

# bhi NES 10-2 Noise

Reviewed by Chris Lorek, G4HCL\*

A DSP loudspeaker? Is this just a gimmick, or can it really help to improve the readability of signals? We asked Chris Lorek, G4HCL, to find out . . .



**8**om at night: "Sorry, I'm having problems reading you due to the band noise." 2m on the local repeater: "There's a lot of wind noise in the background of your audio." Wouldn't it be nice if all received signals were 'crystal clear and BBC quality?' (But then, that could take the fun out of it!) However, 'getting through' means everything in a contact: "if you can't hear 'em you can't work 'em" is an old adage in our hobby.

Many top-of-the-range transceivers nowadays offer DSP - Digital Signal Processing - of received signals. I've used a home-built W9GR DSP add-on audio processor for many years now with my FT-990, with great success. I wouldn't be without it when I'm hunting out grey-line DX signals on the low bands. Together with careful tweaks of the IF bandwidth and IF shift it nicely reduces a lot of the background audio 'mush' that my ears would otherwise have to put up with. Another benefit, besides better readability, is an overall reduction in 'user fatigue', ie I don't get anywhere near as tired in trying to listen through the noise all the time.



The UK company of bhi, located in Bexhill on Sea, has come up with a very easy-to-use accessory for doing just this. They've incorporated a full-featured DSP noise reduction circuit entirely within a small external speaker casing. Measuring 110 x 65 x 55mm it's the size of a typical compact extension mobile speaker.

## SETTING UP

TO USE THE NES 10-2 you just connect a DC supply of between 12 and 28V, and plug the speaker's 2m-long audio lead into your receiver's external speaker 3.5mm jack connection. That's it. Suddenly, received audio that was noisy with static crashes, ignition interference and so on becomes transformed into a nice, quiet background.

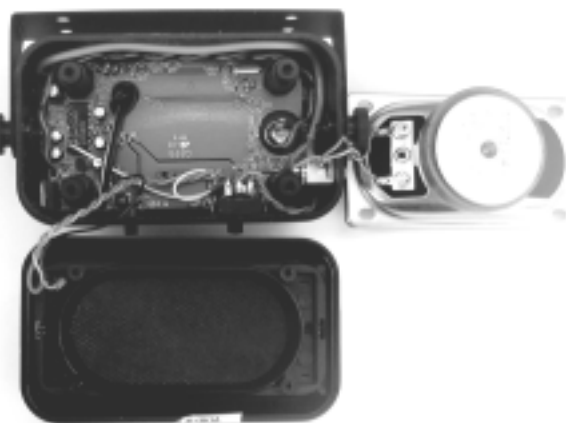
As anyone who's used DSP noise reduction will know, life's not always perfect, and that processed received speech can take on a 'modified' sound. This is because the way DSP works is by looking at 'uncorrelated' signals (ie random noise) and distinguishing this from 'correlated' signals (such as information), reducing the uncorrelated noise whilst keeping hold of the correlated audio. Increasing the actual level of such processing can reduce the level of noise more and more, until you come to the point where the wanted audio is adversely affected. In practice, this has the effect of making the received speech have a gradually increasing unnatural 'hollow' or 'ghostly' effect as the DSP level is also increased.

## ON THE AIR

THE NES 10-2 has eight selectable levels of processing, which you can choose using a number of small DIP switches on

the rear of the speaker case (see **Table 1**). It's supplied pre-set to level '6', which the user instructions say is suitable for most purposes. I experimented with the settings, eventually settling on level '4', ie mid-range, for my own preference for in-shack HF use.

I found that the filter took a short but finite time to adjust itself to the background noise level but, from then on, in virtually all cases the general level of background noise was very nicely reduced. So much so that I found I could often leave my receiver monitoring a given HF net frequency, waiting for a CQ to appear, without having to have the volume turned well down. There's also a 3.5mm



jack socket on the side of the speaker which allows you to plug in a headphone and still get the advantage of the unit's noise reduction, which is useful in the shack as well as when using a mobile headset.

In addition to HF use at home and mobile, I also tested the speaker on VHF and UHF, both SSB and FM, including over 1000 miles-worth of driving around the country and from temporary locations. Once again, on SSB it was almost like having an FM 'squelch', and I found I could continually monitor, say, 144.3 or 433.2MHz with much less strain on my ears. The results on FM were naturally not much clearer from strong, well modulated signals, but it really did clear up audio from the occasional mobile station with a badly-adjusted 'hands free' microphone complete with plenty of background noise.

## CONTROLS

APART FROM THE rear panel DIP switches, the only controls on the speaker are a pre-

| SW1 | SW2 | SW3 | Level |
|-----|-----|-----|-------|
| On  | On  | On  | 1     |
| On  | On  | Off | 2     |
| On  | Off | On  | 3     |
| On  | Off | Off | 4     |
| Off | On  | On  | 5     |
| Off | On  | Off | 6     |
| Off | Off | On  | 7     |
| Off | Off | Off | 8     |

Table 1: The NES 10-2 DIP switch settings.

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# Eliminating Speaker



set volume control and a noise cancellation on / off slider switch. The volume control could more accurately be described as a sensitivity control, because once set, I could then use my receiver's volume control as usual to control the overall volume. The speaker gives up to 2.5W RMS output, quite ample for most purposes. A dual-colour LED behind the speaker grille glows red when the noise suppression is off, and green when on, and this illuminates whenever power was applied.

There's no on / off switch, so you'll need to disconnect the power when you're not

using it unless of course you don't mind the LED being lit all the time. The speaker unit needs a specified 500mA current, I found it drew 76mA with no audio present, so if you use it mobile I'd suggest you wire it to an ignition-switched supply to save long-term battery drain.

## ADD-ONS

OPTIONAL ACCESSORIES include a plug-in mains 12V DC power supply or a fused power plug lead for shack use, and a fused in-vehicle power lead. bhi can also supply a simpler 'fixed level' noise eliminating speaker, the NESCB, which could be perfectly adequate for fixed-channel communications such as FM. Also coming up is the NEIM1031 noise eliminating in-line module, which you can use where an external speaker may not be the best solution.

## OVERALL CONCLUSIONS

AN EXCELLENT, easy-to-use plug-in accessory that can significantly improve your

receiver's audio performance and readability.

The NES 10-2 is currently priced at £99.95 plus P&P, and our thanks go to bhi Ltd, PO Box 136, Bexhill on Sea, East Sussex TN39 3WD for the loan of the unit. Contact bhi on 01293 530147 for further information.

*bhi has kindly offered an NES 10-2 noise elimination speaker as a competition prize for RSGB members. Take a look at the accompanying competition details in this issue to see how you could win one!*



## Win! A bhi NES 10-2 Noise Eliminating Speaker



THE NEW bhi NES Noise Eliminating Speaker is an add-on unit that simply plugs into your receiver or transceiver loudspeaker socket. It can help to improve the readability of signals by using digital signal processing technology to reduce the background noise - be it natural static, mobile wind noises or man-made interference.

You'll have read Chris Lorek's review on pages 38 / 39. Now, thanks to bhi, an NES 10-2 speaker unit could be yours in our free competition exclusive to RSGB members. The NES 10-2 is ideal for the home shack or for mobile use. Enter the competition - it could be you!

## COMPETITION TIME

Look at the three questions below. Write your answers on **a postcard or the back of a sealed envelope** (no letters accepted) and send them to: bhi NES 10-2 Competition, RSGB HQ, Lambda House, Cranborne Road, Potters Bar, Herts EN6 3JE. Don't forget to include your own name and address! The closing date is first post on **Friday 3 January 2003** and the winner will be announced in the February *RadCom*.

### Questions

- How many levels of noise reduction does the bhi NES 10-2 speaker unit incorporate?  
**a) One**                      **b) Four**                      **c) Eight**
- What is the recommended retail price of the bhi NES 10-2?  
**a) £99.95**                      **b) £109.95**                      **c) £119.95**
- Can the bhi NES 10-2 be used on . . .  
**a) FM and SSB only?**    **b) All modes?**                      **c) SSB only?**

### THE SMALL PRINT:

Only one entry per reader (multiple entries will be disqualified). No other correspondence can be entered into. All entries will become the property of the RSGB, please state on your entry if you do not wish to receive further promotional material or offers from the RSGB. Employees of the RSGB are not eligible to enter. The winner will be the first correct entry drawn at random. The draw will take place on 3 January 2003.