

# bhi DSP Noise Reduction Module for Yaesu FT-817

Yaesu's FT-817 is already a remarkable all-mode self-contained transceiver, covering HF, 6m, 2m and 70cm in a carry-around size, complete with its own internal battery pack. Now it's been given even more of a boost on receive with the availability of an add-on audio DSP unit from the UK firm of bhi in East Sussex.

For more information on the transceiver itself, take a look at Peter Hart's, G3SJK, technical review of the FT-817, as the present review deals solely with the add-on DSP facility. The FT-817 review was published in the June 2001 *RadCom*, and is also available on the RSGB's members-only website (see 'Websearch' below).

## AN INTEGRAL SOLUTION

The ready-wired NEDSP1061 unit is described as "a fully integral solution for noise reduction for the FT-817". Even though the transceiver itself is small and compact, there is, somehow, a bit of room to squeeze this tiny unit in as well! Fitting completely within the FT-817's case it can be supplied either as a 'fit it yourself' version, or as a dealer-installed unit in a special 'DSP' version of the FT-817. However, before you think about fitting it yourself I would suggest you take a look at the 10-page fitting instructions. The installation involves the removal of small surface mount components as well as drilling the FT-817 top lid. bhi says that this should only be carried out by a qualified engineer, and that they accept no responsibility for the fitting or installation,

nor are they liable for any damage to equipment caused by its fitting. The fitting instructions are available on bhi's website. You've been warned!

## FEATURES

The DSP unit gives four switchable noise reduction levels to the FT-817; Level 1 gives 11dB white noise reduction, level 2 gives 13dB, level 3 gives 19dB and level 4 gives 35dB. Automatic tone reduction is also a built-in feature, reducing the audio level of constant-one heterodynes. This is automatically switched in when the DSP noise reduction is enabled, with level 1 giving 5dB tone reduction, level 2 giving 8dB, level 3 giving 21dB and level 4 giving 65dB reduction.

The PCB itself is a small 37 x 27mm in size, and draws around 45mA from the radio's DC supply. With the FT-817 drawing typically around 450mA on receive, this means the DSP facility adds only a little to the overall battery drain. The top lid of the FT-817's case is used to mount the small control panel for the internal unit. Here, a single push-button is used to switch the DSP filter on or off and to set the filtering level, with an adjacent two-colour (red / green)

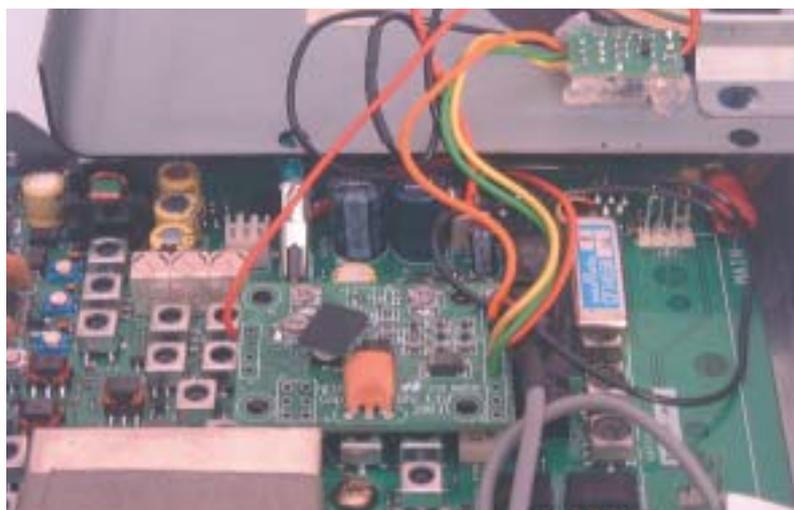
LED giving a visual indication of the DSP on / off state and level setting.

## IN USE

Each time you switch the FT-817 on, the DSP indication LED initially illuminates a constant red to show that the DSP filtering isn't on. The radio also gives a number of short bleeps from its speaker, between one and four, to indicate to you which DSP noise reduction level the unit is currently set to (it remembers the level it was switched to just before the transceiver was last switched off). Briefly pressing the small adjacent button to the LED switches the DSP unit on, with the LED extinguishing to show it's enabled. To change the DSP level, you need to press and hold the button for a second or so. The DSP unit will then switch to the next higher level, indicating this with a number of green LED flashes to show you which level it's now set to, with again a set of bleeps which coincide with the LED flashes. If the button is continuously held it will step through all the levels; you release the button when it reaches the level you want. To switch the DSP off, a short press of the button is all that's needed, the LED then again glowing red to

*Below left: Close-up of control button/LED.*

*Below, right: The bhi DSP unit (centre) installed inside the FT-817.*



show the noise filtering is off.

As well as manual control, there are two 'demonstration modes' available which you can initiate by keeping the DSP button pressed for varying lengths of time when you switch the transceiver on. The first demonstration mode switches on the noise cancellation for one and a half seconds, then off for one and a half seconds. It'll then move on to the next DSP noise reduction level, and continuously repeat this cycle through all four levels. The second demonstration mode sets the DSP filter to level three and switches the DSP on for three seconds, then off for three seconds, repeating this continuously. This can be used to give an idea of how the unit performs in various receive situations.

### ON THE AIR

I've used a number of add-on audio DSP units in the past, but never one that was built into such a versatile transceiver as small as this! Using the FT-817 from home with it connected to my HF antenna system very quickly showed me the DSP system was a worthwhile addition. Using the transceiver in mobile use, and from temporary portable locations with a 'throw it out of the window' HF dipole typically surrounded by TV line time-base noise, fluorescent light interference and the like, showed me it was a *very* worthwhile addition!

I used the FT-817 from several hotel rooms around the UK, as well as portable from locations ranging from inland moors to a couple of ocean-side shipping ports (ie with a good salt-water ground plane but combined with 'noisy' RF locations). In virtually every operation mode and location, I found the DSP filter worked impeccably, always improving the readability of incoming signals to at least some extent. Occasionally, it made otherwise barely readable SSB signals quite understandable. Even on 6m, 2m and 70cm FM, it cleaned up received audio very nicely; I had a quick but pleasant contact through the Hastings 6m repeater using the transceiver in portable mode in Kent with its set-top antenna in what was a very electrically noisy location.

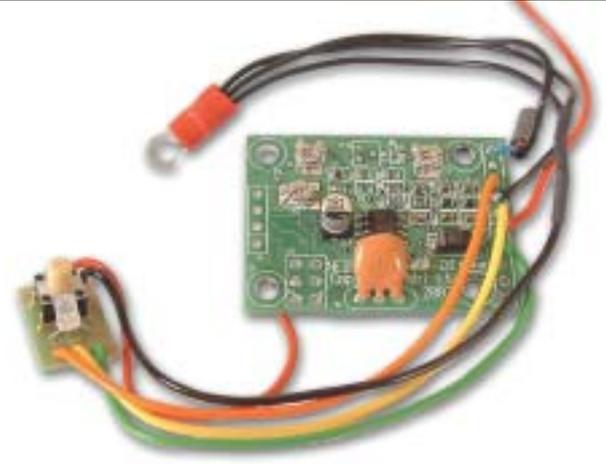
With little or no background receive noise, the DSP filtering had virtually no effect on the received audio quality. As the background noise level increased, with the DSP unit having to 'work harder' as a result, I found the audio was always degraded to some extent, typically with a 'watery' sound. I found I usually couldn't use the highest filtering level, No 4, at all on speech modes if there was more than a moderate level of background noise, as it caused the audio to be severely degraded. But

then, with the DSP switched off, I usually couldn't even tell there was audio there in the first place!

On CW, the filtering worked excellently, with the background noise often virtually disappearing to give 'clean' CW copy; I was most impressed. I only wished there was a DSP audio bandwidth filter included as well to separate multiple close-spaced CW signals. The tone reduction gave a useful, if not 'complete', tone notch on level three, and some, but in my mind not very much, tone reduction on levels one and two. But this is in accordance with the specifications, so I mustn't complain too much!

### CONCLUSIONS

Once I'd used the bhi Noise Reduction module fitted to the FT-817 for a while, I must say that I feel the combination is a winner. Not only on HF, but also on VHF and UHF, the system works well in improving receive signals that little bit more, often making the difference between a very noisy signal and one that's 'readable with little or no difficulty'. It obviously won't get rid of adjacent frequency interference or strong-signal overload problems, that's up to the IF



**The bhi FT-817 DSP module before fitting.**

filters and other performance aspects in your receiver. But when you're using this QRP FT-817 transceiver to communicate with other, typically weak and noisy QRP stations, the bhi add-on DSP filter system could be worth its weight in gold.

Our thanks go to Martin Lynch and Sons for the loan of the bhi DSP-equipped FT-817 for this review. The NEDSP1061 is available from ML&S, Waters & Stanton and Radio World and costs £89.95 plus fitting charge, or you can contact bhi directly on 0870 2407258. ♦

### WEBSEARCH



RadCom FT-817 review:

[www.rsgb.org/membersonly/reviews/ft817/817.pdf](http://www.rsgb.org/membersonly/reviews/ft817/817.pdf)

bhi:

[www.radio.bhinstrumentation.co.uk](http://www.radio.bhinstrumentation.co.uk)

DSP module fitting instructions:

[www.radio.bhinstrumentation.co.uk/html/ft817\\_dsp.html](http://www.radio.bhinstrumentation.co.uk/html/ft817_dsp.html)



**The modified Yaesu FT-817 with the bhi DSP unit installed.**