

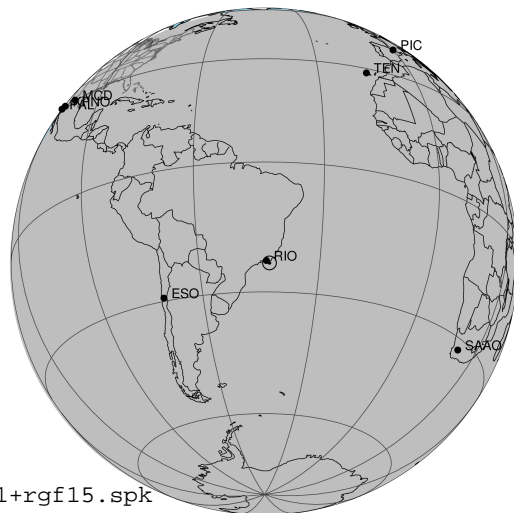
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2043-06-21T02:51:30.540
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068703922140186496
 2Mass ID (if available) : 17511085-2304311

Jupiter 2043-06-21T02:51:30 K7.75 G14.45 Pgt

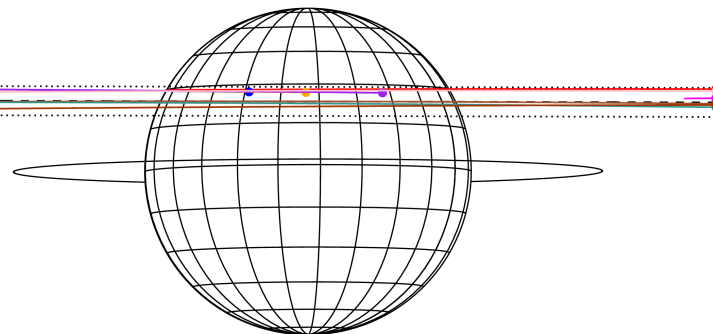
ICRS Star Coord at Epoch: 17h 51m 10.85031s -23°04'31.44466s

RUWE (>1.4 is poor) : 0.86
 K magnitude : 7.745
 G magnitude : 14.445
 RP magnitude : 12.864
 BP magnitude : 18.174
 DUPflag : 0
 Distance (au) : 4.250
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -16.41
 Sun-Target sep (deg) : 178.84
 Sun-Moon sep (deg) : 16.18
 B (ring opening deg) : -2.43
 PA of pole (deg) : 0.11
 Pole direction: RA (deg): 268.05669
 Dec (deg): 64.49732
 C/A sky separation (") : 9.954
 C/A sky separation (km) : 30682.5
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2043-06-21T02:51:30 K7.75 G14.45
 Pgt



Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 KAV
 RIO
 ESO
 SAAO

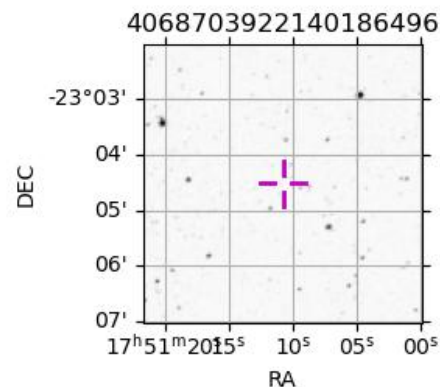


2043-06-21T02:51:30.5400 at: 17 51 10.8503 s: -23 04 31.445 C/A 9.942" PA 179.87 deg v_sky -16.41 km/s D 04.25 AU

Credit: Styled after SORA/Lucky Star

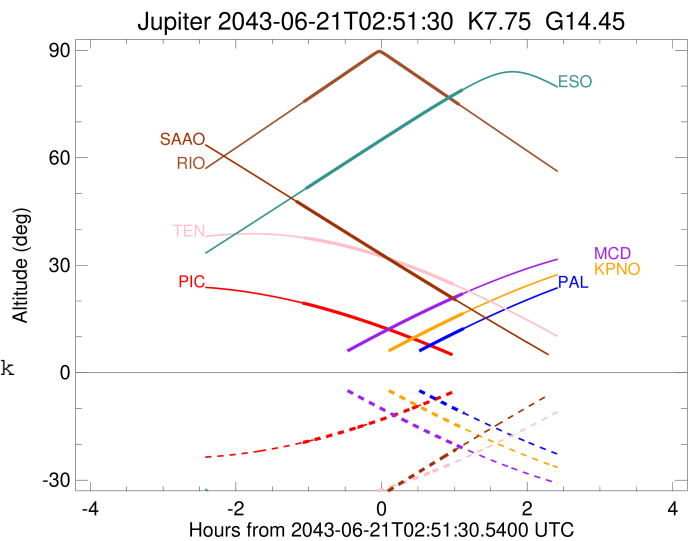
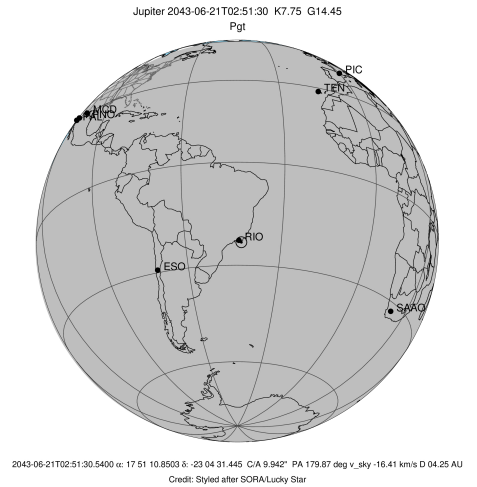
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	JUN 21 01:46 - JUN 21 01:46	Pin
PAL	Palomar Mt (200")	33.4	243.1	+	JUN 21 03:59 - JUN 21 03:59	Pne
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	JUN 21 03:59 - JUN 21 03:59	Pne
MCD	McDonald Obs. 2.7m	30.7	256.0	+	JUN 21 03:58 - JUN 21 03:58	Pne
TEN	Teide Obs./Tenerife	28.3	343.5	+	JUN 21 01:47 - JUN 21 03:50	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 21 01:47 - JUN 21 03:55	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	JUN 21 01:49 - JUN 21 03:58	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	JUN 21 01:41 - JUN 21 03:53	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-06-21T02:48:25.990
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        : 4068703922140186496
2Mass ID (if available) : 17511085-2304311
ICRS Star Coord at Epoch: 17h 51m 10.85031s -23:04:31.44466s
RUWE (>1.4 is poor) : 0.86
K magnitude           : 7.745
G magnitude           : 14.445
RP magnitude          : 12.864
BP magnitude          : 18.174
DUPflag              : 0
Distance (au)         : 4.250
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg)  : 178.84
Sun-Moon sep (deg)    : 16.89
B (ring opening deg) : -2.43
PA of pole (deg)      : 0.11
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 11.672
C/A sky separation (km) : 35980.3
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
    
```

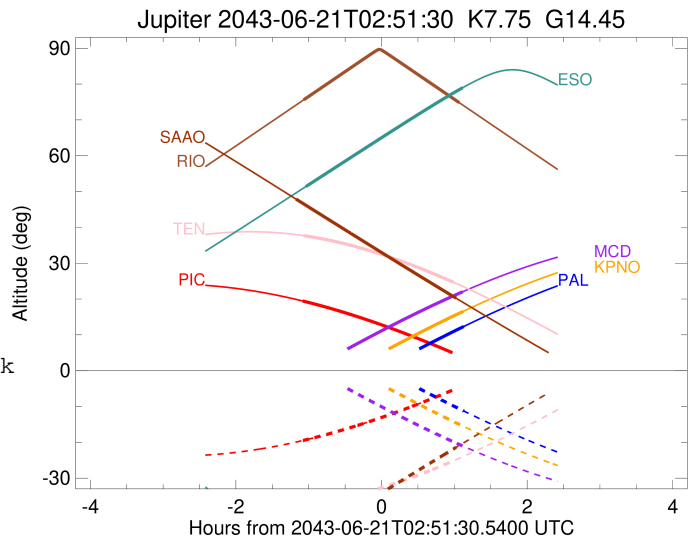
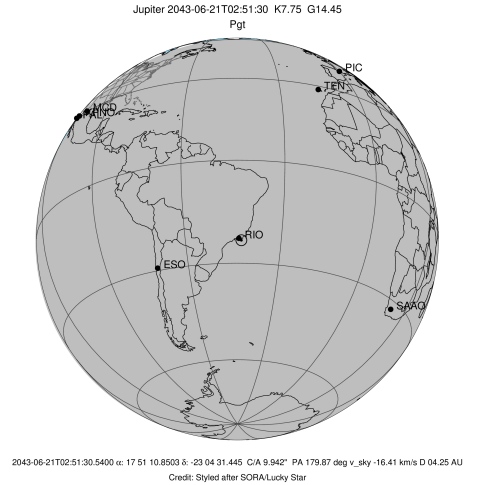


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-21T01:46:41.523	19.44	-19.49	71490.0	30.22	33.60
Jupiter	E	2043-06-21T03:50:24.238	4.94x	-5.39	71490.0	30.07	33.44

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-21T02:56:19.750
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      : 4068703922140186496
2Mass ID (if available) : 17511085-2304311
ICRS Star Coord at Epoch: 17h 51m 10.85031s -23:04:31.44466s
RUWE (>1.4 is poor) : 0.86
K magnitude          : 7.745
G magnitude          : 14.445
RP magnitude         : 12.864
BP magnitude         : 18.174
DUPflag             : 0
Distance (au)       : 4.250
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 178.84
Sun-Moon sep (deg)  : 15.69
B (ring opening deg) : -2.43
PA of pole (deg)    : 0.11
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 11.216
C/A sky separation (km) : 34573.4
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
    
```

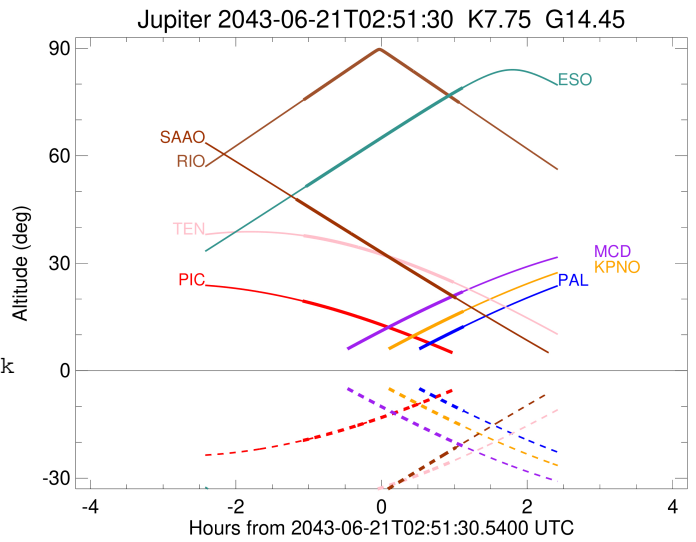
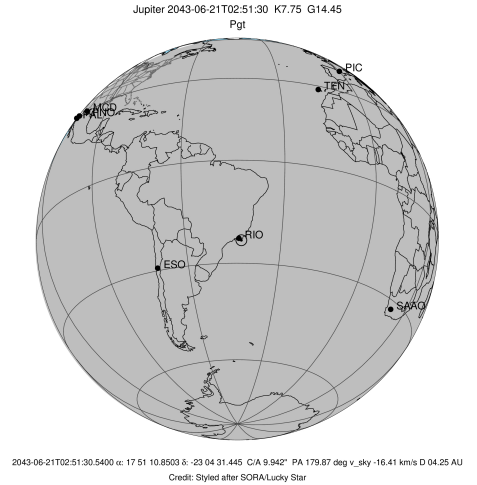


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-21T01:53:01.238	-10.73x	11.81x	71490.2	28.13	31.39
Jupiter	E	2043-06-21T03:59:15.573	12.33	-11.26	71490.0	29.60	32.95

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-21T02:56:14.320
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      : 4068703922140186496
2Mass ID (if available) : 17511085-2304311
ICRS Star Coord at Epoch: 17h 51m 10.85031s -23:04:31.44466s
RUWE (>1.4 is poor) : 0.86
K magnitude          : 7.745
G magnitude          : 14.445
RP magnitude         : 12.864
BP magnitude         : 18.174
DUPflag             : 0
Distance (au)       : 4.250
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 178.84
Sun-Moon sep (deg)  : 15.73
B (ring opening deg) : -2.43
PA of pole (deg)    : 0.11
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (" ) : 11.239
C/A sky separation (km) : 34645.2
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
    
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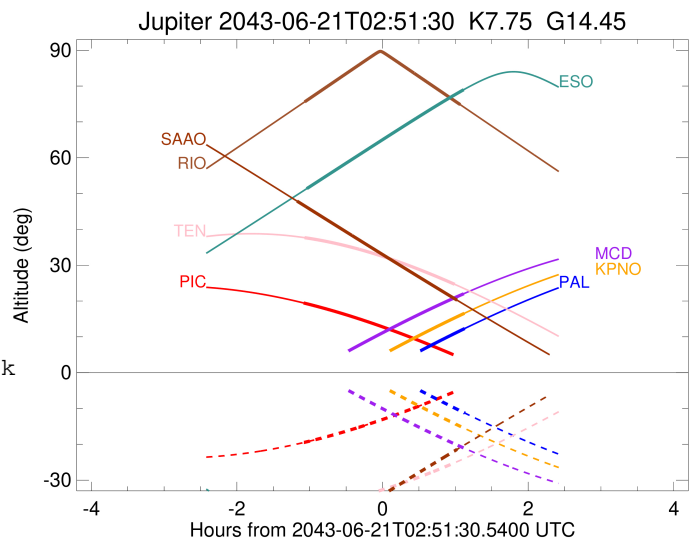
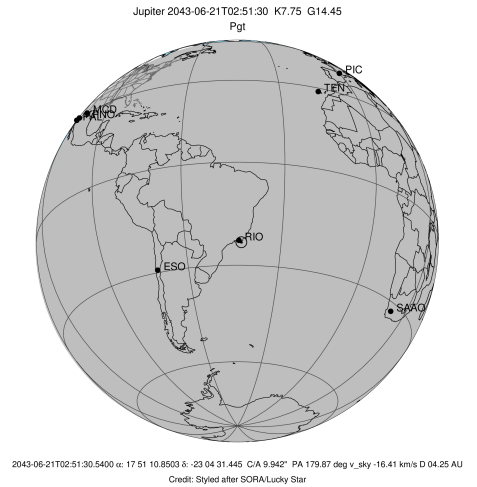


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-21T01:53:06.325	-6.07x	7.15x	71490.2	28.20	31.46
Jupiter	E	2043-06-21T03:59:00.223	16.57	-15.53	71490.0	29.65	33.00

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-21T02:55:59.470
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       : 4068703922140186496
2Mass ID (if available) : 17511085-2304311
ICRS Star Coord at Epoch: 17h 51m 10.85031s -23:04:31.44466s
RUWE (>1.4 is poor) : 0.86
K magnitude           : 7.745
G magnitude           : 14.445
RP magnitude         : 12.864
BP magnitude         : 18.174
DUPflag              : 0
Distance (au)        : 4.250
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 178.84
Sun-Moon sep (deg)   : 15.79
B (ring opening deg) : -2.43
PA of pole (deg)     : 0.11
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 11.287
C/A sky separation (km) : 34793.8
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
    
```

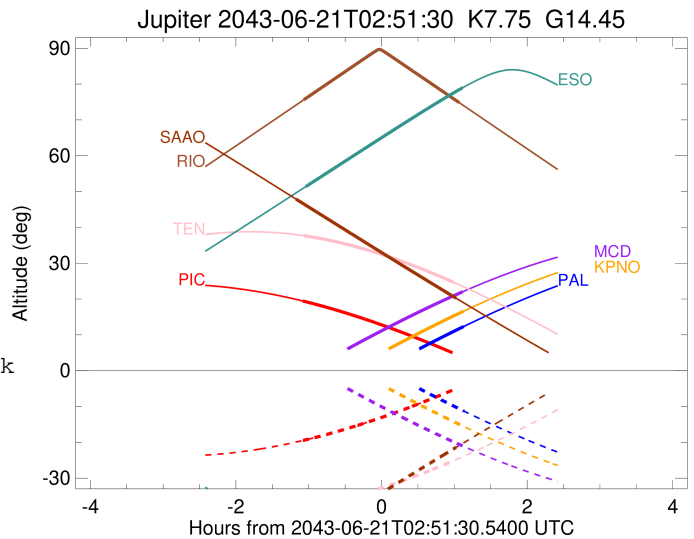
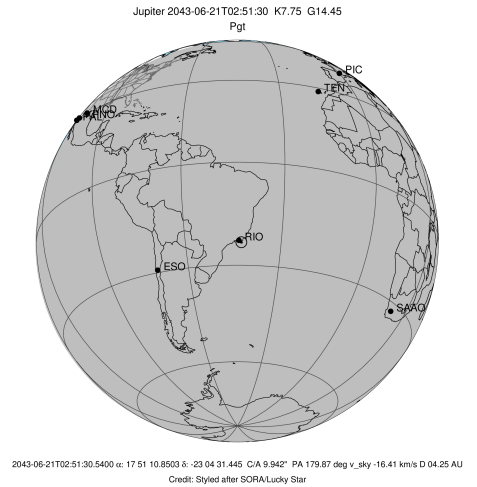


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-21T01:53:07.792	0.34x	0.73x	71490.2	28.36	31.63
Jupiter	E	2043-06-21T03:58:30.446	22.04	-21.03	71490.0	29.75	33.11

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-21T02:49:04.970
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       : 4068703922140186496
2Mass ID (if available) : 17511085-2304311
ICRS Star Coord at Epoch: 17h 51m 10.85031s -23:04:31.44466s
RUWE (>1.4 is poor) : 0.86
K magnitude          : 7.745
G magnitude          : 14.445
RP magnitude         : 12.864
BP magnitude         : 18.174
DUPflag             : 0
Distance (au)        : 4.250
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 178.84
Sun-Moon sep (deg)   : 16.86
B (ring opening deg) : -2.43
PA of pole (deg)     : 0.11
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 11.485
C/A sky separation (km): 35403.1
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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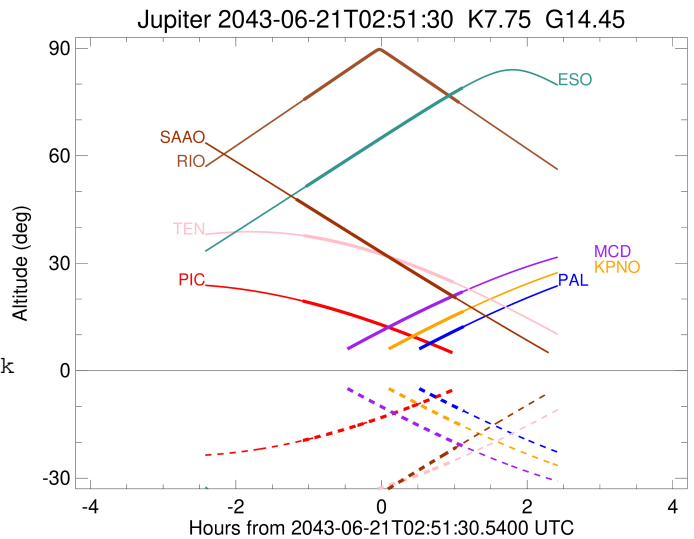
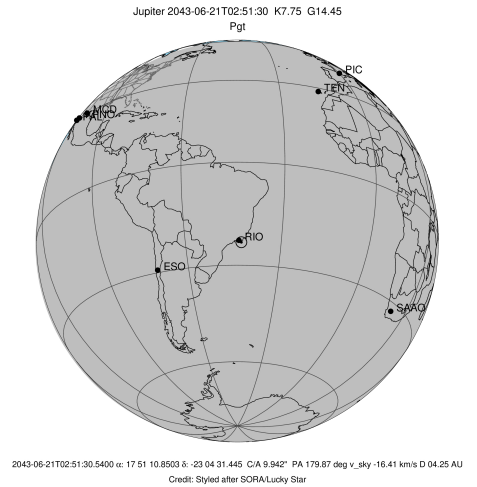


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-21T01:47:24.108	37.68	-37.55	71490.0	29.60	32.94
Jupiter	E	2043-06-21T03:50:56.617	24.67	-25.14	71490.0	29.58	32.93

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-21T02:51:28.370
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      : 4068703922140186496
2Mass ID (if available) : 17511085-2304311
ICRS Star Coord at Epoch: 17h 51m 10.85031s -23:04:31.44466s
RUWE (>1.4 is poor) : 0.86
K magnitude          : 7.745
G magnitude          : 14.445
RP magnitude         : 12.864
BP magnitude         : 18.174
DUPflag             : 0
Distance (au)       : 4.250
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 178.84
Sun-Moon sep (deg)  : 16.45
B (ring opening deg) : -2.43
PA of pole (deg)    : 0.11
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 9.965
C/A sky separation (km): 30718.7
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
    
```

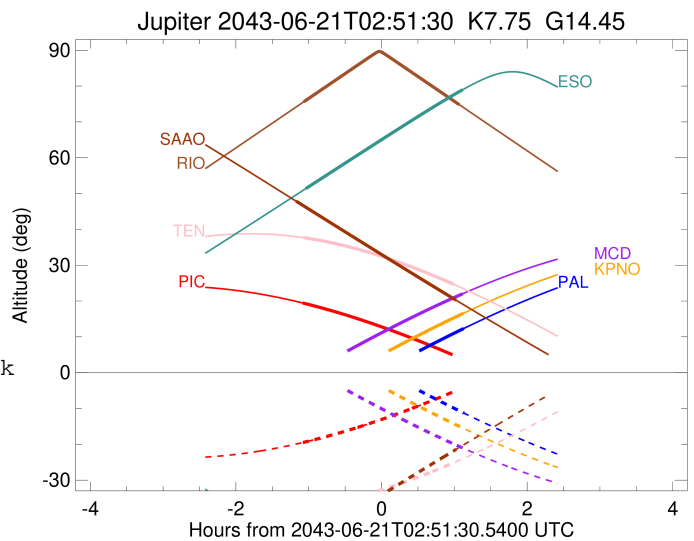
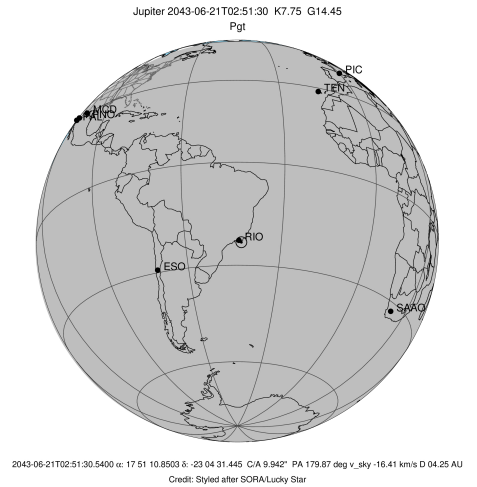


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-21T01:47:30.303	75.62	-74.57	71490.6	25.11	28.15
Jupiter	E	2043-06-21T03:55:26.780	74.84	-76.00	71490.5	25.57	28.64


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-21T02:53:54.880
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      : 4068703922140186496
2Mass ID (if available) : 17511085-2304311
ICRS Star Coord at Epoch: 17h 51m 10.85031s -23:04:31.44466s
RUWE (>1.4 is poor) : 0.86
K magnitude          : 7.745
G magnitude          : 14.445
RP magnitude         : 12.864
BP magnitude         : 18.174
DUPflag             : 0
Distance (au)       : 4.250
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 178.84
Sun-Moon sep (deg)  : 16.04
B (ring opening deg) : -2.43
PA of pole (deg)    : 0.11
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 9.668
C/A sky separation (km) : 29803.0
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
    
```

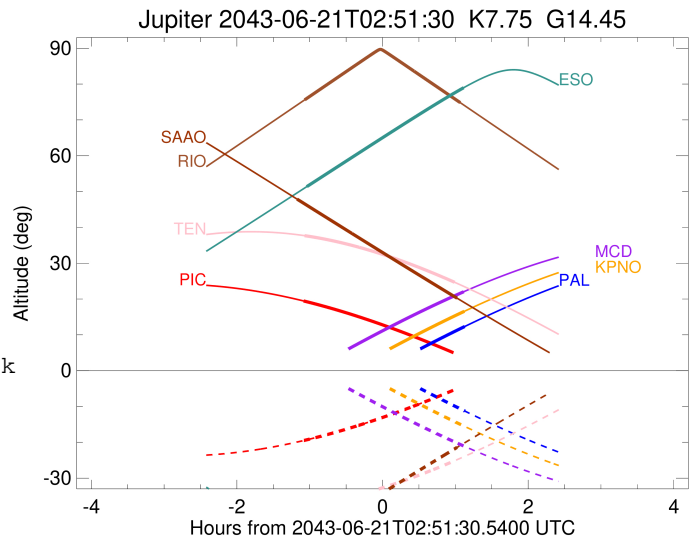
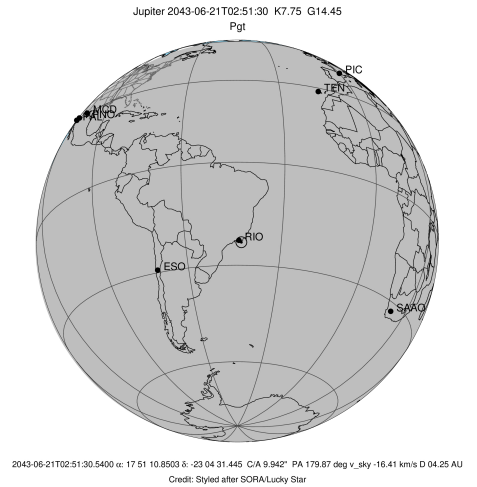


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-06-21T01:49:11.207	51.39	-50.49	71490.7	24.07	27.02
Jupiter	E	2043-06-21T03:58:27.135	78.99	-78.21	71490.6	25.02	28.05


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-06-21T02:46:52.350
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      : 4068703922140186496
2Mass ID (if available) : 17511085-2304311
ICRS Star Coord at Epoch: 17h 51m 10.85031s -23:04:31.44466s
RUWE (>1.4 is poor) : 0.86
K magnitude          : 7.745
G magnitude          : 14.445
RP magnitude         : 12.864
BP magnitude         : 18.174
DUPflag             : 0
Distance (au)       : 4.250
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -16.41
Sun-Target sep (deg) : 178.84
Sun-Moon sep (deg)  : 16.87
B (ring opening deg) : -2.43
PA of pole (deg)    : 0.11
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation ("): 9.238
C/A sky separation (km): 28475.7
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
    
```



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	2043-06-21T01:41:08.215	47.87	-48.98	71490.7	23.65	26.56
Jupiter	E	2043-06-21T03:53:00.211	20.22	-21.41	71490.8	23.18	26.06