

target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2043-07-08T04:05:53.840  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4116875003993720320  
 2Mass ID (if available) : 17420378-2303540

Jupiter 2043-07-08T04:05:53 K8.03 G11.23 Pgt

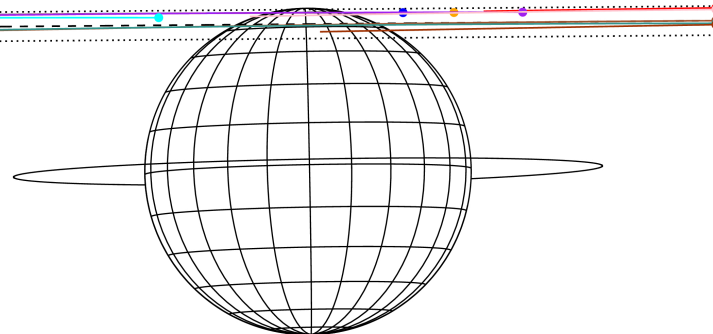
ICRS Star Coord at Epoch: 17h 42m 03.80561s -23°03:54.01982s

RUWE (>1.4 is poor) : 0.82  
 K magnitude : 8.034  
 G magnitude : 11.228  
 RP magnitude : 10.295  
 BP magnitude : 12.127  
 DUPflag : 0  
 Distance (au) : 4.291  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -14.79  
 Sun-Target sep (deg) : 160.54  
 Sun-Moon sep (deg) : 141.11  
 B (ring opening deg) : -2.42  
 PA of pole (deg) : 1.09  
 Pole direction: RA (deg): 268.05669  
 Dec (deg): 64.49732  
 C/A sky separation (") : 20.757  
 C/A sky separation (km) : 64595.4  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2043-07-08T04:05:53 K8.03 G11.23  
 Pgt



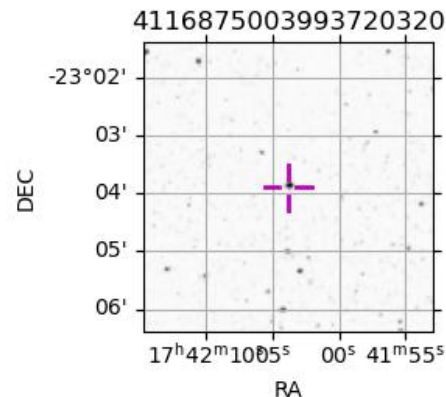
Earth  
 PIC  
 PAL  
 KPNO  
 MCD  
 TEN  
 IRTF  
 RIO  
 ESO  
 SAAO  
 MSO



2043-07-08T04:05:53.8400 a: 17 42 03.8056 8: -23 03 54.020 C/A \*\*\*\*\* PA 180.48 deg v\_sky -14.79 km/s D 04.29 AU  
 Credit: Styled after SORA/Lucky Star

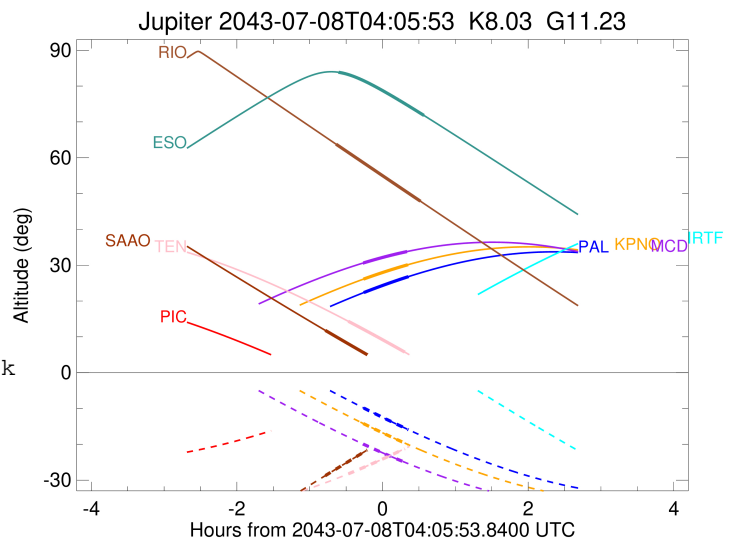
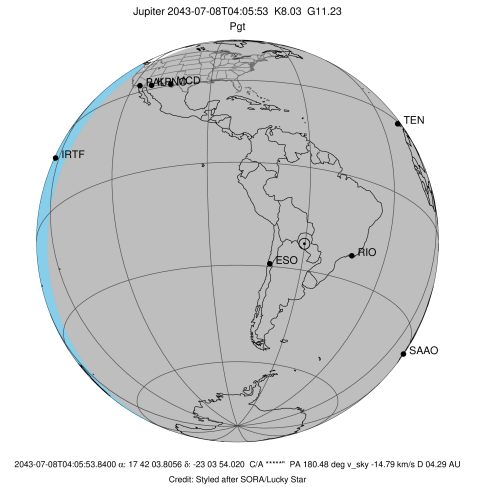
Observable events with sun below -5 deg and altitude above 5 deg

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	+ +	JUL 08 03:50 - JUL 08 04:27	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JUL 08 03:50 - JUL 08 04:26	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JUL 08 03:49 - JUL 08 04:26	Pie
TEN	Teide Obs./Tenerife	28.3	343.5	+ +	JUL 08 03:37 - JUL 08 04:24	Pie
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+ +	JUL 08 03:27 - JUL 08 04:37	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUL 08 03:29 - JUL 08 04:40	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	JUL 08 03:18 - JUL 08 03:18	Pin
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-08T04:08:53.410
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        : 4116875003993720320
2Mass ID (if available) : 17420378-2303540
ICRS Star Coord at Epoch: 17h 42m 03.80561s -23:03:54.01982s
RUWE (>1.4 is poor) : 0.82
K magnitude           : 8.034
G magnitude           : 11.228
RP magnitude          : 10.295
BP magnitude          : 12.127
DUPflag              : 0
Distance (au)         : 4.291
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.79
Sun-Target sep (deg) : 160.54
Sun-Moon sep (deg)   : 141.81
B (ring opening deg) : -2.42
PA of pole (deg)     : 1.09
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 22.337
C/A sky separation (km): 69511.5
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
    
```

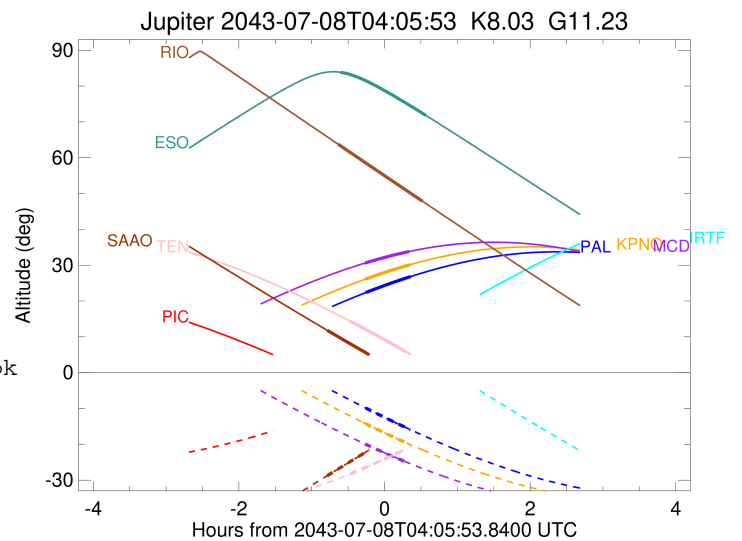
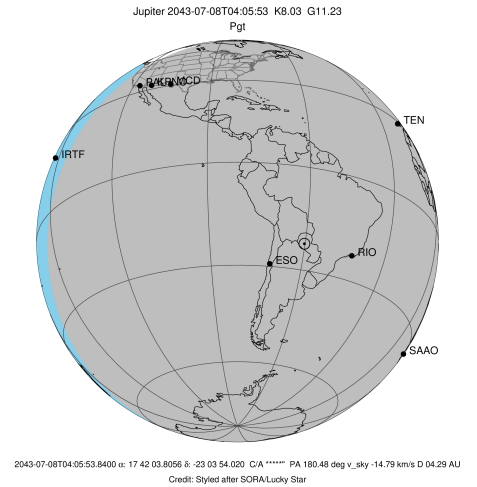


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-08T03:50:27.225	22.35	-9.87	71484.6	75.35	77.02
Jupiter	E	2043-07-08T04:27:18.481	26.81	-15.92	71484.4	77.21	78.69

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-08T04:08:31.920
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        : 4116875003993720320
2Mass ID (if available) : 17420378-2303540
ICRS Star Coord at Epoch: 17h 42m 03.80561s -23:03:54.01982s
RUWE (>1.4 is poor) : 0.82
K magnitude           : 8.034
G magnitude           : 11.228
RP magnitude          : 10.295
BP magnitude          : 12.127
DUPflag              : 0
Distance (au)         : 4.291
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.79
Sun-Target sep (deg) : 160.54
Sun-Moon sep (deg)   : 141.80
B (ring opening deg) : -2.42
PA of pole (deg)     : 1.09
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 22.340
C/A sky separation (km) : 69522.3
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
    
```

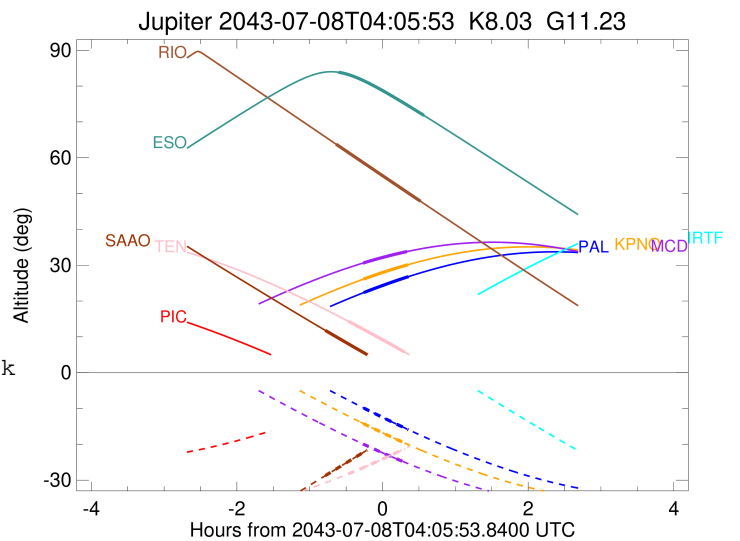
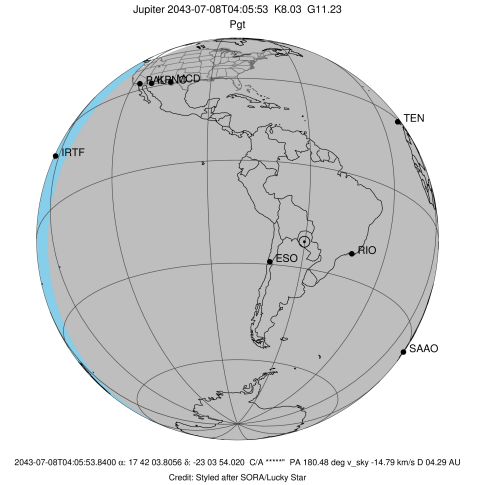


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-08T03:50:10.446	26.10	-14.21	71484.6	75.42	77.09
Jupiter	E	2043-07-08T04:26:52.434	30.13	-20.05	71484.5	77.21	78.68

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-08T04:07:56.470
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      : 4116875003993720320
2Mass ID (if available) : 17420378-2303540
ICRS Star Coord at Epoch: 17h 42m 03.80561s -23:03:54.01982s
RUWE (>1.4 is poor) : 0.82
K magnitude          : 8.034
G magnitude          : 11.228
RP magnitude         : 10.295
BP magnitude         : 12.127
DUPflag             : 0
Distance (au)       : 4.291
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.79
Sun-Target sep (deg) : 160.54
Sun-Moon sep (deg)  : 141.77
B (ring opening deg) : -2.42
PA of pole (deg)    : 1.09
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 22.352
C/A sky separation (km) : 69558.9
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
    
```

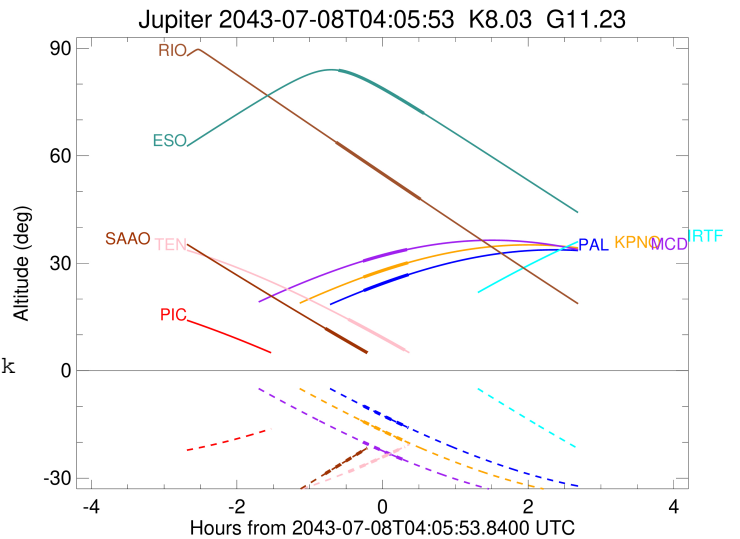
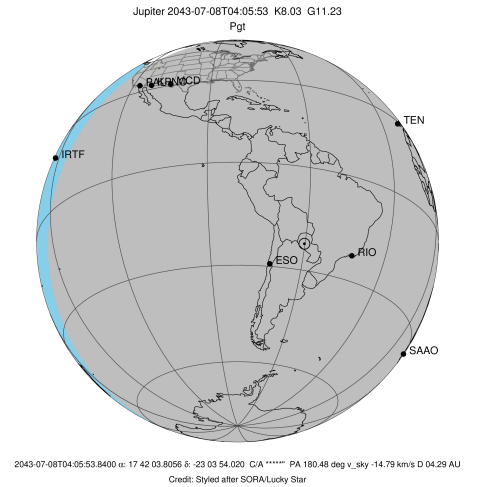


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-08T03:49:47.142	30.59	-19.90	71484.6	75.61	77.26
Jupiter	E	2043-07-08T04:26:05.097	33.80	-25.26	71484.4	77.26	78.73

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-08T04:00:58.500
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        : 4116875003993720320
2Mass ID (if available) : 17420378-2303540
ICRS Star Coord at Epoch: 17h 42m 03.80561s -23:03:54.01982s
RUWE (>1.4 is poor)  : 0.82
K magnitude           : 8.034
G magnitude           : 11.228
RP magnitude          : 10.295
BP magnitude          : 12.127
DUPflag              : 0
Distance (au)         : 4.291
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.79
Sun-Target sep (deg) : 160.54
Sun-Moon sep (deg)   : 140.67
B (ring opening deg) : -2.42
PA of pole (deg)     : 1.09
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 21.968
C/A sky separation (km) : 68363.2
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
    
```

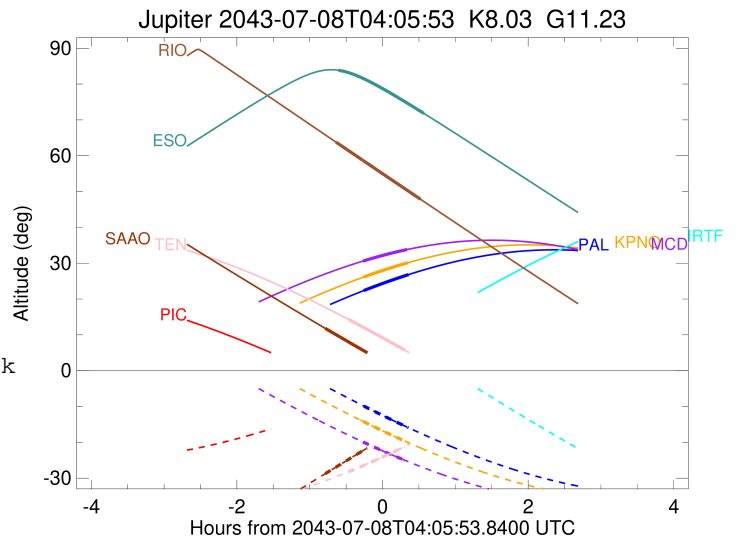
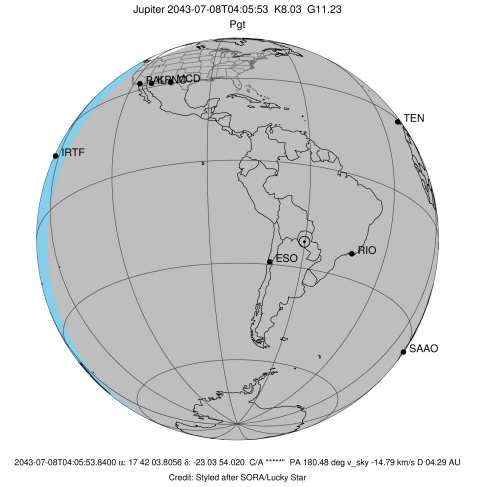


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-08T03:37:43.544	14.34	-28.24	71484.8	72.76	74.71
Jupiter	E	2043-07-08T04:24:17.037	5.73	-21.20	71484.8	72.89	74.82

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-08T04:02:22.040
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        : 4116875003993720320
2Mass ID (if available) : 17420378-2303540
ICRS Star Coord at Epoch: 17h 42m 03.80561s -23:03:54.01982s
RUWE (>1.4 is poor)  : 0.82
K magnitude           : 8.034
G magnitude           : 11.228
RP magnitude          : 10.295
BP magnitude          : 12.127
DUPflag              : 0
Distance (au)         : 4.291
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.79
Sun-Target sep (deg)  : 160.54
Sun-Moon sep (deg)    : 141.17
B (ring opening deg)  : -2.42
PA of pole (deg)      : 1.09
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 20.623
C/A sky separation (km) : 64177.2
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
    
```

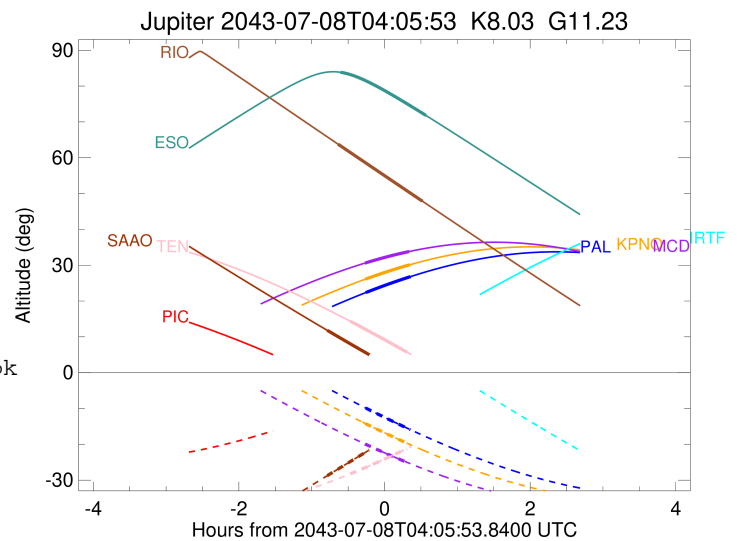
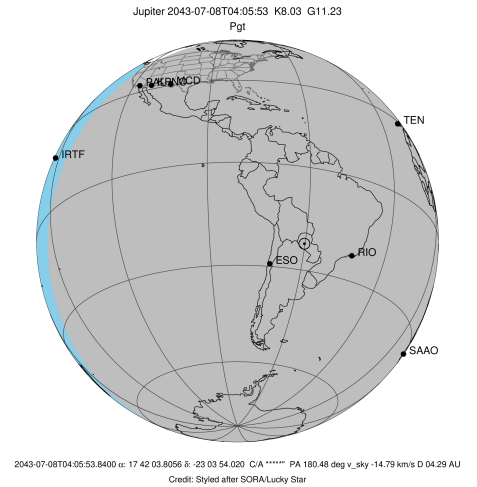


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-08T03:27:40.687	63.76	-83.13	71485.6	63.49	66.29
Jupiter	E	2043-07-08T04:37:09.136	47.86	-67.13	71485.6	63.96	66.72

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-08T04:04:53.680
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        : 4116875003993720320
2Mass ID (if available) : 17420378-2303540
ICRS Star Coord at Epoch: 17h 42m 03.80561s -23:03:54.01982s
RUWE (>1.4 is poor) : 0.82
K magnitude           : 8.034
G magnitude           : 11.228
RP magnitude          : 10.295
BP magnitude          : 12.127
DUPflag              : 0
Distance (au)         : 4.291
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.79
Sun-Target sep (deg)  : 160.54
Sun-Moon sep (deg)    : 141.57
B (ring opening deg)  : -2.42
PA of pole (deg)      : 1.09
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 20.532
C/A sky separation (km) : 63896.0
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
    
```

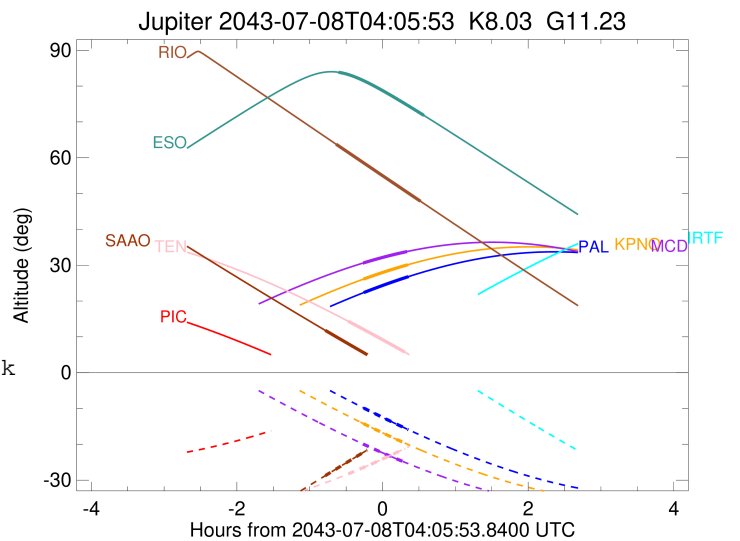
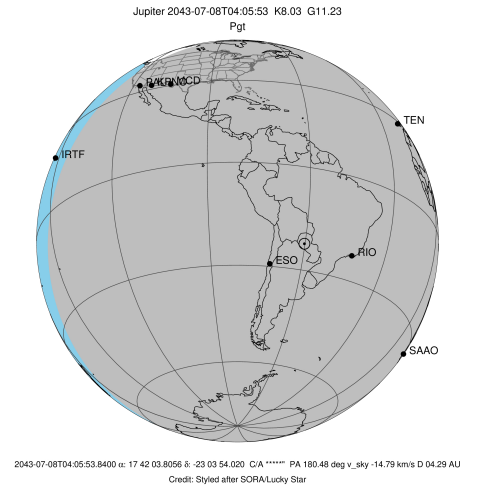


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-08T03:29:40.551	83.84	-71.21	71485.7	62.70	65.57
Jupiter	E	2043-07-08T04:40:08.861	71.77	-83.16	71485.6	63.72	66.50

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-08T04:00:37.340
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        : 4116875003993720320
2Mass ID (if available) : 17420378-2303540
ICRS Star Coord at Epoch: 17h 42m 03.80561s -23:03:54.01982s
RUWE (>1.4 is poor)  : 0.82
K magnitude           : 8.034
G magnitude           : 11.228
RP magnitude          : 10.295
BP magnitude          : 12.127
DUPflag              : 0
Distance (au)         : 4.291
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -14.79
Sun-Target sep (deg)  : 160.54
Sun-Moon sep (deg)    : 140.45
B (ring opening deg)  : -2.42
PA of pole (deg)      : 1.09
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 19.633
C/A sky separation (km) : 61096.8
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	2043-07-08T03:18:42.180	11.82	-28.76	71486.2	58.62	61.78
Jupiter	E	2043-07-08T04:42:44.996	-4.29x	-11.57	71486.2	58.67	61.83