

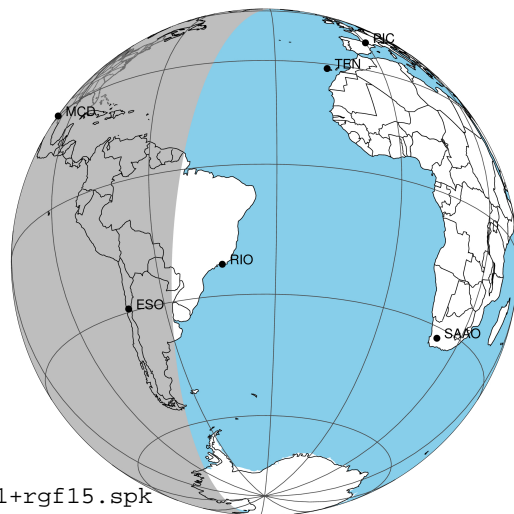
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2031-02-22T09:41:05.880  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4116786660718141824  
 2Mass ID (if available) : 17363301-2247177

Jupiter 2031-02-22T09:41:05 K7.29 G13.31 Pgt

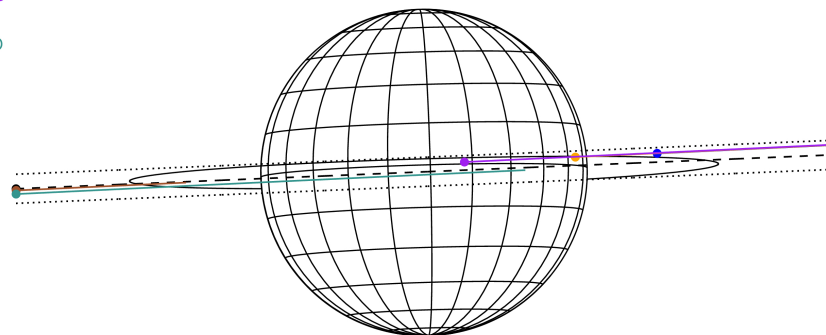
ICRS Star Coord at Epoch: 17h 36m 33.00694s -22:47:17.75783s

RUWE (>1.4 is poor) : 0.88  
 K magnitude : 7.288  
 G magnitude : 13.308  
 RP magnitude : 11.813  
 BP magnitude : 16.437  
 DUPflag : 0  
 Distance (au) : 5.599  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : 24.04  
 Sun-Target sep (deg) : 68.54  
 Sun-Moon sep (deg) : 78.40  
 B (ring opening deg) : -2.66  
 PA of pole (deg) : 1.69  
 Pole direction: RA (deg): 268.05702  
 Dec (deg): 64.49651  
 C/A sky separation (") : 0.073  
 C/A sky separation (km) : 294.6  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2031-02-22T09:41:05 K7.29 G13.31  
 Pgt



Earth  
 PAL  
 KPNO  
 MCD  
 RIO  
 ESO

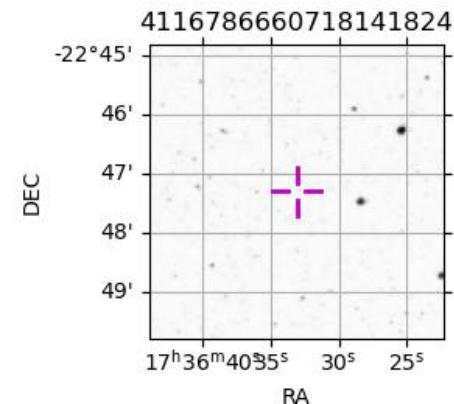


2031-02-22T09:41:05.8800 cc: 17 36 33.00694 s: -22 47 17.7578 C/A 0.063" PA 182.49 deg v\_sky +24.04 km/s D 05.60 AU

Credit: Styled after SORA/Lucky Star

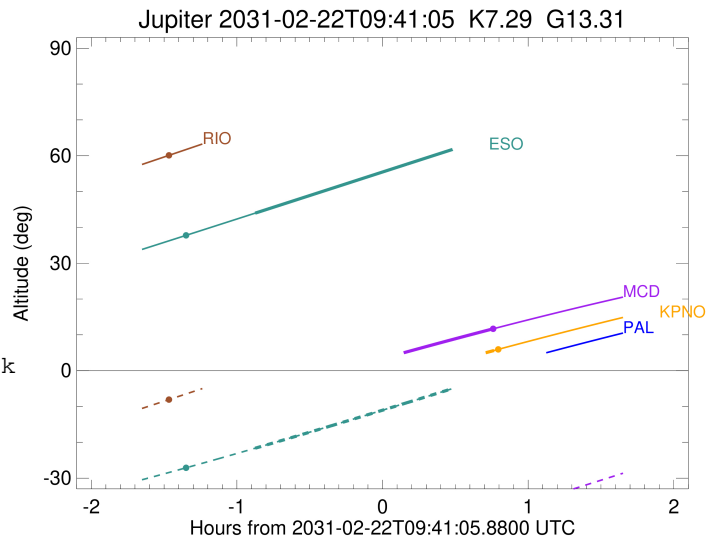
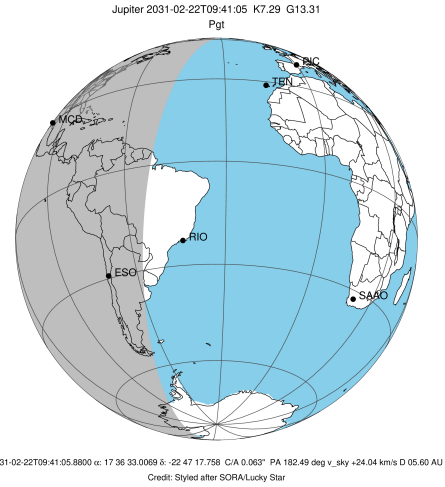
Observable events with sun below -5 deg and altitude above 5 deg

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			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	FEB 22 10:27 - FEB 22 10:27	Pne
MCD	McDonald Obs. 2.7m	30.7	256.0	+	FEB 22 10:27 - FEB 22 10:27	Pne
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
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			Pnn
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	FEB 22 08:48 - FEB 22 08:48	Pin
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



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target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-02-22T09:37:17.820
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       : 4116786660718141824
2Mass ID (if available) : 17363301-2247177
ICRS Star Coord at Epoch: 17h 36m 33.00694s -22:47:17.75783s
RUWE (>1.4 is poor) : 0.88
K magnitude          : 7.288
G magnitude           : 13.308
RP magnitude         : 11.813
BP magnitude         : 16.437
DUPflag             : 0
Distance (au)        : 5.599
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 24.04
Sun-Target sep (deg) : 68.54
Sun-Moon sep (deg)   : 78.50
B (ring opening deg) : -2.66
PA of pole (deg)     : 1.69
Pole direction: RA (deg): 268.05702
Dec (deg): 64.49651
C/A sky separation (") : 0.876
C/A sky separation (km) : 3556.7
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
    
```

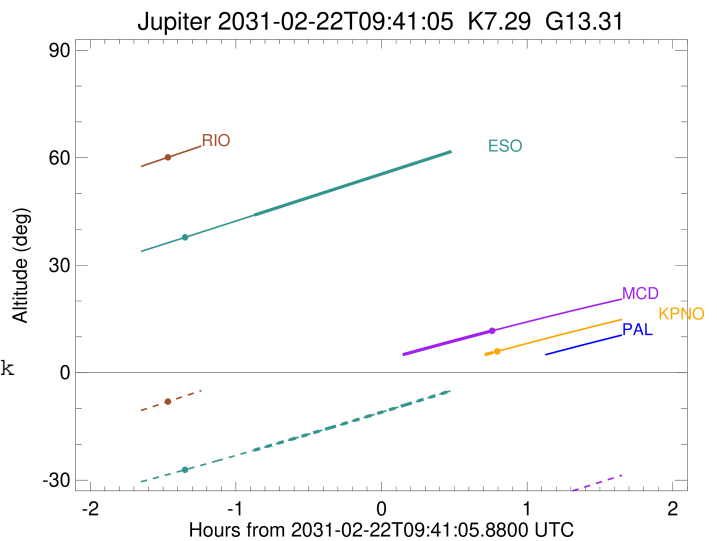
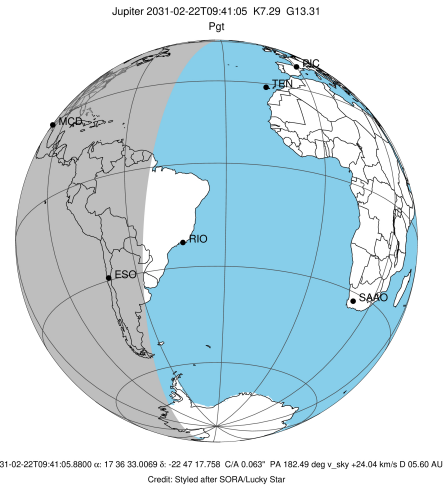


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-02-22T08:47:46.518	-13.54x	-63.31	71492.0	1.79	2.05
Jupiter	E	2031-02-22T10:27:01.690	5.62	-45.80	71492.0	3.90	4.46

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-02-22T09:37:21.790
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      : 4116786660718141824
2Mass ID (if available) : 17363301-2247177
ICRS Star Coord at Epoch: 17h 36m 33.00694s -22:47:17.75783s
RUWE (>1.4 is poor) : 0.88
K magnitude          : 7.288
G magnitude          : 13.308
RP magnitude         : 11.813
BP magnitude         : 16.437
DUPflag             : 0
Distance (au)       : 5.599
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 24.04
Sun-Target sep (deg) : 68.54
Sun-Moon sep (deg)  : 78.61
B (ring opening deg) : -2.66
PA of pole (deg)    : 1.69
Pole direction: RA (deg): 268.05702
Dec (deg): 64.49651
C/A sky separation (" ) : 0.918
C/A sky separation (km) : 3726.4
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
    
```

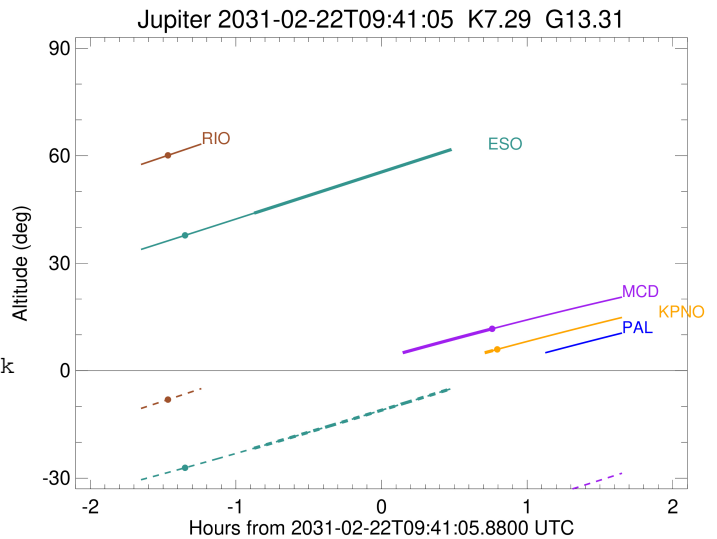
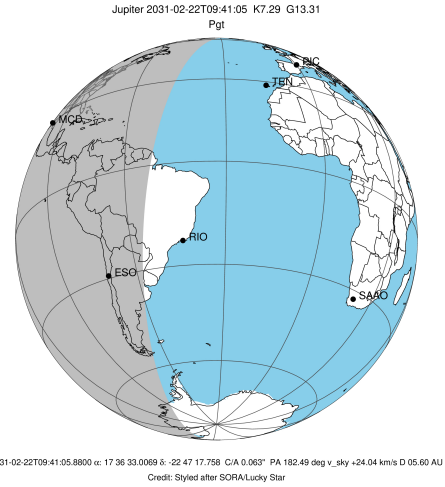


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-02-22T08:47:44.305	-7.02x	-59.47	71492.0	1.92	2.20
Jupiter	E	2031-02-22T10:27:11.753	11.77	-39.91	71492.0	4.03	4.60

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-02-22T09:38:43.630
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       : 4116786660718141824
2Mass ID (if available) : 17363301-2247177
ICRS Star Coord at Epoch: 17h 36m 33.00694s -22:47:17.75783s
RUWE (>1.4 is poor) : 0.88
K magnitude           : 7.288
G magnitude           : 13.308
RP magnitude          : 11.813
BP magnitude          : 16.437
DUPflag              : 0
Distance (au)        : 5.599
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 24.04
Sun-Target sep (deg) : 68.54
Sun-Moon sep (deg)   : 79.29
B (ring opening deg) : -2.66
PA of pole (deg)     : 1.69
Pole direction: RA (deg): 268.05702
Dec (deg): 64.49651
C/A sky separation ("): 0.248
C/A sky separation (km): 1006.6
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	2031-02-22T08:48:36.189	43.96	-21.65	71492.0	-1.79	-2.05
Jupiter	E	2031-02-22T10:29:00.397	65.89	-0.95x	71492.0	0.12	0.13