

target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2031-05-24T06:39:50.610  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4116869398967597312  
 2Mass ID (if available) : 17440208-2253180

Jupiter 2031-05-24T06:39:50 K6.54 G12.75 Pgt

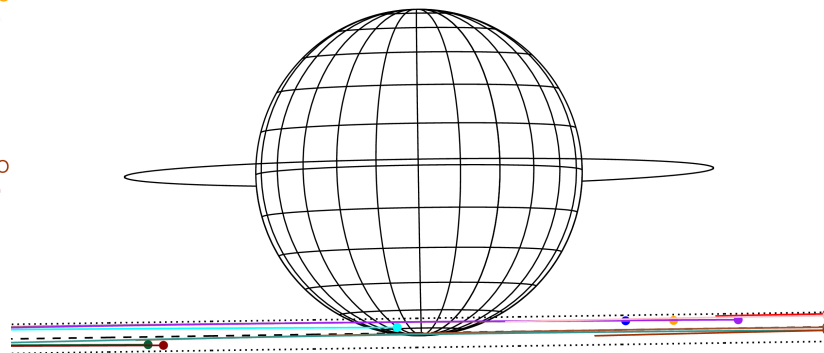
ICRS Star Coord at Epoch: 17h 44m 02.07989s -22:53:18.29386s

RUWE (>1.4 is poor) : 0.80  
 K magnitude : 6.535  
 G magnitude : 12.748  
 RP magnitude : 11.259  
 BP magnitude : 15.943  
 DUPflag : 0  
 Distance (au) : 4.346  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -13.94  
 Sun-Target sep (deg) : 156.17  
 Sun-Moon sep (deg) : 170.68  
 B (ring opening deg) : -2.60  
 PA of pole (deg) : 0.88  
 Pole direction: RA (deg): 268.05694  
 Dec (deg): 64.49651  
 C/A sky separation (") : 22.289  
 C/A sky separation (km) : 70251.8  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2031-05-24T06:39:50 K6.54 G12.75  
 Pgt



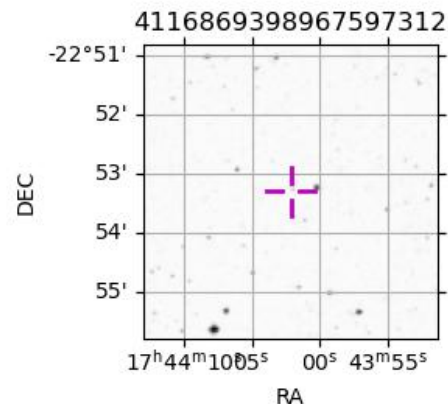
Earth  
 PIC  
 PAL  
 KPNO  
 MCD  
 TEN  
 IRTF  
 RIO  
 ESO  
 AAT  
 SAAO  
 MSO



2031-05-24T06:39:50.6100 α: 17 44 02.07989 δ: -22 53 18.294 C/A \*\*\*\*\* PA 0.85 deg v\_sky -13.94 km/s D 04.35 AU  
 Credit: Styled after SORA/Lucky Star

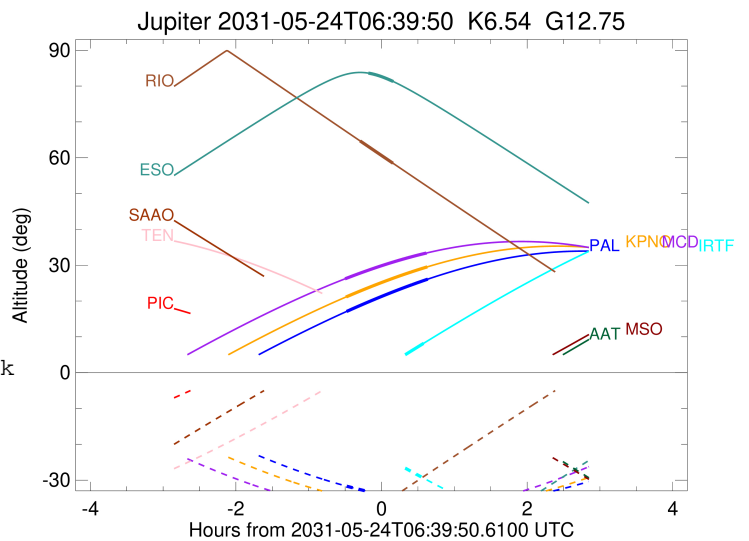
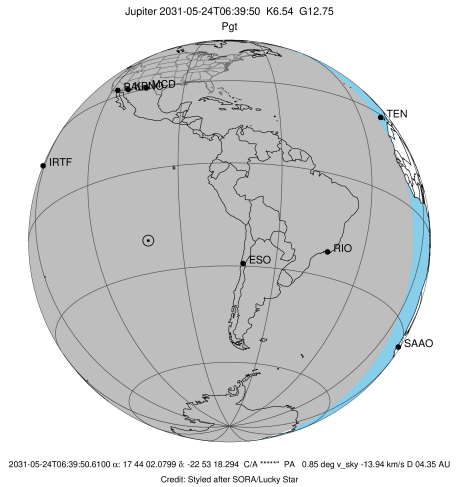
Observable events with sun below -5 deg and altitude above 5 deg

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 24 06:11 - MAY 24 07:18	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	MAY 24 06:10 - MAY 24 07:17	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	MAY 24 06:09 - MAY 24 07:16	Pie
TEN	Teide Obs./Tenerife	28.3	343.5			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+	MAY 24 07:14 - MAY 24 07:14	Pne
KAV	Kavalur Observatory	12.6	78.8			Pnn
RIO	Rio de Janeiro	-22.9	316.8	+ +	MAY 24 06:22 - MAY 24 06:49	Pie
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	MAY 24 06:29 - MAY 24 06:49	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            : 2031-05-24T06:44:36.650
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      : 4116869398967597312
2Mass ID (if available) : 17440208-2253180
ICRS Star Coord at Epoch: 17h 44m 02.07989s -22:53:18.29386s
RUWE (>1.4 is poor) : 0.80
K magnitude          : 6.535
G magnitude          : 12.748
RP magnitude         : 11.259
BP magnitude         : 15.943
DUPflag             : 0
Distance (au)        : 4.346
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.94
Sun-Target sep (deg) : 156.17
Sun-Moon sep (deg)  : 171.00
B (ring opening deg) : -2.60
PA of pole (deg)    : 0.88
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation ("): 20.782
C/A sky separation (km): 65502.4
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
    
```

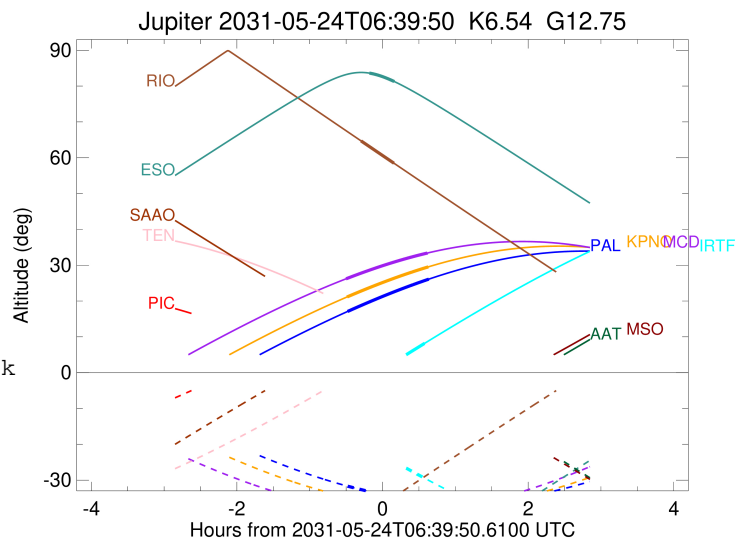
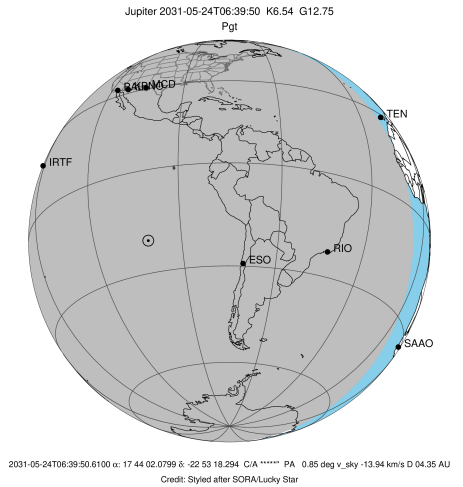


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-24T06:11:05.520	17.08	-31.68	71484.2	-66.73	-69.26
Jupiter	E	2031-05-24T07:18:01.710	26.11	-35.71	71484.3	-65.85	-68.45

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-24T06:44:09.960
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      : 4116869398967597312
2Mass ID (if available) : 17440208-2253180
ICRS Star Coord at Epoch: 17h 44m 02.07989s -22:53:18.29386s
RUWE (>1.4 is poor) : 0.80
K magnitude         : 6.535
G magnitude         : 12.748
RP magnitude        : 11.259
BP magnitude        : 15.943
DUPflag            : 0
Distance (au)       : 4.346
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -13.94
Sun-Target sep (deg) : 156.17
Sun-Moon sep (deg)  : 170.96
B (ring opening deg) : -2.60
PA of pole (deg)    : 0.88
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (" ) : 20.774
C/A sky separation (km) : 65476.7
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
    
```

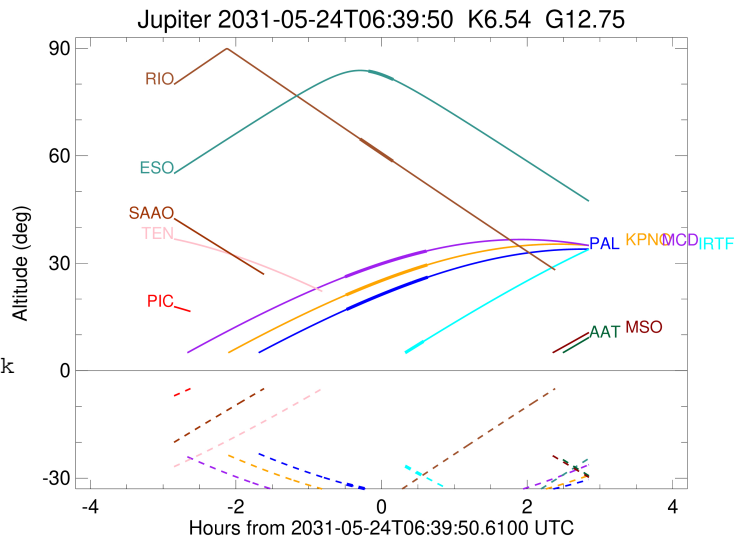
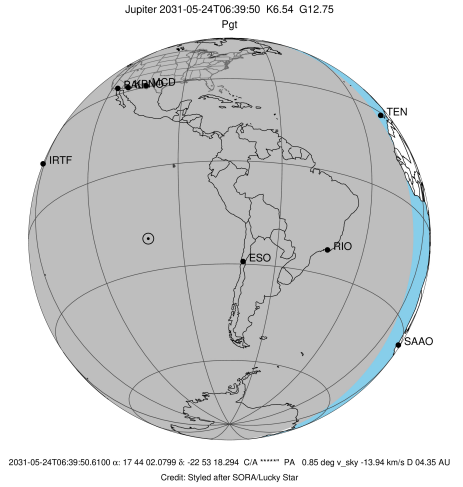


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-24T06:10:38.920	21.13	-34.67	71484.2	-66.65	-69.18
Jupiter	E	2031-05-24T07:17:35.457	29.53	-37.45	71484.3	-65.84	-68.44

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-24T06:43:24.700
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      : 4116869398967597312
2Mass ID (if available) : 17440208-2253180
ICRS Star Coord at Epoch: 17h 44m 02.07989s -22:53:18.29386s
RUWE (>1.4 is poor) : 0.80
K magnitude          : 6.535
G magnitude          : 12.748
RP magnitude         : 11.259
BP magnitude         : 15.943
DUPflag             : 0
Distance (au)       : 4.346
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.94
Sun-Target sep (deg) : 156.17
Sun-Moon sep (deg)  : 170.90
B (ring opening deg) : -2.60
PA of pole (deg)    : 0.88
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 20.754
C/A sky separation (km) : 65414.4
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
    
```

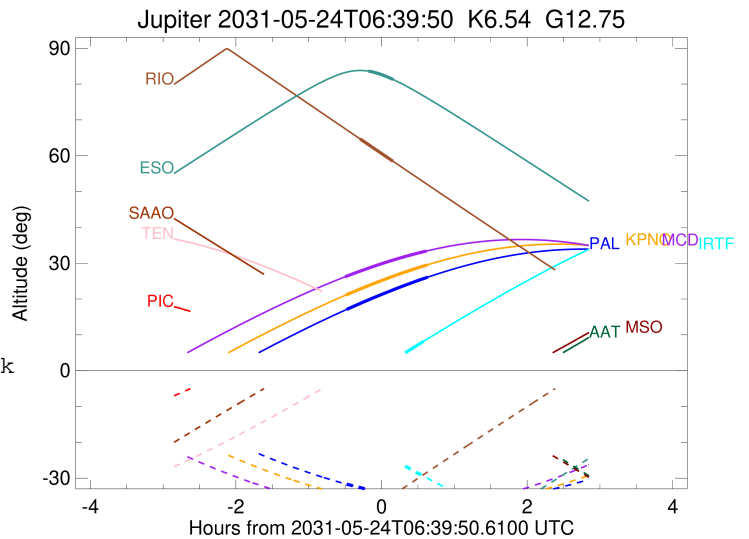
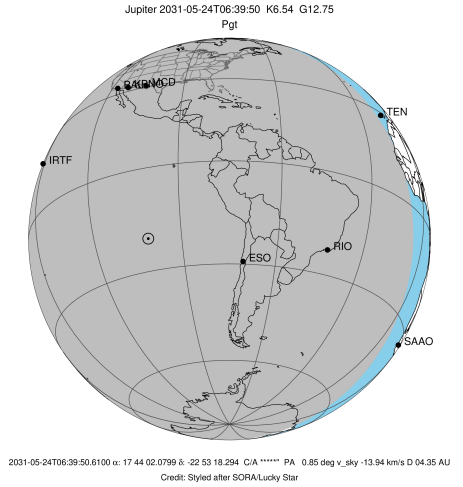


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-24T06:09:48.867	26.20	-37.72	71484.2	-66.47	-69.02
Jupiter	E	2031-05-24T07:16:55.842	33.40	-38.43	71484.3	-65.78	-68.39

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-24T06:47:52.710
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       : 4116869398967597312
2Mass ID (if available) : 17440208-2253180
ICRS Star Coord at Epoch: 17h 44m 02.07989s -22:53:18.29386s
RUWE (>1.4 is poor) : 0.80
K magnitude           : 6.535
G magnitude           : 12.748
RP magnitude          : 11.259
BP magnitude          : 15.943
DUPflag              : 0
Distance (au)         : 4.346
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.94
Sun-Target sep (deg) : 156.17
Sun-Moon sep (deg)   : 171.38
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.88
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 21.533
C/A sky separation (km) : 67868.8
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
    
```

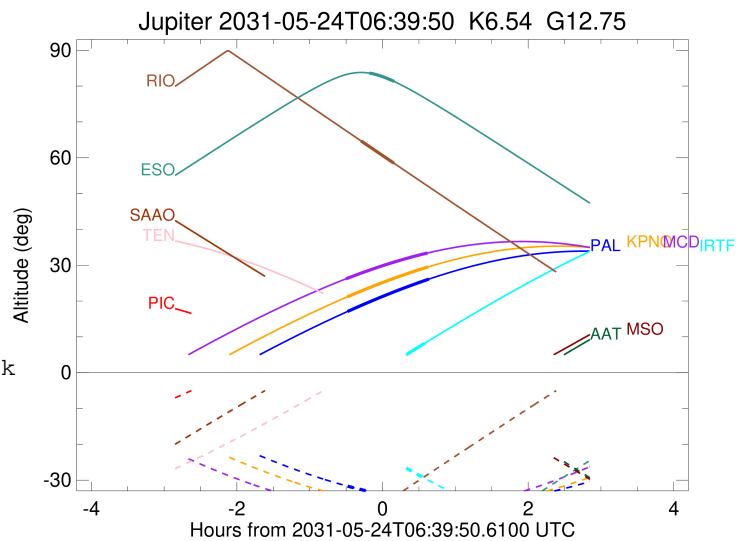
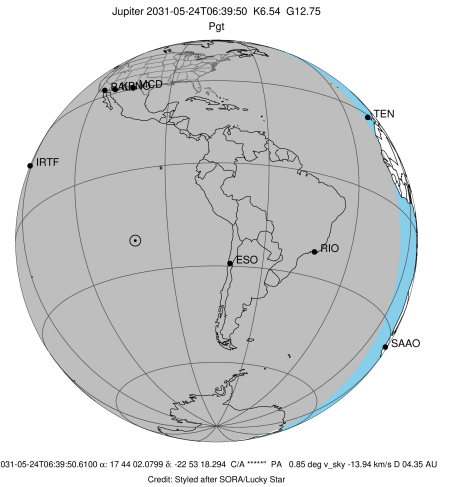


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-24T06:21:10.549	-3.18x	-19.21	71483.6	-72.24	-74.24
Jupiter	E	2031-05-24T07:14:28.535	8.17	-29.44	71483.7	-70.82	-72.96

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-24T06:35:45.000
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       : 4116869398967597312
2Mass ID (if available) : 17440208-2253180
ICRS Star Coord at Epoch: 17h 44m 02.07989s -22:53:18.29386s
RUWE (>1.4 is poor) : 0.80
K magnitude           : 6.535
G magnitude           : 12.748
RP magnitude          : 11.259
BP magnitude          : 15.943
DUPflag              : 0
Distance (au)         : 4.346
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -13.94
Sun-Target sep (deg) : 156.17
Sun-Moon sep (deg)   : 170.41
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.88
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation ("): 22.376
C/A sky separation (km): 70527.5
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
    
```

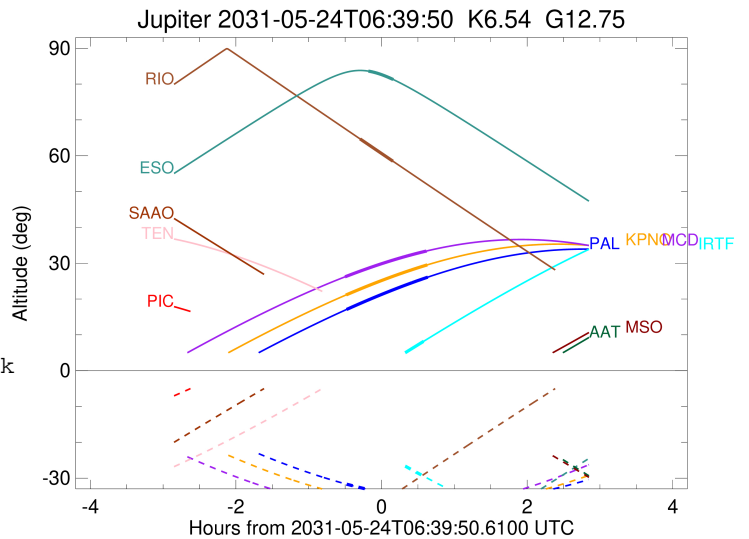
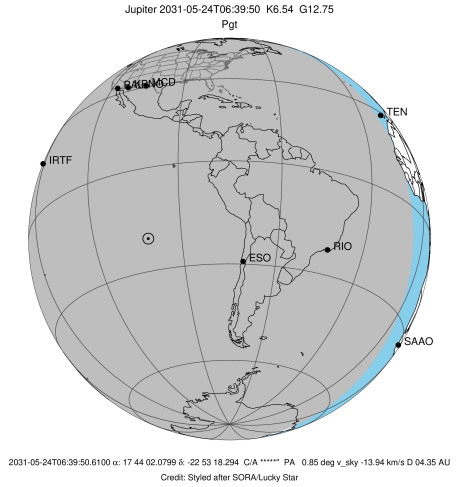


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-24T06:22:12.791	64.68	-40.89	71483.0	-80.01	-81.17
Jupiter	E	2031-05-24T06:49:17.839	58.46	-34.72	71483.0	-80.56	-81.67

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-24T06:39:17.650
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        : 4116869398967597312
2Mass ID (if available) : 17440208-2253180
ICRS Star Coord at Epoch: 17h 44m 02.07989s -22:53:18.29386s
RUWE (>1.4 is poor) : 0.80
K magnitude           : 6.535
G magnitude           : 12.748
RP magnitude          : 11.259
BP magnitude          : 15.943
DUPflag              : 0
Distance (au)         : 4.346
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -13.94
Sun-Target sep (deg) : 156.17
Sun-Moon sep (deg)   : 170.79
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.88
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation ("): 22.507
C/A sky separation (km): 70941.5
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	2031-05-24T06:29:06.796	83.60	-63.91	71482.9	-82.50	-83.38
Jupiter	E	2031-05-24T06:49:28.493	81.27	-59.54	71482.9	-82.49	-83.37