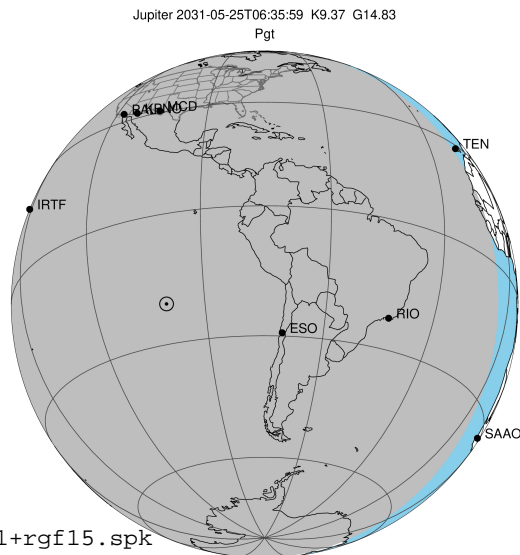


target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-05-25T06:35:59.380
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116881734113756928
 2Mass ID (if available) : 17433429-2252454

Jupiter 2031-05-25T06:35:59 K9.37 G14.83 Pgt

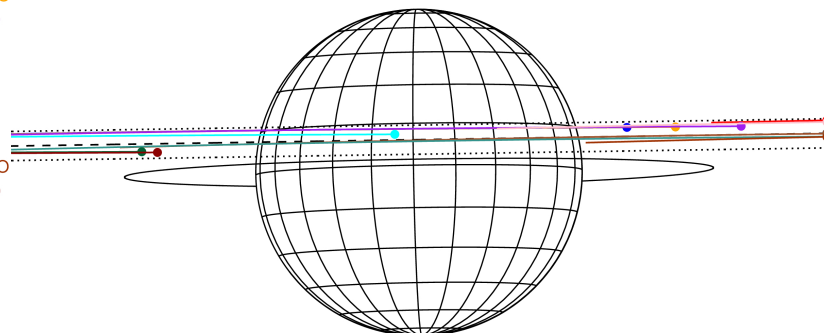
ICRS Star Coord at Epoch: 17h 43m 34.29563s -22:52:45.58941s

RUWE (>1.4 is poor) : 0.94
 K magnitude : 9.365
 G magnitude : 14.833
 RP magnitude : 13.487
 BP magnitude : 16.929
 DUPflag : 0
 Distance (au) : 4.339
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -14.16
 Sun-Target sep (deg) : 157.23
 Sun-Moon sep (deg) : 158.91
 B (ring opening deg) : -2.61
 PA of pole (deg) : 0.93
 Pole direction: RA (deg): 268.05694
 Dec (deg): 64.49651
 C/A sky separation (") : 4.570
 C/A sky separation (km) : 14382.0
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk



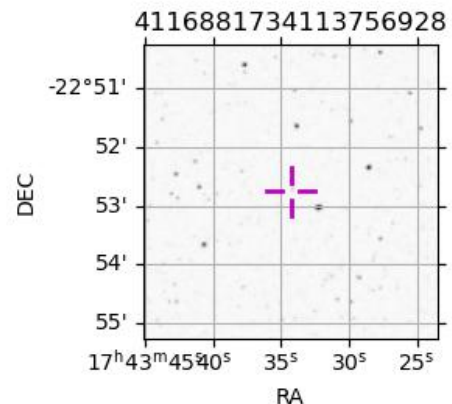
2031-05-25T06:35:59.3800 at: 17 43 34.29563 -22 52 45.589 C/A 4.558" PA 180.89 deg v_sky -14.16 km/s D 04.34 AU
 Credit: Styled after SORA/Lucky Star

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



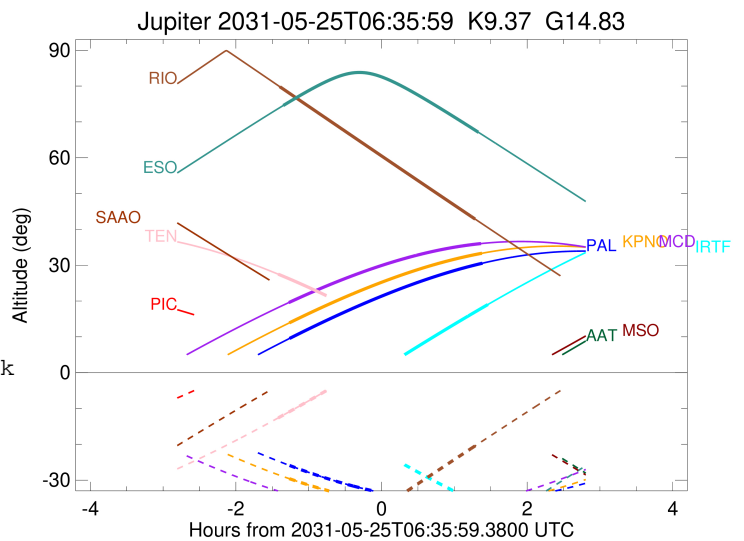
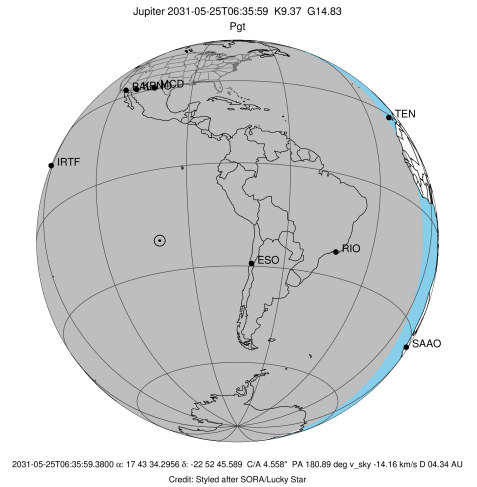
Observable events with sun below -5 deg and altitude above 5 deg

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	+ +	MAY 25 05:20	- MAY 25 07:59	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8				Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	MAY 25 05:20	- MAY 25 07:58	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	MAY 25 05:19	- MAY 25 07:57	Pie
TEN	Teide Obs./Tenerife	28.3	343.5	+	MAY 25 05:10	- MAY 25 05:10	Pin
IRTF	Mauna Kea/IRTF	19.8	204.5	+	MAY 25 08:03	- MAY 25 08:03	Pne
KAV	Kavalur Observatory	12.6	78.8				Pnn
RIO	Rio de Janeiro	-22.9	316.8	+ +	MAY 25 05:12	- MAY 25 07:53	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	MAY 25 05:15	- MAY 25 07:55	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             : 2031-05-25T06:39:59.000
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        : 4116881734113756928
2Mass ID (if available) : 17433429-2252454
ICRS Star Coord at Epoch: 17h 43m 34.29563s -22:52:45.58941s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 9.365
G magnitude           : 14.833
RP magnitude          : 13.487
BP magnitude          : 16.929
DUPflag              : 0
Distance (au)         : 4.339
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.16
Sun-Target sep (deg)  : 157.23
Sun-Moon sep (deg)    : 159.38
B (ring opening deg)  : -2.61
PA of pole (deg)      : 0.93
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (" ) : 6.078
C/A sky separation (km) : 19129.0
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
    
```

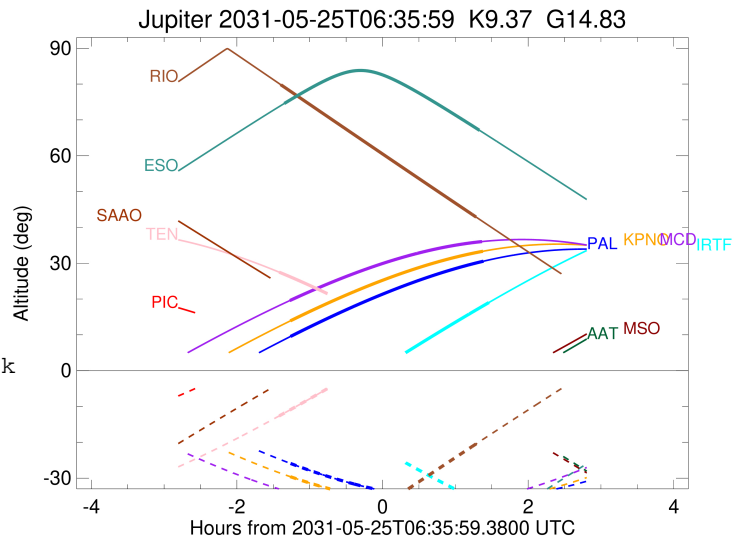
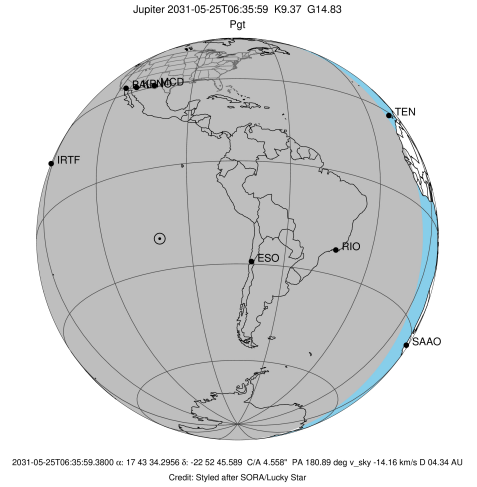


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-25T05:20:13.419	9.55	-25.90	71491.4	14.99	17.01
Jupiter	E	2031-05-25T07:59:12.526	30.55	-35.77	71491.3	15.86	17.99

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-25T06:39:36.520
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        : 4116881734113756928
2Mass ID (if available) : 17433429-2252454
ICRS Star Coord at Epoch: 17h 43m 34.29563s -22:52:45.58941s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 9.365
G magnitude           : 14.833
RP magnitude          : 13.487
BP magnitude          : 16.929
DUPflag              : 0
Distance (au)         : 4.339
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.16
Sun-Target sep (deg) : 157.23
Sun-Moon sep (deg)   : 159.36
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.93
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation ("): 6.087
C/A sky separation (km): 19155.1
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
    
```

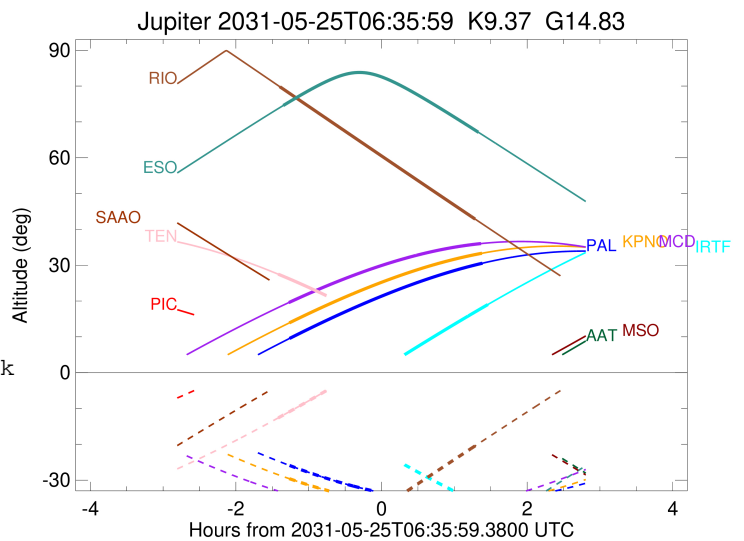
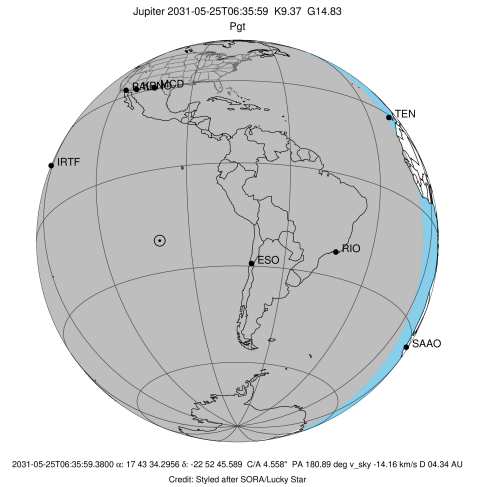


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-25T05:20:01.312	13.90	-29.59	71491.4	15.04	17.07
Jupiter	E	2031-05-25T07:58:42.518	33.33	-36.60	71491.3	15.84	17.96

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch              : 2031-05-25T06:38:58.350
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        : 4116881734113756928
2Mass ID (if available) : 17433429-2252454
ICRS Star Coord at Epoch: 17h 43m 34.29563s -22:52:45.58941s
RUWE (>1.4 is poor)  : 0.94
K magnitude            : 9.365
G magnitude            : 14.833
RP magnitude           : 13.487
BP magnitude           : 16.929
DUPflag               : 0
Distance (au)         : 4.339
f0 (km)                : 0.00
g0 (km)                : 0.00
skyplane vel. (km/s)  : -14.16
Sun-Target sep (deg)  : 157.23
Sun-Moon sep (deg)    : 159.31
B (ring opening deg)  : -2.61
PA of pole (deg)      : 0.93
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 6.107
C/A sky separation (km) : 19217.9
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
    
```

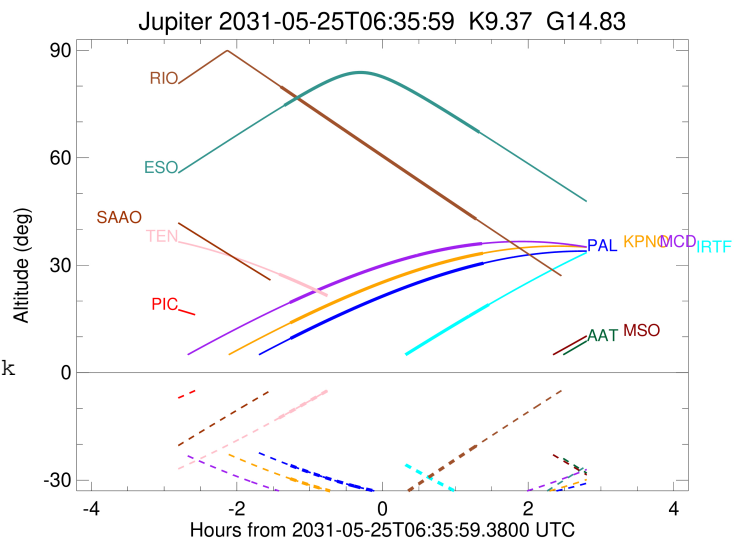
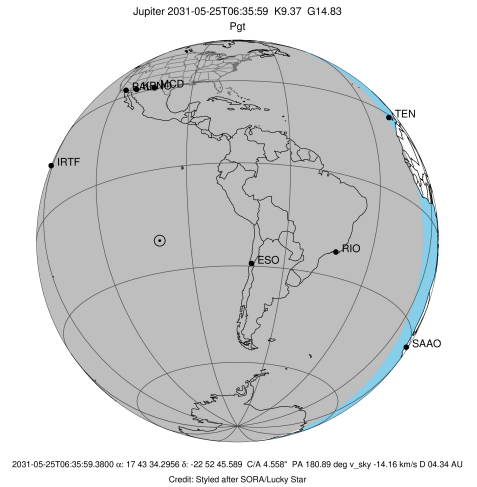


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-25T05:19:36.746	19.56	-33.90	71491.4	15.14	17.19
Jupiter	E	2031-05-25T07:57:55.474	36.03	-36.25	71491.3	15.82	17.94

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-25T06:30:39.950
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      : 4116881734113756928
2Mass ID (if available) : 17433429-2252454
ICRS Star Coord at Epoch: 17h 43m 34.29563s -22:52:45.58941s
RUWE (>1.4 is poor) : 0.94
K magnitude          : 9.365
G magnitude          : 14.833
RP magnitude         : 13.487
BP magnitude         : 16.929
DUPflag             : 0
Distance (au)       : 4.339
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.16
Sun-Target sep (deg) : 157.23
Sun-Moon sep (deg)  : 158.28
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.93
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (" ) : 5.842
C/A sky separation (km) : 18386.3
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
    
```

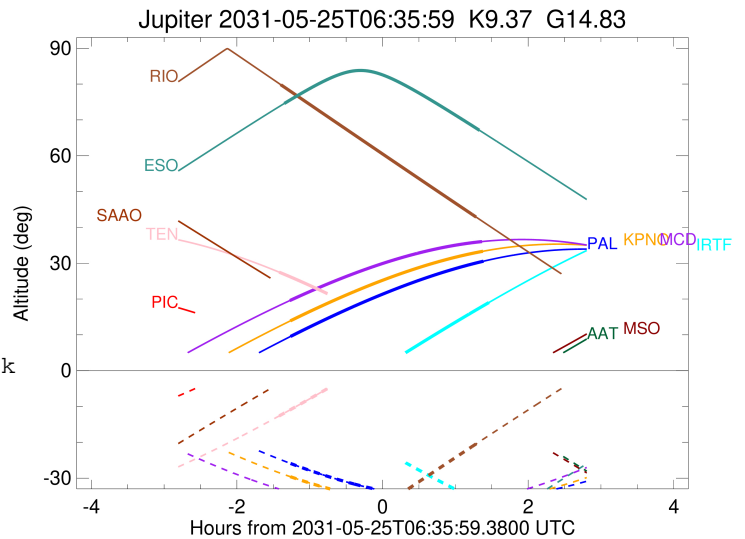
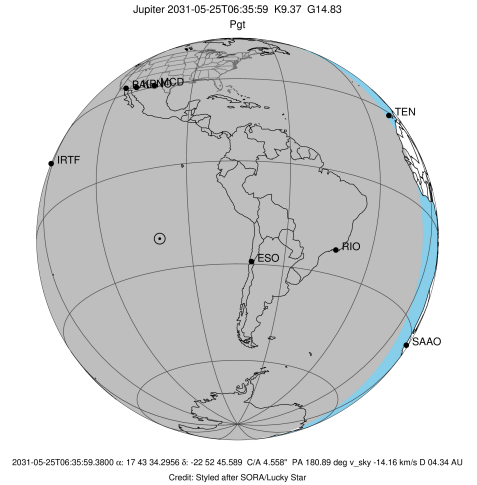


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-25T05:10:50.827	27.49	-12.63	71491.4	15.30	17.36
Jupiter	E	2031-05-25T07:51:04.910	-0.53x	19.89x	71491.4	14.35	16.29

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-25T06:42:43.170
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       : 4116881734113756928
2Mass ID (if available) : 17433429-2252454
ICRS Star Coord at Epoch: 17h 43m 34.29563s -22:52:45.58941s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 9.365
G magnitude           : 14.833
RP magnitude          : 13.487
BP magnitude          : 16.929
DUPflag              : 0
Distance (au)         : 4.339
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.16
Sun-Target sep (deg)  : 157.23
Sun-Moon sep (deg)   : 159.64
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.93
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 5.325
C/A sky separation (km) : 16758.6
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
    
```

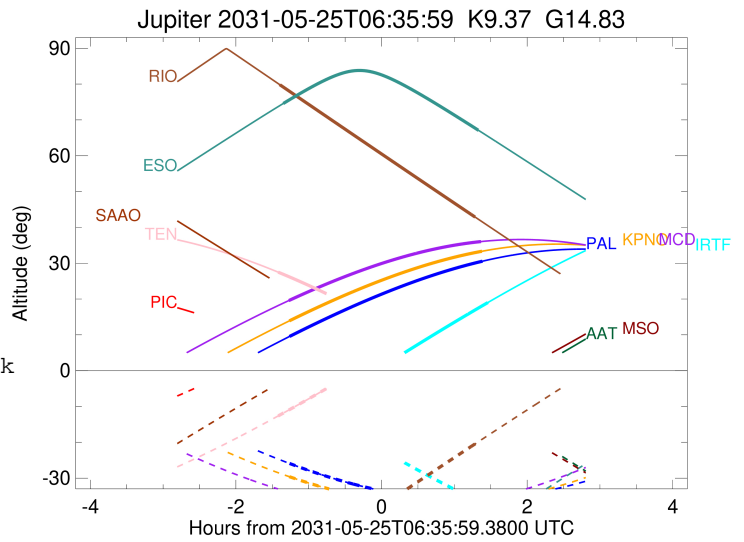
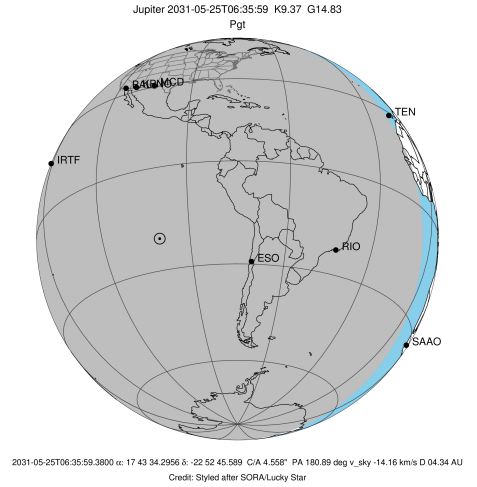


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-25T05:20:55.826	-15.48x	-6.61	71491.5	12.82	14.58
Jupiter	E	2031-05-25T08:03:35.525	19.01	-37.60	71491.4	14.22	16.15

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-25T06:32:29.720
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       : 4116881734113756928
2Mass ID (if available) : 17433429-2252454
ICRS Star Coord at Epoch: 17h 43m 34.29563s -22:52:45.58941s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 9.365
G magnitude           : 14.833
RP magnitude         : 13.487
BP magnitude         : 16.929
DUPflag              : 0
Distance (au)        : 4.339
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.16
Sun-Target sep (deg) : 157.23
Sun-Moon sep (deg)   : 158.79
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.93
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation ("): 4.481
C/A sky separation (km): 14103.8
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
    
```

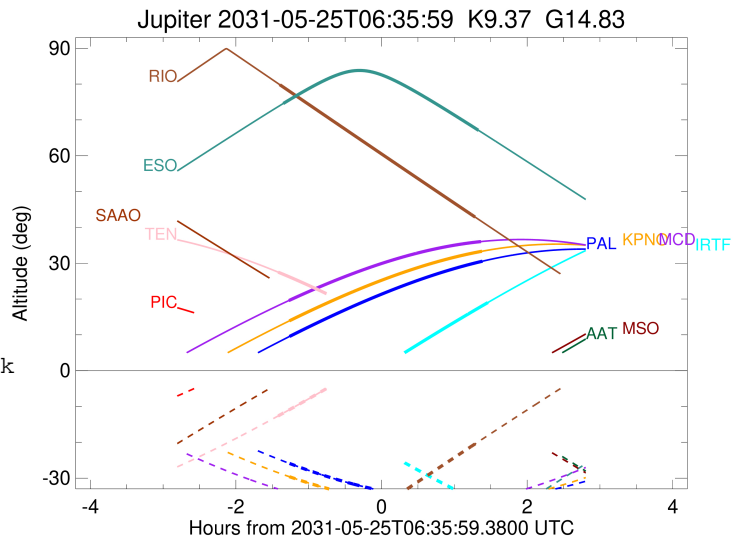
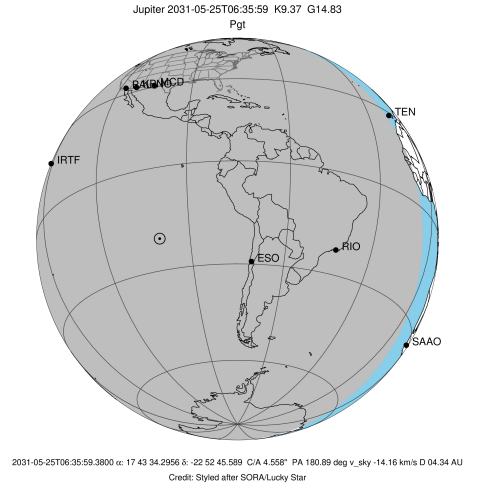


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-25T05:12:11.580	79.81	-56.99	71491.6	11.54	13.14
Jupiter	E	2031-05-25T07:53:09.501	42.86	-20.43	71491.7	10.99	12.51

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-25T06:35:28.880
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        : 4116881734113756928
2Mass ID (if available) : 17433429-2252454
ICRS Star Coord at Epoch: 17h 43m 34.29563s -22:52:45.58941s
RUWE (>1.4 is poor)  : 0.94
K magnitude           : 9.365
G magnitude           : 14.833
RP magnitude          : 13.487
BP magnitude          : 16.929
DUPflag              : 0
Distance (au)         : 4.339
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.16
Sun-Target sep (deg)  : 157.23
Sun-Moon sep (deg)    : 159.18
B (ring opening deg)  : -2.61
PA of pole (deg)      : 0.93
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 4.351
C/A sky separation (km) : 13691.5
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	2031-05-25T05:15:06.382	74.58	-78.57	71491.7	10.91	12.42
Jupiter	E	2031-05-25T07:55:51.142	67.10	-45.17	71491.7	10.93	12.45