

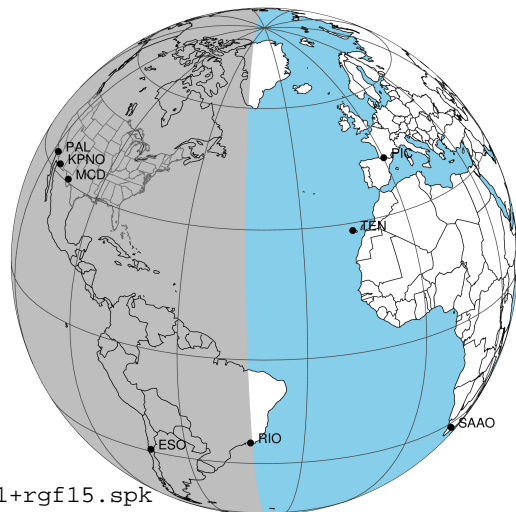
target : Jupiter  
 target radius (km) : 71492.00  
 C/A epoch : 2048-09-17T08:48:44.060  
 Event type : Pgt  
 : Jupiter occs: geocentric, topocentric  
 : Not a ringed target  
 Gaia source ID : 3424396705211661056  
 2Mass ID (if available) : 05543967+2254469

Jupiter 2048-09-17T08:48:44 K9.71 G12.30 Pgt

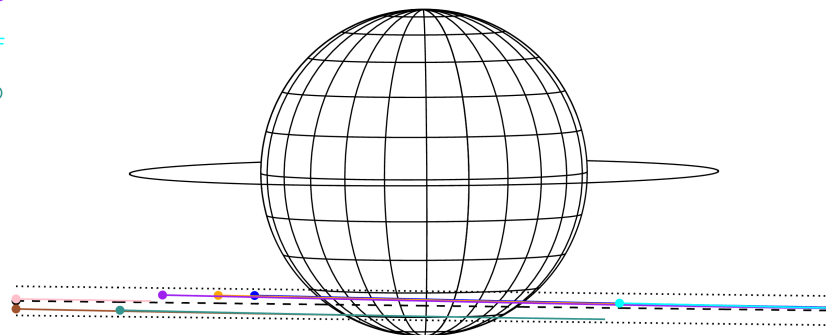
ICRS Star Coord at Epoch: 05h 54m 39.67126s +22:54:46.61731s

RUWE (>1.4 is poor) : 1.15  
 K magnitude : 9.712  
 G magnitude : 12.300  
 RP magnitude : 11.502  
 BP magnitude : 12.977  
 DUPflag : 0  
 Distance (au) : 5.051  
 f0 (km) : 0.00  
 g0 (km) : 0.00  
 skyplane vel. (km/s) : 14.74  
 Sun-Target sep (deg) : 85.70  
 Sun-Moon sep (deg) : 156.45  
 B (ring opening deg) : 2.59  
 PA of pole (deg) : 0.26  
 Pole direction: RA (deg): 268.05733  
 Dec (deg): 64.49722  
 C/A sky separation (") : 15.930  
 C/A sky separation (km) : 58357.7  
 NAIF SPICE kernels : RAJobs\_U111+rgf15.spk

Jupiter 2048-09-17T08:48:44 K9.71 G12.30  
 Pgt



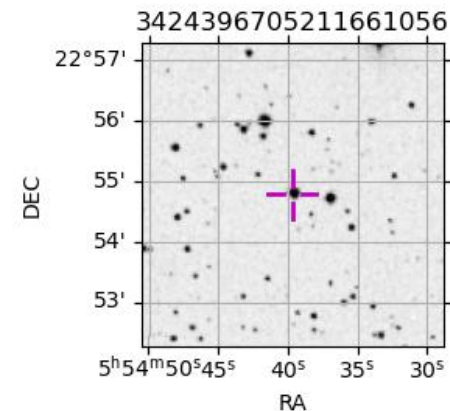
Earth  
 PAL  
 KPNO  
 MCD  
 TEN  
 IRTF  
 RIO  
 ESO



2048-09-17T08:48:44.0600 α: 05 54 39.6713 δ: +22 54 46.617 C/A \*\*\*\*\* PA 359.32 deg v\_sky +14.74 km/s D 05.05 AU  
 Credit: Styled after SORA/Lucky Star

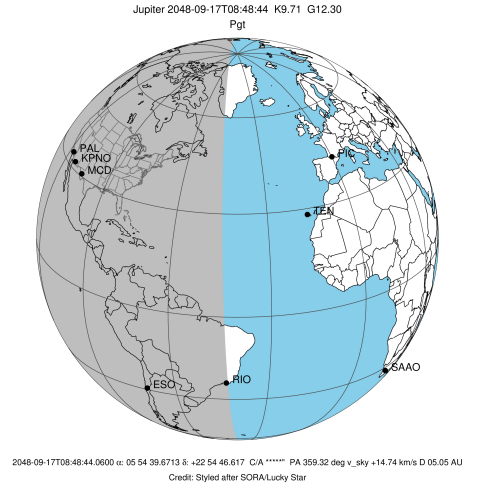
Observable events with sun below -5 deg and altitude above 5 deg

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	+ +	SEP 17 07:51 - SEP 17 09:33	Pie
PMO	Purple Mtn Obs. Nanking	32.1	118.8			Pnn
KPNO	Kitt Peak Natl Obs	32.0	248.4	+ +	SEP 17 07:51 - SEP 17 09:33	Pie
MCD	McDonald Obs. 2.7m	30.7	256.0	+ +	SEP 17 07:52 - SEP 17 09:33	Pie
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	+	SEP 17 08:08 - SEP 17 08:08	Pin
ESO	European Southern Obs. (3.6m)	-29.3	289.3	+ +	SEP 17 08:05 - SEP 17 09:24	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

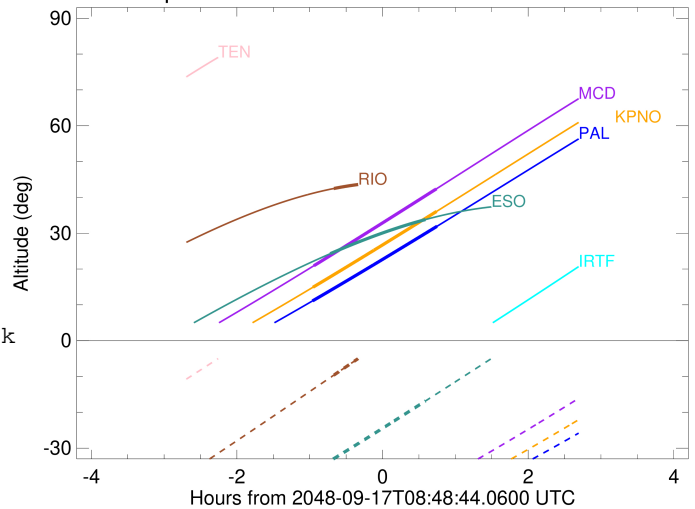


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target                : Jupiter
target radius (km)    : 71492.00
C/A epoch              : 2048-09-17T08:42:12.260
Event type             : Pgt
: Jupiter occs: geocentric, topocentric
: Not a ringed target
Observer code          : PAL
Location               : Palomar Mt (200")
Latitude (deg)         : 33.35622
E. Longitude (deg)    : 243.13601
Altitude (km)         : 1.706
Gaia source ID         : 3424396705211661056
2Mass ID (if available) : 05543967+2254469
ICRS Star Coord at Epoch: 05h 54m 39.67126s +22:54:46.61731s
RUWE (>1.4 is poor)  : 1.15
K magnitude            : 9.712
G magnitude            : 12.300
RP magnitude           : 11.502
BP magnitude           : 12.977
DUPflag                : 0
Distance (au)          : 5.051
f0 (km)                : 0.00
g0 (km)                : 0.00
skyplane vel. (km/s)  : 14.74
Sun-Target sep (deg)  : 85.70
Sun-Moon sep (deg)    : 157.37
B (ring opening deg)  : 2.59
PA of pole (deg)      : 0.26
Pole direction: RA (deg): 268.05733
Dec (deg): 64.49722
C/A sky separation (") : 15.154
C/A sky separation (km) : 55518.9
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
    
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Jupiter 2048-09-17T08:48:44 K9.71 G12.30

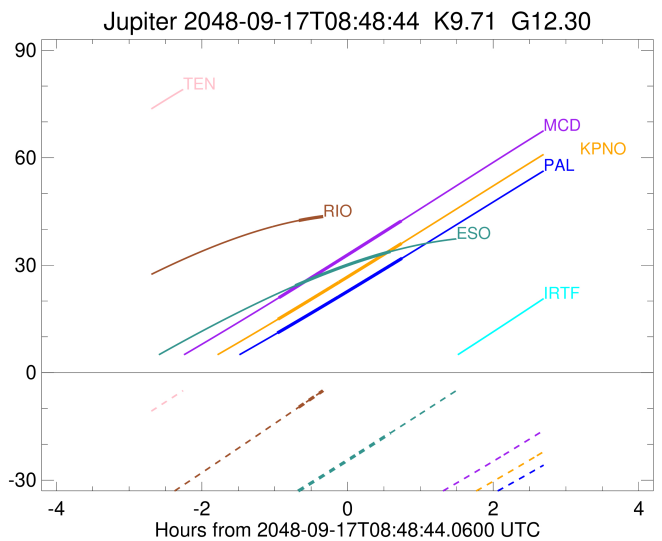
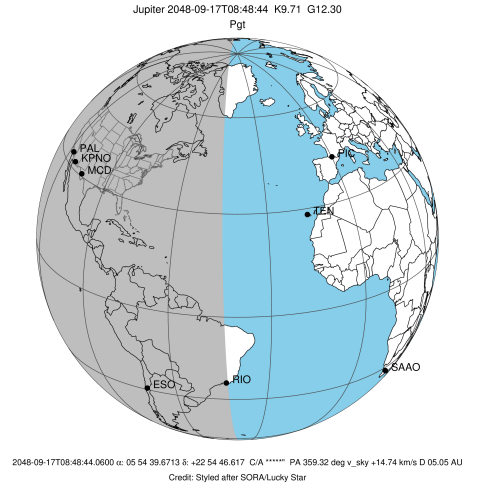


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2048-09-17T07:51:13.018	11.13	-54.81	71486.7	-49.35	-52.96
Jupiter	E	2048-09-17T09:33:33.651	31.91	-46.09	71486.3	-52.39	-55.88

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2048-09-17T08:42:14.570
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        : 3424396705211661056
2Mass ID (if available) : 05543967+2254469
ICRS Star Coord at Epoch: 05h 54m 39.67126s +22:54:46.61731s
RUWE (>1.4 is poor) : 1.15
K magnitude           : 9.712
G magnitude           : 12.300
RP magnitude          : 11.502
BP magnitude          : 12.977
DUPflag              : 0
Distance (au)         : 5.051
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 14.74
Sun-Target sep (deg) : 85.70
Sun-Moon sep (deg)   : 157.38
B (ring opening deg) : 2.59
PA of pole (deg)     : 0.26
Pole direction: RA (deg): 268.05733
Dec (deg): 64.49722
C/A sky separation (") : 15.240
C/A sky separation (km) : 55833.6
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
    
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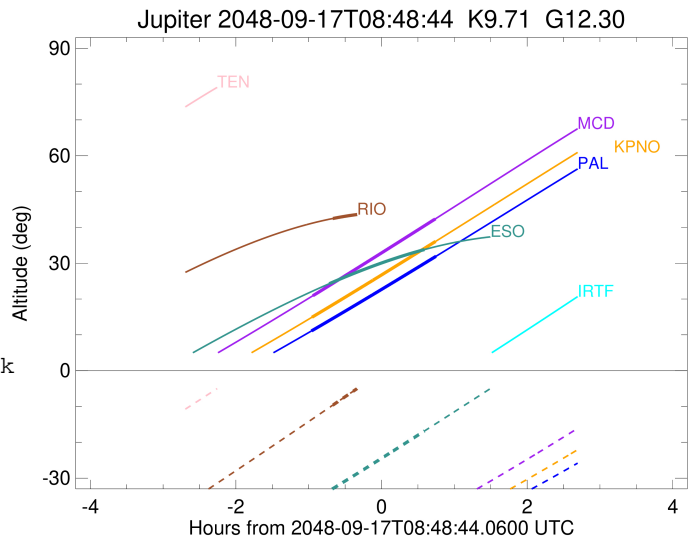
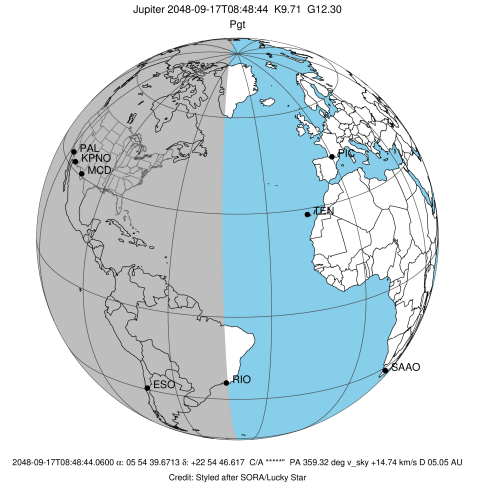


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2048-09-17T07:51:33.870	14.94	-55.48	71486.7	-49.75	-53.34
Jupiter	E	2048-09-17T09:33:17.110	36.07	-43.91	71486.2	-52.78	-56.26

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2048-09-17T08:42:27.690
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        : 3424396705211661056
2Mass ID (if available) : 05543967+2254469
ICRS Star Coord at Epoch: 05h 54m 39.67126s +22:54:46.61731s
RUWE (>1.4 is poor) : 1.15
K magnitude           : 9.712
G magnitude           : 12.300
RP magnitude          : 11.502
BP magnitude          : 12.977
DUPflag              : 0
Distance (au)         : 5.051
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : 14.74
Sun-Target sep (deg) : 85.70
Sun-Moon sep (deg)   : 157.39
B (ring opening deg) : 2.59
PA of pole (deg)     : 0.26
Pole direction: RA (deg): 268.05733
Dec (deg): 64.49722
C/A sky separation (") : 15.347
C/A sky separation (km) : 56222.6
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
    
```

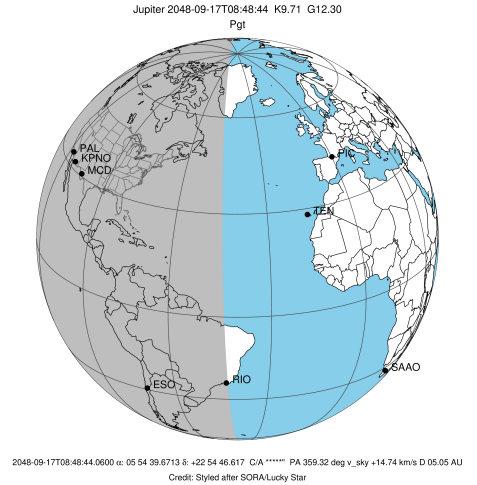


x: target alt < 5.0 deg or sun > -5.0 deg

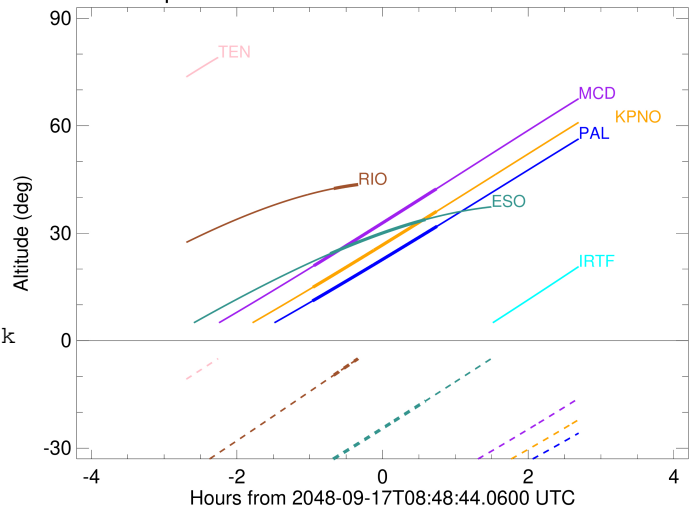
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2048-09-17T07:52:08.906	20.91	-54.37	71486.6	-50.26	-53.84
Jupiter	E	2048-09-17T09:33:07.445	42.37	-39.48	71486.1	-53.26	-56.71

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2048-09-17T08:48:13.140
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        : 3424396705211661056
2Mass ID (if available) : 05543967+2254469
ICRS Star Coord at Epoch: 05h 54m 39.67126s +22:54:46.61731s
RUWE (>1.4 is poor)  : 1.15
K magnitude           : 9.712
G magnitude           : 12.300
RP magnitude          : 11.502
BP magnitude          : 12.977
DUPflag              : 0
Distance (au)         : 5.051
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s)  : 14.74
Sun-Target sep (deg)  : 85.70
Sun-Moon sep (deg)    : 156.71
B (ring opening deg)  : 2.59
PA of pole (deg)      : 0.26
Pole direction: RA (deg): 268.05733
Dec (deg): 64.49722
C/A sky separation (") : 17.173
C/A sky separation (km) : 62911.3
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
    
```



Jupiter 2048-09-17T08:48:44 K9.71 G12.30

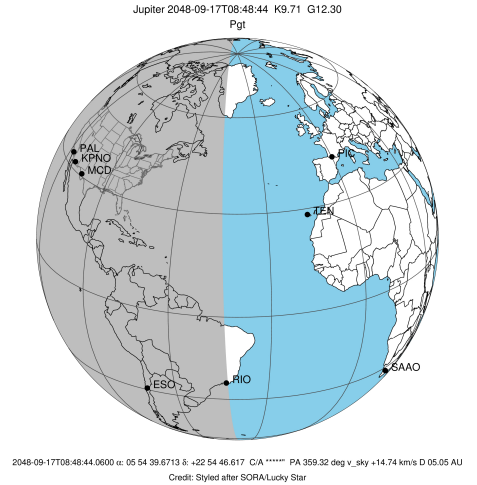


x: target alt < 5.0 deg or sun > -5.0 deg

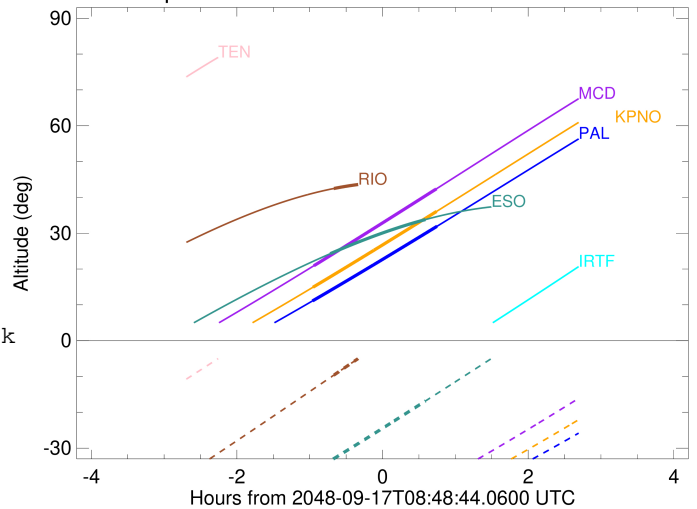
Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2048-09-17T08:08:39.255	42.47	-9.61	71485.1	-60.49	-63.52
Jupiter	E	2048-09-17T09:27:50.142	43.90	8.63x	71484.8	-62.48	-65.36

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2048-09-17T08:44:56.700
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      : 3424396705211661056
2Mass ID (if available) : 05543967+2254469
ICRS Star Coord at Epoch: 05h 54m 39.67126s +22:54:46.61731s
RUWE (>1.4 is poor) : 1.15
K magnitude          : 9.712
G magnitude          : 12.300
RP magnitude         : 11.502
BP magnitude         : 12.977
DUPflag             : 0
Distance (au)       : 5.051
f0 (km)             : 0.00
g0 (km)             : 0.00
skyplane vel. (km/s) : 14.74
Sun-Target sep (deg) : 85.70
Sun-Moon sep (deg)  : 156.98
B (ring opening deg) : 2.59
PA of pole (deg)    : 0.26
Pole direction: RA (deg): 268.05733
Dec (deg): 64.49722
C/A sky separation (" ) : 17.206
C/A sky separation (km) : 63036.1
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 2048-09-17T08:48:44 K9.71 G12.30



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	2048-09-17T08:05:56.518	24.31	-33.48	71485.1	-60.43	-63.46
Jupiter	E	2048-09-17T09:24:05.326	33.80	-16.85	71484.7	-62.99	-65.83