

target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2043-07-02T05:32:33.070  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4068845243731008128  
 2Mass ID (if available) : 17450680-2304470

Jupiter 2043-07-02T05:32:33 K8.86 G14.32 Pgt

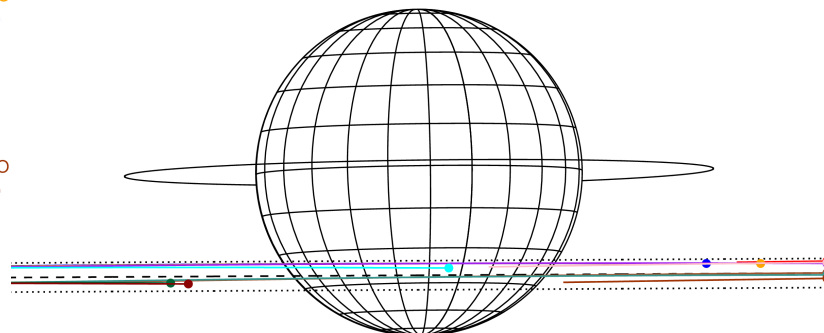
ICRS Star Coord at Epoch: 17h 45m 06.79869s -23:04:47.13080s

RUWE (>1.4 is poor) : 1.05  
 K magnitude : 8.859  
 G magnitude : 14.322  
 RP magnitude : 12.942  
 BP magnitude : 16.622  
 DUPflag : 0  
 Distance (au) : 4.267  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -15.69  
 Sun-Target sep (deg) : 166.90  
 Sun-Moon sep (deg) : 130.80  
 B (ring opening deg) : -2.41  
 PA of pole (deg) : 0.77  
 Pole direction: RA (deg): 268.05669  
 Dec (deg): 64.49732  
 C/A sky separation (") : 14.547  
 C/A sky separation (km) : 45018.6  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2043-07-02T05:32:33 K8.86 G14.32  
 Pgt



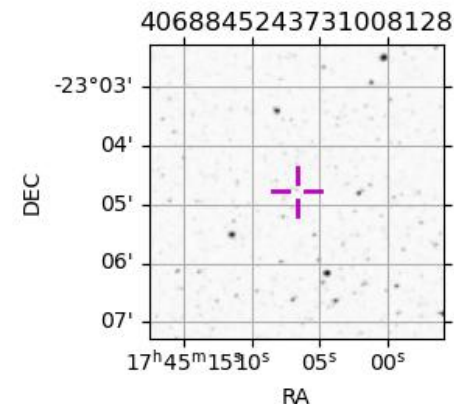
Earth  
 PIC  
 PAL  
 KPNO  
 MCD  
 TEN  
 IRTF  
 RIO  
 ESO  
 AAT  
 SAAO  
 MSO



2043-07-02T05:32:33.0700 α: 17 45 06.7987 δ: -23 04 47.131 C/A \*\*\*\*\* PA 0.32 deg v\_sky -15.69 km/s D 04.27 AU  
 Credit: Styled after SORA/Lucky Star

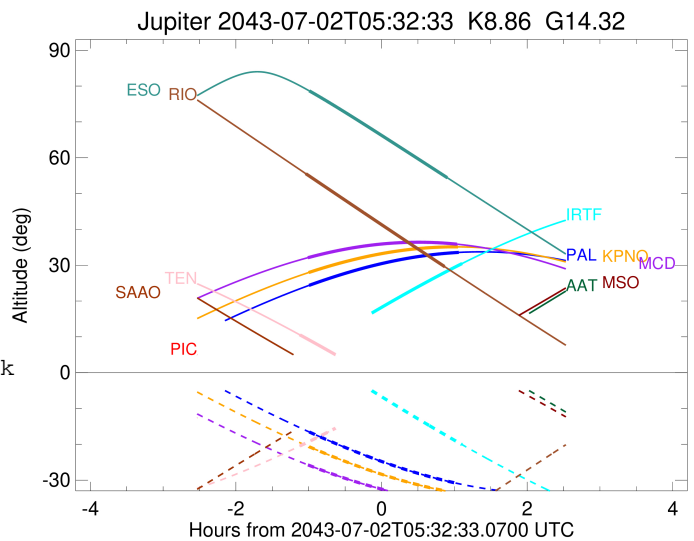
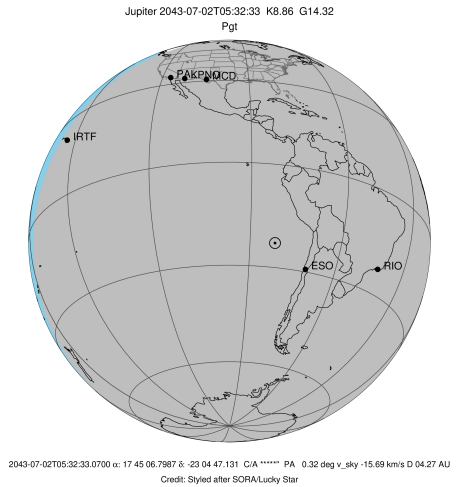
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1			Pnn
PAL	Palomar Mt (200")	33.4	243.1	+ +	JUL 02 04:32 - JUL 02 06:36	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	JUL 02 04:32 - JUL 02 06:35	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	JUL 02 04:31 - JUL 02 06:34	Pie
TEN	Teide Obs./Tenerife	28.3	343.5	+	JUL 02 04:25 - JUL 02 04:25	Pin
IRTF	Mauna Kea/IRTF	19.8	204.5	+	JUL 02 06:38 - JUL 02 06:38	Pne
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+ +	JUL 02 04:30 - JUL 02 06:24	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	JUL 02 04:33 - JUL 02 06:26	Pie
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-02T05:34:37.760
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      : 4068845243731008128
2Mass ID (if available) : 17450680-2304470
ICRS Star Coord at Epoch: 17h 45m 06.79869s -23:04:47.13080s
RUWE (>1.4 is poor) : 1.05
K magnitude         : 8.859
G magnitude         : 14.322
RP magnitude        : 12.942
BP magnitude        : 16.622
DUPflag            : 0
Distance (au)       : 4.267
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -15.69
Sun-Target sep (deg) : 166.90
Sun-Moon sep (deg)  : 131.01
B (ring opening deg) : -2.41
PA of pole (deg)    : 0.77
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (" ) : 12.875
C/A sky separation (km) : 39845.3
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
    
```

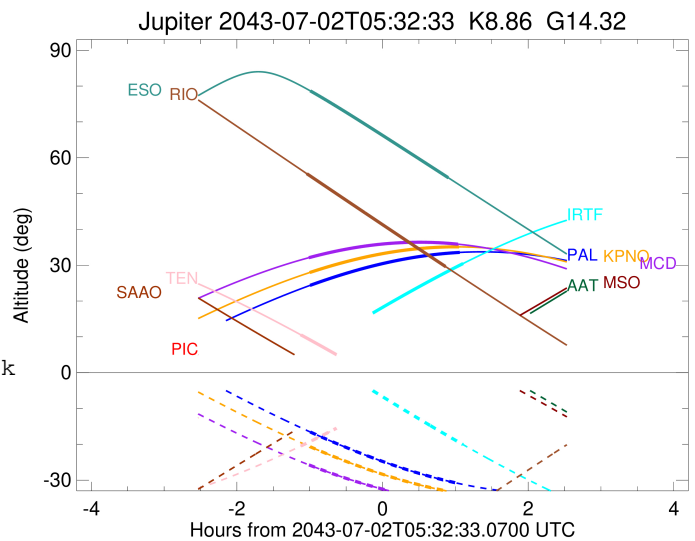
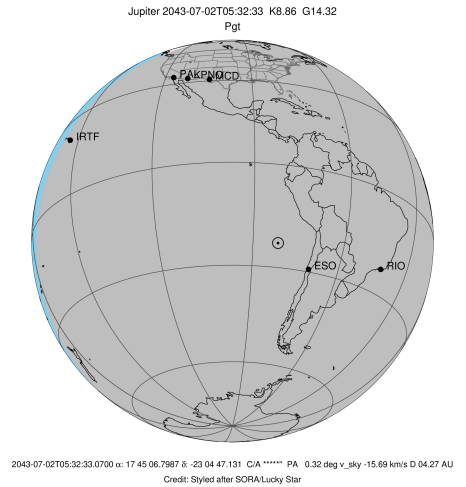


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-02T04:32:58.734	24.38	-16.55	71489.4	-34.54	-38.12
Jupiter	E	2043-07-02T06:36:09.474	33.56	-30.99	71489.6	-33.27	-36.81

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-02T05:34:08.050
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       : 4068845243731008128
2Mass ID (if available) : 17450680-2304470
ICRS Star Coord at Epoch: 17h 45m 06.79869s -23:04:47.13080s
RUWE (>1.4 is poor) : 1.05
K magnitude          : 8.859
G magnitude          : 14.322
RP magnitude         : 12.942
BP magnitude         : 16.622
DUPflag             : 0
Distance (au)        : 4.267
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.69
Sun-Target sep (deg) : 166.90
Sun-Moon sep (deg)   : 131.08
B (ring opening deg) : -2.41
PA of pole (deg)     : 0.77
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 12.885
C/A sky separation (km) : 39876.4
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
    
```

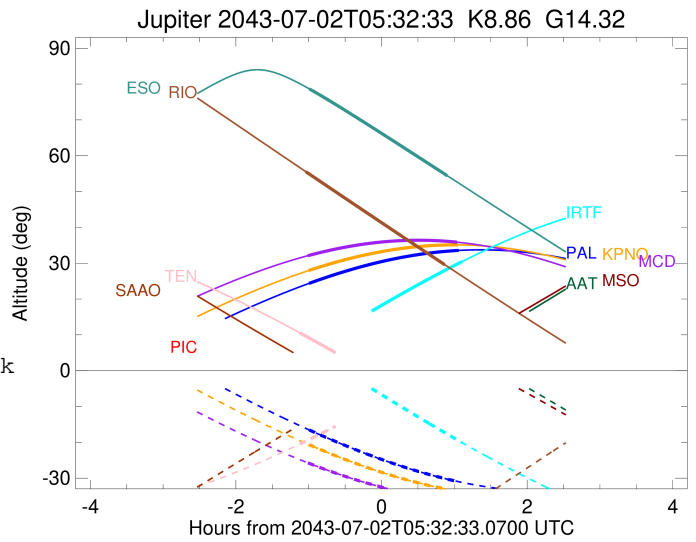
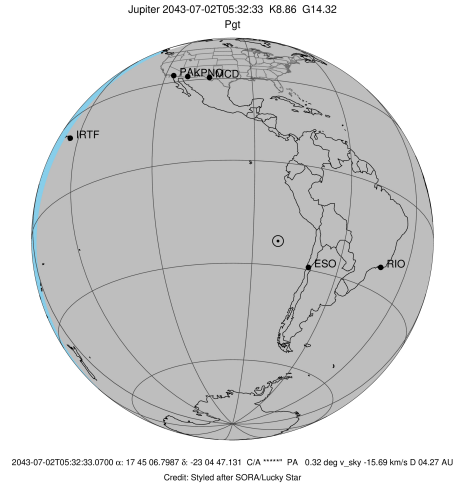


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-02T04:32:35.184	27.95	-20.62	71489.4	-34.53	-38.11
Jupiter	E	2043-07-02T06:35:35.631	35.11	-33.63	71489.6	-33.35	-36.89

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-02T05:33:21.960
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        : 4068845243731008128
2Mass ID (if available) : 17450680-2304470
ICRS Star Coord at Epoch: 17h 45m 06.79869s -23:04:47.13080s
RUWE (>1.4 is poor) : 1.05
K magnitude           : 8.859
G magnitude           : 14.322
RP magnitude          : 12.942
BP magnitude          : 16.622
DUPflag              : 0
Distance (au)         : 4.267
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.69
Sun-Target sep (deg)  : 166.90
Sun-Moon sep (deg)    : 131.18
B (ring opening deg) : -2.41
PA of pole (deg)      : 0.77
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 12.895
C/A sky separation (km) : 39906.5
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
    
```

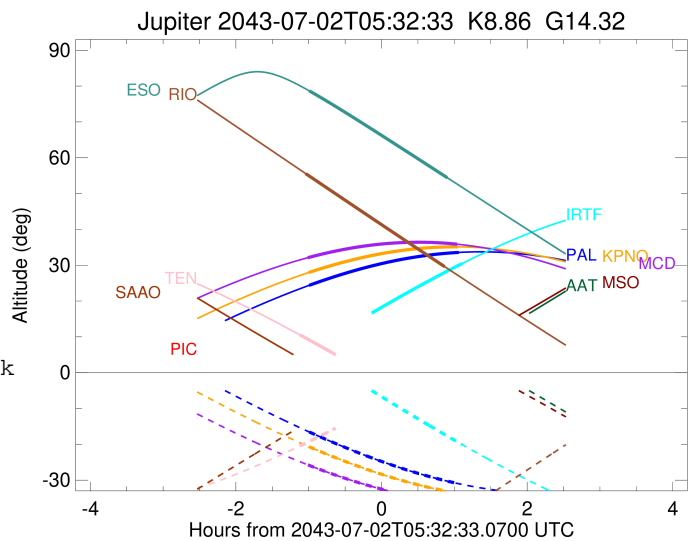
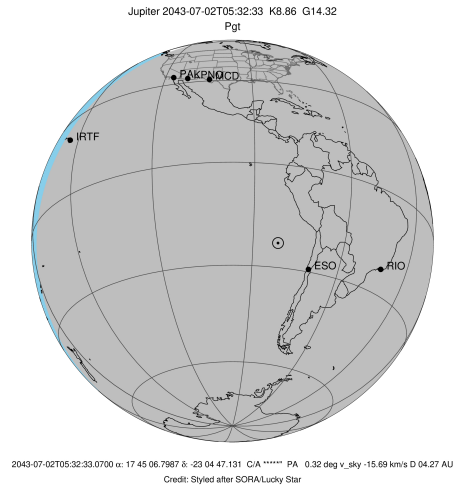


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-02T04:31:55.471	32.09	-25.74	71489.4	-34.50	-38.08
Jupiter	E	2043-07-02T06:34:46.244	35.86	-36.12	71489.6	-33.45	-36.99

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-02T05:26:15.710
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       : 4068845243731008128
2Mass ID (if available) : 17450680-2304470
ICRS Star Coord at Epoch: 17h 45m 06.79869s -23:04:47.13080s
RUWE (>1.4 is poor) : 1.05
K magnitude           : 8.859
G magnitude           : 14.322
RP magnitude         : 12.942
BP magnitude         : 16.622
DUPflag              : 0
Distance (au)        : 4.267
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.69
Sun-Target sep (deg) : 166.90
Sun-Moon sep (deg)   : 131.35
B (ring opening deg) : -2.41
PA of pole (deg)     : 0.77
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 13.508
C/A sky separation (km) : 41803.4
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
    
```

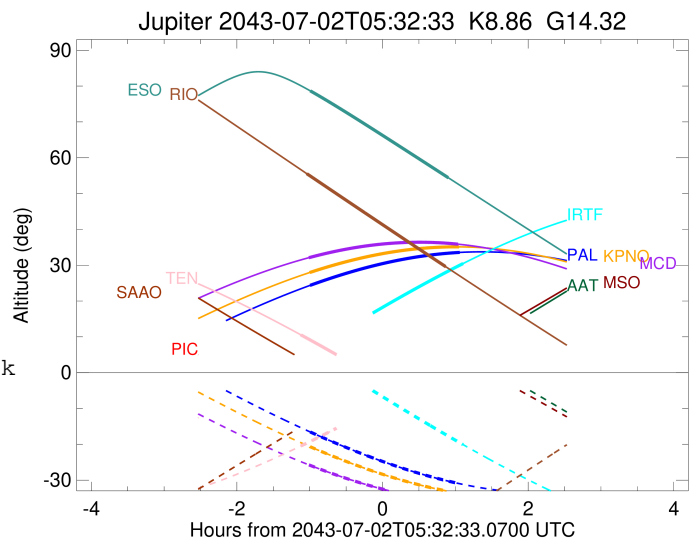
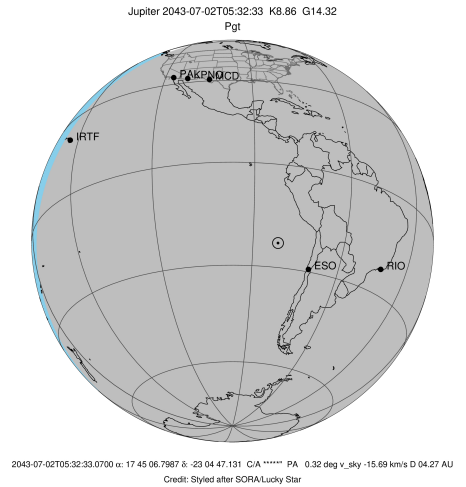


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-02T04:25:12.696	10.56	-20.48	71489.3	-35.65	-39.27
Jupiter	E	2043-07-02T06:27:45.295	-13.75x	2.05x	71489.3	-35.88	-39.51

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2043-07-02T05:38:20.980
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : IRTF
Location            : Mauna Kea/IRTF
Latitude (deg)      : 19.82622
E. Longitude (deg)  : 204.52800
Altitude (km)       : 4.168
Gaia source ID      : 4068845243731008128
2Mass ID (if available) : 17450680-2304470
ICRS Star Coord at Epoch: 17h 45m 06.79869s -23:04:47.13080s
RUWE (>1.4 is poor) : 1.05
K magnitude         : 8.859
G magnitude         : 14.322
RP magnitude        : 12.942
BP magnitude        : 16.622
DUPflag            : 0
Distance (au)       : 4.267
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -15.69
Sun-Target sep (deg) : 166.90
Sun-Moon sep (deg)  : 130.53
B (ring opening deg) : -2.41
PA of pole (deg)    : 0.77
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 13.502
C/A sky separation (km) : 41785.2
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
    
```

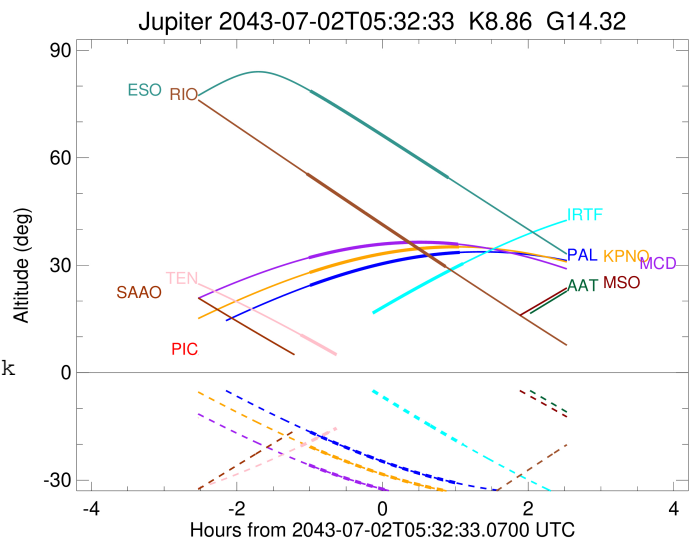
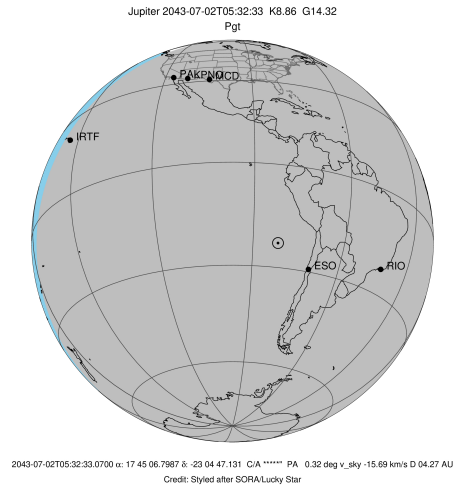


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-02T04:37:28.474	7.03	5.05x	71489.1	-36.74	-40.39
Jupiter	E	2043-07-02T06:38:51.681	30.44	-20.06	71489.4	-34.81	-38.40

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-02T05:27:14.260
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        : 4068845243731008128
2Mass ID (if available) : 17450680-2304470
ICRS Star Coord at Epoch: 17h 45m 06.79869s -23:04:47.13080s
RUWE (>1.4 is poor)  : 1.05
K magnitude           : 8.859
G magnitude           : 14.322
RP magnitude          : 12.942
BP magnitude          : 16.622
DUPflag              : 0
Distance (au)         : 4.267
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.69
Sun-Target sep (deg)  : 166.90
Sun-Moon sep (deg)    : 131.77
B (ring opening deg)  : -2.41
PA of pole (deg)      : 0.77
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 14.818
C/A sky separation (km) : 45859.0
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
    
```



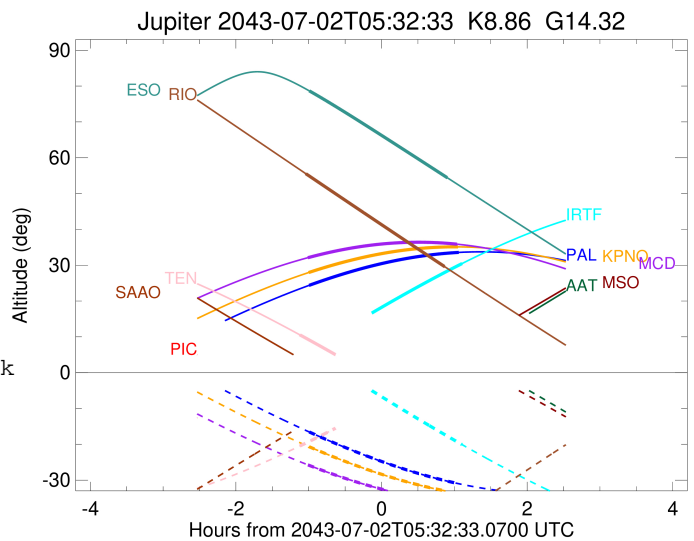
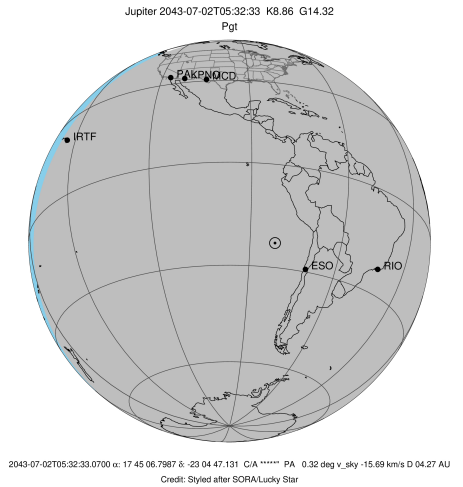
x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2043-07-02T04:30:08.294	55.55	-68.54	71488.7	-39.89	-43.60
Jupiter	E	2043-07-02T06:24:39.641	29.58	-42.42	71488.7	-39.93	-43.63



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2043-07-02T05:29:50.920
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        : 4068845243731008128
2Mass ID (if available) : 17450680-2304470
ICRS Star Coord at Epoch: 17h 45m 06.79869s -23:04:47.13080s
RUWE (>1.4 is poor) : 1.05
K magnitude           : 8.859
G magnitude           : 14.322
RP magnitude          : 12.942
BP magnitude          : 16.622
DUPflag              : 0
Distance (au)         : 4.267
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.69
Sun-Target sep (deg)  : 166.90
Sun-Moon sep (deg)    : 131.72
B (ring opening deg) : -2.41
PA of pole (deg)      : 0.77
Pole direction: RA (deg): 268.05669
Dec (deg): 64.49732
C/A sky separation (") : 14.827
C/A sky separation (km) : 45887.6
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	2043-07-02T04:33:04.386	78.65	-83.19	71488.7	-40.17	-43.88
Jupiter	E	2043-07-02T06:26:47.537	54.40	-66.82	71488.7	-39.74	-43.45