

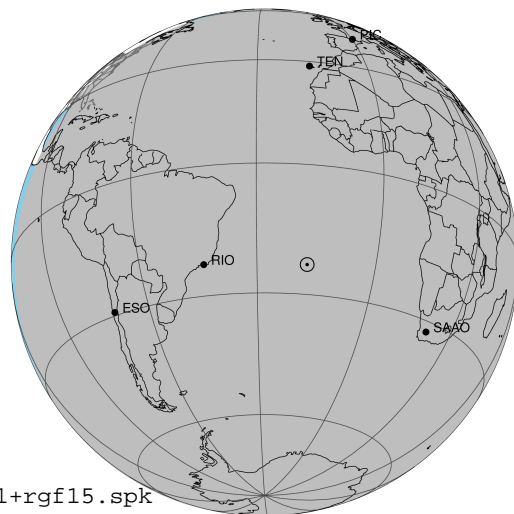
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-06-29T01:13:40.970
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068835794799000192
 2Mass ID (if available) : 17464896-2304400

Jupiter 2043-06-29T01:13:40 K8.71 G14.43 Pgt

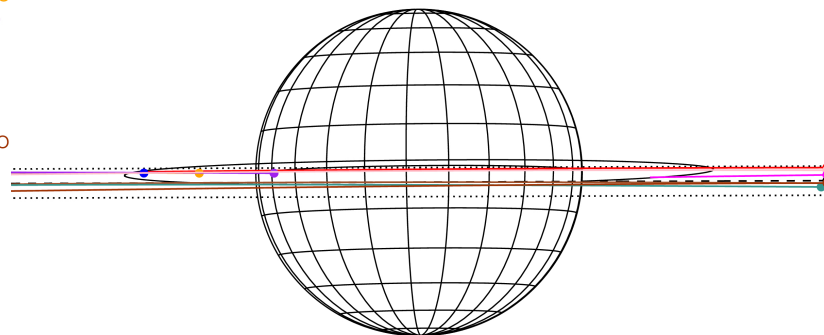
ICRS Star Coord at Epoch: 17h 46m 48.95549s -23:04:40.30555s

RUWE (>1.4 is poor) : 1.02
 K magnitude : 8.705
 G magnitude : 14.428
 RP magnitude : 12.976
 BP magnitude : 17.142
 DUPflag : 0
 Distance (au) : 4.259
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -16.02
 Sun-Target sep (deg) : 170.32
 Sun-Moon sep (deg) : 86.10
 B (ring opening deg) : -2.42
 PA of pole (deg) : 0.58
 Pole direction: RA (deg): 268.05669
 Dec (deg): 64.49732
 C/A sky separation (") : 1.361
 C/A sky separation (km) : 4202.9
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-06-29T01:13:40 K8.71 G14.43
 Pgt



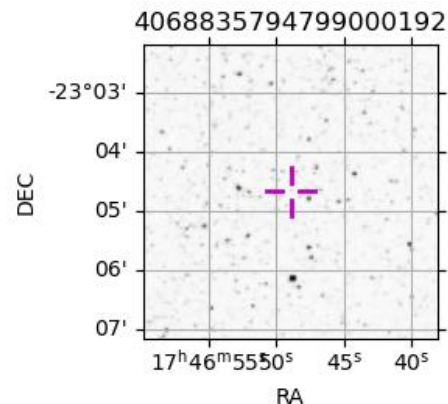
Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 KAV
 RIO
 ESO
 SAAO



2043-06-29T01:13:40.9700 a: 17 46 48.9555 δ: -23 04 40.306 C/A 1.372" PA 0.21 deg v_sky -16.02 km/s D 04.26 AU
 Credit: Styled after SORA/Lucky Star

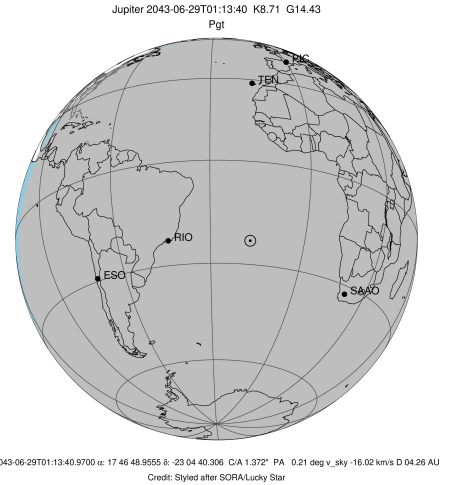
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+ +	JUN 28 23:58 - JUN 29 02:24	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	+ +	JUN 29 02:32 - JUN 29 02:32	Pne
TEN	Teide Obs./Tenerife	28.3	343.5	+ +	JUN 29 00:00 - JUN 29 02:25	Pie
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+ +	JUN 29 00:02 - JUN 29 02:27	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUN 29 00:04 - JUN 29 02:30	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	JUN 28 23:56 - JUN 29 02:22	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn

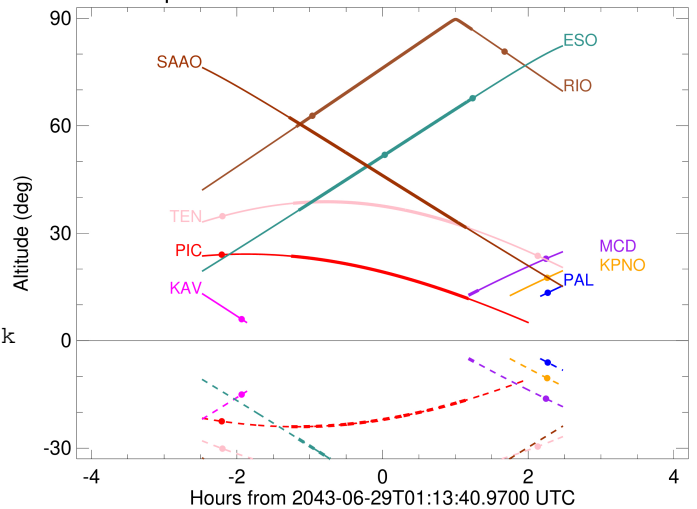


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-29T01:11:25.270
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       : 4068835794799000192
2Mass ID (if available) : 17464896-2304400
ICRS Star Coord at Epoch: 17h 46m 48.95549s -23:04:40.30555s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 8.705
G magnitude           : 14.428
RP magnitude         : 12.976
BP magnitude         : 17.142
DUPflag              : 0
Distance (au)        : 4.259
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.02
Sun-Target sep (deg) : 170.32
Sun-Moon sep (deg)   : 86.40
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.58
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 0.453
C/A sky separation (km): 1397.9
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
    
```



Jupiter 2043-06-29T01:13:40 K8.71 G14.43

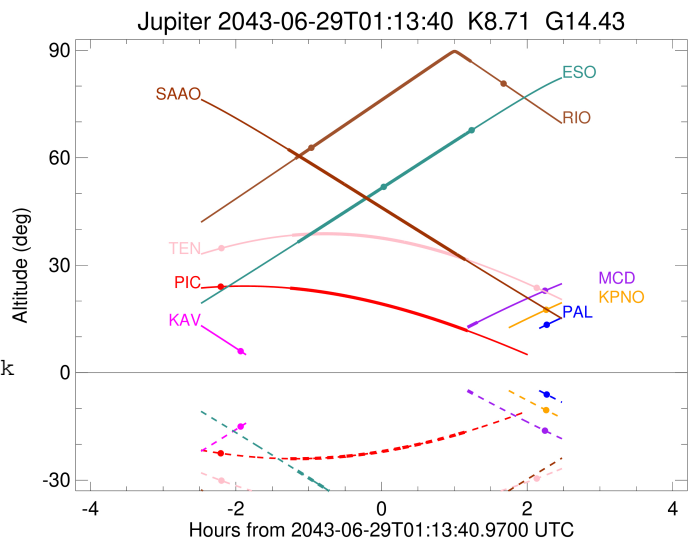
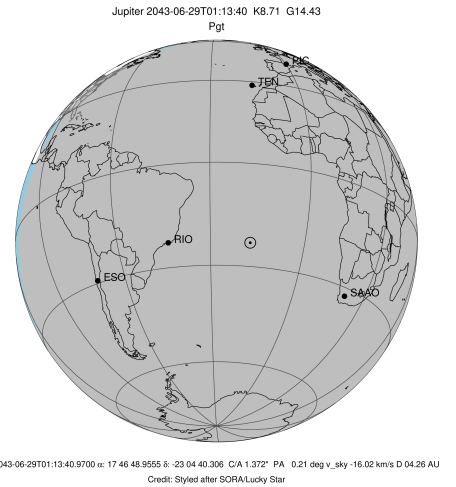


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-28T23:58:32.419	23.59	-24.01	71492.0	0.89	1.01
Jupiter	E	2043-06-29T02:24:32.636	11.71	-16.39	71492.0	1.22	1.39

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T01:19:11.500
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : MCD
Location            : McDonald Obs. 2.7m
Latitude (deg)      : 30.67158
E. Longitude (deg)  : 255.97844
Altitude (km)       : 2.075
Gaia source ID      : 4068835794799000192
2Mass ID (if available) : 17464896-2304400
ICRS Star Coord at Epoch: 17h 46m 48.95549s -23:04:40.30555s
RUWE (>1.4 is poor) : 1.02
K magnitude          : 8.705
G magnitude          : 14.428
RP magnitude         : 12.976
BP magnitude         : 17.142
DUPflag             : 0
Distance (au)        : 4.259
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.02
Sun-Target sep (deg) : 170.32
Sun-Moon sep (deg)  : 86.15
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.58
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (" ) : 0.209
C/A sky separation (km) : 646.6
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
    
```

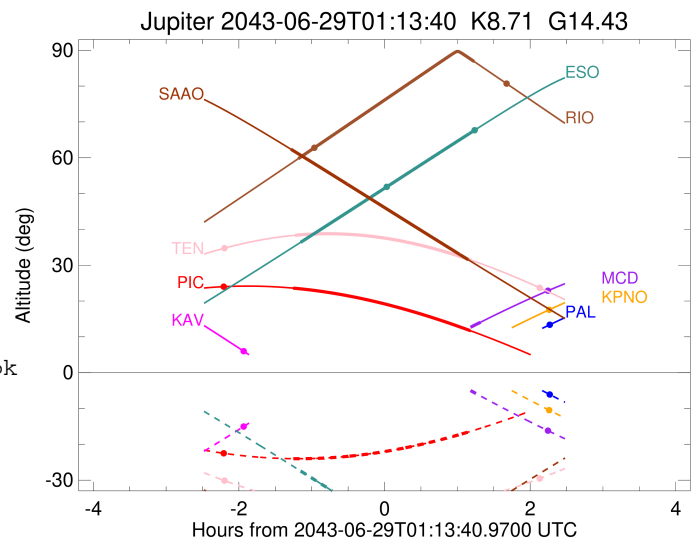
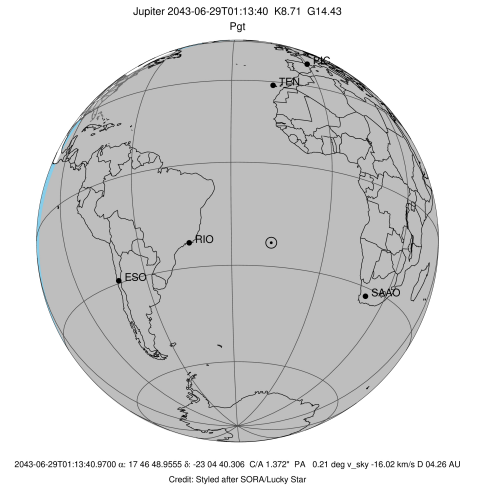


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T00:05:02.249	-14.03x	22.73x	71492.0	-1.45	-1.66
Jupiter	E	2043-06-29T02:32:47.897	14.08	-6.51	71492.0	0.37	0.42

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-29T01:12:31.840
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        : 4068835794799000192
2Mass ID (if available) : 17464896-2304400
ICRS Star Coord at Epoch: 17h 46m 48.95549s -23:04:40.30555s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 8.705
G magnitude           : 14.428
RP magnitude          : 12.976
BP magnitude          : 17.142
DUPflag              : 0
Distance (au)         : 4.259
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.02
Sun-Target sep (deg) : 170.32
Sun-Moon sep (deg)   : 86.68
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.58
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 0.234
C/A sky separation (km): 723.9
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
    
```

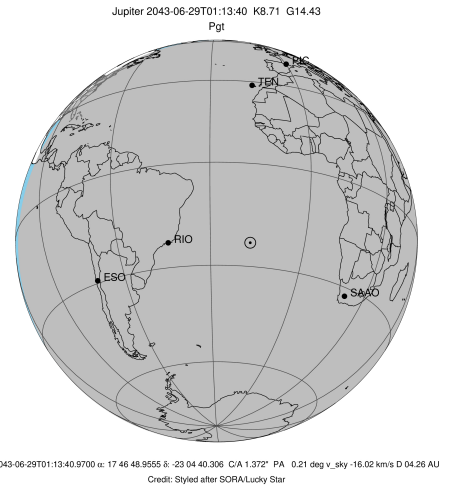


x: target alt < 5.0 deg or sun > -5.0 deg

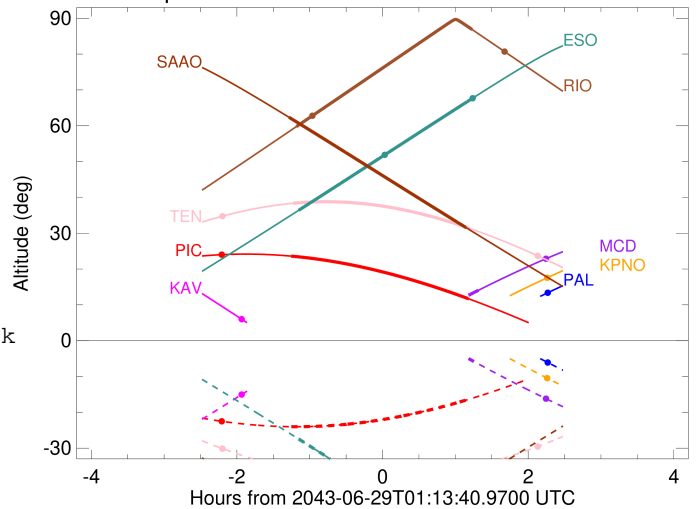
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T00:00:01.254	38.35	-35.98	71492.0	0.22	0.25
Jupiter	E	2043-06-29T02:25:10.209	31.39	-35.48	71492.0	0.76	0.87

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-29T01:15:14.920
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        : 4068835794799000192
2Mass ID (if available) : 17464896-2304400
ICRS Star Coord at Epoch: 17h 46m 48.95549s -23:04:40.30555s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 8.705
G magnitude           : 14.428
RP magnitude          : 12.976
BP magnitude          : 17.142
DUPflag              : 0
Distance (au)         : 4.259
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.02
Sun-Target sep (deg) : 170.32
Sun-Moon sep (deg)   : 87.05
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.58
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 1.373
C/A sky separation (km): 4239.7
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
    
```



Jupiter 2043-06-29T01:13:40 K8.71 G14.43

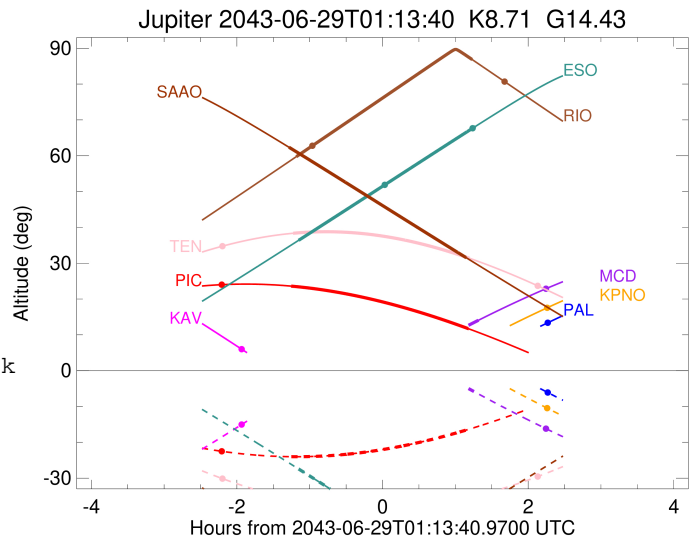
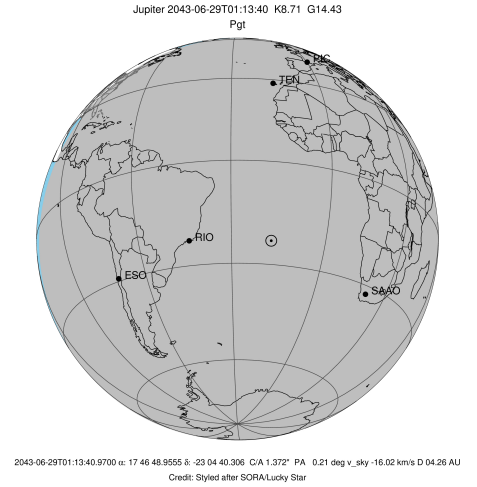


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T00:02:47.642	59.77	-50.24	71492.0	-4.01	-4.59
Jupiter	E	2043-06-29T02:27:34.231	86.84	-83.38	71492.0	-2.96	-3.38

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch             : 2043-06-29T01:17:34.320
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        : 4068835794799000192
2Mass ID (if available) : 17464896-2304400
ICRS Star Coord at Epoch: 17h 46m 48.95549s -23:04:40.30555s
RUWE (>1.4 is poor)  : 1.02
K magnitude           : 8.705
G magnitude           : 14.428
RP magnitude          : 12.976
BP magnitude          : 17.142
DUPflag              : 0
Distance (au)         : 4.259
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.02
Sun-Target sep (deg)  : 170.32
Sun-Moon sep (deg)   : 86.89
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.58
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 1.754
C/A sky separation (km) : 5418.2
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
    
```

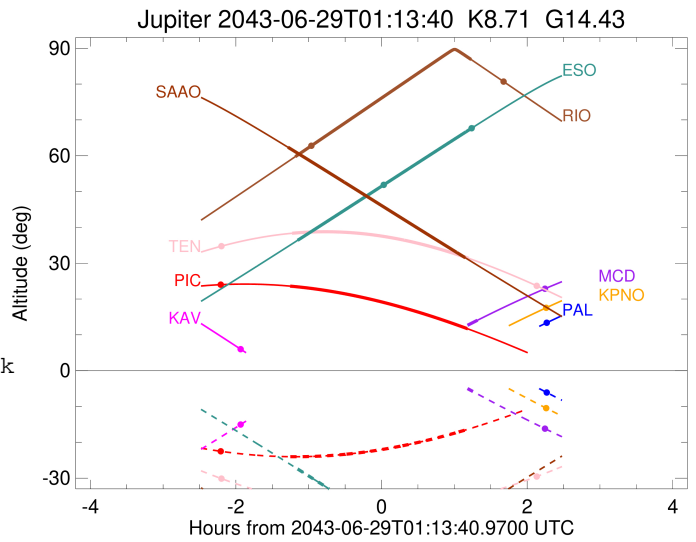
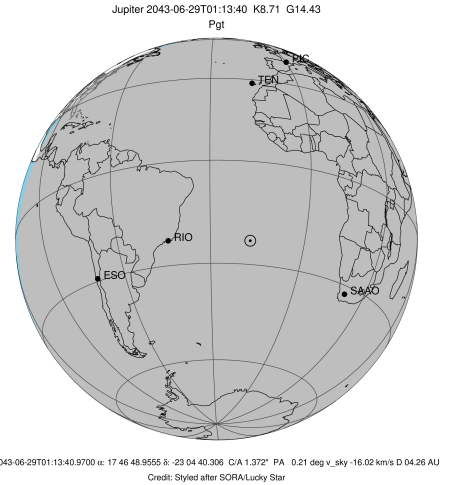


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-29T00:04:35.963	36.39	-27.45	71491.9	-5.16	-5.89
Jupiter	E	2043-06-29T02:30:10.944	68.15	-59.01	71492.0	-3.66	-4.19

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-29T01:09:28.890
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      : 4068835794799000192
2Mass ID (if available) : 17464896-2304400
ICRS Star Coord at Epoch: 17h 46m 48.95549s -23:04:40.30555s
RUWE (>1.4 is poor) : 1.02
K magnitude         : 8.705
G magnitude         : 14.428
RP magnitude        : 12.976
BP magnitude        : 17.142
DUPflag            : 0
Distance (au)       : 4.259
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -16.02
Sun-Target sep (deg) : 170.32
Sun-Moon sep (deg)  : 86.76
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.58
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (" ) : 1.914
C/A sky separation (km) : 5913.0
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	2043-06-28T23:56:46.334	62.32	-70.86	71491.9	-4.78	-5.47
Jupiter	E	2043-06-29T02:22:37.356	31.54	-40.49	71491.9	-4.81	-5.50