Trek: Experience More

Erin Reichert – Director, Professional Services

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Learning Objectives

- After today's course, you will be able to:
  - Describe how SmartCompress technology can control compression in speech-in-noise environments and control gain in non-speech environments.
  - Manage acoustic feedback with the Adaptive Feedback Canceller Pro in Sonic Trek hearing aids.
  - List and describe all the available features and technology in Sonic's Trek Super Power and Ultra Power hearing aids.

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The Hook of 4S Foundation

- Sonic is dedicated to improving lives through enhanced hearing by constantly focusing on the 4S Foundation
  - **Sound** that's natural
  - **Speech** understanding in noise
  - **Simplicity** in all we do
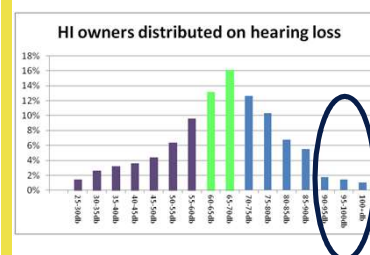 - **Style** that stands out

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Key Insight

- What are the market characteristics for these users?
  - Only an estimated 5-10% of all hearing impaired users are in the profound category*
  - Only an estimated 700,000 to 1.4 million power instruments are sold per year, based on 14 million units/year sold globally
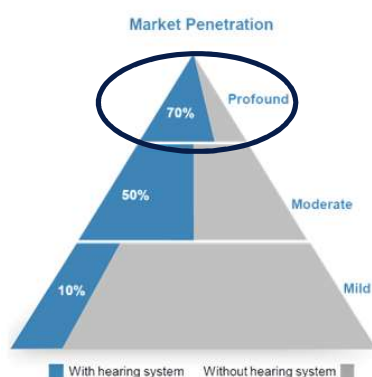

(*Taylor, 2009)

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Feature Benefit Value, Yet Again

Market Penetration

70% Profound

50% Moderate

10% Mild

With hearing system   Without hearing system

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- Higher market penetration than other segments
- Super Power | Ultra Power BTE users have a fundamental *need* for instrumentation

Image source: Niels Granholm-Leth, Carnegie Bank; WHO, Sonova via Hearing Review: HIA Comments on FTC "Now Hear This" Workshop and OTC Hearing Aids Published; May 24, 2017.

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trek™
Experience more

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Trek.
At-a-Glance

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See What's Inside

- Two performance levels
  - Trek[80] | Trek[40]
- Two styles
  - Super Power (SP) | Ultra Power (UP)
- 2.4 GHz Bluetooth® Low Energy
- Near Field Magnetic Induction (NFMI)
- Telecoil
- LED Indicator
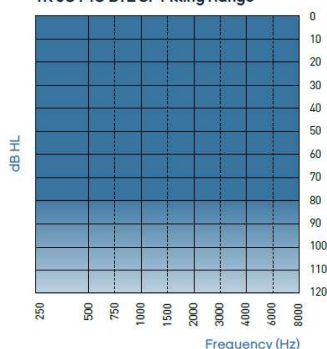- Connectivity Solutions
- Pediatric friendly

4.4mm

Trek SP   Trek UP
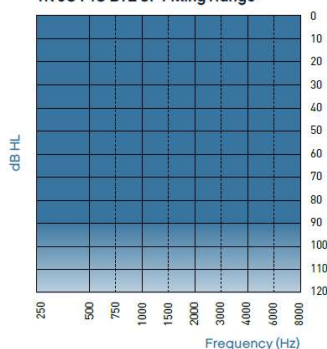
Made for
iPhone | iPad | iPod

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TK 8O l 4O BTE SP Fitting Range

dB HL

Frequency (Hz)

TK 8O l 4O BTE UP Fitting Range

dB HL

Frequency (Hz)

	TK 80|40 BTE SP	TK 80|40 BTE UP
Battery Size	13	675
Peak Gain (dB/2cc)	79	83
Peak MPO (dB SPL/2cc)	139*	142*

*Special care should be taken when fitting and using a hearing instrument with maximum sound pressure capability in excess of 132 dB SPL (IEC 60318-4) since there may be a risk of impairing the remaining hearing of the hearing instrument user.

Sound That's Natural

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More Power, Control and Access to Everyday Sounds

- With Trek, Sonic delivers a natural sound with several technologies delivering power users need
  - Speech Variable Processing (SVP) with SmartCompress
  - Adaptive Feedback Canceller Pro (AFC Pro)
  - Frequency Transfer
  - Extended Dynamic Range
  - SmartMusic

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More Power for Optimized Performance

SoundDNA Platform

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- Phoneme Focus
  - Offers maximum audibility of all the fine details in the speech signal rapidly adjusting the gain to apply the precise amount of amplification to each phoneme
- Envelope Focus
  - Designed to support patients who rely on information from the speech envelope applying less alteration to the amplification of the speech signal, preserving the envelope for greater contrast between phonemes

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Intelligent Amplification in Noise

Configurable adaptive compression system for intelligent amplification in noise

Natural and detailed amplification for your patients – all with SmartCompress

Available in Trek[80]

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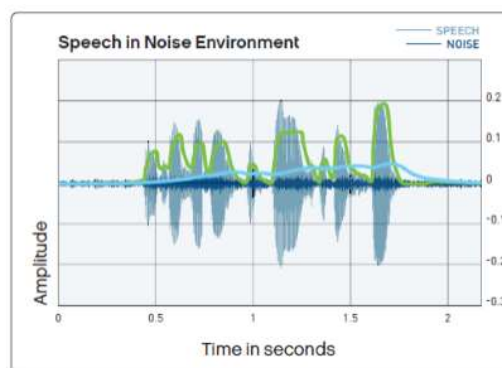
SmartCompress Delivers the Solution

- It's effective
  - Specifically addresses the problem of applying compression in noise
- It's adaptive
  - An adaptive compression system overcomes limitations of fixed Environment Classification system
- Works well with others ☺
  - Complements SVP, directionality and noise reduction, and any fitting rationale of your choice

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SmartCompress - How does it do it?

- SmartCompress uses two SNR level estimators, compared to one in traditional systems
  - Green – fast phonemic estimator
  - Blue – slow, long-term estimator
- Provides accurate measurement of environmental changes in real time

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SmartCompress

- Controls compression in speech-in-noise environments
  - Adaptively varies the compression in speech-in-noise environments
  - Determines how much the compression has to be decreased, or made more linear, for less noise in the output

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- Controls gain in non-speech environments
  - Adaptively limits gain when speech is not present
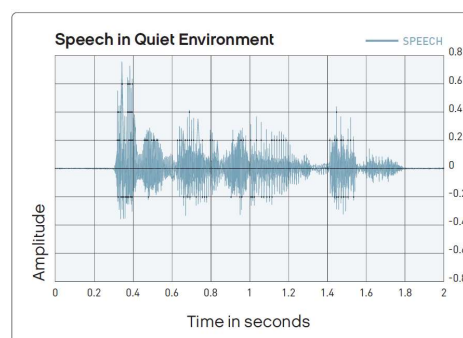 - Determines the occurrence of quiet and noise-only situations and applies less gain to the input

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High SNR
Speech in quiet

High

- SmartCompress does <u>not</u> activate!
- SVP applies the prescribed gain and compression as designated by the selected fitting rationale along with any fine tuning actions made by the hearing care professional

Low

Speech in Quiet Environment — SPEECH

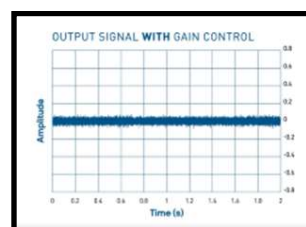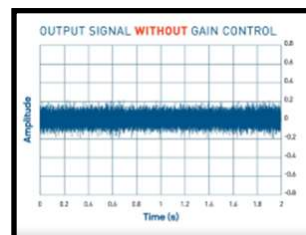Amplitude vs Time in seconds

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Very low SNR

Quiet and Noise-only environments

(Without speech)

- SmartCompress via the **Gain Control** applies less gain to the incoming signal
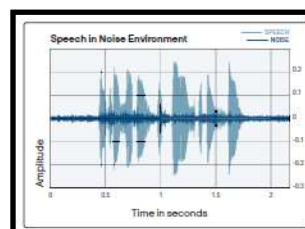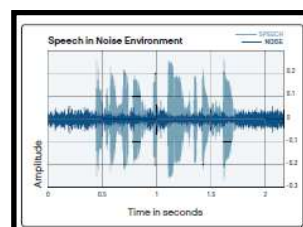- Offers greater listening comfort in non-speech listening environments

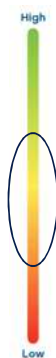www.sonici.com

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Low SNR

Speech-in-noise environments

- SmartCompress via the **Compression Control** reduces compression
- Minimizes the amplification of noise following short pauses in speech or even between phonemes
- Improves the output SNR
- Supports speech and listening comfort in complex environments

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Better Target Match with Less Feedback Risk

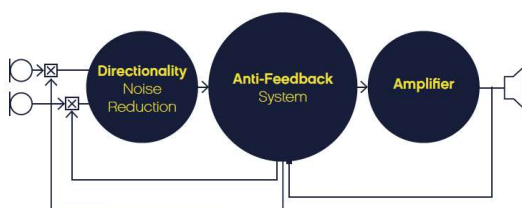Algorithm exclusive to 2019 Products on the SoundDNA Platform

1 Feedback Management system with 2 technologies

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Robust Feedback Cancellation

- Standard system continually operates in background to quickly cancel in static conditions
- Second system quickly reacts to feedback-causing situations

- Speed allows more stable gain in the fitting offering higher feedback margins

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Making Speech Cues Audible

Helps identify consonants for patients with severe high-frequency hearing losses

Access via Frequency Transfer control in EXPRESS*fit*® Pro

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Frequency Transfer

- 10 Destination Regions
  - Adjusts HF source and LF destination regions
- 7 Intensity Settings
  - Adjusts the strength of the HF sounds (source) when mixed with the LF sounds (destination)
- High Frequency Attenuation
  - Turns gain in the HF bands above the destination on or off

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Sounds, Loud and Clear

Advanced feature to keep loud sounds clear in challenging listening environment

Specifically designed for signals with high intensity

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Extended Dynamic Range

- Listening environments with speech can get LOUD
  - Can quickly change in intensity
  - Presence of loud speech signals can have peaks that exceed > 95 dB A

- Digital hearing instruments limit inputs at 95 dB SPL
  - Creates distortion for higher input levels due to compression

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Extended Dynamic Range - Summary

- Adaptively extends dynamic input range
- Expands to growing sound levels only as needed
  - Upper limit depends on input level of speech signal (from 95-113 dB SPL)

- Allows loud peaks to be amplified with less risk of distortion
- For everyday sounds
- Available in Trek[80] only

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Live Music at its Best

Greater enjoyment of life music

Enthusiasts and musicians alike can enjoy clear sounding music again
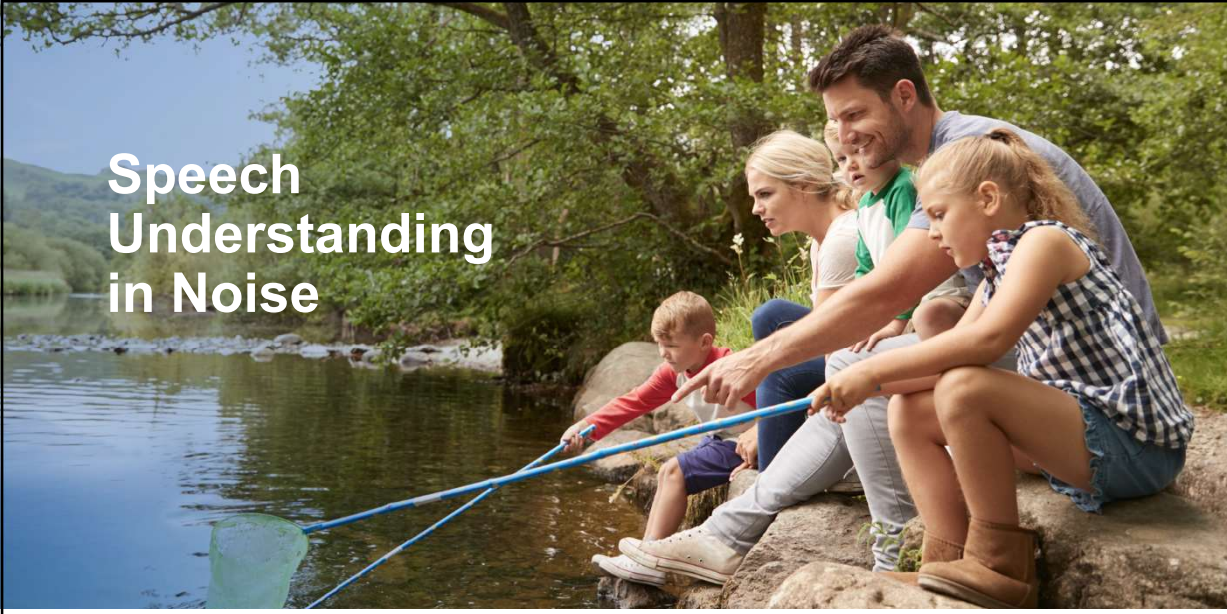
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4 Components to SmartMusic

- Fixed Extended Dynamic Range
  - Increases limit at the input to a fixed 113 dB SPL
- Speech Variable Processing
  - Maintains balance between harmonics
- Wideband Frequency Response
  - Important for perceived naturalness of music

- Controls
  - Fixed Hypercardioid polar setting
  - Position of null does not change
  - Eliminates noise from behind
  - Concentrate on what's on stage
- Available in Trek[80]

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Speech Understanding in Noise

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More Speech, Less Noise in More Places, and Attention to Detail

- With Trek, Sonic delivers what life sounds like in noise
  - SPiN Management
  - Binaural Noise Management
  - Impulse Noise Reduction
  - Soft Noise Reduction
  - Wind Noise Reduction
  - Tinnitus SoundSupport
  - VC Step Size

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More Speech, Less Noise

Speech in Noise (SPiN)
Management introduces a trio
of technologies
- SPiN Directionality
- SPiN Noise Reduction
- SPiN Engage

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SPiN Management

- SPiN Directionality
  - Uses null steering to select the microphones' polar patterns that will produce the optimal SNR in 16 independent frequency bands
- SPiN Noise Reduction
  - Designed to reduce the gain of noise compared to speech operating in 16 independent frequency bands
- SPiN Engage
  - **Trek[80] only!**
    - Determines at which SNR the directional and noise reduction systems will adjust to the environment.

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Less Noise in More Places

Support your patients who encounter situations with distracting, uneven noise from side to side with Binaural Noise Management

Available in Trek[80]

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Nobody Wants Noise

- Impulse Noise Reduction
  - Lessens the discomfort of sudden, loud sounds
- Soft Noise Reduction
  - Reduces those low-level noises without affecting speech
- Wind Noise Reduction
  - Adjusts to outside activities by monitoring the environment and preventing the rush of wind from being amplified

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The Sounds of Relief

Aims to reduce your patient's perception of tinnitus by providing amplification and generating sound relief

Available in all Trek offerings

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Tinnitus SoundSupport

- Offers the following tinnitus relief sound options:
  - 4 broadband sounds

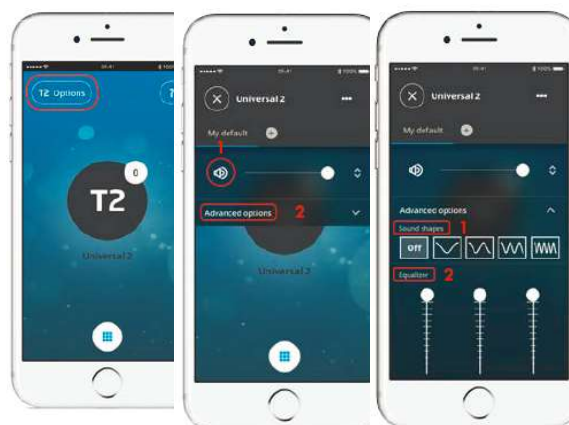 | White Noise | Pink Noise | Red Noise | Shaped to audiogram |

  - 3 nature-like sounds

  | Ocean 1 | Ocean 2 | Ocean 3 |

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Control Tinnitus Sounds - App

- Sonic SoundLink 2 App
  - Adjust tinnitus sound volume or mute entirely
  - Modify tinnitus sound by changing its modulation rate or frequency response
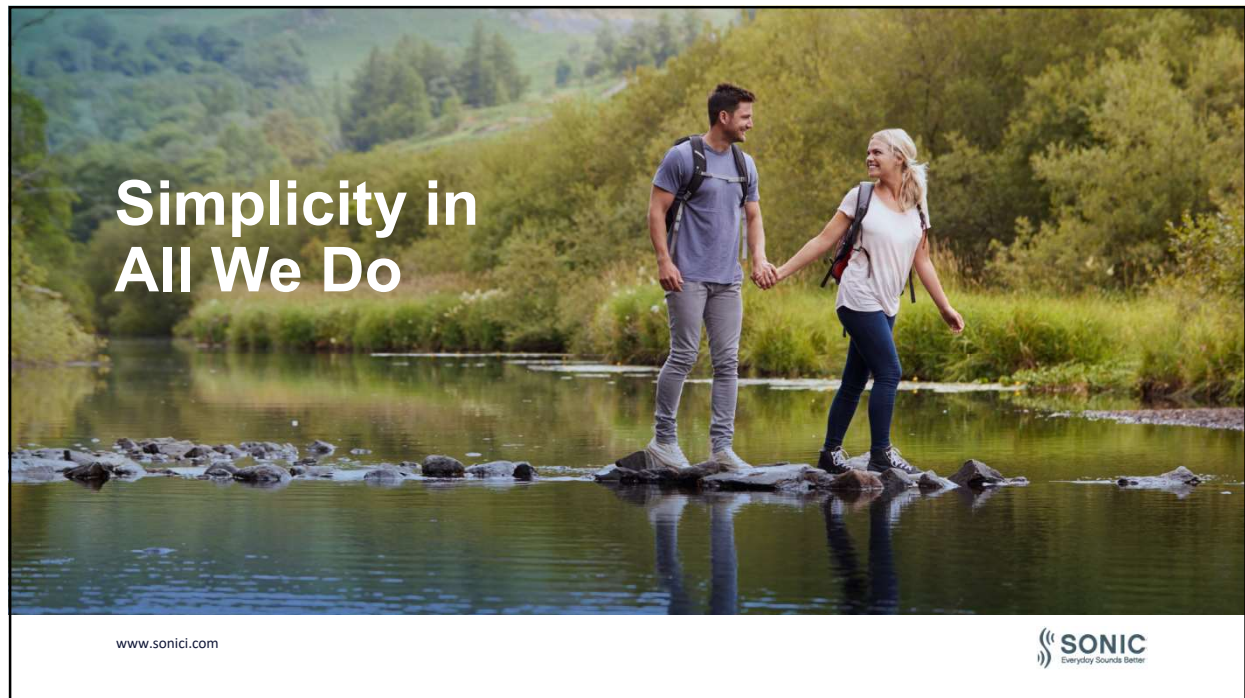
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Attention to Detail – VC Step Size

- Aims to help hearing aid wearers who have a reduced dynamic range
- Designed as a control for loudness growth issues, VC Step size makes finer volume adjustments in 1dB instead of 2.5 dB increments

Volume Up
LED
Volume Down

Program Button

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Simplicity in All We Do

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Welcome to Wireless, Simple Essentials and Tools to Accomplish it All

- Trek delivers solutions that just make sense
  - Dual-Radio System
  - SoundLink 2 App
  - IFTTT
  - Low Frequency Enhancement
  - Binaural Coordination
  - IP Rating
  - EXPRESS*fit*® Pro

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Welcome to Wireless
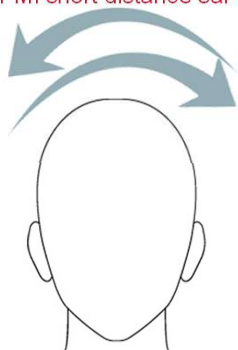
Wireless connectivity is a way of life for today's hearing aid users

Trek offers advanced wireless systems for their world, their way

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Dual-Radio Wireless Technology

Two wireless systems integrated into one hearing aid

a) NFMI short distance ear-to-ear

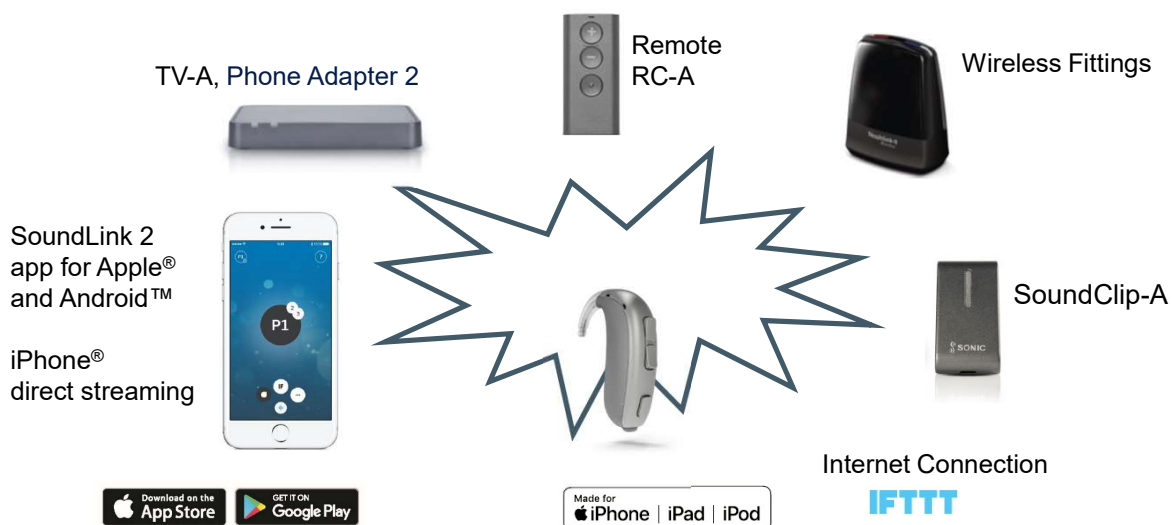b) 2.4 GHz long distance direct-to-hearing aid

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SoundDNA Connectivity Portfolio

TV-A, Phone Adapter 2

Remote
RC-A

Wireless Fittings

SoundLink 2
app for Apple®
and Android™

iPhone®
direct streaming

P1

SoundClip-A

Internet Connection
IFTTT

Made for
iPhone | iPad | iPod

SoundLink 2 App

- Controls wireless operations like volume and program change and more

- Compatible with an iPhone® or Android™ smartphone[1]

- Many conveniences such as "Find My Hearing Aid," advanced Tinnitus SoundSupport controls, battery life percentage indicators, etc.

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P1

[1] Trek is a Made for iPhone® hearing aid that allows you to talk on the phone, stream stereo music, and stream video sound directly to your hearing aid. In addition, download the free SoundLink 2 app to control your hearing aid over your iPhone, iPad®, iPod touch®, and Android™ smartphones and tablets. For information on compatibility, please visit www.sonic.com/connectivity

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Make the Most of Smart Technology

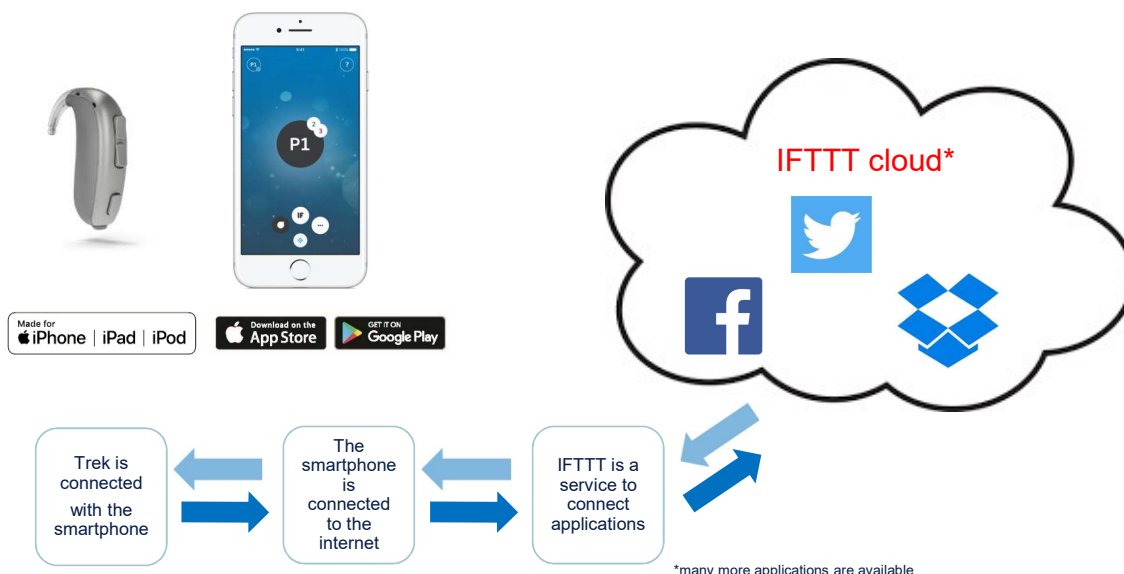If This Then That brings the Internet of Things to Trek

More than 600 internet-connected devices and services

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How Trek is connected with IFTTT

Made for
iPhone | iPad | iPod

Download on the App Store

GET IT ON Google Play

IFTTT cloud*

| Trek is connected with the smartphone | The smartphone is connected to the internet | IFTTT is a service to connect applications |

*many more applications are available

Deep Bass Dynamics

Add low frequencies into direct audio streaming for a high fidelity signal
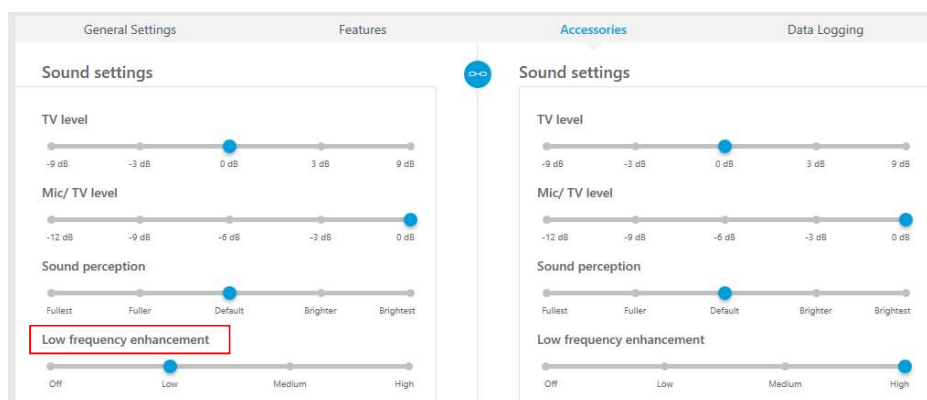
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Low Frequency Enhancement

Available in Trek 80|40

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Simple Essentials

- Binaural Coordination
  - Shares information between left and right ears
- Binaural Synchronization
  - Volume or program change made on one device is simultaneously made on the other
  - Push button mute with one touch

- Non-Telephone Ear Control
  - Reduce gain or mute the input on the opposite device
  - Reduce distractions caused by non-telephone sounds and increase perception of volume for the telephone

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Personalized Sight-and-Sound

- Multicolor LED and Audible Indicators
  - On
  - Program
  - Volume
  - Mute
  - Accessories
  - Flight Mode
  - Battery Warning
  - Microphone Service Check

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Impressive Protection

Trek stands up to everyday exercise, spontaneous splashes, and the imperfections of day-to-day life

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More Protection than Ever

- Compared to previous devices in this segment
- Ingress Protection (IP) rating
- IP68 = Dust-tight and protection against continuous immersion in three feet of water or more.*

* Although highly protected, Trek is not intended for swimming and showering. Encourage patients to use commonsense measures to preserve their electronic devices.
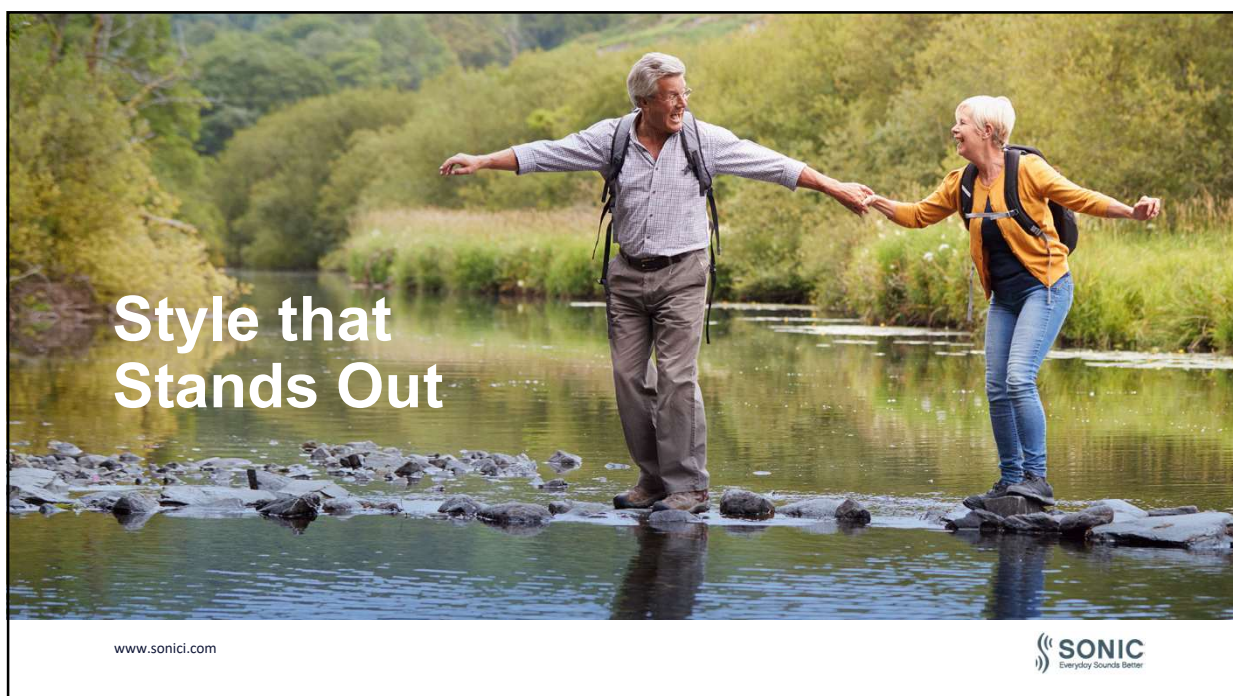
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Tools of the Trade

- Fitting Rationales
  - Default DSL 5
- Adaptation Manager
  - Gradually increase gain
- Data Logging
  - Records information about patient's listening behaviors
- Transfer Fitting
  - Transfer settings from one instrument to another

- Real Ear Fit
  - Uses Inter Module Communication 2 - IMC2 to communicate to REM system
- Noahlink Wireless
  - Best in class wireless programmer
- SoundStudio
  - Experience the sound of Trek right in your office

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Style that Stands Out

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Trek.
Stylish by Design.

1. **Single Push Button**
   » Activates Program change and Flight Mode
   » Provides easy access for up to four listening environments
   » Configurable alerting tones provide audible cue as program is changed

2. **Double Push Button**
   » Activates Volume Control and Mute
   » More sensitive 1 dB volume step size
   » Configurable alerting tones provide audible cue as volume is changed

3. **Multicolor LED Indicator**
   » Allows visual confirmation of Program and Volume change, Battery status, etc.
   » Useful for caregivers, parents, or teachers to check/confirm status of operation

4. **Dual Covered Microphones**
   » Allow for sophisticated directional features to enhance performance in noise
   » Protection from debris and moisture

5. **Battery Compartment**
   » Easy-open design
   » Integrated on/off switch
   » Size 13 (SP) or 675 (UP) battery
   » Tamper-resistant lock keeps the battery secure from children

6. **DAI/FM Compatible**
   » Provides connectivity for Direct Audio Input or FM audio sources
   » DAI adapter 1000
   » FM adapter 10

7. **Acoustic Options**
   » Ships with undamped earhook
   » Damping element available
   » Pediatric earhook available
   » Custom molds available in a variety of styles and configurations

8. **Telecoil**
   » Provides clear sound quality for use with telephones or in looped environments

9. **Non-Telephone Ear Control**
   » Reduces gain or mutes the input from the non-telephone ear

10. **Wireless Connectivity**
   » Near Field Magnetic Induction enables binaural communication between devices
   » 2.4 GHz provides connectivity to external audio sources (mobile phone, television, computer, etc.)

11. **If This Then That (IFTTT)**
   » Connects Trek instruments to other internet-connected smart devices via Sonic Go service

12. **Ingress Protection Rating**
   » Hydrophobic coating and overall design protects against dust and continuous immersion in three feet of water or more
   » IP68

Model Overview

	SP	UP
Battery Size	13	675
Power Model	■	■
Directional Microphones	■	■
Program Button	■	■
Volume Control	■	■
Telecoil	■	■
Wireless Connectivity	■	■
Earhook	■	■
IP Rating	IP68	IP68
Tinnitus SoundSupport	■	■
IFTTT Internet Connection*	■	■
DAI/FM	■	■
LED	■	■

■ Standard

* Requires SoundLink 2 App.

Top shell + button	Beige	Brown	Grey	Black	Red	Blue
Base shell + battery door	Taupe		Dark Grey			

Pediatric Care Kit

Updated Pediatric Kit includes a variety of accessories for the caregiver and child:

- Bag
- Drying and cleaning set
- Cleaning cloth
- Listening tube
- Hand puppet Lion
- Safety cord
- Care guide booklet with instructions for caregivers

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EduMic

- Trek supports all wireless accessories available for the SoundDNA product families **as well as** a new remote microphone – called EduMic

- EduMic is designed for use in modern classrooms

- EduMic offers a transmission range for classroom coverage, one-to-many communication and has a long-lasting battery life to last an entire day in school.

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Reasons to Believe

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Trek's Take Home Message

- Increased power with less audible feedback helps patients hear sounds they were previously unable to hear
- So patients can engage in more conversations, connections, and experiences
- And with advanced connectivity, reliability, and style, Trek gives users the confidence they need to _experience more_ of everyday life

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Thank you!

- As always, thank you for joining me for today's course,
  Trek: Experience More

- Any Questions?
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  - support@sonici.com
  - www.sonici.com

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