

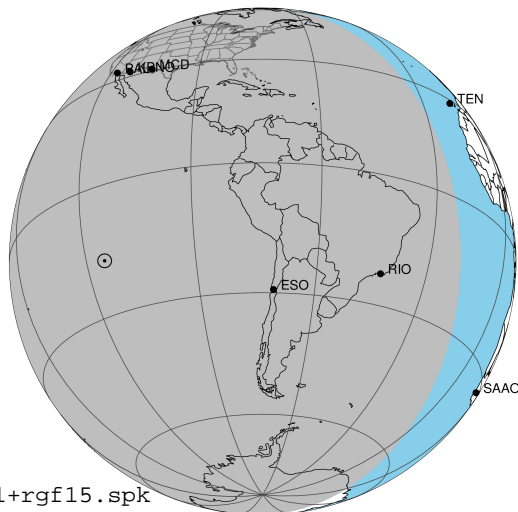
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-05-10T07:33:58.870
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068877954148818944
 2Mass ID (if available) : 17493332-2253371

Jupiter 2031-05-10T07:33:58 K8.25 G14.89 Pgt

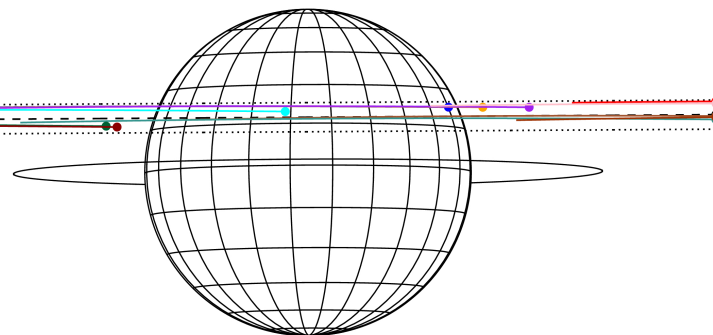
ICRS Star Coord at Epoch: 17h 49m 33.32539s -22:53:37.39127s

RUWE (>1.4 is poor) : 1.02
 K magnitude : 8.252
 G magnitude : 14.886
 RP magnitude : 13.329
 BP magnitude : 18.475
 DUPflag : 0
 Distance (au) : 4.466
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -10.00
 Sun-Target sep (deg) : 141.44
 Sun-Moon sep (deg) : 5.41
 B (ring opening deg) : -2.61
 PA of pole (deg) : 0.29
 Pole direction: RA (deg): 268.05695
 Dec (deg): 64.49651
 C/A sky separation (") : 7.478
 C/A sky separation (km) : 24219.5
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-05-10T07:33:58 K8.25 G14.89
 Pgt



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

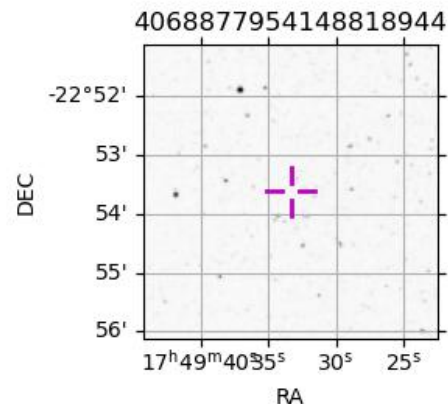


2031-05-10T07:33:58.8700 at: 17 49 33.3254 s: -22 53 37.391 C/A 7.466" PA 180.37 deg v_sky -10.00 km/s D 04.47 AU

Credit: Styled after SORA/Lucky Star

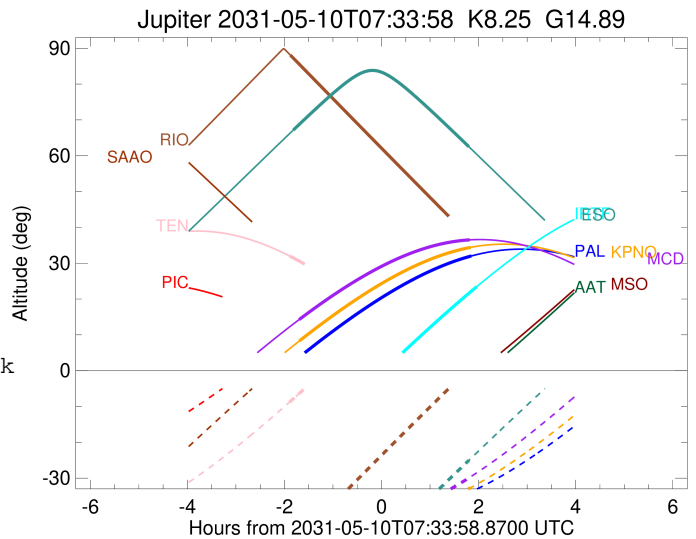
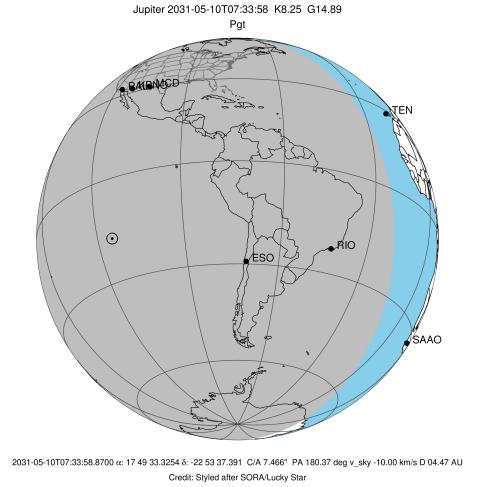
Observable events with sun below -5 deg and altitude above 5 deg

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	+	MAY 10 09:24	- MAY 10 09:24	Pne
PMO	Purple Mtn Obs. Nanking	32.1	118.8				Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	MAY 10 05:52	- MAY 10 09:24	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+	MAY 10 05:52	- MAY 10 09:23	Pie
TEN	Teide Obs./Tenerife	28.3	343.5	+	MAY 10 05:40	- MAY 10 05:40	Pin
IRTF	Mauna Kea/IRTF	19.8	204.5	+	MAY 10 09:31	- MAY 10 09:31	Pne
KAV	Kavalur Observatory	12.6	78.8				Pnn
RIO	Rio de Janeiro	-22.9	316.8	+	MAY 10 05:41	- MAY 10 05:41	Pin
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	MAY 10 05:45	- MAY 10 09:21	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             : 2031-05-10T07:39:28.180
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        : 4068877954148818944
2Mass ID (if available) : 17493332-2253371
ICRS Star Coord at Epoch: 17h 49m 33.32539s -22:53:37.39127s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 8.252
G magnitude           : 14.886
RP magnitude          : 13.329
BP magnitude          : 18.475
DUPflag              : 0
Distance (au)         : 4.466
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -10.00
Sun-Target sep (deg)  : 141.44
Sun-Moon sep (deg)   : 5.70
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.29
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation ("): 8.944
C/A sky separation (km): 28967.0
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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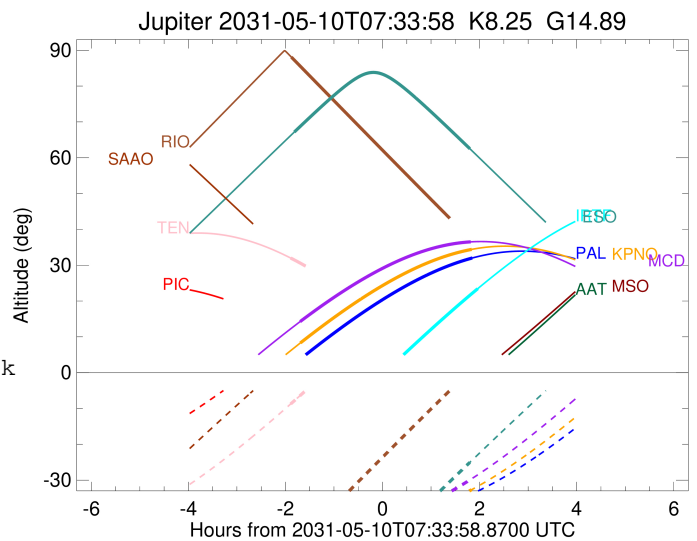
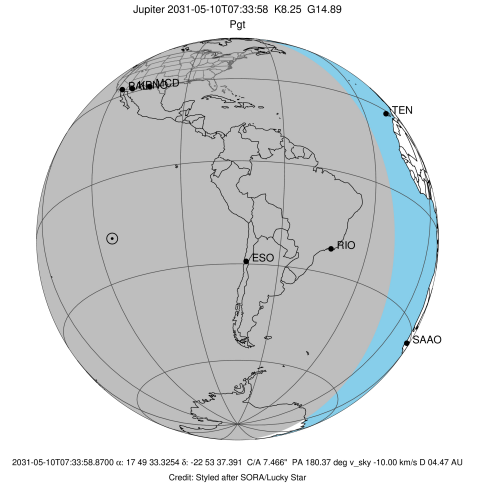


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-10T05:52:38.545	3.83x	-32.71	71490.6	23.26	26.14
Jupiter	E	2031-05-10T09:24:51.987	32.00	-33.77	71490.4	24.20	27.16

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-10T07:38:58.790
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       : 4068877954148818944
2Mass ID (if available) : 17493332-2253371
ICRS Star Coord at Epoch: 17h 49m 33.32539s -22:53:37.39127s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 8.252
G magnitude           : 14.886
RP magnitude         : 13.329
BP magnitude         : 18.475
DUPflag              : 0
Distance (au)        : 4.466
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -10.00
Sun-Target sep (deg) : 141.44
Sun-Moon sep (deg)   : 5.65
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.29
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation ("): 8.952
C/A sky separation (km): 28992.3
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
    
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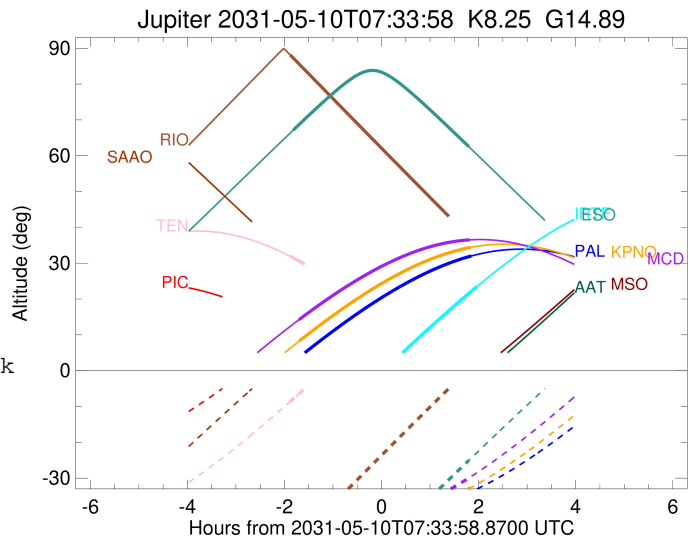
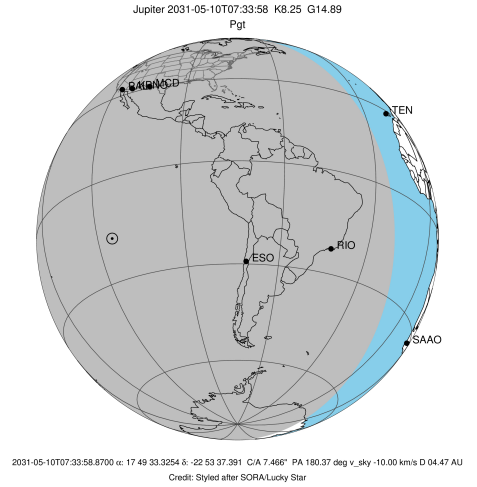


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-10T05:52:29.275	8.30	-36.09	71490.5	23.32	26.21
Jupiter	E	2031-05-10T09:24:09.476	34.40	-32.67	71490.4	24.16	27.12

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-10T07:38:08.490
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      : 4068877954148818944
2Mass ID (if available) : 17493332-2253371
ICRS Star Coord at Epoch: 17h 49m 33.32539s -22:53:37.39127s
RUWE (>1.4 is poor) : 1.02
K magnitude          : 8.252
G magnitude          : 14.886
RP magnitude         : 13.329
BP magnitude         : 18.475
DUPflag             : 0
Distance (au)       : 4.466
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -10.00
Sun-Target sep (deg) : 141.44
Sun-Moon sep (deg)  : 5.57
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.29
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation ("): 8.971
C/A sky separation (km): 29054.1
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
    
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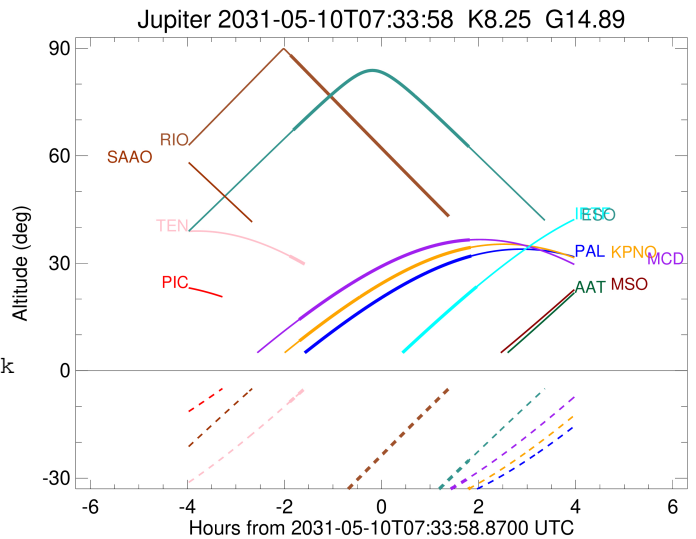
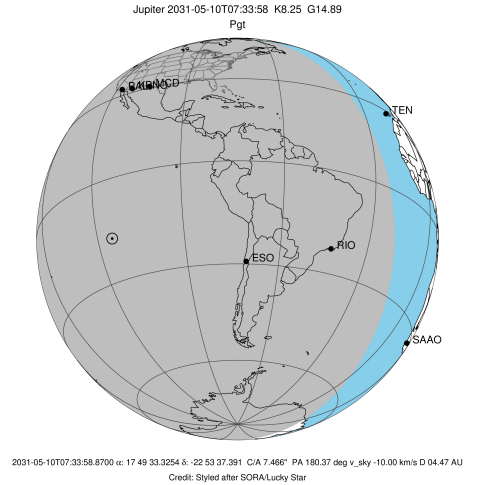


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-10T05:52:05.952	14.24	-39.77	71490.5	23.44	26.34
Jupiter	E	2031-05-10T09:23:03.727	36.51	-29.78	71490.4	24.12	27.07

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-10T07:26:53.890
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       : 4068877954148818944
2Mass ID (if available) : 17493332-2253371
ICRS Star Coord at Epoch: 17h 49m 33.32539s -22:53:37.39127s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 8.252
G magnitude           : 14.886
RP magnitude          : 13.329
BP magnitude          : 18.475
DUPflag              : 0
Distance (au)        : 4.466
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -10.00
Sun-Target sep (deg) : 141.44
Sun-Moon sep (deg)   : 4.49
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.29
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation ("): 8.723
C/A sky separation (km): 28251.5
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
    
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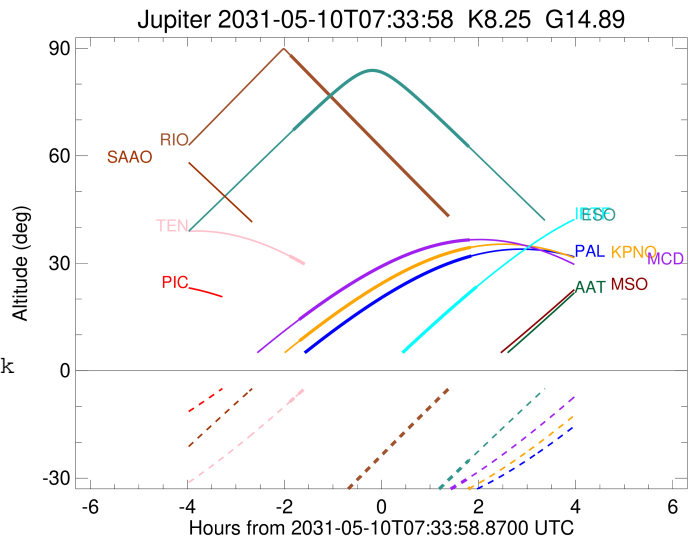
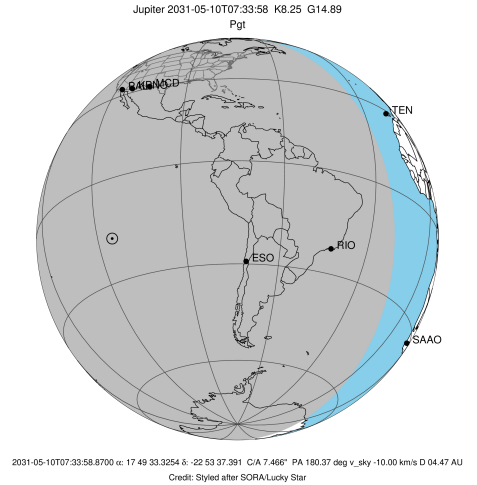


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-10T05:40:23.496	32.00	-8.75	71490.5	23.91	26.85
Jupiter	E	2031-05-10T09:14:44.724	-4.30x	36.97x	71490.7	22.34	25.14

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-10T07:43:06.190
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        : 4068877954148818944
2Mass ID (if available) : 17493332-2253371
ICRS Star Coord at Epoch: 17h 49m 33.32539s -22:53:37.39127s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 8.252
G magnitude           : 14.886
RP magnitude          : 13.329
BP magnitude          : 18.475
DUPflag              : 0
Distance (au)         : 4.466
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -10.00
Sun-Target sep (deg)  : 141.44
Sun-Moon sep (deg)   : 6.12
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.29
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 8.215
C/A sky separation (km) : 26606.9
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
    
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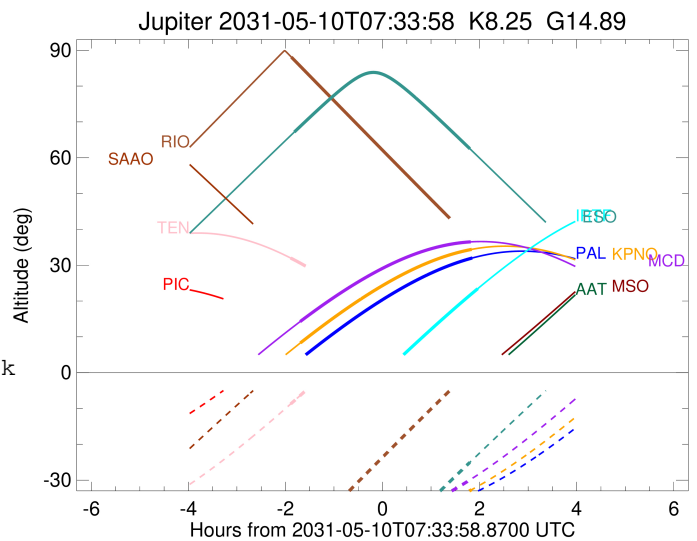
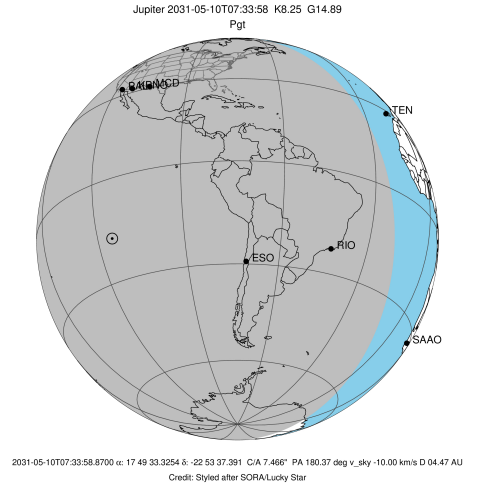


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-10T05:52:04.595	-23.06x	-14.78	71490.8	20.94	23.60
Jupiter	E	2031-05-10T09:31:42.759	23.45	-50.97	71490.6	22.61	25.44

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-10T07:29:30.450
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       : 4068877954148818944
2Mass ID (if available) : 17493332-2253371
ICRS Star Coord at Epoch: 17h 49m 33.32539s -22:53:37.39127s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 8.252
G magnitude           : 14.886
RP magnitude         : 13.329
BP magnitude         : 18.475
DUPflag              : 0
Distance (au)        : 4.466
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -10.00
Sun-Target sep (deg) : 141.44
Sun-Moon sep (deg)  : 5.10
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.29
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation ("): 7.396
C/A sky separation (km) : 23954.1
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
    
```

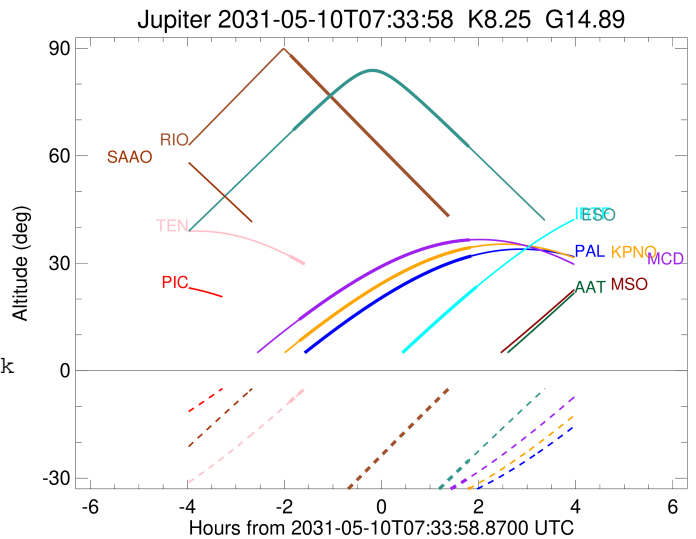
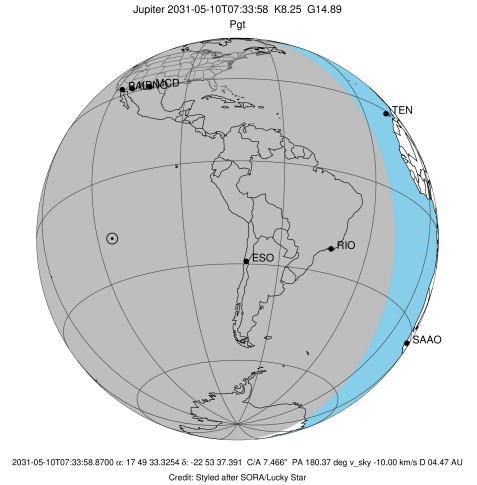


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-10T05:41:21.946	88.07	-49.44	71490.9	19.87	22.43
Jupiter	E	2031-05-10T09:18:23.998	38.26	-0.34x	71491.0	18.86	21.31


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-10T07:33:33.740
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      : 4068877954148818944
2Mass ID (if available) : 17493332-2253371
ICRS Star Coord at Epoch: 17h 49m 33.32539s -22:53:37.39127s
RUWE (>1.4 is poor) : 1.02
K magnitude          : 8.252
G magnitude          : 14.886
RP magnitude         : 13.329
BP magnitude         : 18.475
DUPflag             : 0
Distance (au)       : 4.466
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -10.00
Sun-Target sep (deg) : 141.44
Sun-Moon sep (deg)  : 5.52
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.29
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 7.265
C/A sky separation (km) : 23529.6
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	2031-05-10T05:45:02.728	67.18	-71.06	71491.0	19.10	21.59
Jupiter	E	2031-05-10T09:21:55.397	62.52	-25.04	71491.0	18.88	21.34