

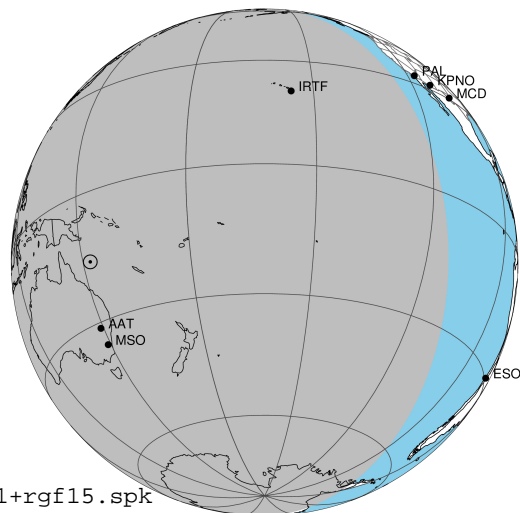
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-05-05T13:47:16.800
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068710725369113856
 2Mass ID (if available) : 17505694-2253421

Jupiter 2031-05-05T13:47:16 K8.62 G14.24 Pgt

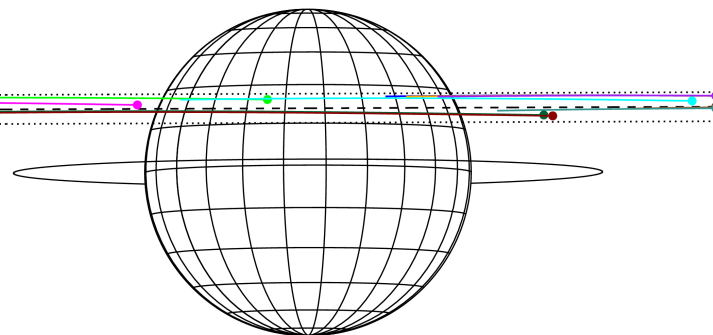
ICRS Star Coord at Epoch: 17h 50m 56.93046s -22:53:42.15507s

RUWE (>1.4 is poor) : 0.94
 K magnitude : 8.617
 G magnitude : 14.236
 RP magnitude : 12.893
 BP magnitude : 16.388
 DUPflag : 0
 Distance (au) : 4.517
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -8.35
 Sun-Target sep (deg) : 136.53
 Sun-Moon sep (deg) : 64.52
 B (ring opening deg) : -2.61
 PA of pole (deg) : 0.14
 Pole direction: RA (deg): 268.05695
 Dec (deg): 64.49651
 C/A sky separation (") : 8.592
 C/A sky separation (km) : 28144.5
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-05-05T13:47:16 K8.62 G14.24
 Pgt



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

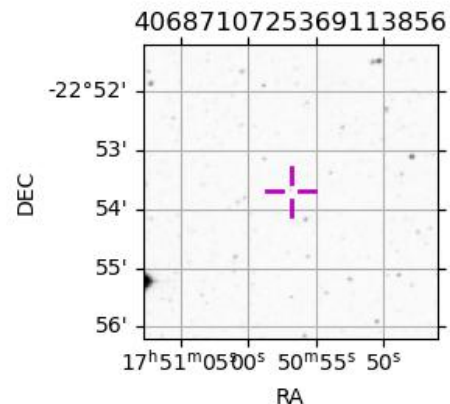


2031-05-05T13:47:16.8000 az: 17 50 56.9305 δ: -22 53 42.155 C/A 8.580° PA 180.22 deg v_sky - 8.35 km/s D 04.52 AU

Credit: Styled after SORA/Lucky Star

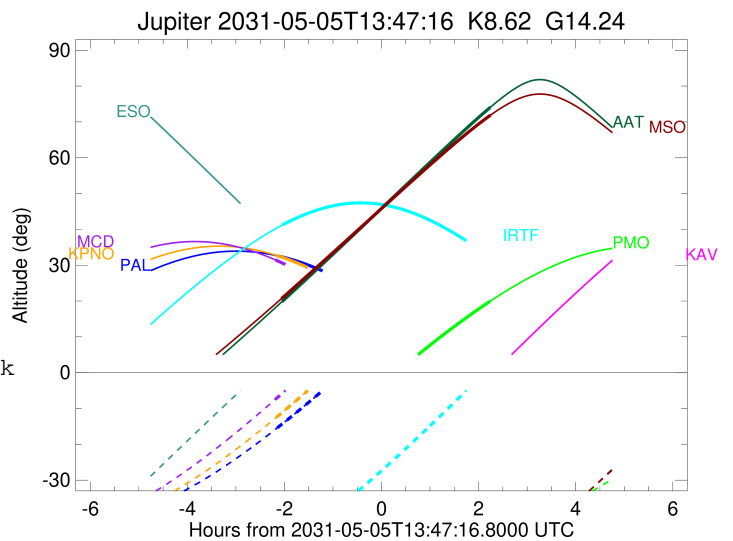
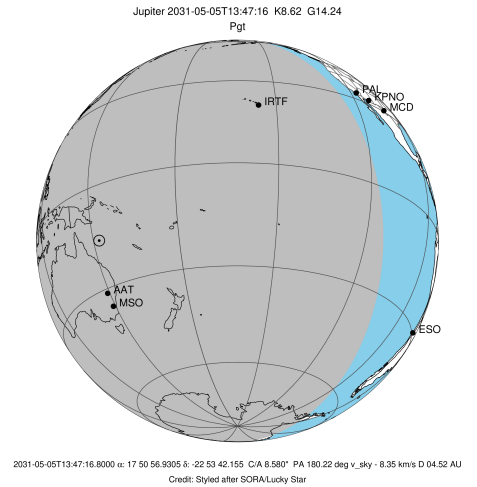
Observable events with sun below -5 deg and altitude above 5 deg

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 05 11:38 - MAY 05 11:38	Pin
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+	MAY 05 16:01 - MAY 05 16:01	Pne
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	MAY 05 11:37 - MAY 05 11:37	Pin
MCD	McDonald Obs. 2.7m	30.7	256.0	+	MAY 05 11:35 - MAY 05 11:35	Pin
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+	MAY 05 11:44 - MAY 05 11:44	Pin
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			Pnn
AAT	Siding Spring (AAT)	-31.3	149.1	+	MAY 05 11:44 - MAY 05 16:01	Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	MAY 05 11:43 - MAY 05 16:02	Pie



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-05T13:40:45.740
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      : 4068710725369113856
2Mass ID (if available) : 17505694-2253421
ICRS Star Coord at Epoch: 17h 50m 56.93046s -22:53:42.15507s
RUWE (>1.4 is poor) : 0.94
K magnitude         : 8.617
G magnitude         : 14.236
RP magnitude        : 12.893
BP magnitude        : 16.388
DUPflag            : 0
Distance (au)       : 4.517
f0 (km)            : 0.00
g0 (km)            : 0.00
skyplane vel. (km/s) : -8.35
Sun-Target sep (deg) : 136.53
Sun-Moon sep (deg)  : 65.07
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.14
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 10.034
C/A sky separation (km) : 32871.1
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
    
```

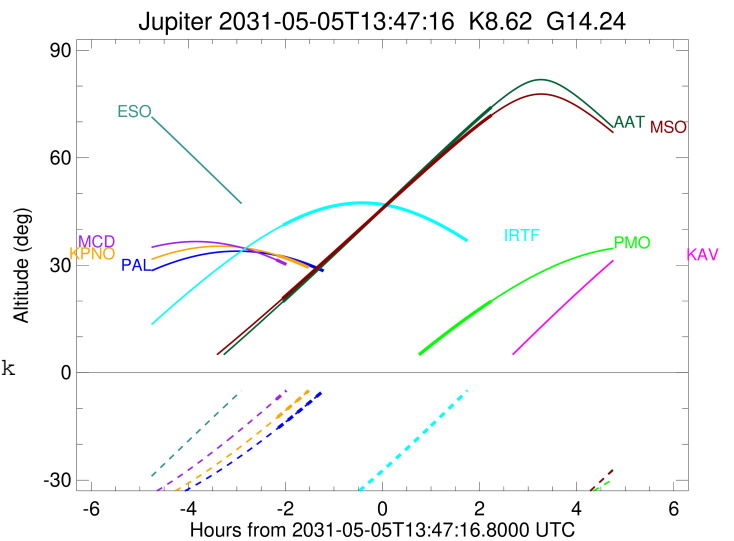
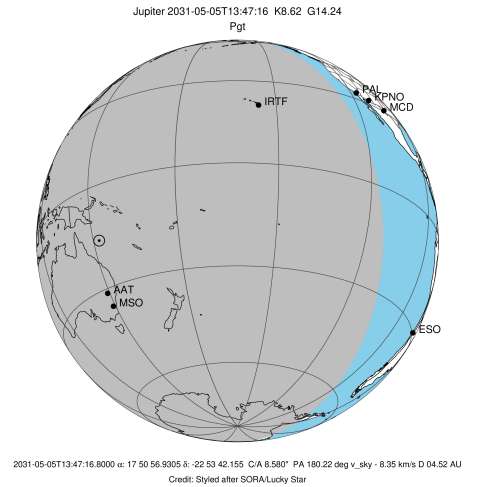


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-05T11:38:29.593	32.63	-15.40	71490.0	27.89	31.13
Jupiter	E	2031-05-05T15:44:32.670	-0.32x	33.82x	71490.2	26.41	29.54

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-05T13:56:41.000
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       : 4068710725369113856
2Mass ID (if available) : 17505694-2253421
ICRS Star Coord at Epoch: 17h 50m 56.93046s -22:53:42.15507s
RUWE (>1.4 is poor) : 0.94
K magnitude          : 8.617
G magnitude          : 14.236
RP magnitude         : 12.893
BP magnitude         : 16.388
DUPflag             : 0
Distance (au)        : 4.517
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -8.35
Sun-Target sep (deg) : 136.53
Sun-Moon sep (deg)  : 64.12
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.14
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 9.684
C/A sky separation (km) : 31723.1
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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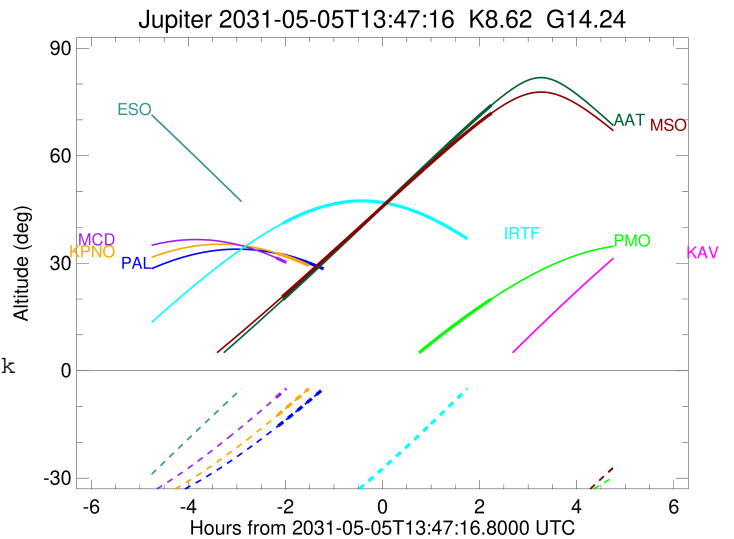
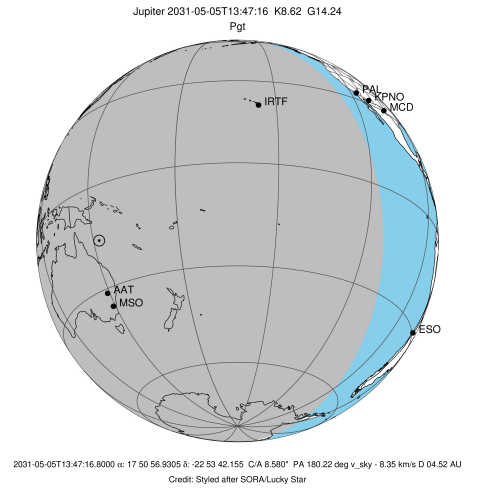


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-05T11:48:14.545	-27.55x	-12.60	71490.3	25.35	28.41
Jupiter	E	2031-05-05T16:01:39.415	19.95	-41.78	71490.1	27.12	30.31

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-05T13:40:03.580
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       : 4068710725369113856
2Mass ID (if available) : 17505694-2253421
ICRS Star Coord at Epoch: 17h 50m 56.93046s -22:53:42.15507s
RUWE (>1.4 is poor) : 0.94
K magnitude          : 8.617
G magnitude          : 14.236
RP magnitude         : 12.893
BP magnitude         : 16.388
DUPflag             : 0
Distance (au)        : 4.517
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -8.35
Sun-Target sep (deg) : 136.53
Sun-Moon sep (deg)  : 65.07
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.14
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (" ) : 9.964
C/A sky separation (km) : 32641.5
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
    
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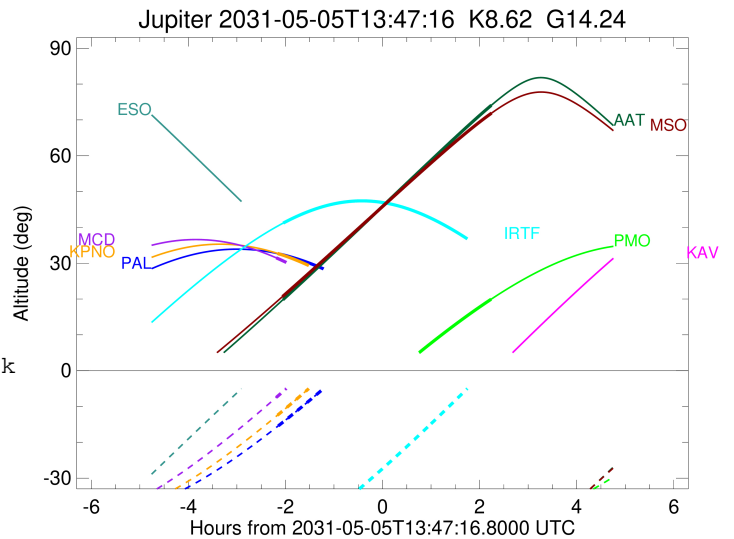
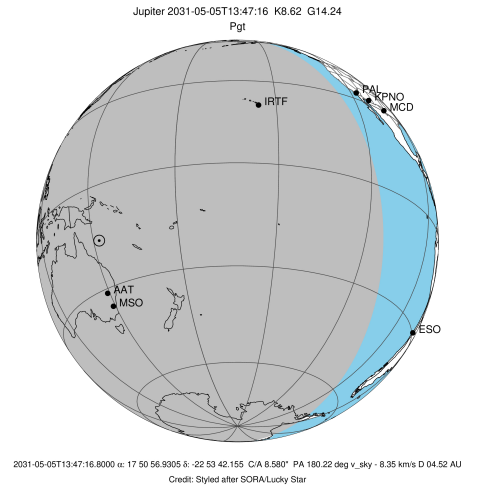


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-05T11:37:24.040	32.75	-12.45	71490.0	27.76	30.99
Jupiter	E	2031-05-05T15:44:27.411	-3.68x	38.30x	71490.2	26.14	29.25

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-05T13:39:11.020
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      : 4068710725369113856
2Mass ID (if available) : 17505694-2253421
ICRS Star Coord at Epoch: 17h 50m 56.93046s -22:53:42.15507s
RUWE (>1.4 is poor) : 0.94
K magnitude          : 8.617
G magnitude          : 14.236
RP magnitude         : 12.893
BP magnitude         : 16.388
DUPflag             : 0
Distance (au)       : 4.517
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -8.35
Sun-Target sep (deg) : 136.53
Sun-Moon sep (deg)  : 65.03
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.14
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation ("): 9.870
C/A sky separation (km): 32332.4
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
    
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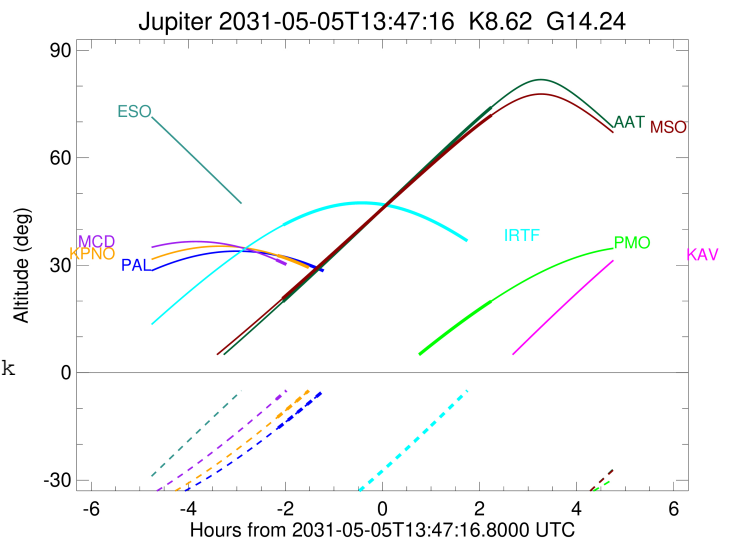
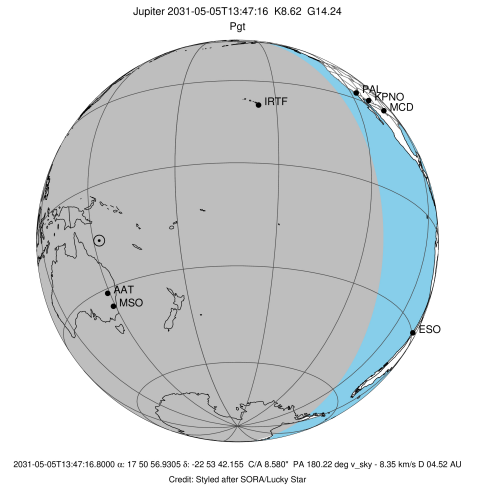


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-05T11:35:52.599	31.50	-7.49	71490.0	27.60	30.82
Jupiter	E	2031-05-05T15:44:31.414	-9.16x	44.90x	71490.2	25.79	28.88

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-05T13:46:08.600
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       : 4068710725369113856
2Mass ID (if available) : 17505694-2253421
ICRS Star Coord at Epoch: 17h 50m 56.93046s -22:53:42.15507s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 8.617
G magnitude           : 14.236
RP magnitude          : 12.893
BP magnitude          : 16.388
DUPflag              : 0
Distance (au)        : 4.517
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -8.35
Sun-Target sep (deg) : 136.53
Sun-Moon sep (deg)   : 65.23
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.14
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 9.906
C/A sky separation (km) : 32450.4
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
    
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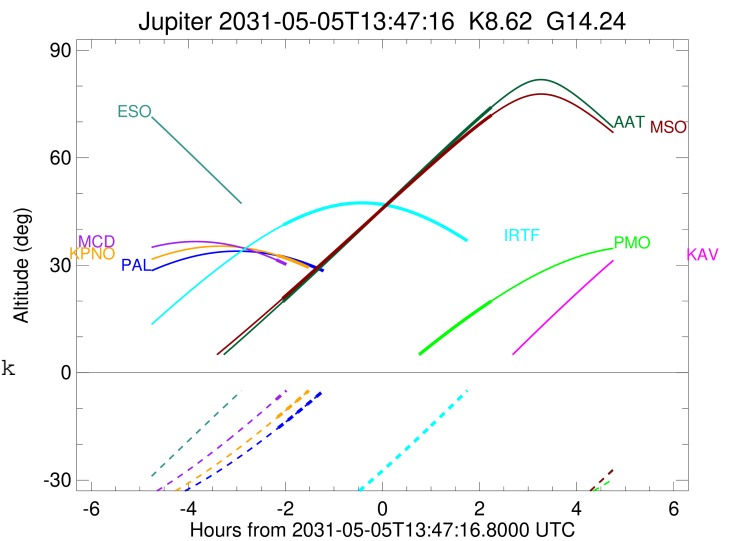
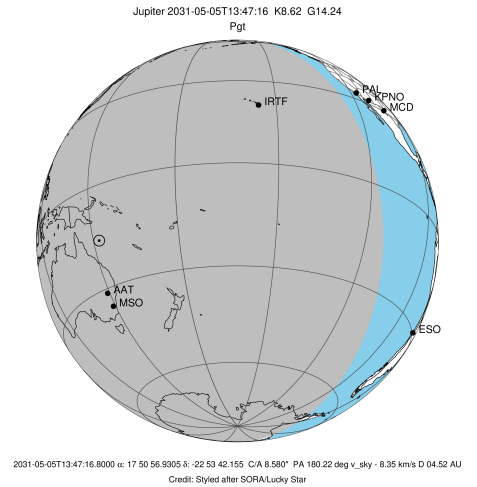


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-05T11:44:38.272	41.20	-48.27	71490.1	26.87	30.04
Jupiter	E	2031-05-05T15:47:33.968	34.44	-1.56x	71490.2	26.48	29.62

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-05T13:54:34.720
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       : 4068710725369113856
2Mass ID (if available) : 17505694-2253421
ICRS Star Coord at Epoch: 17h 50m 56.93046s -22:53:42.15507s
RUWE (>1.4 is poor) : 0.94
K magnitude          : 8.617
G magnitude          : 14.236
RP magnitude         : 12.893
BP magnitude         : 16.388
DUPflag             : 0
Distance (au)        : 4.517
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -8.35
Sun-Target sep (deg) : 136.53
Sun-Moon sep (deg)   : 64.88
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.14
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 8.106
C/A sky separation (km) : 26552.9
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
    
```

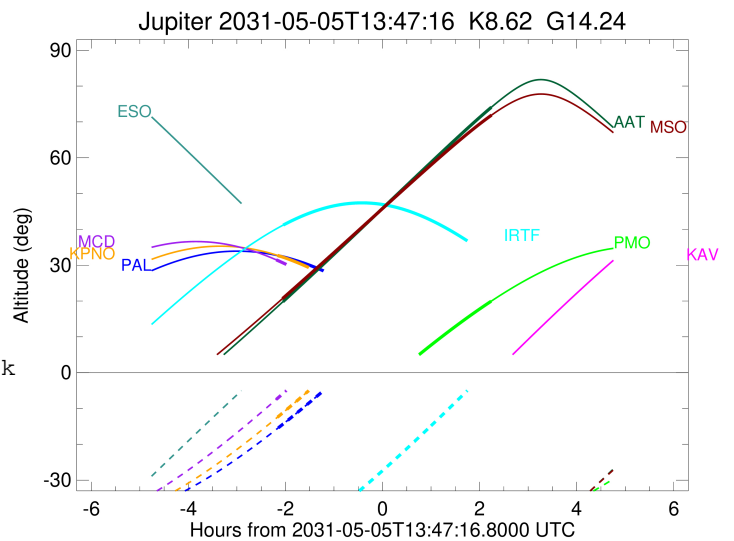
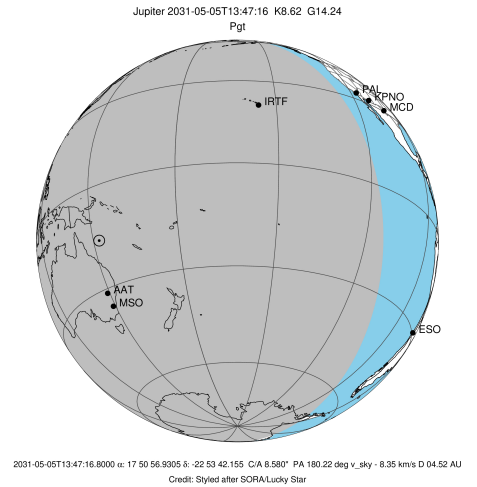


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-05T11:44:25.807	19.85	-55.70	71490.8	20.94	23.61
Jupiter	E	2031-05-05T16:01:55.849	74.10	-58.67	71490.7	22.22	25.01


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-05T13:54:16.390
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        : 4068710725369113856
2Mass ID (if available) : 17505694-2253421
ICRS Star Coord at Epoch: 17h 50m 56.93046s -22:53:42.15507s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 8.617
G magnitude           : 14.236
RP magnitude          : 12.893
BP magnitude          : 16.388
DUPflag              : 0
Distance (au)         : 4.517
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -8.35
Sun-Target sep (deg) : 136.53
Sun-Moon sep (deg)   : 64.89
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.14
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation ("): 7.980
C/A sky separation (km): 26139.2
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	2031-05-05T11:43:40.235	20.68	-54.11	71490.8	20.62	23.26
Jupiter	E	2031-05-05T16:02:09.307	71.90	-57.03	71490.7	21.84	24.59