

## GPS FAILURE & FIRMWARE UPDATES:

There are those who've never had an issue with their H until a Firmware update...

For no apparent reason the H either drifts in flight or behaves erratically at low altitude or on landing?

**Well here's why...**

There were apparently **3 hardware revisions of the GPS units** by the manufacturer and Yuneec keep fitting the latest revision to their newer aircraft.

It is quite an advanced unit but there is no update port included by Yuneec once they've integrated it into their Compass and Barometric Pressure Sensor Units as a GPS Combination Module.

**Only Yuneec can factory flash firmware to the GPS unit** and once done is **not up-gradable** because there is no update port on the Yuneec GPS/Compass & Barometric Pressure Sensor Combination Module.

The latest Firmware Variants for the H are not compatible with the pre-flashed firmware on the older revision GPS units included on the older GPS/C & BPS Modules; specifically with regard to the GPS unit.

**So swapping out the GPS Combination Module is pointless unless you're replacing the old unit with a newer or Current Revision.**

Yuneec aren't telling anyone this because they probably don't know themselves?

Those lucky enough get a new aircraft or a possibly a GPS Combination Module Upgrade; the others suffer in silence.

Also the **GPS unit requires somewhere around 15s of satellite-lock-on-time to correctly orient itself.**

So it's always **advisable to wait around 15s after GPS Lock before takeoff.**

Additionally satellites continuously update their own data and correction algorithms; as a result a significant geographic **move or period of non-use requires a download of "corrected/updated" satellite Information.** This can take anywhere from **5-20min** so again if you haven't used your aircraft for a significant time or you've moved a substantial distance geographically; **you need to leave the aircraft alone for around 15min with full GPS Lock before takeoff.**

**This allows the GPS unit to efficiently update itself** before takeoff rather than in-flight; which is not ideal.

Also you may wish to take into account civilian GPS modules are unable to determine accurate GPS coordinates to < 3m.

This is a security protocol which was previously < 30m.

The military doesn't want civilian users to have accuracy down to < 3m. All satellite data is encrypted with a 3m error.

Your GPS units algorithm is there to ensure accuracy never drops below a value of < 3m.

That's why **you need 7 satellites locked-on for accuracy rather than just the 4 required by military equipment.**

And yes it also **takes a few seconds for your GPS module to accurately make use of the encrypted satellite data; it's not instant.**

So GPS lock means nothing, the same as with your car when it's switched on; yes it's ready to drive but until the engine reaches operational temperature it's not the optimal time to drive away.

So to fly immediately or to fly optimally is your choice.

U-Blox provides correction data valid from 1 to 35 days.

The size of these files increases with the length of the prediction period, from as little as 3kB to 90kB.

Positioning accuracy decreases with the age of the correction data, with 1–3 days old data providing relatively high accuracy and 10–35 days old data progressively less accuracy.

Regular updates help to ensure a high level of position accuracy.

**Accelerometer calibration in the field is a BAD idea...**

Read through my posts to the one on correct calibration protocols.

**In the field you ONLY calibration the compass.**

**You can NOT put the aircraft on a vehicle or near ANY metal objects during calibration...**

**Minimum 5-10m from your car or a gate for example.**

You can take off and even land on your car but you will ALWAYS get the compass warning in that situation.

The module is capable of allowing immediate flight as are all GPS units capable of immediate orientation/location but...

A satellite's geostationary orbit isn't actually geostationary so...

Satellites are continuously updated with new "correction" algorithms; those updates need to be downloaded to your GPS module and that takes time especially from multiple satellites.

Do you prefer to risk those updates in-flight or on the ground? The choice is yours!

Satellites are updated approximately once a month, If you haven't flown in a month you're correction algorithms will be out of date.

If you move geographically a significant distance you'll now be making use of new satellites for which you have no data.

So do as you wish; the facts are not subject to opinion or the empirical evidence of past observation/experience; the facts are what they are whether the user is in agreement or not.

I will repeat; the system is 100% functional immediately on boot-up however for 100% optimized capability anywhere from 30s to 15min may be required dependent on aforementioned circumstances.

Now calculate how long the GPS unit requires to download 90kB of Information and all on a single communication "channel".

Do you want to download updated satellite data in-flight and GPS location Information simultaneously?

That's like being on a phone call and using your phone as a modem to stream video simultaneously on another device; it may work but not efficiently.

The phone will prioritize the call over data transmission when sufficient band-width is unavailable because its primary function is Phone Calls; similarly the GPS module will prioritize Location Data over "updated" satellite information download because it's primary function is GPS Location.

It's common sense to anyone that understands how these systems function. You can buy information but not the common sense to correctly interpret it...