

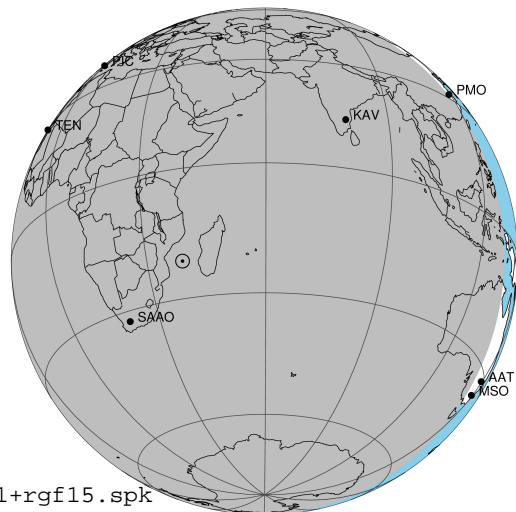
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2031-05-28T21:20:01.330  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4116925199182861696  
 2Mass ID (if available) : 17414977-2252347

Jupiter 2031-05-28T21:20:01 K8.86 G14.45 Pgt

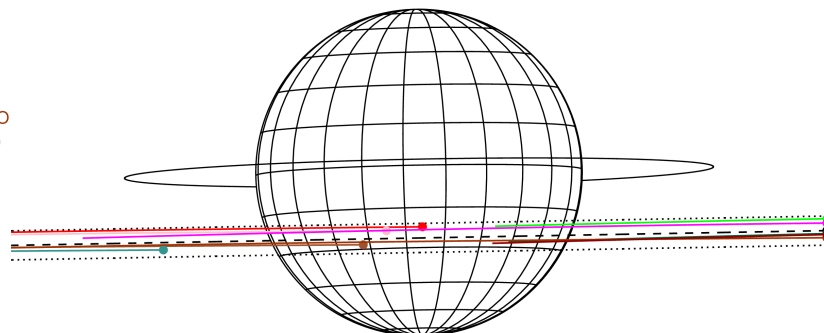
ICRS Star Coord at Epoch: 17h 41m 49.76469s -22:52:34.97183s

RUWE (>1.4 is poor) : 0.94  
 K magnitude : 8.861  
 G magnitude : 14.448  
 RP magnitude : 13.034  
 BP magnitude : 16.943  
 DUPflag : 0  
 Distance (au) : 4.317  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -14.86  
 Sun-Target sep (deg) : 161.11  
 Sun-Moon sep (deg) : 115.46  
 B (ring opening deg) : -2.60  
 PA of pole (deg) : 1.12  
 Pole direction: RA (deg): 268.05693  
 Dec (deg): 64.49651  
 C/A sky separation (") : 9.160  
 C/A sky separation (km) : 28682.4  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2031-05-28T21:20:01 K8.86 G14.45  
 Pgt



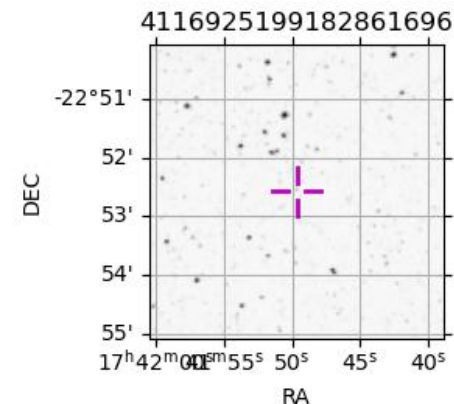
Earth  
 PIC  
 PMO  
 TEN  
 KAV  
 RIO  
 ESO  
 AAT  
 SAAO  
 MSO



2031-05-28T21:20:01.3300 a: 17 41 49.7647 δ: -22 52 34.972 C/A 9.172" PA 1.04 deg v\_sky -14.87 km/s D 04.32 AU  
 Credit: Styled after SORA/Lucky Star

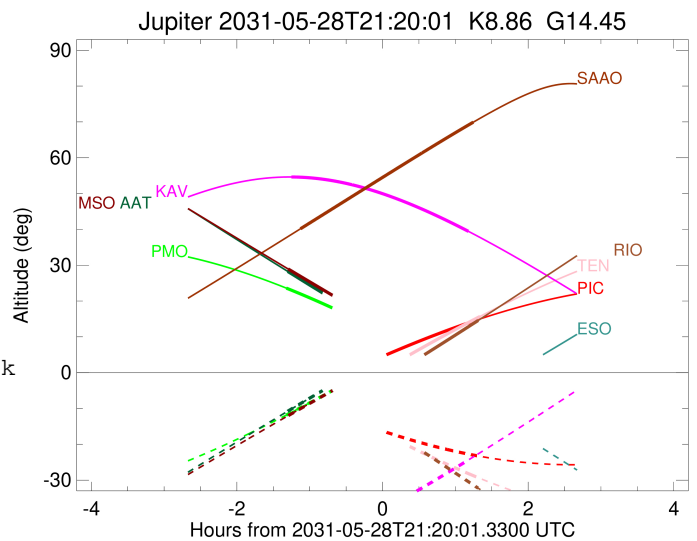
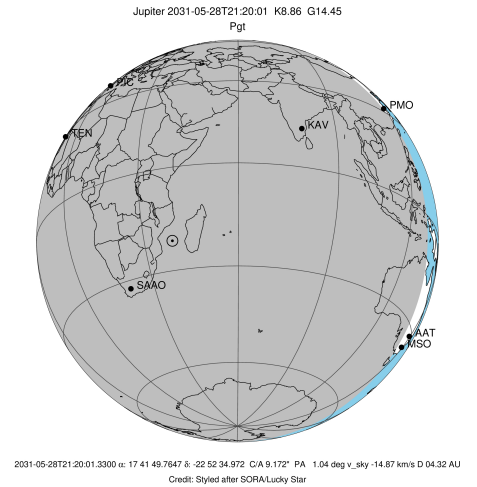
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	MAY 28 22:39 - MAY 28 22:39	Pne
PAL	Palomar Mt (200")	33.4	243.1			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+	MAY 28 20:00 - MAY 28 20:00	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 28 22:40 - MAY 28 22:40	Pne
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+ +	MAY 28 20:04 - MAY 28 22:30	Pie
RIO	Rio de Janeiro	-22.9	316.8	+	MAY 28 22:38 - MAY 28 22:38	Pne
ESO	European Southern Obs. (3.6m)	-29.3	289.3			Pnn
AAT	Siding Spring (AAT)	-31.3	149.1	+	MAY 28 20:01 - MAY 28 20:01	Pin
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	MAY 28 20:12 - MAY 28 22:34	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	MAY 28 20:02 - MAY 28 20:02	Pin



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-28T21:24:46.520
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       : 4116925199182861696
2Mass ID (if available) : 17414977-2252347
ICRS Star Coord at Epoch: 17h 41m 49.76469s -22:52:34.97183s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 8.861
G magnitude           : 14.448
RP magnitude         : 13.034
BP magnitude         : 16.943
DUPflag              : 0
Distance (au)        : 4.317
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.86
Sun-Target sep (deg) : 161.11
Sun-Moon sep (deg)   : 115.76
B (ring opening deg) : -2.60
PA of pole (deg)     : 1.12
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 7.602
C/A sky separation (km) : 23804.3
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
    
```

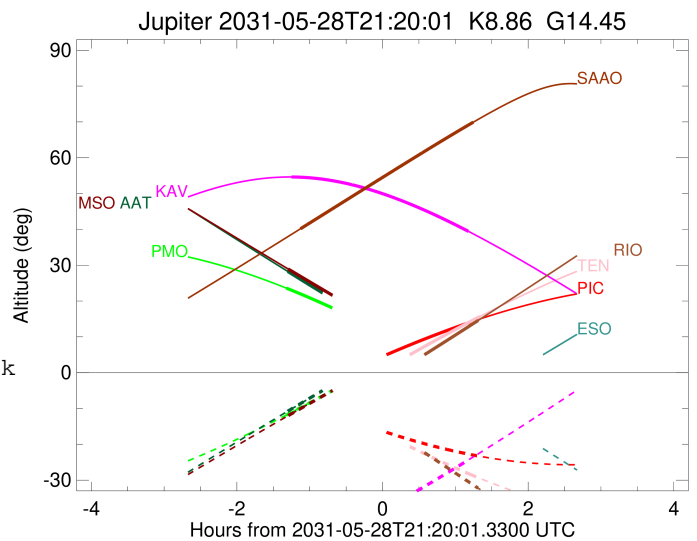
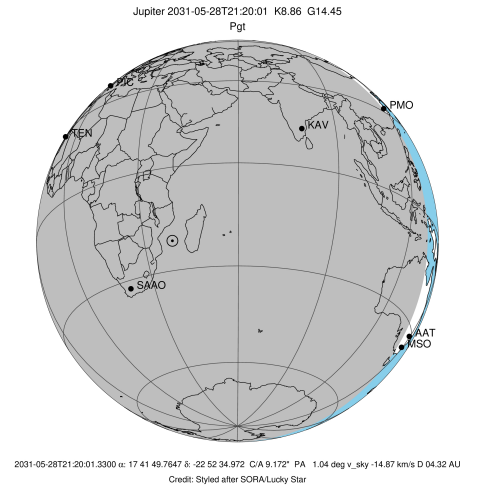


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-28T20:09:49.996	-6.53x	-7.22	71490.9	-19.99	-22.56
Jupiter	E	2031-05-28T22:39:12.067	14.87	-23.27	71491.0	-18.96	-21.42

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-28T21:14:43.810
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        : 4116925199182861696
2Mass ID (if available) : 17414977-2252347
ICRS Star Coord at Epoch: 17h 41m 49.76469s -22:52:34.97183s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 8.861
G magnitude           : 14.448
RP magnitude          : 13.034
BP magnitude          : 16.943
DUPflag              : 0
Distance (au)         : 4.317
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.86
Sun-Target sep (deg)  : 161.11
Sun-Moon sep (deg)    : 115.32
B (ring opening deg) : -2.60
PA of pole (deg)     : 1.12
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 7.790
C/A sky separation (km) : 24392.7
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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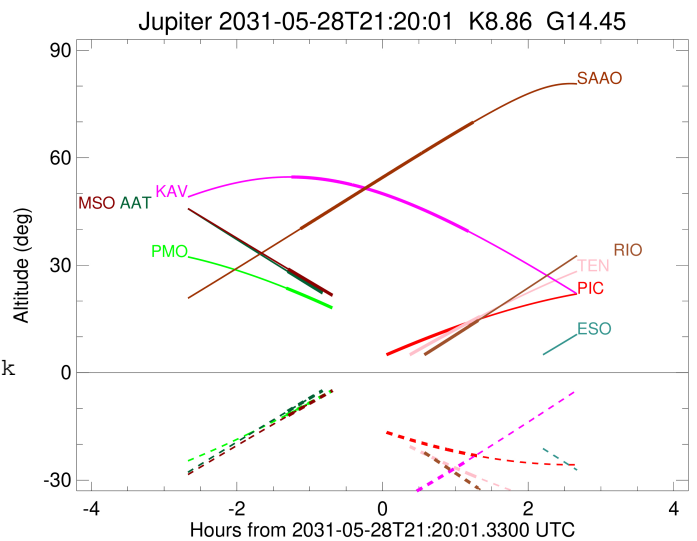
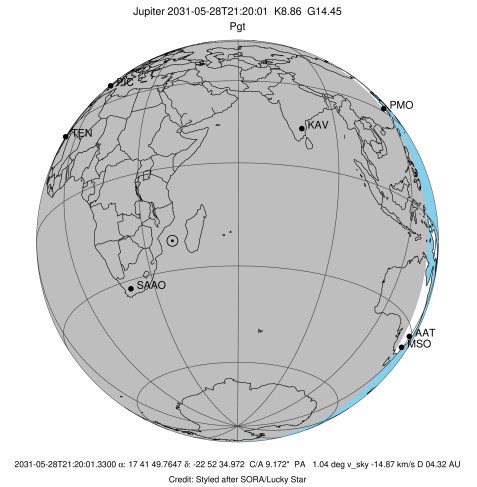


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-28T20:00:41.886	23.61	-11.84	71491.0	-19.59	-22.13
Jupiter	E	2031-05-28T22:29:15.359	-1.30x	16.70x	71490.9	-20.37	-22.99

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-28T21:26:26.990
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       : 4116925199182861696
2Mass ID (if available) : 17414977-2252347
ICRS Star Coord at Epoch: 17h 41m 49.76469s -22:52:34.97183s
RUWE (>1.4 is poor) : 0.94
K magnitude          : 8.861
G magnitude          : 14.448
RP magnitude         : 13.034
BP magnitude         : 16.943
DUPflag             : 0
Distance (au)        : 4.317
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.86
Sun-Target sep (deg) : 161.11
Sun-Moon sep (deg)   : 115.80
B (ring opening deg) : -2.60
PA of pole (deg)     : 1.12
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation ("): 8.116
C/A sky separation (km): 25413.6
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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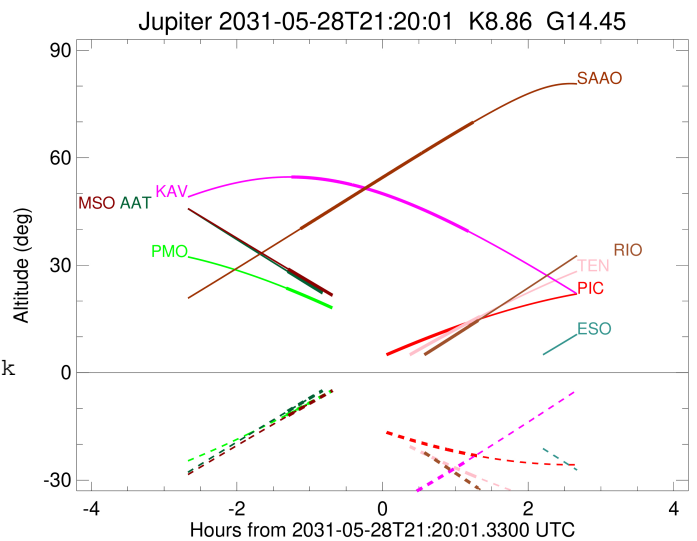
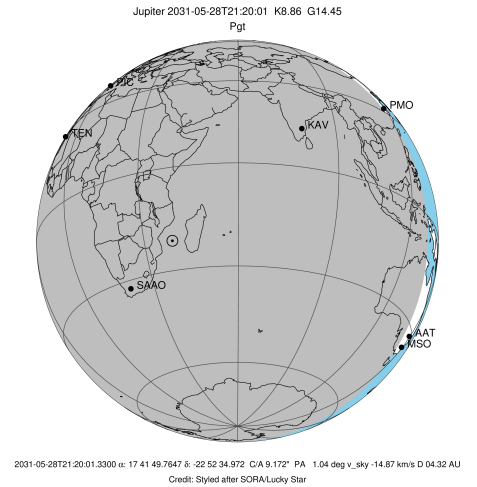


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-28T20:11:43.758	-13.33x	-3.91x	71490.8	-21.49	-24.21
Jupiter	E	2031-05-28T22:40:29.136	15.70	-29.53	71490.9	-20.16	-22.75

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-28T21:17:46.050
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      : 4116925199182861696
2Mass ID (if available) : 17414977-2252347
ICRS Star Coord at Epoch: 17h 41m 49.76469s -22:52:34.97183s
RUWE (>1.4 is poor) : 0.94
K magnitude          : 8.861
G magnitude          : 14.448
RP magnitude         : 13.034
BP magnitude         : 16.943
DUPflag             : 0
Distance (au)       : 4.317
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.86
Sun-Target sep (deg) : 161.11
Sun-Moon sep (deg)  : 115.95
B (ring opening deg) : -2.60
PA of pole (deg)    : 1.12
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation ("): 8.012
C/A sky separation (km) : 25086.7
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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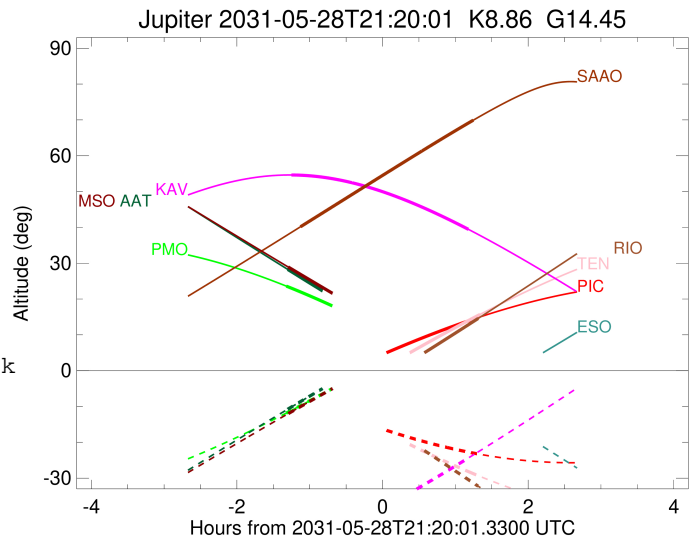
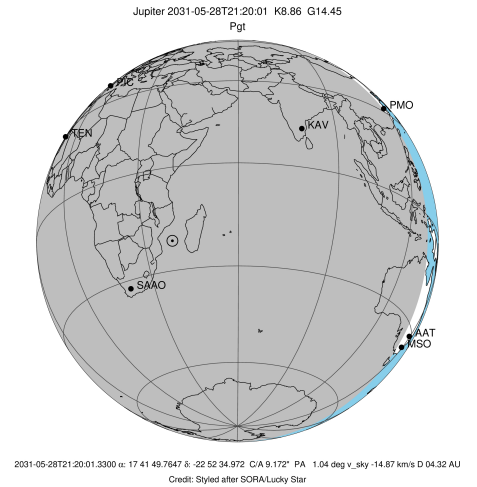


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-28T20:04:55.627	54.62	-50.36	71490.9	-20.52	-23.15
Jupiter	E	2031-05-28T22:30:47.140	39.45	-24.37	71490.8	-20.72	-23.37

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-28T21:26:49.750
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       : 4116925199182861696
2Mass ID (if available) : 17414977-2252347
ICRS Star Coord at Epoch: 17h 41m 49.76469s -22:52:34.97183s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 8.861
G magnitude           : 14.448
RP magnitude          : 13.034
BP magnitude          : 16.943
DUPflag              : 0
Distance (au)        : 4.317
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.86
Sun-Target sep (deg) : 161.11
Sun-Moon sep (deg)   : 115.80
B (ring opening deg) : -2.60
PA of pole (deg)     : 1.12
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 10.055
C/A sky separation (km) : 31485.9
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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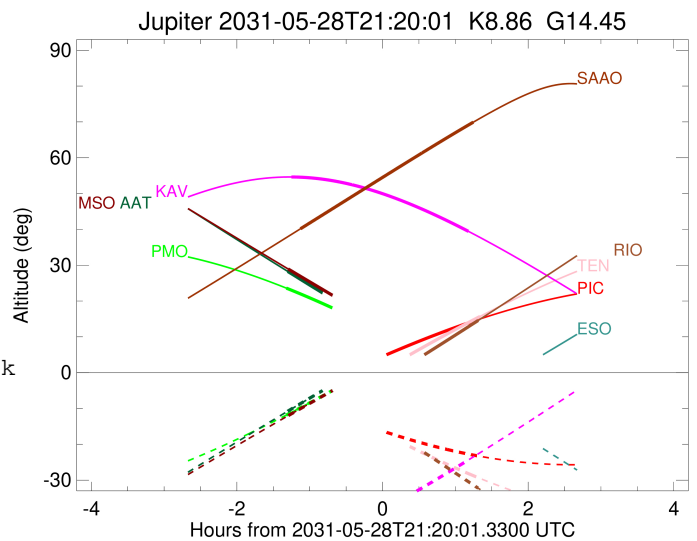
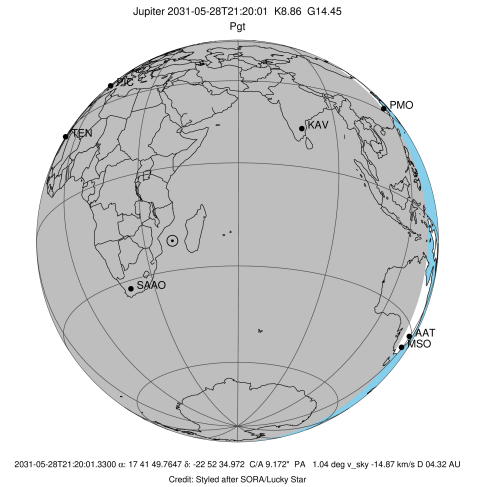


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-28T20:14:05.957	-15.51x	-0.42x	71490.1	-26.78	-29.94
Jupiter	E	2031-05-28T22:38:51.619	14.58	-32.24	71490.3	-25.38	-28.44

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-28T21:13:29.600
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : AAT
Location              : Siding Spring (AAT)
Latitude (deg)        : -31.27703
E. Longitude (deg)    : 149.06608
Altitude (km)         : 1.164
Gaia source ID        : 4116925199182861696
2Mass ID (if available) : 17414977-2252347
ICRS Star Coord at Epoch: 17h 41m 49.76469s -22:52:34.97183s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 8.861
G magnitude           : 14.448
RP magnitude          : 13.034
BP magnitude          : 16.943
DUPflag              : 0
Distance (au)         : 4.317
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.86
Sun-Target sep (deg)  : 161.11
Sun-Moon sep (deg)    : 115.31
B (ring opening deg) : -2.60
PA of pole (deg)      : 1.12
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 10.076
C/A sky separation (km) : 31552.5
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
    
```

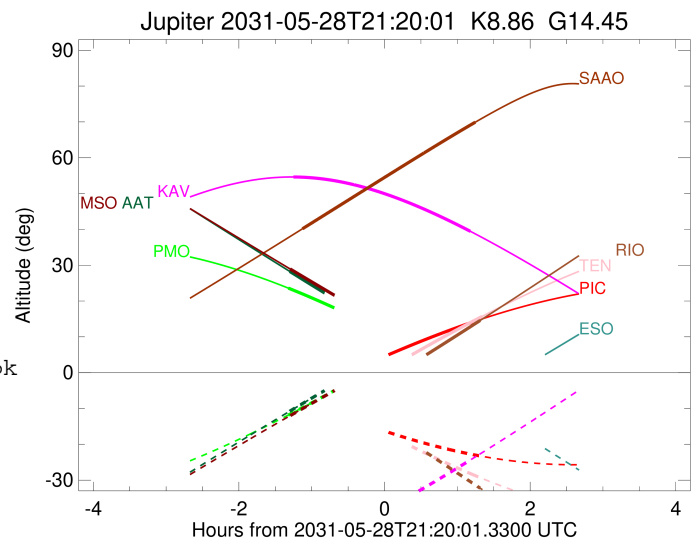
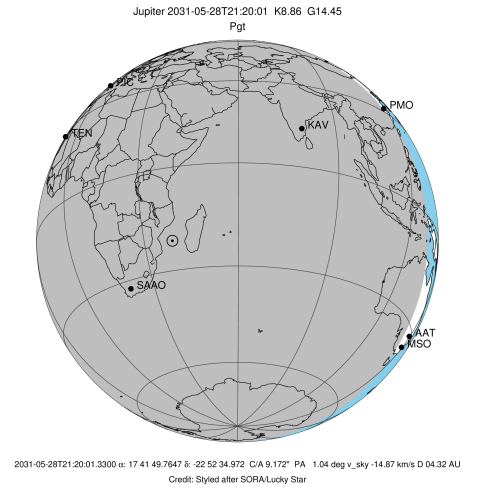


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-28T20:01:56.635	28.26	-10.75	71490.3	-25.67	-28.75
Jupiter	E	2031-05-28T22:25:36.819	-0.80x	16.25x	71490.1	-26.67	-29.83

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-28T21:23:55.980
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      : 4116925199182861696
2Mass ID (if available) : 17414977-2252347
ICRS Star Coord at Epoch: 17h 41m 49.76469s -22:52:34.97183s
RUWE (>1.4 is poor) : 0.94
K magnitude          : 8.861
G magnitude          : 14.448
RP magnitude         : 13.034
BP magnitude         : 16.943
DUPflag             : 0
Distance (au)        : 4.317
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.86
Sun-Target sep (deg) : 161.11
Sun-Moon sep (deg)   : 116.35
B (ring opening deg) : -2.60
PA of pole (deg)     : 1.12
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation ("): 9.647
C/A sky separation (km): 30206.5
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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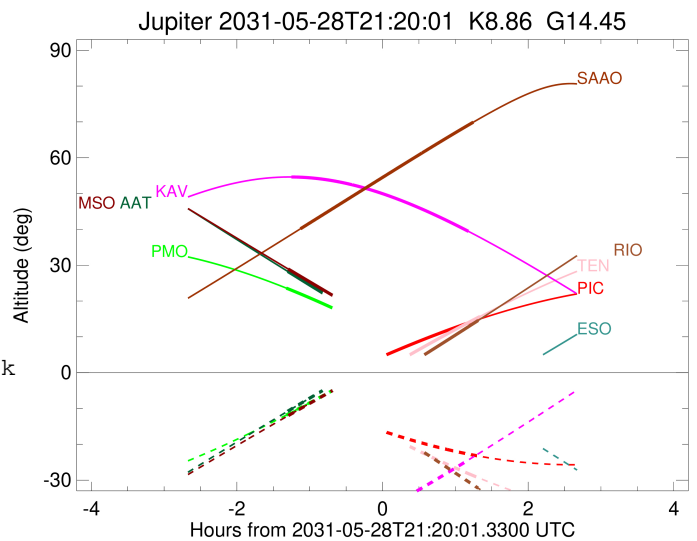
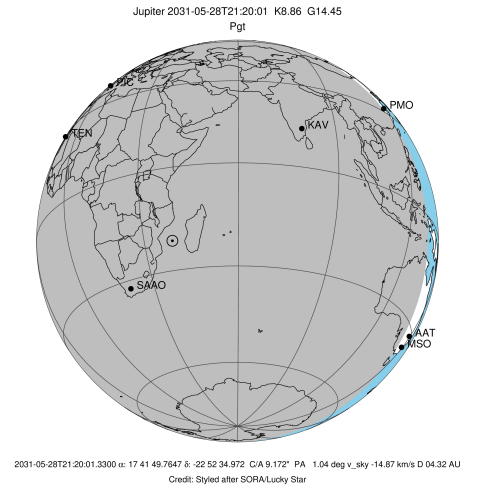
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-28T20:12:35.144	40.19	-56.86	71490.3	-25.49	-28.55
Jupiter	E	2031-05-28T22:34:53.120	69.92	-79.34	71490.4	-24.59	-27.58



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-28T21:13:46.570
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       : 4116925199182861696
2Mass ID (if available) : 17414977-2252347
ICRS Star Coord at Epoch: 17h 41m 49.76469s -22:52:34.97183s
RUWE (>1.4 is poor) : 0.94
K magnitude           : 8.861
G magnitude           : 14.448
RP magnitude          : 13.034
BP magnitude          : 16.943
DUPflag              : 0
Distance (au)        : 4.317
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.86
Sun-Target sep (deg) : 161.11
Sun-Moon sep (deg)   : 115.35
B (ring opening deg) : -2.60
PA of pole (deg)     : 1.12
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation ("): 10.189
C/A sky separation (km): 31905.3
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	2031-05-28T20:02:24.177	28.91	-11.98	71490.2	-26.01	-29.12
Jupiter	E	2031-05-28T22:25:41.416	1.09x	13.69x	71490.1	-26.96	-30.14