

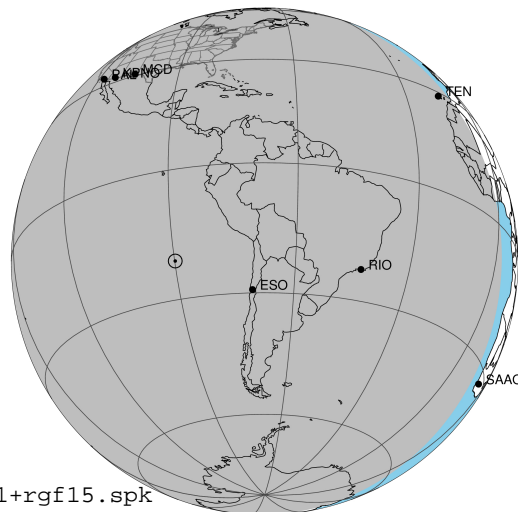
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-05-27T05:56:30.360
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116878268168448128
 2Mass ID (if available) : 17423791-2252571

Jupiter 2031-05-27T05:56:30 K9.42 G14.95 Pgt

ICRS Star Coord at Epoch: 17h 42m 37.91061s -22:52:57.46238s

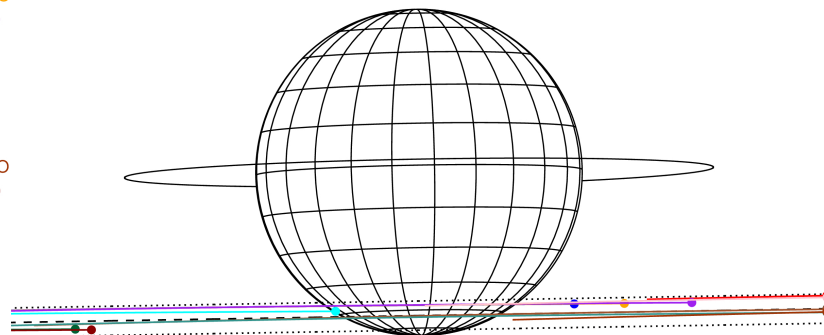
RUWE (>1.4 is poor) : 0.98
 K magnitude : 9.423
 G magnitude : 14.954
 RP magnitude : 13.561
 BP magnitude : 17.373
 DUPflag : 0
 Distance (au) : 4.327
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -14.56
 Sun-Target sep (deg) : 159.35
 Sun-Moon sep (deg) : 135.39
 B (ring opening deg) : -2.60
 PA of pole (deg) : 1.03
 Pole direction: RA (deg): 268.05694
 Dec (deg): 64.49651
 C/A sky separation (") : 19.972
 C/A sky separation (km) : 62674.9
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-05-27T05:56:30 K9.42 G14.95
 Pgt



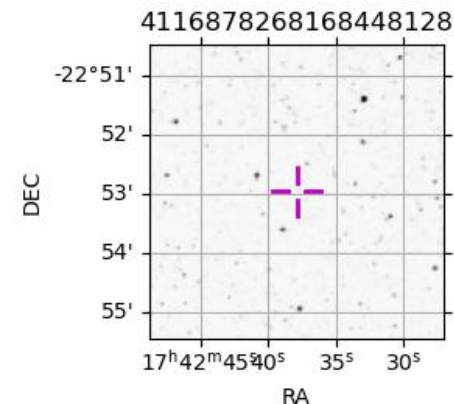
2031-05-27T05:56:30.3600 α: 17 42 37.9106 δ: -22 52 57.462 C/A ***** PA 0.97 deg v_sky -14.56 km/s D 04.33 AU
 Credit: Styled after SORA/Lucky Star

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



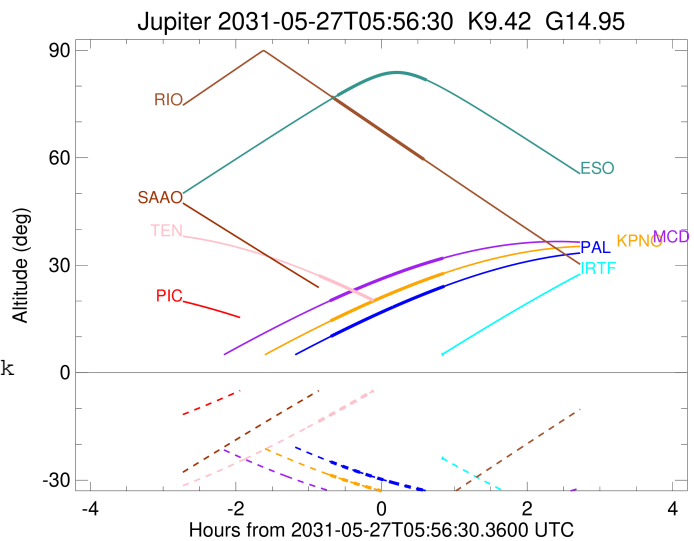
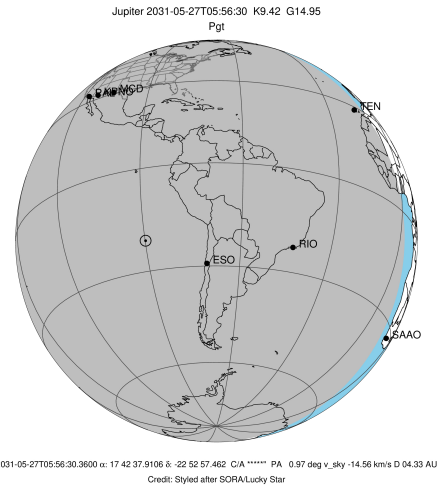
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1			Pnn
PAL	Palomar Mt (200")	33.4	243.1	+ +	MAY 27 05:14 - MAY 27 06:48	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	MAY 27 05:14 - MAY 27 06:47	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	MAY 27 05:13 - MAY 27 06:47	Pie
TEN	Teide Obs./Tenerife	28.3	343.5	+	MAY 27 05:04 - MAY 27 05:04	Pin
IRTF	Mauna Kea/IRTF	19.8	204.5	+	MAY 27 06:47 - MAY 27 06:47	Pne
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+ +	MAY 27 05:15 - MAY 27 06:31	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	MAY 27 05:20 - MAY 27 06:33	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            : 2031-05-27T06:01:38.010
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      : 4116878268168448128
2Mass ID (if available) : 17423791-2252571
ICRS Star Coord at Epoch: 17h 42m 37.91061s -22:52:57.46238s
RUWE (>1.4 is poor) : 0.98
K magnitude          : 9.423
G magnitude          : 14.954
RP magnitude         : 13.561
BP magnitude         : 17.373
DUPflag             : 0
Distance (au)       : 4.327
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.56
Sun-Target sep (deg) : 159.35
Sun-Moon sep (deg)  : 135.94
B (ring opening deg) : -2.60
PA of pole (deg)    : 1.03
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation ("): 18.523
C/A sky separation (km): 58128.5
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
    
```

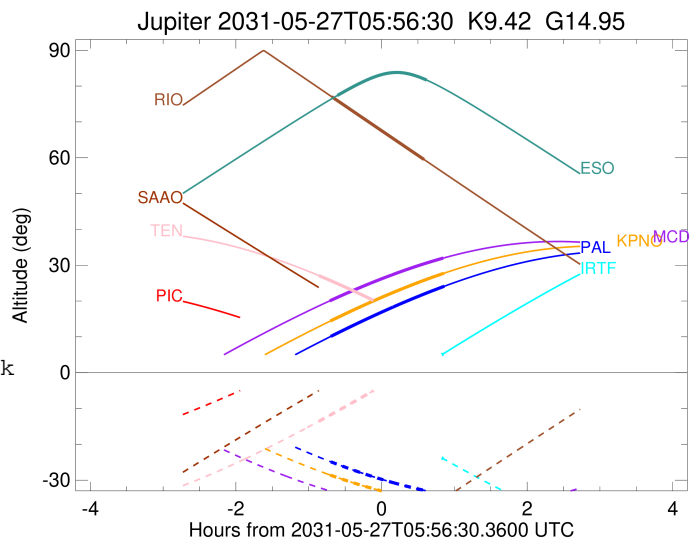
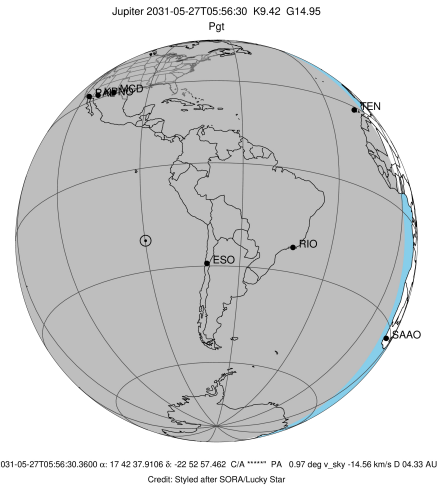


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-27T05:14:46.513	10.13	-24.88	71485.8	-54.87	-58.25
Jupiter	E	2031-05-27T06:48:16.884	24.12	-33.91	71485.9	-53.85	-57.28

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-27T06:01:16.610
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        : 4116878268168448128
2Mass ID (if available) : 17423791-2252571
ICRS Star Coord at Epoch: 17h 42m 37.91061s -22:52:57.46238s
RUWE (>1.4 is poor) : 0.98
K magnitude           : 9.423
G magnitude           : 14.954
RP magnitude          : 13.561
BP magnitude          : 17.373
DUPflag              : 0
Distance (au)         : 4.327
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.56
Sun-Target sep (deg) : 159.35
Sun-Moon sep (deg)   : 135.95
B (ring opening deg) : -2.60
PA of pole (deg)     : 1.03
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 18.510
C/A sky separation (km) : 58086.8
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
    
```

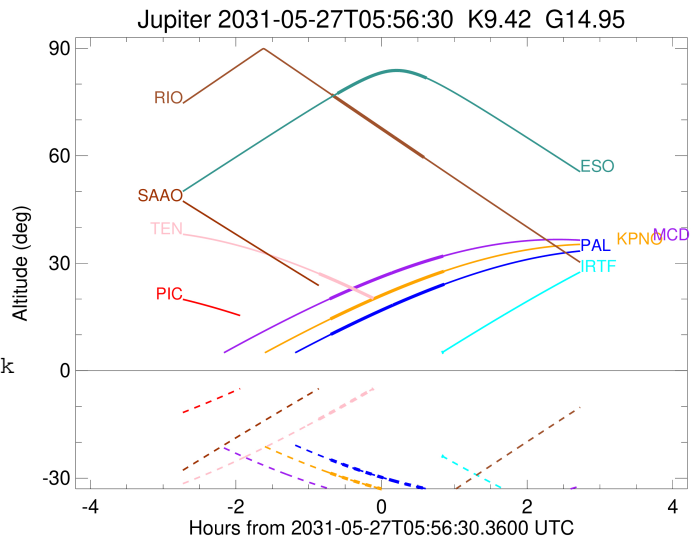
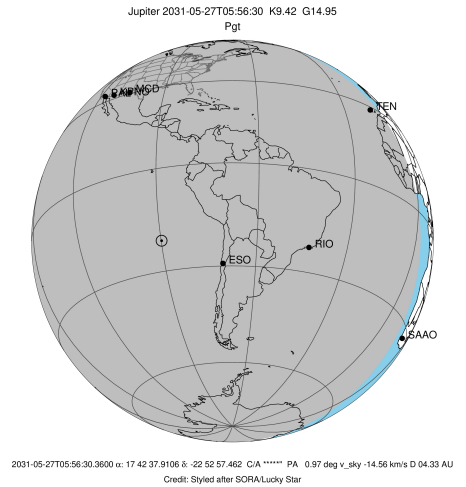


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-27T05:14:27.453	14.44	-28.60	71485.8	-54.79	-58.17
Jupiter	E	2031-05-27T06:47:53.996	27.74	-36.26	71485.9	-53.83	-57.26

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-27T06:00:38.490
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      : 4116878268168448128
2Mass ID (if available) : 17423791-2252571
ICRS Star Coord at Epoch: 17h 42m 37.91061s -22:52:57.46238s
RUWE (>1.4 is poor) : 0.98
K magnitude         : 9.423
G magnitude         : 14.954
RP magnitude        : 13.561
BP magnitude        : 17.373
DUPflag            : 0
Distance (au)       : 4.327
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -14.56
Sun-Target sep (deg) : 159.35
Sun-Moon sep (deg)  : 135.95
B (ring opening deg) : -2.60
PA of pole (deg)    : 1.03
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 18.481
C/A sky separation (km) : 57996.8
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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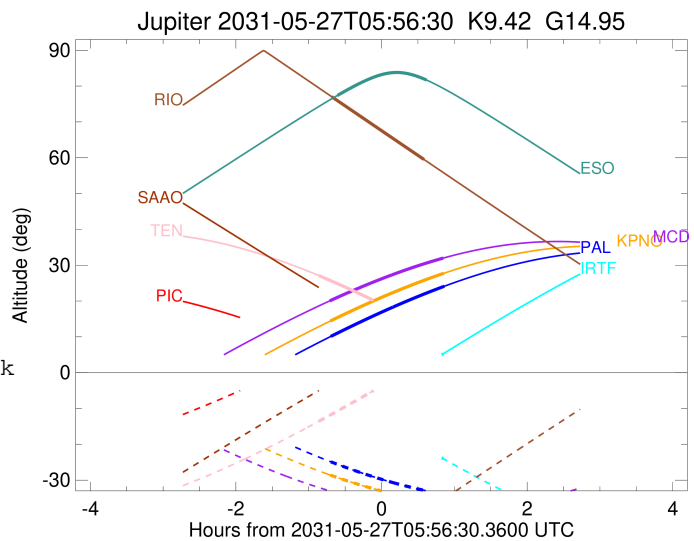
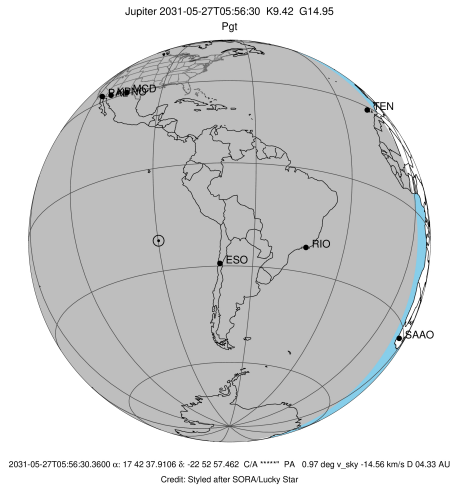


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-27T05:13:48.897	20.04	-32.99	71485.8	-54.62	-58.01
Jupiter	E	2031-05-27T06:47:17.790	31.97	-38.21	71486.0	-53.76	-57.20

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-27T05:51:07.560
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      : 4116878268168448128
2Mass ID (if available) : 17423791-2252571
ICRS Star Coord at Epoch: 17h 42m 37.91061s -22:52:57.46238s
RUWE (>1.4 is poor) : 0.98
K magnitude          : 9.423
G magnitude          : 14.954
RP magnitude         : 13.561
BP magnitude         : 17.373
DUPflag             : 0
Distance (au)       : 4.327
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.56
Sun-Target sep (deg) : 159.35
Sun-Moon sep (deg)  : 135.12
B (ring opening deg) : -2.60
PA of pole (deg)    : 1.03
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 18.621
C/A sky separation (km) : 58436.4
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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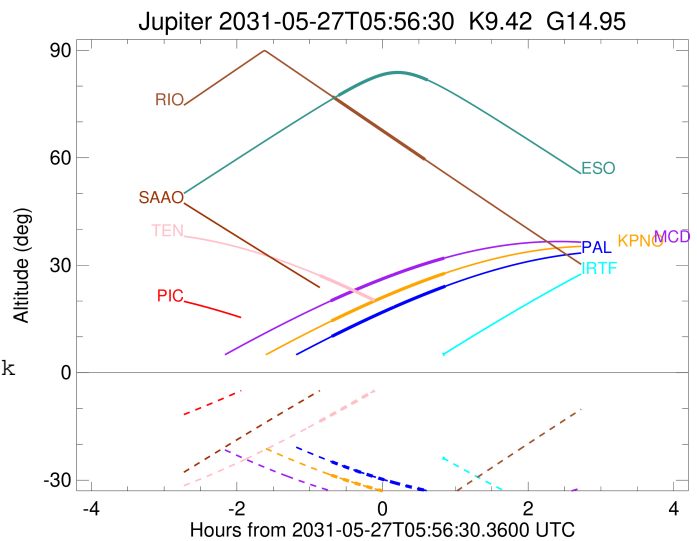
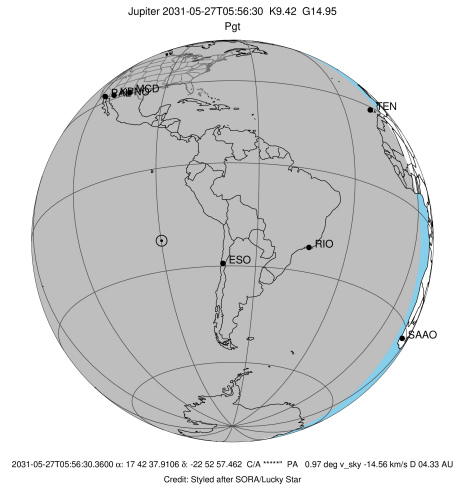


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-27T05:04:58.624	27.08	-13.55	71485.8	-54.40	-57.80
Jupiter	E	2031-05-27T06:37:27.544	11.88	4.54x	71485.7	-55.18	-58.54

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-27T06:04:12.380
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      : 4116878268168448128
2Mass ID (if available) : 17423791-2252571
ICRS Star Coord at Epoch: 17h 42m 37.91061s -22:52:57.46238s
RUWE (>1.4 is poor) : 0.98
K magnitude          : 9.423
G magnitude          : 14.954
RP magnitude         : 13.561
BP magnitude         : 17.373
DUPflag             : 0
Distance (au)       : 4.327
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.56
Sun-Target sep (deg) : 159.35
Sun-Moon sep (deg)  : 135.92
B (ring opening deg) : -2.60
PA of pole (deg)    : 1.03
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 19.315
C/A sky separation (km) : 60613.5
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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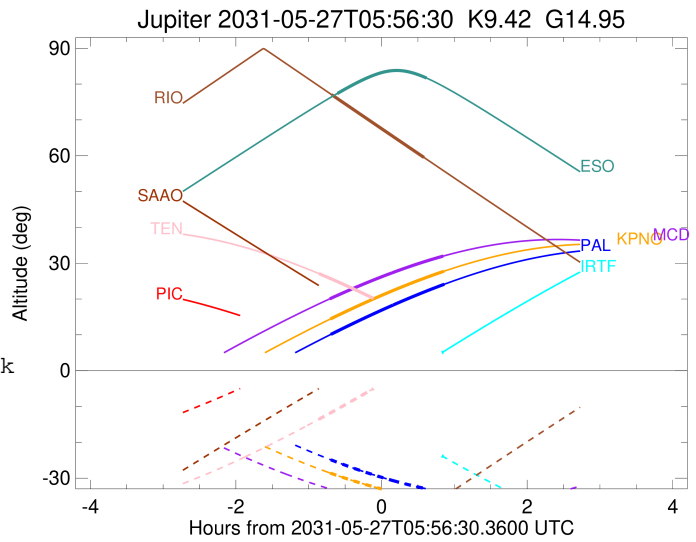
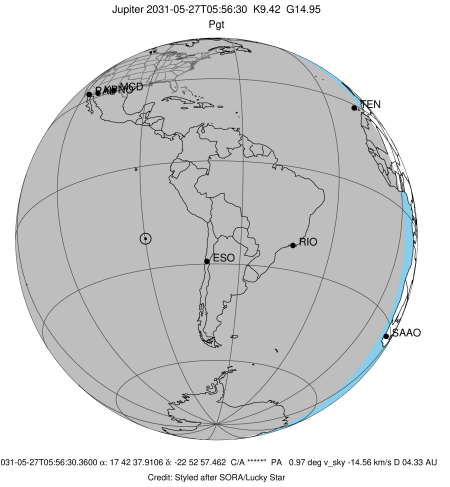


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-27T05:20:47.322	-13.55x	-6.39	71485.2	-58.62	-61.78
Jupiter	E	2031-05-27T06:47:21.278	5.25	-23.99	71485.4	-57.17	-60.41

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-27T05:53:30.680
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        : 4116878268168448128
2Mass ID (if available) : 17423791-2252571
ICRS Star Coord at Epoch: 17h 42m 37.91061s -22:52:57.46238s
RUWE (>1.4 is poor)  : 0.98
K magnitude           : 9.423
G magnitude           : 14.954
RP magnitude          : 13.561
BP magnitude          : 17.373
DUPflag               : 0
Distance (au)         : 4.327
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.56
Sun-Target sep (deg)  : 159.35
Sun-Moon sep (deg)    : 135.73
B (ring opening deg)  : -2.60
PA of pole (deg)      : 1.03
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 20.018
C/A sky separation (km) : 62820.0
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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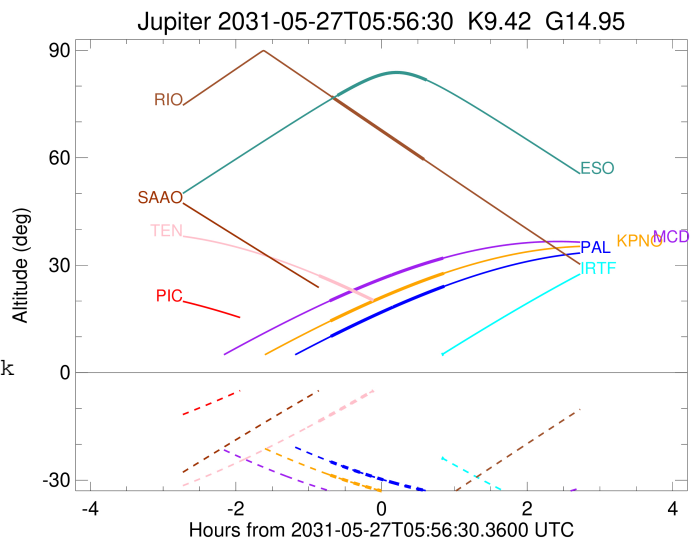
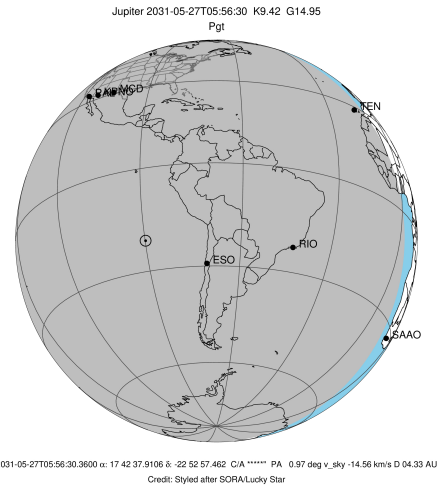


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-27T05:15:34.660	77.00	-56.32	71484.9	-61.27	-64.24
Jupiter	E	2031-05-27T06:31:30.394	59.51	-38.96	71484.8	-61.60	-64.55

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-27T05:56:54.010
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        : 4116878268168448128
2Mass ID (if available) : 17423791-2252571
ICRS Star Coord at Epoch: 17h 42m 37.91061s -22:52:57.46238s
RUWE (>1.4 is poor) : 0.98
K magnitude           : 9.423
G magnitude           : 14.954
RP magnitude          : 13.561
BP magnitude          : 17.373
DUPflag              : 0
Distance (au)         : 4.327
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.56
Sun-Target sep (deg)  : 159.35
Sun-Moon sep (deg)    : 136.05
B (ring opening deg) : -2.60
PA of pole (deg)      : 1.03
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (" ) : 20.194
C/A sky separation (km) : 63370.8
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	2031-05-27T05:20:06.492	77.36	-78.03	71484.7	-62.49	-65.37
Jupiter	E	2031-05-27T06:33:40.286	81.67	-63.22	71484.7	-62.25	-65.15