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The bhi unit provides up to 35dB of white noise cancellation and up to 65dB of audio tone reduction, with switchable levels in eight stages. For this review, bhi provided the module itself as well as the module fitted into a Yaesu SP-8 speaker.

Unlike the 'in-rig' module which operates on low audio levels, this one is designed to handle a higher input level from an external speaker socket, and has an on-board power amplifier to provide 3 watts of audio output into a 4Ω speaker. The audio in and out connections are pre-wired on to a pair of leads, the power lead also comes pre-wired on to a 2.1mm connector to fit on the rear of your speaker. You'll need to provide a DC supply of 12 - 18V to this, typically either from your rig's 13.8V DC supply or an external supply (bhi can also supply a small plug-top DC supply for this if you need one).

To operate the module, a small front panel keyboard unit consisting of two buttons and a tri-colour LED is used, a front panel label is supplied for you to fit over these. The 40-page user manual gives comprehensive fitting instructions as well as handy drilling templates for you to use.

The module itself can be fitted internally to your speaker in a number of ways. Firstly, the 'quick and simple' way is to use the supplied self-adhesive foam pad, and simply stick the PCB down on to a flat surface inside your speaker. For more permanent mounting, the module has four fixing holes which allows it to be fixed to pillars and again a drilling template is provided for this. Finally, for better heat dissipation as well as good mechanical fixing, the on-board heatsink can be reversed and used as a mounting bracket and fixed on to a metal panel inside your speaker. The heatsink is at 0V DC potential so you'll need to ensure that your speaker cabinet is either isolated or is also at 0V DC potential. Alternatively, if you've not much space available, you can remove the heatsink and mount the module directly on to your speaker chassis using the power semiconductors for fixing - you'll need to add an insulator on the voltage regulator here. Finally, a small circular piezo-electric sounder which is wired to the unit is fixed to an appropriate place within the speaker cabinet using a small piece of the supplied self-adhesive foam, making sure that the small hole in the middle of the sounder isn't covered. As well as 'generic' installation instructions, specific details are also included for mounting into the Yaesu SP8 and Kenwood SP31 speakers, including suggested locations for the power socket and keyboard.

The module PCB measures 37 x 55mm and is supplied with full fixing and wiring kits - all you need to supply are the drills for making the appropriate holes.

# bhi NEDSP1062-KBD

## in-speaker noise reduction module

**The UK firm bhi has achieved a good reputation for its DSP noise reduction unit, available as a self-contained mobile speaker, an external in-line unit, or a small PCB for fitting inside a receiver or transceiver. Because many amateurs use a dedicated external speaker for their shack radio, bhi has now come up with a unit that's specifically designed to be retrofitted into such a speaker. Chris Lorek tries it out.**

### SPECIFICATIONS

Noise and tone reduction parameters provided

#### Four Level

Setting	Noise Reduction	Tone Reduction
1	11dB	5dB
2	15dB	8dB
3	20dB	21dB
4	35dB	65dB

#### Eight Level

Setting	Noise Reduction	Tone Reduction
1	9dB	4dB
2	11dB	5dB
3	13dB	6dB
4	15dB	8dB
5	17dB	16dB
6	20dB	21dB
7	24dB	25dB
8	35dB	65dB

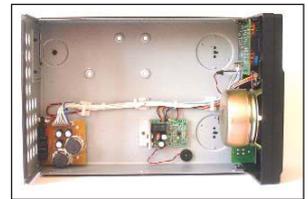
### SETTING UP & OPERATION

Once installed, the module needs just a few of adjustments to set it up. Firstly, you adjust the volume on your receiver to a typical audio level and adjust the input potentiometer control until the 'overload' LED on the module lights, you then back off the control by around a quarter turn. Then set the output potentiometer to a suitable level, and finally hold down the DSP button and adjust the volume of the beeps from the piezo sounder. That's it.

In use, the DSP unit is switched on and off by a press of the left-hand momentary 'Power' button, and in the 'off' position the receiver audio is routed directly to the speaker. The momentary-operation 'DSP' button switches the DSP on and off and sets the level of noise and tone reduction, this cycling through the various levels. Once it reaches the maximum level a further press switches it back to the first level. You can choose between either four or eight selectable levels. To do this, you hold down the DSP button and switch the unit on, and keep the button pressed until the module's piezo sounder emits either four beeps (four levels) or eight beeps (eight levels). With the DSP switched off, the LED glows red on the four level setting and orange for eight levels, reverting to a green display when the DSP is switched on. When you switch between levels, the LED flashes with the number of flashes indicating



Above left: The DSP unit as supplied for in-speaker fitting.



Above right: Here's the unit fitted in a Yaesu SP-8 speaker.



Right: The small DSP operation keypad is fitted to the speaker front panel (bottom, centre).

the level selected, the sounder also beeping the appropriate number of times to give an audible indication.

The performance of the bhi noise and tone reduction system has already been well documented in earlier *RadCom* reviews [1, 2, 3]. The performance was similarly excellent and something I'd certainly recommend for HF and weak signal VHF/UHF SSB use. The module can be fitted into the speaker path of older receivers or transceivers, giving them a new lease of life. I invariably left the DSP switched on, usually set at around level four of the eight-level selection, increasing this as needed in very noisy reception conditions and finding it very useful in picking out signals which were sometimes otherwise unreadable.

### CONCLUSIONS

The module comes with excellent fitting instructions and the on-air performance in improving readability of weak SSB signals or those in noisy conditions was excellent. I already use a bhi unit (how's that for a recommendation!), but if I hadn't already got one this would not have been returned to the supplier - instead I would have bought it for use in my station.

The NEDSP1062-KBD is currently priced at £99.95 and our thanks go to bhi Ltd (tel: 0870 2407258) for the loan of the review units. ♦

### REFERENCES

- [1] 'bhi NES10-2 noise eliminating speaker', by Chris Lorek, G4HCL, *RadCom* December 2002.
- [2] 'bhi DSP noise reduction module for Yaesu FT-817', by Chris Lorek, G4HCL, *RadCom* December 2003.
- [3] 'bhi noise eliminating in-line module and switch box', by Chris Lorek, *RadCom* March 2004.

**WIN a  
bhi NEDSP  
1062-KBD  
See page 61**