

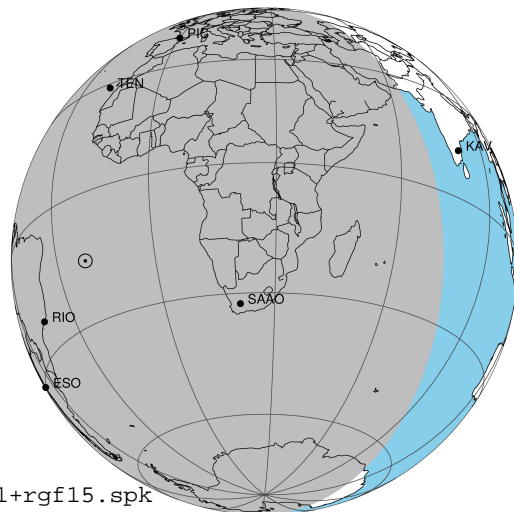
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2031-05-04T01:17:02.360  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4068713474149412096  
 2Mass ID (if available) : 17512030-2254095

Jupiter 2031-05-04T01:17:02 K9.39 G14.83 Pgt

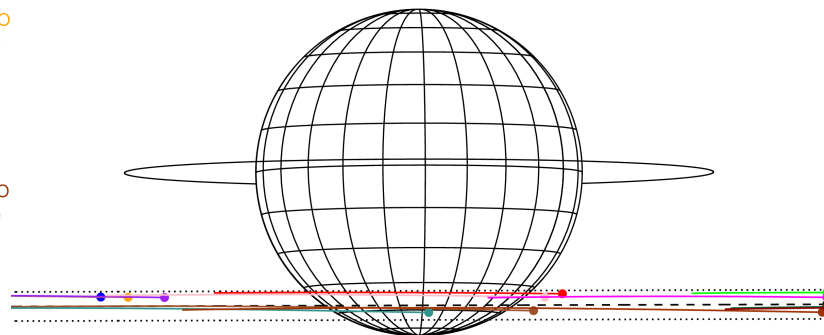
ICRS Star Coord at Epoch: 17h 51m 20.31024s -22:54:09.51858s

RUWE (>1.4 is poor) : 0.91  
 K magnitude : 9.389  
 G magnitude : 14.832  
 RP magnitude : 13.484  
 BP magnitude : 16.995  
 DUPflag : 0  
 Distance (au) : 4.534  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -7.79  
 Sun-Target sep (deg) : 134.97  
 Sun-Moon sep (deg) : 85.45  
 B (ring opening deg) : -2.60  
 PA of pole (deg) : 0.10  
 Pole direction: RA (deg): 268.05695  
 Dec (deg): 64.49651  
 C/A sky separation (") : 17.704  
 C/A sky separation (km) : 58217.0  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2031-05-04T01:17:02 K9.39 G14.83  
 Pgt



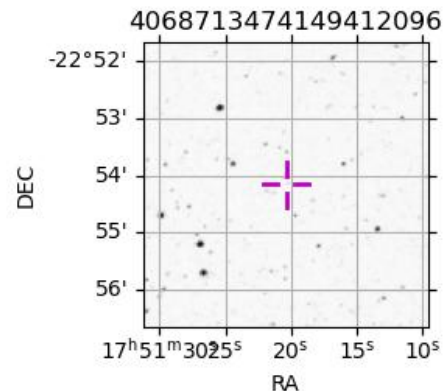
Earth  
 PIC  
 PAL  
 PMO  
 KPNO  
 MCD  
 TEN  
 KAV  
 RIO  
 ESO  
 AAT  
 SAO  
 MSO



2031-05-04T01:17:02.3600 az: 17 51 20.3102 d: -22 54 09.519 C/A \*\*\*\*\* PA 0.15 deg v\_sky - 7.79 km/s D 04.53 AU  
 Credit: Styled after SORA/Lucky Star

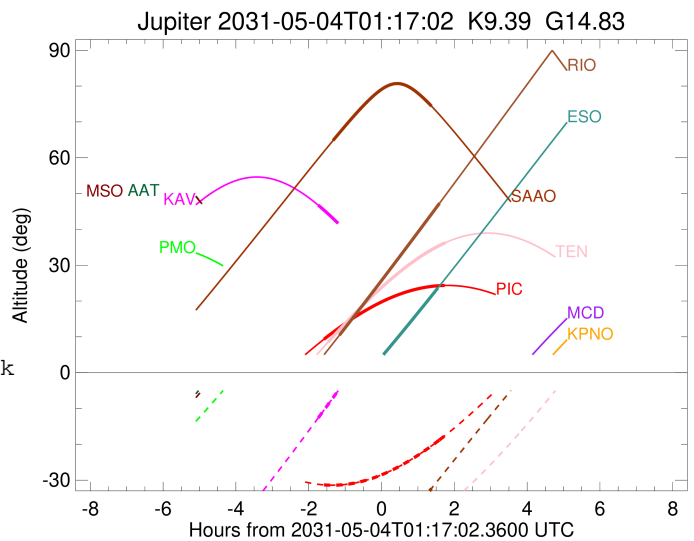
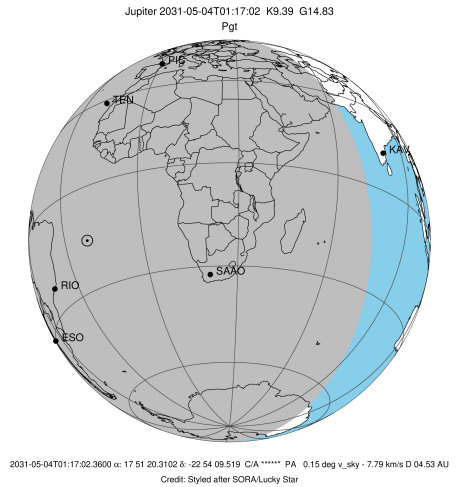
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+ +	MAY 03 23:42 - MAY 04 03:01	Pie
PAL	Palomar Mt (200")	33.4	243.1			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
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 03 23:49 - MAY 04 03:02	Pie
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+	MAY 03 23:32 - MAY 03 23:32	Pin
RIO	Rio de Janeiro	-22.9	316.8	+ +	MAY 04 00:07 - MAY 04 02:52	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	MAY 04 02:49 - MAY 04 02:49	Pne
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	MAY 03 23:57 - MAY 04 02:39	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-04T01:22:12.020
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        : 4068713474149412096
2Mass ID (if available) : 17512030-2254095
ICRS Star Coord at Epoch: 17h 51m 20.31024s -22:54:09.51858s
RUWE (>1.4 is poor)  : 0.91
K magnitude           : 9.389
G magnitude           : 14.832
RP magnitude          : 13.484
BP magnitude          : 16.995
DUPflag              : 0
Distance (au)         : 4.534
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -7.79
Sun-Target sep (deg)  : 134.97
Sun-Moon sep (deg)    : 85.76
B (ring opening deg)  : -2.60
PA of pole (deg)      : 0.10
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 15.994
C/A sky separation (km) : 52594.9
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
    
```

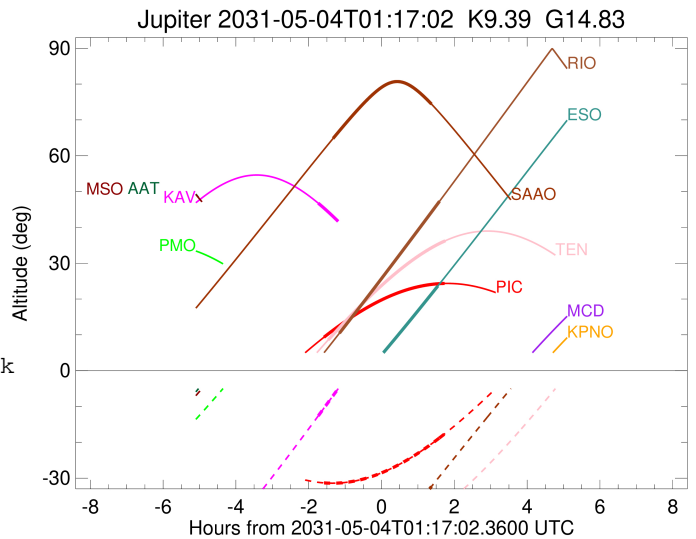
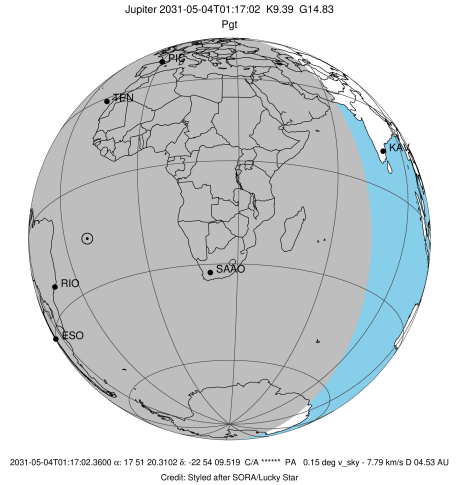


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-03T23:42:13.753	9.33	-31.32	71486.9	-47.83	-51.48
Jupiter	E	2031-05-04T03:01:03.072	24.34	-17.65	71487.0	-47.15	-50.81

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-04T01:26:29.360
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      : 4068713474149412096
2Mass ID (if available) : 17512030-2254095
ICRS Star Coord at Epoch: 17h 51m 20.31024s -22:54:09.51858s
RUWE (>1.4 is poor) : 0.91
K magnitude          : 9.389
G magnitude           : 14.832
RP magnitude         : 13.484
BP magnitude         : 16.995
DUPflag             : 0
Distance (au)        : 4.534
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -7.79
Sun-Target sep (deg) : 134.97
Sun-Moon sep (deg)   : 85.80
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.10
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation ("): 16.364
C/A sky separation (km): 53809.1
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
    
```

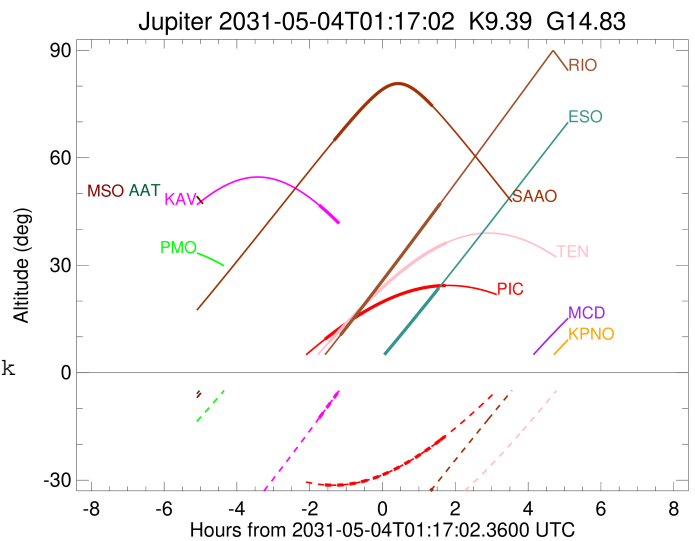
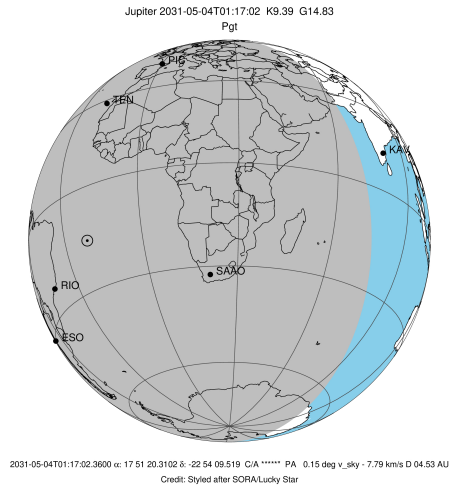


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-03T23:49:02.726	8.55	-42.53	71486.6	-49.61	-53.21
Jupiter	E	2031-05-04T03:02:14.151	36.27	-37.35	71486.8	-48.27	-51.91

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-04T01:05:06.530
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      : 4068713474149412096
2Mass ID (if available) : 17512030-2254095
ICRS Star Coord at Epoch: 17h 51m 20.31024s -22:54:09.51858s
RUWE (>1.4 is poor) : 0.91
K magnitude          : 9.389
G magnitude          : 14.832
RP magnitude         : 13.484
BP magnitude         : 16.995
DUPflag             : 0
Distance (au)       : 4.534
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -7.79
Sun-Target sep (deg) : 134.97
Sun-Moon sep (deg)  : 85.96
B (ring opening deg) : -2.60
PA of pole (deg)    : 0.10
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (" ) : 16.832
C/A sky separation (km) : 55351.8
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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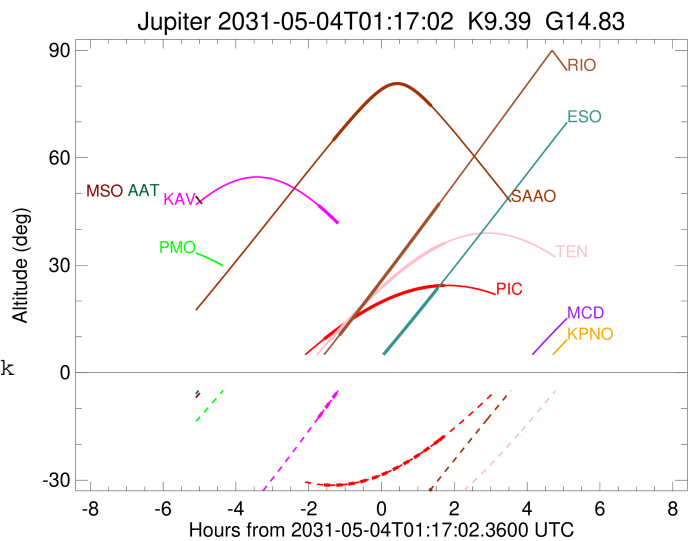
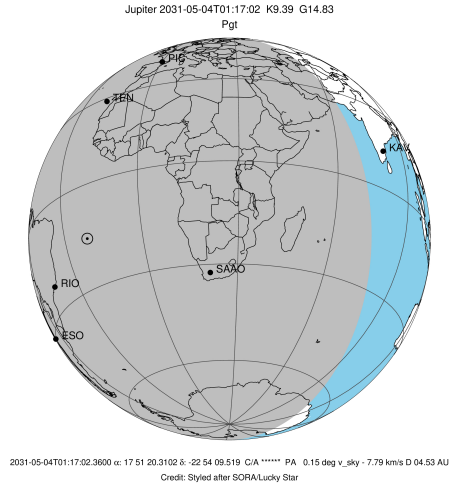


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-03T23:32:50.156	46.74	-12.61	71486.6	-49.87	-53.46
Jupiter	E	2031-05-04T02:38:46.233	11.15	31.26x	71486.3	-51.81	-55.33

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-04T01:31:04.430
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       : 4068713474149412096
2Mass ID (if available) : 17512030-2254095
ICRS Star Coord at Epoch: 17h 51m 20.31024s -22:54:09.51858s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 9.389
G magnitude           : 14.832
RP magnitude          : 13.484
BP magnitude          : 16.995
DUPflag              : 0
Distance (au)        : 4.534
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -7.79
Sun-Target sep (deg) : 134.97
Sun-Moon sep (deg)   : 85.81
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.10
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 18.125
C/A sky separation (km) : 59602.1
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
    
```

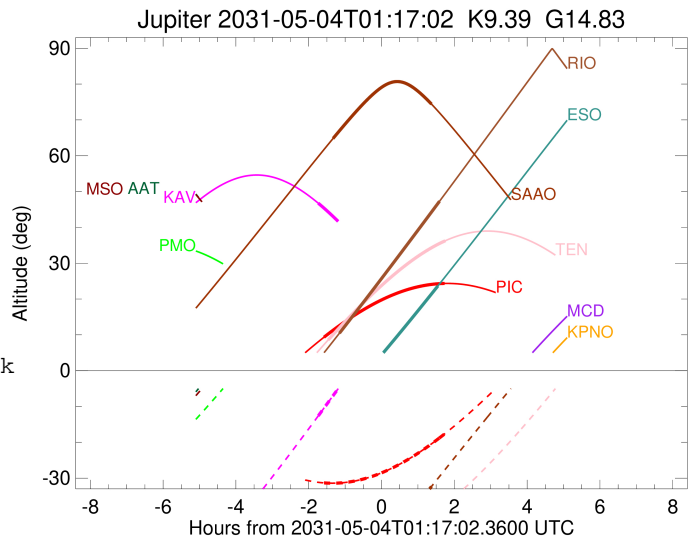
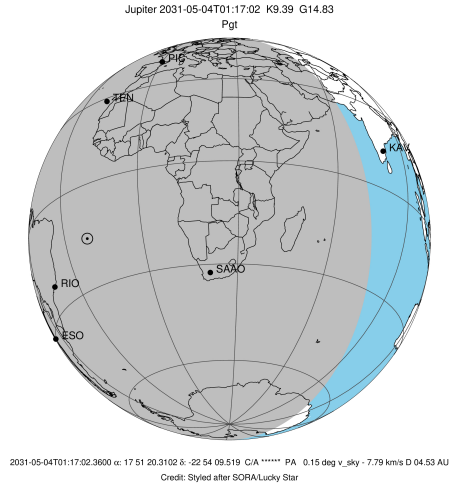


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-04T00:07:44.267	10.46	-51.27	71485.4	-57.52	-60.74
Jupiter	E	2031-05-04T02:52:39.147	47.28	-83.09	71485.7	-55.47	-58.81

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-04T01:31:35.070
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      : 4068713474149412096
2Mass ID (if available) : 17512030-2254095
ICRS Star Coord at Epoch: 17h 51m 20.31024s -22:54:09.51858s
RUWE (>1.4 is poor) : 0.91
K magnitude          : 9.389
G magnitude          : 14.832
RP magnitude         : 13.484
BP magnitude         : 16.995
DUPflag             : 0
Distance (au)       : 4.534
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -7.79
Sun-Target sep (deg) : 134.97
Sun-Moon sep (deg)  : 85.46
B (ring opening deg) : -2.60
PA of pole (deg)    : 0.10
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation ("): 18.626
C/A sky separation (km): 61247.6
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
    
```

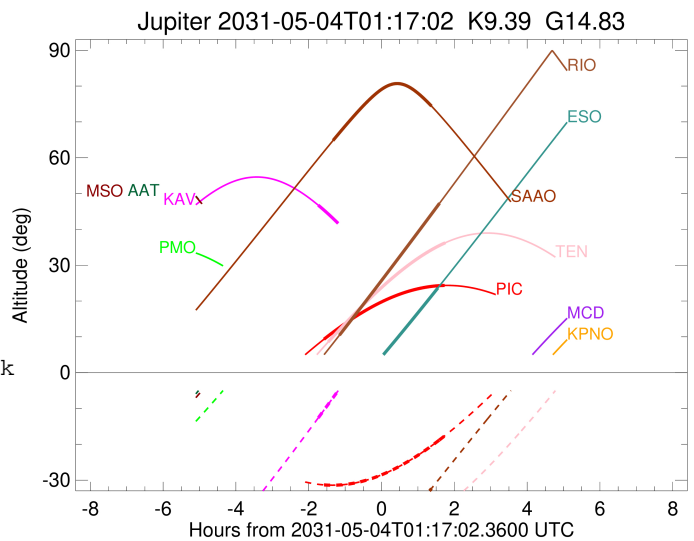
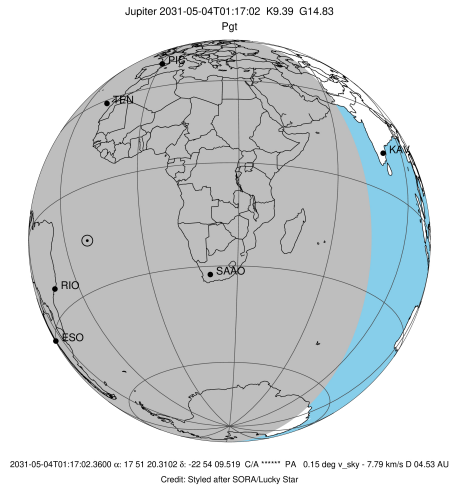


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-04T00:11:34.822	-8.27x	-27.42	71485.0	-59.94	-63.00
Jupiter	E	2031-05-04T02:49:52.122	23.63	-61.49	71485.4	-57.78	-60.99

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-04T01:18:31.240
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        : 4068713474149412096
2Mass ID (if available) : 17512030-2254095
ICRS Star Coord at Epoch: 17h 51m 20.31024s -22:54:09.51858s
RUWE (>1.4 is poor) : 0.91
K magnitude           : 9.389
G magnitude           : 14.832
RP magnitude          : 13.484
BP magnitude          : 16.995
DUPflag              : 0
Distance (au)         : 4.534
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -7.79
Sun-Target sep (deg)  : 134.97
Sun-Moon sep (deg)    : 86.39
B (ring opening deg) : -2.60
PA of pole (deg)      : 0.10
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 18.021
C/A sky separation (km) : 59258.5
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	2031-05-03T23:57:12.908	64.81	-64.96	71485.6	-56.15	-59.45
Jupiter	E	2031-05-04T02:39:28.610	74.39	-32.32	71485.6	-56.04	-59.35