

Flying by Numbers?

This month's column is about setting up and making effective use of your instruments. It's prompted by a couple of people asking what data fields I use and what I feel is the most useful information needed when flying. It is not instrument specific, but the key fields are the same regardless – just for the record my instruments are pretty old – a Competino and a Garmin 76Csx (both circa 2007). Despite being a little dated they provide all the information that flying a paraglider requires and a lot more besides much of which is fairly irrelevant. It's also 'me' specific, I have my own way of doing things; I'm sure it differs with others so it's whatever works for you that matters.

The important thing is to:

- a) Know what in-flight information you need to fly effectively and safely
- b) Understand what the information you're getting, means
- c) Be able to make rational and logical decisions based on that information.



It goes without saying that you need to develop an intuitive feel for whatever instrument you have. You should be able to navigate easily through its various screens and setups and trust what it's telling you. Instruments provide information in only two forms – audio and visual. Sometimes we listen to what they are telling us; at other times we read from the displays. They receive information manually (we press buttons) and/or electronically either via sensors or programming.

For the sake of clarity I'll break instrument information into three main categories.

- i) Flight information
- ii) Meteorological information
- iii) Navigational information

FLIGHT information: This refers to your gliders performance throughout your flight at any given time.

Variometer – the rate of climb or sink (m/s or ft/s). Obviously key information – generally you fly/thermal by audio, but at 0 -2m/s down; or to where ever your sink alarm kicks in, it can be useful to go to visual as the audio ceases, especially on glide as it gives some guide of your approach to the next thermal or finding the best line. Remember, light sink is actually rising air; it just may not yet match our normal sink rate.

Ground speed – crucial if flying a paraglider as it tells us we are managing to make forward progress and especially crucial when ridge soaring to prevent being blown back. When flying downwind on a paraglider and if getting low beware of readings of 60 -70kph as this indicates a fairly fresh wind so a nice open soft landing area is adviseable and avoid anything that could create turbulence. The read-out does not show a negative – you may actually be going backwards, so do a check with the speed bar if there are no visual references and you're uncertain

Altitude - both QNH and QFE but especially the former as it relates to airspace ceilings or levels you may encounter. You should set QNH for the day. I always find it useful to mentally mark cloudbase for the day; it will rise with time, but in strong lift provides a cutaway altitude about 300 -500' lower.

Glide angle – very important when doing comp tasks but also on XC flights. Essentially a combined computation of speed, sink rate and distance. Expect to go to no read-out (infinite) if you go to zero on the vario or start to climb. It may change quite a lot as the three factors can vary considerably – useful method for seeking out the best line. Know your approx. glide in still air for your wing.

Time- depends what you're doing. If just out for a day's soaring it may tell you when it's time for tea. However, increasingly useful on an XC as knowing the time of day gives some indication of thermal strength and where the sources are likely to be – and how long the day has left. In other words the need to speed up a little – or ease off as the thermals weaken.

Airspeed – I don't use. It's as crucial to us as any aircraft but it's done through feel not instruments, any readout will be meaningless – and this assumes you have a probe accurate enough to provide it. Useful for glider speed comparison figures , but that again is best done against others gliders if you wish to compare your wing with similar. That said glide is more important than speed although they are very linked.



METEOROLOGICAL information: This refers to weather conditions as follows.

Wind speed – closely and inversely related to your ground speed, but useful to know if flying in the mountains or to indicate shear layers or wave positions.

Wind direction – direction can vary with height and gives a good indication of thermal drift; descent into sea breeze air. It will often need a two or three 360's to provide that information or you may be looking at old info'. Will help give your best glide once you find the line but don't be a slave to it.

Balloonists find wind speed and direction especially valuable, talk to them and they'll introduce you to a whole new way of steering.

Pressure – can be useful to know the pressure change over a period of time as it can effect thermal development, cloud formation and cloudbase.

Air temperature – perhaps a little academic but I find it interesting to note the temp changes over height to gauge the lapse rate. I also like to know the freezing level – if only because your water bottle starts to freeze and the effects on battery life.

NAVIGATIONAL information: Refers to where you are, where you're going and any airspace you may encounter. It allow you to set and navigate tasks (comps or your own), provides time/distances and bearings.

Map – set up as you wish in terms of orientation, scale and detail but airspace is a must! Personally I only have airspace for total clarity on the map page as the ground is laid out beneath me and paper maps (including an airspace map) are carried. I now zoom right in on the snail-trail during thermalling to relocate the thermal if I drift off – my way of 'find last thermal'.

Distance to turnpoint/goal - useful , but especially so when approaching cylinders or closing defined routes

Bearing – helps in staying on track although I prefer to do it visually from the route trackline.

Compass – useful if following a bearing but not 100% reliable in gps units. Can't say I personally use it much. A separate ball compass is still hard to beat.

I've shared a few of my thoughts – you may vehemently disagree with some parts. If I'm paranoid about anything it's my groundspeed and I have it duplicated on several screens and on some days I often make reference to it. The one thing I haven't mentioned is 'distance from take-off' - OK, I admit to having it on my main screen. Whatever instruments you use they are no substitute for developing the 'inner bird' as some call it, they provide invaluable information but you still need to make sense of it and integrate it into what you are seeing and feeling. The latter are still by far the most important factors in staying up and going far.

After all, who'd buy an instrument that told you where the next thermal was to be found?

