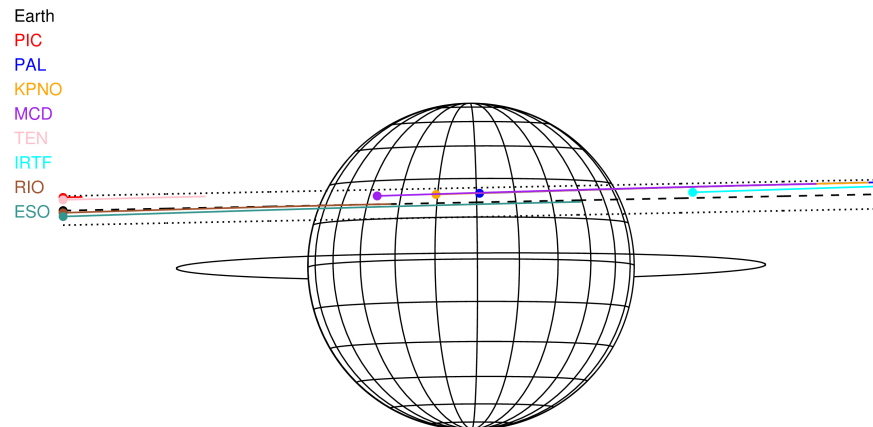
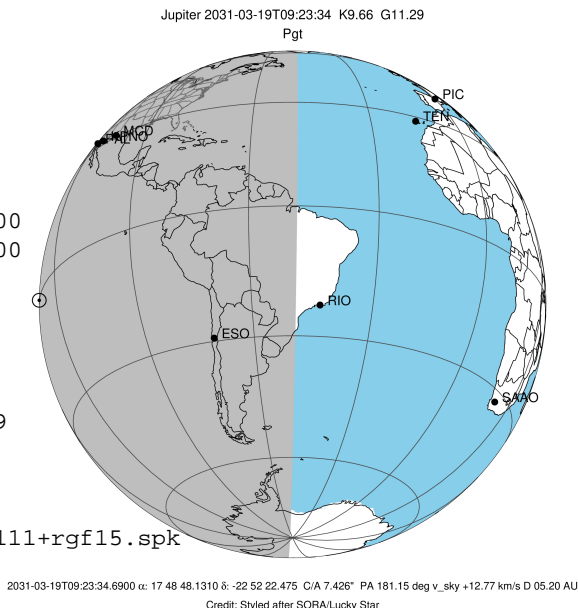


target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2031-03-19T09:23:34.690  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4068889769548792704  
 2Mass ID (if available) : 17484812-2252223

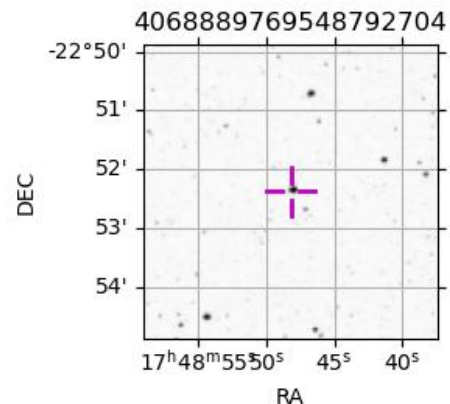
Jupiter 2031-03-19T09:23:34 K9.66 G11.29 Pgt

ICRS Star Coord at Epoch: 17h 48m 48.13099s -22:52:22.47516s  
 RUWE (>1.4 is poor) : 1.02  
 K magnitude : 9.658  
 G magnitude : 11.288  
 RP magnitude : 10.722  
 BP magnitude : 11.667  
 DUPflag : 0  
 Distance (au) : 5.203  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : 12.77  
 Sun-Target sep (deg) : 90.72  
 Sun-Moon sep (deg) : 41.99  
 B (ring opening deg) : -2.63  
 PA of pole (deg) : 0.37  
 Pole direction: RA (deg): 268.05699  
 Dec (deg): 64.49651  
 C/A sky separation (") : 7.436  
 C/A sky separation (km) : 28061.1  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk  
 URKALLv1.spk  
 naif0012.tls  
 nep097.bsp  
 nep101.bsp  
 sat4401.bsp



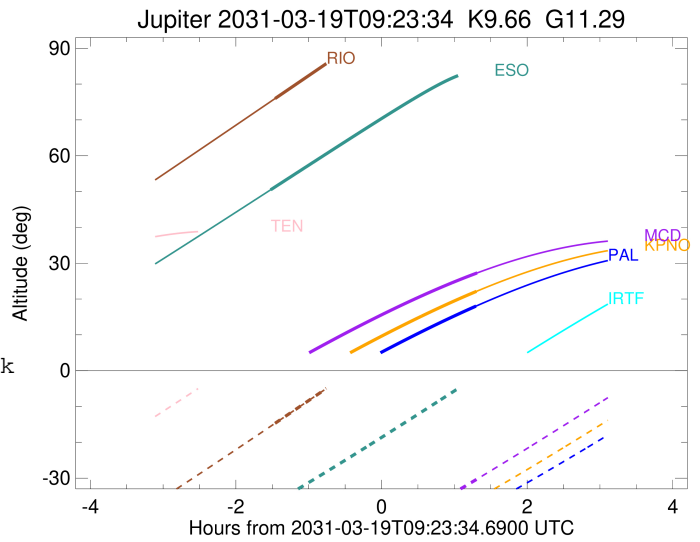
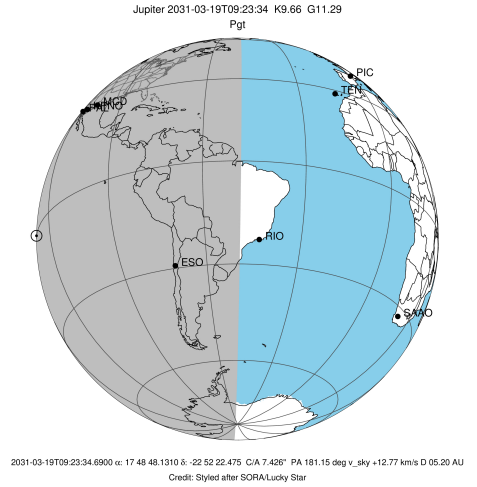
Observable events with sun below -5 deg and altitude above 5 deg

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 19 10:41 - MAR 19 10:41	Pne
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	MAR 19 10:41 - MAR 19 10:41	Pne
MCD	McDonald Obs. 2.7m	30.7	256.0	+	MAR 19 10:42 - MAR 19 10:42	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 19 07:55 - MAR 19 07:55	Pin
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	MAR 19 07:52 - MAR 19 07:52	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            : 2031-03-19T09:16:32.270
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      : 4068889769548792704
2Mass ID (if available) : 17484812-2252223
ICRS Star Coord at Epoch: 17h 48m 48.13099s -22:52:22.47516s
RUWE (>1.4 is poor) : 1.02
K magnitude         : 9.658
G magnitude         : 11.288
RP magnitude        : 10.722
BP magnitude        : 11.667
DUPflag            : 0
Distance (au)       : 5.203
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : 12.77
Sun-Target sep (deg) : 90.72
Sun-Moon sep (deg)  : 42.57
B (ring opening deg) : -2.63
PA of pole (deg)    : 0.37
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 8.466
C/A sky separation (km) : 31947.5
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
    
```

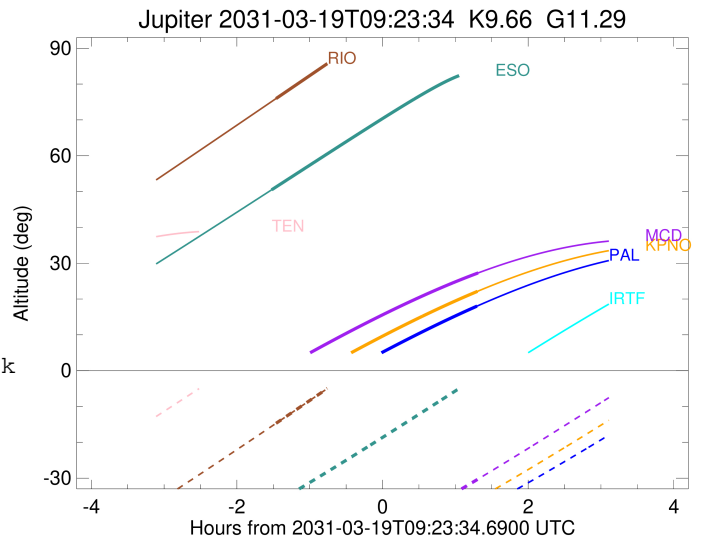
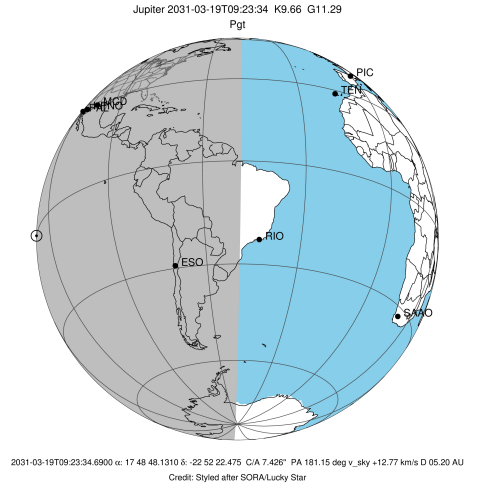


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-19T07:52:44.195	-12.03x	-57.40	71490.3	25.07	28.10
Jupiter	E	2031-03-19T10:41:26.823	18.01	-39.17	71489.9	27.89	31.13

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-19T09:16:42.470
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       : 4068889769548792704
2Mass ID (if available) : 17484812-2252223
ICRS Star Coord at Epoch: 17h 48m 48.13099s -22:52:22.47516s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 9.658
G magnitude           : 11.288
RP magnitude          : 10.722
BP magnitude          : 11.667
DUPflag              : 0
Distance (au)         : 5.203
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 12.77
Sun-Target sep (deg) : 90.72
Sun-Moon sep (deg)   : 42.61
B (ring opening deg) : -2.63
PA of pole (deg)     : 0.37
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 8.485
C/A sky separation (km) : 32020.0
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
    
```

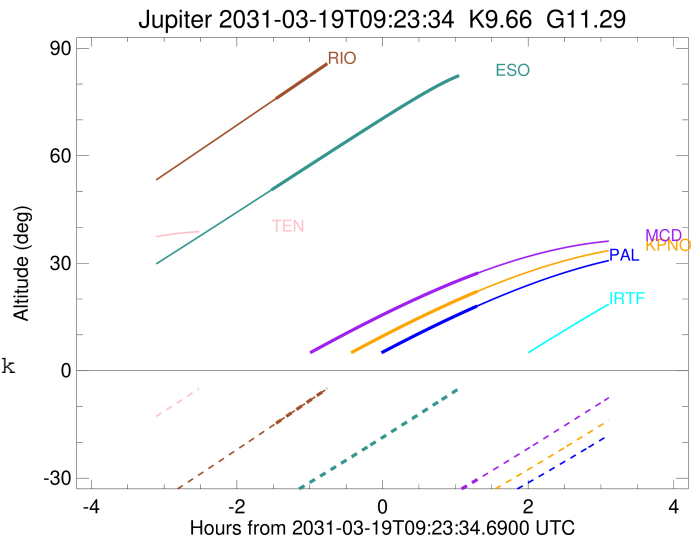
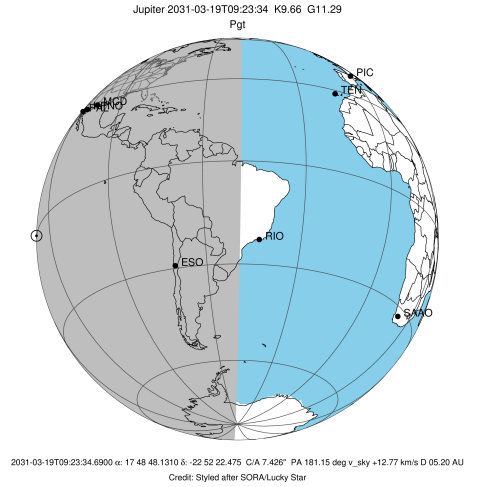


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-19T07:52:42.306	-7.39x	-58.49	71490.3	25.13	28.17
Jupiter	E	2031-03-19T10:41:48.305	22.13	-35.86	71489.9	27.93	31.17

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-19T09:17:07.630
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      : 4068889769548792704
2Mass ID (if available) : 17484812-2252223
ICRS Star Coord at Epoch: 17h 48m 48.13099s -22:52:22.47516s
RUWE (>1.4 is poor) : 1.02
K magnitude          : 9.658
G magnitude          : 11.288
RP magnitude         : 10.722
BP magnitude         : 11.667
DUPflag             : 0
Distance (au)       : 5.203
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : 12.77
Sun-Target sep (deg) : 90.72
Sun-Moon sep (deg)  : 42.64
B (ring opening deg) : -2.63
PA of pole (deg)    : 0.37
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 8.525
C/A sky separation (km) : 32171.7
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
    
```

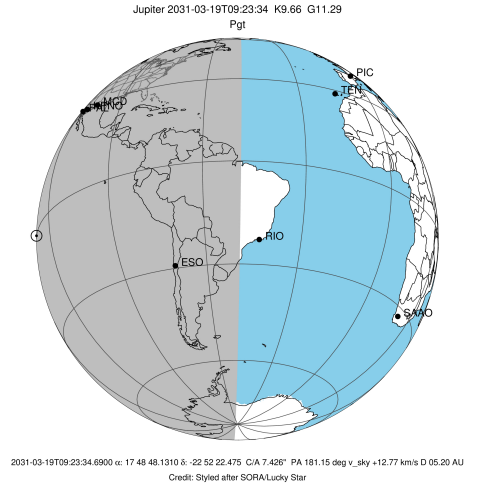


x: target alt < 5.0 deg or sun > -5.0 deg

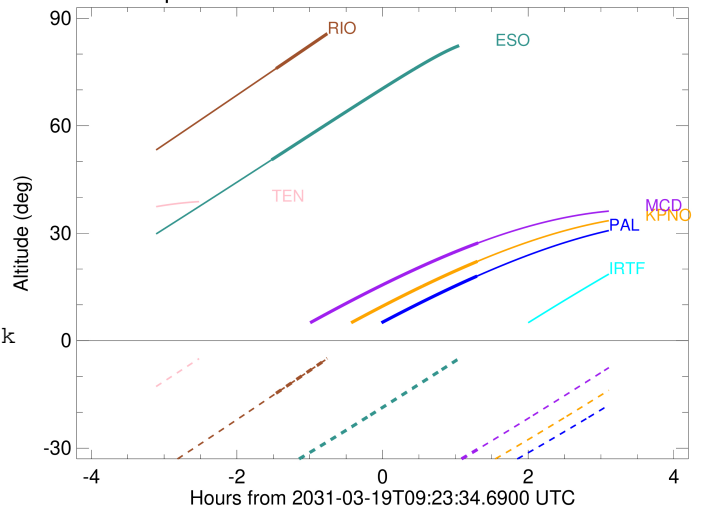
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-19T07:52:52.102	-0.92x	-57.91	71490.3	25.28	28.33
Jupiter	E	2031-03-19T10:42:26.128	27.28	-30.23	71489.9	28.01	31.26

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-19T09:24:32.930
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        : 4068889769548792704
2Mass ID (if available) : 17484812-2252223
ICRS Star Coord at Epoch: 17h 48m 48.13099s -22:52:22.47516s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 9.658
G magnitude           : 11.288
RP magnitude          : 10.722
BP magnitude          : 11.667
DUPflag              : 0
Distance (au)         : 5.203
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 12.77
Sun-Target sep (deg) : 90.72
Sun-Moon sep (deg)   : 42.58
B (ring opening deg) : -2.63
PA of pole (deg)     : 0.37
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 7.439
C/A sky separation (km) : 28069.7
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
    
```



Jupiter 2031-03-19T09:23:34 K9.66 G11.29

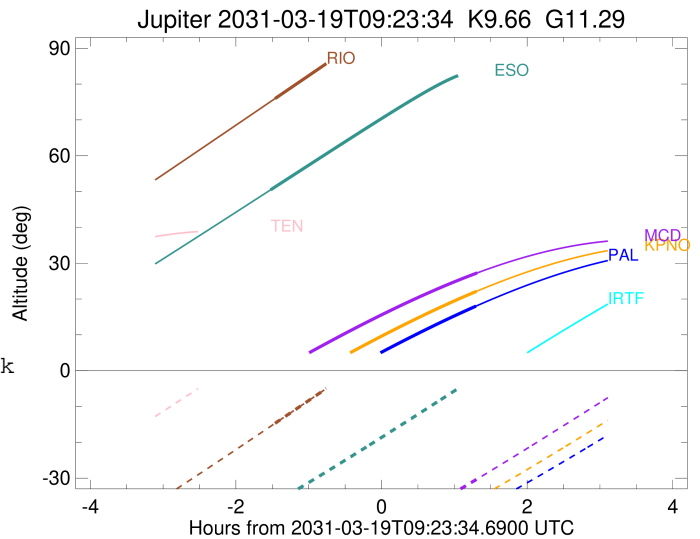
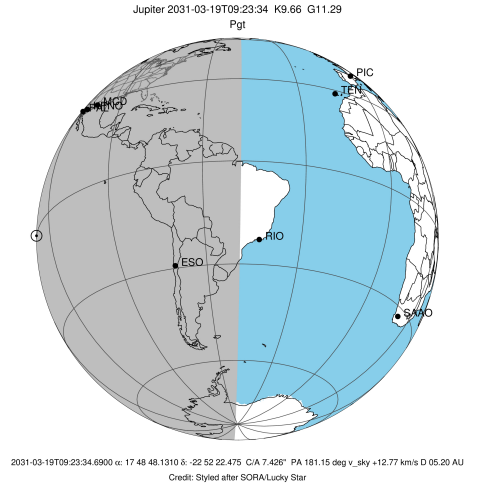


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-19T07:55:49.460	75.94	-14.70	71490.6	22.23	25.02
Jupiter	E	2031-03-19T10:53:21.738	63.09	26.03x	71490.5	23.66	26.58

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-19T09:20:45.080
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       : 4068889769548792704
2Mass ID (if available) : 17484812-2252223
ICRS Star Coord at Epoch: 17h 48m 48.13099s -22:52:22.47516s
RUWE (>1.4 is poor) : 1.02
K magnitude          : 9.658
G magnitude          : 11.288
RP magnitude         : 10.722
BP magnitude         : 11.667
DUPflag             : 0
Distance (au)        : 5.203
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 12.77
Sun-Target sep (deg) : 90.72
Sun-Moon sep (deg)   : 42.86
B (ring opening deg) : -2.63
PA of pole (deg)     : 0.37
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 7.204
C/A sky separation (km) : 27186.6
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	2031-03-19T07:52:10.683	50.47	-37.52	71490.8	21.13	23.82
Jupiter	E	2031-03-19T10:49:58.793	83.73	0.09x	71490.5	23.26	26.14