

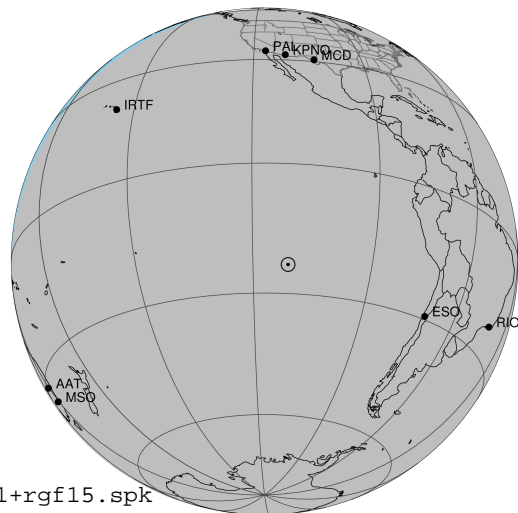
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-06-20T07:26:48.400
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4117504023333247744
 2Mass ID (if available) : 17294605-2248159

Jupiter 2031-06-20T07:26:48 K7.95 G12.10 Pgt

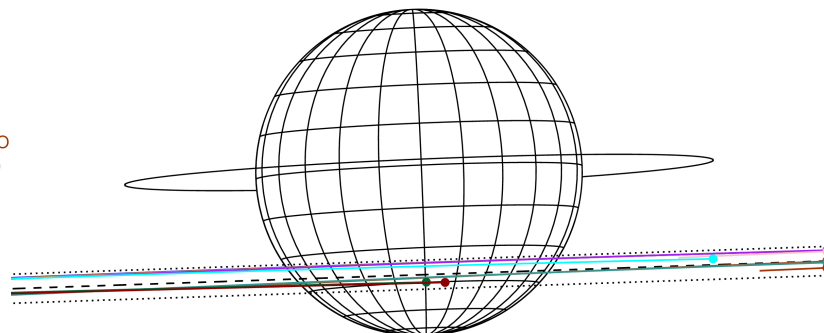
ICRS Star Coord at Epoch: 17h 29m 46.05082s -22:48:16.38189s

RUWE (>1.4 is poor) : 0.94
 K magnitude : 7.947
 G magnitude : 12.099
 RP magnitude : 10.990
 BP magnitude : 13.389
 DUPflag : 0
 Distance (au) : 4.266
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -16.36
 Sun-Target sep (deg) : 174.64
 Sun-Moon sep (deg) : 170.23
 B (ring opening deg) : -2.59
 PA of pole (deg) : 2.42
 Pole direction: RA (deg): 268.05691
 Dec (deg): 64.49651
 C/A sky separation (") : 14.482
 C/A sky separation (km) : 44810.2
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-06-20T07:26:48 K7.95 G12.10 Pgt



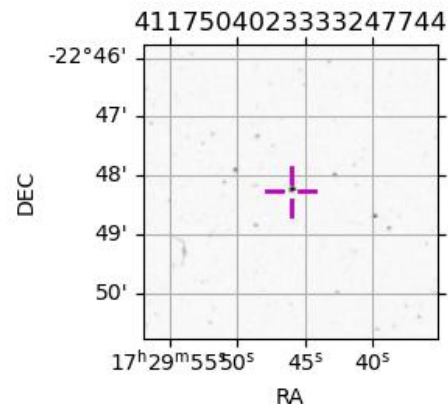
Earth
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 AAT
 SAAO
 MSO



2031-06-20T07:26:48.4000 α: 17 29 46.0508 δ: -22 48 16.382 C/A ***** PA 1.95 deg v_sky -16.36 km/s D 04.27 AU
 Credit: Styled after SORA/Lucky Star

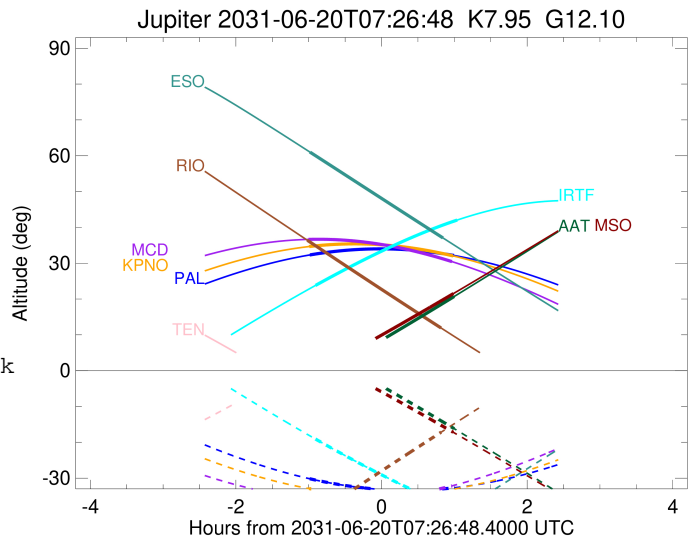
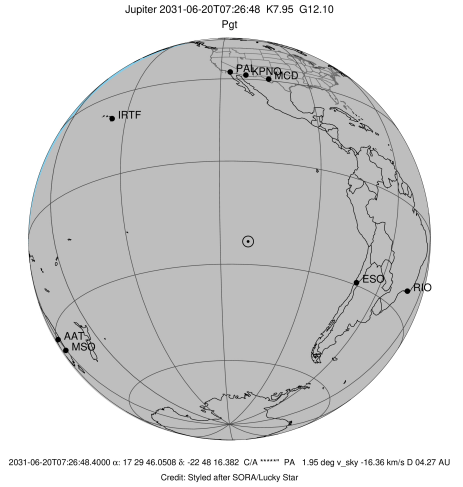
Observable events with sun below -5 deg and altitude above 5 deg

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 20 06:27 - JUN 20 08:26	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JUN 20 06:27 - JUN 20 08:25	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JUN 20 06:26 - JUN 20 08:24	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	JUN 20 06:32 - JUN 20 08:29	Pie
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+ +	JUN 20 06:25 - JUN 20 08:15	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUN 20 06:27 - JUN 20 08:17	Pie
AAT	Siding Spring (AAT)	-31.3	149.1	+ +	JUN 20 08:26 - JUN 20 08:26	Pne
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	JUN 20 08:25 - JUN 20 08:25	Pne



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-06-20T07:26:58.330
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       : 411750402333247744
2Mass ID (if available) : 17294605-2248159
ICRS Star Coord at Epoch: 17h 29m 46.05082s -22:48:16.38189s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 7.947
G magnitude           : 12.099
RP magnitude          : 10.990
BP magnitude          : 13.389
DUPflag              : 0
Distance (au)         : 4.266
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.36
Sun-Target sep (deg)  : 174.64
Sun-Moon sep (deg)   : 170.13
B (ring opening deg) : -2.59
PA of pole (deg)     : 2.42
Pole direction: RA (deg): 268.05691
Dec (deg): 64.49651
C/A sky separation (") : 12.775
C/A sky separation (km) : 39527.8
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
    
```

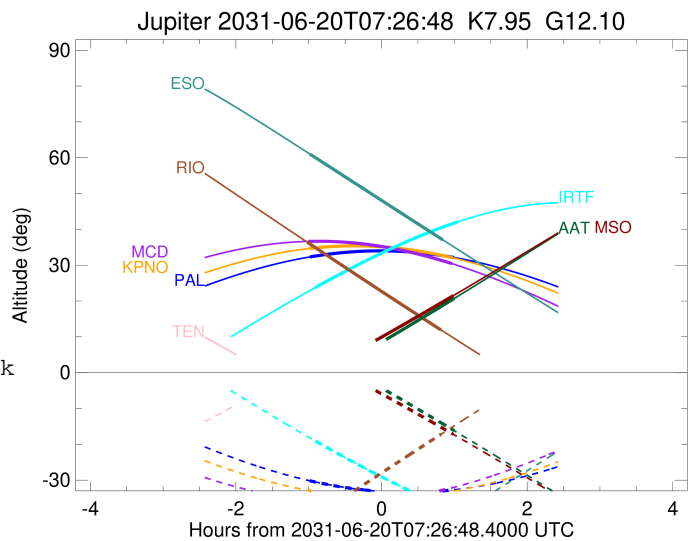
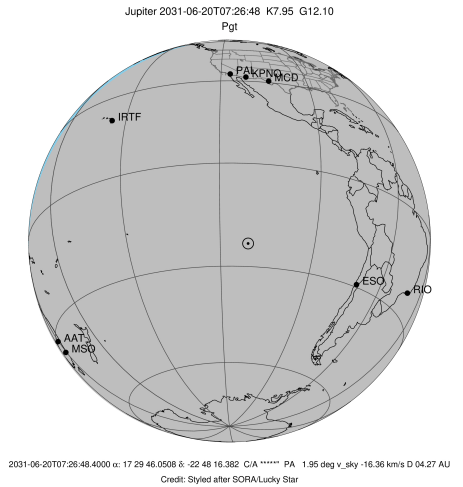


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-20T06:27:43.883	32.30	-30.17	71489.1	-34.10	-37.66
Jupiter	E	2031-06-20T08:26:13.009	32.17	-32.70	71489.3	-33.09	-36.62

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-06-20T07:26:26.570
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       : 4117504023333247744
2Mass ID (if available) : 17294605-2248159
ICRS Star Coord at Epoch: 17h 29m 46.05082s -22:48:16.38189s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 7.947
G magnitude           : 12.099
RP magnitude         : 10.990
BP magnitude         : 13.389
DUPflag              : 0
Distance (au)        : 4.266
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.36
Sun-Target sep (deg) : 174.64
Sun-Moon sep (deg)   : 170.07
B (ring opening deg) : -2.59
PA of pole (deg)     : 2.42
Pole direction: RA (deg): 268.05691
Dec (deg): 64.49651
C/A sky separation ("): 12.801
C/A sky separation (km): 39609.4
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
    
```

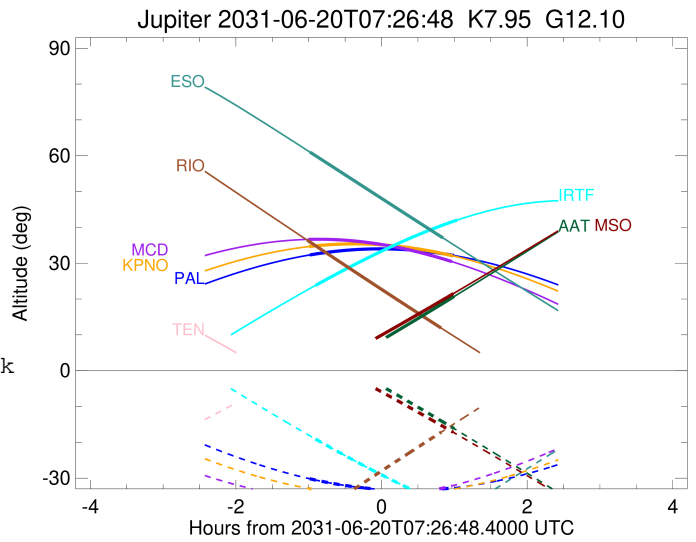
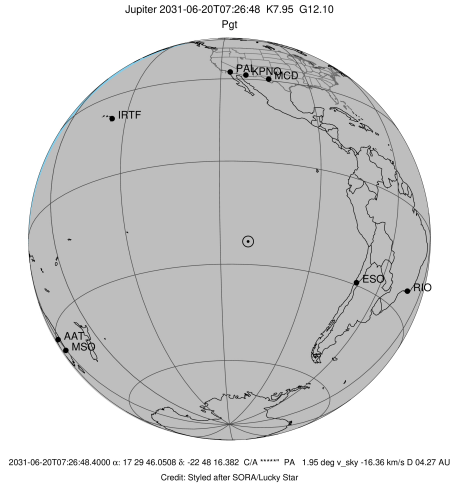


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-20T06:27:17.394	34.65	-32.91	71489.1	-34.13	-37.70
Jupiter	E	2031-06-20T08:25:37.928	32.05	-33.09	71489.2	-33.22	-36.75

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-06-20T07:25:40.320
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      : 4117504023333247744
2Mass ID (if available) : 17294605-2248159
ICRS Star Coord at Epoch: 17h 29m 46.05082s -22:48:16.38189s
RUWE (>1.4 is poor) : 0.94
K magnitude          : 7.947
G magnitude          : 12.099
RP magnitude         : 10.990
BP magnitude         : 13.389
DUPflag             : 0
Distance (au)       : 4.266
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.36
Sun-Target sep (deg) : 174.64
Sun-Moon sep (deg)  : 169.98
B (ring opening deg) : -2.59
PA of pole (deg)    : 2.42
Pole direction: RA (deg): 268.05691
Dec (deg): 64.49651
C/A sky separation (") : 12.836
C/A sky separation (km) : 39715.2
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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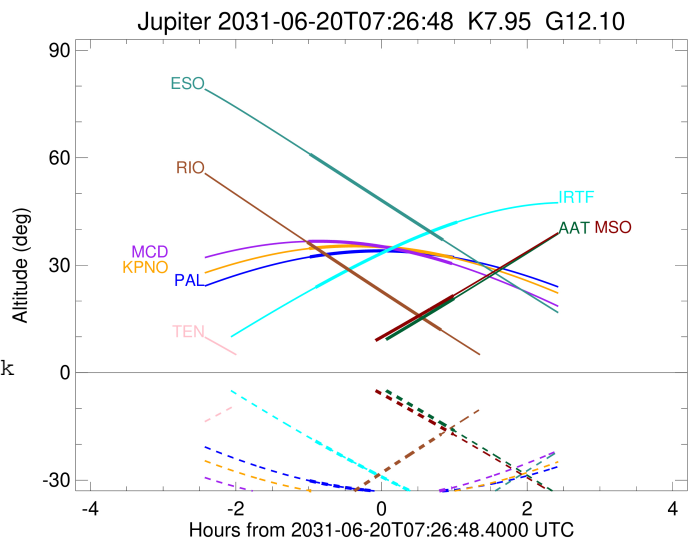
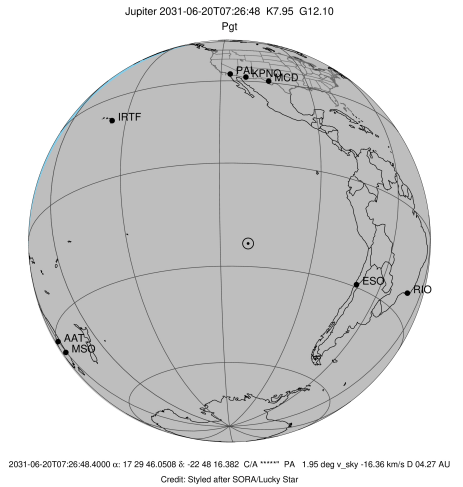


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-20T06:26:36.355	36.64	-35.56	71489.1	-34.17	-37.74
Jupiter	E	2031-06-20T08:24:49.312	30.44	-32.16	71489.2	-33.39	-36.93

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-06-20T07:30:55.250
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      : 411750402333247744
2Mass ID (if available) : 17294605-2248159
ICRS Star Coord at Epoch: 17h 29m 46.05082s -22:48:16.38189s
RUWE (>1.4 is poor) : 0.94
K magnitude          : 7.947
G magnitude          : 12.099
RP magnitude         : 10.990
BP magnitude         : 13.389
DUPflag             : 0
Distance (au)        : 4.266
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.36
Sun-Target sep (deg) : 174.64
Sun-Moon sep (deg)  : 170.68
B (ring opening deg) : -2.59
PA of pole (deg)    : 2.42
Pole direction: RA (deg): 268.05691
Dec (deg): 64.49651
C/A sky separation ("): 13.280
C/A sky separation (km): 41089.7
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
    
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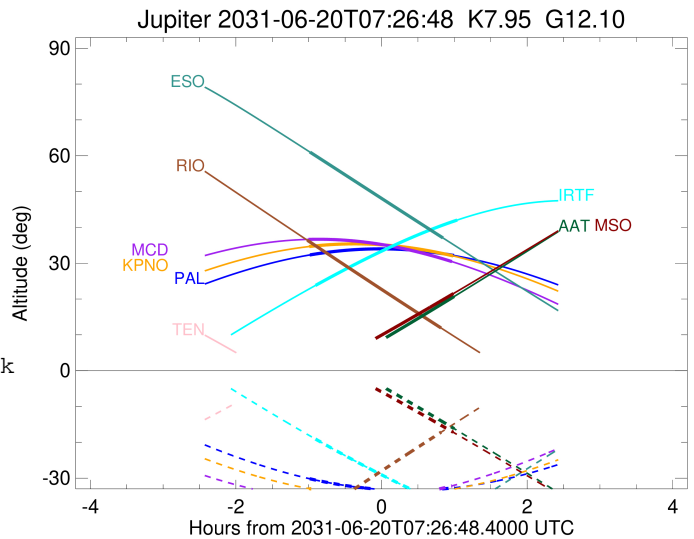
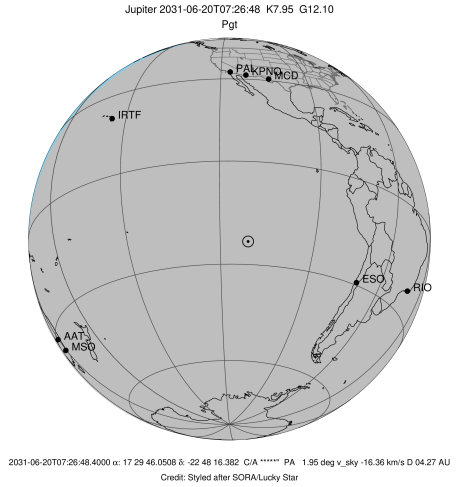


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-20T06:32:27.902	23.80	-19.09	71488.8	-35.95	-39.58
Jupiter	E	2031-06-20T08:29:08.357	42.03	-38.65	71489.1	-34.25	-37.82

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-06-20T07:20:36.790
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        : 4117504023333247744
2Mass ID (if available) : 17294605-2248159
ICRS Star Coord at Epoch: 17h 29m 46.05082s -22:48:16.38189s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 7.947
G magnitude           : 12.099
RP magnitude          : 10.990
BP magnitude          : 13.389
DUPflag              : 0
Distance (au)         : 4.266
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.36
Sun-Target sep (deg)  : 174.64
Sun-Moon sep (deg)   : 169.57
B (ring opening deg) : -2.59
PA of pole (deg)     : 2.42
Pole direction: RA (deg): 268.05691
Dec (deg): 64.49651
C/A sky separation (") : 14.938
C/A sky separation (km) : 46220.2
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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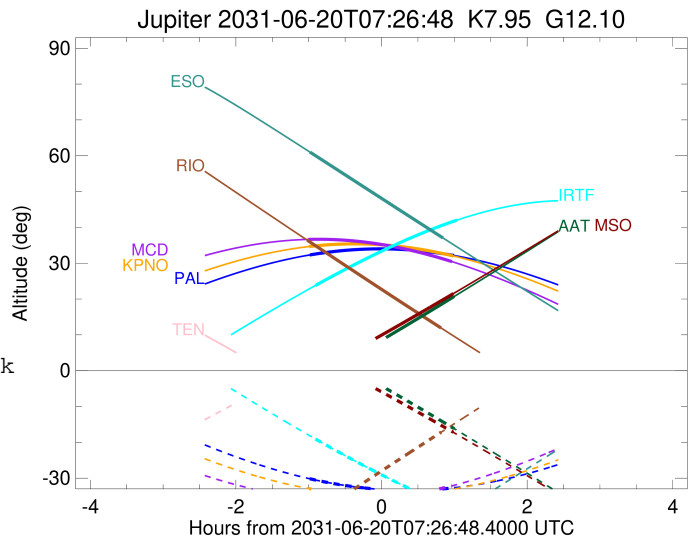
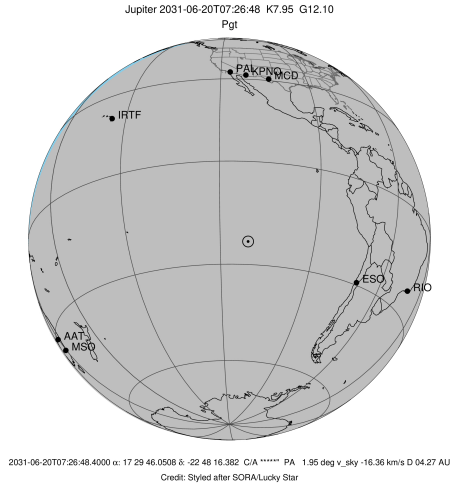


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-20T06:25:42.034	36.40	-41.69	71488.2	-40.20	-43.90
Jupiter	E	2031-06-20T08:15:51.898	11.92	-17.19	71488.1	-40.33	-44.04

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-06-20T07:22:26.640
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      : 411750402333247744
2Mass ID (if available) : 17294605-2248159
ICRS Star Coord at Epoch: 17h 29m 46.05082s -22:48:16.38189s
RUWE (>1.4 is poor) : 0.94
K magnitude          : 7.947
G magnitude          : 12.099
RP magnitude         : 10.990
BP magnitude         : 13.389
DUPflag             : 0
Distance (au)       : 4.266
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.36
Sun-Target sep (deg) : 174.64
Sun-Moon sep (deg)  : 169.84
B (ring opening deg) : -2.59
PA of pole (deg)    : 2.42
Pole direction: RA (deg): 268.05691
Dec (deg): 64.49651
C/A sky separation ("): 14.875
C/A sky separation (km): 46025.8
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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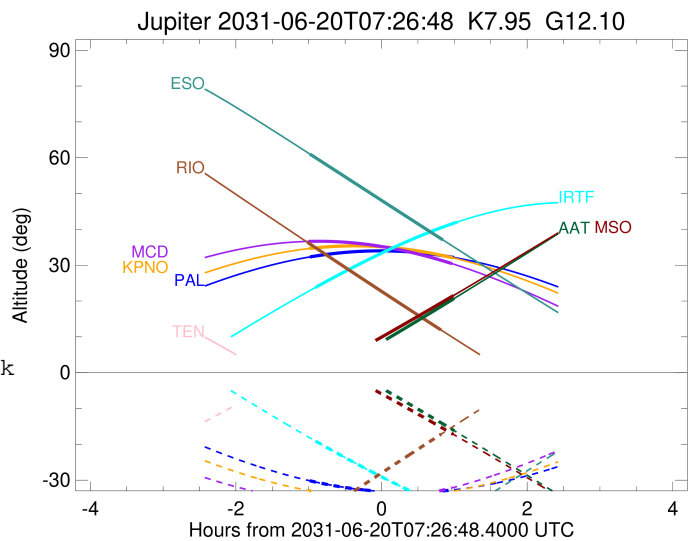
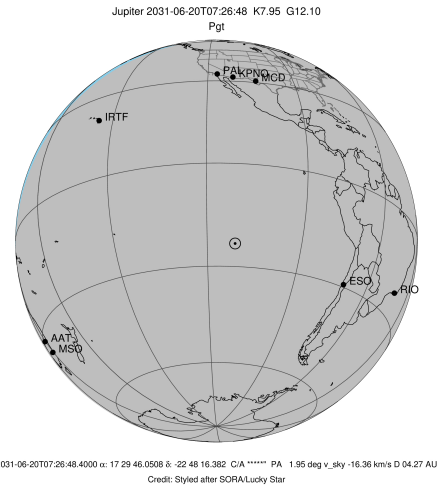


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-20T06:27:50.174	61.01	-66.19	71488.2	-40.19	-43.90
Jupiter	E	2031-06-20T08:17:17.108	37.08	-42.35	71488.2	-39.96	-43.67

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-06-20T07:32:43.320
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       : 411750402333247744
2Mass ID (if available) : 17294605-2248159
ICRS Star Coord at Epoch: 17h 29m 46.05082s -22:48:16.38189s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 7.947
G magnitude           : 12.099
RP magnitude         : 10.990
BP magnitude         : 13.389
DUPflag              : 0
Distance (au)        : 4.266
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.36
Sun-Target sep (deg) : 174.64
Sun-Moon sep (deg)   : 171.08
B (ring opening deg) : -2.59
PA of pole (deg)     : 2.42
Pole direction: RA (deg): 268.05691
Dec (deg): 64.49651
C/A sky separation ("): 15.545
C/A sky separation (km): 48099.9
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
    
```

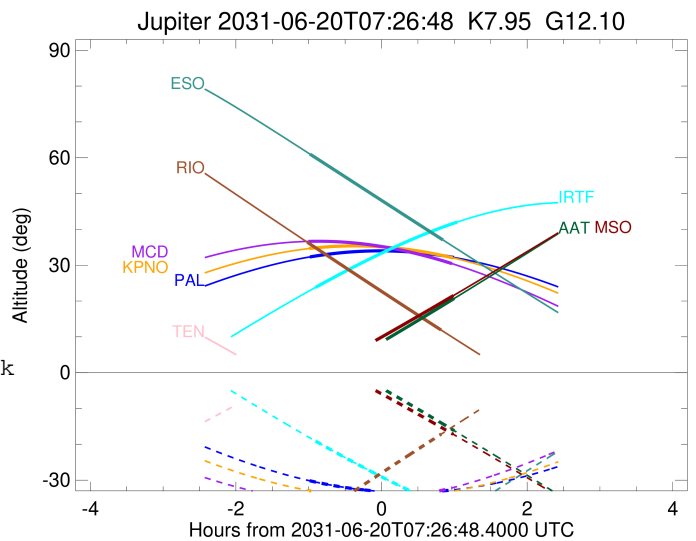
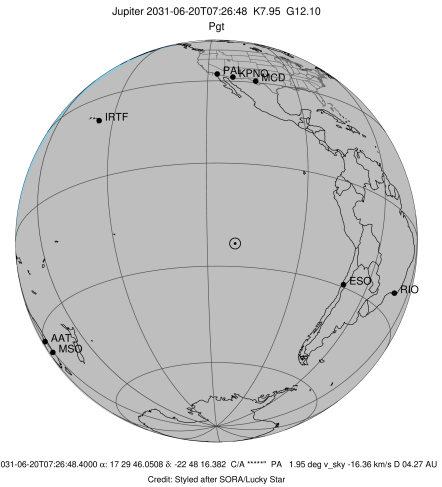


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-20T06:38:37.097	-0.92x	4.85x	71487.7	-43.23	-46.94
Jupiter	E	2031-06-20T08:26:30.894	20.67	-16.15	71488.0	-41.23	-44.95


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-06-20T07:32:26.520
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        : 4117504023333247744
2Mass ID (if available) : 17294605-2248159
ICRS Star Coord at Epoch: 17h 29m 46.05082s -22:48:16.38189s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 7.947
G magnitude           : 12.099
RP magnitude          : 10.990
BP magnitude          : 13.389
DUPflag              : 0
Distance (au)         : 4.266
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.36
Sun-Target sep (deg) : 174.64
Sun-Moon sep (deg)   : 171.06
B (ring opening deg) : -2.59
PA of pole (deg)     : 2.42
Pole direction: RA (deg): 268.05691
Dec (deg): 64.49651
C/A sky separation ("): 15.655
C/A sky separation (km): 48437.8
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
    
```



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	2031-06-20T06:38:39.785	0.92x	2.79x	71487.6	-43.57	-47.28
Jupiter	E	2031-06-20T08:25:55.677	21.49	-17.20	71487.9	-41.62	-45.34