

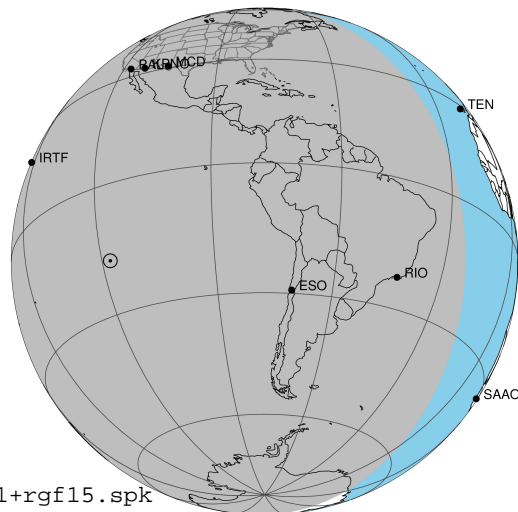
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2031-05-11T07:46:31.100  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4068878400825791104  
 2Mass ID (if available) : 17491349-2254019

Jupiter 2031-05-11T07:46:31 K9.31 G14.36 Pgt

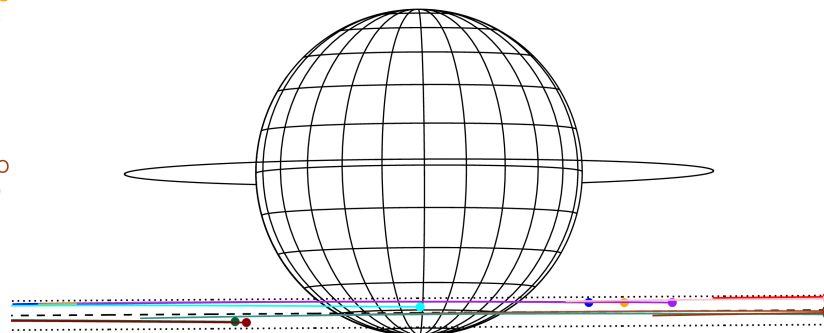
ICRS Star Coord at Epoch: 17h 49m 13.49255s -22:54:02.07099s

RUWE (>1.4 is poor) : 0.84  
 K magnitude : 9.315  
 G magnitude : 14.361  
 RP magnitude : 13.107  
 BP magnitude : 16.119  
 DUPflag : 0  
 Distance (au) : 4.455  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -10.33  
 Sun-Target sep (deg) : 142.49  
 Sun-Moon sep (deg) : 19.92  
 B (ring opening deg) : -2.60  
 PA of pole (deg) : 0.32  
 Pole direction: RA (deg): 268.05695  
 Dec (deg): 64.49651  
 C/A sky separation (") : 19.018  
 C/A sky separation (km) : 61455.7  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2031-05-11T07:46:31 K9.31 G14.36 Pgt



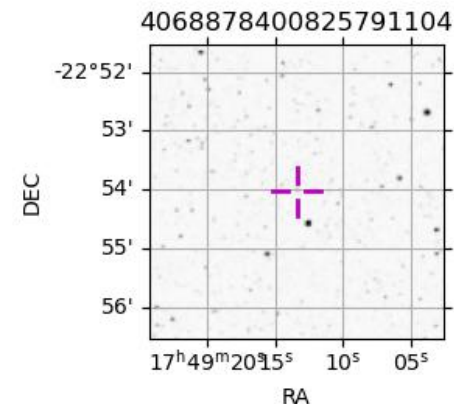
Earth  
 PIC  
 PAL  
 KPNO  
 MCD  
 TEN  
 IRTF  
 RIO  
 ESO  
 AAT  
 SAAO  
 MSO



2031-05-11T07:46:31.1000 α: 17 49 13.4925 δ: -22 54 02.071 C/A \*\*\*\*\* PA 0.39 deg v\_sky -10.33 km/s D 04.46 AU  
 Credit: Styled after SORA/Lucky Star

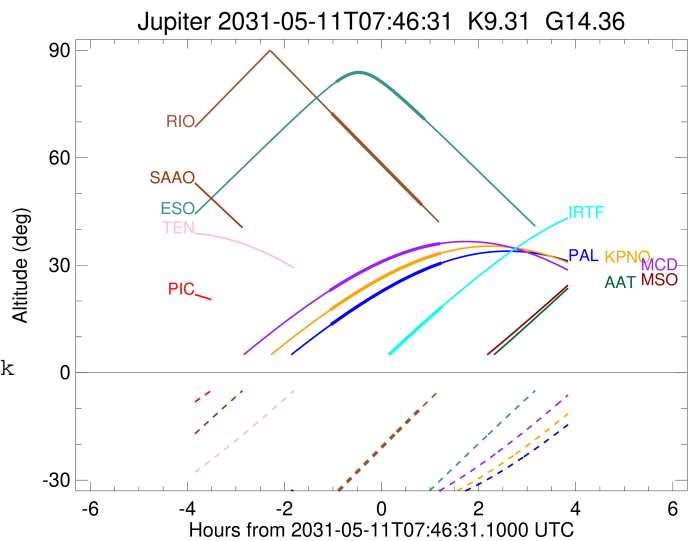
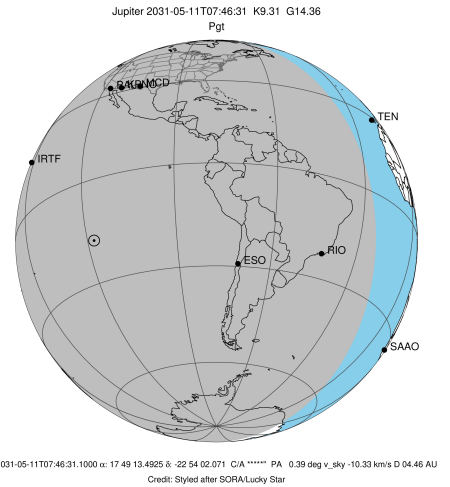
Observable events with sun below -5 deg and altitude above 5 deg

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	+ +	MAY 11 06:44 - MAY 11 09:00	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	MAY 11 06:43 - MAY 11 08:59	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	MAY 11 06:42 - MAY 11 08:58	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+ +	MAY 11 09:01 - MAY 11 09:01	Pne
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+ +	MAY 11 06:44 - MAY 11 08:36	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	MAY 11 06:50 - MAY 11 08:39	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            : 2031-05-11T07:52:35.560
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      : 4068878400825791104
2Mass ID (if available) : 17491349-2254019
ICRS Star Coord at Epoch: 17h 49m 13.49255s -22:54:02.07099s
RUWE (>1.4 is poor) : 0.84
K magnitude          : 9.315
G magnitude          : 14.361
RP magnitude         : 13.107
BP magnitude         : 16.119
DUPflag             : 0
Distance (au)        : 4.455
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -10.33
Sun-Target sep (deg) : 142.49
Sun-Moon sep (deg)  : 20.44
B (ring opening deg) : -2.60
PA of pole (deg)    : 0.32
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 17.519
C/A sky separation (km) : 56610.7
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
    
```

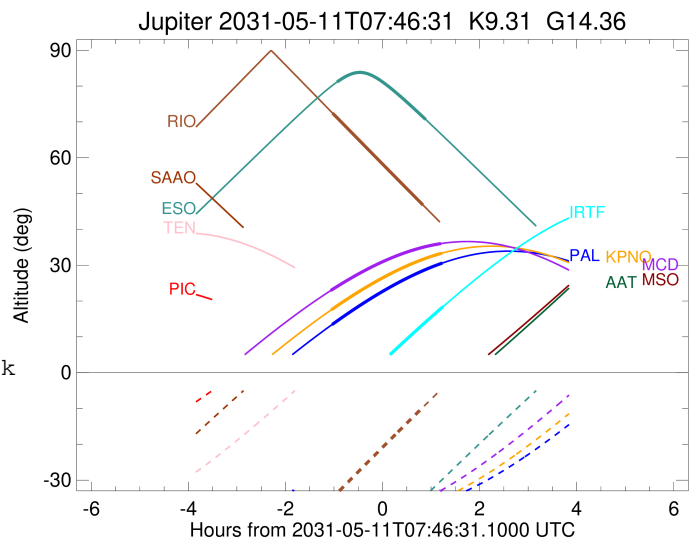
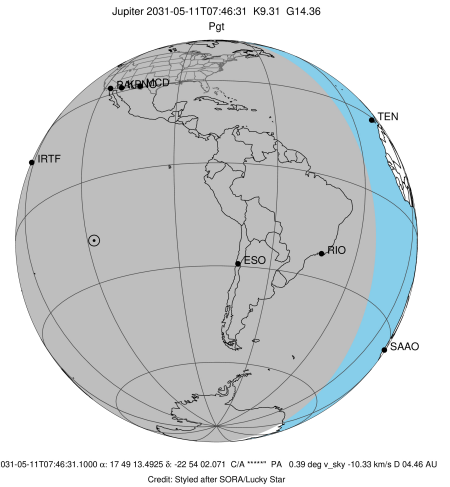


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-11T06:44:04.819	13.41	-37.02	71486.1	-52.82	-56.29
Jupiter	E	2031-05-11T09:00:32.531	30.60	-35.77	71486.2	-51.95	-55.47

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-11T07:51:57.190
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       : 4068878400825791104
2Mass ID (if available) : 17491349-2254019
ICRS Star Coord at Epoch: 17h 49m 13.49255s -22:54:02.07099s
RUWE (>1.4 is poor) : 0.84
K magnitude           : 9.315
G magnitude           : 14.361
RP magnitude          : 13.107
BP magnitude          : 16.119
DUPflag              : 0
Distance (au)         : 4.455
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -10.33
Sun-Target sep (deg) : 142.49
Sun-Moon sep (deg)   : 20.41
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.32
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation ("): 17.514
C/A sky separation (km): 56595.1
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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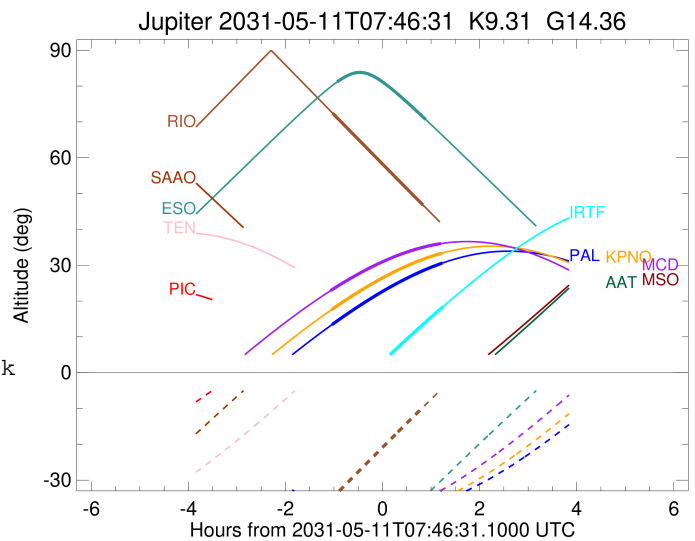
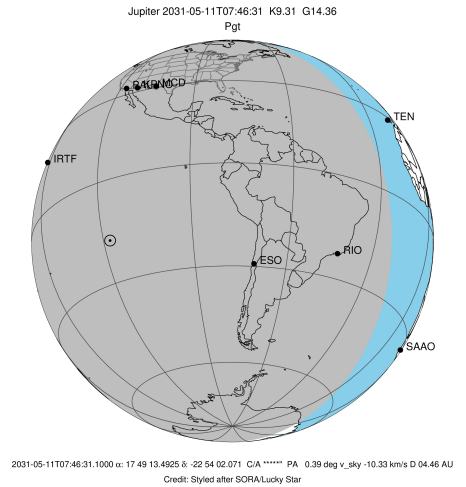


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-11T06:43:36.223	17.59	-39.48	71486.1	-52.75	-56.23
Jupiter	E	2031-05-11T08:59:47.575	33.34	-35.17	71486.2	-51.99	-55.50

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-11T07:50:53.280
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      : 4068878400825791104
2Mass ID (if available) : 17491349-2254019
ICRS Star Coord at Epoch: 17h 49m 13.49255s -22:54:02.07099s
RUWE (>1.4 is poor) : 0.84
K magnitude          : 9.315
G magnitude          : 14.361
RP magnitude         : 13.107
BP magnitude         : 16.119
DUPflag             : 0
Distance (au)        : 4.455
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -10.33
Sun-Target sep (deg) : 142.49
Sun-Moon sep (deg)  : 20.35
B (ring opening deg) : -2.60
PA of pole (deg)    : 0.32
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 17.500
C/A sky separation (km) : 56549.4
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
    
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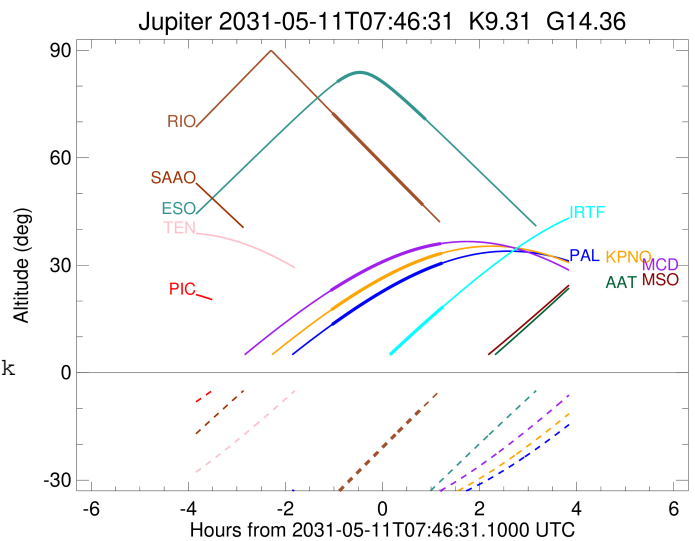
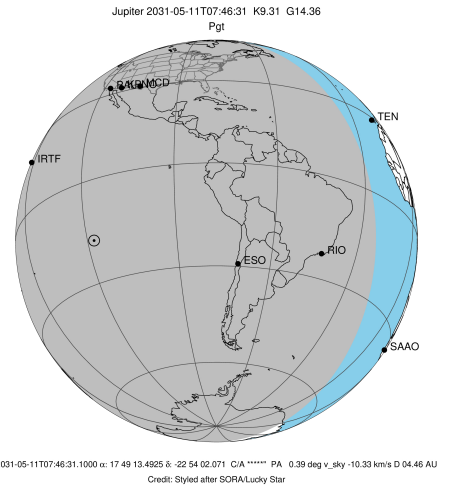


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-11T06:42:40.990	22.94	-41.59	71486.1	-52.61	-56.10
Jupiter	E	2031-05-11T08:58:40.064	36.02	-32.90	71486.2	-52.03	-55.54

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-11T07:57:23.240
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       : 4068878400825791104
2Mass ID (if available) : 17491349-2254019
ICRS Star Coord at Epoch: 17h 49m 13.49255s -22:54:02.07099s
RUWE (>1.4 is poor) : 0.84
K magnitude           : 9.315
G magnitude           : 14.361
RP magnitude         : 13.107
BP magnitude         : 16.119
DUPflag              : 0
Distance (au)        : 4.455
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -10.33
Sun-Target sep (deg) : 142.49
Sun-Moon sep (deg)   : 20.73
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.32
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 18.227
C/A sky separation (km) : 58896.0
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
    
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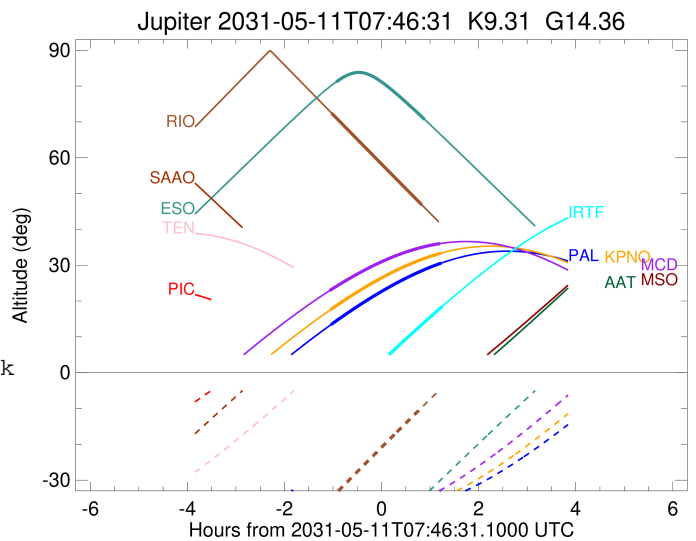
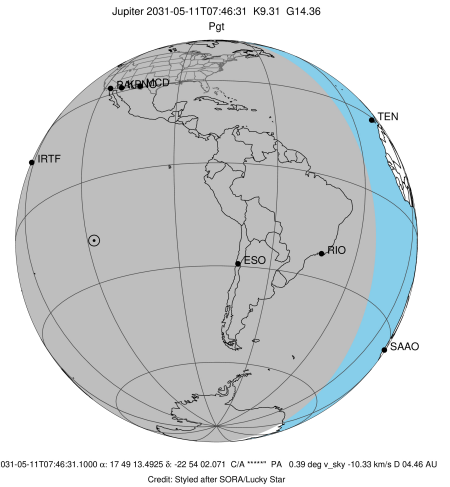


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-11T06:52:23.890	-8.66x	-27.06	71485.6	-56.26	-59.56
Jupiter	E	2031-05-11T09:01:31.333	18.46	-47.97	71485.8	-54.60	-57.99

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-11T07:40:30.740
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       : 4068878400825791104
2Mass ID (if available) : 17491349-2254019
ICRS Star Coord at Epoch: 17h 49m 13.49255s -22:54:02.07099s
RUWE (>1.4 is poor) : 0.84
K magnitude          : 9.315
G magnitude           : 14.361
RP magnitude         : 13.107
BP magnitude         : 16.119
DUPflag             : 0
Distance (au)        : 4.455
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -10.33
Sun-Target sep (deg) : 142.49
Sun-Moon sep (deg)   : 19.73
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.32
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 19.125
C/A sky separation (km) : 61800.2
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
    
```

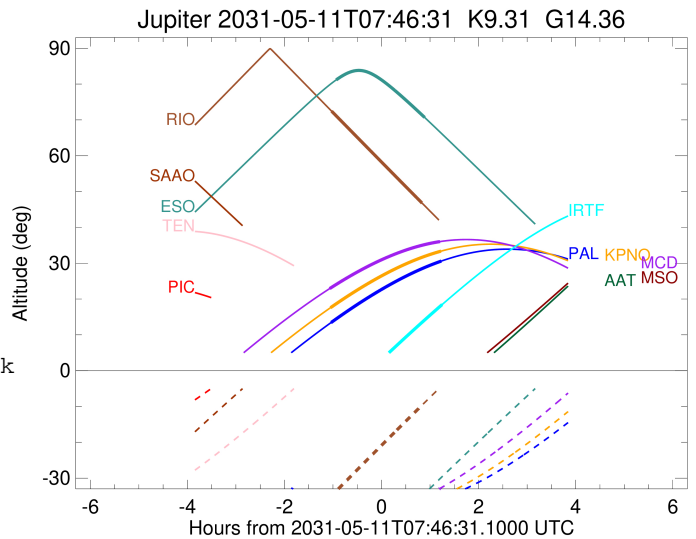
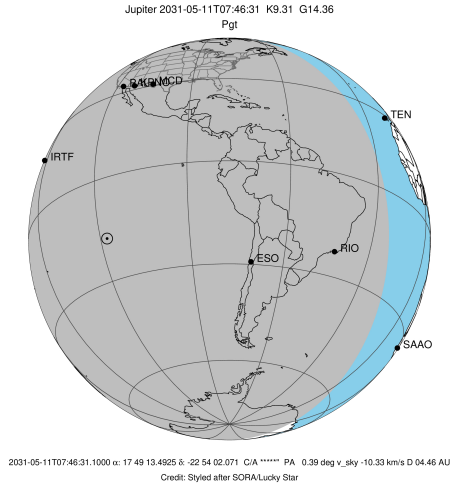


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-11T06:44:46.486	72.45	-34.92	71485.1	-59.28	-62.39
Jupiter	E	2031-05-11T08:36:29.787	46.81	-9.65	71485.0	-60.36	-63.39

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-11T07:45:18.190
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       : 4068878400825791104
2Mass ID (if available) : 17491349-2254019
ICRS Star Coord at Epoch: 17h 49m 13.49255s -22:54:02.07099s
RUWE (>1.4 is poor) : 0.84
K magnitude           : 9.315
G magnitude           : 14.361
RP magnitude          : 13.107
BP magnitude          : 16.119
DUPflag              : 0
Distance (au)         : 4.455
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -10.33
Sun-Target sep (deg) : 142.49
Sun-Moon sep (deg)   : 20.18
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.32
Pole direction: RA (deg): 268.05695
Dec (deg): 64.49651
C/A sky separation (") : 19.235
C/A sky separation (km) : 62156.0
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	2031-05-11T06:50:38.841	81.19	-57.99	71485.0	-60.24	-63.29
Jupiter	E	2031-05-11T08:39:57.543	70.65	-34.27	71485.0	-60.55	-63.57