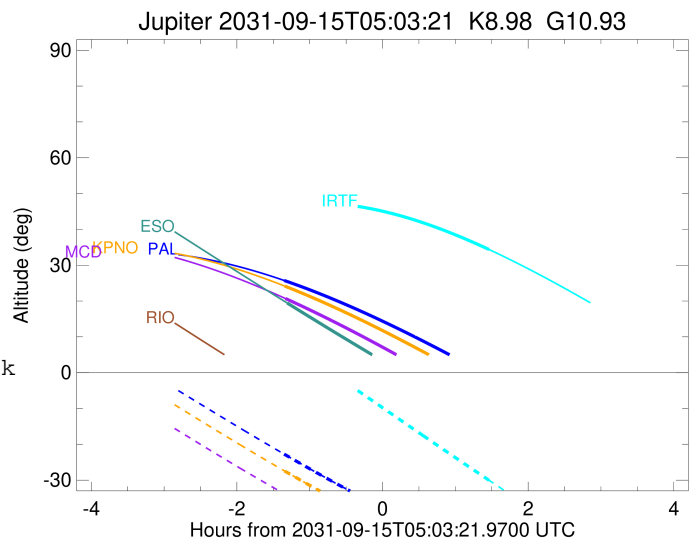
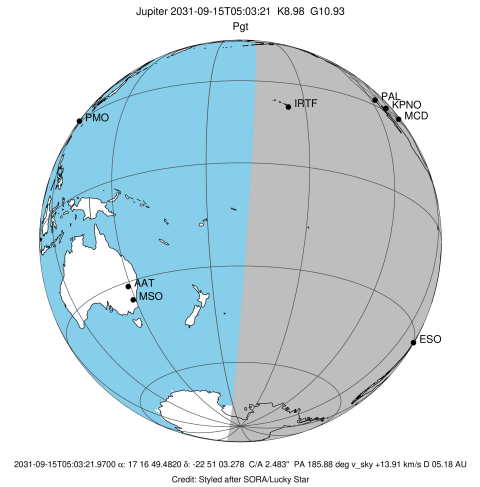



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-09-15T05:08:08.460
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       : 4114498306478570624
2Mass ID (if available) : 17164952-2251028
ICRS Star Coord at Epoch: 17h 16m 49.48200s -22:51:03.27797s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 8.977
G magnitude           : 10.927
RP magnitude          : 10.275
BP magnitude          : 11.397
DUPflag              : 0
Distance (au)         : 5.181
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 13.91
Sun-Target sep (deg) : 88.32
Sun-Moon sep (deg)   : 106.42
B (ring opening deg) : -2.38
PA of pole (deg)     : 3.80
Pole direction: RA (deg): 268.05684
Dec (deg): 64.49652
C/A sky separation ("): 3.777
C/A sky separation (km): 14193.0
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
    
```

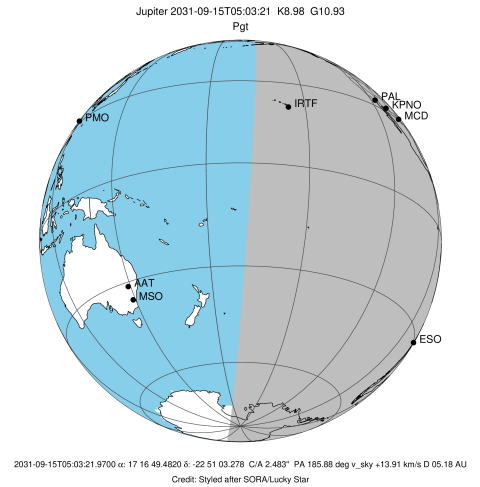


x: target alt < 5.0 deg or sun > -5.0 deg

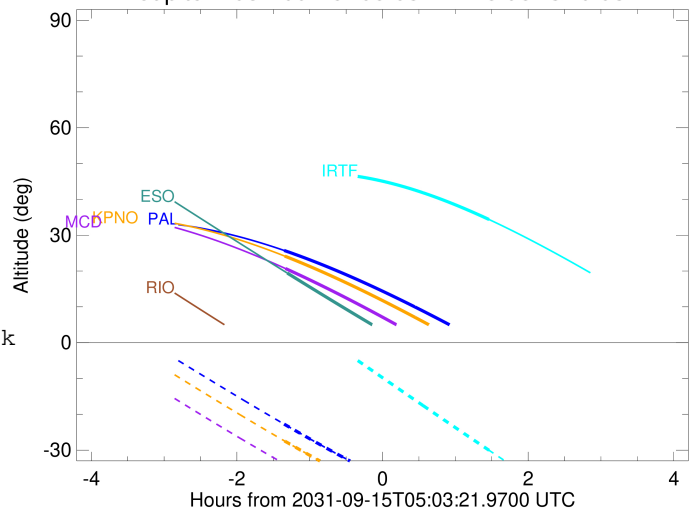
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-09-15T03:42:17.388	25.74	-22.73	71491.8	9.68	11.03
Jupiter	E	2031-09-15T06:33:05.544	-1.32x	-50.18	71491.6	13.02	14.80

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-09-15T05:08:35.740
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        : 4114498306478570624
2Mass ID (if available) : 17164952-2251028
ICRS Star Coord at Epoch: 17h 16m 49.48200s -22:51:03.27797s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 8.977
G magnitude           : 10.927
RP magnitude          : 10.275
BP magnitude          : 11.397
DUPflag              : 0
Distance (au)         : 5.181
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 13.91
Sun-Target sep (deg)  : 88.32
Sun-Moon sep (deg)    : 106.37
B (ring opening deg) : -2.38
PA of pole (deg)      : 3.80
Pole direction: RA (deg): 268.05684
Dec (deg): 64.49652
C/A sky separation (") : 3.716
C/A sky separation (km) : 13961.7
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
    
```



Jupiter 2031-09-15T05:03:21 K8.98 G10.93

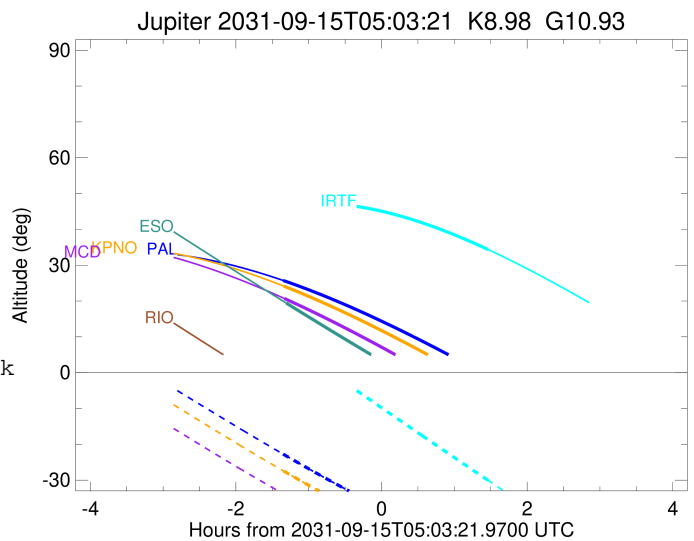
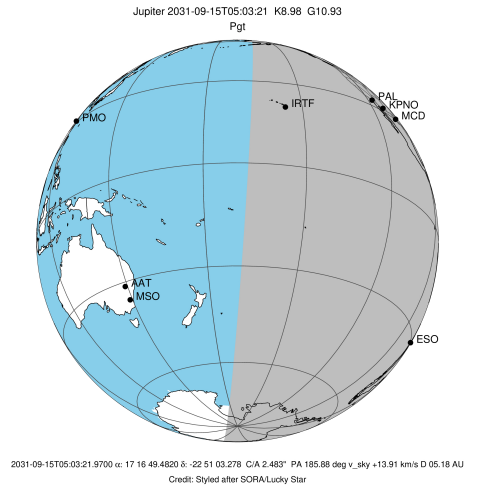


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-09-15T03:42:49.457	24.16	-27.47	71491.8	9.55	10.88
Jupiter	E	2031-09-15T06:33:24.637	-4.80x	-53.29	71491.6	12.78	14.54

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-09-15T05:09:07.180
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       : 4114498306478570624
2Mass ID (if available) : 17164952-2251028
ICRS Star Coord at Epoch: 17h 16m 49.48200s -22:51:03.27797s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 8.977
G magnitude           : 10.927
RP magnitude         : 10.275
BP magnitude         : 11.397
DUPflag              : 0
Distance (au)        : 5.181
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 13.91
Sun-Target sep (deg) : 88.32
Sun-Moon sep (deg)   : 106.28
B (ring opening deg) : -2.38
PA of pole (deg)     : 3.80
Pole direction: RA (deg): 268.05684
Dec (deg): 64.49652
C/A sky separation (") : 3.632
C/A sky separation (km) : 13646.8
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
    
```

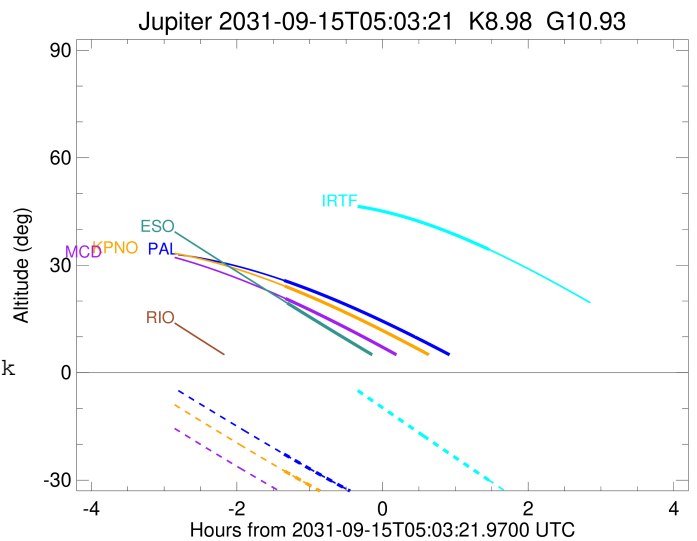
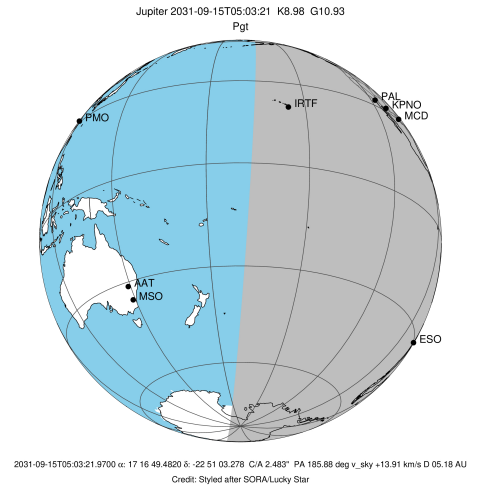


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-09-15T03:43:30.928	20.67	-34.00	71491.8	9.36	10.68
Jupiter	E	2031-09-15T06:33:42.338	-10.38x	-56.16	71491.6	12.48	14.19

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-09-15T05:04:43.100
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       : 4114498306478570624
2Mass ID (if available) : 17164952-2251028
ICRS Star Coord at Epoch: 17h 16m 49.48200s -22:51:03.27797s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 8.977
G magnitude           : 10.927
RP magnitude          : 10.275
BP magnitude          : 11.397
DUPflag              : 0
Distance (au)         : 5.181
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 13.91
Sun-Target sep (deg)  : 88.32
Sun-Moon sep (deg)   : 106.94
B (ring opening deg) : -2.38
PA of pole (deg)     : 3.80
Pole direction: RA (deg): 268.05684
Dec (deg): 64.49652
C/A sky separation (") : 3.656
C/A sky separation (km) : 13736.0
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
    
```

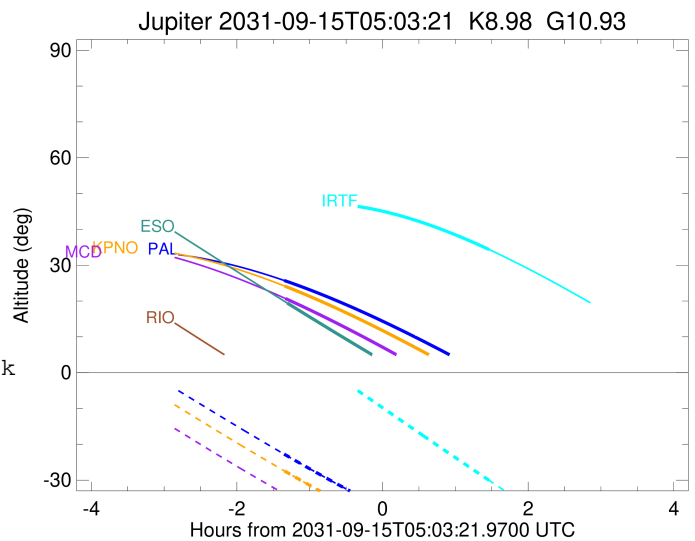
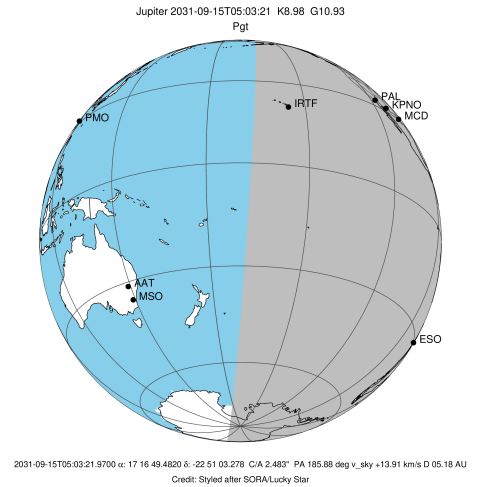


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-09-15T03:37:48.610	46.90	10.33x	71491.8	8.86	10.10
Jupiter	E	2031-09-15T06:31:11.998	34.37	-30.05	71491.6	13.00	14.78

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-09-15T05:10:21.830
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        : 4114498306478570624
2Mass ID (if available) : 17164952-2251028
ICRS Star Coord at Epoch: 17h 16m 49.48200s -22:51:03.27797s
RUWE (>1.4 is poor) : 1.01
K magnitude           : 8.977
G magnitude           : 10.927
RP magnitude          : 10.275
BP magnitude          : 11.397
DUPflag              : 0
Distance (au)         : 5.181
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 13.91
Sun-Target sep (deg)  : 88.32
Sun-Moon sep (deg)    : 106.21
B (ring opening deg) : -2.38
PA of pole (deg)      : 3.80
Pole direction: RA (deg): 268.05684
Dec (deg): 64.49652
C/A sky separation (") : 1.769
C/A sky separation (km) : 6648.1
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	2031-09-15T03:44:55.204	19.42	-61.09	71492.0	3.90	4.45
Jupiter	E	2031-09-15T06:34:43.892	-13.95x	-52.04	71491.9	6.75	7.71