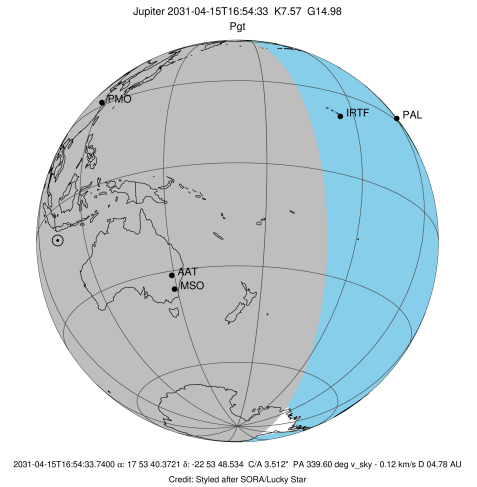


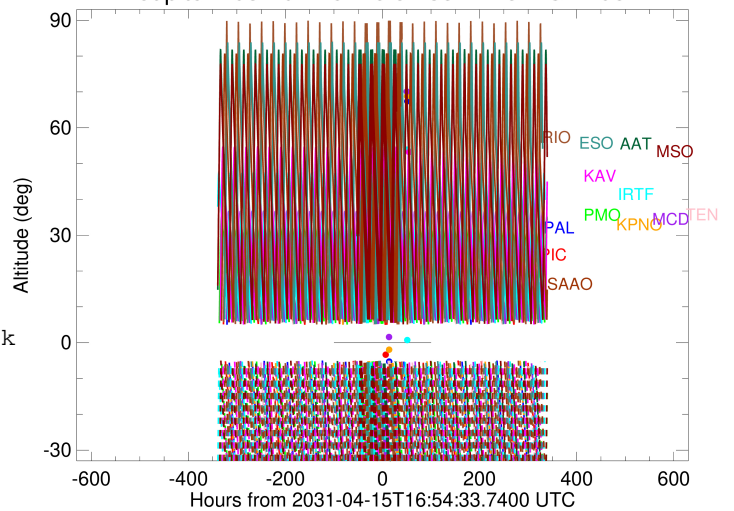


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-04-15T11:02:27.420
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      : 4070154006130346112
2Mass ID (if available) : 17534036-2253482
ICRS Star Coord at Epoch: 17h 53m 40.37207s -22:53:48.53390s
RUWE (>1.4 is poor) : 1.03
K magnitude          : 7.572
G magnitude          : 14.979
RP magnitude         : 13.364
BP magnitude         : 19.404
DUPflag             : 0
Distance (au)        : 4.779
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -0.12
Sun-Target sep (deg) : 116.55
Sun-Moon sep (deg)  : 41.35
B (ring opening deg) : -2.61
PA of pole (deg)    : -0.16
Pole direction: RA (deg): 268.05697
Dec (deg): 64.49651
C/A sky separation ("): 2.081
C/A sky separation (km): 7213.9
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
    
```



Jupiter 2031-04-15T16:54:33 K7.57 G14.98

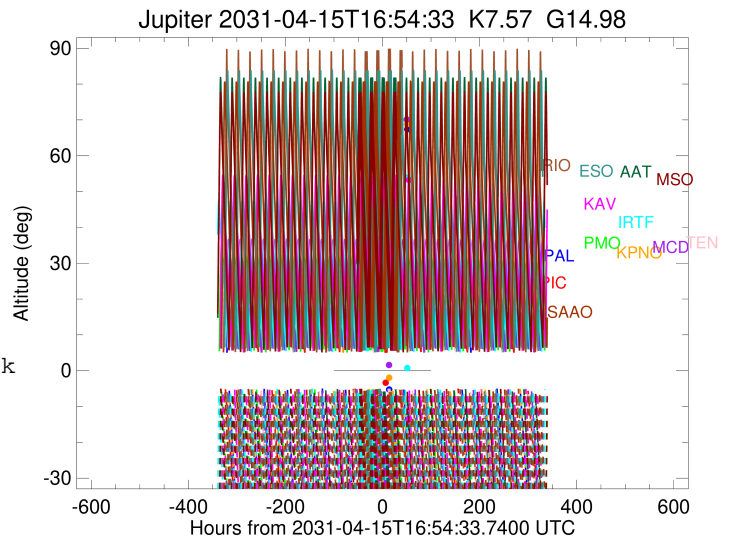
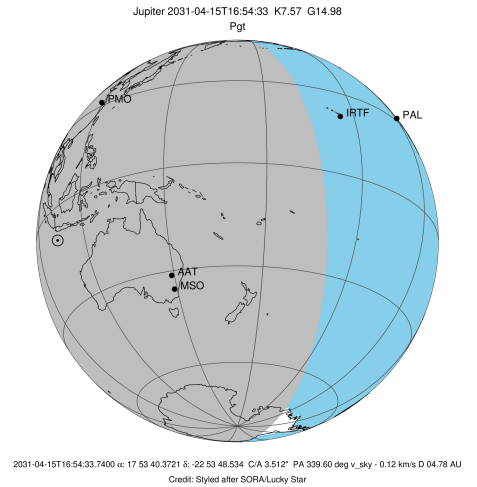


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-04-13T16:34:26.921	6.81	39.48x	71491.3	-12.16	-13.84
Jupiter	E	2031-04-17T09:08:58.238	20.43	-42.19	71492.9	-0.96	-1.10

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-04-15T10:43:10.190
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      : 4070154006130346112
2Mass ID (if available) : 17534036-2253482
ICRS Star Coord at Epoch: 17h 53m 40.37207s -22:53:48.53390s
RUWE (>1.4 is poor) : 1.03
K magnitude         : 7.572
G magnitude         : 14.979
RP magnitude        : 13.364
BP magnitude        : 19.404
DUPflag            : 0
Distance (au)       : 4.780
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -0.12
Sun-Target sep (deg) : 116.55
Sun-Moon sep (deg)  : 41.29
B (ring opening deg) : -2.61
PA of pole (deg)    : -0.16
Pole direction: RA (deg): 268.05697
Dec (deg): 64.49651
C/A sky separation (") : 2.119
C/A sky separation (km) : 7346.3
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
    
```

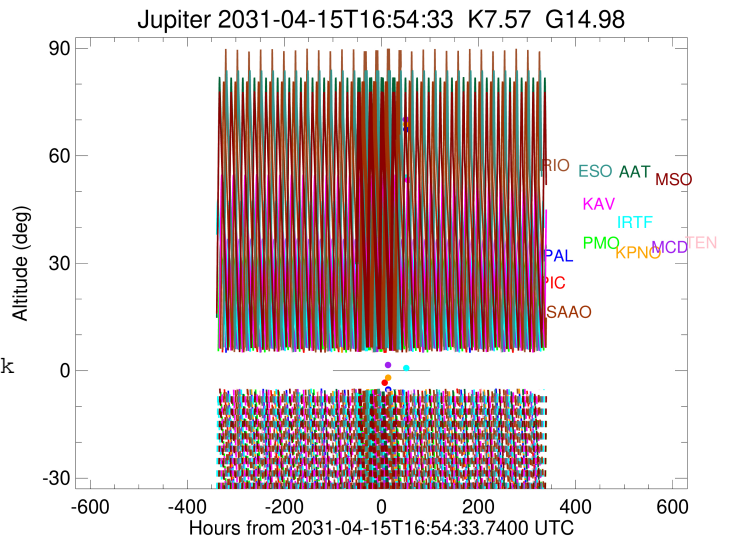
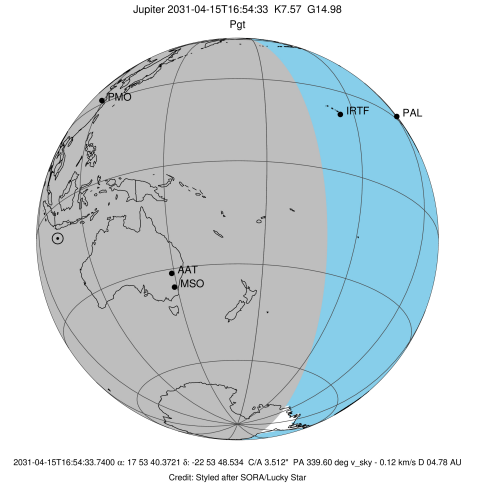


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-04-13T16:42:45.495	2.21x	45.78x	71491.3	-12.44	-14.15
Jupiter	E	2031-04-17T09:04:24.782	23.76	-41.63	71492.2	-0.97	-1.11

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-04-15T10:14:36.870
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       : 4070154006130346112
2Mass ID (if available) : 17534036-2253482
ICRS Star Coord at Epoch: 17h 53m 40.37207s -22:53:48.53390s
RUWE (>1.4 is poor) : 1.03
K magnitude          : 7.572
G magnitude          : 14.979
RP magnitude         : 13.364
BP magnitude         : 19.404
DUPflag             : 0
Distance (au)        : 4.780
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -0.12
Sun-Target sep (deg) : 116.55
Sun-Moon sep (deg)   : 41.21
B (ring opening deg) : -2.61
PA of pole (deg)     : -0.16
Pole direction: RA (deg): 268.05697
Dec (deg): 64.49651
C/A sky separation ("): 2.164
C/A sky separation (km): 7503.1
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
    
```

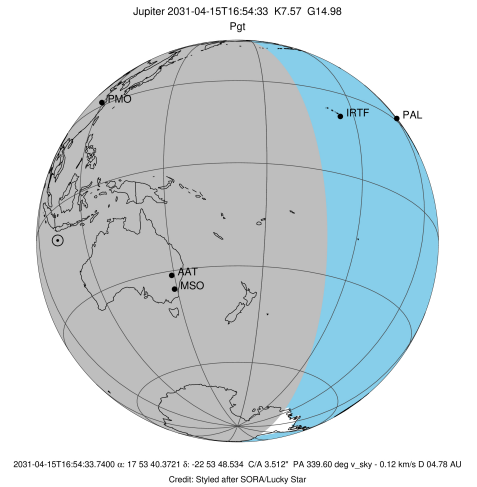


x: target alt < 5.0 deg or sun > -5.0 deg

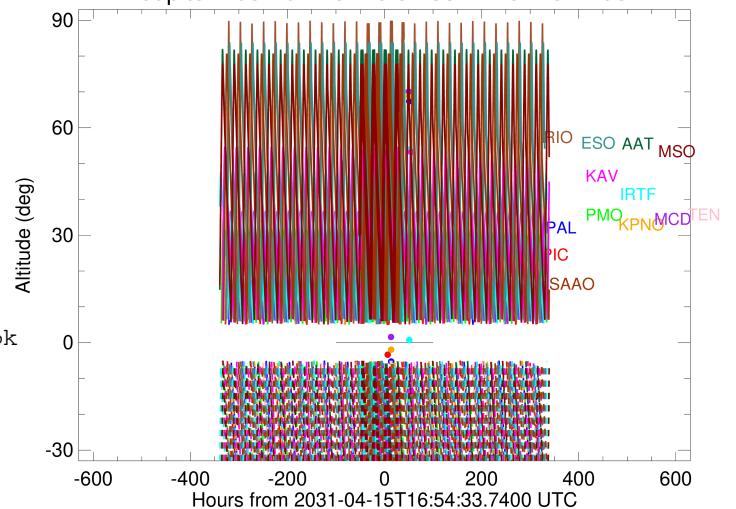
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-04-13T16:50:28.824	-4.52x	53.68x	71491.5	-12.79	-14.54
Jupiter	E	2031-04-17T08:56:50.406	27.72	-39.75	71492.4	-0.95	-1.09

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-04-15T13:33:01.780
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      : 4070154006130346112
2Mass ID (if available) : 17534036-2253482
ICRS Star Coord at Epoch: 17h 53m 40.37207s -22:53:48.53390s
RUWE (>1.4 is poor) : 1.03
K magnitude         : 7.572
G magnitude         : 14.979
RP magnitude        : 13.364
BP magnitude        : 19.404
DUPflag            : 0
Distance (au)       : 4.778
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -0.12
Sun-Target sep (deg) : 116.55
Sun-Moon sep (deg)  : 41.93
B (ring opening deg) : -2.61
PA of pole (deg)    : -0.16
Pole direction: RA (deg): 268.05697
Dec (deg): 64.49651
C/A sky separation (" ) : 2.251
C/A sky separation (km) : 7798.7
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 2031-04-15T16:54:33 K7.57 G14.98

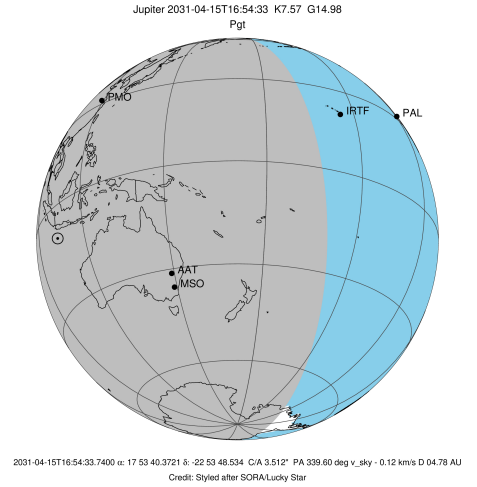


x: target alt < 5.0 deg or sun > -5.0 deg

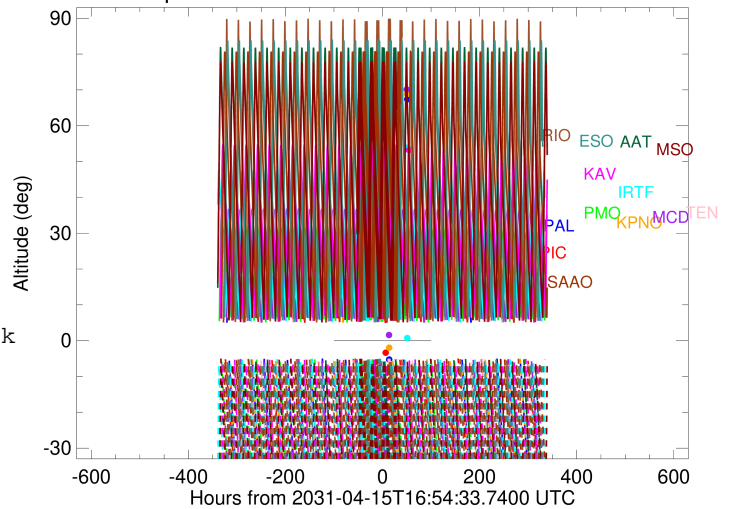
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-04-13T15:04:40.981	47.25	-14.82	71491.7	-12.18	-13.86
Jupiter	E	2031-04-17T09:47:35.129	7.76	-58.68	71492.7	-2.51	-2.87

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-04-16T02:23:13.970
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        : 4070154006130346112
2Mass ID (if available) : 17534036-2253482
ICRS Star Coord at Epoch: 17h 53m 40.37207s -22:53:48.53392s
RUWE (>1.4 is poor) : 1.03
K magnitude           : 7.572
G magnitude           : 14.979
RP magnitude          : 13.364
BP magnitude          : 19.404
DUPflag              : 0
Distance (au)         : 4.770
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -0.12
Sun-Target sep (deg)  : 116.55
Sun-Moon sep (deg)    : 41.28
B (ring opening deg) : -2.61
PA of pole (deg)      : -0.16
Pole direction: RA (deg): 268.05697
Dec (deg): 64.49651
C/A sky separation (") : 3.690
C/A sky separation (km) : 12765.5
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
    
```



Jupiter 2031-04-15T16:54:33 K7.57 G14.98

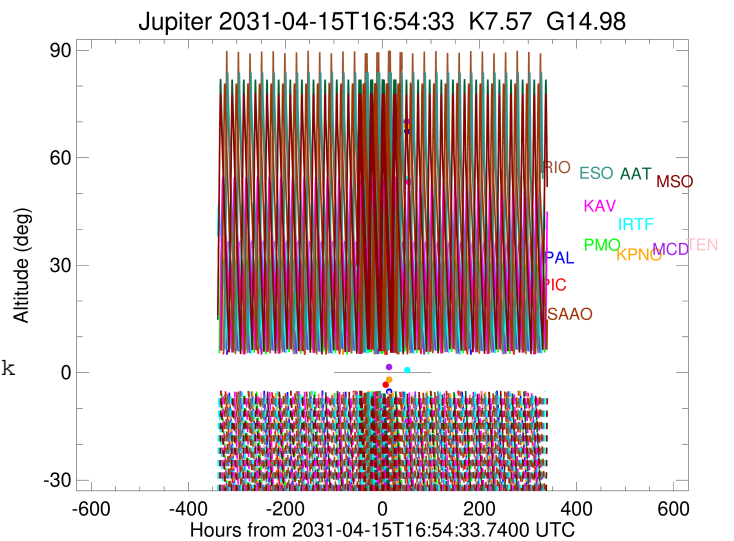
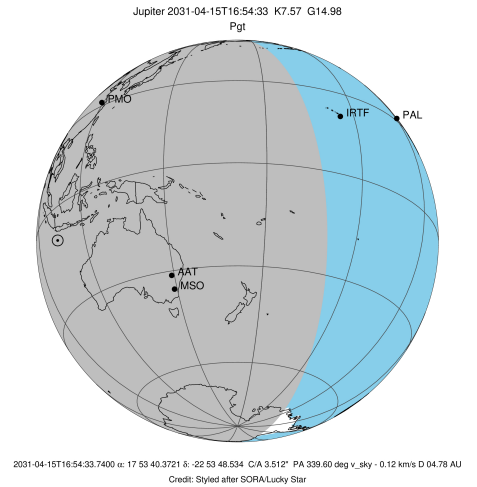


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-04-13T16:53:47.313	-31.87x	46.56x	71490.6	-18.93	-21.39
Jupiter	E	2031-04-17T07:37:49.286	83.00	-21.14	71492.0	-4.93	-5.63

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-04-15T08:29:23.920
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       : 4070154006130346112
2Mass ID (if available) : 17534036-2253482
ICRS Star Coord at Epoch: 17h 53m 40.37207s -22:53:48.53390s
RUWE (>1.4 is poor) : 1.03
K magnitude           : 7.572
G magnitude           : 14.979
RP magnitude         : 13.364
BP magnitude         : 19.404
DUPflag              : 0
Distance (au)        : 4.781
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -0.12
Sun-Target sep (deg) : 116.55
Sun-Moon sep (deg)   : 41.33
B (ring opening deg) : -2.61
PA of pole (deg)     : -0.16
Pole direction: RA (deg): 268.05697
Dec (deg): 64.49651
C/A sky separation (") : 3.912
C/A sky separation (km) : 13564.6
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
    
```

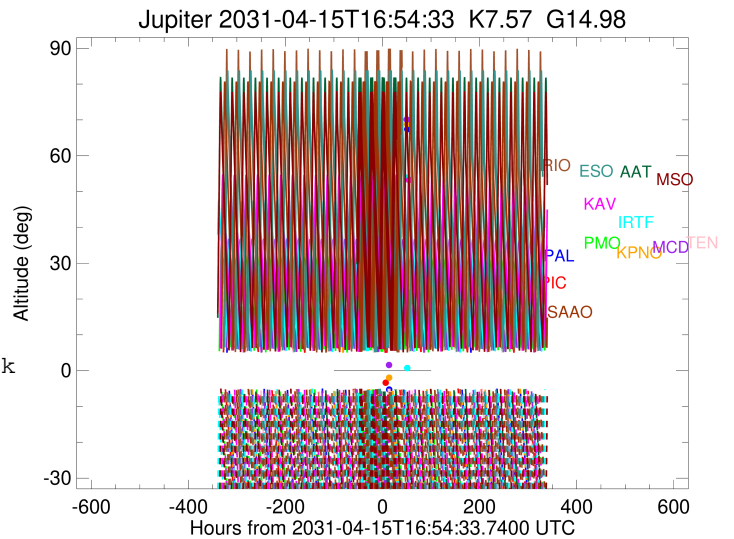
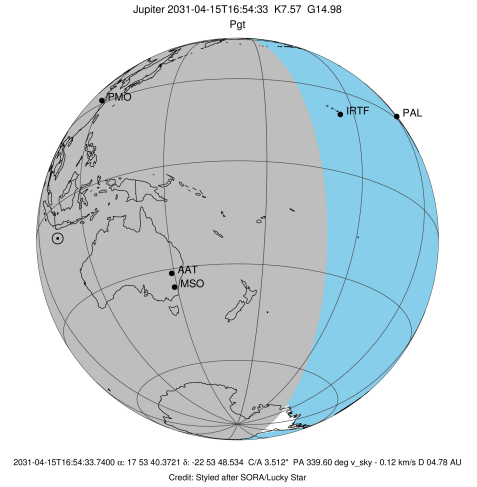


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-04-13T17:17:46.330	-13.40x	50.85x	71490.5	-18.78	-21.23
Jupiter	E	2031-04-17T08:13:13.824	78.31	-37.55	71491.9	-5.44	-6.22

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-04-15T17:02:50.720
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       : 4070154006130346112
2Mass ID (if available) : 17534036-2253482
ICRS Star Coord at Epoch: 17h 53m 40.37207s -22:53:48.53391s
RUWE (>1.4 is poor) : 1.03
K magnitude          : 7.572
G magnitude          : 14.979
RP magnitude         : 13.364
BP magnitude         : 19.404
DUPflag             : 0
Distance (au)        : 4.776
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -0.12
Sun-Target sep (deg) : 116.55
Sun-Moon sep (deg)   : 42.82
B (ring opening deg) : -2.61
PA of pole (deg)     : -0.16
Pole direction: RA (deg): 268.05697
Dec (deg): 64.49651
C/A sky separation (") : 3.642
C/A sky separation (km) : 12615.1
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
    
```



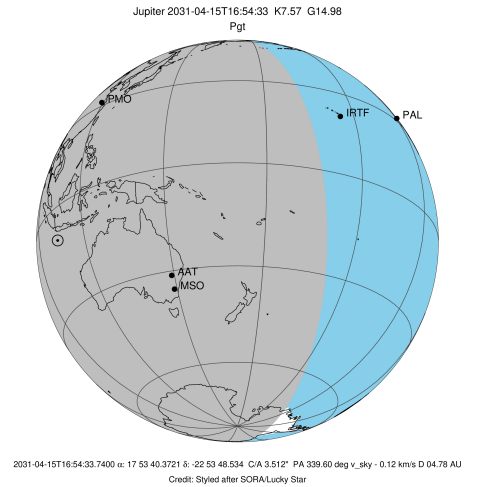
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-04-13T13:52:15.153	27.92	-67.82	71489.7	-17.83	-20.18
Jupiter	E	2031-04-17T08:48:29.401	-25.08x	-14.98	71492.3	-8.59	-9.80

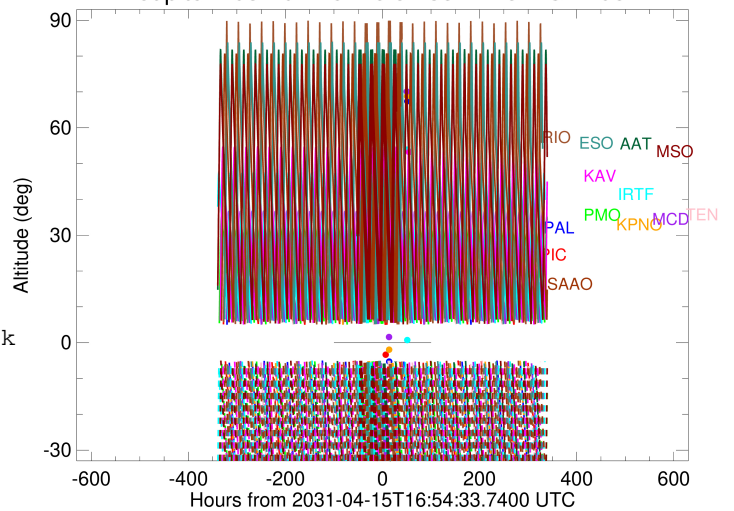


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-04-15T17:03:29.920
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       : 4070154006130346112
2Mass ID (if available) : 17534036-2253482
ICRS Star Coord at Epoch: 17h 53m 40.37207s -22:53:48.53391s
RUWE (>1.4 is poor) : 1.03
K magnitude          : 7.572
G magnitude          : 14.979
RP magnitude         : 13.364
BP magnitude         : 19.404
DUPflag             : 0
Distance (au)        : 4.776
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -0.12
Sun-Target sep (deg) : 116.55
Sun-Moon sep (deg)   : 42.81
B (ring opening deg) : -2.61
PA of pole (deg)     : -0.16
Pole direction: RA (deg): 268.05697
Dec (deg): 64.49651
C/A sky separation (") : 3.770
C/A sky separation (km) : 13058.2
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
    
```



Jupiter 2031-04-15T16:54:33 K7.57 G14.98



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	2031-04-13T13:59:40.262	30.09	-63.94	71490.7	-18.08	-20.46
Jupiter	E	2031-04-17T08:42:25.825	-22.66x	-13.89	71492.6	-8.85	-10.09