

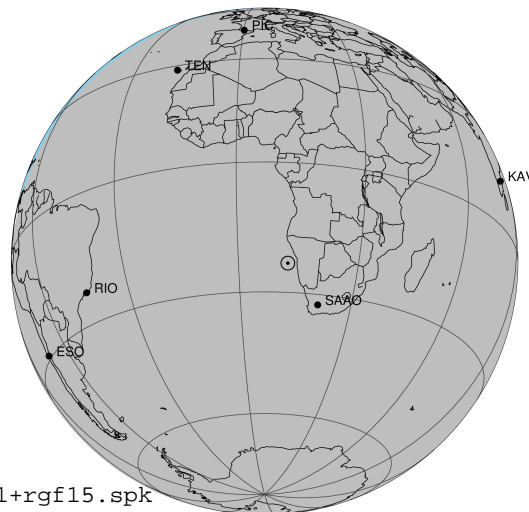
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2043-06-24T23:13:46.780  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4068868848761154816  
 2Mass ID (if available) : 17490295-2304346

Jupiter 2043-06-24T23:13:46 K7.35 G14.53 Pgt

ICRS Star Coord at Epoch: 17h 49m 02.94032s -23:04:34.81183s

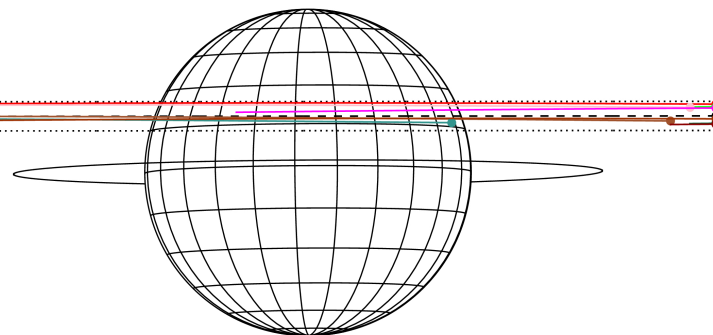
RUWE (>1.4 is poor) : 0.92  
 K magnitude : 7.353  
 G magnitude : 14.528  
 RP magnitude : 12.889  
 BP magnitude : 18.837  
 DUPflag : 0  
 Distance (au) : 4.252  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -16.30  
 Sun-Target sep (deg) : 174.72  
 Sun-Moon sep (deg) : 32.74  
 B (ring opening deg) : -2.42  
 PA of pole (deg) : 0.34  
 Pole direction: RA (deg): 268.05669  
 Dec (deg): 64.49732  
 C/A sky separation (") : 8.004  
 C/A sky separation (km) : 24683.5  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2043-06-24T23:13:46 K7.35 G14.53  
 Pgt



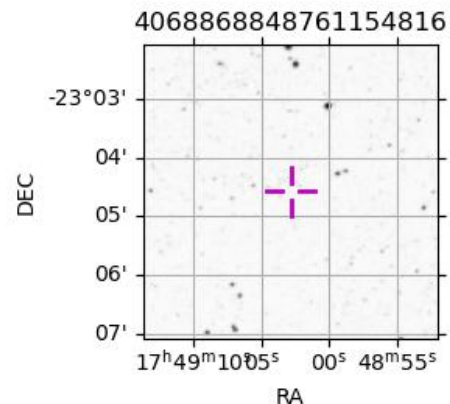
2043-06-24T23:13:46.7800 at: 17 49 02.9403 s: -23 04 34.812 C/A 7.993° PA 180.04 deg v\_sky -16.30 km/s D 04.25 AU  
 Credit: Styled after SORA/Lucky Star

Earth  
 PIC  
 PMO  
 TEN  
 KAV  
 RIO  
 ESO  
 AAT  
 SAAO  
 MSO



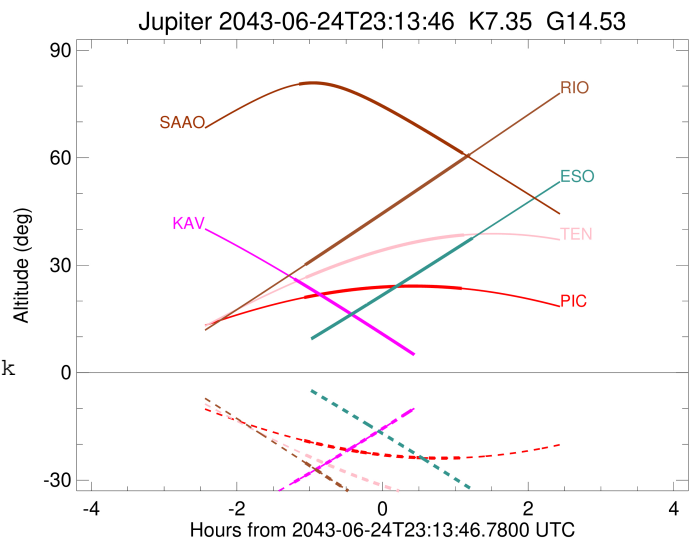
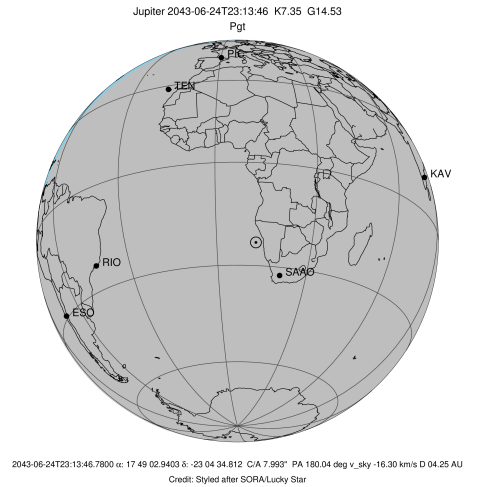
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+ +	JUN 24 22:09 - JUN 25 00:19	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	+ +	JUN 24 22:10 - JUN 25 00:20	Pie
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+	JUN 24 22:01 - JUN 24 22:01	Pin
RIO	Rio de Janeiro	-22.9	316.8	+ +	JUN 24 22:10 - JUN 25 00:25	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	JUN 25 00:27 - JUN 25 00:27	Pne
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	JUN 24 22:05 - JUN 25 00:20	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-24T23:14:14.880
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      : 4068868848761154816
2Mass ID (if available) : 17490295-2304346
ICRS Star Coord at Epoch: 17h 49m 02.94032s -23:04:34.81183s
RUWE (>1.4 is poor) : 0.92
K magnitude          : 7.353
G magnitude          : 14.528
RP magnitude         : 12.889
BP magnitude         : 18.837
DUPflag             : 0
Distance (au)        : 4.252
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.30
Sun-Target sep (deg) : 174.72
Sun-Moon sep (deg)  : 33.13
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.34
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (" ) : 9.886
C/A sky separation (km) : 30487.6
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
    
```

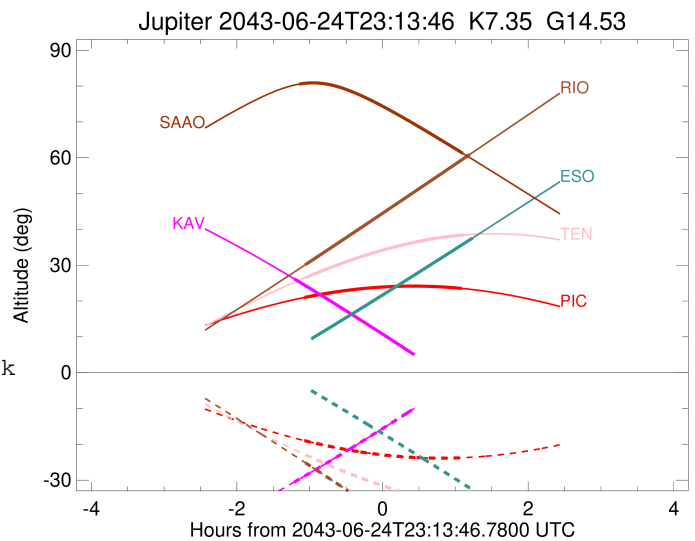
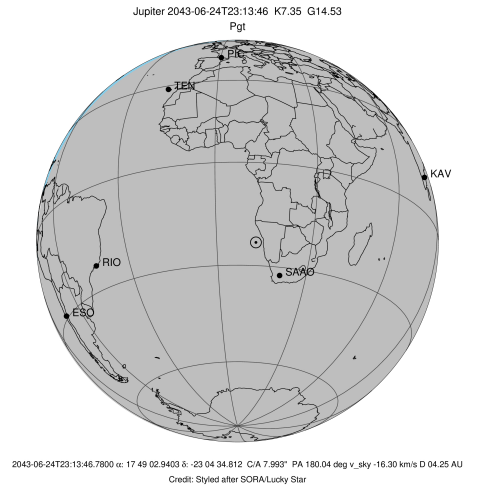


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-24T22:09:23.590	20.98	-18.96	71490.6	24.80	27.81
Jupiter	E	2043-06-25T00:19:04.240	23.51	-23.75	71490.5	25.50	28.57

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch              : 2043-06-24T23:15:50.780
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        : 4068868848761154816
2Mass ID (if available) : 17490295-2304346
ICRS Star Coord at Epoch: 17h 49m 02.94032s -23:04:34.81183s
RUWE (>1.4 is poor)  : 0.92
K magnitude            : 7.353
G magnitude            : 14.528
RP magnitude          : 12.889
BP magnitude          : 18.837
DUPflag               : 0
Distance (au)         : 4.252
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -16.30
Sun-Target sep (deg)  : 174.72
Sun-Moon sep (deg)    : 33.39
B (ring opening deg)  : -2.42
PA of pole (deg)      : 0.34
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 9.565
C/A sky separation (km) : 29495.6
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
    
```

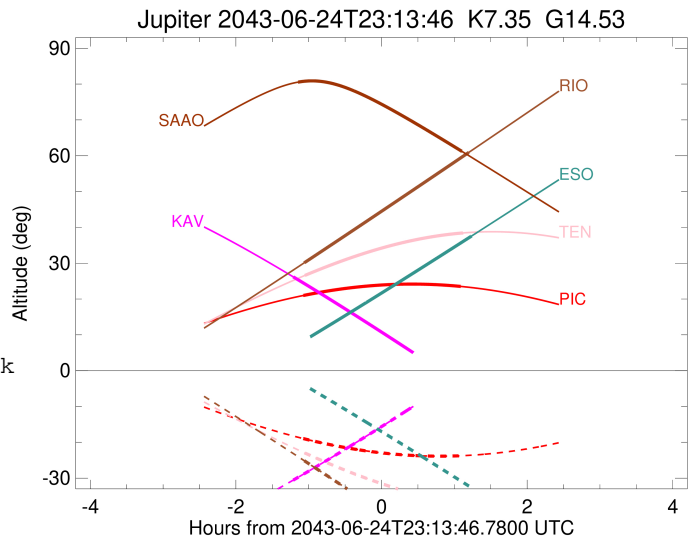
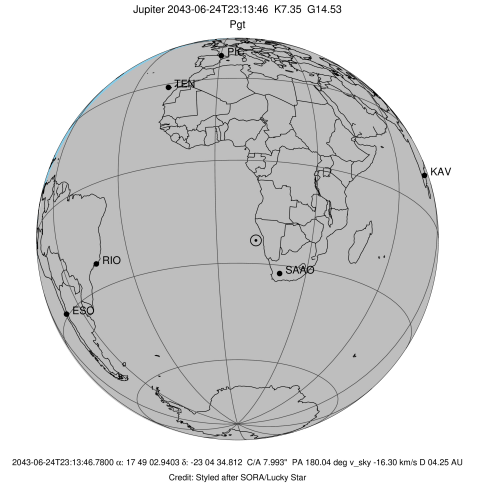


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-24T22:10:37.084	26.58	-22.98	71490.7	23.76	26.69
Jupiter	E	2043-06-25T00:20:54.734	38.44	-37.22	71490.6	24.78	27.79

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-24T23:08:01.980
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      : 4068868848761154816
2Mass ID (if available) : 17490295-2304346
ICRS Star Coord at Epoch: 17h 49m 02.94032s -23:04:34.81183s
RUWE (>1.4 is poor) : 0.92
K magnitude         : 7.353
G magnitude         : 14.528
RP magnitude        : 12.889
BP magnitude        : 18.837
DUPflag            : 0
Distance (au)       : 4.252
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -16.30
Sun-Target sep (deg) : 174.72
Sun-Moon sep (deg)  : 32.16
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.34
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 8.667
C/A sky separation (km) : 26728.4
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
    
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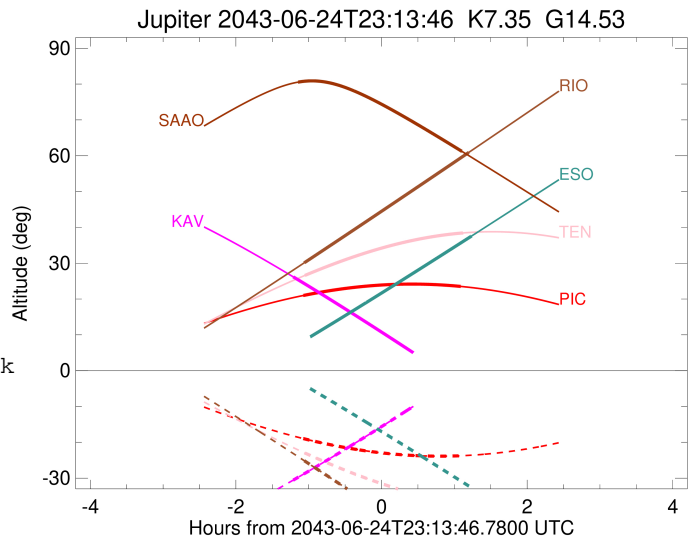
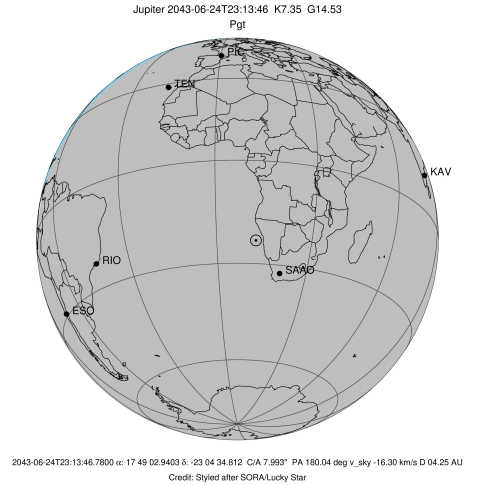


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-24T22:01:03.691	26.18	-30.55	71490.9	22.18	24.96
Jupiter	E	2043-06-25T00:15:30.994	-2.94x	-2.16x	71490.9	21.63	24.36

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-24T23:18:06.450
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       : 4068868848761154816
2Mass ID (if available) : 17490295-2304346
ICRS Star Coord at Epoch: 17h 49m 02.94032s -23:04:34.81183s
RUWE (>1.4 is poor) : 0.92
K magnitude           : 7.353
G magnitude           : 14.528
RP magnitude          : 12.889
BP magnitude          : 18.837
DUPflag              : 0
Distance (au)        : 4.252
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.30
Sun-Target sep (deg) : 174.72
Sun-Moon sep (deg)   : 33.62
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.34
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 7.769
C/A sky separation (km): 23958.0
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
    
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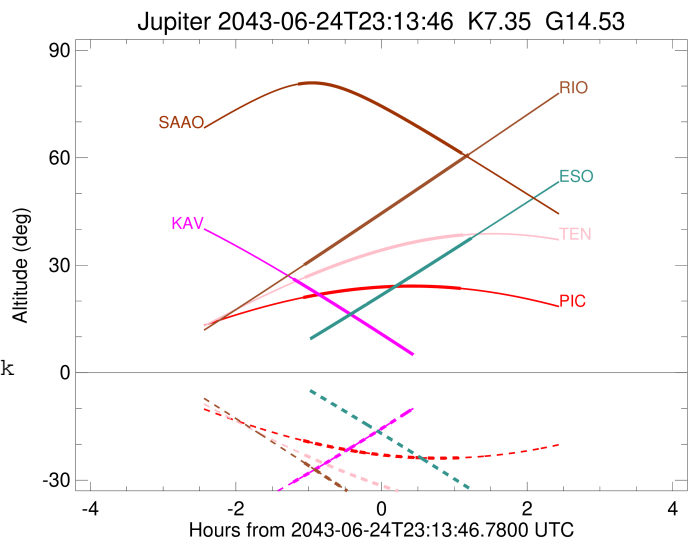
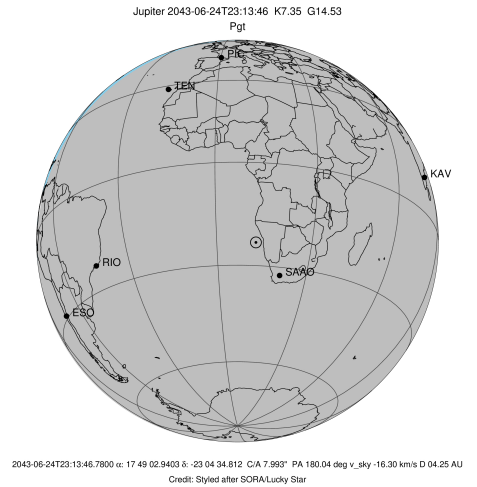


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-24T22:10:10.214	30.12	-25.14	71491.2	18.77	21.22
Jupiter	E	2043-06-25T00:25:40.315	60.91	-55.65	71491.0	20.23	22.83

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-24T23:19:05.920
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      : 4068868848761154816
2Mass ID (if available) : 17490295-2304346
ICRS Star Coord at Epoch: 17h 49m 02.94032s -23:04:34.81183s
RUWE (>1.4 is poor) : 0.92
K magnitude         : 7.353
G magnitude         : 14.528
RP magnitude        : 12.889
BP magnitude        : 18.837
DUPflag            : 0
Distance (au)       : 4.252
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -16.30
Sun-Target sep (deg) : 174.72
Sun-Moon sep (deg)  : 33.53
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.34
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 7.260
C/A sky separation (km) : 22387.9
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
    
```

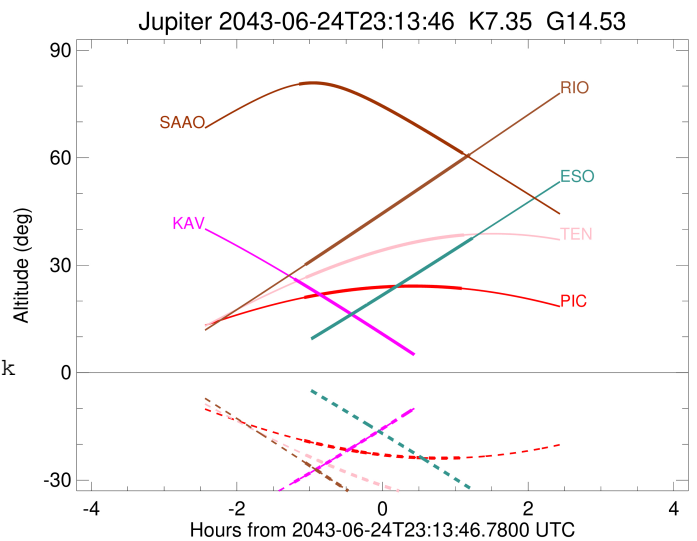
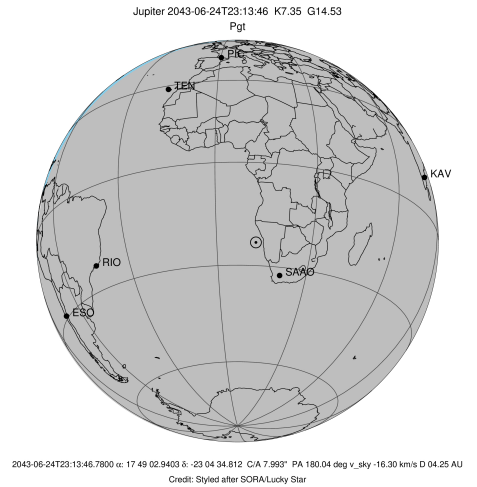


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-24T22:09:49.531	8.37	-3.96x	71491.3	17.37	19.67
Jupiter	E	2043-06-25T00:27:53.375	37.55	-32.67	71491.1	19.04	21.52

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-24T23:12:30.160
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     : 4068868848761154816
2Mass ID (if available) : 17490295-2304346
ICRS Star Coord at Epoch: 17h 49m 02.94032s -23:04:34.81183s
RUWE (>1.4 is poor) : 0.92
K magnitude         : 7.353
G magnitude         : 14.528
RP magnitude        : 12.889
BP magnitude        : 18.837
DUPflag            : 0
Distance (au)      : 4.252
f0 (km)            : 0.00
g0 (km)            : 0.00
skyplane vel. (km/s) : -16.30
Sun-Target sep (deg) : 174.72
Sun-Moon sep (deg)  : 33.04
B (ring opening deg) : -2.42
PA of pole (deg)   : 0.34
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 7.655
C/A sky separation (km) : 23605.4
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	2043-06-24T22:05:04.233	80.54	-78.40	71491.1	19.01	21.49
Jupiter	E	2043-06-25T00:20:03.267	61.20	-66.11	71491.1	19.36	21.87