

and the unit has locked onto the weaker or less obtrusive of them. One simply selects **MANUAL** and retunes the filter. This would have been quite difficult due to the incredibly narrow notch width, had not Datong still left in some small amount of tracking ($\pm 100\text{Hz}$) in the manual mode. This means you only have to get close to the signal for it to lock.

Although primarily a notch filter, there is also a **PEAK** filter mode which can be used for CW reception. This is really a manually tuned application as the unit will not lock onto a CW signal, which is a good design feature — it means you can still have the unit in circuit in this mode. The peak width is stated as 60Hz at -60dB with an 800Hz centre frequency — however you can tune it to peak anywhere between 270 and 3500Hz. It is very effective, although it tends to ring a little when the signal is near the noise.

The MF10 IC

It is worth mentioning this package, as it is likely to appear in more and more designs over the coming months. With the addition of a few resistors and capacitors, the IC will allow the building of two complete second order state-variable active filters. As all the outputs from each section are brought out to the pins, all five filtering functions are accessible — lowpass, highpass, bandpass, allpass and notch. Any of the usual filter responses can be synthesised such as Chebyshev, Butterworth, Bessel etc, and with cascading of the units possible for fourth order responses, the possibilities are endless with minimum component counts.

The resonant frequency of each filter is controlled by an external clock, easily made using CMOS ICs. The clock can run up to 1MHz, and the filter with centre frequencies up to 20kHz. As the stability of the filter is dependent on the clock, some applications might require crystal references.

The notch output is synthesised by summing together the highpass and lowpass outputs in an external op-amp (an LF353 in this application) — the notch frequency can be set independently of the filter frequency by means of two resistors.

As you can see from this short summary, a very versatile IC.

The ANF in use

For this review, the filter was used with a *KW2000A* transceiver. This model only has an SSB mechanical filter, so it is an excellent testbed for gadgets like this. There is no reason to suppose that the filter would work differently with any other rig. The input to the unit was fed from the headphone connector, and the output from the *ANF* connected to an external 4 ohms speaker. The filter rear panel carries two phono sockets for this purpose, plus a coaxial DC socket for its power input (centre tip positive). There is a set of plugs supplied with the unit.

I seem to remember showing some enthusiasm over the *FL3* filter in these pages a few months ago. Well, this one is even better (as a notch filter — the *FL3* also does other things). The only gripe on the *FL3* was that you could hear the internal oscillator sweeping about, but this is not a problem here, mainly because the clock frequency will be outside the audio range.

Datong claim a notch depth of 40dB+. I suspect that the review sample is much better than this. According to my AF oscillator it is nearer 50dB. This figure, if correct, is expected — and using the *ANF* seems to confirm this figure. Deliberately tuning into 7MHz broadcast station carriers found me unable to locate one that I couldn't completely suppress! This leaves IF notch filters in rigs standing.

It is very pleasant to listen on 20 or 40 metres during peak weekend times with the filter in circuit, and be free of the majority of whistles which plague the ether. I say the majority — if you had two of these beasts in series (or more if you're rich) you could probably be completely free!

The action of the automatic scanning is fast and accurate. When no interference is present you don't know it is in circuit. When heterodynes appear, you hear a short burst of them, then they are gone — the speed depends on which end of the AF range the scanner is, relative to the interfering frequency, when the whistle first appears. It takes at the most about 750ms to kill it.

The notch is incredibly narrow — I found it very difficult to detect any difference in audio quality when tuning it manually through a voice signal. This is a very distinct improvement over any other notch

filter I have heard. Coupled with the deep notch, this also means it can be used for signal-to-noise ratio measurements.

One extra not mentioned earlier is the absence of any form of gain control on the unit. I say extra, because the unit incorporates a compander system to keep the gain at constant levels. What happens is that the filter is placed in between two AGC circuits. The one at the input keeps the filter level constant, which prevents varying receiver output levels from affecting the filter performance, while the output AGC readjusts the output level so that any gain or loss in the input circuit is exactly compensated for. The overall effect is that the system remains at unity gain, with the output level matching the receiver volume control setting.

This is very effective in practice and saves having to fiddle with two volume controls (as you had to on the *FL1*).

In the **PEAK** filter mode, no problems were found other than slight running at very low signal levels. Tuning is a bit fiddly due to the narrow width of the filter — I found it easier to tune for a notch first on the received signal, then switch to **PEAK**. In the manual mode the display still indicates the approximate frequency.

I was a bit worried when the unit appeared to be locking onto nothing at times — however a session with the signal generator revealed it was still locking onto signals below the noise level. Another read through the data sheet revealed that this fact stated, so don't worry if this happens. It is just another indication of the performance of the circuit used.

Conclusions

Unequivocally recommended for taking out heterodynes. Given the chance I would have liked to try two in series for the hell of it. Thinking about it maybe Datong could think about getting a second one in the same box — there a lot of occasions when you do get two interfering carriers.

At a price of £67.85 inc. VAT, it sounds a bit expensive but it will be money well spent. You also have the advantage of being able to use it with any other rig you buy.

One other point — it is British, unlike much equipment. ●