

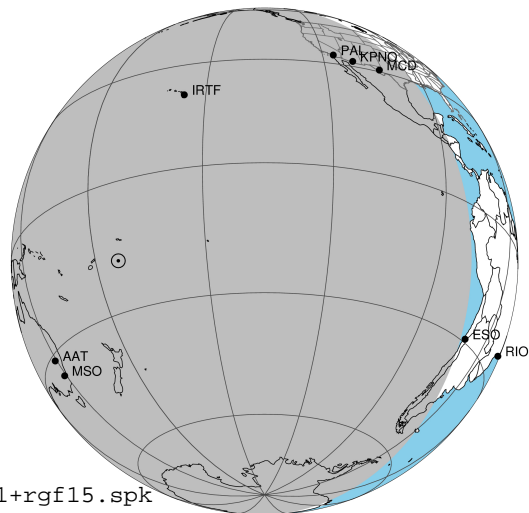
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2031-05-13T11:29:20.040  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4068892346529274624  
 2Mass ID (if available) : 17482887-2253291

Jupiter 2031-05-13T11:29:20 K9.50 G14.97 Pgt

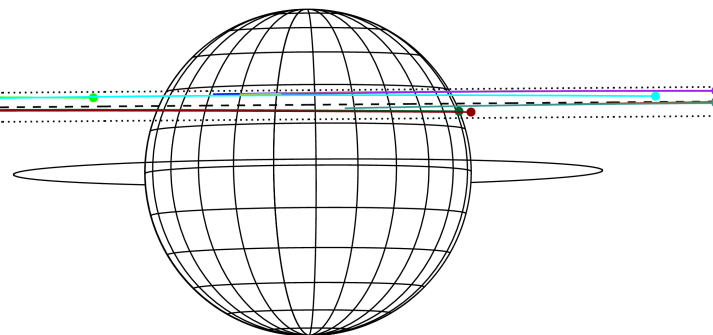
ICRS Star Coord at Epoch: 17h 48m 28.86020s -22:53:29.19860s

RUWE (>1.4 is poor) : 7.74  
 K magnitude : 9.501  
 G magnitude : 14.974  
 RP magnitude : 13.530  
 BP magnitude : 16.985  
 DUPflag : 0  
 Distance (au) : 4.434  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -11.03  
 Sun-Target sep (deg) : 144.74  
 Sun-Moon sep (deg) : 50.74  
 B (ring opening deg) : -2.61  
 PA of pole (deg) : 0.40  
 Pole direction: RA (deg): 268.05695  
 Dec (deg): 64.49651  
 C/A sky separation (") : 9.223  
 C/A sky separation (km) : 29663.1  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2031-05-13T11:29:20 K9.50 G14.97  
 Pgt



Earth  
 PAL  
 PMO  
 KPNO  
 MCD  
 IRTF  
 KAV  
 RIO  
 ESO  
 AAT  
 MSO

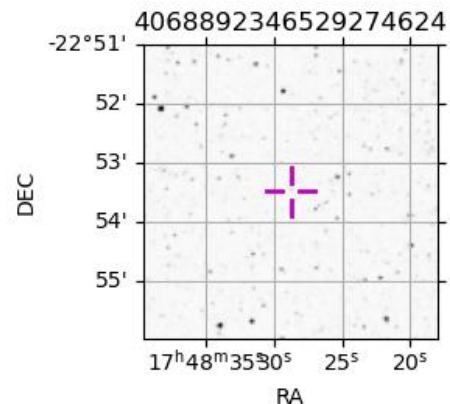


2031-05-13T11:29:20.0400 at: 17 48 28.86020 s: -22 53 29.199 C/A 9.212" PA 180.47 deg v\_sky -11.03 km/s D 04.43 AU

Credit: Styled after SORA/Lucky Star

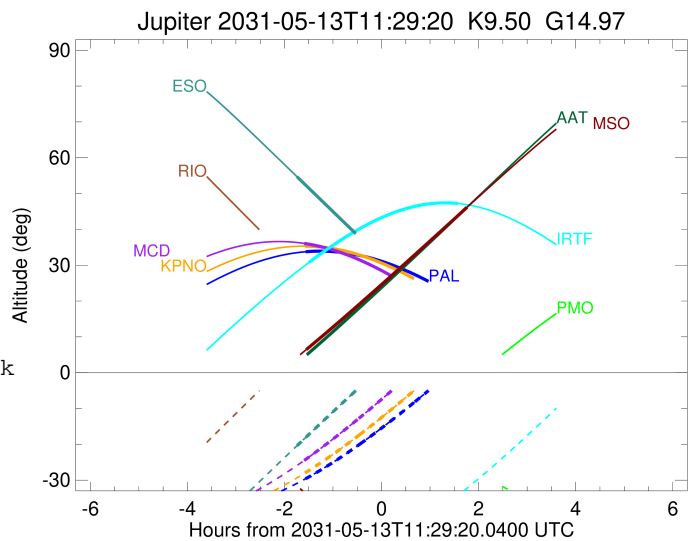
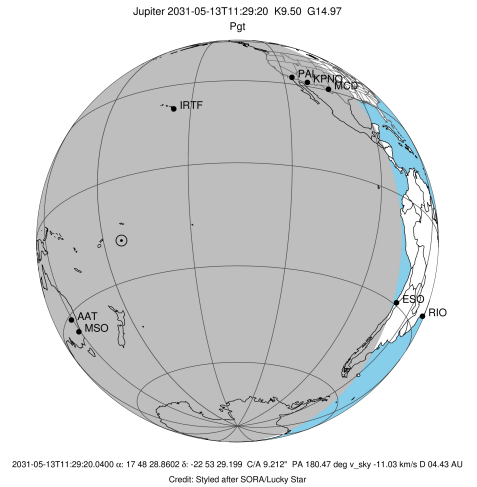
Observable events with sun below -5 deg and altitude above 5 deg

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 13 09:55 - MAY 13 09:55	Pin
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	MAY 13 09:54 - MAY 13 09:54	Pin
MCD	McDonald Obs. 2.7m	30.7	256.0	+	MAY 13 09:53 - MAY 13 09:53	Pin
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	MAY 13 09:59 - MAY 13 13:03	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	+	MAY 13 09:44 - MAY 13 09:44	Pin
AAT	Siding Spring (AAT)	-31.3	149.1	+	MAY 13 13:14 - MAY 13 13:14	Pne
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	MAY 13 09:56 - MAY 13 13:14	Pie



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-13T11:27:02.840
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       : 4068892346529274624
2Mass ID (if available) : 17482887-2253291
ICRS Star Coord at Epoch: 17h 48m 28.86020s -22:53:29.19860s
RUWE (>1.4 is poor) : 7.74
K magnitude           : 9.501
G magnitude           : 14.974
RP magnitude          : 13.530
BP magnitude          : 16.985
DUPflag              : 0
Distance (au)         : 4.434
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -11.03
Sun-Target sep (deg)  : 144.74
Sun-Moon sep (deg)   : 50.93
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.40
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (" ) : 10.838
C/A sky separation (km) : 34854.7
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
    
```

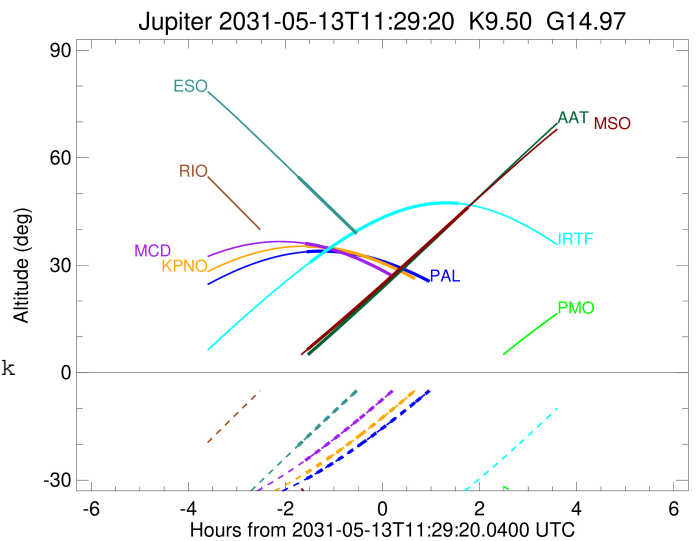
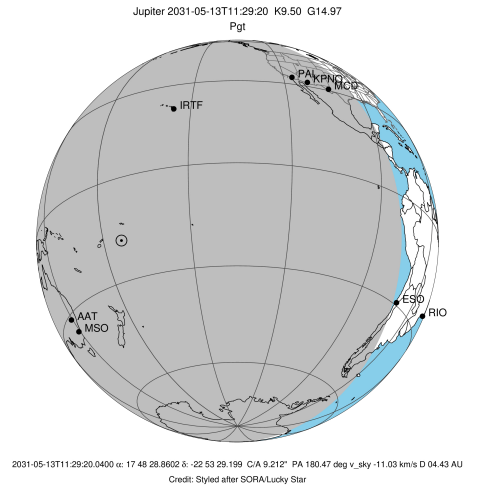


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-13T09:55:40.081	33.75	-29.59	71489.8	29.29	32.62
Jupiter	E	2031-05-13T12:58:39.288	21.48	1.00x	71489.9	28.71	32.01

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch             : 2031-05-13T11:26:23.250
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       : 4068892346529274624
2Mass ID (if available) : 17482887-2253291
ICRS Star Coord at Epoch: 17h 48m 28.86020s -22:53:29.19860s
RUWE (>1.4 is poor) : 7.74
K magnitude           : 9.501
G magnitude           : 14.974
RP magnitude          : 13.530
BP magnitude          : 16.985
DUPflag              : 0
Distance (au)        : 4.434
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -11.03
Sun-Target sep (deg) : 144.74
Sun-Moon sep (deg)   : 50.87
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.40
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 10.790
C/A sky separation (km) : 34701.7
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
    
```

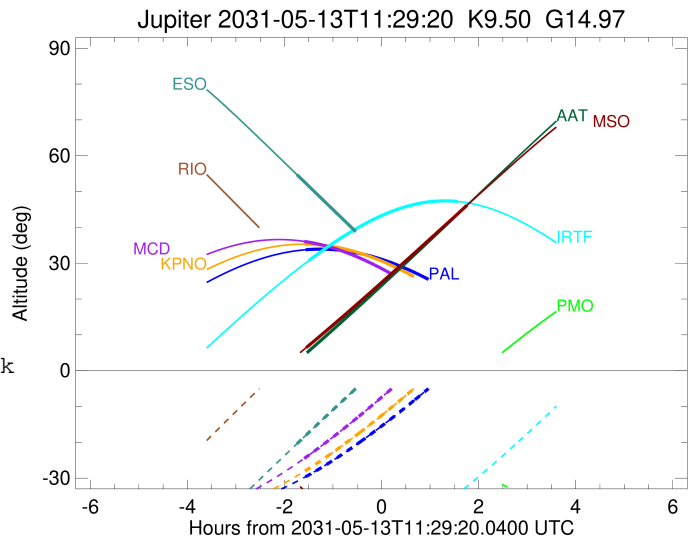
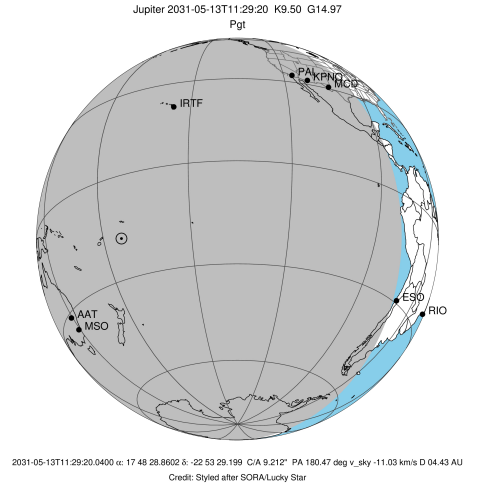


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-13T09:54:53.182	35.31	-27.98	71489.8	29.22	32.54
Jupiter	E	2031-05-13T12:58:13.515	19.53	4.60x	71489.9	28.51	31.79

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-13T11:25:28.700
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       : 4068892346529274624
2Mass ID (if available) : 17482887-2253291
ICRS Star Coord at Epoch: 17h 48m 28.86020s -22:53:29.19860s
RUWE (>1.4 is poor) : 7.74
K magnitude           : 9.501
G magnitude           : 14.974
RP magnitude         : 13.530
BP magnitude         : 16.985
DUPflag              : 0
Distance (au)        : 4.434
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -11.03
Sun-Target sep (deg) : 144.74
Sun-Moon sep (deg)   : 50.78
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.40
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation ("): 10.725
C/A sky separation (km): 34494.1
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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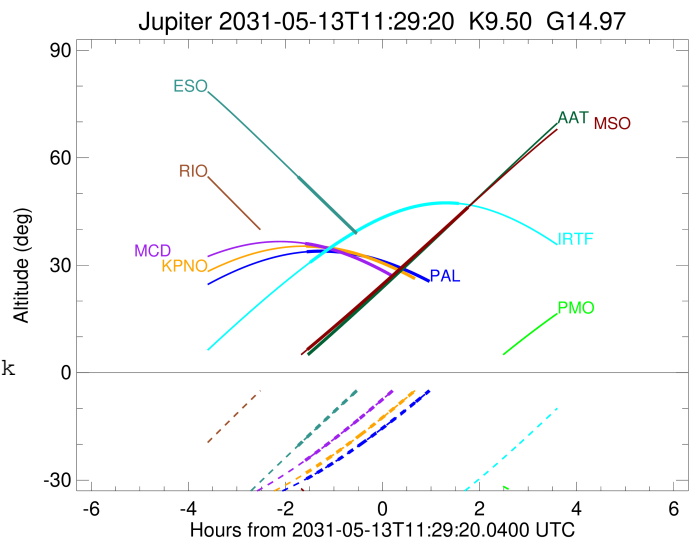
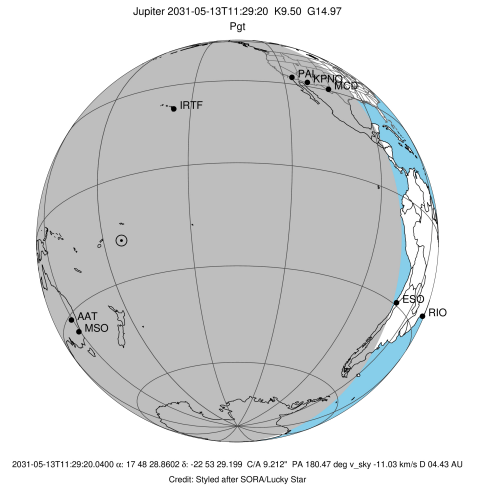


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-13T09:53:44.712	36.08	-24.51	71489.8	29.13	32.45
Jupiter	E	2031-05-13T12:57:42.039	15.66	10.31x	71489.9	28.23	31.49

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-13T11:32:03.910
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       : 4068892346529274624
2Mass ID (if available) : 17482887-2253291
ICRS Star Coord at Epoch: 17h 48m 28.86020s -22:53:29.19860s
RUWE (>1.4 is poor) : 7.74
K magnitude          : 9.501
G magnitude          : 14.974
RP magnitude         : 13.530
BP magnitude         : 16.985
DUPflag             : 0
Distance (au)        : 4.434
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -11.03
Sun-Target sep (deg) : 144.74
Sun-Moon sep (deg)  : 51.43
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.40
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation ("): 10.524
C/A sky separation (km): 33845.1
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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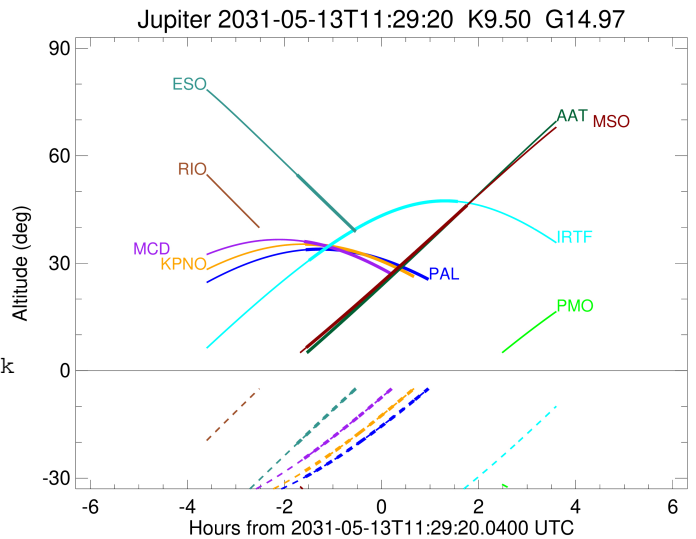
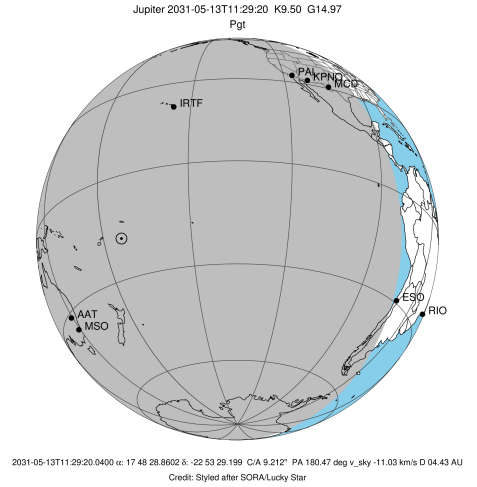


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-13T09:59:48.530	30.78	-51.64	71490.0	27.85	31.08
Jupiter	E	2031-05-13T13:03:43.667	47.22	-34.32	71489.9	28.28	31.55

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-13T11:22:19.490
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      : 4068892346529274624
2Mass ID (if available) : 17482887-2253291
ICRS Star Coord at Epoch: 17h 48m 28.86020s -22:53:29.19860s
RUWE (>1.4 is poor) : 7.74
K magnitude          : 9.501
G magnitude          : 14.974
RP magnitude         : 13.530
BP magnitude         : 16.985
DUPflag             : 0
Distance (au)        : 4.434
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -11.03
Sun-Target sep (deg) : 144.74
Sun-Moon sep (deg)  : 50.67
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.40
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation ("): 8.646
C/A sky separation (km): 27807.8
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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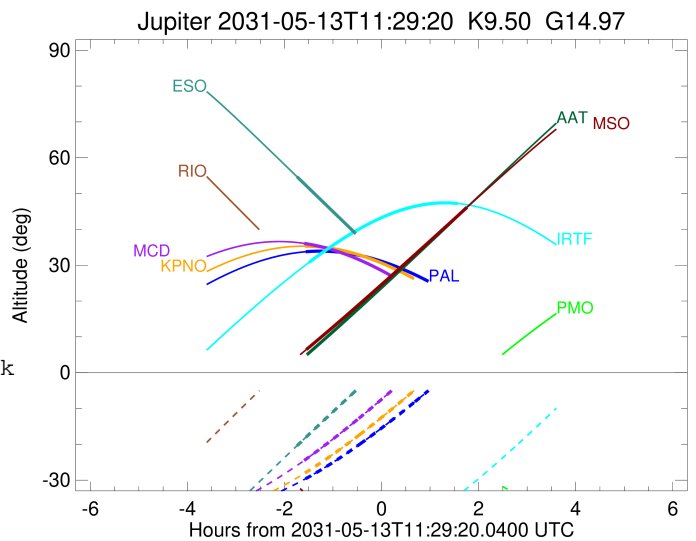
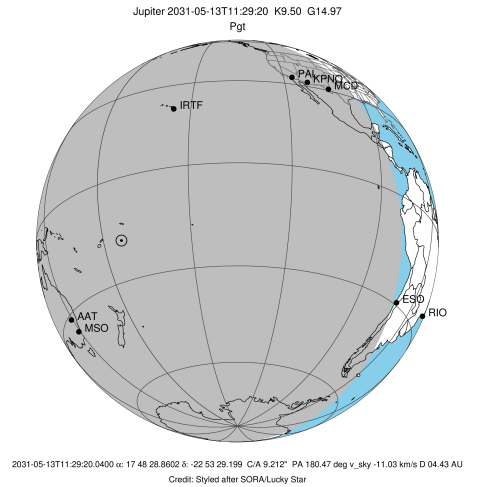


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-13T09:44:51.280	54.70	-20.40	71490.5	23.54	26.45
Jupiter	E	2031-05-13T13:00:55.910	12.54	19.07x	71490.7	22.02	24.79

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-13T11:36:40.040
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       : 4068892346529274624
2Mass ID (if available) : 17482887-2253291
ICRS Star Coord at Epoch: 17h 48m 28.86020s -22:53:29.19860s
RUWE (>1.4 is poor) : 7.74
K magnitude           : 9.501
G magnitude           : 14.974
RP magnitude          : 13.530
BP magnitude          : 16.985
DUPflag              : 0
Distance (au)        : 4.434
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -11.03
Sun-Target sep (deg) : 144.74
Sun-Moon sep (deg)   : 51.58
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.40
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation ("): 8.463
C/A sky separation (km): 27216.4
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
    
```

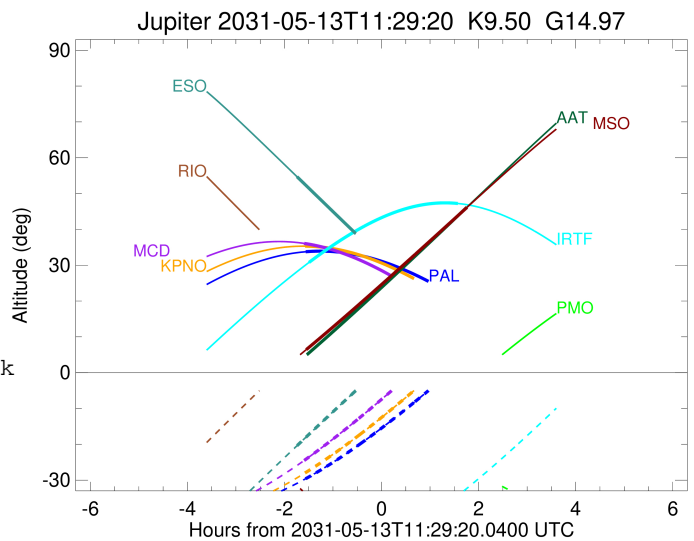
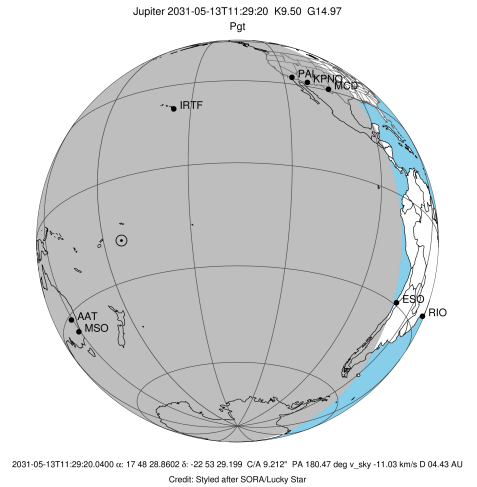


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-13T09:56:54.736	4.97x	-34.01	71490.7	21.62	24.35
Jupiter	E	2031-05-13T13:14:50.127	46.18	-73.70	71490.6	22.98	25.83

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-13T11:36:20.680
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        : 4068892346529274624
2Mass ID (if available) : 17482887-2253291
ICRS Star Coord at Epoch: 17h 48m 28.86020s -22:53:29.19860s
RUWE (>1.4 is poor) : 7.74
K magnitude           : 9.501
G magnitude           : 14.974
RP magnitude          : 13.530
BP magnitude          : 16.985
DUPflag              : 0
Distance (au)         : 4.434
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -11.03
Sun-Target sep (deg)  : 144.74
Sun-Moon sep (deg)    : 51.57
B (ring opening deg) : -2.61
PA of pole (deg)      : 0.40
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (" ) : 8.346
C/A sky separation (km) : 26840.0
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	2031-05-13T09:56:20.165	6.44	-33.90	71490.8	21.33	24.04
Jupiter	E	2031-05-13T13:14:49.155	46.09	-70.47	71490.6	22.62	25.45