

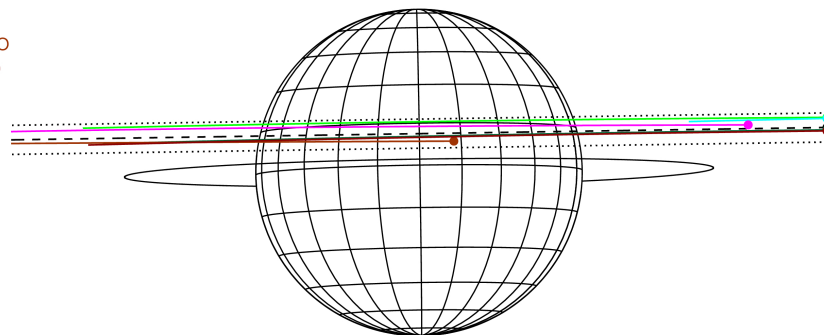
target : Jupiter
 target radius (km) : 71492.00
 C/A epoch : 2031-05-24T17:50:38.250
 Event type : Pgt
 : Jupiter occs: geocentric, topocentric
 : Not a ringed target
 Gaia source ID : 4116870159267826560
 2Mass ID (if available) : 17434917-2252477

Jupiter 2031-05-24T17:50:38 K8.92 G14.06 Pgt

ICRS Star Coord at Epoch: 17h 43m 49.17766s -22:52:47.92076s
 RUWE (>1.4 is poor) : 0.95
 K magnitude : 8.917
 G magnitude : 14.057
 RP magnitude : 12.755
 BP magnitude : 15.885
 DUPflag : 0
 Distance (au) : 4.343
 f0 (km) : 0.00
 g0 (km) : 0.00
 skyplane vel. (km/s) : -14.04
 Sun-Target sep (deg) : 156.67
 Sun-Moon sep (deg) : 165.20
 B (ring opening deg) : -2.61
 PA of pole (deg) : 0.91
 Pole direction: RA (deg): 268.05694
 Dec (deg): 64.49651
 C/A sky separation (") : 5.402
 C/A sky separation (km) : 17013.2
 NAIF SPICE kernels : RAJobs_U111+rgf15.spk



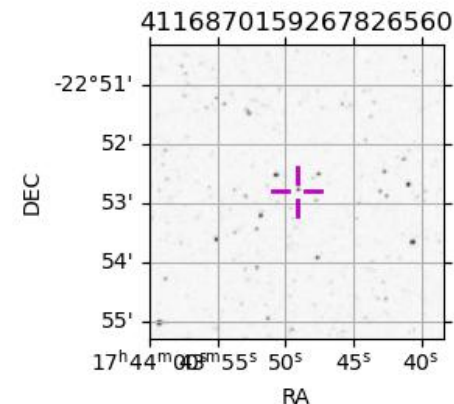
Earth
 PMO
 IRTF
 KAV
 AAT
 SAAO
 MSO



2031-05-24T17:50:38.2500 at: 17 43 49.1777 s: -22 52 47.921 C/A 5.390" PA 180.87 deg v_sky -14.04 km/s D 04.34 AU
 Credit: Styled after SORA/Lucky Star

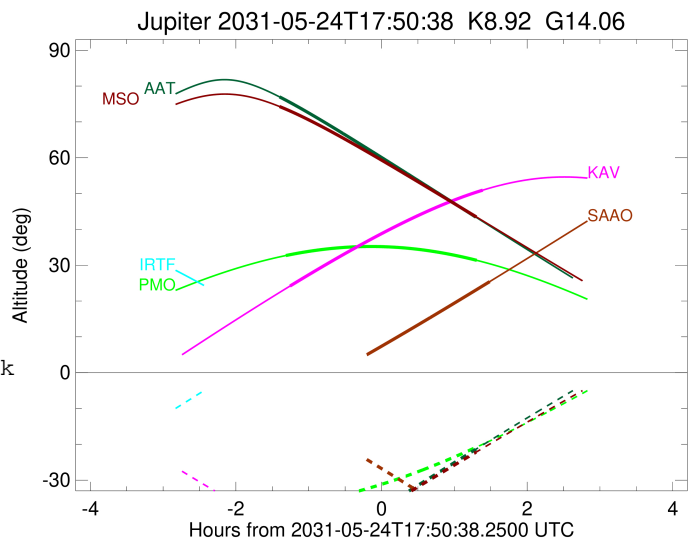
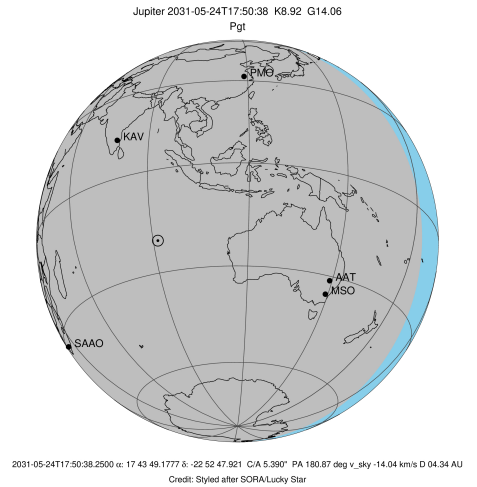
Observable events with sun below -5 deg and altitude above 5 deg

Obs	Location	lat	Elon	Target	Observed Events Interval	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 24 16:31 - MAY 24 19:08	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			Pnn
KAV	Kavalur Observatory	12.6	78.8	+ +	MAY 24 16:35 - MAY 24 19:14	Pie
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 24 16:26 - MAY 24 19:08	Pie
SAAO	So. Afr. Astro. Obs. (Sutherland)	-32.4	20.8		MAY 24 19:19 - MAY 24 19:19	Pne
MSO	Mt. Stromlo Observatory	-35.3	149.0	+ +	MAY 24 16:26 - MAY 24 19:08	Pie



```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-24T17:50:28.350
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       : 4116870159267826560
2Mass ID (if available) : 17434917-2252477
ICRS Star Coord at Epoch: 17h 43m 49.17766s -22:52:47.92076s
RUWE (>1.4 is poor) : 0.95
K magnitude           : 8.917
G magnitude           : 14.057
RP magnitude         : 12.755
BP magnitude         : 15.885
DUPflag              : 0
Distance (au)        : 4.343
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.04
Sun-Target sep (deg) : 156.67
Sun-Moon sep (deg)  : 165.16
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.91
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 7.055
C/A sky separation (km) : 22220.0
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
    
```

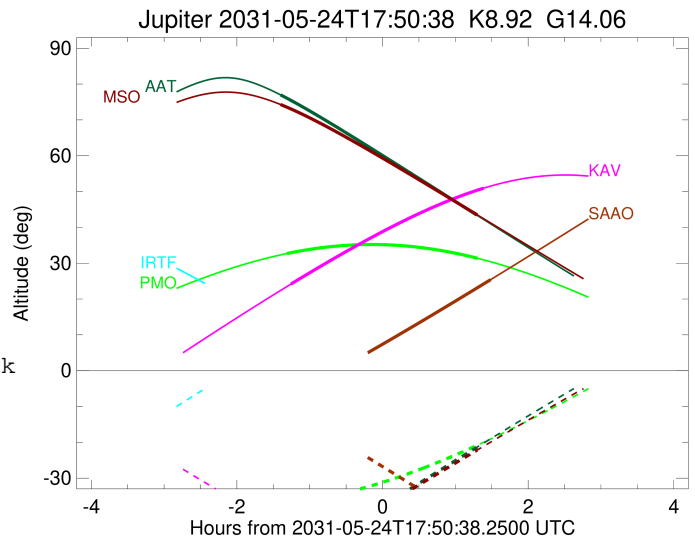
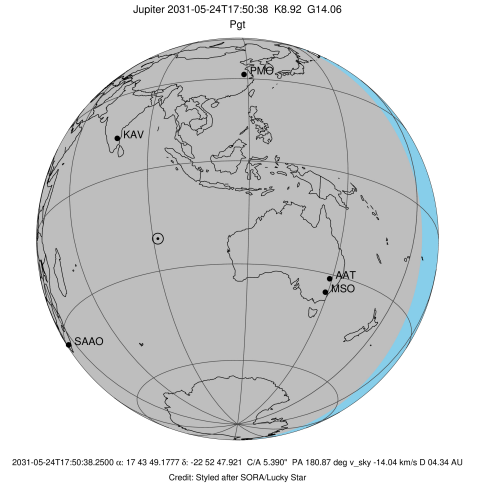


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-24T16:31:55.465	32.70	-36.79	71491.1	17.95	20.31
Jupiter	E	2031-05-24T19:08:59.140	31.37	-20.78	71491.1	18.01	20.38

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-24T17:54:55.150
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      : 4116870159267826560
2Mass ID (if available) : 17434917-2252477
ICRS Star Coord at Epoch: 17h 43m 49.17766s -22:52:47.92076s
RUWE (>1.4 is poor) : 0.95
K magnitude          : 8.917
G magnitude          : 14.057
RP magnitude         : 12.755
BP magnitude         : 15.885
DUPflag             : 0
Distance (au)       : 4.343
f0 (km)              : 0.00
g0 (km)              : 0.00
skyplane vel. (km/s) : -14.04
Sun-Target sep (deg) : 156.67
Sun-Moon sep (deg)  : 165.76
B (ring opening deg) : -2.61
PA of pole (deg)    : 0.91
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 6.408
C/A sky separation (km) : 20181.7
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
    
```

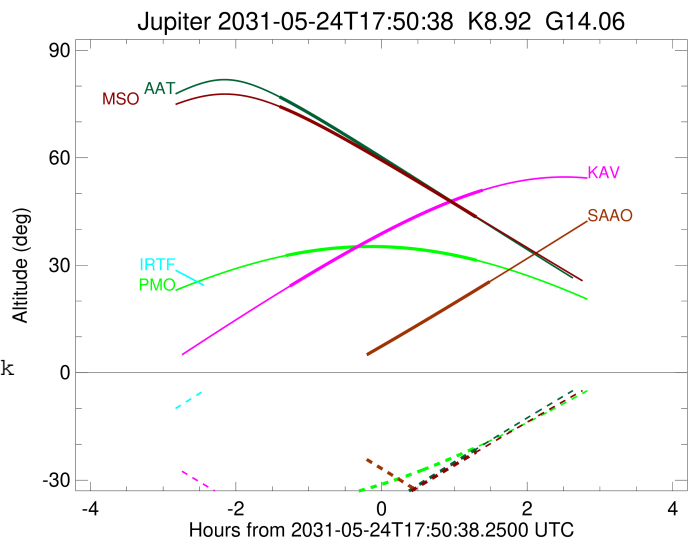
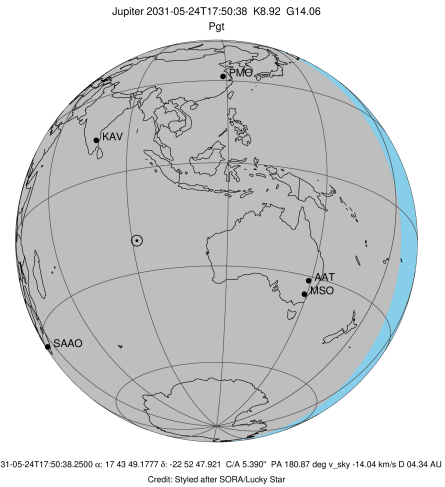


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-24T16:35:12.654	24.17	-44.47	71491.3	15.82	17.94
Jupiter	E	2031-05-24T19:14:03.395	50.94	-55.73	71491.2	16.75	18.97

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch            : 2031-05-24T17:47:19.640
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       : 4116870159267826560
2Mass ID (if available) : 17434917-2252477
ICRS Star Coord at Epoch: 17h 43m 49.17766s -22:52:47.92076s
RUWE (>1.4 is poor) : 0.95
K magnitude           : 8.917
G magnitude           : 14.057
RP magnitude          : 12.755
BP magnitude          : 15.885
DUPflag              : 0
Distance (au)        : 4.343
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.04
Sun-Target sep (deg) : 156.67
Sun-Moon sep (deg)   : 165.04
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.91
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation ("): 5.023
C/A sky separation (km): 15821.8
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
    
```

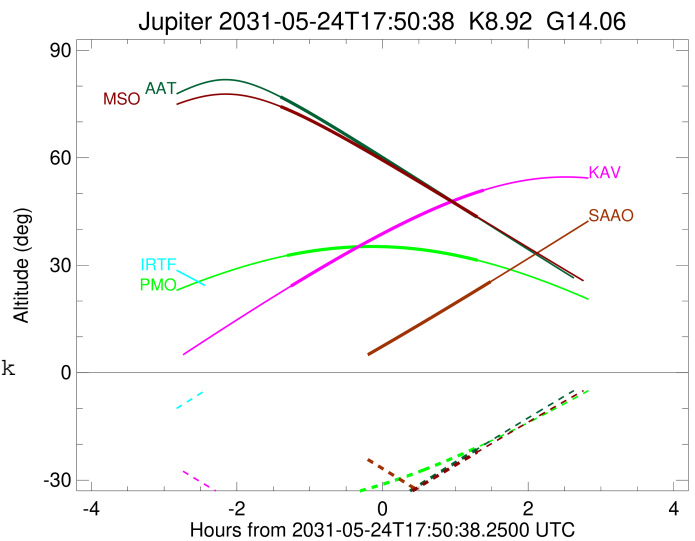
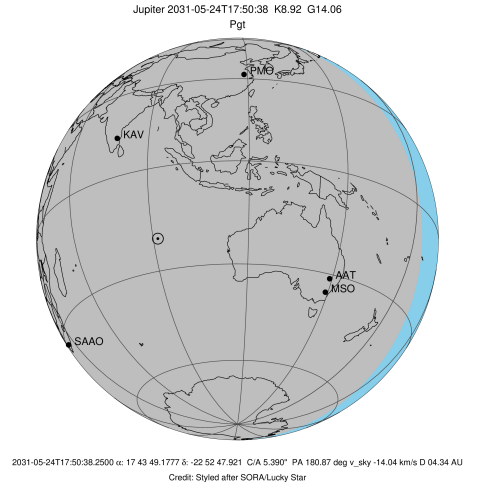


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-24T16:26:38.250	76.97	-55.78	71491.5	12.94	14.72
Jupiter	E	2031-05-24T19:08:21.451	43.43	-21.39	71491.6	12.41	14.12

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-24T17:56:47.830
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        : 4116870159267826560
2Mass ID (if available) : 17434917-2252477
ICRS Star Coord at Epoch: 17h 43m 49.17766s -22:52:47.92076s
RUWE (>1.4 is poor) : 0.95
K magnitude           : 8.917
G magnitude           : 14.057
RP magnitude          : 12.755
BP magnitude          : 15.885
DUPflag              : 0
Distance (au)         : 4.343
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.04
Sun-Target sep (deg) : 156.67
Sun-Moon sep (deg)   : 166.04
B (ring opening deg) : -2.61
PA of pole (deg)     : 0.91
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 4.338
C/A sky separation (km) : 13664.4
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
    
```

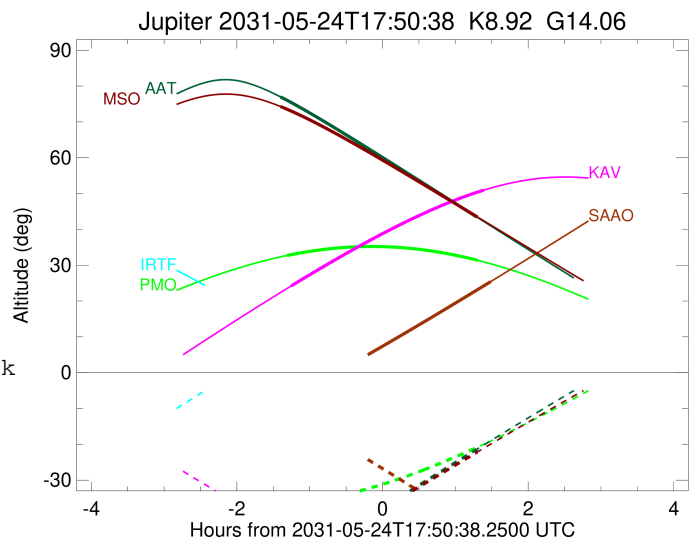
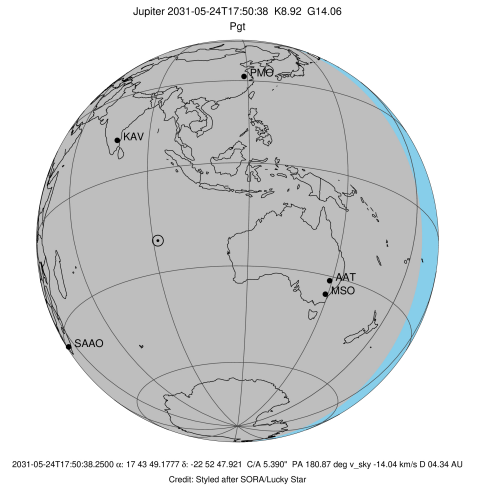


x: target alt < 5.0 deg or sun > -5.0 deg

Target	I/E	UTC	alt	alt-sun	radius	lat-geo	lat-geodetic
Jupiter	I	2031-05-24T16:32:53.305	-7.24x	-10.77	71491.7	10.37	11.82
Jupiter	E	2031-05-24T19:19:48.141	25.42	-45.56	71491.6	11.66	13.27

```

target                : Jupiter
target radius (km)   : 71492.00
C/A epoch             : 2031-05-24T17:47:28.170
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        : 4116870159267826560
2Mass ID (if available) : 17434917-2252477
ICRS Star Coord at Epoch: 17h 43m 49.17766s -22:52:47.92076s
RUWE (>1.4 is poor)  : 0.95
K magnitude           : 8.917
G magnitude           : 14.057
RP magnitude          : 12.755
BP magnitude          : 15.885
DUPflag              : 0
Distance (au)         : 4.343
f0 (km)               : 0.00
g0 (km)               : 0.00
skyplane vel. (km/s) : -14.04
Sun-Target sep (deg)  : 156.67
Sun-Moon sep (deg)    : 165.07
B (ring opening deg)  : -2.61
PA of pole (deg)      : 0.91
Pole direction: RA (deg): 268.05694
Dec (deg): 64.49651
C/A sky separation (") : 4.888
C/A sky separation (km) : 15394.0
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	2031-05-24T16:26:34.686	74.29	-55.04	71491.6	12.58	14.31
Jupiter	E	2031-05-24T19:08:41.093	43.49	-22.16	71491.6	12.08	13.74