Kobo/XCSoar Altimeters And Gauges Notes - www.50k-or-bust.com

These notes relate to the use of a Kobo ebook reader modified to run XCSoar. They are my best shot at the time of writing. I cannot guarantee they are correct or represent ideal solutions but will correct and update them as and when I can. Please inform me of any errors or better solutions you may find. The index for other Kobo/XCSoar notes can be found at:

http://www.50k-or-bust.com/Kobo XCSoar/Kobo XCSoar.htm

XCSoar is optimised for use on a colour display for sailplane flying. It is complicated and can be difficult to set up and very confusing. The object of these notes is help with some of the more obscure elements.

Everybody is different. Different pilots like different things and these notes cover some of the XCSoar gauges I feel are most useful for paragliding. There are many more available but I like to try and keep things simple!

Altitude (Auto)

This is the default altimeter. It shows pressure altitude (Barometric Altitude) if a pressure input is available otherwise it shows GPS altitude. Personally I do not like gauges which can change automatically.

Alt GPS – GPS Altitude

Altitude from the GPS module. In good conditions this can be accurate to within a few metres but is dependent on good reception. The big advantage of GPS altitude is that it is self calibrating and for most cross country flights in the UK it will be close to QNH altitude. However, in more extreme conditions, such as a big continental heat low, it may be significantly different. In conditions of poor GPS reception it may be wildly incorrect.

Alt Baro - Barometric Altitude

This is altitude determined by an air pressure input, such as from a Bluefly module, if available. It has a subscale which is set automatically 20 seconds after the GPS locks. This subscale can also be set manually. The MS5611 pressure sensor in the Bluefly module has a very good specification so should be very reliable for barometric atltiude. I use barometric altitude for my cross country flying unless I am under an airlane defined by flight level.

Automatic Setting of Alt Baro

On switch on the "Alt Baro" gauge will show "---" .

Once the GPS has been locked for 20 seconds XCSoar looks up the ground elevation (height above mean sea level) from data in the .xcm XCSoar map file.

XCSoar then adjusts the subscale on the altimeter until the reading is the same as the elevation from the map file and displays the altitude AMSL on the gauge.

Note that this automatic setting is dependent on the accuracy of the elevation data from the mapping file and the horizontal GPS reading. On steep ground, such as a foot launch site, small horizontal inaccuracies can generate large errors in altitude setting. At the present time I am unclear as to how big such setting errors might be. It is a good idea to check the indicated altitude against the known elevation of the site, or if that is not available, the GPS altitude indicated after the GPS has been locked for some minutes.

Manual Setting of Alt Baro

Press and hold the "Alt Baro" gauge until the "Barometric altitude" window shows. It will show "Alt Baro" and other altitude information:

Alt GPS – The altitude coming from the GPS module. In conditions of good reception this could be within a few metres, but sometimes it can have very large errors indeed.

Terrain – The elevation of the ground surface above mean sea level as read from the map file at the latitude and longitude from the GPS.

H AGL – Height above ground level – The difference between the "Terrain" and the "Alt Baro" readings.

Press "Setup". A "QNH" box showing the subscale setting will appear.

Press the "QNH" subscale box. A list of pressure settings will show. It will be in the pressure units selected in the "Units" part of XCSoar. (In Europe millibars or hectopascals are standard and actually the same units!)

Select the pressure setting you want. If you want to adjust the altimeter to read a particular height you will have to work out what you need to set it to or set it by trial and error. An increase of 1 millibar will increase the indicated altitude by approximately 30 feet (10 metres) and vice verse.

FL – Flight Level

If a pressure input is available this shows the altitude in hundreds of feet

referenced to 1013 millibars. The XCSoar manual states that this is only available if the correct QNH has been set but when using a Bluefly module it appears to be correct at all times.

<u>Battery – Battery Percent</u>

Battery percent – With the standard battery the Kobo shuts down very quickly after this falls below about 45%. (more detail in hardware notes). It behaves a bit differently with the Large Battery modification. At the bottom of the box it will say "AC On" or "AC Off" indicating whether or not external power is available. On the Kobo Touch this appears to show what the external power status was at start up rather than following changes. On the Mini it appears to work OK.

<u>Glide Ratio Average – GR Avg</u>

Distance covered / Height lost over a selected period of time.

The period of time can be selected in the Glide Computer:

Config 1 / System / Glide Computer / Glide Computer / GR average period

This screen also has the selection "Nav. by baro altitude" "On" or "Off".

Although not clearly stated in the manual, it appears that this determines whether the GR Average is calculated from pressure or GPS altitude.

<u>Thermal Climb, Last 30s – TC 30s</u>

Average climb over the last 30 seconds based on pressure altitude if available, otherwise based on GPS altitude.

<u>Time Loc – Time Local</u>

This is the local time set up by:

Config 1 / System / Setup / Time

Set "UTC offset" for your local time zone and daylight saving.

Setting "Use GPS time" "On" will set the time automatically once a GPS satellite is received. If GPS reception is lost the clock will keep running independently.

N.B. This is different from the Kobo system time. The "created" or "modified"

date and time of files displayed in things like Windows Explorer will show the Kobo system time at the time they were created or modified. To make sure these are correct put the Kobo into eRreader mode and set the date and time there.

V GND – Speed Ground

Ground speed as measured by the GPS.

WP Dist – Next Distance

The distance to the next waypoint in the task or waypoint selected for "GoTo".

Vario Bar

If there is a Bluefly module fitted the vario can be displayed as a bar on the right hand side of the Map area.

Config 1 / System / Gauges / FLARM, Other / Vario bar "On"