

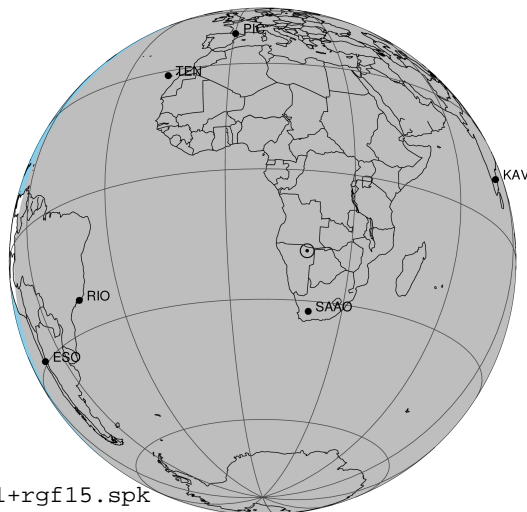
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2032-07-28T22:49:39.680  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 6865262853362535552  
 2Mass ID (if available) : 19502676-2129546

Jupiter 2032-07-28T22:49:39 K9.56 G11.50 Pgt

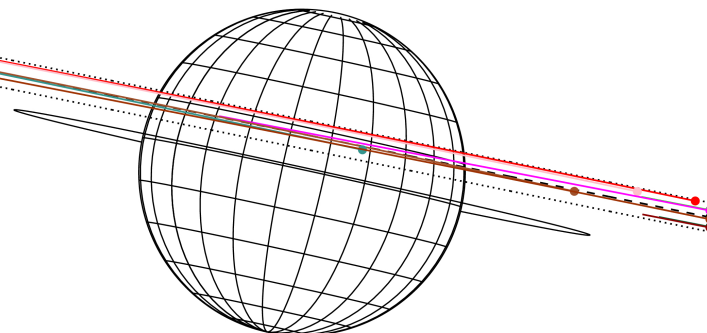
ICRS Star Coord at Epoch: 19h 50m 26.78260s -21:29:54.52447s

RUWE (>1.4 is poor) : 1.47  
 K magnitude : 9.562  
 G magnitude : 11.498  
 RP magnitude : 10.861  
 BP magnitude : 11.970  
 DUPflag : 0  
 Distance (au) : 4.132  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -15.63  
 Sun-Target sep (deg) : 169.59  
 Sun-Moon sep (deg) : 94.86  
 B (ring opening deg) : -1.02  
 PA of pole (deg) : -12.26  
 Pole direction: RA (deg): 268.05662  
 Dec (deg): 64.49656  
 C/A sky separation (") : 5.514  
 C/A sky separation (km) : 16526.0  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2032-07-28T22:49:39 K9.56 G11.50  
 Pgt



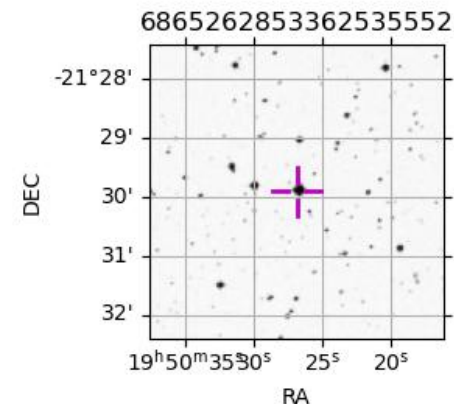
Earth  
 PIC  
 PMO  
 TEN  
 KAV  
 RIO  
 ESO  
 AAT  
 SAAO  
 MSO



2032-07-28T22:49:39.6800 at: 19 50 26.7826 s: -21 29 54.524 C/A 5.507" PA 168.47 deg v\_sky -15.63 km/s D 04.13 AU  
 Credit: Styled after SORA/Lucky Star

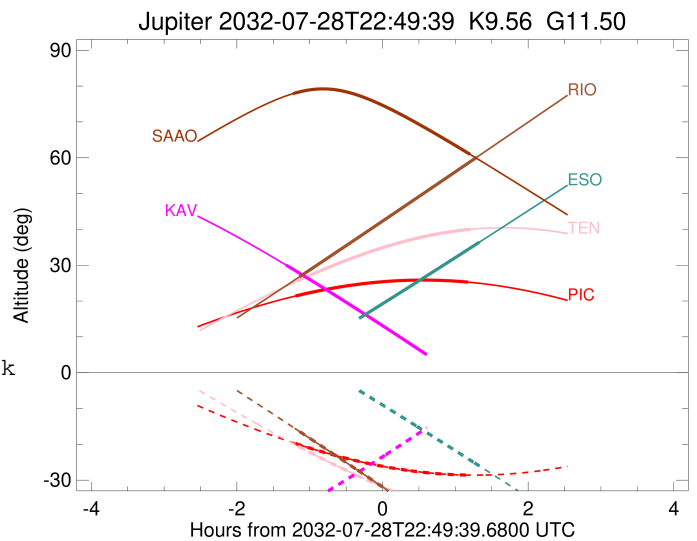
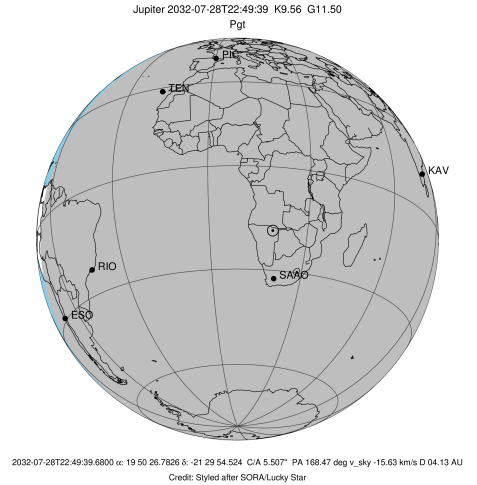
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+ +	JUL 28 21:38 - JUL 29 00:00	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	+ +	JUL 28 21:39 - JUL 29 00:02	Pie
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+	JUL 28 21:30 - JUL 28 21:30	Pin
RIO	Rio de Janeiro	-22.9	316.8	+ +	JUL 28 21:41 - JUL 29 00:07	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	JUL 29 00:09 - JUL 29 00:09	Pne
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	JUL 28 21:36 - JUL 29 00:01	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



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target                : Jupiter
target radius (km)    : 71492.00
C/A epoch              : 2032-07-28T22:49:13.280
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        : 6865262853362535552
2Mass ID (if available) : 19502676-2129546
ICRS Star Coord at Epoch: 19h 50m 26.78260s -21:29:54.52447s
RUWE (>1.4 is poor)  : 1.47
K magnitude           : 9.562
G magnitude           : 11.498
RP magnitude          : 10.861
BP magnitude          : 11.970
DUPflag              : 0
Distance (au)         : 4.132
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -15.63
Sun-Target sep (deg)  : 169.59
Sun-Moon sep (deg)    : 95.28
B (ring opening deg)  : -1.02
PA of pole (deg)      : -12.26
Pole direction: RA (deg): 268.05662
Dec (deg): 64.49656
C/A sky separation (") : 7.428
C/A sky separation (km) : 22262.6
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
    
```

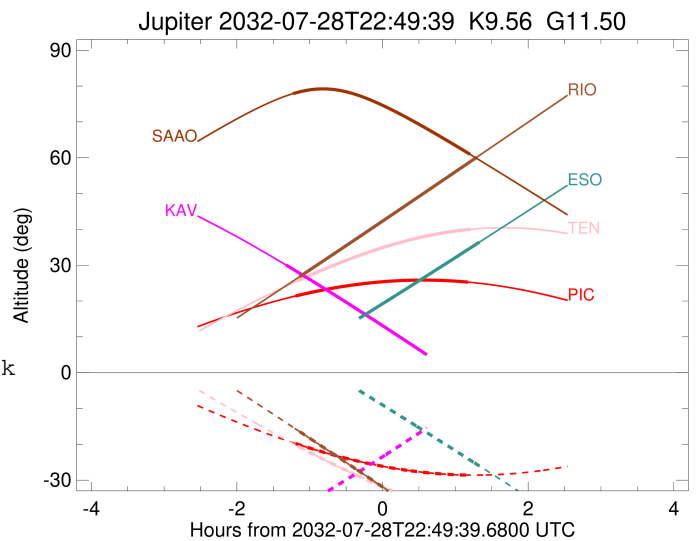
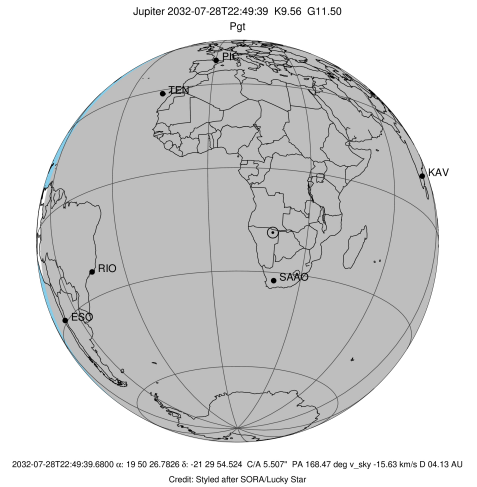


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2032-07-28T21:38:12.814	21.42	-19.80	71491.9	18.98	21.45
Jupiter	E	2032-07-29T00:00:12.763	25.27	-28.59	71491.9	17.15	19.43

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2032-07-28T22:51:07.340
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       : 6865262853362535552
2Mass ID (if available) : 19502676-2129546
ICRS Star Coord at Epoch: 19h 50m 26.78260s -21:29:54.52447s
RUWE (>1.4 is poor) : 1.47
K magnitude           : 9.562
G magnitude           : 11.498
RP magnitude          : 10.861
BP magnitude          : 11.970
DUPflag              : 0
Distance (au)         : 4.132
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.63
Sun-Target sep (deg) : 169.59
Sun-Moon sep (deg)   : 95.39
B (ring opening deg) : -1.02
PA of pole (deg)     : -12.26
Pole direction: RA (deg): 268.05662
Dec (deg): 64.49656
C/A sky separation (") : 7.197
C/A sky separation (km) : 21568.9
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
    
```

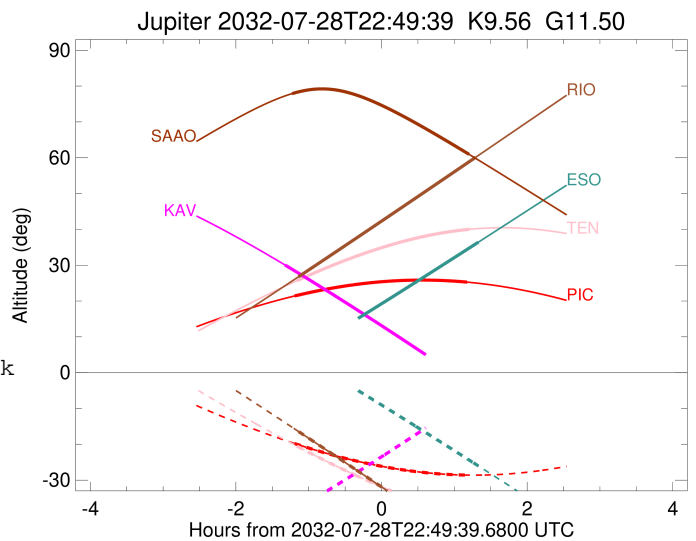
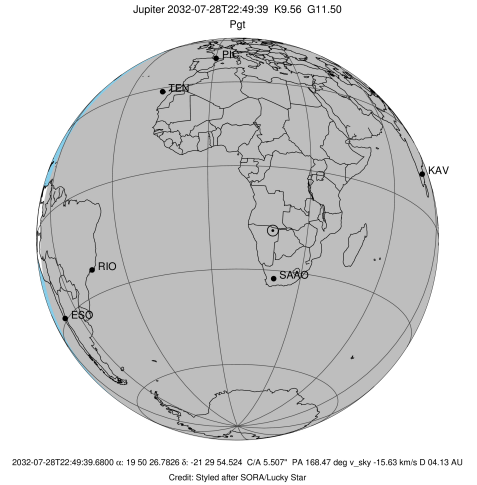


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2032-07-28T21:39:59.107	25.68	-20.51	71491.9	18.25	20.64
Jupiter	E	2032-07-29T00:02:05.218	40.01	-40.21	71491.9	16.68	18.90

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2032-07-28T22:43:21.730
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        : 6865262853362535552
2Mass ID (if available) : 19502676-2129546
ICRS Star Coord at Epoch: 19h 50m 26.78260s -21:29:54.52447s
RUWE (>1.4 is poor) : 1.47
K magnitude           : 9.562
G magnitude           : 11.498
RP magnitude          : 10.861
BP magnitude          : 11.970
DUPflag              : 0
Distance (au)         : 4.132
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.63
Sun-Target sep (deg) : 169.59
Sun-Moon sep (deg)   : 95.16
B (ring opening deg) : -1.02
PA of pole (deg)     : -12.26
Pole direction: RA (deg): 268.05662
Dec (deg): 64.49656
C/A sky separation (") : 5.811
C/A sky separation (km) : 17415.5
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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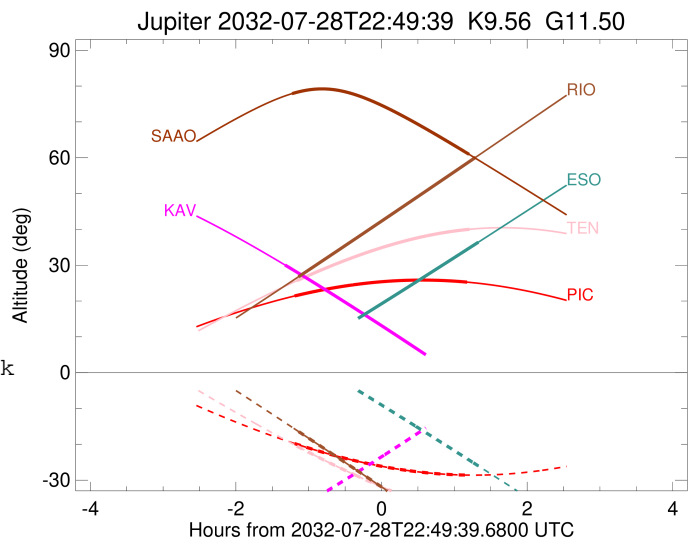
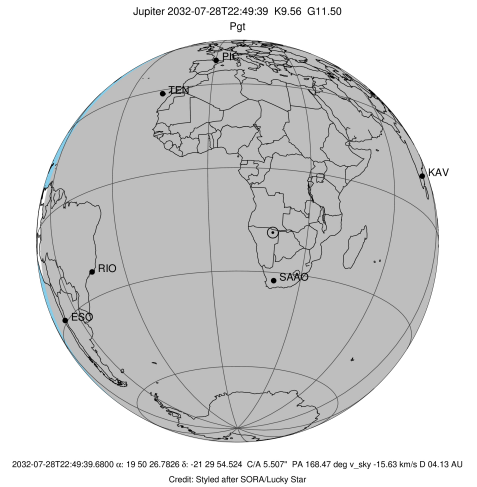


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2032-07-28T21:30:20.072	30.01	-39.90	71491.9	15.50	17.59
Jupiter	E	2032-07-28T23:57:02.186	-1.99x	-8.47	71491.9	12.71	14.46

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2032-07-28T22:54:31.950
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      : 6865262853362535552
2Mass ID (if available) : 19502676-2129546
ICRS Star Coord at Epoch: 19h 50m 26.78260s -21:29:54.52447s
RUWE (>1.4 is poor) : 1.47
K magnitude          : 9.562
G magnitude          : 11.498
RP magnitude         : 10.861
BP magnitude         : 11.970
DUPflag             : 0
Distance (au)       : 4.132
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.63
Sun-Target sep (deg) : 169.59
Sun-Moon sep (deg)  : 95.44
B (ring opening deg) : -1.02
PA of pole (deg)    : -12.26
Pole direction: RA (deg): 268.05662
Dec (deg): 64.49656
C/A sky separation (") : 5.517
C/A sky separation (km) : 16534.4
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
    
```

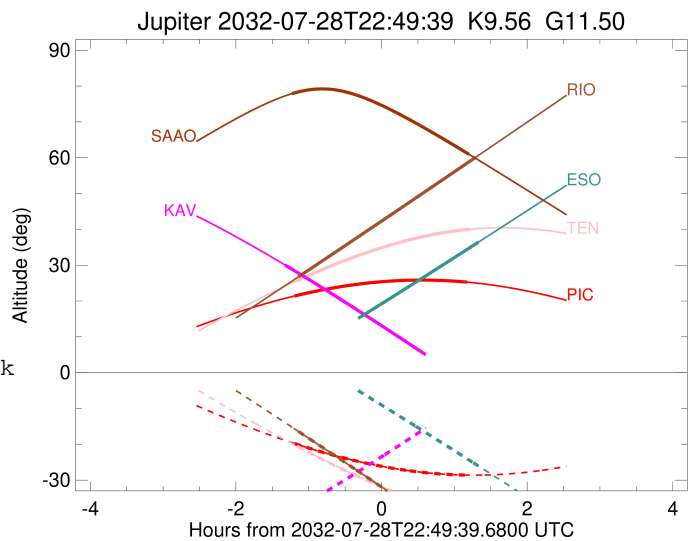
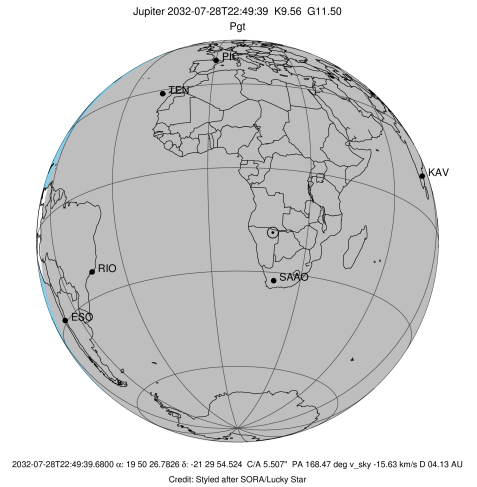


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2032-07-28T21:41:26.480	26.81	-16.46	71491.9	13.79	15.66
Jupiter	E	2032-07-29T00:07:12.436	60.10	-49.67	71491.9	12.76	14.52

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2032-07-28T22:55:44.970
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       : 6865262853362535552
2Mass ID (if available) : 19502676-2129546
ICRS Star Coord at Epoch: 19h 50m 26.78260s -21:29:54.52447s
RUWE (>1.4 is poor) : 1.47
K magnitude           : 9.562
G magnitude           : 11.498
RP magnitude          : 10.861
BP magnitude          : 11.970
DUPflag              : 0
Distance (au)        : 4.132
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.63
Sun-Target sep (deg) : 169.59
Sun-Moon sep (deg)   : 95.10
B (ring opening deg) : -1.02
PA of pole (deg)     : -12.26
Pole direction: RA (deg): 268.05662
Dec (deg): 64.49656
C/A sky separation ("): 5.081
C/A sky separation (km): 15227.6
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
    
```

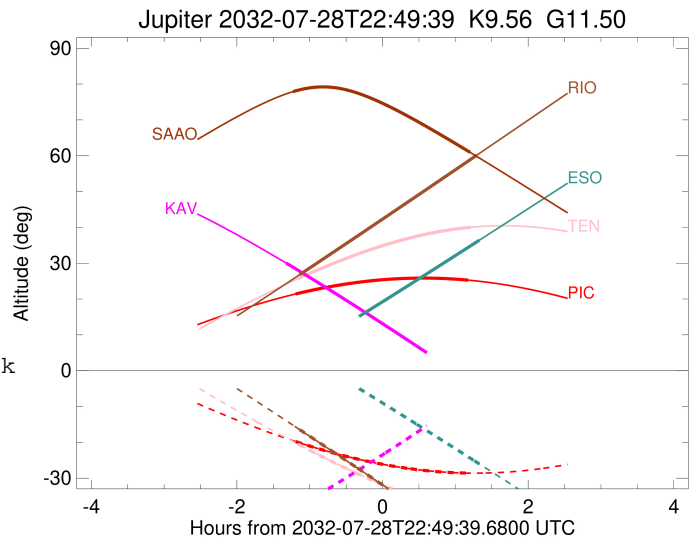
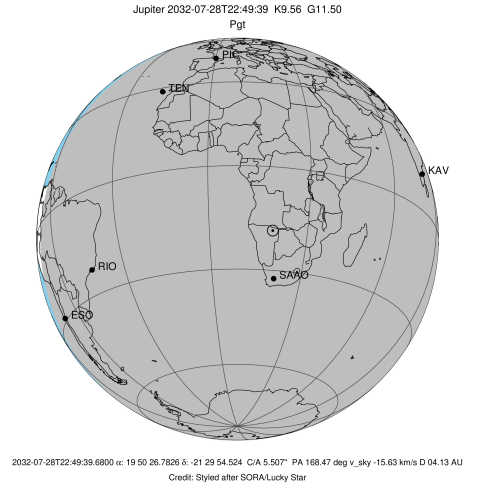


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2032-07-28T21:41:28.731	5.02	4.94x	71491.9	12.52	14.24
Jupiter	E	2032-07-29T00:09:28.241	36.42	-26.03	71491.9	11.94	13.59

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2032-07-28T22:48:51.450
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        : 6865262853362535552
2Mass ID (if available) : 19502676-2129546
ICRS Star Coord at Epoch: 19h 50m 26.78260s -21:29:54.52447s
RUWE (>1.4 is poor) : 1.47
K magnitude           : 9.562
G magnitude           : 11.498
RP magnitude          : 10.861
BP magnitude          : 11.970
DUPflag              : 0
Distance (au)         : 4.132
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.63
Sun-Target sep (deg) : 169.59
Sun-Moon sep (deg)   : 95.80
B (ring opening deg) : -1.02
PA of pole (deg)     : -12.26
Pole direction: RA (deg): 268.05662
Dec (deg): 64.49656
C/A sky separation (") : 5.034
C/A sky separation (km) : 15085.6
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	2032-07-28T21:36:05.181	77.89	-69.73	71491.9	13.22	15.03
Jupiter	E	2032-07-29T00:01:48.142	60.94	-67.75	71491.9	11.00	12.52