

# bhi

Noise Cancellation Products

## PRODUCT SELECTION BOOKLET



Removing unwanted background noise and interference from voice and radio communication channels to leave clear audible speech

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**bhi Ltd design and manufacture a range of DSP noise cancelling products that remove unwanted noise and interference from noisy radio and voice communication channels. Unwanted background noise, white noise, hiss, hash, plasma TV interference, computer hash etc can be removed so that you can hear the speech signal much more clearly, enabling you to listen stress free!**

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**Proudly serving the following markets:**



Amateur



Commercial

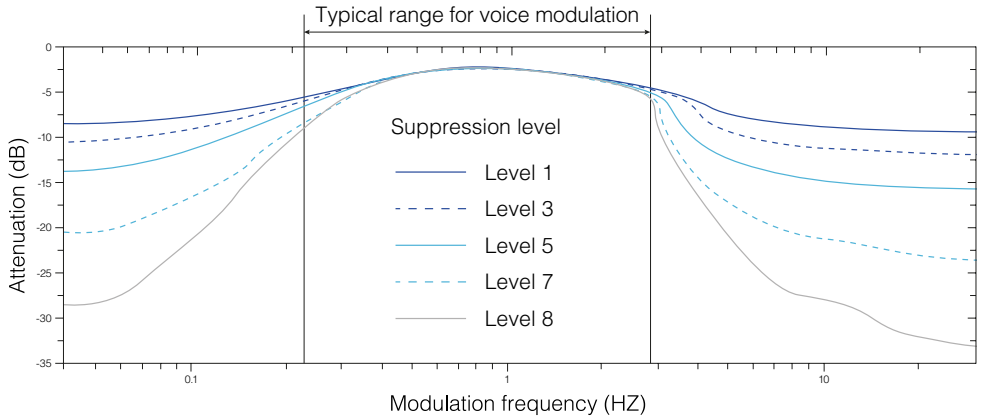


Medical



Military

# How does bhi DSP Noise Cancelling Technology work?



bhi DSP noise cancelling technology operates in the frequency domain and the software algorithm recognises human speech. The system works out whether the received signal has speech or noise characteristics. The typical range of human voice modulation is around 0.6 to 6Hz.

The pass-band of the bhi DSP technology is subdivided into sub-bands, and if the signal has noise characteristics, the noise portion is removed from this sub-band.

The speech then passes through with the noise removed (depending on the filter level setting). If no noise is present the speech remains unchanged (try it with a clear FM signal). A technique called “spectral diffusion” is used to minimise the phenomenon of “musical tones” that you can find with other DSP technologies for most filter settings.

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*There is almost no distortion of the speech signal, even for very low signal-to-noise ratios of 0 dB. The bhi DSP technology is self-adapting to a changing noise environment, and no training of the noise filter is required.*

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Customers can adjust the DSP filter level to suit their own needs and application. When doing this, it does not change the characteristics of the noise, that is, any residual noise still sounds natural.

# bhi DSP Noise Cancellation Product Selection Chart

Use the selection path below to choose your bhi DSP noise cancelling product:

Do you use an extension speaker or headphones?

If yes, go to **[A]**

If no, go to **[B]**

## **[A] - In-line units**

Do you listen to stereo signals or use more than one radio simultaneously?

If yes, select **Compact In-Line** or **Dual In-Line**

If no, select **NEIM1031MKII** or **ANEM MKII** or **NEDSP1062-KBD**

## **[B] - Amplified DSP speakers & internal low level audio DSP modules**

Would you like to retrofit one of our low level audio DSP module inside your radio?

If yes, go to **[C]**

If no, go to **[D]**

## **[C] - Low level audio DSP noise cancelling modules**

1. **NEDSP1061-KBD** - Suitable for many amateur radio transceivers and receiver installations, fitted in the receive audio path. Note: This involves the removal of small SMD components and should only be carried out by someone with the appropriate electronic skills.
2. **NEDSP1061-PCB**, **NEDSP1068-PCBA**, **NEDSP900** commercial install modules suitable for a variety of radio and voice communication applications.

## **[D] - Amplified DSP speakers**

Do you operate mobile?

If yes, select the **NES10-2MK3** or **DSPKR**

If no, select the **DESKTOP**, **NES10-2MK3** or **DSPKR**

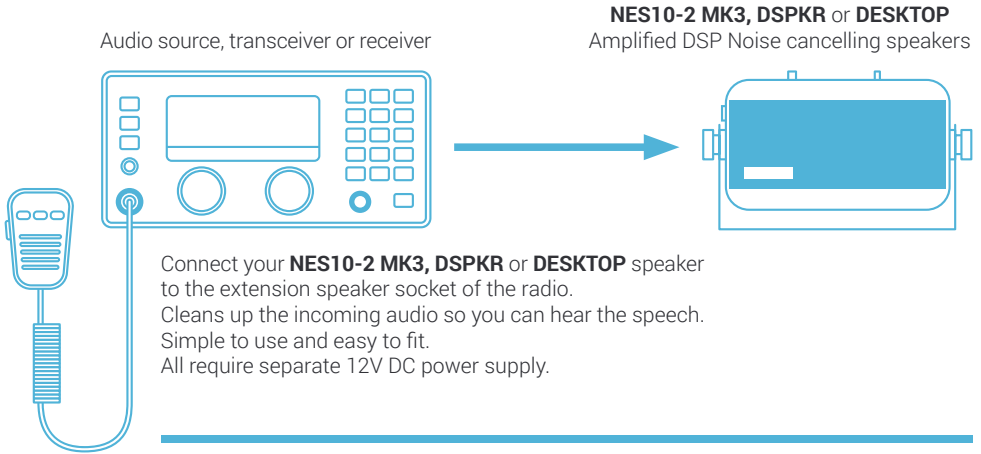
# bhi Product Selection Table



Product Description	Speaker	Head-phone Socket	Speaker Socket	Line Level Audio	Internal Install	DSP Filtering	Audio Power (Watts)
<b>DSPKR</b> DSP Noise Cancelling Speaker	✓	✓		✓		✓	10
<b>NES10-2-MK3</b> DSP Noise Cancelling Speaker	✓	✓				✓	2.5
<b>DESKTOP</b> DSP Noise Cancelling Base Station Speaker	✓	✓		✓		✓	10
<b>NEIM1031MKII</b> Amplified inline DSP Module		✓	✓	✓		✓	3
<b>Dual In-Line</b> Dual channel DSP noise eliminating inline module		✓	✓	✓		✓	7
<b>Compact-In-Line</b> Dual channel DSP noise cancelling module (Portable)		✓	✓	✓		✓	0.2
<b>ANEM</b> Compact inline DSP module		✓	✓	✓		✓	3
<b>NEDSP1061-KBD</b> Low-level audio DSP module				✓	✓	✓	
<b>NEDSP1062-KBD</b> Amplified DSP Speaker Module				✓	✓	✓	
<b>NEDSP900 / NEDSP1061-PCB / NEDSP1068-PCBA</b> Low level audio DSP PCB modules				✓	✓	✓	

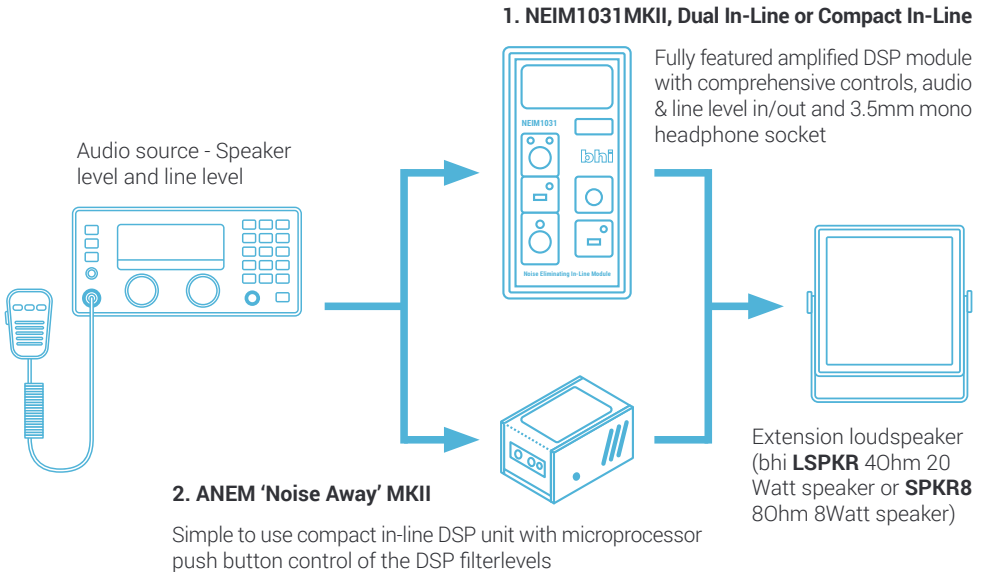
Note: All bhi DSP noise cancelling products are designed to minimise the effects of RF interference.

# External installations



## Using in-line with a loudspeaker or headphones

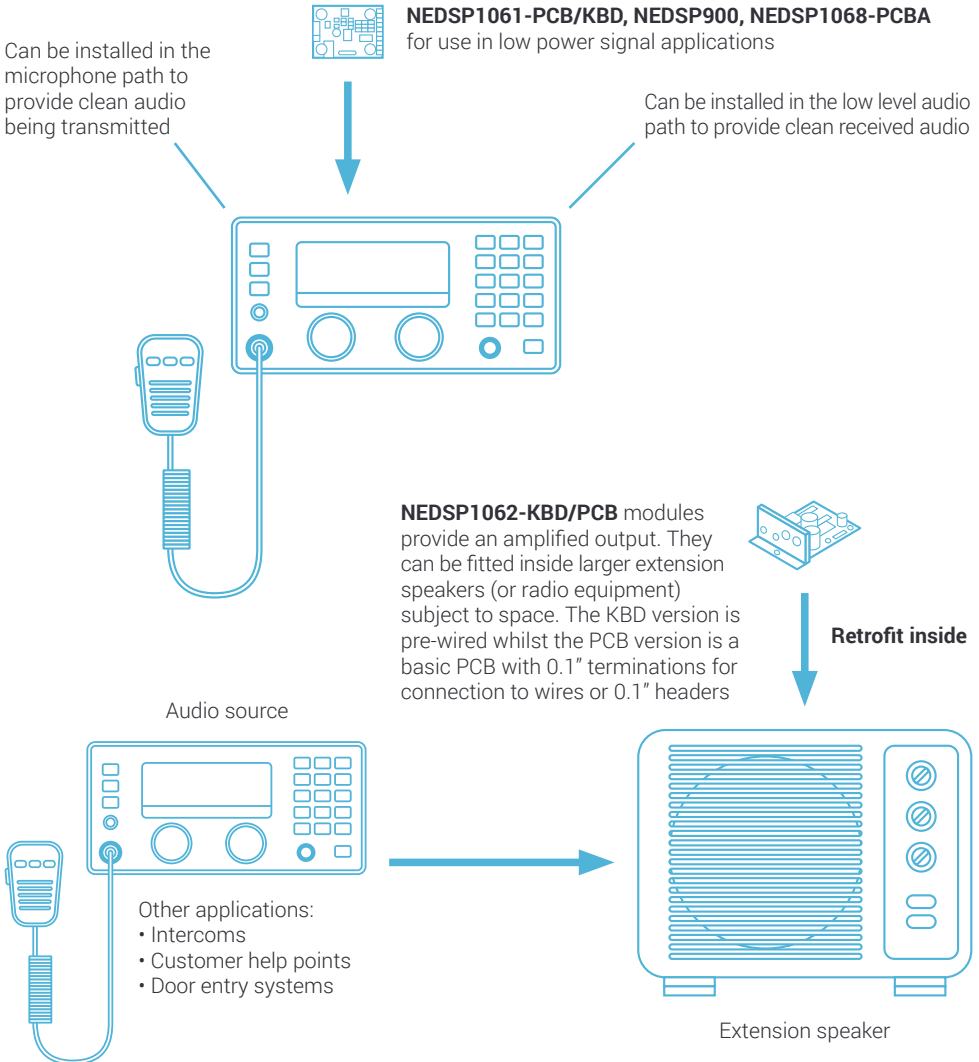
Where an external loudspeaker is being used there are four bhi in-line solutions.



# Internal installations



The **NEDSP1061-KBD** and **NEDSP1062-KBD** are pre-wired modules that are quite easy to install if you know what you are doing. There are also basic DSP modules for use in commercial installations.



# DSP Noise Cancelling Speakers

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bhi's amplified DSP noise cancelling speakers simply connect to the extension speaker socket of your radio or receiver and require a 12V DC power supply to operate them. The DSPKR and DESKTOP speakers have the added feature that they can also operate with a line level input from an SDR radio or computer. Audio leads, fused DC power leads and user manuals are supplied with all products.

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## NES10-2MK3 DSP noise cancelling speaker

- Fully adaptive DSP noise cancelling 9 to 35dB
- Power on/off switch with audio bypass
- 8 noise cancelling filter levels
- 2.5Watts audio - 3.5mm mono headphone socket
- 2m audio lead with integral 3.5mm mono jack plug
- Compact robust speaker housing with metal mounting bracket



[www.bhi-ltd.com/nes10-2mk3](http://www.bhi-ltd.com/nes10-2mk3)

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## DSPKR 10 Watt DSP noise cancelling speaker

- 10Watts audio
- 8 filter levels
- Simple pushbutton control
- Audio input level LED
- Separate volume control
- Filter level scroll and store function
- Sleep mode to conserve battery power
- Adjustable mounting bracket
- 3.5mm mono Headphone socket
- Up to 6Watts input
- Dims: 135(W) x 130(H) x 85 (D)mm, Weight 0.85Kg



[www.bhi-ltd.com/dspkr](http://www.bhi-ltd.com/dspkr)





## DESKTOP 10Watt DSP noise cancelling base station speaker

- Quality 10Watt amplified DSP base station speaker
- 4" bass driver and 1" tweeter
- Works with most radios and receivers including SDR
- Simple to operate with easy to use rotary controls
- Speaker level and line level audio inputs
- Audio input level overload feature
- Noise reduction 9 to 35dB (8 levels)
- Microprocessor controlled functions
- 3.5mm headphone socket (mono or stereo phones)



[www.bhi-ltd.com/desktop](http://www.bhi-ltd.com/desktop)



"I have sometimes been a little sceptical about DSP noise cancellation, but this really does reduce noise very effectively without any annoying and distracting DSP artefacts..."

*RadCom Jan '14 review*

"Unit works great, gets interference out very well. Would not be able operate my amateur radio at home location, I use a Kenwood TS450 HF Transceiver"

*David Digweed VE3FOI*

"An excellent easy-to-use plug-in accessory that can significantly improve your receivers audio performance and readability"

*RadCom magazine review*



*Don't just take our word for it. Listen to the sound files and videos on our website!*

# DSP Noise Cancelling In-line Modules

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bhi's DSP noise cancelling in-line modules are designed to fit between your radio/audio source and speaker/headphones or recording equipment. The NEIM1031MKII and ANEM MKII accept mono signals. The stereo/dual channel Dual In-Line and Compact In-Line modules incorporate our newer improved DSP Noise Cancelling technology, giving improved speech quality at high noise levels. All the bhi in-line units require a separate 12V DC supply and are supplied with audio and power leads, plus a user instruction manual.

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## NEIM1031 MKII

- Fully Adaptive DSP noise cancelling 9 - 35dB
- 8 user selectable noise cancelling levels
- Line level input and output phono sockets
- 3.5mm mono audio input/output sockets
- 3.5mm mono headphone socket
- Separate output volume control
- Noise Cancellation on/off switch
- 12 – 24V DC operation 500mA
- Input level control with overload warning LED



[www.bhi-ltd.com/neim1031](http://www.bhi-ltd.com/neim1031)

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## ANEM MKII

- Compact, Stylish, easy to use in-line module
- Simple microprocessor controlled functions
- Noise reduction 9 – 35dB (8 levels)
- Tone reduction 4 – 65dB
- Power supply 12 – 18V DC (300mA)
- Visual and audio indication of filter level
- Power on/off Audio bypass Switch
- Use with a speaker or headphones
- Velcro strips for chassis mounting
- Standard 3.5mm mono audio connections



[www.bhi-ltd.com/anem](http://www.bhi-ltd.com/anem)



## Compact In-Line

- Compact handheld battery operated DSP noise cancelling module
- New improved stereo/dual channel noise cancelling algorithm
- Processed speech clearer and more intelligible
- Easy to use controls for all functions
- Use with mono, stereo or two separate audio channel inputs
- Ideal for portable use, DXing, and special event stations
- Use with headphones or a speakers
- Over 40 hours battery life
- Power supply 8 -16V DC (350mA max)



[www.bhi-ltd.com/compact](http://www.bhi-ltd.com/compact)

## Dual In-Line

- New improved dual channel DSP noise cancelling algorithm
- Use with mono, stereo or two separate channels
- 8 noise filter levels - 8 to 40dB noise cancellation
- Great flexibility - accepts speaker level and line level audio
- Separate 7Watt mono audio and stereo headphone amplifiers
- Easy to use controls for all functions
- Improved audio quality - processed speech much clearer and intelligible



[www.bhi-ltd.com/dual](http://www.bhi-ltd.com/dual)



“Unbelievable! Noise gone! Other products don’t compare. Your new Dual In-Line allows me to monitor 2 separate frequencies with my receiver as it has 2 VFO’s. Perfection.”  
*Ron Monfeli*



# PCB Modules - Low Level Audio

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bhi's range of internal DSP noise cancelling pcb modules are suitable for retrofitting inside many amateur radio and commercial HF transceivers, receivers and radios. Commercial versions of these modules can be designed into a wide range of voice communication equipment and OEM applications, both in the receive and microphone path.

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## NEDSP1061-KBD

- Pre-wired DSP module for easy installation
- Fully adaptive noise cancelling 9 to 35dB (8 levels)
- Single button operation with LED and audible indication
- Input / output audio level adjustment
- Input overload indication LED
- 5 - 15V DC operation



[www.bhi-ltd.com/nedsp1061-kbd](http://www.bhi-ltd.com/nedsp1061-kbd)

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## NEDSP1061-PCB / NEDSP1068-PCBA

- Low level audio DSP modules for commercial applications
- Fully adaptive noise cancelling 9 to 35dB
- Suitable for OEM applications
- Input and output audio level adjustment
- Input overload indication LED
- 5 - 15V DC operation
- Small size 28mm x 36mm x 12mm
- Fit in Microphone or line level audio path
- 0.1" pitch Connections



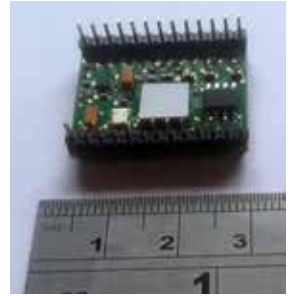
[www.bhi-ltd.com/nedsp1061-pcb](http://www.bhi-ltd.com/nedsp1061-pcb)

[www.bhi-ltd.com/nedsp1068-pcba](http://www.bhi-ltd.com/nedsp1068-pcba)



## NEDSP900

- Dual channel configurable Noise Suppression
- Up to 30dB maximum gain configurable input amplifiers
- Low power consumption (typ <5mA)
- Wide supply voltage range (3 to 20V DC)
- In and outputs RF protected with LC low pass filter
- Up to 40dB noise suppression
- Audio bandwidth 300Hz to 5KHz



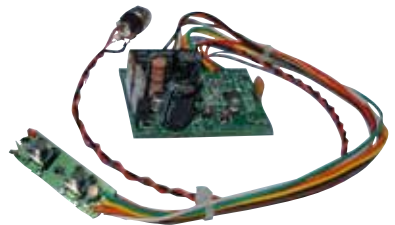
[www.bhi-ltd.com/nedsp900](http://www.bhi-ltd.com/nedsp900)

## PCB Modules - Amplified Audio



### NEDSP1062-KBD speaker retrofit module

- Passive speaker DSP conversion kit
- 8 levels noise cancellation up to 35dB
- Simple to fit pre-wired DSP module
- Virtually no distortion to the speech
- Frequency response 50Hz - 4.3KHz
- Visual and audible indication of DSP level
- Input and Output level controls
- 3 watts output (4 ohms) with audio bypass
- Small size 37 x 50mm
- 12 - 18V DC voltage supply range
- Supplied with fitting kit, labels, fused dc power lead and install instructions
- NEDSP1062-PCB commercial version available with 0.1" connections



[www.bhi-ltd.com/nedsp1062-kbd](http://www.bhi-ltd.com/nedsp1062-kbd)

[www.bhi-ltd.com/nedsp1062-pcb](http://www.bhi-ltd.com/nedsp1062-pcb)

# Noise Cancelling Intercom

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## NEIS-RM25

Noise eliminating intercom system that removes the noise and interference from within noisy environments to leave clear speech. Suitable for use in a wide range of noisy environments where the sounds of fans, motors, engines, air-conditioning, traffic etc give rise to poor voice communications. The voice quality in medical treatment rooms where radiotherapy and CT scanners are installed is greatly improved and the NEIS-RM25 intercom system is suitable for installation with TomoTherapy/ Accuray scanners and most other makes of radiotherapy machines and CT scanners.



The NEIS-RM25 consists of a stylish desktop unit with a “push-to-talk” (ptt) button connected to a remote “hands free” speaker unit via a straight through CAT5 data connection, with connections to a 25ft microphone assembly that is located near the patient for optimum speech quality. Power is supplied by a medical power supply connected to the desk unit.

## Accessories - For use with our main DSP products

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### 1042 Six Way Switch Box

- Connect up to 6 pieces of equipment to connect to your bhi DSP noise cancelling product
- Supplied with 2 ALD-001 3.5mm mono audio plug leads

### Extension speakers

- LSPKR** - A 20W 40hm 4” extension speaker
- SPKR8** - 80hm 8Watt extension speaker

### Two Way Mini Switch Box

- Connect two radios to your bhi DSP noise cancelling product
- Supplied with 2 ALD-001 3.5mm mono audio plug leads

### UK Mains Plug-in DC Power Supplies

- PSU12-1A** - 12V DC unregulated 1A for DSPKR and Dual In-Line (European two pin version PSU12-1A-EU)
- PSU12-2A** - 24 watt 12V DC 2 amp plug-in switch mode power supply for the bhi DESKTOP
- 1030-UKPA** - 12V DC unregulated 500mA for NES10-2MK3, NEIM1031MKII, ANEM MKII, NEDSP1062-KBD and Compact In-line

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View all of our products and accessories at [www.bhi-ltd.com](http://www.bhi-ltd.com)

## To find out more

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### Don't put up with noise and interference any longer

Get in touch with us today if you would like to discuss your noise problems, and we can help you to select the best product to improve the speech quality in your comms system.

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Call us on: **+44(0)1444 870333**

Email: **sales@bhi-ltd.com**

Order online securely at: **www.bhi-ltd.com**

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bhi DSP noise cancelling products clean up  
noisy voice signals to leave clear speech



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