

## **Magnetic Variation in the Ockam Instrument system and OckamSoft**

Magnetic Variation (MagVar) is an important piece of information, needed whenever it is necessary to convert between true to magnetic directions, or when converting between Lat/Lon and Range/Bearing.

In the Ockam system, the goal is to have all direction output (Wind Direction, Heading, Waypoint and Back Bearing) in magnetic because most sailors, using binnacles or hockey pucks, expect it. MagVar is sometimes required by the system to convert true to magnetic, particularly with waypoint bearing because some NMEA sources only output true bearing (e.g. RMB).

Because of its importance, the Ockam System has always output this information in addition to using it internally.

In the Instrument System (tag 'o' output), MagVar can come from 2 or 3 sources;

1. The default source is the 032 Compass interface, which has digital switches for setting the value.
2. With CPU revision 16 (Unisyn) and 041B interface installed, MagVar can be sourced by the GPS. If one of the sentences HDG, HDM, HVD or RMC is being provided, the MagVar output will switch from the compass switches to the GPS-provided value. The output format will also switch from 1 decimal to 2 decimals (i.e. xx.x to xx.xx) as a signal to OckamSoft (described later).
3. Manual "Cal" entry by computer (K7=<MagVar>). This overrides both other sources, both for output and internal use.

OckamSoft does lots of Lat/Lon <--> Range/Bearing conversion and current calculations based on Lat/Lon, and therefore require accurate MagVar to work correctly.

In OckamSoft, the MagVar input comes from 5 hierarchical sources;

1. The .ini file. This is the initial value used, the value in use the last time OckamSoft was shut-down (whatever the level).
2. The Ockam System. The ini-file value is replaced by the compass-switch value (tag 'o', xx.x format) when detected.
3. Chart MagVar. When a chart is opened, it's MagVar replaces the compass-switch value. Changing compass-switch MagVar no longer has an effect.
4. GPS MagVar. If a GPS MagVar (tag 'o', xx.xx format) is detected, the chart MagVar value is replaced by the GPS MagVar. Changing charts or compass-switch MagVar no longer have an effect.
5. Manual entry. By changing MagVar in the Race course/set course dialog, MagVar is locked in manual. None of the other sources have an effect until shut-down.