

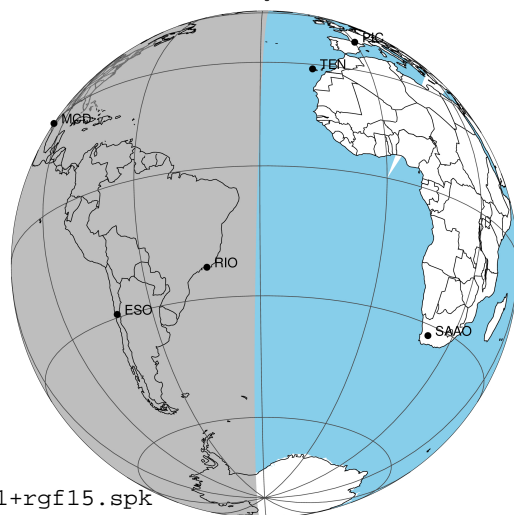
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2031-03-16T08:10:15.700  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4068934402849220096  
 2Mass ID (if available) : 17474024-2252036

Jupiter 2031-03-16T08:10:15 K8.08 G14.49 Pgt

ICRS Star Coord at Epoch: 17h 47m 40.25118s -22:52:03.71088s

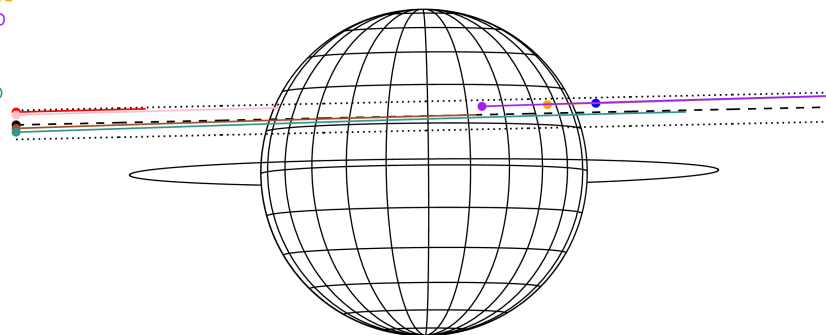
RUWE (>1.4 is poor) : 0.90  
 K magnitude : 8.079  
 G magnitude : 14.490  
 RP magnitude : 12.951  
 BP magnitude : 17.950  
 DUPflag : 0  
 Distance (au) : 5.252  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : 14.22  
 Sun-Target sep (deg) : 87.95  
 Sun-Moon sep (deg) : 2.08  
 B (ring opening deg) : -2.63  
 PA of pole (deg) : 0.49  
 Pole direction: RA (deg): 268.05700  
 Dec (deg): 64.49651  
 C/A sky separation (") : 6.498  
 C/A sky separation (km) : 24753.8  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2031-03-16T08:10:15 K8.08 G14.49  
 Pgt



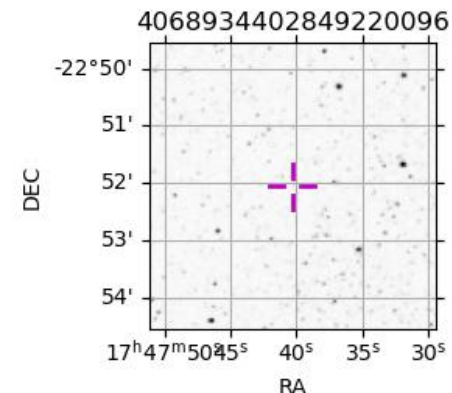
2031-03-16T08:10:15.7000 cc: 17 47 40.2512 s: -22 52 03.7111 C/A 6.488" PA 181.25 deg v\_sky +14.22 km/s D 05.25 AU  
 Credit: Styled after SORA/Lucky Star

Earth  
 PIC  
 PAL  
 KPNO  
 MCD  
 TEN  
 RIO  
 ESO



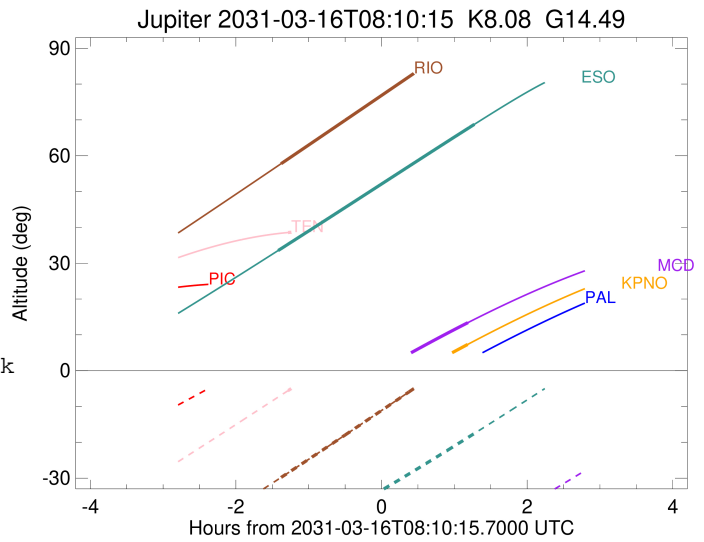
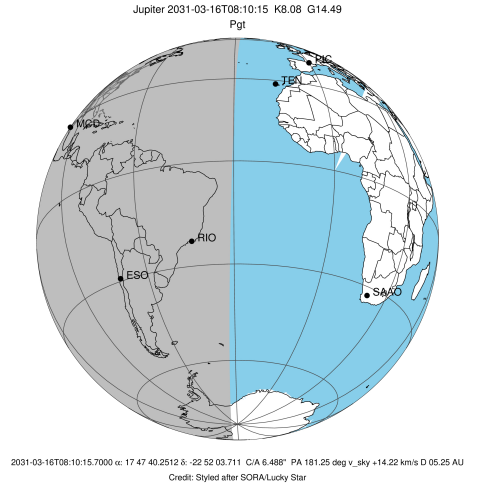
Observable events with sun below -5 deg and altitude above 5 deg

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			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+	MAR 16 09:21 - MAR 16 09:21	Pne
MCD	McDonald Obs. 2.7m	30.7	256.0	+	MAR 16 09:21 - MAR 16 09:21	Pne
TEN	Teide Obs./Tenerife	28.3	343.5	+	MAR 16 06:53 - MAR 16 06:53	Pin
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 16 06:47 - MAR 16 06:47	Pin
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+	MAR 16 06:45 - MAR 16 09:26	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



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target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-16T08:03:30.990
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      : 4068934402849220096
2Mass ID (if available) : 17474024-2252036
ICRS Star Coord at Epoch: 17h 47m 40.25118s -22:52:03.71088s
RUWE (>1.4 is poor) : 0.90
K magnitude          : 8.079
G magnitude          : 14.490
RP magnitude         : 12.951
BP magnitude         : 17.950
DUPflag             : 0
Distance (au)       : 5.252
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 14.22
Sun-Target sep (deg) : 87.95
Sun-Moon sep (deg)  : 1.24
B (ring opening deg) : -2.63
PA of pole (deg)    : 0.49
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (" ) : 7.338
C/A sky separation (km) : 27955.0
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
    
```

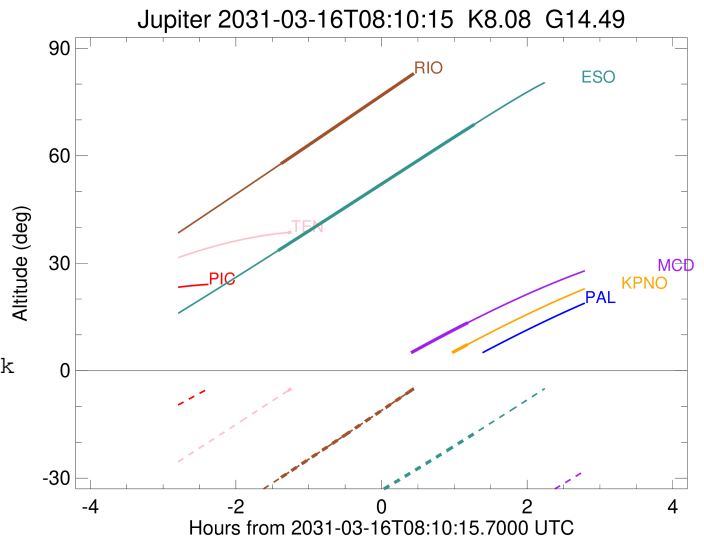
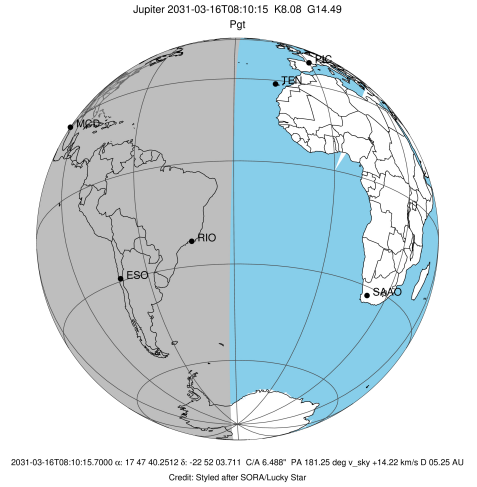


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-16T06:46:38.908	-22.93x	-57.90	71490.7	21.62	24.35
Jupiter	E	2031-03-16T09:21:15.942	7.32	-50.91	71490.4	24.36	27.33

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-16T08:03:33.750
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      : 4068934402849220096
2Mass ID (if available) : 17474024-2252036
ICRS Star Coord at Epoch: 17h 47m 40.25118s -22:52:03.71088s
RUWE (>1.4 is poor) : 0.90
K magnitude         : 8.079
G magnitude         : 14.490
RP magnitude        : 12.951
BP magnitude        : 17.950
DUPflag            : 0
Distance (au)       : 5.252
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : 14.22
Sun-Target sep (deg) : 87.95
Sun-Moon sep (deg)  : 1.23
B (ring opening deg) : -2.63
PA of pole (deg)    : 0.49
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (" ) : 7.383
C/A sky separation (km) : 28124.7
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
    
```

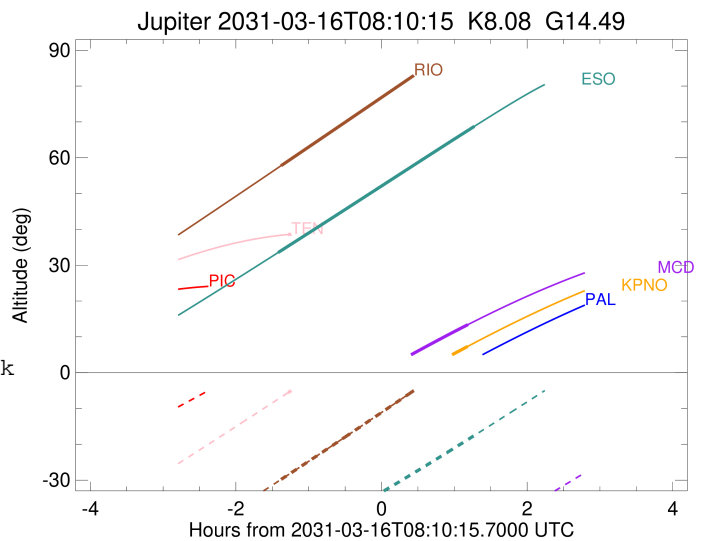
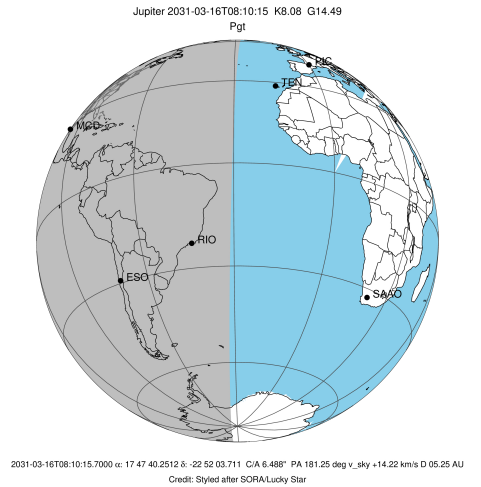


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-16T06:46:29.377	-16.37x	-60.96	71490.7	21.75	24.50
Jupiter	E	2031-03-16T09:21:31.184	13.42	-46.71	71490.4	24.49	27.48

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-03-16T08:11:40.860
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : TEN
Location              : Teide Obs./Tenerife
Latitude (deg)        : 28.30050
E. Longitude (deg)    : 343.48909
Altitude (km)         : 2.395
Gaia source ID        : 4068934402849220096
2Mass ID (if available) : 17474024-2252036
ICRS Star Coord at Epoch: 17h 47m 40.25118s -22:52:03.71088s
RUWE (>1.4 is poor) : 0.90
K magnitude           : 8.079
G magnitude           : 14.490
RP magnitude          : 12.951
BP magnitude          : 17.950
DUPflag              : 0
Distance (au)         : 5.252
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 14.22
Sun-Target sep (deg)  : 87.95
Sun-Moon sep (deg)   : 1.68
B (ring opening deg) : -2.63
PA of pole (deg)     : 0.49
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (") : 7.791
C/A sky separation (km) : 29677.4
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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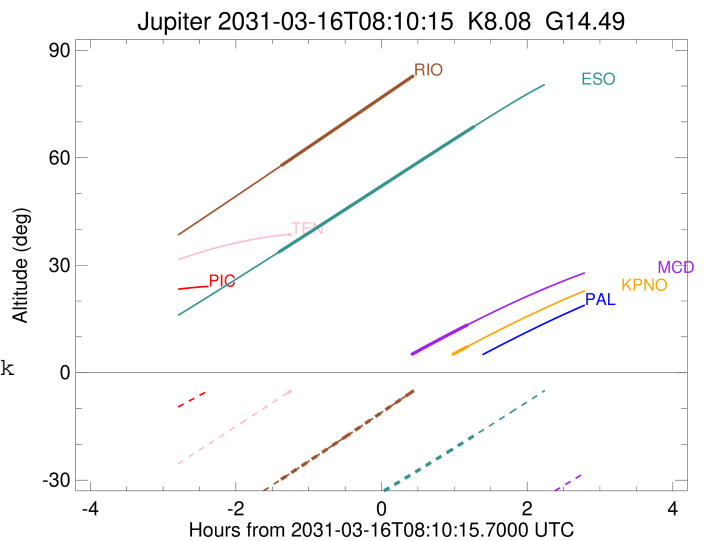
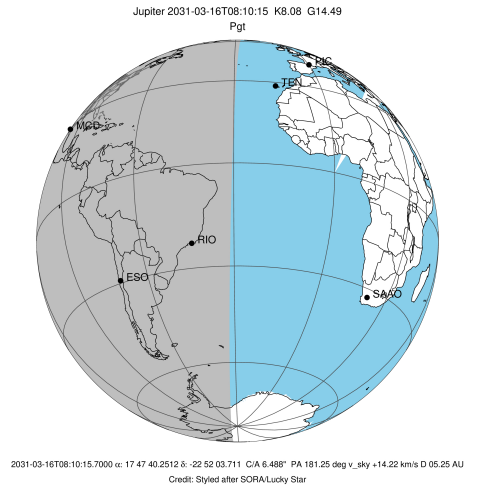


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-16T06:53:11.841	38.56	-5.59	71490.5	23.74	26.66
Jupiter	E	2031-03-16T09:30:08.998	30.16	28.48x	71490.3	25.04	28.07

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-16T08:08:23.970
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       : 4068934402849220096
2Mass ID (if available) : 17474024-2252036
ICRS Star Coord at Epoch: 17h 47m 40.25118s -22:52:03.71088s
RUWE (>1.4 is poor) : 0.90
K magnitude           : 8.079
G magnitude           : 14.490
RP magnitude          : 12.951
BP magnitude          : 17.950
DUPflag              : 0
Distance (au)         : 5.252
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 14.22
Sun-Target sep (deg) : 87.95
Sun-Moon sep (deg)   : 2.00
B (ring opening deg) : -2.63
PA of pole (deg)     : 0.49
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation (") : 6.474
C/A sky separation (km) : 24663.7
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
    
```

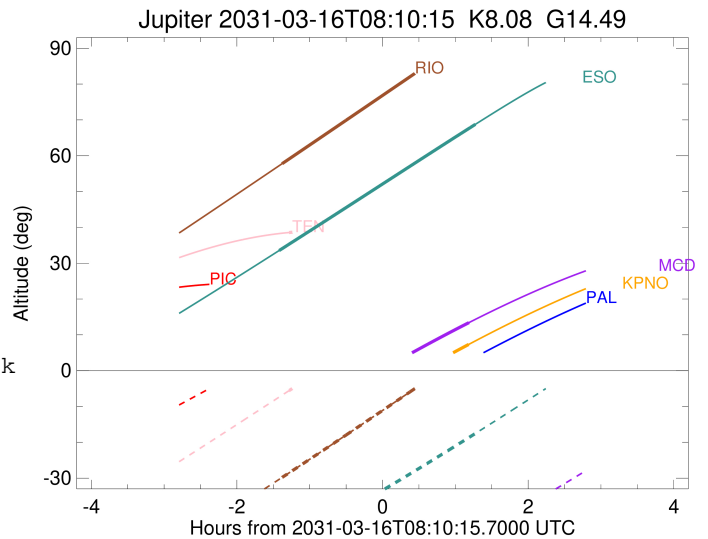
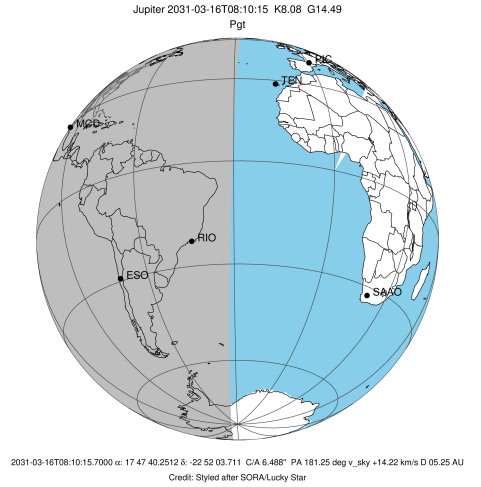


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-03-16T06:47:34.974	57.78	-29.79	71491.0	19.08	21.56
Jupiter	E	2031-03-16T09:29:37.313	84.86	7.14x	71490.8	21.01	23.68

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-03-16T08:05:36.860
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       : 4068934402849220096
2Mass ID (if available) : 17474024-2252036
ICRS Star Coord at Epoch: 17h 47m 40.25118s -22:52:03.71088s
RUWE (>1.4 is poor) : 0.90
K magnitude          : 8.079
G magnitude          : 14.490
RP magnitude         : 12.951
BP magnitude         : 17.950
DUPflag             : 0
Distance (au)        : 5.252
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : 14.22
Sun-Target sep (deg) : 87.95
Sun-Moon sep (deg)   : 2.03
B (ring opening deg) : -2.63
PA of pole (deg)     : 0.49
Pole direction: RA (deg): 268.05700
Dec (deg): 64.49651
C/A sky separation ("): 6.146
C/A sky separation (km): 23411.9
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	2031-03-16T06:45:08.053	33.54	-48.88	71491.1	17.80	20.15
Jupiter	E	2031-03-16T09:26:50.361	68.77	-17.52	71490.9	20.23	22.83