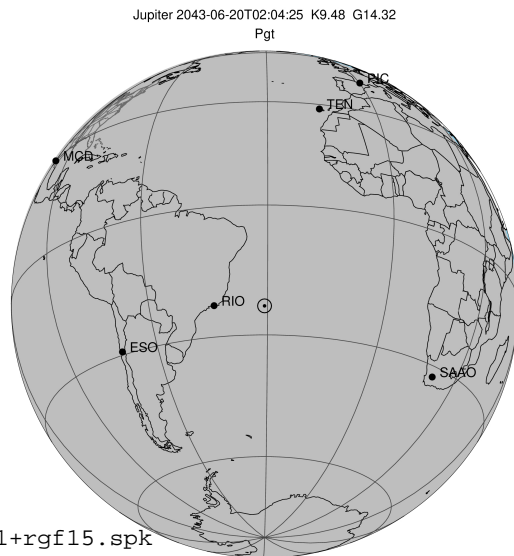


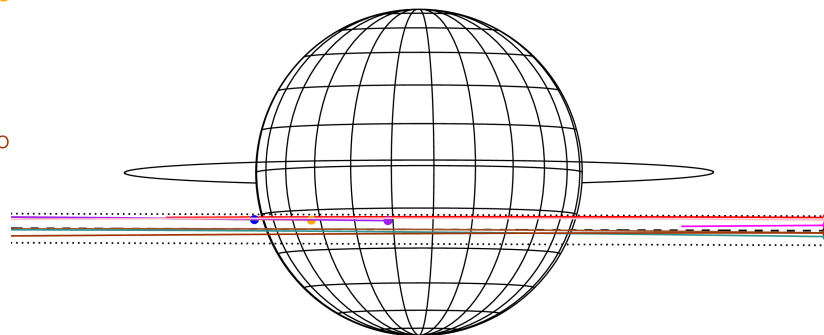
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2043-06-20T02:04:25.660  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4068692853891886976  
 2Mass ID (if available) : 17514527-2304482

Jupiter 2043-06-20T02:04:25 K9.48 G14.32 Pgt

ICRS Star Coord at Epoch: 17h 51m 45.27466s -23:04:48.22111s  
 RUWE (>1.4 is poor) : 0.95  
 K magnitude : 9.476  
 G magnitude : 14.316  
 RP magnitude : 13.080  
 BP magnitude : 16.011  
 DUPflag : 0  
 Distance (au) : 4.250  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -16.41  
 Sun-Target sep (deg) : 179.66  
 Sun-Moon sep (deg) : 28.22  
 B (ring opening deg) : -2.42  
 PA of pole (deg) : 0.05  
 Pole direction: RA (deg): 268.05668  
 Dec (deg): 64.49732  
 C/A sky separation (") : 8.091  
 C/A sky separation (km) : 24943.1  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk



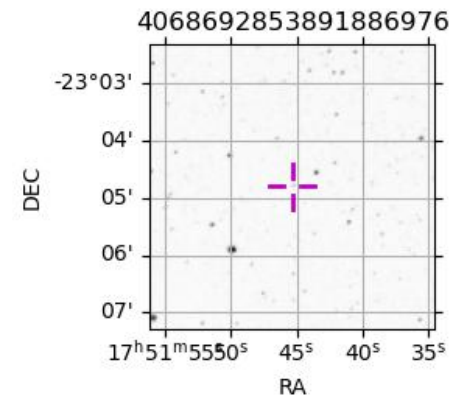
Earth  
 PIC  
 PAL  
 KPNO  
 MCD  
 TEN  
 KAV  
 RIO  
 ESO  
 SAAO



2043-06-20T02:04:25.6600 at: 17 51 45.2747 s: -23 04 48.2211 C/A 8.103" PA 359.82 deg v\_sky -16.41 km/s D 04.25 AU  
 Credit: Styled after SORA/Lucky Star

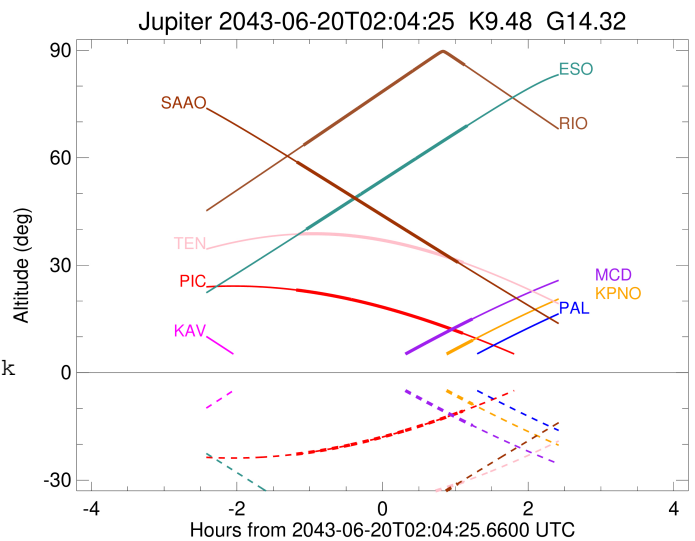
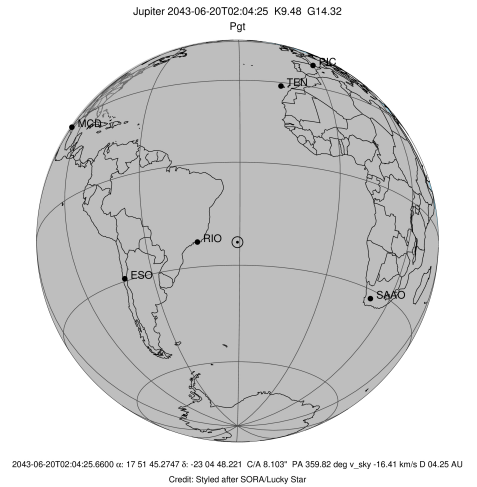
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+ +	JUN 20 00:53 - JUN 20 03:10	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	+ +	JUN 20 03:18 - JUN 20 03:18	Pne
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JUN 20 03:18 - JUN 20 03:18	Pne
TEN	Teide Obs./Tenerife	28.3	343.5	+ +	JUN 20 00:55 - JUN 20 03:11	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 20 00:59 - JUN 20 03:12	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUN 20 01:01 - JUN 20 03:14	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	JUN 20 00:53 - JUN 20 03:06	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-20T02:01:54.600
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      : 4068692853891886976
2Mass ID (if available) : 17514527-2304482
ICRS Star Coord at Epoch: 17h 51m 45.27466s -23:04:48.22111s
RUWE (>1.4 is poor) : 0.95
K magnitude          : 9.476
G magnitude          : 14.316
RP magnitude         : 13.080
BP magnitude         : 16.011
DUPflag             : 0
Distance (au)       : 4.250
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 179.66
Sun-Moon sep (deg)  : 28.77
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.05
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (" ) : 6.293
C/A sky separation (km) : 19398.3
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
    
```

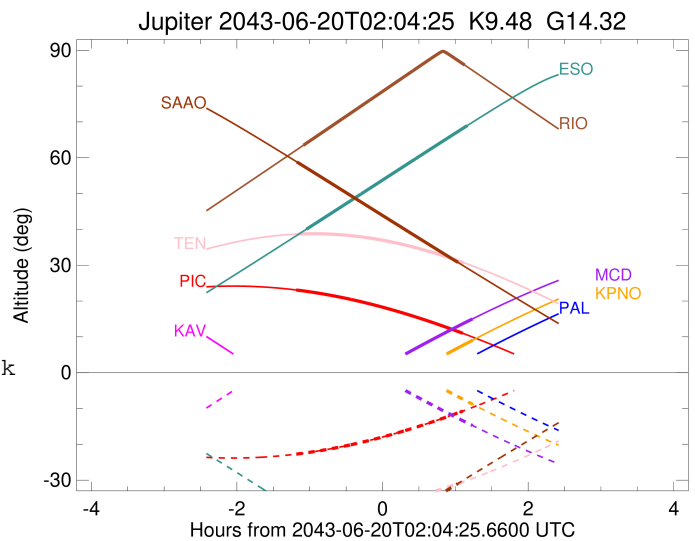
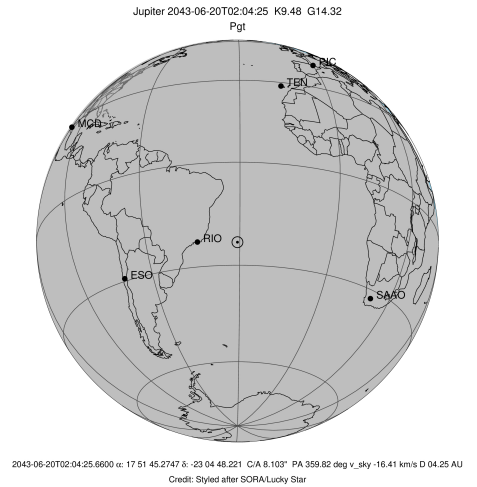


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-20T00:53:22.476	23.08	-22.73	71491.4	-15.78	-17.90
Jupiter	E	2043-06-20T03:10:39.514	10.98	-10.72	71491.4	-15.80	-17.92

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch              : 2043-06-20T02:10:00.610
Event type             : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code          : KPNO
Location               : Kitt Peak Natl Obs
Latitude (deg)         : 31.96333
E. Longitude (deg)     : 248.40000
Altitude (km)          : 2.120
Gaia source ID         : 4068692853891886976
2Mass ID (if available) : 17514527-2304482
ICRS Star Coord at Epoch: 17h 51m 45.27466s -23:04:48.22111s
RUWE (>1.4 is poor)  : 0.95
K magnitude             : 9.476
G magnitude             : 14.316
RP magnitude           : 13.080
BP magnitude           : 16.011
DUPflag                : 0
Distance (au)          : 4.250
f0 (km)                : 0.00
g0 (km)                : 0.00
skyplane vel. (km/s)   : -16.41
Sun-Target sep (deg)   : 179.66
Sun-Moon sep (deg)     : 27.60
B (ring opening deg)   : -2.42
PA of pole (deg)       : 0.05
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 6.950
C/A sky separation (km) : 21426.2
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
    
```

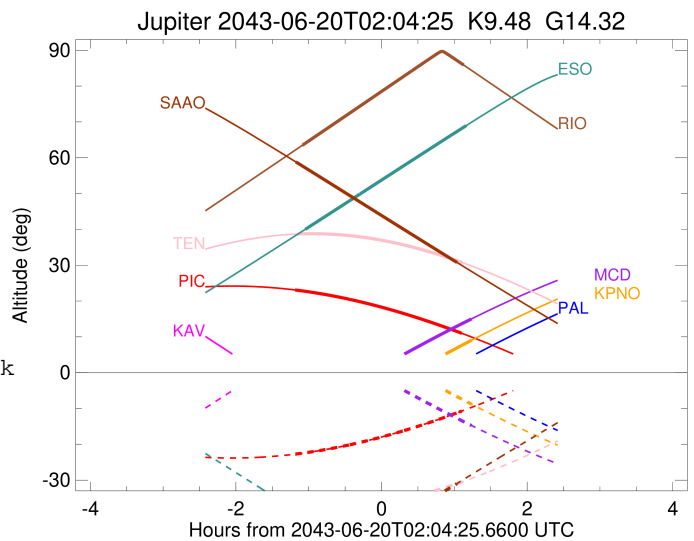
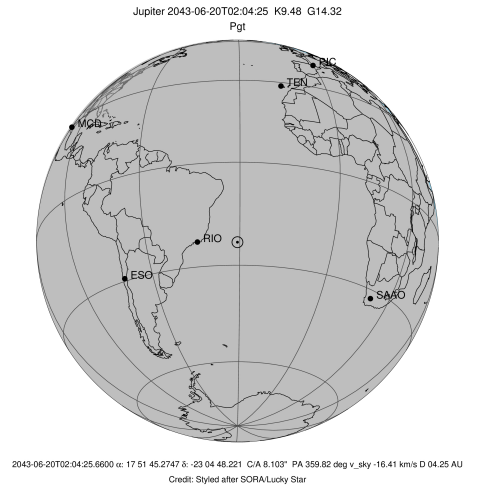


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-20T01:00:48.876	-17.43x	17.53x	71491.2	-18.19	-20.57
Jupiter	E	2043-06-20T03:18:42.842	9.06	-8.81	71491.3	-16.70	-18.92

```

target                : Jupiter
target radius (km)    : 71492.00
C/A epoch              : 2043-06-20T02:09:53.710
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        : 4068692853891886976
2Mass ID (if available) : 17514527-2304482
ICRS Star Coord at Epoch: 17h 51m 45.27466s -23:04:48.22111s
RUWE (>1.4 is poor)  : 0.95
K magnitude            : 9.476
G magnitude           : 14.316
RP magnitude          : 13.080
BP magnitude          : 16.011
DUPflag              : 0
Distance (au)         : 4.250
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -16.41
Sun-Target sep (deg)  : 179.66
Sun-Moon sep (deg)    : 27.66
B (ring opening deg)  : -2.42
PA of pole (deg)      : 0.05
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 6.896
C/A sky separation (km) : 21259.5
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
    
```

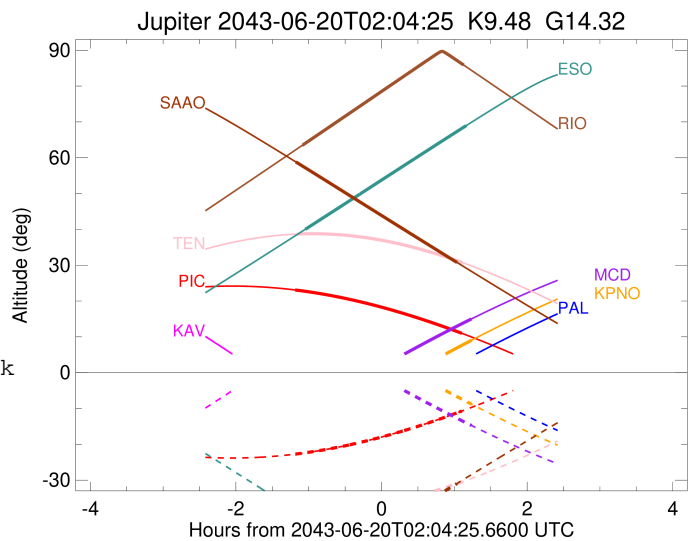
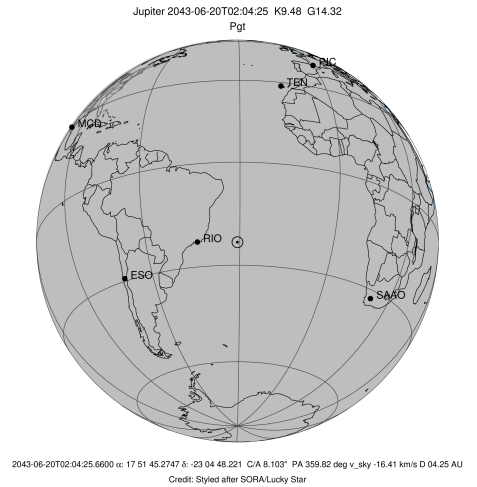


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-20T01:00:52.303	-10.87x	10.97x	71491.2	-18.05	-20.42
Jupiter	E	2043-06-20T03:18:26.463	14.98	-14.72	71491.3	-16.58	-18.79

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-20T02:02:58.290
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      : 4068692853891886976
2Mass ID (if available) : 17514527-2304482
ICRS Star Coord at Epoch: 17h 51m 45.27466s -23:04:48.22111s
RUWE (>1.4 is poor) : 0.95
K magnitude         : 9.476
G magnitude         : 14.316
RP magnitude        : 13.080
BP magnitude        : 16.011
DUPflag            : 0
Distance (au)       : 4.250
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 179.66
Sun-Moon sep (deg)  : 28.75
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.05
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (" ) : 6.503
C/A sky separation (km) : 20047.5
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
    
```

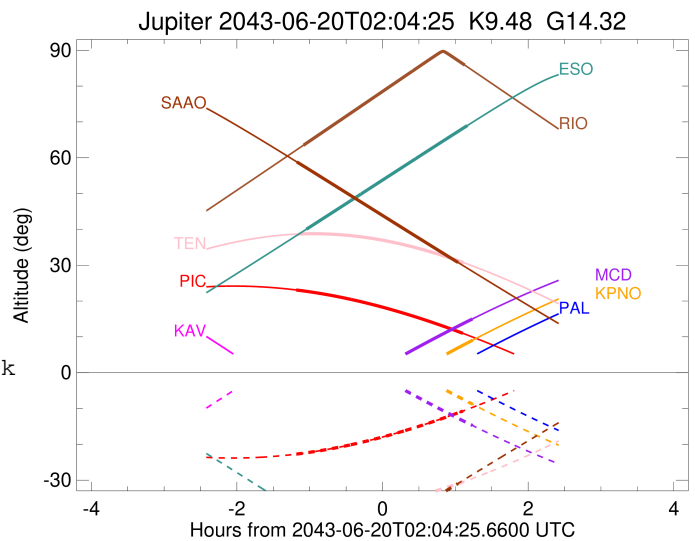
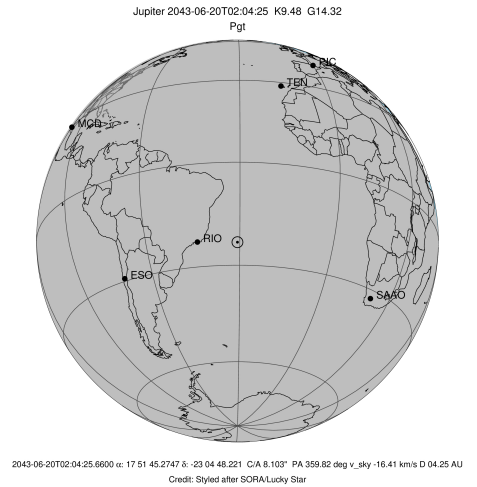


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-20T00:54:59.910	38.69	-38.35	71491.3	-16.44	-18.63
Jupiter	E	2043-06-20T03:11:03.857	30.73	-30.45	71491.4	-16.26	-18.43

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-20T02:05:44.120
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      : 4068692853891886976
2Mass ID (if available) : 17514527-2304482
ICRS Star Coord at Epoch: 17h 51m 45.27466s -23:04:48.22111s
RUWE (>1.4 is poor) : 0.95
K magnitude         : 9.476
G magnitude         : 14.316
RP magnitude        : 13.080
BP magnitude        : 16.011
DUPflag            : 0
Distance (au)       : 4.250
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 179.66
Sun-Moon sep (deg)  : 28.49
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.05
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (" ) : 8.093
C/A sky separation (km) : 24948.5
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
    
```

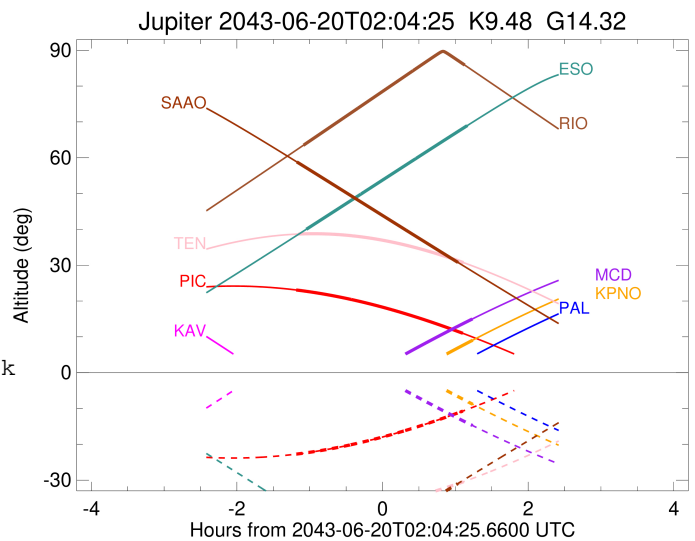
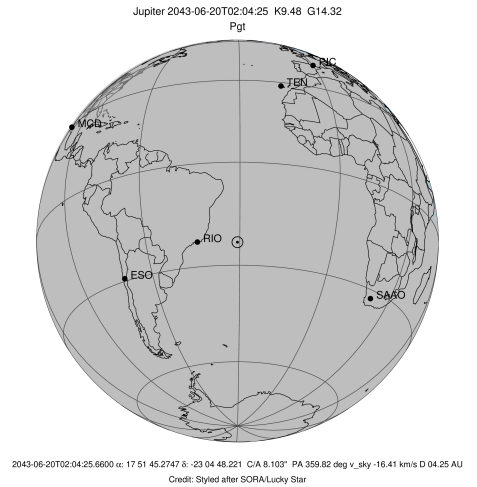


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-20T00:59:21.430	63.50	-63.59	71491.0	-20.82	-23.48
Jupiter	E	2043-06-20T03:12:00.671	85.89	-85.89	71491.0	-20.15	-22.74

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-20T02:08:09.460
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     : 4068692853891886976
2Mass ID (if available) : 17514527-2304482
ICRS Star Coord at Epoch: 17h 51m 45.27466s -23:04:48.22111s
RUWE (>1.4 is poor) : 0.95
K magnitude         : 9.476
G magnitude         : 14.316
RP magnitude        : 13.080
BP magnitude        : 16.011
DUPflag            : 0
Distance (au)      : 4.250
f0 (km)            : 0.00
g0 (km)            : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 179.66
Sun-Moon sep (deg) : 28.10
B (ring opening deg) : -2.42
PA of pole (deg)   : 0.05
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (" ) : 8.458
C/A sky separation (km) : 26072.5
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
    
```



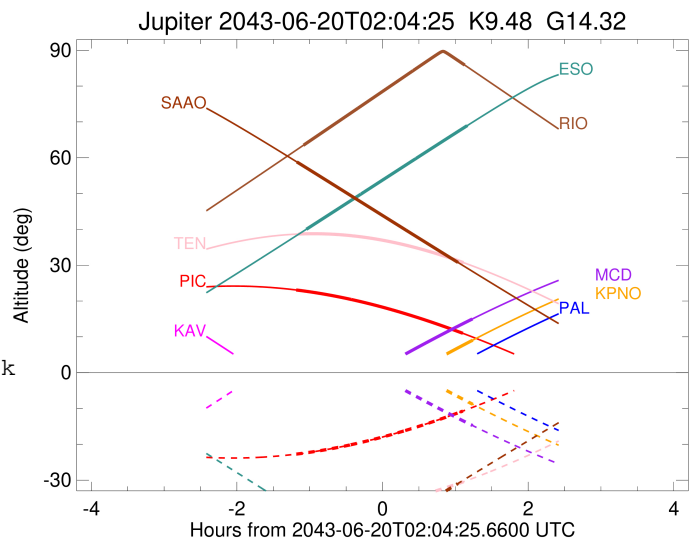
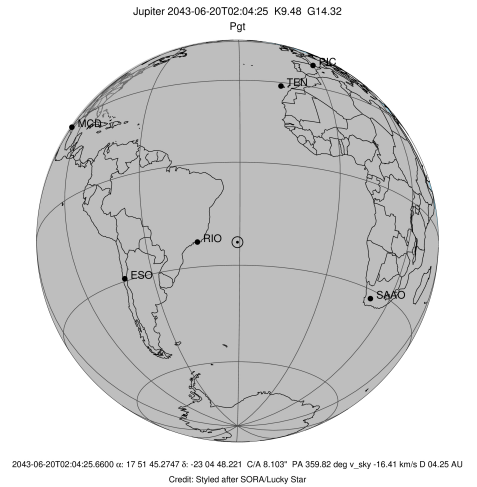
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-20T01:01:42.096	40.03	-40.21	71490.9	-21.99	-24.76
Jupiter	E	2043-06-20T03:14:19.151	68.97	-69.06	71491.0	-20.87	-23.54



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-20T02:00:01.390
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       : 4068692853891886976
2Mass ID (if available) : 17514527-2304482
ICRS Star Coord at Epoch: 17h 51m 45.27466s -23:04:48.22111s
RUWE (>1.4 is poor) : 0.95
K magnitude           : 9.476
G magnitude           : 14.316
RP magnitude          : 13.080
BP magnitude          : 16.011
DUPflag              : 0
Distance (au)         : 4.250
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 179.66
Sun-Moon sep (deg)   : 29.01
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.05
Pole direction: RA (deg): 268.05668
Dec (deg): 64.49732
C/A sky separation (") : 8.678
C/A sky separation (km) : 26753.2
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	2043-06-20T00:53:53.698	58.81	-58.89	71490.9	-21.82	-24.57
Jupiter	E	2043-06-20T03:06:30.247	30.79	-30.96	71490.9	-22.19	-24.97