Nucleus®
COCHLEAR IMPLANT SYSTEM

User Manual
for the SPrint™ speech processor
and accessories

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Note: This manual is designed for use with **SPrint**™ speech processors programmed with Nucleus® WinDPS R110.00 or later, excluding R125.

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Introduction

This manual is for users of the SPrint™ Speech Processor, which is part of the Nucleus® 24 cochlear implant system. The SPrint is used with the following Nucleus 24 cochlear implant systems:

- Nucleus® 24

- Nucleus® 24k

- Nucleus® 24 Contour™

- Nucleus® 24 Double Array

The SPrint is also used with the auditory brainstem implant, the Nucleus® 24 ABI. Please refer to the User Manual Addendum for the SPrint speech processor and accessories, if you are a Nucleus 24 ABI recipient.

Nucleus 24 implant systems consist of three parts:

- the implant

- the speech processor

- the headset

Together these three parts convert sounds from the environment into coded electrical information that

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is interpreted by your brain as sound.

This manual is intended for use by adult and adolescent implant users. It may also assist caregivers, teachers and other adults involved with children who use the implant.

This manual contains:

- instructions on fitting, using and caring for the speech processor, headset and accessories

- troubleshooting procedures

- basic technical information

- warnings and precautions

Inside the back cover of this manual is a *Quick Reference Guide* that you may tear out and carry with you. For further information, contact your implant centre or your clinician for expert advice.

This manual does not describe the operation of the cochlear implant. Please contact your implant surgeon or implant centre for more information.

Understanding the Cochlear Implant System

The SPrint™ Speech Processor

The speech processor is a small computer worn on your body and connected to the headset by cables. It receives sounds from a microphone in the headset, converts them to electrical signals and sends the signals back to the headset.

Earphone socket
External input socket
Indicator light
Headset cable cover
Headset cable cover release latch
LCD panel
Battery cover release latch
Battery cover
Battery case release latch
Battery case
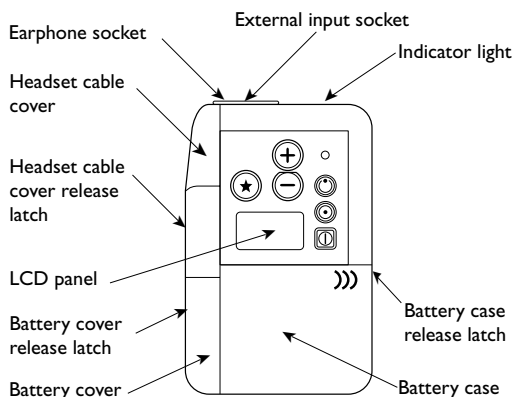
Figure 1: Front view of the SPrint speech processor

Features

The speech processor incorporates the following features, designed to optimize its performance and ease of use:

- up to four different listening programs customized for different conditions

- a volume control in addition to the microphone sensitivity control

- an autosensitivity control

- a liquid crystal display (LCD) panel to display control settings and symbols

- an external input socket, enabling the speech processor to accept signals directly from external devices

- a red indicator light at the top of the speech processor, which indicates that the batteries are working and your microphone is picking up sounds

- detachable battery cases; a standard two battery case and a smaller one battery case as an alternative

- an optional button lock that disables some buttons to prevent users from accidentally changing the speech processor settings

- an optional personal alarm that provides users with signals that indicate when settings have been changed or the battery level is low

- an optional public alarm, for use with children, which provides signals that are audible to bystanders

Control Buttons
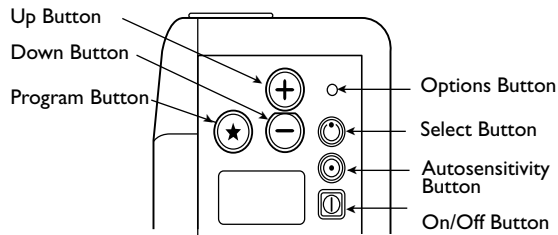
Figure 2: Controls on the speech processor

The speech processor is controlled by a set of push buttons, and an LCD panel displays information for the user.

- The On/Off button (⬛) turns the speech processor on and off. The speech processor uses power whenever it is on, even if you are not using it.

- The Program button (⬤) selects one of the

programs your clinician has created for you.

- The Select button (◎) provides access to the button lock, the microphone sensitivity and the volume controls (provided your clinician has enabled the volume control for the current program).
- The Options button (o) provides access to the alarm features of the speech processor.
- The Up (⊕) and Down (⊖) buttons adjust the microphone sensitivity and the volume.
- The Autosensitivity button (◉) turns the autosensitivity feature on and off.

LCD Panel
When the speech processor is turned on, the LCD panel displays:

- the active program
- symbols and settings for the active listening control, either the microphone sensitivity or the volume
- symbols to indicate active features and diagnostics

Indicator Light
The indicator light activity depends on the battery level.

- When the battery level is normal, the indicator light varies in brightness in response to the level of sound you receive.
- When the battery level is low, the indicator light blinks slowly.
- When the batteries are dead, the indicator light turns off.

Transmitting Coil

The transmitting coil is attached to the microphone by the transmitting cable and is held securely in place by magnetic attraction between a magnet in the coil and a magnet in the implanted unit.

Note:

Your transmitting coil may look slightly different to the one shown.

Figure 3: The transmitting coil

HS8 Headset

The headset consists of:

- a transmitting coil worn over the implant
- a microphone case worn behind the ear
- a short transmitting cable to connect the transmitting coil to the microphone
- a long headset cable to connect the microphone to the SPrint speech processor
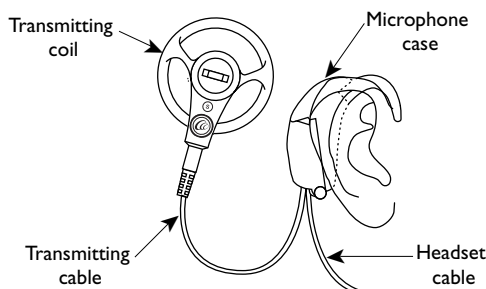
Figure 4: The HS8 headset

HS9 Headset

The HS9 headset can be used by individuals with absent or malformed outer ears who may not be able to wear the HS8 behind the ear microphone. The HS9 consists of:

- a lapel microphone that plugs into the external input socket of the SPrint speech processor
- a transmitting coil
- a cable that connects the coil to the SPrint speech processor

Cables

The HS8 headset cable, the HS8 transmitting cable and the HS9 cable are described below. The three cables come in a variety of lengths.

- The HS8 headset cable features a 4 pin female plug that attaches to the HS8 microphone and a 4 pin large female plug that attaches to the SPrint speech processor.
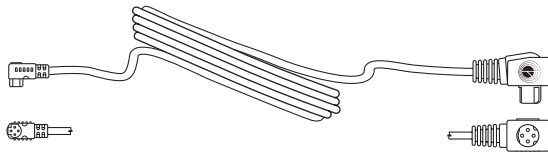
Figure 5: The HS8 headset cable

- The HS8 transmitting cable features a 4 pin female plug that attaches to the HS8 microphone and a 2 pin male plug that attaches to the transmitting coil.

Figure 6: The HS8 transmitting cable

- The HS9 cable features a 2 pin male plug that attaches to the coil and a 4 pin large female plug that attaches to the SPrint.
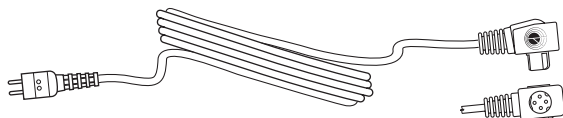
Figure 7: The HS9 cable

High Energy NiCad Charger

The High Energy NiCad Charger recharges the nickel cadmium (NiCd) batteries supplied for use with the speech processor.

The charger includes the following features:

- A charge time of six hours (overnight).
- Protection against overcharging.
- Charging of one or two NiCd batteries on separate charging and timing circuits. You may insert a battery into the second slot at any time to recharge it independently of the first.
- Lights that indicate when batteries are properly inserted and when charging is complete.

   Note:

   In some regions an alternative charger may be used. Please read instructions supplied with it for further information.

Accessories

Cochlear offers a wide range of SPrint accessories designed for different listening situations.

Lapel Microphone
The lapel microphone improves communication in noisy situations.

Telecoil
The telecoil is for use with a hearing aid compatible telephone or in a room with an induction loop system.

TV/Hi-Fi Cable
TV/Hi-Fi cable is for use with equipment that is powered from a wall outlet, particularly a TV, stereo or personal computer.

Personal Audio Cable
The personal audio cable is for use with battery powered equipment such as a personal stereo.

FM Cable
The FM cable is for use with FM listening systems.

Other accessories for the SPrint include pouches in various sizes and styles, ear hooks, lapel clips, a microphone lock, a microphone sleeve, a dry pack, a telephone adaptor, a telecoil phone positioner, monitor earphones and a signal check.

Some accessories may not be available in all regions. Please contact the Cochlear office or distributor in your region for more information.

Using the System

At the initial programming session, your clinician will help you set up your speech processor and headset using the following procedure:

1. Insert batteries into the speech processor.

2. Assemble the headset and connect it to the speech processor.

3. Fit the speech processor and headset so they are comfortable to wear.

4. Turn on the speech processor and select the appropriate program.

5. Adjust the microphone sensitivity.

6. Adjust the volume (if your clinician has enabled it).

These procedures are described in detail on the following pages.

Fitting the Speech Processor

Changing the Battery Case

The speech processor comes fitted with a two battery case. Cochlear also supplies an alternative one battery case.

With the one battery case, the speech processor is smaller but you will need to replace the battery more frequently.

To replace the battery case:

1. Grasp the body of the speech processor in your left hand.

2. Grasp the battery case with your right hand and put your right index finger in the battery case release latch.

3. Slide the release latch (A) and then slide the battery case (B) to separate it from the speech processor (C).
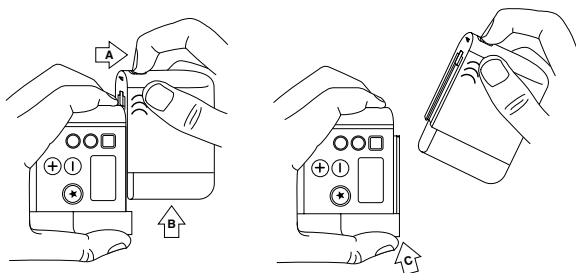
4. Slide the replacement battery case along the runner at the base of the speech processor until it clicks into position.

Inserting the batteries

Before inserting batteries into the speech processor, ensure they are fully charged (see 'Replacing and Recharging Batteries').

To insert batteries into the speech processor:

1. Put your thumbnail in the battery cover release latch. Slide the latch and pull the battery cover back. Do not attempt to remove the cover completely.

Battery cover release latch
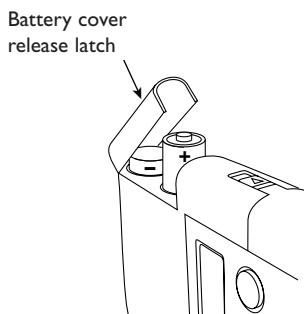
2. Slide in the new batteries in the orientation shown in the diagram on the back of the battery case.
3. Push the battery cover back into place.

Wearing the Speech Processor

You may choose to wear your speech processor in various ways:

- attached to your belt or waistband using the belt clip on the back of the speech processor
- in one of the pouches supplied by Cochlear
- in a shirt or blouse pocket
- in a cloth pocket attached to the inside of your clothing

Removing the belt clip

To remove the belt clip on the back of the speech processor, remove the battery case and slide the clip off the back of the speech processor.

Using the pouches

Three pouches are available:

- pouches for the one battery case and the two battery case that are designed to be worn on a belt or inside a pocket
- a pouch with a harness that can be worn on a child's back or chest

To fit the pouch, turn off the speech processor and remove the belt clip. Open the pouch flap and gently pull the pouch over the speech processor battery case. Slide the pouch on until you can see all the control buttons through the large opening on the front of the pouch.

To remove the pouch, open the pouch flap and push the speech processor up from the bottom until you can grip it easily. Slide off the pouch.

Fitting the Headset

Assembling the Headset

When assembling the headset, do not pull on the headset or transmitting cables – grasp only the connectors. If you have trouble assembling the headset, ask your clinician to help you.

Connecting the transmitting coil

Plug the two-pin connector on the transmitting cable into the socket in the transmitting coil.

Connecting the microphone cables

1. Hold the microphone case with one hand and put your thumbnail in the slot on the microphone cover. Remove the microphone cover by pulling it away from the microphone case.

Slot
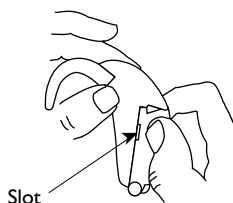
2. Plug the orange connector on the headset cable (A) into the orange socket at the bottom of the microphone case.
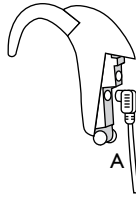
3. Plug the transmitting cable (B) into the socket at the top of the microphone case.
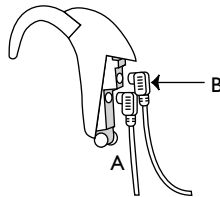
4. Slide the cover hinge over the cables and then over the plastic lip at the bottom of the microphone case. Do not force the hinge over the lip. Ensure the cables extend from the bottom of the microphone case.

5. Close the microphone cover.

Connecting the Headset to the Speech Processor

1. Turn off the speech processor.

2. Hold the speech processor with one hand and put your thumbnail in the headset cable cover release latch. Slide the latch and pull the headset cable cover back.

Headset
cable cover
release latch
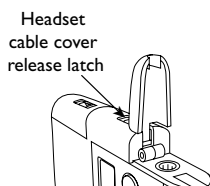
3. Plug the large end of the headset cable into the socket and lay the cable in the groove just above the socket.
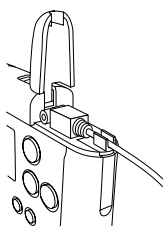
4. Hold the cable in the groove while you click the cover closed. Ensure that the cable comes through the hole at the top of the case.

When removing or fitting your cochlear implant system you may wish to disconnect the headset from the speech processor. To do this, unplug the headset cable from the speech processor. Leave the headset cable plugged into the microphone.

Wearing the Headset

Hook the microphone ear hook over your ear and place the transmitting coil over the implant.

Locking the microphone cover

Cochlear supplies a sleeve that slides over the microphone cover to prevent young children tampering with the microphone cover.

Ear hook

Microphone cover
with sleeve

Figure 8: The microphone cover with sleeve

To use the sleeve:

1. Unscrew the ear hook from the microphone.
2. Slide the sleeve over the end of the microphone.
3. Screw the ear hook back into place.

Adjusting the magnet
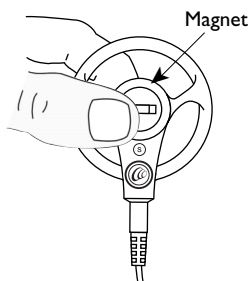
Magnet

Figure 9: Adjusting the magnet on the transmitting coil

Your clinician should adjust the magnet in the transmitting coil to a comfortable strength.

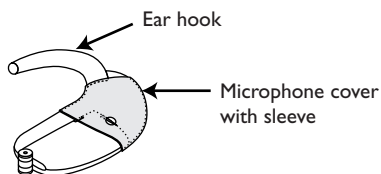To hold the transmitting coil more firmly against your head, turn the magnet in the coil clockwise. Be careful that this change does not cause skin irritation. To hold the coil less firmly against your head, turn the magnet counter-clockwise. If the magnetic force is too weak, the coil may fall off. In this instance, consult your clinician about receiving a stronger magnet. If the magnetic force is too strong, it may cause discomfort or skin irritation.

Cochlear supplies the transmitting coil with a standard strength magnet but a number of alternative strength magnets are available. Consult your clinician before choosing a magnet of a different strength. To remove the magnet, turn it counter-clockwise. Insert the replacement magnet and turn it clockwise to a stable and comfortable position.

To keep the required magnetic force to a minimum, you may occasionally need to trim or shave your hair in the area over the implant to about 6 mm or less. The patch of trimmed hair can be concealed by the rest of your hair. Ask your clinician to teach you how to do this or contact your implant centre for advice.

Alternative parts

Cochlear supplies the headset with a standard 11 cm transmitting cable, but alternative transmitting cable lengths are also available. The 20 cm and 28 cm cables enable the microphone case to be worn over the ear on the side opposite to the implant.

Cochlear supplies the headset with a 100 cm headset cable for adults and a 60 cm headset cable

for children, but shorter cables are also available.

You may wish to carry a spare headset and transmitting cable with you.

A small ear hook and a large ear hook are supplied with the headset.

Adjusting the Shape of the Ear Hook

The shape of the ear hook can be adjusted to obtain a more comfortable fit.

To adjust the shape of the ear hook, unscrew it from the microphone case and place it in hot water (at least 60°C) for 5 minutes. Remove the ear hook from the water and bend or straighten it to obtain the desired shape. Hold the ear hook in position under cold running water for 30 seconds or until it has hardened.

The process can be repeated as often as required.

Note:

Do not use a hair dryer or other source of direct heat to soften the ear hook.

Turning on the Speech Processor

Press the On/Off (🔘) button to turn on the speech processor. The speech processor takes about a second to perform its start-up checks. The LCD panel then displays the program number and the listening control settings.

Press the On/Off button again to turn off the speech processor.

Selecting a Program

Program Number
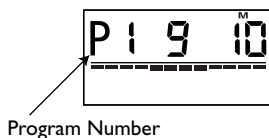
Figure 10: The LCD Panel

The speech processor can store up to four speech processing programs at any one time, enabling your clinician to develop programs for different listening environments.

The speech processor labels the programs from P1 to P4 and displays the current program number on the LCD panel.

To change to the next program in the sequence, press the Program button (🔘). If a program is not installed, the speech processor skips to the next available program. The speech processor retains the current program setting until you press the Program button again, even if you turn off the speech processor.

Adjusting the Listening Controls

The speech processor features both a microphone sensitivity and a volume control.

- The microphone sensitivity controls the softest level of sound picked up by the microphone.

  Reduce the microphone sensitivity to filter out background noise. Increase the sensitivity in quiet environments to hear very soft sounds.

- The volume controls your perception of loudness.

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

Your clinician may choose to disable your volume control. If both the microphone sensitivity and the volume controls are available, press the Select (◎) button to alternate between them. The LCD panel displays the active control.

Adjusting the Microphone Sensitivity

Microphone sensitivity

P1 9 10

Segment meter
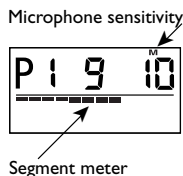
If you use the microphone sensitivity control, the speech processor displays a small 'M' at the top of the LCD panel. Underneath, the LCD panel displays the microphone sensitivity as a number between 0 and 20. For normal conversation, you would typically set the sensitivity to approximately 8.

The speech processor also displays the signal level picked up by the microphone in a 12 segment meter. The meter fluctuates according to the level of sound received, with 12 being the highest level and 0 the lowest level.

To adjust microphone sensitivity:

Press the Select (◎) button until the 'M' symbol appears on the LCD panel.

- To increase the microphone sensitivity, press the Up (⊕) button.

- To decrease the microphone sensitivity, press the Down (⊖) button.

If you need to set the microphone sensitivity consistently higher than 10, consult your clinician.

The microphone sensitivity setting is saved with the current program. If you select another program, the microphone sensitivity will change to the setting saved with that program.

Using Autosensitivity

When autosensitivity is turned on, the microphone sensitivity will decrease automatically in a noisy environment. To activate autosensitivity press the autosensitivity button (◉). When autosensitivity is on, the speech processor displays the letter 'A' on the LCD panel.

Autosensitivity on

P1 9A 10

Adjusting the Volume

Volume

P1 9 10
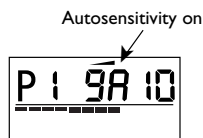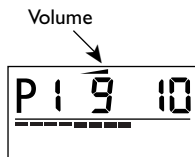
If you use the volume control, the speech processor displays a small triangle at the top of the LCD panel. Underneath, the LCD panel displays the volume as a number between 0 and 9.

To adjust the volume:

1. Press the Select (◎) button until the volume symbol appears on the LCD panel.

2. Adjust the volume to a comfortable listening level.

3. To increase the volume, press the Up (⊕) button.

4. To decrease the volume, press the Down (⊖) button.

If you are adjusting the volume setting often, or if adjusting the volume causes you discomfort, consult your clinician as your programs may need adjustment.

The volume setting is saved with the current program. If you select another program, the volume will change to the setting saved with that program.

Changing Speech Processor Settings

The speech processor has three features that your clinician may enable during programming. They are:

Button lock
The button lock (🔒)disables the buttons on the speech processor including the On/Off button (🔘). Use the button lock to prevent young children from tampering with the controls.

Personal alarm
The personal alarm (📢) informs users when certain speech processor functions are used and when the battery is low.

Public alarm
The public alarm (🔔) informs bystanders when certain speech processor functions are used. It may help parents and teachers assist a young child in using their speech processor, especially a child who does not reliably report dead batteries.

The LCD panel normally displays a symbol for each feature that you have enabled. For example, the diagram shows the LCD display when you have enabled all three features.
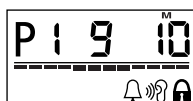
Button Lock

To lock the buttons, press and hold down the
Select Button (⦾) for several seconds until the
button lock symbol (🔒) appears on the LCD panel
and you hear a long beep.

```
 P I  9   ᴹ
        I0
 ‗‗‗‗‗‗‗‗‗
          🔒
```
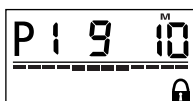
When the buttons are locked, the On/Off button
(⦿) has no effect. To turn off the speech
processor, you need to unlock the buttons first. To
unlock the buttons, press and hold down the Select
button (⦾) until the button lock symbol (🔒)
disappears from the LCD panel and you hear a
long beep.

```
 P I  9   ᴹ
        I0
 ‗‗‗‗‗‗‗‗‗
```
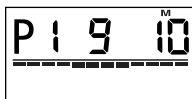
Personal Alarm

The personal alarm has five types of signal:

Lock or reset (1 beep)

Each time the buttons are locked or unlocked, or a
reset operation is performed, the speech processor
emits one long beep.

Program button (pings)

Each time the Program button is pressed, the
speech processor emits a series of pings

corresponding to the program number, that is,
1 ping = P1, 2 pings = P2, etc.

Other buttons (1 ping)

The speech processor emits a single ping each time
you press the Up, Down, Options, Autosensitivity
or Select buttons.

Low battery power (4 pings)

The speech processor emits four short pings every
minute when the batteries are nearly dead.

Invalid button press (1 ping)

If you press a button inappropriately, the speech
processor emits a lower-pitched ping. The settings
remain unchanged.

Public Alarm

The public alarm has five signals that work the
same way as the corresponding signals for the
personal alarm.

To access the personal and/or public alarm insert a
pointed object, such as a pen tip, into the Options
button hole.

Insert a pointed object into the Options button hole
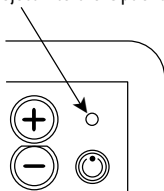
Press down repeatedly to cycle through the
following options as shown in the diagram below:

1. Public and personal alarms off.

2. Public alarm on (🔔).

3. Personal alarm on (🔊).

4. Public and personal alarms on (🔔🔊).

Stop pressing the Options button when the LCD
panel displays the symbol(s) corresponding to the
desired feature.
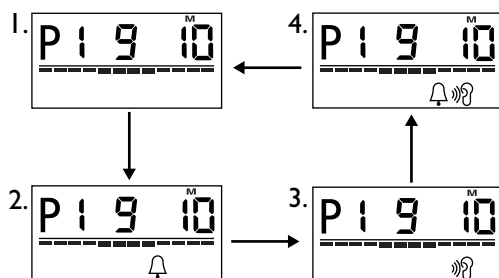
Resetting the Speech Processor

To return the speech processor to the settings
programmed by your clinician:

1. Turn off the speech processor.

2. Hold down the Program button (⊛) while
    turning the speech processor back on.

The speech processor emits a long beep (if either
the public or personal alarm is enabled) and
returns to its default settings.

Replacing and Recharging Batteries

The speech processor is powered by one or two AA batteries. Cochlear recommends using only high energy rechargeable batteries or high quality disposable alkaline batteries.

Caution:

Carry spare batteries in a closed plastic bag. Otherwise the batteries may short circuit on loose metal objects and burn you.

Using NiCd Batteries

Cochlear recommends using NiCd batteries rated at least 1000 mAh. Batteries rated at less than 1000 mAh may not provide satisfactory longevity.

For optimal use of NiCd batteries:

• Do not mix fully charged batteries with partly charged batteries.

• Replace the batteries only when the LCD panel displays the low battery symbol. See 'Checking the Battery Condition'.

NiCd batteries have a fairly high self-discharge rate. Over several weeks, a fully charged battery will slowly discharge, even if it is not used. With your speech processor Cochlear supplies NiCd batteries, which may have discharged by the time you receive them. Recharge the batteries before using them in your speech processor.

When used correctly, NiCd batteries last for approximately 300 charge/discharge cycles. When their longevity starts to decrease, dispose of the NiCd batteries appropriately.

Using NiMH batteries

For best use of NiMH batteries:

• Do not mix fully charged batteries with partly charged batteries.
• Do not recharge high energy NiMH batteries in the High Energy NiCad Charger supplied by Cochlear or any other NiCad charger.
• Use a charger specifically designed for NiMH batteries.

Using Alkaline Batteries

For best use of alkaline batteries:

• Do not recharge disposable alkaline batteries.

• Do not mix new and partially used batteries.

Checking the Battery Condition

When the batteries get low, the red indicator light on the top of the speech processor blinks and the LCD panel flashes the low battery symbol. If the personal or public alarms are on, the speech processor emits four 'pings' every minute until the batteries are dead.

When the batteries are dead, the speech processor stops operating. The red indicator light goes out and the LCD panel displays only the low battery symbol.
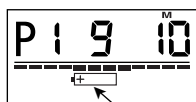
Low battery symbol

Replacing the Batteries

To replace the batteries:

1. Turn off the speech processor.

2. Put your thumbnail in the battery cover release latch. Slide the latch and pull the battery cover back. Do not attempt to remove the cover completely.

Battery cover release hatch
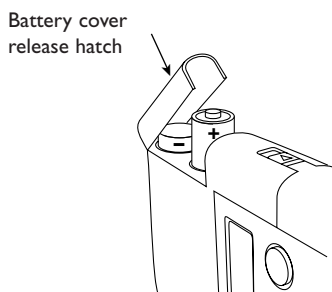
3. Remove the old batteries.
    If the batteries are rechargeable, recharge them in the battery charger. If they are disposable, dispose of them appropriately.

4. Slide in the new batteries.

    *   In the two battery case, insert the upper battery (nearest the display panel) with the positive (+) terminal pointing to the open end. Insert the lower battery with the negative (–) terminal pointing to the open end.

    *   In the one battery case, insert the battery with the positive (+) terminal pointing to the open end.

5. Push the battery cover back into place with your thumb.

Do not leave dead batteries in the speech processor as they may leak corrosive fluids and seriously damage the speech processor.

Recharging NiCd Batteries

Cochlear supplies a High Energy NiCad Charger to recharge high energy AA size NiCd batteries.

Caution:

Do not recharge carbon, zinc, alkaline (including rechargeable alkaline), NiMH or lithium batteries in the High Energy NiCad Charger.

Setting the Adaptor Configuration

The battery charger has an AC adaptor suitable for a wall outlet (AC power supply).

If you have a universal adaptor:

1. Set the adaptor to 6 V DC output.

2. Choose the correct adaptor plug.

3. Set the polarity as shown on the charger's label (that is, negative inside, positive outside).

Caution:

Ensure you set the adaptor output correctly or it may damage the charger.

Charging a NiCd Battery

1. Connect the adaptor to the charger. Plug the adaptor into an AC outlet and turn on the power.

2. Insert the battery so that the polarity of the battery matches the polarity of the charger slot, positive (+) to positive, negative (–) to negative.

AC adaptor
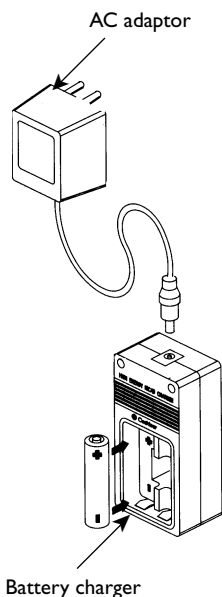
Battery charger

The indicator light above the slot turns red
when you insert the battery with the correct
polarity. If you insert the battery incorrectly, the
indicator light may flicker but it will not stay on
and the battery will not charge. However, you
will not damage the battery or the charger.

3. After approximately six hours, the indicator
   light turns green, indicating the battery is fully
   charged. Remove the battery from the slot when
   ready to use.

   If you leave the battery in the charger, it is kept
   fully charged by trickle charging. It will not be
   damaged or overcharged.

For best use of the battery charger:

1. If a power failure interrupts the charging, remove and reinsert the battery to reactivate the timing circuit.

2. Do not overcharge the batteries, as it will reduce their life. Overcharging may occur if you move the battery while in its charger slot. The charger may restart the charge cycle and overcharge the battery.

3. Use the charger indoors only.

    Note:

    In some regions an alternative charger may be used. Please read instructions supplied with it for further information.

Connecting External Devices to the Speech Processor

The speech processor can accept signals directly from external sources through the external input socket. The socket may be used to connect to:

*   lapel microphone

*   telephone adaptor

*   telecoil

*   TV/Hi-Fi cable (TV1)

*   personal audio cable (WALK1)

*   FM cable
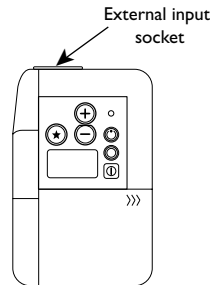
Figure 11: External input socket

Note:

Connect the personal audio cable only to equipment powered by batteries. To connect the speech processor to AC powered equipment (i.e. equipment connected to a wall outlet) use the TV/Hi-Fi cable.

When you connect a lapel microphone, telecoil or telephone adaptor to the external input socket, the speech processor turns off the headset microphone and processes signals only from the external input socket.

If you connect any other Cochlear device to the external input socket, the speech processor mixes the external signal with environmental sound received from the headset microphone. Adjust the microphone sensitivity to control the level of environmental sound received from the headset microphone.

To prevent damage to the external input socket:

• keep the rubber flap in place when the socket is not in use

• teach children not to put anything in the socket

Using the Accessories

Using the Lapel Microphone

The lapel microphone can improve communication in noisy environments. Contact your clinician for the best program settings in these conditions.

1. Plug the lapel microphone into the speech processor external input socket.

2. Select microphone sensitivity on the speech processor. Adjust the microphone sensitivity to suit the loudness of the speaker and the environmental noise.

When talking to one person, try clipping the microphone to their clothing. When talking in a small group, either pass the microphone from speaker to speaker or place the microphone on the table. If you pass the microphone around, hold it no more than 10 cm from the speaker and point it toward the speaker's mouth.

Securing the Headset Cable

You can use the lapel clip to hold the headset cable to your clothes.

1. Remove the small rubber ring from the lapel clip.

2. Place the cable in the clip as shown and attach the clip to your clothing
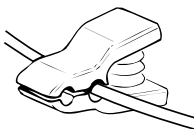
3. Keep the rubber band (and spare band) in a safe place for future use.

You can attach the headset cable securely in one position.

1. Remove the rubber band from the lapel clip.

2. Thread the cable through the rubber band and reattach the rubber band to the lapel clip.
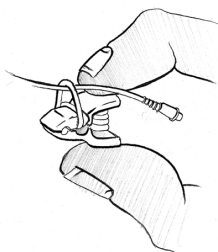
3. Loop the rubber band twice around the inner slot of the lapel clip.

4. Gently pull the cable through the jaws of the clip to fit in the same slot as the rubber band.
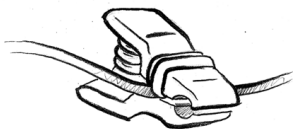
4. Attach the clip to your clothing

You can move the cable through the clip by opening the jaws and gently pulling the cable through its slot. You can then attach the clip to a convenient place on your clothing.

Securing the Headset Microphone

The microphone lock (mic lock) is used to anchor the microphone case over the external ear.

1. With the tubing pointing down, hook the two claws of the mic lock plastic clamp into the holes on each side of the microphone case.

2. Hook the microphone case over the ear and pass the tubing under the ear lobe and up to the ear hook.

3. Measure the length of tubing required to fit under the ear lobe allowing for 5 mm of tubing to be fitted over the ear hook itself.

4. Remove the microphone and mic lock from the ear and cut the tubing at the measured point.
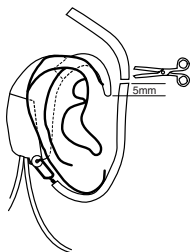
5. Slide the cut end of the tubing 5 mm over the ear hook.

6. Hook the microphone case complete with mic lock over the ear and secure the tubing under the ear lobe. Place the transmitting coil in position over the implant.
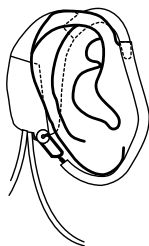
Listening on the Telephone

Telephone Adaptor

The Nucleus® telephone adaptor (for body worn processors) is used to provide a direct connection from the telephone to your SPrint for the Nucleus cochlear implant system.

Note:

The telephone adaptor may not be available in your region due to variations in telephone systems. Contact your clinician or your nearest Cochlear office for further information.

Compatibility

The Nucleus telephone adaptor is compatible with telephones that have a detachable handset cord with a four way modular plug.
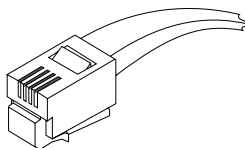
Figure 12: Four way modular plug

The Nucleus telephone adaptor is not compatible with:

*   mobile telephones

*   cordless telephones

*   telephones without detachable handset cords

*   telephones without four way modular plugs on the handset cord

Installing your telephone adaptor
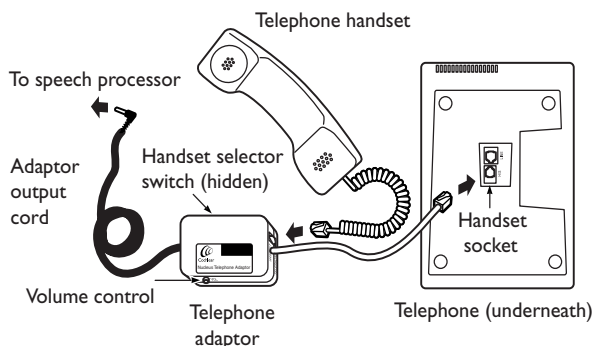
Figure 13: Installing the telephone adaptor

1. Unplug the telephone handset cord from the telephone.

2. Plug the adaptor telephone cord into the telephone handset socket.The position of the handset socket depends on the make of the telephone. It may be located at the rear of the telephone, on the side of the telephone or underneath the telephone.

3. Plug the telephone handset cord into the handset socket of the adaptor.

4. Check the telephone handset is operating normally by listening for the dial tone. This can be done by placing the earpiece of the telephone handset next to your headset microphone. Otherwise have a hearing person check this for you.

5. Plug the adaptor output cord into the external input socket of the SPrint speech processor.

6. Set the handset selector switch on the telephone adaptor to the appropriate position. This can be

checked by lifting the telephone handset and listening for the dial tone through your cochlear implant.

7. Try position 1 first. If this does not work, try position 2. If neither position works, contact your clinician.

8. Adjust the volume control on the telephone adaptor, using a screwdriver to achieve a suitable volume. Future adjustment should not be necessary once you have done this.

9. The self-adhesive strip can be used to anchor the adaptor to any convenient flat surface if required.

Using your telephone adaptor

Plug the adaptor output cord into the external input socket of the SPrint. The microphone in your headset no longer remains on once you connect your SPrint speech processor to the telephone adaptor. Therefore, you will not perceive any environmental sounds once you have connected your speech processor to the telephone adaptor.

When you have completed the call, unplug the adaptor output cord from your SPrint.

The telephone can be used by a hearing person while the adaptor is connected.

> **Caution:**
>
> Do not use the telephone during a thunderstorm as there is a small chance that the telephone can be a source of electric shock.

Your telephone service provider may be able to provide you with information about whether it is possible to use the telephone during a storm in the event of an emergency. When you receive your telephone adaptor, please check in your telephone directory or contact your telephone service provider to obtain this information.

Note:

For troubleshooting and cleaning your Nucleus telephone adaptor, refer to your Telephone Adaptor User Guide.

Using the Telecoil

Using the telecoil with a hearing aid compatible telephone which has been fitted with an induction loop in the handset (in many countries telephones have an induction loop built into the handset):

1. Set the microphone sensitivity button on the SPrint to 0.

2. Plug the telecoil into the external input socket on the SPrint.
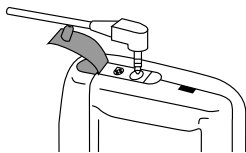
3. Place the telecoil on or over the earpiece of the telephone handset.

4. Increase the microphone sensitivity button to the desired level.

5. If a clear signal is not received, reposition the telecoil on the handset to improve the clarity.

Using the telecoil in an induction loop environment:

1. Set the microphone sensitivity button on the SPrint to 0.

2. Plug the telecoil into the external input socket on the SPrint.

3. Attach the telecoil to your clothing using the m-clip, so that it is in a vertical position to pick up the induction field.

4. Increase the microphone sensitivity button to the desired level (you may need to tilt the telecoil slightly to obtain the best sound).

Using the telecoil phone positioner

The telecoil phone positioner can be used to hold the telecoil on or over the earpiece of the telephone handset. The telecoil can be placed either on the outside or inside of the earpiece of the handset. In addition, the telecoil can be placed in a vertical or horizontal position to obtain the best reception.
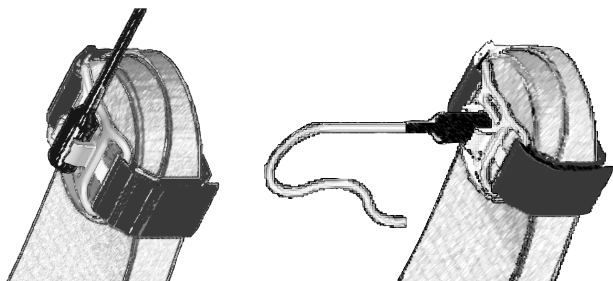
Figure 14: Placing the telecoil in the telecoil phone positioner

FM Cable: SPrint

A Cochlear FM cable is used to transfer audio signals from a commercially available FM system to the SPrint. There are a variety of FM cables available to suit different systems. The table below indicates the correct FM cable for each compatible system.

FM System	Transmitter	Receiver	FM Cable
Phonic Ear Easy Listener	PE300T	PE300R	FM 2
Phonic Ear	PE300T	PE350R	FM 2
Phonic Ear Easy Listener	PE300T	PE300R	FM 7
Phonic Ear	PE300T	PE350R	FM 7
Phonic Ear	PE481T	PE475R	FM 10
Telex	TW5	TDR7	FM 10
Connevans	CRM200	CRM200	FM 12
Phonic Ear	PE441T	PE445R	FM 12
Phonic Ear	PE471T	PE475R	FM 13
Phonak	Microvox	Microvox (with com 1 output module)	FM 14
Sennheiser Mikroport	SK2013PLL	EK2013PLL	FM 15
Comtek	M72	PR72B	FM 16
Audiological Eng. Corp.	Williams TX	Chorus Rx	FM 17
Panasonic	WX-1600	RD-544/12	FM 18
Phonic Ear	PE461T	PE 461 R	FM 19
Phonic Ear (Solaris)	PE571T	PE575	FM 19

Table 1: FM cable: SPrint

To connect an FM cable to your SPrint, follow the steps below.

1. Check that the FM system is working. To do this, connect earphones to the FM receiver and ask someone to listen while the FM transmitter is operating. Speech should be clear and background noise minimal.

2. Set the SPrint sensitivity to 0. Switch the processor and the FM receiver off.

3. Set the volume of the FM receiver to the minimum setting, unless it is locked or taped in a preset position.

4. Adjust the tone and volume controls for the FM receiver to the settings recommended by your audiologist.

   Note:

   Your audiologist may adjust the controls for you. Once they are set, it is not recommended they be changed without consulting your audiologist.

5. Insert the FM cable connector marked with the FM number into the FM receiver audio output or headphone socket.

6. Insert the connector marked 'COCHLEAR' into the SPrint external input socket.

7. Switch the speech processor on.

8. Switch the FM transmitter on.

9. Switch the FM receiver on.

10. Adjust the volume of the FM system to the setting recommended by your audiologist, unless already preset. It is not advisable to set the processor's sensitivity and the FM volume to their maximum setting.

11. Adjust the sensitivity of the SPrint to control the level of environmental sound.

12. To listen to the FM system only, set the sensitivity of the SPrint to 0.

13. The microphone in your headset remains on and you may perceive some environmental sounds. Adjust the microphone sensitivity to alter the balance between the environmental sound and the audio equipment.

- To hear more environmental sound and less from the audio equipment, press the Up (⊕) button.

- To hear less environmental sound and more from the audio equipment, press the Down (⊖) button.

Listening to the TV, Hi-Fi or Personal Computer

The TV/Hi-Fi cable can be used to connect a TV, stereo or personal computer (PC) to the speech processor.

Caution:

Do not plug your speech processor directly into a TV, stereo or PC without using the TV/Hi-Fi cable. The cable has electrical isolation to protect you from electrical shock.

A 5.5 m cable connects the TV, stereo, or PC to the speech processor.

To connect the TV/Hi-Fi cable:

1. Turn off the speech processor and the external audio equipment.

2. Plug the cable connector marked 'COCHLEAR' into the speech processor external input socket as shown.

Volume control knob
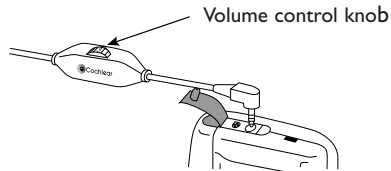
3. Plug the cable connector marked 'TV1' into the output socket on your audio equipment.

4. Turn on the speech processor and select the appropriate program. Contact your clinician for advice on which program settings to use with your audio equipment.

5. Adjust the volume of your audio equipment using the control knob on the TV/Hi-Fi cable, near the speech processor.

• On position 1 the volume is very low and few sounds are picked up from the audio equipment.

• On position 5 the maximum volume is picked up from the audio equipment.

6. The microphone in your headset remains on and you may perceive some environmental sounds. Adjust the microphone sensitivity to alter the balance between the environmental sound and the audio equipment.

• To hear more environmental sound and less from the audio equipment, press the Up (⊕) button.

- To hear less environmental sound and more from the audio equipment, press the Down (⊖) button.

Note:

Like other consumer electrical and communication equipment, devices which connect your speech processor to AC powered equipment (equipment connected to a wall outlet), such as the TV/Hi-Fi cable or telephone adaptor, should not be used during electrical storms.

Personal Audio Cable

The personal audio cable (WALK 1) can be used to connect battery powered equipment, such as a personal stereo, to the speech processor. The personal audio cable should not be connected to mains powered equipment, for example TV, stereo or PC. It does not have a volume control, so you may have to adjust microphone sensitivity or volume control on the personal stereo until a comfortable level is reached.

To connect the personal audio cable:
1. Turn off the speech processor and the personal stereo.
2. Plug the cable connector marked 'COCHLEAR' into the speech processor external input socket.

3. Plug the cable connector labelled 'WALK 1' into the output socket on your personal stereo.
4. Turn the speech processor on and select the appropriate program.
5. The microphone in your headset remains on and you may perceive some environmental sounds. Adjust the microphone sensitivity on the speech processor and the volume on the external equipment to alter the balance between the environmental sound and the personal stereo.

   • To hear more environmental sound and less from the audio equipment, press the Up (⊕) button.

   • To hear less environmental sound and more from the studio equipment, press the Down (⊖) button.
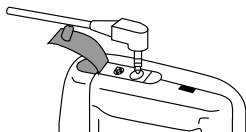
Monitoring the Speech Processor

The monitor earphones can be used by a hearing person to check that sound is being received by the SPrint microphone. They are particularly useful for detecting the microphone input of a child's SPrint.

The monitor earphones can help to:

• assess whether the balance between the sounds received by the headset microphone and an FM receiver is appropriate

• identify any microphone distortions
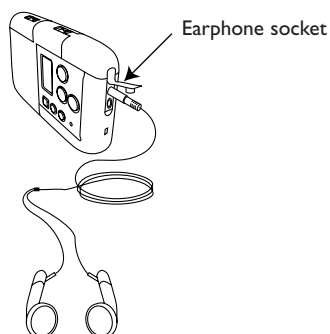
Figure 15: Connecting the monitor earphones

To use the monitor earphones:

1. Leave the SPrint turned on.

2. Align the earphone connector with the earphone socket and insert the connector. Do not use excessive force. The sound you hear is the sound received by the microphone before it is processed by the speech processor.

3. Adjust the microphone sensitivity and volume to the desired levels. If the sounds you hear are distorted, contact your clinician or Cochlear for advice.

Note:

The monitor earphones are used to detect an input from the microphone, not to assess the quality of the signal that will be heard by the recipients.

Checking the Transmitting Coil

The signal check can be used to check that the transmitting coil is sending a signal across the skin to the implant. It is particularly useful for checking the transmitting coil and cable of a child's SPrint.
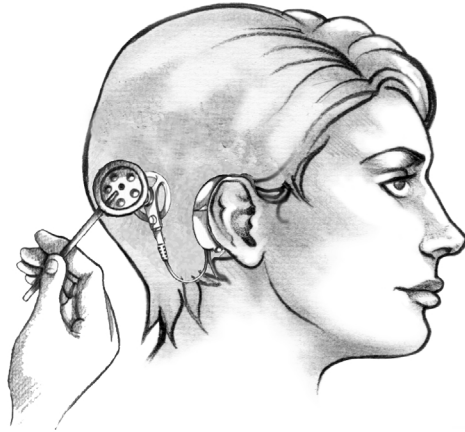
To use the signal check another person is required.

1. Leave the speech processor on the head and select the normal program settings.
2. Place the signal check over the transmitting coil.

3. If the system is functioning, the red light in the centre of the signal check will illuminate.
4. If the red light does not illuminate, perform the following steps until the problem is identified.

   • Change the headset cable. Hold the signal check over the transmitting coil and speak into the microphone. If the signal check light illuminates with incoming sound, then the original headset cable is faulty.

- If the signal check still does not illuminate, change the transmitting cable. Hold the signal check over the transmitting coil and speak into the microphone. If the signal check light illuminates with incoming sound, then the original transmitting cable is faulty.

5. If the signal check still does not illuminate, plug the lapel microphone into the speech processor external input socket, thereby disconnecting the headset microphone. Align and hold the signal check over the transmitting coil. If the signal check light illuminates with incoming sound, then the problem is in the headset microphone and you should contact your implant centre.

Caring for the System

Storing the SPrint™ Speech Processor

When you are not using your SPrint™ speech processor, store it in the storage case provided. Loosely wrap the headset and cables, tuck them into the pouch in the lid of the storage box and place the speech processor in the box.

For long term storage, remove the batteries from the battery case.

Keeping the SPrint Speech Processor Clean

Avoid getting sand or dirt into any part of the system. If you do, shake out as much sand or dirt as possible. If necessary, contact your implant centre or Cochlear to arrange repair.

To clean external parts of the system, wipe gently with a cloth slightly dampened with mild detergent. Regular cleaning prevents dirt building up.

Clean the pouch by hand washing it in cold water and mild detergent. Ensure it is completely dry before use.

Keeping the SPrint Speech Processor Dry

If you live in a humid environment, or perspire heavily, excess moisture may get into the speech processor or headset. Use the dry pack supplied with your speech processor to remove excess moisture. Do not wear any external part of your SPrint speech processor while bathing or swimming.

To remove excess moisture from the speech processor and headset:

1. Remove the batteries from the speech processor.
2. Place the speech processor, headset and dry pack into the pouch provided.
3. Roll down the top of the pouch provided and snap it shut.
4. Leave the pouch overnight. The dry pack will absorb excess moisture in that time.

The effective life of a dry pack depends on the relative humidity of the environment. To reuse the dry pack, follow the instructions included with it.

You can also buy a suitable dry pack from a pharmacy or electronics store.

Caution:

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

If you drop your speech processor into water, take the following steps to minimise damage:

- Remove the battery case immediately.
- Return the speech processor and battery case to Cochlear or your implant centre for repair.

Cochlear cannot guarantee that they will be able to repair any water-damaged part.

Troubleshooting

Diagnostic Tests

There are some tests that you can perform to identify faults.

Testing RF transmission

To check that the speech processor is transmitting sounds to the cochlear implant, turn on the speech processor and place the transmitting coil over the back of the speech processor as shown.

Transmitting coil

Back of SPrint speech processor
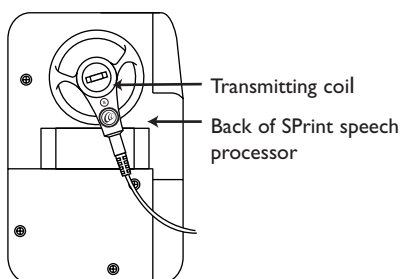
The LCD panel displays the RF test coil symbol ((⟨⟨•⟩⟩)) if your speech processor is transmitting.

Headset function check

1. Turn on the speech processor and ensure the coil is directly over the cochlear implant.

2. Set the microphone sensitivity to 10. Speak normally into the headset microphone.

   If the segment meter responds to speech, then the headset and its connection to the speech processor are functioning correctly.

3. If the segment meter does not respond to speech, replace the headset cable with a spare cable and check the segment meter in response to speech.

4. If the segment meter still does not respond to speech, replace the transmitting cable with a spare cable and check the meter in response to speech.

5. If the segment meter still does not respond to speech, connect the lapel microphone to the speech processor external input socket and check the meter in response to speech.

If you still have a problem, contact your implant centre.

Symptoms

### The Read Manual (⚠) and Service Required (⌐) symbols are displayed
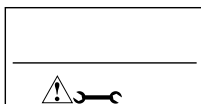
If the LCD panel displays the Read Manual and Service Required symbols together, the current speech processor program is faulty. Turn the speech

processor off and then on again.

If another program is available, the speech processor automatically selects it and continues to work normally. If no other program is available, the speech processor stops working but continues to display the Read Manual and Service Required symbols. Return the speech processor to your clinician for testing.

The LCD panel displays the low battery (⊞▭) symbol
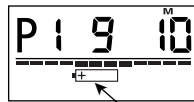
Low battery symbol

If the LCD panel displays the Low Battery symbol:

1. Check that the batteries are inserted correctly.

2. If the Low Battery symbol still appears, replace the batteries.

If you have the personal alarm enabled, it will sound four short pings each minute when the batteries in your speech processor are nearly dead. Replace the batteries immediately.

I don't hear anything
I only hear sounds intermittently
Check the display panel troubleshooting symbols and functioning of the headset as described below:

1. Turn on the speech processor.

2. Ensure the headset is properly connected.

3. Check the headset function. See 'Headset Function Check'.

4. Check the RF transmission. See 'Testing RF Transmission'.

If the RF Test symbol does not appear, inform your implant centre that the speech processor failed the transmission test.

Speech sounds unclear to me
Speech sounds too soft /too noisy

Soft speech and loud background noise are the two main factors that may influence your ability to understand speech in a particular environment.

If background noise is too loud, turn the autosensitivity on.

If this does not help, turn the autosensitivity off and:

1. Check that the headset transmitting coil is in place.

2. Check the segment meter.

  • If the meter displays less than five segments, the speaker may be too soft. Check the meter while you speak. If the meter works normally when you speak, and the environment is quiet, turn up the microphone sensitivity. Otherwise, ask the other speaker to talk more loudly.

  • If the meter consistently displays more than eight segments, try to locate and remove sources of background noise. Try turning the microphone sensitivity down so that the segment meter displays between five and eight segments.

```
┌─────────────────┐
│  P I  9    10   │
│  ▬▬▬▬▬▬▬        │
└─────────────────┘
         │   │
         ↕   ↕
```

Normal range
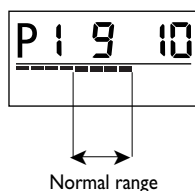
3. After adjusting the sensitivity, you may need to adjust the volume, if enabled. If loud sounds are uncomfortably loud, turn down the volume. If speech, including your own voice, is too soft, try turning up the volume.

If you still have a problem after trying these solutions, you and the speaker may need to move to a quiet room. Sometimes individual room acoustics and background noise cause problems that cannot be resolved.

In addition, other factors not related to the performance of the speech processor may influence your ability to understand speech in a particular situation. For example:

• interference from tinnitus (head noises)

• loss of concentration due to illness or fatigue

• quick changes of topic in conversation

• difficulty in lipreading the speaker, due to poor position of the speaker or poor lighting

If you find that you still have problems, contact your implant centre for assistance.

Sounds are uncomfortably loud
If turning down the volume has no effect, remove your headset, turn off the speech processor and consult your clinician.

Intermittent buzzing sounds

You may occasionally perceive intermittent buzzing or distorted speech. Electromagnetic interference (EMI) may temporarily affect the operation of your speech processor and transmitting cables.

Electromagnetic fields of different strengths are produced by almost all types of electronic devices. The headset cables, like antennae, pick up environmental electromagnetic fields. The speech processor attempts to process these signals as environmental sounds. The EMI will be no louder than your programmed comfort levels and will not hurt you or damage your speech processor.

Common sources of EMI include:

• radio transmission towers

• mobile phone towers

• TV transmission towers

• shopping centre security systems

• airport security systems

• some digital mobile telephones

However other electronic devices that are sources of EMI may not be readily visible. If you hear intermittent buzzing or distorted speech, look for electronic equipment that may be a source of EMI and move away from it. If you still hear buzzing or distorted speech, turn off your speech processor, remove your transmitting coil and consult your clinician.

The cochlear implant has been carefully designed to protect users from most sources of EMI. The

cochlear implant cannot be affected by EMI and cannot send unprocessed electrical signals to the electrode array.

Battery charger will not charge batteries
If the charge light does not turn on when you insert batteries into the battery charger:

1. Check that the batteries are not already charged.
2. Remove and reinsert the batteries to ensure they are properly connected.
3. Ensure the charger is switched on.

If the charger still does not work, return it to Cochlear for repair. Do not attempt to repair it yourself.

> **Note:**
> In some regions an alternative charger may be used. Please read instructions supplied with it for further information.

Warnings and Precautions

This section describes the warnings and precautions that apply to your cochlear implant system. Read this section carefully to ensure that you understand the care of your system.

Discuss these warnings and precautions with your physician before undergoing any major medical procedure.

Warnings

Medical Treatments Generating Induced Currents

Some medical treatments generate induced currents that may cause tissue damage or permanent damage to the cochlear implant. Warnings for specific treatments are given below.

- **Electrosurgery:** Electrosurgical instruments are capable of inducing radio frequency currents that could flow through the electrode array. **Monopolar** electrosurgical instruments must **not** be used on the head or neck of a cochlear implant patient as induced currents could cause

damage to cochlear tissues or permanent damage to the implant. **Bipolar** electrosurgical instruments may be used on the head and neck of patients. However, the cautery electrodes must not contact the implant and should be kept more than 1 cm from the extracochlear electrodes

- **Diathermy or Neurostimulation:** Do not use diathermy or neurostimulation directly over the cochlear implant. High currents induced into the electrode lead can cause tissue damage to the cochlea or permanent damage to the implant.

- **Electroconvulsive Therapy:** Do not use electroconvulsive therapy on a cochlear implant patient under any circumstances. Electroconvulsive therapy may cause tissue damage to the cochlea or damage to the cochlear implant.

Ionizing Radiation Therapy

Do not use this therapy directly over the cochlear implant because it may cause damage to the implant.

Magnetic Resonance Imaging (MRI)

Magnetic Resonance Imaging (MRI) is contraindicated except under the circumstances described below. Do not allow a patient with a cochlear implant to be in a room where an MRI scanner is located except under the following special circumstances.

The Nucleus cochlear implant is now designed with a removable magnet and specific

characteristics to enable it to withstand MRI up to 1.5 tesla. However, many Nucleus® 22 cochlear implants do not have a removable magnet. For patients with one of these implants MRI is contraindicated and they should not be allowed to enter a room where an MRI scanner is located.

To check that the patient has a Nucleus cochlear implant with a removable magnet, the physician should use an X-ray to check the radiopaque lettering on the implant. There are three platinum letters printed on each implant. If the middle letter is a 'C', 'H', 'J', 'L', 'P' or 'T' the implant has a removable magnet.

If a removable cochlear implant magnet is in place, it must be removed surgically before the patient undergoes an MRI procedure as tissue damage may occur if the recipient is exposed to MRI. Once the magnet has been removed, MRI can be performed. The patient must take off the speech processor and headset before entering a room where an MRI scanner is located.

Once the magnet is surgically removed, the quality of MRI will be affected by the metal in the cochlear implant. Image shadowing may extend as far as 6 cm from the implant, thereby resulting in loss of diagnostic information in the vicinity of the implant.

If you require additional information about removal of magnet, please contact Cochlear.

Loss of Residual Hearing

Insertion of the electrode into the cochlea will result in complete loss of residual hearing in the implanted ear.

Long-term Effects of Electrical Stimulation by the Cochlear Implant

Most patients can benefit from electrical stimulation levels that are considered safe, based on animal experimental data. For some patients, the levels needed to produce the loudest sounds exceed these levels. The long-term effects of such stimulation in humans are unknown.

Ingestion of Small Parts

Parents and caregivers should be counselled that the external implant system contains small parts which may be hazardous if swallowed.

Head Trauma

A blow to the head in the area of the cochlear implant may damage the implant and result in its failure. Young children who are developing their motor skills are at greater risk to receive an impact to the head from hard objects (e.g. a table or chair).

Precautions

If you experience a significant change in performance or the sound becomes uncomfortable, turn off your speech processor and contact your implant centre.

Use the cochlear implant system only with the approved devices and accessories listed in this manual.

The speech processor and other parts of the system contain complex electronic parts. These parts are

durable but must be treated with care. The speech processor must not be opened by anyone other than Cochlear's qualified service personnel or the warranty will be invalidated.

Each speech processor is programmed specifically for each individual. Never wear another person's speech processor or lend yours to another user. Using another person's speech processor may result in uncomfortably loud or distorted sounds.

Do not operate the speech processor at temperatures above 40°C or less than 5°C.

Do not store the speech processor at temperatures above 50°C or less than -20°C.

Store, transport or operate the speech processor at relative humidity between 0% to 90%.

The speech processor sound quality may be intermittently distorted when you are within approximately 1½ km of a radio or television transmission tower. The effect is temporary and will not damage the speech processor.

Theft and Metal Detection Systems

Devices such as airport metal detectors and commercial theft detection systems produce strong electromagnetic fields. Some cochlear implant recipients may experience a distorted sound sensation when passing through or near one of these devices. To avoid this, turn off the speech processor when in the vicinity of one of these devices.

The materials used in the cochlear implant also may activate metal detection systems. For this

reason, recipients should carry the Cochlear Implant Patient Identification Card with them at all times.

Electrostatic Discharge

A discharge of static electricity can damage the electrical components of the cochlear implant system or corrupt the stored speech programs.

If static electricity is present (for example, when putting on or removing clothes over the head or getting out of a vehicle), cochlear implant recipients should touch something conductive (for example, a metal door handle) before the cochlear implant system contacts any object or person.

Prior to engaging in activities that create extreme electrostatic discharge, such as children playing on plastic slides, the speech processor and headset should be removed. Clinicians should use an anti-static shield on the computer monitor when programming a cochlear implant recipient.

Mobile Telephones

Some types of digital mobile telephones (for example, GSM) may interfere with the operation of the external equipment. As a result, cochlear implant recipients may perceive a distorted sound sensation when in close proximity ($\sim$ 0.5 m) to a digital mobile telephone in use.

Air Travel

Some airlines request that passengers turn off electrical equipment, such as laptop computers during take-off and landing or whenever the seat belt sign is illuminated. Your speech processor is a

computer and therefore it should be turned off when such a request is made. You should notify airline personnel of your hearing impairment so they can alert you to safety measures.

General Information

SPrint™ Speech Processor Specifications

Dimensions:
103 x 67 x 23 mm (with two batteries)

Weight:
114 g (with one battery)
146 g (with two batteries)

External audio input:
3.5 mm Audio Input Socket with signal inputs
typically in the range of 0.1 – 30 mV (RMS).
The ring connection provides a current-limited
supply (150 µA) for an external input device.

Headset connection:
Custom 4-pin connector

Power consumption:
Average 100 mW
One or two 1.5 V AA size high energy NiCd or
alkaline batteries

Transmission frequency:
5.0 MHz

Equipment classification:
The speech processor is internally powered
equipment type B, with an F type applied part.

IP44:
Degrees of protection provided by enclosures for
electrical equipment. The relevant standards are
IEC 529 and AS 1939 - 1990.

HS8 Headset

Microphone dimensions:
38.5 x 17.4 x 7.8 mm

Transmitting coil:
35.4 mm in diameter

Transmitting frequency:
5.0 MHz

Battery Charger

Dimensions:
110 x 56 x 40 mm

Weight:
100 g (without batteries or AC adaptor)

Circuit:
Two independent charge systems for rapid charging
of one or two high energy NiCd AA batteries. Each
system charges a NiCd battery with a current of
180 mA in six hours. The indicator light shows red
when the charge cycle is in progress. The light
changes to green when the cycle is complete and

the current has reduced to 20 mA trickle charge.

Current supply:
6V DC, 500 mA

AC Adaptor

Output required:
6V DC, 500 mA

Caution:

Be sure to use an AC adaptor that is
compatible with the standard power
outlet in your country or you may
damage your charger.

Registration

In accordance with international practice and regulatory legislation, each component of the cochlear implant system is shipped with a registration card. Registering your cochlear implant system secures your warranty rights and enables Cochlear to track all devices.

Also provided is a patient identification card which you should carry at all times.

The implant centre and the cochlear implant user are responsible for correctly completing both the registration card and the patient identification card. Please return registration cards to Cochlear within 30 days of receiving the cochlear implant system.

This information is collected and used in accordance with legal requirements concerning data protection.

Certification and Applied Standards

The Nucleus® 22 and the Nucleus® 24 cochlear implant systems fulfil the essential requirements listed in Annex 1 of the EC directive 90/385/EEC on Active Implantable Medical Devices as last ammended by EC Directive 93/68/EEC. They were approved for CE-Mark according to Annex 2 by Notified Body 0197 in 1993 (Nucleus 22 system) and 1995/1996 (Nucleus 24 system).

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Cochlear