

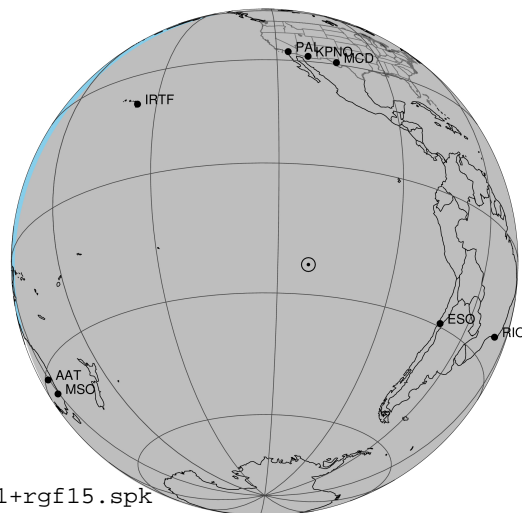
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2043-06-29T07:33:05.510  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4068836030919259904  
 2Mass ID (if available) : 17464040-2304486

Jupiter 2043-06-29T07:33:05 K9.89 G14.61 Pgt

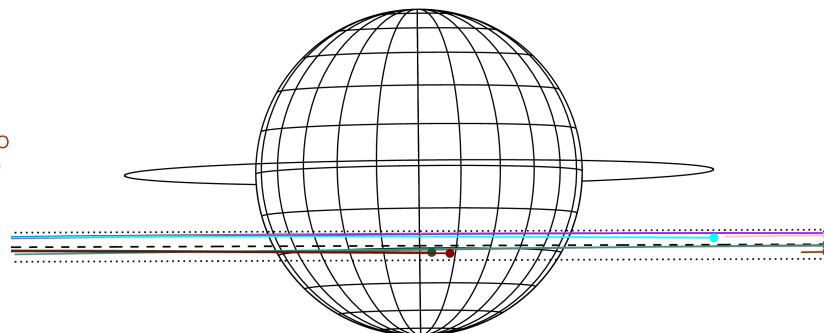
ICRS Star Coord at Epoch: 17h 46m 40.40252s -23:04:48.90611s

RUWE (>1.4 is poor) : 1.05  
 K magnitude : 9.893  
 G magnitude : 14.613  
 RP magnitude : 13.401  
 BP magnitude : 16.276  
 DUPflag : 0  
 Distance (au) : 4.259  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -16.00  
 Sun-Target sep (deg) : 170.04  
 Sun-Moon sep (deg) : 89.70  
 B (ring opening deg) : -2.42  
 PA of pole (deg) : 0.60  
 Pole direction: RA (deg): 268.05669  
 Dec (deg): 64.49732  
 C/A sky separation (") : 10.385  
 C/A sky separation (km) : 32079.3  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2043-06-29T07:33:05 K9.89 G14.61  
 Pgt



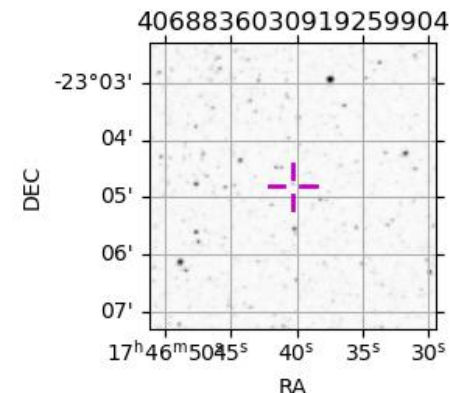
Earth  
 PAL  
 KPNO  
 MCD  
 TEN  
 IRTF  
 RIO  
 ESO  
 AAT  
 SAAO  
 MSO



2043-06-29T07:33:05.5100 α: 17 46 40.40252 δ: -23 04 48.906 C/A \*\*\*\*\* PA 0.21 deg v\_sky -16.00 km/s D 04.26 AU  
 Credit: Styled after SORA/Lucky Star

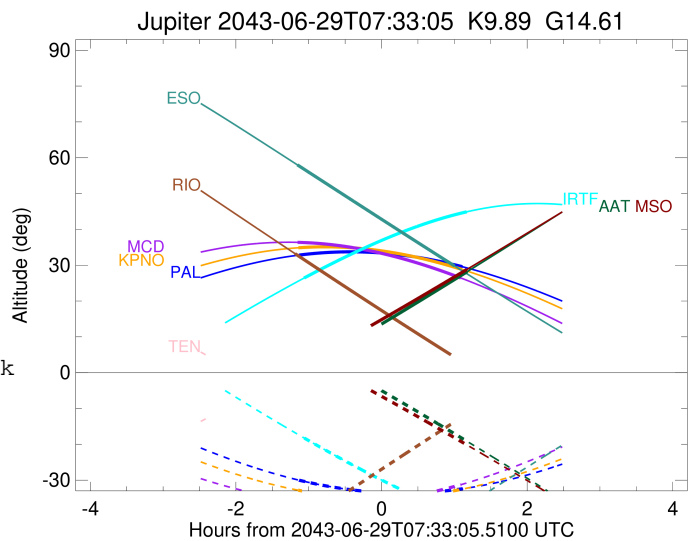
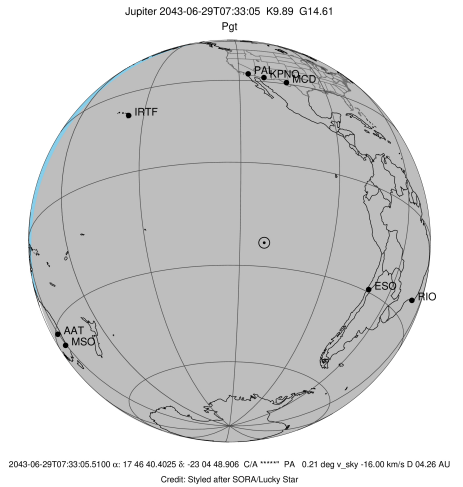
Observable events with sun below -5 deg and altitude above 5 deg

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 29 06:25 - JUN 29 08:39	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JUN 29 06:24 - JUN 29 08:39	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JUN 29 06:23 - JUN 29 08:38	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	JUN 29 06:29 - JUN 29 08:43	Pie
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+	JUN 29 06:21 - JUN 29 06:21	Pin
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUN 29 06:23 - JUN 29 08:33	Pie
AAT	Siding Spring (AAT)	-31.3	149.1	+	JUN 29 08:43 - JUN 29 08:43	Pne
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	JUN 29 08:43 - JUN 29 08:43	Pne



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T07:32:27.300
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       : 4068836030919259904
2Mass ID (if available) : 17464040-2304486
ICRS Star Coord at Epoch: 17h 46m 40.40252s -23:04:48.90611s
RUWE (>1.4 is poor) : 1.05
K magnitude           : 9.893
G magnitude           : 14.613
RP magnitude         : 13.401
BP magnitude         : 16.276
DUPflag              : 0
Distance (au)        : 4.259
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.00
Sun-Target sep (deg) : 170.04
Sun-Moon sep (deg)  : 90.23
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.60
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 8.673
C/A sky separation (km): 26791.4
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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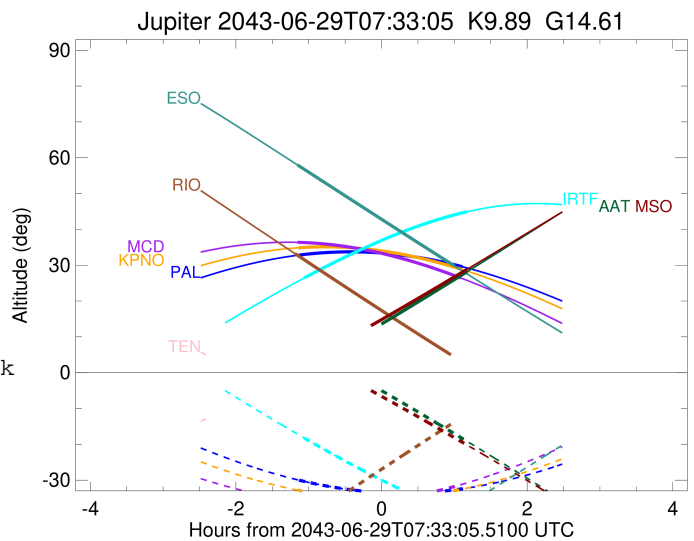
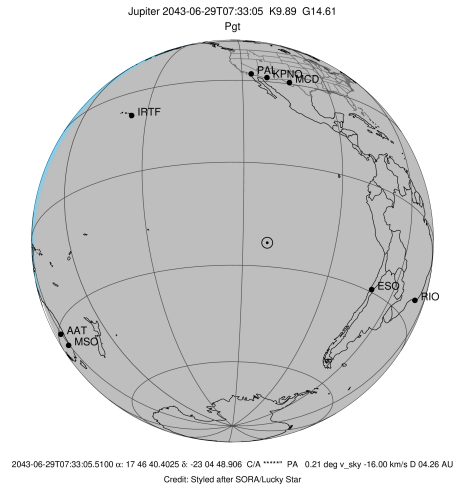


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T06:25:04.968	32.82	-30.01	71490.8	-22.40	-25.20
Jupiter	E	2043-06-29T08:39:53.721	29.56	-32.40	71490.9	-21.74	-24.48

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch             : 2043-06-29T07:31:55.340
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        : 4068836030919259904
2Mass ID (if available) : 17464040-2304486
ICRS Star Coord at Epoch: 17h 46m 40.40252s -23:04:48.90611s
RUWE (>1.4 is poor)  : 1.05
K magnitude           : 9.893
G magnitude           : 14.613
RP magnitude          : 13.401
BP magnitude          : 16.276
DUPflag              : 0
Distance (au)         : 4.259
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -16.00
Sun-Target sep (deg)  : 170.04
Sun-Moon sep (deg)    : 90.24
B (ring opening deg)  : -2.42
PA of pole (deg)      : 0.60
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 8.711
C/A sky separation (km) : 26907.7
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
    
```

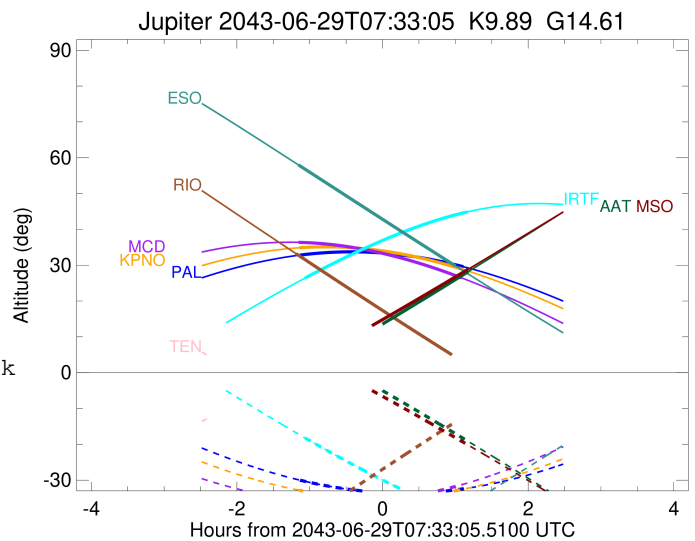
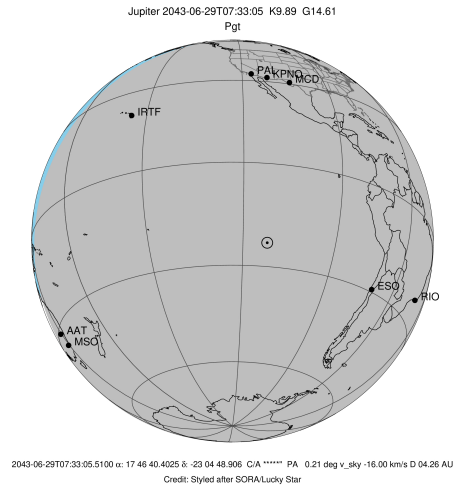


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T06:24:37.365	34.86	-32.82	71490.8	-22.45	-25.26
Jupiter	E	2043-06-29T08:39:19.994	28.82	-32.53	71490.9	-21.89	-24.64

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T07:31:09.640
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      : 4068836030919259904
2Mass ID (if available) : 17464040-2304486
ICRS Star Coord at Epoch: 17h 46m 40.40252s -23:04:48.90611s
RUWE (>1.4 is poor) : 1.05
K magnitude          : 9.893
G magnitude          : 14.613
RP magnitude         : 13.401
BP magnitude         : 16.276
DUPflag             : 0
Distance (au)       : 4.259
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -16.00
Sun-Target sep (deg) : 170.04
Sun-Moon sep (deg)  : 90.23
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.60
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (" ) : 8.761
C/A sky separation (km) : 27064.5
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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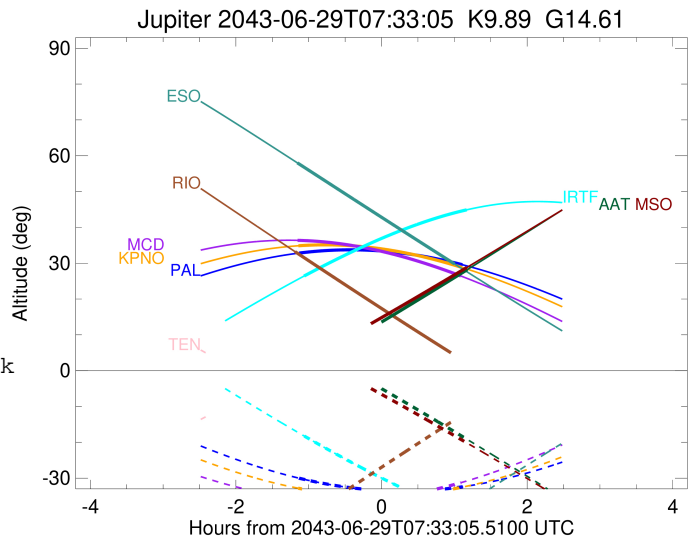
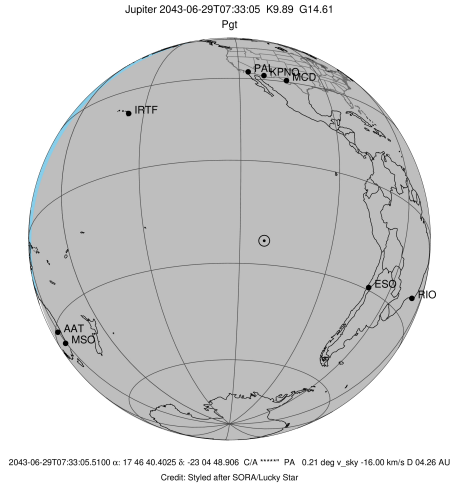


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T06:23:55.434	36.37	-35.60	71490.8	-22.51	-25.33
Jupiter	E	2043-06-29T08:38:34.223	26.42	-31.26	71490.9	-22.09	-24.87

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T07:36:30.250
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      : 4068836030919259904
2Mass ID (if available) : 17464040-2304486
ICRS Star Coord at Epoch: 17h 46m 40.40252s -23:04:48.90611s
RUWE (>1.4 is poor) : 1.05
K magnitude          : 9.893
G magnitude          : 14.613
RP magnitude         : 13.401
BP magnitude         : 16.276
DUPflag             : 0
Distance (au)       : 4.259
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.00
Sun-Target sep (deg) : 170.04
Sun-Moon sep (deg)  : 90.28
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.60
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 9.092
C/A sky separation (km) : 28086.5
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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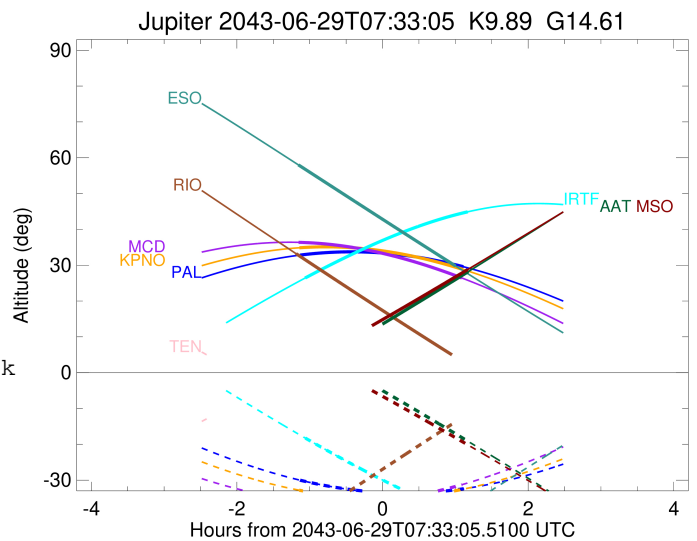
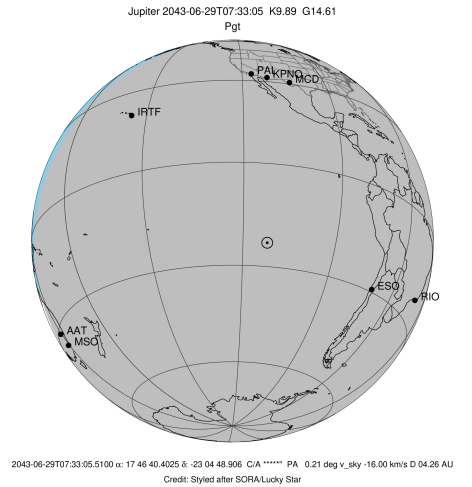


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T06:29:27.992	26.44	-18.25	71490.7	-23.88	-26.82
Jupiter	E	2043-06-29T08:43:17.032	44.89	-40.39	71490.8	-22.49	-25.31

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T07:26:43.910
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       : 4068836030919259904
2Mass ID (if available) : 17464040-2304486
ICRS Star Coord at Epoch: 17h 46m 40.40252s -23:04:48.90611s
RUWE (>1.4 is poor) : 1.05
K magnitude           : 9.893
G magnitude           : 14.613
RP magnitude         : 13.401
BP magnitude         : 16.276
DUPflag              : 0
Distance (au)        : 4.259
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.00
Sun-Target sep (deg) : 170.04
Sun-Moon sep (deg)   : 89.99
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.60
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 10.972
C/A sky separation (km) : 33892.4
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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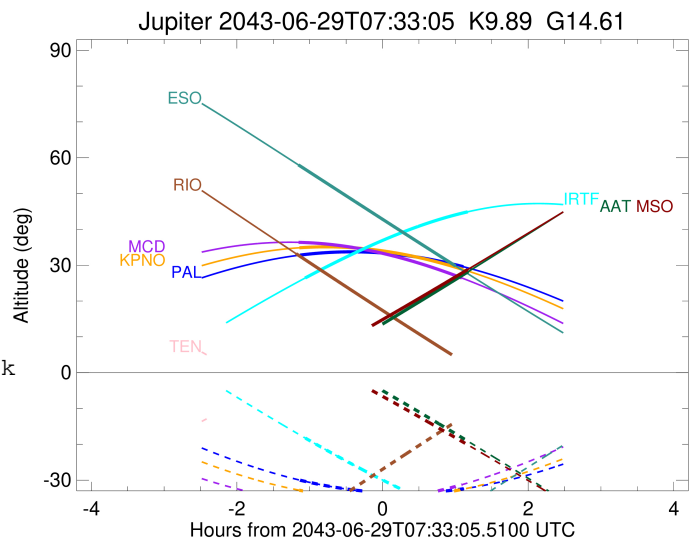
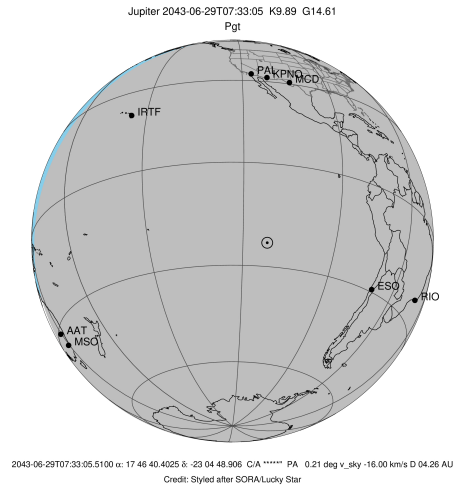


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T06:21:46.193	33.23	-42.97	71490.2	-28.10	-31.35
Jupiter	E	2043-06-29T08:32:12.061	4.58x	-13.98	71490.2	-28.48	-31.76

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T07:28:17.680
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      : 4068836030919259904
2Mass ID (if available) : 17464040-2304486
ICRS Star Coord at Epoch: 17h 46m 40.40252s -23:04:48.90611s
RUWE (>1.4 is poor) : 1.05
K magnitude          : 9.893
G magnitude          : 14.613
RP magnitude         : 13.401
BP magnitude         : 16.276
DUPflag             : 0
Distance (au)       : 4.259
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.00
Sun-Target sep (deg) : 170.04
Sun-Moon sep (deg)  : 90.36
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.60
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 10.868
C/A sky separation (km) : 33570.3
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
    
```

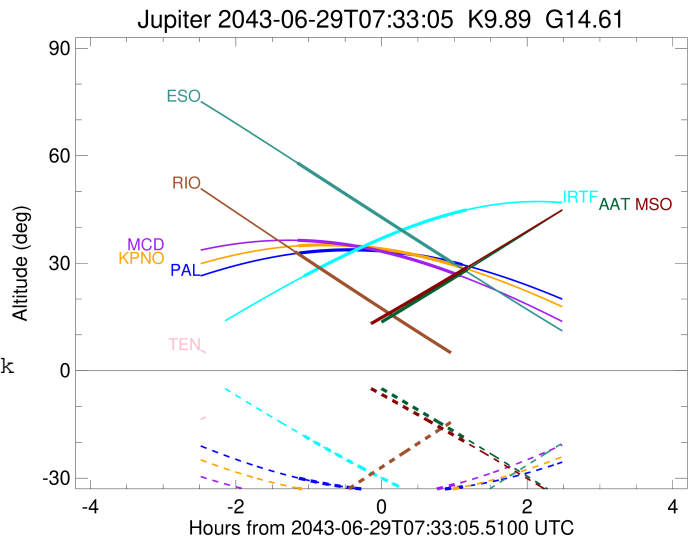
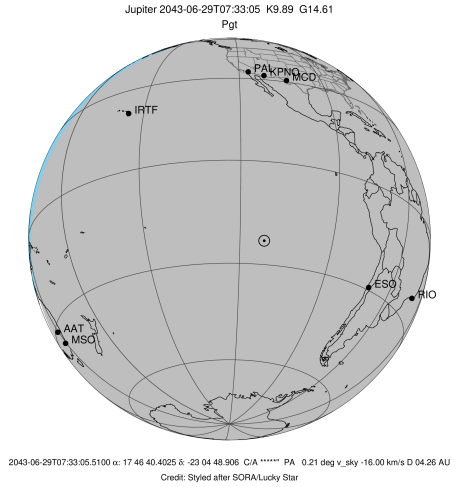


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T06:23:46.413	58.00	-67.41	71490.2	-27.98	-31.23
Jupiter	E	2043-06-29T08:33:11.519	29.81	-39.24	71490.2	-28.08	-31.33

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T07:39:07.260
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       : 4068836030919259904
2Mass ID (if available) : 17464040-2304486
ICRS Star Coord at Epoch: 17h 46m 40.40252s -23:04:48.90611s
RUWE (>1.4 is poor) : 1.05
K magnitude           : 9.893
G magnitude           : 14.613
RP magnitude         : 13.401
BP magnitude         : 16.276
DUPflag              : 0
Distance (au)        : 4.259
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.00
Sun-Target sep (deg) : 170.04
Sun-Moon sep (deg)   : 89.93
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.60
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 11.318
C/A sky separation (km) : 34961.9
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
    
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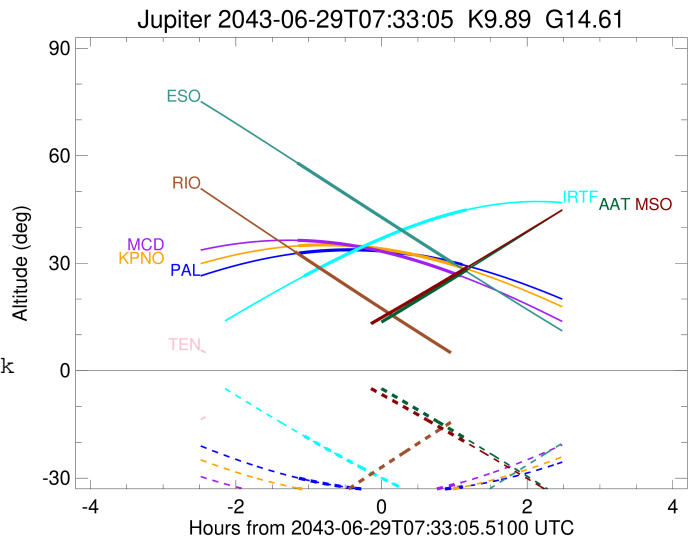
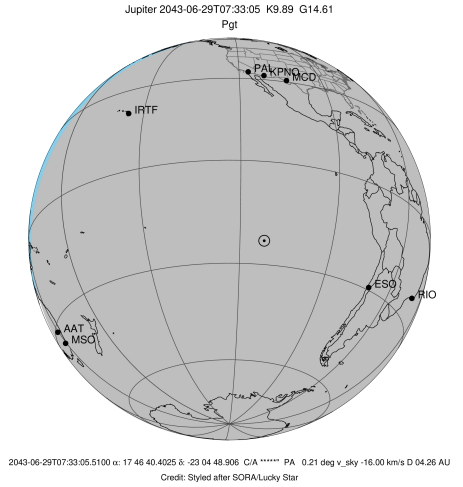
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T06:34:02.791	1.85x	6.15x	71490.0	-30.19	-33.57
Jupiter	E	2043-06-29T08:43:44.948	28.20	-19.20	71490.2	-28.32	-31.59



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-29T07:38:51.210
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        : 4068836030919259904
2Mass ID (if available) : 17464040-2304486
ICRS Star Coord at Epoch: 17h 46m 40.40252s -23:04:48.90611s
RUWE (>1.4 is poor) : 1.05
K magnitude           : 9.893
G magnitude           : 14.613
RP magnitude          : 13.401
BP magnitude          : 16.276
DUPflag              : 0
Distance (au)         : 4.259
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.00
Sun-Target sep (deg)  : 170.04
Sun-Moon sep (deg)   : 89.95
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.60
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 11.433
C/A sky separation (km) : 35317.4
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	2043-06-29T06:33:59.452	3.56x	4.06x	71489.9	-30.49	-33.89
Jupiter	E	2043-06-29T08:43:17.574	28.78	-20.13	71490.2	-28.67	-31.96