

# **Dittel LX-1000 AUDIO VARIO/SPEED DIRECTOR**

(As installed in the club Astir)

The LX-1000 vario takes up two places in the instrument panel. The main unit consists of an LCD and a number of switches and knobs. The other unit is a more conventional vario type display with an analogue needle. The LX-1000 will generate different audio tones in the vario and speed director modes.

In the club Astir, **both units are calibrated in m/s rather than Knots**. There is also a standard Winter mechanical vario installed, which is calibrated in Knots just to be confusing. However, conversion from m/s to Knots is easily achieved by multiplying the m/s value by two.

**1 m/s  $\approx$  2 kts**

Depending on how the switches are set on the main LX-1000 unit, the behaviour of both the LCD and the analogue display can be altered. The instrument is German, so some of the switch markings are a little cryptic.



Main Unit front panel

### The obvious controls

#### **ON**

This switch turns the unit on.

#### **V**

Volume control knob. The noises made by the unit are described a little later.

#### **BATT/TEMP**

2-position switch that temporarily displays battery voltage or temperature information (°C) in the LCD.

### The not so obvious controls

#### **AUTO/SC**

The LX-1000 has three modes of operation, which can be selected using the 3-position switch labelled **AUTO/SC**.

**Centre:** Standard vario with 25-second averager

**Bottom:** Speed director

**Top:** 'Auto' mode. Switches automatically between Vario and Speed Director modes as you fly

## Vario Mode (Centre position)

### **LCD on main unit**

Shows the average rate of climb or descent over the past 25 seconds. This is roughly the time needed to perform one turn in the thermal.

When bragging about thermal strengths in the bar after your epic flight, this is the number you should use. The peak climb rate shown on the analogue display is fairly meaningless (unless you're a thermal centring God), since one half of the turn may be in 6kts (3 m/s) while the other is only in 2kts (1 m/s). In which case you're probably only going up at around 3-4 kts.

### **Analogue vario unit**

This functions as a standard vario unit, but the sensitivity can be altered with a couple of cunning switch flicks.

### **R**

The 3-position switch labelled **R** can be used to alter the vario scale.

1	= vario indicator scale is as marked	ie. $\pm 5$ m/s ( $\pm 10$ kts)
2	= vario indicator scale is * 2	ie. $\pm 10$ m/s ( $\pm 20$ kts)
0.5	= vario indicator scale is * 0.5	ie. $\pm 2.5$ m/s ( $\pm 5$ kts)

Normally this should be set to 1 to give a 5 m/s (10 kts) vario.

..././..

The 3-position switch labelled with groups of dots can be used to set the **damping rate** of the vario. That is the speed at which the needle follows variations in thermal strength.

Set on a low value, the needle will follow every little variation in climb rate very accurately, but may make it difficult to follow what's going on - especially in turbulent thermals. Higher damping values will smooth out the 'noise' in the readout, but sacrifice some of the accuracy.

Positions are:

Top:	...	2.5}
Middle:	.	0.8} second damping.
Bottom:	..	1.5}

It's pretty much down to personal preference what setting you use, but 0.8 or 1.5 are probably more appropriate.

### **Audio tones**

Gives an intermittent tone for climb and a steady tone for sink.

## Speed Director Mode (Bottom position - labelled SC)

When the unit is in the speed director mode, it tells you the most efficient speed to fly (STF) *between thermals* in order to increase your cross-country speed. The directions it gives depend on a number of parameters:

- **Wing loading.** If you're tanked up with water, you need to fly faster to stay efficient.
- **Next expected thermal strength.** If the next thermal is strong enough, then it may be beneficial to fly to it faster than max L/D as the extra height lost can be quickly regained in the thermal.
- **How clean your wings are.** Performance is adversely affected by bugs or rain on the wings.
- **Sink or lift rate of the air that you're flying through.** You need to fly quickly through the sink so that little time is spent in it. Equally, it is a good idea to slow down in the lift to make maximum use of it - even if you decide not to stop and thermal.

The first three of these can be set manually, while the unit itself determines the last item.

### **BAL (Ballast)**

This knob is used to set the wing loading in kg/m<sup>2</sup>. Obviously you don't want to have to sit down and calculate this before every flight, so a rough rule of thumb is to set it to 30 for a light pilot, 32 for a heavy pilot and up to 50 if full of water.

Don't forget to turn it down again if you dump your water!

### **MC**

This knob is used to change the MacCready setting - that is the average *expected* strength of the whole of the *next* climb, in m/s. As a start, set it somewhere below 1 m/s (2 kts) and then adjust as appropriate. If you find that the speed director is determined to fly you into the ground, then turn the MC setting down. Conversely, if the day is stonking and the thermals are reliable, crank the value up a bit.

*Most UK comp pilots set this at about half the 25-second average of the next climb they expect to take (based on the climb they have just had and how they expect the next climb to perform).*

### **N/M**

This switch tells the LX-1000 that you've got debris on the wings. Set to **N** for Normal and to **M** if the wings are covered with mosquitoes, rain or other pilots' pee bags.

### **Analogue vario unit display**

When the LX-1000 is in Speed Director mode **the needle no longer gives a thermal strength readout!** Instead, it gives speed to fly directions.

It points **DOWN** to indicate that you should fly **FASTER**

It points **UP** to indicate that you should fly **SLOWER**

It stays horizontal if your speed is about right.

### **Audio tones in Speed Director mode**

A **continuous** tone indicates that you should fly **faster**

An **intermittent** tone indicates that you should fly **slower**

It remains silent if your speed is about right

Whilst the director gives a good approximate speed to fly, try not chase it around too much.

### **Auto Mode (Top position)**

When the mode switch is in the **Auto** position, the LX-1000 switches automatically between **Vario** mode and **Speed to Fly** (Speed director) mode.

If you exceed **54kts**, the unit switches into **Speed to Fly** mode.

The unit does not return to **Vario** mode until the speed goes **below 48kts**.

It is important to notice that there is a 6kt overlap between the speeds at which the modes switch. The reason for this is that when you are cruising between thermals (or final gliding), if the lift is good it may be appropriate to fly at min. sink to make the most of the energy. You will not always want to stop and thermal. It would not be convenient if the unit switched into vario mode in this case.

The implication of this is that when thermalling in Auto mode, it is important to keep the speed under control and not exceed 54kts. Unfortunately the unit does not give any obvious warning that it has switched into speed director mode, other than the slightly different audio tones. If you realise that the mode has changed, you must bring the speed back to 48kts to switch back into Vario mode.