

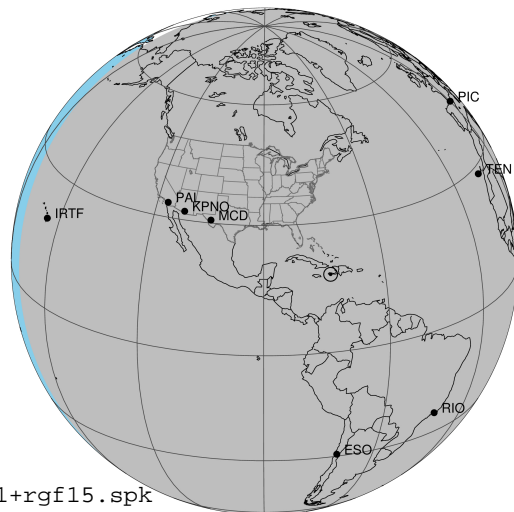
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2038-01-28T05:08:16.900
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 865478657955367680
 2Mass ID (if available) : 07371680+2158194

Jupiter 2038-01-28T05:08:16 K9.67 G11.97 Pgt

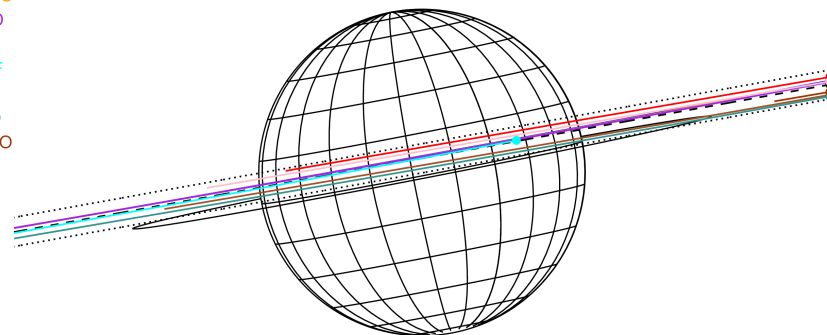
ICRS Star Coord at Epoch: 07h 37m 16.79094s +21:58:19.37856s

RUWE (>1.4 is poor) : 0.90
 K magnitude : 9.672
 G magnitude : 11.970
 RP magnitude : 11.266
 BP magnitude : 12.530
 DUPflag : 0
 Distance (au) : 4.282
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -16.24
 Sun-Target sep (deg) : 164.61
 Sun-Moon sep (deg) : 109.14
 B (ring opening deg) : 1.17
 PA of pole (deg) : 10.99
 Pole direction: RA (deg): 268.05621
 Dec (deg): 64.49691
 C/A sky separation (") : 1.972
 C/A sky separation (km) : 6123.2
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2038-01-28T05:08:16 K9.67 G11.97
 Pgt



Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 SAAO

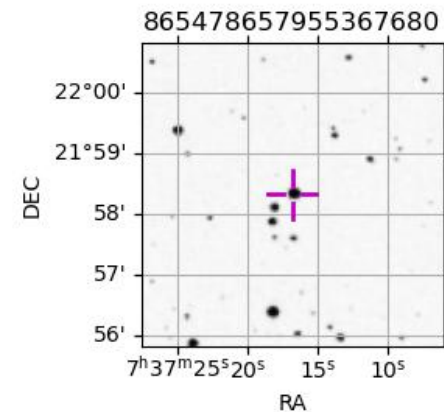


2038-01-28T05:08:16.9000 cc: 07 37 16.7909 s: +21 58 19.379 C/A 1.979 PA 190.25 deg v_sky -16.24 km/s D 04.28 AU

Credit: Styled after SORA/Lucky Star

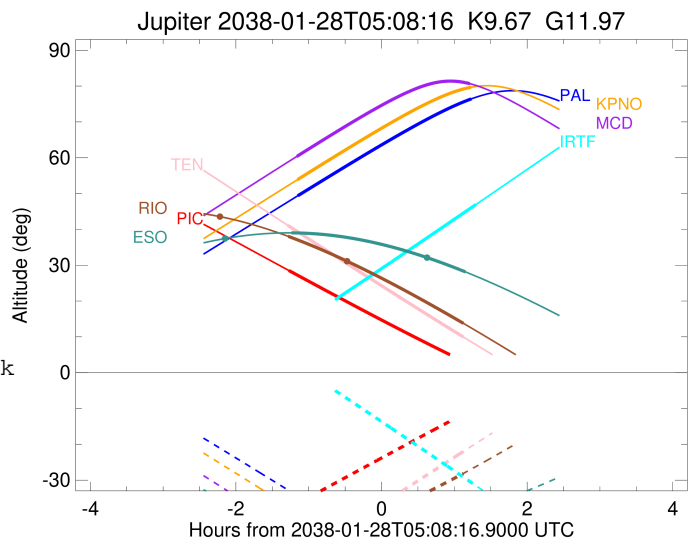
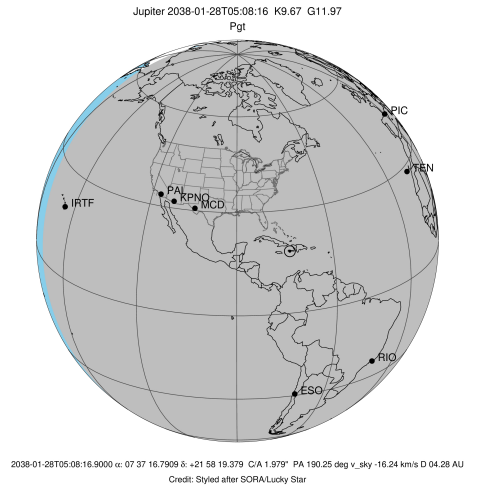
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	JAN 28 03:51 - JAN 28 03:51	Pin
PAL	Palomar Mt (200")	33.4	243.1	+ +	JAN 28 03:59 - JAN 28 06:22	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JAN 28 03:59 - JAN 28 06:21	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JAN 28 03:58 - JAN 28 06:21	Pie
TEN	Teide Obs./Tenerife	28.3	343.5	+ +	JAN 28 03:51 - JAN 28 06:15	Pie
IRTF	Mauna Kea/IRTF	19.8	204.5		JAN 28 06:25 - JAN 28 06:25	Pne
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+ +	JAN 28 03:51 - JAN 28 06:15	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JAN 28 03:54 - JAN 28 06:17	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            : 2038-01-28T05:04:12.920
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      : 865478657955367680
2Mass ID (if available) : 07371680+2158194
ICRS Star Coord at Epoch: 07h 37m 16.79094s +21:58:19.37856s
RUWE (>1.4 is poor) : 0.90
K magnitude          : 9.672
G magnitude          : 11.970
RP magnitude         : 11.266
BP magnitude         : 12.530
DUPflag             : 0
Distance (au)       : 4.282
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.24
Sun-Target sep (deg) : 164.61
Sun-Moon sep (deg)  : 109.60
B (ring opening deg) : 1.17
PA of pole (deg)    : 10.99
Pole direction: RA (deg): 268.05621
Dec (deg): 64.49691
C/A sky separation (" ) : 3.505
C/A sky separation (km) : 10885.2
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
    
```

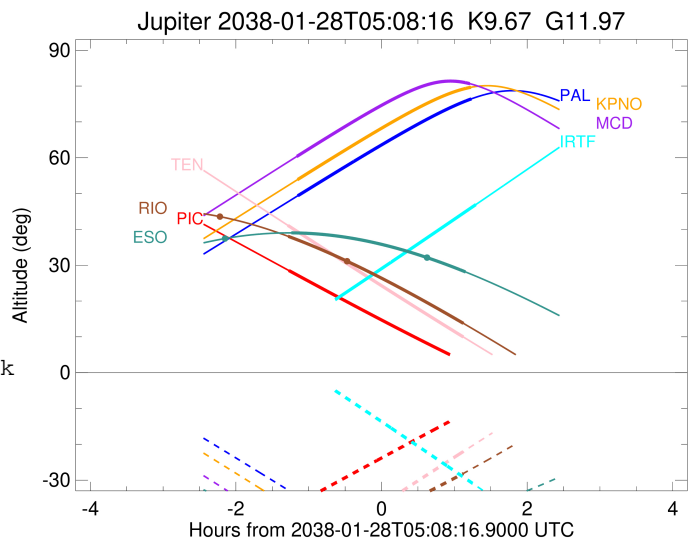
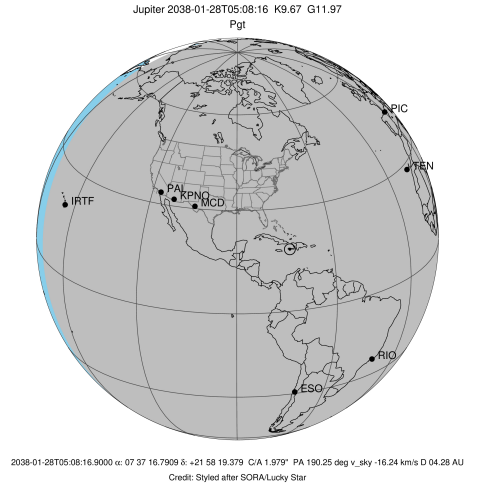


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2038-01-28T03:51:53.803	28.52	-37.79	71492.0	7.55	8.61
Jupiter	E	2038-01-28T06:17:02.523	2.97x	-11.36	71491.9	9.91	11.29

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2038-01-28T05:10:56.860
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        : 865478657955367680
2Mass ID (if available) : 07371680+2158194
ICRS Star Coord at Epoch: 07h 37m 16.79094s +21:58:19.37856s
RUWE (>1.4 is poor) : 0.90
K magnitude           : 9.672
G magnitude           : 11.970
RP magnitude          : 11.266
BP magnitude          : 12.530
DUPflag              : 0
Distance (au)         : 4.282
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.24
Sun-Target sep (deg)  : 164.61
Sun-Moon sep (deg)    : 109.83
B (ring opening deg) : 1.17
PA of pole (deg)      : 10.99
Pole direction: RA (deg): 268.05621
Dec (deg): 64.49691
C/A sky separation (") : 2.294
C/A sky separation (km) : 7124.6
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
    
```

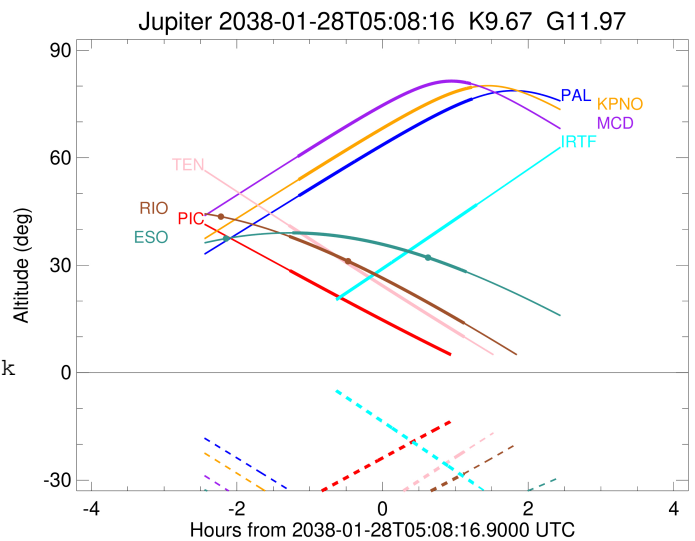
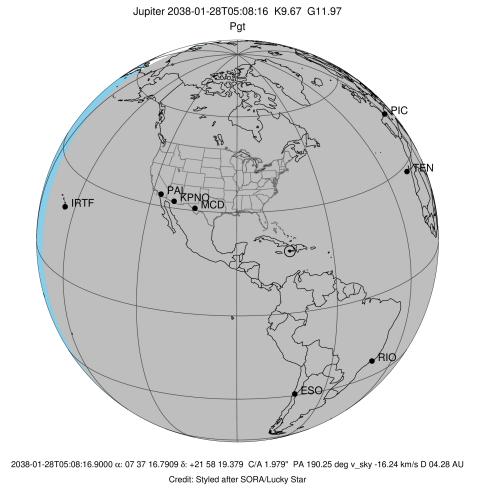


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2038-01-28T03:59:25.282	49.40	-34.46	71492.0	5.06	5.79
Jupiter	E	2038-01-28T06:22:18.483	76.42	-63.42	71492.0	6.55	7.47

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2038-01-28T05:10:29.310
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        : 865478657955367680
2Mass ID (if available) : 07371680+2158194
ICRS Star Coord at Epoch: 07h 37m 16.79094s +21:58:19.37856s
RUWE (>1.4 is poor) : 0.90
K magnitude           : 9.672
G magnitude           : 11.970
RP magnitude          : 11.266
BP magnitude          : 12.530
DUPflag              : 0
Distance (au)         : 4.282
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.24
Sun-Target sep (deg) : 164.61
Sun-Moon sep (deg)   : 109.89
B (ring opening deg) : 1.17
PA of pole (deg)     : 10.99
Pole direction: RA (deg): 268.05621
Dec (deg): 64.49691
C/A sky separation ("): 2.248
C/A sky separation (km): 6980.5
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
    
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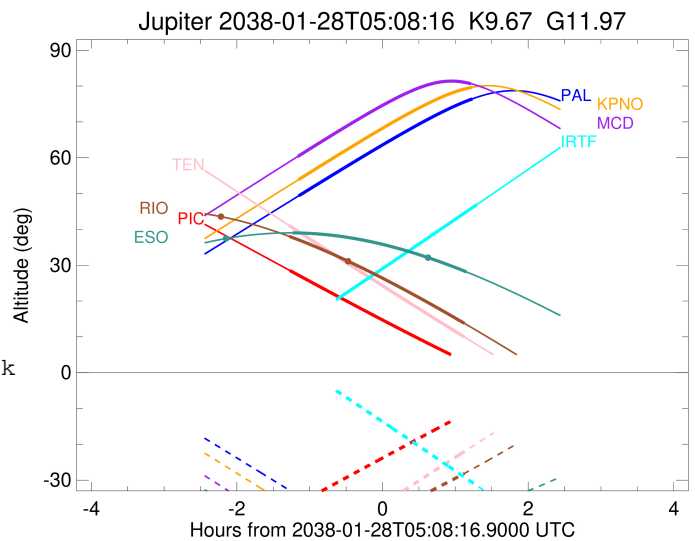
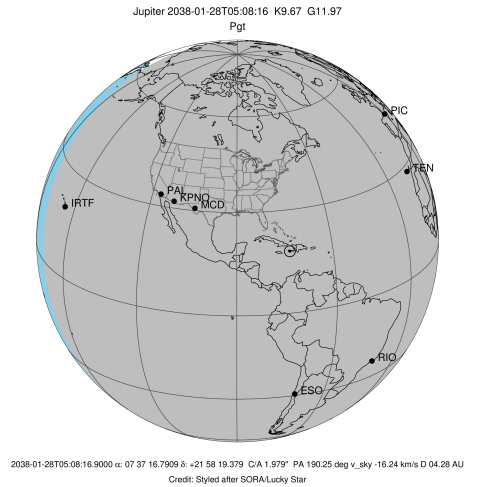


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2038-01-28T03:59:02.561	53.87	-38.84	71492.0	4.90	5.60
Jupiter	E	2038-01-28T06:21:48.582	79.65	-67.85	71492.0	6.48	7.40

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2038-01-28T05:09:47.040
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       : 865478657955367680
2Mass ID (if available) : 07371680+2158194
ICRS Star Coord at Epoch: 07h 37m 16.79094s +21:58:19.37856s
RUWE (>1.4 is poor) : 0.90
K magnitude           : 9.672
G magnitude           : 11.970
RP magnitude         : 11.266
BP magnitude         : 12.530
DUPflag              : 0
Distance (au)        : 4.282
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.24
Sun-Target sep (deg) : 164.61
Sun-Moon sep (deg)   : 109.96
B (ring opening deg) : 1.17
PA of pole (deg)     : 10.99
Pole direction: RA (deg): 268.05621
Dec (deg): 64.49691
C/A sky separation (") : 2.216
C/A sky separation (km) : 6882.7
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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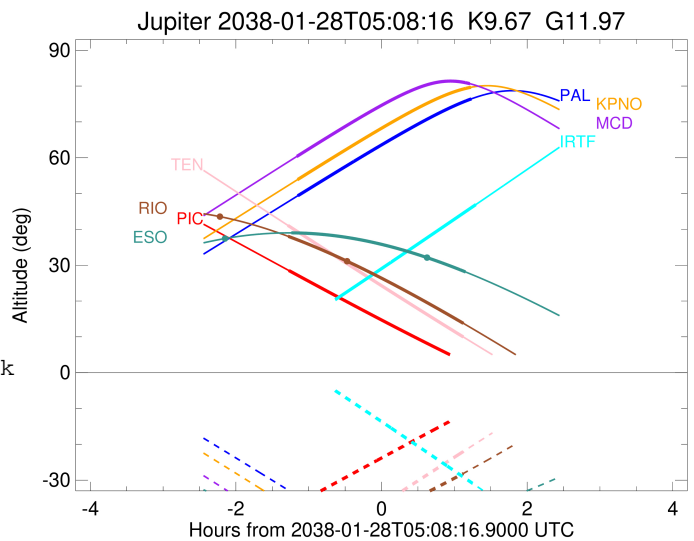
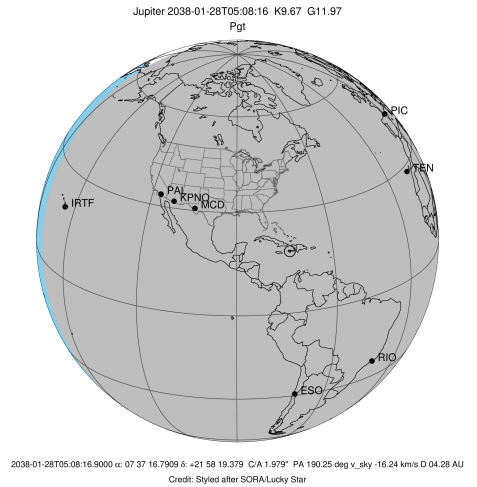


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2038-01-28T03:58:25.999	60.34	-45.26	71492.0	4.75	5.43
Jupiter	E	2038-01-28T06:21:04.448	80.66	-73.56	71492.0	6.47	7.39

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2038-01-28T05:03:11.340
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        : 865478657955367680
2Mass ID (if available) : 07371680+2158194
ICRS Star Coord at Epoch: 07h 37m 16.79094s +21:58:19.37856s
RUWE (>1.4 is poor) : 0.90
K magnitude           : 9.672
G magnitude           : 11.970
RP magnitude          : 11.266
BP magnitude          : 12.530
DUPflag              : 0
Distance (au)         : 4.282
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.24
Sun-Target sep (deg) : 164.61
Sun-Moon sep (deg)   : 109.79
B (ring opening deg) : 1.17
PA of pole (deg)     : 10.99
Pole direction: RA (deg): 268.05621
Dec (deg): 64.49691
C/A sky separation (") : 2.963
C/A sky separation (km) : 9200.1
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
    
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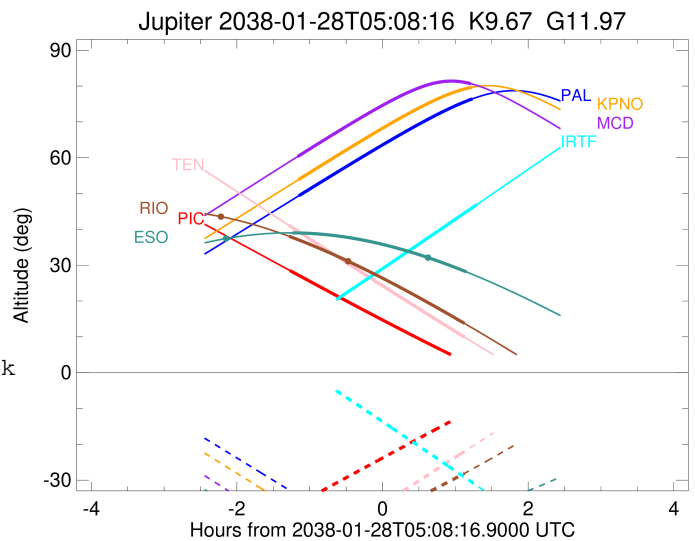
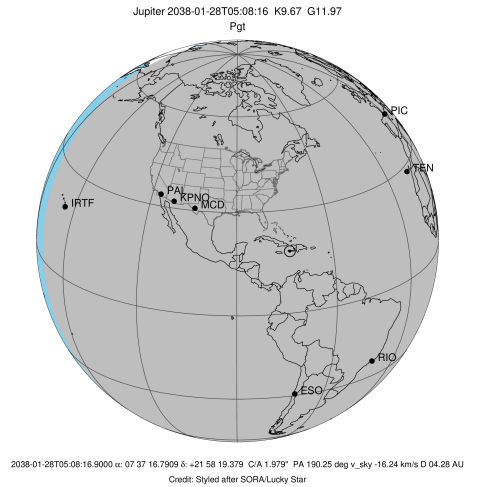


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2038-01-28T03:51:10.147	41.10	-53.75	71492.0	6.07	6.93
Jupiter	E	2038-01-28T06:15:47.275	9.95	-21.99	71492.0	8.70	9.92

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2038-01-28T05:13:58.440
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      : 865478657955367680
2Mass ID (if available) : 07371680+2158194
ICRS Star Coord at Epoch: 07h 37m 16.79094s +21:58:19.37856s
RUWE (>1.4 is poor) : 0.90
K magnitude         : 9.672
G magnitude         : 11.970
RP magnitude        : 11.266
BP magnitude        : 12.530
DUPflag            : 0
Distance (au)       : 4.282
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -16.24
Sun-Target sep (deg) : 164.61
Sun-Moon sep (deg)  : 109.31
B (ring opening deg) : 1.17
PA of pole (deg)    : 10.99
Pole direction: RA (deg): 268.05621
Dec (deg): 64.49691
C/A sky separation (") : 1.980
C/A sky separation (km) : 6149.1
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
    
```

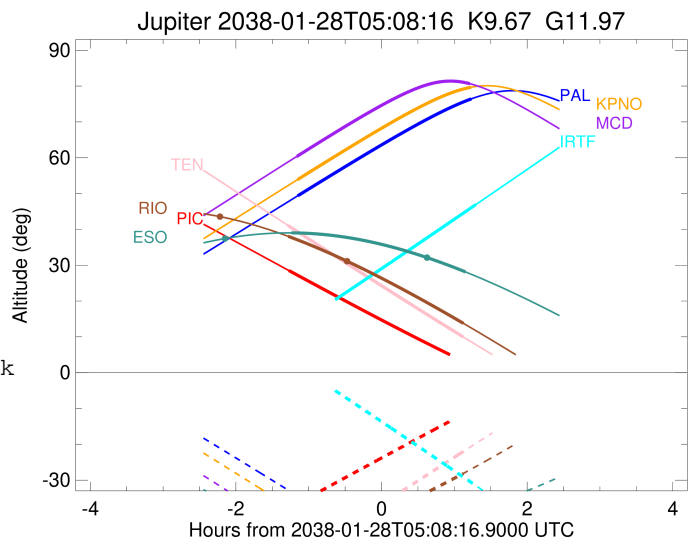
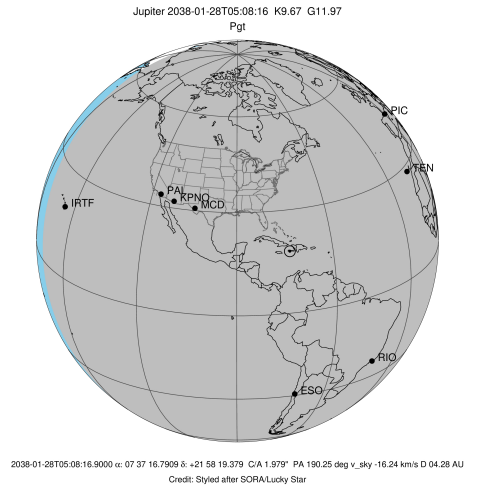


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2038-01-28T04:01:35.525	13.94	1.34x	71492.0	4.65	5.31
Jupiter	E	2038-01-28T06:25:52.301	46.88	-31.48	71492.0	5.38	6.14

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2038-01-28T05:03:19.210
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       : 865478657955367680
2Mass ID (if available) : 07371680+2158194
ICRS Star Coord at Epoch: 07h 37m 16.79094s +21:58:19.37856s
RUWE (>1.4 is poor) : 0.90
K magnitude          : 9.672
G magnitude          : 11.970
RP magnitude         : 11.266
BP magnitude         : 12.530
DUPflag             : 0
Distance (au)        : 4.282
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.24
Sun-Target sep (deg) : 164.61
Sun-Moon sep (deg)  : 109.79
B (ring opening deg) : 1.17
PA of pole (deg)    : 10.99
Pole direction: RA (deg): 268.05621
Dec (deg): 64.49691
C/A sky separation (") : 1.003
C/A sky separation (km) : 3115.7
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
    
```

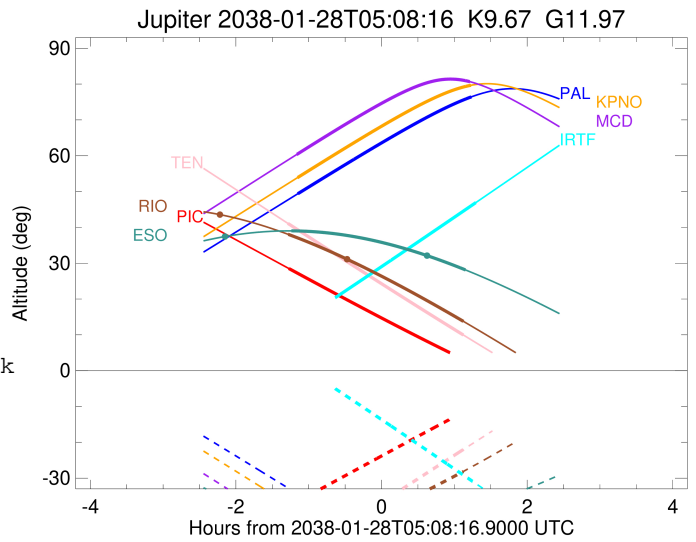
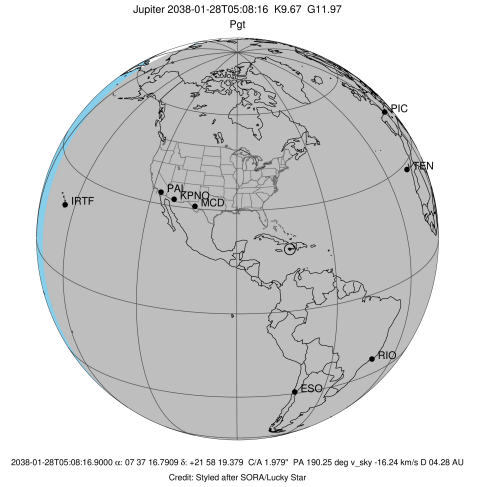


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2038-01-28T03:51:28.950	38.04	-47.56	71492.0	1.22	1.40
Jupiter	E	2038-01-28T06:15:37.544	13.79	-28.14	71492.0	3.84	4.39


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2038-01-28T05:05:35.760
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      : 865478657955367680
2Mass ID (if available) : 07371680+2158194
ICRS Star Coord at Epoch: 07h 37m 16.79094s +21:58:19.37856s
RUWE (>1.4 is poor) : 0.90
K magnitude          : 9.672
G magnitude          : 11.970
RP magnitude         : 11.266
BP magnitude         : 12.530
DUPflag             : 0
Distance (au)        : 4.282
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.24
Sun-Target sep (deg) : 164.61
Sun-Moon sep (deg)  : 109.79
B (ring opening deg) : 1.17
PA of pole (deg)    : 10.99
Pole direction: RA (deg): 268.05621
Dec (deg): 64.49691
C/A sky separation (") : 0.539
C/A sky separation (km) : 1674.8
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	2038-01-28T03:53:59.720	39.02	-40.43	71492.0	0.27	0.31
Jupiter	E	2038-01-28T06:17:25.831	28.13	-38.80	71492.0	2.55	2.91