

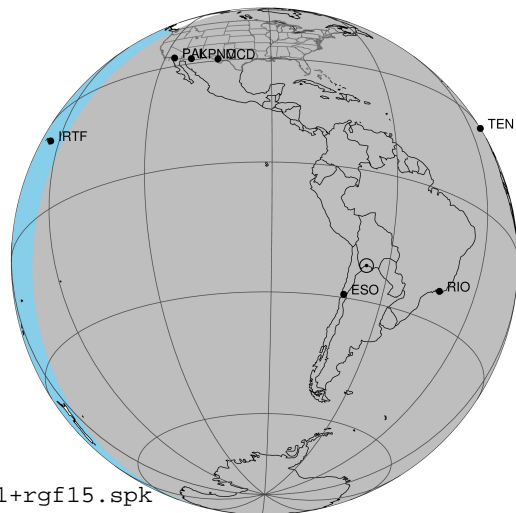
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-07-12T04:29:33.510
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116544463365771136
 2Mass ID (if available) : 17400772-2304214

Jupiter 2043-07-12T04:29:33 K9.38 G13.78 Pgt

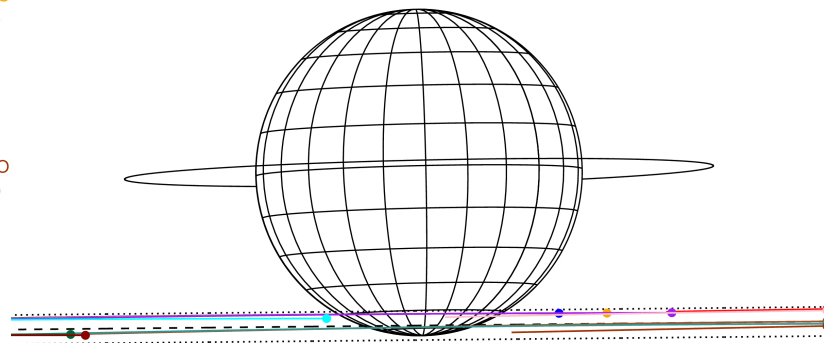
ICRS Star Coord at Epoch: 17h 40m 07.73931s -23°04'21.45378s

RUWE (>1.4 is poor) : 0.92
 K magnitude : 9.376
 G magnitude : 13.781
 RP magnitude : 12.619
 BP magnitude : 15.186
 DUPflag : 0
 Distance (au) : 4.312
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -13.98
 Sun-Target sep (deg) : 156.26
 Sun-Moon sep (deg) : 87.52
 B (ring opening deg) : -2.40
 PA of pole (deg) : 1.30
 Pole direction: RA (deg): 268.05670
 Dec (deg): 64.49732
 C/A sky separation (") : 21.431
 C/A sky separation (km) : 67026.8
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-07-12T04:29:33 K9.38 G13.78
 Pgt



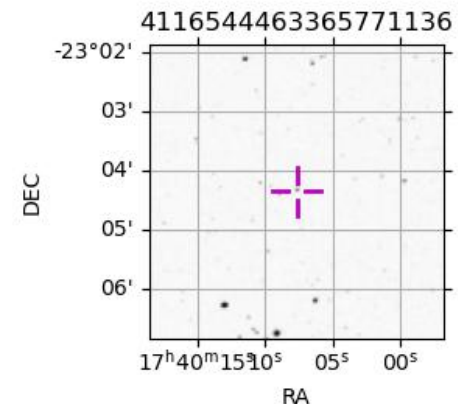
Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 AAT
 SAAO
 MSO



2043-07-12T04:29:33.5100 α: 17 40 07.7393 δ: -23 04 21.454 C/A ***** PA 0.57 deg v_sky -13.98 km/s D 04.31 AU
 Credit: Styled after SORA/Lucky Star

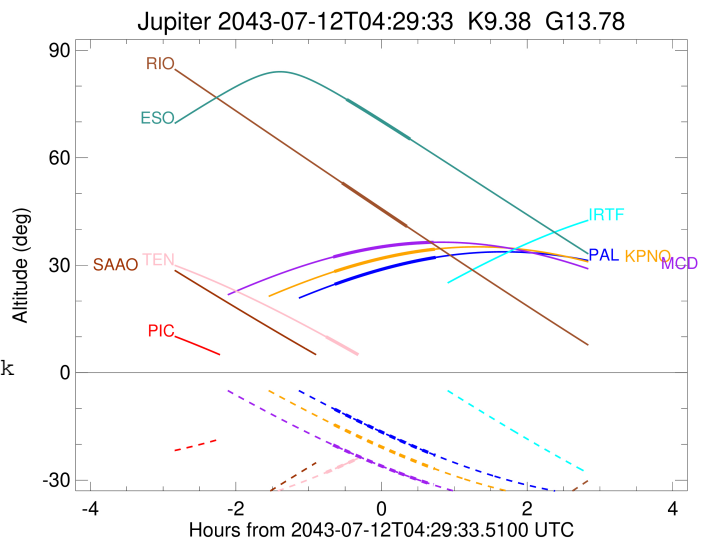
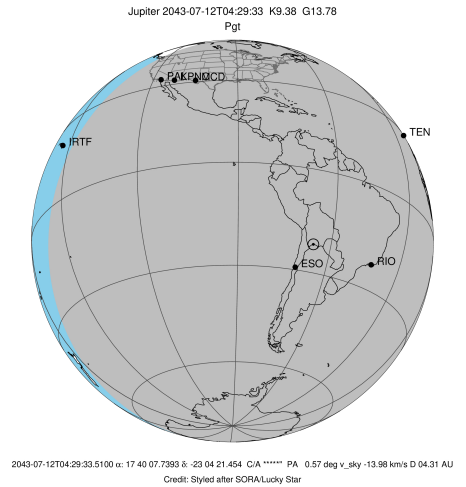
Observable events with sun below -5 deg and altitude above 5 deg

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 12 03:51 - JUL 12 05:14	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JUL 12 03:50 - JUL 12 05:13	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JUL 12 03:49 - JUL 12 05:12	Pie
TEN	Teide Obs./Tenerife	28.3	343.5	+	JUL 12 03:43 - JUL 12 03:43	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 03:57 - JUL 12 04:50	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUL 12 04:00 - JUL 12 04:53	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-12T04:32:33.320
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       : 4116544463365771136
2Mass ID (if available) : 17400772-2304214
ICRS Star Coord at Epoch: 17h 40m 07.73931s -23:04:21.45378s
RUWE (>1.4 is poor) : 0.92
K magnitude           : 9.376
G magnitude           : 13.781
RP magnitude          : 12.619
BP magnitude          : 15.186
DUPflag              : 0
Distance (au)         : 4.312
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.98
Sun-Target sep (deg) : 156.26
Sun-Moon sep (deg)   : 87.95
B (ring opening deg) : -2.40
PA of pole (deg)     : 1.30
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 19.800
C/A sky separation (km): 61925.7
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
    
```

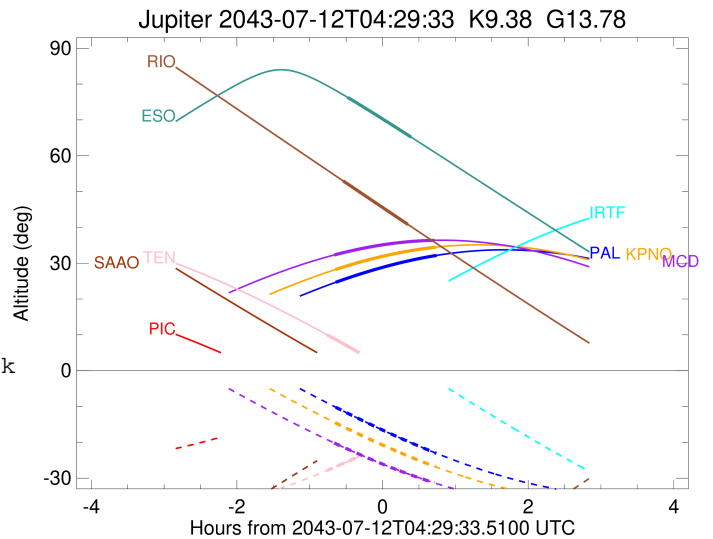
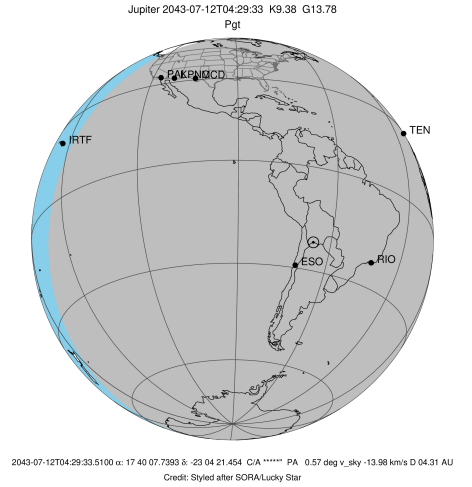


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-12T03:51:02.850	24.67	-10.21	71486.0	-60.98	-63.97
Jupiter	E	2043-07-12T05:13:59.583	32.16	-23.07	71486.2	-59.00	-62.13

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-12T04:31:59.970
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      : 4116544463365771136
2Mass ID (if available) : 17400772-2304214
ICRS Star Coord at Epoch: 17h 40m 07.73931s -23:04:21.45378s
RUWE (>1.4 is poor) : 0.92
K magnitude          : 9.376
G magnitude          : 13.781
RP magnitude         : 12.619
BP magnitude         : 15.186
DUPflag             : 0
Distance (au)       : 4.312
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -13.98
Sun-Target sep (deg) : 156.26
Sun-Moon sep (deg)  : 88.00
B (ring opening deg) : -2.40
PA of pole (deg)    : 1.30
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 19.805
C/A sky separation (km) : 61942.0
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
    
```

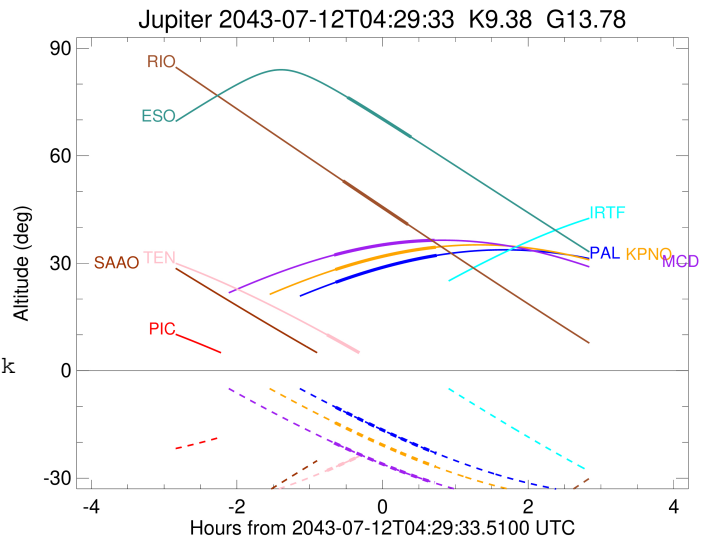
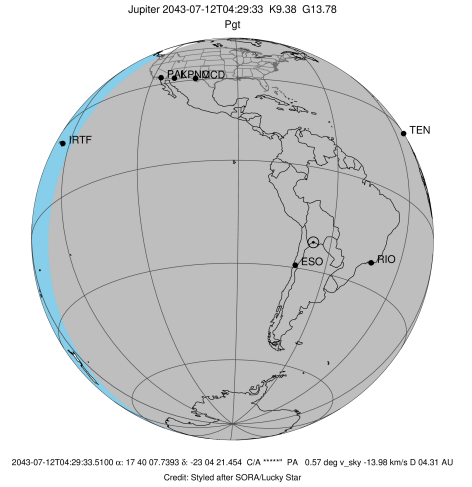


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-12T03:50:35.410	28.21	-14.53	71486.0	-60.96	-63.95
Jupiter	E	2043-07-12T05:13:21.321	34.46	-26.82	71486.2	-59.08	-62.20

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-12T04:31:07.400
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       : 4116544463365771136
2Mass ID (if available) : 17400772-2304214
ICRS Star Coord at Epoch: 17h 40m 07.73931s -23:04:21.45378s
RUWE (>1.4 is poor) : 0.92
K magnitude           : 9.376
G magnitude           : 13.781
RP magnitude          : 12.619
BP magnitude          : 15.186
DUPflag              : 0
Distance (au)        : 4.312
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.98
Sun-Target sep (deg) : 156.26
Sun-Moon sep (deg)   : 88.04
B (ring opening deg) : -2.40
PA of pole (deg)     : 1.30
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 19.807
C/A sky separation (km) : 61948.9
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
    
```

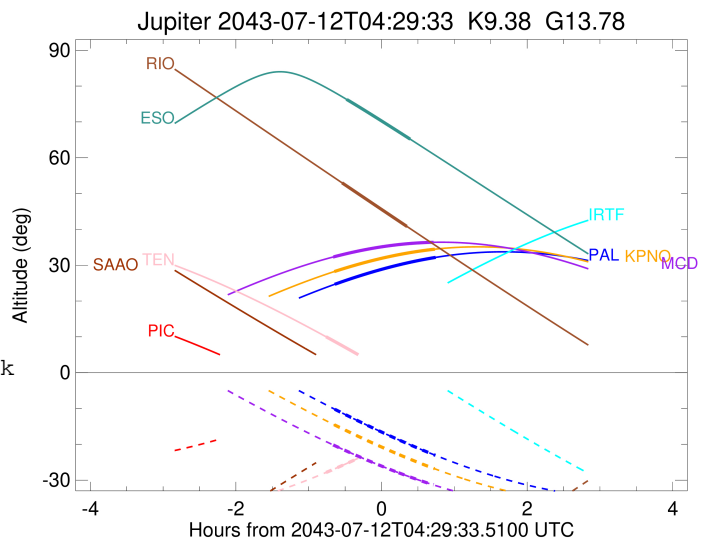
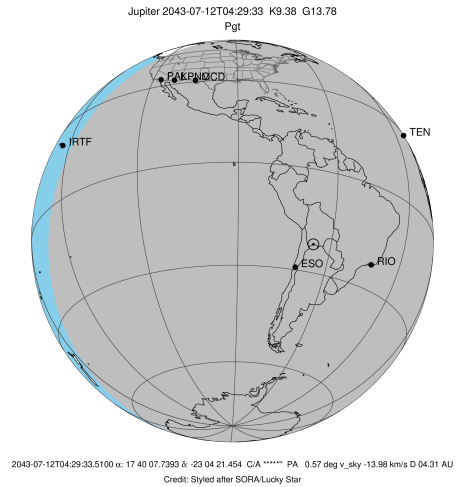


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-12T03:49:47.918	32.29	-20.18	71486.0	-60.90	-63.90
Jupiter	E	2043-07-12T05:12:25.210	36.39	-31.33	71486.2	-59.17	-62.28

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-12T04:22:19.870
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      : 4116544463365771136
2Mass ID (if available) : 17400772-2304214
ICRS Star Coord at Epoch: 17h 40m 07.73931s -23:04:21.45378s
RUWE (>1.4 is poor) : 0.92
K magnitude          : 9.376
G magnitude          : 13.781
RP magnitude         : 12.619
BP magnitude         : 15.186
DUPflag             : 0
Distance (au)       : 4.312
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.98
Sun-Target sep (deg) : 156.26
Sun-Moon sep (deg)  : 87.57
B (ring opening deg) : -2.40
PA of pole (deg)    : 1.30
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 20.337
C/A sky separation (km) : 63605.8
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
    
```

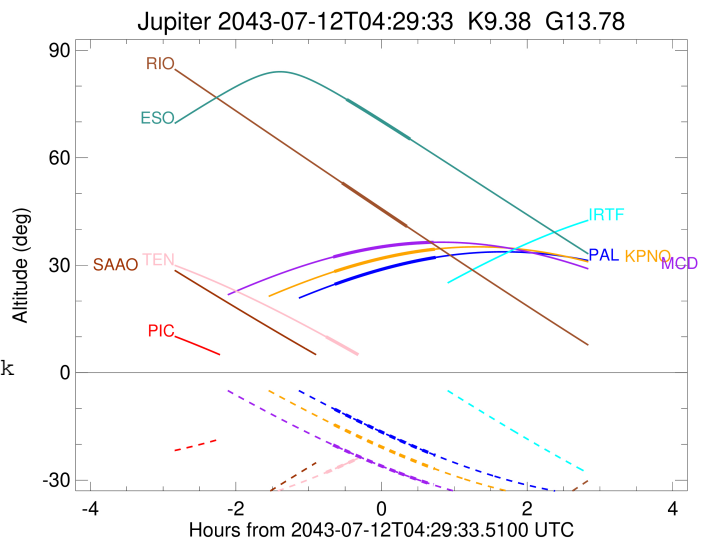
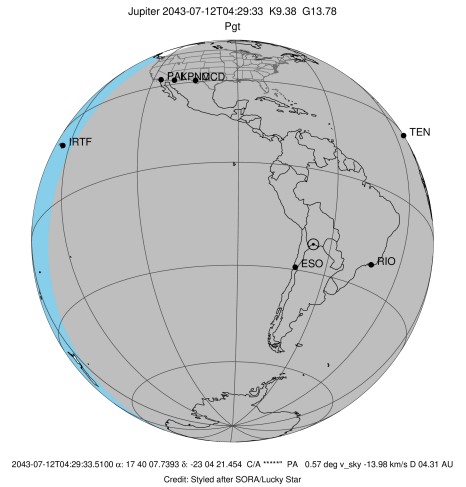


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-12T03:43:53.081	10.02	-27.86	71485.7	-62.88	-65.72
Jupiter	E	2043-07-12T05:00:58.808	-5.00x	-15.36	71485.8	-62.65	-65.52

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-12T04:23:44.420
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      : 4116544463365771136
2Mass ID (if available) : 17400772-2304214
ICRS Star Coord at Epoch: 17h 40m 07.73931s -23:04:21.45378s
RUWE (>1.4 is poor) : 0.92
K magnitude          : 9.376
G magnitude          : 13.781
RP magnitude         : 12.619
BP magnitude         : 15.186
DUPflag             : 0
Distance (au)       : 4.312
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -13.98
Sun-Target sep (deg) : 156.26
Sun-Moon sep (deg)  : 88.20
B (ring opening deg) : -2.40
PA of pole (deg)    : 1.30
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 21.647
C/A sky separation (km) : 67702.2
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
    
```

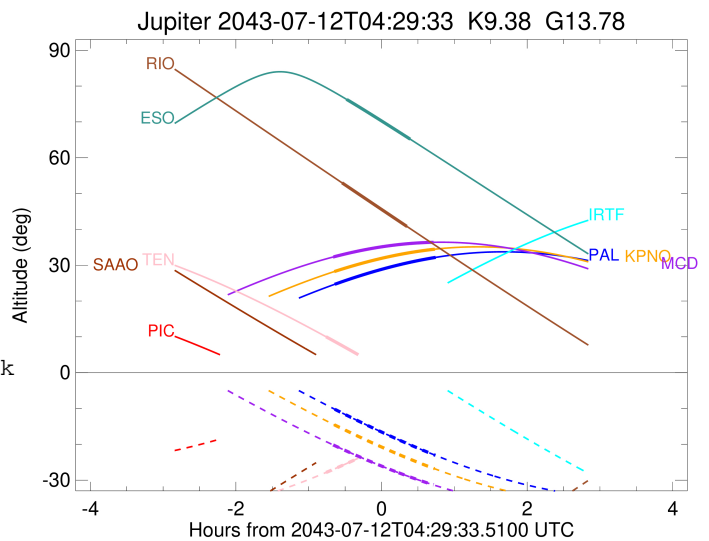
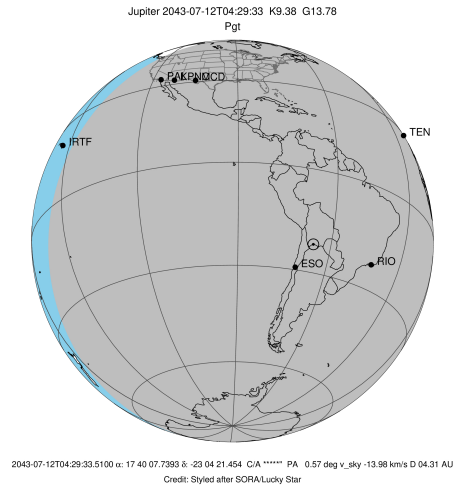


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-12T03:57:01.410	52.99	-76.45	71484.9	-71.40	-73.49
Jupiter	E	2043-07-12T04:50:32.144	40.81	-64.13	71484.9	-70.91	-73.05

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-12T04:26:56.910
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       : 4116544463365771136
2Mass ID (if available) : 17400772-2304214
ICRS Star Coord at Epoch: 17h 40m 07.73931s -23:04:21.45378s
RUWE (>1.4 is poor) : 0.92
K magnitude           : 9.376
G magnitude           : 13.781
RP magnitude          : 12.619
BP magnitude          : 15.186
DUPflag              : 0
Distance (au)        : 4.312
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.98
Sun-Target sep (deg) : 156.26
Sun-Moon sep (deg)   : 88.40
B (ring opening deg) : -2.40
PA of pole (deg)     : 1.30
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 21.684
C/A sky separation (km) : 67819.4
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	2043-07-12T04:00:47.233	76.28	-77.11	71484.8	-71.97	-74.00
Jupiter	E	2043-07-12T04:53:08.820	65.19	-82.80	71484.9	-70.94	-73.07