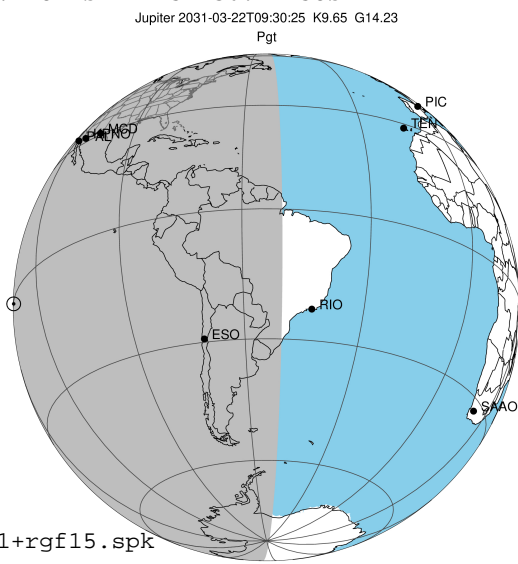


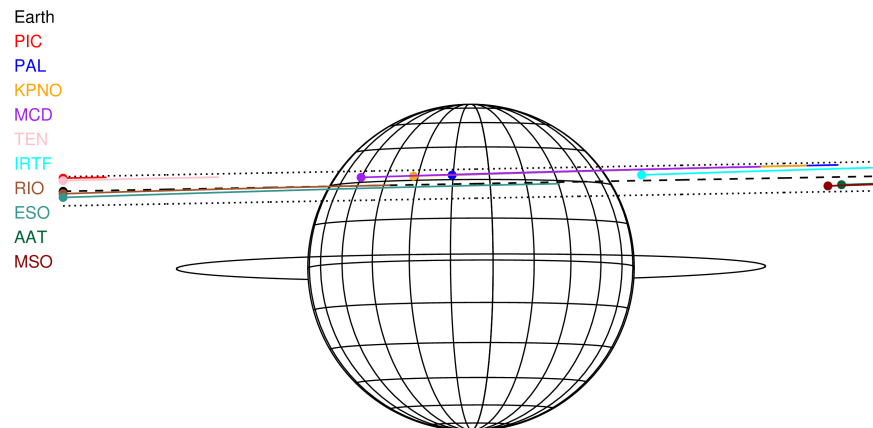
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-03-22T09:30:25.160
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068901215701181568
 2Mass ID (if available) : 17494843-2252360

Jupiter 2031-03-22T09:30:25 K9.65 G14.23 Pgt

ICRS Star Coord at Epoch: 17h 49m 48.42844s -22:52:36.21458s
 RUWE (>1.4 is poor) : 0.92
 K magnitude : 9.646
 G magnitude : 14.234
 RP magnitude : 13.062
 BP magnitude : 15.707
 DUPflag : 0
 Distance (au) : 5.154
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : 11.34
 Sun-Target sep (deg) : 93.48
 Sun-Moon sep (deg) : 83.79
 B (ring opening deg) : -2.63
 PA of pole (deg) : 0.26
 Pole direction: RA (deg): 268.05699
 Dec (deg): 64.49651
 C/A sky separation (") : 9.811
 C/A sky separation (km) : 36676.4
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLvl.spk
 naif0012.tls
 nep097.bsp
 nep101.bsp
 sat4401.bsp

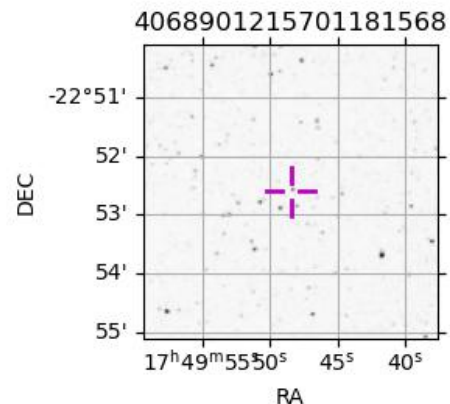


2031-03-22T09:30:25.1600 x: 17 49 48.4284 s: -22 52 36.215 C/A 9.801" PA 181.06 deg v_sky +11.34 km/s D 05.15 AU
 Credit: Styled after SORA/Lucky Star



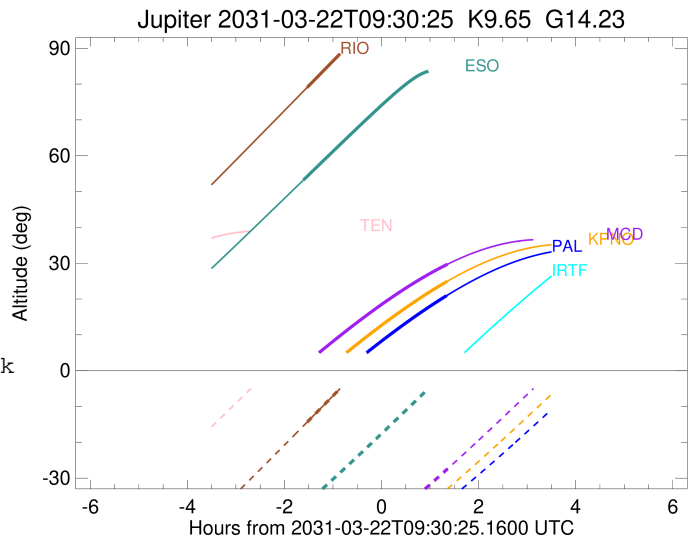
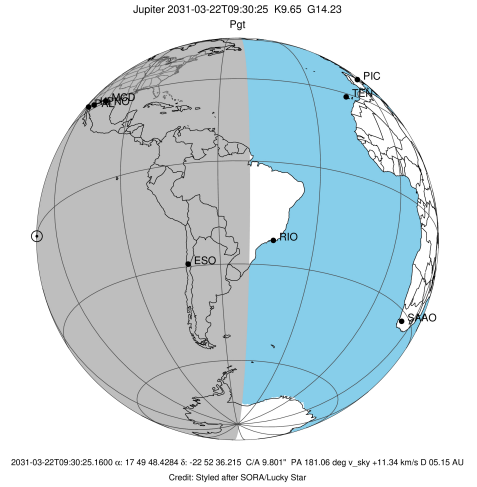
Observable events with sun below -5 deg and altitude above 5 deg

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	+	MAR 22 10:50 - MAR 22 10:50	Pne
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	MAR 22 10:51 - MAR 22 10:51	Pne
MCD	McDonald Obs. 2.7m	30.7	256.0	+	MAR 22 10:52 - MAR 22 10:52	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	+	MAR 22 07:58 - MAR 22 07:58	Pin
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	MAR 22 07:54 - MAR 22 07:54	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



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-22T09:22:30.660
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       : 4068901215701181568
2Mass ID (if available) : 17494843-2252360
ICRS Star Coord at Epoch: 17h 49m 48.42844s -22:52:36.21458s
RUWE (>1.4 is poor) : 0.92
K magnitude          : 9.646
G magnitude           : 14.234
RP magnitude         : 13.062
BP magnitude         : 15.707
DUPflag             : 0
Distance (au)        : 5.154
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 11.34
Sun-Target sep (deg) : 93.48
Sun-Moon sep (deg)   : 84.00
B (ring opening deg) : -2.63
PA of pole (deg)     : 0.26
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation ("): 10.891
C/A sky separation (km): 40713.7
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
    
```

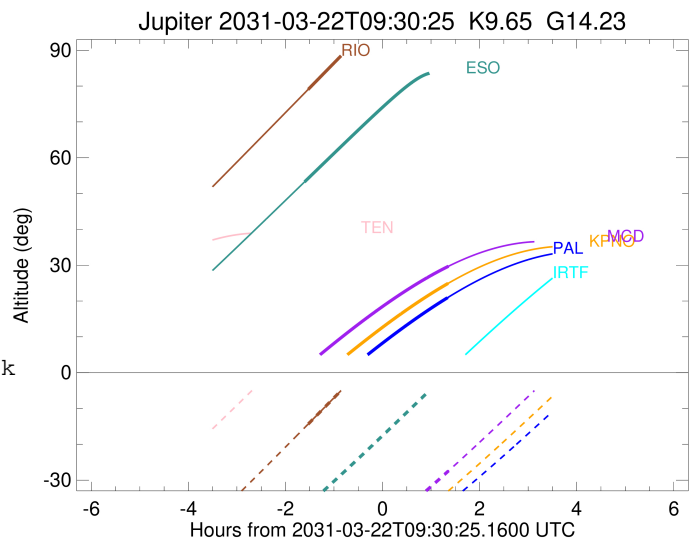
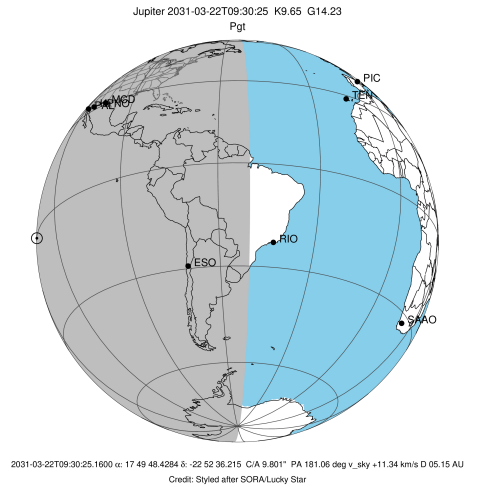


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-22T07:55:31.336	-9.36x	-56.22	71489.2	33.13	36.66
Jupiter	E	2031-03-22T10:50:49.910	20.93	-36.49	71488.7	36.11	39.74

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-22T09:22:45.980
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       : 4068901215701181568
2Mass ID (if available) : 17494843-2252360
ICRS Star Coord at Epoch: 17h 49m 48.42844s -22:52:36.21458s
RUWE (>1.4 is poor) : 0.92
K magnitude           : 9.646
G magnitude           : 14.234
RP magnitude          : 13.062
BP magnitude          : 15.707
DUPflag              : 0
Distance (au)         : 5.154
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 11.34
Sun-Target sep (deg) : 93.48
Sun-Moon sep (deg)   : 84.07
B (ring opening deg) : -2.63
PA of pole (deg)     : 0.26
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 10.910
C/A sky separation (km) : 40783.0
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
    
```

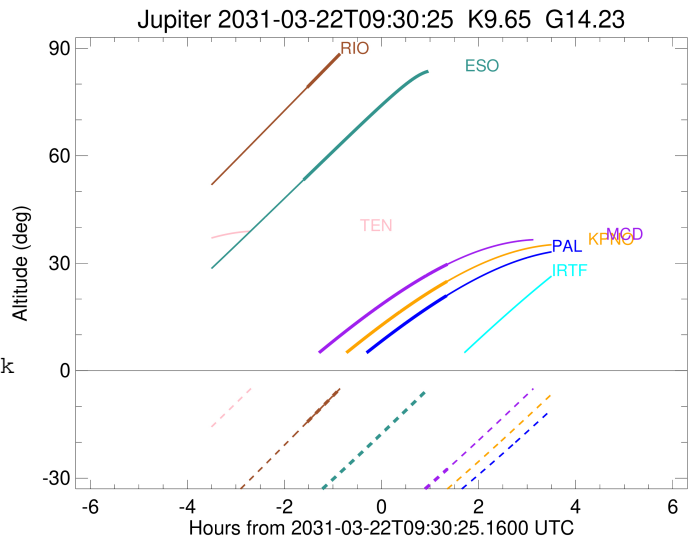
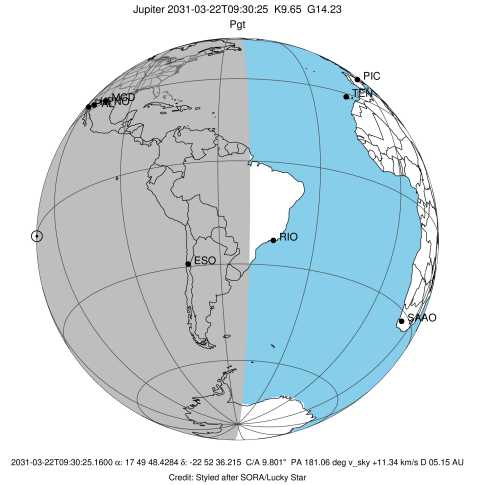


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-22T07:55:33.171	-4.72x	-57.19	71489.2	33.20	36.73
Jupiter	E	2031-03-22T10:51:17.258	24.89	-33.11	71488.7	36.15	39.78

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-22T09:23:20.020
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        : 4068901215701181568
2Mass ID (if available) : 17494843-2252360
ICRS Star Coord at Epoch: 17h 49m 48.42844s -22:52:36.21458s
RUWE (>1.4 is poor) : 0.92
K magnitude           : 9.646
G magnitude           : 14.234
RP magnitude          : 13.062
BP magnitude          : 15.707
DUPflag              : 0
Distance (au)         : 5.154
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 11.34
Sun-Target sep (deg)  : 93.48
Sun-Moon sep (deg)    : 84.16
B (ring opening deg) : -2.63
PA of pole (deg)      : 0.26
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 10.948
C/A sky separation (km) : 40926.4
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
    
```

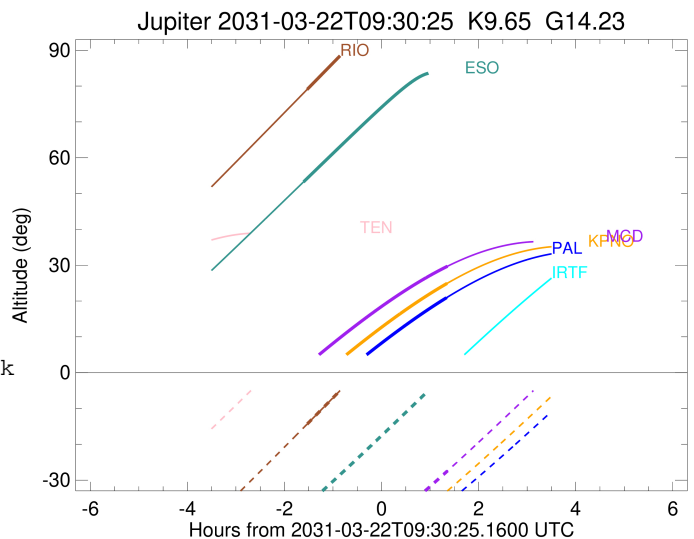
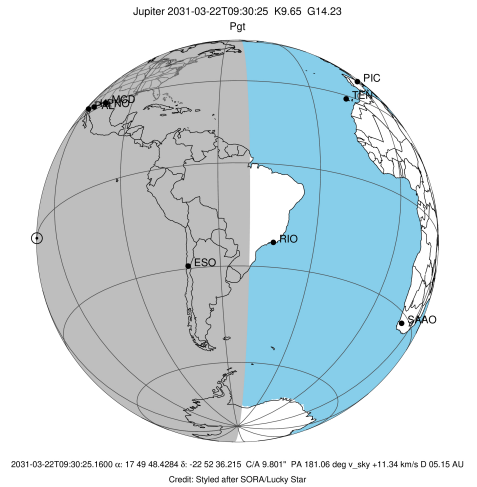


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-22T07:55:50.976	1.73x	-56.46	71489.1	33.37	36.90
Jupiter	E	2031-03-22T10:52:03.518	29.71	-27.40	71488.7	36.22	39.86

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-22T09:32:17.720
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      : 4068901215701181568
2Mass ID (if available) : 17494843-2252360
ICRS Star Coord at Epoch: 17h 49m 48.42844s -22:52:36.21458s
RUWE (>1.4 is poor) : 0.92
K magnitude          : 9.646
G magnitude          : 14.234
RP magnitude         : 13.062
BP magnitude         : 15.707
DUPflag             : 0
Distance (au)       : 5.154
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : 11.34
Sun-Target sep (deg) : 93.48
Sun-Moon sep (deg)  : 84.72
B (ring opening deg) : -2.63
PA of pole (deg)    : 0.26
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 9.807
C/A sky separation (km) : 36661.5
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
    
```

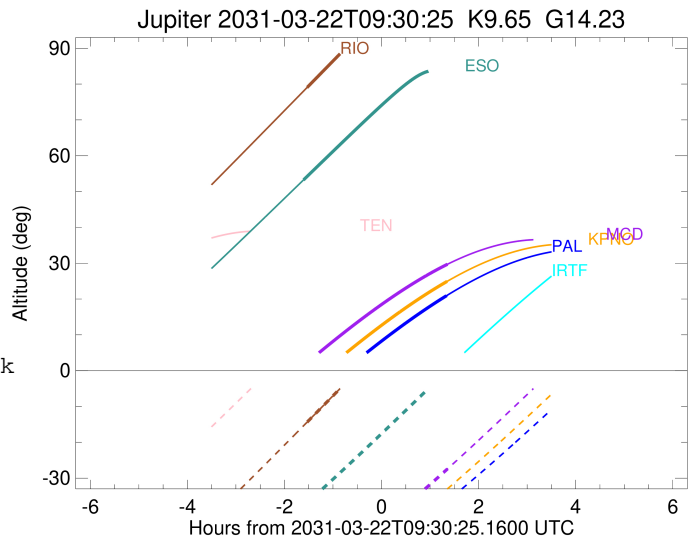
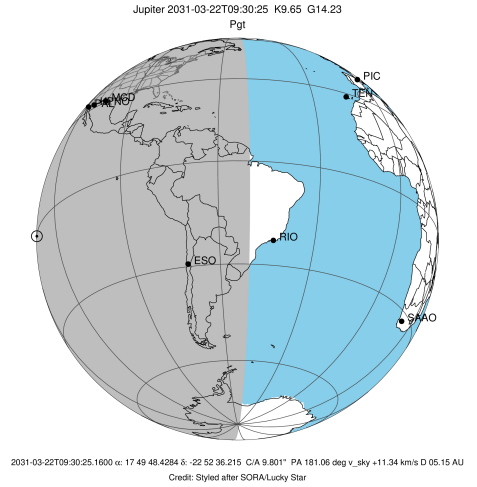


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-22T07:58:32.144	79.06	-14.35	71489.7	29.98	33.35
Jupiter	E	2031-03-22T11:06:02.631	57.70	28.56x	71489.5	31.30	34.74

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-22T09:27:47.440
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      : 4068901215701181568
2Mass ID (if available) : 17494843-2252360
ICRS Star Coord at Epoch: 17h 49m 48.42844s -22:52:36.21458s
RUWE (>1.4 is poor) : 0.92
K magnitude          : 9.646
G magnitude          : 14.234
RP magnitude         : 13.062
BP magnitude         : 15.707
DUPflag             : 0
Distance (au)       : 5.154
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 11.34
Sun-Target sep (deg) : 93.48
Sun-Moon sep (deg)  : 84.74
B (ring opening deg) : -2.63
PA of pole (deg)    : 0.26
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (" ) : 9.595
C/A sky separation (km) : 35867.3
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	2031-03-22T07:53:59.728	53.23	-37.72	71489.8	28.86	32.16
Jupiter	E	2031-03-22T11:02:19.064	81.36	2.40x	71489.5	30.98	34.40