

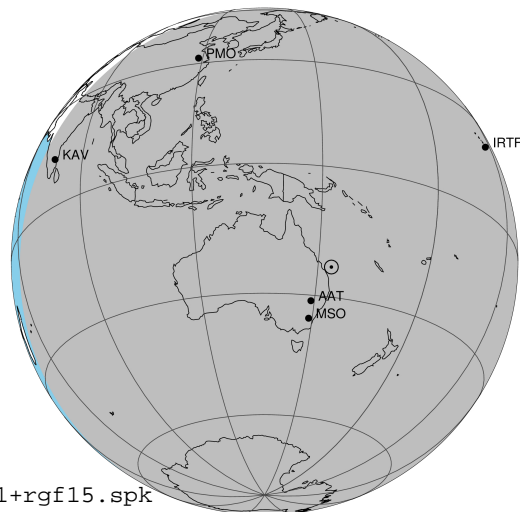
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-06-29T13:49:55.250
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4111723963771261696
 2Mass ID (if available) : 17244803-2245307

Jupiter 2031-06-29T13:49:55 K9.77 G13.61 Pgt

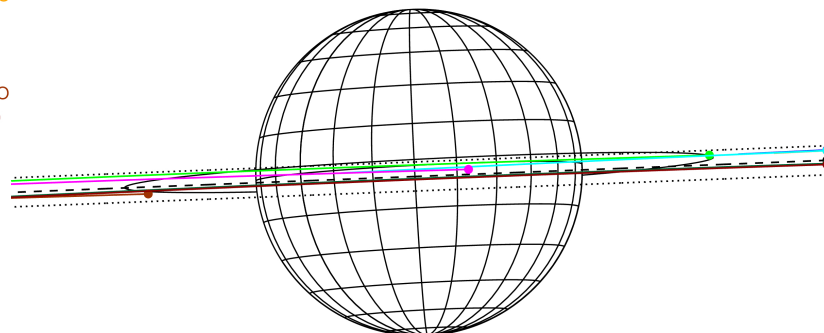
ICRS Star Coord at Epoch: 17h 24m 48.03013s -22:45:30.68307s

RUWE (>1.4 is poor) : 1.02
 K magnitude : 9.770
 G magnitude : 13.612
 RP magnitude : 12.558
 BP magnitude : 14.750
 DUPflag : 0
 Distance (au) : 4.288
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -15.44
 Sun-Target sep (deg) : 164.67
 Sun-Moon sep (deg) : 55.67
 B (ring opening deg) : -2.58
 PA of pole (deg) : 2.95
 Pole direction: RA (deg): 268.05691
 Dec (deg): 64.49651
 C/A sky separation (") : 0.542
 C/A sky separation (km) : 1684.3
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk

Jupiter 2031-06-29T13:49:55 K9.77 G13.61
 Pgt



Earth
 PAL
 PMO
 KPNO
 IRTF
 KAV
 AAT
 SAAO
 MSO

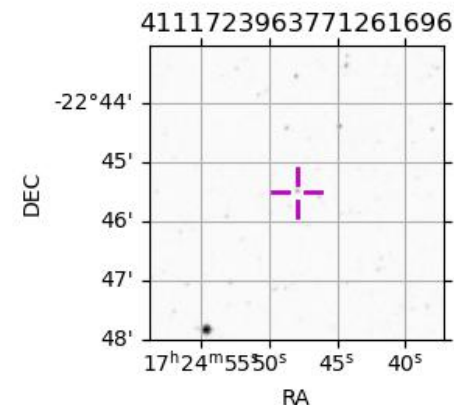


2031-06-29T13:49:55.2500 a: 17 24 48.03013 -22 45 30.683 C/A 0.553" PA 2.24 deg v_sky -15.44 km/s D 04.29 AU

Credit: Styled after SORA/Lucky Star

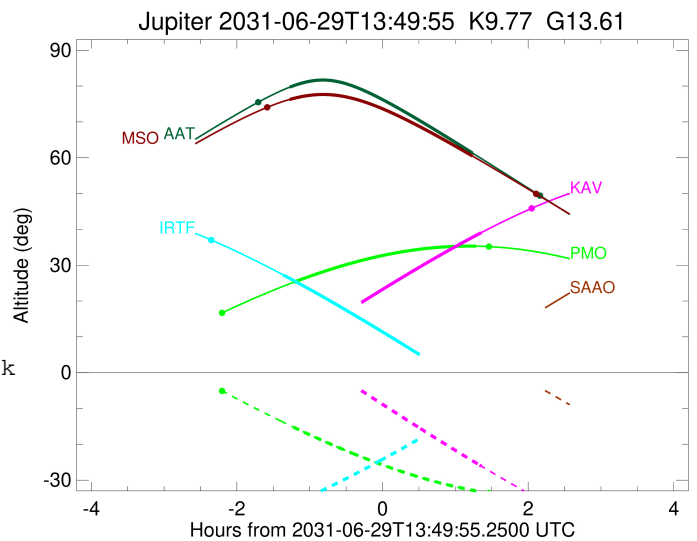
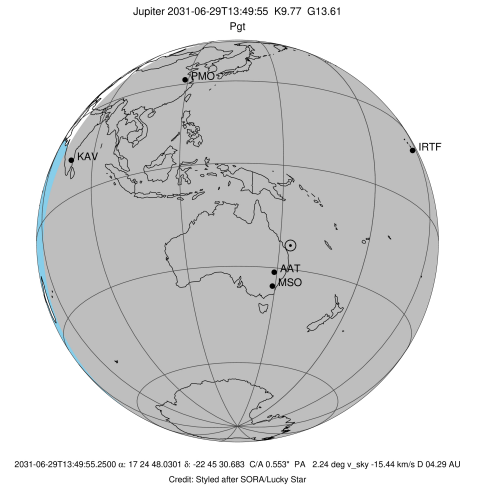
Observable events with sun below -5 deg and altitude above 5 deg

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	+ +	JUN 29 12:36 - JUN 29 15:07	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	+	JUN 29 12:28 - JUN 29 12:28	Pin
KAV	Kavalur Observatory	12.6	78.8	+	JUN 29 15:11 - JUN 29 15:11	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	+ +	JUN 29 12:33 - JUN 29 15:03	Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8			Pnn
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	JUN 29 12:33 - JUN 29 15:04	Pie



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target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-06-29T13:51:51.250
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       : 4111723963771261696
2Mass ID (if available) : 17244803-2245307
ICRS Star Coord at Epoch: 17h 24m 48.03013s -22:45:30.68307s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 9.770
G magnitude           : 13.612
RP magnitude         : 12.558
BP magnitude         : 14.750
DUPflag              : 0
Distance (au)        : 4.288
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -15.44
Sun-Target sep (deg) : 164.67
Sun-Moon sep (deg)   : 55.96
B (ring opening deg) : -2.58
PA of pole (deg)     : 2.95
Pole direction: RA (deg): 268.05691
Dec (deg): 64.49651
C/A sky separation ("): 1.079
C/A sky separation (km): 3357.2
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
    
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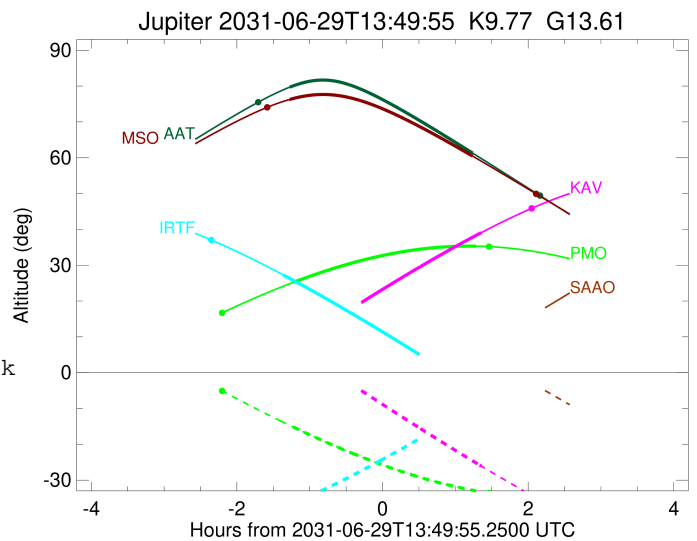
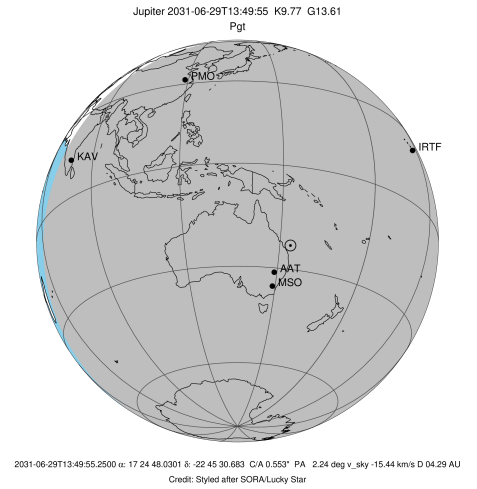


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-29T12:36:29.113	25.21	-15.19	71492.0	1.70	1.94
Jupiter	E	2031-06-29T15:07:03.856	35.31	-32.99	71492.0	3.51	4.01

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-06-29T13:44:06.920
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       : 4111723963771261696
2Mass ID (if available) : 17244803-2245307
ICRS Star Coord at Epoch: 17h 24m 48.03013s -22:45:30.68307s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 9.770
G magnitude           : 13.612
RP magnitude          : 12.558
BP magnitude          : 14.750
DUPflag              : 0
Distance (au)        : 4.288
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.44
Sun-Target sep (deg) : 164.67
Sun-Moon sep (deg)   : 56.30
B (ring opening deg) : -2.58
PA of pole (deg)     : 2.95
Pole direction: RA (deg): 268.05691
Dec (deg): 64.49651
C/A sky separation ("): 0.459
C/A sky separation (km): 1429.0
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
    
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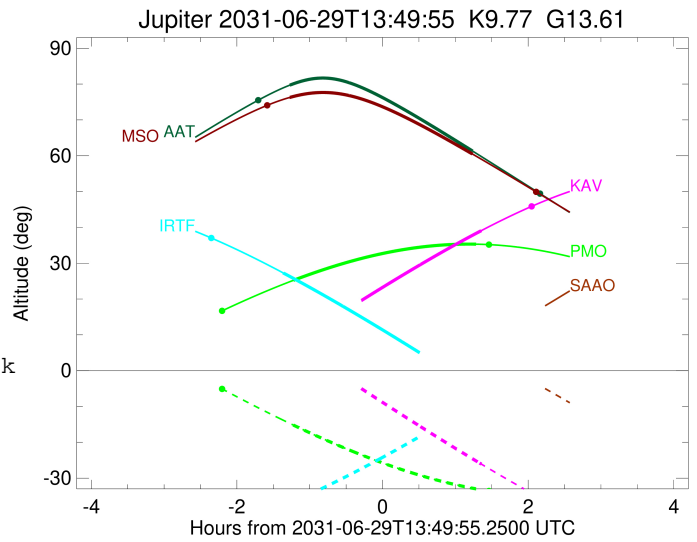
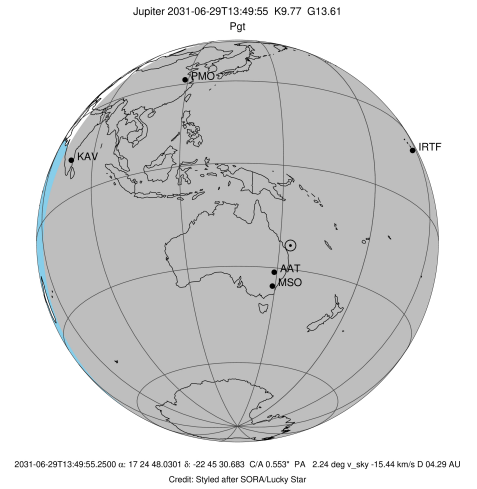


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-29T12:28:11.198	27.27	-37.67	71492.0	0.93	1.07
Jupiter	E	2031-06-29T15:00:43.137	-3.62x	-10.35	71492.0	1.25	1.43

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-06-29T13:55:36.820
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       : 4111723963771261696
2Mass ID (if available) : 17244803-2245307
ICRS Star Coord at Epoch: 17h 24m 48.03013s -22:45:30.68307s
RUWE (>1.4 is poor) : 1.02
K magnitude           : 9.770
G magnitude           : 13.612
RP magnitude          : 12.558
BP magnitude          : 14.750
DUPflag              : 0
Distance (au)        : 4.288
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.44
Sun-Target sep (deg) : 164.67
Sun-Moon sep (deg)   : 55.53
B (ring opening deg) : -2.58
PA of pole (deg)     : 2.95
Pole direction: RA (deg): 268.05691
Dec (deg): 64.49651
C/A sky separation ("): 0.235
C/A sky separation (km): 731.3
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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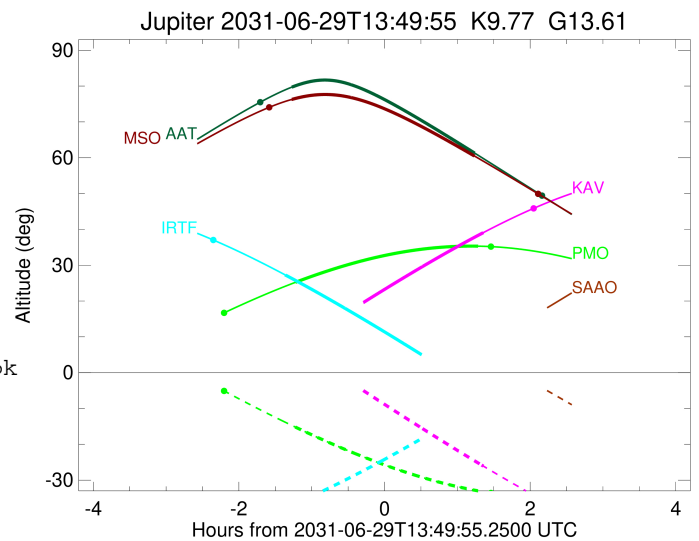
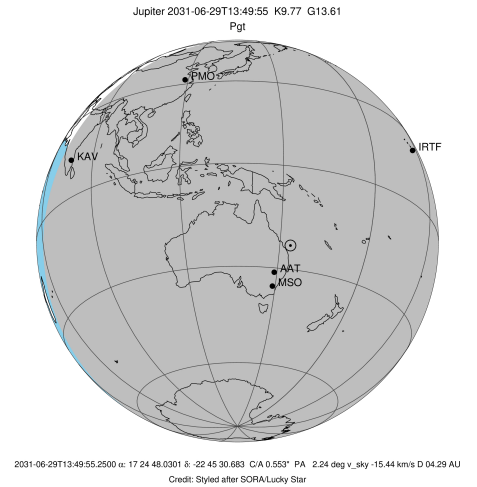


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-29T12:39:21.068	8.05	6.88x	71492.0	-0.72	-0.82
Jupiter	E	2031-06-29T15:11:18.074	39.08	-26.06	71492.0	1.78	2.04

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-06-29T13:48:39.330
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      : 4111723963771261696
2Mass ID (if available) : 17244803-2245307
ICRS Star Coord at Epoch: 17h 24m 48.03013s -22:45:30.68307s
RUWE (>1.4 is poor) : 1.02
K magnitude         : 9.770
G magnitude         : 13.612
RP magnitude        : 12.558
BP magnitude        : 14.750
DUPflag            : 0
Distance (au)       : 4.288
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : -15.44
Sun-Target sep (deg) : 164.67
Sun-Moon sep (deg)  : 56.55
B (ring opening deg) : -2.58
PA of pole (deg)    : 2.95
Pole direction: RA (deg): 268.05691
Dec (deg): 64.49651
C/A sky separation (" ) : 0.840
C/A sky separation (km) : 2611.8
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
    
```

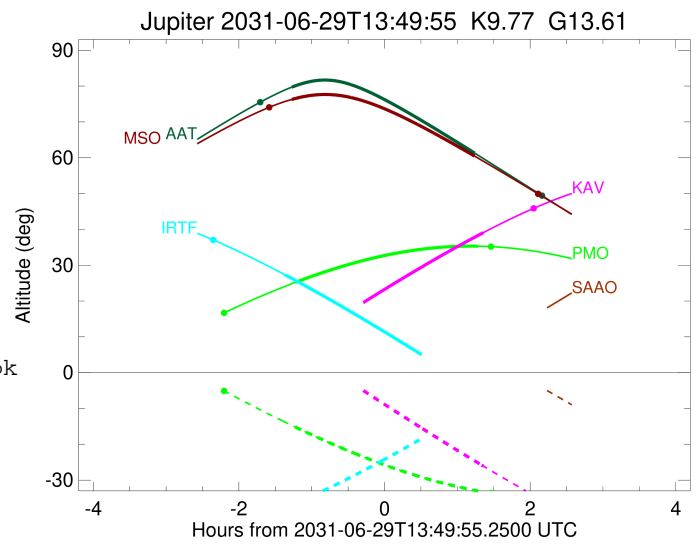
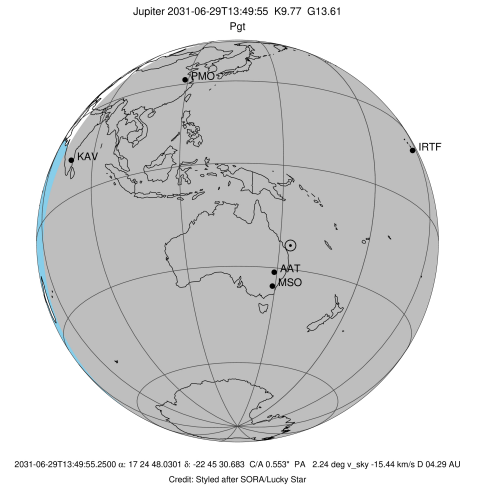


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-06-29T12:33:29.551	79.69	-67.76	71492.0	-2.81	-3.22
Jupiter	E	2031-06-29T15:03:58.206	61.34	-75.14	71492.0	-1.55	-1.77

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-06-29T13:48:41.870
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      : 4111723963771261696
2Mass ID (if available) : 17244803-2245307
ICRS Star Coord at Epoch: 17h 24m 48.03013s -22:45:30.68307s
RUWE (>1.4 is poor) : 1.02
K magnitude          : 9.770
G magnitude          : 13.612
RP magnitude         : 12.558
BP magnitude         : 14.750
DUPflag             : 0
Distance (au)       : 4.288
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -15.44
Sun-Target sep (deg) : 164.67
Sun-Moon sep (deg)  : 56.53
B (ring opening deg) : -2.58
PA of pole (deg)    : 2.95
Pole direction: RA (deg): 268.05691
Dec (deg): 64.49651
C/A sky separation (" ) : 0.981
C/A sky separation (km) : 3051.7
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	2031-06-29T12:33:28.139	76.26	-66.36	71492.0	-3.17	-3.62
Jupiter	E	2031-06-29T15:04:04.383	60.47	-72.86	71492.0	-1.90	-2.17