

Sun Compass for Microsoft Flight Simulator

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Navigation is that science of art by means of which ships and aircraft are guided by the most convenient route from one point to another on the Earth's surface.

There is a considerable field for astronomical navigation. When there are no radio navigation aids, and magnetic compass is unusable due to high and fast changing magnetic variation, the astronomical navigation method is the only one possible. Sun compass is one of the simplest astronomical instrument.



Bumstead sun compass, 1928.

At the daytime the sun is the only celestial body, which can be observed. For successful operation of the sun compass only the sun itself and knowledge of the time of day are necessary. The principle upon which sun compass is constructed is close to the principle of the old sundial. The shadow thrown by the sun on the face of the instrument, which is in the form of twenty-four-hour clock, indicated the exact direction of the flight.

Description



Sun compass in MSFS

- 1 – direction of flight mark
- 2 – heading set knob
- 3 – heading dial
- 4 – time dial
- 5 – pointer
- 6 – gnomon
- 7 – gnomon' shadow
- 8 – mounting screw

The pointer (5) is rotated by the clock mechanism and it is constantly points to the current sun position on the sky sphere. The clock mechanism can be rotated by means of the heading set knob (2). The instrument is automatically switched to north or south hemisphere configuration.

Using sun compass in MSFS

While in flight, rotate the mechanism by the heading set knob (2) so, that the shadow (7) is positioned between marks on the pointer' arrow tail. The true heading can be read against the flight direction mark (1). On the screenshot aircraft is flying heading to the true north.

The limitations

It is impossible to use sun compass at dusk, dawn and during night. Also, it is impossible to see the gnomon' shadow if any kind of precipitations (i.e. rain or snow) occurs.

Suggested readings

“Astronomical methods in aerial navigation” NACA tech. rep. NACA-TR-198:

http://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/19930091264_1993091264.pdf

APPLIED GYRODYNAMICS FOR STUDENTS, ENGINEERS AND USERS OF GYROSCOPIC APPARATUS:

<http://gyros.biz/theindex.asp>