

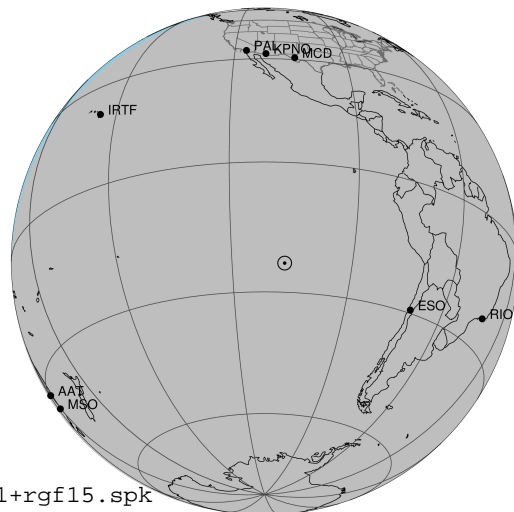
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2043-06-24T07:10:25.110  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4068871597596383744  
 2Mass ID (if available) : 17492510-2304261

Jupiter 2043-06-24T07:10:25 K9.79 G13.34 Pgt

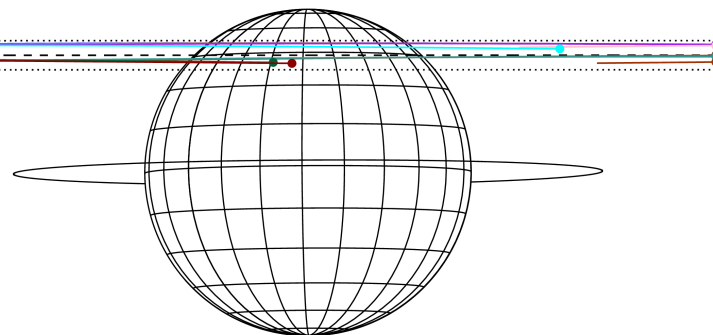
ICRS Star Coord at Epoch: 17h 49m 25.09621s -23:04:26.27614s

RUWE (>1.4 is poor) : 0.81  
 K magnitude : 9.790  
 G magnitude : 13.341  
 RP magnitude : 12.331  
 BP magnitude : 14.384  
 DUPflag : 0  
 Distance (au) : 4.251  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -16.33  
 Sun-Target sep (deg) : 175.45  
 Sun-Moon sep (deg) : 24.44  
 B (ring opening deg) : -2.43  
 PA of pole (deg) : 0.30  
 Pole direction: RA (deg): 268.05669  
 Dec (deg): 64.49732  
 C/A sky separation (") : 16.661  
 C/A sky separation (km) : 51370.9  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2043-06-24T07:10:25 K9.79 G13.34  
 Pgt



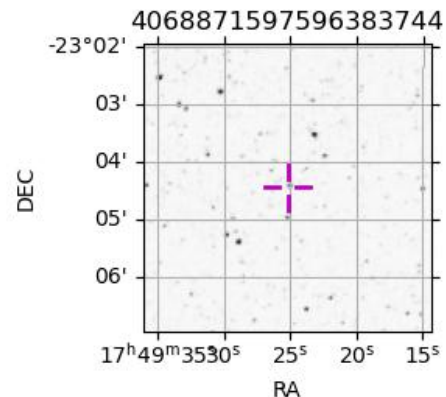
Earth  
 PAL  
 KPNO  
 MCD  
 TEN  
 IRTF  
 RIO  
 ESO  
 AAT  
 SAAO  
 MSO



2043-06-24T07:10:25.1100 a: 17 49 25.0962 s: -23 04 26.276 C/A \*\*\*\*\* PA 180.01 deg v\_sky -16.33 km/s D 04.25 AU  
 Credit: Styled after SORA/Lucky Star

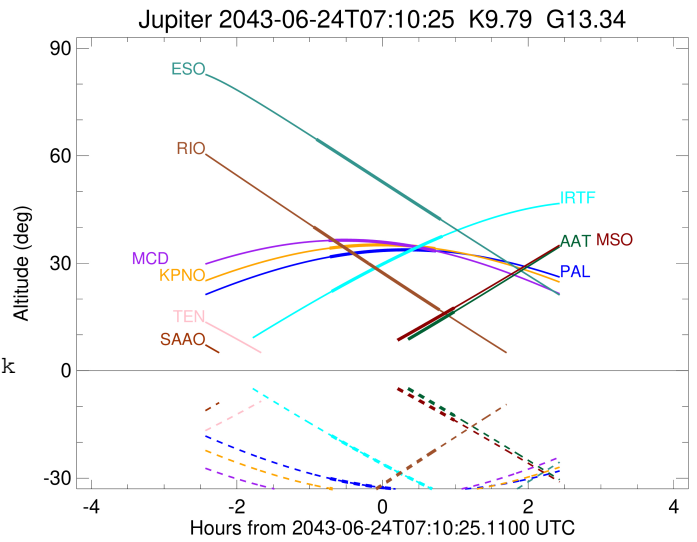
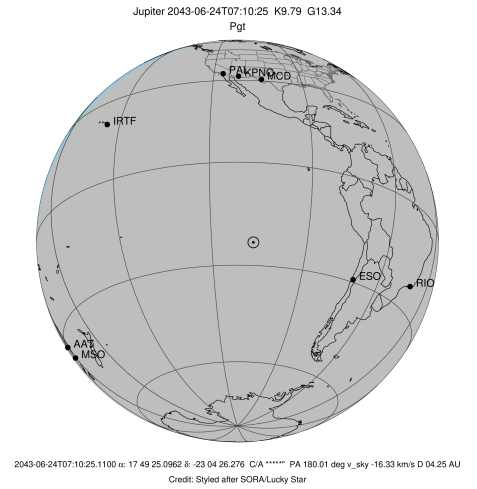
Observable events with sun below -5 deg and altitude above 5 deg

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 24 06:27 - JUN 24 07:54	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JUN 24 06:26 - JUN 24 07:53	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JUN 24 06:26 - JUN 24 07:53	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	JUN 24 06:28 - JUN 24 07:59	Pie
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+ +	JUN 24 06:13 - JUN 24 07:57	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUN 24 06:16 - JUN 24 07:58	Pie
AAT	Siding Spring (AAT)	-31.3	149.1	+ +	JUN 24 08:09 - JUN 24 08:09	Pne
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	JUN 24 08:09 - JUN 24 08:09	Pne



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-24T07:10:48.780
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      : 4068871597596383744
2Mass ID (if available) : 17492510-2304261
ICRS Star Coord at Epoch: 17h 49m 25.09621s -23:04:26.27614s
RUWE (>1.4 is poor) : 0.81
K magnitude          : 9.790
G magnitude          : 13.341
RP magnitude         : 12.331
BP magnitude         : 14.384
DUPflag             : 0
Distance (au)        : 4.251
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.33
Sun-Target sep (deg) : 175.45
Sun-Moon sep (deg)  : 24.88
B (ring opening deg) : -2.43
PA of pole (deg)    : 0.30
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 18.378
C/A sky separation (km): 56665.8
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
    
```

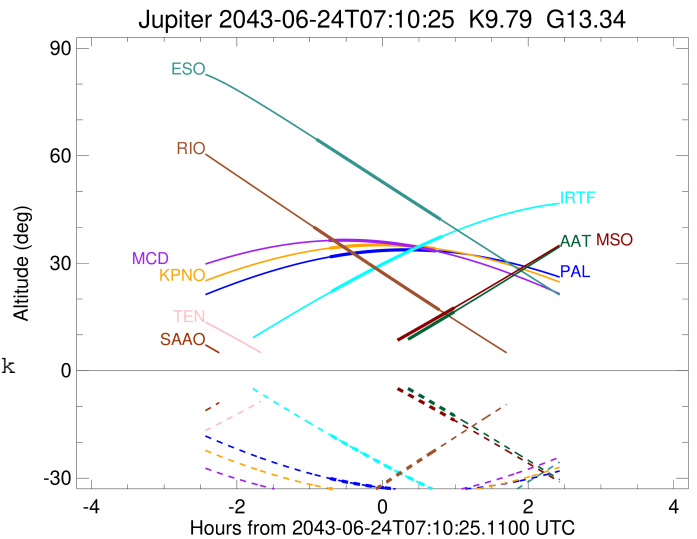
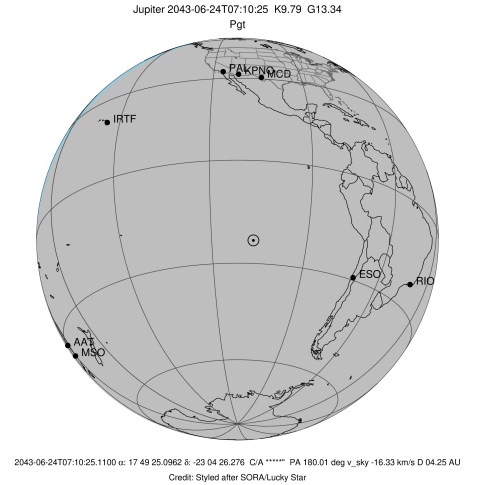


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-24T06:27:17.437	31.77	-30.09	71487.0	51.99	55.50
Jupiter	E	2043-06-24T07:54:19.374	33.43	-33.40	71486.9	52.65	56.13

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-24T07:10:22.260
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        : 4068871597596383744
2Mass ID (if available) : 17492510-2304261
ICRS Star Coord at Epoch: 17h 49m 25.09621s -23:04:26.27614s
RUWE (>1.4 is poor) : 0.81
K magnitude           : 9.790
G magnitude           : 13.341
RP magnitude          : 12.331
BP magnitude          : 14.384
DUPflag              : 0
Distance (au)         : 4.251
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.33
Sun-Target sep (deg) : 175.45
Sun-Moon sep (deg)   : 24.82
B (ring opening deg) : -2.43
PA of pole (deg)     : 0.30
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 18.351
C/A sky separation (km): 56584.3
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
    
```

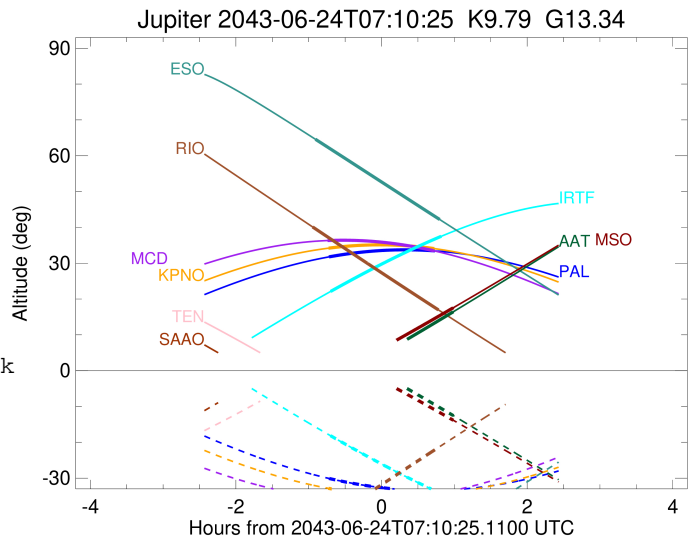
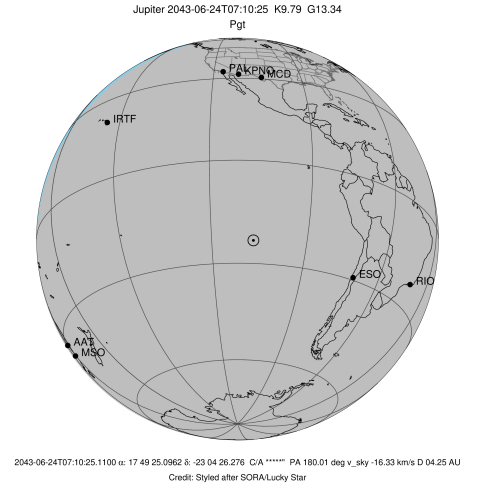


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-24T06:26:46.204	34.19	-32.85	71487.0	51.93	55.44
Jupiter	E	2043-06-24T07:53:58.595	34.07	-34.48	71486.9	52.50	55.99

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-24T07:09:43.060
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       : 4068871597596383744
2Mass ID (if available) : 17492510-2304261
ICRS Star Coord at Epoch: 17h 49m 25.09621s -23:04:26.27614s
RUWE (>1.4 is poor) : 0.81
K magnitude           : 9.790
G magnitude           : 13.341
RP magnitude          : 12.331
BP magnitude          : 14.384
DUPflag              : 0
Distance (au)        : 4.251
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.33
Sun-Target sep (deg) : 175.45
Sun-Moon sep (deg)  : 24.73
B (ring opening deg) : -2.43
PA of pole (deg)    : 0.30
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 18.317
C/A sky separation (km) : 56478.1
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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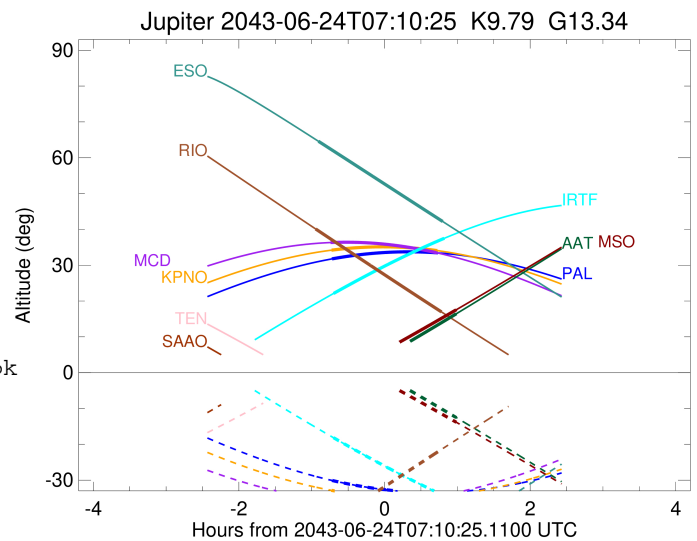
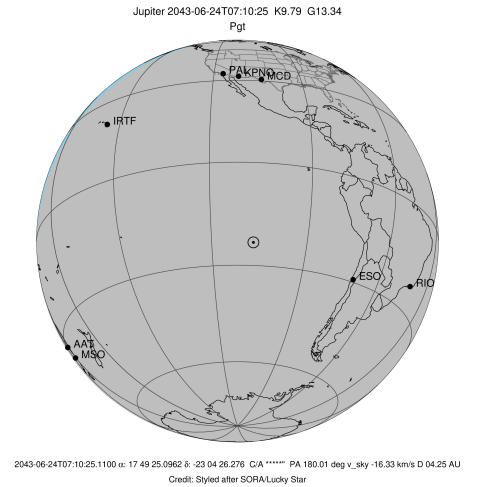


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-24T06:25:59.793	36.32	-35.53	71487.0	51.86	55.37
Jupiter	E	2043-06-24T07:53:28.101	33.47	-34.50	71487.0	52.29	55.79

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-24T07:14:09.760
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       : 4068871597596383744
2Mass ID (if available) : 17492510-2304261
ICRS Star Coord at Epoch: 17h 49m 25.09621s -23:04:26.27614s
RUWE (>1.4 is poor) : 0.81
K magnitude           : 9.790
G magnitude           : 13.341
RP magnitude          : 12.331
BP magnitude          : 14.384
DUPflag              : 0
Distance (au)        : 4.251
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.33
Sun-Target sep (deg) : 175.45
Sun-Moon sep (deg)   : 25.28
B (ring opening deg) : -2.43
PA of pole (deg)     : 0.30
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 17.871
C/A sky separation (km) : 55103.3
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
    
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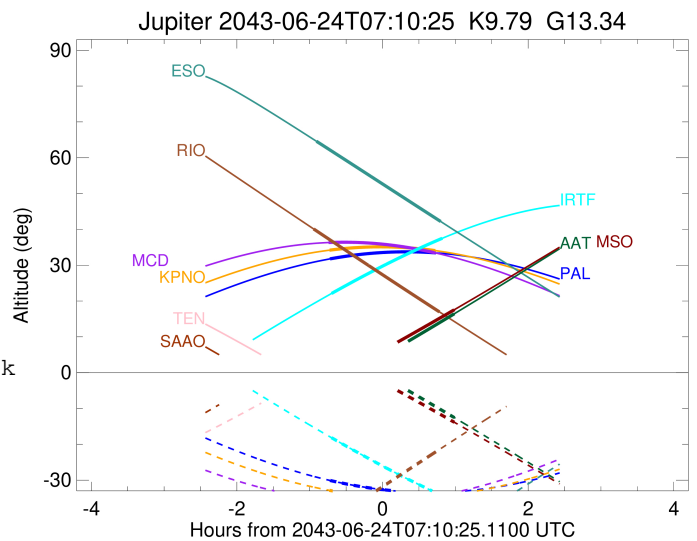
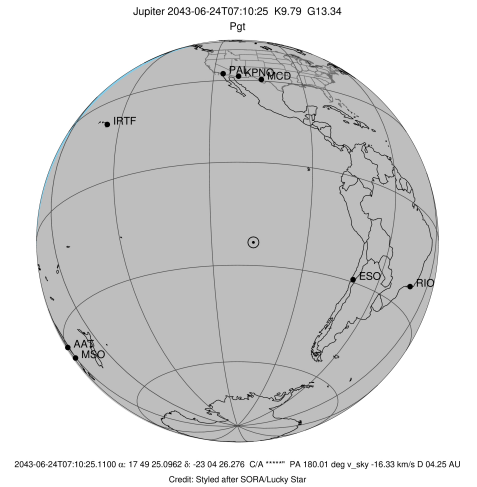


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-24T06:28:26.757	22.10	-18.16	71487.3	49.63	53.23
Jupiter	E	2043-06-24T07:59:43.580	37.51	-34.32	71487.1	51.01	54.56

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-24T07:05:21.860
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        : 4068871597596383744
2Mass ID (if available) : 17492510-2304261
ICRS Star Coord at Epoch: 17h 49m 25.09621s -23:04:26.27614s
RUWE (>1.4 is poor) : 0.81
K magnitude           : 9.790
G magnitude           : 13.341
RP magnitude          : 12.331
BP magnitude          : 14.384
DUPflag              : 0
Distance (au)         : 4.251
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.33
Sun-Target sep (deg) : 175.45
Sun-Moon sep (deg)   : 23.86
B (ring opening deg) : -2.43
PA of pole (deg)     : 0.30
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 16.204
C/A sky separation (km): 49963.9
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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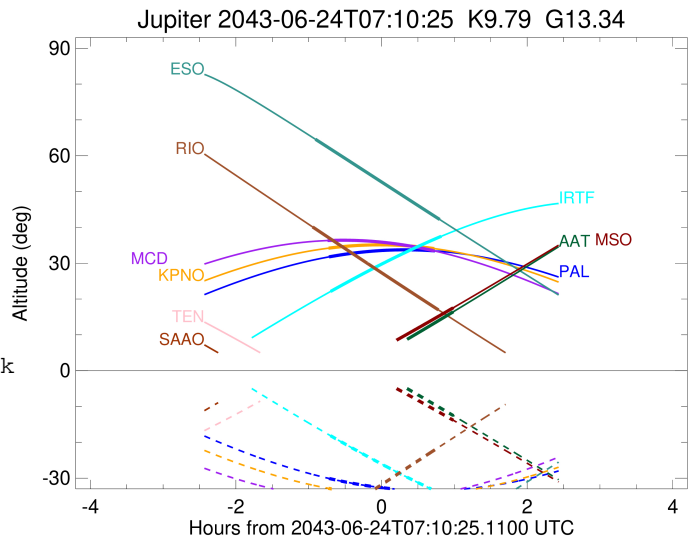
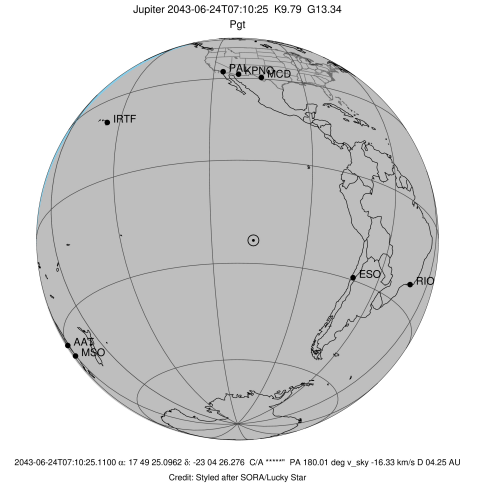


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-24T06:13:47.826	40.08	-44.57	71488.1	44.51	48.21
Jupiter	E	2043-06-24T07:57:12.469	16.99	-21.46	71488.1	44.02	47.73

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-24T07:07:03.690
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      : 4068871597596383744
2Mass ID (if available) : 17492510-2304261
ICRS Star Coord at Epoch: 17h 49m 25.09621s -23:04:26.27614s
RUWE (>1.4 is poor) : 0.81
K magnitude          : 9.790
G magnitude          : 13.341
RP magnitude         : 12.331
BP magnitude         : 14.384
DUPflag             : 0
Distance (au)       : 4.251
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.33
Sun-Target sep (deg) : 175.45
Sun-Moon sep (deg)  : 24.23
B (ring opening deg) : -2.43
PA of pole (deg)    : 0.30
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 16.270
C/A sky separation (km): 50167.8
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
    
```

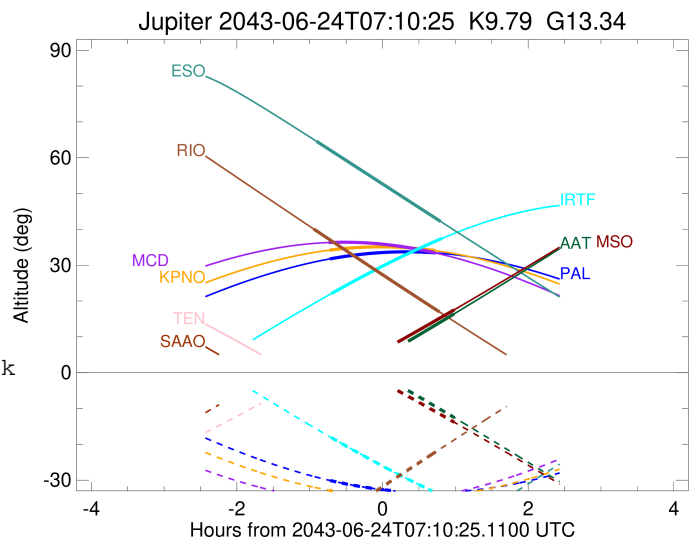
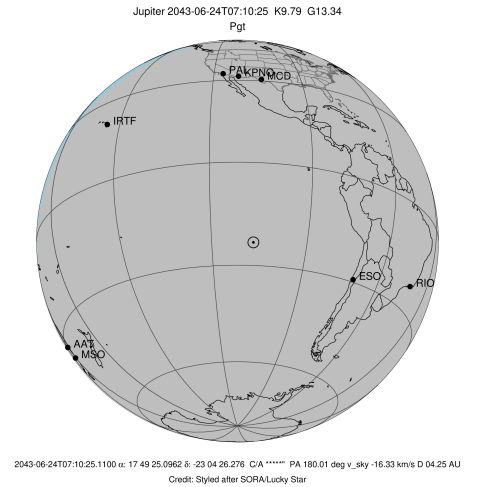


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-24T06:16:04.521	64.56	-68.91	71488.1	44.53	48.24
Jupiter	E	2043-06-24T07:58:13.616	42.23	-46.67	71488.1	44.41	48.12

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-24T07:15:29.230
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       : 4068871597596383744
2Mass ID (if available) : 17492510-2304261
ICRS Star Coord at Epoch: 17h 49m 25.09621s -23:04:26.27614s
RUWE (>1.4 is poor) : 0.81
K magnitude           : 9.790
G magnitude           : 13.341
RP magnitude          : 12.331
BP magnitude          : 14.384
DUPflag              : 0
Distance (au)         : 4.251
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.33
Sun-Target sep (deg) : 175.45
Sun-Moon sep (deg)   : 25.07
B (ring opening deg) : -2.43
PA of pole (deg)     : 0.30
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 15.594
C/A sky separation (km) : 48081.1
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
    
```



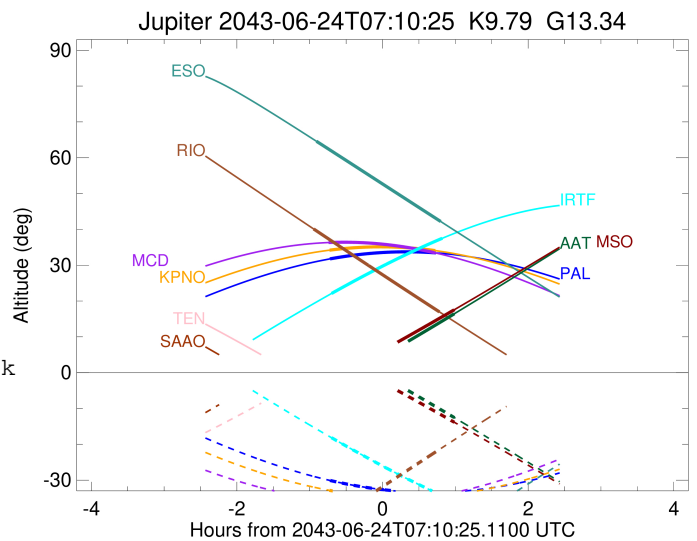
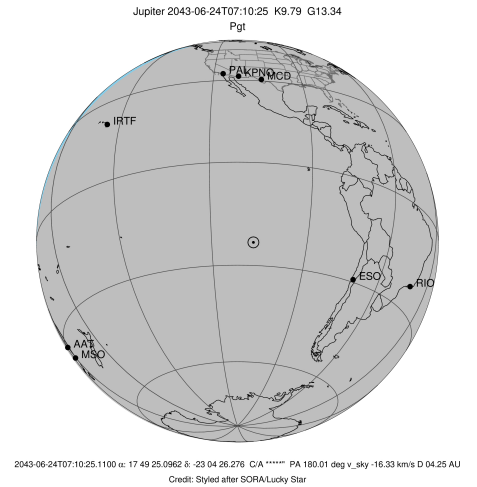
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-24T06:21:09.761	-4.81x	8.17x	71488.5	41.39	45.11
Jupiter	E	2043-06-24T08:09:30.932	16.43	-12.53	71488.3	43.06	46.78



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-24T07:15:15.740
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       : 4068871597596383744
2Mass ID (if available) : 17492510-2304261
ICRS Star Coord at Epoch: 17h 49m 25.09621s -23:04:26.27614s
RUWE (>1.4 is poor) : 0.81
K magnitude          : 9.790
G magnitude          : 13.341
RP magnitude         : 12.331
BP magnitude         : 14.384
DUPflag             : 0
Distance (au)        : 4.251
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.33
Sun-Target sep (deg) : 175.45
Sun-Moon sep (deg)   : 25.04
B (ring opening deg) : -2.43
PA of pole (deg)     : 0.30
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 15.484
C/A sky separation (km): 47744.2
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	2043-06-24T06:20:38.193	-2.88x	6.04x	71488.5	41.05	44.77
Jupiter	E	2043-06-24T08:09:36.141	17.57	-13.85	71488.3	42.67	46.39