

target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-07-19T03:33:53.730
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116732131811108352
 2Mass ID (if available) : 17370552-2303360

Jupiter 2043-07-19T03:33:53 K9.81 G14.81 Pgt

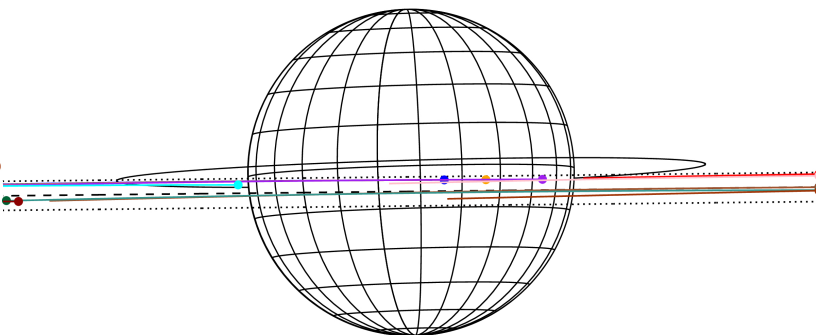
ICRS Star Coord at Epoch: 17h 37m 05.52902s -23°03'36.23081s

RUWE (>1.4 is poor) : 0.96
 K magnitude : 9.812
 G magnitude : 14.809
 RP magnitude : 13.547
 BP magnitude : 16.583
 DUPflag : 0
 Distance (au) : 4.360
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -12.25
 Sun-Target sep (deg) : 148.92
 Sun-Moon sep (deg) : 6.19
 B (ring opening deg) : -2.39
 PA of pole (deg) : 1.63
 Pole direction: RA (deg): 268.05670
 Dec (deg): 64.49732
 C/A sky separation (") : 2.623
 C/A sky separation (km) : 8295.4
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-07-19T03:33:53 K9.81 G14.81
 Pgt



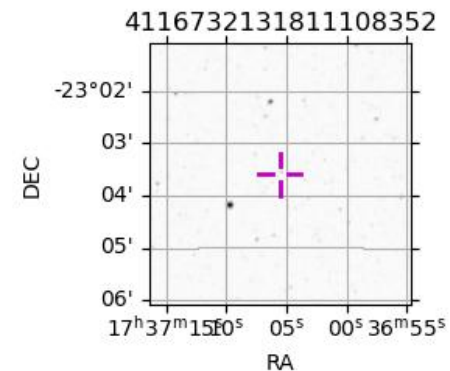
Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 AAT
 SAAO
 MSO



2043-07-19T03:33:53.7300 a: 17 37 05.5290 s -23 03 36.231 C/A 2.634" PA 0.62 deg v_sky -12.25 km/s D 04.36 AU
 Credit: Styled after SORA/Lucky Star

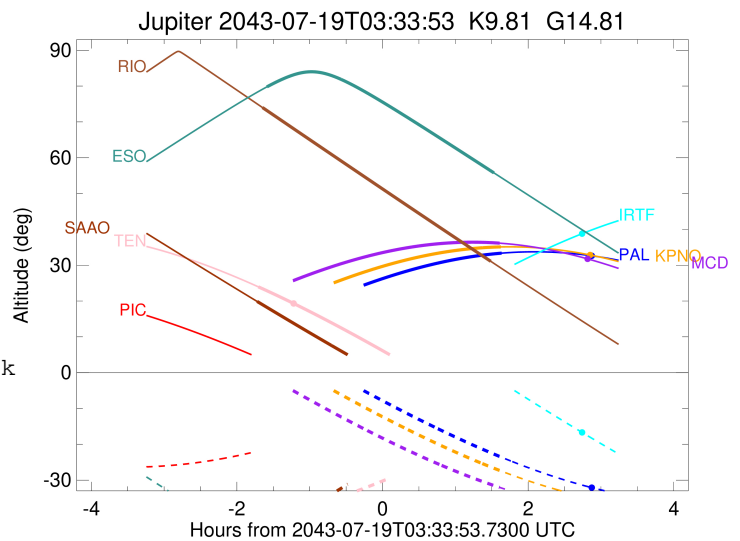
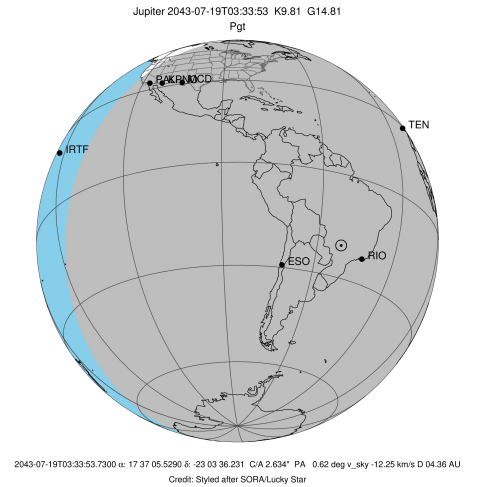
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1			Pnn
PAL	Palomar Mt (200")	33.4	243.1	+	JUL 19 05:12 - JUL 19 05:12	Pne
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	JUL 19 05:11 - JUL 19 05:11	Pne
MCD	McDonald Obs. 2.7m	30.7	256.0	+	JUL 19 05:10 - JUL 19 05:10	Pne
TEN	Teide Obs./Tenerife	28.3	343.5	+	JUL 19 01:51 - JUL 19 01:51	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 19 01:54 - JUL 19 05:03	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	JUL 19 01:58 - JUL 19 05:05	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	JUL 19 01:50 - JUL 19 01:50	Pin
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-19T03:37:39.200
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       : 4116732131811108352
2Mass ID (if available) : 17370552-2303360
ICRS Star Coord at Epoch: 17h 37m 05.52902s -23:03:36.23081s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 9.812
G magnitude           : 14.809
RP magnitude          : 13.547
BP magnitude          : 16.583
DUPflag              : 0
Distance (au)         : 4.360
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -12.25
Sun-Target sep (deg)  : 148.92
Sun-Moon sep (deg)   : 6.64
B (ring opening deg) : -2.39
PA of pole (deg)     : 1.63
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 1.044
C/A sky separation (km): 3302.0
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
    
```

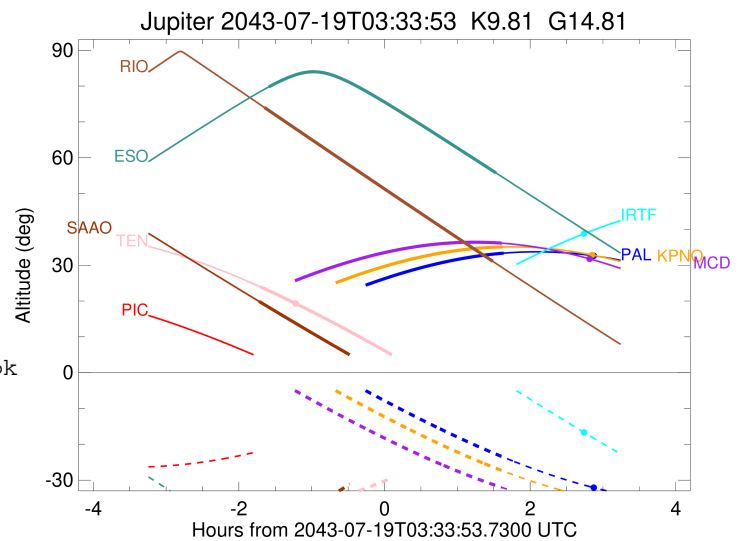
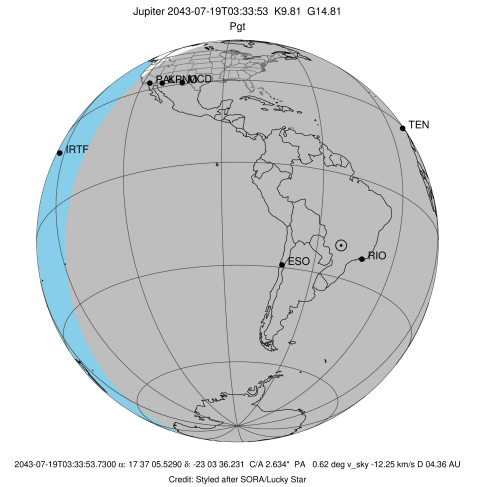


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-19T02:02:44.419	13.56	9.46x	71492.0	-4.13	-4.72
Jupiter	E	2043-07-19T05:12:04.988	33.36	-23.62	71492.0	-1.40	-1.60

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-19T03:37:07.440
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       : 4116732131811108352
2Mass ID (if available) : 17370552-2303360
ICRS Star Coord at Epoch: 17h 37m 05.52902s -23:03:36.23081s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 9.812
G magnitude           : 14.809
RP magnitude         : 13.547
BP magnitude         : 16.583
DUPflag              : 0
Distance (au)        : 4.360
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.25
Sun-Target sep (deg) : 148.92
Sun-Moon sep (deg)  : 6.67
B (ring opening deg) : -2.39
PA of pole (deg)    : 1.63
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (" ) : 1.044
C/A sky separation (km) : 3301.7
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
    
```

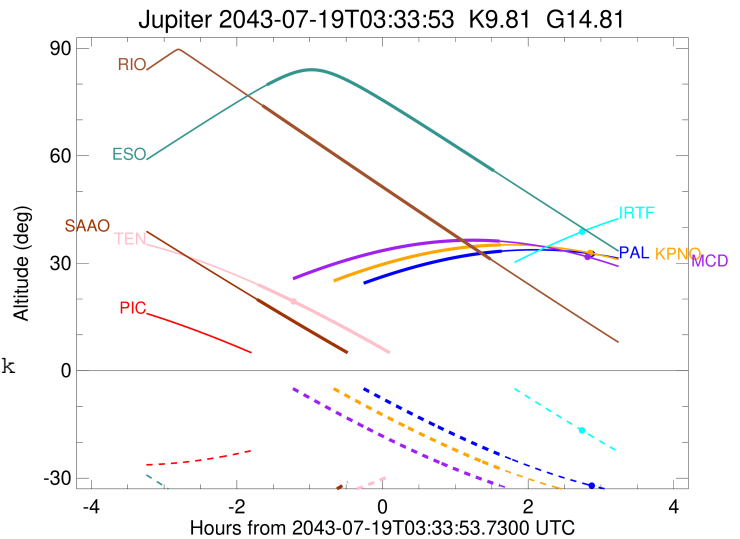
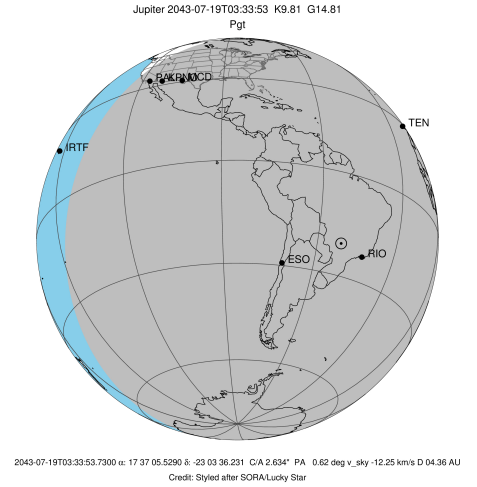


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-19T02:02:25.014	17.76	4.87x	71492.0	-4.09	-4.67
Jupiter	E	2043-07-19T05:11:26.199	35.10	-27.43	71492.0	-1.46	-1.67

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-19T03:36:16.150
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       : 4116732131811108352
2Mass ID (if available) : 17370552-2303360
ICRS Star Coord at Epoch: 17h 37m 05.52902s -23:03:36.23081s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 9.812
G magnitude           : 14.809
RP magnitude          : 13.547
BP magnitude          : 16.583
DUPflag              : 0
Distance (au)        : 4.360
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.25
Sun-Target sep (deg) : 148.92
Sun-Moon sep (deg)   : 6.72
B (ring opening deg) : -2.39
PA of pole (deg)     : 1.63
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 1.038
C/A sky separation (km): 3281.6
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
    
```

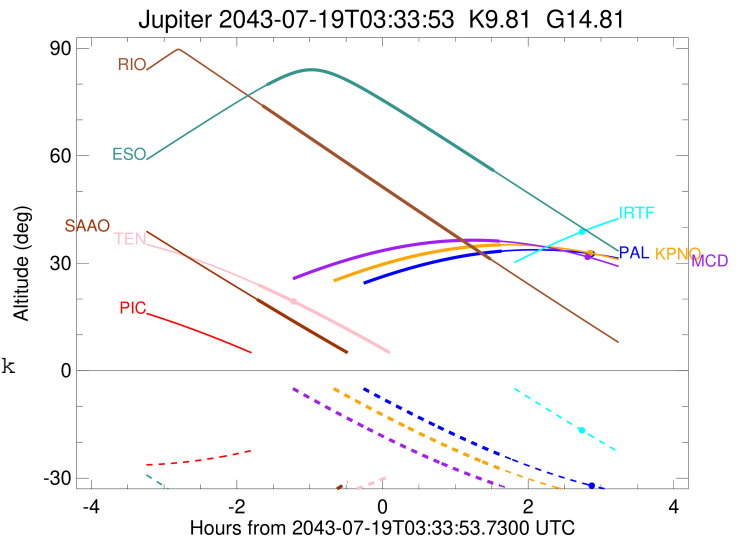
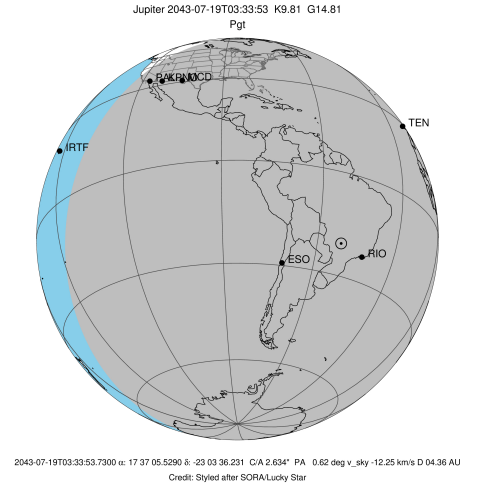


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-19T02:01:48.477	23.12	-1.47x	71492.0	-4.00	-4.57
Jupiter	E	2043-07-19T05:10:28.578	36.14	-32.03	71492.0	-1.53	-1.75

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-19T03:26:48.100
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       : 4116732131811108352
2Mass ID (if available) : 17370552-2303360
ICRS Star Coord at Epoch: 17h 37m 05.52902s -23:03:36.23081s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 9.812
G magnitude           : 14.809
RP magnitude         : 13.547
BP magnitude         : 16.583
DUPflag              : 0
Distance (au)        : 4.360
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.25
Sun-Target sep (deg) : 148.92
Sun-Moon sep (deg)   : 7.04
B (ring opening deg) : -2.39
PA of pole (deg)     : 1.63
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 1.468
C/A sky separation (km): 4641.2
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
    
```

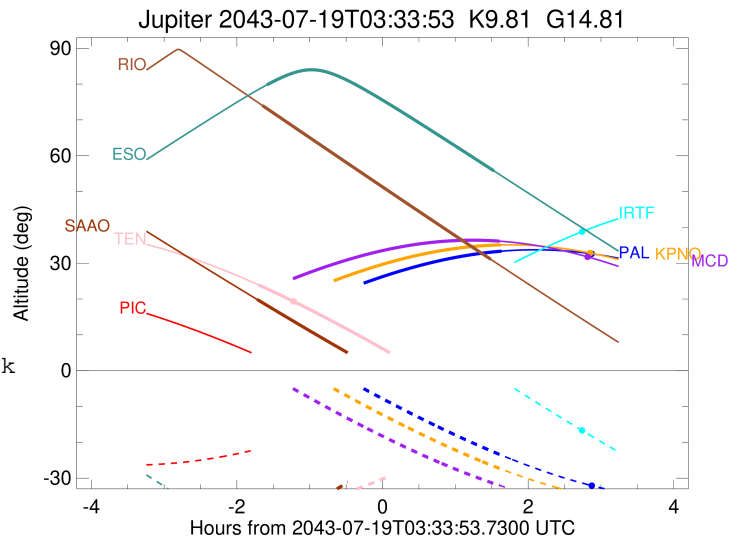
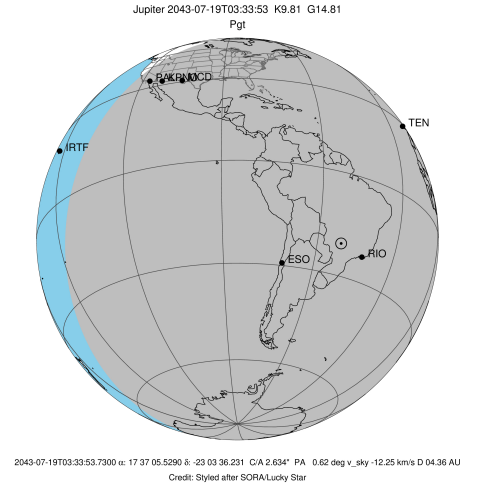


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-19T01:51:36.939	23.95	-40.08	71492.0	-4.14	-4.73
Jupiter	E	2043-07-19T05:03:19.621	-11.75x	-15.77	71492.0	-3.43	-3.93

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-19T03:28:33.430
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        : 4116732131811108352
2Mass ID (if available) : 17370552-2303360
ICRS Star Coord at Epoch: 17h 37m 05.52902s -23:03:36.23081s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 9.812
G magnitude           : 14.809
RP magnitude          : 13.547
BP magnitude          : 16.583
DUPflag              : 0
Distance (au)         : 4.360
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -12.25
Sun-Target sep (deg) : 148.92
Sun-Moon sep (deg)   : 6.54
B (ring opening deg) : -2.39
PA of pole (deg)     : 1.63
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 2.782
C/A sky separation (km): 8796.5
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
    
```

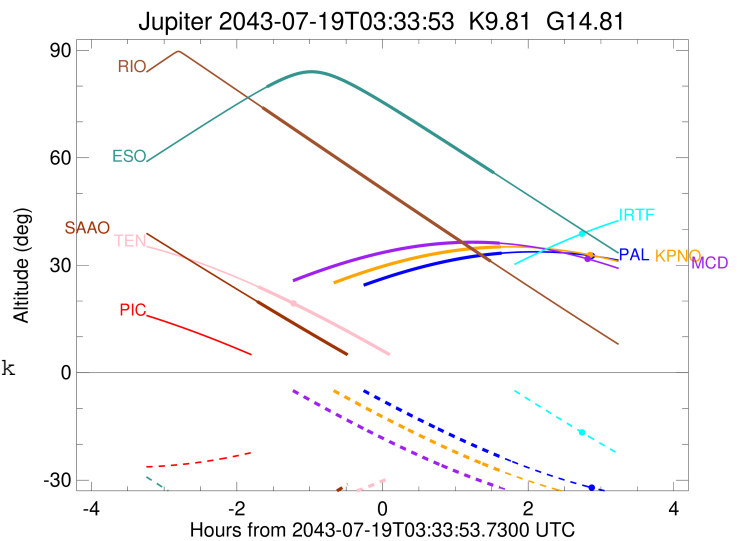
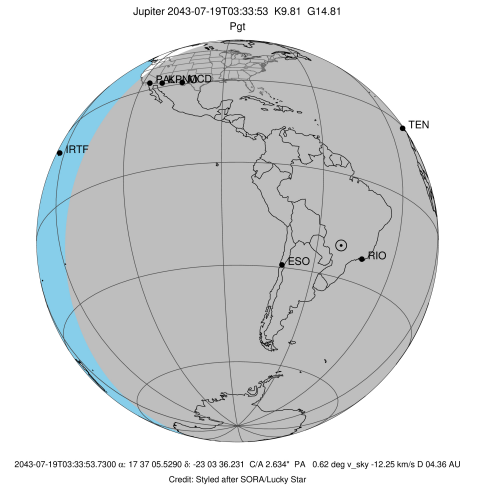


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-19T01:54:57.022	74.01	-74.99	71491.9	-7.71	-8.80
Jupiter	E	2043-07-19T05:03:08.520	31.07	-61.22	71491.9	-6.65	-7.59

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-19T03:31:59.720
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       : 4116732131811108352
2Mass ID (if available) : 17370552-2303360
ICRS Star Coord at Epoch: 17h 37m 05.52902s -23:03:36.23081s
RUWE (>1.4 is poor) : 0.96
K magnitude           : 9.812
G magnitude           : 14.809
RP magnitude          : 13.547
BP magnitude          : 16.583
DUPflag              : 0
Distance (au)        : 4.360
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.25
Sun-Target sep (deg) : 148.92
Sun-Moon sep (deg)   : 6.31
B (ring opening deg) : -2.39
PA of pole (deg)     : 1.63
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation ("): 2.853
C/A sky separation (km): 9021.3
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
    
```

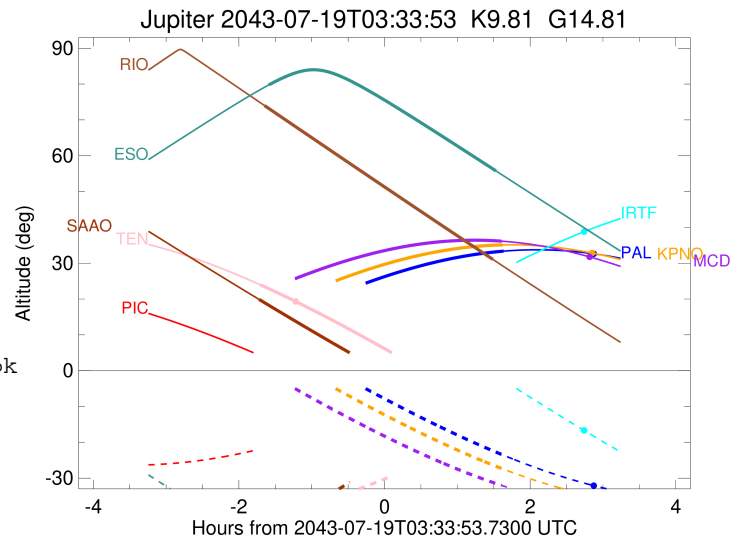
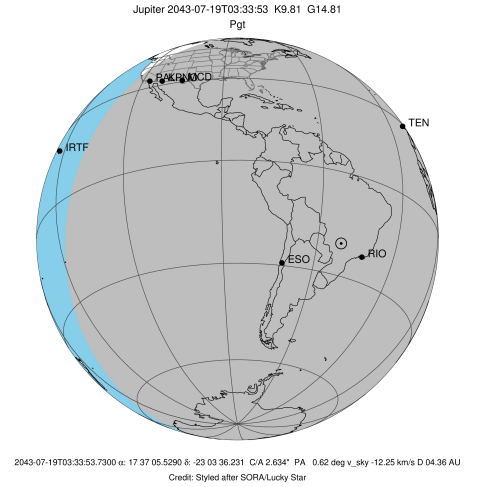


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-19T01:58:38.939	79.78	-50.71	71491.8	-8.23	-9.39
Jupiter	E	2043-07-19T05:05:45.644	55.76	-80.95	71491.9	-6.54	-7.46

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-19T03:26:33.300
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     : 4116732131811108352
2Mass ID (if available) : 17370552-2303360
ICRS Star Coord at Epoch: 17h 37m 05.52902s -23:03:36.23081s
RUWE (>1.4 is poor) : 0.96
K magnitude         : 9.812
G magnitude         : 14.809
RP magnitude        : 13.547
BP magnitude        : 16.583
DUPflag            : 0
Distance (au)      : 4.360
f0 (km)            : 0.00
g0 (km)            : 0.00
skyplane vel. (km/s) : -12.25
Sun-Target sep (deg) : 148.92
Sun-Moon sep (deg) : 6.23
B (ring opening deg) : -2.39
PA of pole (deg)   : 1.63
Pole direction: RA (deg): 268.05670
Dec (deg): 64.49732
C/A sky separation (" ) : 3.768
C/A sky separation (km) : 11913.6
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	2043-07-19T01:50:35.200	19.88	-46.91	71491.8	-9.88	-11.26
Jupiter	E	2043-07-19T05:03:56.188	-16.18x	-6.77	71491.8	-9.23	-10.52