

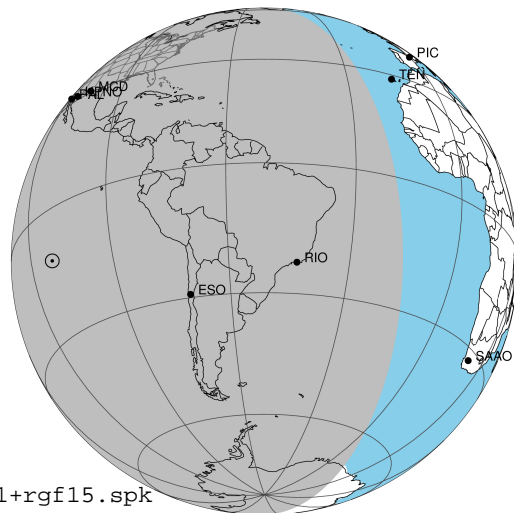
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2031-04-22T07:19:16.140  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4070200731005144576  
 2Mass ID (if available) : 17532110-2253599

Jupiter 2031-04-22T07:19:16 K9.21 G14.96 Pgt

ICRS Star Coord at Epoch: 17h 53m 21.09948s -22:54:00.31793s

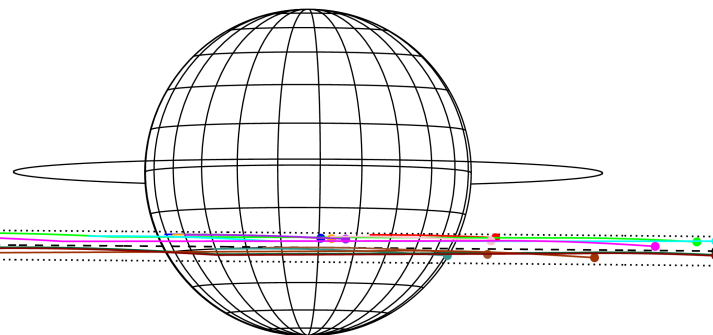
RUWE (>1.4 is poor) : 0.93  
 K magnitude : 9.210  
 G magnitude : 14.959  
 RP magnitude : 13.595  
 BP magnitude : 17.231  
 DUPflag : 0  
 Distance (au) : 4.683  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -3.05  
 Sun-Target sep (deg) : 123.08  
 Sun-Moon sep (deg) : 130.04  
 B (ring opening deg) : -2.60  
 PA of pole (deg) : -0.12  
 Pole direction: RA (deg): 268.05697  
 Dec (deg): 64.49651  
 C/A sky separation (") : 9.663  
 C/A sky separation (km) : 32817.6  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2031-04-22T07:19:16 K9.21 G14.96  
 Pgt



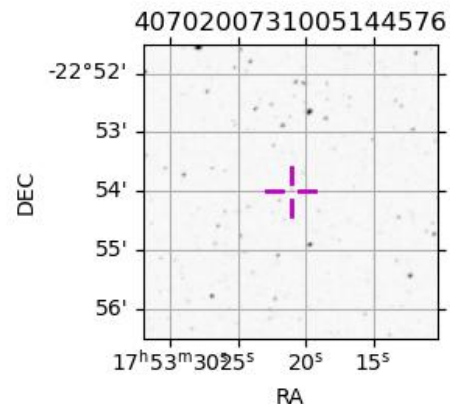
2031-04-22T07:19:16.1400 α: 17 53 21.0995 δ: -22 54 00.318 C/A 9.675° PA 359.52 deg v\_sky - 3.05 km/s D 04.68 AU  
 Credit: Styled after SORA/Lucky Star

Earth  
 PIC  
 PAL  
 PMO  
 KPNO  
 MCD  
 TEN  
 IRTF  
 KAV  
 RIO  
 ESO  
 AAT  
 SAAO  
 MSO



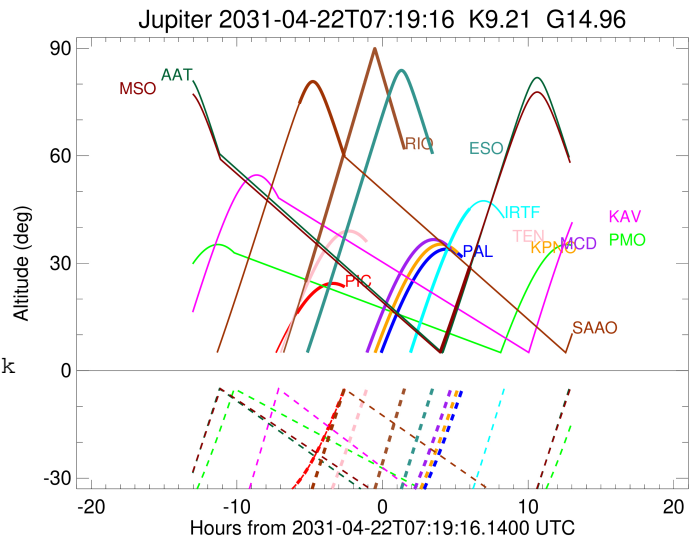
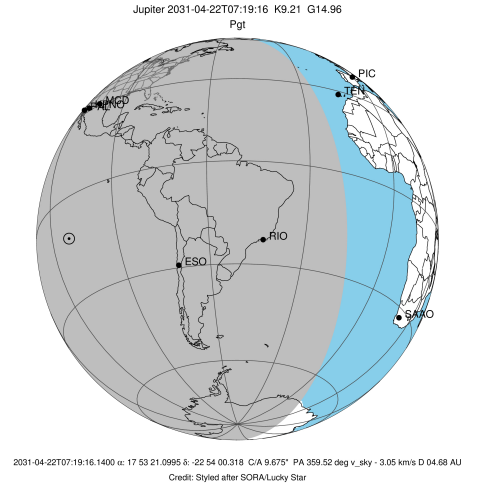
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	APR 22 01:27 - APR 22 01:27	Pin
PAL	Palomar Mt (200")	33.4	243.1			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
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	+	APR 22 01:38 - APR 22 01:38	Pin
IRTF	Mauna Kea/IRTF	19.8	204.5	+	APR 22 13:19 - APR 22 13:19	Pne
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+	APR 22 02:02 - APR 22 02:02	Pin
ESO	European Southern Obs. (3.6m)	-29.3	289.3			Pnn
AAT	Siding Spring (AAT)	-31.3	149.1	+	APR 22 13:21 - APR 22 13:21	Pne
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	APR 22 01:36 - APR 22 01:36	Pin
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	APR 22 13:19 - APR 22 13:19	Pne



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-04-22T06:56:09.840
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        : 4070200731005144576
2Mass ID (if available) : 17532110-2253599
ICRS Star Coord at Epoch: 17h 53m 21.09948s -22:54:00.31792s
RUWE (>1.4 is poor) : 0.93
K magnitude           : 9.210
G magnitude           : 14.959
RP magnitude          : 13.595
BP magnitude          : 17.231
DUPflag              : 0
Distance (au)         : 4.683
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -3.05
Sun-Target sep (deg)  : 123.08
Sun-Moon sep (deg)   : 130.51
B (ring opening deg) : -2.60
PA of pole (deg)     : -0.12
Pole direction: RA (deg): 268.05697
Dec (deg): 64.49651
C/A sky separation (") : 8.129
C/A sky separation (km) : 27610.0
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
    
```

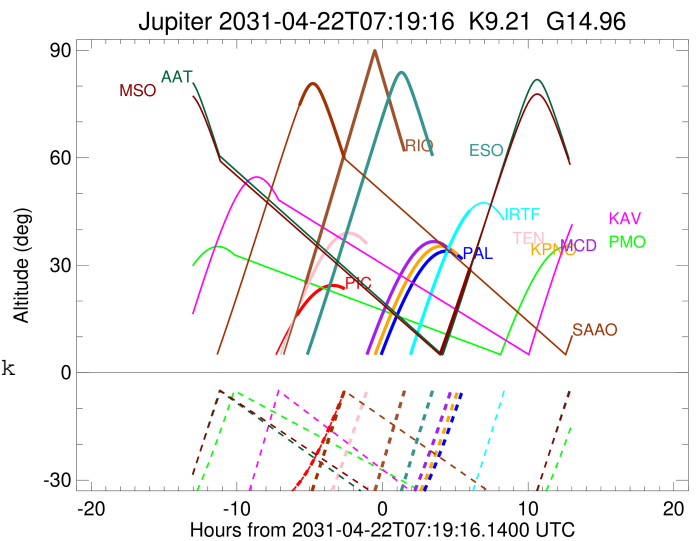
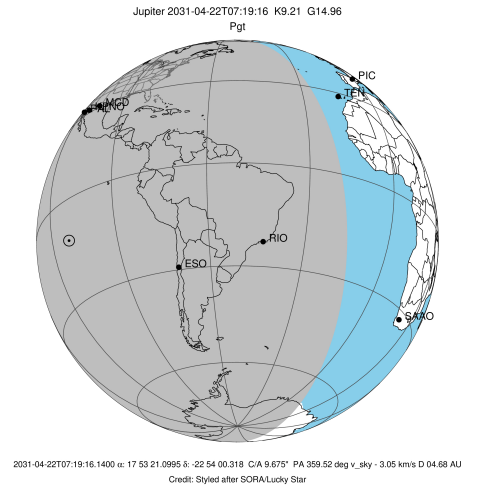


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-04-22T01:27:05.761	16.04	-31.51	71490.6	-22.84	-25.68
Jupiter	E	2031-04-22T12:50:01.903	-47.40x	57.47x	71490.4	-24.57	-27.56

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-04-22T06:59:52.830
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       : 4070200731005144576
2Mass ID (if available) : 17532110-2253599
ICRS Star Coord at Epoch: 17h 53m 21.09948s -22:54:00.31792s
RUWE (>1.4 is poor) : 0.93
K magnitude           : 9.210
G magnitude           : 14.959
RP magnitude          : 13.595
BP magnitude          : 17.231
DUPflag              : 0
Distance (au)        : 4.683
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -3.05
Sun-Target sep (deg) : 123.08
Sun-Moon sep (deg)   : 130.70
B (ring opening deg) : -2.60
PA of pole (deg)     : -0.12
Pole direction: RA (deg): 268.05697
Dec (deg): 64.49651
C/A sky separation (") : 8.301
C/A sky separation (km) : 28191.4
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
    
```

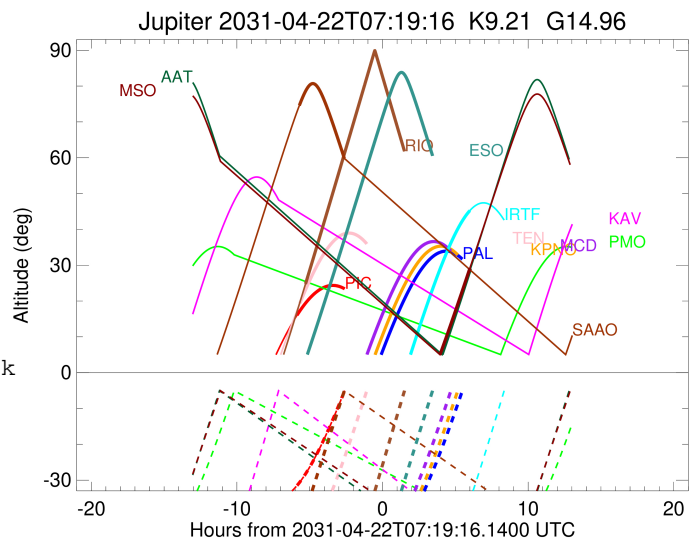
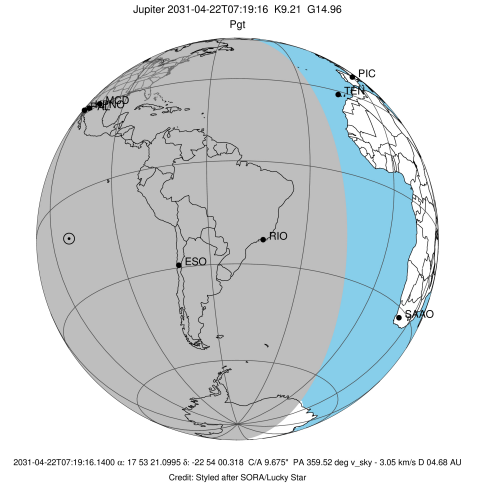


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-04-22T01:38:54.090	19.36	-48.94	71490.5	-23.94	-26.87
Jupiter	E	2031-04-22T12:38:34.253	-31.55x	72.99x	71490.3	-25.35	-28.40

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-04-22T08:01:20.380
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        : 4070200731005144576
2Mass ID (if available) : 17532110-2253599
ICRS Star Coord at Epoch: 17h 53m 21.09948s -22:54:00.31793s
RUWE (>1.4 is poor) : 0.93
K magnitude           : 9.210
G magnitude           : 14.959
RP magnitude          : 13.595
BP magnitude          : 17.231
DUPflag              : 0
Distance (au)         : 4.682
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -3.05
Sun-Target sep (deg) : 123.08
Sun-Moon sep (deg)   : 129.26
B (ring opening deg) : -2.60
PA of pole (deg)     : -0.12
Pole direction: RA (deg): 268.05697
Dec (deg): 64.49651
C/A sky separation (") : 9.119
C/A sky separation (km) : 30968.3
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
    
```

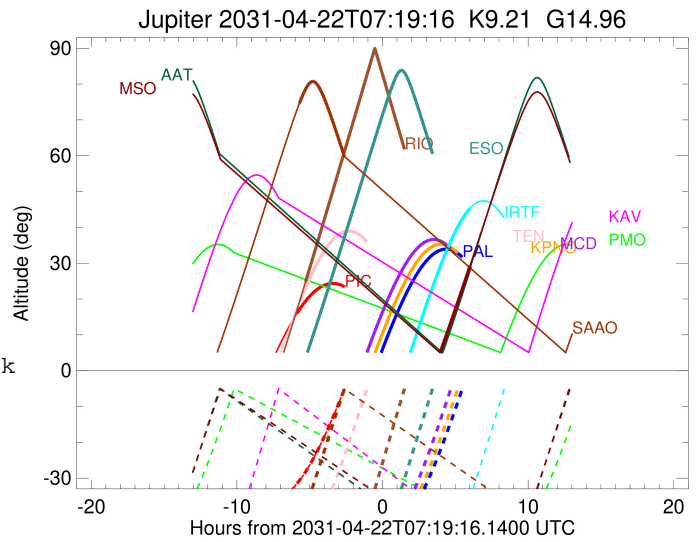
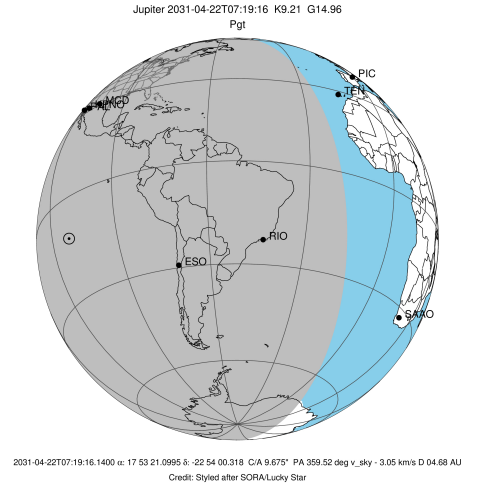


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-04-22T01:18:05.773	-75.81x	46.75x	71490.0	-27.93	-31.18
Jupiter	E	2031-04-22T13:19:12.499	45.24	-35.63	71490.6	-23.17	-26.05

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-04-22T07:14:15.720
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        : 4070200731005144576
2Mass ID (if available) : 17532110-2253599
ICRS Star Coord at Epoch: 17h 53m 21.09948s -22:54:00.31793s
RUWE (>1.4 is poor) : 0.93
K magnitude           : 9.210
G magnitude           : 14.959
RP magnitude          : 13.595
BP magnitude          : 17.231
DUPflag              : 0
Distance (au)         : 4.683
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -3.05
Sun-Target sep (deg) : 123.08
Sun-Moon sep (deg)   : 130.82
B (ring opening deg) : -2.60
PA of pole (deg)     : -0.12
Pole direction: RA (deg): 268.05697
Dec (deg): 64.49651
C/A sky separation (") : 9.665
C/A sky separation (km) : 32825.8
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
    
```

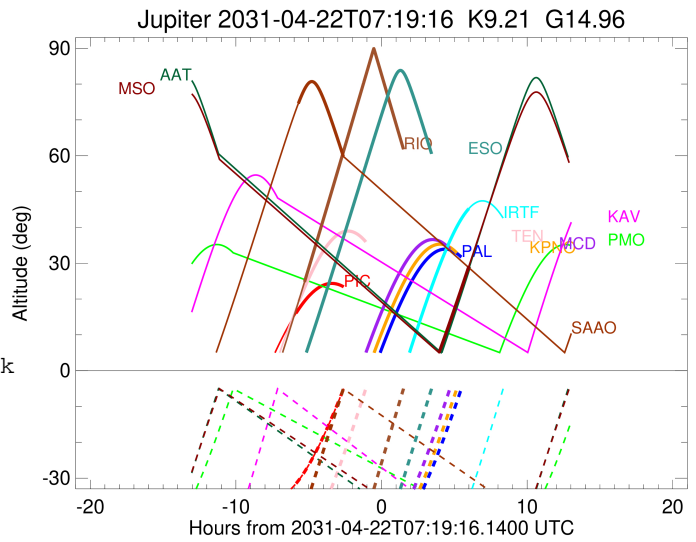
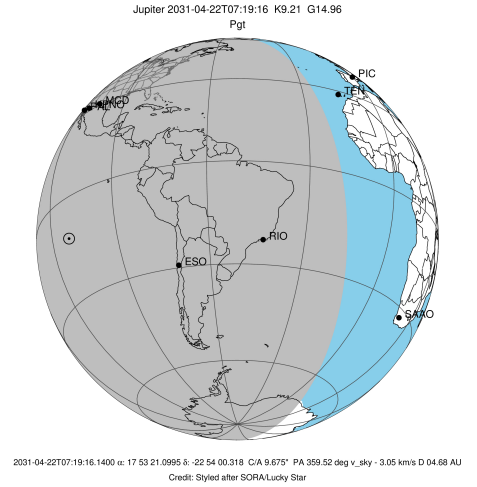


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-04-22T02:02:00.056	24.76	-74.10	71489.8	-29.01	-32.32
Jupiter	E	2031-04-22T12:24:03.926	13.53	39.73x	71489.8	-28.87	-32.18

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-04-22T07:37:22.330
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      : 4070200731005144576
2Mass ID (if available) : 17532110-2253599
ICRS Star Coord at Epoch: 17h 53m 21.09948s -22:54:00.31793s
RUWE (>1.4 is poor) : 0.93
K magnitude          : 9.210
G magnitude          : 14.959
RP magnitude         : 13.595
BP magnitude         : 17.231
DUPflag             : 0
Distance (au)        : 4.683
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -3.05
Sun-Target sep (deg) : 123.08
Sun-Moon sep (deg)  : 129.46
B (ring opening deg) : -2.60
PA of pole (deg)    : -0.12
Pole direction: RA (deg): 268.05697
Dec (deg): 64.49651
C/A sky separation (" ) : 11.120
C/A sky separation (km) : 37764.5
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
    
```

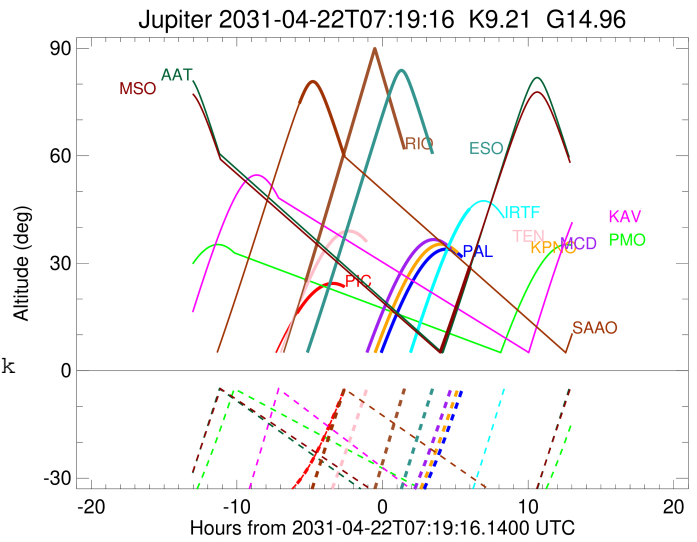
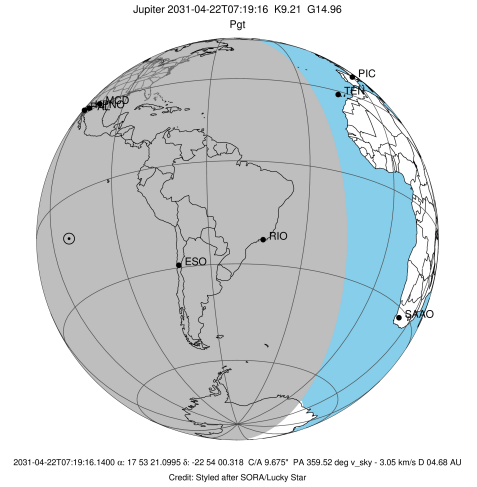


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-04-22T01:08:21.470	-1.88x	44.91x	71489.5	-31.08	-34.51
Jupiter	E	2031-04-22T13:21:46.056	29.02	-68.95	71489.8	-28.96	-32.27

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-04-22T06:44:43.120
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       : 4070200731005144576
2Mass ID (if available) : 17532110-2253599
ICRS Star Coord at Epoch: 17h 53m 21.09948s -22:54:00.31792s
RUWE (>1.4 is poor) : 0.93
K magnitude          : 9.210
G magnitude          : 14.959
RP magnitude         : 13.595
BP magnitude         : 17.231
DUPflag             : 0
Distance (au)        : 4.683
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -3.05
Sun-Target sep (deg) : 123.08
Sun-Moon sep (deg)   : 130.83
B (ring opening deg) : -2.60
PA of pole (deg)     : -0.12
Pole direction: RA (deg): 268.05697
Dec (deg): 64.49651
C/A sky separation ("): 10.332
C/A sky separation (km): 35093.3
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
    
```

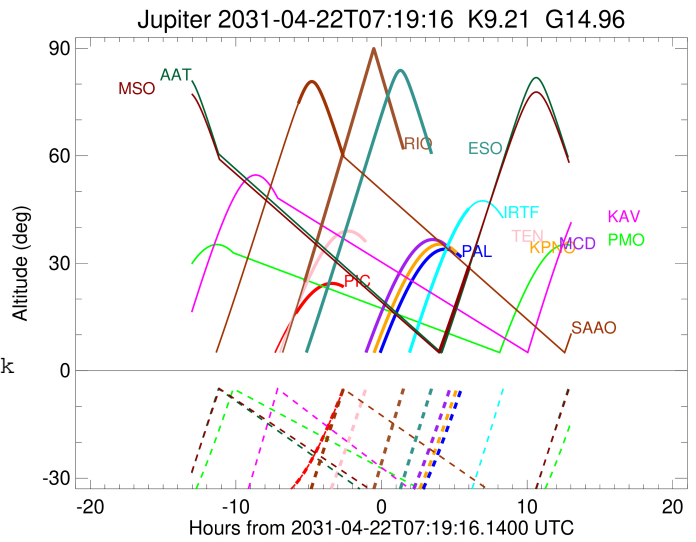
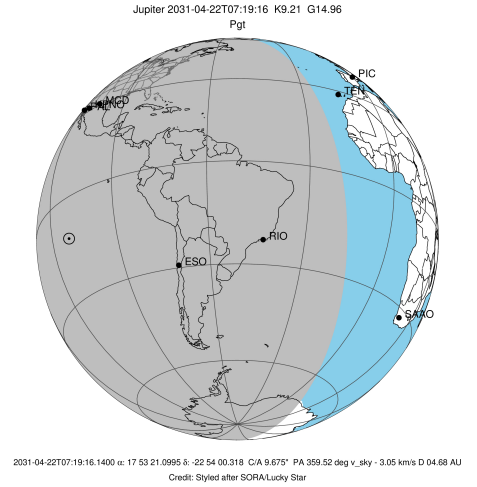


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-04-22T01:36:33.412	74.56	-43.92	71489.9	-28.64	-31.93
Jupiter	E	2031-04-22T12:32:09.303	-28.07x	37.50x	71489.5	-31.54	-35.00

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch              : 2031-04-22T07:36:24.240
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        : 4070200731005144576
2Mass ID (if available) : 17532110-2253599
ICRS Star Coord at Epoch: 17h 53m 21.09948s -22:54:00.31793s
RUWE (>1.4 is poor)  : 0.93
K magnitude           : 9.210
G magnitude           : 14.959
RP magnitude          : 13.595
BP magnitude          : 17.231
DUPflag              : 0
Distance (au)         : 4.683
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -3.05
Sun-Target sep (deg)  : 123.08
Sun-Moon sep (deg)    : 129.51
B (ring opening deg)  : -2.60
PA of pole (deg)      : -0.12
Pole direction: RA (deg): 268.05697
Dec (deg): 64.49651
C/A sky separation (") : 11.197
C/A sky separation (km) : 38027.0
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	2031-04-22T01:10:56.332	-0.39x	41.22x	71489.5	-31.39	-34.83
Jupiter	E	2031-04-22T13:19:28.687	29.18	-65.12	71489.8	-29.33	-32.66