

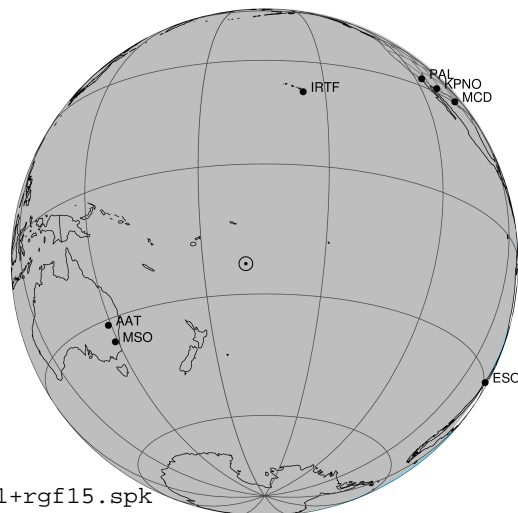
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2031-06-11T11:17:11.490  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4116708599793684352  
 2Mass ID (if available) : 17343950-2250144

Jupiter 2031-06-11T11:17:11 K8.97 G13.53 Pgt

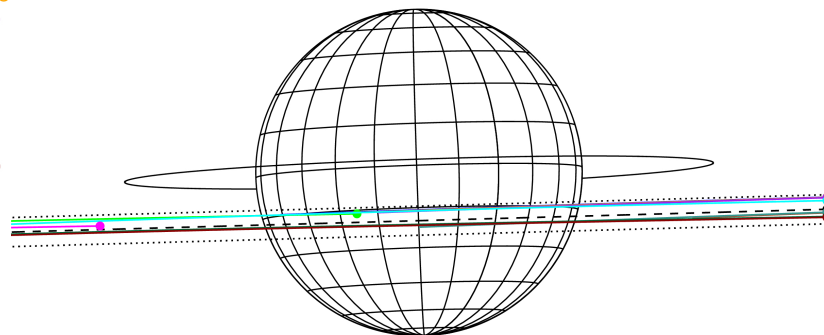
ICRS Star Coord at Epoch: 17h 34m 39.48936s -22:50:14.75734s

RUWE (>1.4 is poor) : 1.11  
 K magnitude : 8.968  
 G magnitude : 13.531  
 RP magnitude : 12.346  
 BP magnitude : 15.027  
 DUPflag : 0  
 Distance (au) : 4.269  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -16.38  
 Sun-Target sep (deg) : 175.74  
 Sun-Moon sep (deg) : 77.81  
 B (ring opening deg) : -2.60  
 PA of pole (deg) : 1.89  
 Pole direction: RA (deg): 268.05692  
 Dec (deg): 64.49651  
 C/A sky separation (") : 6.814  
 C/A sky separation (km) : 21096.6  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2031-06-11T11:17:11 K8.97 G13.53  
 Pgt



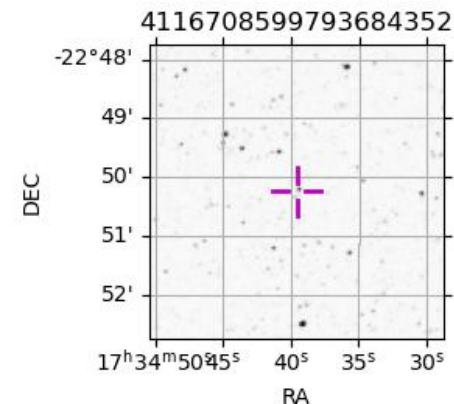
Earth  
 PAL  
 PMO  
 KPNO  
 MCD  
 IRTF  
 KAV  
 RIO  
 ESO  
 AAT  
 MSO



2031-06-11T11:17:11.4900 a: 17 34 39.4894 δ: -22 50 14.757 C/A 6.826" PA 1.60 deg v\_sky -16.38 km/s D 04.27 AU  
 Credit: Styled after SORA/Lucky Star

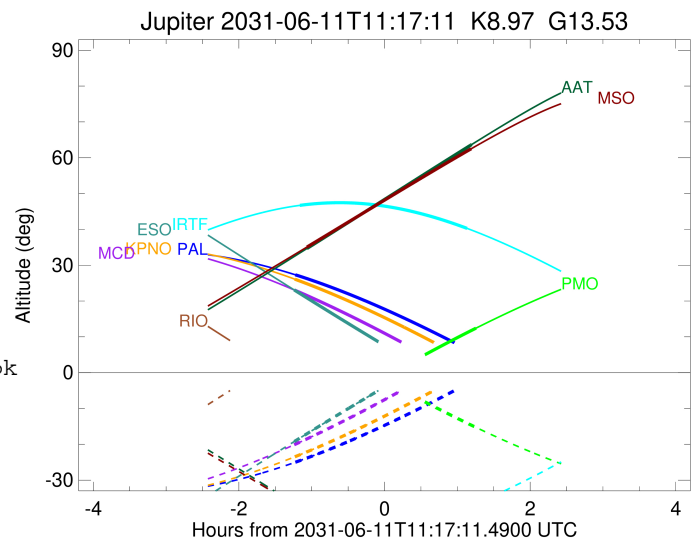
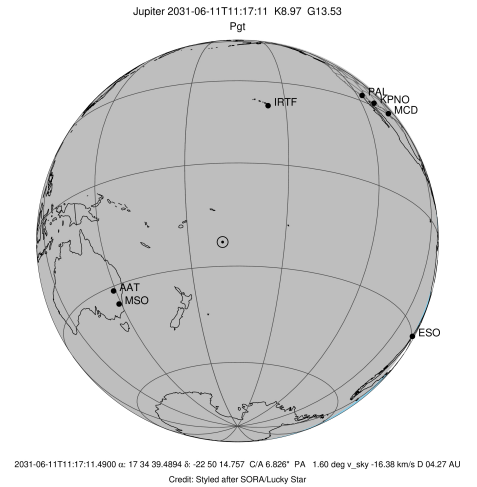
Observable events with sun below -5 deg and altitude above 5 deg

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 11 10:03 - JUN 11 10:03	Pin
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+	JUN 11 12:32 - JUN 11 12:32	Pne
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	JUN 11 10:03 - JUN 11 10:03	Pin
MCD	McDonald Obs. 2.7m	30.7	256.0	+	JUN 11 10:02 - JUN 11 10:02	Pin
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+	JUN 11 10:07 - JUN 11 12:25	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 11 10:02 - JUN 11 10:02	Pin
AAT	Siding Spring (AAT)	-31.3	149.1	+	JUN 11 10:13 - JUN 11 12:28	Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	JUN 11 10:13 - JUN 11 12:28	Pie



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-06-11T11:13:14.420
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        : 4116708599793684352
2Mass ID (if available) : 17343950-2250144
ICRS Star Coord at Epoch: 17h 34m 39.48936s -22:50:14.75734s
RUWE (>1.4 is poor) : 1.11
K magnitude           : 8.968
G magnitude           : 13.531
RP magnitude          : 12.346
BP magnitude          : 15.027
DUPflag              : 0
Distance (au)         : 4.269
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.38
Sun-Target sep (deg)  : 175.74
Sun-Moon sep (deg)    : 77.97
B (ring opening deg) : -2.60
PA of pole (deg)     : 1.89
Pole direction: RA (deg): 268.05692
Dec (deg): 64.49651
C/A sky separation (" ) : 5.288
C/A sky separation (km) : 16372.9
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
    
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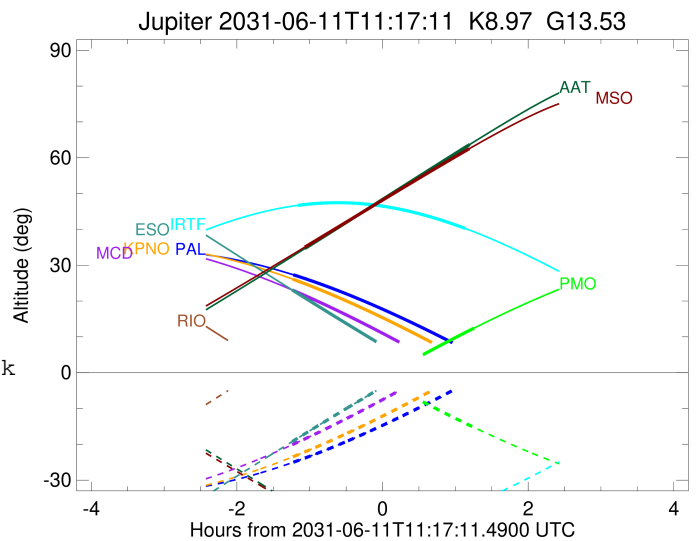
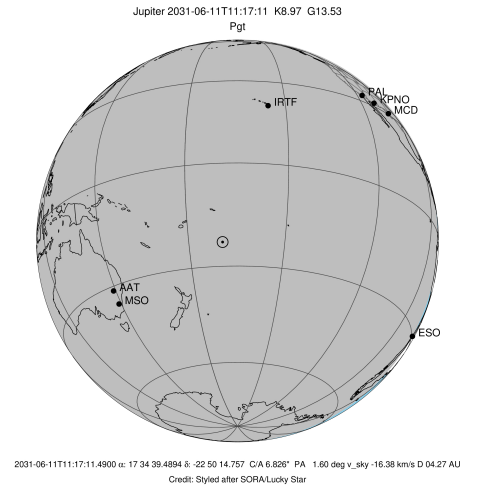


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-11T10:03:44.040	27.31	-25.00	71491.5	-13.22	-15.03
Jupiter	E	2031-06-11T12:23:05.818	6.91	-3.52x	71491.5	-13.35	-15.17

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-06-11T11:22:45.820
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      : 4116708599793684352
2Mass ID (if available) : 17343950-2250144
ICRS Star Coord at Epoch: 17h 34m 39.48936s -22:50:14.75734s
RUWE (>1.4 is poor) : 1.11
K magnitude          : 8.968
G magnitude          : 13.531
RP magnitude         : 12.346
BP magnitude         : 15.027
DUPflag             : 0
Distance (au)       : 4.269
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.38
Sun-Target sep (deg) : 175.74
Sun-Moon sep (deg)  : 77.95
B (ring opening deg) : -2.60
PA of pole (deg)    : 1.89
Pole direction: RA (deg): 268.05692
Dec (deg): 64.49651
C/A sky separation ("): 5.679
C/A sky separation (km) : 17581.4
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
    
```

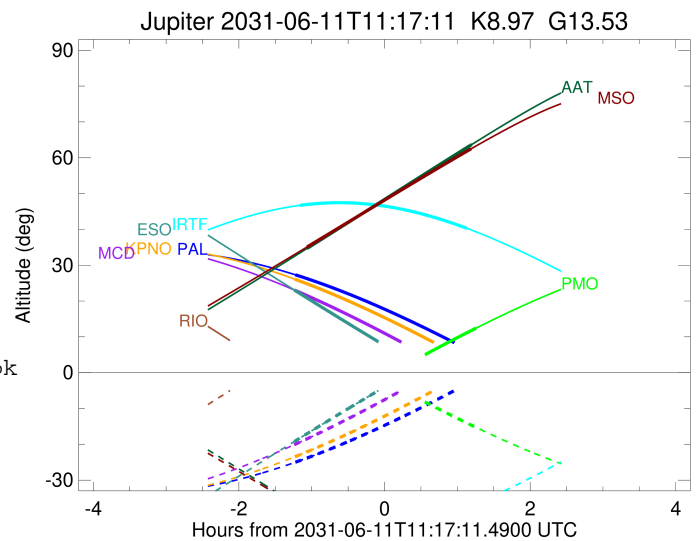
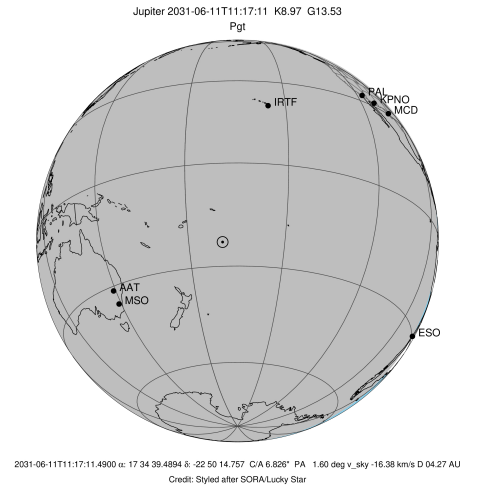


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-11T10:12:24.566	-13.97x	10.35x	71491.4	-15.04	-17.07
Jupiter	E	2031-06-11T12:32:36.607	12.43	-15.28	71491.5	-13.44	-15.27

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-06-11T11:12:50.190
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      : 4116708599793684352
2Mass ID (if available) : 17343950-2250144
ICRS Star Coord at Epoch: 17h 34m 39.48936s -22:50:14.75734s
RUWE (>1.4 is poor) : 1.11
K magnitude          : 8.968
G magnitude          : 13.531
RP magnitude         : 12.346
BP magnitude         : 15.027
DUPflag             : 0
Distance (au)       : 4.269
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.38
Sun-Target sep (deg) : 175.74
Sun-Moon sep (deg)  : 77.92
B (ring opening deg) : -2.60
PA of pole (deg)    : 1.89
Pole direction: RA (deg): 268.05692
Dec (deg): 64.49651
C/A sky separation (") : 5.363
C/A sky separation (km) : 16605.2
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
    
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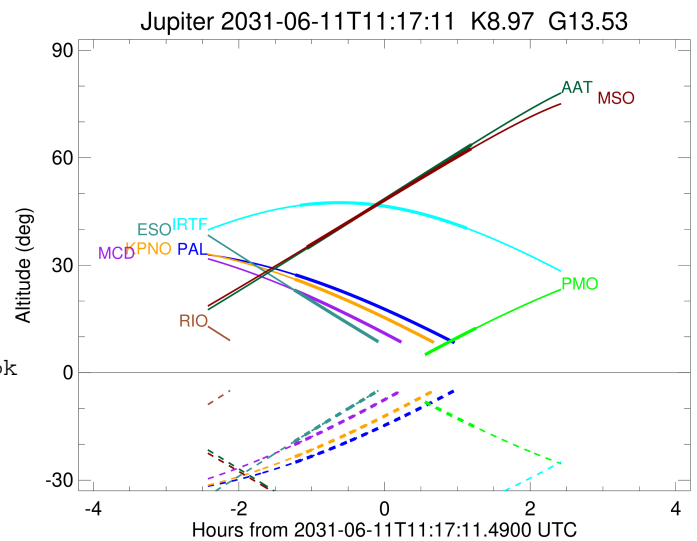
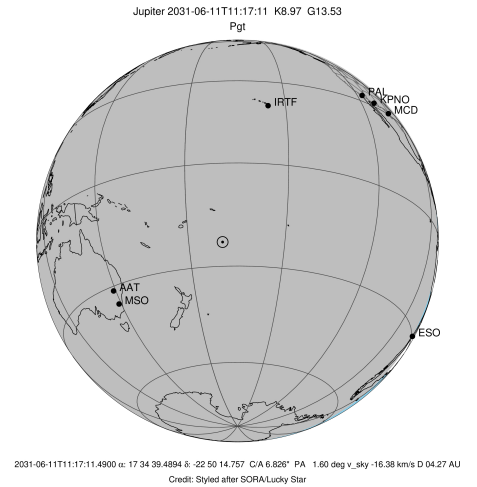


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-11T10:03:18.562	26.09	-23.48	71491.5	-13.37	-15.20
Jupiter	E	2031-06-11T12:22:45.022	3.92x	-0.38x	71491.5	-13.57	-15.43

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-06-11T11:12:20.590
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      : 4116708599793684352
2Mass ID (if available) : 17343950-2250144
ICRS Star Coord at Epoch: 17h 34m 39.48936s -22:50:14.75734s
RUWE (>1.4 is poor) : 1.11
K magnitude          : 8.968
G magnitude          : 13.531
RP magnitude         : 12.346
BP magnitude         : 15.027
DUPflag             : 0
Distance (au)        : 4.269
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.38
Sun-Target sep (deg) : 175.74
Sun-Moon sep (deg)  : 77.83
B (ring opening deg) : -2.60
PA of pole (deg)    : 1.89
Pole direction: RA (deg): 268.05692
Dec (deg): 64.49651
C/A sky separation (") : 5.465
C/A sky separation (km) : 16918.3
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
    
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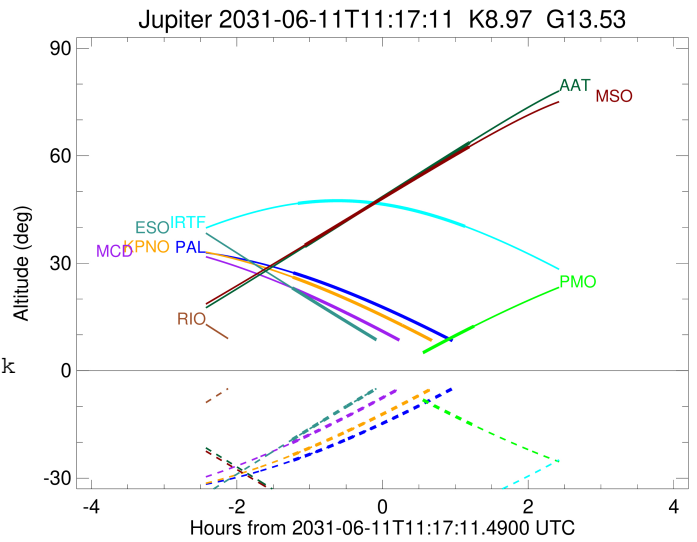
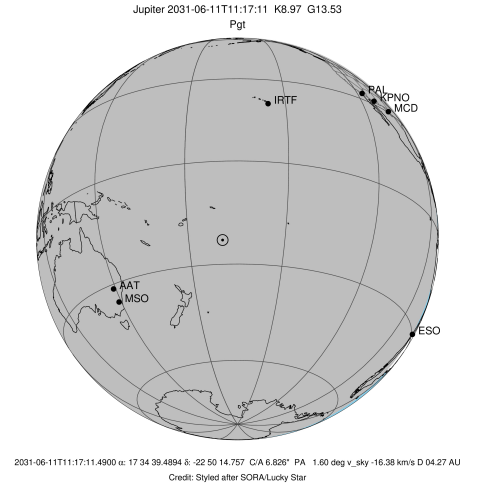


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-11T10:02:45.000	23.09	-20.12	71491.5	-13.57	-15.42
Jupiter	E	2031-06-11T12:22:22.135	-1.13x	4.82x	71491.5	-13.87	-15.76

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-06-11T11:16:19.120
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        : 4116708599793684352
2Mass ID (if available) : 17343950-2250144
ICRS Star Coord at Epoch: 17h 34m 39.48936s -22:50:14.75734s
RUWE (>1.4 is poor) : 1.11
K magnitude           : 8.968
G magnitude           : 13.531
RP magnitude          : 12.346
BP magnitude          : 15.027
DUPflag              : 0
Distance (au)         : 4.269
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.38
Sun-Target sep (deg) : 175.74
Sun-Moon sep (deg)   : 78.47
B (ring opening deg) : -2.60
PA of pole (deg)     : 1.89
Pole direction: RA (deg): 268.05692
Dec (deg): 64.49651
C/A sky separation (") : 5.423
C/A sky separation (km) : 16788.8
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
    
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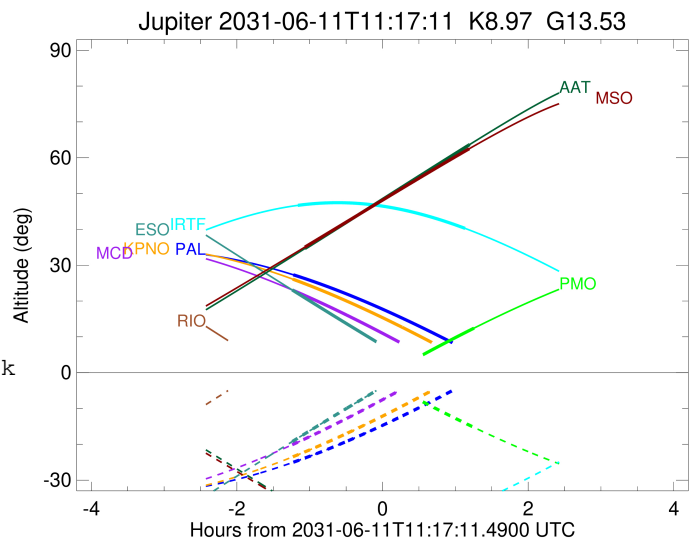
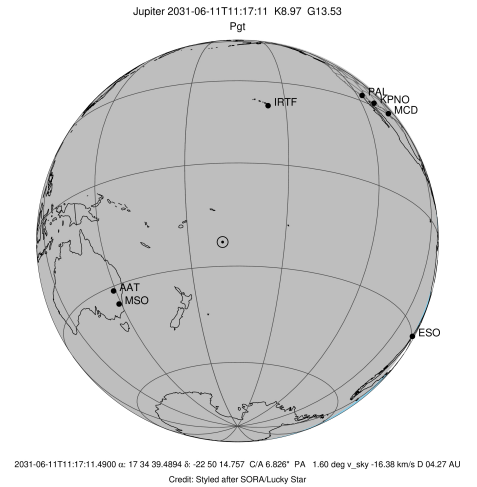


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-11T10:07:27.183	46.70	-47.08	71491.5	-13.89	-15.78
Jupiter	E	2031-06-11T12:25:15.367	40.27	-37.64	71491.5	-13.42	-15.26

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-06-11T11:11:13.210
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        : 4116708599793684352
2Mass ID (if available) : 17343950-2250144
ICRS Star Coord at Epoch: 17h 34m 39.48936s -22:50:14.75734s
RUWE (>1.4 is poor) : 1.11
K magnitude           : 8.968
G magnitude           : 13.531
RP magnitude          : 12.346
BP magnitude          : 15.027
DUPflag              : 0
Distance (au)         : 4.269
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.38
Sun-Target sep (deg)  : 175.74
Sun-Moon sep (deg)    : 77.76
B (ring opening deg) : -2.60
PA of pole (deg)      : 1.89
Pole direction: RA (deg): 268.05692
Dec (deg): 64.49651
C/A sky separation (") : 7.724
C/A sky separation (km) : 23912.5
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
    
```



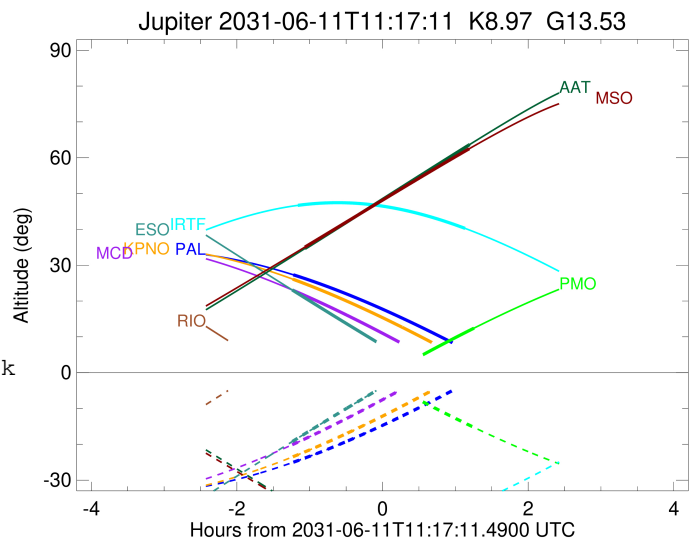
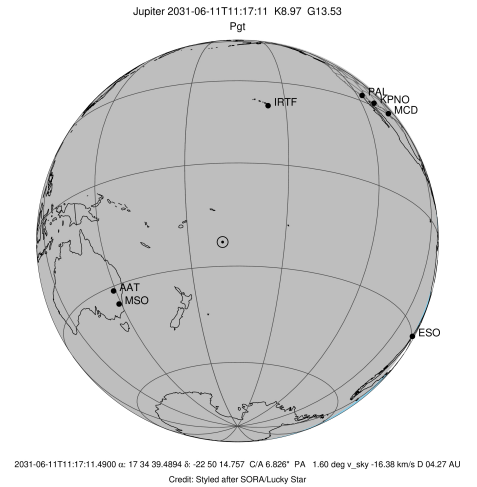
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-11T10:02:51.109	23.07	-19.22	71491.0	-19.27	-21.77
Jupiter	E	2031-06-11T12:20:05.660	-4.82x	8.11x	71490.9	-19.78	-22.33



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-06-11T11:21:15.050
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        : 4116708599793684352
2Mass ID (if available) : 17343950-2250144
ICRS Star Coord at Epoch: 17h 34m 39.48936s -22:50:14.75734s
RUWE (>1.4 is poor) : 1.11
K magnitude           : 8.968
G magnitude           : 13.531
RP magnitude          : 12.346
BP magnitude          : 15.027
DUPflag              : 0
Distance (au)         : 4.269
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.38
Sun-Target sep (deg)  : 175.74
Sun-Moon sep (deg)    : 78.64
B (ring opening deg) : -2.60
PA of pole (deg)      : 1.89
Pole direction: RA (deg): 268.05692
Dec (deg): 64.49651
C/A sky separation (") : 7.342
C/A sky separation (km) : 22731.6
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
    
```



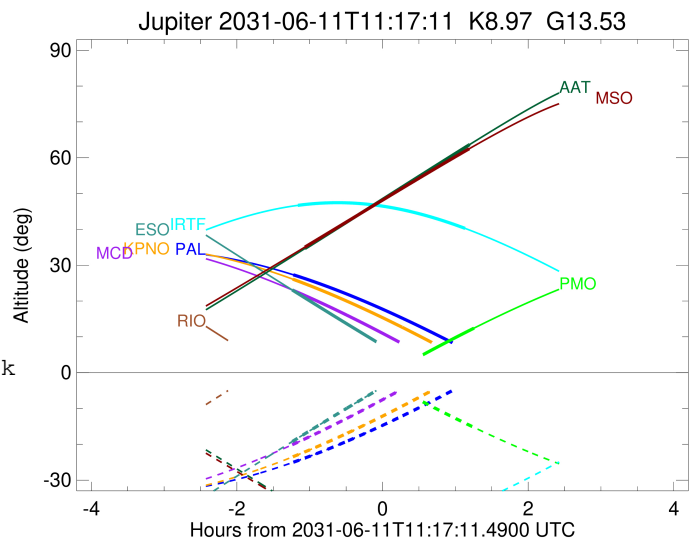
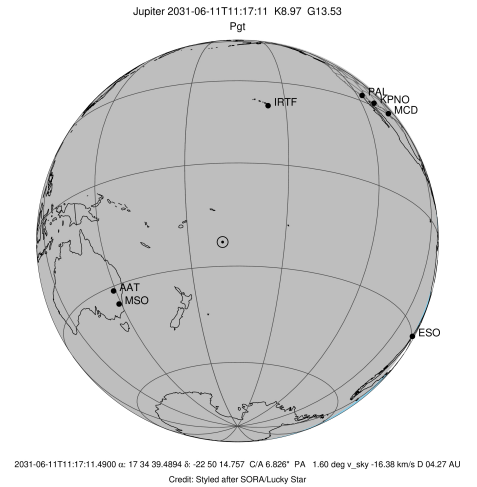
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-11T10:13:15.038	34.65	-38.71	71491.0	-19.26	-21.75
Jupiter	E	2031-06-11T12:28:53.869	63.65	-67.55	71491.1	-17.89	-20.24



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-06-11T11:21:03.920
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        : 4116708599793684352
2Mass ID (if available) : 17343950-2250144
ICRS Star Coord at Epoch: 17h 34m 39.48936s -22:50:14.75734s
RUWE (>1.4 is poor) : 1.11
K magnitude           : 8.968
G magnitude           : 13.531
RP magnitude          : 12.346
BP magnitude          : 15.027
DUPflag              : 0
Distance (au)         : 4.269
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.38
Sun-Target sep (deg)  : 175.74
Sun-Moon sep (deg)    : 78.64
B (ring opening deg) : -2.60
PA of pole (deg)      : 1.89
Pole direction: RA (deg): 268.05692
Dec (deg): 64.49651
C/A sky separation (") : 7.475
C/A sky separation (km) : 23142.5
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	2031-06-11T10:13:09.554	35.03	-38.95	71491.0	-19.58	-22.12
Jupiter	E	2031-06-11T12:28:38.017	62.50	-66.10	71491.1	-18.25	-20.65