

# Datong FL3 Review

The subject of this review is the most recent of the Datong line of audio filters, which started with the Frequency Agile Filter, type FL1. This latter filter is unique as it possesses the ability to automatically lock onto an interfering heterodyne within the passband of the receiver, and will notch it out within 1 or 2 seconds. This is both claimed, and in practice is true, to be an advantage over the difficulty of manually tuning a very narrow notch filter onto a heterodyne whistle which may well move slightly after a short while.

The next model to be introduced was the FL2. This still features the notch filter, although not automatic in this model and with the addition of five pushbuttons and three potentiometers, the result is a very versatile multi-mode audio filter.

The FL3 is in fact identical to the FL2 except that it also contains an automatic notch filter, as in the FL1, thus enhancing its capabilities, whilst still providing a manually controlled notch. It isn't clear whether the automatic notch is the same circuit as for the FL1. For those already possessing the FL2, the notch filter pcb is available ready built (type FL2/A) to upgrade the FL2 to FL3. Another difference between the 2/3 is that the former allowed a DC supply of +8/20v (stated on the rear panel, or 10-20v in the instructions), the latter requiring 10-15v (reverse polarity protected).

The unit is packaged in a Vero G-Line metal case, with extensive screened legends on the front panel identifying the various controls, using both white and yellow to differentiate between the modes obtainable. External power is required of 400mA max at 10-15v DC negative earth. Phono connectors and leads are provided for the input/out-

**By Tony Bailey G3WPO**

**It offers a  
receive signal  
processing system  
which can improve the  
most expensive of  
transceivers and  
transform the  
performance of older  
models particularly on  
CW**

put, and a 3.5mm jack for external power. Datong have taken the trouble to note that the DC jack plug will short the supply during insertion, and advise either switching off the supply or checking that it is short circuit proof.

The internal construction is on two pcb's, the main one carrying all the circuits except for the automatic notch filter which is on an additional pcb mounted upside down on pillars. The pcb's are of professional appearance and quality with few trailing wires. The review unit was supplied with instructions for the FL2 unit, plus an advertising flyer on the FL3, but no specific instructions on the FL3.

## **Can it work?**

Before looking at the facilities offered by the unit, it is worth taking a look at the theory behind the FL3, as classic theory would lead you to believe that selectivity needs to be at an earlier stage in the receiver than the audio amplifier. The Datong philosophy is that with modern SSB receivers, the whole of the receiver amplification and mix-

ing chain is linear, including the detector (normally a product detector) with the main SSB filter selectivity guarding against blocking etc., placed early on in the chain. Together with an effective ABC system ahead of the main filter, the assumption is that extra selectivity can be placed at any point in the receiver system after this main filtering without resulting problems from overload effects.

Given this assumption, additional filtering at the AF end after a linear detector should have the same effect as if it was earlier on, and if the audio filter bandwidth is less than that of the SSB filter, then the former will control the overall passband. This argument does not hold for envelope detection as sum and difference products are present, although useful results are still claimed.

The only possible disadvantage is the appearance of an interfering signal stronger than the wanted signal within the main receiver passband, which will activate the AGC and cause a reduction in signal strength of the wanted signal. It is claimed that the effect of this when using the FL3 is similar to fading, and is not a disadvantage when compared with the benefits gained from the filtering.

The unit is not supplied with a circuit or block diagram, presumably in an attempt to guard the circuit design. A total of 12 poles of filtering are available, using tuneable state-variable active filters, involving some 22 op-amps. All 12 poles are used for CW, with the other modes using a combination of two 5-pole (one high-/one low-pass), and one 2 pole notch or peak filters. All three filters are tuneable from 200 to 3500Hz, using a linear control voltage for ease of tracking.