Welcome!

Judy Grobstein, AuD-FAAA, MACAud
Manager of Education and Audiology

Best option for audio is to call in using
Phone Number: 02 8518 1923 Access Code: 802 832 511

For technical questions or log-in information please contact Dan Towns
Direct line: 02 8823 9005 Dan_towns@Starkey.com.au

Housekeeping

Webinar Experience

If not using speakers and you haven't already, please call into the call center number 02 8518 1923 and enter access code 802 832 511

Please be sure to keep microphones muted

If you have any questions, please type them in the chat box. You can view the chat box by clicking the chat bubble at the bottom of your screen

If you have any technical issues, please contact Dan Towns at Dan_towns@starkey.com.au or call him direct at 02 8823 9005

Housekeeping

Endorsed Session

This Session is endorsed for ACAud, AudA and HAASA points

You must stay logged on for the full session

AudA members must complete a 10 questions quiz with a passing score of 70% as well as your CPD Reflections and Evaluations

ACAud, HAASA and NZAS members must complete the quiz to receive full points.

Housekeeping

Learning Objectives

Identify the noise management features accessed within the Sound Manager screen of the Inspire programming software

Identify what microphone modalities are available for Livio AI and Livio devices

Describe how to successfully fit and fine-tune Starkey's frequency lowering feature

Mastering Advanced Features

Judy Grobstein, AuD-FAAA, MACAud
Manager of Education and Audiology

Agenda

- Hearing Reality
- Frequency Lowering
- Stream Boost
- CROS

livio AI

Our Best Sounding
And Best Performing
Hearing Aid Ever

The Heart of Starkey Sound Quality

Multicore Twin Compressors and
eSTAT Starkey's Proprietary Fitting Formula

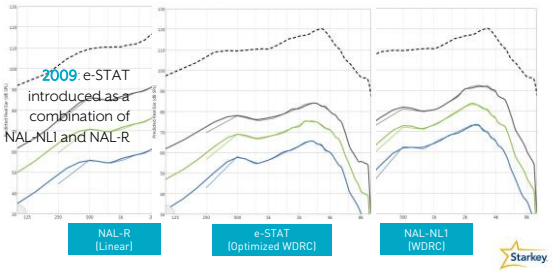
eSTAT: Starkey's Proprietary Fitting Formula

Emphasizes audibility for speech understanding

Developed for Starkey's proprietary compression architecture

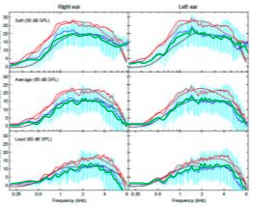
Optimizes response modeling regardless of hearing aid style

Optimizes vent hearing aid interaction



Results: eStat Targets (Starkey's Proprietary Fitting Formula)

Real-ear insertion gains (REIGs) and targets for speech (ISTS)



Starting from **NAL-NL1** targets, gains were usually adjusted downward on the **first visit**, based on participants' feedback.

Little change was made **after 1 month**

Adjusted gains were often relatively close to **eStat targets**

Relating hearing-aid gain settings to clinical outcome measures
Christophe Micheyl[1], William S Woods[1], Joyce Rosenthal[2], Sridhar Kalluri[2], Peter Johannesen[3], Jose L. Blanco[4], Patricia Perez-Gonzalez[3], Enrique A Lopez-Poveda[3], Brent Edwards[2]
[1]Starkey Hearing Research Center, Berkeley, CA [2]Starkey Hearing Technologies, Eden Prairie, MN [3]University of Salamanca, Salamanca Spain [4]Sonvotica SL, Albacete, Spain

Comfort and Personalization Redefined

Twin Compression Architecture

Utilizes wide dynamic range for a fuller perception of loudness and natural sound quality & unique music approach

Feedback Cancellation

Automatically applies personalized sensitivity settings and auto gain adjust for a feedback-free start with reduced artifacts and distortion

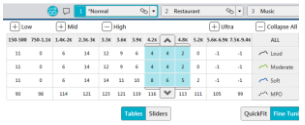
Comprehensive Sound Manager

Hearing Reality seamlessly categorizes complex listening situations to enhance and adapt in all environments

Starkey

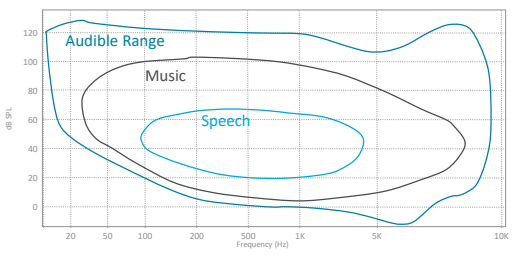
Speech Optimization

- 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 Ratios change based on the gain required at each frequency and input level

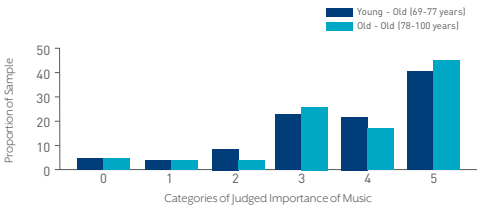


Multicore Twin Compressors

Giving speech and music the individual attention they deserve for an exceptional listening experience



Music is Important



"The Importance of Music To Seniors"
A. Cohen, B. Bailey,and T. Nilsson *Psychomusicology* (2002)

Starkey

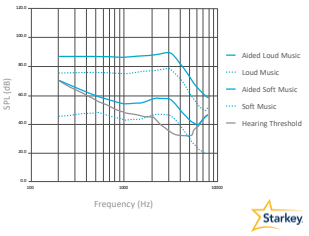
Proprietary Fitting Formula

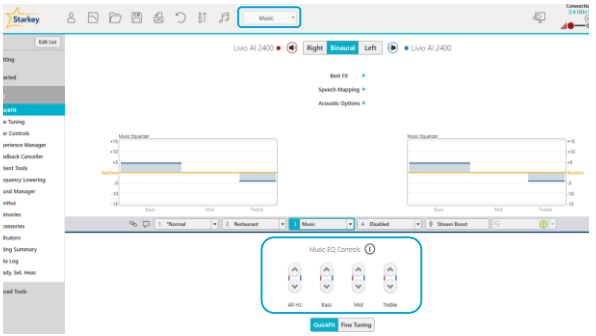
Evidenced-based prescription optimized for music

Restores audibility for soft music

Restores desired loudness for loud music

Unique compression TKs & CRs





Hearing Reality

Continuous optimization of audibility, intelligibility, comfort and sound

Sound Enhancement

Speech in Noise

Speech in Loud Noise

Quiet

Sound Enhancement

Speech in Noise

Reduces noise in between pauses of speech

Reduces listening effort

Speech in Loud Noise

Binaural noise management designed for dynamic background noise

Improves clarity and preserves spatial cues

Quiet

Ensures hearing aids are quiet in quiet environments

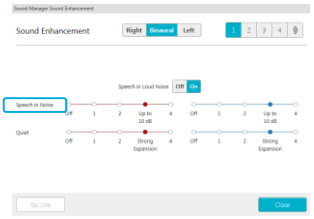
Increases listener comfort

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 wide range of input levels
- Recognizes speech vs. noise patterns

Inspire Settings for Speech in Noise



1 = up to 6 dB
2 = up to 8 dB
3 = up to 10dB
4 = up to 20 dB

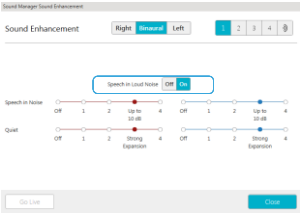
Spatial Speech Enhancement

Reduces steady-state and dynamic background noise

Reduces interfering sounds from the sides

Preserves interaural level differences for localization

Inspire Settings for Speech in Loud Noise



Attenuation follows setting of **Speech in Noise**

Quiet

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

Inspire Settings for Quiet

1 = Minimum
2 = Moderate
3 = Strong
4 = Maximum

Situational Sound Management

Transients	Wind	Machine Noise	Auto Music
			

Situational Sound Management

Transients	Wind	Machine Noise	Auto Music
Quickly attenuates brief loud sounds	Reduces sound of turbulence over microphone	Reduces level of steady state noise	Optimizes environmental music without compromising speech
Increases listener comfort	Increases listener comfort	Increases listening comfort	Enhances perception of music

Transient Noise Reduction

Improves comfort
for loud, transient sounds

Quickly **attenuates**
brief, loud sounds

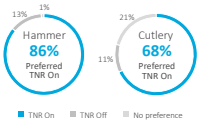
No distortion of other
environmental or speech sounds

Preserves natural
sound quality

Starkey

Transient Noise Reduction

Preferred (vs. off) to better tolerate hammer and cutlery transient sounds



Starkey

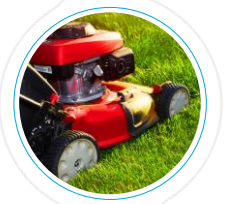
Wind

Designed to keep patients comfortable in windy environments

Starkey

Machine Noise

Designed to deliver comfort for loud steady state noise



Starkey

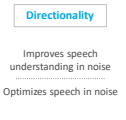
Auto Music

Designed to automatically deliver an optimized sound quality of music when it is the primary signal

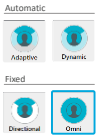
Situational Sound Management

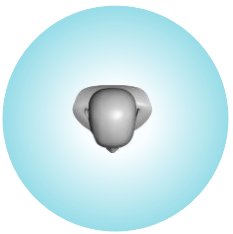
Directionality

Directionality

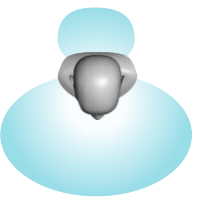


Directionality

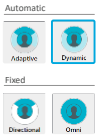


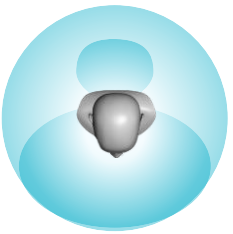


Directionality

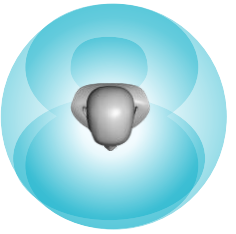


Directionality

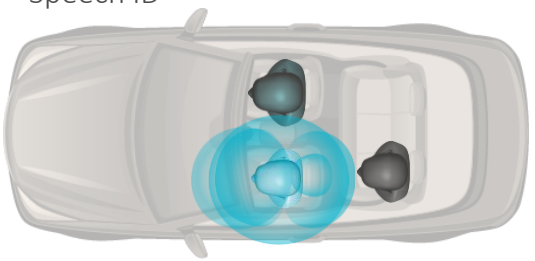




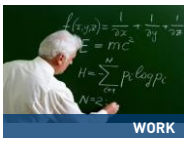
Directionality



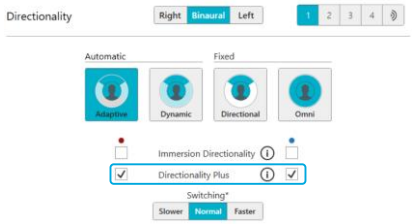
Speech ID



Examples of SPEECH ID Everyday



Directionality



Maximum Noise Management

Whenever, wherever, patient needs it

Maximum Noise Management

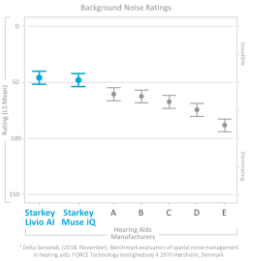
Maximum Gain Adaptation

Speech and Noise 85 dB SPL		Directionality Plus 80 dB SPL		Comfort Boost 75 dB SPL	
2400	20 dB	2400	20 dB	2400	20 dB
2000	8 dB	2000	15 dB	2000	20 dB
1600	6 dB	1600	10 dB	1600	20 dB

Whenever, wherever, patient needs it

Effortless and Enjoyable Listening

Top rated for reducing background noise in noisy environments



Frequency Lowering

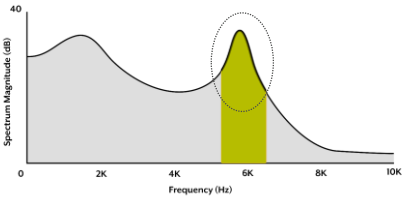
Speech Shift

- Smart Candidacy Criteria
- Maintains broad bandwidth
- Preserves harmonic structure to minimize distortion
- Active only for high frequency speech sounds

Speech Shift

Fulop, Fitz & O'Shaughnessy (2011)

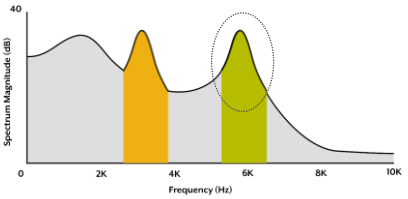
High frequency spectral energy is detected



Speech Shift

Fulop, Fitz & O'Shaughnessy (2011)

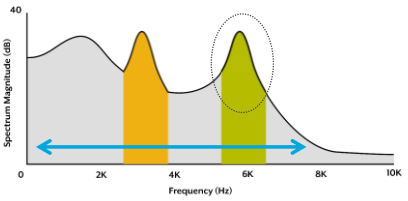
Spectral peaks are recreated in a lower frequency region



Speech Shift

Fulop, Fitz & O'Shaughnessy (2011)

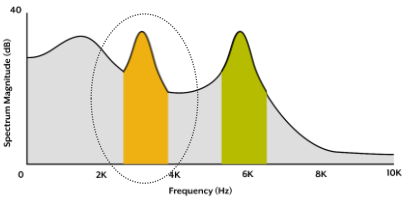
Original speech signal and broad bandwidth is maintained



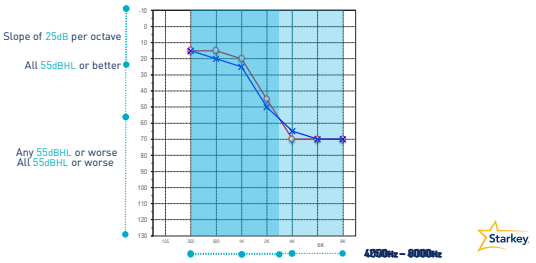
Speech Shift

Fulop, Fitz & O'Shaughnessy (2011)

Harmonic structure is preserved



Smart Candidacy Criteria

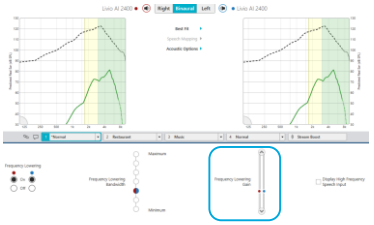


Inspire Settings for Frequency Lowering

Frequency Lowering Bandwidth

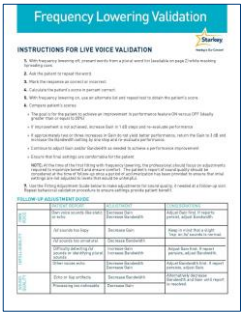
- Adjustments affect sound quality
- 7 discrete settings
- Default to setting 3 or 5

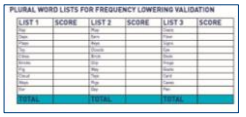
Inspire Settings for Frequency Lowering



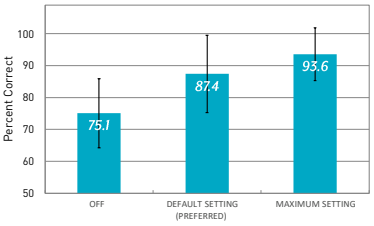
Frequency Lowering Gain

- Controls amount of additional gain in the target region
- Adjustments affect audibility
- Extends from 0 to 10 dB





Average S-Test Results



Wireless Connectivity and Streaming

Dual Radio

2.4 GHz + NFMI

Ear-to-Ear data and audio communication

Reliable direct connectivity to phones and accessories

Dual-Radio Wireless Technology

The Best of Both Wireless Worlds

NFMI
Near Field Magnetic Induction

- Highly reliable over short distances (approx. 20 cm)
- Ear-to-ear DATA and AUDIO communication
  - Ear-to-ear User Controls
  - Binaural detection and coordination of Wind, Noise, Music, and Directionality features
  - Ear-to-ear phone streaming
  - Spatial Speech Enhancement
  - CROS System functionality

2.4 GHz

- Range of 10+ meters with best performance within line of sight
- Global frequency band
- Direct connectivity to phones and Starkey Hearing Technologies accessories

Micro RIC 312 only

- Ear-to-Ear DATA communication
  - Ear-to-Ear User Controls
  - Binaural detection and coordination of Wind, Noise, Music, and Directionality features

NFMI radio is available in all Livio AI and Livio products EXCEPT for the micro RIC 312.

Direct Streaming Protocols

Low Energy Audio (LEA)

- Apple's proprietary streaming protocol
- Allows direct streaming between Livio AI and Livio devices
- Works in conjunction with Bluetooth Low Energy for pairing and data sharing

Building on the Best

Wireless Technology

With a new Android Streaming for Hearing Aids (ASHA) wireless protocol, we are able to **STREAM DIRECTLY** from select **Android** phones*.

NEW

Android Streaming

Stream phone calls, music and more, directly from Android* smartphones

*Currently compatible with **Google Pixel 3 and 4** smartphones with Android 10 operating system.

Patient-Focused Accessories

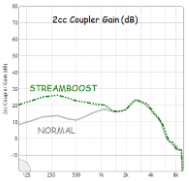
Livio AI Offers Amazon Echo Connectivity

Stream Boost

- Activates hearing aid settings optimized for high-quality streamed audio
- Stream Boost settings are automatically applied whenever streaming starts with no interaction required by the patient
- When streaming stops, the hearing aids revert to previous settings

Stream Boost Memory

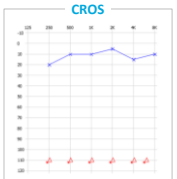
To compensate for vent loss with streamed audio, low- and mid-frequency gain is automatically increased for vented and open canal fittings when the Stream Boost is active.



2cc Gain Settings for Normal and Stream Boost
Open Fit / Multicurve View

CROS System

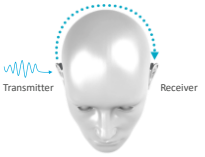
CROS/BiCROS



Contralateral Routing of Signal
- One unaidable ear
- One normal hearing ear

Binaural Contralateral Routing of Signal
- One unaidable ear
- One better/aidable ear

Wireless CROS System



Consists of:

Transmitter
- Worn on the unaidable ear
- Microphone enabled for CROS and/or BiCROS

Receiver
- Worn on the normal or better ear
- Microphone enabled for BiCROS or Hearing Aid Only mode

CROS Stream
Audio streamed from the Transmitter to the Receiver

Starkey's First Wireless CROS System
introduced on the Synergy platform in Muse standard products

Livio CROS System

- Livio AI 2400
- Livio 2400, 2000, 1600, 1200 NEW
- Standard products (with NFMI):
  - RIC 312, BTE 13, RIC R

CROS System
Receiver and Transmitter — **must be the same style**

NFMI
Utilizes NFMI of the Thrive Dual Radio technology

Expected Battery Life*
RIC 312: 3-5 days
BTE 13: 4-6 days
RIC R: 14 hours

*All RIC battery life estimates based on 50 gain receivers

Starkey

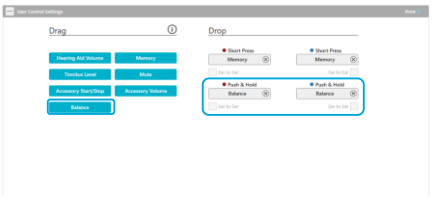
CROS Fitting Considerations

Memories:
CROS modes can still be set on a per-memory basis in compatible memories.

CROS Streaming:
The CROS stream is active in any CROS or BiCROS memory during the fitting session.

Starkey

CROS User Balance Control



Starkey

Transients
4 settings
Up to 15 dB adaptation
Fast acting

Auto Music
Feature and gain adaptation

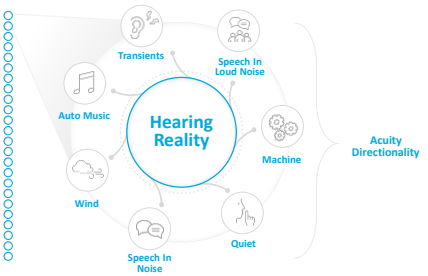
Wind
4 settings
Up to 30 dB adaptation

Speech In Noise
4 settings available
Up to 20 dB adaptation
Fast-acting

Speech In Loud Noise
On/Off
NFMI Audio Streaming
Up to 20 dB adaptation

Machine
4 settings
Up to 20 dB adaptation

Quiet
4 settings available
Fast-acting



EVERY 6 ms

100+
SOUND QUALITY
Patents

livio + livio AI


RIC 312


Micro RIC 312


RIC R


BTE 13

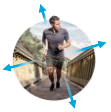
livio AI
2400 | with Healthable Technology

livio
2400, 2000, 1600, 1200

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

livio AI

Microelectromechanical System (MEMS)
Embedded Sensor Technology



Accelerometer
Detects axis orientation

Gyroscope
Detects angular orientation

Artificial Intelligence and Machine Learning

To perform tasks that typically require human intelligence

To automatically learn and adapt based on the acoustic environment

livio AI

Starkey

Learn More

Back to the Basics
Tuesday 18 February 2020

Mastering Advanced Features
Tuesday 10 March 2020

Bringing it all Together with Inspire 2019.1 Software
Tuesday 7 April 2020

All courses 1:00pm to 2:00pm Sydney Time

Endorsed for Live and Recorded sessions

Register Now

Sunday 3 May 2020
6:00pm - 9:00pm
(Welcome drinks and canapés from 5:30pm)
Crown Hotel Perth, Crystal Club, Level 15

Starkey's Chief Innovation Officer Dave Fabry PhD introduces the next generation in sound

Your Starkey team

Dawn Rollings
- **Managing Director**
- 0407 095 529
- dawn_rollings@starkey.com.au

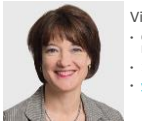
Vincent Santana
- Senior Product Specialist & Sales Support (NSW, SA, ACT)
- 0413 834 718
- vincent_santana@starkey.com.au

Joanne Sahdeo
- Product Specialist & Sales Support (QLD, WA, NT)
- 0407 603 292
- joanne_sahdeo@starkey.com.au

Nicholas Bajan
- Product Specialist & Sales Support (VIC, TAS)
- 0448 664 11
- nicholas_bajan@starkey.com.au

Your Starkey team – training & support

Judy Grobstein
- Manager of Education and Audiology
- 0439 802 020
- judy_grobstein@starkey.com



Vija Heath
- Customer Relations Team Leader / Audiologist
- 1800 024 985
- vija_heath@starkey.com.au

Customer Service
1800 024 985 / australia@starkey.com.au

Questions?

Starkey Hearing Technologies

Endorsement Points

ACAud Endorsed: 202005 (2 CEP points)

AudA Endorsed: CPD1920 048 (Category 1.2) (1 CPD point)

HAASA Endorsed: CPED2018-2020 (2020-004) (1.5 CPED points)

Thank You!

Judy Grobstein, AuD-FAAA, MACAud
Judy_Grobstein@Starkey.com