

target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-05-30T06:30:12.450
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116553564260071168
 2Mass ID (if available) : 17410841-2252252

Jupiter 2031-05-30T06:30:12 K9.29 G12.46 Pgt

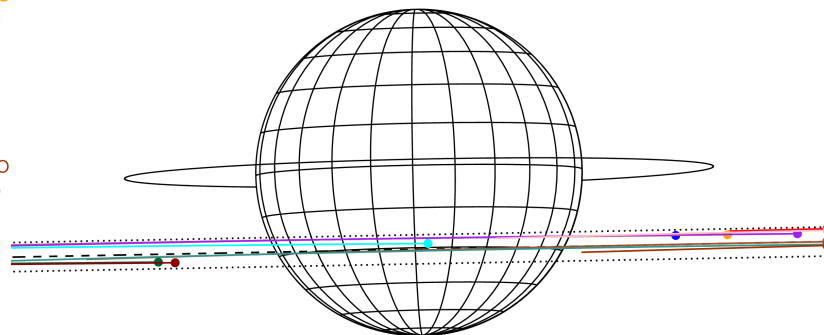
ICRS Star Coord at Epoch: 17h 41m 08.39037s -22:52:25.91994s

RUWE (>1.4 is poor) : 0.87
 K magnitude : 9.292
 G magnitude : 12.459
 RP magnitude : 11.527
 BP magnitude : 13.341
 DUPflag : 0
 Distance (au) : 4.310
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -15.10
 Sun-Target sep (deg) : 162.59
 Sun-Moon sep (deg) : 98.17
 B (ring opening deg) : -2.60
 PA of pole (deg) : 1.19
 Pole direction: RA (deg): 268.05693
 Dec (deg): 64.49651
 C/A sky separation (") : 10.765
 C/A sky separation (km) : 33652.3
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-05-30T06:30:12 K9.29 G12.46
 Pgt



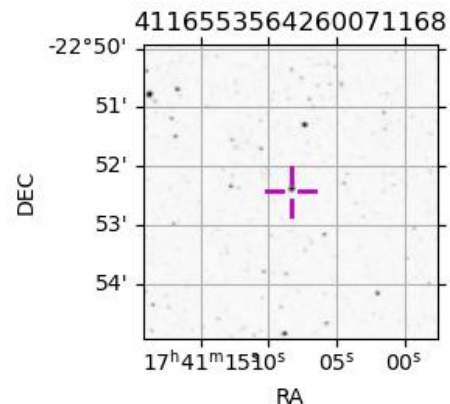
Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 AAT
 SAAO
 MSO



2031-05-30T06:30:12.4500 α: 17 41 08.3904 δ: -22 52 25.920 C/A ***** PA 1.10 deg v_sky -15.10 km/s D 04.31 AU
 Credit: Styled after SORA/Lucky Star

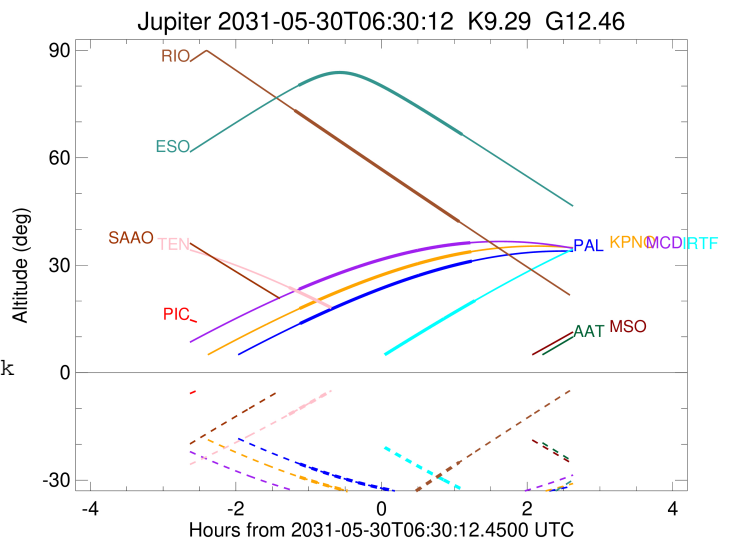
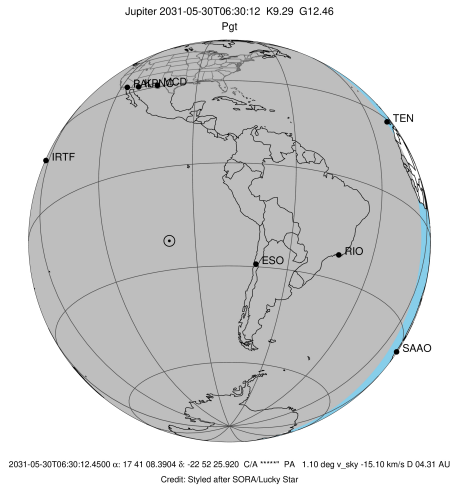
Observable events with sun below -5 deg and altitude above 5 deg

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 30 05:23 - MAY 30 07:44	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	MAY 30 05:22 - MAY 30 07:44	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	MAY 30 05:22 - MAY 30 07:43	Pie
TEN	Teide Obs./Tenerife	28.3	343.5	+	MAY 30 05:13 - MAY 30 05:13	Pin
IRTF	Mauna Kea/IRTF	19.8	204.5	+	MAY 30 07:47 - MAY 30 07:47	Pne
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+ +	MAY 30 05:18 - MAY 30 07:34	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	MAY 30 05:21 - MAY 30 07:36	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             : 2031-05-30T06:33:59.640
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        : 4116553564260071168
2Mass ID (if available) : 17410841-2252252
ICRS Star Coord at Epoch: 17h 41m 08.39037s -22:52:25.91994s
RUWE (>1.4 is poor) : 0.87
K magnitude           : 9.292
G magnitude           : 12.459
RP magnitude          : 11.527
BP magnitude          : 13.341
DUPflag              : 0
Distance (au)         : 4.310
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.10
Sun-Target sep (deg)  : 162.59
Sun-Moon sep (deg)    : 98.60
B (ring opening deg) : -2.60
PA of pole (deg)      : 1.19
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (" ) : 9.221
C/A sky separation (km) : 28823.4
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
    
```

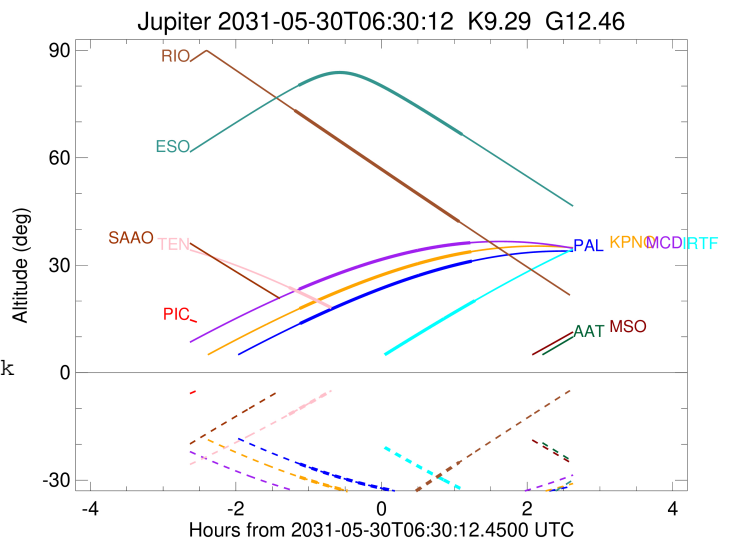
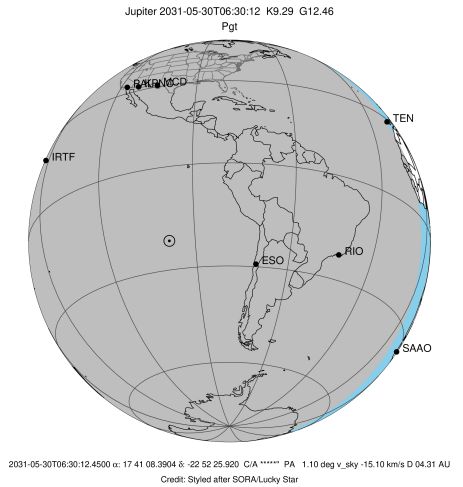


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-30T05:23:04.051	13.70	-25.49	71490.4	-24.27	-27.23
Jupiter	E	2031-05-30T07:44:33.196	31.13	-35.07	71490.5	-23.37	-26.26

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-30T06:33:34.930
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        : 4116553564260071168
2Mass ID (if available) : 17410841-2252252
ICRS Star Coord at Epoch: 17h 41m 08.39037s -22:52:25.91994s
RUWE (>1.4 is poor) : 0.87
K magnitude           : 9.292
G magnitude           : 12.459
RP magnitude          : 11.527
BP magnitude          : 13.341
DUPflag              : 0
Distance (au)         : 4.310
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.10
Sun-Target sep (deg) : 162.59
Sun-Moon sep (deg)   : 98.65
B (ring opening deg) : -2.60
PA of pole (deg)     : 1.19
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation ("): 9.215
C/A sky separation (km): 28805.2
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
    
```

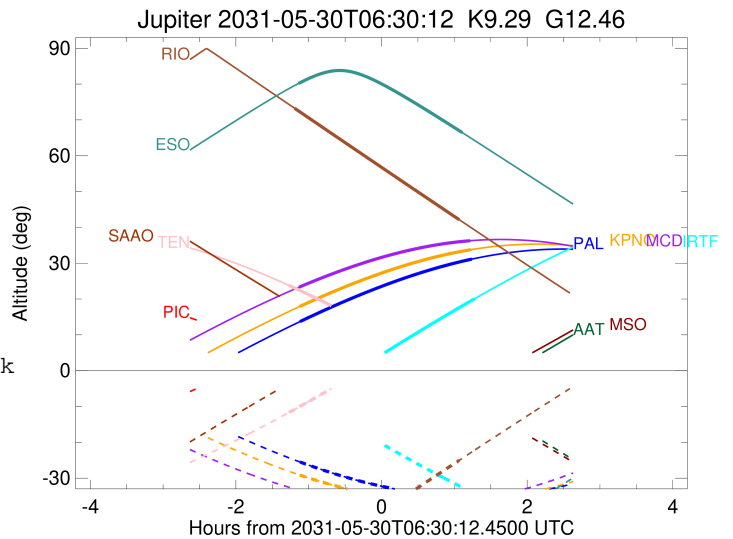


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-30T05:22:46.890	17.91	-29.12	71490.4	-24.22	-27.18
Jupiter	E	2031-05-30T07:44:03.252	33.77	-36.24	71490.5	-23.40	-26.29

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-30T06:32:53.890
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       : 4116553564260071168
2Mass ID (if available) : 17410841-2252252
ICRS Star Coord at Epoch: 17h 41m 08.39037s -22:52:25.91994s
RUWE (>1.4 is poor) : 0.87
K magnitude           : 9.292
G magnitude           : 12.459
RP magnitude          : 11.527
BP magnitude          : 13.341
DUPflag              : 0
Distance (au)        : 4.310
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.10
Sun-Target sep (deg) : 162.59
Sun-Moon sep (deg)   : 98.69
B (ring opening deg) : -2.60
PA of pole (deg)     : 1.19
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation ("): 9.199
C/A sky separation (km): 28755.6
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
    
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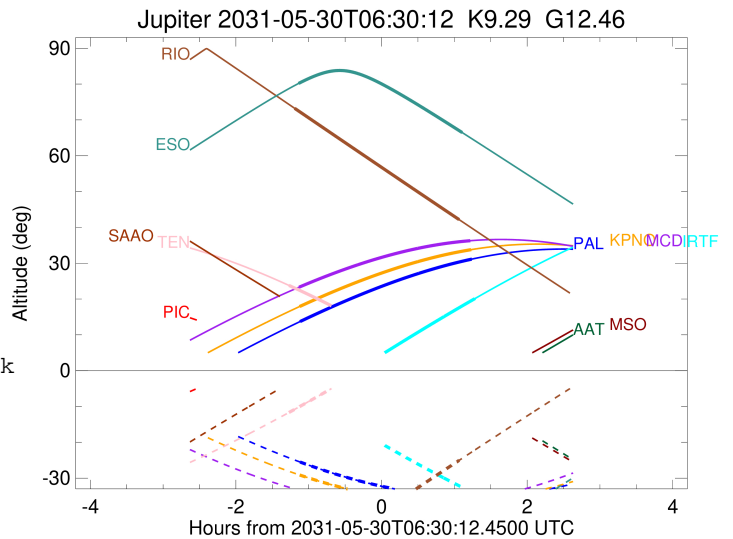
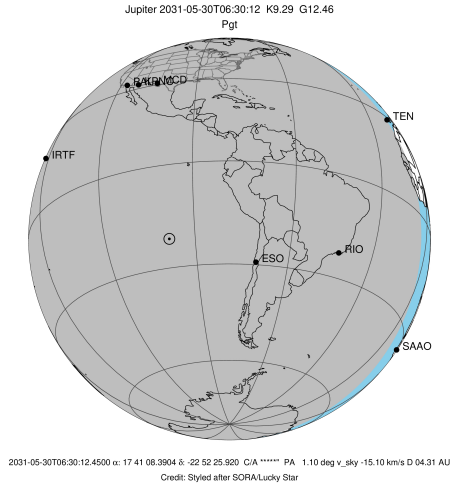


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-30T05:22:14.287	23.29	-33.34	71490.5	-24.12	-27.08
Jupiter	E	2031-05-30T07:43:17.503	36.27	-36.40	71490.5	-23.42	-26.32

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-30T06:24:31.690
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      : 4116553564260071168
2Mass ID (if available) : 17410841-2252252
ICRS Star Coord at Epoch: 17h 41m 08.39037s -22:52:25.91994s
RUWE (>1.4 is poor) : 0.87
K magnitude          : 9.292
G magnitude          : 12.459
RP magnitude         : 11.527
BP magnitude         : 13.341
DUPflag             : 0
Distance (au)        : 4.310
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.10
Sun-Target sep (deg) : 162.59
Sun-Moon sep (deg)  : 98.23
B (ring opening deg) : -2.60
PA of pole (deg)    : 1.19
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation ("): 9.521
C/A sky separation (km): 29761.8
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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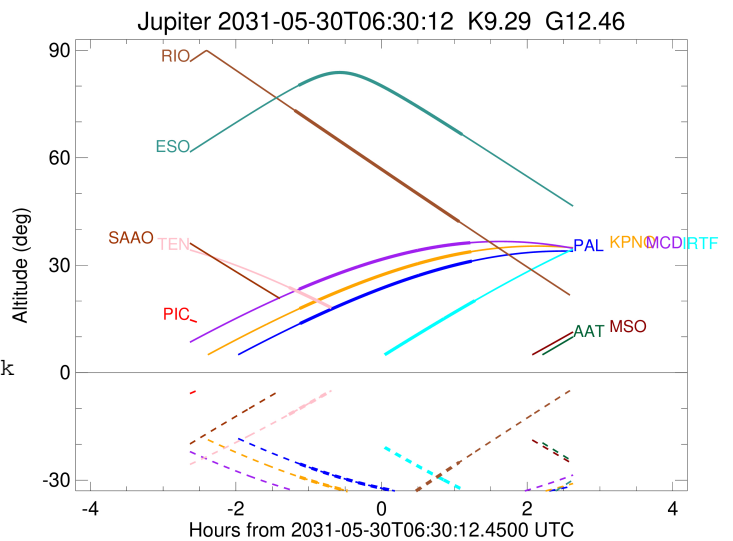
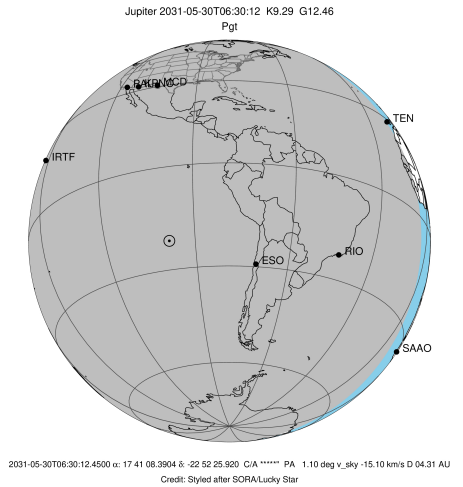


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-30T05:13:57.579	23.79	-11.67	71490.4	-24.22	-27.18
Jupiter	E	2031-05-30T07:35:34.912	-1.84x	16.79x	71490.3	-25.03	-28.06

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-30T06:37:00.750
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      : 4116553564260071168
2Mass ID (if available) : 17410841-2252252
ICRS Star Coord at Epoch: 17h 41m 08.39037s -22:52:25.91994s
RUWE (>1.4 is poor) : 0.87
K magnitude         : 9.292
G magnitude         : 12.459
RP magnitude        : 11.527
BP magnitude        : 13.341
DUPflag            : 0
Distance (au)       : 4.310
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -15.10
Sun-Target sep (deg) : 162.59
Sun-Moon sep (deg)  : 98.36
B (ring opening deg) : -2.60
PA of pole (deg)    : 1.19
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (" ) : 9.960
C/A sky separation (km) : 31135.5
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
    
```

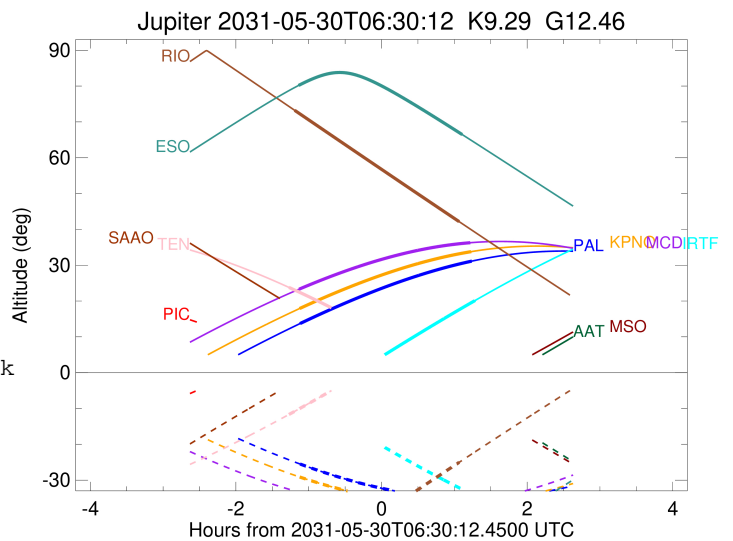
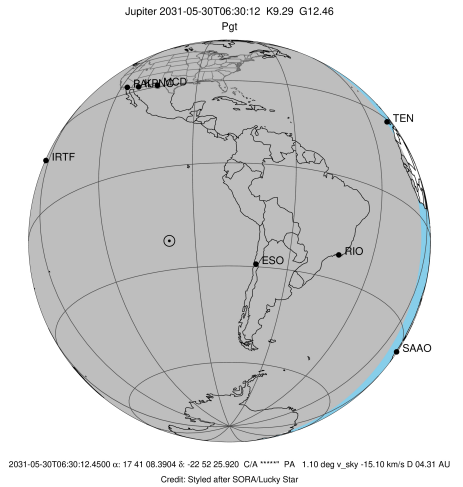


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-30T05:26:12.140	-9.41x	-7.26	71490.1	-26.53	-29.67
Jupiter	E	2031-05-30T07:47:10.775	20.12	-34.30	71490.3	-25.10	-28.14

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-30T06:26:14.670
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        : 4116553564260071168
2Mass ID (if available) : 17410841-2252252
ICRS Star Coord at Epoch: 17h 41m 08.39037s -22:52:25.91994s
RUWE (>1.4 is poor) : 0.87
K magnitude           : 9.292
G magnitude           : 12.459
RP magnitude          : 11.527
BP magnitude          : 13.341
DUPflag              : 0
Distance (au)         : 4.310
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.10
Sun-Target sep (deg) : 162.59
Sun-Moon sep (deg)   : 98.86
B (ring opening deg) : -2.60
PA of pole (deg)     : 1.19
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation ("): 10.877
C/A sky separation (km): 34002.3
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
    
```

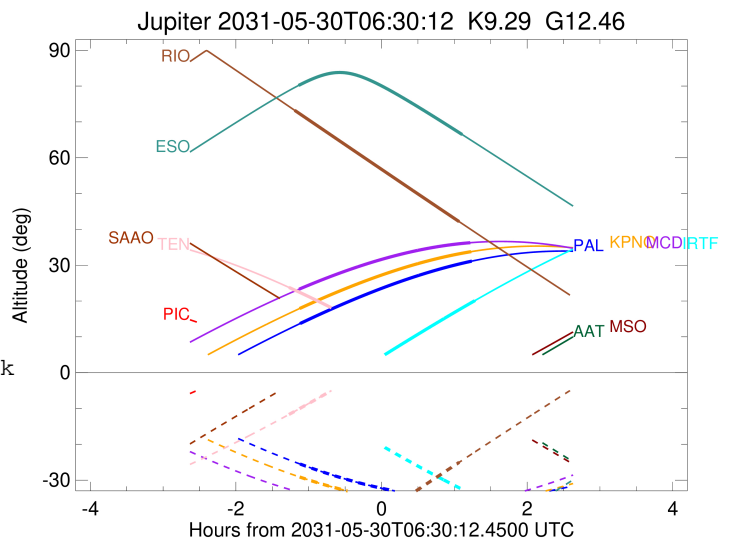
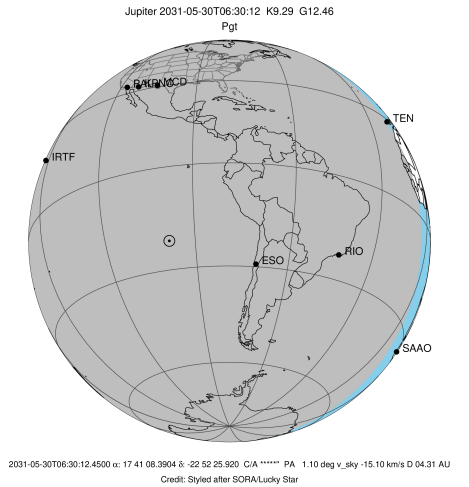


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-30T05:18:34.768	73.24	-55.79	71489.9	-28.21	-31.48
Jupiter	E	2031-05-30T07:34:12.008	42.15	-25.03	71489.9	-28.68	-31.97

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-30T06:29:15.330
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      : 4116553564260071168
2Mass ID (if available) : 17410841-2252252
ICRS Star Coord at Epoch: 17h 41m 08.39037s -22:52:25.91994s
RUWE (>1.4 is poor) : 0.87
K magnitude          : 9.292
G magnitude          : 12.459
RP magnitude         : 11.527
BP magnitude         : 13.341
DUPflag             : 0
Distance (au)       : 4.310
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.10
Sun-Target sep (deg) : 162.59
Sun-Moon sep (deg)  : 99.06
B (ring opening deg) : -2.60
PA of pole (deg)    : 1.19
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (" ) : 10.989
C/A sky separation (km) : 34352.4
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	2031-05-30T05:21:53.720	80.17	-78.11	71489.8	-28.81	-32.11
Jupiter	E	2031-05-30T07:36:39.542	66.47	-49.78	71489.9	-28.73	-32.03