

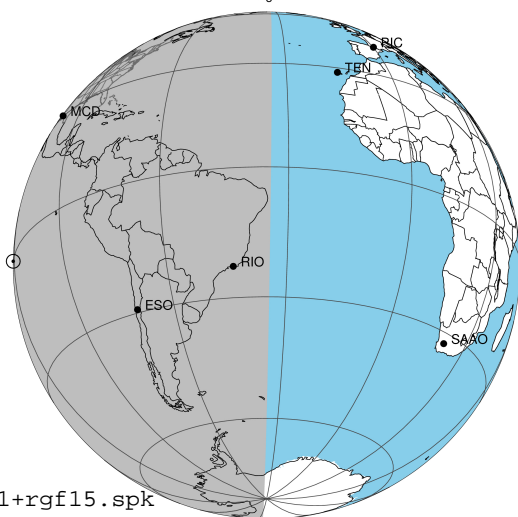
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-03-19T08:23:53.980
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4068889769548977024
 2Mass ID (if available) : 17484722-2252424

Jupiter 2031-03-19T08:23:53 K9.19 G13.70 Pgt

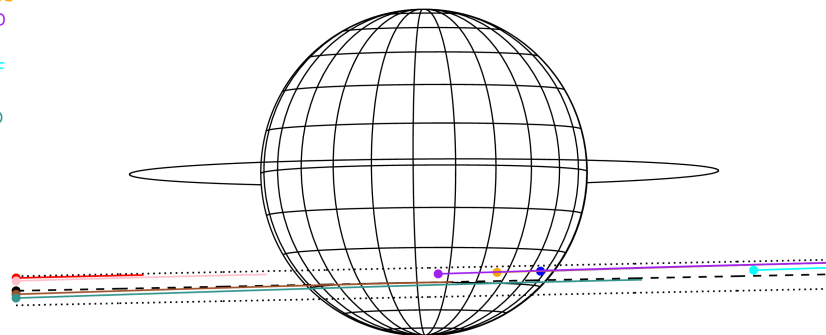
ICRS Star Coord at Epoch: 17h 48m 47.22402s -22:52:42.43231s

RUWE (>1.4 is poor) : 0.97
 K magnitude : 9.192
 G magnitude : 13.699
 RP magnitude : 12.520
 BP magnitude : 15.156
 DUPflag : 0
 Distance (au) : 5.204
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : 12.79
 Sun-Target sep (deg) : 90.69
 Sun-Moon sep (deg) : 41.41
 B (ring opening deg) : -2.62
 PA of pole (deg) : 0.37
 Pole direction: RA (deg): 268.05699
 Dec (deg): 64.49651
 C/A sky separation (") : 12.769
 C/A sky separation (km) : 48190.5
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-03-19T08:23:53 K9.19 G13.70
 Pgt



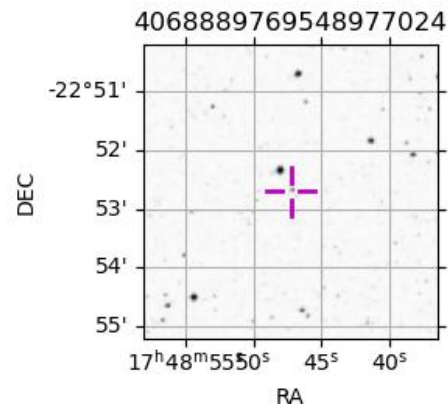
Earth
 PIC
 PAL
 KPNO
 MCD
 TEN
 IRTF
 RIO
 ESO



2031-03-19T08:23:53.9800 α: 17 48 47.2240 δ: -22 52 42.432 C/A ***** PA 1.16 deg v_sky +12.79 km/s D 05.20 AU
 Credit: Styled after SORA/Lucky Star

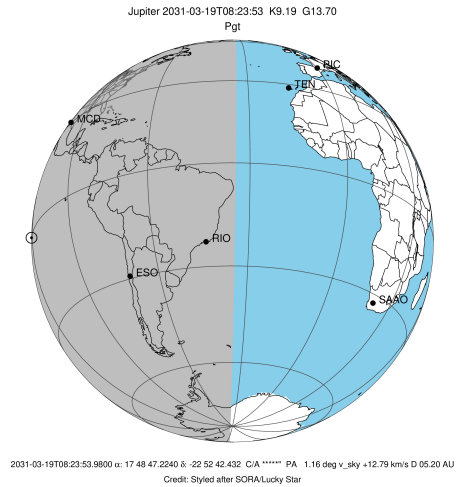
Observable events with sun below -5 deg and altitude above 5 deg

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 19 09:30 - MAR 19 09:30	Pne
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	MAR 19 09:31 - MAR 19 09:31	Pne
MCD	McDonald Obs. 2.7m	30.7	256.0	+	MAR 19 09:31 - MAR 19 09:31	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 07:12 - MAR 19 07:12	Pin
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	MAR 19 07:11 - MAR 19 09:29	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

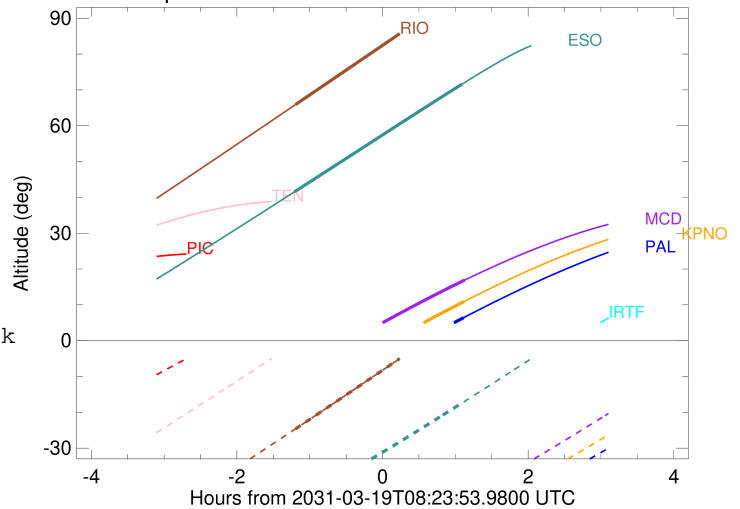


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-19T08:17:36.780
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       : 4068889769548977024
2Mass ID (if available) : 17484722-2252424
ICRS Star Coord at Epoch: 17h 48m 47.22402s -22:52:42.43231s
RUWE (>1.4 is poor) : 0.97
K magnitude           : 9.192
G magnitude           : 13.699
RP magnitude         : 12.520
BP magnitude         : 15.156
DUPflag              : 0
Distance (au)        : 5.204
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 12.79
Sun-Target sep (deg) : 90.69
Sun-Moon sep (deg)   : 41.91
B (ring opening deg) : -2.62
PA of pole (deg)     : 0.37
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 11.879
C/A sky separation (km) : 44833.4
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
    
```



Jupiter 2031-03-19T08:23:53 K9.19 G13.70

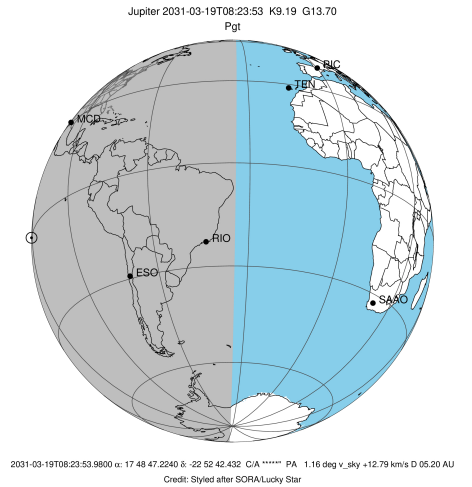


x: target alt < 5.0 deg or sun > -5.0 deg

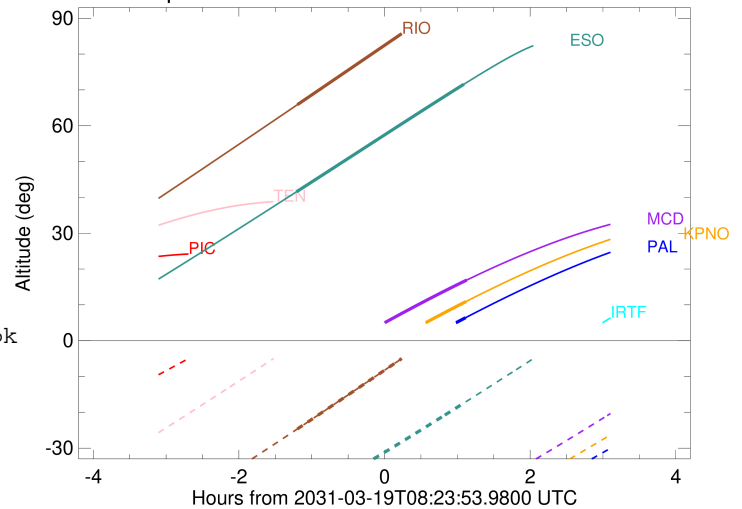
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-19T07:05:16.040	-21.56x	-55.36	71488.1	-40.25	-43.96
Jupiter	E	2031-03-19T09:30:46.838	6.42	-50.42	71488.5	-37.34	-41.00

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-19T08:17:36.640
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      : 4068889769548977024
2Mass ID (if available) : 17484722-2252424
ICRS Star Coord at Epoch: 17h 48m 47.22402s -22:52:42.43231s
RUWE (>1.4 is poor) : 0.97
K magnitude         : 9.192
G magnitude         : 13.699
RP magnitude        : 12.520
BP magnitude        : 15.156
DUPflag            : 0
Distance (au)       : 5.204
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : 12.79
Sun-Target sep (deg) : 90.69
Sun-Moon sep (deg)  : 41.96
B (ring opening deg) : -2.62
PA of pole (deg)    : 0.37
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 11.859
C/A sky separation (km) : 44758.4
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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Jupiter 2031-03-19T08:23:53 K9.19 G13.70

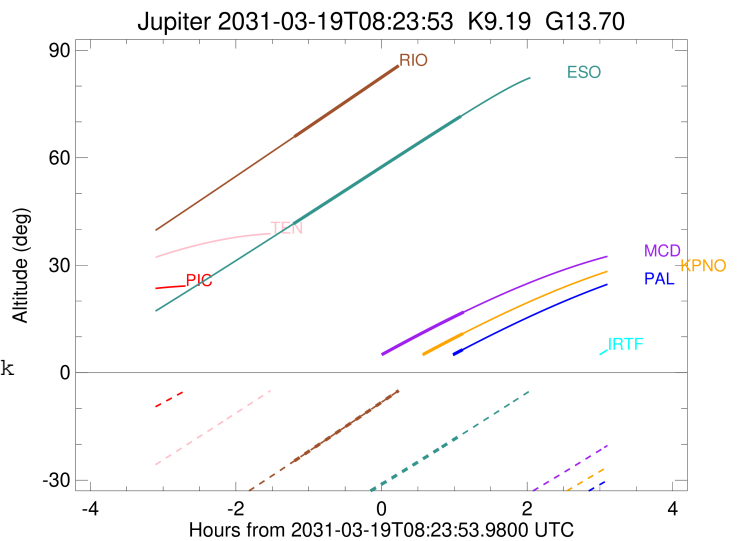
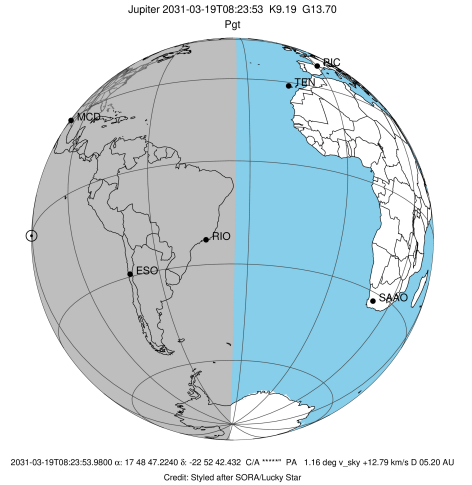


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-19T07:04:59.741	-16.96x	-58.05	71488.1	-40.19	-43.90
Jupiter	E	2031-03-19T09:31:03.408	10.92	-48.34	71488.5	-37.27	-40.93

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-19T08:17:45.380
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      : 4068889769548977024
2Mass ID (if available) : 17484722-2252424
ICRS Star Coord at Epoch: 17h 48m 47.22402s -22:52:42.43231s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 9.192
G magnitude          : 13.699
RP magnitude         : 12.520
BP magnitude         : 15.156
DUPflag             : 0
Distance (au)       : 5.204
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : 12.79
Sun-Target sep (deg) : 90.69
Sun-Moon sep (deg)  : 42.02
B (ring opening deg) : -2.62
PA of pole (deg)    : 0.37
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 11.815
C/A sky separation (km) : 44590.0
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
    
```

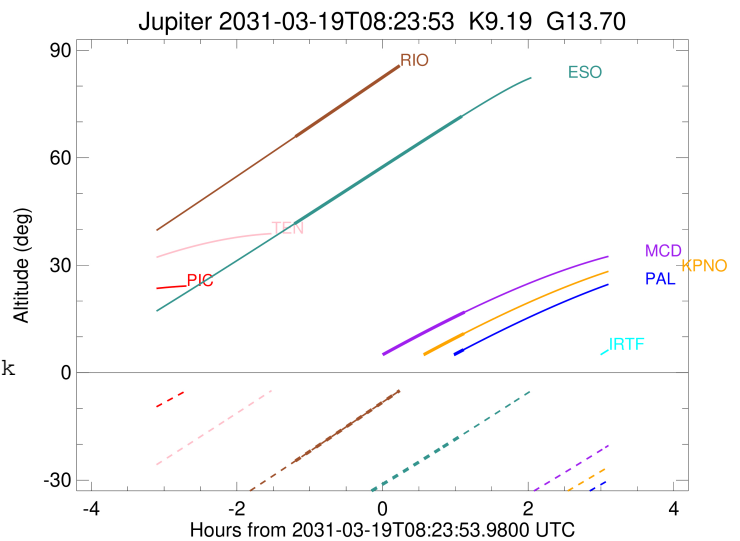
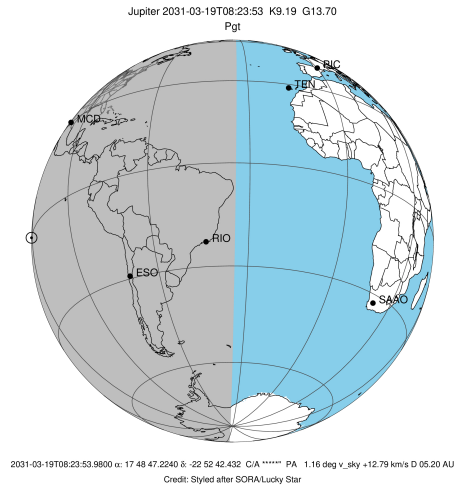


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-19T07:04:40.865	-10.47x	-60.10	71488.1	-40.02	-43.73
Jupiter	E	2031-03-19T09:31:39.645	16.91	-43.92	71488.6	-37.12	-40.78

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-19T08:22:56.020
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      : 4068889769548977024
2Mass ID (if available) : 17484722-2252424
ICRS Star Coord at Epoch: 17h 48m 47.22402s -22:52:42.43231s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 9.192
G magnitude          : 13.699
RP magnitude         : 12.520
BP magnitude         : 15.156
DUPflag             : 0
Distance (au)       : 5.204
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 12.79
Sun-Target sep (deg) : 90.69
Sun-Moon sep (deg)  : 42.16
B (ring opening deg) : -2.62
PA of pole (deg)    : 0.37
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 12.776
C/A sky separation (km) : 48216.0
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
    
```

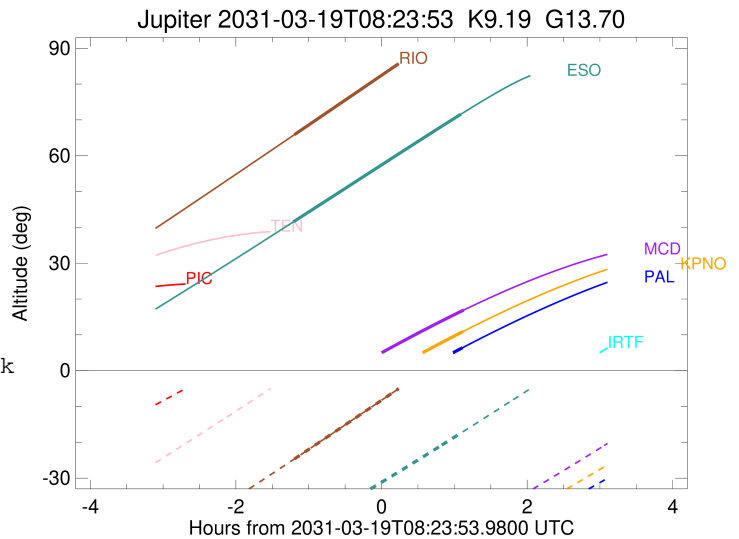
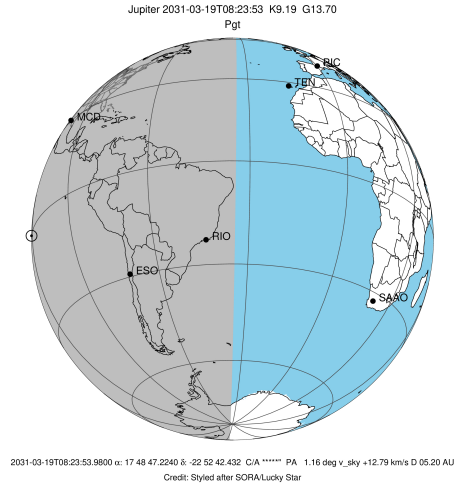


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-19T07:12:07.345	65.87	-24.64	71487.5	-43.41	-47.12
Jupiter	E	2031-03-19T09:34:00.078	81.38	7.88x	71487.8	-41.54	-45.26

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-19T08:20:06.290
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      : 4068889769548977024
2Mass ID (if available) : 17484722-2252424
ICRS Star Coord at Epoch: 17h 48m 47.22402s -22:52:42.43231s
RUWE (>1.4 is poor) : 0.97
K magnitude          : 9.192
G magnitude          : 13.699
RP magnitude         : 12.520
BP magnitude         : 15.156
DUPflag             : 0
Distance (au)       : 5.204
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : 12.79
Sun-Target sep (deg) : 90.69
Sun-Moon sep (deg)  : 42.35
B (ring opening deg) : -2.62
PA of pole (deg)    : 0.37
Pole direction: RA (deg): 268.05699
Dec (deg): 64.49651
C/A sky separation (") : 13.081
C/A sky separation (km) : 49367.2
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	2031-03-19T07:11:23.378	41.56	-45.18	71487.3	-44.94	-48.64
Jupiter	E	2031-03-19T09:29:20.739	71.58	-17.41	71487.7	-42.46	-46.18