

LK8000 Flight Computer – A Minimal Configuration Setup

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The LK8000 Flight Computer software provides, amongs other things, a GPS-driven moving map displaying terrain, waypoints, landable sites and airspace – the basic vital information needed for safe cross-country flight. However, there is such a profusion of other features that it can be overwhelming to the new user and therefore, like all such tools, a potentially dangerous distraction in flight. The situation is not improved by the complexity of the program's menu system and the lack, so far, of a single authoritative source of documentation covering all the features of the current release (v4.0b, as at Sept 2013). Note that this should not be interpreted as criticism of the author of (and contributors to) the LK8000 project. Rather, it is an almost inevitable consequence of the multi-contributor open-source development process which, although having many positive attributes, does have limitations which need to be recognised.

These notes, based on my personal experience with LK8000 v3 and v4 over the past 12 months, attempt to describe setting up a minimal configuration which should serve the needs of glider pilots up to Silver C level at the very least. They are a 'first shot' at the problem and reflect some personal preferences, but I've written it up in the hope that it may be useful to other early-XC pilots and newcomers to LK8000.

Hardware and Software

I'm assuming you have a PNA-type device such as the Vertica V2 with the LK8000 software installed – likely as part of the great package put together and marketed by Jerry O'Neill. These notes apply to software versions 3 and 4, and an upgrade from earlier versions is strongly recommended. This is straightforward – see <http://www.lk8000.it/download/software.html>.

Note that in general it is good to keep open-source software updated even if the new features are not required. There will always be bug-fixes (as well as new bugs!) and upgrades are usually much simpler to make from the immediately prior version.

LK8000 Documentation

The manual for v4 describes only the new features (mainly 'Multi-Maps' – which we are going to disable anyhow!) so, if you don't already have it, you should download the very comprehensive (305 page) *LK8000 Handbook for version 3* from <http://www.lk8000.it/download/manuals.html>. If only it had a better index.....

The original *User Manual – Preliminary Documentation* for v1.22 provided by Jerry is still a useful document, though many details (particularly menu items) have changed.

Note that a very good feature of LK8000 is that most of the parameter entry screens in the configuration menus have a 'Help' button which does provide useful information.

1. Proposed Minimal Configuration

This section describes my set-up (with some justifications for the choices). I'm assuming you've at

least turned LK8000 on a few times and taken it for a car drive (if not a back-seat flight in a glider) so you have some familiarity with the menu system and switching screens between map and info pages.

In LK8000 v4 the configuration settings described in this section are all accessed via

MainMenu | Config | Config1/3 | LK8000Setup | SystemSetup|

which brings up one of a group of 23 screens which you step through using **Next** and **Prev** buttons.

(NB In LX8000 v3.x the equivalent access path is:

MainMenu | Config | Config1/3 | LK8000 | SystemSetup)

a) To avoid 'getting lost' in the large number of Info Pages, we retain just one, the list of **Landables** (Table 2.2). Similarly we restrict the number of different Bottom Bars (Info Stripes) to just 3 and, in LK8000 v4, disable all the new **Multimaps**. These restrictions result in a major reduction in the amount of screen clicking in flight (and, of course, as you get completely comfortable with LK8000 operation you can readily bring any of the disabled features back on a one-by-one basis).

Go to **p10 Interface** and then:

in **Configure Info Pages** turn **OFF** everything except **2.2 LND**

in **Configure Bottom Bar** turn **OFF** everything except **TRM0, CRU7 and FIN8**

in **Configure Multimaps** set **1, 2, 3 & 4** to **Disabled** (step not available in LX8000 v3.x)

Touching the bottom centre 'hot spot' will now just toggle back and forth between the **Map** display and the **Landables** Info Page.

b) Set the 5 individual fields of each of the 3 Bottom Bars (Info Stripes) to display the data of your choice via:

p16 InfoBox Cruise

p17 InfoBox Thermal

p18 InfoBox FinalGlide

NB There is a very long list of choices for these fields. To facilitate planning your setup and minimise scrolling up and down on the entry screen, these are listed in an Appendix below.

c) Clean-up the moving map screen by minimising superimposed data:

In **p11 Appearance**

set **Landables Style** to **Unboxed, no units** and set **Hide Units** to **ON**

In **p13 Map Overlays**

set **Show Clock, Glide Bar, Variometer Bar, Thermal Bar & FLARM** to **Disabled**

set **Screen Data** to **Half overlay** and **Font size** to **Small font**

NB LX8000 v3 allows you to remove the screen overlay entirely and that might be appropriate in

some installations. I can't see why the option was removed in v4 as all that overlay data can also be displayed in the bottom bar 'Info Stripes'.

2. Suggestions for other settings

a) In **SystemSetup | p5 Glide Computer** I set **Auto wind** to **circling**

as I consider the other Auto-wind modes too difficult to use in practice.

b) In **SystemSetup | p5 Glide Computer** I set **Auto Mc mode** to **ON** with **Average thermal** as I'm fortunate enough to have a vario which makes use of this data.

c) Having an appropriate airfield waypoint identified as **Home** is necessary to make use of the **Goto Home** navigation feature. Set this up using

Nav | Waypoint Lookup and selecting **L639 Russels Fla** (for example)

On the resulting screen select **Details**, then **Next**, then **Next** again, then **Set as new Home**

So simple really, why did you never think of that :).

d) I set up just two **Custom Keys** (screen 'hot-spots') – **Goto Home** on the top left and **Mark Location** (useful for 'tagging' thermal positions) on the top right respectively, via:

System Setup | p10 Interface | Configure Custom Keys

I recommend leaving all 4 Bottom Bar custom keys disabled as they overlap regular keys (being distinguished only by the length of the click).

3. Infrequently used but important operations

Because you don't need these often it's all too easy to forget how to do them!

a) Navigating the **Landables Info Page 2.2**

I consider it *really important* to practice this frequently as one day you *are* going to need do do it reliably when you're under pressure to get to a safe landout site. Do it as part of every pre-flight instrument check?

We've already set up to reach this page directly from the Map display via a short click in the centre of the bottom bar (Info Stripe). Firstly, note that the page title is actually **2.2 LNDB 1/5**. i.e. there are 4 more pages of landables which can be accessed by vertical 'swipes' (up or down) the screen mid-line. You should never need these, but you might actually get one by accident if you 'smear' the screen while trying to make a selection in turbulence. So, if that does happen, you now know how to get back to **1/5** (and if you find how to disable that 'sub-page switching', do it and let me know!).

Note that the listed landables are sorted on the basis of the selected column heading. By default this should be **Distance** so that the nearest is at the top of the list. If not, click on the **Distance** header.

Note that landables that have been flagged as actual airfields in the waypoint list are in a normal font while others (paddocks, farm strips etc) are in italic. Also, if the landable is unreachable from your current position, it will be coloured red.

By default the top item on the list (i.e. the nearest landable) will be highlighted and this will often be what you want. However, if you've made your decision to land-out early enough one of the others could be a better option. So, to change the selection click over the centre of the bottom item on the list and the highlight will move down one step. Similarly, clicking on the centre of the top list item will move the highlight one step up (and it will cycle again if you keep clicking rather than move to the next sub-page). See the diagrams on page 40 of the *LK8000 Handbook for version 3* if this is not clear.

Having selected your landout make a LONG click on the centre of the screen. You will get a set of buttons offering (amongst other things) **Details** (which may well contain some useful notes if you have time to read them – and you should have)) and **Goto** which will immediately reset your navigation to that landable and return you to the map screen.

b) Adding a waypoint.

No, it's not in the Nav menu hierarch! You need**System Setup | p21 Waypoint Edit**

4) Interfacing to External Devices

I'll put some notes here when I've checked that my LXNav v7 & Nano system is working properly,

Feedback and questions welcome, [rob.ggk\(at\)gmail.com](mailto:rob.ggk(at)gmail.com)

Appendix - Bottom-Bar (Info Stripe) field options

NB The Info Stripe set-up screens (**System Setup | p16, 17 & 18**) allow entries for 8 fields each, but only 5 fit in the screen width of the Vertica PNA in landscape mode (and only 3 in portrait?).

For explanations highlight the option and click on **Help**.

AA Delta Time	AA Distance Max	AADistance Min	AA Distance Tg
AA Speed Max	AA Speed Min	AA Speed Tg	AA time
Airspace Horiz Dist	Airspace Vert Dist	Airspeed IAS	Airspeed TAS
Altern AGL	Altern QNH	Altern1 Arrival	Altern1 Req Efficiency
Altern1 bearing	Altern1 distance	Altern2 Arrival	Altern2 Req Efficiency
Altern2 bearing	Altern2 distance	Altitude AGL	Altitude BARO
Altitude GPS	Altitude QFE	Altitude QNH	Average Efficiency
Battery Percent	Bearing	Bearing Difference	BestAltern Req.Efficiency
BestAltern Arrival	Best Altern bearing	BestAltern distance	Current Flaps
Eff.cruise last therm	Eff.last 20 sec	Ext.Batt.1 Voltage	Ext.Batt.2 Voltage
Ext.Batt.Bank	Flight level	ForecastTemperature	G load
Head Wind Speed	Home Alt.Arrival	Home Distance	Home Radial
L/D vario	Logger	McCready Equiv	McCready Setting
Max Altitude Reached	Max Height gained	Multitarget Bearing	
Netto Vario	Next Alt.Arrival	Next Alt.Required	Next Arrival Time
Next Distance	Next Re.Efficiency	Next Time To Go	
OLC Classic Dist	OLC Classic Score	OLC Classic Speed	
OLC Classic*Predicted Distance		OLC Classic*Predicted Score	
OLC Classic*Predicted Speed			
OLC FAI 3 Tps Distance		OLC FAI 3 Tps Speed	
OLC FAI Triangle Distance	OLC FAI Triangle Score	OLC FAI Triangle Speed	
OLC FAI Triangle*Predicted Distance		OLC FAI Triangle*Predicted Score	
OLC FAI Triangle*Predicted Speed			
OLC FAI Triangle Distance close %		OLC FAI Triangle Distance to close	
OLC League Dist	OLC League Score	OLC League Speed	
OLC Plus Score	OLC Plus*PredictedScore		
Odometer	Outside Air Temp	Percentage climb	Relative Humidity
Speed McCready	Speed To Fly	Speed Ground	

Task Alt.Arrival	Task Alt.Required	Task Arrival Time	Task Covered Distance
Task Distance	Task Req.Efficiency	Task Speed	Task Speed Average
Task Speed Instantaneous		Task Time To Go	Team Bearing
Team Bearing Diff	Team Code	Team Range	Terrain Elevation
Thermal All	Thermal Average	Thermal Ave. Last	Thermal Gain
Thermal Gain Last	Thermal Last 30sec	Time UTC	Time local
Time of flight	Track	Vario	Wind Bearing
Wind Speed	_Experimental1	_Experimental2	
_Reserved1	_Reservedr	_Reserved3	_Reserved4

What's the betting that what you'd *really* like is not there?