

target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-07-12T03:30:35.600
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4114691854909340288
 2Mass ID (if available) : 17185010-2241456

Jupiter 2031-07-12T03:30:35 K8.25 G14.07 Pgt

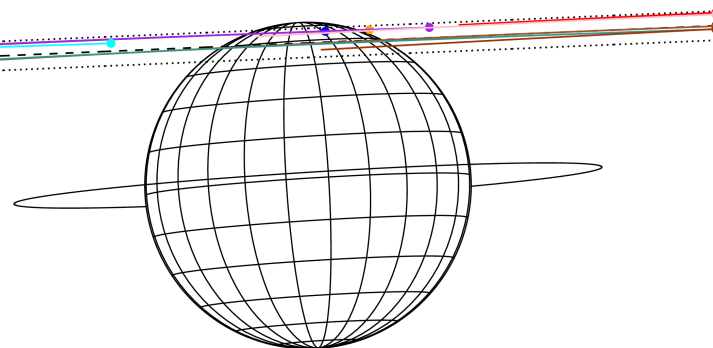
ICRS Star Coord at Epoch: 17h 18m 50.09436s -22:41:45.78871s

RUWE (>1.4 is poor) : 1.09
 K magnitude : 8.253
 G magnitude : 14.074
 RP magnitude : 12.591
 BP magnitude : 16.971
 DUPflag : 0
 Distance (au) : 4.357
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -12.92
 Sun-Target sep (deg) : 151.31
 Sun-Moon sep (deg) : 126.38
 B (ring opening deg) : -2.57
 PA of pole (deg) : 3.59
 Pole direction: RA (deg): 268.05690
 Dec (deg): 64.49651
 C/A sky separation (") : 19.748
 C/A sky separation (km) : 62402.9
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-07-12T03:30:35 K8.25 G14.07
 Pgt



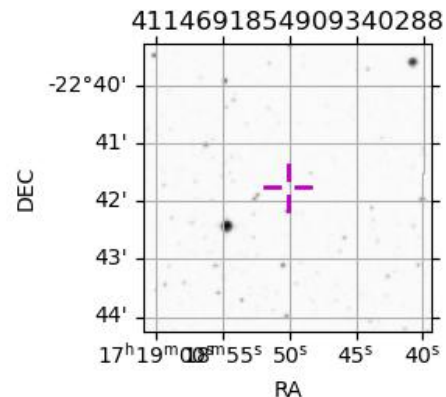
Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 SAAO



2031-07-12T03:30:35.6000 a: 17 18 50.0944 d: -22 41 45.789 C/A ***** PA 182.42 deg v_sky -12.92 km/s D 04.36 AU
 Credit: Styled after SORA/Lucky Star

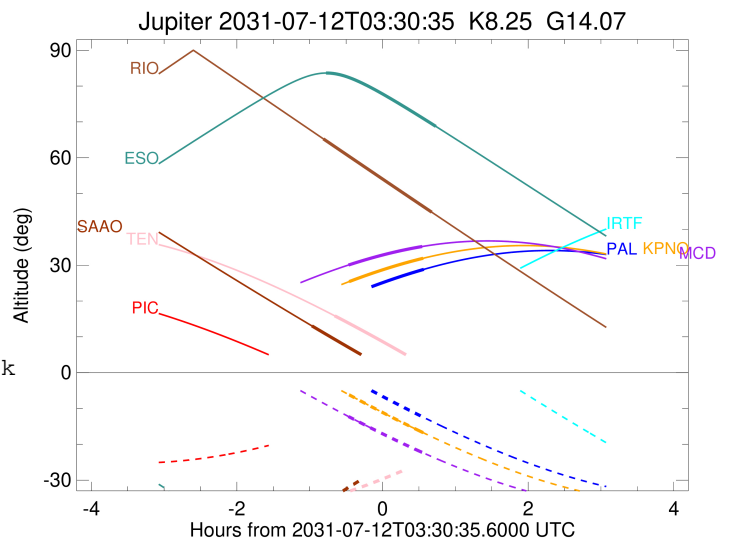
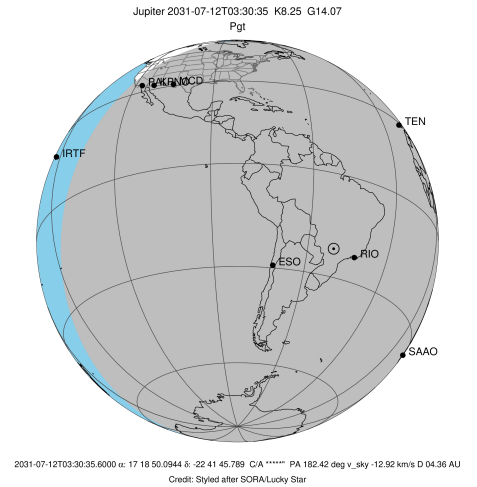
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1			Pnn
PAL	Palomar Mt (200")	33.4	243.1	+	JUL 12 04:04 - JUL 12 04:04	Pne
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JUL 12 03:03 - JUL 12 04:04	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JUL 12 03:02 - JUL 12 04:03	Pie
TEN	Teide Obs./Tenerife	28.3	343.5	+	JUL 12 02:51 - JUL 12 02:51	Pin
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 12 02:41 - JUL 12 04:11	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUL 12 02:44 - JUL 12 04:14	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	JUL 12 02:32 - JUL 12 02:32	Pin
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-07-12T03:34:01.640
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      : 4114691854909340288
2Mass ID (if available) : 17185010-2241456
ICRS Star Coord at Epoch: 17h 18m 50.09436s -22:41:45.78871s
RUWE (>1.4 is poor) : 1.09
K magnitude          : 8.253
G magnitude          : 14.074
RP magnitude         : 12.591
BP magnitude         : 16.971
DUPflag             : 0
Distance (au)       : 4.357
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.92
Sun-Target sep (deg) : 151.31
Sun-Moon sep (deg)   : 126.43
B (ring opening deg) : -2.57
PA of pole (deg)     : 3.59
Pole direction: RA (deg): 268.05690
Dec (deg): 64.49651
C/A sky separation ("): 21.272
C/A sky separation (km): 67217.7
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
    
```

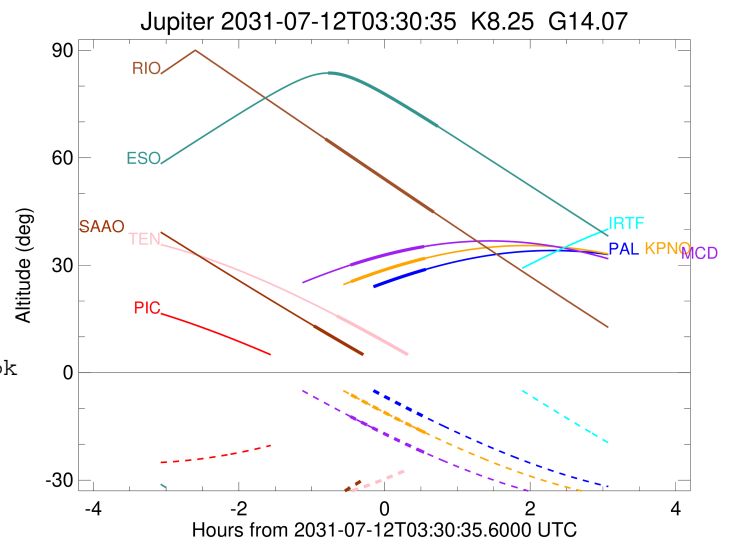
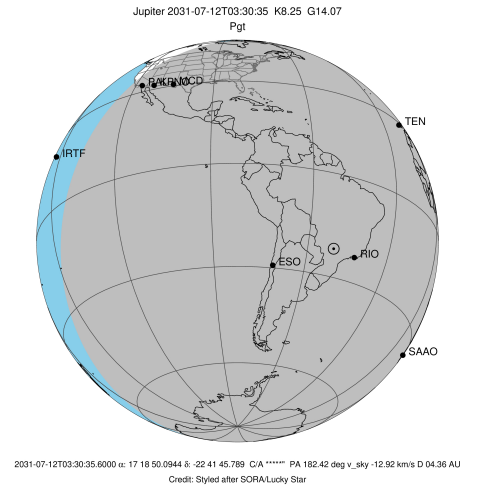


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-07-12T03:03:19.423	21.57	-1.67x	71484.3	68.34	70.72
Jupiter	E	2031-07-12T04:04:40.585	28.84	-12.51	71483.9	71.48	73.56

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-07-12T03:33:36.750
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        : 4114691854909340288
2Mass ID (if available) : 17185010-2241456
ICRS Star Coord at Epoch: 17h 18m 50.09436s -22:41:45.78871s
RUWE (>1.4 is poor) : 1.09
K magnitude           : 8.253
G magnitude           : 14.074
RP magnitude          : 12.591
BP magnitude          : 16.971
DUPflag              : 0
Distance (au)         : 4.357
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -12.92
Sun-Target sep (deg)  : 151.31
Sun-Moon sep (deg)    : 126.50
B (ring opening deg) : -2.57
PA of pole (deg)      : 3.59
Pole direction: RA (deg): 268.05690
Dec (deg): 64.49651
C/A sky separation (") : 21.278
C/A sky separation (km) : 67236.3
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
    
```

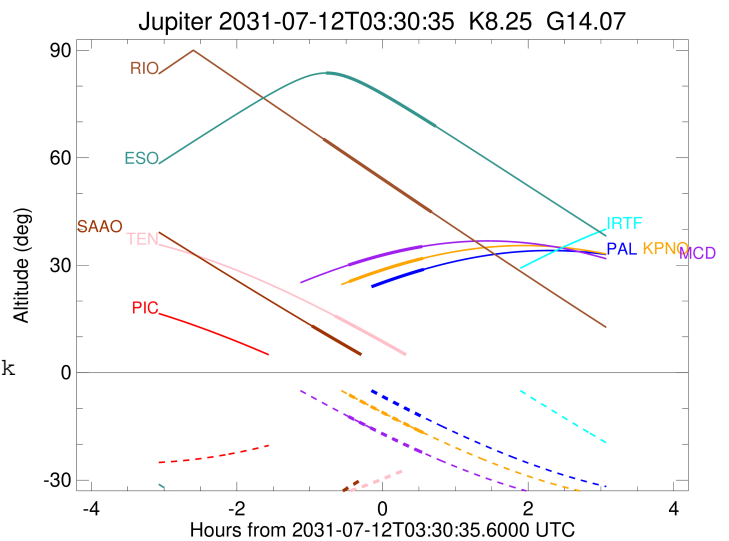
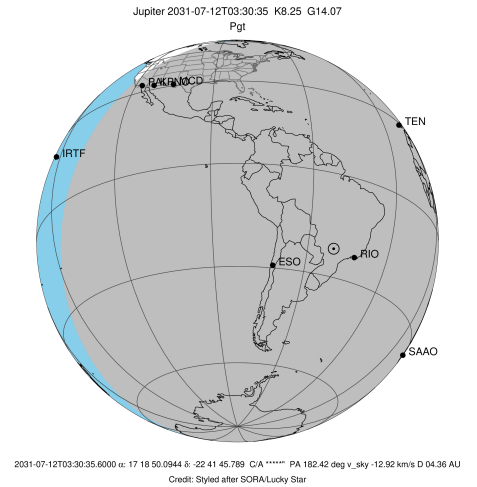


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-07-12T03:03:01.728	25.41	-6.17	71484.2	68.42	70.79
Jupiter	E	2031-07-12T04:04:08.998	31.93	-16.76	71483.9	71.48	73.56

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-07-12T03:32:56.110
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        : 4114691854909340288
2Mass ID (if available) : 17185010-2241456
ICRS Star Coord at Epoch: 17h 18m 50.09436s -22:41:45.78871s
RUWE (>1.4 is poor) : 1.09
K magnitude           : 8.253
G magnitude           : 14.074
RP magnitude          : 12.591
BP magnitude          : 16.971
DUPflag              : 0
Distance (au)         : 4.357
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -12.92
Sun-Target sep (deg)  : 151.31
Sun-Moon sep (deg)   : 126.60
B (ring opening deg) : -2.57
PA of pole (deg)     : 3.59
Pole direction: RA (deg): 268.05690
Dec (deg): 64.49651
C/A sky separation (") : 21.294
C/A sky separation (km) : 67286.9
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
    
```

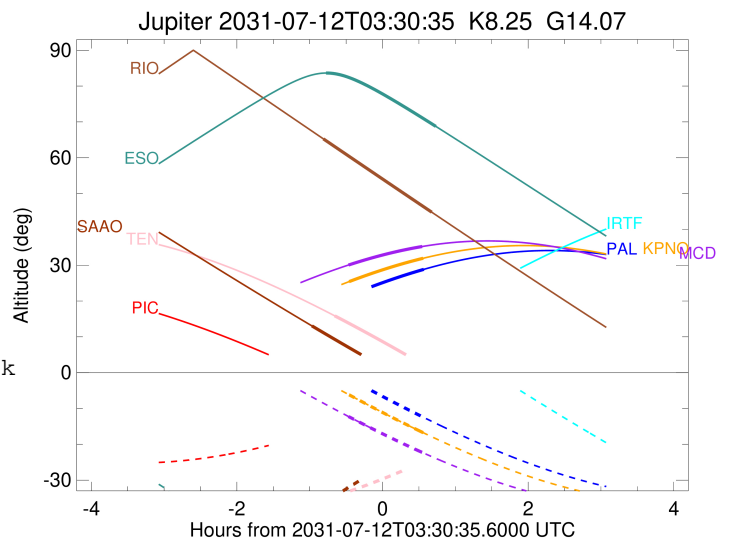
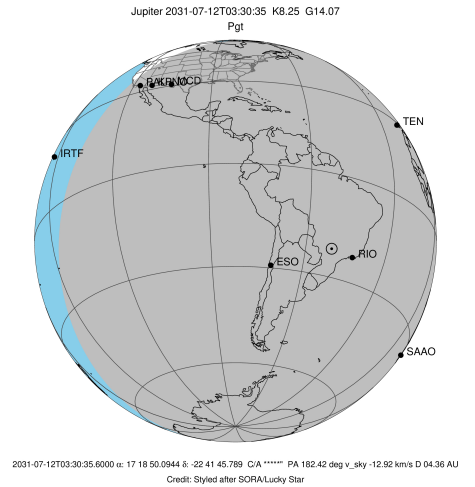


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-07-12T03:02:35.570	30.05	-12.24	71484.2	68.61	70.96
Jupiter	E	2031-07-12T04:03:14.708	35.21	-22.25	71483.9	71.53	73.60

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-07-12T03:25:07.700
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      : 4114691854909340288
2Mass ID (if available) : 17185010-2241456
ICRS Star Coord at Epoch: 17h 18m 50.09436s -22:41:45.78871s
RUWE (>1.4 is poor) : 1.09
K magnitude          : 8.253
G magnitude          : 14.074
RP magnitude         : 12.591
BP magnitude         : 16.971
DUPflag             : 0
Distance (au)       : 4.357
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -12.92
Sun-Target sep (deg) : 151.31
Sun-Moon sep (deg)  : 126.94
B (ring opening deg) : -2.57
PA of pole (deg)    : 3.59
Pole direction: RA (deg): 268.05690
Dec (deg): 64.49651
C/A sky separation ("): 20.985
C/A sky separation (km): 66310.6
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
    
```

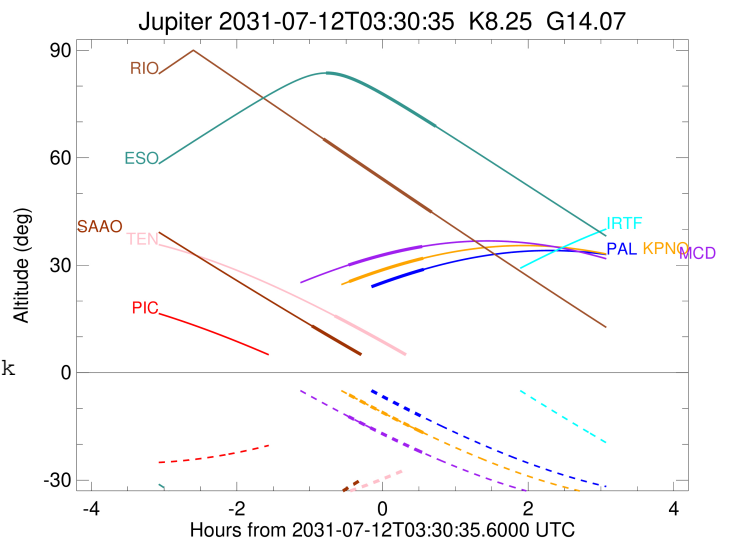
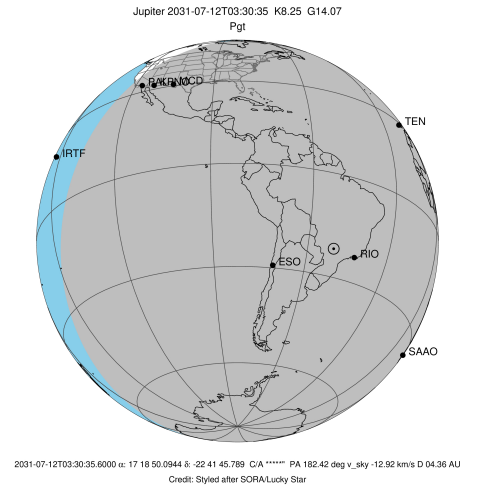


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-07-12T02:51:11.870	15.87	-34.41	71484.4	67.32	69.80
Jupiter	E	2031-07-12T03:59:12.476	3.20x	-25.60	71484.2	68.47	70.84

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-07-12T03:26:26.150
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       : 4114691854909340288
2Mass ID (if available) : 17185010-2241456
ICRS Star Coord at Epoch: 17h 18m 50.09436s -22:41:45.78871s
RUWE (>1.4 is poor) : 1.09
K magnitude          : 8.253
G magnitude          : 14.074
RP magnitude         : 12.591
BP magnitude         : 16.971
DUPflag             : 0
Distance (au)        : 4.357
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.92
Sun-Target sep (deg) : 151.31
Sun-Moon sep (deg)   : 127.31
B (ring opening deg) : -2.57
PA of pole (deg)     : 3.59
Pole direction: RA (deg): 268.05690
Dec (deg): 64.49651
C/A sky separation ("): 19.640
C/A sky separation (km): 62059.4
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
    
```

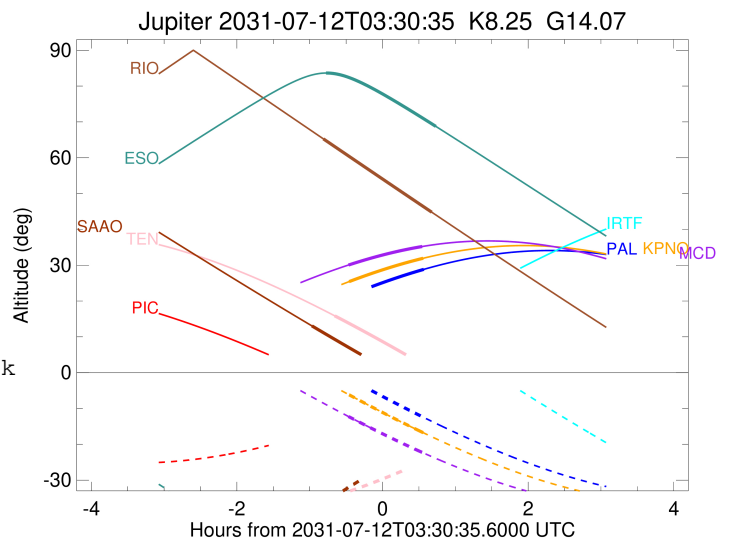
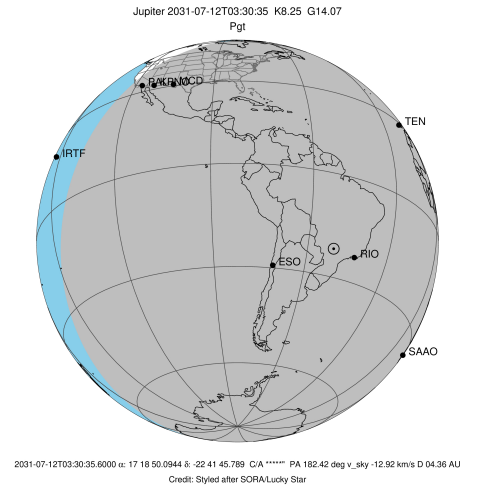


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-07-12T02:41:51.085	65.26	-86.08	71485.4	59.30	62.41
Jupiter	E	2031-07-12T04:11:12.468	44.78	-73.19	71485.2	60.87	63.87

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-07-12T03:29:14.790
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      : 4114691854909340288
2Mass ID (if available) : 17185010-2241456
ICRS Star Coord at Epoch: 17h 18m 50.09436s -22:41:45.78871s
RUWE (>1.4 is poor) : 1.09
K magnitude          : 8.253
G magnitude          : 14.074
RP magnitude         : 12.591
BP magnitude         : 16.971
DUPflag             : 0
Distance (au)       : 4.357
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -12.92
Sun-Target sep (deg) : 151.31
Sun-Moon sep (deg)  : 127.21
B (ring opening deg) : -2.57
PA of pole (deg)    : 3.59
Pole direction: RA (deg): 268.05690
Dec (deg): 64.49651
C/A sky separation (") : 19.525
C/A sky separation (km) : 61696.9
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
    
```

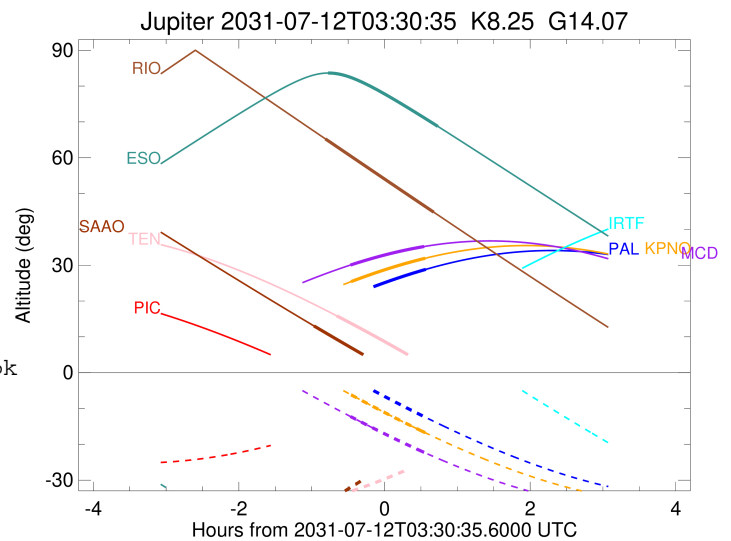
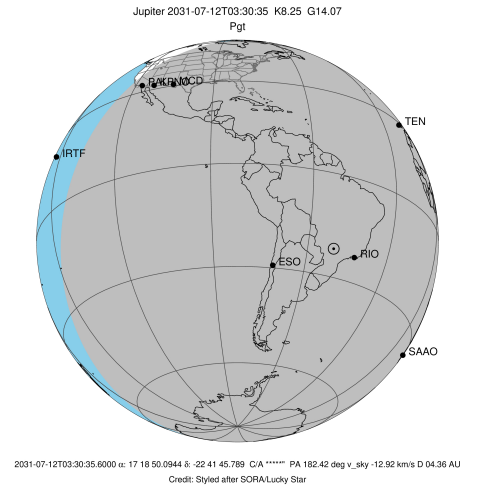


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-07-12T02:44:00.150	83.63	-61.12	71485.5	58.40	61.57
Jupiter	E	2031-07-12T04:14:33.779	68.74	-79.56	71485.2	60.60	63.62

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-07-12T03:24:30.340
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        : 4114691854909340288
2Mass ID (if available) : 17185010-2241456
ICRS Star Coord at Epoch: 17h 18m 50.09436s -22:41:45.78871s
RUWE (>1.4 is poor) : 1.09
K magnitude           : 8.253
G magnitude           : 14.074
RP magnitude          : 12.591
BP magnitude          : 16.971
DUPflag              : 0
Distance (au)         : 4.357
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -12.92
Sun-Target sep (deg)  : 151.31
Sun-Moon sep (deg)    : 126.87
B (ring opening deg) : -2.57
PA of pole (deg)      : 3.59
Pole direction: RA (deg): 268.05690
Dec (deg): 64.49651
C/A sky separation (") : 18.692
C/A sky separation (km) : 59063.0
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	2031-07-12T02:32:27.669	13.05	-38.38	71486.0	55.13	58.50
Jupiter	E	2031-07-12T04:16:55.539	-6.93x	-16.65	71485.8	56.13	59.44