

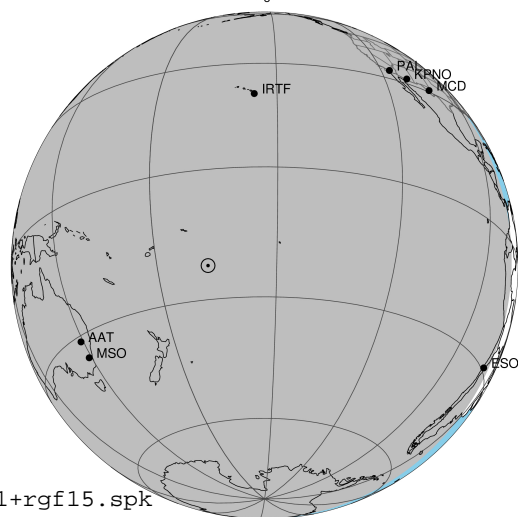
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-06-03T11:05:54.270
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116749350414323072
 2Mass ID (if available) : 17385896-2251218

Jupiter 2031-06-03T11:05:54 K9.35 G13.67 Pgt

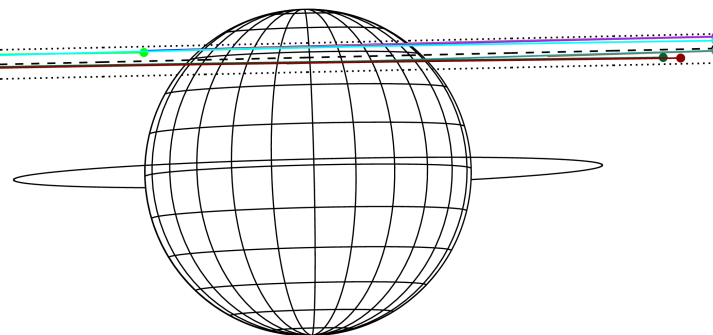
ICRS Star Coord at Epoch: 17h 38m 58.97020s -22:51:21.95779s

RUWE (>1.4 is poor) : 1.00
 K magnitude : 9.347
 G magnitude : 13.672
 RP magnitude : 12.524
 BP magnitude : 15.043
 DUPflag : 0
 Distance (au) : 4.291
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -15.70
 Sun-Target sep (deg) : 167.10
 Sun-Moon sep (deg) : 41.02
 B (ring opening deg) : -2.61
 PA of pole (deg) : 1.43
 Pole direction: RA (deg): 268.05693
 Dec (deg): 64.49651
 C/A sky separation (") : 16.178
 C/A sky separation (km) : 50349.0
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-06-03T11:05:54 K9.35 G13.67
 Pgt



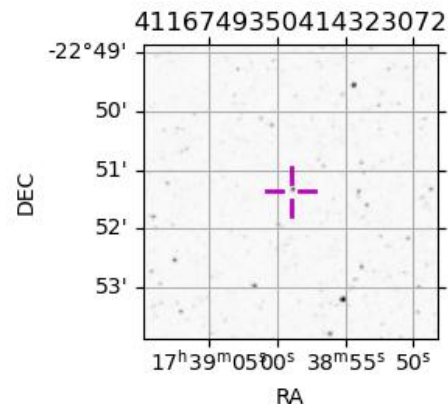
Earth
 PAL
 PMO
 KPNO
 MCD
 IRTF
 RIO
 ESO
 AAT
 MSO



2031-06-03T11:05:54.2700 a: 17 38 58.9702 d: -22 51 21.958 C/A ***** PA 181.27 deg v_sky -15.70 km/s D 04.29 AU
 Credit: Styled after SORA/Lucky Star

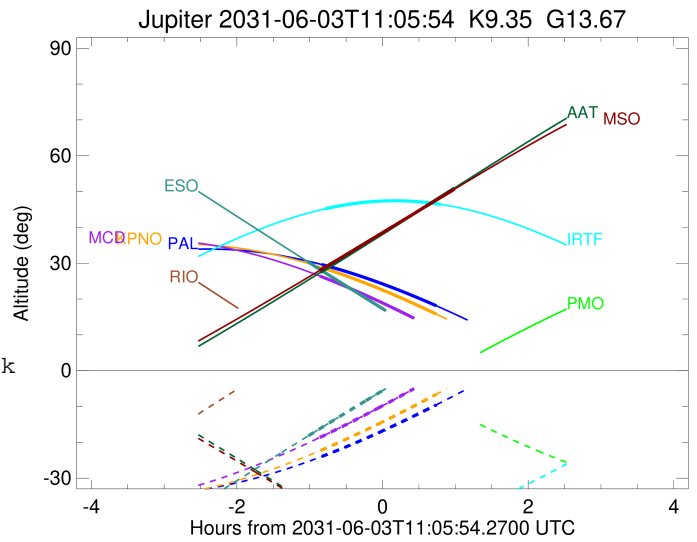
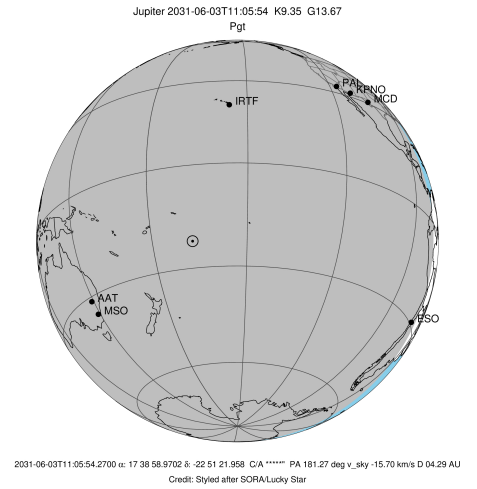
Observable events with sun below -5 deg and altitude above 5 deg

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	+ +	JUN 03 10:15 - JUN 03 11:50	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JUN 03 10:15 - JUN 03 11:50	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+	JUN 03 10:14 - JUN 03 10:14	Pin
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	JUN 03 10:18 - JUN 03 11:53	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	+	JUN 03 10:04 - JUN 03 10:04	Pin
AAT	Siding Spring (AAT)	-31.3	149.1	+ +	JUN 03 10:15 - JUN 03 12:05	Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	JUN 03 10:14 - JUN 03 12:05	Pie



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-06-03T11:03:01.400
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       : 4116749350414323072
2Mass ID (if available) : 17385896-2251218
ICRS Star Coord at Epoch: 17h 38m 58.97020s -22:51:21.95779s
RUWE (>1.4 is poor) : 1.00
K magnitude           : 9.347
G magnitude           : 13.672
RP magnitude          : 12.524
BP magnitude          : 15.043
DUPflag              : 0
Distance (au)         : 4.291
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.70
Sun-Target sep (deg) : 167.10
Sun-Moon sep (deg)   : 41.67
B (ring opening deg) : -2.61
PA of pole (deg)     : 1.43
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation ("): 17.773
C/A sky separation (km): 55311.2
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
    
```

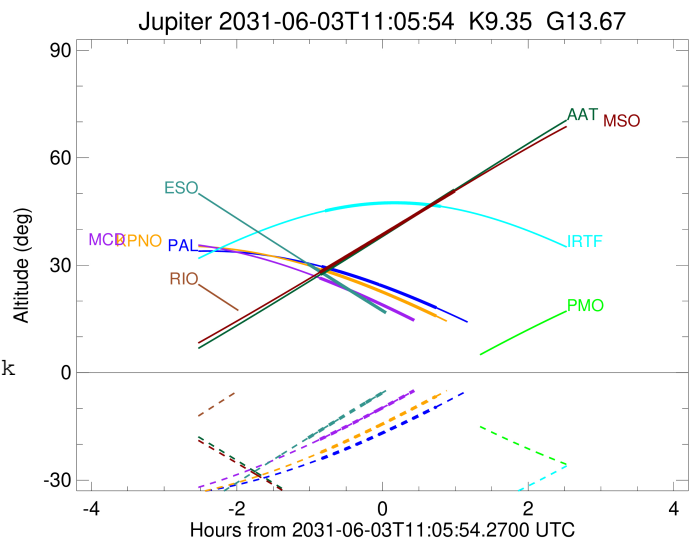
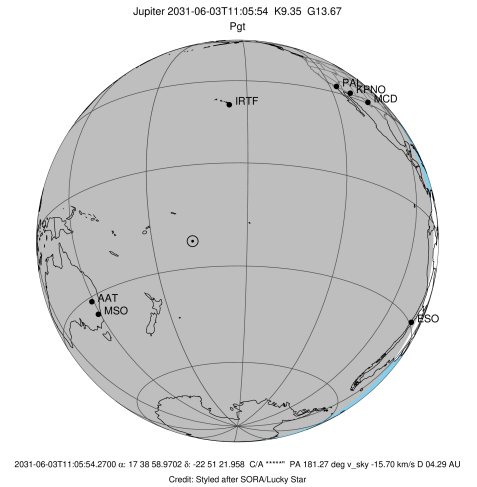


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-03T10:15:54.403	29.61	-23.95	71486.4	50.71	54.27
Jupiter	E	2031-06-03T11:50:15.620	18.11	-9.54	71486.5	50.43	54.00

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-06-03T11:02:36.280
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      : 4116749350414323072
2Mass ID (if available) : 17385896-2251218
ICRS Star Coord at Epoch: 17h 38m 58.97020s -22:51:21.95779s
RUWE (>1.4 is poor) : 1.00
K magnitude         : 9.347
G magnitude         : 13.672
RP magnitude        : 12.524
BP magnitude        : 15.043
DUPflag            : 0
Distance (au)       : 4.291
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -15.70
Sun-Target sep (deg) : 167.10
Sun-Moon sep (deg)  : 41.70
B (ring opening deg) : -2.61
PA of pole (deg)    : 1.43
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (" ) : 17.708
C/A sky separation (km) : 55110.0
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
    
```

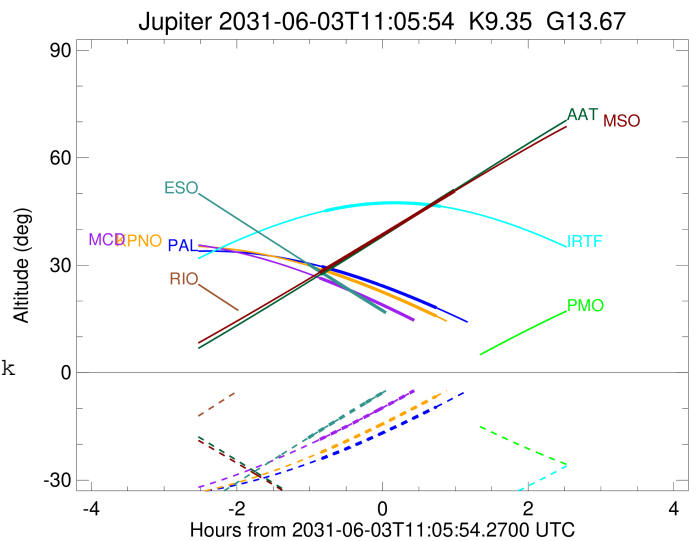
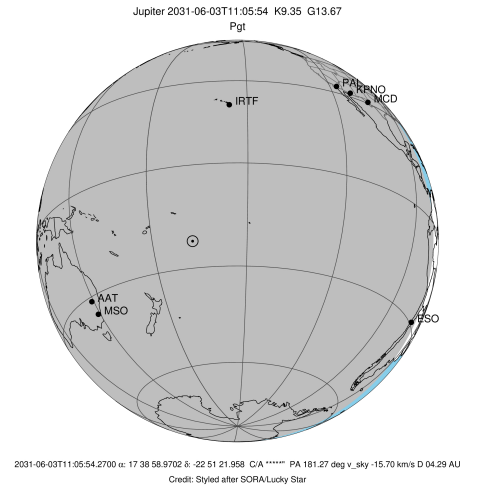


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-03T10:15:11.794	28.84	-22.23	71486.5	50.50	54.07
Jupiter	E	2031-06-03T11:50:09.235	15.80	-6.59	71486.5	50.14	53.72

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-06-03T11:02:03.880
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        : 4116749350414323072
2Mass ID (if available) : 17385896-2251218
ICRS Star Coord at Epoch: 17h 38m 58.97020s -22:51:21.95779s
RUWE (>1.4 is poor) : 1.00
K magnitude           : 9.347
G magnitude           : 13.672
RP magnitude          : 12.524
BP magnitude          : 15.043
DUPflag              : 0
Distance (au)         : 4.291
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.70
Sun-Target sep (deg) : 167.10
Sun-Moon sep (deg)   : 41.73
B (ring opening deg) : -2.61
PA of pole (deg)     : 1.43
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation ("): 17.620
C/A sky separation (km): 54836.7
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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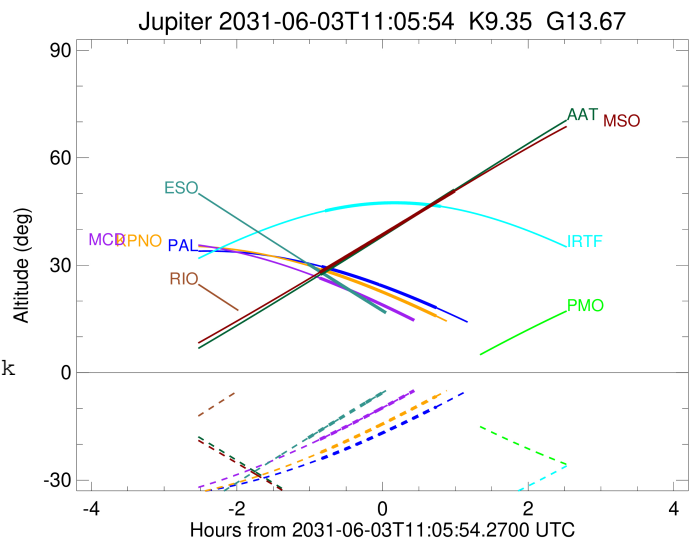
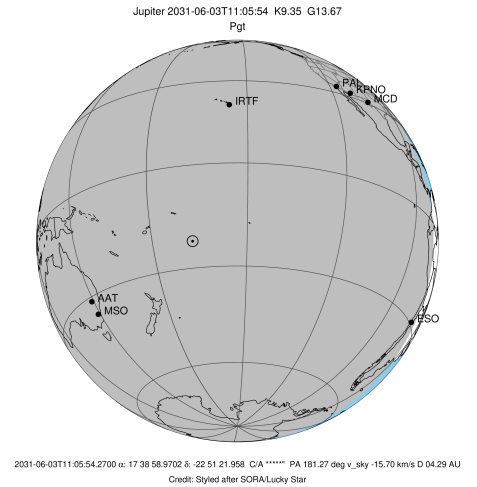


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-03T10:14:14.220	26.42	-18.65	71486.5	50.22	53.80
Jupiter	E	2031-06-03T11:50:03.661	11.50	-1.58x	71486.6	49.74	53.33

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-06-03T11:06:12.320
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      : 4116749350414323072
2Mass ID (if available) : 17385896-2251218
ICRS Star Coord at Epoch: 17h 38m 58.97020s -22:51:21.95779s
RUWE (>1.4 is poor) : 1.00
K magnitude          : 9.347
G magnitude          : 13.672
RP magnitude         : 12.524
BP magnitude         : 15.043
DUPflag             : 0
Distance (au)       : 4.291
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.70
Sun-Target sep (deg) : 167.10
Sun-Moon sep (deg)  : 41.49
B (ring opening deg) : -2.61
PA of pole (deg)    : 1.43
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 17.563
C/A sky separation (km) : 54657.6
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
    
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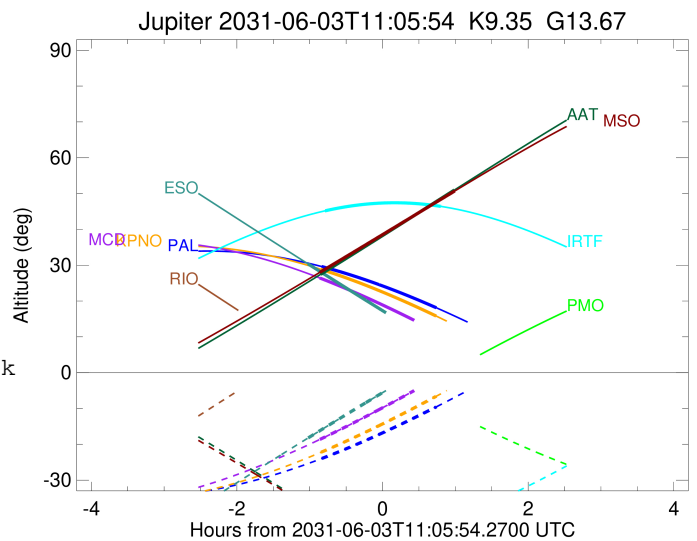
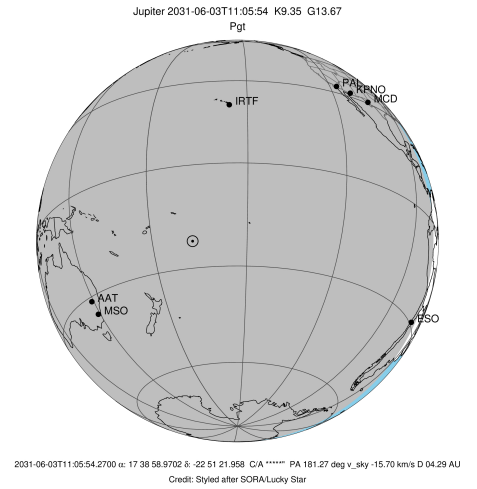


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-03T10:18:32.043	45.17	-47.98	71486.6	49.53	53.13
Jupiter	E	2031-06-03T11:53:51.213	46.42	-42.14	71486.6	49.94	53.53

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-06-03T11:00:30.890
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      : 4116749350414323072
2Mass ID (if available) : 17385896-2251218
ICRS Star Coord at Epoch: 17h 38m 58.97020s -22:51:21.95779s
RUWE (>1.4 is poor) : 1.00
K magnitude          : 9.347
G magnitude          : 13.672
RP magnitude         : 12.524
BP magnitude         : 15.043
DUPflag             : 0
Distance (au)       : 4.291
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.70
Sun-Target sep (deg) : 167.10
Sun-Moon sep (deg)  : 41.86
B (ring opening deg) : -2.61
PA of pole (deg)    : 1.43
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 15.405
C/A sky separation (km) : 47942.0
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
    
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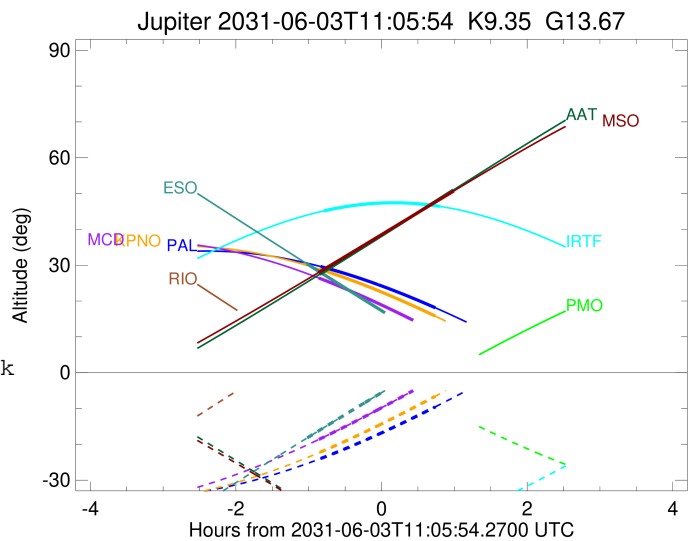
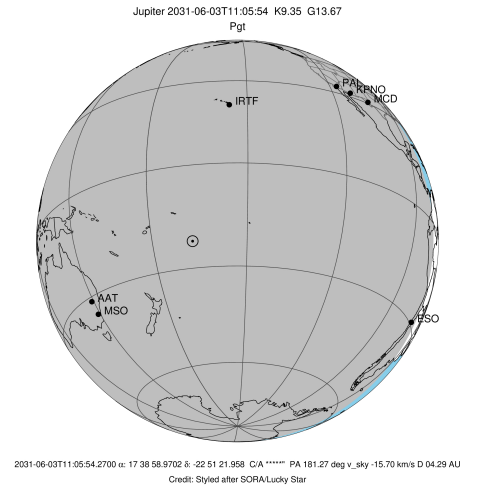


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-03T10:04:36.167	30.35	-18.23	71487.8	42.45	46.17
Jupiter	E	2031-06-03T11:56:44.990	6.83	4.43x	71487.9	41.64	45.36

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-06-03T11:10:17.160
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       : 4116749350414323072
2Mass ID (if available) : 17385896-2251218
ICRS Star Coord at Epoch: 17h 38m 58.97020s -22:51:21.95779s
RUWE (>1.4 is poor) : 1.00
K magnitude           : 9.347
G magnitude           : 13.672
RP magnitude          : 12.524
BP magnitude          : 15.043
DUPflag              : 0
Distance (au)        : 4.291
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.70
Sun-Target sep (deg) : 167.10
Sun-Moon sep (deg)   : 40.88
B (ring opening deg) : -2.61
PA of pole (deg)     : 1.43
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 15.549
C/A sky separation (km) : 48390.0
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
    
```

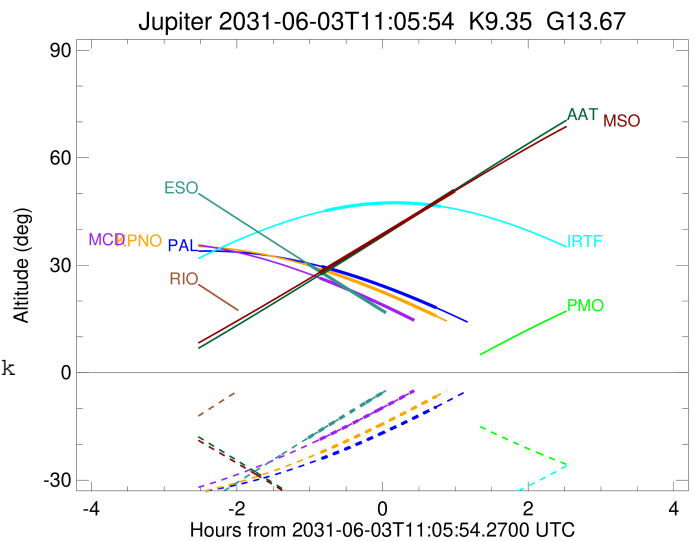
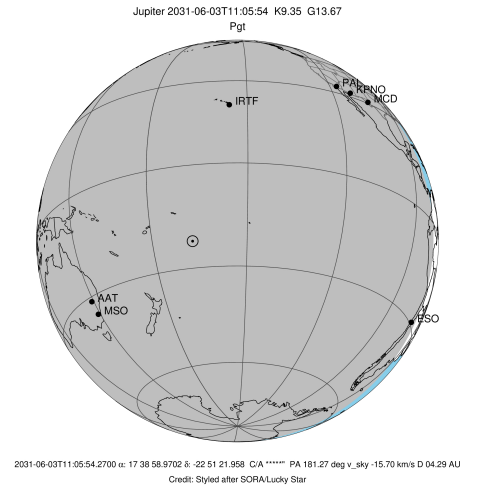


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-03T10:14:59.931	27.46	-39.11	71487.9	41.88	45.60
Jupiter	E	2031-06-03T12:05:17.305	51.00	-62.61	71487.7	43.14	46.86

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-06-03T11:10:05.200
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      : 4116749350414323072
2Mass ID (if available) : 17385896-2251218
ICRS Star Coord at Epoch: 17h 38m 58.97020s -22:51:21.95779s
RUWE (>1.4 is poor) : 1.00
K magnitude          : 9.347
G magnitude          : 13.672
RP magnitude         : 12.524
BP magnitude         : 15.043
DUPflag             : 0
Distance (au)       : 4.291
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.70
Sun-Target sep (deg) : 167.10
Sun-Moon sep (deg)  : 40.91
B (ring opening deg) : -2.61
PA of pole (deg)    : 1.43
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation ("): 15.421
C/A sky separation (km): 47993.1
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	2031-06-03T10:14:23.364	28.02	-39.15	71487.9	41.48	45.19
Jupiter	E	2031-06-03T12:05:30.410	50.72	-61.55	71487.7	42.69	46.41