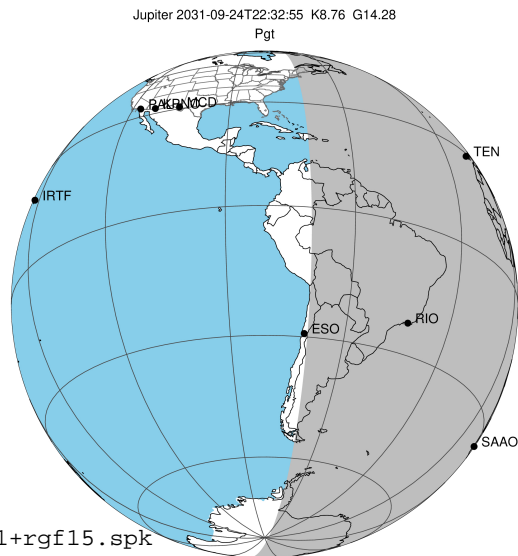


target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-09-24T22:32:55.660
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4114616297837874944
 2Mass ID (if available) : 17210581-2256374

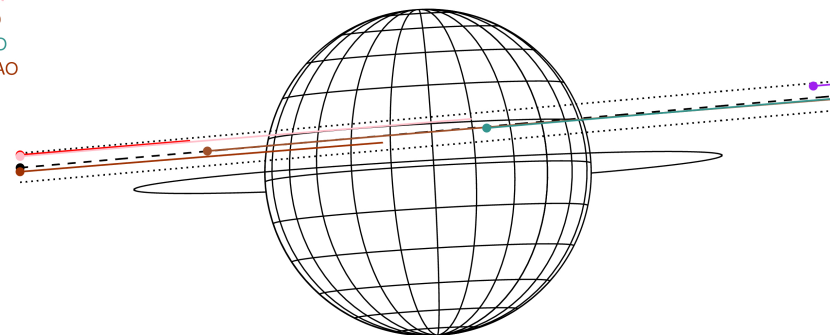
Jupiter 2031-09-24T22:32:55 K8.76 G14.28 Pgt

ICRS Star Coord at Epoch: 17h 21m 05.81273s -22:56:37.61769s
 RUWE (>1.4 is poor) : 1.12
 K magnitude : 8.760
 G magnitude : 14.285
 RP magnitude : 12.846
 BP magnitude : 16.994
 DUPflag : 0
 Distance (au) : 5.329
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : 18.34
 Sun-Target sep (deg) : 79.81
 Sun-Moon sep (deg) : 22.17
 B (ring opening deg) : -2.35
 PA of pole (deg) : 3.35
 Pole direction: RA (deg): 268.05683
 Dec (deg): 64.49652
 C/A sky separation (") : 4.599
 C/A sky separation (km) : 17773.2
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLv1.spk
 naif0012.tls
 nep097.bsp
 nep101.bsp
 sat4401.bsp



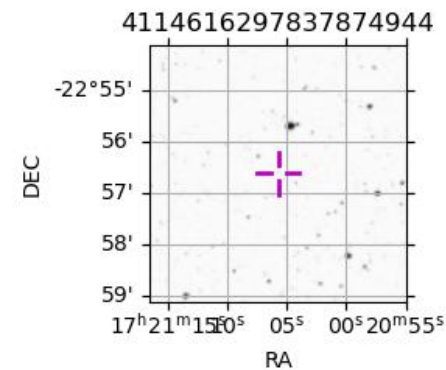
2031-09-24T22:32:55.6600 cc: 17 21 05.8127 s: -22 56 37.618 C/A 4.589° PA 185.04 deg v_sky +18.34 km/s D 05.33 AU
 Credit: Styled after SORA/Lucky Star

Earth
 PIC
 MCD
 TEN
 RIO
 ESO
 SAAO



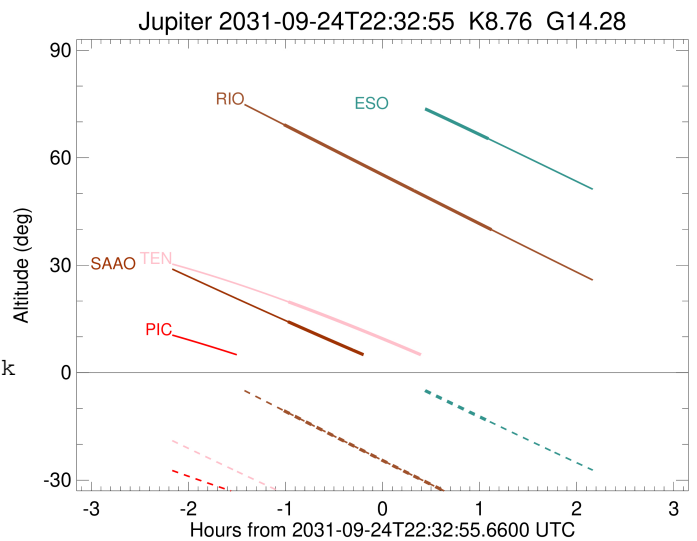
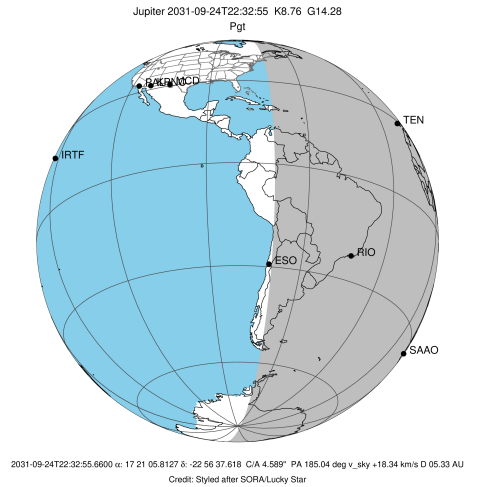
Observable events with sun below -5 deg and altitude above 5 deg

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			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	+	SEP 24 21:34 - SEP 24 21:34	Pin
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	+	SEP 24 21:32 - SEP 24 23:40	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	SEP 24 23:38 - SEP 24 23:38	Pne
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	SEP 24 21:34 - SEP 24 21:34	Pin
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-09-24T22:37:25.680
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        : 4114616297837874944
2Mass ID (if available) : 17210581-2256374
ICRS Star Coord at Epoch: 17h 21m 05.81273s -22:56:37.61769s
RUWE (>1.4 is poor) : 1.12
K magnitude           : 8.760
G magnitude           : 14.285
RP magnitude          : 12.846
BP magnitude          : 16.994
DUPflag              : 0
Distance (au)         : 5.329
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 18.34
Sun-Target sep (deg) : 79.81
Sun-Moon sep (deg)   : 21.44
B (ring opening deg) : -2.35
PA of pole (deg)     : 3.35
Pole direction: RA (deg): 268.05683
Dec (deg): 64.49652
C/A sky separation (" ) : 5.657
C/A sky separation (km) : 21865.0
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
    
```

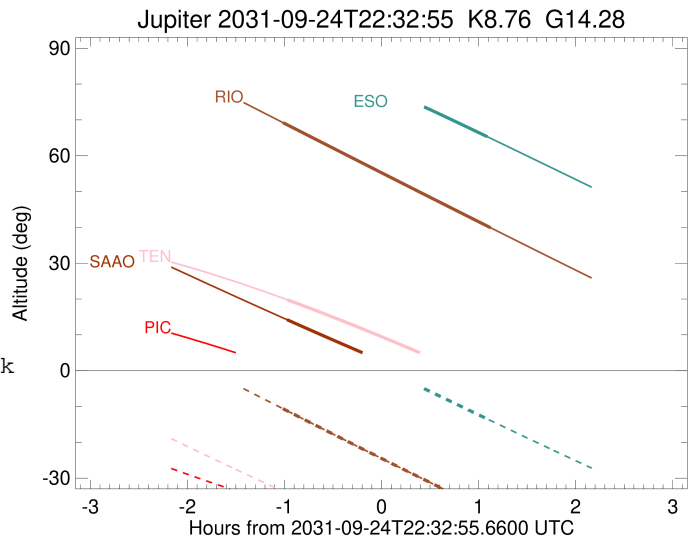
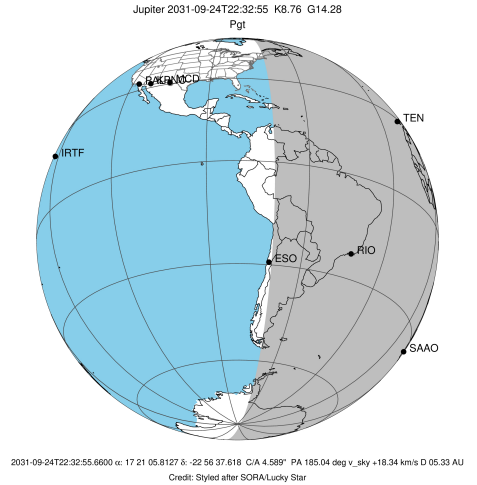


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-09-24T21:34:44.960	19.77	-34.25	71491.4	16.47	18.67
Jupiter	E	2031-09-24T23:39:41.122	-3.49x	-56.79	71491.2	19.03	21.51

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-09-24T22:36:21.500
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       : 4114616297837874944
2Mass ID (if available) : 17210581-2256374
ICRS Star Coord at Epoch: 17h 21m 05.81273s -22:56:37.61769s
RUWE (>1.4 is poor) : 1.12
K magnitude           : 8.760
G magnitude           : 14.285
RP magnitude          : 12.846
BP magnitude          : 16.994
DUPflag              : 0
Distance (au)        : 5.329
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 18.34
Sun-Target sep (deg) : 79.81
Sun-Moon sep (deg)   : 21.96
B (ring opening deg) : -2.35
PA of pole (deg)     : 3.35
Pole direction: RA (deg): 268.05683
Dec (deg): 64.49652
C/A sky separation ("): 4.555
C/A sky separation (km): 17606.0
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
    
```

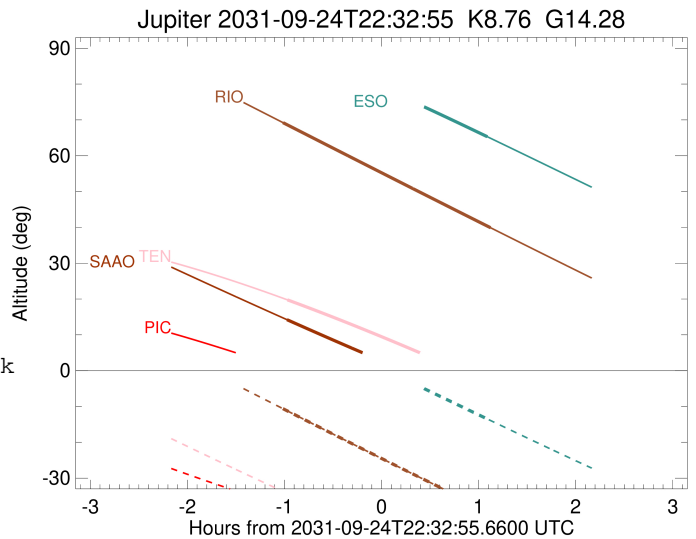
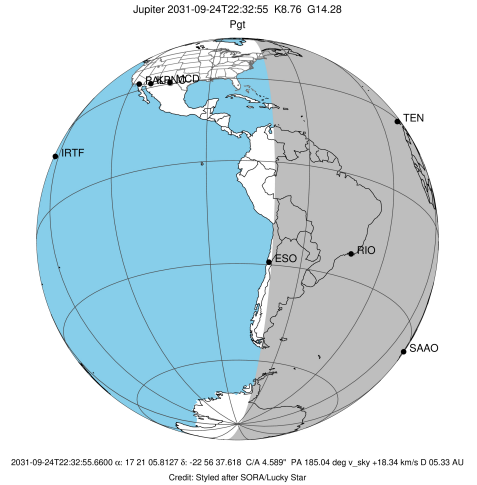


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-09-24T21:32:01.763	69.23	-10.61	71491.6	12.72	14.47
Jupiter	E	2031-09-24T23:40:21.074	39.89	-39.39	71491.5	15.63	17.73

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-09-24T22:33:54.140
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       : 4114616297837874944
2Mass ID (if available) : 17210581-2256374
ICRS Star Coord at Epoch: 17h 21m 05.81273s -22:56:37.61769s
RUWE (>1.4 is poor) : 1.12
K magnitude           : 8.760
G magnitude           : 14.285
RP magnitude         : 12.846
BP magnitude         : 16.994
DUPflag              : 0
Distance (au)        : 5.329
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 18.34
Sun-Target sep (deg) : 79.81
Sun-Moon sep (deg)   : 22.41
B (ring opening deg) : -2.35
PA of pole (deg)     : 3.35
Pole direction: RA (deg): 268.05683
Dec (deg): 64.49652
C/A sky separation ("): 4.436
C/A sky separation (km): 17144.9
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
    
```

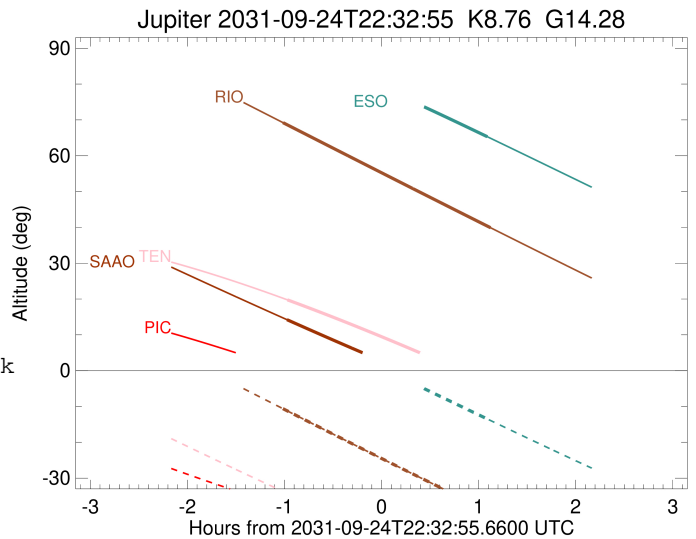
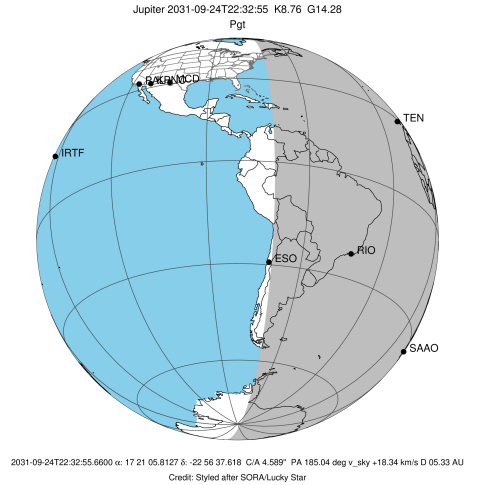


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-09-24T21:29:21.289	82.07	14.59x	71491.7	12.09	13.75
Jupiter	E	2031-09-24T23:38:18.507	65.30	-13.48	71491.5	15.49	17.58

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-09-24T22:38:04.340
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        : 4114616297837874944
2Mass ID (if available) : 17210581-2256374
ICRS Star Coord at Epoch: 17h 21m 05.81273s -22:56:37.61769s
RUWE (>1.4 is poor) : 1.12
K magnitude           : 8.760
G magnitude           : 14.285
RP magnitude          : 12.846
BP magnitude          : 16.994
DUPflag              : 0
Distance (au)         : 5.329
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 18.34
Sun-Target sep (deg)  : 79.81
Sun-Moon sep (deg)    : 21.50
B (ring opening deg) : -2.35
PA of pole (deg)      : 3.35
Pole direction: RA (deg): 268.05683
Dec (deg): 64.49652
C/A sky separation (") : 3.784
C/A sky separation (km) : 14624.0
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	2031-09-24T21:34:31.677	14.23	-54.73	71491.7	10.59	12.06
Jupiter	E	2031-09-24T23:41:10.476	-9.74x	-52.91	71491.6	13.00	14.79