

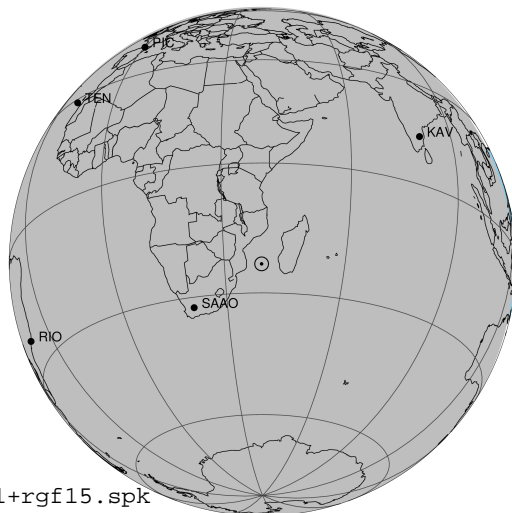
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2043-06-19T21:24:33.640  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4068692927021348352  
 2Mass ID (if available) : 17515176-2304521

Jupiter 2043-06-19T21:24:33 K7.88 G14.41 Pgt

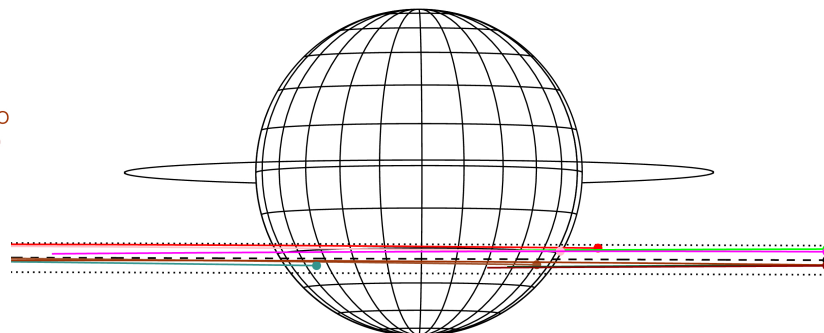
ICRS Star Coord at Epoch: 17h 51m 51.75394s -23:04:52.12027s

RUWE (>1.4 is poor) : 0.85  
 K magnitude : 7.883  
 G magnitude : 14.407  
 RP magnitude : 12.859  
 BP magnitude : 17.885  
 DUPflag : 0  
 Distance (au) : 4.251  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -16.41  
 Sun-Target sep (deg) : 179.59  
 Sun-Moon sep (deg) : 30.51  
 B (ring opening deg) : -2.42  
 PA of pole (deg) : 0.04  
 Pole direction: RA (deg): 268.05668  
 Dec (deg): 64.49732  
 C/A sky separation (") : 12.272  
 C/A sky separation (km) : 37831.2  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2043-06-19T21:24:33 K7.88 G14.41  
 Pgt



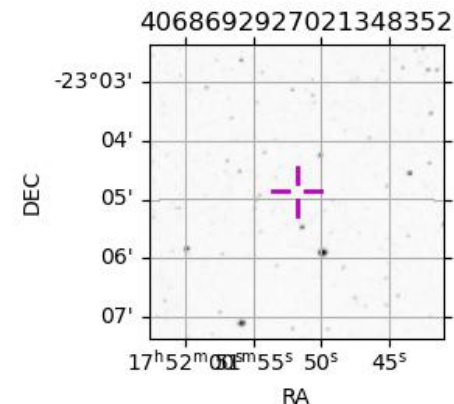
Earth  
 PIC  
 PMO  
 TEN  
 KAV  
 RIO  
 ESO  
 AAT  
 SAAO  
 MSO



2043-06-19T21:24:33.6400 a: 17 51 51.7539 8: -23 04 52.120 C/A \*\*\*\*\* PA 359.81 deg v\_sky -16.41 km/s D 04.25 AU  
 Credit: Styled after SORA/Lucky Star

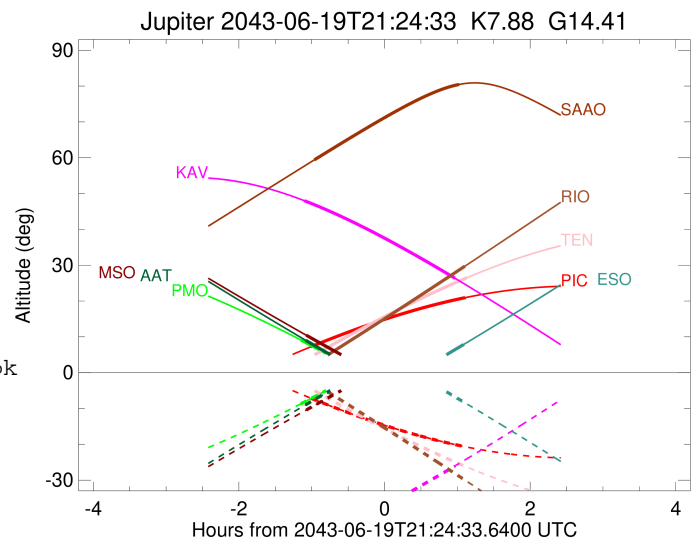
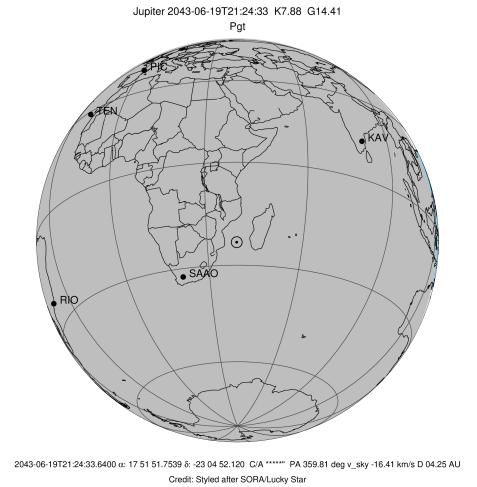
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+ +	JUN 19 20:23 - JUN 19 22:31	Pie
PAL	Palomar Mt (200")	33.4	243.1			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+	JUN 19 20:15 - JUN 19 20:15	Pin
KPNO	Kitt Peak Natl Obs	32.0	248.4			Pnn
MCD	McDonald Obs. 2.7m	30.7	256.0			Pnn
TEN	Teide Obs./Tenerife	28.3	343.5	+	JUN 19 22:32 - JUN 19 22:32	Pne
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+ +	JUN 19 20:18 - JUN 19 22:22	Pie
RIO	Rio de Janeiro	-22.9	316.8	+	JUN 19 22:30 - JUN 19 22:30	Pne
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	JUN 19 22:29 - JUN 19 22:29	Pne
AAT	Siding Spring (AAT)	-31.3	149.1	+	JUN 19 20:19 - JUN 19 20:19	Pin
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	JUN 19 20:26 - JUN 19 22:25	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	JUN 19 20:20 - JUN 19 20:20	Pin



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-19T21:27:38.350
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : PIC
Location              : Pic du Midi
Latitude (deg)        : 42.93656
E. Longitude (deg)    : 0.14231
Altitude (km)         : 2.890
Gaia source ID        : 4068692927021348352
2Mass ID (if available) : 17515176-2304521
ICRS Star Coord at Epoch: 17h 51m 51.75394s -23:04:52.12027s
RUWE (>1.4 is poor)  : 0.85
K magnitude           : 7.883
G magnitude           : 14.407
RP magnitude          : 12.859
BP magnitude          : 17.885
DUPflag              : 0
Distance (au)         : 4.251
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg)  : 179.59
Sun-Moon sep (deg)    : 30.37
B (ring opening deg)  : -2.42
PA of pole (deg)      : 0.04
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 10.509
C/A sky separation (km) : 32396.0
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
    
```

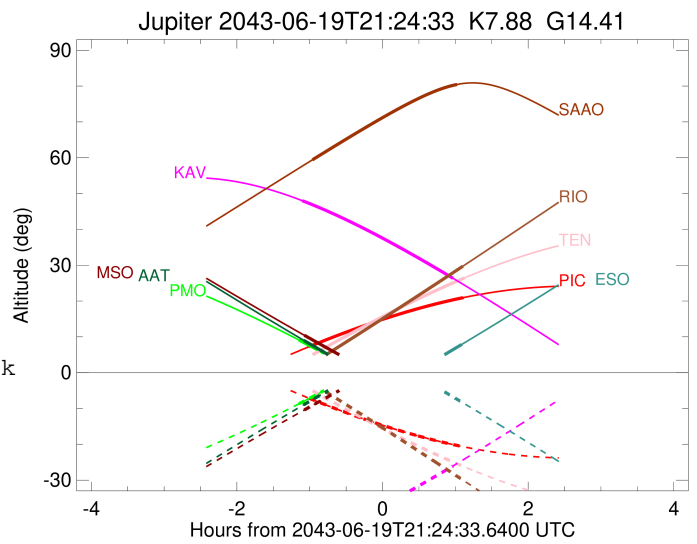
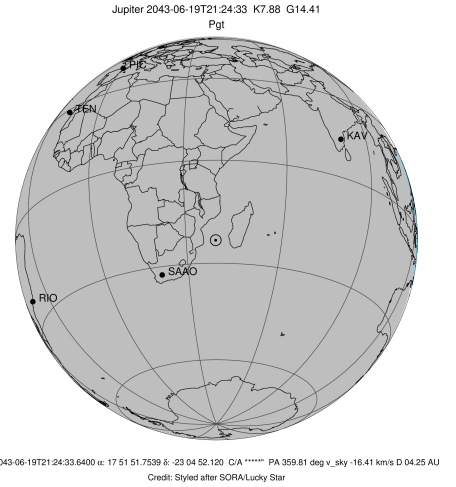


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-19T20:23:51.649	7.22	-7.12	71490.3	-27.47	-30.68
Jupiter	E	2043-06-19T22:31:11.391	20.95	-20.68	71490.4	-26.47	-29.61

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-19T21:18:50.310
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       : 4068692927021348352
2Mass ID (if available) : 17515176-2304521
ICRS Star Coord at Epoch: 17h 51m 51.75394s -23:04:52.12027s
RUWE (>1.4 is poor) : 0.85
K magnitude          : 7.883
G magnitude          : 14.407
RP magnitude         : 12.859
BP magnitude         : 17.885
DUPflag             : 0
Distance (au)        : 4.251
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 179.59
Sun-Moon sep (deg)   : 31.18
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.04
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 11.137
C/A sky separation (km) : 34333.0
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
    
```

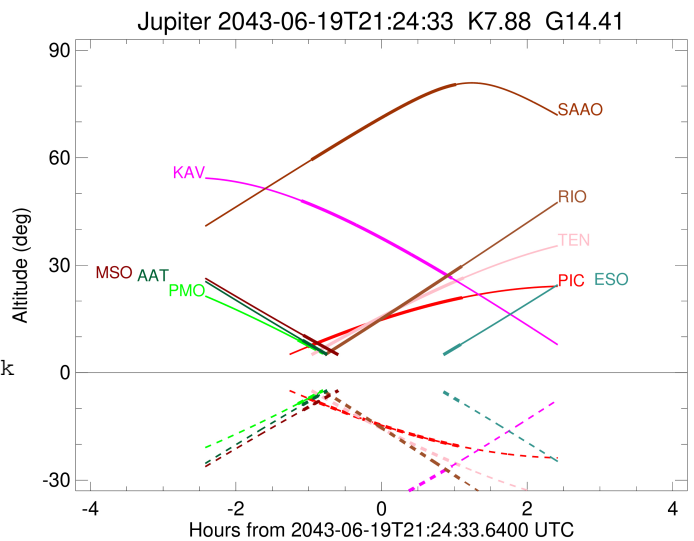
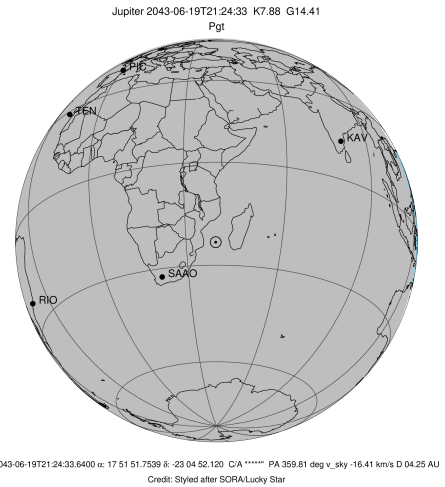


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-19T20:15:41.236	9.12	-8.69	71490.2	-28.39	-31.67
Jupiter	E	2043-06-19T22:22:24.323	-15.06x	15.38x	71490.1	-28.99	-32.30

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-19T21:29:27.420
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : TEN
Location             : Teide Obs./Tenerife
Latitude (deg)       : 28.30050
E. Longitude (deg)   : 343.48909
Altitude (km)        : 2.395
Gaia source ID       : 4068692927021348352
2Mass ID (if available) : 17515176-2304521
ICRS Star Coord at Epoch: 17h 51m 51.75394s -23:04:52.12027s
RUWE (>1.4 is poor) : 0.85
K magnitude          : 7.883
G magnitude           : 14.407
RP magnitude         : 12.859
BP magnitude         : 17.885
DUPflag             : 0
Distance (au)        : 4.251
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 179.59
Sun-Moon sep (deg)   : 30.15
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.04
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation ("): 10.950
C/A sky separation (km): 33758.0
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
    
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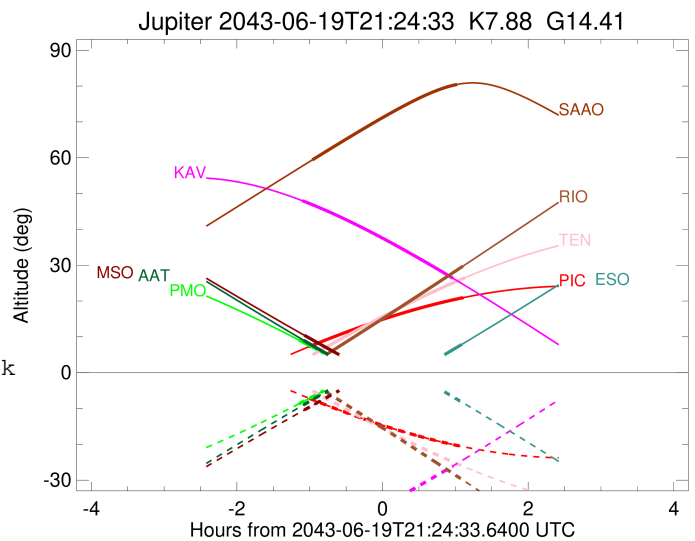
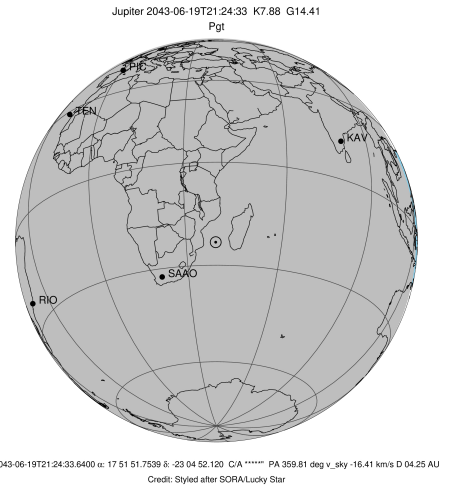


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-19T20:26:12.890	4.86x	-4.90x	71490.1	-28.86	-32.16
Jupiter	E	2043-06-19T22:32:20.772	26.48	-26.32	71490.3	-27.53	-30.75

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-19T21:20:22.620
Event type          : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code       : KAV
Location           : Kavalur Observatory
Latitude (deg)     : 12.57556
E. Longitude (deg) : 78.83167
Altitude (km)     : 0.722
Gaia source ID     : 4068692927021348352
2Mass ID (if available) : 17515176-2304521
ICRS Star Coord at Epoch: 17h 51m 51.75394s -23:04:52.12027s
RUWE (>1.4 is poor) : 0.85
K magnitude        : 7.883
G magnitude        : 14.407
RP magnitude       : 12.859
BP magnitude       : 17.885
DUPflag           : 0
Distance (au)     : 4.251
f0 (km)           : 0.00
g0 (km)           : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 179.59
Sun-Moon sep (deg) : 31.33
B (ring opening deg) : -2.42
PA of pole (deg)   : 0.04
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 11.248
C/A sky separation (km) : 34677.1
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
    
```

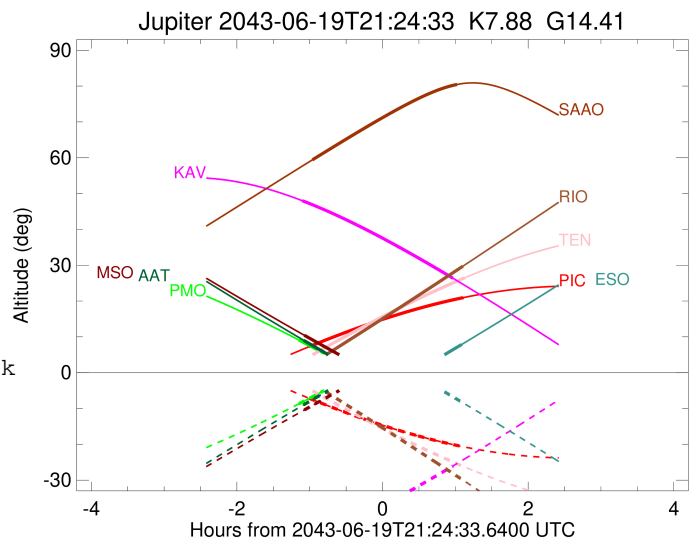
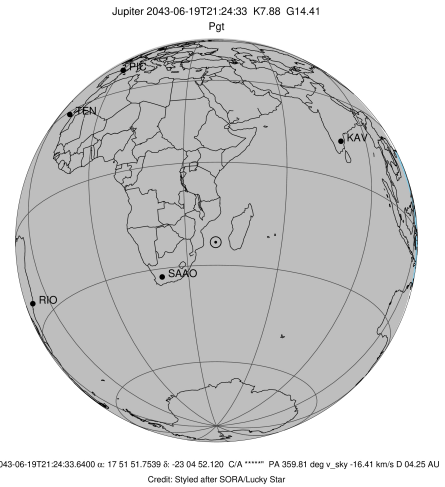


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-19T20:18:24.109	48.01	-47.57	71490.1	-28.90	-32.20
Jupiter	E	2043-06-19T22:22:38.327	26.35	-26.03	71490.1	-29.21	-32.54

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-19T21:30:52.740
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      : 4068692927021348352
2Mass ID (if available) : 17515176-2304521
ICRS Star Coord at Epoch: 17h 51m 51.75394s -23:04:52.12027s
RUWE (>1.4 is poor) : 0.85
K magnitude          : 7.883
G magnitude          : 14.407
RP magnitude         : 12.859
BP magnitude         : 17.885
DUPflag             : 0
Distance (au)       : 4.251
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 179.59
Sun-Moon sep (deg)  : 29.89
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.04
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 12.878
C/A sky separation (km) : 39699.6
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
    
```

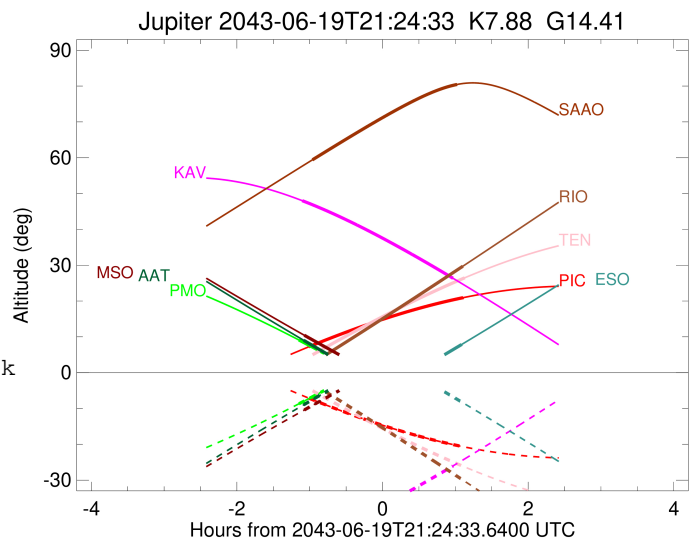
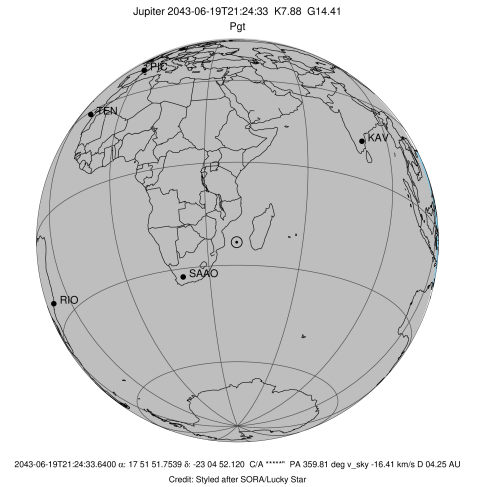


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-19T20:30:33.194	3.42x	-3.80x	71489.4	-34.51	-38.09
Jupiter	E	2043-06-19T22:30:47.501	29.71	-29.97	71489.6	-32.92	-36.44

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-19T21:30:20.260
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      : 4068692927021348352
2Mass ID (if available) : 17515176-2304521
ICRS Star Coord at Epoch: 17h 51m 51.75394s -23:04:52.12027s
RUWE (>1.4 is poor) : 0.85
K magnitude          : 7.883
G magnitude          : 14.407
RP magnitude         : 12.859
BP magnitude         : 17.885
DUPflag             : 0
Distance (au)       : 4.251
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 179.59
Sun-Moon sep (deg)  : 29.78
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.04
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 13.412
C/A sky separation (km) : 41345.8
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
    
```



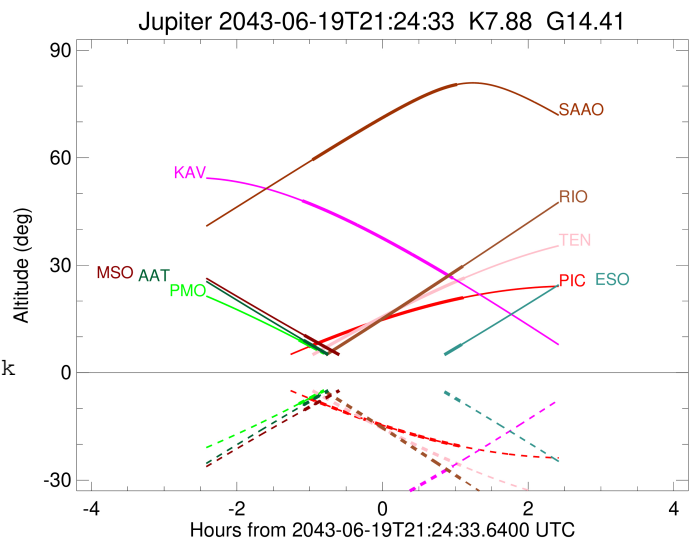
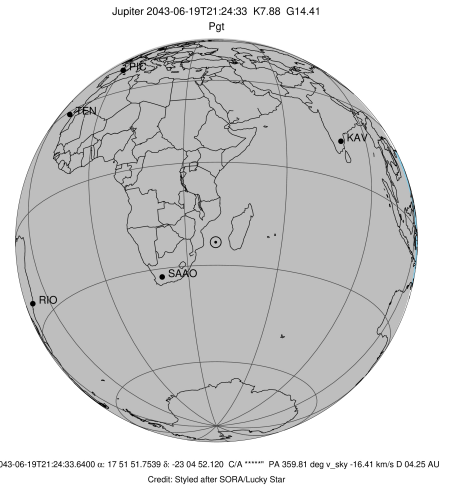
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-19T20:30:26.688	-14.84x	14.41x	71489.2	-36.03	-39.66
Jupiter	E	2043-06-19T22:29:51.234	7.88	-8.20	71489.4	-34.53	-38.11



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-19T21:18:56.610
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      : 4068692927021348352
2Mass ID (if available) : 17515176-2304521
ICRS Star Coord at Epoch: 17h 51m 51.75394s -23:04:52.12027s
RUWE (>1.4 is poor) : 0.85
K magnitude          : 7.883
G magnitude          : 14.407
RP magnitude         : 12.859
BP magnitude         : 17.885
DUPflag             : 0
Distance (au)       : 4.251
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 179.59
Sun-Moon sep (deg)  : 31.04
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.04
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 13.485
C/A sky separation (km) : 41570.6
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
    
```



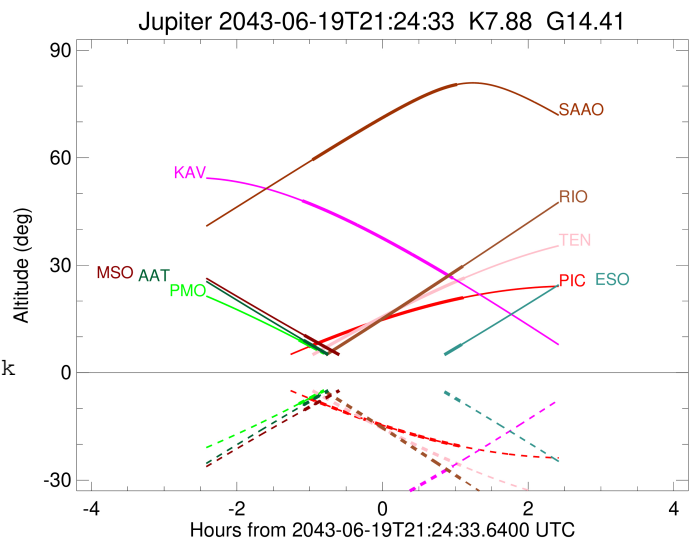
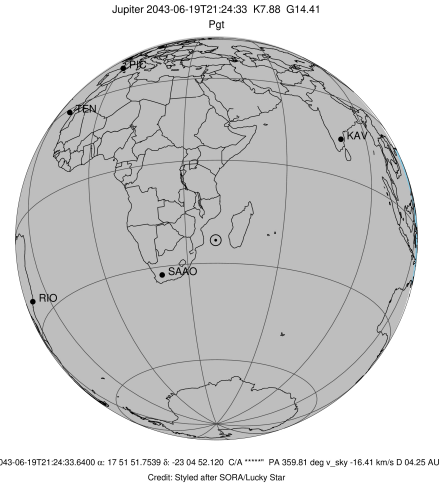
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-19T20:19:35.924	9.04	-8.97	71489.3	-35.21	-38.82
Jupiter	E	2043-06-19T22:18:39.265	-13.20x	13.10x	71489.2	-35.79	-39.41



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-19T21:26:23.180
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : SAAO
Location             : So. Afr. Astro. Obs. (Sutherland)
Latitude (deg)       : -32.37953
E. Longitude (deg)   : 20.81070
Altitude (km)        : 1.768
Gaia source ID       : 4068692927021348352
2Mass ID (if available) : 17515176-2304521
ICRS Star Coord at Epoch: 17h 51m 51.75394s -23:04:52.12027s
RUWE (>1.4 is poor) : 0.85
K magnitude           : 7.883
G magnitude           : 14.407
RP magnitude          : 12.859
BP magnitude          : 17.885
DUPflag              : 0
Distance (au)        : 4.251
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 179.59
Sun-Moon sep (deg)   : 30.72
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.04
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 12.629
C/A sky separation (km) : 38933.7
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
    
```

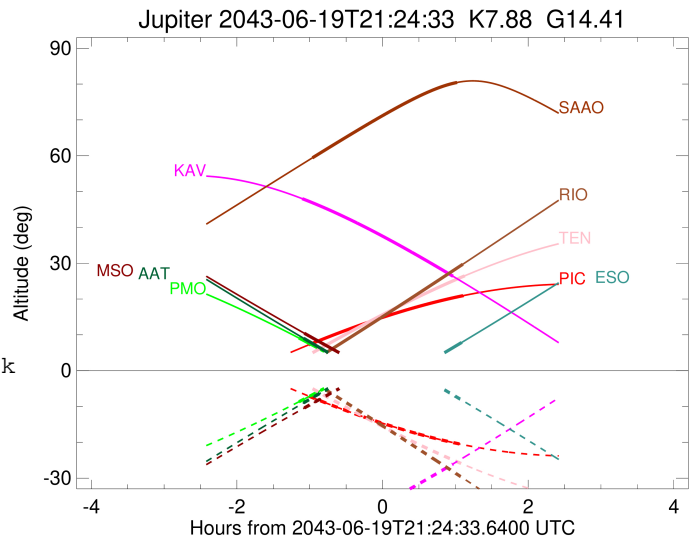
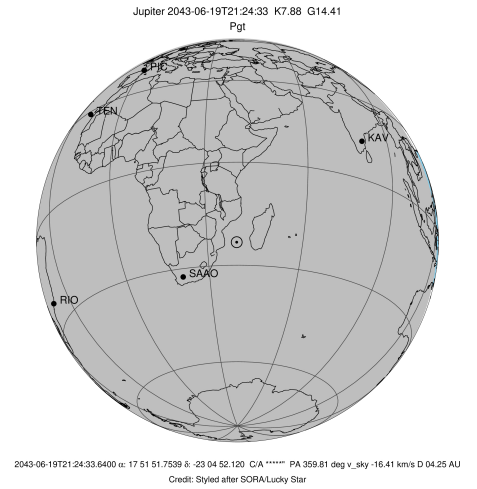


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-19T20:26:49.596	59.41	-59.80	71489.6	-33.41	-36.95
Jupiter	E	2043-06-19T22:25:49.936	80.43	-80.81	71489.7	-32.65	-36.16

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-19T21:19:11.920
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        : 4068692927021348352
2Mass ID (if available) : 17515176-2304521
ICRS Star Coord at Epoch: 17h 51m 51.75394s -23:04:52.12027s
RUWE (>1.4 is poor) : 0.85
K magnitude           : 7.883
G magnitude           : 14.407
RP magnitude          : 12.859
BP magnitude          : 17.885
DUPflag              : 0
Distance (au)         : 4.251
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 179.59
Sun-Moon sep (deg)   : 31.03
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.04
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 13.586
C/A sky separation (km) : 41883.2
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	2043-06-19T20:20:05.688	10.45	-10.41	71489.3	-35.54	-39.16
Jupiter	E	2043-06-19T22:18:38.943	-10.68x	10.56x	71489.2	-36.07	-39.70