

# freedom™ **Hybrid™**

## User Guide

for the Freedom™ Hybrid™ Sound Processor with BTE,  
Mini BTE and Bodyworn Wearing Options



Hear now. And always



**Cochlear™**

## Symbols



Note  
Important information or advice.  
Can save inconvenience.

---



Tip  
Time saving hint or saves inconvenience.

---



Caution (no harm)  
Special care to be taken to ensure safety and effectiveness.  
Could cause damage to equipment.

---



Warning (harmful)  
Potential safety hazards and serious adverse reactions.  
Could cause harm to person.

---

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# Introduction

## Purpose of this guide

This user guide provides detailed step-by-step instructions on how to use, maintain and troubleshoot your Freedom™ Hybrid™ Sound Processor.

If you are new to your processor it is recommended that you read the Freedom Hybrid Quick Start guide before reading this guide. The Quick Start guide will provide you with the essential information you need to familiarise yourself with the basic operations of your processor.

Once you understand the basic functions of your processor, this guide provides more in-depth information that's outside the scope of the Quick Start guide – particularly in the areas of advanced user operations, maintenance and troubleshooting.

This guide provides the most comprehensive source of information available for your processor.

## Overview

Your processor enables the combination of electrical and acoustic hearing in a single Behind The Ear (BTE) processor.

The processor is suitable for recipients who have residual levels of low frequency hearing. It is used together with a Nucleus® Hybrid Implant, Nucleus Freedom Implant or a Nucleus 24 Implant, (specifically the CI24R and CI24M models) to transmit sound to the cochlea.

Your processor consists of the Processing Unit, coil, Freedom Hybrid Acoustic Component and a choice of three wearing options.

The BTE Controller allows your processor to be worn behind the ear as a BTE Processor. It is powered by three 675 disposable batteries or the BTE rechargeable battery.

The Mini BTE Controller also allows your processor to be worn behind the ear as a BTE Processor. It is powered by two 675 disposable batteries.

The Bodyworn Controller is worn on the body. It uses either two AAA nickel/metal-hydride (NiMH) batteries, or disposable alkaline batteries.

The three wearing options can be used interchangeably with the same Processing Unit.



For details on warnings and precautions, refer to the Important Information booklet included in the documentation you received with your processor.

# Overview of your processor components

This section of the guide describes the component parts of your processor.

## How your processor works

Sound can be received in four ways by your processor from:

- The microphone
- The in-built telecoil
- An accessory
- A mix of microphone sound and sound from the in-built telecoil or an accessory

Sound is then processed in the following way to produce hearing:

1. The sound is coded by the Processing Unit and transmitted through the coil to the cochlear implant.
2. The low-frequency sound is transmitted through the Acoustic Component directly into the ear through the earpiece.
3. The implant's electrodes stimulate the cochlea's hearing nerve fibres, which relay the signals to the brain to produce hearing sensations.

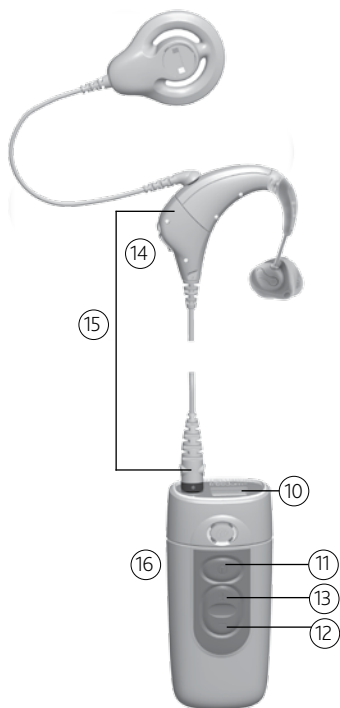
Your processor has been programmed for use with your implant only. It is important to only use your own processor, to never swap yours with another person, and if you have two implants, to correctly match your processor to the correct implant.



BTE wearing option



Mini BTE wearing option



Bodyworn wearing option

- 1 Coil
- 2 Magnet
- 3 Processing Unit
- 4 Acoustic Component
- 5 Acoustic Component Earhook
- 6 Acoustic Component Cable
- 7 Acoustic Component Earpiece
- 8 BTE Controller
- 9 Mini BTE Controller
- 10 Display
- 11 Select button
- 12 Decrease button
- 13 Increase button
- 14 Accessories connection
- 15 Bodyworn Shoe & Cable
- 16 Bodyworn Controller



## Processor with BTE or Mini BTE Controller

Both the BTE and Mini BTE Controllers are normally attached to the Processing Unit and worn behind the ear. The Mini BTE offers a smaller two Zinc Air battery option than the standard BTE, providing a smaller and lighter wearing option.

## Processor with Bodyworn Controller

The Bodyworn Controller is worn separately to the Processing Unit and attached with the Bodyworn Cable. The large screen makes it easy to view and change settings for adult users. The Bodyworn Controller is easily interchangeable with the BTE and Mini BTE Controllers.

## The Processing Unit

The Processing Unit, incorporating Nucleus SmartSound™ technology, is the brain of your processor, where sound signals are encoded for transmission to the implant.

The Processing Unit is worn on the ear, with either the BTE Controller (or Mini BTE Controller) or the shoe that connects it to the Bodyworn Controller.

Both the coil (attached to the cable) and Bodyworn Cable are available in a variety of lengths and colours.

## The controller

In addition to housing the batteries, controllers have:

- A display that indicates the operations occurring.
- Buttons that operate your processor.

The BTE Controller contains three 675 disposable batteries or the BTE rechargeable battery. The Mini BTE Controller contains two 675 disposable batteries. The BTE and Mini BTE Controllers attach directly to the Processing Unit when worn.

The Bodyworn Controller can be worn in a pouch on a harness or attached to a belt. It can also be held in a pocket or secured to your clothing.

## Freedom™ Hybrid™ Acoustic Component

The Acoustic Component works in a similar way to a standard hearing aid. The Processing Unit amplifies low frequency sound and sends it to the earpiece through the earhook and connecting cable. The earpiece sends low frequency sound directly into your ear canal.



Acoustic Component: with earhook (1), cable (2) and earpiece (3)



Avoid placing the Acoustic Component Earpiece against the magnet of the coil or against any other magnets, due to a low risk of damaging the receiver in the earpiece.

# Wearing your processor

System diagrams of the different wearing options can be found in Overview of your processor components. They provide a good reference on how to assemble your processor.

## Positioning your processor and coil

Your processor is contoured to fit neatly and comfortably behind the ear. A magnet holds the coil in place over the implant.

You may find it easier to turn your processor on before placing it on your ear. To turn on your processor push and hold the Select button for a few seconds, until you either hear sounds (if your processor is in place on your head), or the active program (P1, P2, P3 or P4) shows on the display.

To place your processor on your ear/head:

1. Place the earhook over your ear while simultaneously holding the coil in either of your hands. Do not let the coil hang freely as the strain can damage the cable.
2. Place the coil on your head; the magnet should hold it in place over your implant.
3. Place the Acoustic Component in your ear.

For a more secure or comfortable fit you can:

- Use a standard earhook if you no longer use the Acoustic Component
- Adjust the coil length and magnet depth/strength
- Change the coil
- Use a Mic Lock™ with the standard earhook
- Adjust the length of the Acoustic Component Cable (this should be performed by your clinician only)

Read the following sections for more details.

## Removing your processor from your ear/head

To remove your processor from your ear/head:

1. Grip the earpiece with one hand and loosen it. Take care not to hold the earpiece by its cable.
2. Continue to remove the earpiece with one hand, while removing the Processing Unit and coil with your other hand. Take care not to hold the Acoustic Component Cable or coil cable.

## Changing the Acoustic Component

The Acoustic Component plugs into the Processing Unit at the earhook connector. If you no longer wish to use the Acoustic Component, you can replace it with a standard earhook that does not include an earpiece.

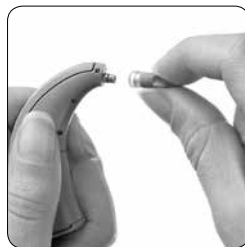
It is not possible to remove the earpiece from the cable and earhook. The earpiece is part of the Acoustic Component, which cannot be disassembled. The Acoustic Component can only be separated from the Processing Unit at the earhook.

The shape of the Acoustic Component Earhook cannot be adjusted but it provides an excellent fit due to the presence of the earpiece and connecting cable.

Two different earhooks are available:

- The earhook that comes as part of the Acoustic Component
- An alternative standard earhook that enables your processor to be worn without the earpiece and cable

To remove the Acoustic Component or standard earhook, twist the earhook 90 degrees as shown and pull it away from the Processing Unit, taking care not to pull the cable.



Removing the Acoustic Component

To attach the Acoustic Component or earhook to the Processing Unit, simply push the plug on the Processing Unit into the socket of the earhook.

**!** To avoid damaging the cable, grip the Acoustic Component by the earhook when pushing it in, or pulling it out. Do not hold it by the cable.

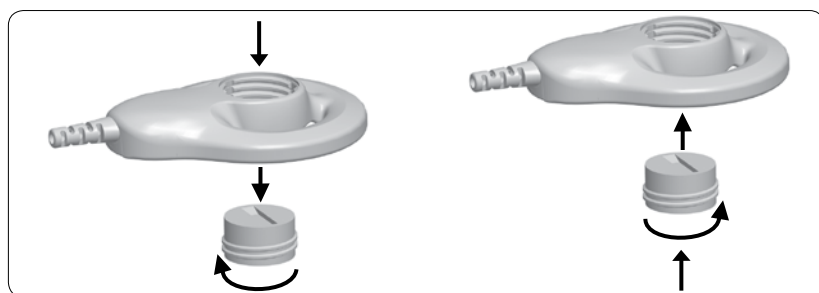
## Adjusting the coil and magnet

Make sure the coil is positioned correctly against the implant by placing it where the magnet “pull” feels the strongest.

You can change how close the magnet sits to your head by changing its depth in the coil, effectively changing its “strength”. You can also replace the magnet with a stronger or weaker one if changing the depth of the magnet in the coil is not sufficient.

### Changing magnet depth

To adjust how tight the coil sits against your skin, try adjusting how closely positioned the magnet is to your head by changing its depth in the coil before changing the magnet itself.



Adjusting the magnet

To adjust the magnet position (depth in the coil):

1. Insert a thin coin or screwdriver into the magnet slot on the topside of the coil.
2. Twist in a clockwise direction from above to increase magnet strength, or twist in an anticlockwise direction from above to reduce magnet strength.

Do not force the magnet to turn if it becomes difficult to turn during insertion or removal. The movement should be smooth and turning should need only a small amount of force. If turning becomes difficult:

- The magnet may not be correctly aligned in the coil.
- You may be turning the magnet in the wrong direction.

## Changing magnet strength

To change the magnet to a stronger or weaker one:

1. Insert a coin or screwdriver into the magnet slot on the topside of the coil.
2. Twist in a clockwise direction from above to remove the magnet.
3. Insert the new magnet into the underside of the coil.
4. Twist in a clockwise direction with your fingers from below to further insert the magnet.
5. If necessary, use a coin or screwdriver from above to further adjust.

If the magnet strength is too weak the coil may fall off. If it is too strong, it may cause discomfort or skin irritation.

Consult your clinician if you wish to change the magnet strength.

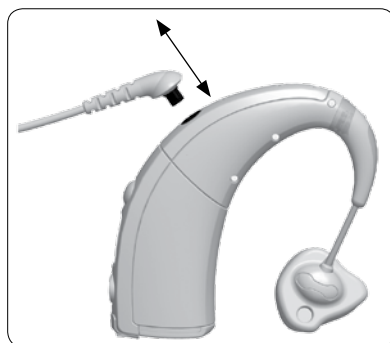
Store spare magnets safely. Store them away from credit and other cards that have a magnetic strip.

## Changing the coil

Coils are available in various colours and lengths. If you wish to change coil colour or find that the cable is too long or too short, you can change the coil. The coil cannot be separated from the coil cable.

To remove the coil from the Processing Unit, always hold the plug securely with two fingers and pull it away from your processor. You may damage the plug, cable or the Processing Unit if you pull the cable or twist the plug.

The coil plugs into the Processing Unit as shown below. Make sure the coil is securely attached to the Processing Unit by pushing the plug firmly into the socket.



Changing the coil

Regularly check to see if there are any breaks in the coil cable, particularly if you are experiencing intermittent sound. If there are breaks you will need a new coil. If there are no visible breaks it is still a good idea to test the coil by using a new one.

If you plug the coil cable into the Processing Unit when your processor is turned on, your processor may turn off. If this occurs, hold down the Select button to turn your processor back on, that is, until you either hear sound or the display shows.

## A secure fit using the Mic Lock™

When using the standard earhook instead of the Acoustic Component, a Mic Lock™ can be used to hold the Processing Unit in place behind the ear. The Mic Lock cannot be used while the Acoustic Component is connected to your processor.

The tube Mic Lock can be used on the BTE Controller, the Mini BTE Controller and the Bodyworn Cable. The stirrup Mic Lock is for use with the Bodyworn Cable.

To fit the Mic Lock:

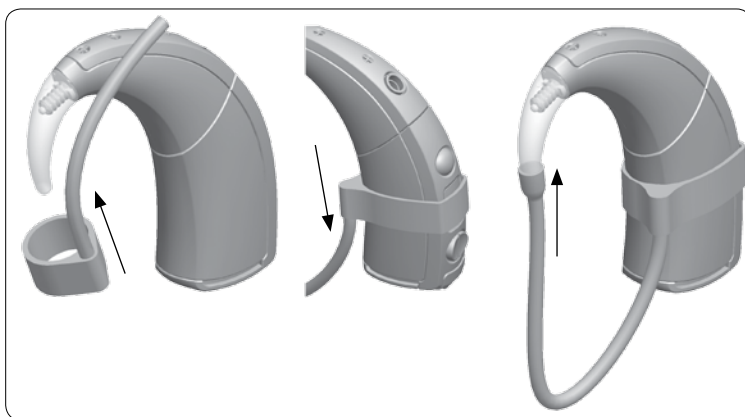
1. For the tube Mic Lock, thread the earhook and Processing Unit through the Mic Lock tube and move it down the unit until it fits firmly.

For the BTE or Mini BTE Controller, position the Mic Lock between the buttons, so the transparent band covers the display. Alternatively, clip the stirrup Mic Lock into the two holes towards the base of the Bodyworn Controller shoe.

2. Put your processor on your ear.
3. Bring the tubing around to the front of your ear and up to the earhook. Either sized earhook can be worn with the Mic Lock.

If the tube Mic Lock does not feel comfortable, for a better fit, rotate the band around the base of your processor.

4. Hold your processor firmly in place, and determine where the tubing should be cut.
5. Mark the tubing, allowing for an additional few millimetres, so it can attach to the earhook.
6. Cut the tubing only when you are certain the length will allow a secure and comfortable fit. It is important not to cut it too short.
7. Feed it on to your earhook.



Fitting the Mic Lock

To wear the Processing Unit with the Mic Lock in place, fold your ear down and gently pass your ear lobe through the loop made by the Processing Unit and Mic Lock until it is in position on your ear. Alternatively, bring the tubing to the front of your ear and feed it on to your earhook.

Your processor should fit securely with the Mic Lock in place.

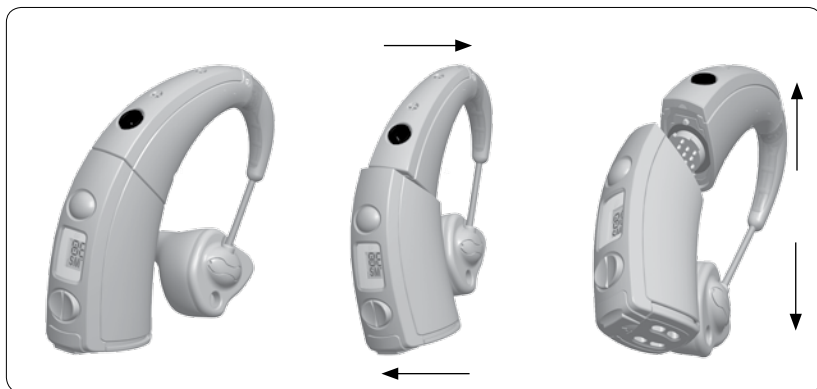
To remove the Processing Unit with the Mic Lock attached, fold down your ear lobe and reverse the process. Alternatively, ease the tubing off the earhook.



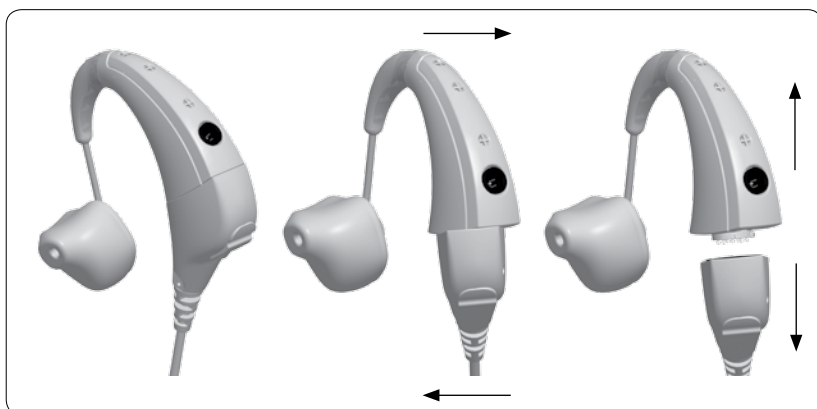
# Changing your wearing option

## Removing the Processing Unit from the controller

To remove the Processing Unit from the BTE Controller, Mini BTE Controller or Bodyworn Cable, gently twist the controller or cable shoe to your left and the Processing Unit to your right, until the parts separate.



Removing the Processing Unit from the BTE Controller



Removing the Processing Unit from the Bodyworn Controller

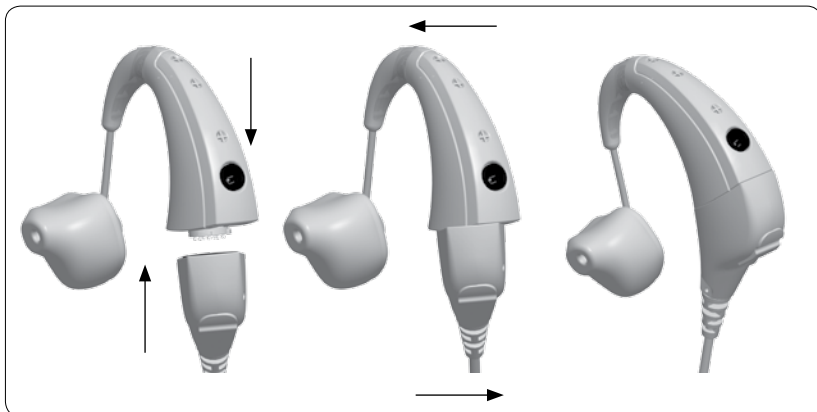
## Attaching the Processing Unit to the controller

To attach the Processing Unit to the BTE Controller, Mini BTE Controller or Bodyworn Cable:

1. Hold the controller or cable shoe, and the Processing Unit so they touch. The controller or shoe should face to the left and the Processing Unit to the right of the final position.
2. Twist the controller or shoe, and the Processing Unit until the two parts fit into place.



Attaching the Processing Unit to the BTE Controller



Attaching the Processing Unit to the Bodyworn Controller

- ❗ Make sure the controller or shoe and Processing Unit are aligned correctly, as even a slight misalignment can cause technical problems. Check for broken or bent contacts between the controller or shoe and the Processing Unit, which can cause misalignment. Return your processor to your clinician if any contacts are bent or broken.

To attach the Bodyworn Cable to the controller:

1. Line up the dot mark on the plug with the dot mark at the top of the controller.
2. Push the plug into the socket.



Dots lined up on connector and controller

To avoid damaging the cable, grip the connector when pushing the cable in, or pulling it out.



# Using your processor

## Turning your processor on and off

### BTE and Mini BTE



Push and hold the Select button for more than one second to turn on or off.



The display shows the current program when turned on.



The display is empty when turned off.

### Bodyworn



Push and hold the Select button for more than one second to turn on or off.



The display shows the current program when turned on.



The display is empty when turned off.



When you first turn on your processor, three horizontal lines will show on either the left or right side of the display, indicating whether your processor was programmed for the left or right ear.






This is very helpful if you are bilaterally implanted and have two processors.

# Understanding the display

These symbols display on all three controllers:

| Symbol  | Meaning   |
|---|---|
| <b>P1, P2, P3, P4</b>   | Program 1, Program 2, Program 3, Program 4                        |
| <b>M</b>  | Microphone  |
| <b>T</b>  | Telecoil  |
| <b>MT</b>   | Microphone and Telecoil on at the same time                       |
| <b>S</b>  | Sensitivity (ranges from 0 to 20)                                 |
| <b>V</b>  | Volume (ranges from 0 to 9)                                       |
| <b>EA</b>   | External Accessory: flashes when accessory is first turned on     |
|  | Lines on left of display: processor programmed for the left ear   |
|  | Lines on right of display: processor programmed for the right ear |
| <b>H1</b>   | Flat battery  |
| <b>H2</b>   | Low battery   |
| <b>H3</b>   | Coil error  |
| <b>H4</b>   | Audio error   |
| <b>H5</b>   | Program corrupted   |
| <b>H6</b>   | Implant ID error (incorrect implant detected by your processor)   |

In addition to the above, these symbols display on the Bodyworn Controller:

| Symbol  | Meaning  |
|---|--|
| <b>x</b>  | External Accessory is activated                                    |
|  | Sound level indicator sounds are being picked up by your processor |
|  | Battery Level Indicator: battery power is full                     |
|  | One segment of Battery Level Indicator: battery power is low       |

The display generally shows the program in use, for example, P1 and whether the microphone, in-built telecoil or both are operating. The information on the display varies according to the program and functions being used.

When the lapel microphone is used with the BTE or Mini BTE Controller, no M or T shows on the display.

The Bodyworn Controller display (backlight) will light up for a few seconds when a button is pressed, or a help message first shows on the display.

In addition, help messages may show, either as a warning or sign that action needs to be taken. For example H2 shows for low batteries, or H3 if the coil is not in place or is not working. For more information on help messages, see *Troubleshooting*.

When the microphone sensitivity or volume is changed, the symbol, S or V will show on the display correspondingly. This lets you know which function you are changing. The sound level will show as a number, and change when you push the increase or decrease button.

The display will return to the normal P status when no further changes to the level occur.

## Processor programs

Up to four sound processing programs (P1 to P4) are available for your use, providing that your clinician has enabled them for you.

You can change programs to help you hear better in different listening situations.

### Program options available

The program levels and features are selected at the programming session, when your clinician programs your processor to suit your hearing needs.

By including different features, the programs can be varied to help you hear better in different listening situations:

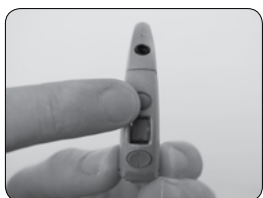
- Programs can include ways to improve your hearing, using Nucleus SmartSound.
- While you are normally able to vary settings for microphone sensitivity or volume, your clinician can also have them set at a fixed level within a program so they cannot be changed.

- The volume function may be turned off.
- The private tones can be activated or turned on at the programming session. In addition, users of Bodyworn Controllers can have public tones and backlighting to the display turned on.

For more information on private and public tones, see *Troubleshooting*.

## Changing programs

### BTE and Mini BTE



1. Push the Select button briefly to change the program.



The display shows the selected program.



2. Continue pushing the Select button until you reach the program you want.

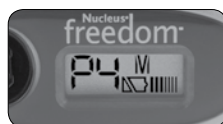
### Bodyworn



1. Push the Select button briefly to change the program.



The display shows the selected program.



2. Continue pushing the Select button until you reach the program you want.



If the private or public tone is operating, you will hear a tone or tones indicating the program you are changing to. For example, to change from P2 to P3, press the Select button briefly – you will hear three tones as you change to P3. To move to P4 or P1, wait until the tones finish before briefly pressing the Select button again. Repeat to move to P1.

If the private or public tone is not operating, you will not hear any tones when you press the Select button. However there will be a slight gap in sound while changing between the programs. To continue changing to another program, wait until you hear the sound from the new program before you press the button again. If you press the Select button when there is no sound, your processor will not move to the next program. You need to wait for the sound first before you press the Select button again.

Continue pushing the Select button briefly until you reach the program you want. Your processor will only move through the number of programs that your clinician has set up. For example, if you only have two programs set up, it will only move through P1 and P2 (P3 and P4 will not show).

The program you select operates until you press the Select button again. When you switch your processor off and on again, it will return to the program and settings you were using before you switched it off. That is, your processor will remember the last program you used, including any changes to the microphone sensitivity and volume settings you made.

## Changing your perception of loudness

You can use the microphone sensitivity and volume controls to change the loudness levels of the sounds you hear.

Your clinician will set up your programs so you:

- Can change both microphone sensitivity and volume.
- Can change microphone sensitivity only.
- Cannot change microphone sensitivity and volume.

Each of your programs may be set up differently.

Microphone sensitivity and volume settings are saved for each program, providing that your clinician has enabled you to make changes. If you change to a new program, the settings will be the same as they were when you last used that program. If you are adjusting the sensitivity or volume settings often, consult your clinician.

## Controlling microphone sensitivity

The microphone sensitivity controls the softest level of sound picked up by the microphone. The recommended level is 12. Your clinician, however, may have programmed the sensitivity control to change the sensitivity of the implant sound and volume of the earpiece simultaneously.

If sensitivity changes are enabled, you can:

- Decrease the sensitivity of the implant sound to reduce background noise in noisy situations.
- Increase the sensitivity of the implant sound to hear very soft sounds in quiet situations.

To change the microphone sensitivity:

### BTE and Mini BTE



1. Briefly push either the Increase or Decrease button.



The display shows the current sensitivity level.



2. Continue pushing until you reach the sensitivity level you want.

### Bodyworn



1. Briefly push either the Increase or Decrease button.



The display shows the current sensitivity level.



2. Continue pushing until you reach the sensitivity level you want.

If you find you often set the sensitivity higher or lower than 12, consult your clinician.

## Controlling volume

The volume controls your perception of loudness.

Your clinician will set up your programs so you can either:

- Change the volume of the implant sound alone.
- Change the volume of the earpiece alone.
- Change volume of the earpiece and sensitivity of the implant sound simultaneously.

If volume changes are enabled, you can:

- Reduce the volume if sounds are uncomfortably loud.
- Increase the volume if speech, including your own voice, is too soft.

The volume level is shown as a number between 0 and 9.

If you are adjusting the volume setting often, or if adjusting the volume causes you discomfort, consult your clinician.

To change the volume level:

### BTE and Mini BTE



1. Push either the Increase or Decrease button and hold for more than one second.



The display shows the current volume level.



2. Continue pushing the Increase or Decrease button until you reach the volume level you want.

## Bodyworn



1. Push either the Increase or Decrease button and hold for more than one second.



The display shows the current volume level.



2. Continue pushing the Increase or Decrease button until you reach the volume level you want.

The display will return to normal after a few seconds.

## Using SmartSound™ in different listening environments

Your processor incorporates innovative Nucleus SmartSound technology.

SmartSound is designed to mimic the ear's adaptive capabilities, delivering improved hearing outcomes and behave in the same way as natural hearing, providing control over how sound is processed in different listening environments.

There are various SmartSound 2 options available, grouped within four hearing environments. The following functions may be included as options, within a program:

- Everyday is ideal for the typical listening conditions of everyday life and can automatically adjust the sounds you hear for maximum clarity and comfort.
- Noise is suitable for environments with significant background noise, improving the audibility of wanted sound from various positions.
- Focus is useful where there is significant background noise but focus is needed on a single source of sound.
- Music is used to listen to all types of music from any audio source.

Discuss with your clinician how you want these options applied to your programs. You can only use these options if your clinician has set them up in one or more of your four programs. You can then use a SmartSound 2 option by changing to the program(s) where it is available.

## Using the Telephone with your processor

You may use your telephone and your processor with:

- The normal microphone setting.
- The telecoil, which is displayed as the T on the display.
- The telecoil and microphone on at the same time (depending on how your clinician has set up your processor), which is displayed as MT on the display.

To use the telephone with your processor on the microphone setting:

1. Position the telephone handset by lining it up with your cheekbone.
2. Move the handset up and backwards so that it is slightly above the ear.
3. Turn the handset so that the earpiece touches your head. This will help you hear the voice on the phone more clearly.

To use the telephone with the telecoil or telecoil and microphone setting:

1. Press the Increase and Decrease buttons for a few seconds until your processor changes to the T or MT setting.
2. Position the handset slightly lower on the ear and further back than the position suggested for the microphone setting.

Do not hold the handset too high or too far back behind the ear. In these positions the signal will not be optimal.

The optimal position will be different for different telephones. Try moving the phone earpiece around to achieve the best sound.

# Using the telecoil

The in-built telecoil allows you to receive signals from a

- Hearing aid compatible telephone.
- Room fitted with an induction loop.
- Personal induction loop, such as a neck loop or cushion loop (commercially available).

The sound signal from an amplifier, TV or Hi-Fi can also be sent from an induction loop to the telecoil.

To select the in-built telecoil, push both the Increase and Decrease buttons at the same time, for a few seconds, until a T shows on the display.



Telecoil selected

Make sure your finger presses both sides of the button area.

To disable the telecoil when it is selected, push and hold the Increase and Decrease buttons together for a few seconds.

Your clinician can set your program to operate as either a telecoil alone, or as a mix of your in-built telecoil and processor microphone. If your clinician sets your program as a mix of the telecoil and microphone, this will show as MT on the display.



Mix of telecoil and microphone

Sensitivity and/or volume levels can be changed when using T or MT in the same way as described previously. This will increase or decrease the sensitivity of the telecoil (as well as the microphone if MT is used) and overall volume of the telecoil (as well as the microphone if MT is used).

To reset your program after using T or MT push all three buttons together (Increase, Decrease and Select) for a few seconds. Your processor will reset the program to microphone (M) as well as the sensitivity and volume levels if they were adjusted.



Disable the telecoil when not using the telephone, as it can reduce the microphone volume.

## **From accessory to telecoil**

To move to the in-built telecoil when an accessory is attached, push both the Increase and Decrease buttons at the same time, for a few seconds, until a T shows on the display.

## **From telecoil to accessory**

To move back to the accessory, push both the Increase and Decrease buttons at the same time, for a few seconds, then repeat this until you can hear with the accessory again.

## **From accessory to microphone**

Alternatively you may wish to move from using your accessory, to using your microphone only, while leaving the accessory attached.

When using an accessory, to move to the microphone only setting, push both the Increase and Decrease buttons at the same time, for a few seconds, then do this again, until an M shows on the display (except when using a lapel microphone) or you hear sound through the microphone.

## **From microphone to accessory**

To move back to the accessory, push both the Increase and Decrease buttons at the same time, for a few seconds, until you can hear the accessory again.

Make sure your finger presses both sides of the button area.

## **Locking the buttons**

The button lock can be used to prevent children from changing the controls or to avoid accidental button presses changing your processor settings.

To lock or unlock the buttons, push both the Select and Decrease buttons for a few seconds.

The display will briefly show +L to indicate the buttons are locked.



Button lock enabled

If you press any button when locked, an L will briefly show on the display.

You will need to unlock the buttons before turning off your processor.

To unlock the buttons, press the Select and Decrease buttons together for a few seconds.

The display will briefly show -L to indicate the buttons are unlocked.



Button lock disabled

## Resetting your processor

To reset your processor to the default settings (e.g. after adjusting the microphone sensitivity or volume levels and/or using the telecoil or an external accessory,) press and hold all three buttons (Select, Increase, Decrease) together for a few seconds.

Make sure your finger presses both sides of the Increase/Decrease button area. You will hear a sound and the display will go blank for a moment.

Resetting will not damage your processor. It returns the settings to the default settings set by your clinician at your last visit.



## Enabling the private and public tones

Private and public tones can be used to hear when certain processor functions are started, and warnings occur.

The private tone is heard by you and nobody else. It can be used with the BTE Controller, Mini BTE Controller or Bodyworn Controller.

The public tone is only available with the Bodyworn Controller. It is heard by both you and people around you. It allows people around you to assist you when there is an alarm, for example when the batteries are going flat.

When using the Bodyworn Controller, both the private and public tones can operate. If you wish to use one or both of the tones, ask the clinician to include them in your programs.

To stop the tone, press any button.

For more information on what the tones indicate, see *Troubleshooting*.



# Changing the batteries

Batteries should be replaced when any of the following occur:

- Low or flat battery warning tones are heard.
- Low or flat battery help message shows on the display (H1 or H2).
- Low battery warning shows on the Bodyworn Controller (only a small segment of the battery is on the display).
- You stop hearing sound.
- The sound you hear becomes intermittent.

For information on the warning sounds or indicators, see *Troubleshooting*.

Remove batteries when they are flat, or when the battery holder is to be stored for a period of time.

Use only battery types recommended by your clinician or Cochlear Limited. Other types may not have sufficient energy to allow your processor to either function properly or last for a long time.

When using disposable batteries, never mix fully charged batteries with partially charged ones. Always change each battery. It only takes one low or flat battery to stop your processor from working. Similarly, never mix brands or battery types, for example, Zinc Air with alkaline batteries.



Flat batteries may leak corrosive fluids and cause damage if left inside your controller.

Dispose of used batteries in accordance with your local regulations.

Never dispose of batteries in fire.

Do not let children replace batteries without adult supervision.

Make sure that batteries are kept out of reach of young children.

Batteries can be harmful if swallowed. If swallowed, seek prompt medical attention at the nearest emergency centre or Poisons Information Centre.

# Replacing BTE and Mini BTE Controller batteries

## Standard Zinc Air or Silver Oxide/Alkaline batteries

The BTE Controller uses three high power 675 Zinc Air batteries. The Mini BTE Controller uses two. Silver Oxide or alkaline batteries can also be used in very humid conditions: your BTE processor will only operate for a few hours when Silver Oxide or alkaline batteries are used.

**!** Do not use rechargeable NiMH button cells (HB 116/054).

High Power 675 Zinc Air batteries are sealed, usually with a seal or tab.

To change the batteries:

1. Remove the new set of batteries from their pack and make sure the seals are removed.
2. Let the new batteries stand for one minute, outside of their packaging with their seals removed, to allow the air to activate the batteries.
3. Turn off your processor.



675 Zinc Air battery pack

4. With your fingernail in each side of the base of the battery holder, pull the battery holder out.

You can also use your keyring tool to help remove and store battery holders for your BTE or Mini BTE Controller. Slide the keyring tool onto the edge of the battery holder and pull the battery holder out of the controller.

5. Remove the flat batteries by tipping the battery holder to one side and pushing each battery out. They slide out from one side only.

To push the batteries out, try using the end of the controller or the tip of your keyring tool.

6. With the positive battery terminal (the side with the holes) facing down, slide the fresh batteries into place. Push them in from the right hand side when viewed from the back of the battery holder.

Do not force the batteries into place. They should fit easily.

Take care all the batteries have the holes facing down. Your processor will only work for a very limited time if a battery is put in the wrong way, and then all batteries will need to be replaced.

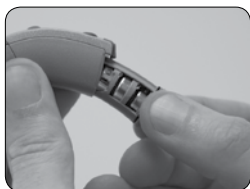


Positive battery terminal (this side facing downwards)

7. Replace the battery holder by sliding it up from the bottom into the controller until it clips into place.



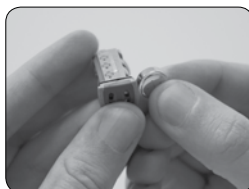
In older BTE battery holders, the bottom battery stands out a little and appears not to be in position. This is normal. The bottom battery will be correctly placed when the battery holder is inside the controller.



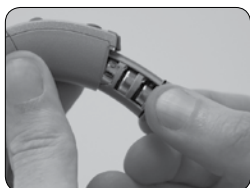
Remove the battery rack.



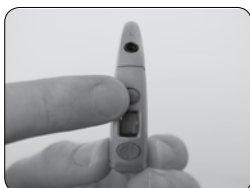
Remove the used batteries.



Insert the new batteries.



Replace the battery rack.



Turn on your processor.



Dispose of used batteries in accordance with your local regulations. Never dispose of batteries in fire.

## Rechargeable BTE Controller battery (A25)

A rechargeable lithium ion battery can be used with the BTE Controller in place of the standard battery holder (three Zinc Air). Detailed instructions for use are provided with the BTE Rechargeable Battery (A25) and BTE Recharger.

Always use the Freedom BTE Recharger available from Cochlear Limited to recharge the Freedom BTE Rechargeable Battery. A power supply is also supplied to connect the BTE Recharger to mains power or the power outlet. Cochlear™ also supply a charger that can be connected to a 12 volt power supply such as a car outlet.

To get the longest battery life, always fully charge the rechargeable battery before you use it. The battery is supplied partially charged and has a shelf life of two years. It is not recommended to store fully charged batteries for longer than three weeks.

The BTE Rechargeable Battery (A25) and BTE Recharger may not be available in some countries. Contact your nearest Cochlear office for details.



Rechargeable BTE Controller Battery (A25)

## Replacing Bodyworn Controller batteries

Your Bodyworn Controller holds two AAA batteries. Cochlear recommends rechargeable nickel/metal-hydrate (NiMH) batteries, or disposable alkaline batteries. For optimum battery life of rechargeable batteries, use NiMH batteries of at least 800mAh capacity.

To replace the batteries:

1. Turn off your processor.
2. Firmly hold the cover and slide it down, to reveal the battery compartment.
3. Remove the old batteries and replace with new ones.

Make sure the + and – symbols on the batteries match the + and – symbols in the compartment.

4. Slide the cover back until it clicks into place.



Remove the battery compartment.



Remove the used batteries.



Insert the new batteries.



Replace the battery compartment.



Turn on your processor.



Dispose of used batteries in accordance with your local regulations. Never dispose of batteries in a fire.

## Recharging NiMH batteries

Use the charger supplied to charge NiMH batteries for use with your Bodyworn battery pack. For more information on how to use it, see the instructions supplied with the charger.



Do not use the charger for zinc/carbon, alkaline, lithium or any other disposable batteries.

Always ensure the batteries are placed so the + and – symbols on the batteries match the + and – symbols in the compartment.

## General precautions for the use of batteries

Generally, the following precautions apply so you can get the most out of your batteries:



## All battery types

- Carry spare batteries in a closed plastic bag for safety, making sure they do not come into contact with either each other or metallic objects, for example coins or hair clips. Any of these situations may accidentally short circuit the battery, which may heat up and even crack open.
- Only charge rechargeable batteries. Do not recharge disposable batteries, e.g. zinc/carbon or alkaline batteries.
- Store batteries in cool places.
- Do not heat batteries, for example never leave batteries in sunlight, behind a window or in a car.
- Never immerse batteries in water.
- Do not deform batteries. For example, do not force them into your processor. Do not drop batteries on hard floors.
- If a battery has leaked fluid, do not allow the fluid or liquid to come in contact with skin or eyes. If contact is made, wash with a lot of water and seek medical attention. It is always a good idea to wash your hands after you have handled batteries.

## Rechargeable batteries

- Ensure your battery charger is suitable for the type of battery you are using.
- After storing rechargeable batteries for an extended period, it may be necessary to charge and discharge them (that is, use them until they are fully flat) several times to obtain maximum performance.
- Remove rechargeable batteries from the charger, immediately after they are charged.
- As you use rechargeable NiMH batteries, their battery life will shorten. When batteries no longer last for a reasonable period of time, dispose of them carefully, in accordance with local regulations.



# Accessories

The following accessories, or wired assistive listening devices, can be connected to your processor.

- Lapel microphone, to improve communication in noisy environments.
- FM cable, to send sound signals from a commercially available FM listening system to your processor. For a list of the FM cables available, and for information on the one suited to your needs, contact your clinician.
- TV/Hi-Fi cable, to connect a TV, Hi-Fi or stereo, personal computer or other mains powered sound source to your processor.
- Personal Audio cable, to connect personal music systems, handheld games or other battery powered equipment to your processor.



Do not use the Personal Audio cable to connect to equipment using a wall outlet, that is, to a mains powered device.

In addition, commercially available wireless technology assistive listening devices you may want to try include:

- Induction loop systems.
- FM systems (such as the MicroLink™ Freedom).

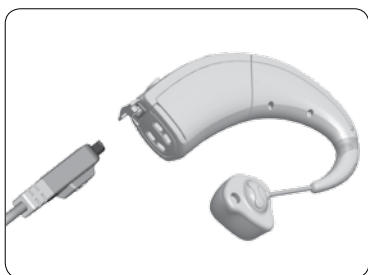
Your in-built telecoil operates with induction loop systems. The MicroLink Freedom is a Phonak product that fits the BTE Controller only. It will not fit into the Mini BTE Controller.

## Connecting accessories

Your accessories plug into the socket either at the base of the BTE Controller or the Bodyworn Cable Shoe.

To attach the accessory:

1. Use your fingernail to lift the socket cover.
2. Push the accessory plug into the socket.



Plugging an accessory into the accessory socket

3. Push both the Increase and Decrease buttons at the same time for a few seconds to activate the accessory. EA (External Accessory) shows briefly on the display while the change is happening.



EA flashes briefly when External Accessory (EA) is activated

A short tone (if the private or public tone is turned on in that program) confirms the accessory's connection. (The tone also sounds when the accessory is disconnected.)

Press either the Increase or Decrease button to adjust the sound level. If the Increase or Decrease is not pressed again within a short time, the display will go back to the program display.

An X on the Bodyworn Controller display shows the accessory has been activated.



Accessory activated (X) on Bodyworn Controller

To stop using the accessory, remove it from either the base of the BTE Controller or the Bodyworn Cable Shoe.

When not using an accessory, always keep the socket cover in place, over the socket, to protect your processor.

# Using accessories

## Lapel microphone

When using a lapel microphone, you will only hear sounds through the lapel microphone. Adjusting either the microphone sensitivity or volume changes the level of sound heard through the microphone.

## Audio mixing and other accessories

The sound from your processor's microphone will be mixed with that from the:

- Personal audio cable
- TV/Hi-Fi cable
- FM cable
- FM system

If both the accessory and microphone are activated, both an M and X show on the Bodyworn Controller display.



Both accessory and microphone activated

The microphone sensitivity button varies the level received by the microphone, while the sound from the accessory remains constant.

To hear more environmental sound, press the Increase button. To hear less environmental sound, press the Decrease button.

If you only want to hear the signal from the accessory, press the Decrease button until the microphone sensitivity is zero (0). This will switch off the external sounds received by the microphone.

When the accessory has a volume level control, it can be used to change the level of sound being heard from the accessory.

To change the sound level when using microphone sensitivity, press either the Increase or Decrease button. If not pressed again within a short time, the display will revert to the program display.

When you change the volume level, the total sound signal changes, that is the level of the accessory and the microphone signal change together. generally the volume control level should be set at 2 or more.

To change the sound level when using an accessory, press either the Increase or Decrease button for more than one second. You will hear a tone and/or see a flashing V on the display.

The balance between the amount of sound heard from the accessory as compared with that heard from your processor microphone will be set for each program when the clinician sets up that program. If the sound level is unsatisfactory when you are using an accessory, ask your clinician to change it at your next programming session. Alternatively your clinician may give you different sound level options on different programs.

## Monitor earphones

Monitor earphones can be used by another person (with unaided hearing) to listen to the sound signal from:

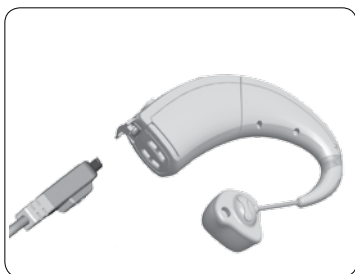
- The microphone
- The in-built telecoil
- The microphone and in-built telecoil together
- The lapel microphone
- An accessory (other than the lapel microphone) and microphone together



Monitor earphones

To use the monitor earphones:

1. Make sure your processor is turned on.
2. Lift the socket cover and push the monitor earphone plug into the accessory socket at the base of the BTE Controller or Bodyworn Controller shoe. Do not try to force the plug into the socket.



Plugging the monitor earphone plug into the accessory socket

3. If you wish to test an accessory, plug it into the monitor earphone connector.



Testing an accessory with the monitor earphones

4. Press both the Increase and Decrease buttons for a few seconds to activate the earphones.
5. Have another person listen to the sound. Note that monitor earphones only indicate that sound can be heard: they do not indicate the quality of the sound heard by the processor user.

If you attach the accessory after you have pressed the Increase and Decrease buttons, press them again to activate the accessory.

Press any button to continue the sounds through the monitor earphones. The sound will stop when no buttons have been pressed for 90 seconds. To re-start the sound in the monitor earphones, press both the Increase and Decrease buttons again for a few seconds.

## Accessories and the telecoil

When you are using an accessory with your processor, it is possible to switch to the in-built telecoil or the microphone only setting, with the accessory still attached to your processor. For example, if you are using your TV/Hi-Fi cable and then wish to use a telephone with a telecoil induction loop, you can switch to the in-built telecoil setting while the TV/Hi-Fi cable is still attached.

This set of actions is part of a cycle. Each time you push both the Increase and Decrease buttons at the same time, for a few seconds, you move on to the next setting. Starting from where you can hear the accessory, by pushing the buttons you move to the in-built telecoil, then to the microphone and finally return to the accessory. To skip a setting, push the buttons a second time.

When an accessory is not attached the cycle is microphone – telecoil – microphone.



The accessories mentioned cannot be used with the BTE Mini Controller because it does not have an accessory socket.

Certain accessories may not be available in all countries.



# Care and maintenance

## General cleaning

Keep battery contacts clean: use a soft brush to gently clean the battery contacts. Take care not to apply force that may damage the contacts.

If batteries are dirty, wipe them with a clean dry cloth. Be careful to keep batteries dry and free from moisture.

Keep the contacts clean where the Processing Unit and either the BTE Controller, Mini BTE Controller or Bodyworn Cable Shoe connect: use a swab dampened with medicinal alcohol to gently clean the contacts.

Use a soft, clean, dry cloth to clean the device. Regular cleaning prevents dirt from building up. Do not use harsh chemicals, cleaning solvents, or strong detergents to clean the device.

See *Cleaning the microphone protector* for information on how to clean the microphone protector.

See *Cleaning the Acoustic Component* for information on how to clean the Acoustic Component.

## Cleaning the microphone protector

The microphone protector should be in place at all times. Clean it daily with a soft brush or cloth, while it is positioned on your processor. Do not clean the underside of the protector. Do not use chemicals.



Cleaning the microphone protector

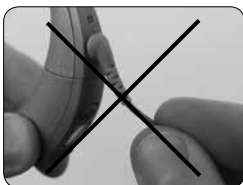
## Replacing the microphone protector

Replace the microphone protector when sound quality is degraded or it becomes dirty. If you are unsure if it needs to be replaced, try using a new protector and if the sound quality improves or is louder then dispose of the old protector. Replace the protector every month (at the very least) to ensure optimal sound quality and hearing performance.

You can also ask a hearing person to check for the presence of sound by using the monitor earphones. Refer to *Monitor earphones* for further information.



1. Pull out the coil by holding the plug firmly.



Do not pull the cable.



2. Remove the dirty protector using your fingernail.



3. Attach the new protector.

Always use the microphone protector. It protects your processor from dirt and moisture.

## Cleaning the Acoustic Component

Clean the Acoustic Component on a regular basis so as to remove the build up of wax and to optimise acoustic performance.

Two tools are supplied with your Acoustic Component; a brush and a vent cleaner. The brush is used daily to clean both the ear shell and the WaxBuster filter if you have it (see *Using your wax management system* below). The vent cleaner is used to remove wax from the earpiece vent. Do not use the vent cleaner to clean any other part of the Acoustic Component or processor.

Clean the earpiece daily with a dry cloth. Clean away any traces of wax from around the vent opening. If necessary, clean the earpiece with a cloth slightly dampened with cleaning fluid that is suitable/recommended for standard hearing aids. Always handle the Acoustic Component with care on a flat surface and take particular care not to drop it or to twist the earpiece cable. The wax filter should be cleaned (WaxBuster system) or changed (NoWax system) when it is clogged with wax or when the earpiece does not sound normal.

Remove the Acoustic Component from the Processing Unit monthly and clean the connectors with a dry cloth. Do not use chemicals to clean the connectors.

## Using your wax management system

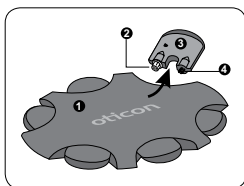
The excretion of wax inside the earpiece can reduce hearing performance. Two wax management systems are available from Cochlear that help to prevent wax from entering the earpiece: NoWax and WaxBuster.

Your audiologist will help you to decide on the most suitable wax management system for your needs.

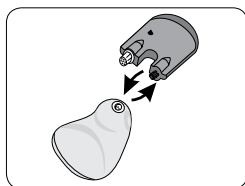
### NoWax system

Depending on the amount of wax deposited, Cochlear recommend that you change the NoWax earpiece filter every month. Change the filter if you perceive a decrease in acoustic hearing performance or if you notice that the filter is blocked.

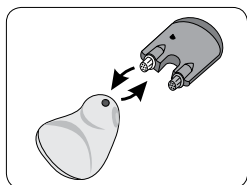
To change the NoWax filter:



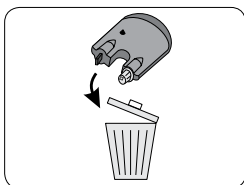
1. Remove the tool (3) from the shell (1). One arm of the tool is a filter removal tool (4) and the other holds a new filter (2).



2. Push the removal tool into the used wax filter on the earpiece and remove the filter.



3. Push the new filter into the earpiece.



4. Dispose of the used removal tool and used filter.

## WaxBuster system

You do not need to change the WaxBuster filter on a regular basis. Use the cleaning brush supplied by Cochlear on a daily basis to remove excess wax from the filter. Clean the filter with a dry cloth.

If you think that there might be a problem with your WaxBuster filter, please contact your audiologist. Do not try to remove or replace it yourself.

## Care

Your processor and Acoustic Component should work well, even when used in very cold or hot outdoor temperatures. generally, in cold temperatures your body heat is sufficient to keep your processor warm and working well. In very cold weather, wear a hat or headband over your processor. When not worn, do not leave your processor in very hot areas, for example in sunlight, behind a window or in a car.

For information on the temperature ranges your processor is tested to perform within, see Technical information, Environmental conditions.

Do not wear your processor while bathing or swimming. If your processor does get wet, wipe it dry with a soft cloth and place it in the dry aid kit or Dry & Store® for at least 12 hours. If it subsequently does not work, return it to your clinician. Cochlear Limited cannot guarantee that they will be able to repair any water-damaged part.

Take off your processor when sleeping as you may put strain on the earpiece cable and damage it.

Take off your processor when applying powder, makeup or hair product. These substances can get into and damage your processor.

Avoid getting sand or dirt into any part of the system. If this happens, shake out as much as possible, and if necessary contact your clinician to arrange for its repair.

## Storage

Store your processor overnight or when you are not using it, in a dry aid kit or drying pack such as the Dry & Store. Moisture or humidity may cause your processor to cut-out or stop working. Before using the dry aid kit, read the manufacturer's instructions for use. It is recommended that you store your processor and Acoustic Component fully assembled.



Dry aid kit



Dry & Store

By not wearing the processor and Acoustic Component overnight you will help your ear to dry and minimise the risk of putting strain on the earpiece cable while turning in your sleep.

To store your processor overnight, you may either leave your battery/batteries in the controller, or remove the battery holder from the controller and place it separately, with the batteries in the holder, in the drying kit.



Keep the drying chemical material away from young children. Swallowing this material can cause serious internal injuries.

For long-term storage, remove the batteries from the controller. Remember to store them separately, to avoid them from short circuiting each other.

You can also buy dry aid kits or drying packs for use with your processor, from an electronics store or pharmacy.

## Disposal

Dispose of electrical components in accordance with your local regulations.

## Warnings and precautions

For details on warnings and precautions, refer to the Important Information booklet included in the document pack you received with your processor.

# Troubleshooting

Your processor has several indicators of possible problems, namely:

- H help messages.
- Private and public tones.
- The battery indicator (Bodyworn only).

Read the following sections for information on how to use the above indicators to solve a problem. To troubleshoot more specific problems, see *Troubleshooting specific problems*.

## Help messages

The help messages below may show on your processor display.

When troubleshooting a H message, you may find that the H message on your display is replaced with another. Take the action suggested to rectify that problem. Continue until no H messages are displayed.

| Help message | Meaning  | Action to take  | Repeating help message  |
|--------------|--|---|---|
| H1           | <b>Flat battery</b><br>Note: you will stop hearing sound and will only be able to turn your processor off. | Change the batteries. *   | H1 will show for approximately 5 minutes or until your processor is turned off.   |
| H2           | <b>Low battery</b>   | Be prepared to change the batteries. *<br>If you are not ready to change the batteries, press any button to return to the normal display. | H2 will only appear once. If you do not change the batteries or press any buttons, the H1 message will eventually show to indicate the batteries are nearly flat. |
| H3           | <b>Coil error</b>  | Check:<br>- Coil position<br>- Cable is connected<br>- For cable damage<br>If H3 still shows, replace the coil.                           | H3 will remain on the display until the coil error is fixed.<br><br>The H3 error will only show for a Nucleus 24 implant if the coil has been damaged.            |

|           |   |  |   |
|-----------|---|--|---|
| <b>H4</b> | <b>Audio error</b>  | Follow the steps in the Other problems section.  | H4 will reappear after 5 seconds if there is still no sound.  |
| <b>H5</b> | <b>Program corrupted</b>  | Use a different program on your processor if possible.<br>Contact your clinician who will check your corrupted program(s). | H5 will remain on the display if all four programs are corrupted.<br>H5 will flash briefly if only some of your programs are corrupted (for example you may be able to use P3).   |
| <b>H6</b> | <b>Implant ID</b><br>(incorrect implant detected by your processor) | Place your processor on the correct implant.   | H6 will remain on the display until your processor is placed on the correct implant. The H6 help message may also appear if two coils are placed together.<br>H6 will be cleared if you press any button on your processor.<br>Note: If you are using the Bodyworn Controller it will also beep four times if public tones are enabled. |

\* Refer to the Changing batteries section for further information.

## Private and public tones

Private and/or public tones indicate when a particular function of your processor has been used. Tones can only be activated or adjusted by your clinician.

To stop either the private or public tone, press any button.

If you have difficulty hearing the private tone, ask your clinician to adjust it at your programming session.

### Private tones

The private tone is heard by you and by nobody else. It can be used with each type of controller. Private tones can only be heard if your clinician activates them for a particular program. There are two types of tones: high pitched and low pitched.



High-pitched tones are heard when:

- Your processor completes a function.
- The buttons are locked or unlocked.
- You change programs. For example, when you move from P2 (program 2) to P3 (program 3), three tones are heard.

Low-pitched tones are heard when:

- The battery/batteries are low (two low tones).
- The batteries are flat (four low tones).

A high-pitched tone followed by a low-pitched tone is heard when the wrong button is pressed.

If you have difficulty hearing the private tone, ask your clinician to adjust it at your programming session.

## Public tones

The public tone is only available with the Bodyworn Controller. Both you and people around you hear it. It allows people around you to assist you when there is an alarm, for example when the batteries are going flat.

Public tones can only be heard if your clinician activates them for a particular program.

Low-pitched tones are heard when:

- Your processor completes a function.
- The buttons are locked or unlocked.
- You change programs. For example, when you move from P4 (program 4) to program P1 (program 1), one tone is heard.

High-pitched tones are heard when:

- The battery/batteries are low (two high tones).
- The batteries are flat (four high tones).
- A H3 coil error or H4 audio error occurs. You will hear four high-pitched tones, which will repeat every minute until the problem has been fixed.

A high-pitched tone followed by a low-pitched tone is heard when the wrong button is pressed.

## Bodyworn Controller battery indicator

The display on the Bodyworn Controller includes a battery level indicator.

When the battery is:

- Full, both battery segments are lit.
- Low, one battery segment is lit.
- Flat, the H1 help message shows.

## Troubleshooting specific problems

You may encounter some problems to which the H help messages and tones don't directly refer to. Take the following steps to try to fix the problem. After each step, check if you hear any sound.

If there is still a problem after you have performed the necessary actions, contact your clinician. Only a person authorised by Cochlear Limited should repair your processor.

| Help message                    | Action/Steps to take          | Further information  |
|---------------------------------|-------------------------------|--|
| Your processor will not turn on | 1. Check alignment            | See <i>Attaching the Processing Unit to the controller</i> |
|                                 | 2. Check the batteries        | See <i>Changing batteries</i>                              |
|                                 | 3. Try a spare battery holder | See <i>Changing batteries</i>                              |
|                                 | 4. Try a spare controller     | See <i>Attaching the Processing Unit to the controller</i> |
| There is nothing on the display | Reset your processor          | See <i>Resetting your processor</i>                        |

|   |  |  |
|---|--|--|
| There is no sound coming from both the implant and earpiece                 | <ol style="list-style-type: none"> <li>1. Check for sound</li> <li>2. Check and adjust sensitivity</li> <li>3. Check and adjust volume</li> <li>4. Check and change program</li> <li>5. Disable the telecoil</li> <li>6. Reset your processor</li> <li>7. Check the batteries</li> <li>8. Try a spare battery holder</li> <li>9. Check the coil</li> <li>10. Try a spare controller</li> </ol> | <p>Make sure you are in an environment that is loud enough for you to hear</p> <p>See <i>Controlling microphone sensitivity</i></p> <p>See <i>Controlling volume</i></p> <p>See <i>Changing programs</i></p> <p>See <i>Using the telecoil</i></p> <p>See <i>Resetting your processor</i></p> <p>See <i>Changing batteries</i></p> <p>See <i>Changing batteries</i></p> <p>See <i>Changing the coil</i></p> <p>See <i>Attaching the Processing Unit to the controller</i></p> |
| There is no sound coming from the earpiece but the implant sound is working | <ol style="list-style-type: none"> <li>1. Check and adjust volume</li> <li>2. Clean earpiece and remove wax</li> <li>3. Change the wax filter</li> <li>4. Check the earpiece cable</li> </ol>  | <p>See <i>Controlling volume</i></p> <p>See <i>Cleaning the Acoustic Component</i></p> <p>See <i>Cleaning the Acoustic Component</i></p> <p>Replace the Acoustic Component if there is a break in the cable</p>  |
| There is no sound coming from the implant but the earpiece sound is working | <ol style="list-style-type: none"> <li>1. Check and adjust volume</li> <li>2. Check and change program</li> <li>3. Disable the telecoil</li> <li>4. Reset your processor</li> <li>5. Check the coil</li> <li>6. Try a spare controller</li> </ol>  | <p>See <i>Controlling volume</i></p> <p>See <i>Changing programs</i></p> <p>See <i>Using the telecoil</i></p> <p>See <i>Resetting your processor</i></p> <p>See <i>Changing the coil</i></p> <p>See <i>Attaching the Processing Unit to the controller</i></p>   |

|  |   |   |
|--|---|---|
| The sound is intermittent or volume goes up and down       | 1. Check for sound  | Make sure you are in an environment that is loud enough for you to hear   |
|  | 2. Check alignment  | See <i>Attaching the Processing Unit to the controller</i>  |
|  | 3. Check your settings  | Check that your sensitivity, volume and program are suitable  |
|  | 4. Reset your processor   | See <i>Resetting your processor</i>   |
|  | 5. Check the batteries  | See <i>Changing batteries</i>   |
|  | 6. Try a spare battery holder   | See <i>Changing batteries</i>   |
|  | 7. Check the coil   | See <i>Changing the coil</i>  |
|  | 8. Check the Acoustic Component cable   | Replace the Acoustic Component if there is a break in the cable   |
|  | 9. Try a spare controller   | See <i>Attaching the Processing Unit to the controller</i>  |
| The sound is too loud and uncomfortable                    | 1. Check your settings  | Check that your sensitivity, volume and program are suitable  |
|  | 2. Reset your processor   | See <i>Resetting your processor</i>   |
| The sound is too quiet or muffled                          | 1. Check your settings  | Check that your sensitivity, volume and program are suitable  |
|  | 2. Reset your processor   | See <i>Resetting your processor</i>   |
|  | 3. Clean the microphone ports   | See <i>Cleaning</i>   |
|  | 4. Replace the microphone protector   | See <i>Changing the microphone protector</i>  |
|  | 5. Clean earpiece and remove wax  | See <i>Cleaning the Acoustic Component</i>  |
|  | 7. Change the wax filter  | See <i>Cleaning the Acoustic Component</i>  |
| You hear interference such as buzzing or distorted speech. | Try moving away from any electronic device that may be causing interference, for example buzzing sounds or distorted speech | Common sources of interference include: <ul style="list-style-type: none"> <li>• Radio and TV transmission towers</li> <li>• Mobile phone towers</li> <li>• Shopping centre and airport security systems</li> <li>• Some digital mobile phones</li> <li>• Battery chargers</li> <li>• Fluorescent lighting</li> <li>• Mains power boards</li> </ul> |

# Other Information

## Storing your personal details

For future reference, keep this guide in a safe place.

Your processor stores your first name, last name, implant type, MAP identifiers and recipient identifier.

This allows you to:

- Attend another clinic for programming if you need to
- Identify your processor as your own

When your clinician opens the program they have access to this information. This information can only be accessed in a programming session.

## Technical information

### Specifications

#### Physical configuration

Modular architecture: earpiece, cable and earhook are detachable from the Processing Unit as a single component. BTE Controller, Mini BTE Controller and Bodyworn Shoe and Cable are detachable from the Processing Unit, allowing connection of the Processing Unit to a different controller.

Dual microphone architecture, microphones protected by a replaceable hydrophobic mesh.

The Processing Unit, BTE Controller, Mini BTE Controller and Bodyworn Controllers are protected against solid foreign objects greater than or equal to 1.0 mm diameter, and protected against splashing water (IP44).

The processor and Acoustic Component are IP44 splash proof. The connection between the Processing Unit and any controller or Bodyworn shoe is splash proof. All accessories are not splash proof.

## Materials

### Processing Unit, BTE and Mini BTE Controller

ABS plastic is used for all components that come into contact with the user's skin, apart from the earhook, which is made out of EVA material.

Sealed internal epoxy fibreglass and polyimide printed circuit boards with electronic circuitry

The Acoustic Component connector is made from stainless steel.

### Bodyworn Controller

PC/PBT plastic case

### Acoustic Component

Earhook: EVA and thermo last

Connector Socket: gold & nickel plated stainless steel

Cable: PU/TU Copolymer

Earpiece: Acrylic for ear mould. ABS for face plate. UV cured acrylic for lacquer

### Coil & cables

PVC and ABS plastic is used for all components that come into contact with the user's skin.

PVC used for Coil cable and Bodyworn cable

Sealed internal epoxy fibreglass and polyimide printed circuit boards with electronic circuitry cable attached to the coil.

The earpiece cable consists of polyurethane with TU polymer.

### Dimensions (typical)

Processing Unit: 38 x 24 x 12 mm

Acoustic Component:

Earpiece: Depends on recipient ear shape. Thickness varies from 0.6 mm to 1 mm.

Earpiece connector socket: Length 3.7 mm x diameter 2.95 mm.

Earpiece cable: Length varies from 5 mm to 26 mm. Adjustable by +/- 3 mm.

Earpiece Receiver: 5 x 4 x 3 mm. Weight .66 g

Earhook: 16.5 mm

BTE Controller: 37.5 x 22.5 x 14.5 mm

Mini BTE Controller: 31.3 x 14.5 x 20.3 mm

Bodyworn Controller: 78 x 35 x 17 mm

Coil: 41 x 32.8 x 7 mm (1.61 x 1.29 x 0.28 in.)

Coil cable lengths: 6, 8, 11, 28 cm

### **Weight (typical)**

Processing Unit: 4.2 g

Earpiece: 0.9 g

Acoustic Component: 2.8 g (typical as weight varies for each recipient)

BTE Controller: 9.9 g (includes three Zinc Air batteries)

Mini BTE Controller: 7.6 g (includes two Zinc Air batteries)

Bodyworn Controller: 25 g (excluding batteries)

Coil and cable: 4.8 g

### **Electronic circuitry**

Custom analog and digital integrated circuit with Digital Signal processing (DSP) capabilities

Dual microphone system

Internal Telecoil

Visual indicator of system functional status via a display

External receiver encapsulated within the earpiece (custom-made)

## Operating characteristics

### Batteries

BTE Controller: PR44 (675) Zinc Air, or SR44 silver oxide or LR44 alkaline batteries

1 x BTE Rechargeable lithium ion battery

Mini BTE Controller: PR44 (675) Zinc Air, or SR44 silver oxide or LR44 alkaline batteries

Bodyworn Controller: AAA size, LR03 alkaline or HR03 NiMH batteries

### Power consumption

60 mW typical

Earpiece adds 3 mW to 4 mW average on typical power consumption

### External audio inputs

Four-pin custom connector for connection to external audio accessories

### Accessories

Lapel microphone

Monitor earphones

TV Hi-Fi cable for mains power equipment

Personal audio cable for battery operated equipment



Do not use the Personal Audio cable to connect to equipment that are mains powered, i.e. connected to a wall outlet.

Only the TV/Hi-Fi cable may be connected to equipment that are mains powered.

### Transmitting cable and coil connection

Four-pin connector at the point of connection with the Processing Unit, sealed when mated; cable permanently connected to the coil.



## Controls

Push-button sealed 3-button interface, allowing Power On/Off, program switching (P1, P2, P3 or P4) and Microphone sensitivity/Volume control

The functional status is displayed at all times via a display.

The Bodyworn Controller display has a backlight.

## Audio amplification

Three audio inputs for dual microphones and AUX inputs or Telecoil. All audio processing is done using DSP.

Class-D amplified output drives the receiver within the earpiece.

The system covers the following PTAs (Pure Tone Audiograms):

15-80 dB Hearing Loss (HL) @ 125 Hz

25-80 dB HL @ 250 Hz

25-90 dB HL @ 500 Hz

30-90 dB HL @ 1 kHz

30-90 dB HL @ 2 kHz

Acoustic Component Receiver: Total harmonic distortion 2% typical @ 500 Hz, nominal drive

## Programmability features

In-built Flash memory for storage of user programs

## Signal processing

The audio signal processing is implemented digitally using DSP technologies.

Digital AGC & ASC with options such as Autosensitivity™, ADRO®, Beam™ and Whisper™.

The Acoustic Component only benefits from Beam. The Acoustic Component does not benefit from Autosensitivity, ADRO and Whisper.

Programmable speech coding strategies: ACE™, SPEAK and CIS with a wide range of programmable parameters available for user's selection on the same processor (cochlear implant only, not Acoustic Component).

Up to 22 high-resolution bandpass filters provide spectral energy estimates over the frequency range 100 to 8000 Hz, depending on the program settings. Filters with the maximum outputs can be selected. These can be varied. The program determines the filters selected and hence the electrodes stimulated.

Eight fixed high-resolution filters for selecting and customizing acoustical amplification over the range 125 Hz (approx) to 1.8 kHz (approx).

## Environmental conditions

Storage Temperature: -40 °C (-40 °F) to +50 °C (+122 °F)

Storage Relative Humidity: 0% to 90%

Operating Temperature: +5 °C (+41 °F) to +40 °C (+104 °F)

Operating Relative Humidity: 0% to 90% RH, IP44 splash-proof design (earpiece excepted)











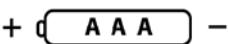




Check manufacturer's recommended operating conditions for batteries used in your processor.

## Equipment classification

Your processor is internally powered equipment Type B as described in the international standard IEC 60601-1:2005.

# Labelling symbols

The symbols below are found on your processor components and packaging.

| Symbol  | Meaning  |
|---|--|
|    | See instructions   |
|    | Fragile  |
|    | Temperature limit  |
|    | Humidity limit   |
|    | Type B equipment   |
|    | Bodyworn power button  |
|    | Bodyworn Increase button   |
|    | Bodyworn Decrease button   |
|    | Bodyworn battery polarity  |
|    | BTE battery polarity   |
|   | TV/Hi-Fi maximum volume  |
|  | TV/Hi-Fi minimum volume  |
| <b>L</b>  | Left audio channel   |
| <b>R</b>  | Right audio channel  |
| <b>IP44</b>   | IP rating<br>Protected against solid foreign objects greater than or equal to 1.0 mm diameter, and protected against splashing water |
| <b>Rx Only</b>  | This device restricted to sale by or on the order of a physician   |
|  | Disposal<br>Dispose of electrical components in accordance with your local regulations   |

## Serial number

The serial number is 101005 plus the number found on the spine of the Processing Unit, under the microphone protector, for example, 1010051234579.



Serial number

We suggest you make a note of the full serial number for future reference.

For more information on how to remove the microphone protector, see Care and maintenance.

## Warranty, registration and patient identification card

Your warranty is included in the document pack you received with your processor.

Please complete the registration card and return it to Cochlear Limited within 30 days of receiving your product.

You should also complete the supplied patient identification card and carry it with you at all times.

The statements made in this guide are believed to be true and correct as of the date of publication. However, specifications are subject to change without notice.

Nucleus® cochlear implant systems are covered by one or more international patents.

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# Glossary

|                           |  |
|---------------------------|--|
| Acoustic Component        | See <i>Hybrid Acoustic Component</i> below.  |
| Behind The Ear Controller | The BTE Controller contains three 675 disposable batteries or the BTE rechargeable battery. It has a display that indicates the operations occurring and buttons that operate your processor.  |
| Bodyworn                  | Type of controller that is carried on a person's body. It uses either two AAA nickel/metal-hydrate (NiMH) batteries, or disposable alkaline batteries. It has a display that indicates the operations occurring and buttons that operate your processor. |
| Bodyworn Cable            | Attaches the Processing Unit to the Bodyworn Controller  |
| BTE                       | See Behind The Ear Controller above.   |
| Cochlea                   | The auditory portion of the inner ear, of which the implant stimulates to create hearing.  |
| Coil                      | Part of the processor that lies on the side of the head. The processor transmits the digitally coded sound through the coil to the implant just under the skin.  |
| Controller                | Enables control of the processor's functionality, e.g. program selection, processor on/off, microphone sensitivity, loudness etc. It also contains the batteries.  |

|                           |  |
|---------------------------|--|
| Hybrid                    | Hybrid is the brand name of the electro-acoustic hearing solution available from Cochlear Limited, that enables hearing by means of both electrical stimulation of the cochlea and acoustic amplification of sound into the ear canal. |
| Hybrid Acoustic Component | Part of the processor that channels low-frequency sound through the earpiece into the ear. The Hybrid Acoustic Component Consists of the Hybrid earhook, earpiece and connecting cable.  |
| Implant                   | An implanted electronic device that bypasses the damaged hair cells in the inner ear or cochlea and stimulates the hearing nerves directly. It consists of a receiver stimulator and electrode array.                                  |
| MAP                       | A MAP (or program) can be described as the settings that determine how a processor converts environmental sound into channel stimulation data for the recipient's electrode array.   |
| Mini BTE Controller       | The Mini BTE Controller contains two 675 disposable batteries and is slightly smaller than the standard BTE Controller. It has a display that indicates the operations occurring and buttons that operate your processor.              |
| Mic Lock                  | A fixing aid used to hold your processor in place behind the ear.  |
| Nucleus                   | Cochlear Limited was established as a division of the Nucleus group in 1981, and was the original startup company in Sydney. Nucleus is used as a brand name for much of the Cochlear product range.                                   |
| Program                   | See <i>MAP</i> .   |
| Processing Unit           | Component of the processor where sound signals are encoded for transmission to the implant.  |

|                 |  |
|-----------------|--|
| Processor       | See <i>Sound Processor</i> .   |
| SmartSound      | SmartSound is a suite of four input processing technologies. These technologies can be applied to your available program slots, providing control over how sound is processed in different listening environments.   |
| SmartSound 2    | SmartSound 2 is an application of SmartSound technology. It is designed to mimic the ear's adaptive capabilities, delivering improved hearing outcomes and behave in the same way as natural hearing, providing control over how sound is processed in different listening environments. |
| Sound Processor | Captures and codes sound which is then transmitted through the coil to the cochlear implant. It consists of a Processing Unit, controller and coil.  |
| Telecoil        | The in-built telecoil allows you to receive signals from a hearing aid compatible telephone, a room fitted with an induction loop, or personal induction loop, such as a neck loop or cushion loop (commercially available).   |





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