

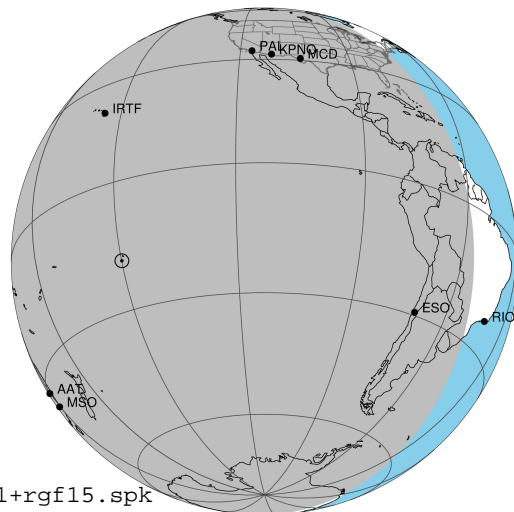
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-05-14T09:55:57.910
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068886750245122048
 2Mass ID (if available) : 17480853-2253270

Jupiter 2031-05-14T09:55:57 K8.22 G14.39 Pgt

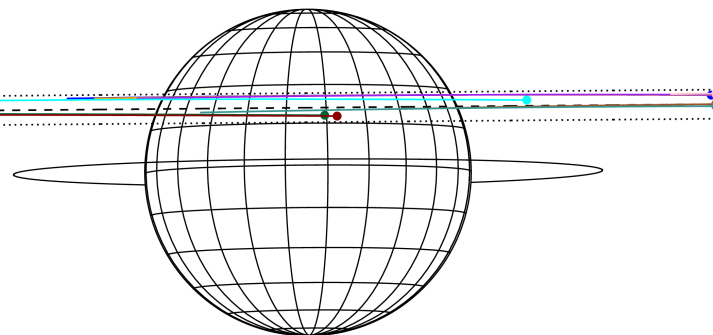
ICRS Star Coord at Epoch: 17h 48m 08.52894s -22:53:27.22948s

RUWE (>1.4 is poor) : 0.85
 K magnitude : 8.216
 G magnitude : 14.388
 RP magnitude : 12.864
 BP magnitude : 17.579
 DUPflag : 0
 Distance (au) : 4.426
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -11.32
 Sun-Target sep (deg) : 145.72
 Sun-Moon sep (deg) : 63.74
 B (ring opening deg) : -2.61
 PA of pole (deg) : 0.44
 Pole direction: RA (deg): 268.05695
 Dec (deg): 64.49651
 C/A sky separation (") : 8.842
 C/A sky separation (km) : 28381.4
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-05-14T09:55:57 K8.22 G14.39
 Pgt



Earth
 PAL
 PMO
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 AAT
 MSO

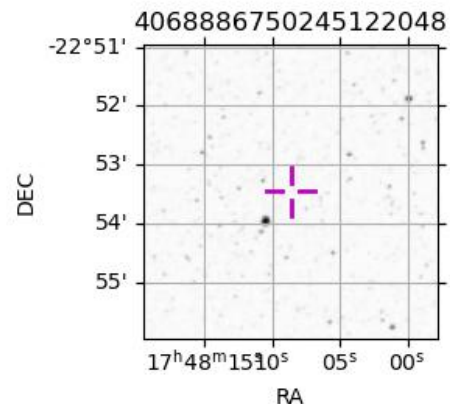


2031-05-14T09:55:57.9100 at: 17 48 08.5289 s: -22 53 27.229 s: C/A 8.831" PA 180.50 deg v_sky -11.32 km/s D 04.43 AU

Credit: Styled after SORA/Lucky Star

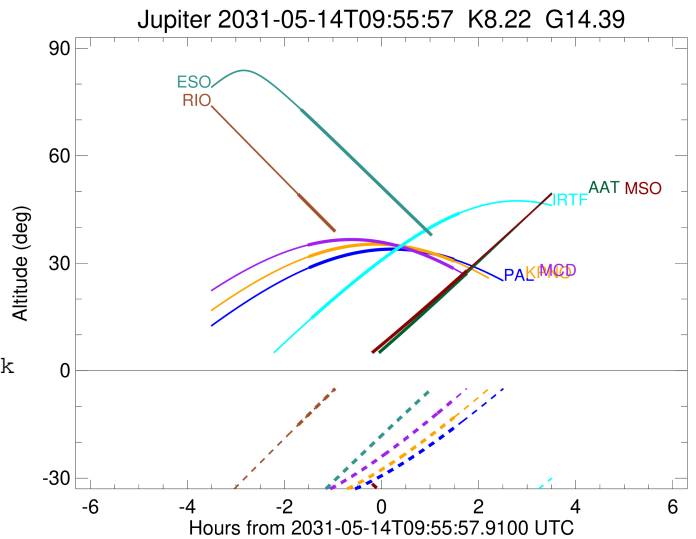
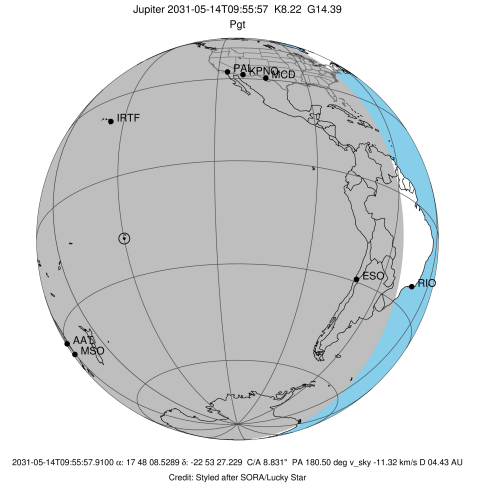
Observable events with sun below -5 deg and altitude above 5 deg

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	+ +	MAY 14 08:26 - MAY 14 11:26	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	MAY 14 08:25 - MAY 14 11:25	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	MAY 14 08:24 - MAY 14 11:24	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	MAY 14 08:29 - MAY 14 11:32	Pie
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+	MAY 14 08:12 - MAY 14 08:12	Pin
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	MAY 14 08:16 - MAY 14 08:16	Pin
AAT	Siding Spring (AAT)	-31.3	149.1	+	MAY 14 11:41 - MAY 14 11:41	Pne
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	MAY 14 11:41 - MAY 14 11:41	Pne



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-14T09:56:24.920
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      : 4068886750245122048
2Mass ID (if available) : 17480853-2253270
ICRS Star Coord at Epoch: 17h 48m 08.52894s -22:53:27.22948s
RUWE (>1.4 is poor) : 0.85
K magnitude          : 8.216
G magnitude          : 14.388
RP magnitude         : 12.864
BP magnitude         : 17.579
DUPflag             : 0
Distance (au)       : 4.426
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -11.32
Sun-Target sep (deg) : 145.72
Sun-Moon sep (deg)  : 64.22
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.44
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation ("): 10.488
C/A sky separation (km): 33664.8
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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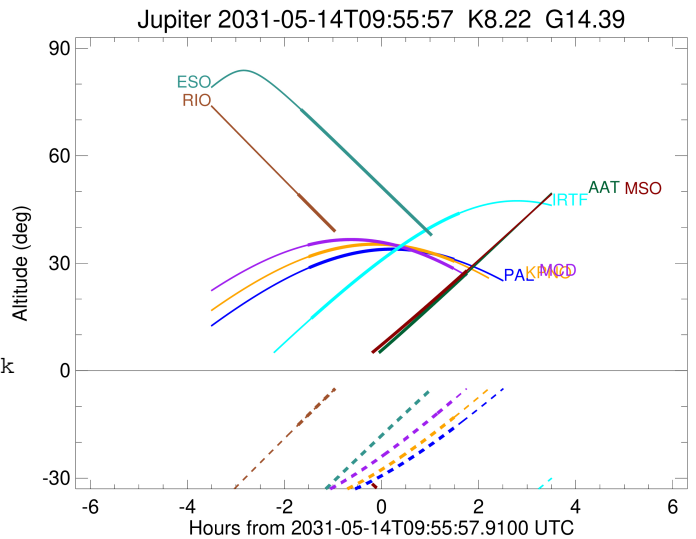
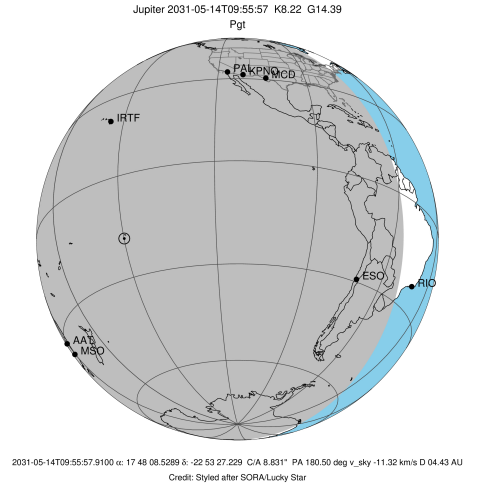


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-14T08:26:19.081	28.72	-37.22	71490.0	27.92	31.16
Jupiter	E	2031-05-14T11:26:18.408	31.00	-15.83	71490.0	27.91	31.15

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-14T09:55:46.120
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        : 4068886750245122048
2Mass ID (if available) : 17480853-2253270
ICRS Star Coord at Epoch: 17h 48m 08.52894s -22:53:27.22948s
RUWE (>1.4 is poor) : 0.85
K magnitude           : 8.216
G magnitude           : 14.388
RP magnitude          : 12.864
BP magnitude          : 17.579
DUPflag              : 0
Distance (au)         : 4.426
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -11.32
Sun-Target sep (deg)  : 145.72
Sun-Moon sep (deg)   : 64.21
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.44
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 10.463
C/A sky separation (km) : 33582.8
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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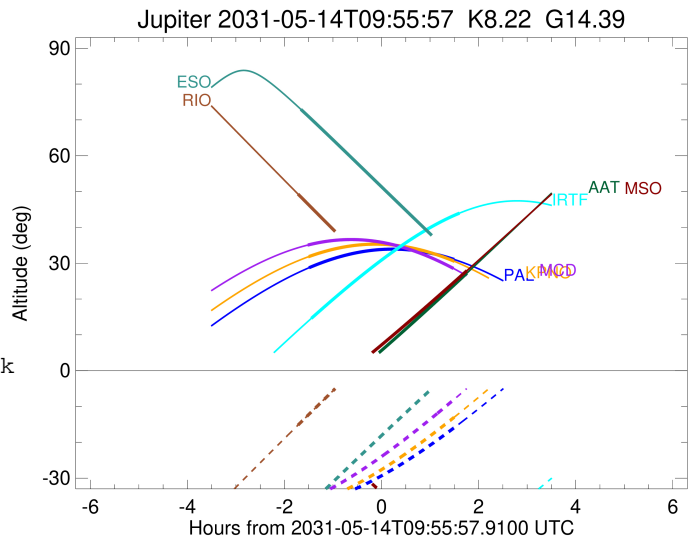
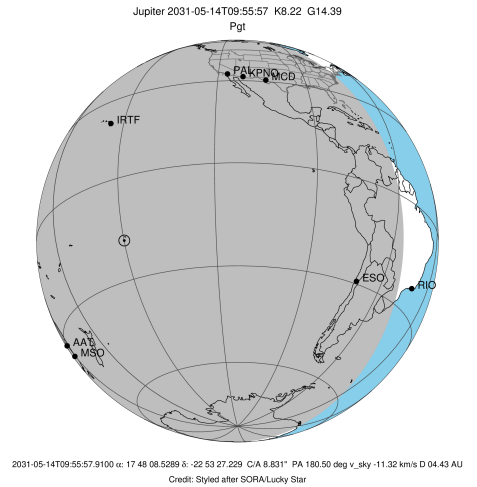


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-14T08:25:42.416	31.80	-37.39	71490.0	27.91	31.15
Jupiter	E	2031-05-14T11:25:43.568	30.55	-13.02	71490.0	27.77	31.00

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-14T09:54:49.050
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      : 4068886750245122048
2Mass ID (if available) : 17480853-2253270
ICRS Star Coord at Epoch: 17h 48m 08.52894s -22:53:27.22948s
RUWE (>1.4 is poor) : 0.85
K magnitude         : 8.216
G magnitude         : 14.388
RP magnitude        : 12.864
BP magnitude        : 17.579
DUPflag            : 0
Distance (au)       : 4.426
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -11.32
Sun-Target sep (deg) : 145.72
Sun-Moon sep (deg)  : 64.17
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.44
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (" ) : 10.430
C/A sky separation (km) : 33476.8
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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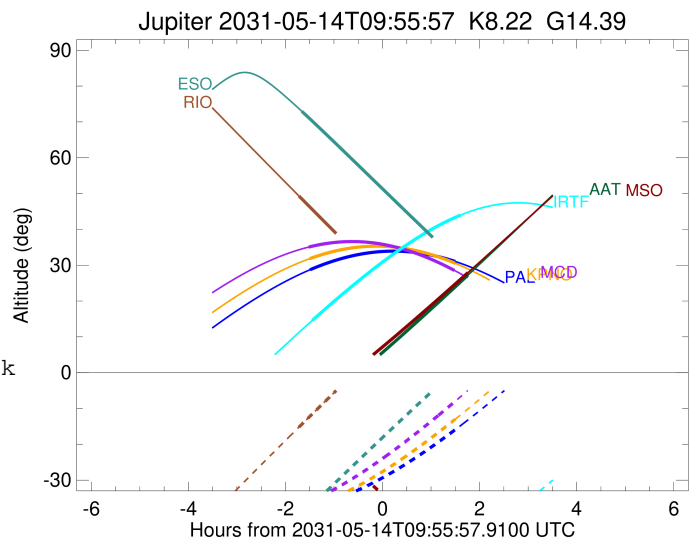
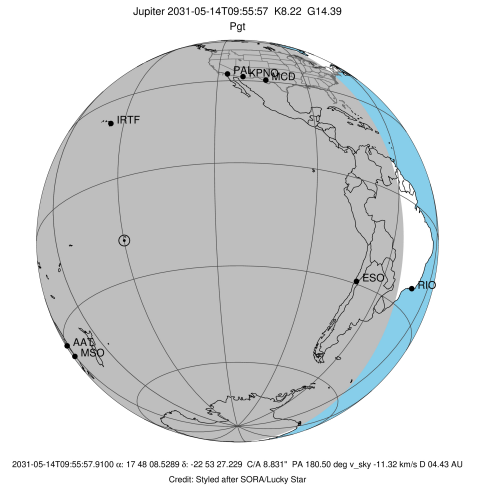


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-14T08:24:45.206	35.06	-36.10	71490.0	27.91	31.15
Jupiter	E	2031-05-14T11:24:55.572	28.53	-8.16	71490.0	27.58	30.80

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-14T10:01:18.240
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       : 4068886750245122048
2Mass ID (if available) : 17480853-2253270
ICRS Star Coord at Epoch: 17h 48m 08.52894s -22:53:27.22948s
RUWE (>1.4 is poor) : 0.85
K magnitude          : 8.216
G magnitude           : 14.388
RP magnitude         : 12.864
BP magnitude         : 17.579
DUPflag             : 0
Distance (au)        : 4.425
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -11.32
Sun-Target sep (deg) : 145.72
Sun-Moon sep (deg)   : 64.43
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.44
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 10.006
C/A sky separation (km) : 32115.2
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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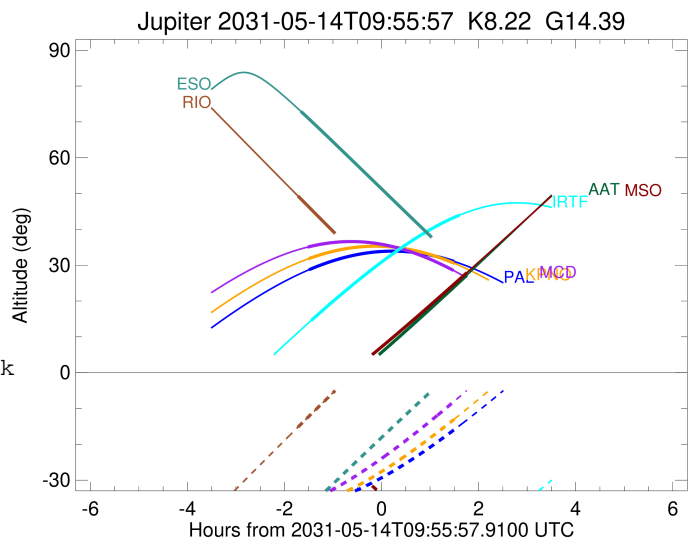
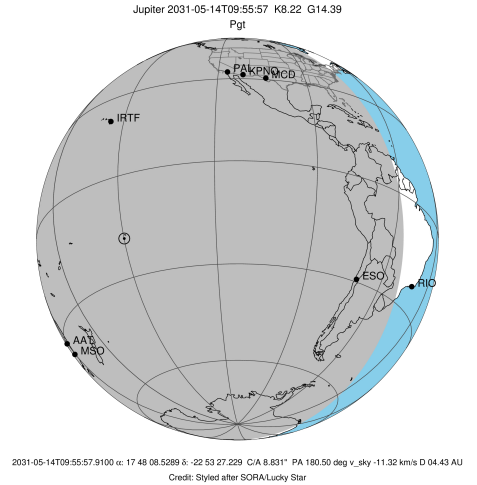


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-14T08:29:14.960	14.59	-43.28	71490.2	26.05	29.16
Jupiter	E	2031-05-14T11:32:20.899	43.96	-47.57	71490.1	27.02	30.20

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-14T09:48:26.520
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        : 4068886750245122048
2Mass ID (if available) : 17480853-2253270
ICRS Star Coord at Epoch: 17h 48m 08.52894s -22:53:27.22948s
RUWE (>1.4 is poor) : 0.85
K magnitude           : 8.216
G magnitude           : 14.388
RP magnitude          : 12.864
BP magnitude          : 17.579
DUPflag              : 0
Distance (au)         : 4.426
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -11.32
Sun-Target sep (deg) : 145.72
Sun-Moon sep (deg)   : 63.76
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.44
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation ("): 8.408
C/A sky separation (km): 26986.1
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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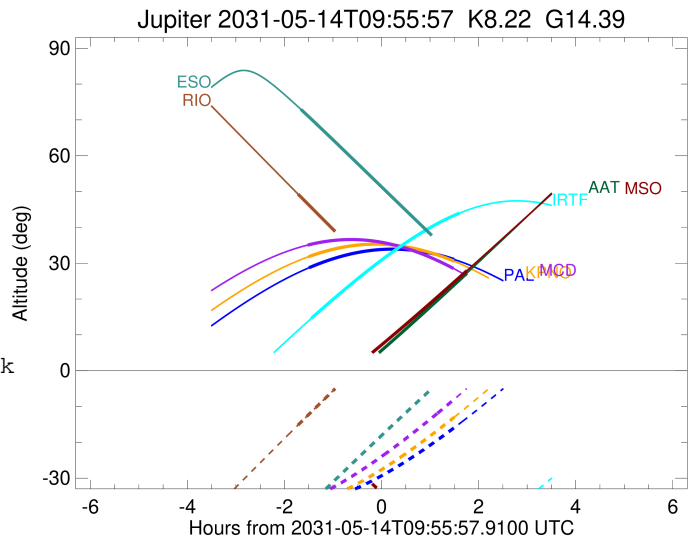
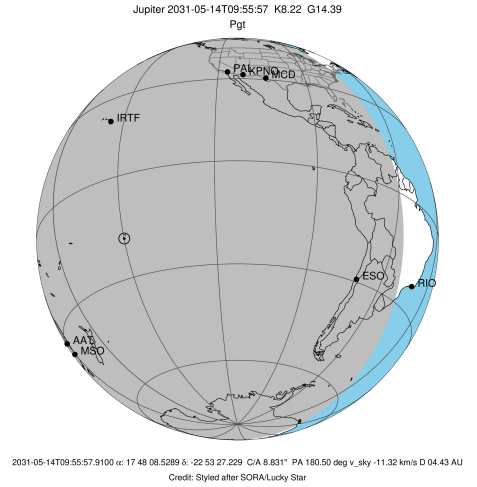


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-14T08:12:47.825	49.29	-15.18	71490.6	22.89	25.74
Jupiter	E	2031-05-14T11:25:16.854	6.42	25.23x	71490.8	21.28	23.98

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-14T09:50:52.880
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        : 4068886750245122048
2Mass ID (if available) : 17480853-2253270
ICRS Star Coord at Epoch: 17h 48m 08.52894s -22:53:27.22948s
RUWE (>1.4 is poor) : 0.85
K magnitude           : 8.216
G magnitude           : 14.388
RP magnitude          : 12.864
BP magnitude          : 17.579
DUPflag              : 0
Distance (au)         : 4.426
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -11.32
Sun-Target sep (deg)  : 145.72
Sun-Moon sep (deg)    : 64.18
B (ring opening deg) : -2.61
PA of pole (deg)      : 0.44
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 8.465
C/A sky separation (km) : 27171.4
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
    
```

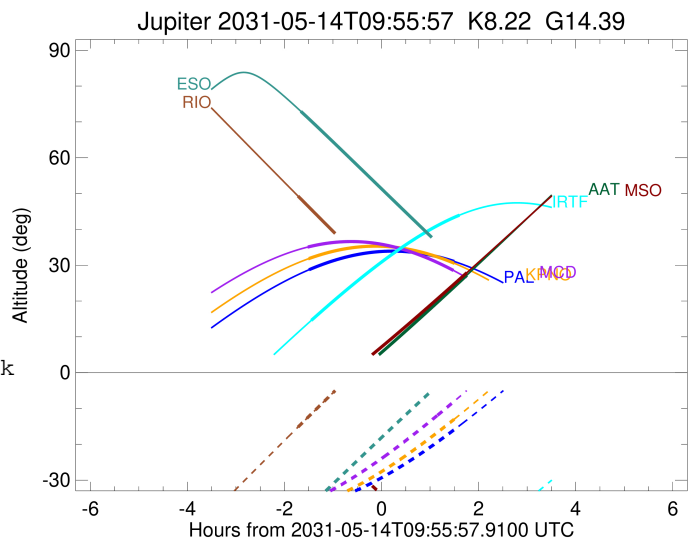
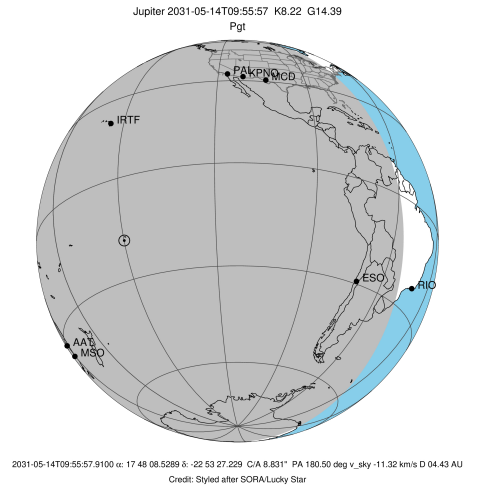


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-14T08:16:15.272	72.95	-39.73	71490.6	22.74	25.58
Jupiter	E	2031-05-14T11:26:13.905	31.67	0.74x	71490.7	21.64	24.37


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-14T10:03:25.940
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      : 4068886750245122048
2Mass ID (if available) : 17480853-2253270
ICRS Star Coord at Epoch: 17h 48m 08.52894s -22:53:27.22948s
RUWE (>1.4 is poor) : 0.85
K magnitude          : 8.216
G magnitude          : 14.388
RP magnitude         : 12.864
BP magnitude         : 17.579
DUPflag             : 0
Distance (au)       : 4.425
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -11.32
Sun-Target sep (deg) : 145.72
Sun-Moon sep (deg)  : 64.20
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.44
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation ("): 7.824
C/A sky separation (km) : 25113.2
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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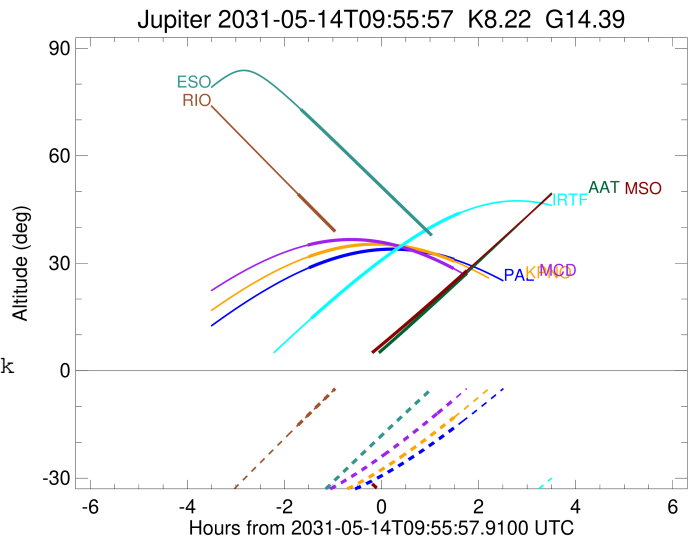
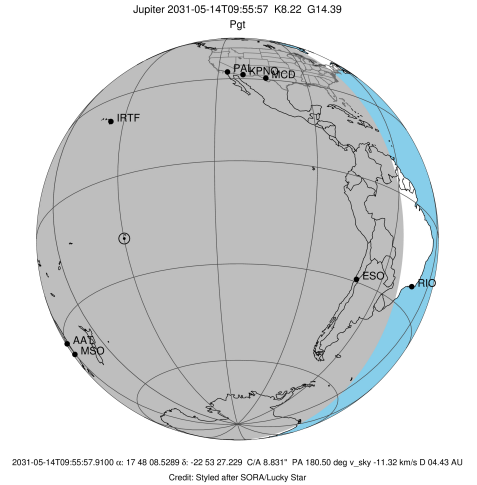


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-14T08:23:43.622	-11.58x	-14.39	71490.9	19.86	22.42
Jupiter	E	2031-05-14T11:41:31.053	27.22	-56.37	71490.8	21.25	23.95


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-14T10:03:05.760
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        : 4068886750245122048
2Mass ID (if available) : 17480853-2253270
ICRS Star Coord at Epoch: 17h 48m 08.52894s -22:53:27.22948s
RUWE (>1.4 is poor) : 0.85
K magnitude           : 8.216
G magnitude           : 14.388
RP magnitude          : 12.864
BP magnitude          : 17.579
DUPflag              : 0
Distance (au)         : 4.425
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -11.32
Sun-Target sep (deg) : 145.72
Sun-Moon sep (deg)   : 64.21
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.44
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 7.718
C/A sky separation (km) : 24773.7
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	2031-05-14T08:23:14.447	-9.31x	-15.14	71491.0	19.60	22.14
Jupiter	E	2031-05-14T11:41:23.462	27.89	-55.17	71490.8	20.93	23.60