DSPKR

10 Watt Amplified DSP noise cancelling Speaker

User Manual Issue E

bhi Ltd

DSP noise cancellation products for radio and voice communications

Important Information:

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DSPKR 10 Watt RMS Amplified DSP noise cancelling Speaker

1. **Packing List** - The DSPKR is shipped with the following:

- DSPKR noise cancelling speaker
- Integral black audio lead with 3.5mm mono plug attached.
- Speaker mounting bracket
- Fused DC power lead 1030-FPL (Red cable +ve, Black/red cable –ve)
- Mounting screws
- Operating manual & customer feedback card

2. **Introduction**

The bhi **DSPKR** amplified DSP noise cancelling speaker greatly improves the clarity and intelligibility of speech in radio and voice communication systems. 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 speaker will enable the user to listen and concentrate "**stress-free**". Suitable applications where the speakers will be of great benefit are: Amateur radio, CB radio, two-way radio, HF radio, marine communications, scanners, taxi base stations and especially mobile installations. The speaker incorporates unique DSP technology to remove unwanted background noise and interference from speech and has up to 7 DSP filter levels allowing the user to optimise for their level of noise and interference. The speaker simply connects into the extension speaker socket or headphone socket of your audio equipment.
The **DSPKR** comprises a wide frequency range 4" speaker and an audio amplifier capable of producing up to 10-Watts RMS audio power, with built in bhi DSP noise cancelling technology. The unit also has a sleep mode, and requires an audio input signal of between 80 and 500mV level and a DC supply of between 10 and 16 Volts (2A). The unit is supplied with an attached black 2 metre audio cable with a moulded 3.5mm jack plug for the audio input, and a 1030-FPL 2.1mm fused DC power lead with bare ends. A 3.5mm mono auxiliary output socket is provided to allow the speaker to be used with headphones or to drive another loudspeaker. A 12V DC power supply **PSU12-1A** is available as an optional extra for UK customers, and the **PSU12-1A-EU** for European customers.

Note: The **DSPKR** is designed for speech signals and is not really suitable for music.

3. **Installation**

The speaker comes with a mounting bracket that enables the speaker to be used free-standing on a desk or secured into vehicles using the self tapping screws provided.
When installing, ensure that adequate access can be gained to allow operation of the Function button. Furthermore, when installing in vehicles, ensure that the unit is not in direct sunlight or in a hot area.

Make sure that the 3.5mm plug lead and fused DC power lead are routed away from sources of electronic interference or RF cables.

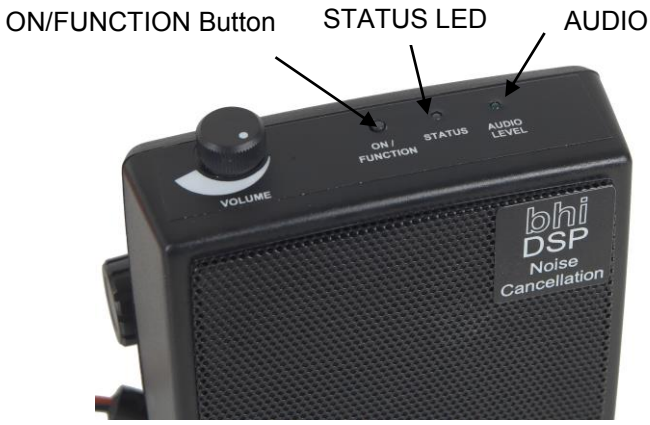
For best results try to use a separate power supply to power the speaker, and in a vehicle, power directly from the vehicle battery as this will minimise the chance of alternator whine and other electronic interference occurring.

4. Operation

Once installed and connected to the required audio source, apply power to both the audio source and the speaker. When power is applied to the speaker, the indicators will step through in sequence and the speaker will emit a low tone and the two high tones.

5. Audio Level setting

An AUDIO LEVEL LED indicates the audio input level that is being received from your audio source. Once the correct audio level has been set on your audio source, the volume control on the DSPKR is used to adjust the volume to suit your conditions.
To set the audio level, turn your source volume control down to zero (the DSPKR volume can also be set low or zero). Slowly increase the source volume until the AUDIO LEVEL LED lights. The optimum input level is when the LED is on continuously most of the time, but if this is not achievable the unit should still function correctly as long as there are some flashes of green AUDIO LEVEL LED. If the AUDIO LEVEL LED flashes rapidly, it indicates that audio input level is too high and audio distortion may occur. Reduce the source volume until the rapid flashing virtually stops.



6. ON/Noise Cancellation

The DSPKR STATUS LED will show Red to indicate that noise cancelling is off. When the FUNCTION button is pressed momentarily, the unit will step through the noise cancelling levels and the STATUS LED will be Orange. Each time the FUNCTION button is pressed the speaker will beep a number of times corresponding with the filter level, and the STATUS LED will also flash, starting with one beep and flash for filter level one, ending with 7 beeps and 7 led flashes for level 7. A double tone will be heard when the button is next pressed and the LED will turn red again. Subsequent button presses will cause the speaker to cycle back through the 7 filter levels again. Use this feature to select and store your desired filter level (**6.1**) to suit your listening conditions (If the speaker volume is too high it may be difficult to hear the beeps). If the speaker is switched off at this stage it will go back to DSP filter off and the STATUS LED will be red.

Filter level table

Noise Cancelling	STATE Indicator	Tone Reduction (dB)	White Noise Reduction (dB)
OFF	Red	None	None
1	Orange	4	9
2	Orange	5	11
3	Orange	6	13
4	Orange	8	15
5	Orange	16	17
6	Orange	21	20
7	Orange	25	24

6.1. Storing and un-storing a selected level of noise cancelling

Once a suitable filter level has been selected, press and hold the FUNCTION button for a few seconds to store the selection. The unit will respond with a single tone beep and the STATUS LED will turn green. Further presses of the FUNCTION button will now cause the unit to cycle between noise cancelling "off" (STATUS LED red) and noise cancelling "on" at the saved level (STATUS LED – green). To un-store the saved level, press and hold the FUNCTION button again until the unit emits a tone. The STATUS indicator will change back to red and the unit can now cycle through the various levels of noise cancellation again. If the speaker is switched off at this stage, it will remember the last stored setting but with noise cancellation off (red LED) when switched back on.
Note: It is advisable not to drive a vehicle and change the filter level at the same time, and higher levels of noise cancellation will remove a lot of noise, but the user will note that the audio can be slightly distorted if high levels of noise are present with the signal. Switching off the noise cancellation will restore the audio. If there is a lot of noise present you may need to increase the output volume when listening with the noise cancellation switched on, once the noise has been removed. If the volume is increased and the noise cancellation is then switched off, the resulting unprocessed signal will be at a higher level. Care must be taken to avoid excessive signal levels to avoid possible damage to your hearing or equipment. bhi Ltd does not accept responsibility for damage to equipment or hearing however caused.

7. Sleep mode

The DSPKR has a sleep mode to save energy when not in use. In this mode the speaker is put to sleep by: 1. Pressing and holding the FUNCTION button for approximately 6 seconds. You will hear a single beep after a few seconds, then after approximately six seconds three beeps descending in frequency. Releasing the button after this will leave the speaker in sleep mode, or 2. Auto sleep is enabled (comes as standard, see **7.1**). In sleep mode the unit consumes very little current (3mA) and the STATUS indicator flashes red approximately every 15 seconds to show that it is still powered but in sleep mode.

7.1. Auto sleep function

The Auto sleep feature means that if the unit fails to see any audio above the minimum required level for more than 60 minutes, it will automatically go into Sleep mode. The Auto Sleep feature can be can be turned on or off at power-up by pressing and holding the FUNCTION button whilst turning the power on. After approximately 10 seconds a set of two, three tone beeps ascending in frequency indicate that the Auto Sleep feature is disabled, and a set of two, three tone beeps descending in frequency will indicate that Auto Sleep feature is enabled. After releasing the button you will hear a single beep, then a set of three beeps and the STATUS LED will be red indicating the unit is ready for use. The unit wakes up if the signal level increases above the minimum required level or if the FUNCTION button is pressed once. Three beeps ascending in frequency will be heard and the audio will be restored to the last known setting.
When the Auto sleep is disabled, the speaker is always on and will not go to sleep if no signal is present. The speaker can still put to sleep manually as in **7.** Above.

7.2. Waking the speaker up

The DSPKR will wake up if the signal level increases above the minimum required level or if the FUNCTION button is pressed once. Three beeps ascending in frequency will be heard and the audio will be restored to the last known setting.

8. Specifications

DC Power

DC input voltage	10 to 16 Volts DC.
Current	2 Amps maximum
Protection	Over current and reverse polarity protected

Audio Input

Impedance	Terminated with approximately 8 Ohm load
Minimum input level	80 to 500 mV (for correct working levels)
Maximum	6 Watts (maximum withstand)

Audio output

Impedance	Internal Speaker 8 Ohms (Nominal)
External speaker/phones	4 Ohms (minimum)
Level	10 Watts nominal (with 12V DC. supply)
Controls	On/function button
	Speaker volume control
Indications	Power ON/ FUNCTION
	AUDIO LEVEL
Connections	2.1mm DC power jack
	3.5 mm mono, external speaker/headset socket
	Integral 2M long 3.5mm mono jack plug lead (audio input)

9. Troubleshooting/FAQs

Speaker doesn't work at all, no sound from the speaker:

- Check that the power connector on your power supply is suitable for the power socket on the speaker (2.1mm, centre positive). Check the fuse. Check connections to your power supply.
- Check that you have switched your radio communication equipment on and that you have a signal for the speaker to process. To verify this, remove the audio connector from the external speaker socket on your equipment.
- Check that the AUDIO LEVEL LED is illuminating green.

The green input overload LED doesn't illuminate or only seems to come on when the speaker is very loud, or doesn't appear to operate properly:

- The factory default input overload LED setting is calibrated so that the audio input level to the speaker is correct. This factory setting can be restored by the following procedure: 1. Ensure **NOTHING** is connected to the audio input of the DSPKR. 2. Hold FUNCTION button down. 3. While still holding the button down, apply power to the DSPKR. (Don't let go of the button). 4. Keep the button held down for the full 30 seconds until you hear chimes an beeps. 5. Release the button.

The speaker works but the noise cancellation doesn't appear to improve the audio quality of the signal:

- Check the filter is switched on and increase the level to see if this makes any difference.
- Check that the AUDIO LEVEL LED is illuminating green.

The volume from the speaker is low and cannot be increased:

- The speaker is designed to work with external speaker sockets of radio communications equipment, and although it will work with some earphone and headphone sockets, there may be occasions where the signal output from these is not enough for the speaker electronics to process the signal effectively. bhi have another product that will work with these levels of signal, the NEIM1031MKII (DSP Noise Eliminating In-line Module). Please contact bhi for more information.

Sometimes there is a short delay before the noise cancellation is active:

- This is due to the time the DSP takes to start processing the signals. This gives you the opportunity to check that the DSP is not taking out any detail from the signal.

Sometimes I can hear a processing sound in the speaker when no signal is present:

- This is normal and is caused by the DSP processor. When a signal is applied you should not be able to hear this in the speaker.

I can hear noises/speech in the speaker when I transmit:

- The DPSKR has been specifically designed to minimise against the effects of stray RF. If you do hear noises in the speaker, this is probably due to high levels of RF being present in the vicinity. Carry out the standard checks necessary to minimise this. 1. Make sure that the 3.5mm black audio lead and the red/black fused DC power lead are routed away from sources of electronic interference or RF cables. 2. Try using a separate DC power supply for the DSPKR. 3. Reduce the volume on your radio in steps and then increase the volume on the DSPKR to compensate (as long as the input LED still flashes green the input level is ok) until the RF disappears. 4. Fit ferrites to the leads at outlined on the bhi website FAQ page (http://www.bhi-ltd.com/index.php/support/faq.html).

10. bhi support

Every DSPKR noise eliminating speaker comes with a 12 month guarantee against defective materials and workmanship. If you do have a problem then please refer to the troubleshooting guide (section 9). If you have not resolved your problem then please contact us. Before you make your call please have the following information to hand:

1. Your serial number (found on the back of the unit).
2. Details of when and where you purchased the unit.

See our website for FAQs for answers to other common questions; otherwise most queries can be resolved over the telephone or via email. If not we will arrange with you to have your unit sent back to us for analysis, repair or replacement (if within 12 months from date of purchase, if outside the guarantee period an estimate of the cost of repair will be given).

For contact details please refer to the back cover of this manual. If you have any suggestions for improvements please complete and return the customer feedback form.

Note: Opening the case will void any warranty unless agreed beforehand by bhi Ltd.
No user serviceable parts inside.

Weee Statement for correct disposal of this product

(Applicable in the European Union and other European countries with separate collection systems). This marking shown on the product or its literature, indicates that it should not be disposed of with other household wastes at the end of its working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate this from other types of wastes and recycle it responsibly to promote the sustainable reuse of material resources.
Household users should contact either the retailer where they purchased this product, or their local government office, for details of where and how they can take this item for environmentally safe recycling. Business users should contact their supplier and check the terms and conditions of the purchase contract. This product should not be mixed with other commercial wastes for dis

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