

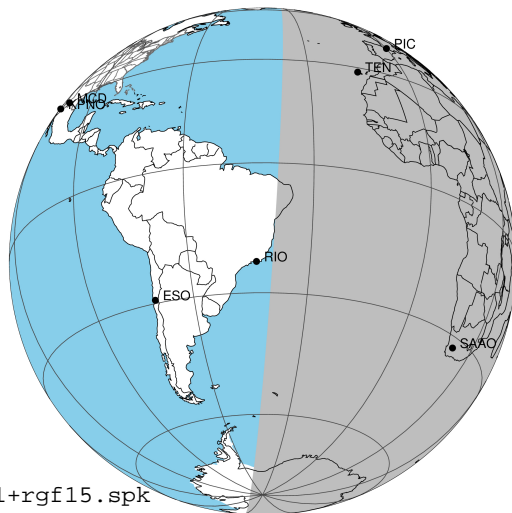
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-09-15T20:27:24.030
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4114310874130741504
 2Mass ID (if available) : 17170433-2251334

Jupiter 2031-09-15T20:27:24 K9.15 G13.56 Pgt

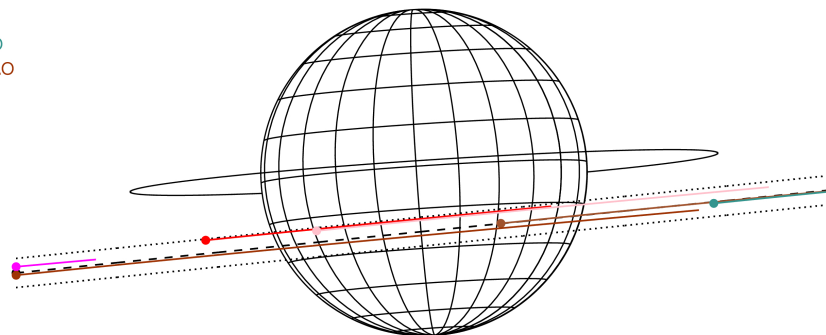
ICRS Star Coord at Epoch: 17h 17m 04.32714s -22:51:33.65672s

RUWE (>1.4 is poor) : 1.03
 K magnitude : 9.146
 G magnitude : 13.561
 RP magnitude : 12.407
 BP magnitude : 14.960
 DUPflag : 0
 Distance (au) : 5.191
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : 14.21
 Sun-Target sep (deg) : 87.76
 Sun-Moon sep (deg) : 98.51
 B (ring opening deg) : -2.38
 PA of pole (deg) : 3.78
 Pole direction: RA (deg): 268.05684
 Dec (deg): 64.49652
 C/A sky separation (") : 6.819
 C/A sky separation (km) : 25669.6
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-09-15T20:27:24 K9.15 G13.56
 Pgt



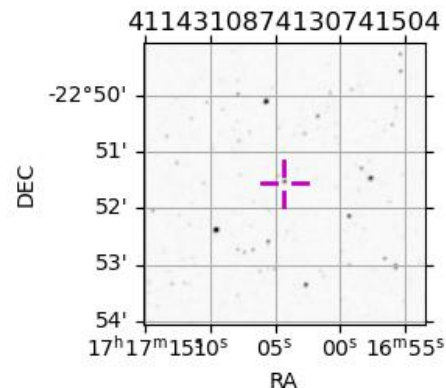
Earth
 PIC
 TEN
 KAV
 RIO
 ESO
 SAAO



2031-09-15T20:27:24.0300 a: 17 17 04.3271 s: -22 51 33.657 C/A 6.828" PA 5.81 deg v_sky +14.21 km/s D 05.19 AU
 Credit: Styled after SORA/Lucky Star

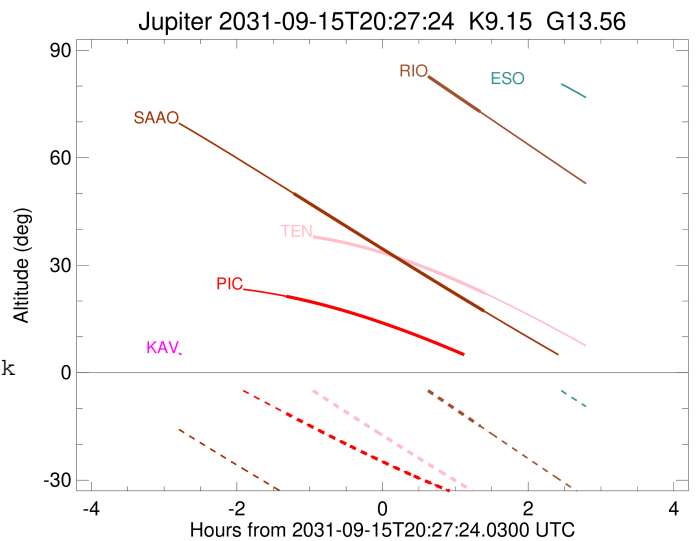
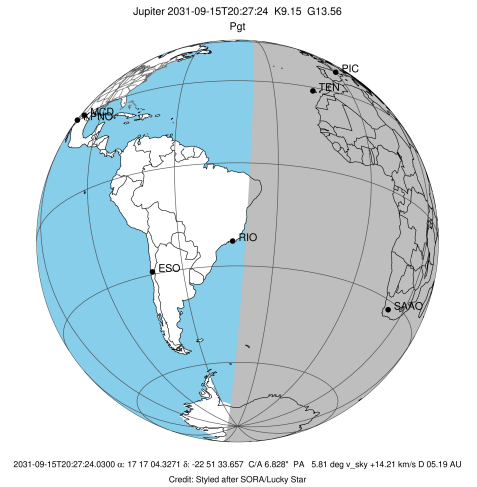
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OCode
PIC	Pic du Midi	42.9	0.1	+	SEP 15 19:08 - SEP 15 19:08	Pin
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 15 21:51 - SEP 15 21:51	Pne
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 15 21:47 - SEP 15 21:47	Pne
ESO	European Southern Obs. (3.6m)	-29.3	289.3			Pnn
AAT	Siding Spring (AAT)	-31.3	149.1			Pnn
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+	SEP 15 19:14 - SEP 15 21:51	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0			Pnn



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target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-09-15T20:30:22.600
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        : 4114310874130741504
2Mass ID (if available) : 17170433-2251334
ICRS Star Coord at Epoch: 17h 17m 04.32714s -22:51:33.65672s
RUWE (>1.4 is poor) : 1.03
K magnitude           : 9.146
G magnitude           : 13.561
RP magnitude          : 12.407
BP magnitude          : 14.960
DUPflag               : 0
Distance (au)         : 5.191
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 14.21
Sun-Target sep (deg)  : 87.76
Sun-Moon sep (deg)    : 98.66
B (ring opening deg) : -2.38
PA of pole (deg)      : 3.78
Pole direction: RA (deg): 268.05684
Dec (deg): 64.49652
C/A sky separation (") : 5.329
C/A sky separation (km) : 20061.7
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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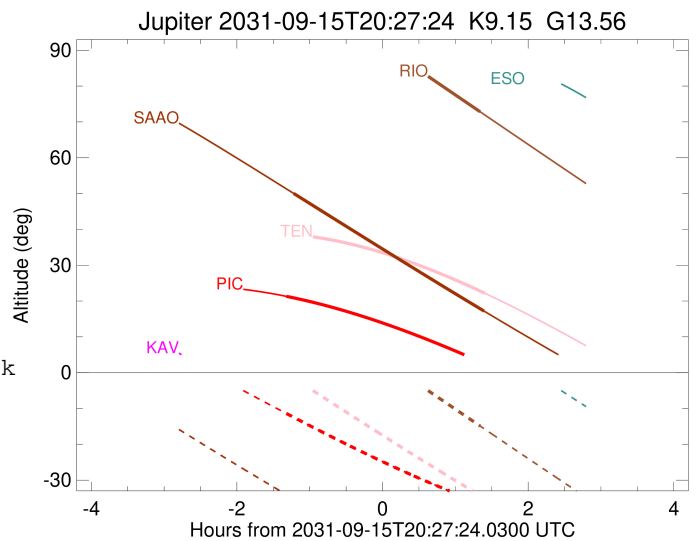
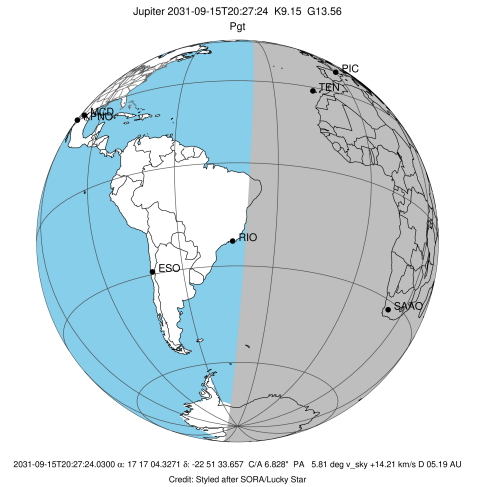


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-09-15T19:08:08.399	21.31	-11.38	71491.3	-18.15	-20.53
Jupiter	E	2031-09-15T21:51:59.470	2.44x	-36.70	71491.5	-14.59	-16.57

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-09-15T20:29:39.170
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       : 4114310874130741504
2Mass ID (if available) : 17170433-2251334
ICRS Star Coord at Epoch: 17h 17m 04.32714s -22:51:33.65672s
RUWE (>1.4 is poor) : 1.03
K magnitude           : 9.146
G magnitude           : 13.561
RP magnitude          : 12.407
BP magnitude          : 14.960
DUPflag              : 0
Distance (au)         : 5.191
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 14.21
Sun-Target sep (deg) : 87.76
Sun-Moon sep (deg)   : 98.96
B (ring opening deg) : -2.38
PA of pole (deg)     : 3.78
Pole direction: RA (deg): 268.05684
Dec (deg): 64.49652
C/A sky separation ("): 5.502
C/A sky separation (km): 20714.1
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
    
```

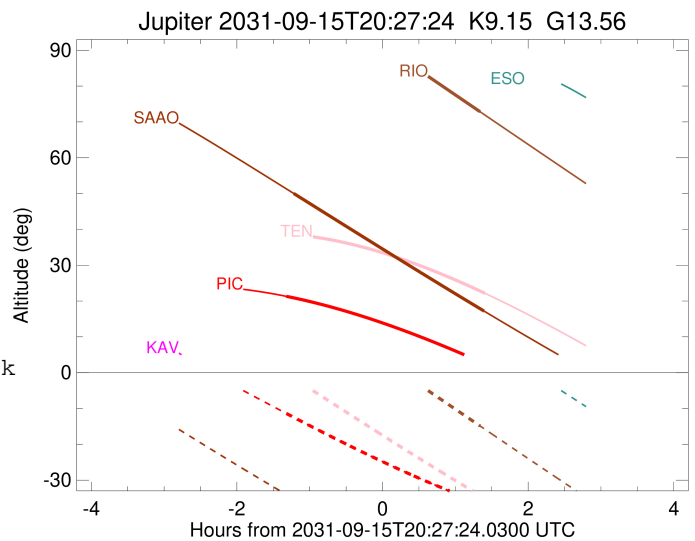
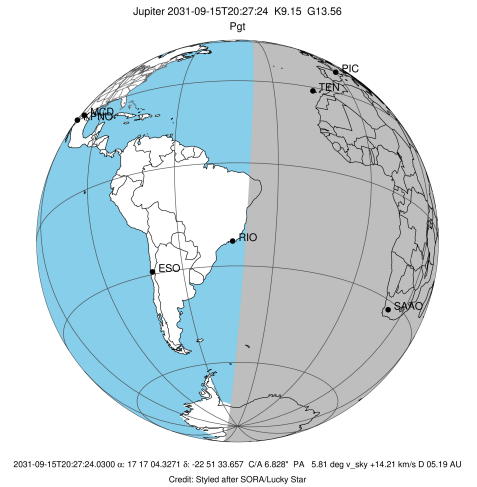


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-09-15T19:07:02.932	38.75	0.05x	71491.2	-18.85	-21.31
Jupiter	E	2031-09-15T21:51:44.522	22.17	-35.00	71491.5	-15.04	-17.07

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-09-15T20:27:19.000
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       : 4114310874130741504
2Mass ID (if available) : 17170433-2251334
ICRS Star Coord at Epoch: 17h 17m 04.32714s -22:51:33.65672s
RUWE (>1.4 is poor) : 1.03
K magnitude          : 9.146
G magnitude          : 13.561
RP magnitude         : 12.407
BP magnitude         : 14.960
DUPflag             : 0
Distance (au)        : 5.191
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 14.21
Sun-Target sep (deg) : 87.76
Sun-Moon sep (deg)   : 99.43
B (ring opening deg) : -2.38
PA of pole (deg)     : 3.78
Pole direction: RA (deg): 268.05684
Dec (deg): 64.49652
C/A sky separation ("): 6.819
C/A sky separation (km): 25671.3
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
    
```

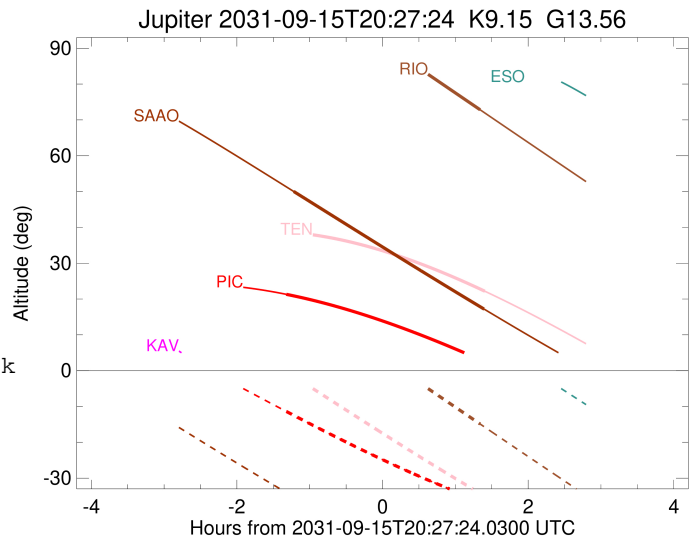
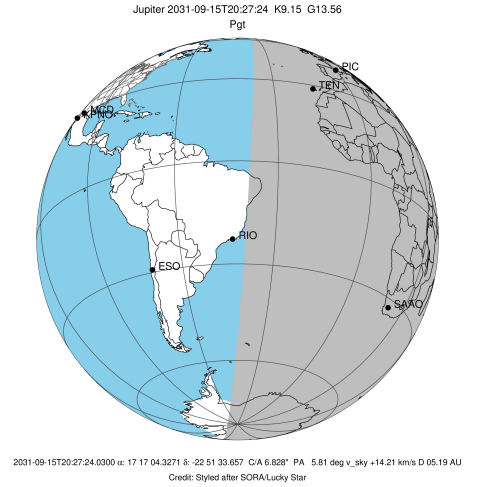


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-09-15T19:06:40.610	69.98	22.01x	71490.8	-23.37	-26.26
Jupiter	E	2031-09-15T21:47:50.725	72.82	-14.89	71491.2	-18.92	-21.38

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-09-15T20:33:02.140
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       : 4114310874130741504
2Mass ID (if available) : 17170433-2251334
ICRS Star Coord at Epoch: 17h 17m 04.32714s -22:51:33.65672s
RUWE (>1.4 is poor) : 1.03
K magnitude           : 9.146
G magnitude           : 13.561
RP magnitude         : 12.407
BP magnitude         : 14.960
DUPflag              : 0
Distance (au)        : 5.191
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 14.21
Sun-Target sep (deg) : 87.76
Sun-Moon sep (deg)   : 98.92
B (ring opening deg) : -2.38
PA of pole (deg)     : 3.78
Pole direction: RA (deg): 268.05684
Dec (deg): 64.49652
C/A sky separation ("): 7.276
C/A sky separation (km): 27393.0
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	2031-09-15T19:14:12.453	50.02	-35.20	71490.7	-24.14	-27.09
Jupiter	E	2031-09-15T21:51:03.926	17.20	-59.10	71491.0	-21.02	-23.70