

bhi

Noise **E**liminating **M**arine **S**peaker

NEMS

Operation and Installation Manual



1077-102D Issue A

Important Information.

No user serviceable parts inside. Warranty void if speaker opened.

Prolonged exposure to high sound levels may lead to hearing damage. bhi accept no responsibility to damage to hearing through incorrect operation of this equipment.

Although this product is waterproof it isn't designed to be submerged.

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1. Overview

1.1 bhi

bhi Ltd are specialists in the design, development and manufacture of Digital Signal Processing (DSP) noise cancelling products and other specialist electronics.

1.2 Introduction

The bhi **NEMS Noise Eliminating Marine Speaker** greatly improves the clarity and intelligibility of speech in radio communications. It is suitable for use in many applications where high background noise and interference mean that you cannot clearly hear what is being said. The **NEMS** enables the user to listen and concentrate “**stress-free**”.

The **NEMS** is compact and easy to install. It incorporates DSP technology and is fully adaptive to any change in noise levels and interference, requiring no further adjustment.

When the power is switched off the **NEMS’s** circuitry is disconnected and the speaker behaves as a normal extension speaker.

The speaker mounts like any standard external speaker and is powered by any 12 – 18 V_{dc} unregulated power source. The speaker is fitted with a fused power lead.

The speaker is supplied with a 1.2 metre long audio lead terminated in a 3.5mm mono jack plug.

Note:

This product is designed for speech only, and isn’t suitable for music broadcasts, unless the noise cancellation is switched off.

1.3 Audio DSP Noise cancellation.

The bhi DSP processes the incoming audio signal and then differentiates the speech from the noise. The unwanted noise and interference are then attenuated to leave only the speech.

The following diagrams are taken from actual audio signals and illustrate how the audio signal is being processed.

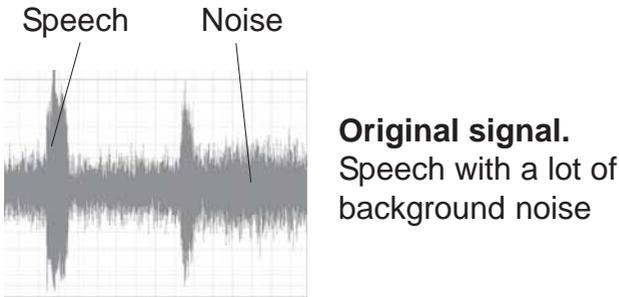


Figure 1. Audio signal before processing.

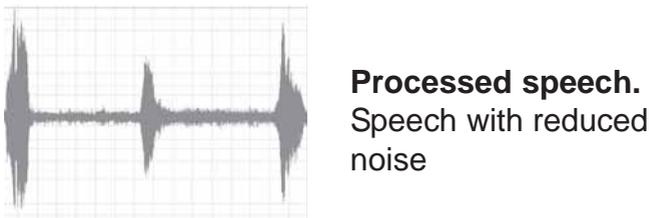


Figure 2. Audio signal after processing.

1.4 Unpacking

Check that the following items are included in the package:

- **NEMS** Speaker complete with mounting bracket.
- Audio lead
- Customer feedback card

Please report any missing items or damage to your supplier as soon as possible.

2. Installation

2.1 Overview

The following diagrams show the main components of the **NEMS** noise cancelling loudspeaker.

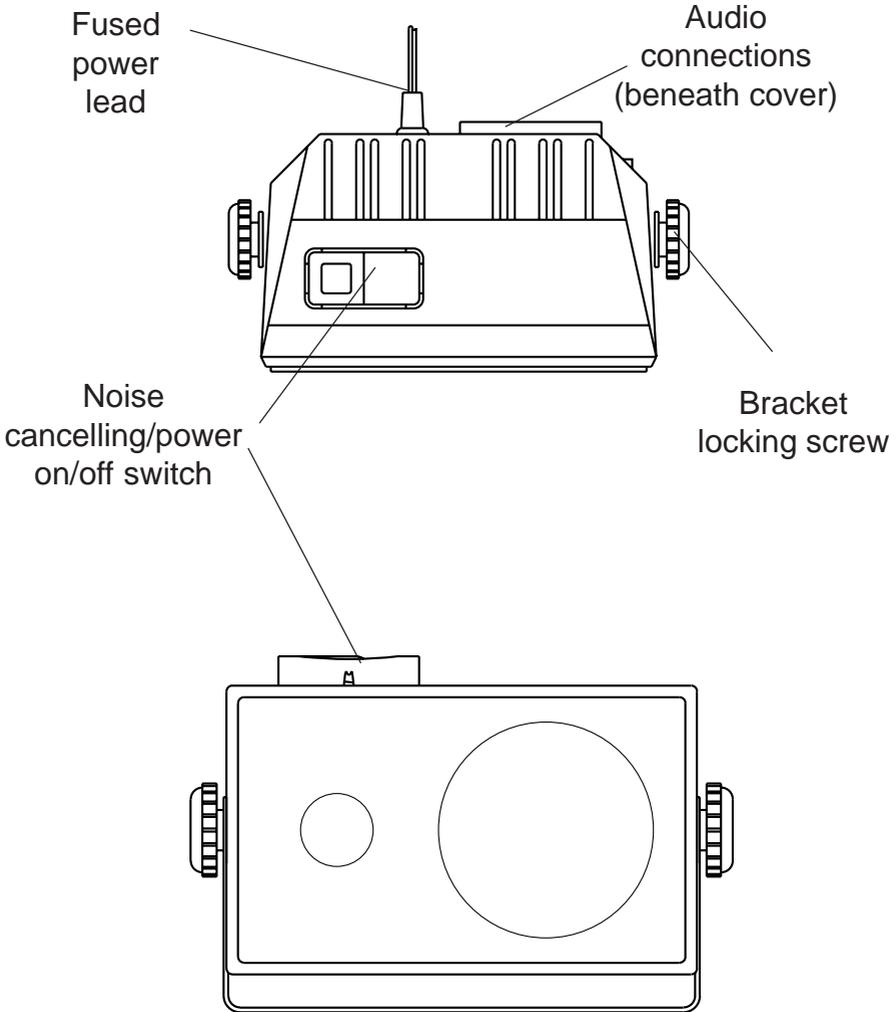


Figure 3. NEMS features.

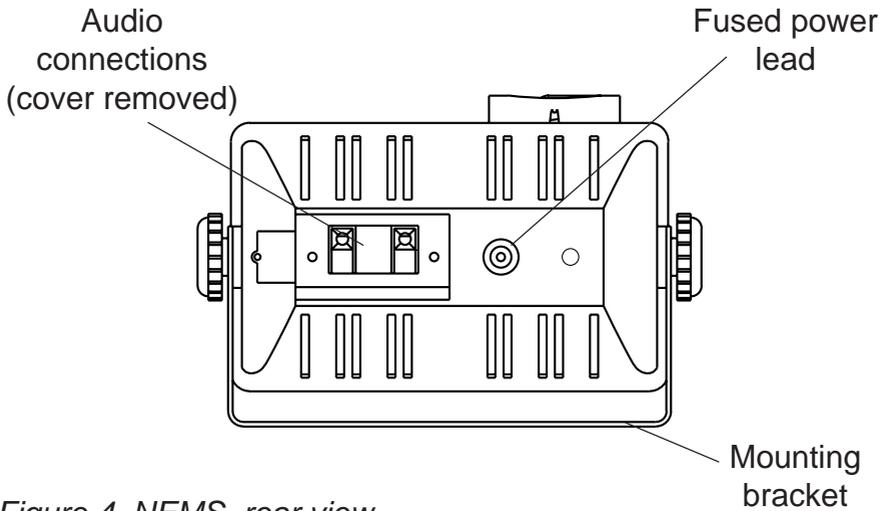


Figure 4. NEMS rear view.

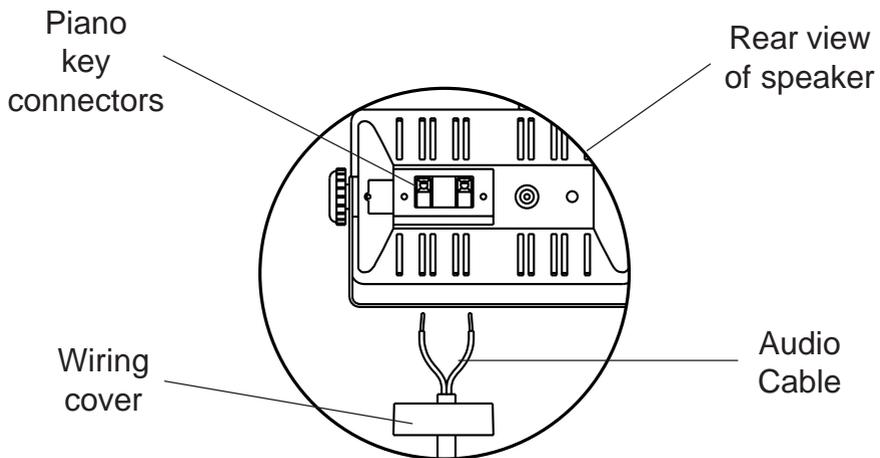
2.2 NEMS mounting

The **NEMS** needs to be mounted so that it can be connected to a 12 - 18V_{dc} power source, and the radio. Locate a suitable rigid position to mount the **NEMS** speaker. The **NEMS** is mounted by holes in the adjustable metal bracket. The bracket swivels to allow the **NEMS** to be adjusted to suit the listener.

Fix the speaker using suitable fixings (not supplied), it may be necessary to remove the bracket to assist installation.

2.3 Audio connection

Before fitting the audio lead, ensure that the radio has a 3.5mm mono extension speaker socket for the **NEMS** to connect to. If the radio has a different connector then an adapter will be require (see your dealer or bhi for more information). The free end of the lead is connected to the **NEMS** as shown in figure 5.



Connect the Red wire to the +Ve Red connector.

Connect the white wire to the -ve Black connector.

Figure 5. Audio connections.

Remove the audio connector cover from the rear of the speaker. Insert the audio cable through the hole in the cover. The piano key connectors are opened by pressing the bottom of the coloured lever. Insert the wires into the correct speaker connection as shown in the above diagram. Ensure that the blade of the connector is clamping the exposed strands of the wire and not the insulation. Push the cover over the connections.

Run the audio cable to the radio. Ensure the radio is switched off and connect the 3.5mm mono jack plug to the socket marked extension speaker (using any adapter if required).

2.4 Power connection

The **NEMS** is fitted with a fused power lead. The **NEMS** requires 12 - 18V_{dc} to operate. If the supply voltage is higher than this it will be necessary to use a power adapter (not supplied), to convert the voltage to within these limits.

The cable with the white stripe is the positive lead. Connect the cable to the power supply. If the power lead is shortened ensure the fuse holder is still connected.

Note:

If any of the cables pass through walls, bulkheads etc. ensure that they adequately protected from damage. Also ensure the wires are properly secured and do not present a trip hazard.

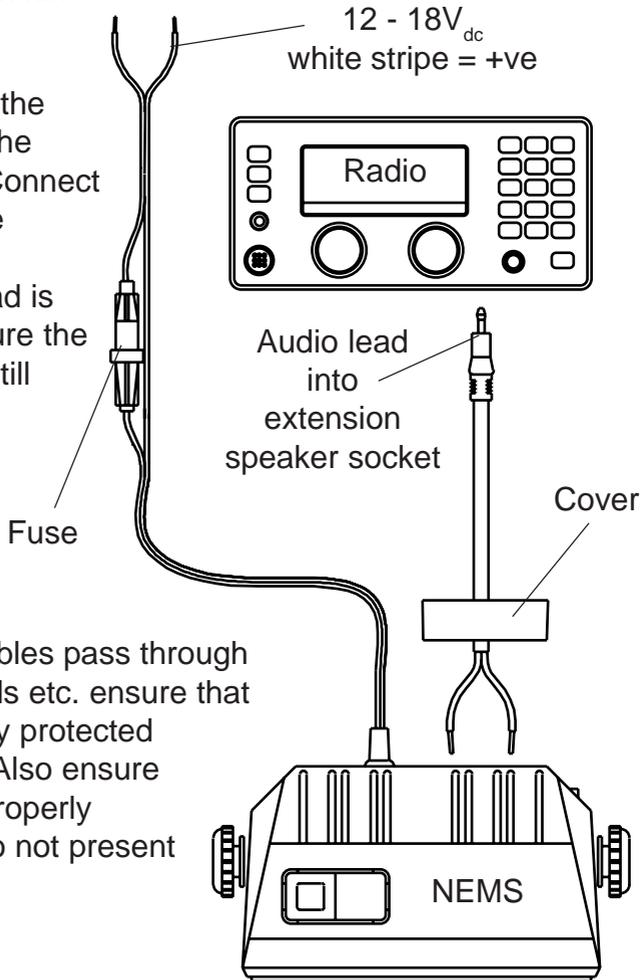


Figure 6. Connection overview.

3. Operation

3.1 Operation

The **NEMS** speaker provides noise cancellation when power is applied to the speaker and it is switched on. Removing the power, or switching the **NEMS** off will remove the noise cancellation and the speaker circuitry will be bypassed. In this mode the speaker acts as a normal extension speaker.

To check the operation tune the radio into a band where there is a lot of background noise (turn the squelch off). Turn on the **NEMS**, the red led will illuminate in the switch.

The level of noise will drop after a short delay as the DSP adapts to the noise present on the audio signal. Turn the switch off and the noise will return.

If the **NEMS** doesn't operate as expected the please turn to section 5 - troubleshooting.

Note:

If a slight pop is heard when the speaker is switched on this is nothing to worry about and is normal.

There is no need to turn the noise cancelling off if the noise levels reduce, as the DSP is fully adaptive and will learn the new noise conditions, and will not interfere with the audio signal.

3.2 Remote operation.

If the **NEMS** on/off switch is inaccessible due to the chosen mounting position it is possible to install another switch in the power line. Leave the **NEMS** power switch on, and control the power and noise cancellation with this new switch.

4. Specifications

4.1 ELECTRICAL CHARACTERISTICS

($V_s=16V$, $T_{amb}=25^{\circ}C$ unless otherwise stated)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_s	Supply voltage		12	16	18	V
P_o	Output power	$d = 10\%$ $f = 1\text{KHz}$	12V 1.7	16V	18V 3.17	V_s W
B	Frequency response (-3dB)	$P_o = 1W$ $R_L = 8\Omega$	50		4300	Hz
d	Distortion	$f = 1\text{KHz}$ $P_o = 0.2 - 2.4W$		0.8		%
R_i	Input resistance		21	22	23	W
T_s	System delay			26		mS
	Noise reduction			20		dB
	Tone reduction			21		dB

5. Troubleshooting

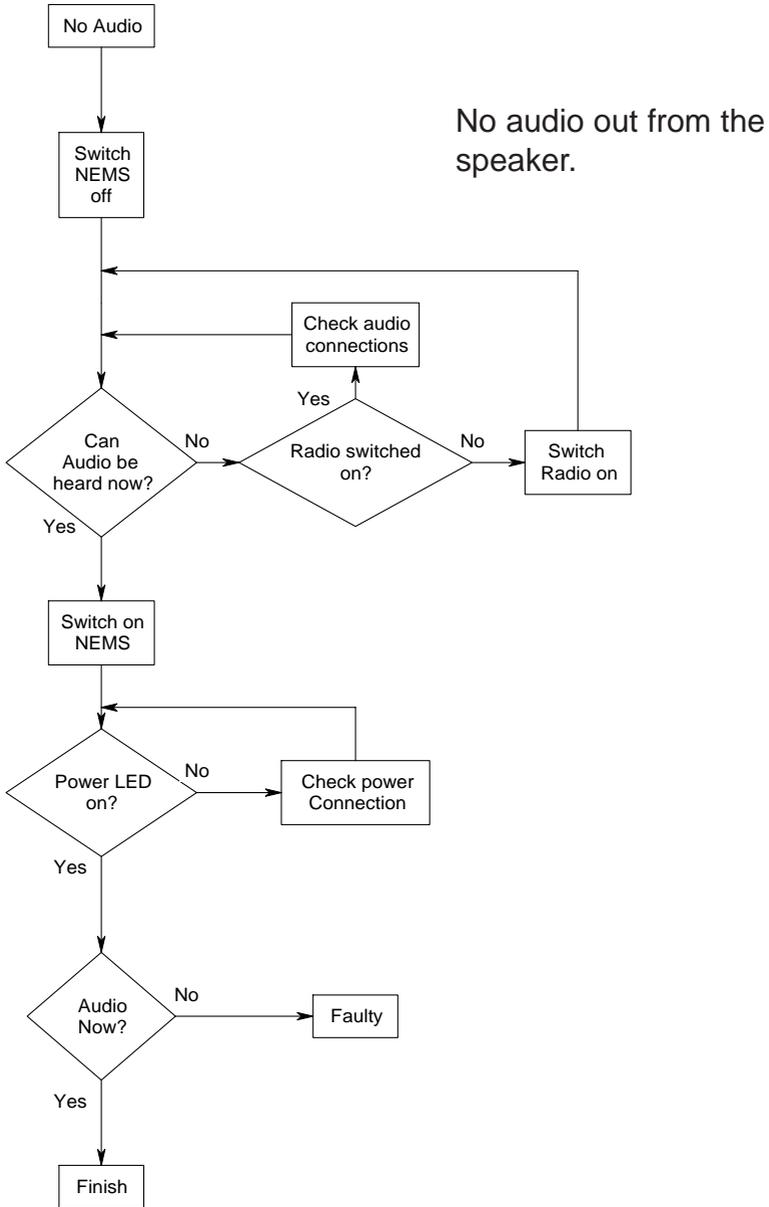


Figure 7. Fault finding chart.

6. Other products

Other noise cancellation products from bhi. Visit www.bhi-ltd.co.uk for more information.

6.1 NES10-2 MKII Noise Eliminating speaker.

DSP noise cancellation built into a compact speaker unit. The unit provides an easy to install solution noise reduction



Features:

- Fully adaptive noise cancellation 9 -35dB
- 8 user selectable noise cancellation levels
- Mono earpiece socket
- Input sensitivity control
- Noise cancellation On/Off switch
- LED indication of power and noise cancellation
- 12-24VDC operation
- On/Off audio bypass switch.
- Greatly improved signal to noise ratio
- Easy to install with adjustable mounting bracket
- 2m audio lead
- Optional extras available.

6.2 NES5 Noise Eliminating speaker.



Basic plug and go noise cancelling speaker preset to 20dB of noise reduction.

Features:

- Fully adaptive noise cancellation 20dB
- 12-24VDC operation
- Compact robust speaker unit.
- Greatly improved signal to noise ratio
- Easy to install with adjustable mounting bracket
- 2m audio lead

6.3 NEIM1031 In-line module.

Then **NEIM1031** provides a flexible solution to noise reduction. It features both amplified inputs and outputs, along with line level signal processing. The unit also features an audio bypass when the unit is switched off, so there is no need to disconnect when not in use.



Features:

- Fully adaptive noise cancellation 9 -35dB
- 8 user selectable noise cancellation levels
- Mono earpiece socket
- Input sensitivity control
- Noise cancellation On/Off switch
- Line level in/out
- Input overload indication
- Power on/off with audio bypass.

6.4 NEIM1031 accessories.



LSPKR

20 Watt extension speaker for use with the NEIM1031. Fitted with a 3.5mm mono jack plug.



1031-STAND

Clear Acrylic stand to mount the NEIM1031. The NEIM1031 can be used horizontally or vertically



6.5 DSP modules.

DSP module range.

NEDSP1061-PCB:

Low signal level module

NEDSP1061-KBD:

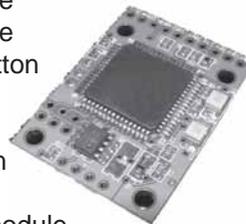
Low signal level module controlled by single button keyboard.

NEDSP1062 - KBD:

Amplified DSP module controlled by a 2 button keyboard.

NEDSP1062 - PCB:

Basic amplified DSP module



6.6 Switch Box

Order code: 1042 Switch Box

Need to Connect more than one piece of equipment to your bhi Noise Eliminating Speaker or module?



6.7 Adapters and power supplies

Power adapters:

1030-UKPA 12V DC UK power adapter

1030-EUPA 12 VDC European adapter

1030-VEPL Fused vehicle power adapter

Audio leads:

ALD-001 1.2m 3.5mm - 3.5mm mono lead

ALD-002 2.5m 3.5mm - 3.5mm mono lead

ALD-003 phono -phono plug

ALD-004 3.5mm stereo plug - phono plug

ALD-005 3.5mm mono plug - phono plug

Audio adapters:

ADP-P001 6.35mm plug - 3.5mm mono socket

ADP-P002 6.35mm plug - 3.5mm mono socket

ADP-P003 3.5mm stereo plug - 3.5mm mono socket

ADP-P004 Phono plug - 3.5mm mono socket

ADP-P005 2.5mm mono plug - 3.5mm mono socket

ADP-P006 2.5mm stereo plug - 3.5mm mono socket

ADP-P007 6.35mm stereo plug - 3.5mm stereo socket

ADP-P008 3.5mm stereo - aircraft adapter

ADP-S001 3.5mm mono socket - 3.5mm mono plug

ADP-S002 6.35mm socket - 3.5mm mono plug

ADP-S003 6.35mm stereo socket - 3.5mm mono plug

ADP-S004 2.5mm stereo socket - 3.5mm mono plug

ADP-S005 2.5mm mono socket - 3.5mm mono plug

6.8 Other products.

NCH Noise Cancelling Headphones



These headphones feed an inverted copy of the ambient noise to cancel it out. The headphones effectively remove noise such as blower noise, ambient noise, jet engine noise or music from another room.

The headphones are supplied with an aircraft adapter, so you can now listen to the film, or CD player without all the jet engine noise. Also supplied with carry bag.



BBRP Banner Badge



Get the message across

Easy to program using push buttons on back: no cords, no wires, no software needed. Enter your message and watch it scroll across.



Applications

- ID badge
- Club badge
- Restaurants
- Receptions
- Gifts
- Stag and Hen nights
- DJs
- etc...

What will yours say?

Notes:

Notes:



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