

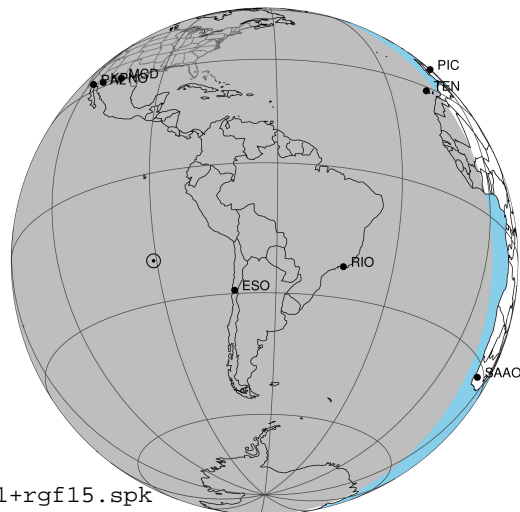
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-05-22T05:59:54.180
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116890534598985728
 2Mass ID (if available) : 17445716-2252567

Jupiter 2031-05-22T05:59:54 K5.64 G13.85 Pgt

ICRS Star Coord at Epoch: 17h 44m 57.16658s -22:52:56.78582s

RUWE (>1.4 is poor) : 0.99
 K magnitude : 5.640
 G magnitude : 13.846
 RP magnitude : 12.036
 BP magnitude : 18.314
 DUPflag : 0
 Distance (au) : 4.360
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -13.47
 Sun-Target sep (deg) : 154.01
 Sun-Moon sep (deg) : 164.52
 B (ring opening deg) : -2.61
 PA of pole (deg) : 0.78
 Pole direction: RA (deg): 268.05694
 Dec (deg): 64.49651
 C/A sky separation (") : 10.008
 C/A sky separation (km) : 31649.0
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-05-22T05:59:54 K5.64 G13.85
 Pgt

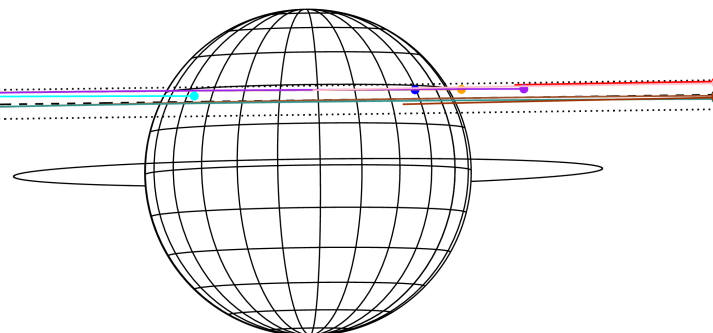


2031-05-22T05:59:54.1800 at: 17 44 57.1666 s: -22 52 56.786 C/A 9.996° PA 180.78 deg v_sky -13.47 km/s D 04.36 AU

Credit: Styled after SORA/Lucky Star

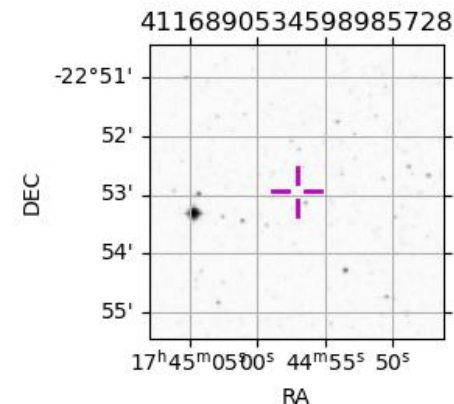
Earth

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



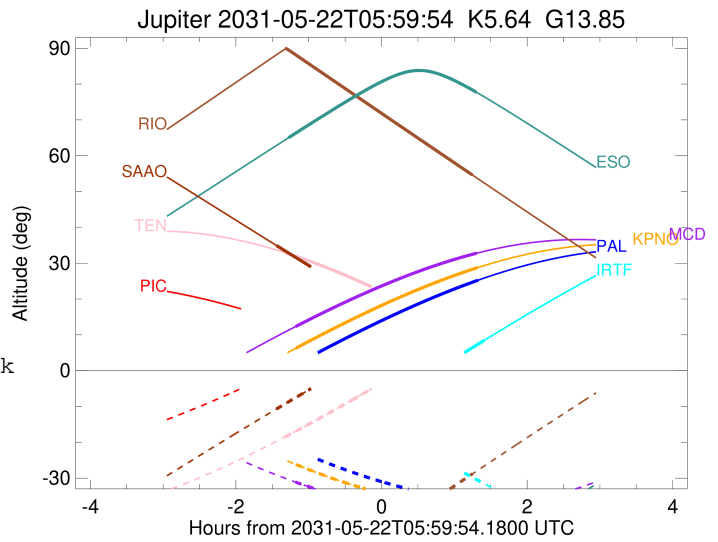
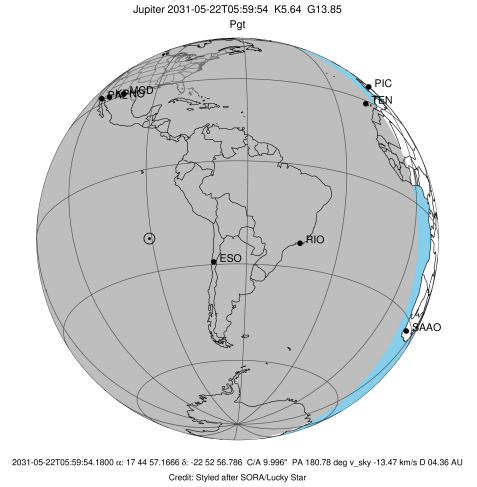
Observable events with sun below -5 deg and altitude above 5 deg

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 22 07:19	- MAY 22 07:19	Pne
PMO	Purple Mtn Obs. Nanking	32.1	118.8				Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	MAY 22 04:49	- MAY 22 07:19	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+	MAY 22 04:49	- MAY 22 07:18	Pie
TEN	Teide Obs./Tenerife	28.3	343.5	+	MAY 22 04:40	- MAY 22 04:40	Pin
IRTF	Mauna Kea/IRTF	19.8	204.5	+	MAY 22 07:24	- MAY 22 07:24	Pne
KAV	Kavalur Observatory	12.6	78.8				Pnn
RIO	Rio de Janeiro	-22.9	316.8	+	MAY 22 04:40	- MAY 22 07:14	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	MAY 22 04:43	- MAY 22 07:18	Pie
AAT	Siding Spring (AAT)	-31.3	149.1				Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	MAY 22 04:33	- MAY 22 04:33	Pin
MSO	Mt. Stromlo Observatory	-35.3	149.0				Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-22T06:04:48.450
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       : 4116890534598985728
2Mass ID (if available) : 17445716-2252567
ICRS Star Coord at Epoch: 17h 44m 57.16658s -22:52:56.78582s
RUWE (>1.4 is poor) : 0.99
K magnitude          : 5.640
G magnitude          : 13.846
RP magnitude         : 12.036
BP magnitude         : 18.314
DUPflag             : 0
Distance (au)        : 4.360
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.47
Sun-Target sep (deg) : 154.01
Sun-Moon sep (deg)  : 163.94
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.78
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation ("): 11.409
C/A sky separation (km): 36077.9
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
    
```

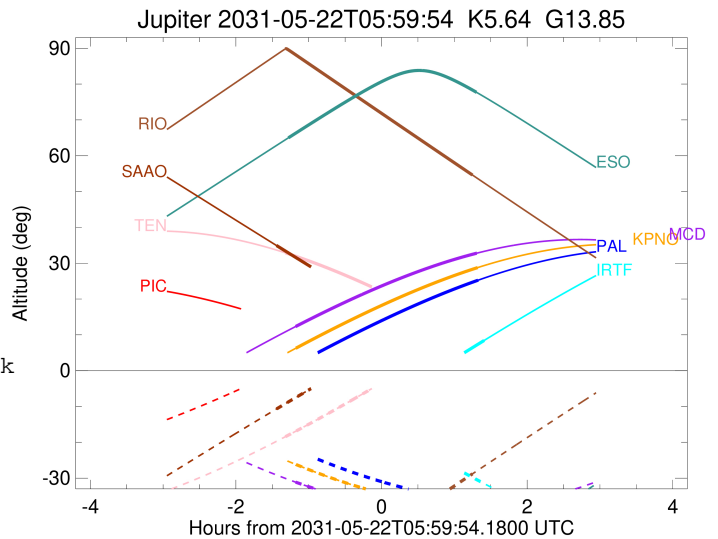
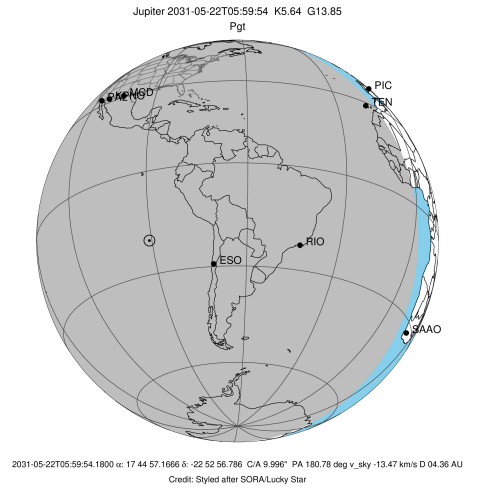


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-22T04:49:24.403	1.75x	-22.17	71489.7	29.70	33.05
Jupiter	E	2031-05-22T07:19:36.421	25.26	-36.14	71489.6	30.72	34.13

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-22T06:04:31.400
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        : 4116890534598985728
2Mass ID (if available) : 17445716-2252567
ICRS Star Coord at Epoch: 17h 44m 57.16658s -22:52:56.78582s
RUWE (>1.4 is poor) : 0.99
K magnitude           : 5.640
G magnitude           : 13.846
RP magnitude          : 12.036
BP magnitude          : 18.314
DUPflag              : 0
Distance (au)         : 4.360
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -13.47
Sun-Target sep (deg)  : 154.01
Sun-Moon sep (deg)    : 163.99
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.78
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 11.424
C/A sky separation (km) : 36126.9
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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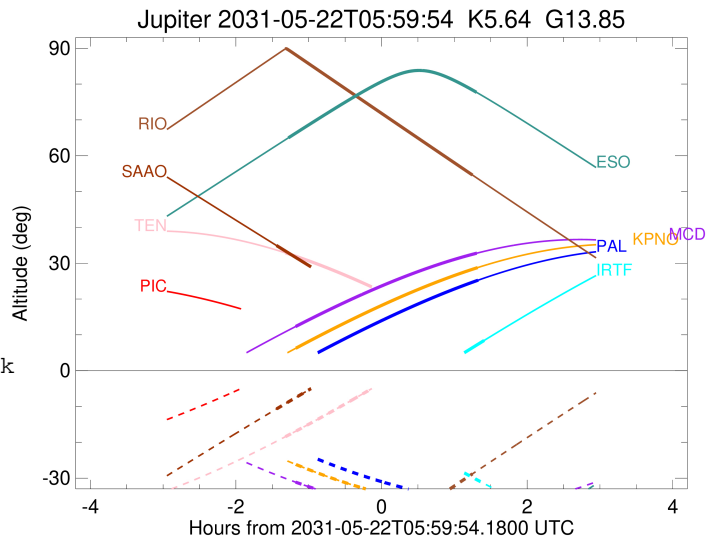
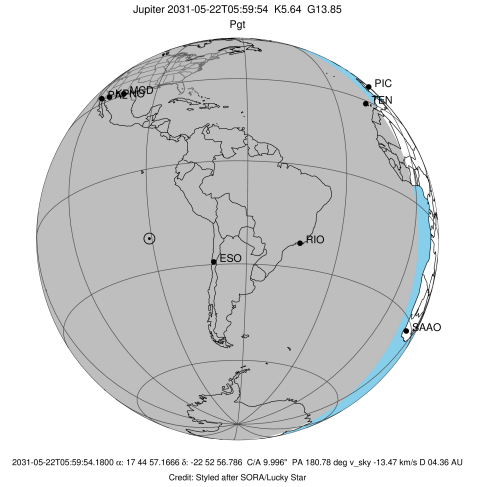


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-22T04:49:20.190	6.26	-26.18	71489.7	29.76	33.12
Jupiter	E	2031-05-22T07:19:08.657	28.77	-37.84	71489.6	30.73	34.14

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-22T06:03:59.790
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       : 4116890534598985728
2Mass ID (if available) : 17445716-2252567
ICRS Star Coord at Epoch: 17h 44m 57.16658s -22:52:56.78582s
RUWE (>1.4 is poor) : 0.99
K magnitude           : 5.640
G magnitude           : 13.846
RP magnitude         : 12.036
BP magnitude         : 18.314
DUPflag              : 0
Distance (au)        : 4.360
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.47
Sun-Target sep (deg) : 154.01
Sun-Moon sep (deg)   : 164.07
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.78
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 11.457
C/A sky separation (km) : 36230.0
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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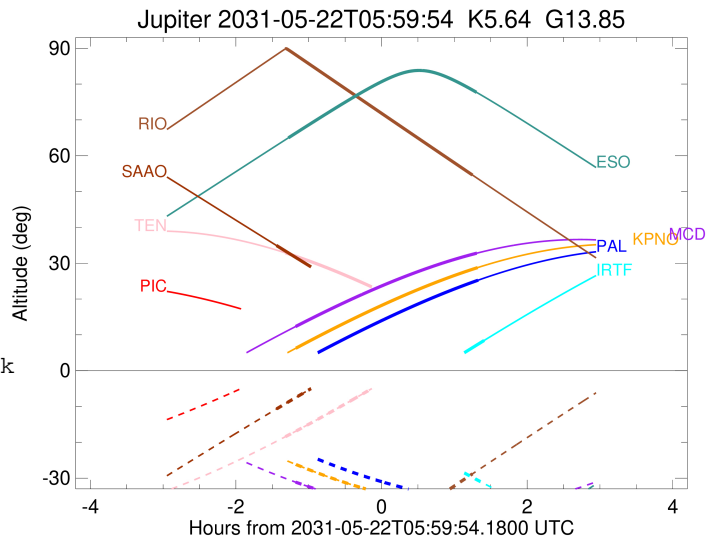
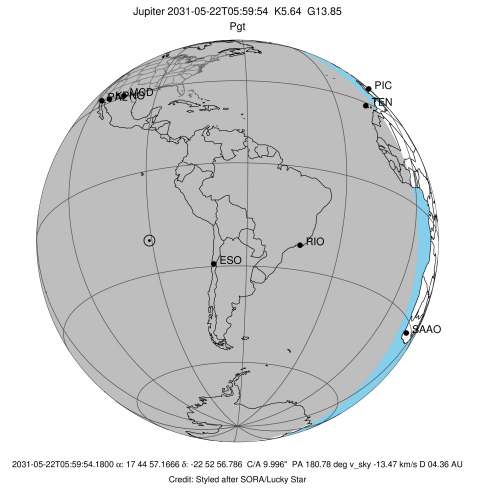


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-22T04:49:07.141	12.32	-31.11	71489.7	29.90	33.27
Jupiter	E	2031-05-22T07:18:22.273	32.79	-38.76	71489.6	30.77	34.18

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch              : 2031-05-22T05:55:22.250
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        : 4116890534598985728
2Mass ID (if available) : 17445716-2252567
ICRS Star Coord at Epoch: 17h 44m 57.16658s -22:52:56.78582s
RUWE (>1.4 is poor)  : 0.99
K magnitude            : 5.640
G magnitude            : 13.846
RP magnitude           : 12.036
BP magnitude           : 18.314
DUPflag               : 0
Distance (au)         : 4.360
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -13.47
Sun-Target sep (deg)  : 154.01
Sun-Moon sep (deg)    : 165.11
B (ring opening deg)  : -2.61
PA of pole (deg)      : 0.78
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 11.383
C/A sky separation (km) : 35998.3
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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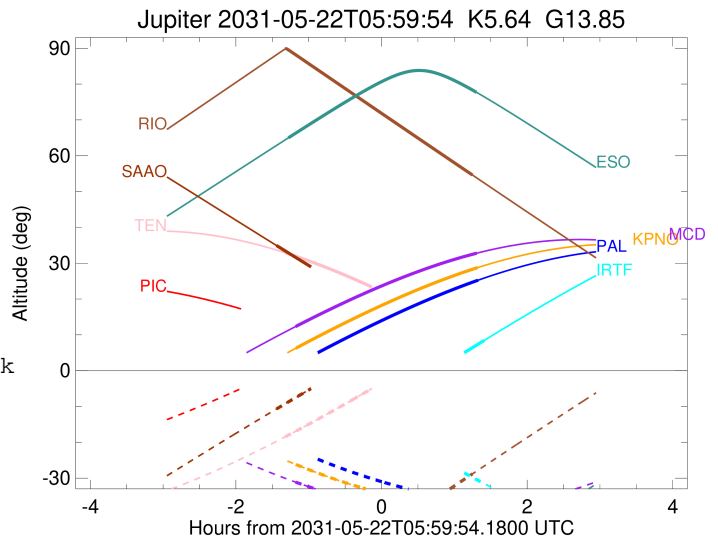
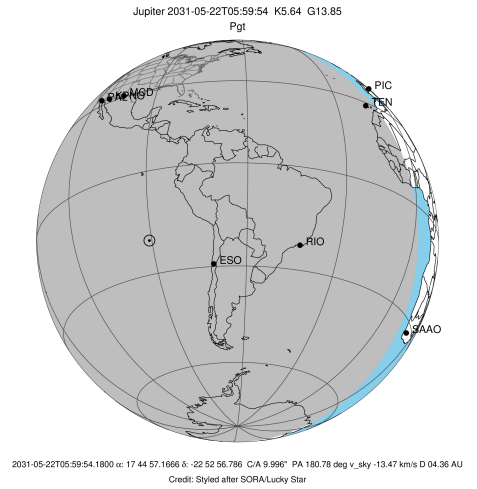


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-22T04:40:42.551	32.89	-18.43	71489.6	30.56	33.96
Jupiter	E	2031-05-22T07:10:28.318	9.84	11.08x	71489.7	29.68	33.03

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-22T06:06:49.850
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       : 4116890534598985728
2Mass ID (if available) : 17445716-2252567
ICRS Star Coord at Epoch: 17h 44m 57.16658s -22:52:56.78582s
RUWE (>1.4 is poor) : 0.99
K magnitude           : 5.640
G magnitude           : 13.846
RP magnitude         : 12.036
BP magnitude         : 18.314
DUPflag              : 0
Distance (au)        : 4.360
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.47
Sun-Target sep (deg) : 154.01
Sun-Moon sep (deg)   : 163.64
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.78
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 10.606
C/A sky separation (km) : 33539.7
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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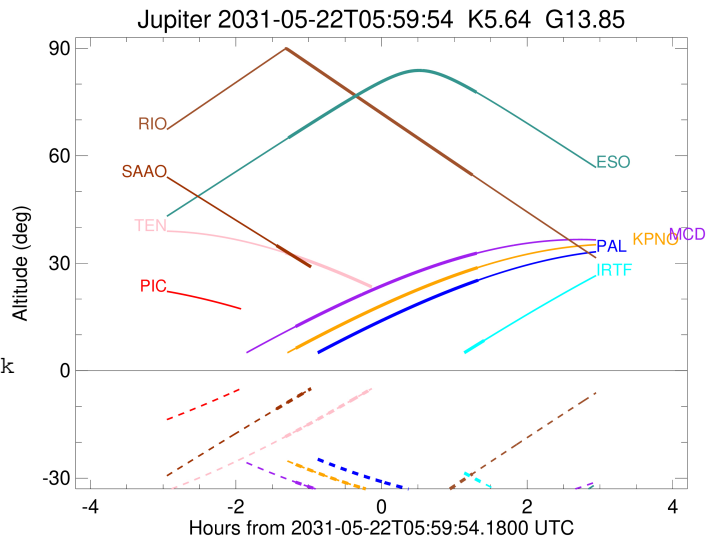
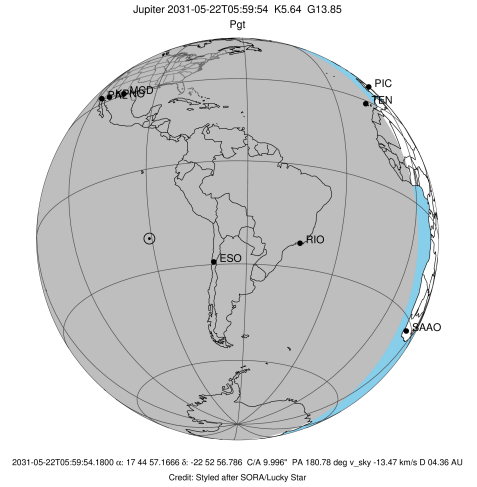


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-22T04:48:14.943	-25.78x	0.18x	71490.1	27.23	30.42
Jupiter	E	2031-05-22T07:24:30.307	8.43	-31.52	71489.9	28.67	31.96

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-22T05:57:39.490
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      : 4116890534598985728
2Mass ID (if available) : 17445716-2252567
ICRS Star Coord at Epoch: 17h 44m 57.16658s -22:52:56.78582s
RUWE (>1.4 is poor) : 0.99
K magnitude          : 5.640
G magnitude          : 13.846
RP magnitude         : 12.036
BP magnitude         : 18.314
DUPflag             : 0
Distance (au)       : 4.360
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.47
Sun-Target sep (deg) : 154.01
Sun-Moon sep (deg)  : 165.02
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.78
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 9.979
C/A sky separation (km) : 31557.3
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
    
```

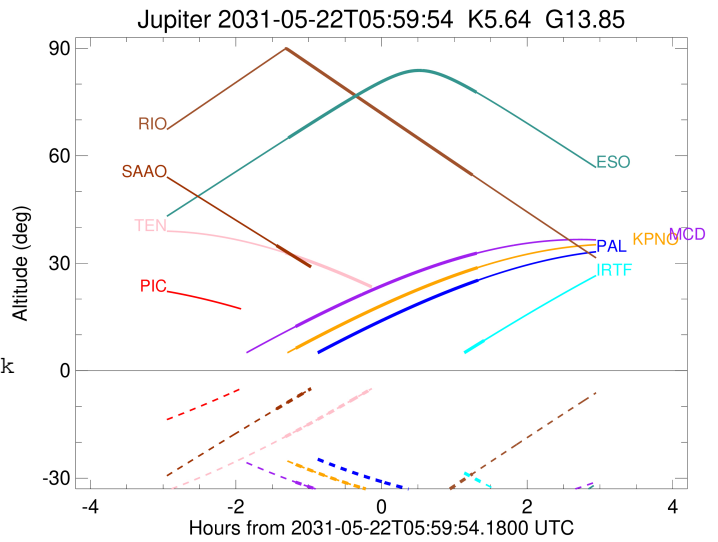
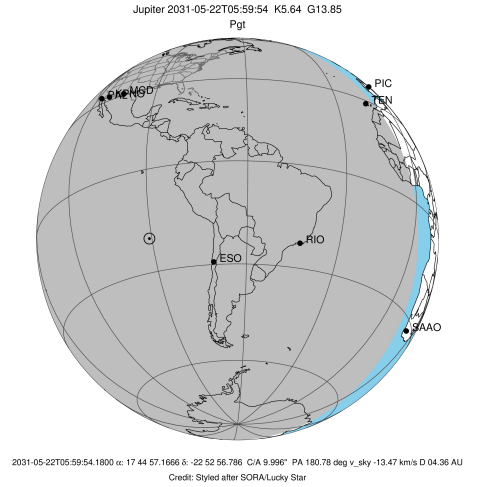


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-22T04:40:36.514	89.80	-64.10	71490.2	26.25	29.37
Jupiter	E	2031-05-22T07:14:53.806	54.60	-28.79	71490.2	25.86	28.95

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-22T06:00:44.080
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      : 4116890534598985728
2Mass ID (if available) : 17445716-2252567
ICRS Star Coord at Epoch: 17h 44m 57.16658s -22:52:56.78582s
RUWE (>1.4 is poor) : 0.99
K magnitude          : 5.640
G magnitude          : 13.846
RP magnitude         : 12.036
BP magnitude         : 18.314
DUPflag             : 0
Distance (au)       : 4.360
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.47
Sun-Target sep (deg) : 154.01
Sun-Moon sep (deg)  : 164.66
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.78
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 9.782
C/A sky separation (km) : 30933.6
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
    
```

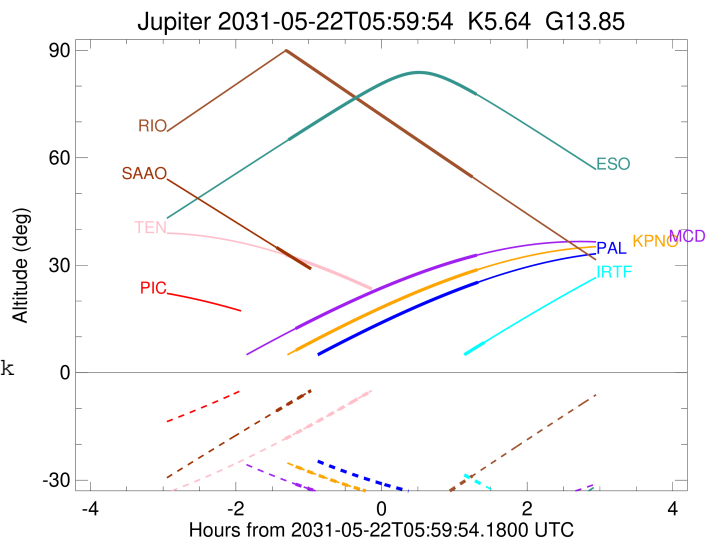
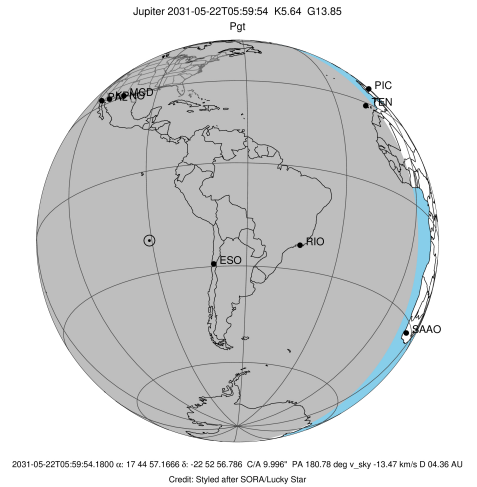


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-22T04:43:07.860	64.98	-81.21	71490.3	25.39	28.45
Jupiter	E	2031-05-22T07:18:10.340	77.69	-53.13	71490.3	25.61	28.69


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-22T05:53:39.430
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       : 4116890534598985728
2Mass ID (if available) : 17445716-2252567
ICRS Star Coord at Epoch: 17h 44m 57.16658s -22:52:56.78582s
RUWE (>1.4 is poor) : 0.99
K magnitude           : 5.640
G magnitude           : 13.846
RP magnitude         : 12.036
BP magnitude         : 18.314
DUPflag              : 0
Distance (au)        : 4.360
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.47
Sun-Target sep (deg) : 154.01
Sun-Moon sep (deg)   : 165.35
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.78
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 9.127
C/A sky separation (km) : 28861.2
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	2031-05-22T04:33:25.329	34.92	-10.68	71490.4	24.38	27.36
Jupiter	E	2031-05-22T07:14:36.804	2.22x	19.12x	71490.6	23.14	26.02