

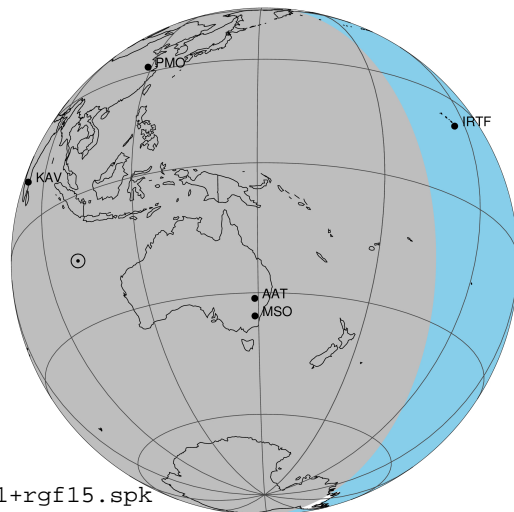
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-05-01T17:09:16.300
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068714264424528768
 2Mass ID (if available) : 17515289-2253444

Jupiter 2031-05-01T17:09:16 K8.71 G13.95 Pgt

ICRS Star Coord at Epoch: 17h 51m 52.90418s -22:53:44.65440s

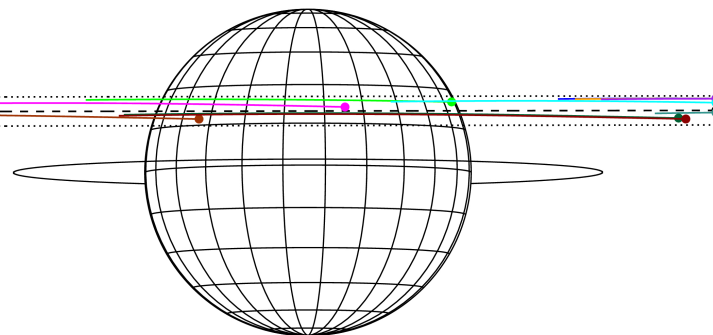
RUWE (>1.4 is poor) : 0.84
 K magnitude : 8.711
 G magnitude : 13.954
 RP magnitude : 12.657
 BP magnitude : 15.898
 DUPflag : 0
 Distance (au) : 4.562
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -6.91
 Sun-Target sep (deg) : 132.58
 Sun-Moon sep (deg) : 115.78
 B (ring opening deg) : -2.61
 PA of pole (deg) : 0.04
 Pole direction: RA (deg): 268.05696
 Dec (deg): 64.49651
 C/A sky separation (") : 8.141
 C/A sky separation (km) : 26933.5
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-05-01T17:09:16 K8.71 G13.95
 Pgt



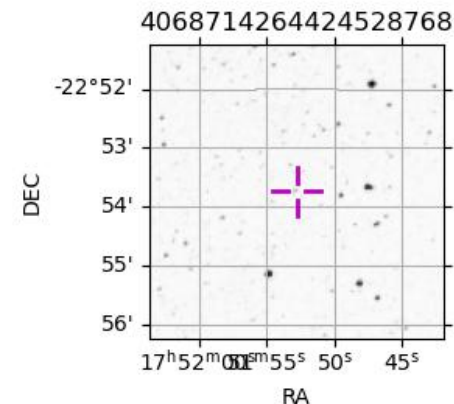
2031-05-01T17:09:16.3000 at: 17 51 52.9042 s -22 53 44.654 C/A 8.129° PA 180.09 deg v_sky - 6.91 km/s D 04.56 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 PAL
 PMO
 KPNO
 MCD
 TEN
 IRTF
 KAV
 RIO
 ESO
 AAT
 SAAO
 MSO



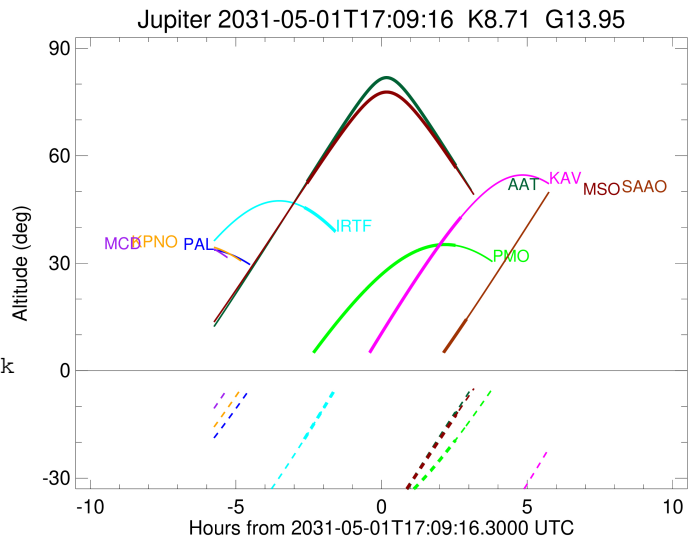
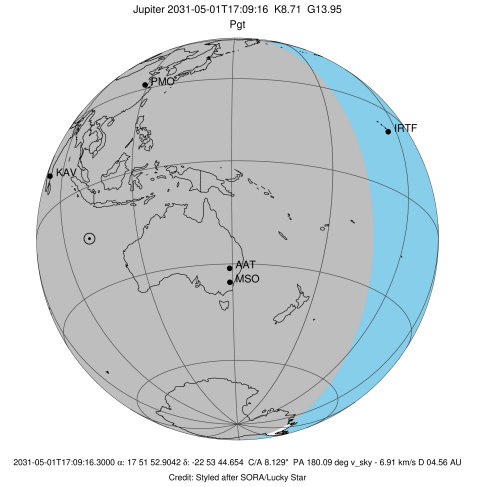
Observable events with sun below -5 deg and altitude above 5 deg

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			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+	MAY 01 19:41 - MAY 01 19:41	Pne
KPNO	Kitt Peak Natl Obs	32.0	248.4			Pnn
MCD	McDonald Obs. 2.7m	30.7	256.0			Pnn
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+	MAY 01 14:30 - MAY 01 14:30	Pin
KAV	Kavalur Observatory	12.6	78.8	+	MAY 01 19:53 - MAY 01 19:53	Pne
RIO	Rio de Janeiro	-22.9	316.8			Pnn
ESO	European Southern Obs. (3.6m)	-29.3	289.3			Pnn
AAT	Siding Spring (AAT)	-31.3	149.1	+	MAY 01 14:36 - MAY 01 19:42	Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	MAY 01 20:04 - MAY 01 20:04	Pne
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	MAY 01 14:35 - MAY 01 19:42	Pie



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-01T17:15:12.480
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       : 4068714264424528768
2Mass ID (if available) : 17515289-2253444
ICRS Star Coord at Epoch: 17h 51m 52.90418s -22:53:44.65440s
RUWE (>1.4 is poor) : 0.84
K magnitude           : 8.711
G magnitude           : 13.954
RP magnitude         : 12.657
BP magnitude         : 15.898
DUPflag              : 0
Distance (au)        : 4.562
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -6.91
Sun-Target sep (deg) : 132.58
Sun-Moon sep (deg)   : 116.32
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.04
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation ("): 9.624
C/A sky separation (km): 31839.4
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
    
```

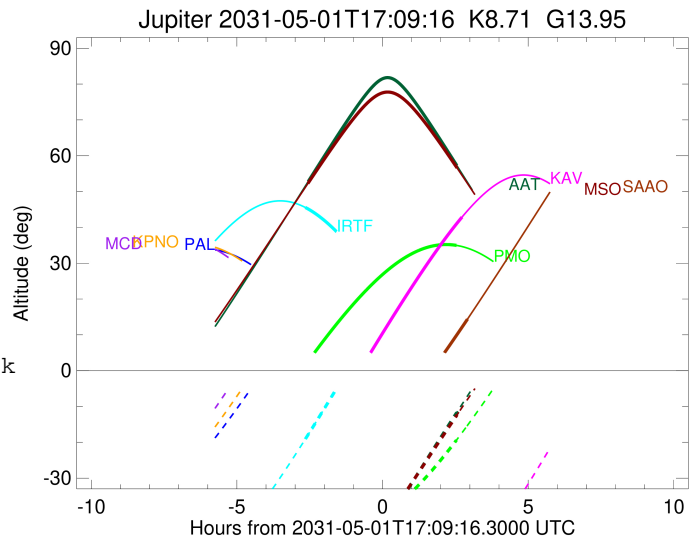
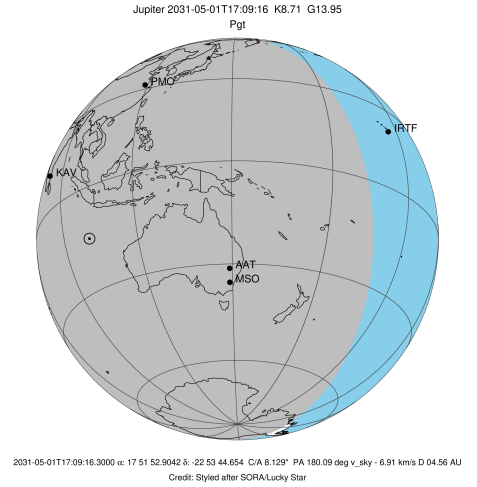


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-01T14:45:21.012	4.32x	-39.52	71490.3	25.54	28.61
Jupiter	E	2031-05-01T19:41:44.411	34.96	-19.37	71490.1	26.62	29.77

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-01T16:59:26.140
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        : 4068714264424528768
2Mass ID (if available) : 17515289-2253444
ICRS Star Coord at Epoch: 17h 51m 52.90418s -22:53:44.65440s
RUWE (>1.4 is poor) : 0.84
K magnitude           : 8.711
G magnitude           : 13.954
RP magnitude          : 12.657
BP magnitude          : 15.898
DUPflag              : 0
Distance (au)         : 4.562
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -6.91
Sun-Target sep (deg) : 132.58
Sun-Moon sep (deg)   : 115.79
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.04
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation (") : 9.189
C/A sky separation (km) : 30402.5
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
    
```

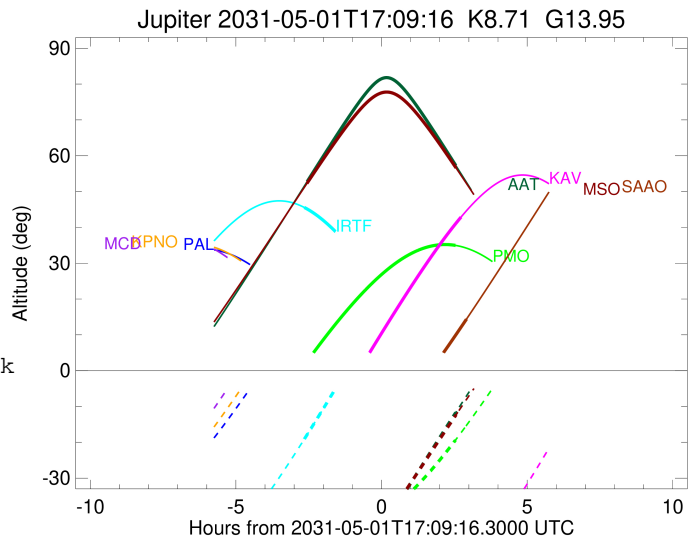
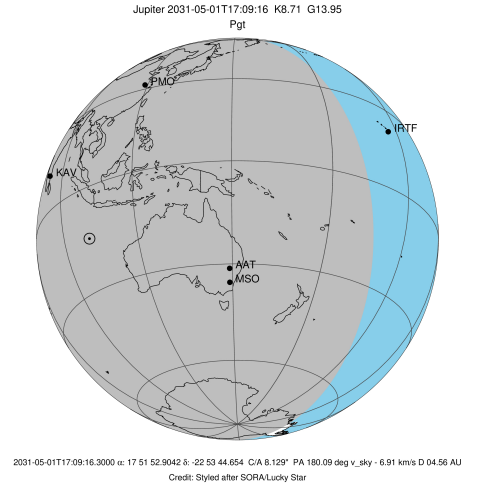


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-01T14:30:16.465	45.55	-19.10	71490.2	25.89	28.98
Jupiter	E	2031-05-01T19:32:09.026	-6.37x	50.05x	71490.5	23.82	26.75

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-01T17:21:42.980
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : KAV
Location              : Kavalur Observatory
Latitude (deg)        : 12.57556
E. Longitude (deg)    : 78.83167
Altitude (km)         : 0.722
Gaia source ID        : 4068714264424528768
2Mass ID (if available) : 17515289-2253444
ICRS Star Coord at Epoch: 17h 51m 52.90418s -22:53:44.65440s
RUWE (>1.4 is poor)  : 0.84
K magnitude           : 8.711
G magnitude           : 13.954
RP magnitude          : 12.657
BP magnitude          : 15.898
DUPflag              : 0
Distance (au)         : 4.562
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -6.91
Sun-Target sep (deg)  : 132.58
Sun-Moon sep (deg)    : 116.30
B (ring opening deg)  : -2.61
PA of pole (deg)      : 0.04
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation (") : 8.785
C/A sky separation (km) : 29062.0
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
    
```

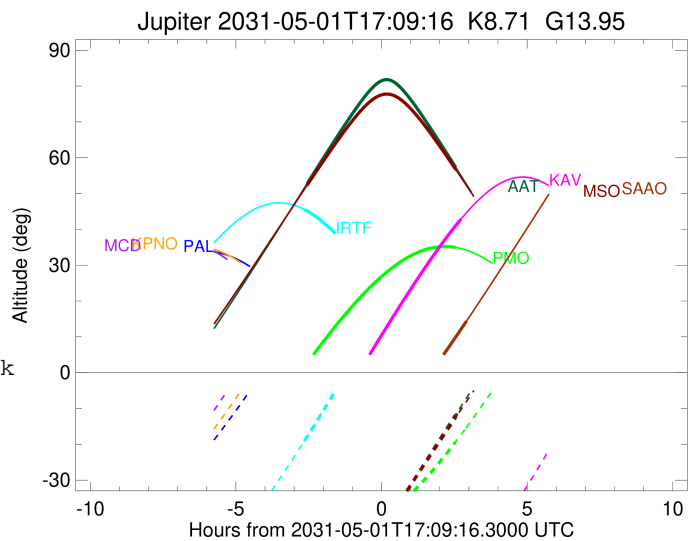
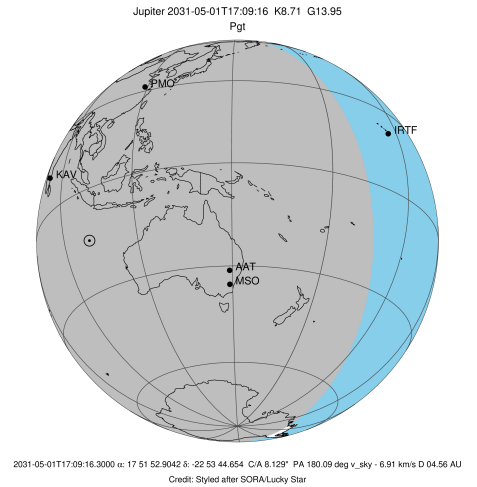


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-01T14:43:42.102	-22.47x	-24.93	71490.6	22.57	25.39
Jupiter	E	2031-05-01T19:53:00.151	42.85	-57.17	71490.3	24.97	27.99

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-01T17:09:47.790
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       : 4068714264424528768
2Mass ID (if available) : 17515289-2253444
ICRS Star Coord at Epoch: 17h 51m 52.90418s -22:53:44.65440s
RUWE (>1.4 is poor) : 0.84
K magnitude           : 8.711
G magnitude           : 13.954
RP magnitude         : 12.657
BP magnitude         : 15.898
DUPflag              : 0
Distance (au)        : 4.562
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -6.91
Sun-Target sep (deg) : 132.58
Sun-Moon sep (deg)  : 116.62
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.04
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation ("): 7.865
C/A sky separation (km): 26022.2
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
    
```

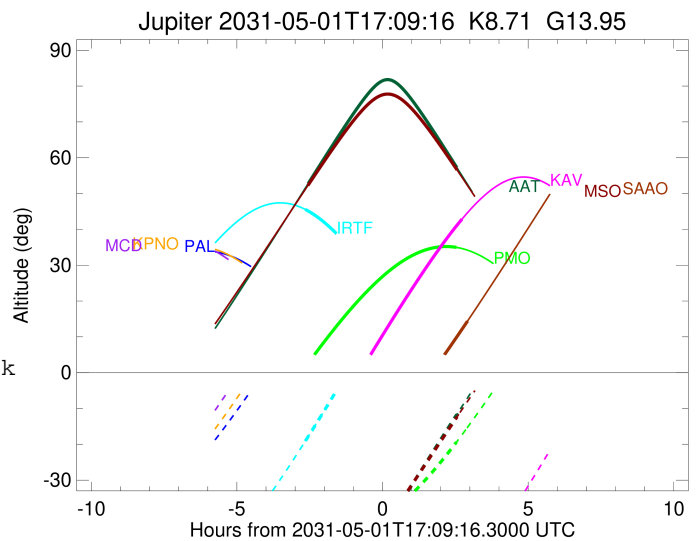
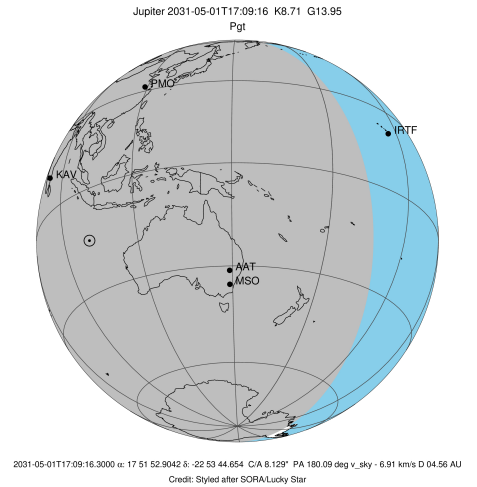


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-01T14:36:17.754	52.80	-72.09	71490.8	20.93	23.60
Jupiter	E	2031-05-01T19:42:14.627	57.28	-11.68	71490.8	20.92	23.59

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-01T17:18:29.240
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : SAAO
Location            : So. Afr. Astro. Obs. (Sutherland)
Latitude (deg)      : -32.37953
E. Longitude (deg)  : 20.81070
Altitude (km)       : 1.768
Gaia source ID      : 4068714264424528768
2Mass ID (if available) : 17515289-2253444
ICRS Star Coord at Epoch: 17h 51m 52.90418s -22:53:44.65440s
RUWE (>1.4 is poor) : 0.84
K magnitude          : 8.711
G magnitude          : 13.954
RP magnitude         : 12.657
BP magnitude         : 15.898
DUPflag             : 0
Distance (au)       : 4.562
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -6.91
Sun-Target sep (deg) : 132.58
Sun-Moon sep (deg)  : 115.81
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.04
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation ("): 6.803
C/A sky separation (km): 22507.1
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
    
```

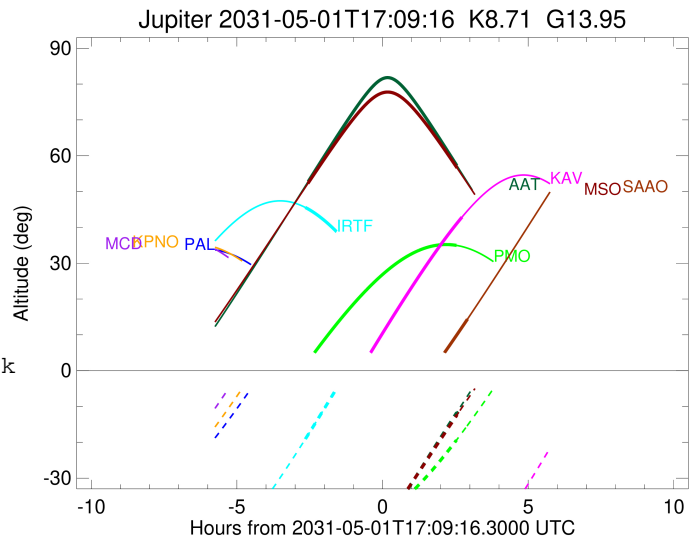
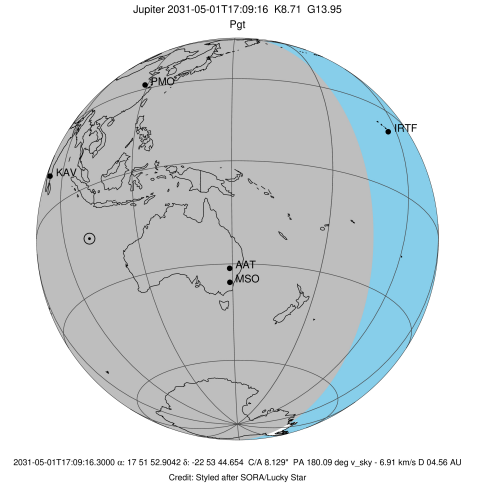


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-01T14:26:17.556	-34.33x	17.00x	71491.1	17.73	20.06
Jupiter	E	2031-05-01T20:04:19.079	14.38	-52.05	71491.0	19.48	22.00

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-01T17:09:47.240
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       : 4068714264424528768
2Mass ID (if available) : 17515289-2253444
ICRS Star Coord at Epoch: 17h 51m 52.90418s -22:53:44.65440s
RUWE (>1.4 is poor) : 0.84
K magnitude           : 8.711
G magnitude           : 13.954
RP magnitude         : 12.657
BP magnitude         : 15.898
DUPflag              : 0
Distance (au)        : 4.562
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -6.91
Sun-Target sep (deg) : 132.58
Sun-Moon sep (deg)  : 116.61
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.04
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation ("): 7.732
C/A sky separation (km): 25581.2
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	2031-05-01T14:35:33.421	52.24	-68.56	71490.9	20.57	23.20
Jupiter	E	2031-05-01T19:42:57.454	56.57	-12.31	71490.9	20.56	23.19