

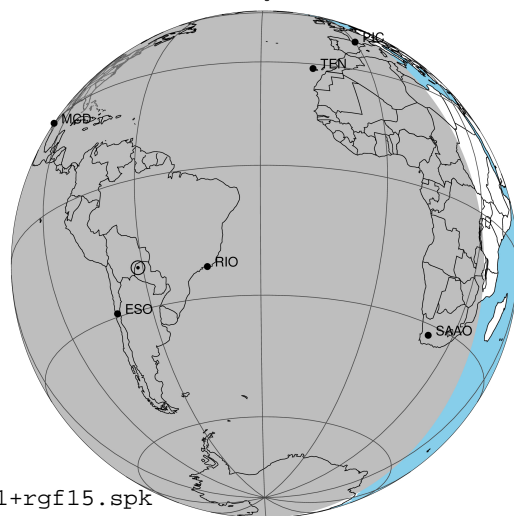
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-05-23T04:01:51.190
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4069578755337641216
 2Mass ID (if available) : 18055146-2302123

Jupiter 2043-05-23T04:01:51 K9.86 G14.45 Pgt

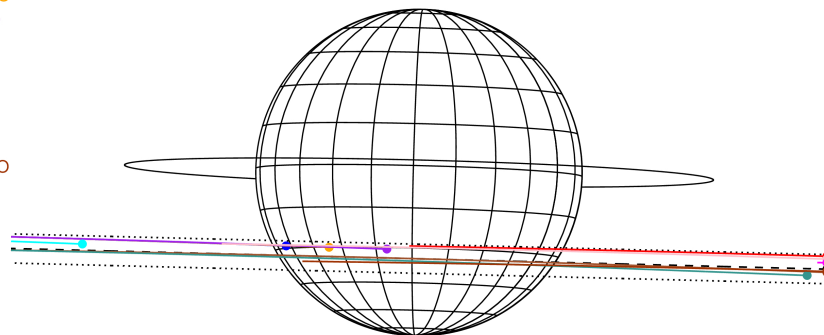
ICRS Star Coord at Epoch: 18h 05m 51.46899s -23:02:12.57503s

RUWE (>1.4 is poor) : 1.91
 K magnitude : 9.858
 G magnitude : 14.449
 RP magnitude : 13.275
 BP magnitude : 15.877
 DUPflag : 0
 Distance (au) : 4.375
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -12.44
 Sun-Target sep (deg) : 150.01
 Sun-Moon sep (deg) : 39.09
 B (ring opening deg) : -2.43
 PA of pole (deg) : -1.47
 Pole direction: RA (deg): 268.05667
 Dec (deg): 64.49732
 C/A sky separation (") : 11.910
 C/A sky separation (km) : 37790.3
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-05-23T04:01:51 K9.86 G14.45
 Pgt



Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 KAV
 RIO
 ESO
 SAAO

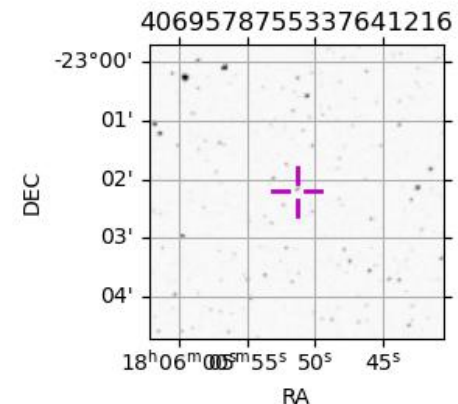


2043-05-23T04:01:51.1900 a: 18 05 51.4689 8: -23 02 12.575 C/A ***** PA 358.55 deg v_sky -12.44 km/s D 04.37 AU

Credit: Styled after SORA/Lucky Star

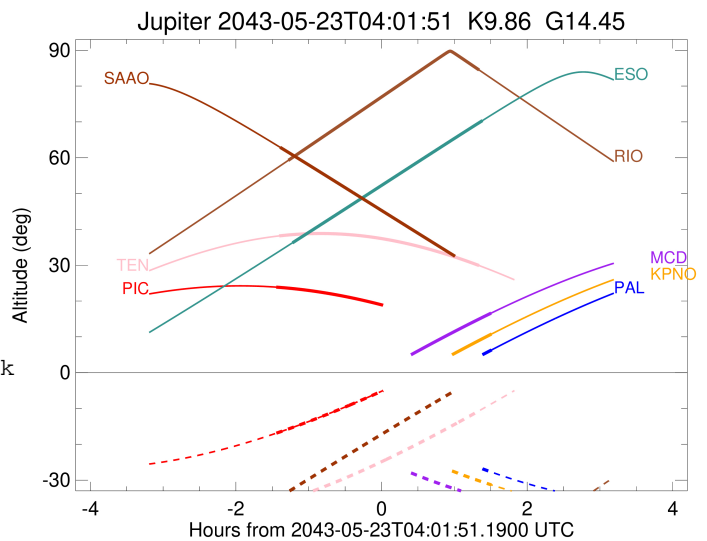
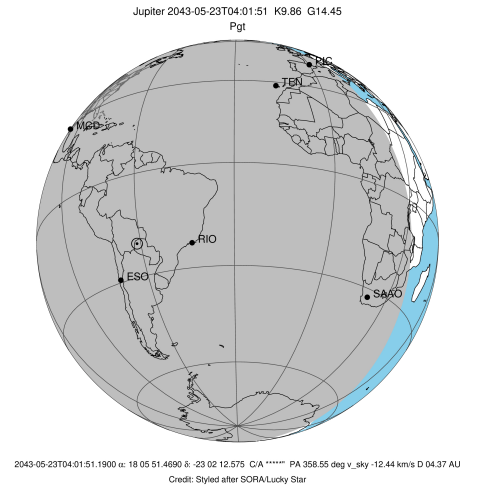
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events	Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	MAY 23 02:35 - MAY 23 02:35		Pin
PAL	Palomar Mt (200")	33.4	243.1	+	MAY 23 05:32 - MAY 23 05:32		Pne
PMO	Purple Mtn Obs. Nanking	32.1	118.8				Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	MAY 23 05:32 - MAY 23 05:32		Pne
MCD	McDonald Obs. 2.7m	30.7	256.0	+	MAY 23 05:32 - MAY 23 05:32		Pne
TEN	Teide Obs./Tenerife	28.3	343.5	+	MAY 23 02:37 - MAY 23 05:22		Pie
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 23 02:45 - MAY 23 05:22		Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	MAY 23 02:48 - MAY 23 05:25		Pie
AAT	Siding Spring (AAT)	-31.3	149.1				Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	MAY 23 02:38 - MAY 23 02:38		Pin
MSO	Mt. Stromlo Observatory	-35.3	149.0				Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-05-23T03:58:24.750
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       : 4069578755337641216
2Mass ID (if available) : 18055146-2302123
ICRS Star Coord at Epoch: 18h 05m 51.46899s -23:02:12.57503s
RUWE (>1.4 is poor) : 1.91
K magnitude           : 9.858
G magnitude           : 14.449
RP magnitude          : 13.275
BP magnitude          : 15.877
DUPflag              : 0
Distance (au)         : 4.375
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -12.44
Sun-Target sep (deg) : 150.01
Sun-Moon sep (deg)   : 39.60
B (ring opening deg) : -2.43
PA of pole (deg)     : -1.47
Pole direction: RA (deg): 268.05667
Dec (deg): 64.49732
C/A sky separation (") : 10.169
C/A sky separation (km) : 32268.7
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
    
```

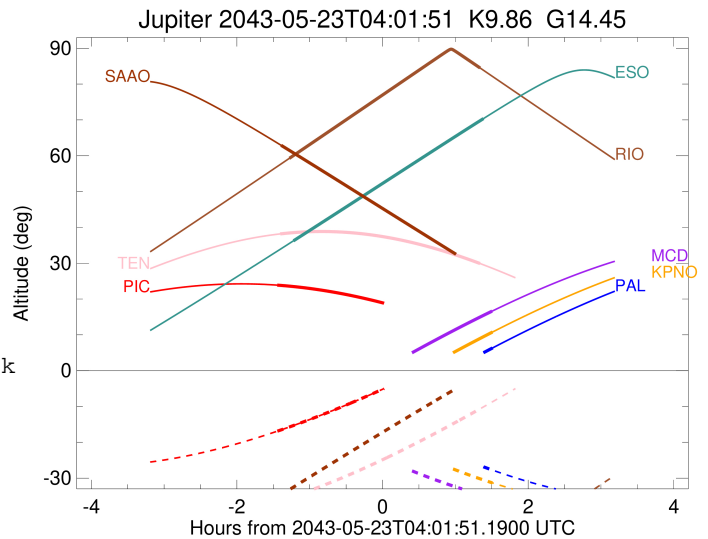
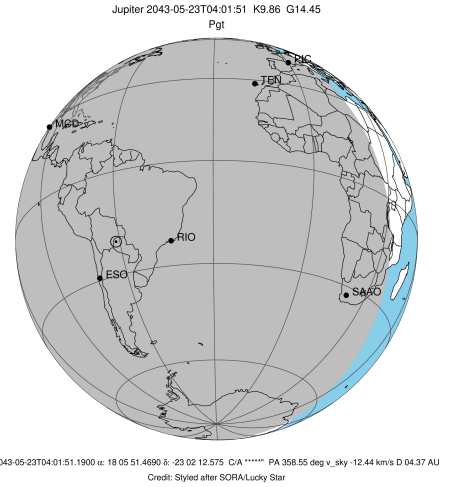


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-05-23T02:35:08.974	23.87	-16.89	71490.4	-26.57	-29.71
Jupiter	E	2043-05-23T05:21:58.916	10.11	7.83x	71490.3	-27.23	-30.42

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-05-23T04:09:23.770
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        : 4069578755337641216
2Mass ID (if available) : 18055146-2302123
ICRS Star Coord at Epoch: 18h 05m 51.46899s -23:02:12.57503s
RUWE (>1.4 is poor) : 1.91
K magnitude           : 9.858
G magnitude           : 14.449
RP magnitude          : 13.275
BP magnitude          : 15.877
DUPflag              : 0
Distance (au)         : 4.375
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -12.44
Sun-Target sep (deg) : 150.01
Sun-Moon sep (deg)   : 38.45
B (ring opening deg) : -2.43
PA of pole (deg)     : -1.47
Pole direction: RA (deg): 268.05667
Dec (deg): 64.49732
C/A sky separation (") : 10.803
C/A sky separation (km) : 34277.0
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
    
```

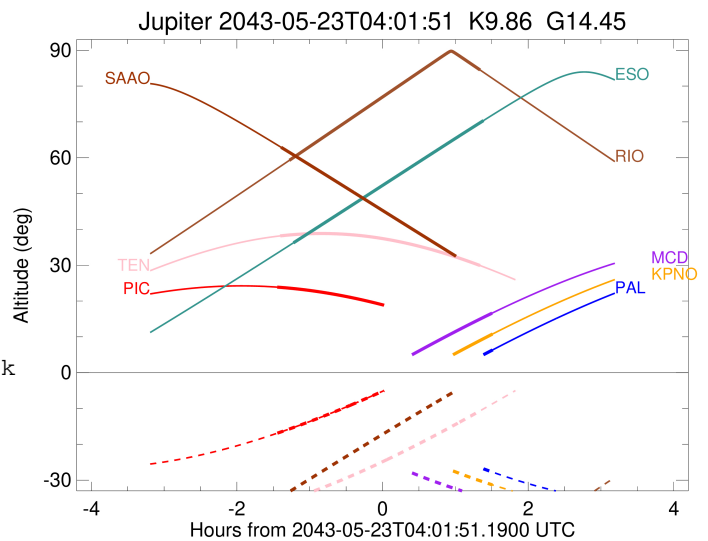
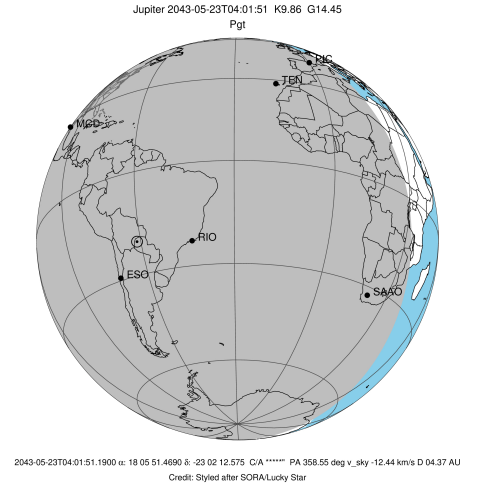


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-05-23T02:45:04.759	-26.12x	-0.80x	71490.1	-29.31	-32.64
Jupiter	E	2043-05-23T05:32:39.061	6.36	-27.77	71490.2	-27.98	-31.23

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-05-23T04:09:25.380
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        : 4069578755337641216
2Mass ID (if available) : 18055146-2302123
ICRS Star Coord at Epoch: 18h 05m 51.46899s -23:02:12.57503s
RUWE (>1.4 is poor) : 1.91
K magnitude           : 9.858
G magnitude           : 14.449
RP magnitude          : 13.275
BP magnitude          : 15.877
DUPflag              : 0
Distance (au)         : 4.375
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -12.44
Sun-Target sep (deg) : 150.01
Sun-Moon sep (deg)   : 38.49
B (ring opening deg) : -2.43
PA of pole (deg)     : -1.47
Pole direction: RA (deg): 268.05667
Dec (deg): 64.49732
C/A sky separation (") : 10.778
C/A sky separation (km) : 34199.8
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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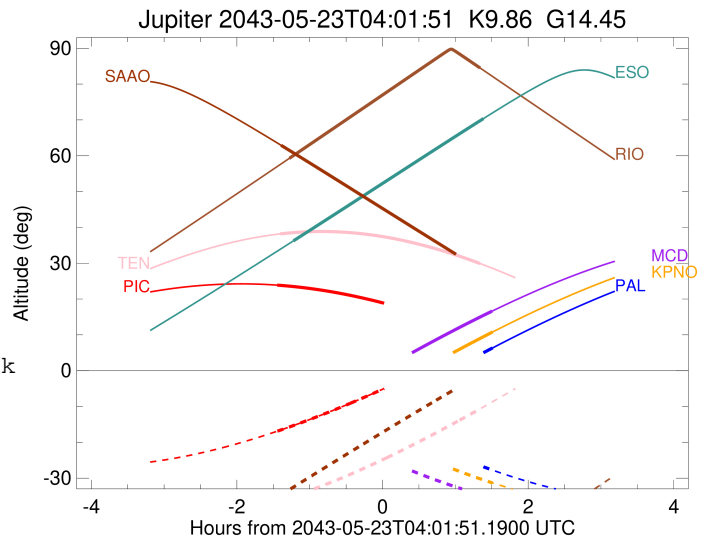
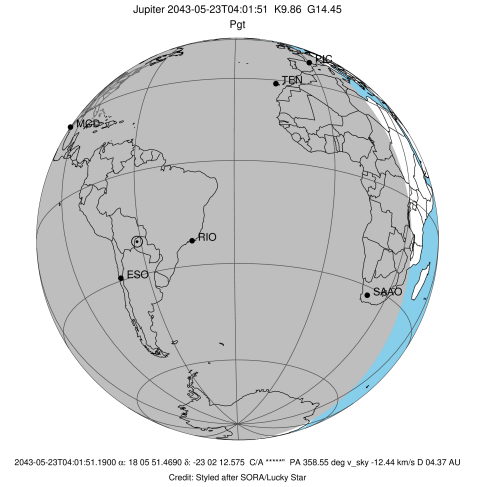


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-05-23T02:45:18.061	-21.44x	-5.43	71490.1	-29.25	-32.57
Jupiter	E	2043-05-23T05:32:29.278	10.78	-31.33	71490.2	-27.93	-31.17

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-05-23T04:09:16.520
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       : 4069578755337641216
2Mass ID (if available) : 18055146-2302123
ICRS Star Coord at Epoch: 18h 05m 51.46899s -23:02:12.57503s
RUWE (>1.4 is poor) : 1.91
K magnitude           : 9.858
G magnitude           : 14.449
RP magnitude          : 13.275
BP magnitude          : 15.877
DUPflag              : 0
Distance (au)        : 4.375
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -12.44
Sun-Target sep (deg) : 150.01
Sun-Moon sep (deg)   : 38.56
B (ring opening deg) : -2.43
PA of pole (deg)     : -1.47
Pole direction: RA (deg): 268.05667
Dec (deg): 64.49732
C/A sky separation ("): 10.726
C/A sky separation (km): 34035.1
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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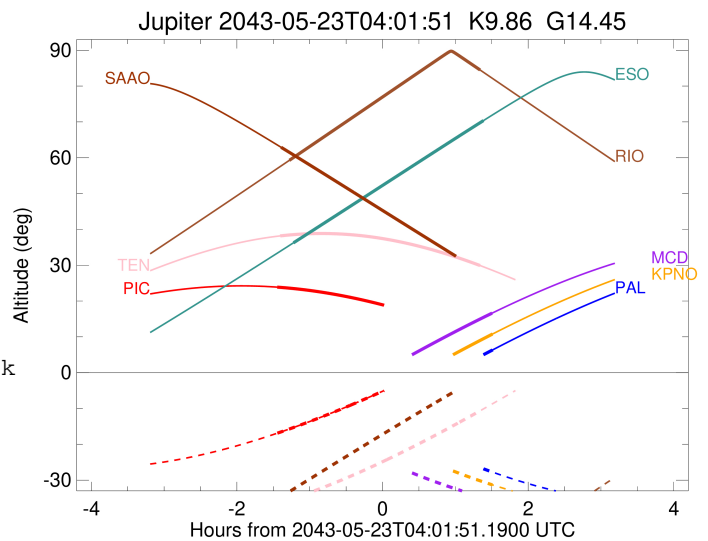
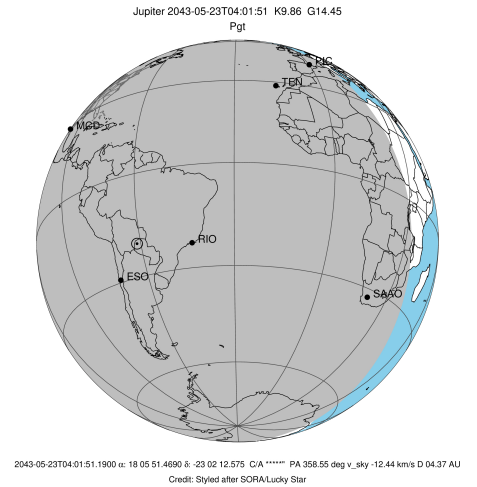


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-05-23T02:45:24.037	-14.83x	-11.69	71490.1	-29.09	-32.41
Jupiter	E	2043-05-23T05:32:07.327	16.61	-35.38	71490.2	-27.81	-31.05

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-05-23T03:59:55.650
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       : 4069578755337641216
2Mass ID (if available) : 18055146-2302123
ICRS Star Coord at Epoch: 18h 05m 51.46899s -23:02:12.57503s
RUWE (>1.4 is poor) : 1.91
K magnitude           : 9.858
G magnitude           : 14.449
RP magnitude          : 13.275
BP magnitude          : 15.877
DUPflag              : 0
Distance (au)        : 4.375
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.44
Sun-Target sep (deg) : 150.01
Sun-Moon sep (deg)   : 39.64
B (ring opening deg) : -2.43
PA of pole (deg)     : -1.47
Pole direction: RA (deg): 268.05667
Dec (deg): 64.49732
C/A sky separation ("): 10.372
C/A sky separation (km): 32910.1
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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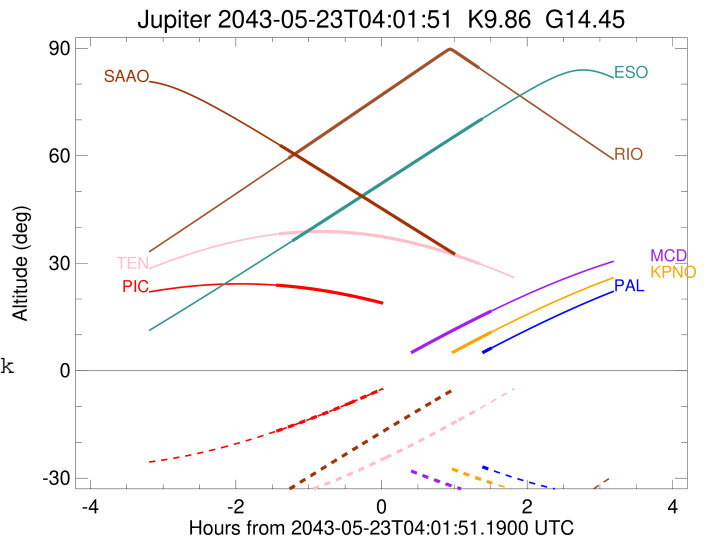
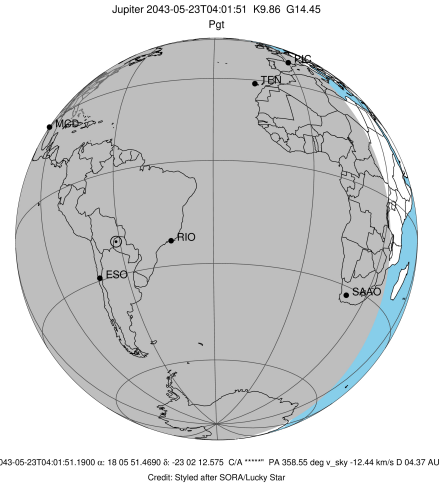


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-05-23T02:37:40.246	38.18	-36.19	71490.3	-27.29	-30.49
Jupiter	E	2043-05-23T05:22:18.347	29.89	-10.64	71490.3	-27.72	-30.95

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-05-23T04:03:49.480
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      : 4069578755337641216
2Mass ID (if available) : 18055146-2302123
ICRS Star Coord at Epoch: 18h 05m 51.46899s -23:02:12.57503s
RUWE (>1.4 is poor) : 1.91
K magnitude          : 9.858
G magnitude          : 14.449
RP magnitude         : 13.275
BP magnitude         : 15.877
DUPflag             : 0
Distance (au)       : 4.375
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.44
Sun-Target sep (deg) : 150.01
Sun-Moon sep (deg)  : 39.49
B (ring opening deg) : -2.43
PA of pole (deg)    : -1.47
Pole direction: RA (deg): 268.05667
Dec (deg): 64.49732
C/A sky separation (") : 11.907
C/A sky separation (km) : 37783.5
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
    
```

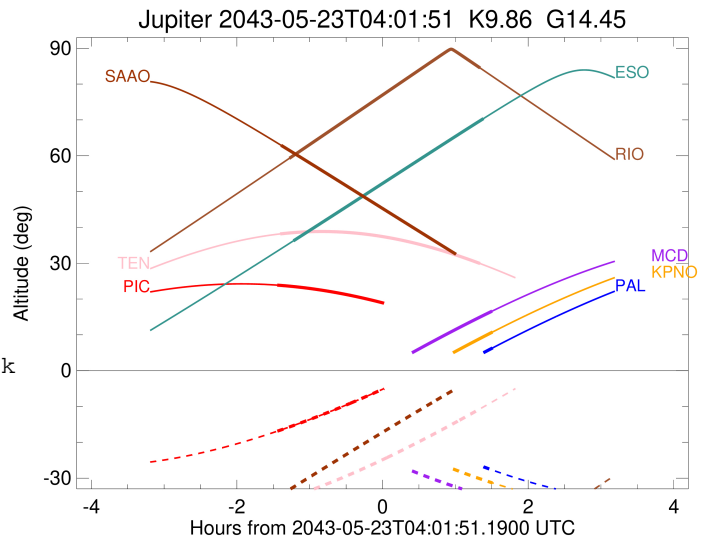
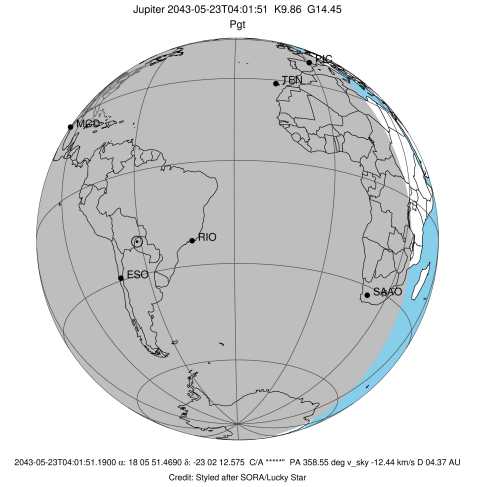


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-05-23T02:45:05.963	59.27	-87.55	71489.7	-32.11	-35.59
Jupiter	E	2043-05-23T05:22:15.881	84.49	-54.56	71489.7	-31.89	-35.36


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-05-23T04:07:06.860
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       : 4069578755337641216
2Mass ID (if available) : 18055146-2302123
ICRS Star Coord at Epoch: 18h 05m 51.46899s -23:02:12.57503s
RUWE (>1.4 is poor) : 1.91
K magnitude           : 9.858
G magnitude           : 14.449
RP magnitude          : 13.275
BP magnitude          : 15.877
DUPflag              : 0
Distance (au)        : 4.375
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.44
Sun-Target sep (deg) : 150.01
Sun-Moon sep (deg)   : 39.12
B (ring opening deg) : -2.43
PA of pole (deg)     : -1.47
Pole direction: RA (deg): 268.05667
Dec (deg): 64.49732
C/A sky separation (") : 12.252
C/A sky separation (km) : 38875.4
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
    
```

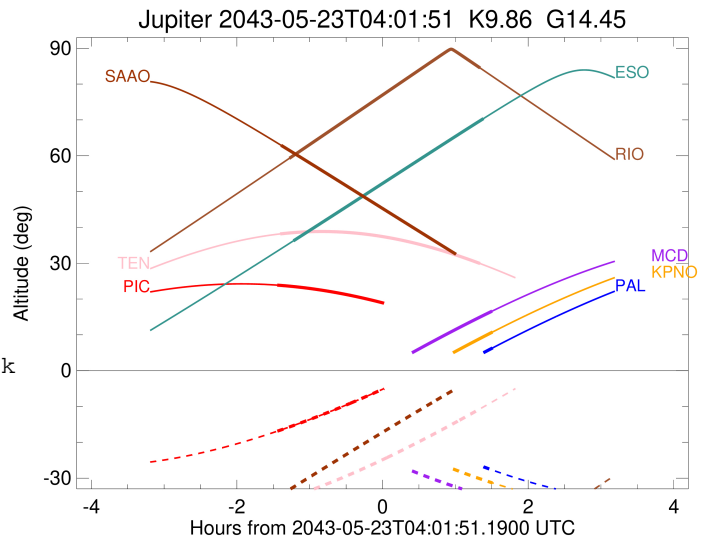
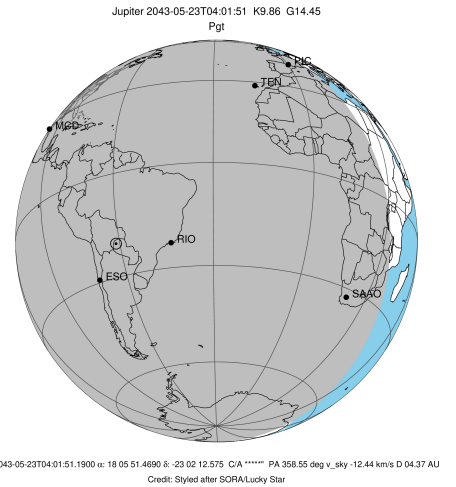


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-05-23T02:48:28.209	36.24	-63.45	71489.5	-33.41	-36.95
Jupiter	E	2043-05-23T05:25:07.496	70.38	-76.62	71489.7	-32.61	-36.11


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-05-23T03:56:00.690
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       : 4069578755337641216
2Mass ID (if available) : 18055146-2302123
ICRS Star Coord at Epoch: 18h 05m 51.46899s -23:02:12.57503s
RUWE (>1.4 is poor) : 1.91
K magnitude          : 9.858
G magnitude          : 14.449
RP magnitude         : 13.275
BP magnitude         : 15.877
DUPflag             : 0
Distance (au)        : 4.375
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -12.44
Sun-Target sep (deg) : 150.01
Sun-Moon sep (deg)   : 39.92
B (ring opening deg) : -2.43
PA of pole (deg)     : -1.47
Pole direction: RA (deg): 268.05667
Dec (deg): 64.49732
C/A sky separation (") : 12.492
C/A sky separation (km) : 39637.0
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
    
```



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	2043-05-23T02:38:15.238	62.91	-34.66	71489.6	-33.16	-36.68
Jupiter	E	2043-05-23T05:14:19.276	30.00	-2.68x	71489.4	-34.27	-37.84