

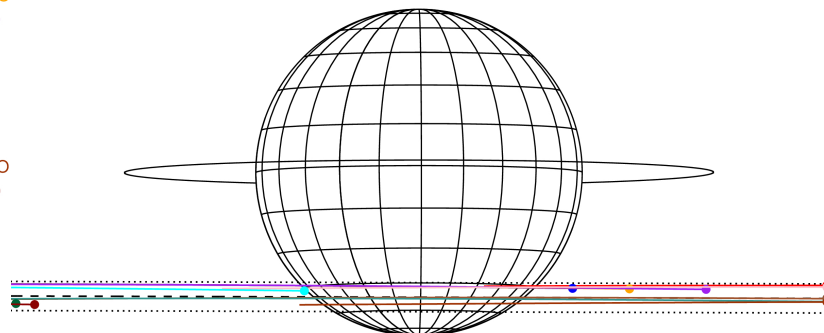
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-06-20T04:26:02.230
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068693060050294528
 2Mass ID (if available) : 17514201-2304577

Jupiter 2043-06-20T04:26:02 K8.80 G14.83 Pgt

ICRS Star Coord at Epoch: 17h 51m 41.99867s -23:04:57.98881s
 RUWE (>1.4 is poor) : 0.95
 K magnitude : 8.804
 G magnitude : 14.828
 RP magnitude : 13.388
 BP magnitude : 17.547
 DUPflag : 0
 Distance (au) : 4.250
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -16.41
 Sun-Target sep (deg) : 179.65
 Sun-Moon sep (deg) : 27.07
 B (ring opening deg) : -2.42
 PA of pole (deg) : 0.06
 Pole direction: RA (deg): 268.05669
 Dec (deg): 64.49732
 C/A sky separation (") : 17.722
 C/A sky separation (km) : 54631.3
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk



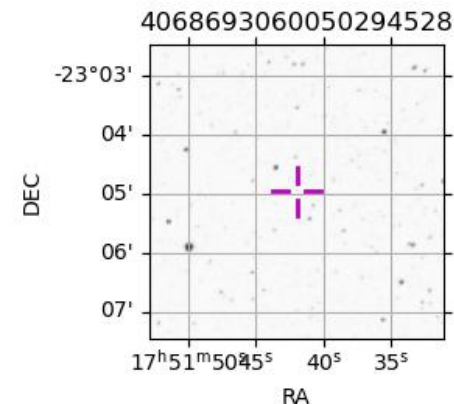
Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO
 AAT
 SAAO
 MSO



2043-06-20T04:26:02.2300 a: 17 51 41.9987 d: -23 04 57.9889 C/A ***** PA 359.83 deg v_sky -16.41 km/s D 04.25 AU
 Credit: Styled after SORA/Lucky Star

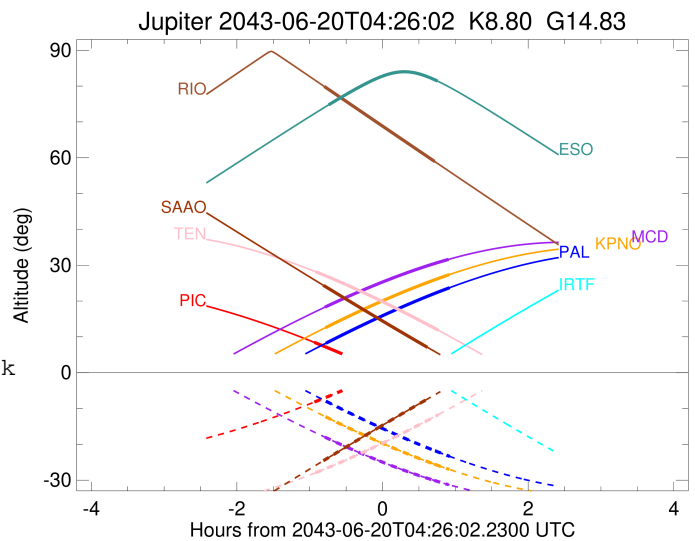
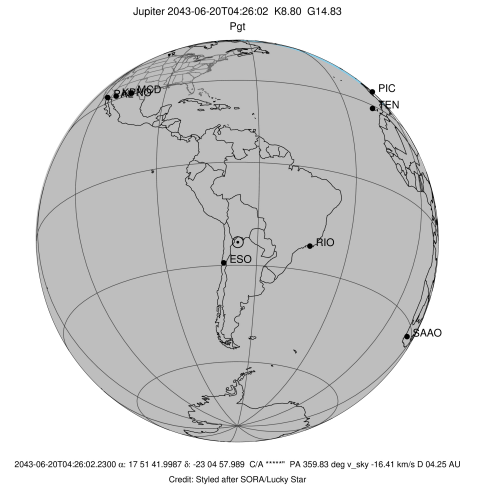
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	JUN 20 03:29 - JUN 20 03:29	Pin
PAL	Palomar Mt (200")	33.4	243.1	+ +	JUN 20 03:39 - JUN 20 05:21	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JUN 20 03:39 - JUN 20 05:21	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JUN 20 03:38 - JUN 20 05:20	Pie
TEN	Teide Obs./Tenerife	28.3	343.5	+ +	JUN 20 03:30 - JUN 20 05:12	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 03:38 - JUN 20 05:09	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUN 20 03:41 - JUN 20 05:11	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	JUN 20 03:37 - JUN 20 05:03	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-20T04:21:18.760
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        : 4068693060050294528
2Mass ID (if available) : 17514201-2304577
ICRS Star Coord at Epoch: 17h 51m 41.99867s -23:04:57.98881s
RUWE (>1.4 is poor) : 0.95
K magnitude           : 8.804
G magnitude           : 14.828
RP magnitude          : 13.388
BP magnitude          : 17.547
DUPflag              : 0
Distance (au)         : 4.250
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg)  : 179.65
Sun-Moon sep (deg)    : 27.70
B (ring opening deg) : -2.42
PA of pole (deg)      : 0.06
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 16.193
C/A sky separation (km) : 49917.2
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
    
```

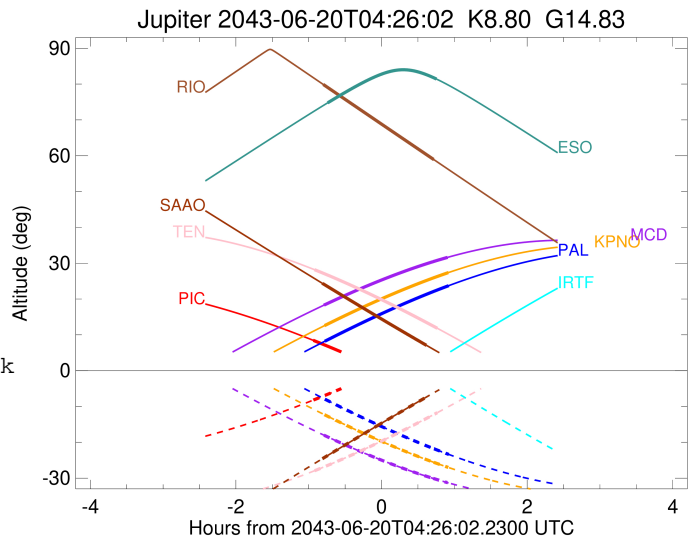
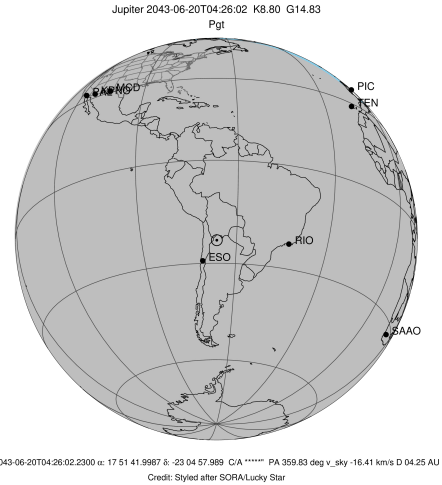


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-20T03:29:55.244	8.45	-8.20	71488.1	-44.07	-47.78
Jupiter	E	2043-06-20T05:12:55.615	-7.31x	7.46x	71488.1	-44.45	-48.16

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-20T04:30:28.200
Event type           : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code        : PAL
Location             : Palomar Mt (200")
Latitude (deg)       : 33.35622
E. Longitude (deg)   : 243.13601
Altitude (km)        : 1.706
Gaia source ID       : 4068693060050294528
2Mass ID (if available) : 17514201-2304577
ICRS Star Coord at Epoch: 17h 51m 41.99867s -23:04:57.98881s
RUWE (>1.4 is poor) : 0.95
K magnitude          : 8.804
G magnitude          : 14.828
RP magnitude         : 13.388
BP magnitude         : 17.547
DUPflag             : 0
Distance (au)        : 4.250
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 179.65
Sun-Moon sep (deg)   : 26.77
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.06
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 16.231
C/A sky separation (km): 50035.0
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
    
```

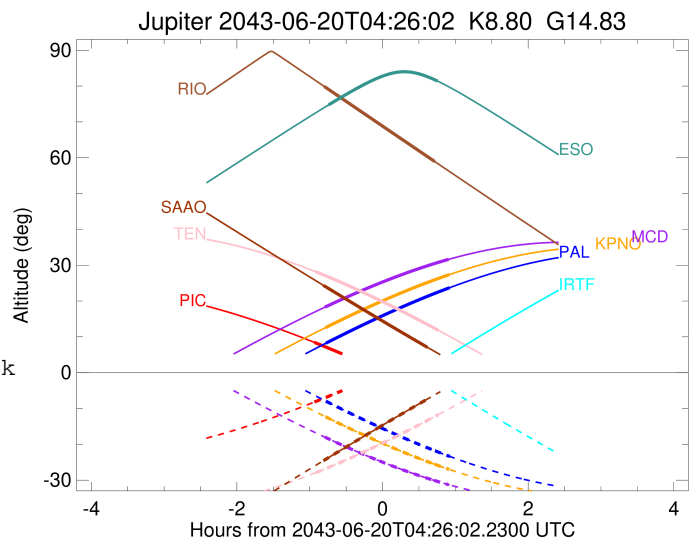
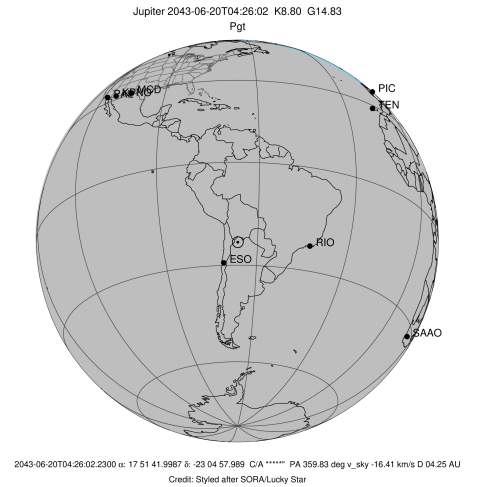


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-20T03:39:20.135	8.21	-7.94	71488.0	-45.03	-48.73
Jupiter	E	2043-06-20T05:21:23.942	23.72	-23.37	71488.1	-43.79	-47.51

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-20T04:30:10.140
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        : 4068693060050294528
2Mass ID (if available) : 17514201-2304577
ICRS Star Coord at Epoch: 17h 51m 41.99867s -23:04:57.98881s
RUWE (>1.4 is poor) : 0.95
K magnitude           : 8.804
G magnitude           : 14.828
RP magnitude          : 13.388
BP magnitude          : 17.547
DUPflag              : 0
Distance (au)         : 4.250
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 179.65
Sun-Moon sep (deg)   : 26.83
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.06
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 16.218
C/A sky separation (km) : 49994.5
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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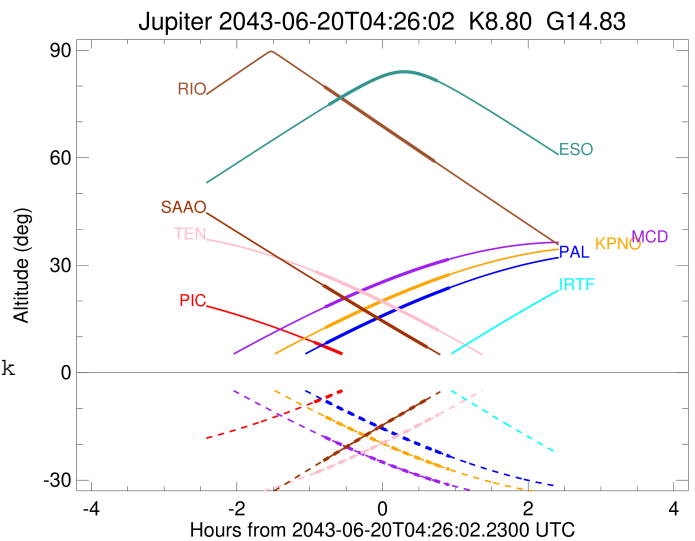
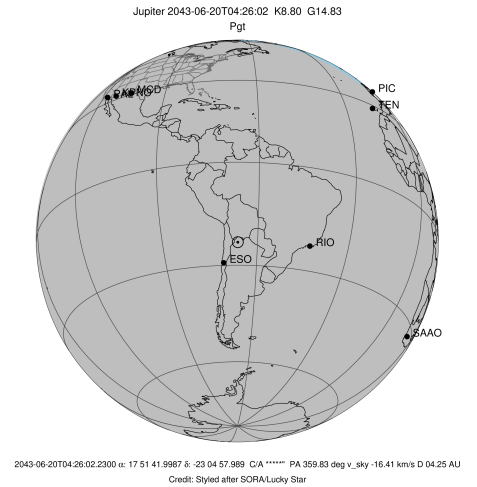


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-20T03:39:05.817	12.57	-12.30	71488.0	-44.96	-48.66
Jupiter	E	2043-06-20T05:21:03.022	27.36	-27.00	71488.2	-43.78	-47.49

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-20T04:29:37.620
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        : 4068693060050294528
2Mass ID (if available) : 17514201-2304577
ICRS Star Coord at Epoch: 17h 51m 41.99867s -23:04:57.98881s
RUWE (>1.4 is poor) : 0.95
K magnitude           : 8.804
G magnitude           : 14.828
RP magnitude          : 13.388
BP magnitude          : 17.547
DUPflag              : 0
Distance (au)         : 4.250
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg)  : 179.65
Sun-Moon sep (deg)    : 26.93
B (ring opening deg) : -2.42
PA of pole (deg)      : 0.06
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 16.189
C/A sky separation (km) : 49907.7
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
    
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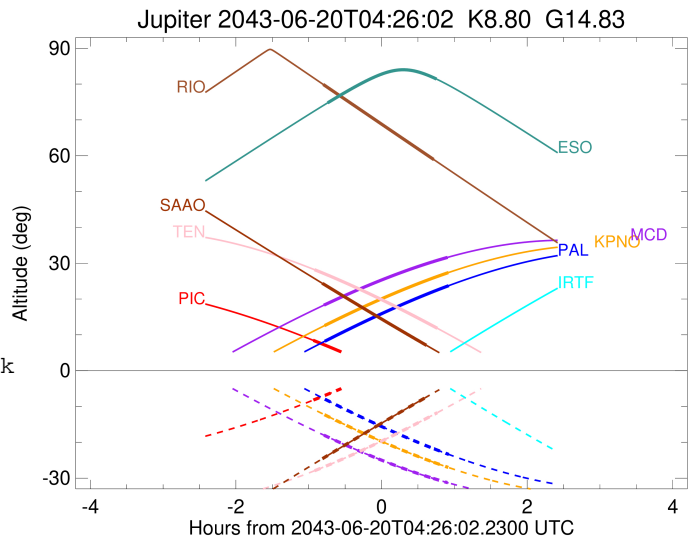
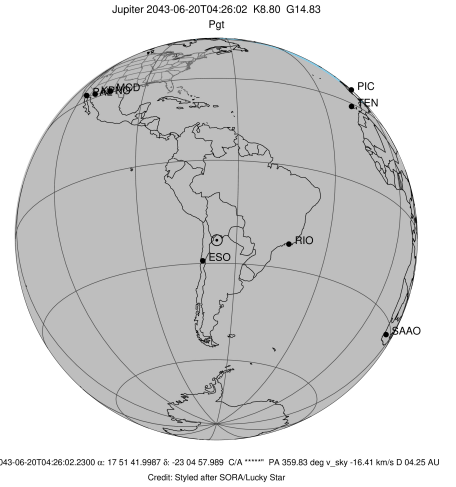


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-20T03:38:36.071	18.29	-18.00	71488.0	-44.82	-48.52
Jupiter	E	2043-06-20T05:20:29.259	31.62	-31.26	71488.2	-43.74	-47.45

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-20T04:21:20.880
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      : 4068693060050294528
2Mass ID (if available) : 17514201-2304577
ICRS Star Coord at Epoch: 17h 51m 41.99867s -23:04:57.98881s
RUWE (>1.4 is poor) : 0.95
K magnitude          : 8.804
G magnitude          : 14.828
RP magnitude         : 13.388
BP magnitude         : 17.547
DUPflag             : 0
Distance (au)       : 4.250
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 179.65
Sun-Moon sep (deg)  : 27.83
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.06
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (" ) : 16.362
C/A sky separation (km) : 50440.0
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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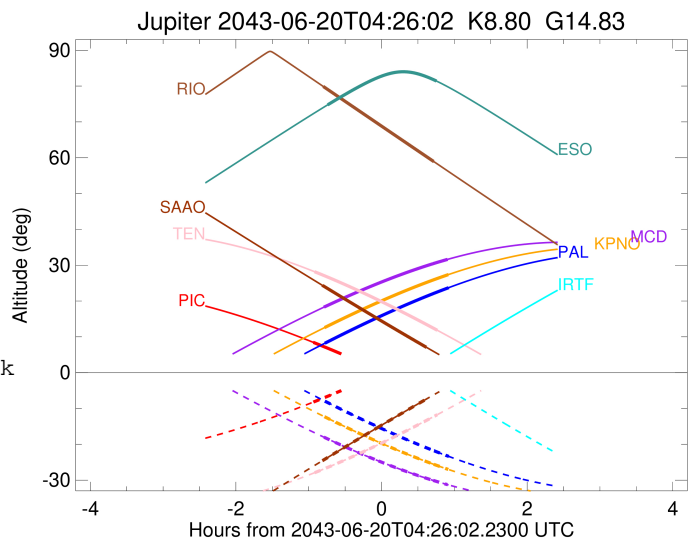
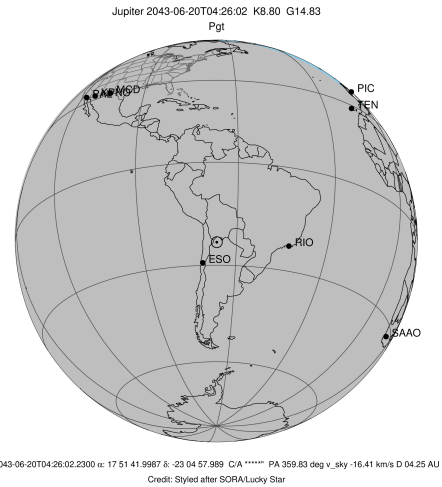


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-20T03:30:52.475	28.18	-27.93	71488.0	-44.68	-48.38
Jupiter	E	2043-06-20T05:12:01.958	11.83	-11.72	71488.0	-45.05	-48.76

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-20T04:23:32.580
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      : 4068693060050294528
2Mass ID (if available) : 17514201-2304577
ICRS Star Coord at Epoch: 17h 51m 41.99867s -23:04:57.98881s
RUWE (>1.4 is poor) : 0.95
K magnitude          : 8.804
G magnitude          : 14.828
RP magnitude         : 13.388
BP magnitude         : 17.547
DUPflag             : 0
Distance (au)       : 4.250
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 179.65
Sun-Moon sep (deg)  : 27.74
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.06
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 17.772
C/A sky separation (km) : 54785.2
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
    
```

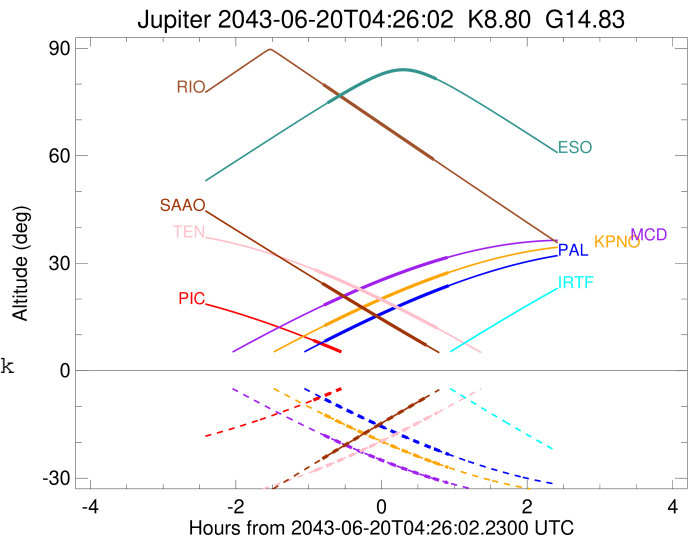
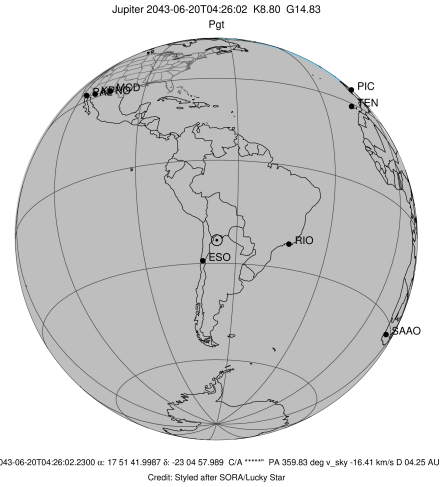


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-20T03:38:05.722	79.87	-79.93	71487.3	-50.02	-53.61
Jupiter	E	2043-06-20T05:09:04.885	58.93	-59.09	71487.3	-50.02	-53.60

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-20T04:26:30.300
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      : 4068693060050294528
2Mass ID (if available) : 17514201-2304577
ICRS Star Coord at Epoch: 17h 51m 41.99867s -23:04:57.98881s
RUWE (>1.4 is poor) : 0.95
K magnitude          : 8.804
G magnitude          : 14.828
RP magnitude         : 13.388
BP magnitude         : 17.547
DUPflag             : 0
Distance (au)       : 4.250
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 179.65
Sun-Moon sep (deg)  : 27.41
B (ring opening deg) : -2.42
PA of pole (deg)    : 0.06
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 17.939
C/A sky separation (km) : 55301.3
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
    
```

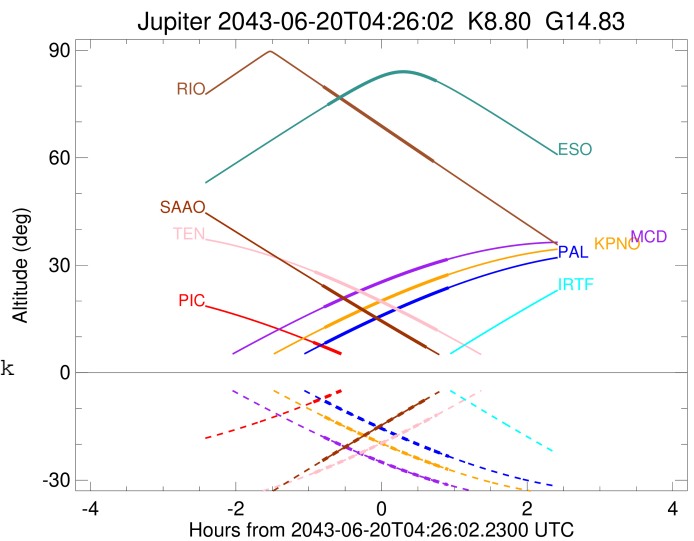
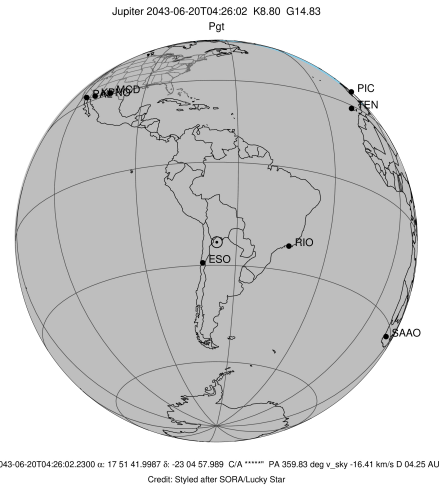


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-20T03:41:38.851	74.75	-74.85	71487.2	-50.93	-54.48
Jupiter	E	2043-06-20T05:11:20.806	81.39	-81.72	71487.2	-50.41	-53.98


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-20T04:20:03.120
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       : 4068693060050294528
2Mass ID (if available) : 17514201-2304577
ICRS Star Coord at Epoch: 17h 51m 41.99867s -23:04:57.98881s
RUWE (>1.4 is poor) : 0.95
K magnitude          : 8.804
G magnitude          : 14.828
RP magnitude         : 13.388
BP magnitude         : 17.547
DUPflag             : 0
Distance (au)        : 4.250
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 179.65
Sun-Moon sep (deg)   : 27.78
B (ring opening deg) : -2.42
PA of pole (deg)     : 0.06
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 18.696
C/A sky separation (km) : 57635.0
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	2043-06-20T03:37:17.232	24.38	-24.58	71486.8	-53.36	-56.81
Jupiter	E	2043-06-20T05:03:00.849	7.08	-7.37	71486.7	-53.97	-57.39