

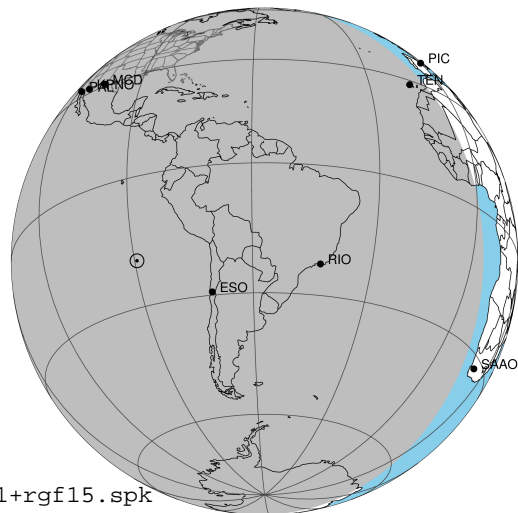
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-05-18T05:53:49.450
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068843418336222208
 2Mass ID (if available) : 17463944-2253438

Jupiter 2031-05-18T05:53:49 K8.82 G14.57 Pgt

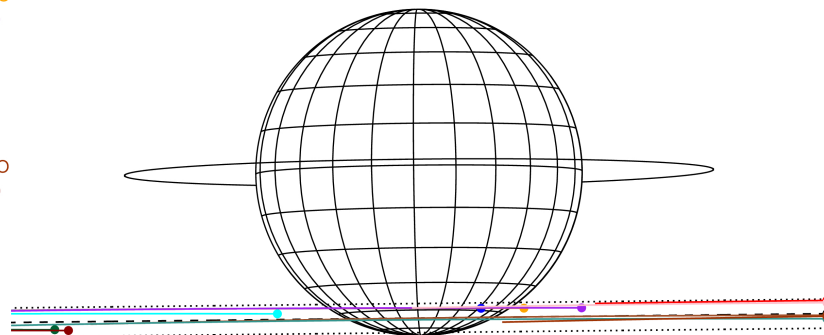
ICRS Star Coord at Epoch: 17h 46m 39.43753s -22:53:44.06240s

RUWE (>1.4 is poor) : 0.94
 K magnitude : 8.822
 G magnitude : 14.565
 RP magnitude : 13.111
 BP magnitude : 17.294
 DUPflag : 0
 Distance (au) : 4.392
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -12.44
 Sun-Target sep (deg) : 149.76
 Sun-Moon sep (deg) : 114.63
 B (ring opening deg) : -2.60
 PA of pole (deg) : 0.60
 Pole direction: RA (deg): 268.05694
 Dec (deg): 64.49651
 C/A sky separation (") : 20.020
 C/A sky separation (km) : 63767.6
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-05-18T05:53:49 K8.82 G14.57
 Pgt



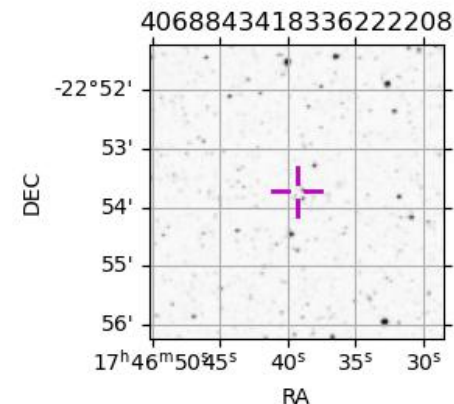
Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 AAT
 SAAO
 MSO



2031-05-18T05:53:49.4500 α: 17 46 39.4375 δ: -22 53 44.062 C/A ***** PA 0.62 deg v_sky -12.44 km/s D 04.39 AU
 Credit: Styled after SORA/Lucky Star

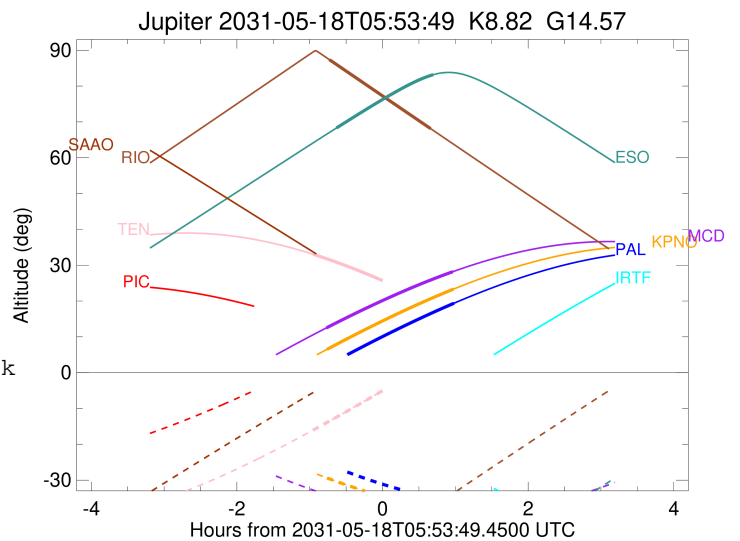
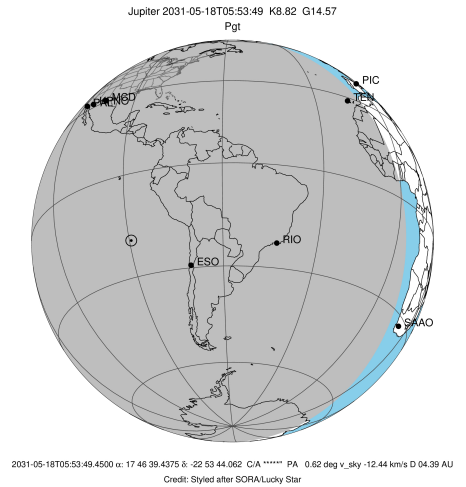
Observable events with sun below -5 deg and altitude above 5 deg

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 18 06:52 - MAY 18 06:52	Pne
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	MAY 18 05:08 - MAY 18 06:52	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	MAY 18 05:07 - MAY 18 06:51	Pie
TEN	Teide Obs./Tenerife	28.3	343.5	+	MAY 18 04:56 - MAY 18 04:56	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 18 05:10 - MAY 18 06:33	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	MAY 18 05:15 - MAY 18 06:35	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             : 2031-05-18T06:00:45.260
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        : 4068843418336222208
2Mass ID (if available) : 17463944-2253438
ICRS Star Coord at Epoch: 17h 46m 39.43753s -22:53:44.06240s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 8.822
G magnitude           : 14.565
RP magnitude          : 13.111
BP magnitude          : 17.294
DUPflag              : 0
Distance (au)         : 4.392
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -12.44
Sun-Target sep (deg) : 149.76
Sun-Moon sep (deg)   : 114.51
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.60
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 18.679
C/A sky separation (km) : 59493.9
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
    
```

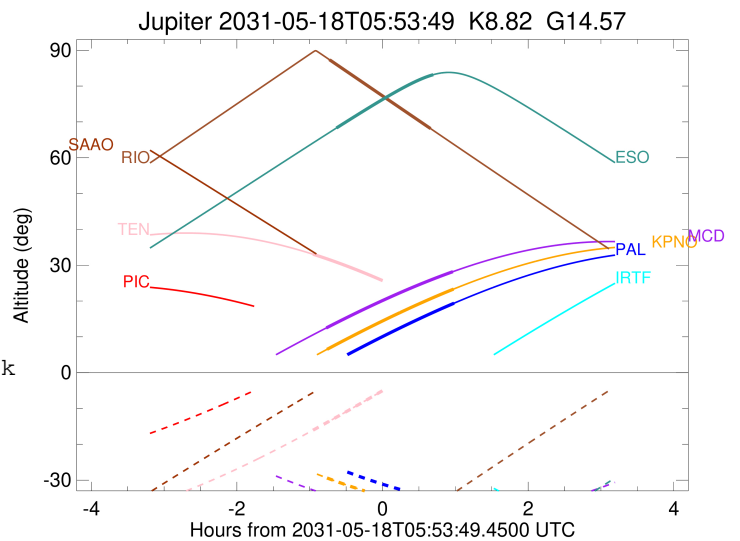
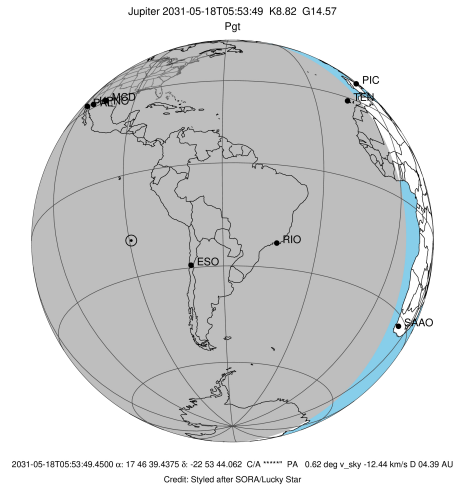


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-18T05:08:22.797	2.03x	-25.56	71485.5	-56.85	-60.11
Jupiter	E	2031-05-18T06:52:46.081	19.38	-35.90	71485.6	-55.72	-59.05

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-18T06:00:26.390
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      : 4068843418336222208
2Mass ID (if available) : 17463944-2253438
ICRS Star Coord at Epoch: 17h 46m 39.43753s -22:53:44.06240s
RUWE (>1.4 is poor) : 0.94
K magnitude         : 8.822
G magnitude         : 14.565
RP magnitude        : 13.111
BP magnitude        : 17.294
DUPflag            : 0
Distance (au)       : 4.392
f0 (km)            : 0.00
g0 (km)            : 0.00
skyplane vel. (km/s) : -12.44
Sun-Target sep (deg) : 149.76
Sun-Moon sep (deg)  : 114.58
B (ring opening deg) : -2.60
PA of pole (deg)    : 0.60
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 18.661
C/A sky separation (km) : 59437.3
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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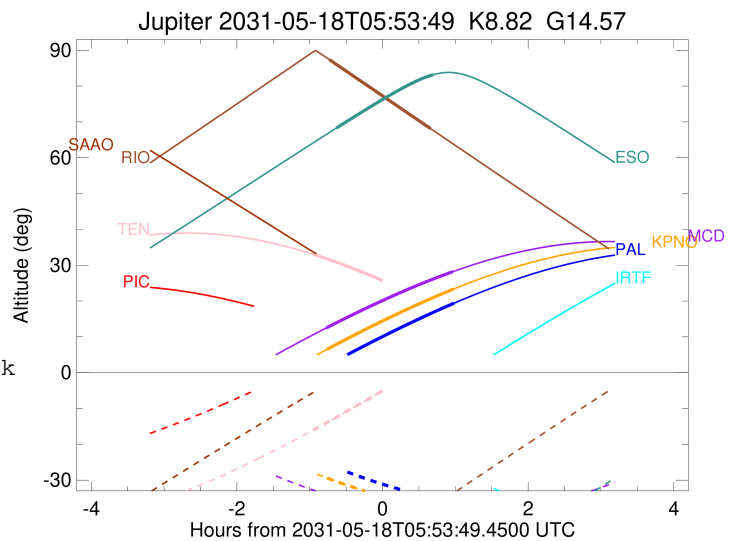
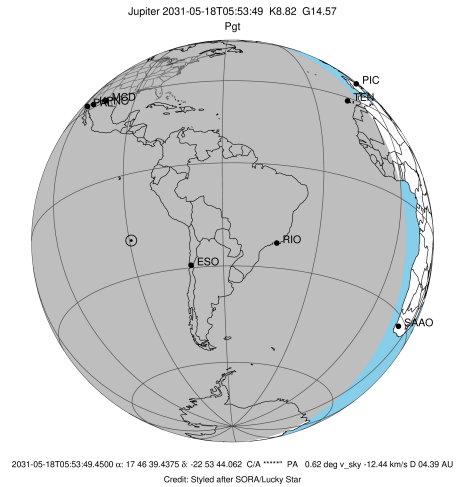


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-18T05:08:06.216	6.51	-29.39	71485.5	-56.75	-60.02
Jupiter	E	2031-05-18T06:52:25.883	23.33	-38.17	71485.7	-55.67	-59.01

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-18T05:59:49.410
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       : 4068843418336222208
2Mass ID (if available) : 17463944-2253438
ICRS Star Coord at Epoch: 17h 46m 39.43753s -22:53:44.06240s
RUWE (>1.4 is poor) : 0.94
K magnitude          : 8.822
G magnitude          : 14.565
RP magnitude         : 13.111
BP magnitude         : 17.294
DUPflag             : 0
Distance (au)        : 4.392
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.44
Sun-Target sep (deg) : 149.76
Sun-Moon sep (deg)   : 114.69
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.60
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 18.624
C/A sky separation (km) : 59319.6
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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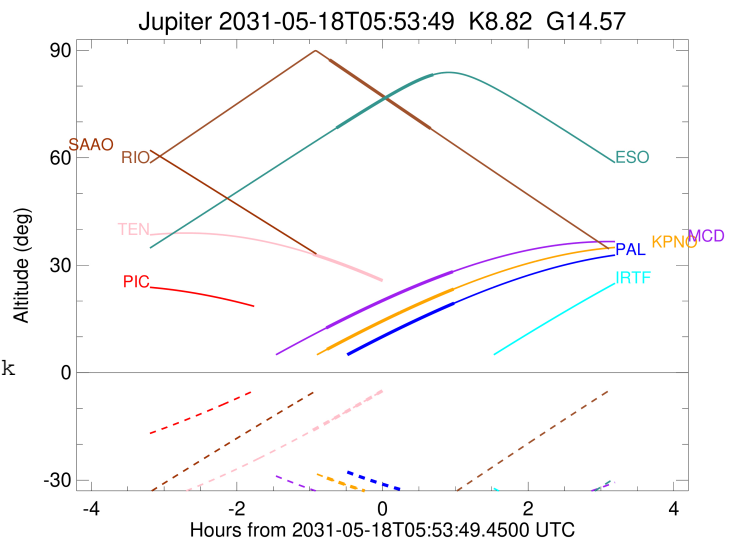
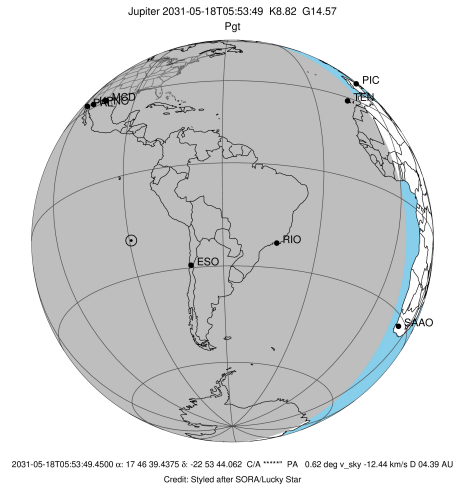


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-18T05:07:27.317	12.48	-33.97	71485.5	-56.53	-59.82
Jupiter	E	2031-05-18T06:51:52.586	28.20	-39.98	71485.7	-55.56	-58.90

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-18T05:48:29.490
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      : 4068843418336222208
2Mass ID (if available) : 17463944-2253438
ICRS Star Coord at Epoch: 17h 46m 39.43753s -22:53:44.06240s
RUWE (>1.4 is poor) : 0.94
K magnitude          : 8.822
G magnitude          : 14.565
RP magnitude         : 13.111
BP magnitude         : 17.294
DUPflag             : 0
Distance (au)        : 4.392
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.44
Sun-Target sep (deg) : 149.76
Sun-Moon sep (deg)  : 115.24
B (ring opening deg) : -2.60
PA of pole (deg)    : 0.60
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 18.611
C/A sky separation (km) : 59278.4
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
    
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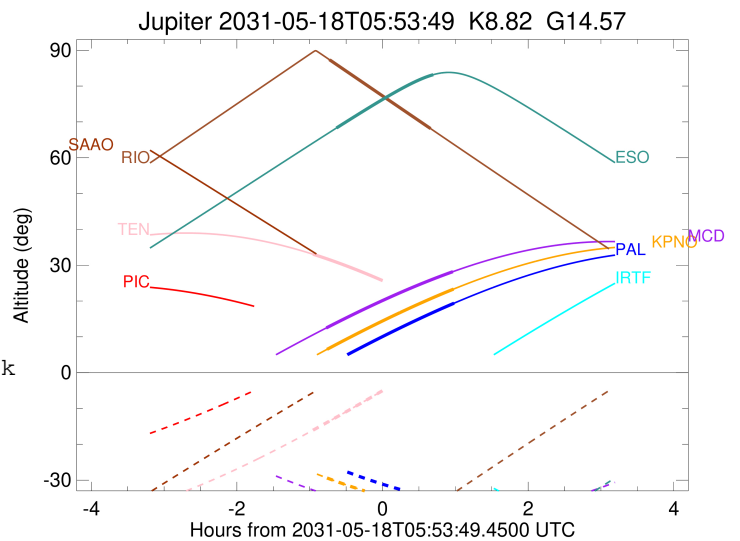
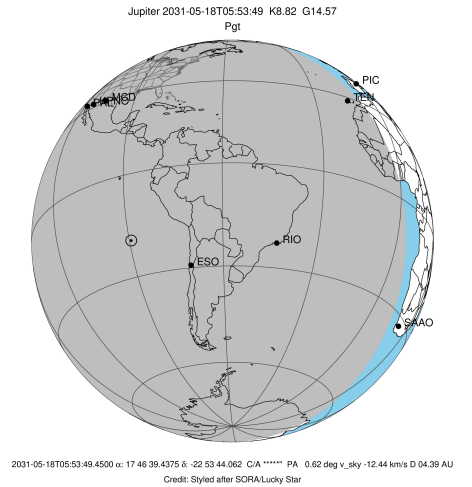


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-18T04:56:27.900	33.07	-16.07	71485.7	-55.54	-58.88
Jupiter	E	2031-05-18T06:40:43.677	18.25	4.53x	71485.5	-56.45	-59.74

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-18T05:51:46.510
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       : 4068843418336222208
2Mass ID (if available) : 17463944-2253438
ICRS Star Coord at Epoch: 17h 46m 39.43753s -22:53:44.06240s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 8.822
G magnitude           : 14.565
RP magnitude          : 13.111
BP magnitude          : 17.294
DUPflag              : 0
Distance (au)        : 4.392
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.44
Sun-Target sep (deg) : 149.76
Sun-Moon sep (deg)   : 115.54
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.60
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation ("): 20.031
C/A sky separation (km): 63802.9
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
    
```

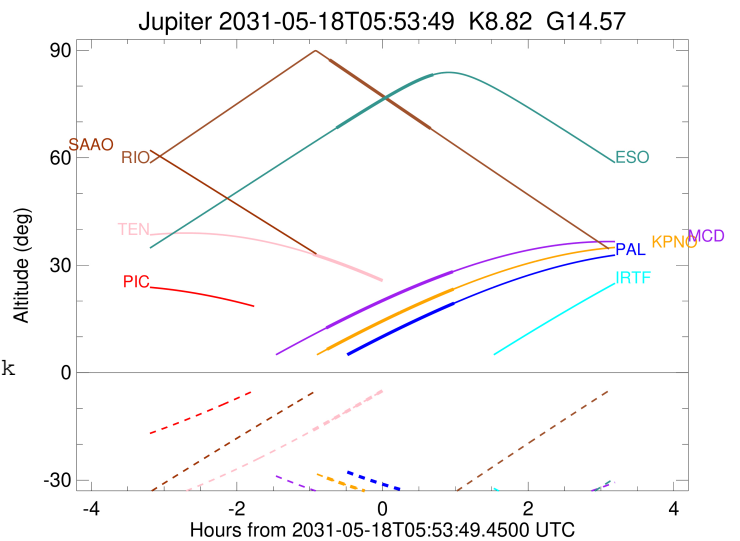
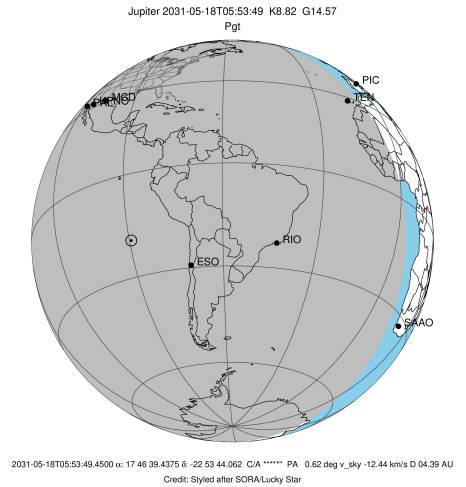


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-18T05:10:04.886	87.36	-57.09	71484.6	-62.97	-65.81
Jupiter	E	2031-05-18T06:33:30.257	68.11	-37.93	71484.6	-63.32	-66.13

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-18T05:55:47.020
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      : 4068843418336222208
2Mass ID (if available) : 17463944-2253438
ICRS Star Coord at Epoch: 17h 46m 39.43753s -22:53:44.06240s
RUWE (>1.4 is poor) : 0.94
K magnitude          : 8.822
G magnitude          : 14.565
RP magnitude         : 13.111
BP magnitude         : 17.294
DUPflag             : 0
Distance (au)       : 4.392
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -12.44
Sun-Target sep (deg) : 149.76
Sun-Moon sep (deg)  : 115.37
B (ring opening deg) : -2.60
PA of pole (deg)    : 0.60
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 20.257
C/A sky separation (km) : 64522.3
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	2031-05-18T05:15:51.686	68.29	-77.32	71484.4	-64.59	-67.30
Jupiter	E	2031-05-18T06:35:37.873	83.17	-61.93	71484.5	-64.28	-67.02