

COMPASS CALIBRATION PRIMER

Applies to all DJI product. By Ian Wood, SILLY GOOSE MEDIA (sillygoosemedia.com). Originally published Jan 2015 on phantompilots.com. Updated October 2018.

WHY CALIBRATE THE COMPASS?

Accurate compass data is an essential part of accurate and safe flying. The compass must be calibrated to provide accurate data. Inaccurate compass data will conflict with the GPS and cause erratic behavior. Compass calibration measures only magnetic **deviation** though it may also trigger setting the magnetic **declination** offset at the same time.

HOW DOES CALIBRATION WORK?

Compass calibration measures the magnetic environment both onboard and nearby and **detects nonlinear anomalies** within it. By turning the compass 360 degrees in two different planes, the drone can see where the compass reading is nonlinear and correct it.

SIGNS OF A COMPASS PROBLEM

- You get a compass warning. Duh!
- The compass reading is not most of the way to the left (green). Older drones, a MOD value not close to 1450.
- The drone suddenly stops using P-GPS mode and reverts to ATTI even when enough GPS satellites are available.
- The drone flies in a circular pattern known as “toilet bowl effect”.
- The horizon in your image is rolling left and right like a cargo ship in a storm.
- The drone flies like it is drunk.

SHOULD I CALIBRATE?

You do not need to calibrate before every flight. In many cases, it is better to fly with a slightly off calibration than one done in an area where there might be magnetic interference. Calibration should only be done if you can be sure the magnetic environment around your drone will be consistent between calibration and flight. If you get a warning or the reading isn't ideal, the first thing to do is make sure the drone is **not in an area of localized magnetic interference**. Move to another area and check again.

NOTE: Do not calibrate your compass if you are uncertain about the possibility of magnetic interference in the immediate area.

DO CALIBRATE...

- If you get a compass warning or bad reading and are very sure there is nothing nearby causing magnetic interference.
- If you have added or removed something metallic to the drone or have changed or reset firmware.
- If you are far away from where you last calibrated (250 miles or more is a good benchmark).
- If there is a significant change in terrain (e.g. from grassland to mountains).

NOTE: The absence of a compass warning does not mean your compass is necessarily calibrated properly.

DO NOT CALIBRATE...

- Before every flight. This is both unnecessary and risky.
- If near, on or in concrete, stone, iron, power lines, pipes, a beach, a boat, a balcony, a car, speakers, etc.
- If you are not certain the immediate area is free of a localized magnetic influence.
- Unless you have a reason to do so based on the above information.

PRE-CALIBRATION CHECKLIST

- Everything on the drone that will be used in-flight should be set as it would be in flight (e.g. tracker, camera, etc.).
- Remove all metal within 15-20ft, e.g. watch, phone, ring, belt, coins, controller. Yes, your belt even!
- Calibrate on grass or dirt or other natural surface.
- Start the calibration process by booting up normally from a level surface if possible.

HOW TO CALIBRATE

This guide is generic to all DJI drones. Follow the steps in your app and/or user manual. It's pretty simple. It is important that once you are done, do a quick check of the compass reading and conduct a quick test flight. If you're not happy, you can do another calibration and re-test.