
Product Review

bhi NES10-2 MK4 DSP Noise Cancelling Speaker

Reviewed by Mark Wilson, K1RO
k1ro@arrl.org

bhi offers a variety of DSP noise cancelling products. The NES10-2 MK4 is the fourth generation of bhi's compact speaker with active DSP features built-in. At about 2.5 × 4.3 × 2.2 inches (height, width, depth) and weighing about 12 ounces, this speaker could fit in just about any mobile or portable station. The NES10-2 MK4 can be used with the power turned off (no amplification or processing). When the power is turned on but the DSP function is turned off, it's a 5 W amplified speaker. Switch on the DSP filtering and you get adjustable noise reduction and automatic reduction of heterodynes or other tones.

Overview

This speaker is designed to connect to a transceiver's external speaker jack via an attached 6-foot cable with a monaural 3.5-millimeter plug. The manual cautions that headphone or line-level audio-output jacks may



not provide an audio level high enough to drive the NES10-2 MK4. I found that it worked fine when connected to either the external speaker or headphone jack of my transceiver. Maximum input power is 5 W.

Bottom Line

The compact bhi NES10-2 MK4 DSP noise cancelling speaker effectively reduces noise and eliminates tones. It would be a good add-on to most transceivers, especially ones that don't provide these functions.

The NES10-2 MK4 comes with a mounting bracket and requires 10 – 18 V dc at 500 mA. A 5½ foot long, fused power cable is included. The **OFF/ON/DSP** switch on top powers the speaker and engages the DSP function. An **OUTPUT LEVEL ADJUST** control on the top is used to set the speaker volume to be the same with the power on or off. After the initial adjustment, use the transceiver's volume control during normal operation. The rear-panel **FILTER LEVEL** knob provides DSP level adjustment in eight steps (see Figure 10). There's a 3.5-millimeter monaural jack on the side of the speaker that provides headphone-level audio. The internal speaker is muted when headphones are plugged in.

The NES 10-2 MK4 is specified to reduce noise by 8 to 40 dB, and tones by up to 65 dB. There is no provision to perform the functions separately. An LED at the upper right behind the speaker grille glows red with power applied, and green when DSP is active. An LED on the left side flashes red if the audio input is too high.

Using the DSP Speaker

As mentioned in the instructions, there is a delay and audio click when you first power on the speaker. With DSP activated, in many cases there is a slight delay before the DSP starts processing signals and noise cancellation and tone reduction are applied.

With the processing turned off, the audio from the speaker sounded about the same as from the speaker in my transceiver. With the DSP feature engaged, the manual suggests starting with a **FILTER LEVEL** setting of 6 (30 dB of noise reduction). Depending on how you mount the speaker, you may find it difficult to access the **FILTER LEVEL** knob on the rear panel.

As with most adjustable DSP systems I have used, I found that settings in the mid range offered the best compromise between signal quality and noise elimination. There was still quite a bit of noise present at the lower settings. At the higher levels, I could hear more digital artifacts and distortion. The artifacts were most noticeable with no signals present, or during pauses in the other station's transmissions. With a signal present, the artifacts were much weaker. According to bhi, the DSP noise reduction operates by identifying whether or not speech is present in the signal. The filter level adjusts the amount of noise that passes through with the speech components.

The tone reduction capabilities worked well. It took the processor about a second to eliminate a single tone and slightly longer to eliminate two tones. It worked well with multiple tones of the same amplitude or different amplitudes. Because the tone reduction is not



Figure 10 — The bhi NES10-2 MK4 rear panel. The knob in the center is for the eight-step **FILTER LEVEL** adjustment.

instantaneous, the noise reduction feature can be used with CW signals even though tone reduction cannot be turned off separately. Some DSP systems attack a tone quickly enough to suppress desired CW signals.

I didn't experience any RF interference to the speaker while transmitting. The manual includes a section with suggestions on what to do if that happens, including using ferrites on the speaker and power leads or trying a different power supply.

The noise reduction and tone reduction features of the NES10-2 MK4 are similar to those in my transceiver. If you have an older radio with DSP features, or one that does not feature built-in DSP noise and tone reduction, this speaker could make a noticeable improvement in listening comfort.

Manufacturer: bhi Ltd., P.O. Box 318, Burgess Hill, West Sussex RH15 9NR, England; www.bhi-ltd.com. US dealers for bhi products: DX Engineering (www.dxengineering.com) and GigaParts (www.gigaparts.com). Price: \$170.

