

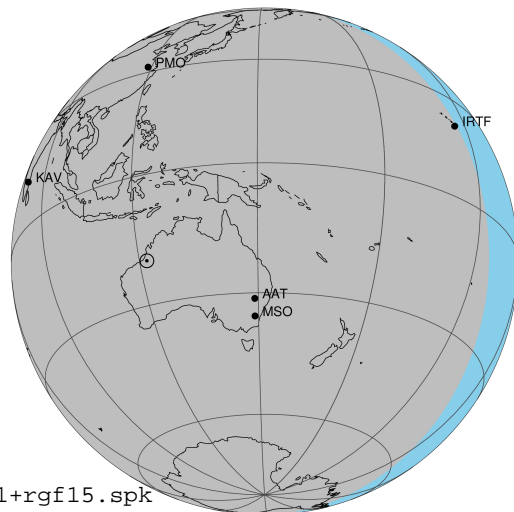
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2031-05-20T15:48:24.050  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 4068857162169473792  
 2Mass ID (if available) : 17453888-2253282

Jupiter 2031-05-20T15:48:24 K5.83 G14.69 Pgt

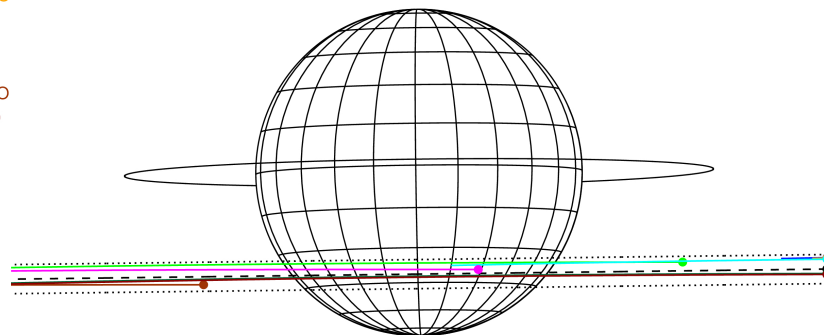
ICRS Star Coord at Epoch: 17h 45m 38.86109s -22:53:28.30089s

RUWE (>1.4 is poor) : 1.29  
 K magnitude : 5.827  
 G magnitude : 14.685  
 RP magnitude : 13.940  
 BP magnitude : 17.474  
 DUPflag : 0  
 Distance (au) : 4.372  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : -13.08  
 Sun-Target sep (deg) : 152.32  
 Sun-Moon sep (deg) : 145.05  
 B (ring opening deg) : -2.60  
 PA of pole (deg) : 0.71  
 Pole direction: RA (deg): 268.05694  
 Dec (deg): 64.49651  
 C/A sky separation (") : 14.034  
 C/A sky separation (km) : 44503.5  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2031-05-20T15:48:24 K5.83 G14.69  
 Pgt



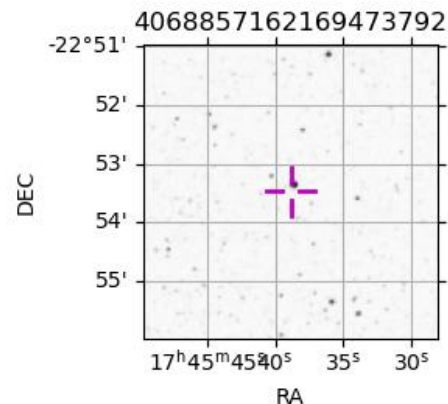
Earth  
 PAL  
 PMO  
 KPNO  
 IRTF  
 KAV  
 AAT  
 SAAO  
 MSO



2031-05-20T15:48:24.0500 α: 17 45 38.8611 δ: -22 53 28.301 C/A \*\*\*\*\* PA 0.71 deg v\_sky -13.08 km/s D 04.37 AU  
 Credit: Styled after SORA/Lucky Star

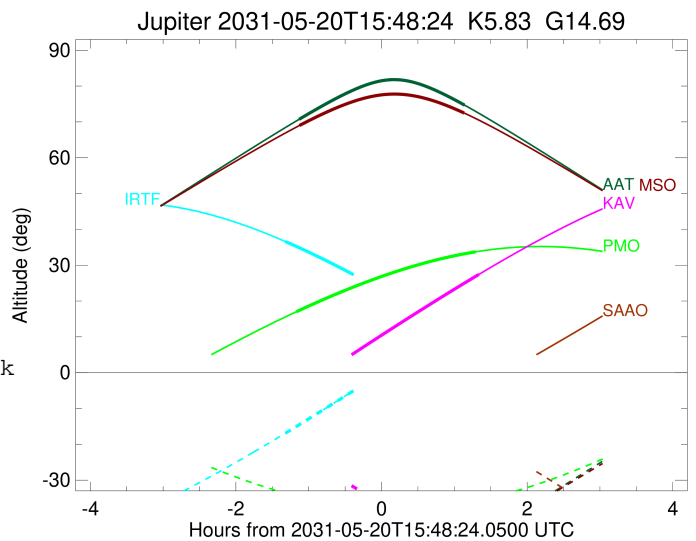
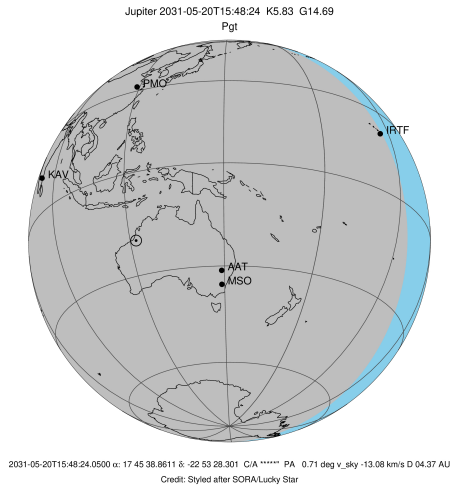
Observable events with sun below -5 deg and altitude above 5 deg

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			Pnn
PMO	Purple Mtn Obs. Nanking	32.1	118.8	+ +	MAY 20 14:38 - MAY 20 17:06	Pie
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			Pnn
IRTF	Mauna Kea/IRTF	19.8	204.5	+	MAY 20 14:29 - MAY 20 14:29	Pin
KAV	Kavalur Observatory	12.6	78.8	+	MAY 20 17:08 - MAY 20 17:08	Pne
RIO	Rio de Janeiro	-22.9	316.8			Pnn
ESO	European Southern Obs. (3.6m)	-29.3	289.3			Pnn
AAT	Siding Spring (AAT)	-31.3	149.1	+ +	MAY 20 14:40 - MAY 20 16:56	Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	MAY 20 14:40 - MAY 20 16:56	Pie



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-20T15:52:24.700
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : PMO
Location              : Purple Mtn Obs. Nanking
Latitude (deg)        : 32.06667
E. Longitude (deg)    : 118.82089
Altitude (km)         : 0.364
Gaia source ID        : 4068857162169473792
2Mass ID (if available) : 17453888-2253282
ICRS Star Coord at Epoch: 17h 45m 38.86109s -22:53:28.30089s
RUWE (>1.4 is poor)  : 1.29
K magnitude           : 5.827
G magnitude           : 14.685
RP magnitude          : 13.940
BP magnitude          : 17.474
DUPflag              : 0
Distance (au)         : 4.372
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : -13.08
Sun-Target sep (deg)  : 152.32
Sun-Moon sep (deg)    : 144.94
B (ring opening deg)  : -2.60
PA of pole (deg)     : 0.71
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 12.501
C/A sky separation (km) : 39640.4
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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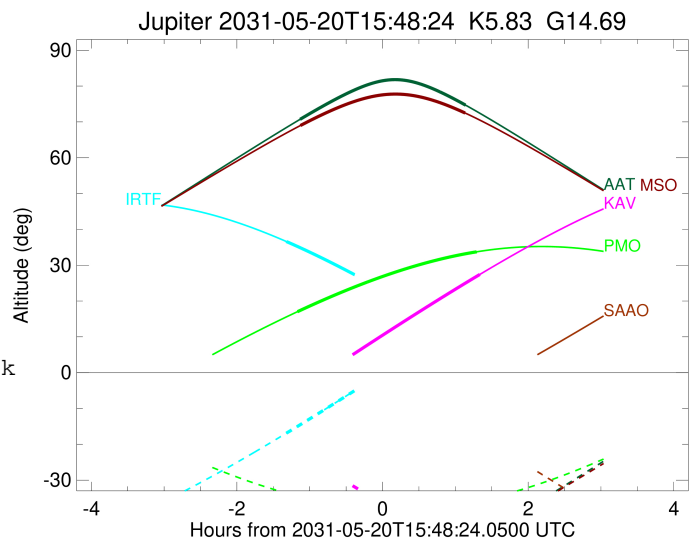
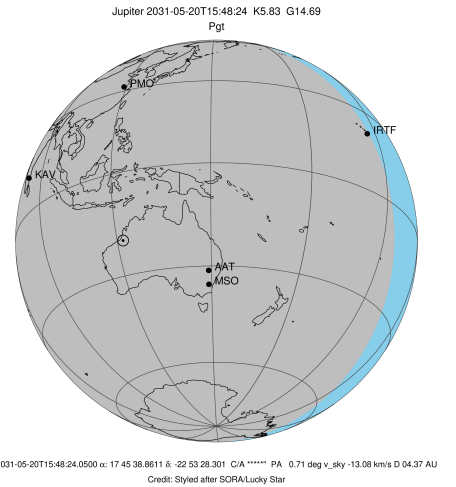


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-20T14:38:19.040	17.02	-34.42	71489.1	-34.08	-37.64
Jupiter	E	2031-05-20T17:06:03.786	33.73	-35.80	71489.2	-33.37	-36.91

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-20T15:41:57.710
Event type            : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code         : IRTF
Location              : Mauna Kea/IRTF
Latitude (deg)       : 19.82622
E. Longitude (deg)   : 204.52800
Altitude (km)        : 4.168
Gaia source ID       : 4068857162169473792
2Mass ID (if available) : 17453888-2253282
ICRS Star Coord at Epoch: 17h 45m 38.86109s -22:53:28.30089s
RUWE (>1.4 is poor) : 1.29
K magnitude           : 5.827
G magnitude           : 14.685
RP magnitude          : 13.940
BP magnitude          : 17.474
DUPflag              : 0
Distance (au)        : 4.372
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.08
Sun-Target sep (deg) : 152.32
Sun-Moon sep (deg)   : 145.83
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.71
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 12.935
C/A sky separation (km) : 41018.5
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
    
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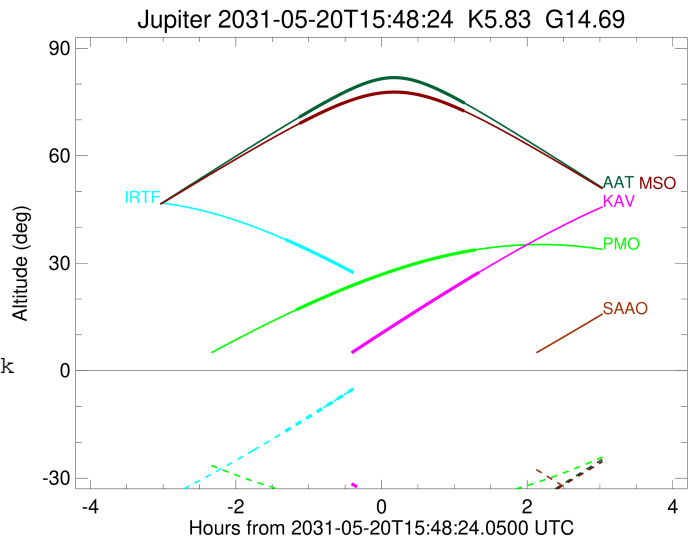
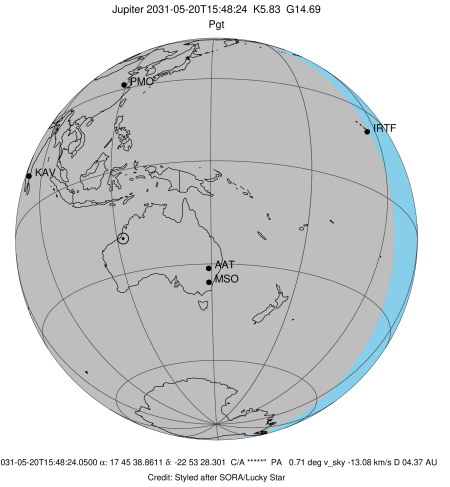


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-20T14:29:11.931	36.60	-16.89	71489.0	-34.50	-38.08
Jupiter	E	2031-05-20T16:55:15.919	9.84	14.89x	71488.8	-35.60	-39.22

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-20T15:56:36.320
Event type          : Pgt
                    : Jupiter occs: geocentric, topocentric
                    : Not a ringed target
Observer code       : KAV
Location            : Kavalur Observatory
Latitude (deg)      : 12.57556
E. Longitude (deg)  : 78.83167
Altitude (km)       : 0.722
Gaia source ID      : 4068857162169473792
2Mass ID (if available) : 17453888-2253282
ICRS Star Coord at Epoch: 17h 45m 38.86109s -22:53:28.30089s
RUWE (>1.4 is poor) : 1.29
K magnitude          : 5.827
G magnitude          : 14.685
RP magnitude         : 13.940
BP magnitude         : 17.474
DUPflag             : 0
Distance (au)       : 4.372
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.08
Sun-Target sep (deg) : 152.32
Sun-Moon sep (deg)  : 144.45
B (ring opening deg) : -2.60
PA of pole (deg)    : 0.71
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 13.400
C/A sky separation (km) : 42491.8
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
    
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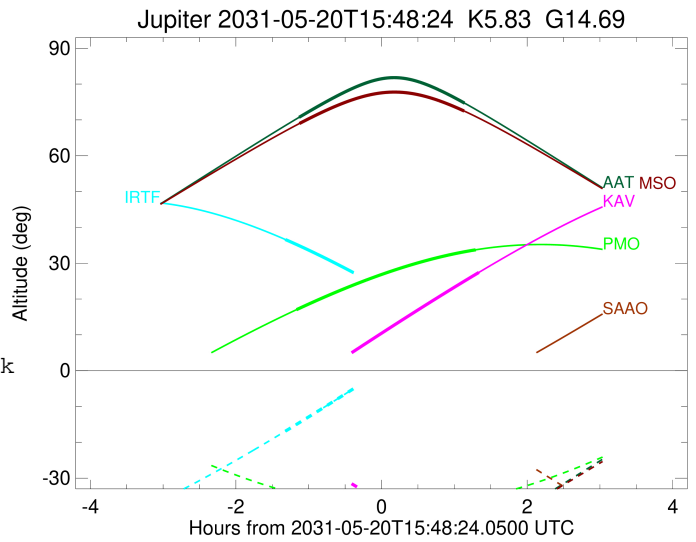
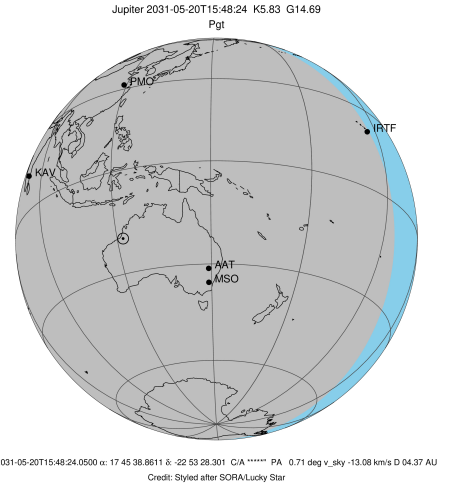


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-20T14:43:47.234	-3.97x	-23.17	71488.6	-37.18	-40.84
Jupiter	E	2031-05-20T17:08:36.101	27.42	-50.28	71488.8	-35.75	-39.37

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-20T15:48:44.490
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       : 4068857162169473792
2Mass ID (if available) : 17453888-2253282
ICRS Star Coord at Epoch: 17h 45m 38.86109s -22:53:28.30089s
RUWE (>1.4 is poor) : 1.29
K magnitude           : 5.827
G magnitude           : 14.685
RP magnitude         : 13.940
BP magnitude         : 17.474
DUPflag              : 0
Distance (au)        : 4.372
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -13.08
Sun-Target sep (deg) : 152.32
Sun-Moon sep (deg)   : 145.54
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.71
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 14.323
C/A sky separation (km) : 45417.5
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
    
```

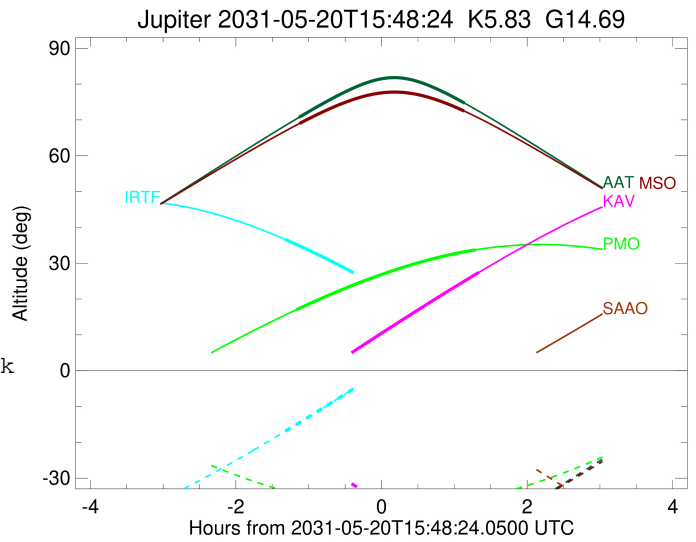
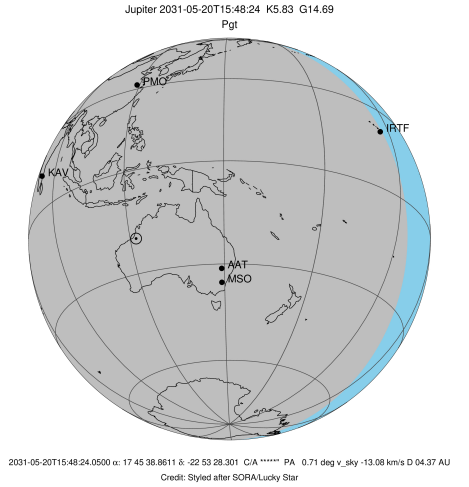


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-20T14:40:29.403	70.71	-75.70	71488.2	-39.54	-43.24
Jupiter	E	2031-05-20T16:56:54.522	74.66	-48.95	71488.2	-39.45	-43.15

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-20T15:48:43.730
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        : 4068857162169473792
2Mass ID (if available) : 17453888-2253282
ICRS Star Coord at Epoch: 17h 45m 38.86109s -22:53:28.30089s
RUWE (>1.4 is poor) : 1.29
K magnitude           : 5.827
G magnitude           : 14.685
RP magnitude          : 13.940
BP magnitude          : 17.474
DUPflag              : 0
Distance (au)         : 4.372
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -13.08
Sun-Target sep (deg) : 152.32
Sun-Moon sep (deg)   : 145.53
B (ring opening deg) : -2.60
PA of pole (deg)     : 0.71
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 14.462
C/A sky separation (km) : 45858.4
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	2031-05-20T14:40:50.274	69.00	-72.47	71488.2	-39.99	-43.70
Jupiter	E	2031-05-20T16:56:32.211	72.46	-48.58	71488.2	-39.90	-43.61