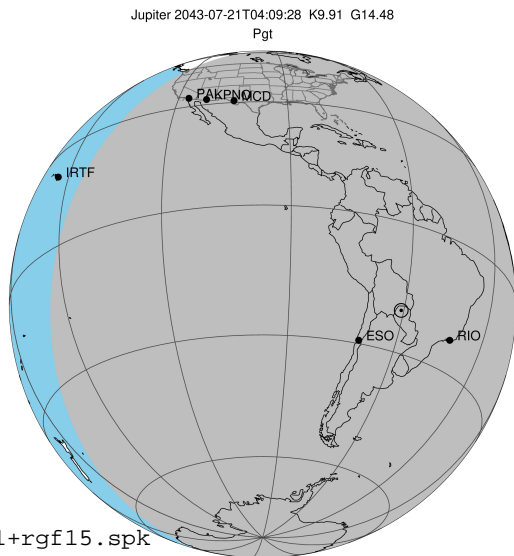


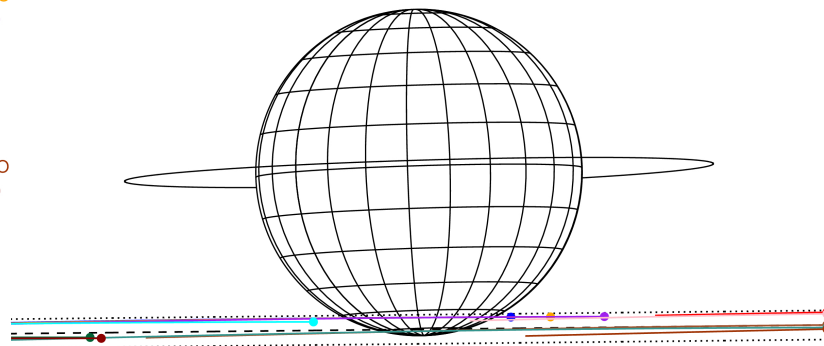
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-07-21T04:09:28.900
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116640670565247872
 2Mass ID (if available) : 17361765-2303482

Jupiter 2043-07-21T04:09:28 K9.91 G14.48 Pgt

ICRS Star Coord at Epoch: 17h 36m 17.64808s -23:03:48.19998s
 RUWE (>1.4 is poor) : 0.91
 K magnitude : 9.907
 G magnitude : 14.476
 RP magnitude : 13.290
 BP magnitude : 15.998
 DUPflag : 0
 Distance (au) : 4.376
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -11.67
 Sun-Target sep (deg) : 146.81
 Sun-Moon sep (deg) : 22.42
 B (ring opening deg) : -2.38
 PA of pole (deg) : 1.72
 Pole direction: RA (deg): 268.05670
 Dec (deg): 64.49732
 C/A sky separation (") : 21.647
 C/A sky separation (km) : 68700.1
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk



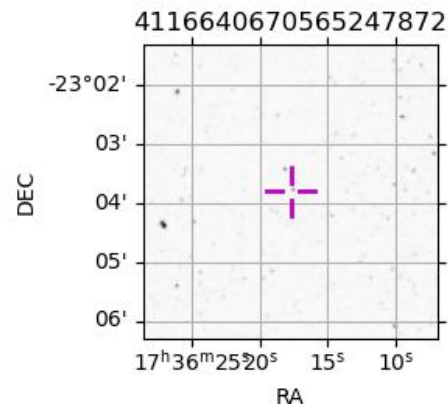
Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 AAT
 SAAO
 MSO



2043-07-21T04:09:28.9000 α: 17 36 17.6481 δ: -23 03 48.200 C/A ***** PA 0.61 deg v_sky -11.67 km/s D 04.38 AU
 Credit: Styled after SORA/Lucky Star

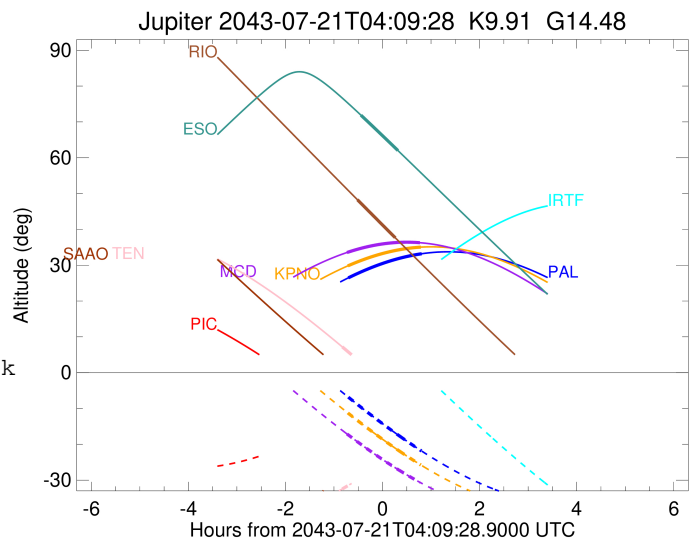
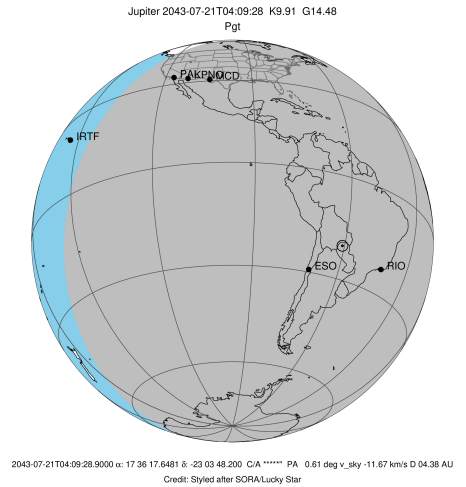
Observable events with sun below -5 deg and altitude above 5 deg

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 21 03:27 - JUL 21 04:57	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JUL 21 03:26 - JUL 21 04:56	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JUL 21 03:25 - JUL 21 04:55	Pie
TEN	Teide Obs./Tenerife	28.3	343.5	+	JUL 21 03:19 - JUL 21 03:19	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 21 03:38 - JUL 21 04:25	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUL 21 03:42 - JUL 21 04:28	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             : 2043-07-21T04:12:29.210
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        : 4116640670565247872
2Mass ID (if available) : 17361765-2303482
ICRS Star Coord at Epoch: 17h 36m 17.64808s -23:03:48.19998s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 9.907
G magnitude           : 14.476
RP magnitude          : 13.290
BP magnitude          : 15.998
DUPflag              : 0
Distance (au)         : 4.376
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -11.67
Sun-Target sep (deg)  : 146.81
Sun-Moon sep (deg)    : 23.04
B (ring opening deg) : -2.38
PA of pole (deg)      : 1.72
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 20.018
C/A sky separation (km): 63532.7
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
    
```

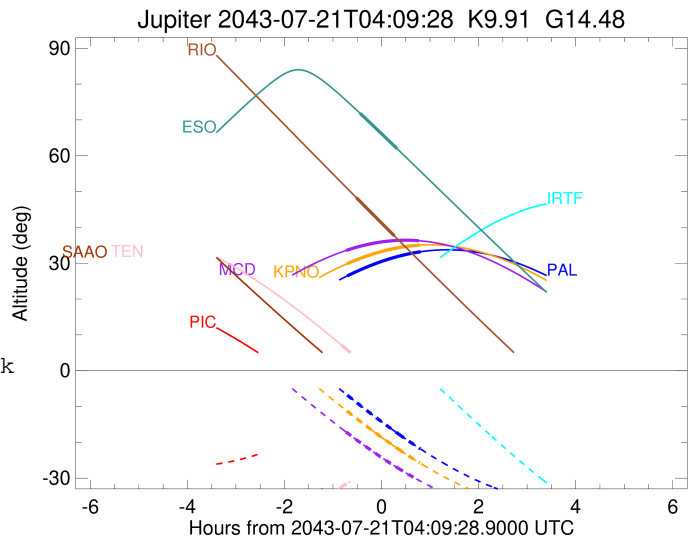
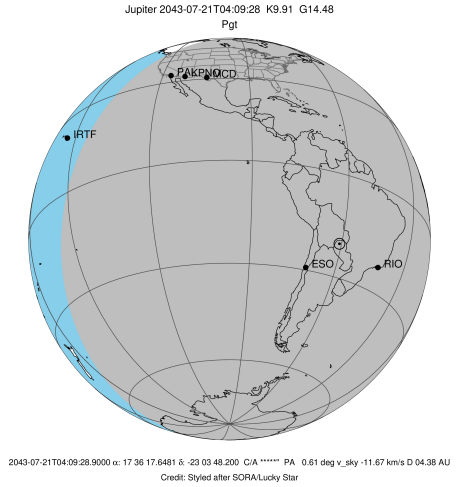


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-21T03:27:10.944	26.46	-6.83	71485.7	-64.04	-66.79
Jupiter	E	2043-07-21T04:57:43.329	33.19	-21.85	71486.0	-61.33	-64.30

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-21T04:11:46.670
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       : 4116640670565247872
2Mass ID (if available) : 17361765-2303482
ICRS Star Coord at Epoch: 17h 36m 17.64808s -23:03:48.19998s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 9.907
G magnitude           : 14.476
RP magnitude          : 13.290
BP magnitude          : 15.998
DUPflag              : 0
Distance (au)        : 4.376
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -11.67
Sun-Target sep (deg) : 146.81
Sun-Moon sep (deg)   : 23.00
B (ring opening deg) : -2.38
PA of pole (deg)     : 1.72
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 20.028
C/A sky separation (km): 63563.0
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
    
```

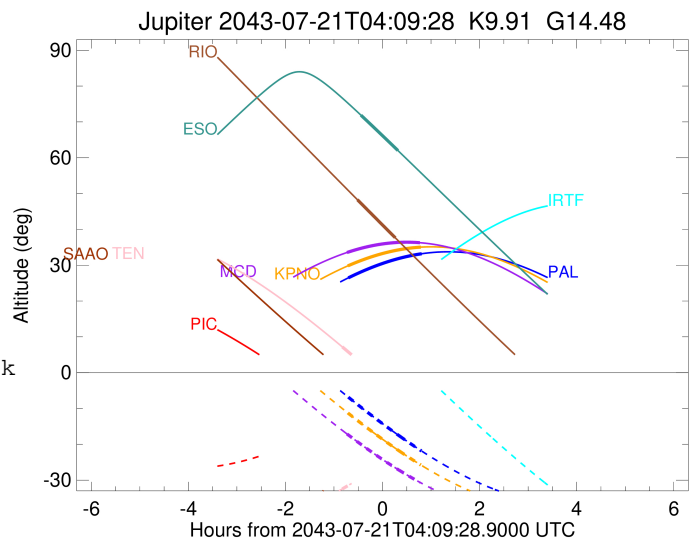
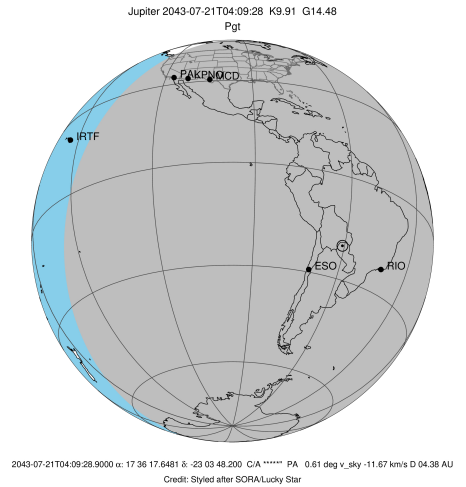


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-21T03:26:37.907	29.81	-11.24	71485.7	-64.04	-66.79
Jupiter	E	2043-07-21T04:56:52.778	35.04	-25.76	71486.0	-61.45	-64.41

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-21T04:10:40.800
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      : 4116640670565247872
2Mass ID (if available) : 17361765-2303482
ICRS Star Coord at Epoch: 17h 36m 17.64808s -23:03:48.19998s
RUWE (>1.4 is poor) : 0.91
K magnitude          : 9.907
G magnitude          : 14.476
RP magnitude         : 13.290
BP magnitude         : 15.998
DUPflag             : 0
Distance (au)        : 4.376
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -11.67
Sun-Target sep (deg) : 146.81
Sun-Moon sep (deg)  : 22.92
B (ring opening deg) : -2.38
PA of pole (deg)    : 1.72
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 20.037
C/A sky separation (km): 63591.2
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
    
```

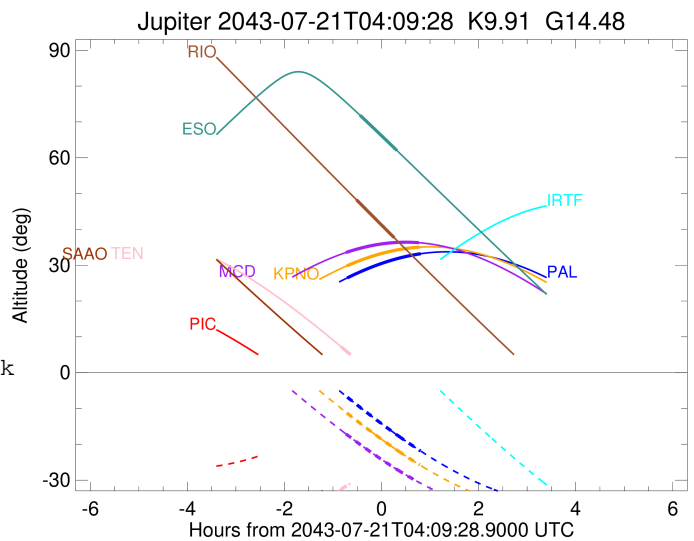
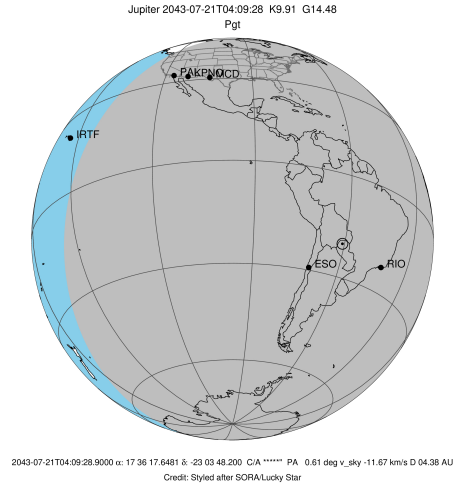


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-21T03:25:41.317	33.54	-17.12	71485.7	-64.00	-66.76
Jupiter	E	2043-07-21T04:55:39.858	36.27	-30.60	71486.0	-61.59	-64.54

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-21T04:00:25.370
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       : 4116640670565247872
2Mass ID (if available) : 17361765-2303482
ICRS Star Coord at Epoch: 17h 36m 17.64808s -23:03:48.19998s
RUWE (>1.4 is poor) : 0.91
K magnitude          : 9.907
G magnitude           : 14.476
RP magnitude         : 13.290
BP magnitude         : 15.998
DUPflag             : 0
Distance (au)        : 4.376
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -11.67
Sun-Target sep (deg) : 146.81
Sun-Moon sep (deg)   : 21.82
B (ring opening deg) : -2.38
PA of pole (deg)     : 1.72
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 20.619
C/A sky separation (km) : 65438.4
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
    
```

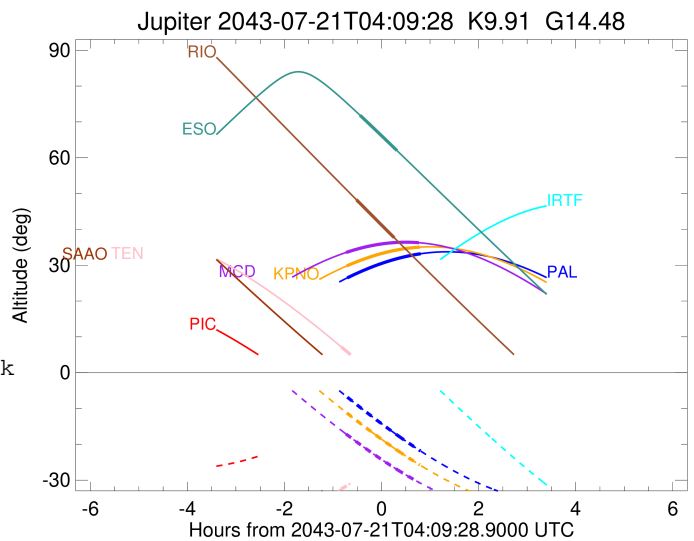
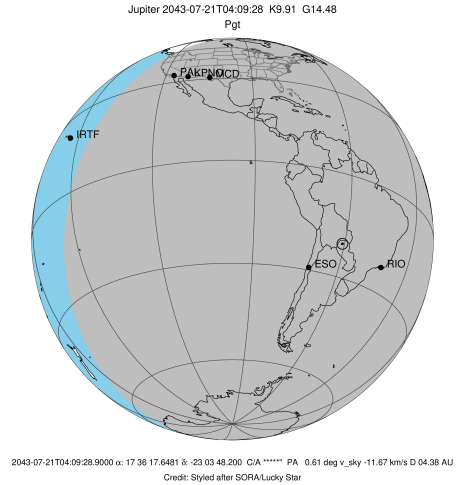


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-21T03:19:49.672	7.18	-32.45	71485.4	-66.51	-69.06
Jupiter	E	2043-07-21T04:41:18.186	-8.99x	-19.94	71485.5	-65.82	-68.43

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-21T04:01:50.560
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        : 4116640670565247872
2Mass ID (if available) : 17361765-2303482
ICRS Star Coord at Epoch: 17h 36m 17.64808s -23:03:48.19998s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 9.907
G magnitude           : 14.476
RP magnitude          : 13.290
BP magnitude          : 15.998
DUPflag              : 0
Distance (au)         : 4.376
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -11.67
Sun-Target sep (deg)  : 146.81
Sun-Moon sep (deg)    : 22.01
B (ring opening deg) : -2.38
PA of pole (deg)      : 1.72
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 21.900
C/A sky separation (km) : 69505.0
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
    
```

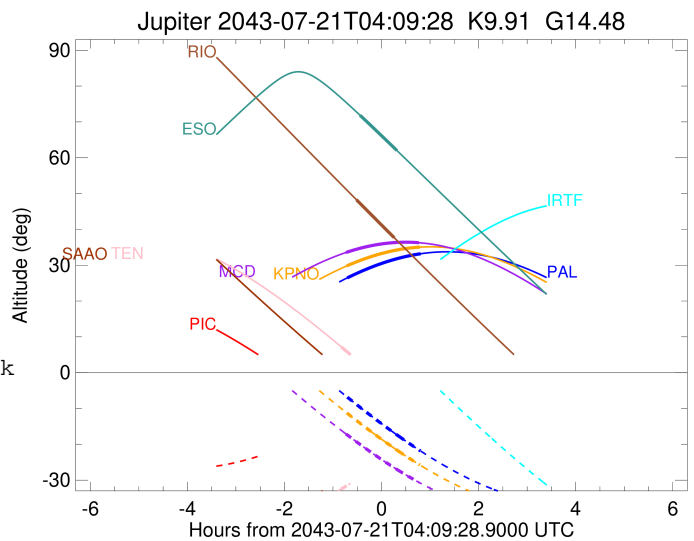
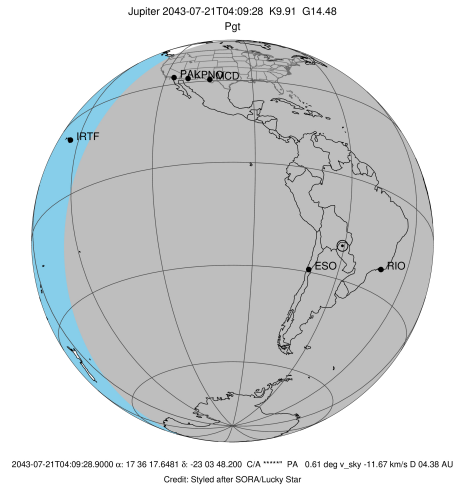


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-21T03:38:36.888	48.24	-80.59	71484.6	-76.78	-78.30
Jupiter	E	2043-07-21T04:25:08.907	37.68	-69.94	71484.7	-75.83	-77.45

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-21T04:05:36.450
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        : 4116640670565247872
2Mass ID (if available) : 17361765-2303482
ICRS Star Coord at Epoch: 17h 36m 17.64808s -23:03:48.19998s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 9.907
G magnitude           : 14.476
RP magnitude          : 13.290
BP magnitude          : 15.998
DUPflag              : 0
Distance (au)         : 4.376
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -11.67
Sun-Target sep (deg)  : 146.81
Sun-Moon sep (deg)   : 22.40
B (ring opening deg) : -2.38
PA of pole (deg)      : 1.72
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (" ) : 21.916
C/A sky separation (km) : 69555.5
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	2043-07-21T03:42:51.550	71.86	-72.66	71484.6	-77.27	-78.74
Jupiter	E	2043-07-21T04:28:23.870	62.04	-80.17	71484.7	-75.70	-77.34