

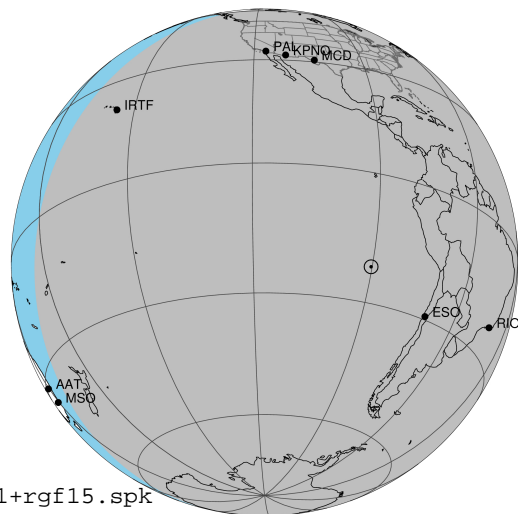
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2043-07-13T06:06:53.570  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4116554840009738112  
 2Mass ID (if available) : 17393816-2304085

Jupiter 2043-07-13T06:06:53 K8.20 G13.63 Pgt

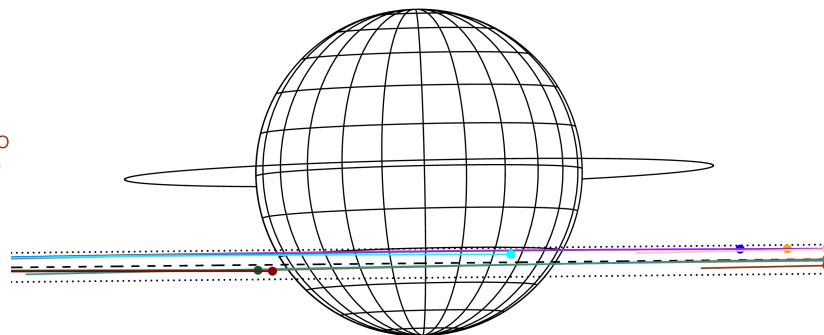
ICRS Star Coord at Epoch: 17h 39m 38.14872s -23:04:08.62647s

RUWE (>1.4 is poor) : 0.95  
 K magnitude : 8.199  
 G magnitude : 13.627  
 RP magnitude : 12.262  
 BP magnitude : 15.879  
 DUPflag : 0  
 Distance (au) : 4.319  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -13.74  
 Sun-Target sep (deg) : 155.13  
 Sun-Moon sep (deg) : 74.26  
 B (ring opening deg) : -2.40  
 PA of pole (deg) : 1.36  
 Pole direction: RA (deg): 268.05670  
 Dec (deg): 64.49732  
 C/A sky separation (") : 12.696  
 C/A sky separation (km) : 39768.6  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2043-07-13T06:06:53 K8.20 G13.63  
 Pgt



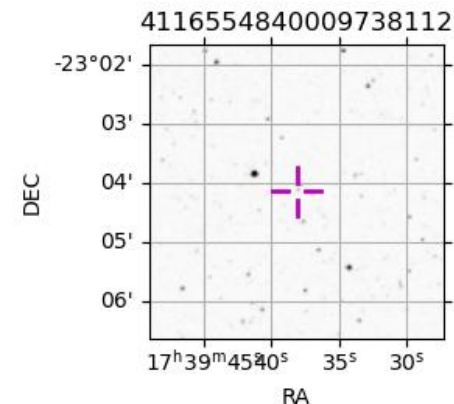
Earth  
 PAL  
 KPNO  
 MCD  
 TEN  
 IRTF  
 RIO  
 ESO  
 AAT  
 SAAO  
 MSO



2043-07-13T06:06:53.5700 α: 17 39 38.1487 δ: -23 04 08.6262 C/A \*\*\*\*\* PA 0.59 deg v\_sky -13.74 km/s D 04.32 AU  
 Credit: Styled after SORA/Lucky Star

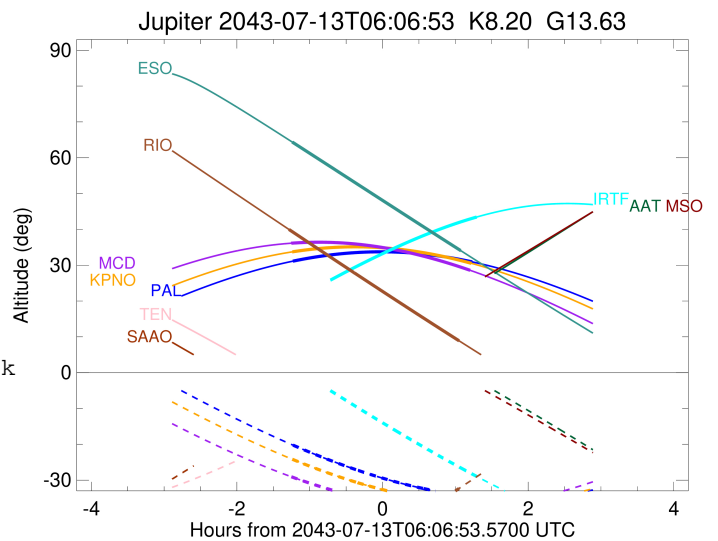
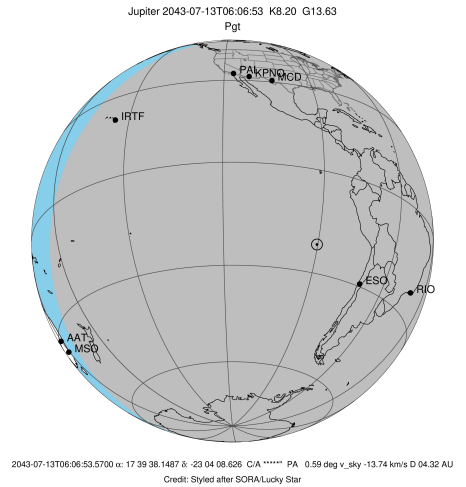
Observable events with sun below -5 deg and altitude above 5 deg

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 13 04:53 - JUL 13 07:20	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JUL 13 04:52 - JUL 13 07:20	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JUL 13 04:51 - JUL 13 07:19	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5			Pne
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+ +	JUL 13 04:49 - JUL 13 07:09	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUL 13 04:52 - JUL 13 07:11	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



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target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-13T06:06:53.670
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        : 4116554840009738112
2Mass ID (if available) : 17393816-2304085
ICRS Star Coord at Epoch: 17h 39m 38.14872s -23:04:08.62647s
RUWE (>1.4 is poor) : 0.95
K magnitude           : 8.199
G magnitude           : 13.627
RP magnitude          : 12.262
BP magnitude          : 15.879
DUPflag              : 0
Distance (au)         : 4.319
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -13.74
Sun-Target sep (deg)  : 155.13
Sun-Moon sep (deg)    : 74.75
B (ring opening deg) : -2.40
PA of pole (deg)      : 1.36
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 11.004
C/A sky separation (km) : 34467.9
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
    
```

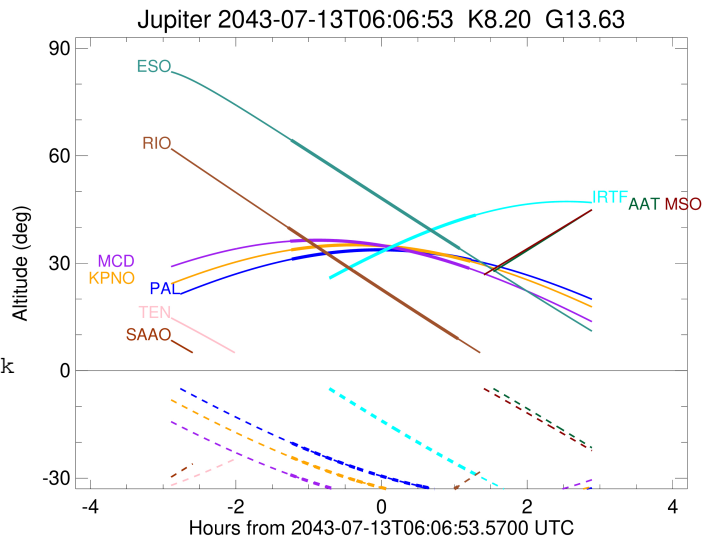
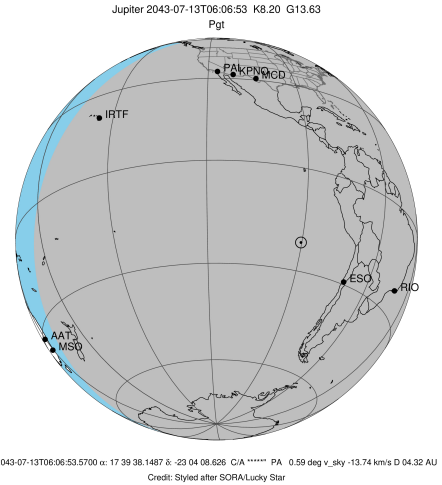


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-13T04:53:05.008	31.13	-20.22	71490.1	-29.67	-33.02
Jupiter	E	2043-07-13T07:20:45.855	30.93	-34.46	71490.2	-28.12	-31.38

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-13T06:06:16.060
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      : 4116554840009738112
2Mass ID (if available) : 17393816-2304085
ICRS Star Coord at Epoch: 17h 39m 38.14872s -23:04:08.62647s
RUWE (>1.4 is poor) : 0.95
K magnitude          : 8.199
G magnitude          : 13.627
RP magnitude         : 12.262
BP magnitude         : 15.879
DUPflag             : 0
Distance (au)       : 4.319
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.74
Sun-Target sep (deg) : 155.13
Sun-Moon sep (deg)  : 74.79
B (ring opening deg) : -2.40
PA of pole (deg)    : 1.36
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 11.034
C/A sky separation (km) : 34561.4
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
    
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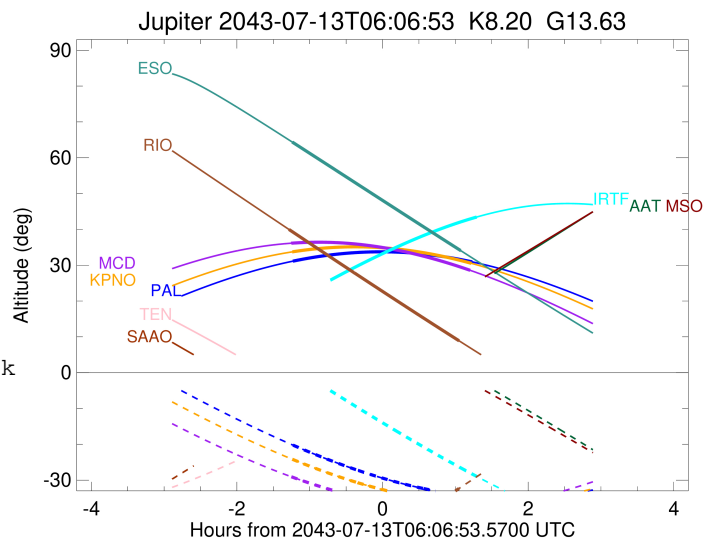
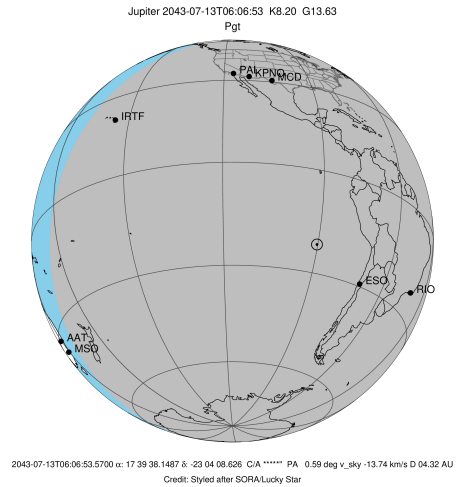


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-13T04:52:34.280	33.72	-24.17	71490.1	-29.70	-33.06
Jupiter	E	2043-07-13T07:20:04.933	30.53	-36.31	71490.2	-28.26	-31.53

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-13T06:05:21.300
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       : 4116554840009738112
2Mass ID (if available) : 17393816-2304085
ICRS Star Coord at Epoch: 17h 39m 38.14872s -23:04:08.62647s
RUWE (>1.4 is poor) : 0.95
K magnitude           : 8.199
G magnitude           : 13.627
RP magnitude          : 12.262
BP magnitude          : 15.879
DUPflag              : 0
Distance (au)         : 4.319
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -13.74
Sun-Target sep (deg) : 155.13
Sun-Moon sep (deg)   : 74.81
B (ring opening deg) : -2.40
PA of pole (deg)     : 1.36
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 11.073
C/A sky separation (km) : 34684.8
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
    
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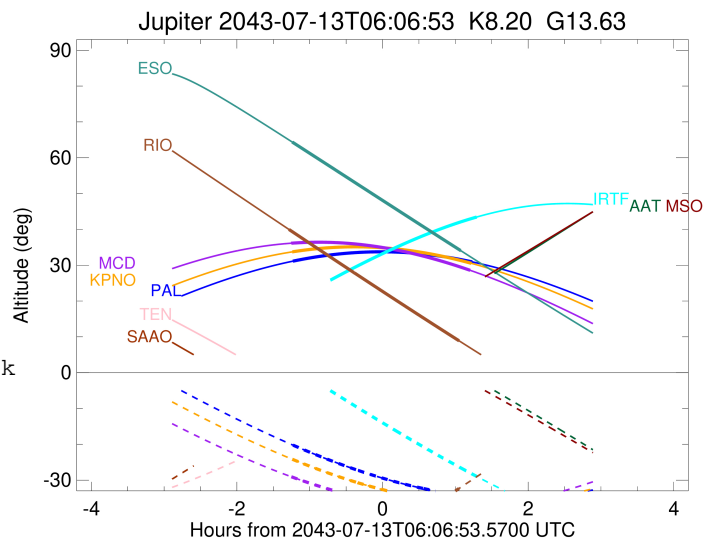
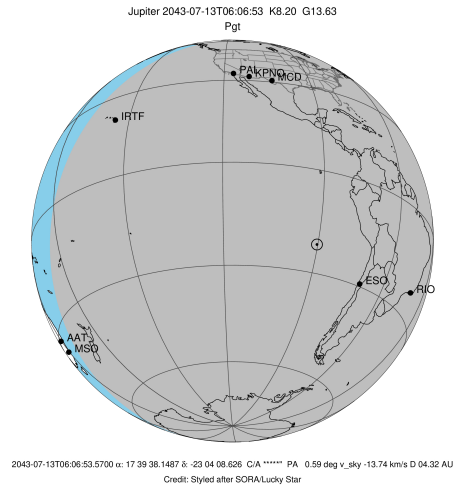


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-13T04:51:46.199	36.13	-29.06	71490.0	-29.74	-33.09
Jupiter	E	2043-07-13T07:19:08.707	28.57	-37.51	71490.2	-28.46	-31.73

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-13T06:11:38.290
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        : 4116554840009738112
2Mass ID (if available) : 17393816-2304085
ICRS Star Coord at Epoch: 17h 39m 38.14872s -23:04:08.62647s
RUWE (>1.4 is poor) : 0.95
K magnitude           : 8.199
G magnitude           : 13.627
RP magnitude          : 12.262
BP magnitude          : 15.879
DUPflag              : 0
Distance (au)         : 4.319
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -13.74
Sun-Target sep (deg)  : 155.13
Sun-Moon sep (deg)    : 74.60
B (ring opening deg) : -2.40
PA of pole (deg)      : 1.36
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (") : 11.471
C/A sky separation (km) : 35932.0
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
    
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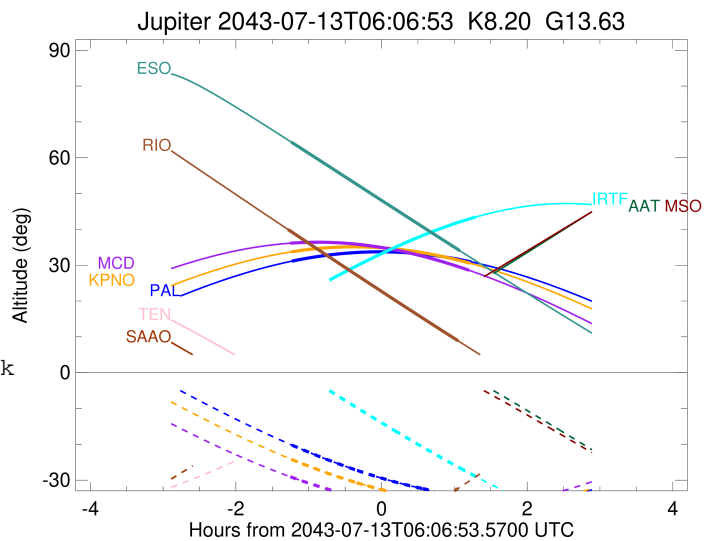
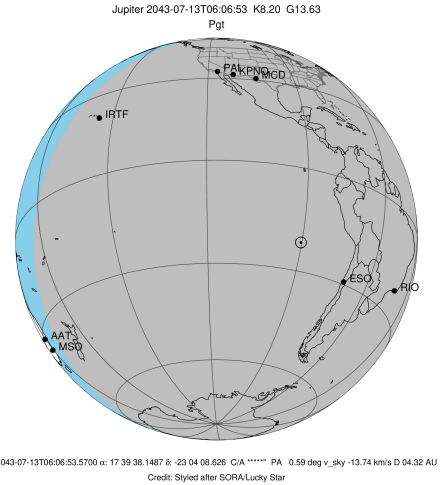


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-13T04:58:22.211	21.03	0.48x	71489.9	-31.42	-34.87
Jupiter	E	2043-07-13T07:24:31.050	43.44	-28.97	71490.1	-29.04	-32.35

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-13T05:59:31.260
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       : 4116554840009738112
2Mass ID (if available) : 17393816-2304085
ICRS Star Coord at Epoch: 17h 39m 38.14872s -23:04:08.62647s
RUWE (>1.4 is poor) : 0.95
K magnitude          : 8.199
G magnitude          : 13.627
RP magnitude         : 12.262
BP magnitude         : 15.879
DUPflag             : 0
Distance (au)        : 4.319
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.74
Sun-Target sep (deg) : 155.13
Sun-Moon sep (deg)  : 74.82
B (ring opening deg) : -2.40
PA of pole (deg)    : 1.36
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 13.186
C/A sky separation (km): 41300.9
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
    
```

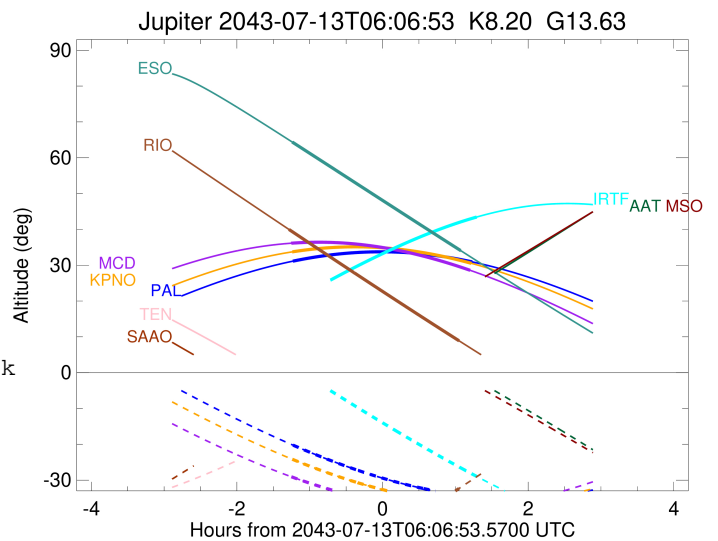
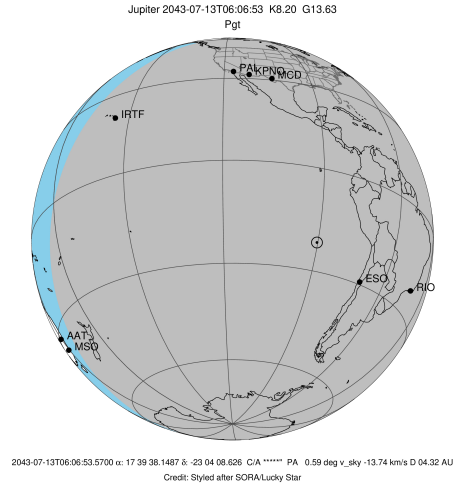


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-13T04:49:47.794	39.98	-64.31	71489.3	-35.42	-39.03
Jupiter	E	2043-07-13T07:09:56.389	8.90	-32.33	71489.4	-35.17	-38.77

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-13T06:01:41.810
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        : 4116554840009738112
2Mass ID (if available) : 17393816-2304085
ICRS Star Coord at Epoch: 17h 39m 38.14872s -23:04:08.62647s
RUWE (>1.4 is poor) : 0.95
K magnitude           : 8.199
G magnitude           : 13.627
RP magnitude          : 12.262
BP magnitude          : 15.879
DUPflag              : 0
Distance (au)         : 4.319
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -13.74
Sun-Target sep (deg)  : 155.13
Sun-Moon sep (deg)   : 75.07
B (ring opening deg) : -2.40
PA of pole (deg)     : 1.36
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 13.108
C/A sky separation (km): 41059.2
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	2043-07-13T04:52:27.339	64.38	-82.69	71489.3	-35.41	-39.02
Jupiter	E	2043-07-13T07:11:25.660	34.05	-57.10	71489.4	-34.77	-38.36