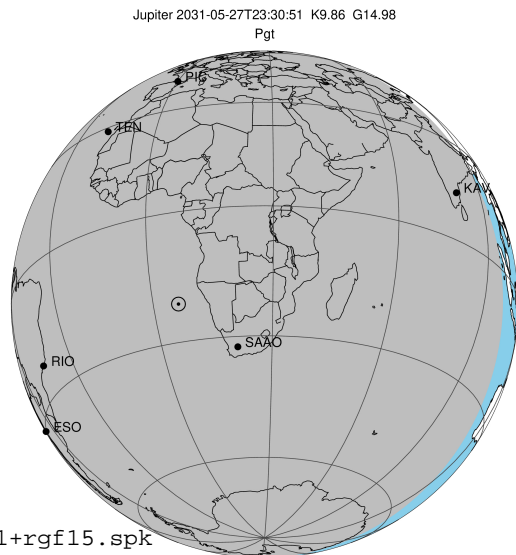


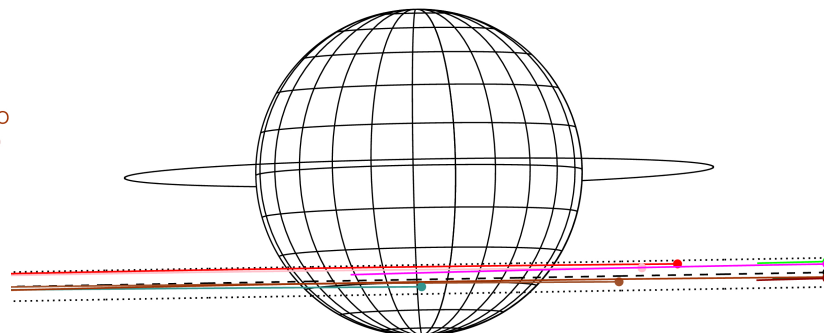
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2031-05-27T23:30:51.120  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4116878817924529792  
 2Mass ID (if available) : 17421657-2252470

Jupiter 2031-05-27T23:30:51 K9.86 G14.98 Pgt

ICRS Star Coord at Epoch: 17h 42m 16.56887s -22:52:47.36251s  
 RUWE (>1.4 is poor) : 1.29  
 K magnitude : 9.858  
 G magnitude : 14.981  
 RP magnitude : 13.678  
 BP magnitude : 16.826  
 DUPflag : 0  
 Distance (au) : 4.323  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -14.70  
 Sun-Target sep (deg) : 160.13  
 Sun-Moon sep (deg) : 126.56  
 B (ring opening deg) : -2.60  
 PA of pole (deg) : 1.07  
 Pole direction: RA (deg): 268.05693  
 Dec (deg): 64.49651  
 C/A sky separation (") : 14.951  
 C/A sky separation (km) : 46873.3  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk



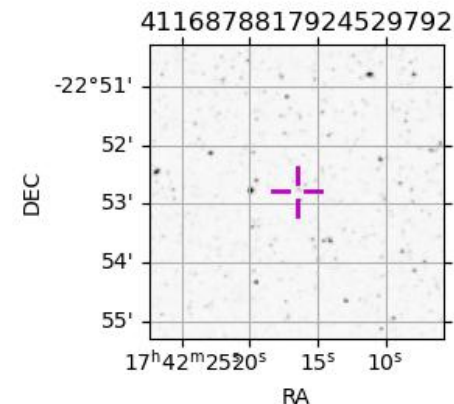
Earth  
 PIC  
 PMO  
 TEN  
 KAV  
 RIO  
 ESO  
 AAT  
 SAAO  
 MSO



2031-05-27T23:30:51.1200 α: 17 42 16.56889 δ: -22 52 47.363 C/A \*\*\*\*\* PA 1.00 deg v\_sky -14.70 km/s D 04.32 AU  
 Credit: Styled after SORA/Lucky Star

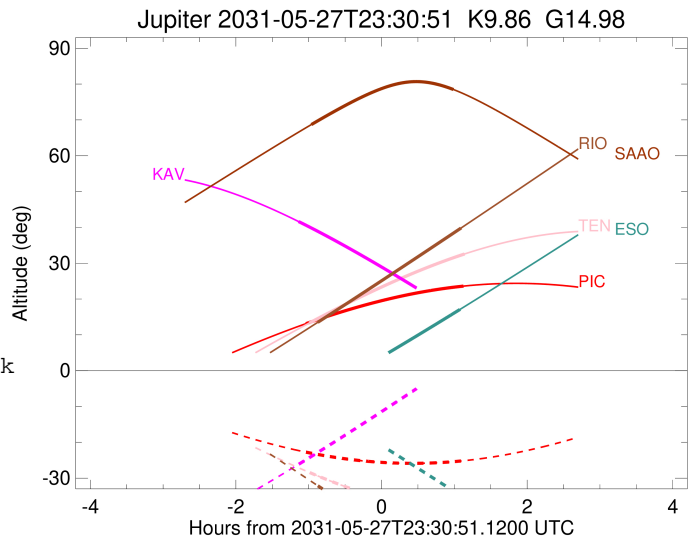
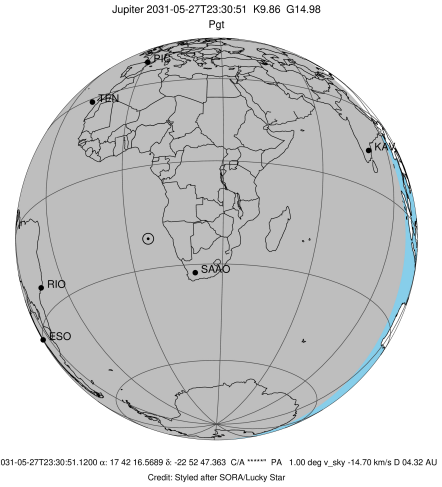
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+ +	MAY 27 22:28 - MAY 28 00:38	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 27 22:31 - MAY 28 00:39	Pie
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+	MAY 27 22:22 - MAY 27 22:22	Pin
RIO	Rio de Janeiro	-22.9	316.8	+ +	MAY 27 22:38 - MAY 28 00:36	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	MAY 28 00:35 - MAY 28 00:35	Pne
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	MAY 27 22:33 - MAY 28 00:30	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-27T23:33:34.050
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      : 4116878817924529792
2Mass ID (if available) : 17421657-2252470
ICRS Star Coord at Epoch: 17h 42m 16.56887s -22:52:47.36251s
RUWE (>1.4 is poor) : 1.29
K magnitude         : 9.858
G magnitude         : 14.981
RP magnitude        : 13.678
BP magnitude        : 16.826
DUPflag            : 0
Distance (au)       : 4.323
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -14.70
Sun-Target sep (deg) : 160.13
Sun-Moon sep (deg)  : 126.95
B (ring opening deg) : -2.60
PA of pole (deg)    : 1.07
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 13.174
C/A sky separation (km) : 41301.6
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
    
```

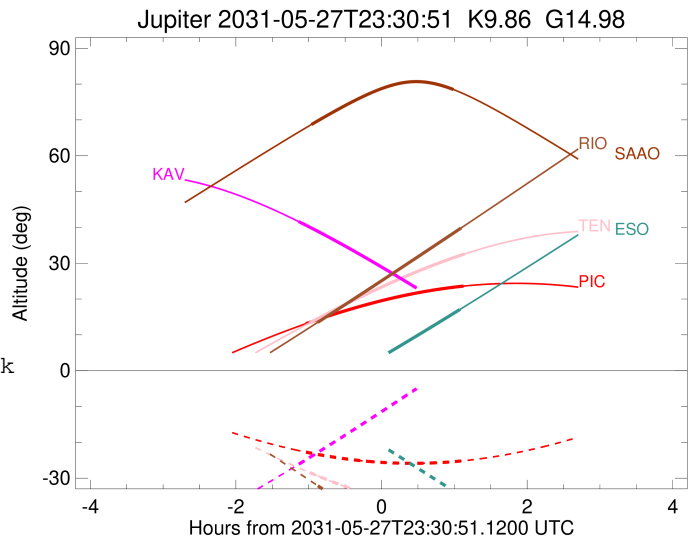
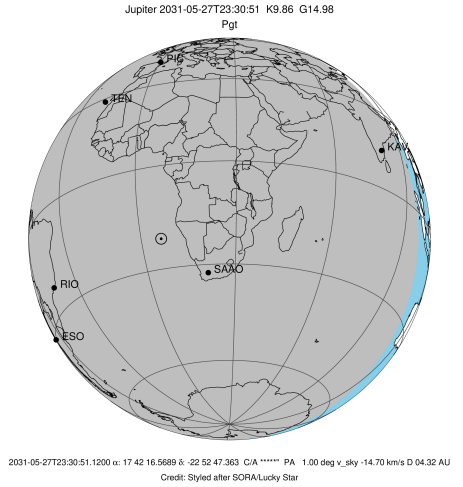


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-27T22:28:39.479	13.13	-22.74	71488.8	-35.63	-39.25
Jupiter	E	2031-05-28T00:38:14.943	23.59	-25.15	71488.9	-35.00	-38.59

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-27T23:35:39.540
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      : 4116878817924529792
2Mass ID (if available) : 17421657-2252470
ICRS Star Coord at Epoch: 17h 42m 16.56887s -22:52:47.36251s
RUWE (>1.4 is poor) : 1.29
K magnitude          : 9.858
G magnitude          : 14.981
RP magnitude         : 13.678
BP magnitude         : 16.826
DUPflag             : 0
Distance (au)       : 4.323
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.70
Sun-Target sep (deg) : 160.13
Sun-Moon sep (deg)  : 127.16
B (ring opening deg) : -2.60
PA of pole (deg)    : 1.07
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 13.578
C/A sky separation (km) : 42568.1
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
    
```

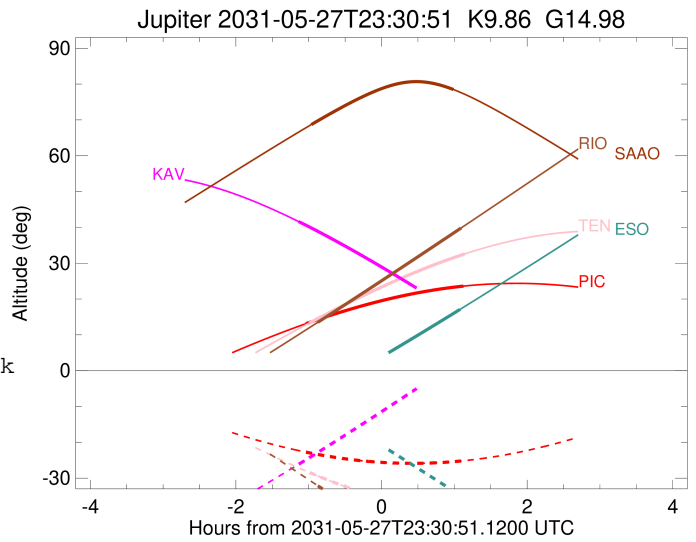
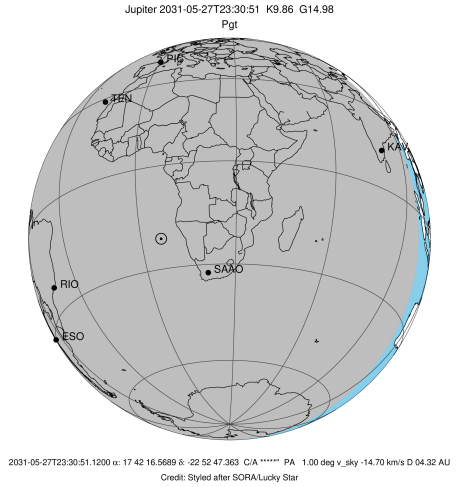


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-27T22:31:40.474	13.35	-28.44	71488.6	-37.06	-40.72
Jupiter	E	2031-05-28T00:39:16.258	32.57	-40.14	71488.8	-36.06	-39.69

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-27T23:25:06.370
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       : 4116878817924529792
2Mass ID (if available) : 17421657-2252470
ICRS Star Coord at Epoch: 17h 42m 16.56887s -22:52:47.36251s
RUWE (>1.4 is poor) : 1.29
K magnitude           : 9.858
G magnitude           : 14.981
RP magnitude         : 13.678
BP magnitude         : 16.826
DUPflag              : 0
Distance (au)        : 4.323
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.70
Sun-Target sep (deg) : 160.13
Sun-Moon sep (deg)   : 126.49
B (ring opening deg) : -2.60
PA of pole (deg)     : 1.07
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation ("): 14.022
C/A sky separation (km): 43960.8
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
    
```

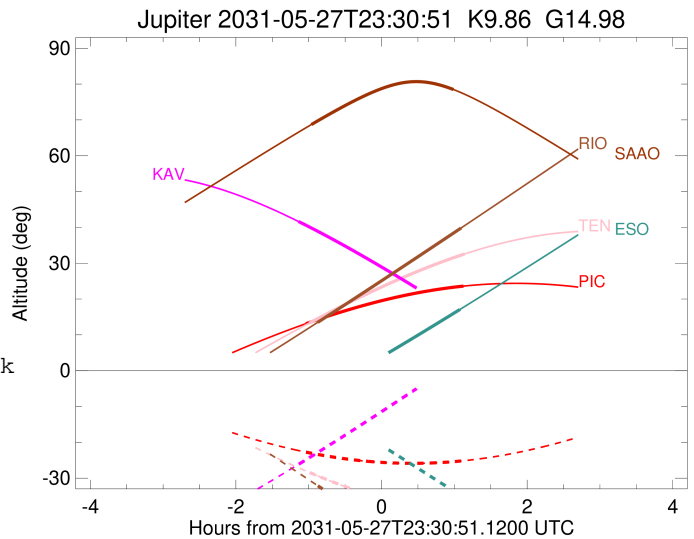
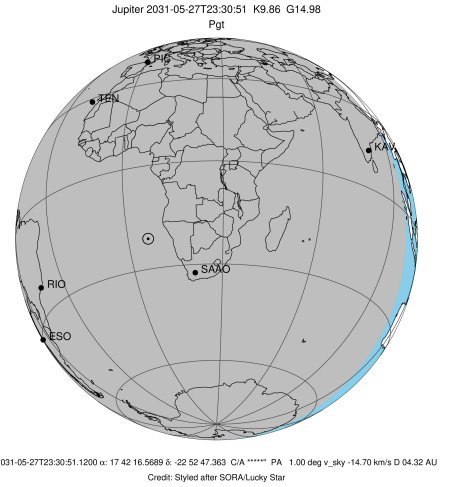


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-27T22:22:40.365	41.60	-26.11	71488.6	-37.55	-41.22
Jupiter	E	2031-05-28T00:27:54.499	17.10	1.34x	71488.4	-38.38	-42.07

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-27T23:37:39.480
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        : 4116878817924529792
2Mass ID (if available) : 17421657-2252470
ICRS Star Coord at Epoch: 17h 42m 16.56887s -22:52:47.36251s
RUWE (>1.4 is poor)  : 1.29
K magnitude           : 9.858
G magnitude           : 14.981
RP magnitude          : 13.678
BP magnitude          : 16.826
DUPflag              : 0
Distance (au)         : 4.323
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -14.70
Sun-Target sep (deg)  : 160.13
Sun-Moon sep (deg)    : 127.36
B (ring opening deg)  : -2.60
PA of pole (deg)      : 1.07
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 15.447
C/A sky separation (km) : 48425.3
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
    
```

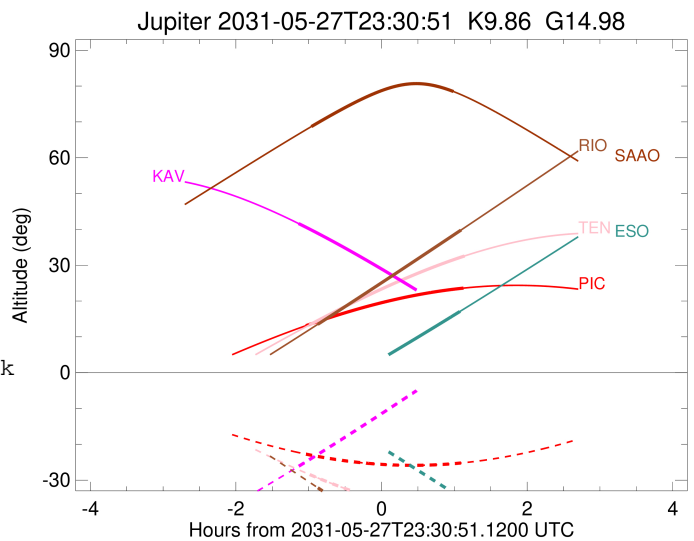
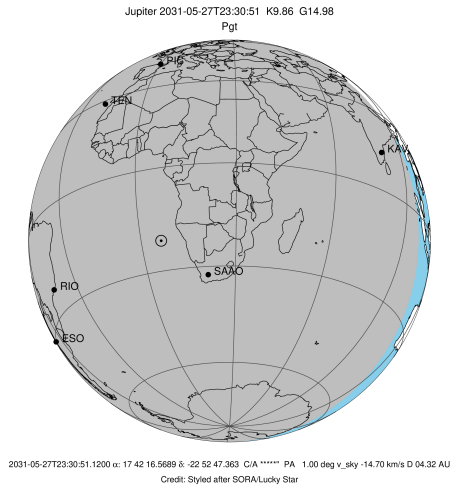


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-27T22:38:25.333	13.52	-32.13	71487.6	-43.29	-47.01
Jupiter	E	2031-05-28T00:36:26.678	39.82	-59.07	71487.8	-41.94	-45.66

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-27T23:37:40.560
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       : 4116878817924529792
2Mass ID (if available) : 17421657-2252470
ICRS Star Coord at Epoch: 17h 42m 16.56887s -22:52:47.36251s
RUWE (>1.4 is poor) : 1.29
K magnitude           : 9.858
G magnitude           : 14.981
RP magnitude          : 13.678
BP magnitude          : 16.826
DUPflag              : 0
Distance (au)        : 4.323
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.70
Sun-Target sep (deg) : 160.13
Sun-Moon sep (deg)   : 127.11
B (ring opening deg) : -2.60
PA of pole (deg)     : 1.07
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation (") : 15.973
C/A sky separation (km) : 50075.0
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
    
```

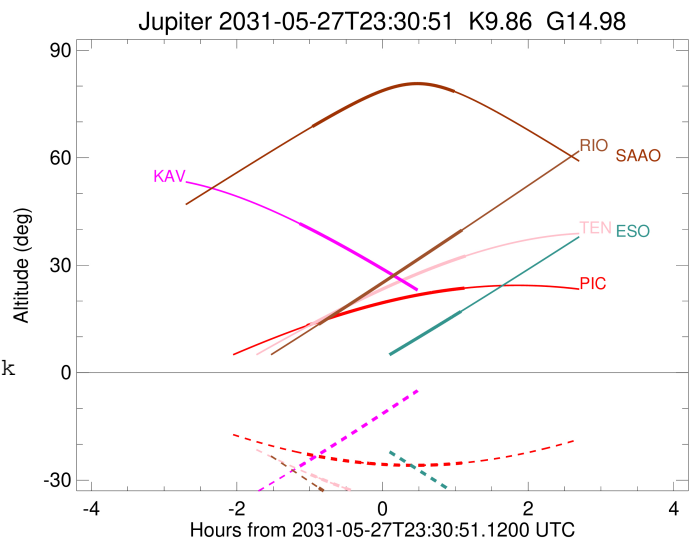
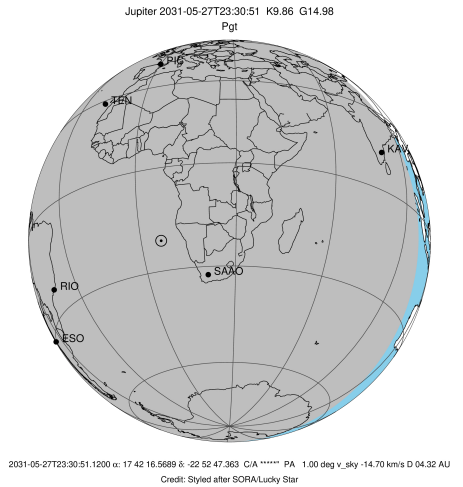


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-27T22:39:23.727	-6.18x	-10.06	71487.3	-45.07	-48.77
Jupiter	E	2031-05-28T00:35:30.820	17.09	-34.74	71487.6	-43.72	-47.44

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-27T23:31:39.990
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       : 4116878817924529792
2Mass ID (if available) : 17421657-2252470
ICRS Star Coord at Epoch: 17h 42m 16.56887s -22:52:47.36251s
RUWE (>1.4 is poor) : 1.29
K magnitude           : 9.858
G magnitude           : 14.981
RP magnitude          : 13.678
BP magnitude          : 16.826
DUPflag              : 0
Distance (au)        : 4.323
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.70
Sun-Target sep (deg) : 160.13
Sun-Moon sep (deg)   : 127.34
B (ring opening deg) : -2.60
PA of pole (deg)     : 1.07
Pole direction: RA (deg): 268.05693
Dec (deg): 64.49651
C/A sky separation ("): 15.288
C/A sky separation (km): 47929.7
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	2031-05-27T22:33:05.511	68.70	-79.18	71487.8	-42.29	-46.01
Jupiter	E	2031-05-28T00:30:09.854	78.47	-62.03	71487.8	-41.96	-45.68