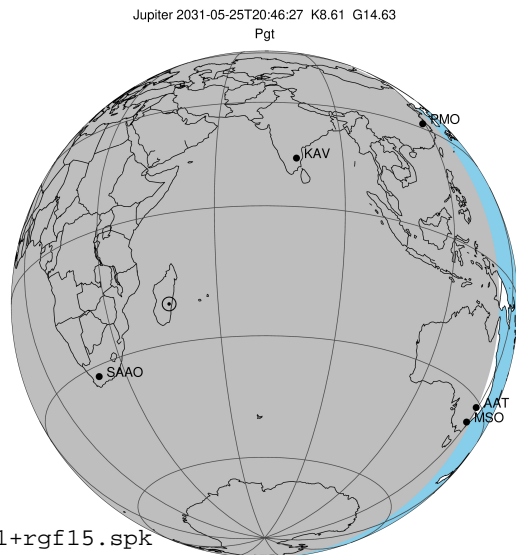


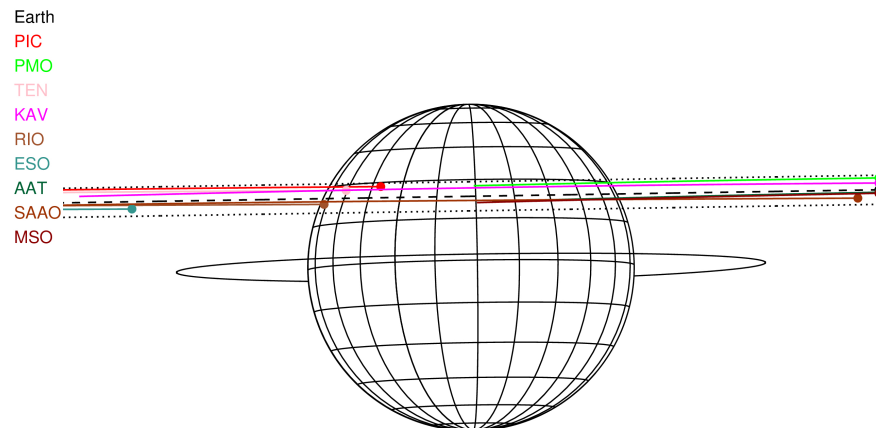
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-05-25T20:46:27.020
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116880467193144704
 2Mass ID (if available) : 17431763-2252363

Jupiter 2031-05-25T20:46:27 K8.61 G14.63 Pgt

ICRS Star Coord at Epoch: 17h 43m 17.61090s -22:52:36.60498s
 RUWE (>1.4 is poor) : 1.03
 K magnitude : 8.611
 G magnitude : 14.631
 RP magnitude : 13.163
 BP magnitude : 17.556
 DUPflag : 0
 Distance (au) : 4.335
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -14.28
 Sun-Target sep (deg) : 157.87
 Sun-Moon sep (deg) : 151.89
 B (ring opening deg) : -2.61
 PA of pole (deg) : 0.96
 Pole direction: RA (deg): 268.05694
 Dec (deg): 64.49651
 C/A sky separation (") : 9.917
 C/A sky separation (km) : 31183.2
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk
 URKALLv1.spk
 naif0012.tls
 nep097.bsp
 nep101.bsp
 sat4401.bsp

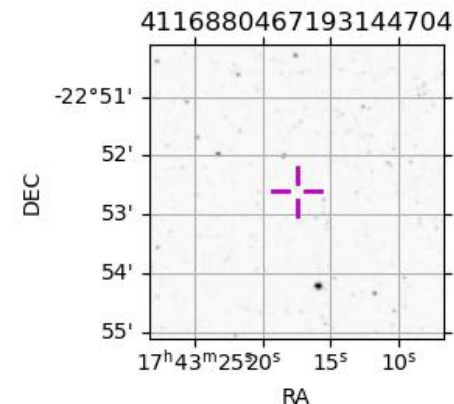


2031-05-25T20:46:27.0200 at: 17 43 17.6109 s: -22 52 36.605 C/A 9.905" PA 180.92 deg v_sky -14.28 km/s D 04.34 AU
 Credit: Styled after SORA/Lucky Star



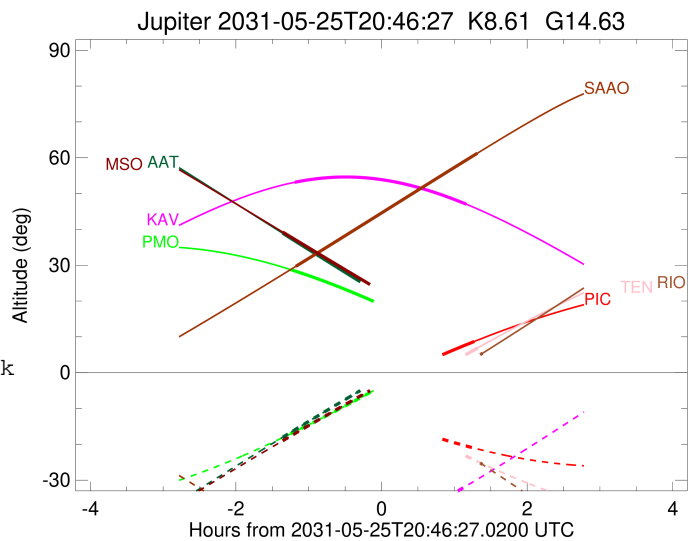
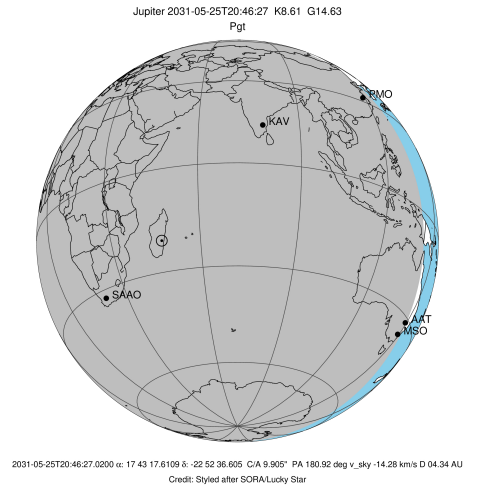
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	OEcode
PIC	Pic du Midi	42.9	0.1	+	MAY 25 22:02 - MAY 25 22:02	Pne
PAL	Palomar Mt (200")	33.4	243.1			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+	MAY 25 19:31 - MAY 25 19:31	Pin
KPNO	Kitt Peak Natl Obs	32.0	248.4			Pnn
MCD	McDonald Obs. 2.7m	30.7	256.0			Pnn
TEN	Teide Obs./Tenerife	28.3	343.5	+	MAY 25 22:05 - MAY 25 22:05	Pne
IRTF	Mauna Kea/IRTF	19.8	204.5			Pnn
KAV	Kavalur Observatory	12.6	78.8	+ +	MAY 25 19:34 - MAY 25 21:56	Pie
RIO	Rio de Janeiro	-22.9	316.8	+	MAY 25 22:09 - MAY 25 22:09	Pne
ESO	European Southern Obs. (3.6m)	-29.3	289.3			Pnn
AAT	Siding Spring (AAT)	-31.3	149.1	+	MAY 25 19:24 - MAY 25 19:24	Pin
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8	+ +	MAY 25 19:35 - MAY 25 22:05	Pie
MSO	Mt. Stromlo Observatory	-35.3	149.0	+	MAY 25 19:25 - MAY 25 19:25	Pin




```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-25T20:52:35.890
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        : 4116880467193144704
2Mass ID (if available) : 17431763-2252363
ICRS Star Coord at Epoch: 17h 43m 17.61090s -22:52:36.60498s
RUWE (>1.4 is poor)  : 1.03
K magnitude           : 8.611
G magnitude           : 14.631
RP magnitude          : 13.163
BP magnitude          : 17.556
DUPflag               : 0
Distance (au)         : 4.335
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.28
Sun-Target sep (deg)  : 157.87
Sun-Moon sep (deg)    : 152.48
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.96
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (" ) : 10.820
C/A sky separation (km) : 34020.9
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
    
```

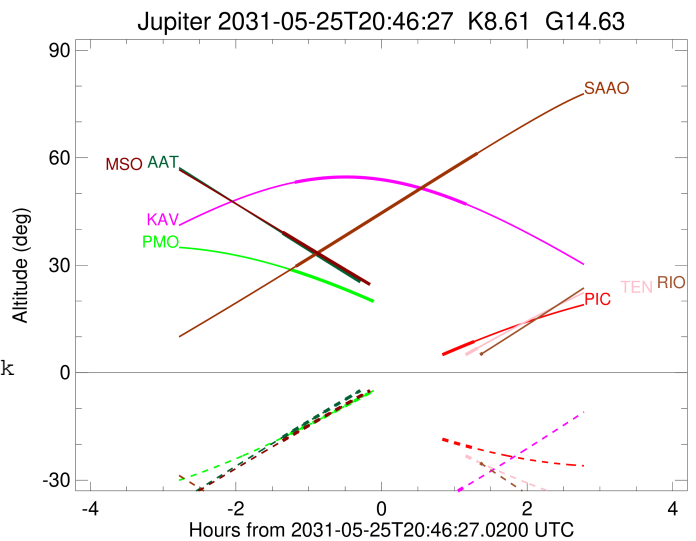
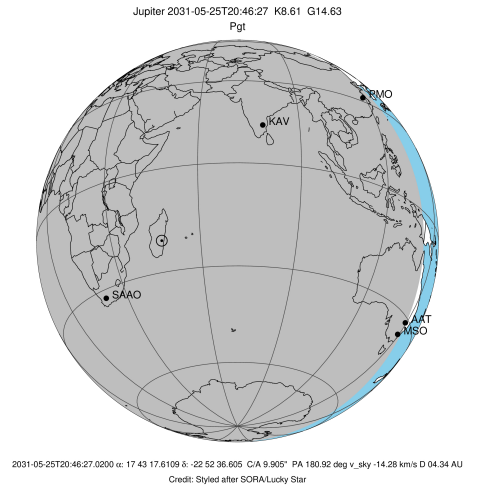


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-25T19:39:00.010	-23.06x	2.31x	71490.0	27.71	30.93
Jupiter	E	2031-05-25T22:05:29.831	6.86	-24.78	71489.8	29.05	32.36


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-25T20:52:21.560
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        : 4116880467193144704
2Mass ID (if available) : 17431763-2252363
ICRS Star Coord at Epoch: 17h 43m 17.61090s -22:52:36.60498s
RUWE (>1.4 is poor)  : 1.03
K magnitude           : 8.611
G magnitude           : 14.631
RP magnitude          : 13.163
BP magnitude          : 17.556
DUPflag              : 0
Distance (au)         : 4.335
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.28
Sun-Target sep (deg)  : 157.87
Sun-Moon sep (deg)    : 152.52
B (ring opening deg) : -2.61
PA of pole (deg)      : 0.96
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 8.887
C/A sky separation (km) : 27944.6
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
    
```

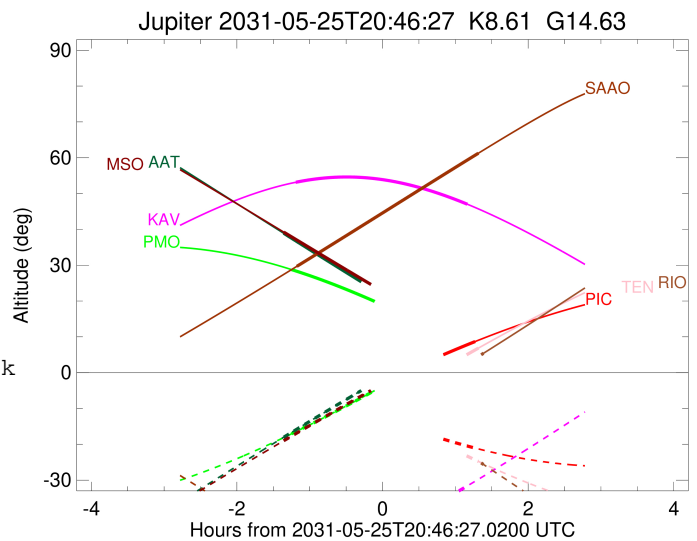
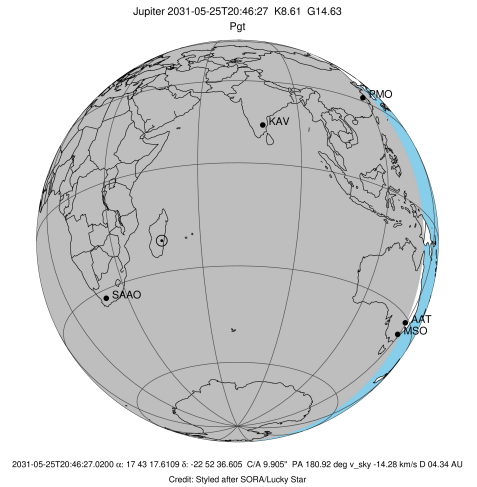


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-25T19:34:18.625	-25.23x	8.04x	71490.7	22.38	25.19
Jupiter	E	2031-05-25T22:09:38.326	5.40	-25.62	71490.5	23.67	26.59

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-25T20:40:34.700
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : AAT
Location              : Siding Spring (AAT)
Latitude (deg)        : -31.27703
E. Longitude (deg)    : 149.06608
Altitude (km)         : 1.164
Gaia source ID        : 4116880467193144704
2Mass ID (if available) : 17431763-2252363
ICRS Star Coord at Epoch: 17h 43m 17.61090s -22:52:36.60498s
RUWE (>1.4 is poor)  : 1.03
K magnitude           : 8.611
G magnitude           : 14.631
RP magnitude          : 13.163
BP magnitude          : 17.556
DUPflag              : 0
Distance (au)         : 4.335
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.28
Sun-Target sep (deg)  : 157.87
Sun-Moon sep (deg)   : 151.43
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.96
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 9.136
C/A sky separation (km) : 28726.6
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
    
```

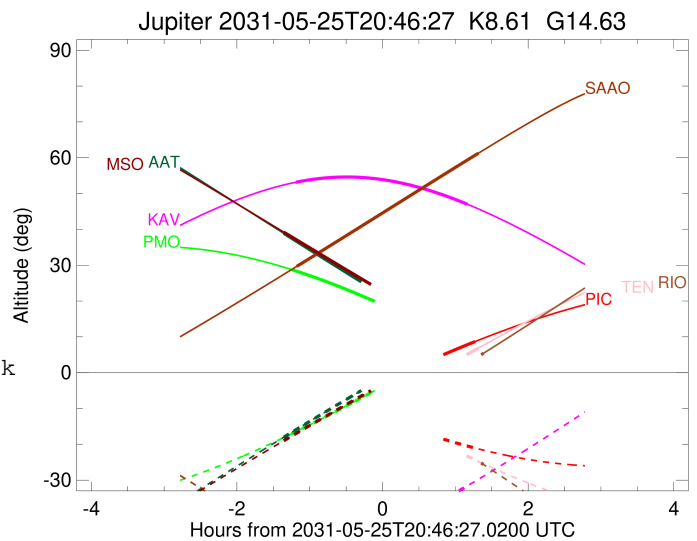
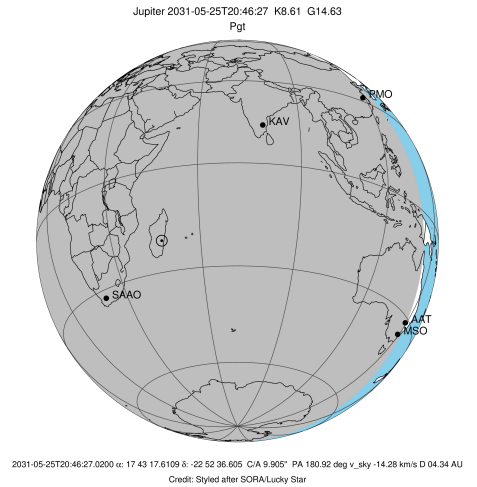


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-25T19:24:58.705	38.93	-18.03	71490.4	24.17	27.13
Jupiter	E	2031-05-25T21:56:47.072	7.39	11.66x	71490.6	23.10	25.97

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-25T20:50:55.690
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : SAAO
Location              : So. Afr. Astro. Obs. (Sutherland)
Latitude (deg)        : -32.37953
E. Longitude (deg)    : 20.81070
Altitude (km)         : 1.768
Gaia source ID        : 4116880467193144704
2Mass ID (if available) : 17431763-2252363
ICRS Star Coord at Epoch: 17h 43m 17.61090s -22:52:36.60498s
RUWE (>1.4 is poor) : 1.03
K magnitude           : 8.611
G magnitude           : 14.631
RP magnitude          : 13.163
BP magnitude          : 17.556
DUPflag              : 0
Distance (au)         : 4.335
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.28
Sun-Target sep (deg)  : 157.87
Sun-Moon sep (deg)   : 152.73
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.96
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation ("): 9.339
C/A sky separation (km): 29364.8
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
    
```

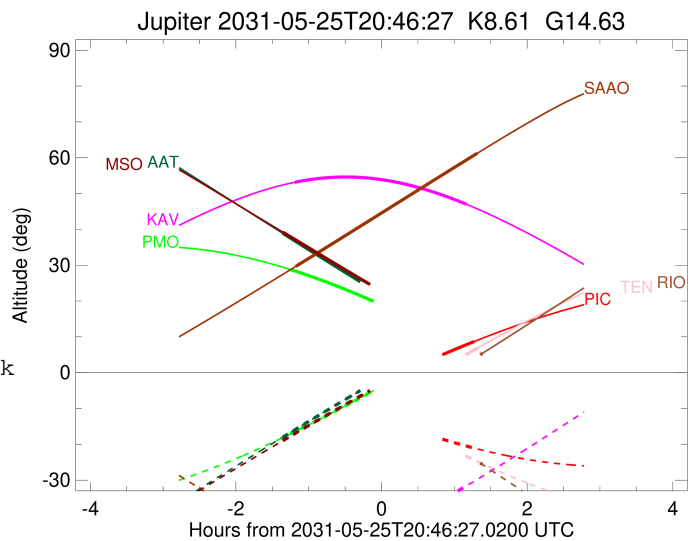
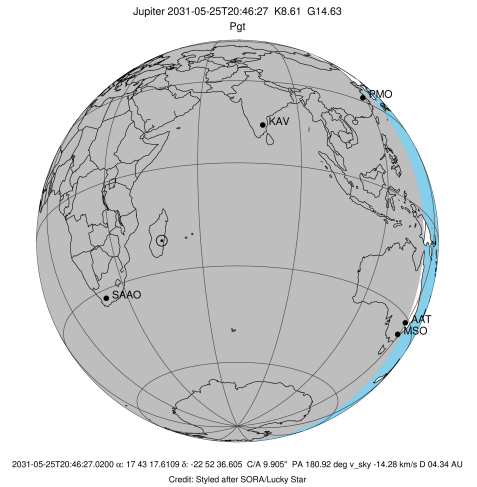


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-25T19:35:52.246	29.68	-49.01	71490.5	23.65	26.57
Jupiter	E	2031-05-25T22:05:26.713	61.25	-77.17	71490.4	24.67	27.67


```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-25T20:40:49.930
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : MSO
Location              : Mt. Stromlo Observatory
Latitude (deg)        : -35.32000
E. Longitude (deg)    : 149.00833
Altitude (km)         : 0.770
Gaia source ID        : 4116880467193144704
2Mass ID (if available) : 17431763-2252363
ICRS Star Coord at Epoch: 17h 43m 17.61090s -22:52:36.60498s
RUWE (>1.4 is poor)  : 1.03
K magnitude           : 8.611
G magnitude           : 14.631
RP magnitude          : 13.163
BP magnitude          : 17.556
DUPflag              : 0
Distance (au)         : 4.335
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.28
Sun-Target sep (deg)  : 157.87
Sun-Moon sep (deg)    : 151.47
B (ring opening deg)  : -2.61
PA of pole (deg)      : 0.96
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 9.018
C/A sky separation (km) : 28355.2
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	2031-05-25T19:25:00.578	39.24	-19.01	71490.5	23.82	26.75
Jupiter	E	2031-05-25T21:57:14.083	8.86	9.45x	71490.6	22.80	25.64