Hearing Reality

A New Standard in Clarity and Comfort

Starkey Education & Training

@StarkeyHearing

CAN YOU HEAR ME?

If you have any technical problems, please stay logged on and call Audiology Online at 1-800-753-2160

This session is available for 1/.1 CEU

Must stay logged on for the full session

Must successfully complete a short quiz

Course Objectives

- Know what features are accessed within the Sound Manager in the Inspire software for the new Livio AI and Livio devices
- Know what microphone modalities are available for various styles of hearing aids available from Starkey
- Know adaptation levels available for the Speech in Noise and Speech in Loud Noise algorithms

Agenda

- Livio AI/Livio product info & Thrive Platform
- eSTAT
- Twin Compression Architecture
- Sound Manager
  - Sound Enhancement
  - Situational Sound Management
  - Directionality
- Custom hearing aids: Acuity Immersion

NEW

Rechargeable

Longest-lasting Healthable rechargeable hearing aid

Smallest 2.4 GHz rechargeable RIC with streaming capability

CROS Compatible

All-in-One Charger*

Portable charging up to 3x

Mini Turbo Charger

3.5-hour charge in **7 minutes**

*Included with Livio AI rechargeable

Starkey

livio AI

2400

with Healthable Technology

livio

2400, 2000, 1600, 1200, 1000

NEW

RIC R Lithium-Ion Rechargeable

- Dual Radio with 2.4 GHz+NFMI
- 2.4 GHz Wireless Programming only
- 2.4 GHz Accessories
- Hearing Reality features including Spatial Speech Enhancement
- Features of Halo iQ
- Ear to Ear User Controls
- Tinnitus Technology
- CROS System (not 1200/1000)
- Self Check
- Rocker Switch
- Telecoil
- IP 68**
- Snap Fit Smart Receiver Matrix Options: 107/40, 115/50, 120/60, 130/70

Exclusive Livio AI Technology

- Embedded Sensor Technology and Artificial Intelligence
- Body and Brain Tracking with Thrive Wellness Score
- Fall Detection and Alerts
- Natural User Interface Tap Control
- Language Translation
- Thrive Assistant (also on Livio 2400)
- Transcribe
- Custom Healthable Receiver with Heart Rate Sensor COMING SOON

Starkey

RIC R (LITHIUM-ION RECHARGEABLE)

Starkey

Battery Life (Full charge)	Streaming Time
24 Hours	Includes 1 hour streaming
22 Hours	Includes 4 hours streaming

Estimations for 50-Gain Receiver

Starkey Hearing Technologies Mini Turbo Charger

Features

On-board battery: A fully charged Mini Turbo charger can fully charge a pair of hearing aids 4 times!

Turbo Charge: In 7 minutes, a turbo charge provides 3.5 hours of hearing aid use

Double Tap: Sensor within the charger refreshes the LED indicator lights with a double-tap to the top of the charger

Versatile: Compatible with Livio AI/Livio RIC R & Muse iQ RIC R

3.5-hour charge in just 7 minutes

Fully-charge a pair of hearing aids 4 times with the onboard battery

Starkey

livio AI

2400

with Healthable Technology

livio

2400, 2000, 1600, 1200, 1000

NEW

Micro RIC 312

- 2.4 GHz **(no NFMI)**
- 2.4 GHz Wireless Programming only
- 2.4 GHz Accessories
- Hearing Reality features **(no Spatial Speech Enhancement)**
- **NOT CROS System Compatible**
- **No Ear to Ear Phone**
- Ear to Ear User Controls
- Tinnitus Technology
- Self Check
- Single Push Button
- IP 68
- Battery Life: 4-7 days

Snap Fit Smart Receiver Matrix Options: 107/40, 115/50, 120/60, 130/70

Starkey

livio AI

2400 with Healthable Technology

NEW

Micro RIC 312

Exclusive Livio AI Technology

- Embedded Sensor Technology and Artificial Intelligence
- Body and Brain Tracking with Thrive Wellness Score
- Natural User Interface Tap Control
- Language Translation
- Fall Detection and Alerts
- Thrive Assistant (also on Livio 2400)
- Transcribe

Starkey

livio AI 2400 with Healthable Technology

livio 2400, 2000, 1600, 1200, 1000

RIC 312

- Dual Radio with 2.4 GHz+NFMI
- 2.4 GHz Wireless Programming only
- 2.4 GHz Accessories
- Hearing Reality features including Spatial Speech Enhancement and **Transient Noise Reduction**
- Ear to Ear User Controls
- Tinnitus Technology
- **CROS System (2400/2000/1600 only)**
- **Self Check**
- Rocker Switch
- IP 58
- Battery Life: 4-7 days

Snap Fit Smart Receiver Matrix Options: 107/40, 115/50, 120/60, 130/70

COMING SOON Livio AI and Livio currently in the field are eligible for a Performance Update via Inspire to obtain new features

livio AI 2400 with Healthable Technology

livio 2400, 2000, 1600, 1200, 1000

BTE 13

- Dual Radio with 2.4 GHz+NFMI
- 2.4 GHz Wireless Programming only
- 2.4 GHz Accessories
- Hearing Reality features including Spatial Speech Enhancement and **Transient Noise Reduction**
- Ear to Ear User Controls
- Tinnitus Technology
- **CROS System (2400/2000/1600 only)**
- **Self Check**
- Rocker Switch
- Telecoil
- IP 68
- Battery Life: 7-11 days

Matrix: 130/70

COMING SOON Livio AI and Livio currently in the field are eligible for a Performance Update via Inspire to obtain new features

Livio AI/Livio CROS System

Universal Transmitter

- Tier-Agnostic
- Self Check unavailable
- Custom Healthable Heart Rate Sensor will be unavailable
- **Embedded sensor technology disabled**

Receiver has **all sensor technology** available. CROS users will have the benefit of:

- Activity Tracking – Thrive Wellness score
- Fall Alerts
- Natural User Interface - Double Tap
- COMING SOON Custom Healthable Heart Rate Sensor (on RIC R)

Patient-Focused 2.4 GHz Accessories

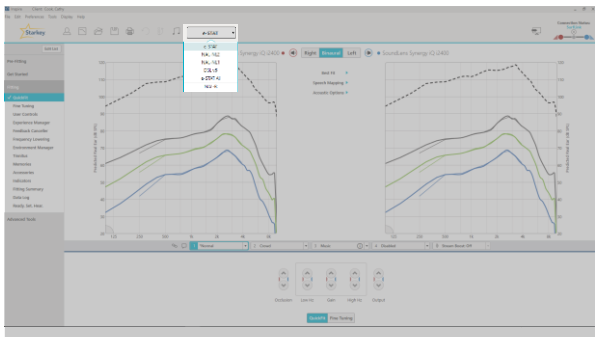
Mini Remote Microphone
Miniature, single purpose companion microphone

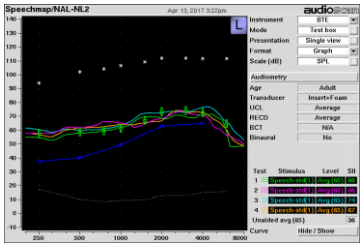
Remote Microphone +
Multipurpose easy-to-use remote microphone

TV
Stream audio from a TV or other sources

Remote
Simple control at your patient's fingertips

The Science Behind e-STAT





Manufacturer-specific approaches to signal processing impact hearing aid responses.

Universal fitting formulas do not produce equivalent results.

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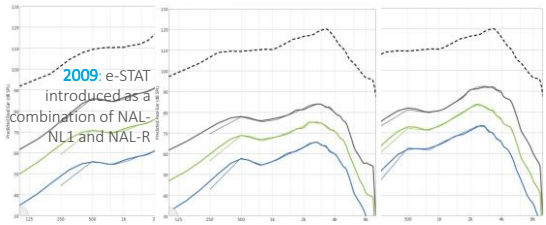
Principles of e-STAT

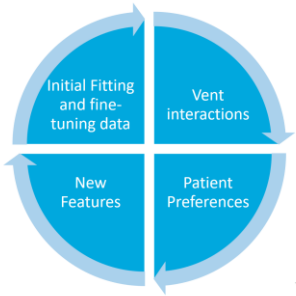
- Emphasizes **audibility** for speech understanding
- Developed for Starkey's **proprietary compression architecture**
- **Optimizes** response modeling regardless of hearing aid style
- Minimizes **vent-hearing aid interaction**



2009: e-STAT introduced as a combination of NAL-NL1 and NAL-R

Starkey

e-STAT keeps evolving



Starkey

Speech Optimization: Starkey Compression

- Starkey WDRC compression system gain changes track speech input smoothly, quickly and accurately
- Allows for precise, intuitive management of speech by allowing discrete gain adjustments
  - **Per channel changes to soft, moderate and loud speech inputs**
- Compression Kneepoints based on the Long Term Average Speech Spectrum (LTASS)
  - Provides max gain at soft speech inputs
- Compression Ratios change based on the gain required at each frequency and input level
- Compression architecture defines sound quality

Starkey

Made for *music*

Twin Compression

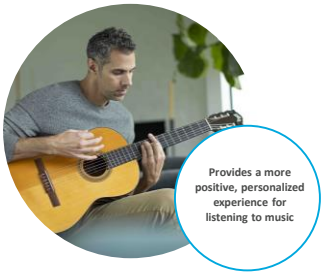
Unique Music Compression

10 kHz Bandwidth
24 Channels

Compression Variables Optimized for Music

Loud Music Processed without Distortion

Linear Gain at High Inputs to Restore Loudness



3 to 1

Music Memory
preferred over *Normal
for acoustic music listening during clinical field trials

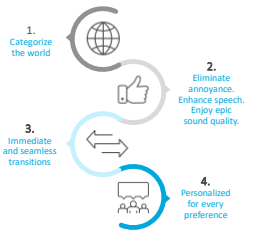
Hearing Reality

Hearing Reality

Incorporates the algorithms in the hearing aid that help to manage all the layers of sound in the environment

Includes compression, expansion, directionality, and advanced environmental detection and management algorithms

- Clarity
- Audibility for speech
- Unprecedented sound quality for music
- Listening comfort in noise and wind
- Reduced listening effort for speech in noise



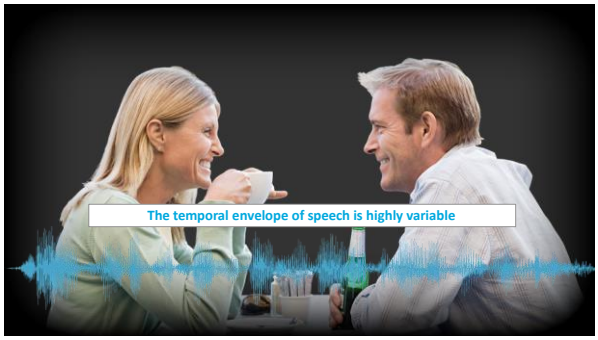
Speech in Noise: Fast-acting Noise Management

Speech in Noise

- Ultra fast processing to instantly track and filter noise even between the syllables of speech
  - Active 100% of the time
  - Makes very quick decisions over a wider range of input levels
  - Recognizes speech vs. noise patterns

Speech in Noise

- Patented SNR analysis
- Dynamic voice identification, coupled with a spectral noise control
  - Starts operating at positive signal to noise ratios
  - Smart enough to identify speech in real-time

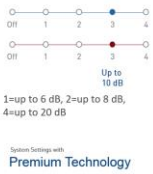


Speech in Noise videos

Speech in Noise

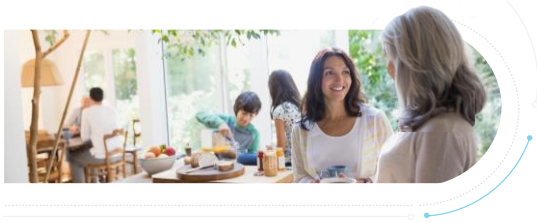
- Clinically proven to reduce listening effort & subjective comfort of noise
- Preserves speech intelligibility
- Performs in the real-world

Speech in Noise



1=up to 6 dB, 2=up to 8 dB, 4=up to 20 dB

System Settings with
Premium Technology



Speech in Loud Noise: Spatial Speech Enhancement

Hearing Reality

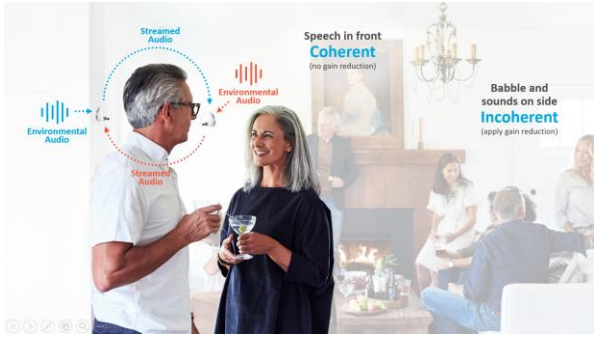
FEATURING

Spatial Speech Enhancement

Reduces steady-state and dynamic background noise

Reduces interfering sounds from the sides

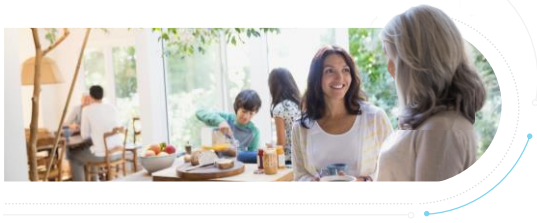
Preserves interaural level differences for localization



Speech in Loud Noise

On/Off: attenuation follows setting of Speech in Noise

- Level 1, 2, 3 or 4



Transient Noise Reduction

NEW

Transient Noise Reduction

Transient Noise Reduction

- Designed to improve comfort for loud, transient sounds

Fast-acting noise reduction

- Quickly attenuate transient acoustic signals without distorting other important environmental or speech sounds

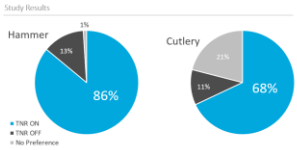
Reduces annoyance or discomfort of loud transient sounds

- Preserves a more natural sound quality

Transient Noise Reduction

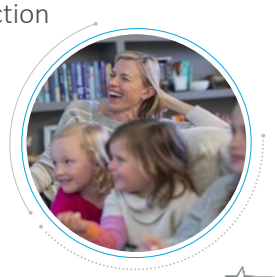
Study showed participants preferred listening to hammer and cutlery transient sounds with Transient Noise Reduction ON vs. OFF.

Individuals were better able to tolerate loud transient sounds with the feature ON vs. OFF.



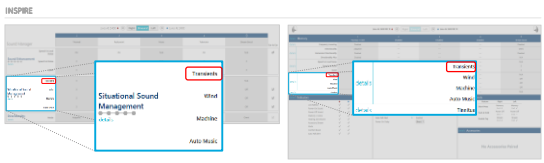
Transient Noise Reduction

- Transient Noise Reduction is available in Livio AI and all tiers of Livio
- Not available for CROS
- Applied to both acoustic and non-acoustic inputs
- Disabled in the dedicated Music memory



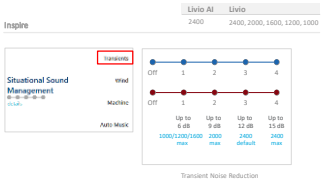
Transient Noise Reduction in Inspire

- Transient Noise Reduction will appear as 'Transients' in Sound Manager and on the Fitting Summary screen
  - Also appears in the printable reports



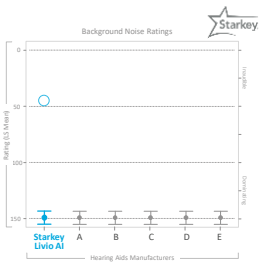
Transient Noise Reduction in Inspire

- Strength of the feature is adjustable in the Inspire fitting software
- Adjustment capabilities are technology tier dependent
- Users do NOT have Transient adjustments in the Thrive mobile app



Effortless and Enjoyable Listening

Top rated for reducing background noise in noisy environments



NEW

Improved Output Compression Limiting Architecture

Increases output for a fuller perception of loudness and natural sound quality

Output Compression Limiting Architecture

- Optimizes the hearing aid response
- Listeners will now enjoy a more natural, less harsh sound quality especially when input levels are loud

Output Compression Limiting Demonstration

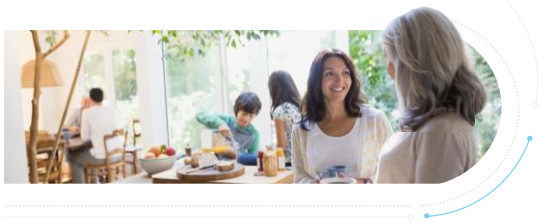
Audio Files Examples

Improvements to Feedback Cancellation

Reduction in artifacts and distortion

Personalized Feedback Cancellation Sensitivity Settings

Automatically applies personalized sensitivity settings per memory and provides a feedback free start



Quiet: Enhancing Expansion

Quiet

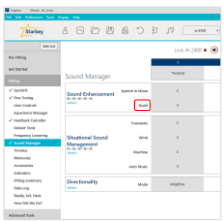
Enhancing Expansion with our patented fast-acting noise management, Acuity Quiet makes hearing aids quieter in low level environments than what is possible with Expansion alone.

IMPROVED

Acuity Quiet

Less aggressive default settings

- Provides more gain for soft speech sounds
- Better audibility and sound quality



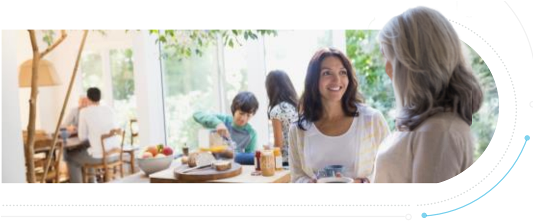
Auto Music

Designed to optimize the sound quality of background music while simultaneously prioritizing speech and maintaining comfort.

Music Adaptation

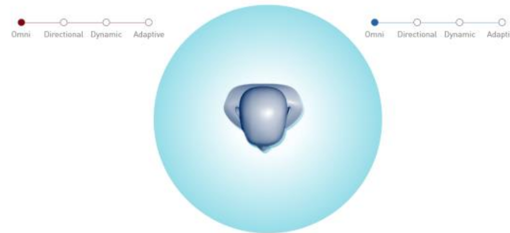
Automatic Feature Changes

Gain Changes

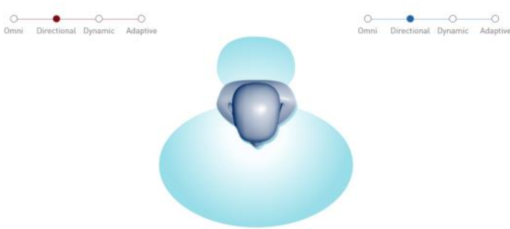


Directionality

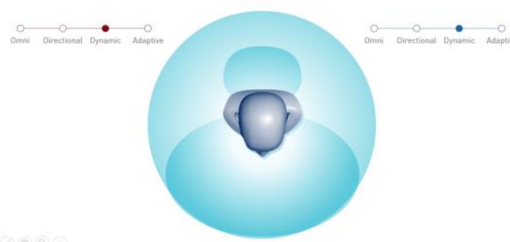
Microphone Response & Directionality



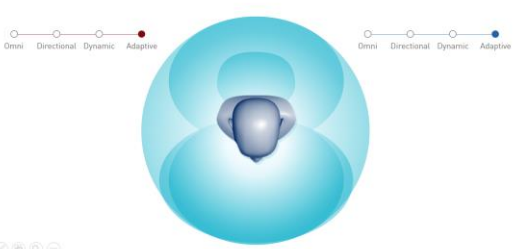
Microphone Response & Directionality



Microphone Response & Directionality



Microphone Response & Directionality



Directionality

Starkey

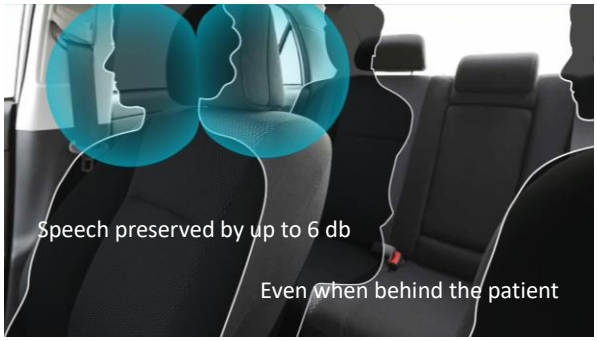
Multi-channel Adaptive Null Steering

Continuous, independent adaptation in all channels

Points the null toward the biggest noise source

Provides the best performance in any environment

Speech ID



UPDATED

Immersion Directionality

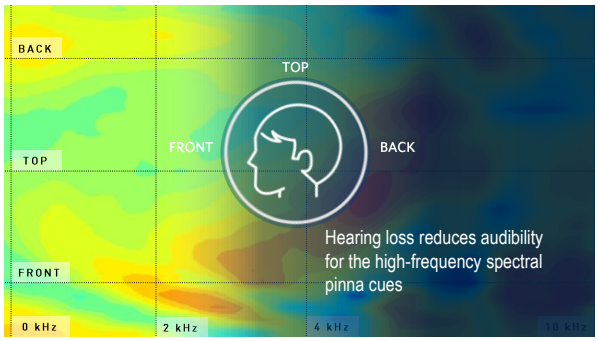
- Update to Best Fit defaults Immersion Directionality Off
- Allows for personalization of fitting
- Maximizes speech understanding in quiet
- Turning feature on
  - May improve clarity of speech in quiet conversation environments
  - May improve front/back localization issues

IMPROVED

Stream Boost

Provides improved sound quality for streamed signals in Livio AI and Livio.

Gain for the hearing aid microphone and streamed inputs are optimized individually before being combined and delivered to the ear


BACK
TOP
FRONT
BACK
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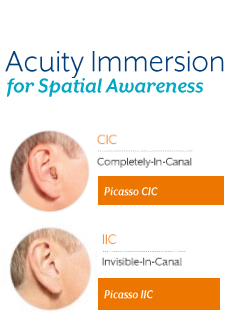
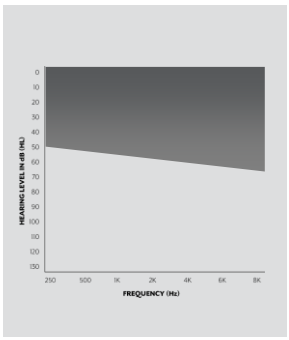
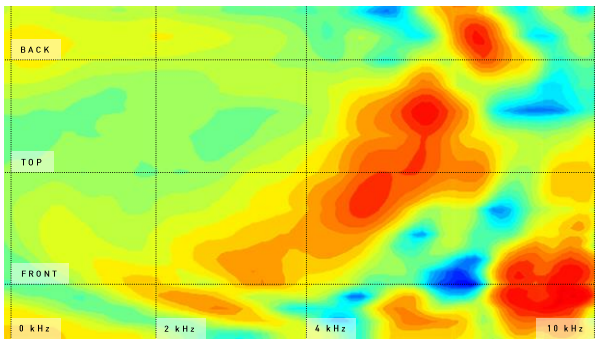
Hearing loss reduces audibility for the high-frequency spectral pinna cues
0 kHz
2 kHz
4 kHz
10 kHz


Acuity Immersion
for Spatial Awareness
CIC
Completely-In-Canal
Picasso CIC
IIC
Invisible-In-Canal
Picasso IIC


HEARING LEVEL IN dB (HL)
FREQUENCY (Hz)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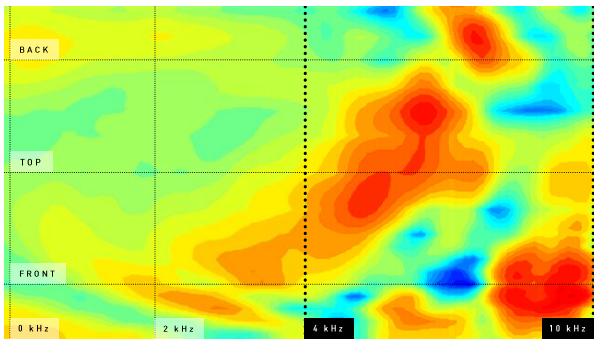
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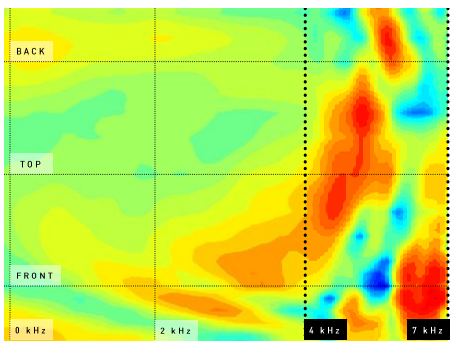
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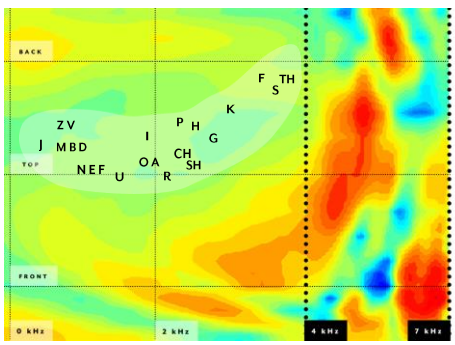
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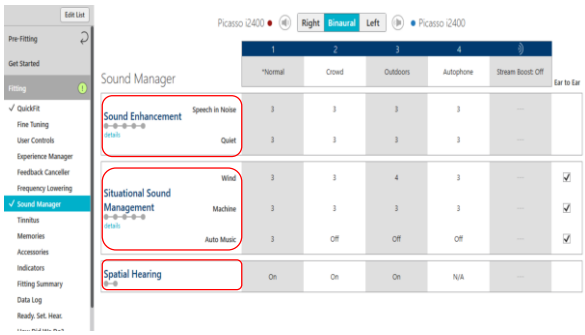
Inspire 2019



Hearing Reality

"My hearing aids don't sound harsh when I'm in a loud environment."

"My hearing aids don't chirp."

"Music sounds rich and full."

"My own voice sounds clear and not artificial."

"I don't have difficulty making my hearing aid loud enough."

"Speech isn't muffled in quiet settings."

"I can't hear my hair brushing against the hearing aid."

"There's no background noise when I listen to a streamed signal."

"Environmental sounds don't overpower the streamed signal."

Starkey

Learn More

"Evolution of the Hearing Revolution"

"Thrive Hearing Control Mobile App"

"Inspire 2019: Evolution of Programming Software"

"Evolution of Rechargeables: Starkey's Lithium Ion Solutions"

"Livio AI & Fall Detection"

"Lasting Connections: Starkey Hearing Technologies 2.4 GHz Wireless Accessories"

"Hearing Reality Sound Quality Features"

"Livio AI CROS System"

"Hearing Care Anywhere: Revolution in Remote Programming"

Thank You

@StarkeyHearing

Starkey