

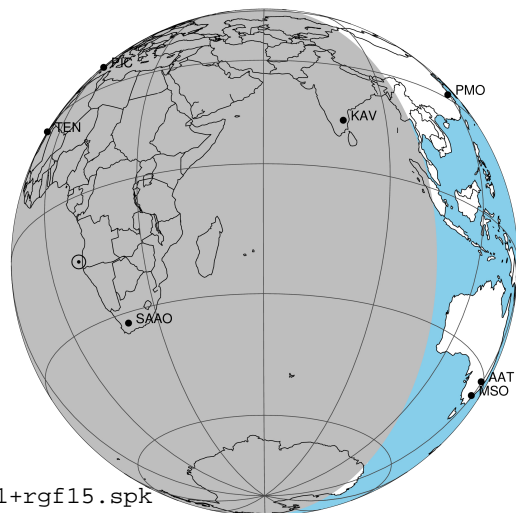
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-05-01T23:13:45.090
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068712782541394560
 2Mass ID (if available) : 17514957-2253501

Jupiter 2031-05-01T23:13:45 K6.81 G11.96 Pgt

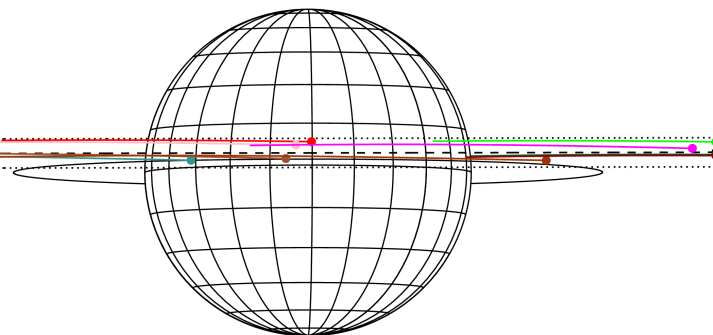
ICRS Star Coord at Epoch: 17h 51m 49.57580s -22:53:50.13358s

RUWE (>1.4 is poor) : 0.75
 K magnitude : 6.808
 G magnitude : 11.962
 RP magnitude : 10.640
 BP magnitude : 14.019
 DUPflag : 0
 Distance (au) : 4.559
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -7.00
 Sun-Target sep (deg) : 132.83
 Sun-Moon sep (deg) : 112.60
 B (ring opening deg) : -2.61
 PA of pole (deg) : 0.04
 Pole direction: RA (deg): 268.05696
 Dec (deg): 64.49651
 C/A sky separation (") : 2.592
 C/A sky separation (km) : 8568.4
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-05-01T23:13:45 K6.81 G11.96
 Pgt



Earth
 PIC
 PMO
 KPNO
 MCD
 TEN
 KAV
 RIO
 ESO
 AAT
 SAAO
 MSO

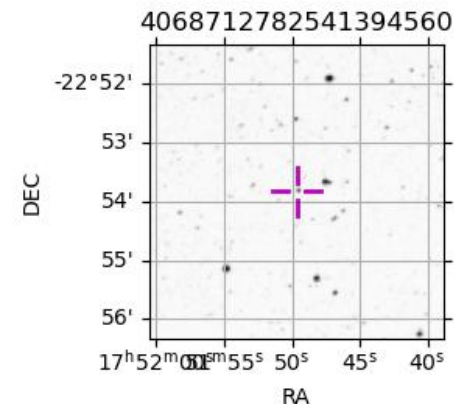


2031-05-01T23:13:45.0900 at: 17 51 49.5758 s: -22 53 50.1334 C/A 2.580" PA 180.09 deg v_sky - 7.00 km/s D 04.56 AU

Credit: Styled after SORA/Lucky Star

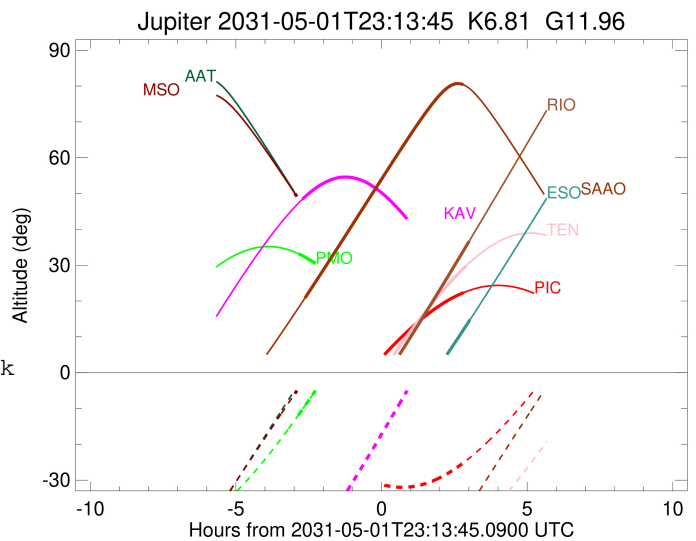
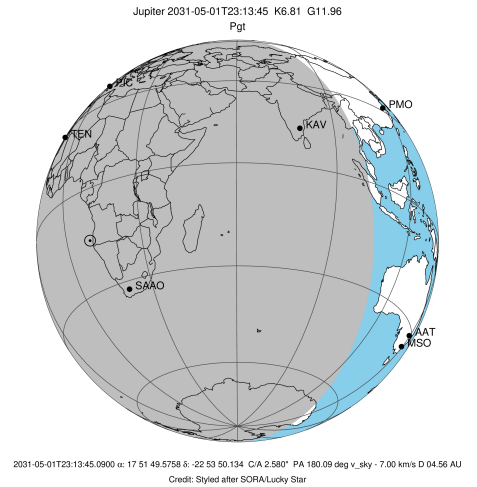
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	MAY 02 02:03 - MAY 02 02:03	Pne
PAL	Palomar Mt (200")	33.4	243.1			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+	MAY 01 20:22 - MAY 01 20:22	Pin
KPNO	Kitt Peak Natl Obs	32.0	248.4			Pnn
MCD	McDonald Obs. 2.7m	30.7	256.0			Pnn
TEN	Teide Obs./Tenerife	28.3	343.5	+	MAY 02 02:07 - MAY 02 02:07	Pne
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+	MAY 01 20:31 - MAY 01 20:31	Pin
RIO	Rio de Janeiro	-22.9	316.8	+	MAY 02 02:14 - MAY 02 02:14	Pne
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	MAY 02 02:15 - MAY 02 02:15	Pne
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	MAY 01 20:36 - MAY 02 02:01	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	MAY 01 20:15 - MAY 01 20:15	Pin



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-01T23:22:39.820
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        : 4068712782541394560
2Mass ID (if available) : 17514957-2253501
ICRS Star Coord at Epoch: 17h 51m 49.57580s -22:53:50.13358s
RUWE (>1.4 is poor) : 0.75
K magnitude           : 6.808
G magnitude           : 11.962
RP magnitude          : 10.640
BP magnitude          : 14.019
DUPflag              : 0
Distance (au)         : 4.558
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -7.00
Sun-Target sep (deg)  : 132.83
Sun-Moon sep (deg)    : 112.87
B (ring opening deg) : -2.61
PA of pole (deg)      : 0.04
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation (") : 4.091
C/A sky separation (km) : 13527.0
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
    
```

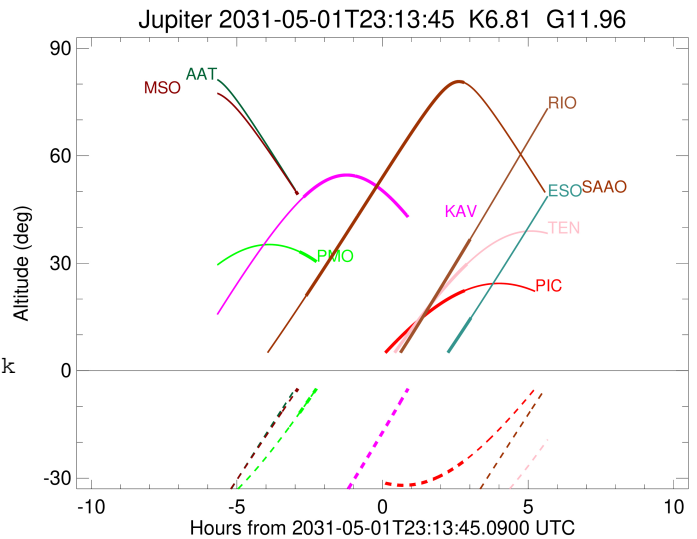
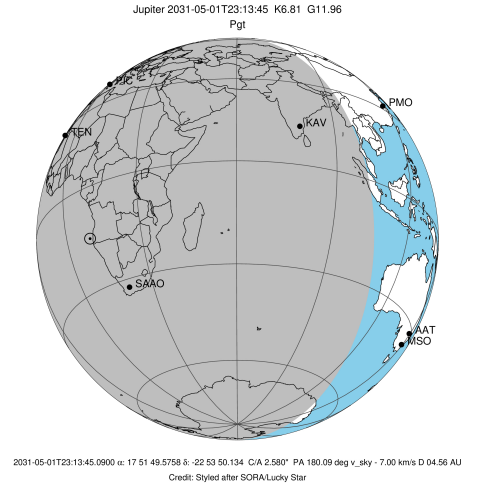


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-01T20:36:38.358	-22.11x	-16.12	71491.7	9.91	11.30
Jupiter	E	2031-05-02T02:03:18.072	22.36	-25.08	71491.6	11.46	13.05

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-01T23:03:36.040
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : PMO
Location             : Purple Mtn Obs. Nanking
Latitude (deg)       : 32.06667
E. Longitude (deg)  : 118.82089
Altitude (km)        : 0.364
Gaia source ID       : 4068712782541394560
2Mass ID (if available) : 17514957-2253501
ICRS Star Coord at Epoch: 17h 51m 49.57580s -22:53:50.13358s
RUWE (>1.4 is poor) : 0.75
K magnitude           : 6.808
G magnitude           : 11.962
RP magnitude          : 10.640
BP magnitude          : 14.019
DUPflag              : 0
Distance (au)        : 4.559
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -7.00
Sun-Target sep (deg) : 132.83
Sun-Moon sep (deg)  : 112.50
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.04
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation (") : 3.884
C/A sky separation (km) : 12842.6
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
    
```

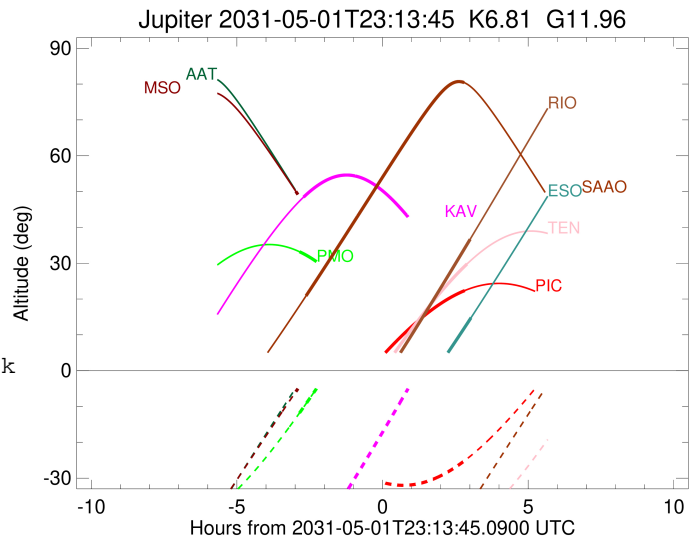
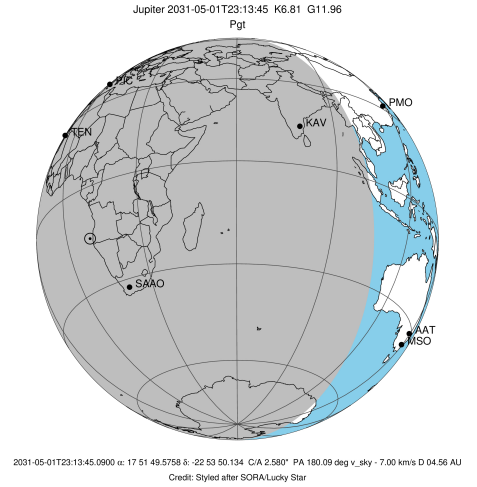


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-01T20:22:43.730	33.20	-11.81	71491.7	11.08	12.62
Jupiter	E	2031-05-02T01:48:30.506	-17.77x	55.45x	71491.8	9.11	10.39

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-01T23:25:58.190
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        : 4068712782541394560
2Mass ID (if available) : 17514957-2253501
ICRS Star Coord at Epoch: 17h 51m 49.57580s -22:53:50.13358s
RUWE (>1.4 is poor) : 0.75
K magnitude           : 6.808
G magnitude           : 11.962
RP magnitude          : 10.640
BP magnitude          : 14.019
DUPflag              : 0
Distance (au)         : 4.558
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -7.00
Sun-Target sep (deg) : 132.83
Sun-Moon sep (deg)   : 112.89
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.04
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation (") : 3.618
C/A sky separation (km) : 11962.2
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
    
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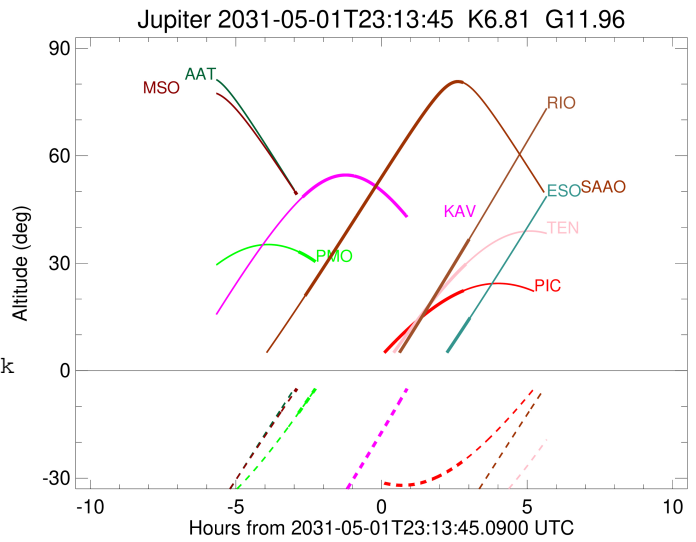
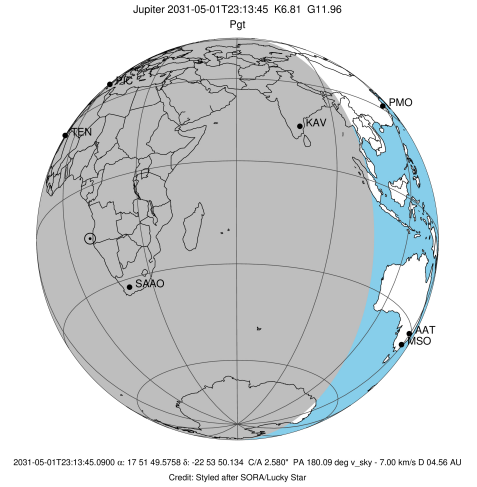


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-01T20:36:58.105	-32.75x	-12.43	71491.8	8.39	9.57
Jupiter	E	2031-05-02T02:07:44.630	29.76	-43.85	71491.7	10.55	12.02

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-01T23:09:29.960
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : KAV
Location             : Kavalur Observatory
Latitude (deg)       : 12.57556
E. Longitude (deg)   : 78.83167
Altitude (km)        : 0.722
Gaia source ID       : 4068712782541394560
2Mass ID (if available) : 17514957-2253501
ICRS Star Coord at Epoch: 17h 51m 49.57580s -22:53:50.13358s
RUWE (>1.4 is poor) : 0.75
K magnitude           : 6.808
G magnitude           : 11.962
RP magnitude         : 10.640
BP magnitude         : 14.019
DUPflag              : 0
Distance (au)        : 4.559
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -7.00
Sun-Target sep (deg) : 132.83
Sun-Moon sep (deg)   : 113.13
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.04
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation ("): 3.674
C/A sky separation (km): 12148.1
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
    
```

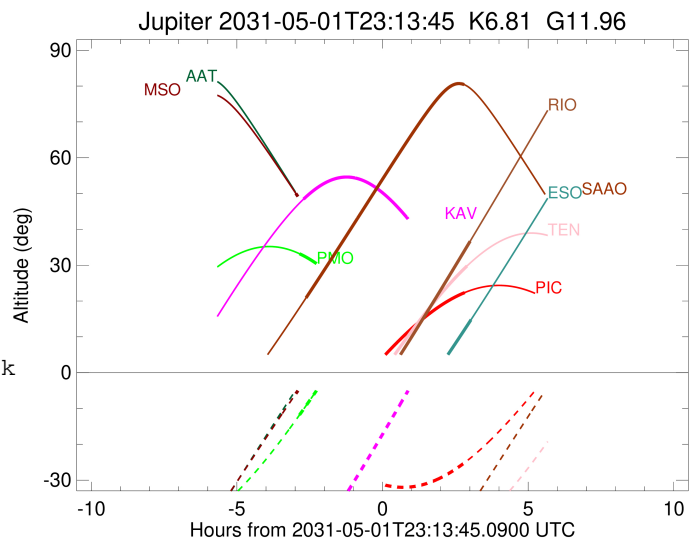
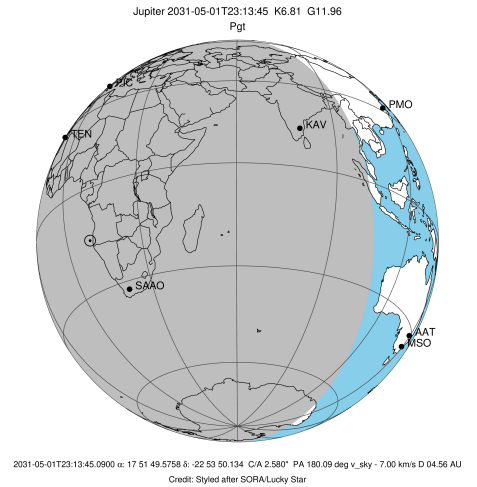


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-01T20:31:09.835	48.44	-51.27	71491.7	9.77	11.14
Jupiter	E	2031-05-02T01:48:53.409	23.58	19.21x	71491.8	8.90	10.15

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-01T23:27:11.860
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      : 4068712782541394560
2Mass ID (if available) : 17514957-2253501
ICRS Star Coord at Epoch: 17h 51m 49.57580s -22:53:50.13358s
RUWE (>1.4 is poor) : 0.75
K magnitude          : 6.808
G magnitude          : 11.962
RP magnitude         : 10.640
BP magnitude         : 14.019
DUPflag             : 0
Distance (au)       : 4.558
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -7.00
Sun-Target sep (deg) : 132.83
Sun-Moon sep (deg)  : 112.89
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.04
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation (") : 1.786
C/A sky separation (km) : 5904.8
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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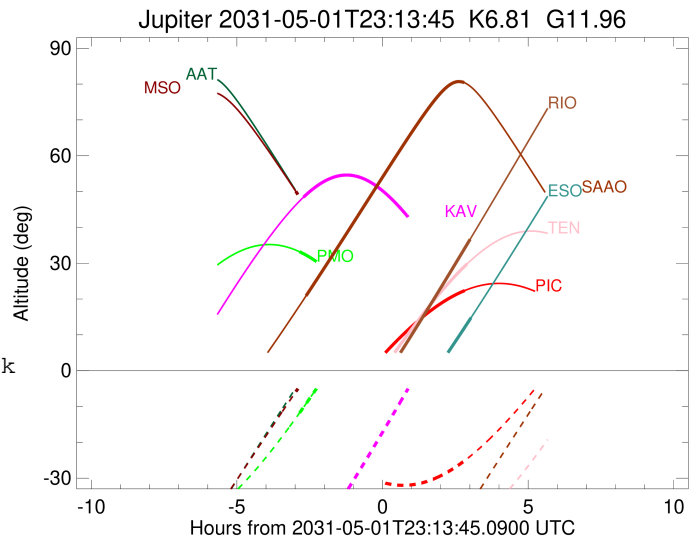
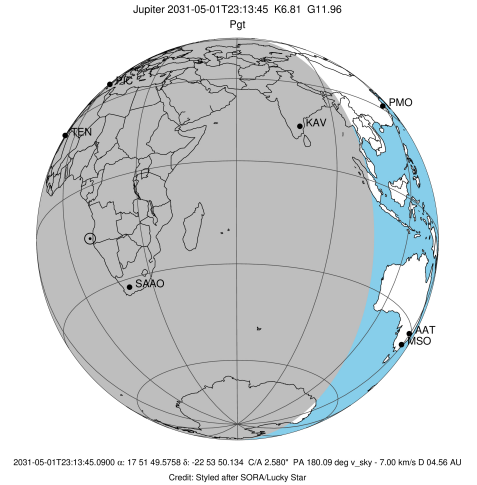


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-01T20:31:39.753	-32.56x	-1.75x	71492.0	3.61	4.13
Jupiter	E	2031-05-02T02:14:16.427	36.68	-78.74	71491.9	5.97	6.82

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-01T23:23:57.260
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        : 4068712782541394560
2Mass ID (if available) : 17514957-2253501
ICRS Star Coord at Epoch: 17h 51m 49.57580s -22:53:50.13358s
RUWE (>1.4 is poor) : 0.75
K magnitude           : 6.808
G magnitude           : 11.962
RP magnitude          : 10.640
BP magnitude          : 14.019
DUPflag              : 0
Distance (au)         : 4.558
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -7.00
Sun-Target sep (deg)  : 132.83
Sun-Moon sep (deg)    : 112.56
B (ring opening deg) : -2.61
PA of pole (deg)      : 0.04
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation (") : 1.322
C/A sky separation (km) : 4371.7
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
    
```

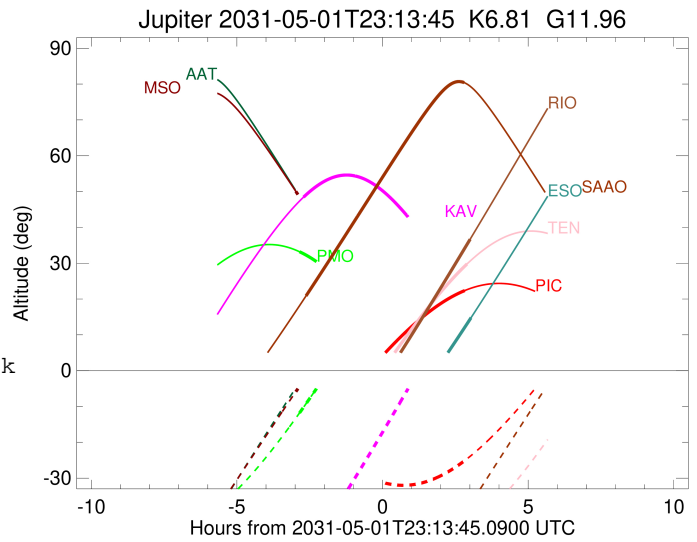
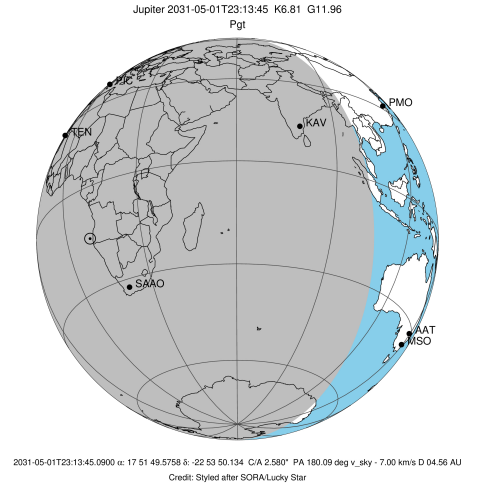


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-01T20:24:50.600	-37.61x	19.96x	71492.0	2.90	3.32
Jupiter	E	2031-05-02T02:15:56.694	14.74	-54.10	71491.9	4.67	5.34


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-01T23:21:22.250
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     : 4068712782541394560
2Mass ID (if available) : 17514957-2253501
ICRS Star Coord at Epoch: 17h 51m 49.57580s -22:53:50.13358s
RUWE (>1.4 is poor) : 0.75
K magnitude         : 6.808
G magnitude         : 11.962
RP magnitude        : 10.640
BP magnitude        : 14.019
DUPflag            : 0
Distance (au)      : 4.559
f0 (km)            : 0.00
g0 (km)            : 0.00
skyplane vel. (km/s) : -7.00
Sun-Target sep (deg) : 132.83
Sun-Moon sep (deg)  : 113.50
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.04
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation (") : 2.150
C/A sky separation (km) : 7108.5
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
    
```

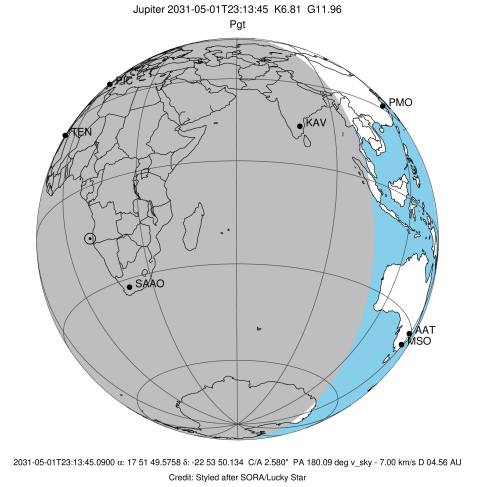


x: target alt < 5.0 deg or sun > -5.0 deg

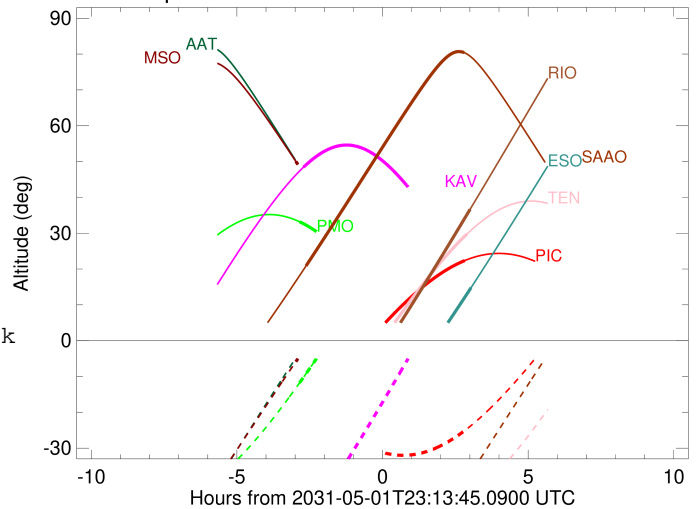
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-01T20:36:19.878	20.89	-58.36	71491.9	4.74	5.41
Jupiter	E	2031-05-02T02:01:51.156	80.40	-40.01	71491.9	5.99	6.84


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-01T23:01:39.750
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : MSO
Location              : Mt. Stromlo Observatory
Latitude (deg)        : -35.32000
E. Longitude (deg)    : 149.00833
Altitude (km)         : 0.770
Gaia source ID        : 4068712782541394560
2Mass ID (if available) : 17514957-2253501
ICRS Star Coord at Epoch: 17h 51m 49.57580s -22:53:50.13358s
RUWE (>1.4 is poor) : 0.75
K magnitude           : 6.808
G magnitude           : 11.962
RP magnitude          : 10.640
BP magnitude          : 14.019
DUPflag              : 0
Distance (au)         : 4.559
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -7.00
Sun-Target sep (deg) : 132.83
Sun-Moon sep (deg)   : 112.53
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.04
Pole direction: RA (deg): 268.05696
Dec (deg): 64.49651
C/A sky separation (") : 1.614
C/A sky separation (km) : 5335.5
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
    
```



Jupiter 2031-05-01T23:13:45 K6.81 G11.96



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	2031-05-01T20:15:09.759	50.04	-5.89	71491.9	5.38	6.14
Jupiter	E	2031-05-02T01:53:31.843	-14.34x	39.55x	71492.0	3.08	3.52