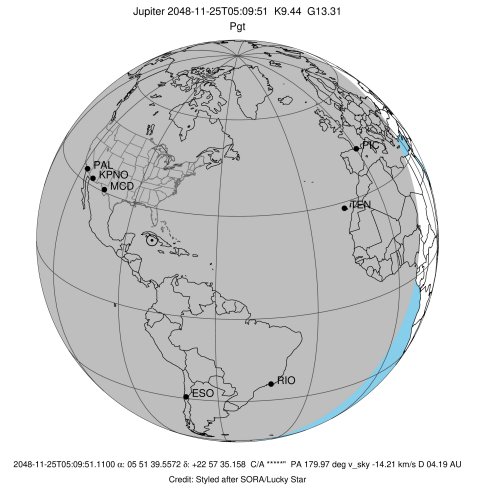


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2048-11-25T04:05:06.415	-16.02x	-6.08	71489.5	32.17	35.65
Jupiter	E	2048-11-25T06:28:47.037	14.60	-38.65	71489.7	30.77	34.18

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2048-11-25T05:08:32.430
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        : 3427388545070888576
2Mass ID (if available) : 05513956+2257352
ICRS Star Coord at Epoch: 05h 51m 39.55719s +22:57:35.15780s
RUWE (>1.4 is poor) : 3.03
K magnitude           : 9.443
G magnitude           : 13.313
RP magnitude          : 12.208
BP magnitude          : 14.482
DUPflag              : 0
Distance (au)         : 4.188
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.21
Sun-Target sep (deg)  : 154.84
Sun-Moon sep (deg)   : 26.50
B (ring opening deg) : 2.54
PA of pole (deg)     : -0.06
Pole direction: RA (deg): 268.05736
Dec (deg): 64.49721
C/A sky separation (" ) : 10.037
C/A sky separation (km) : 30484.2
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
    
```

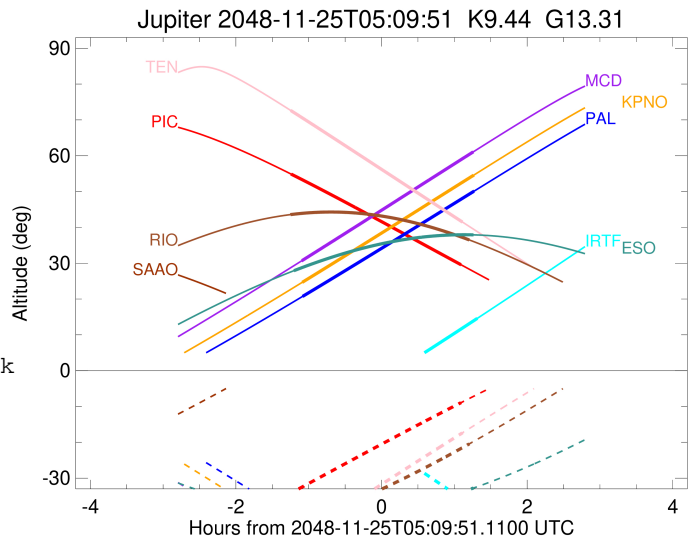
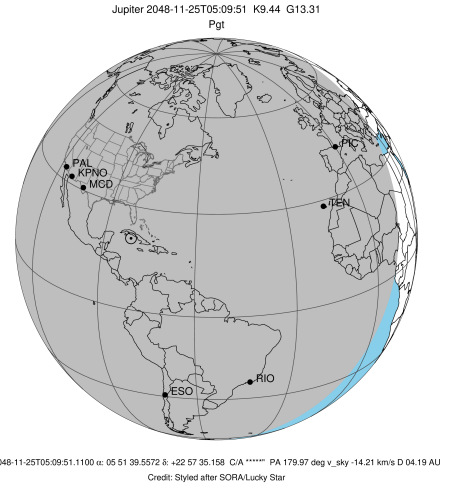


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2048-11-25T03:54:57.589	43.56	-42.69	71490.4	25.22	28.27
Jupiter	E	2048-11-25T06:22:11.248	36.49	-20.43	71490.4	25.41	28.47


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2048-11-25T05:11:47.640
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       : 3427388545070888576
2Mass ID (if available) : 05513956+2257352
ICRS Star Coord at Epoch: 05h 51m 39.55719s +22:57:35.15780s
RUWE (>1.4 is poor) : 3.03
K magnitude           : 9.443
G magnitude           : 13.313
RP magnitude          : 12.208
BP magnitude          : 14.482
DUPflag              : 0
Distance (au)        : 4.188
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.21
Sun-Target sep (deg) : 154.84
Sun-Moon sep (deg)  : 26.80
B (ring opening deg) : 2.54
PA of pole (deg)    : -0.06
Pole direction: RA (deg): 268.05736
Dec (deg): 64.49721
C/A sky separation ("): 9.898
C/A sky separation (km): 30063.0
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	2048-11-25T03:57:40.079	27.90	-39.45	71490.4	25.13	28.17
Jupiter	E	2048-11-25T06:25:40.292	37.90	-32.76	71490.4	24.74	27.75