



blue mountain avionics

Product	EFIS One, Sport, EFIS Lite- Does not include Gen 4 product	
Release	2.70 and later	
Subject	Magnetometer Calibration	
Original	02/02/2007	Larry Romig

Magnetometer Calibration Using “MAGCAL” Routine

Installation of the magnetometer is crucial to the performance of your Blue Mountain EFIS unit. Your magnetometer installation needs to be optimized before attempting this routine. Magnetometer performance is affected by;

- proximity of ferrous metals (iron and most steels) to the magnetometer unit
- proximity to electrical cables and antennas.
- magnetometer wiring. The magnetometer cable should be manufactured by using four conductor shielded cabling for its entire length to give best performance.
- orientation of the magnetometer to the EFIS centerline axis. This includes the relationship of Yaw, Pitch and Roll. Any variation of these axis of the magnetometer to axis of the EFIS may introduce errors.

By addressing these points of installation many of the deviation errors can be avoided. If deviation error still exists it is possible to correct small errors by using the Magnetometer calibration program.

Currently this can be accessed by booting your EFIS, plugging in the programming keyboard, and using the escape key to access the blue mountain command shell menu. From the command shell menu scroll down to the command shell option and hit enter.

You should now be at the "C:\>" prompt. From here you need to type the command "magcal" and hit enter. A calibration array similar to other sensor calibration arrays will appear on the screen. The calibration procedure is very similar to a normal compass swing. The calibration array will show a value in the box marked "Heading" for the compass position that you are at. This will be recorded below in the calibration table under the column labeled "Raw". For that position enter the corrected heading in the column labeled "Corrected". There are enough positions in the table to do the major cardinal compass points (N, E, S, W) as well as the minor cardinal points (NE, SE, SW, NW). If the magnetometer is installed as good as it can be the calibration of the major cardinal points should be enough.

To use the Magnetometer calibration table you will need to be able position your aircraft at different compass headings on the ground. A compass Rose is useful for this but not necessary to get close. Tail-dragger aircraft MUST be calibrated in a level flight attitude, yes you'll have to use a tail stand.

Typically we will adjust at the four cardinal points of the compass. A close approximation can be made by using a GPS heading or a combination of GPS and whiskey compass heading.

Once you have stabilized the heading you'll need to make the determination if your magnetometer heading is "ahead" or "behind" the heading you have the airplane on and by how much. We will have two bits of information we will need to enter into the table, "Raw" data and "Corrected" data.

For example;

The aircraft is placed on a heading that corresponds to 90 degrees and this is verified with a GPS and whiskey compass reading. Your magnetometer tells you that you are on a heading of 81 degrees. We want the mag to read 90 degrees, so we will enter the 81 degrees into the Raw data column and 90 in to the Corrected data column. The EFIS will calculate the data around this point and when the magnetometer is reading 81 degrees will display 90 degrees.

Now let's turn the aircraft to a GPS/Compass heading of 180 degrees.

With the heading of 180 degrees confirmed by the GPS and or compass, we have a magnetometer reading of 186 degrees. Enter the 186 degrees into the Raw data column and 180 degrees into the Corrected column. The EFIS will calculate the data around this point and when the magnetometer reads 186 degrees it will display 180 degrees.

Next turn the aircraft to a heading of 270 and degrees and confirm with the GPS or compass.

The magnetometer gives a reading of 276 degrees, so we will enter that data in the Raw column and 270 degrees into the Corrected column.

Finally set the aircraft up at 0/360 degrees and confirm the heading with the GPS or compass.

At this heading the magnetometer gives a heading of 356 degrees. Enter that value into the Raw data column and 0 or 360 in to the Corrected data column. When the magnetometer reads 356 it will display a value of 0 degrees.

This should give you well calibrated heading information.

The EFIS unit will use the raw data provided directly from the magnetometer if there is no calibration data entered into the table.