

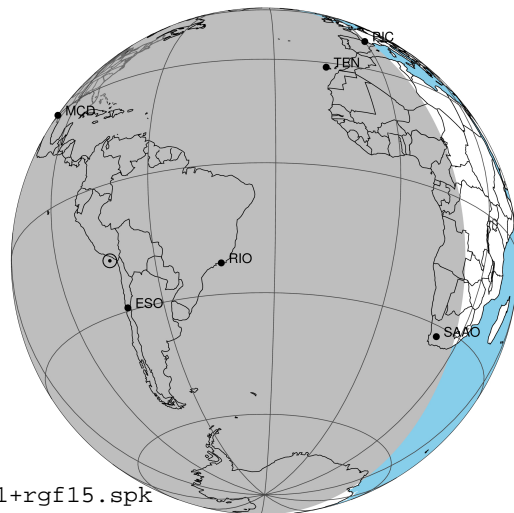
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-05-11T04:46:05.490
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068878430995951872
 2Mass ID (if available) : 17491598-2253423

Jupiter 2031-05-11T04:46:05 K8.45 G14.69 Pgt

ICRS Star Coord at Epoch: 17h 49m 16.00232s -22:53:42.55014s

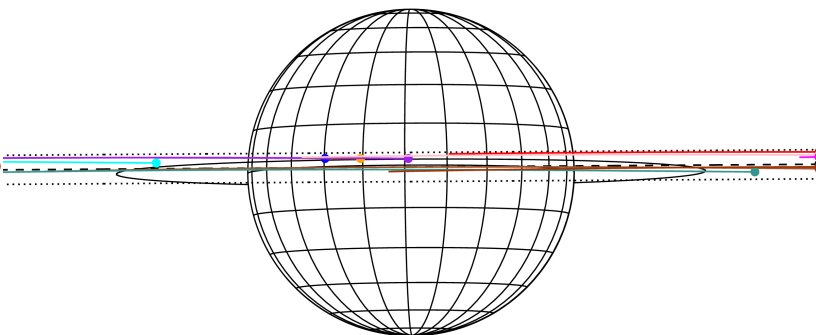
RUWE (>1.4 is poor) : 1.00
 K magnitude : 8.449
 G magnitude : 14.689
 RP magnitude : 13.191
 BP magnitude : 17.480
 DUPflag : 0
 Distance (au) : 4.457
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -10.29
 Sun-Target sep (deg) : 142.36
 Sun-Moon sep (deg) : 18.10
 B (ring opening deg) : -2.61
 PA of pole (deg) : 0.32
 Pole direction: RA (deg): 268.05695
 Dec (deg): 64.49651
 C/A sky separation (") : 0.740
 C/A sky separation (km) : 2392.6
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-05-11T04:46:05 K8.45 G14.69
 Pgt



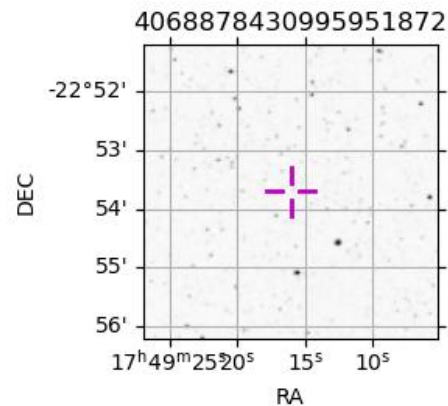
2031-05-11T04:46:05.490 at: 17 49 16.00232 s: -22 53 42.55014 s C/A 0.728" PA 180.39 deg v_sky -10.29 km/s D 04.46 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 KAV
 RIO
 ESO
 SAAO



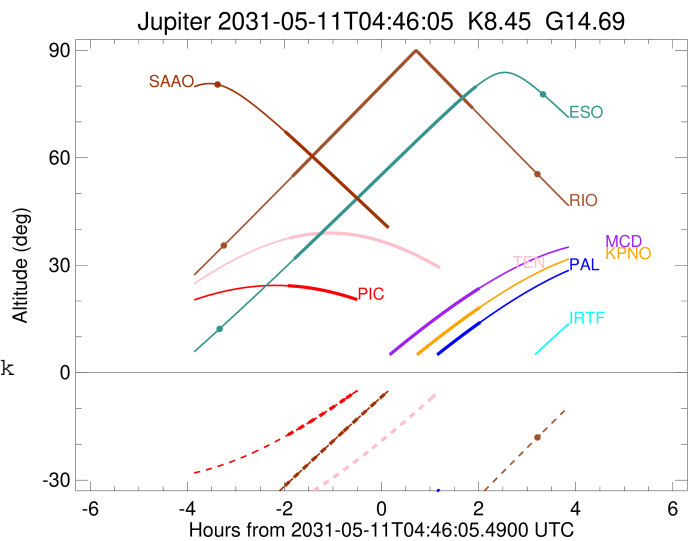
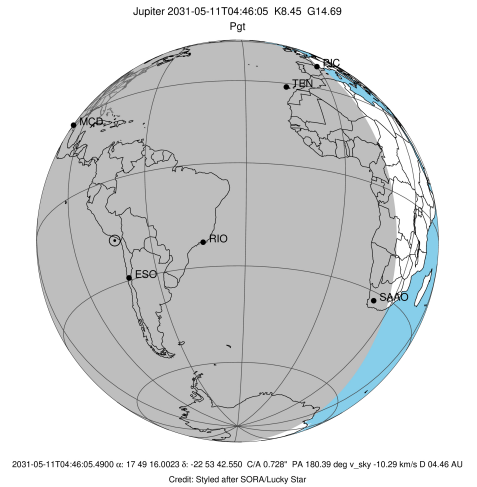
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	MAY 11 02:50 - MAY 11 02:50	Pin
PAL	Palomar Mt (200")	33.4	243.1	+	MAY 11 06:48 - MAY 11 06:48	Pne
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	MAY 11 06:47 - MAY 11 06:47	Pne
MCD	McDonald Obs. 2.7m	30.7	256.0	+	MAY 11 06:47 - MAY 11 06:47	Pne
TEN	Teide Obs./Tenerife	28.3	343.5	+	MAY 11 02:52 - MAY 11 02:52	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	+	MAY 11 02:56 - MAY 11 06:38	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	MAY 11 02:58 - MAY 11 06:43	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	MAY 11 02:46 - MAY 11 02:46	Pin
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-11T04:42:13.580
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : PIC
Location            : Pic du Midi
Latitude (deg)      : 42.93656
E. Longitude (deg)  : 0.14231
Altitude (km)       : 2.890
Gaia source ID      : 4068878430995951872
2Mass ID (if available) : 17491598-2253423
ICRS Star Coord at Epoch: 17h 49m 16.00232s -22:53:42.55014s
RUWE (>1.4 is poor) : 1.00
K magnitude          : 8.449
G magnitude          : 14.689
RP magnitude         : 13.191
BP magnitude         : 17.480
DUPflag             : 0
Distance (au)       : 4.457
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -10.29
Sun-Target sep (deg) : 142.36
Sun-Moon sep (deg)  : 17.69
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.32
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (" ) : 2.455
C/A sky separation (km) : 7934.1
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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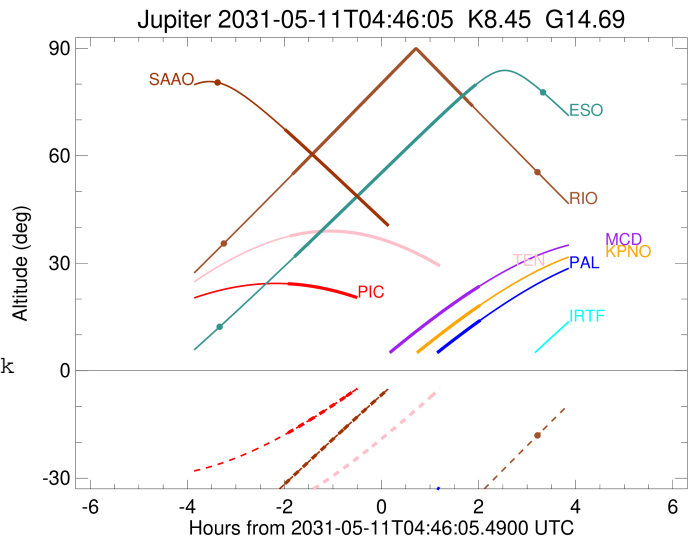
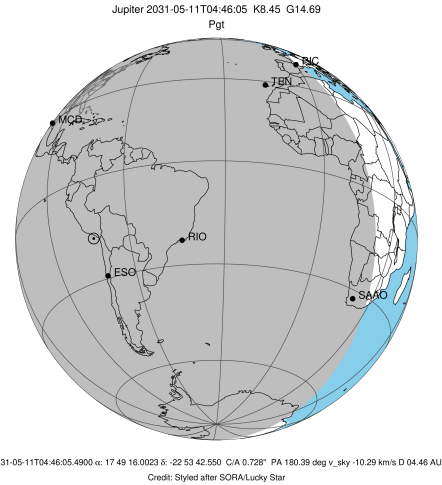


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-11T02:50:30.034	24.27	-17.35	71491.9	6.65	7.59
Jupiter	E	2031-05-11T06:34:36.015	4.33x	19.00x	71491.9	5.78	6.61

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-11T04:54:31.840
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       : 4068878430995951872
2Mass ID (if available) : 17491598-2253423
ICRS Star Coord at Epoch: 17h 49m 16.00232s -22:53:42.55014s
RUWE (>1.4 is poor) : 1.00
K magnitude           : 8.449
G magnitude           : 14.689
RP magnitude          : 13.191
BP magnitude          : 17.480
DUPflag              : 0
Distance (au)         : 4.457
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -10.29
Sun-Target sep (deg) : 142.36
Sun-Moon sep (deg)   : 18.75
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.32
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation ("): 1.816
C/A sky separation (km): 5868.3
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
    
```

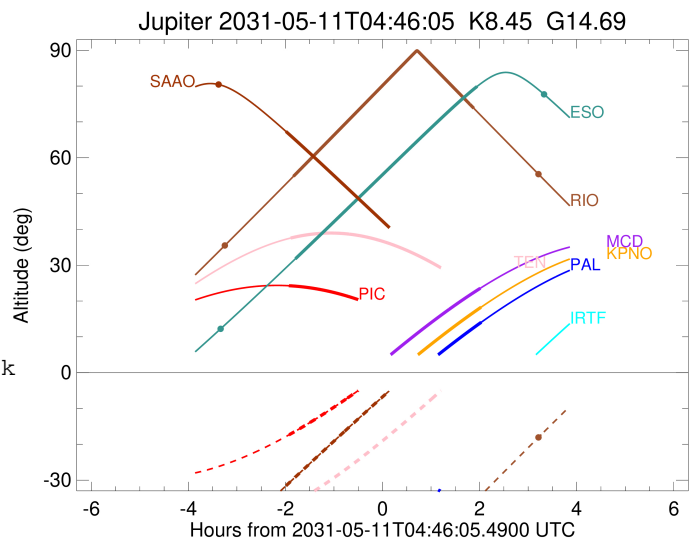
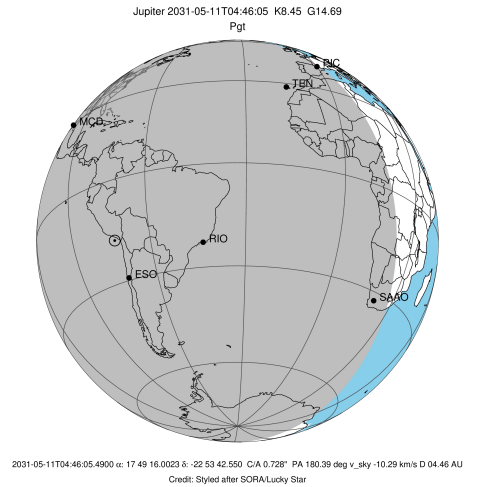


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-11T02:58:32.134	-29.55x	-5.03	71492.0	3.94	4.51
Jupiter	E	2031-05-11T06:48:09.622	14.07	-37.27	71491.9	5.39	6.16

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-11T04:54:31.140
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        : 4068878430995951872
2Mass ID (if available) : 17491598-2253423
ICRS Star Coord at Epoch: 17h 49m 16.00232s -22:53:42.55014s
RUWE (>1.4 is poor) : 1.00
K magnitude           : 8.449
G magnitude           : 14.689
RP magnitude          : 13.191
BP magnitude          : 17.480
DUPflag              : 0
Distance (au)         : 4.457
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -10.29
Sun-Target sep (deg) : 142.36
Sun-Moon sep (deg)   : 18.78
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.32
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation ("): 1.839
C/A sky separation (km): 5943.5
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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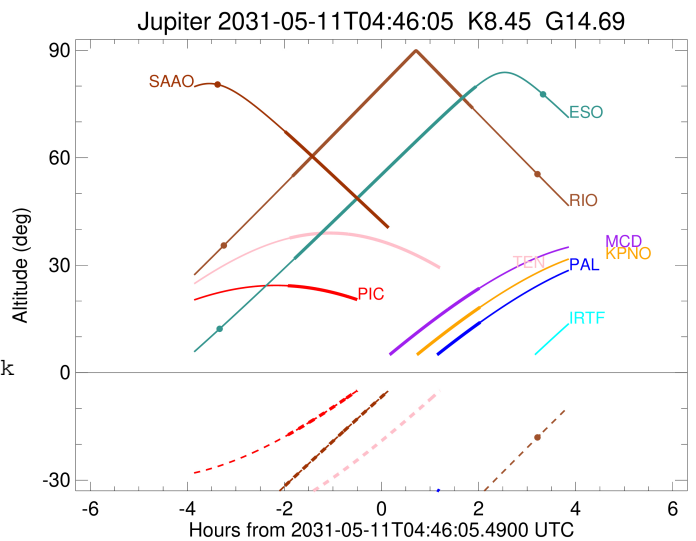
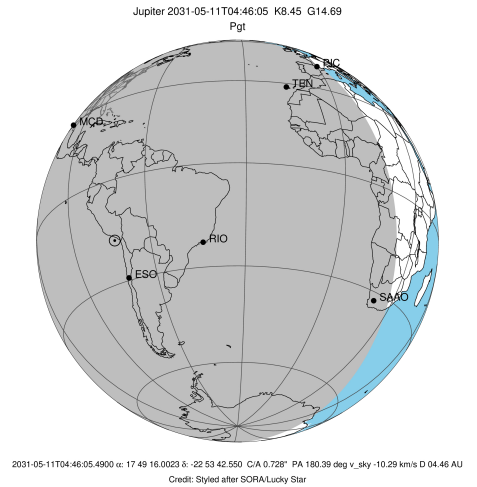


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-11T02:58:55.880	-24.85x	-9.70	71492.0	3.99	4.56
Jupiter	E	2031-05-11T06:47:46.056	18.24	-39.66	71491.9	5.43	6.20

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-11T04:54:18.030
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       : 4068878430995951872
2Mass ID (if available) : 17491598-2253423
ICRS Star Coord at Epoch: 17h 49m 16.00232s -22:53:42.55014s
RUWE (>1.4 is poor) : 1.00
K magnitude           : 8.449
G magnitude           : 14.689
RP magnitude          : 13.191
BP magnitude          : 17.480
DUPflag              : 0
Distance (au)         : 4.457
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -10.29
Sun-Target sep (deg)  : 142.36
Sun-Moon sep (deg)   : 18.79
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.32
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 1.889
C/A sky separation (km) : 6106.2
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
    
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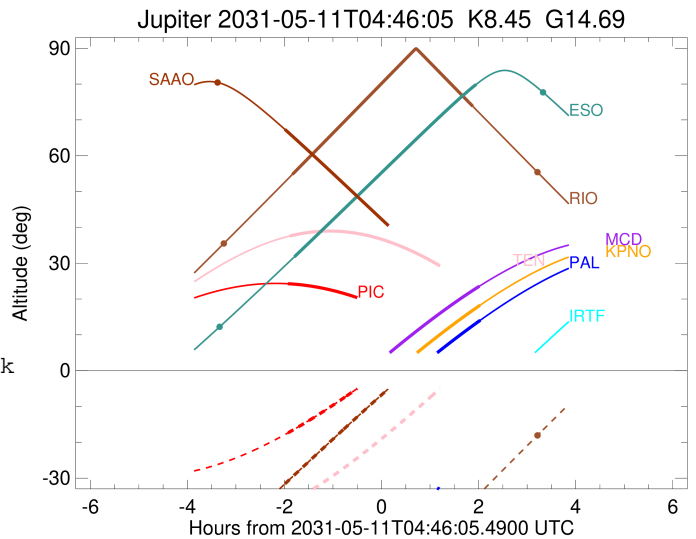
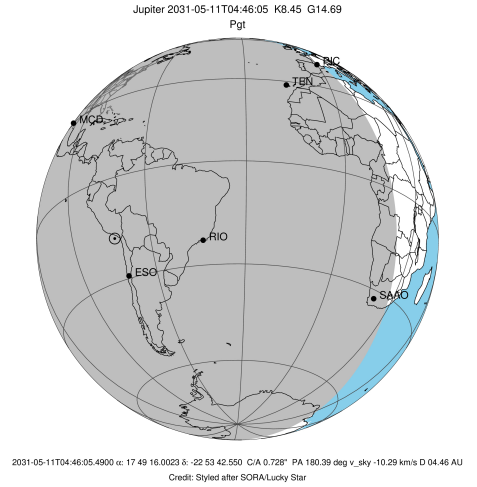


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-11T02:59:18.993	-18.17x	-16.02	71491.9	4.12	4.70
Jupiter	E	2031-05-11T06:47:01.900	23.57	-41.63	71491.9	5.51	6.30

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-11T04:43:44.520
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        : 4068878430995951872
2Mass ID (if available) : 17491598-2253423
ICRS Star Coord at Epoch: 17h 49m 16.00232s -22:53:42.55014s
RUWE (>1.4 is poor) : 1.00
K magnitude           : 8.449
G magnitude           : 14.689
RP magnitude          : 13.191
BP magnitude          : 17.480
DUPflag              : 0
Distance (au)         : 4.457
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -10.29
Sun-Target sep (deg)  : 142.36
Sun-Moon sep (deg)   : 17.94
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.32
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 2.251
C/A sky separation (km) : 7276.2
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
    
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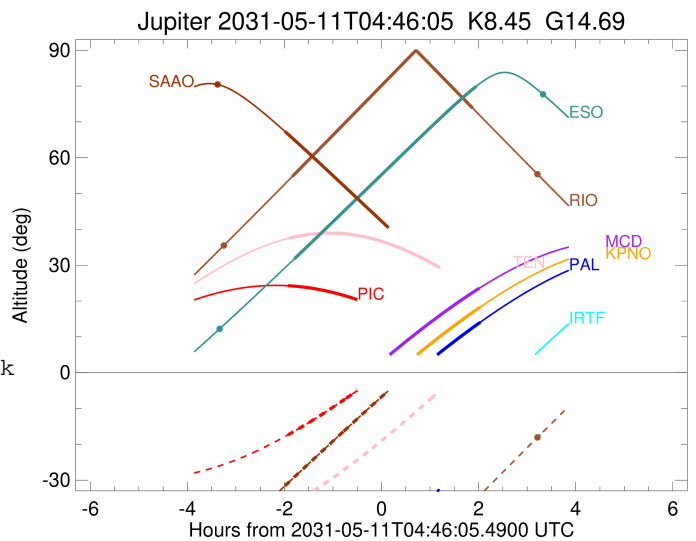
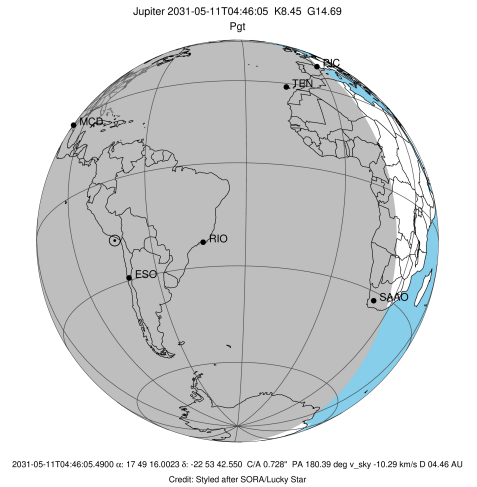


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-11T02:52:46.888	37.59	-36.87	71491.9	5.92	6.76
Jupiter	E	2031-05-11T06:34:59.297	24.05	2.54x	71491.9	5.35	6.11

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-11T04:47:46.770
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        : 4068878430995951872
2Mass ID (if available) : 17491598-2253423
ICRS Star Coord at Epoch: 17h 49m 16.00232s -22:53:42.55014s
RUWE (>1.4 is poor) : 1.00
K magnitude           : 8.449
G magnitude           : 14.689
RP magnitude          : 13.191
BP magnitude          : 17.480
DUPflag              : 0
Distance (au)         : 4.457
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -10.29
Sun-Target sep (deg)  : 142.36
Sun-Moon sep (deg)   : 18.57
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.32
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 0.733
C/A sky separation (km) : 2368.4
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
    
```

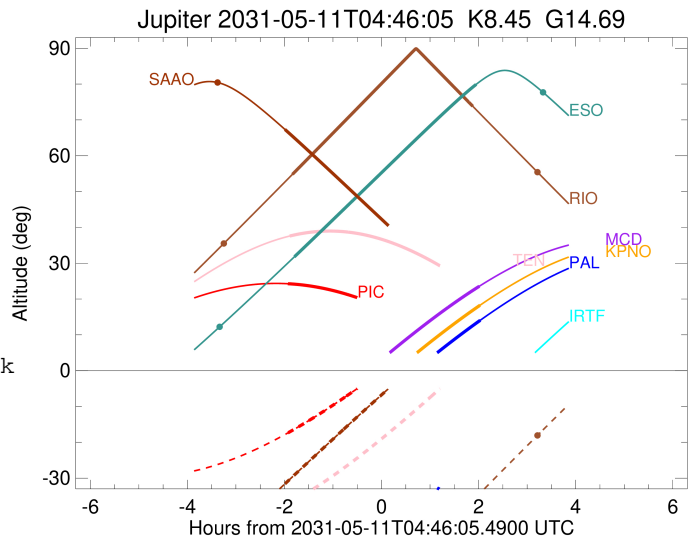
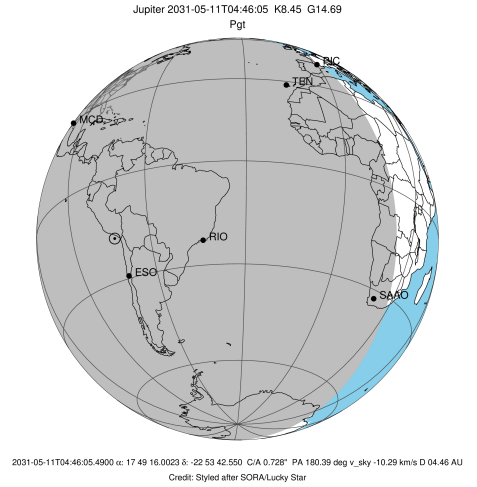


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-11T02:56:08.323	54.83	-84.80	71492.0	1.60	1.83
Jupiter	E	2031-05-11T06:38:47.407	73.83	-36.29	71492.0	1.77	2.03


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-11T04:51:28.690
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        : 4068878430995951872
2Mass ID (if available) : 17491598-2253423
ICRS Star Coord at Epoch: 17h 49m 16.00232s -22:53:42.55014s
RUWE (>1.4 is poor) : 1.00
K magnitude           : 8.449
G magnitude           : 14.689
RP magnitude          : 13.191
BP magnitude          : 17.480
DUPflag              : 0
Distance (au)         : 4.457
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -10.29
Sun-Target sep (deg)  : 142.36
Sun-Moon sep (deg)   : 18.90
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.32
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (" ) : 0.390
C/A sky separation (km) : 1259.5
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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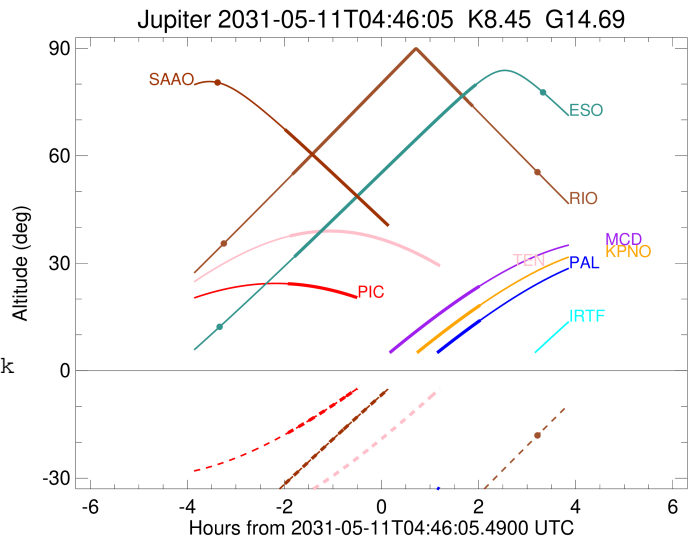
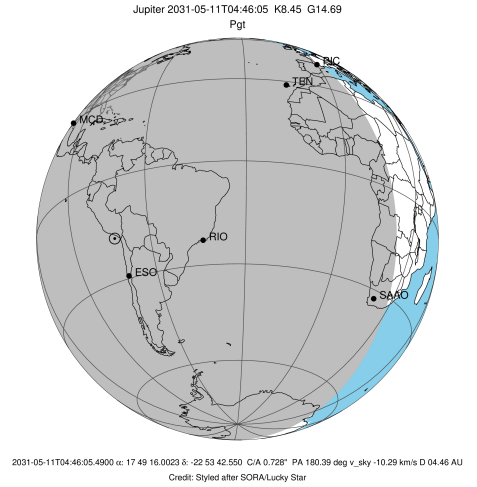


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-11T02:58:23.419	31.78	-64.32	71492.0	0.41	0.47
Jupiter	E	2031-05-11T06:43:04.116	79.90	-59.60	71492.0	1.27	1.45


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-11T04:39:14.800
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        : 4068878430995951872
2Mass ID (if available) : 17491598-2253423
ICRS Star Coord at Epoch: 17h 49m 16.00232s -22:53:42.55014s
RUWE (>1.4 is poor) : 1.00
K magnitude           : 8.449
G magnitude           : 14.689
RP magnitude          : 13.191
BP magnitude          : 17.480
DUPflag              : 0
Distance (au)         : 4.457
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -10.29
Sun-Target sep (deg)  : 142.36
Sun-Moon sep (deg)    : 17.72
B (ring opening deg) : -2.61
PA of pole (deg)      : 0.32
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 0.180
C/A sky separation (km) : 581.6
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	2031-05-11T02:46:43.384	67.33	-31.59	71492.0	1.03	1.18
Jupiter	E	2031-05-11T06:33:06.733	19.91	13.84x	71492.0	-0.36	-0.41