

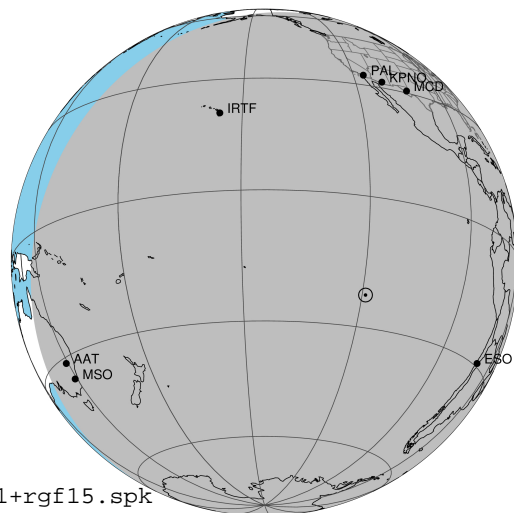
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2030-06-05T07:54:52.970
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 6307363399224161024
 2Mass ID (if available) : 15095032-1631493

Jupiter 2030-06-05T07:54:52 K9.07 G10.97 Pgt

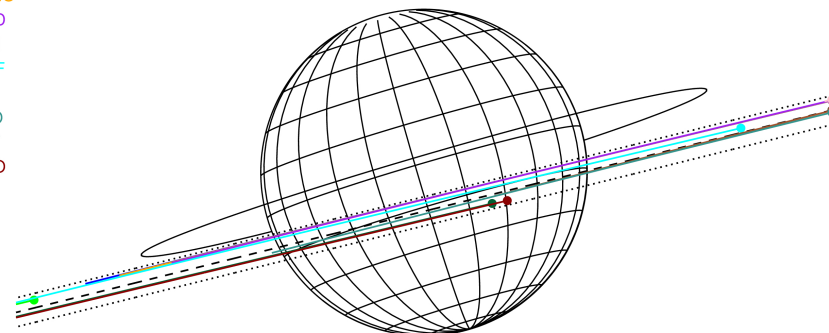
ICRS Star Coord at Epoch: 15h 09m 50.34630s -16:31:51.13046s

RUWE (>1.4 is poor) : 1.57
 K magnitude : 9.075
 G magnitude : 10.969
 RP magnitude : 10.340
 BP magnitude : 11.432
 DUPflag : 0
 Distance (au) : 4.452
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -14.25
 Sun-Target sep (deg) : 155.26
 Sun-Moon sep (deg) : 110.51
 B (ring opening deg) : -3.25
 PA of pole (deg) : 16.30
 Pole direction: RA (deg): 268.05724
 Dec (deg): 64.49652
 C/A sky separation (") : 5.112
 C/A sky separation (km) : 16506.8
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2030-06-05T07:54:52 K9.07 G10.97
 Pgt



Earth
 PAL
 PMO
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 AAT
 MSO



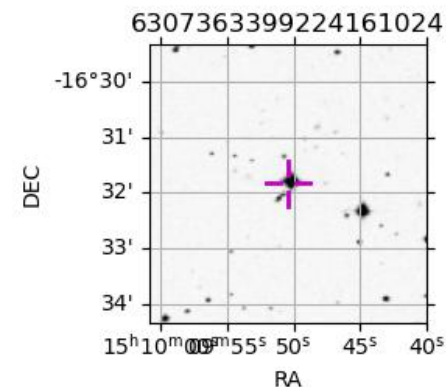
2030-06-05T07:54:52.9700 @: 15 09 50.3463 @: -16 31 51.130 C/A 5.1125" PA 13.92 deg v_sky -14.25 km/s D 04.45 AU

Credit: Styled after SORA/Lucky Star

naif0012.tls
 nep097.bsp
 nep101.bsp
 sat4401.bsp

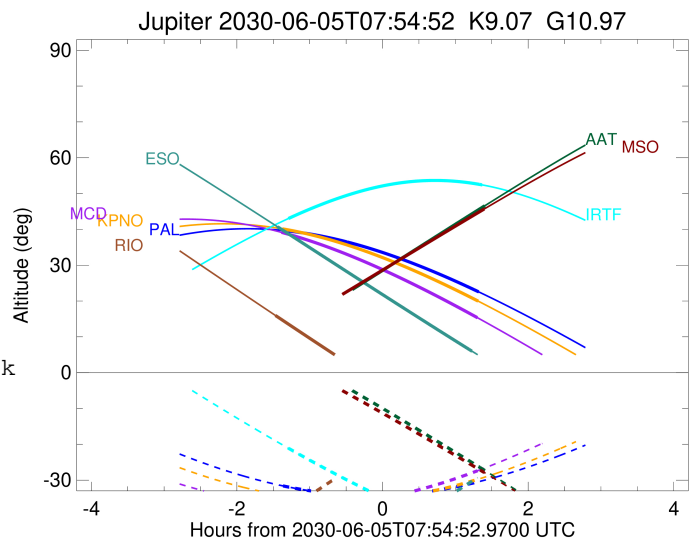
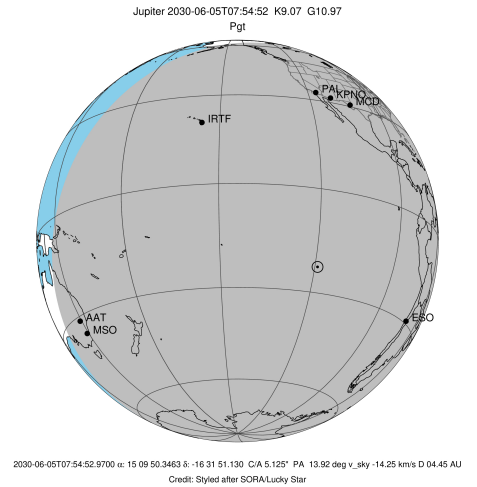
Observable events with sun below -5 deg and altitude above 5 deg

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 05 06:33 - JUN 05 09:14	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JUN 05 06:32 - JUN 05 09:13	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JUN 05 06:31 - JUN 05 09:13	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	JUN 05 06:37 - JUN 05 09:17	Pie
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+ +	JUN 05 06:26 - JUN 05 06:26	Pin
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUN 05 06:28 - JUN 05 09:08	Pie
AAT	Siding Spring (AAT)	-31.3	149.1	+ +	JUN 05 09:19 - JUN 05 09:19	Pne
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	JUN 05 09:18 - JUN 05 09:18	Pne



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2030-06-05T07:53:26.050
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      : 6307363399224161024
2Mass ID (if available) : 15095032-1631493
ICRS Star Coord at Epoch: 15h 09m 50.34630s -16:31:51.13046s
RUWE (>1.4 is poor) : 1.57
K magnitude          : 9.075
G magnitude          : 10.969
RP magnitude         : 10.340
BP magnitude         : 11.432
DUPflag             : 0
Distance (au)       : 4.452
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.25
Sun-Target sep (deg) : 155.26
Sun-Moon sep (deg)  : 110.91
B (ring opening deg) : -3.25
PA of pole (deg)    : 16.30
Pole direction: RA (deg): 268.05724
Dec (deg): 64.49652
C/A sky separation (") : 3.518
C/A sky separation (km) : 11358.7
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
    
```

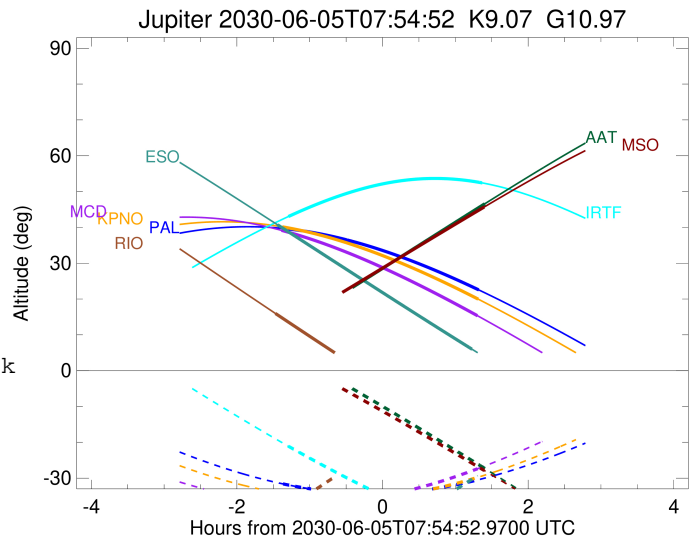
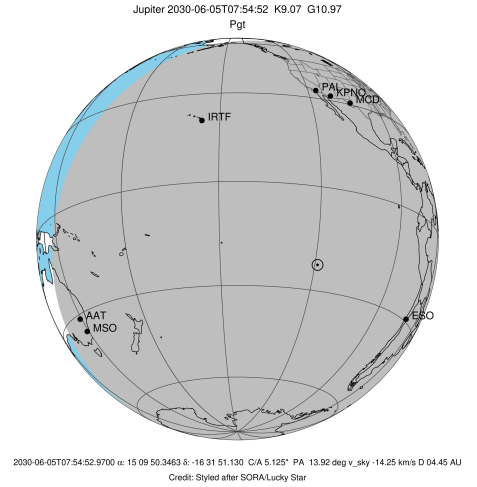


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2030-06-05T06:33:00.831	39.70	-31.62	71491.4	-11.72	-13.34
Jupiter	E	2030-06-05T09:14:12.477	22.54	-30.42	71491.8	-6.73	-7.68

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2030-06-05T07:52:51.310
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        : 6307363399224161024
2Mass ID (if available) : 15095032-1631493
ICRS Star Coord at Epoch: 15h 09m 50.34630s -16:31:51.13046s
RUWE (>1.4 is poor) : 1.57
K magnitude           : 9.075
G magnitude           : 10.969
RP magnitude          : 10.340
BP magnitude          : 11.432
DUPflag              : 0
Distance (au)         : 4.452
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.25
Sun-Target sep (deg)  : 155.26
Sun-Moon sep (deg)   : 110.86
B (ring opening deg) : -3.25
PA of pole (deg)     : 16.30
Pole direction: RA (deg): 268.05724
Dec (deg): 64.49652
C/A sky separation (") : 3.536
C/A sky separation (km) : 11416.9
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
    
```

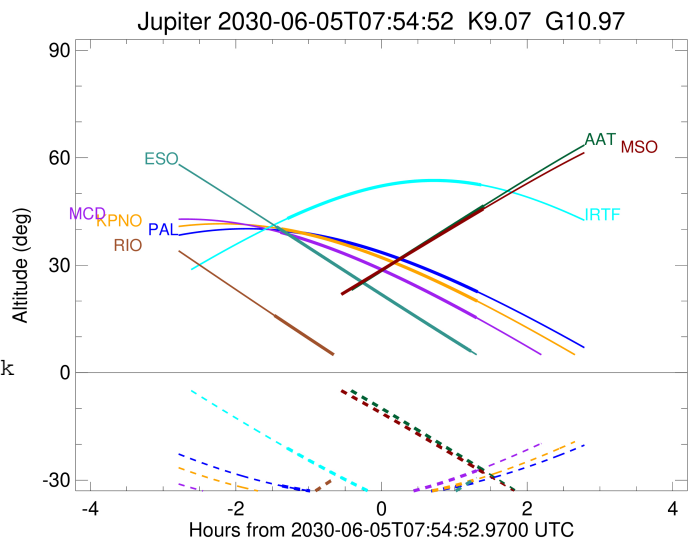
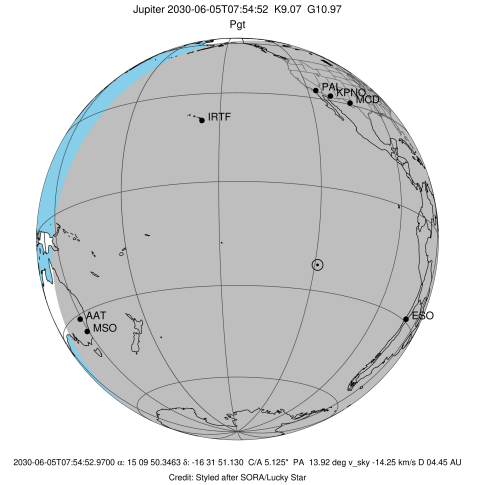


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2030-06-05T06:32:25.634	40.13	-34.22	71491.4	-11.72	-13.34
Jupiter	E	2030-06-05T09:13:42.103	19.97	-29.74	71491.8	-6.82	-7.79

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2030-06-05T07:52:05.010
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        : 6307363399224161024
2Mass ID (if available) : 15095032-1631493
ICRS Star Coord at Epoch: 15h 09m 50.34630s -16:31:51.13046s
RUWE (>1.4 is poor) : 1.57
K magnitude           : 9.075
G magnitude           : 10.969
RP magnitude          : 10.340
BP magnitude          : 11.432
DUPflag              : 0
Distance (au)         : 4.452
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.25
Sun-Target sep (deg)  : 155.26
Sun-Moon sep (deg)    : 110.79
B (ring opening deg) : -3.25
PA of pole (deg)      : 16.30
Pole direction: RA (deg): 268.05724
Dec (deg): 64.49652
C/A sky separation (") : 3.557
C/A sky separation (km) : 11484.0
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
    
```

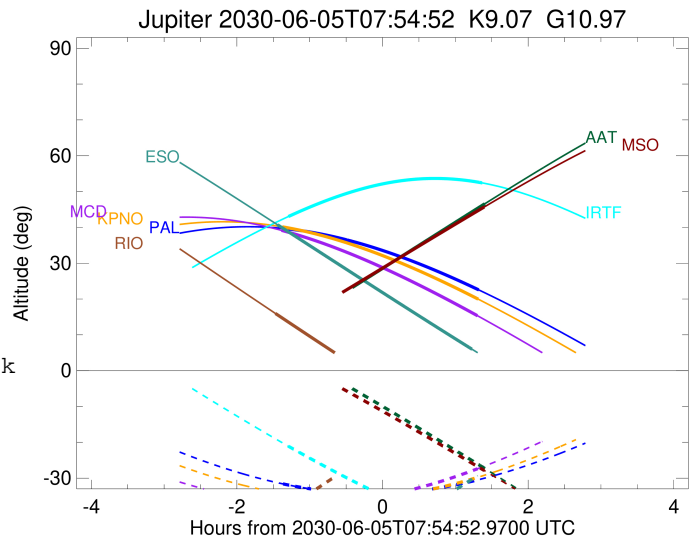
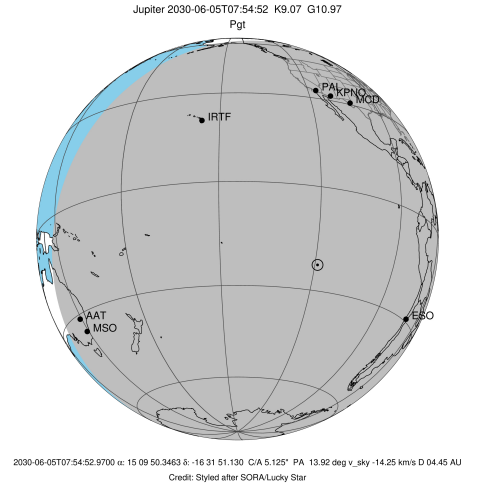


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2030-06-05T06:31:35.604	39.17	-36.66	71491.4	-11.71	-13.32
Jupiter	E	2030-06-05T09:13:04.882	15.35	-27.39	71491.8	-6.95	-7.94

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2030-06-05T07:57:16.370
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       : 6307363399224161024
2Mass ID (if available) : 15095032-1631493
ICRS Star Coord at Epoch: 15h 09m 50.34630s -16:31:51.13046s
RUWE (>1.4 is poor) : 1.57
K magnitude           : 9.075
G magnitude           : 10.969
RP magnitude         : 10.340
BP magnitude         : 11.432
DUPflag              : 0
Distance (au)        : 4.452
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.25
Sun-Target sep (deg) : 155.26
Sun-Moon sep (deg)   : 111.28
B (ring opening deg) : -3.25
PA of pole (deg)     : 16.30
Pole direction: RA (deg): 268.05724
Dec (deg): 64.49652
C/A sky separation ("): 4.062
C/A sky separation (km): 13116.1
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
    
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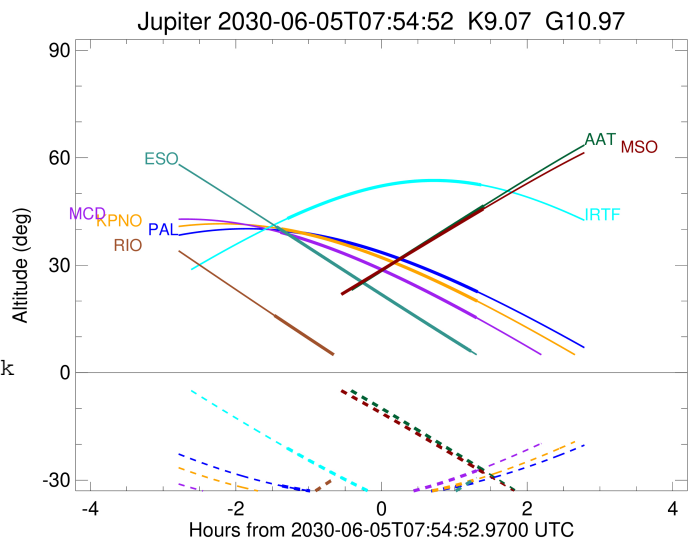
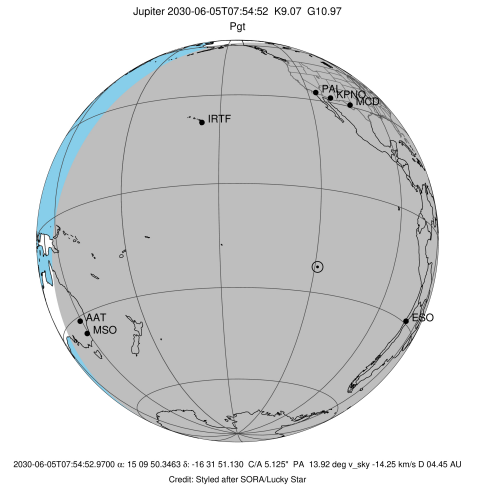


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2030-06-05T06:37:18.297	43.02	-21.08	71491.2	-13.47	-15.31
Jupiter	E	2030-06-05T09:17:06.131	52.41	-44.99	71491.7	-7.78	-8.87

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2030-06-05T07:47:21.970
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      : 6307363399224161024
2Mass ID (if available) : 15095032-1631493
ICRS Star Coord at Epoch: 15h 09m 50.34630s -16:31:51.13046s
RUWE (>1.4 is poor) : 1.57
K magnitude          : 9.075
G magnitude          : 10.969
RP magnitude         : 10.340
BP magnitude         : 11.432
DUPflag             : 0
Distance (au)       : 4.452
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.25
Sun-Target sep (deg) : 155.26
Sun-Moon sep (deg)  : 110.15
B (ring opening deg) : -3.25
PA of pole (deg)    : 16.30
Pole direction: RA (deg): 268.05724
Dec (deg): 64.49652
C/A sky separation (") : 5.479
C/A sky separation (km) : 17690.6
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
    
```

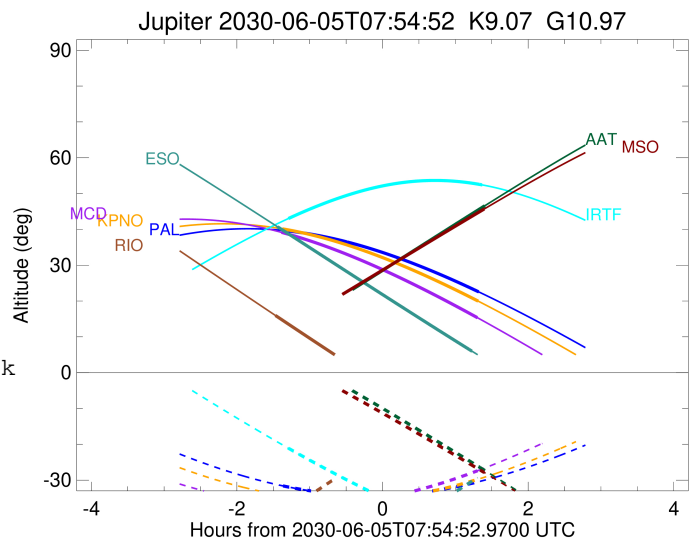
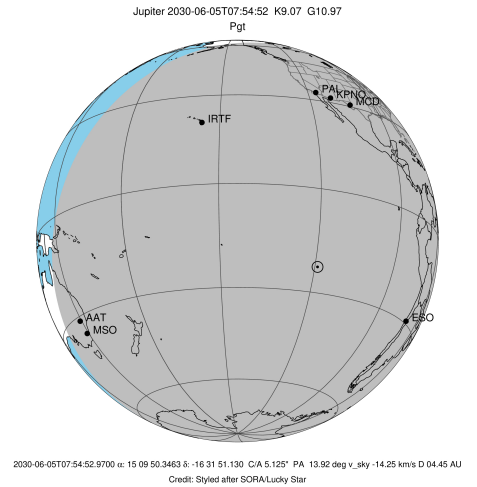


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2030-06-05T06:26:37.015	15.98	-40.64	71490.9	-16.20	-18.37
Jupiter	E	2030-06-05T09:09:01.386	-19.33x	-4.77x	71491.3	-12.52	-14.25

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2030-06-05T07:48:03.330
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       : 6307363399224161024
2Mass ID (if available) : 15095032-1631493
ICRS Star Coord at Epoch: 15h 09m 50.34630s -16:31:51.13046s
RUWE (>1.4 is poor) : 1.57
K magnitude           : 9.075
G magnitude           : 10.969
RP magnitude         : 10.340
BP magnitude         : 11.432
DUPflag              : 0
Distance (au)        : 4.452
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.25
Sun-Target sep (deg) : 155.26
Sun-Moon sep (deg)  : 110.54
B (ring opening deg) : -3.25
PA of pole (deg)    : 16.30
Pole direction: RA (deg): 268.05724
Dec (deg): 64.49652
C/A sky separation ("): 5.467
C/A sky separation (km): 17653.4
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
    
```

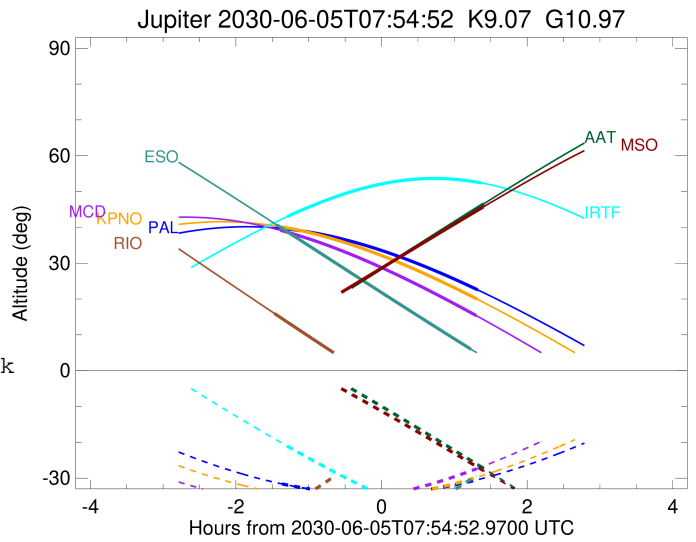
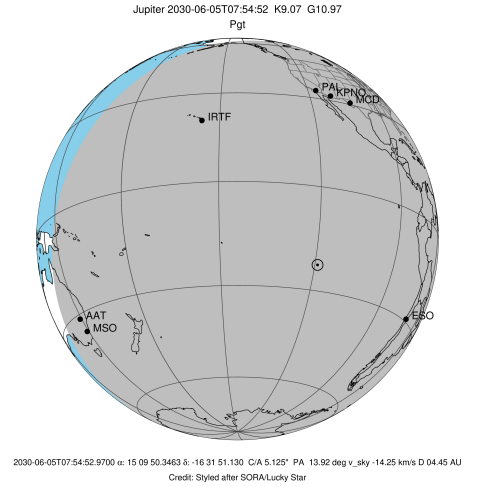


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2030-06-05T06:28:16.349	40.74	-65.15	71490.8	-16.43	-18.62
Jupiter	E	2030-06-05T09:08:36.961	5.99	-30.31	71491.3	-12.29	-13.99

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2030-06-05T08:00:02.100
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      : 6307363399224161024
2Mass ID (if available) : 15095032-1631493
ICRS Star Coord at Epoch: 15h 09m 50.34630s -16:31:51.13046s
RUWE (>1.4 is poor) : 1.57
K magnitude          : 9.075
G magnitude          : 10.969
RP magnitude         : 10.340
BP magnitude         : 11.432
DUPflag             : 0
Distance (au)       : 4.452
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.25
Sun-Target sep (deg) : 155.26
Sun-Moon sep (deg)  : 111.15
B (ring opening deg) : -3.25
PA of pole (deg)    : 16.30
Pole direction: RA (deg): 268.05724
Dec (deg): 64.49652
C/A sky separation ("): 6.228
C/A sky separation (km): 20109.5
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
    
```

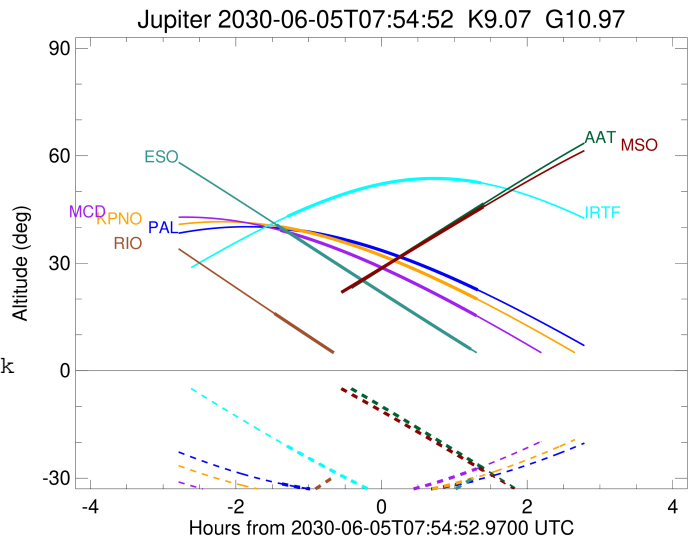
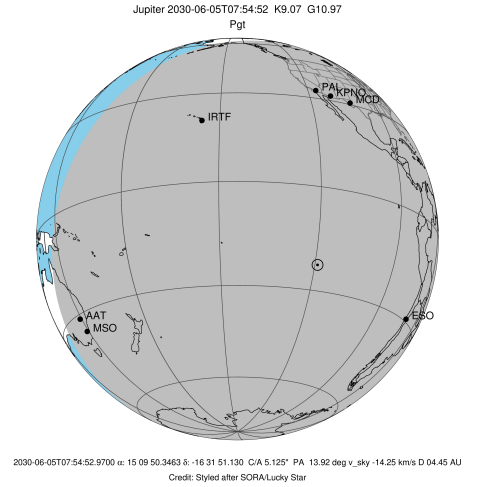


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2030-06-05T06:40:13.901	12.66	4.52x	71490.4	-19.20	-21.69
Jupiter	E	2030-06-05T09:19:12.251	46.59	-27.31	71491.2	-13.37	-15.19


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2030-06-05T07:59:40.300
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       : 6307363399224161024
2Mass ID (if available) : 15095032-1631493
ICRS Star Coord at Epoch: 15h 09m 50.34630s -16:31:51.13046s
RUWE (>1.4 is poor) : 1.57
K magnitude           : 9.075
G magnitude           : 10.969
RP magnitude          : 10.340
BP magnitude          : 11.432
DUPflag              : 0
Distance (au)        : 4.452
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.25
Sun-Target sep (deg) : 155.26
Sun-Moon sep (deg)   : 111.13
B (ring opening deg) : -3.25
PA of pole (deg)     : 16.30
Pole direction: RA (deg): 268.05724
Dec (deg): 64.49652
C/A sky separation ("): 6.330
C/A sky separation (km): 20438.4
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	2030-06-05T06:39:57.506	13.36	2.60x	71490.4	-19.45	-21.97
Jupiter	E	2030-06-05T09:18:46.927	45.70	-27.88	71491.2	-13.67	-15.53