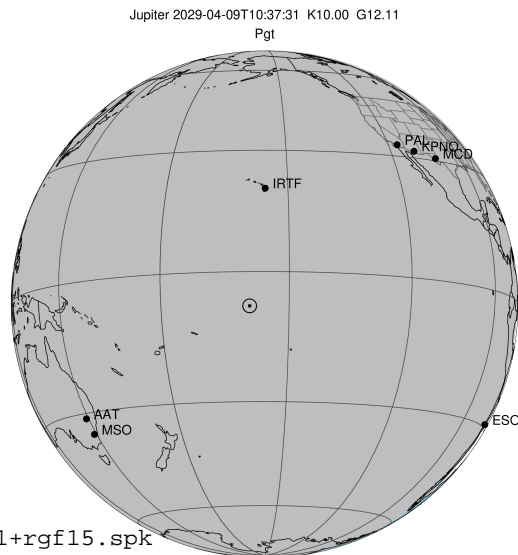


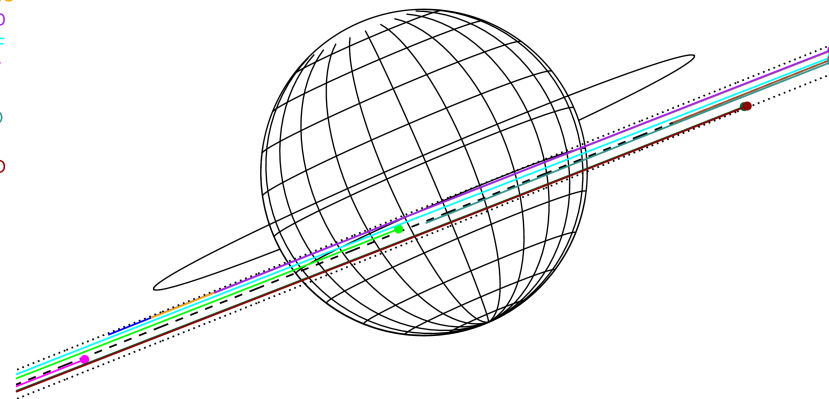
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2029-04-09T10:37:31.850
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 3631244559272698112
 2Mass ID (if available) : 13252838-0717381

Jupiter 2029-04-09T10:37:31 K10.00 G12.11 Pgt

ICRS Star Coord at Epoch: 13h 25m 28.37631s -07:17:38.15664s
 RUWE (>1.4 is poor) : 1.29
 K magnitude : 9.996
 G magnitude : 12.110
 RP magnitude : 11.456
 BP magnitude : 12.603
 DUPflag : 0
 Distance (au) : 4.451
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -17.22
 Sun-Target sep (deg) : 176.60
 Sun-Moon sep (deg) : 128.01
 B (ring opening deg) : -3.12
 PA of pole (deg) : 23.33
 Pole direction: RA (deg): 268.05750
 Dec (deg): 64.49656
 C/A sky separation (") : 6.230
 C/A sky separation (km) : 20110.7
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk



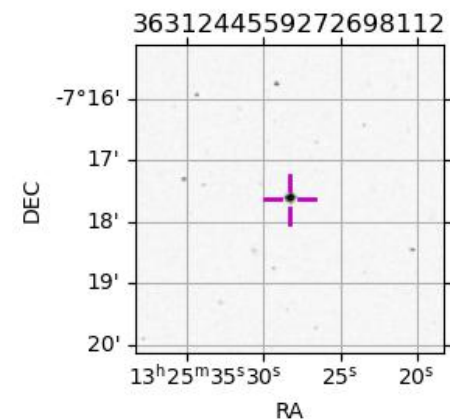
Earth
 PAL
 PMO
 KPNO
 MCD
 IRTF
 KAV
 RIO
 ESO
 AAT
 MSO



2029-04-09T10:37:31.8500 at: 13 25 28.3763 s -07 17 38.157 C/A 6.240" PA 21.74 deg v_sky -17.22 km/s D 04.45 AU
 Credit: Styled after SORA/Lucky Star

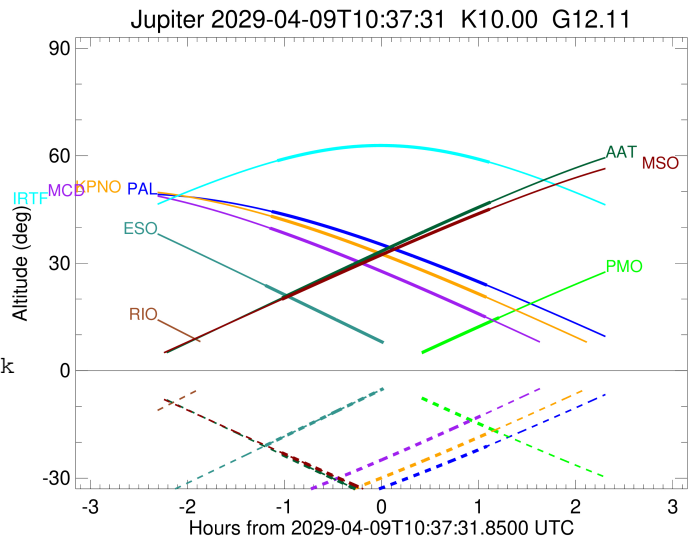
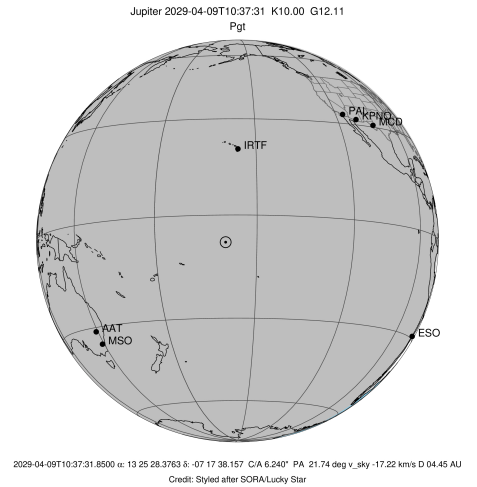
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events	Interval	OCode
PIC	Pic du Midi	42.9	0.1				Pnn
PAL	Palomar Mt (200")	33.4	243.1	+ +	APR 09 09:29 - APR 09 11:42		Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+ +	APR 09 11:50 - APR 09 11:50		Pne
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	APR 09 09:29 - APR 09 11:42		Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	APR 09 09:28 - APR 09 11:41		Pie
TEN	Teide Obs./Tenerife	28.3	343.5				Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	APR 09 09:33 - APR 09 11:44		Pie
KAV	Kavalur Observatory	12.6	78.8				Pnn
RIO	Rio de Janeiro	-22.9	316.8				Pnn
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	APR 09 09:25 - APR 09 09:25		Pin
AAT	Siding Spring (AAT)	-31.3	149.1	+ +	APR 09 09:36 - APR 09 11:44		Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8				Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	APR 09 09:35 - APR 09 11:44		Pie



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2029-04-09T10:36:03.210
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       : 3631244559272698112
2Mass ID (if available) : 13252838-0717381
ICRS Star Coord at Epoch: 13h 25m 28.37631s -07:17:38.15664s
RUWE (>1.4 is poor) : 1.29
K magnitude           : 9.996
G magnitude           : 12.110
RP magnitude         : 11.456
BP magnitude         : 12.603
DUPflag              : 0
Distance (au)        : 4.451
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -17.22
Sun-Target sep (deg) : 176.60
Sun-Moon sep (deg)  : 128.61
B (ring opening deg) : -3.12
PA of pole (deg)    : 23.33
Pole direction: RA (deg): 268.05750
Dec (deg): 64.49656
C/A sky separation ("): 4.699
C/A sky separation (km): 15170.2
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
    
```

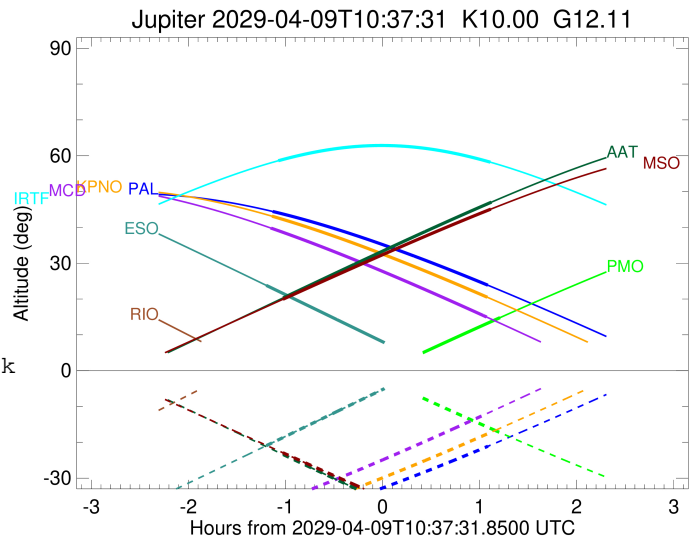
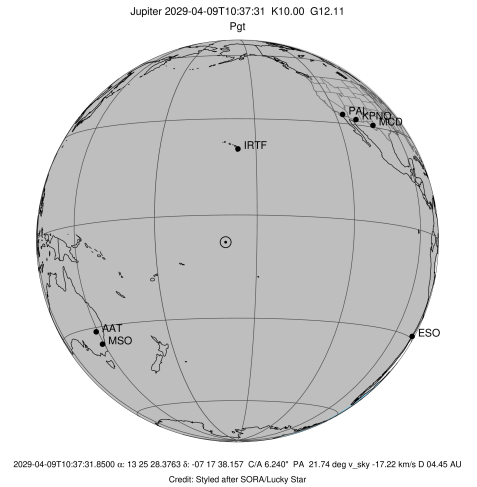


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2029-04-09T09:29:40.225	44.43	-42.59	71491.2	-14.15	-16.07
Jupiter	E	2029-04-09T11:42:39.626	23.85	-21.10	71491.6	-10.43	-11.89

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2029-04-09T10:43:39.480
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       : 3631244559272698112
2Mass ID (if available) : 13252838-0717381
ICRS Star Coord at Epoch: 13h 25m 28.37631s -07:17:38.15664s
RUWE (>1.4 is poor) : 1.29
K magnitude           : 9.996
G magnitude           : 12.110
RP magnitude          : 11.456
BP magnitude          : 12.603
DUPflag              : 0
Distance (au)         : 4.451
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -17.22
Sun-Target sep (deg) : 176.60
Sun-Moon sep (deg)   : 127.48
B (ring opening deg) : -3.12
PA of pole (deg)     : 23.33
Pole direction: RA (deg): 268.05750
Dec (deg): 64.49656
C/A sky separation ("): 5.863
C/A sky separation (km): 18928.6
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
    
```

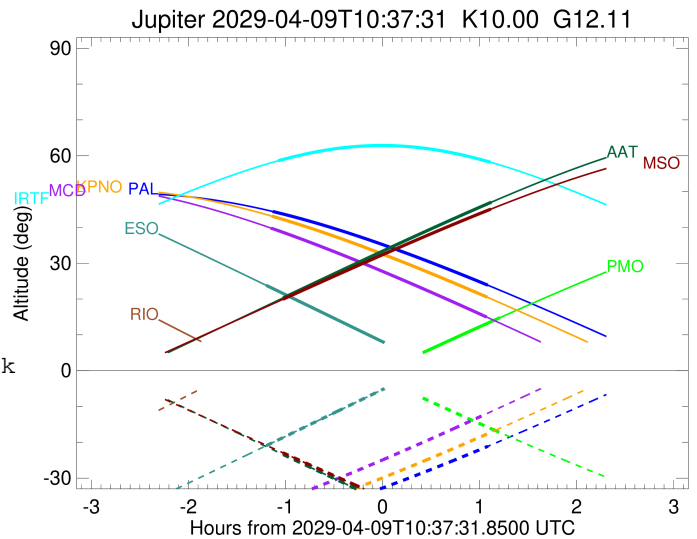
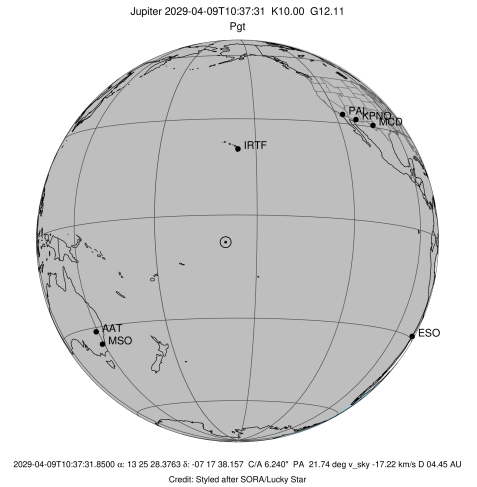


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2029-04-09T09:36:45.639	-13.10x	10.32x	71490.9	-17.05	-19.32
Jupiter	E	2029-04-09T11:50:08.213	14.80	-17.28	71491.3	-13.47	-15.31

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2029-04-09T10:35:36.540
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       : 3631244559272698112
2Mass ID (if available) : 13252838-0717381
ICRS Star Coord at Epoch: 13h 25m 28.37631s -07:17:38.15664s
RUWE (>1.4 is poor) : 1.29
K magnitude           : 9.996
G magnitude           : 12.110
RP magnitude          : 11.456
BP magnitude          : 12.603
DUPflag              : 0
Distance (au)        : 4.451
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -17.22
Sun-Target sep (deg) : 176.60
Sun-Moon sep (deg)   : 128.62
B (ring opening deg) : -3.12
PA of pole (deg)     : 23.33
Pole direction: RA (deg): 268.05750
Dec (deg): 64.49656
C/A sky separation (") : 4.698
C/A sky separation (km) : 15165.3
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
    
```

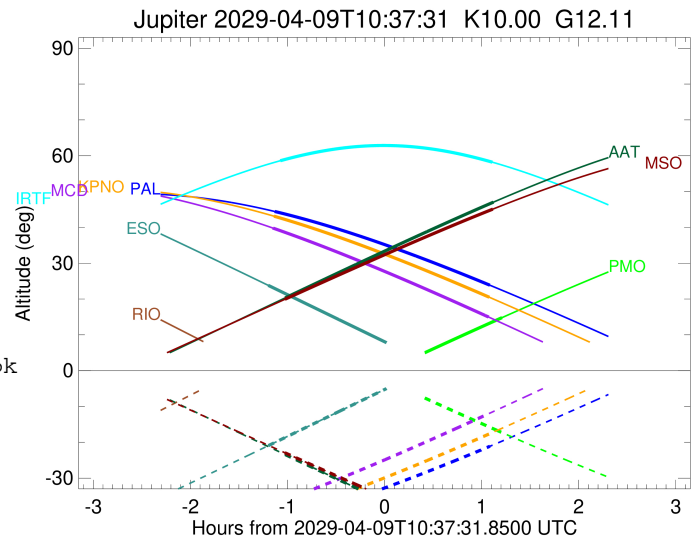
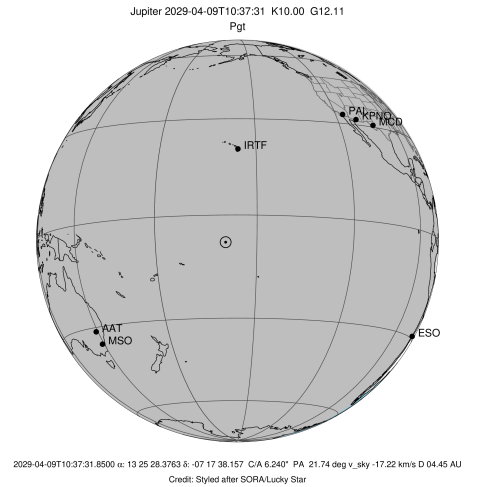


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2029-04-09T09:29:11.006	43.13	-41.00	71491.2	-14.11	-16.03
Jupiter	E	2029-04-09T11:42:17.505	20.50	-17.65	71491.6	-10.47	-11.93

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2029-04-09T10:35:02.880
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      : 3631244559272698112
2Mass ID (if available) : 13252838-0717381
ICRS Star Coord at Epoch: 13h 25m 28.37631s -07:17:38.15664s
RUWE (>1.4 is poor) : 1.29
K magnitude          : 9.996
G magnitude          : 12.110
RP magnitude         : 11.456
BP magnitude         : 12.603
DUPflag             : 0
Distance (au)       : 4.451
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -17.22
Sun-Target sep (deg) : 176.60
Sun-Moon sep (deg)  : 128.62
B (ring opening deg) : -3.12
PA of pole (deg)    : 23.33
Pole direction: RA (deg): 268.05750
Dec (deg): 64.49656
C/A sky separation ("): 4.689
C/A sky separation (km): 15136.9
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
    
```

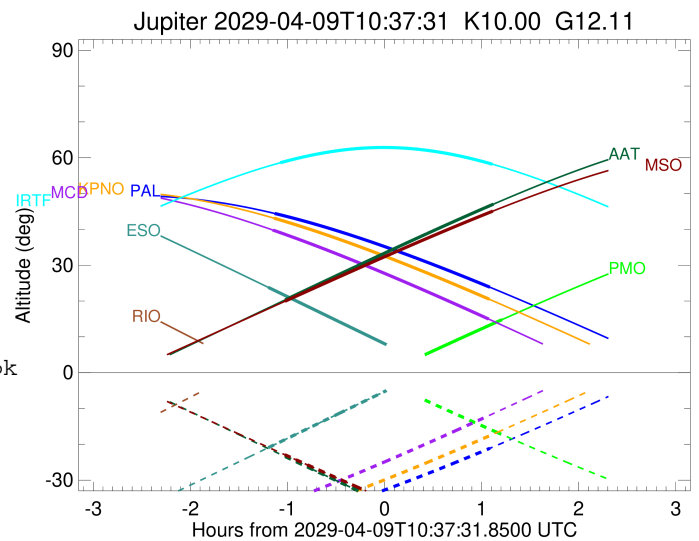
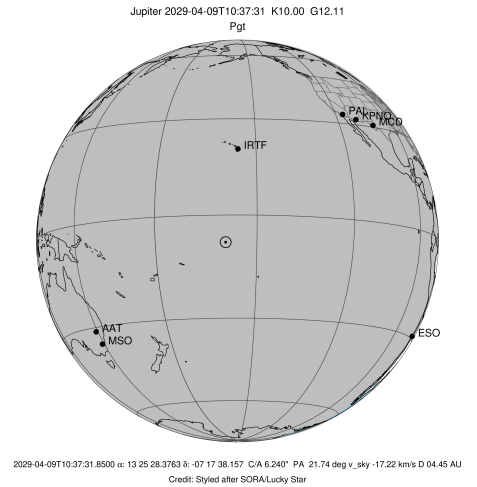


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2029-04-09T09:28:31.595	39.81	-37.36	71491.2	-14.04	-15.95
Jupiter	E	2029-04-09T11:41:52.198	14.97	-12.02	71491.6	-10.51	-11.97

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2029-04-09T10:38:41.240
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      : 3631244559272698112
2Mass ID (if available) : 13252838-0717381
ICRS Star Coord at Epoch: 13h 25m 28.37631s -07:17:38.15664s
RUWE (>1.4 is poor) : 1.29
K magnitude          : 9.996
G magnitude          : 12.110
RP magnitude         : 11.456
BP magnitude         : 12.603
DUPflag             : 0
Distance (au)       : 4.451
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -17.22
Sun-Target sep (deg) : 176.60
Sun-Moon sep (deg)  : 128.57
B (ring opening deg) : -3.12
PA of pole (deg)    : 23.33
Pole direction: RA (deg): 268.05750
Dec (deg): 64.49656
C/A sky separation (") : 5.387
C/A sky separation (km) : 17389.9
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
    
```

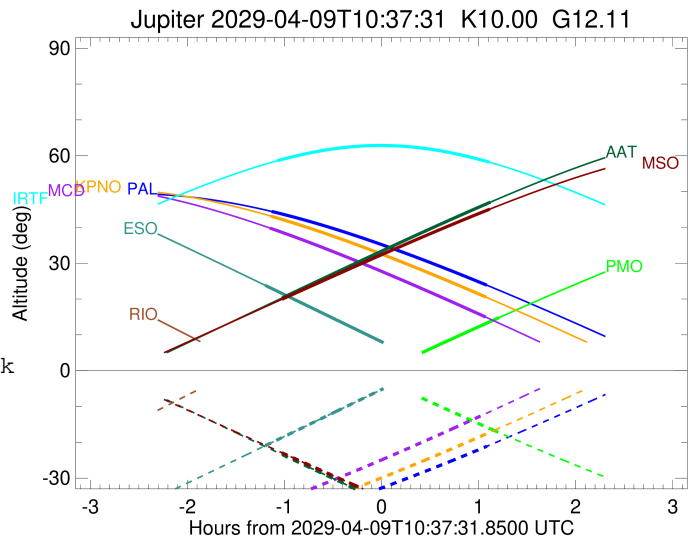
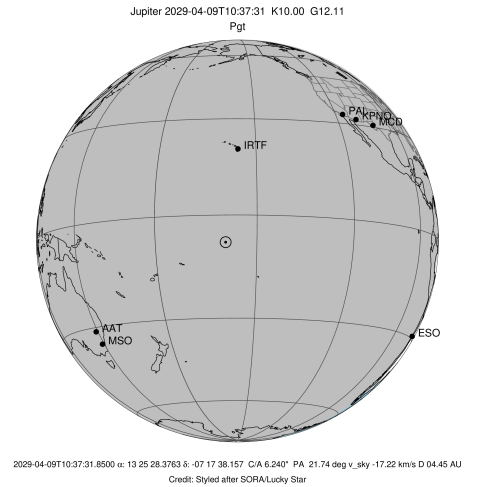


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2029-04-09T09:33:04.966	58.59	-59.88	71491.0	-16.19	-18.35
Jupiter	E	2029-04-09T11:44:15.874	58.18	-56.06	71491.4	-11.98	-13.63

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2029-04-09T10:31:26.830
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      : 3631244559272698112
2Mass ID (if available) : 13252838-0717381
ICRS Star Coord at Epoch: 13h 25m 28.37631s -07:17:38.15664s
RUWE (>1.4 is poor) : 1.29
K magnitude          : 9.996
G magnitude          : 12.110
RP magnitude         : 11.456
BP magnitude         : 12.603
DUPflag             : 0
Distance (au)       : 4.451
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -17.22
Sun-Target sep (deg) : 176.60
Sun-Moon sep (deg)  : 128.66
B (ring opening deg) : -3.12
PA of pole (deg)    : 23.33
Pole direction: RA (deg): 268.05750
Dec (deg): 64.49656
C/A sky separation (" ) : 6.457
C/A sky separation (km) : 20845.7
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
    
```

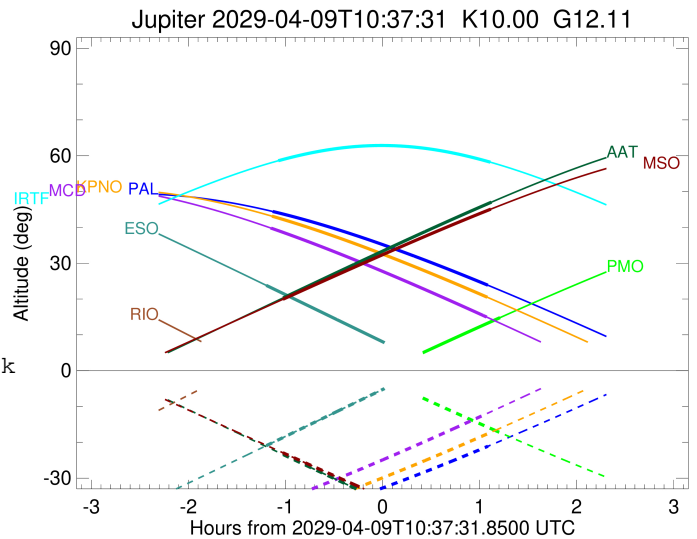
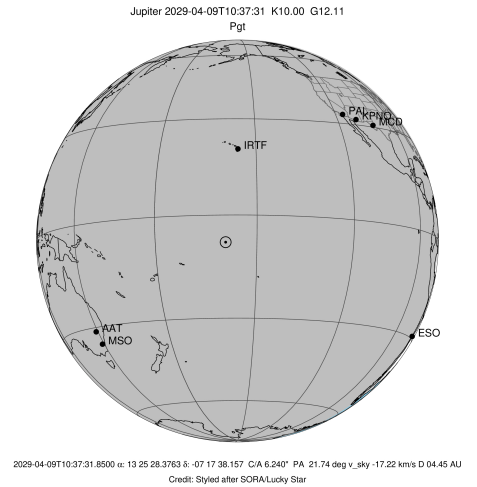


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2029-04-09T09:25:42.573	23.80	-20.93	71490.7	-18.49	-20.90
Jupiter	E	2029-04-09T11:37:35.268	-4.95x	7.65x	71491.0	-15.51	-17.60


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2029-04-09T10:40:40.680
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      : 3631244559272698112
2Mass ID (if available) : 13252838-0717381
ICRS Star Coord at Epoch: 13h 25m 28.37631s -07:17:38.15664s
RUWE (>1.4 is poor) : 1.29
K magnitude          : 9.996
G magnitude          : 12.110
RP magnitude         : 11.456
BP magnitude         : 12.603
DUPflag             : 0
Distance (au)       : 4.451
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -17.22
Sun-Target sep (deg) : 176.60
Sun-Moon sep (deg)  : 128.09
B (ring opening deg) : -3.12
PA of pole (deg)    : 23.33
Pole direction: RA (deg): 268.05750
Dec (deg): 64.49656
C/A sky separation (" ) : 7.560
C/A sky separation (km) : 24406.2
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
    
```

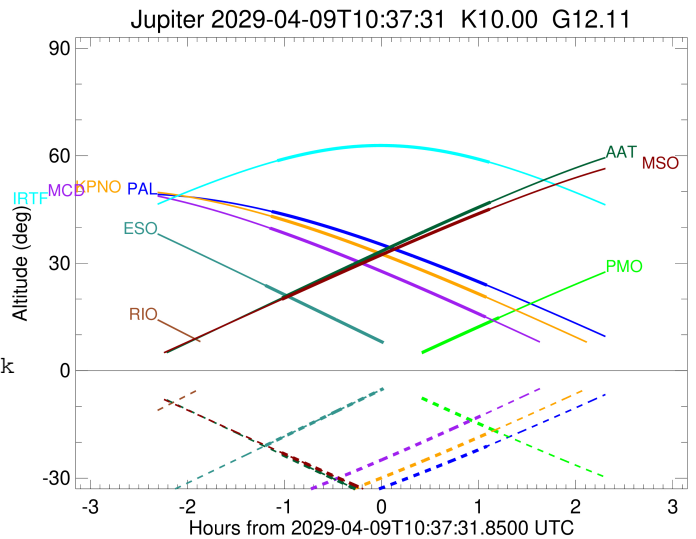
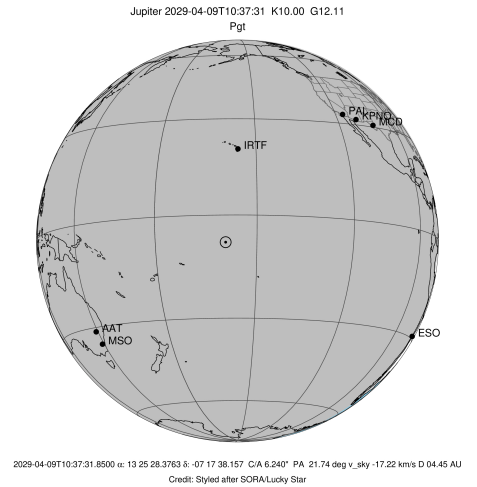


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2029-04-09T09:36:10.696	20.32	-23.43	71490.2	-21.88	-24.64
Jupiter	E	2029-04-09T11:44:50.723	47.03	-49.83	71490.7	-17.90	-20.25


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2029-04-09T10:40:21.480
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      : 3631244559272698112
2Mass ID (if available) : 13252838-0717381
ICRS Star Coord at Epoch: 13h 25m 28.37631s -07:17:38.15664s
RUWE (>1.4 is poor) : 1.29
K magnitude         : 9.996
G magnitude         : 12.110
RP magnitude        : 11.456
BP magnitude        : 12.603
DUPflag            : 0
Distance (au)      : 4.451
f0 (km)            : 0.00
g0 (km)            : 0.00
skyplane vel. (km/s) : -17.22
Sun-Target sep (deg) : 176.60
Sun-Moon sep (deg)  : 128.10
B (ring opening deg) : -3.12
PA of pole (deg)    : 23.33
Pole direction: RA (deg): 268.05750
Dec (deg): 64.49656
C/A sky separation (") : 7.651
C/A sky separation (km) : 24698.3
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	2029-04-09T09:35:55.986	19.92	-22.91	71490.1	-22.11	-24.89
Jupiter	E	2029-04-09T11:44:27.933	45.09	-47.70	71490.7	-18.17	-20.55