From Pioneer to Modern Day: The Cochlear™ Nucleus® 22 Implant Upgrade to the Nucleus® 6 Sound Processor

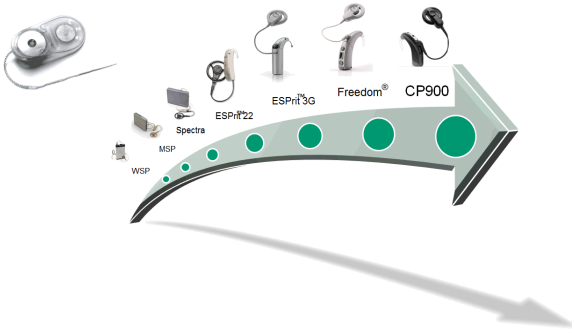
Hear now. And always.

Cochlear®

Learning Objectives

- Perform Nucleus 6 upgrades for Nucleus 22 recipients in an efficient manner, to optimize patient outcomes.
- Effectively counsel recipients on the functional aspects of their upgrade.
- Implement programming adjustments to address the most common patient feedback encountered when upgrading from previous technology.

Cochlear's Lifetime Support



Key Benefits for Nucleus 22 Implant Users

Hearing Performance

For users of Esprit 3G, Spectra: (IIDR of 40 dB, Dual-microphones)

SmartSound® iQ

- SCAN
- Noise reduction (Wind & Background)

Connectivity

Cochlear™ Wireless Accessories

- Phone Clip
- Mini Microphone
- TV Streamer

Water Protection

Aqua+*

- Waterproof housing
- Aqua+ Coil (N22)

Reliability

Innovations

- P2i nanocoating
- Titanium connectors
- Stronger plastic
- IP57 rating
- Modular coil & cable

Control and Management

Remotes

- CR230 Remote Assistant
- CR210 Remote Control

SNR-NR and WNR are approved for use with any recipient ages 6 years and older, who is able to 1) complete objective speech perception testing in quiet and in noise in order to determine and document performance 2) report a preference for different program settings. SCAN is FDA approved for use with any recipient age 6 years old and older, to be used at the discretion of the recipient/parent/caregiver.

*The Nucleus 6 Sound Processor with the Nucleus Aqua+ is water resistant to level IP68 of the International Standard IEC60529. This water protection only applies when you use the Nucleus Aqua+ and rechargeable batteries without the acoustic component.

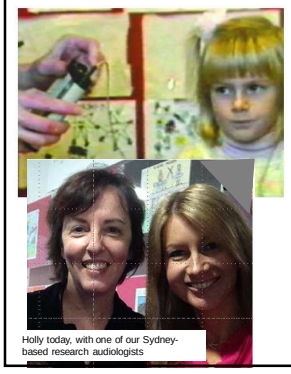
People are very open-minded about new things,

as long as they are exactly like the old ones.

Charles F. Kettering

Source: http://people-equation.com/no-leadership-title-you-can-still-influence-change

Unique Population



Holly today, with one of our Sydney-based research audiologists

- Discuss recipient's goals and your goals for the upgrade experience

About the Nucleus 22 Implant

Hear now. And always.

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About the Nucleus 22 Implant

What makes the Nucleus 22 unique?

No telemetry capability

What does it mean for you & your patients?

The CP900 for N22 sound processors **cannot:**

- **run impedance test**
- **perform compliance measurement**
- **detect 'Coil off' status**
- **allow 'Auto Processor Off' option**
- **log the time of coil off the implant**

About the Nucleus 22 Implant

What is different about the N22 coil?

N22

2.5 MHz transmission frequency

Coils (N22)

CI24M | CI24R Series | CI24RE Series | CI500 Series | CI422

5.0 MHz transmission frequency

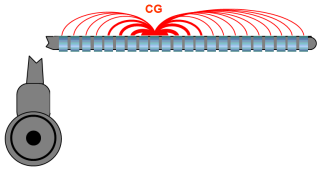
Standard Coils

Programming the Nucleus 22

- SPeak is the only sound coding strategy
  - Uses up to 20 channels
- Stimulation modes: Bipolar (BP, BP+1, etc.), CG, Variable Mode, or Pseudomonopolar
  - Your upgrade patients will not likely need changes to stimulation mode
- When re-MAPping, each T and C must be measured individually as interpolation is not allowed in the software
  - If patient was recently programmed, consider simply converting
- Gain adjustments may have been made if recipient does not use ADRO (ADRO available in Freedom only)
  - Reducing gains = less likely channel will be chosen for stimulation
  - Increasing gains = more likely channel will be stimulated

Common Ground Mode

- Most diagnostic for short and open circuits
  - Allows you to isolate individual electrodes
  - Historically used with children to monitor individual electrodes
  - You may see patients in this mode; recommend maintaining "as is"

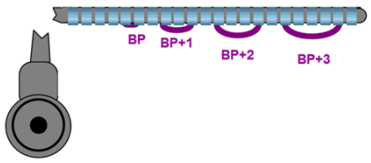


Bipolar Mode

- The wider the BP mode the more neural elements are recruited
- The wider the BP mode the less current you need to stimulate
- Wider modes often used to work around facial nerve stimulation and out of compliance electrodes
- Note that *new* Nucleus 22 processor MAPs will default to BP+3, but that may not be the mode historically used by the recipient
  - Typically convert from current processor's MAP as opposed to creating a brand new MAP
  - If you must create a new MAP, obtain CDX or a print-out of old MAP
    - Otherwise, pitch percept may be different

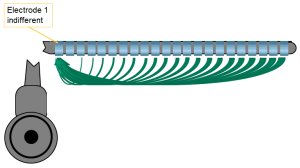
Variable Mode

- Combinations of different bipolar modes in the same MAP
- With variable mode you must be mindful of pitch perceptions and may need to do pitch ranking

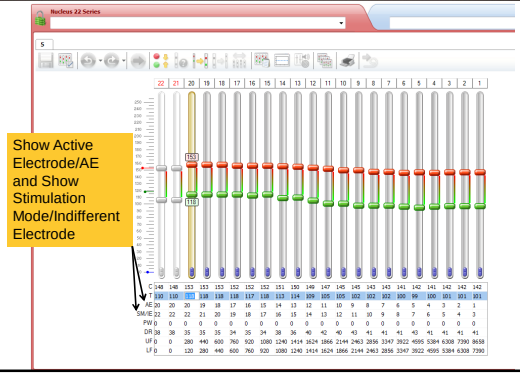


Pseudomonopolar Mode

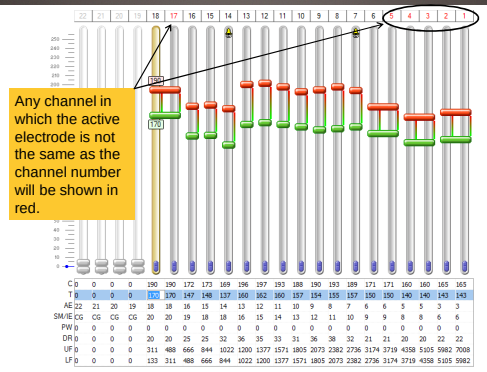
- All active electrodes reference back to one indifferent electrode
- Usually the electrode closest to the cochleostomy acts as the indifferent
- Advantages:
  - Broadest bipolar mode possible
  - Work around facial stimulation and out of compliance



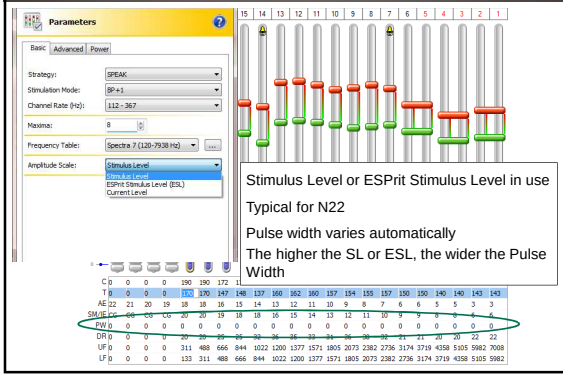
How will you know?



Why are some channel numbers in red?



Why does Pulse Width (PW) = 0?



Frequency Allocation Table (FAT)

- There are three FAT which will not directly convert to the Nucleus 6
  - 120 Hz to 8658 Hz becomes 120 Hz to 7938 Hz
    - Counsel on difference; likely to be acceptable
  - 133 Hz to 9620 Hz becomes 133 Hz to 7938 Hz
    - If necessary, can create a Custom FAT & disable 2 most basal channels to keep same frequency-to-channel allocation for the 133-7938 Hz range as was in older processor
  - 150 Hz to 10823 Hz becomes 150 Hz to 7938 Hz
    - If necessary, can create a Custom FAT & disable 2 most basal channels to keep the same frequency-to-channel allocation for the 150-7938 Hz range as was in older processor

Setting up for Nucleus 6 for N22 Upgrades

Hear now. And always.

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Processor and Remote Choices

CP910 or CP920:

- Consider whether the recipient is likely to use wired accessories, now that we have the wireless options

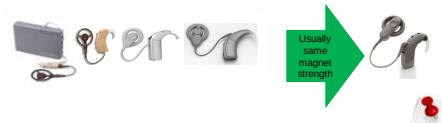
CR230 or CR210:

- Consider whether the recipient wants or needs the CR230 Remote Assistant, or if the CR210 fits their lifestyle better

Magnet Strength

Which magnet strength to order?

- Mostly all recipients can use the same magnet strength



CP900 Series Magnets (½M to 5M)

CP900 Series Coil (N22 6M) (integrated)

Tip!

Ensure you have multiple strengths available in the event the recipient's strength has changed

Coil Differences

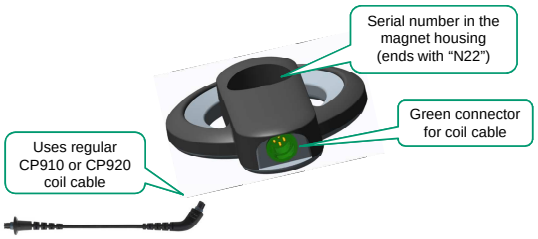
CP900 Series

- Modular cable
- No visible external inscription

Freedom® **ESPrit™ 3G**

- Integrated cable with green plug
- Inscription on underside of coil

CP900 Series Coil (N22) in Detail

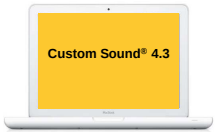


Battery Considerations

Cochlear Americas includes 3 Batteries in the N6 for Nucleus 22 upgrade configuration, and recommends Standard Rechargeables for this population.

Battery suitability for current users of 3 zinc air batteries	2 zinc air	Standard Rechargeable
≥ 2 days	✓	✓✓
< 2 days	50% of users are unable to use disposable batteries ✗	✓

Programming Preparation



CP910 | CP920
Sound Processors

CP900 Series Coil (N22)

- When was the last programming visit and is the current MAP in your database?
- Consider obtaining CDX file if patient is new to your clinic
  - *Especially* if processor is older than Freedom

Programming the CP900 for Nucleus 22 Implant Users

Hear now. And always.

Conversion Process – From Freedom®

The MAP conversion will involve 1 step:

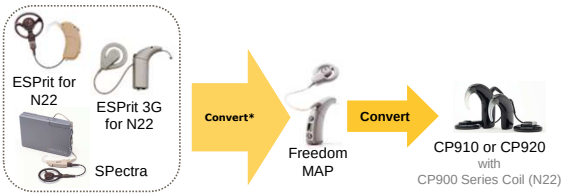
Freedom
MAP

Convert

CP910 or CP920
with
CP900 Series Coil (N22)

Conversion Process – From Older Processor

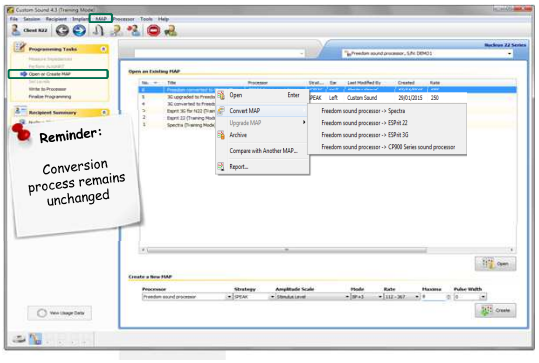
The MAP conversion will involve 2 steps:



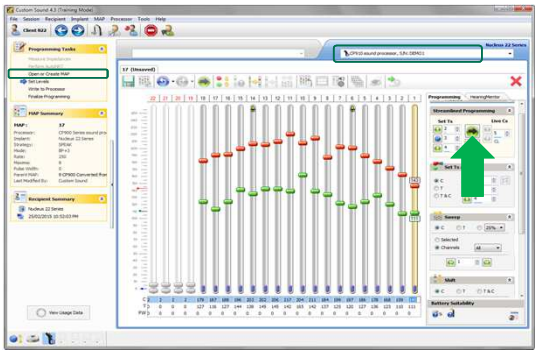
*** Choose 'Convert' to keep the Frequency Allocation Table unchanged whenever possible**

TIP: You don't need an actual Freedom SP

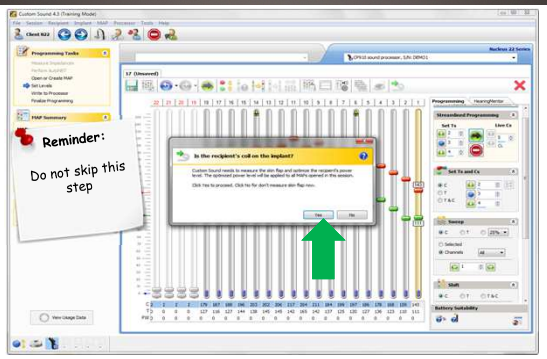
Convert from Freedom to CP900 Series



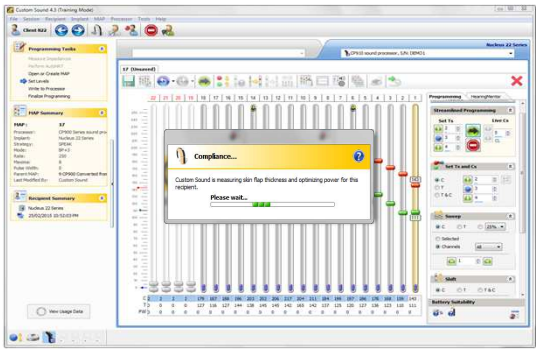
Go Live with Converted MAP



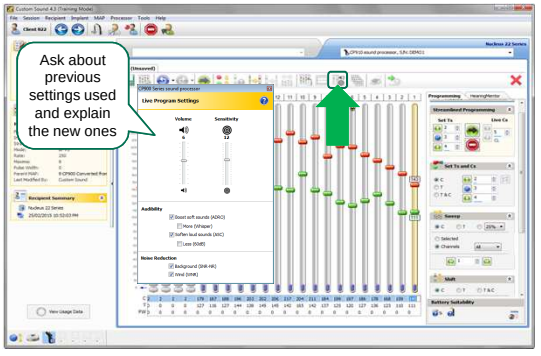
Go Live: Prompt to Optimize Power



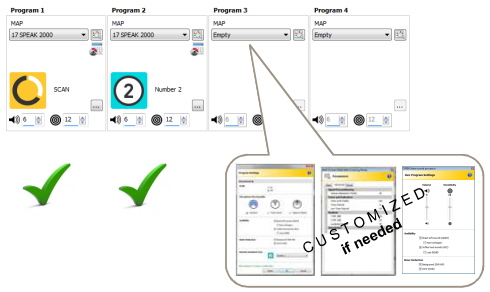
Go Live: Prompt to Optimize Power



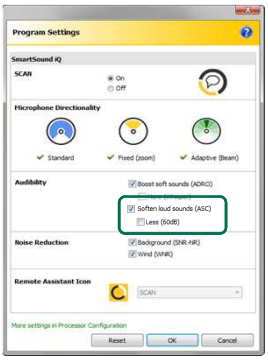
Go Live: Review MAP Settings



Write to Processor



SCAN Program – Option to Turn ASC Off



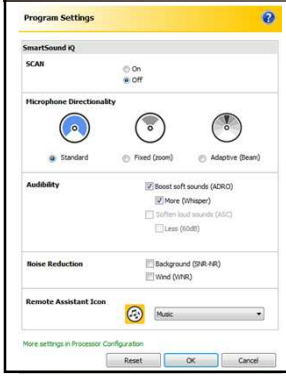
When to use:

With recipients who have expressed a preference for not having ASC enabled in the past.

Alternatively, you may offer 'ASC Less' for these recipients to try first.

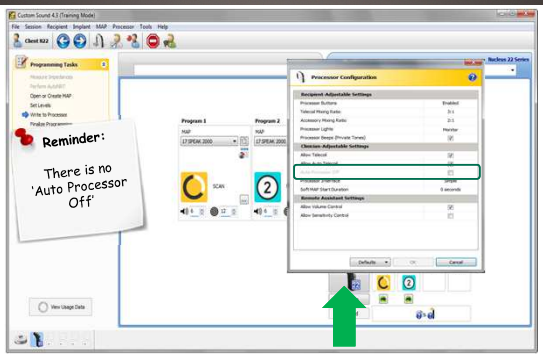
ASC is recommended for recipients who are accustomed to using it, when creating a 'SCAN On' program.

SCAN Off Programs

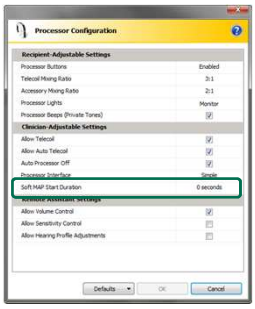


Note that Whisper is available only in conjunction with ADRO

Check Processor Configuration Options



CP900 'Soft MAP Start' Option

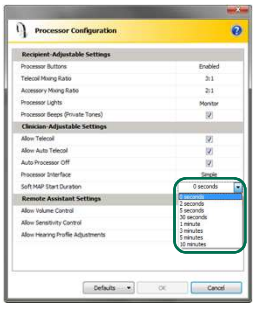


What is the 'Soft MAP Start' option?
It's a customized, slow increase of the MAP's volume every time the processor is turned on and coil is on the implant.

Who would benefit from it?
Recipients who have reported experiencing discomfort or sensitivity to the electrical stimulation when they first start listening with the sound processor in the day.

CP900 Series Sound Processor ONLY

CP900 'Soft MAP Start' Option



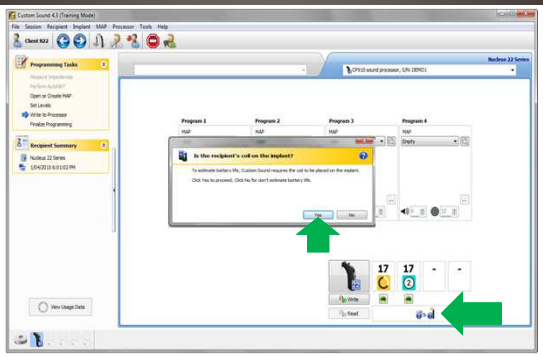
How does it work?
The electrical stimulation increases from threshold up to applied volume of the MAP.

How do I implement it?
Select the duration (from 2 seconds to 10 minutes). Adjust as needed based on the recipient's needs.

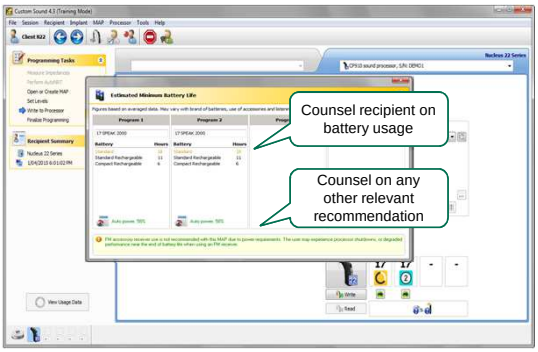
What is the 'Soft MAP Start' default duration?
Zero seconds, off by default.

http://cltd-jira.cochlear.com/browse/FIT-17936

Estimate Battery Life Prompt: Coil on Head



Check Estimated Battery Life



Data Usage for N22 Users

The Data Viewer will not display coil off time (due to lack of back telemetry). Instead, it will display as 'battery flat', meaning that the processor was turned on but no stimulation to the implant occurred, as not enough power was available.

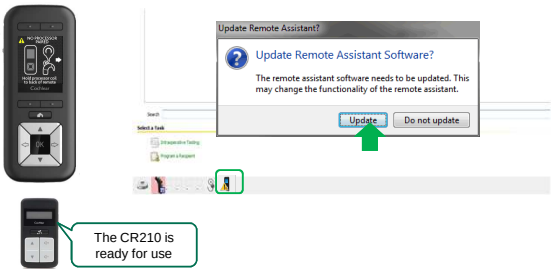
Tip!

Remind the recipient to turn the sound processor off when removing from the head.

Prepare the CR230 for N22 Users

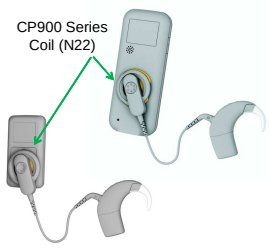
Update the CR230 software in Custom Sound® 4.3

- to enable pairing the CR230 with the CP900 Series Coil (N22)



Recipient Orientation

Pair CP900 (N22) Coil with CR230 Remote Assistant within 25 seconds



Tips:
Should the pairing not work...
- ensure that the pairing takes place *within 25 seconds of turning processor on*
- ensure that the CR230 has been upgraded (not required for the CR210)

Recipient Orientation

Optimizing battery life

Turning processor on and off

- The Sound Processor power consumption with the coil decoupled from the implant is significantly greater than when it is coupled to the implant.
- A small number of recipients may notice that the Sound Processor shuts down with a battery empty alarm soon after it is turned on.

➢ Instruct recipient to place coil on head promptly.

➢ Similarly, instruct the recipient to turn it off promptly.

Recipient Orientation

Optimizing battery life

- Counsel the recipient to **always turn the processor off while the coil is still on the head**, particularly those with a lower battery life estimate.

Step 1
'Turn off'

Step 2
'Remove'

Tip!
Practice identifying lower button by touch

Battery Life - Expectations

Counseling for recipients with Wireless Accessories

- **Provide appropriate expectation on battery life**
  - When streaming through a Wireless Accessory, the sound processor will consume a more significant amount of power from the battery.

  - Recommend to always use a Standard Rechargeable Battery when streaming from Wireless Accessories, as they have the most power.

Other Considerations

- If a remote was not chosen, use the upper button on the sound processor to initiate Mini Microphone or TV Streamer use (after first pairing)

- If bilateral, consider keeping programs the same on both sides.

Recipient Orientation

What is different for Nucleus® 22 implant recipients?

- The processor light table is slightly different than shown in the CR230 Remote Assistant User Guide.
- See '**Supplement for N22 Implants**'

	TYPE OF INDICATION				
	Key Press	Alert	Pair Coil Pair Wireless Acc	Microphone activity	Telecoil/ Accessory/FM
MODE	DISPLAYED?				
Child	Yes	Yes *	Yes	Yes	Yes
Monitor	Yes	Yes *	Yes	No	No
Adult	No	No	No	No	No
Suspend	No	No	No	No	No

* you will not see the orange flashing light that warns you when your coil is off your implant

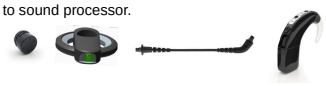
Summary of Typical Fitting Workflow

Hear now. And always.

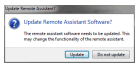
CP900 for N22 Fitting Workflow

Prepare | Update → Convert / Adjust → Battery | Pair → Counsel

1. **Prepare CP900 for N22**, connecting magnet to coil; coil to cable, and cable to sound processor.



2. **Update the CR230 Remote Assistant** in Custom Sound®



3. **Connect new CP900 to Custom Sound®**
   - **N22 coil on recipient's head**

CP900 for N22 Fitting Workflow

Prepare | Update | Convert / Adjust | Battery | Pair | Counsel

4. **Convert** recipient's current MAP to a CP900 Series Sound Processor (or to Freedom® first as required)

5. **Go live in the new CP900 MAP**
   - Custom Sound® will optimize the Power Level for the CP900 with the new N22 coil by measuring the skin flap before going live when you click Yes.

   - Check whether the volume and sensitivity are very different to the original MAP to counsel the recipient. Allow generous time in live mode to promote acclimatization, before making any adjustments based on initial impression. Perhaps use this time to show the CP900 Quick Guide and other components.

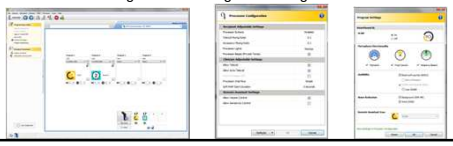
CP900 for N22 Fitting Workflow

Prepare | Update | Convert / Adjust | Battery | Pair | Counsel

6. **Save MAP** and write MAP notes on what adjustments, if any, were made when converting original

7. **For users of processor prior to Freedom®,** consider creating a customized program similar to original MAP (TSPL defaults 25 dB)

8. **Write MAP to processor.** Consider any customization of the Processor Configuration or Program Settings



CP900 for N22 fitting workflow

Prepare | Update | Convert / Adjust | Battery | Pair | Counsel

9. **Click on battery icon** to view 'Estimated Minimum Battery Life'. Click 'Yes' at the prompt to estimate battery life.

10. **Finalize Programming** session

11. **Pair CP900 Series Sound Processor with Remote Assistant / Remote Control** (as applicable) showing recipient how to do it. [Remember the 25 second pairing window from turning the sound processor on]

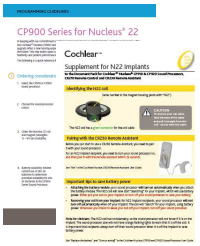
CP900 for N22 Fitting Workflow

Prepare | Update → Convert / Adjust → Battery | Pair → Counsel

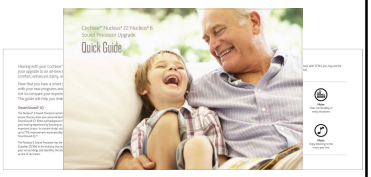
12. Provide orientation on:

- Battery life
- How to optimize battery (turn off before removing coil from head)
- Program functionality (SCAN and custom)
- Sound processor use (automatic turn on)
- Maintenance (microphone cover, rechargeable batteries, Dry Aid Kit)
- Remote Assistant / Remote Control use
- Cochlear Wireless Accessories and Aqua+

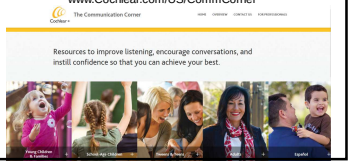
N22 Upgrade Support Materials



N22 Programming Guidelines
N22 Supplemental IFU
myCochlear Clinic



N22 N6 Upgrade Quick Guide
The Communication Corner
www.Cochlear.com/US/CommCorner



Lifetime Commitment

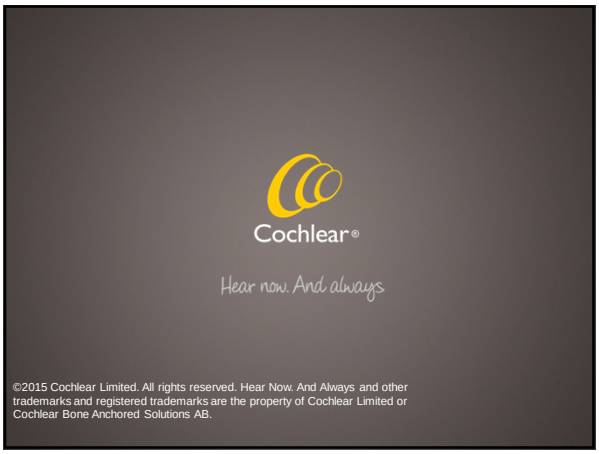
As you explore the world of sound around you, know that you are not alone. You are part of the Cochlear Family. We are here, providing the resources and support you need now and for years to come.

myCochlear Recipient
myCochlear gives you access to secure, personalized information, online tools and support resources to help you make the most of your hearing life with Cochlear and your new sound processor.

myCochlear.com/US
Recipient Support and Technical Services

Our Recipient Support Center is located in Denver, Colorado where you can reach a helpful and highly-trained customer service agent from 6am to 6pm (MST), Monday through Friday.

1-800-483-3123
customer@cochlear.com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