

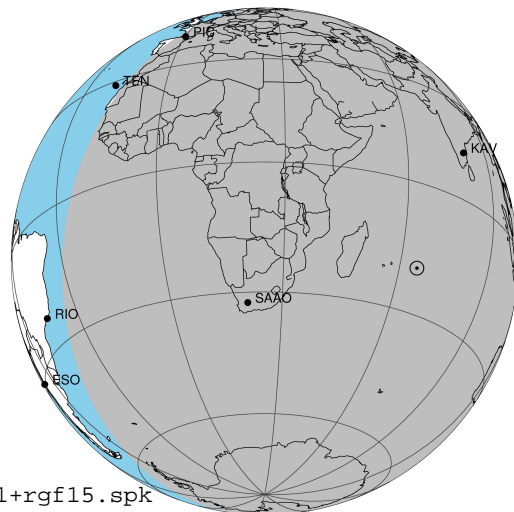
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2043-07-24T19:46:31.040  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4116684479252759680  
 2Mass ID (if available) : 17345780-2303254

Jupiter 2043-07-24T19:46:31 K8.69 G13.77 Pgt

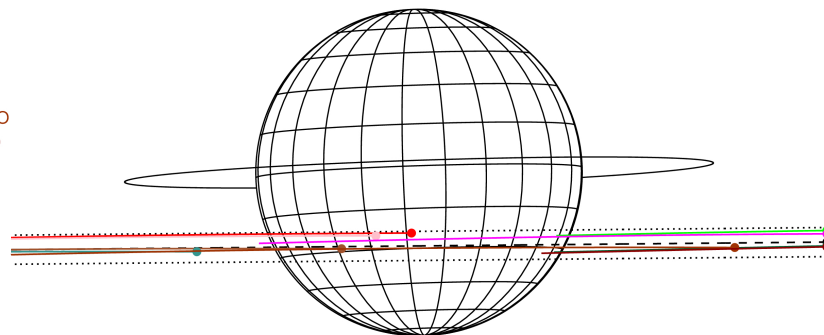
ICRS Star Coord at Epoch: 17h 34m 57.80478s -23°03:25.57454s

RUWE (>1.4 is poor) : 0.88  
 K magnitude : 8.690  
 G magnitude : 13.773  
 RP magnitude : 12.506  
 BP magnitude : 15.585  
 DUPflag : 0  
 Distance (au) : 4.407  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -10.57  
 Sun-Target sep (deg) : 143.02  
 Sun-Moon sep (deg) : 69.36  
 B (ring opening deg) : -2.38  
 PA of pole (deg) : 1.86  
 Pole direction: RA (deg): 268.05670  
 Dec (deg): 64.49731  
 C/A sky separation (") : 10.061  
 C/A sky separation (km) : 32159.2  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2043-07-24T19:46:31 K8.69 G13.77  
 Pgt



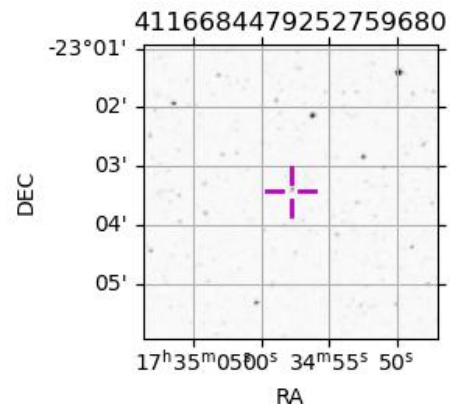
Earth  
 PIC  
 PMO  
 TEN  
 KAV  
 RIO  
 ESO  
 AAT  
 SAAO  
 MSO



2043-07-24T19:46:31.0400 α: 17 34 57.8048 δ: -23 03 25.575 C/A \*\*\*\*\* PA 0.54 deg v\_sky -10.57 km/s D 04.41 AU  
 Credit: Styled after SORA/Lucky Star

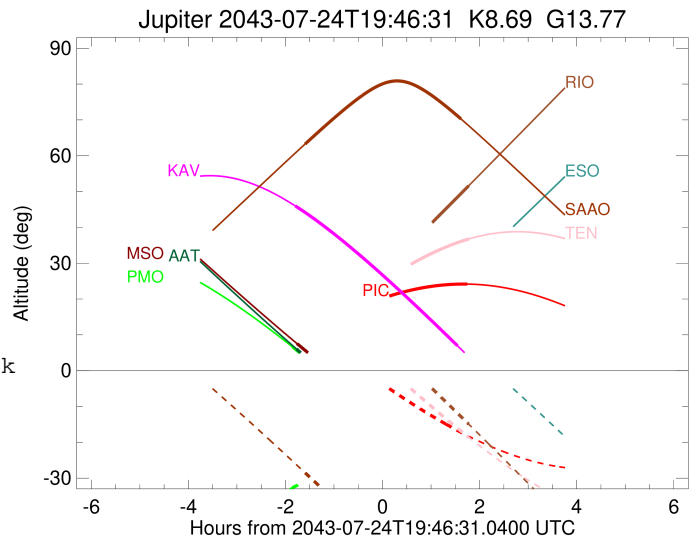
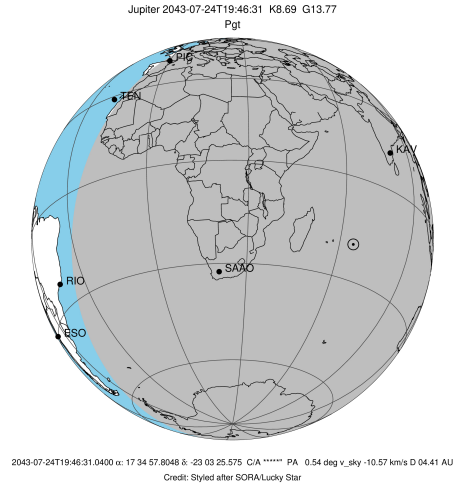
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	JUL 24 21:31 - JUL 24 21:31	Pne
PAL	Palomar Mt (200")	33.4	243.1			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+	JUL 24 17:55 - JUL 24 17:55	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	+	JUL 24 21:33 - JUL 24 21:33	Pne
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+ +	JUL 24 17:59 - JUL 24 21:19	Pie
RIO	Rio de Janeiro	-22.9	316.8	+	JUL 24 21:33 - JUL 24 21:33	Pne
ESO	European Southern Obs. (3.6m)	-29.3	289.3			Pnn
AAT	Siding Spring (AAT)	-31.3	149.1	+	JUL 24 18:00 - JUL 24 18:00	Pin
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	JUL 24 18:11 - JUL 24 21:23	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	JUL 24 18:00 - JUL 24 18:00	Pin



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-24T19:49:49.220
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      : 4116684479252759680
2Mass ID (if available) : 17345780-2303254
ICRS Star Coord at Epoch: 17h 34m 57.80478s -23:03:25.57454s
RUWE (>1.4 is poor) : 0.88
K magnitude          : 8.690
G magnitude          : 13.773
RP magnitude         : 12.506
BP magnitude         : 15.585
DUPflag             : 0
Distance (au)       : 4.407
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -10.57
Sun-Target sep (deg) : 143.02
Sun-Moon sep (deg)  : 69.80
B (ring opening deg) : -2.38
PA of pole (deg)    : 1.86
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49731
C/A sky separation (" ) : 8.296
C/A sky separation (km) : 26519.4
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
    
```

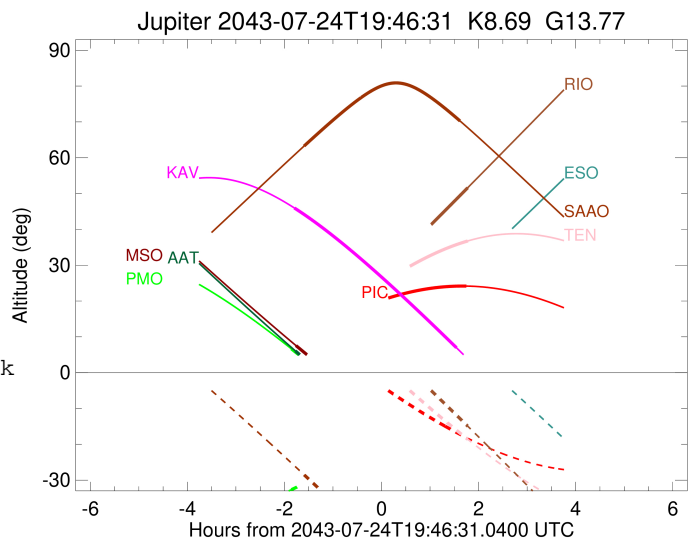
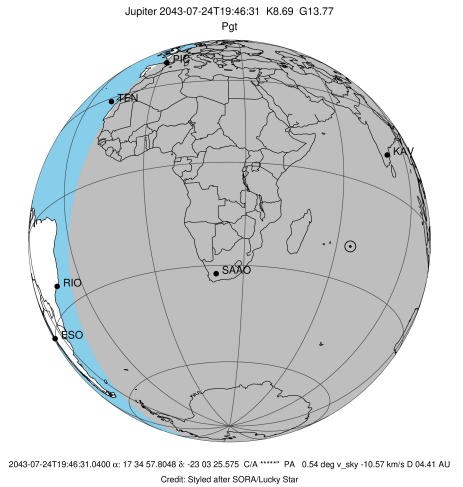


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-24T18:07:54.335	9.73	12.92x	71490.8	-23.50	-26.41
Jupiter	E	2043-07-24T21:31:20.340	24.16	-18.10	71491.1	-20.28	-22.89

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-24T19:37:20.290
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       : 4116684479252759680
2Mass ID (if available) : 17345780-2303254
ICRS Star Coord at Epoch: 17h 34m 57.80478s -23:03:25.57454s
RUWE (>1.4 is poor) : 0.88
K magnitude           : 8.690
G magnitude           : 13.773
RP magnitude         : 12.506
BP magnitude         : 15.585
DUPflag              : 0
Distance (au)        : 4.407
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -10.57
Sun-Target sep (deg) : 143.02
Sun-Moon sep (deg)  : 68.86
B (ring opening deg) : -2.38
PA of pole (deg)    : 1.86
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49731
C/A sky separation ("): 9.099
C/A sky separation (km): 29083.6
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
    
```

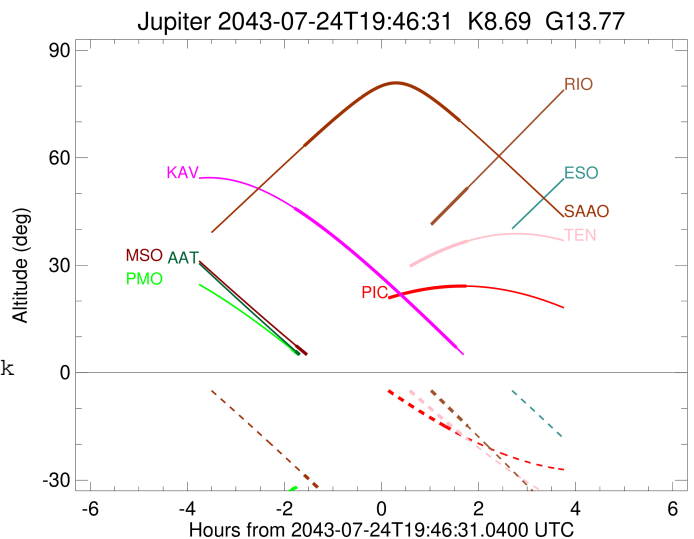
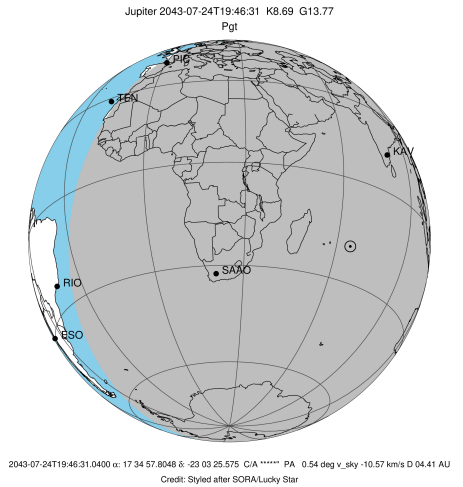


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-24T17:55:15.737	6.63	-32.65	71490.7	-24.50	-27.48
Jupiter	E	2043-07-24T21:21:22.146	-34.42x	0.34x	71490.8	-23.48	-26.38

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-24T19:52:42.380
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        : 4116684479252759680
2Mass ID (if available) : 17345780-2303254
ICRS Star Coord at Epoch: 17h 34m 57.80478s -23:03:25.57454s
RUWE (>1.4 is poor) : 0.88
K magnitude           : 8.690
G magnitude           : 13.773
RP magnitude          : 12.506
BP magnitude          : 15.585
DUPflag              : 0
Distance (au)         : 4.407
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -10.57
Sun-Target sep (deg) : 143.02
Sun-Moon sep (deg)   : 69.95
B (ring opening deg) : -2.38
PA of pole (deg)     : 1.86
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49731
C/A sky separation ("): 8.675
C/A sky separation (km): 27730.2
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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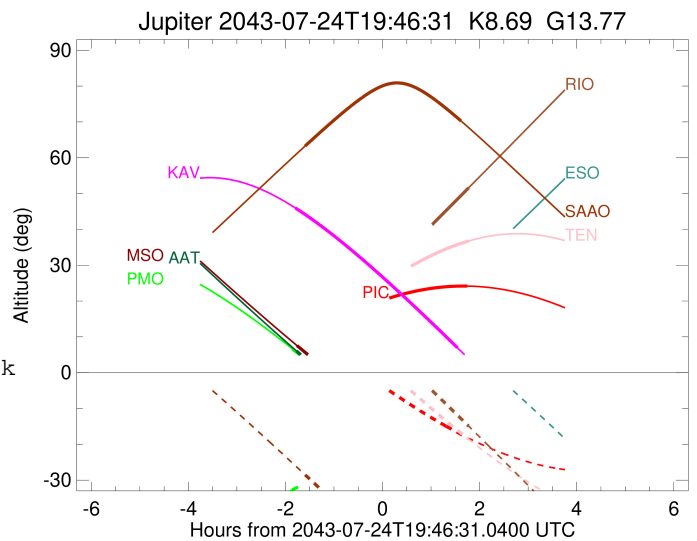
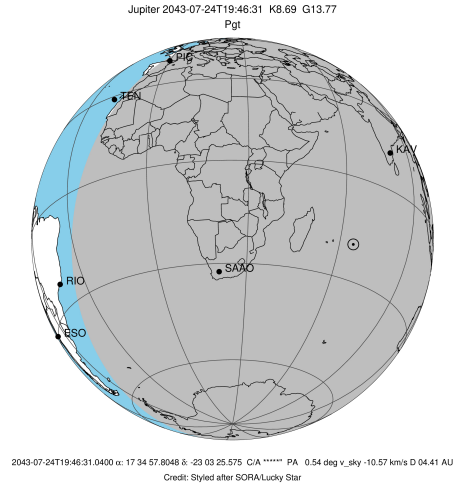


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-24T18:11:19.055	8.58	22.23x	71490.6	-24.80	-27.81
Jupiter	E	2043-07-24T21:33:11.590	36.76	-18.60	71491.0	-21.08	-23.76

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-24T19:38:16.290
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      : 4116684479252759680
2Mass ID (if available) : 17345780-2303254
ICRS Star Coord at Epoch: 17h 34m 57.80478s -23:03:25.57454s
RUWE (>1.4 is poor) : 0.88
K magnitude          : 8.690
G magnitude          : 13.773
RP magnitude         : 12.506
BP magnitude         : 15.585
DUPflag             : 0
Distance (au)       : 4.407
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -10.57
Sun-Target sep (deg) : 143.02
Sun-Moon sep (deg)  : 69.52
B (ring opening deg) : -2.38
PA of pole (deg)    : 1.86
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49731
C/A sky separation ("): 9.181
C/A sky separation (km): 29347.3
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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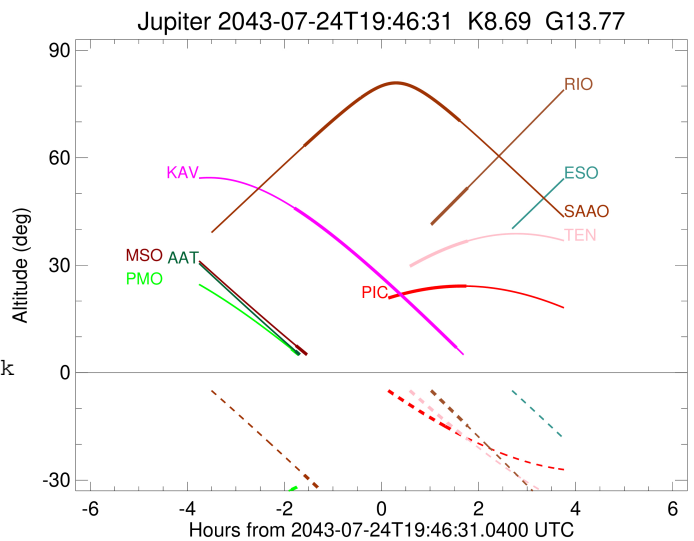
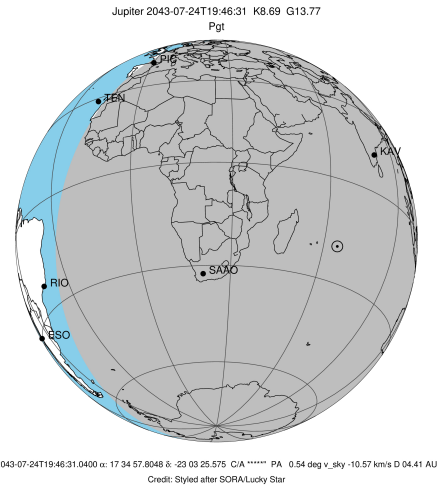


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-24T17:58:59.646	45.94	-55.28	71490.6	-24.96	-27.98
Jupiter	E	2043-07-24T21:19:10.548	6.96	-41.37	71490.7	-23.73	-26.66

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-24T19:55:45.270
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       : 4116684479252759680
2Mass ID (if available) : 17345780-2303254
ICRS Star Coord at Epoch: 17h 34m 57.80478s -23:03:25.57454s
RUWE (>1.4 is poor) : 0.88
K magnitude           : 8.690
G magnitude           : 13.773
RP magnitude          : 12.506
BP magnitude          : 15.585
DUPflag              : 0
Distance (au)        : 4.407
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -10.57
Sun-Target sep (deg) : 143.02
Sun-Moon sep (deg)   : 70.05
B (ring opening deg) : -2.38
PA of pole (deg)     : 1.86
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49731
C/A sky separation ("): 10.489
C/A sky separation (km): 33527.7
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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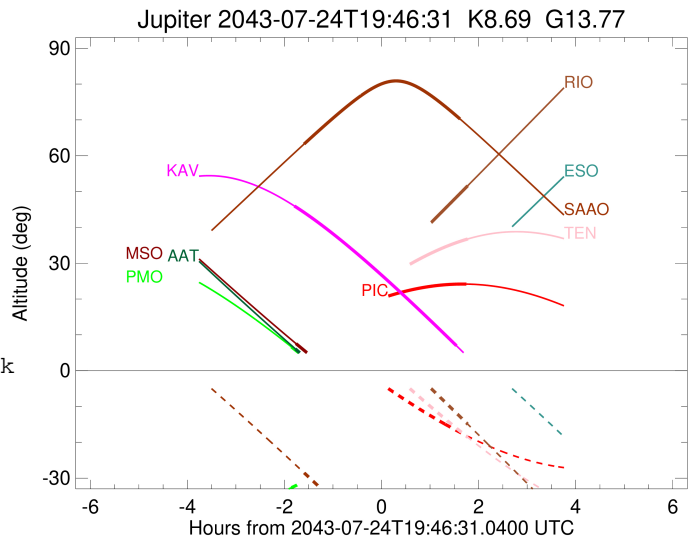
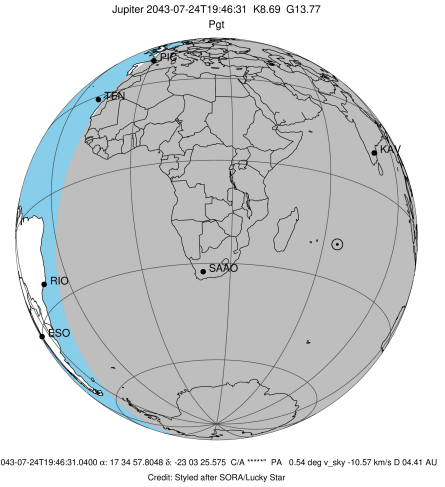


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-24T18:17:05.494	7.90	25.70x	71490.0	-30.14	-33.52
Jupiter	E	2043-07-24T21:33:02.762	51.61	-14.93	71490.5	-25.90	-29.00

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-24T19:38:25.600
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       : 4116684479252759680
2Mass ID (if available) : 17345780-2303254
ICRS Star Coord at Epoch: 17h 34m 57.80478s -23:03:25.57454s
RUWE (>1.4 is poor) : 0.88
K magnitude          : 8.690
G magnitude           : 13.773
RP magnitude         : 12.506
BP magnitude         : 15.585
DUPflag             : 0
Distance (au)        : 4.407
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -10.57
Sun-Target sep (deg) : 143.02
Sun-Moon sep (deg)   : 68.89
B (ring opening deg) : -2.38
PA of pole (deg)     : 1.86
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49731
C/A sky separation ("): 11.354
C/A sky separation (km): 36294.0
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
    
```

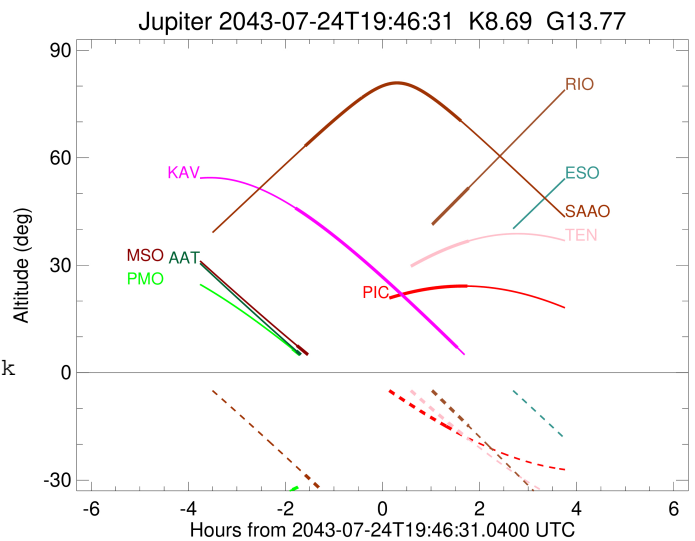
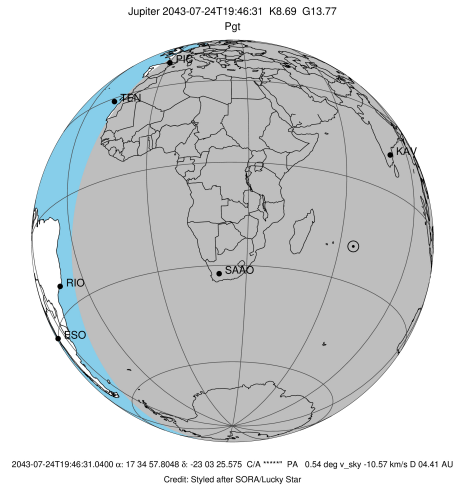


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-24T18:00:07.705	6.06	-37.45	71489.9	-31.00	-34.42
Jupiter	E	2043-07-24T21:18:21.175	-27.15x	3.52x	71490.1	-29.78	-33.14

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-24T19:47:13.030
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      : 4116684479252759680
2Mass ID (if available) : 17345780-2303254
ICRS Star Coord at Epoch: 17h 34m 57.80478s -23:03:25.57454s
RUWE (>1.4 is poor) : 0.88
K magnitude          : 8.690
G magnitude          : 13.773
RP magnitude         : 12.506
BP magnitude         : 15.585
DUPflag             : 0
Distance (au)       : 4.407
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -10.57
Sun-Target sep (deg) : 143.02
Sun-Moon sep (deg)  : 70.26
B (ring opening deg) : -2.38
PA of pole (deg)    : 1.86
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49731
C/A sky separation ("): 10.379
C/A sky separation (km): 33177.6
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
    
```



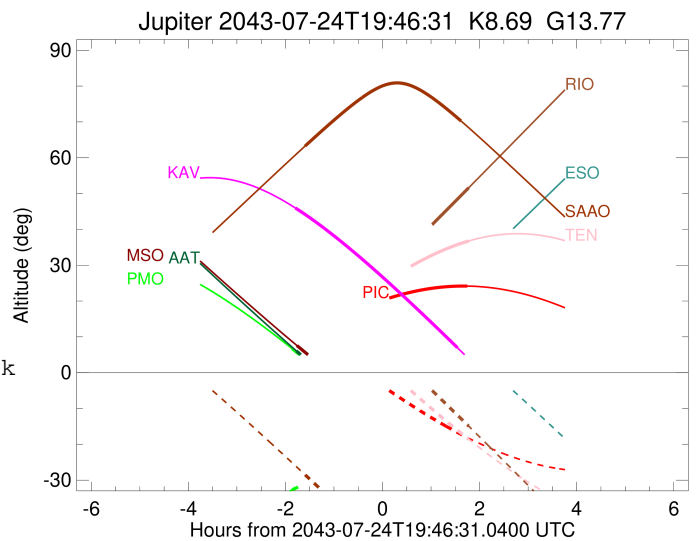
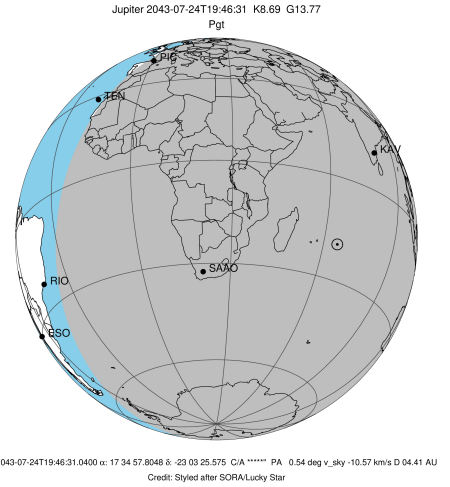
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-24T18:10:59.555	63.29	-28.53	71490.2	-29.18	-32.50
Jupiter	E	2043-07-24T21:23:30.000	70.27	-68.23	71490.5	-26.40	-29.54



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-24T19:38:47.160
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      : 4116684479252759680
2Mass ID (if available) : 17345780-2303254
ICRS Star Coord at Epoch: 17h 34m 57.80478s -23:03:25.57454s
RUWE (>1.4 is poor) : 0.88
K magnitude          : 8.690
G magnitude          : 13.773
RP magnitude         : 12.506
BP magnitude         : 15.585
DUPflag             : 0
Distance (au)       : 4.407
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -10.57
Sun-Target sep (deg) : 143.02
Sun-Moon sep (deg)  : 68.94
B (ring opening deg) : -2.38
PA of pole (deg)    : 1.86
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49731
C/A sky separation (" ) : 11.447
C/A sky separation (km) : 36589.5
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
    
```



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	2043-07-24T18:00:49.100	7.56	-37.39	71489.9	-31.31	-34.75
Jupiter	E	2043-07-24T21:18:18.224	-23.78x	1.72x	71490.1	-30.03	-33.40