


Sound Preference: *Flexibility Leads to Personalization*




ReSound

ReSound LINQ®

Learning Objectives


- After this course learners will be able to discuss the benefits of using either Nature Sounds or the Tinnitus Manager in the ReSound Smart app.
- After this course learners will be able to demonstrate how to program Nature Sounds into a ReSound hearing instrument.
- After this course learners will be able to demonstrate how to use the Tinnitus Manager in the ReSound Smart app.



ReSound

ReSound LINQ®

Back to Basics: Sound as a sense



ReSound

ReSound LINQ®



What does a single droplet
mean to you?

What does a cluster of
droplets mean to you?

Back to Basics: Sound as a sense

The sound of water, depending on tempo, fullness, modulation and many other factors can help us identify particular situations – *Auditory Scene*.



Single Droplet:
Did I shut the faucet off all the way? Annoying



Trickling:
Uh oh! Frustrating



Constant/Full:
Zzzzz... Calming

ReSound LINEX

Sound Preference

Sounds we listen to (and prefer to listen to) can be influenced by factors and contexts such as mood, environment, time of day, etc.

For example...

An alarm clock going off at 7am vs 3am

- 7am implies starting your day, 3am would be very annoying if not intended; or if it goes off unintentionally on a Saturday morning.

Music: we use different types of music for different types of activities and moods

- Up beat with cardio exercise/introspective for meditation; happy for weddings; sad for funerals; notes have different tones/moods; beats per minute (BPM)

Relevant sound therapy:

- Whale songs during a work meeting may not be the preferred choice
- Lyrical music during a university lecture may be distracting



ReSound LINEX

Sound Preference: Variety is the spice of life

Sounds preference has great variance. What is soothing and therapeutic to one individual might be considered annoying and distracting to another person.

Henry et al. (2004)

- Air and water sounds used in sound therapy caused the least amount of annoyance to the subjects. These sounds were preferred over the other options including narrowband, broadband stimuli, and other nature-inspired sounds.

Progressive Tinnitus Management (PTM): Collaborative counseling

- 3 classifications of sounds: Background, Interesting & Soothing
- 3 types: Environmental, Music & Speech



ReSound LINEX

Sound Preference: Variety is the spice of life

Searchfield et al. (2010)

- Sounds used for sound therapy can vary in their temporal, spectral and emotion-evoking characteristics, and showed that individual differences can influence the effectiveness of specific sounds over others.

Reavis et al. (2012)

- Modulated sounds, particularly low-rate amplitude tones with a higher carrier frequency in the tinnitus pitch range, were the most effective sounds in reducing tinnitus loudness.

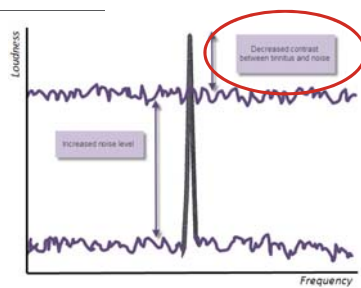
These results demonstrate the variance in tinnitus sufferers' sound preferences.

Preference can also be based on what is available:

- I prefer X sound over Y sound if, but if I have the option, I'd prefer Z sound.

ReSound LINX®

Sound Therapy: The Goal



ReSound LINX®

Flexibility Leads to Personalization

- There are more options for sound therapy than ever before.

- Combination Units
- Advanced tinnitus sound generators
- Wireless connectivity (2.4GHz)
- Apps
- Sound Libraries
- Bluetooth portable speakers
- Bluetooth wireless headphones
- Tabletop sound generators



- Think creatively on ways to implement sound therapy for tinnitus management.

- Using a Bluetooth portable speaker with a sound therapy app; allows for greater portability, endless sound options, cost effectiveness

- Layering of sounds for dynamic soundscapes (ReSound Relief™)

ReSound LINX®

Flexibility Leads to Personalization

With great variance in sound preference, flexible tinnitus tools are needed to meet the individual needs for each patient.



ReSound LINER®

Flexibility offered by ReSound: Tinnitus Sound Generator (TSG)

To allow for a personalized solution, the TSG feature comes with **4 pre-installed selection of tinnitus therapy sounds**, as well as flexible fitting parameters:

Frequency Shaping:

Allows you to frequency shape the white noise according to your patient's preferences

Amplitude Modulation:

Adds a randomized soothing and dynamic ocean wave sensation to the white noise

Environmental Steering™

Automatically adjusts the volume of the TSG depending on listening environment, to ensure listening comfort in all situations



ReSound LINER®

Flexibility offered by ReSound: Nature Sounds

Inspired by nature, the TSG also includes six soothing water-inspired sounds that use the natural sound qualities of their environments. Nature Sounds can be used as an alternative to the Standard TSG.

Nature Sounds:

- Ocean
- Breaking Waves*
- Calming Waves
- Beach Surf
- Shoreline
- Water Creek

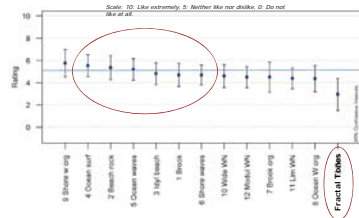


ReSound LINER®

Sound Preference: Variety is the spice of life

DELTA SenseLab (2014)

- Had subjects rate preferences for 13 different water-inspired stimuli.



Great variance in individual preferences. Clear preference of certain nature sounds over fractal tones.

6 sound files circled are Nature Sounds for LINUX².

ReSound

ReSound LINUX²

Flexibility offered by ReSound: ReSound Relief™

ReSound Relief is a multisensory and educational app that empowers the user's sound therapy flexibility. It allows them to personalize soundscapes they find most therapeutic for their tinnitus.

Features include:

- Layering (5) & Customization of sounds
- Educational tips
- Import sounds
- Usage data
- Bubble popping (Tactile)
- Mood coloring (Visual)



ReSound LINUX²

Flexibility offered by ReSound: Smart app: *Tinnitus Manager*

TSG



Controls for:

- Sound Variation
 - Amplitude Modulation
- Pitch
 - Frequency Shaping

Nature Sounds



Choose between the six new Nature Sounds in the HI.



Or, enable white noise to control Pitch. Sound Variation will not be available.

ReSound LINUX²

ReSound

Personalization: Summary



- Because each case of tinnitus is unique, ReSound lets you personalize your sound therapy in the way that best helps relieve your tinnitus.
- ReSound Relief empowers users to create sounds most therapeutic for their individual needs. This can be used for anyone.
- Tinnitus Manager allows the user to personalize the TSG/Nature Sounds settings. You should decide if this is appropriate for your patient.
- Personalized sound therapy and informed counseling have been an effective form of therapy for many people.

ReSound LINX®

Smart app: *Tinnitus Manager*



ReSound LINX®

Tinnitus manager: The benefits

Personalization

- Allows users to modify TSG/Nature Sounds to their particular and unique preferences.

Flexibility

- Allows users to make modifications to sounds, offering a greater variety of sound therapy options.
- Allows users to make on-the-fly adjustments should their sound therapy preferences change based on factors such as time of day, mood, environment, etc.

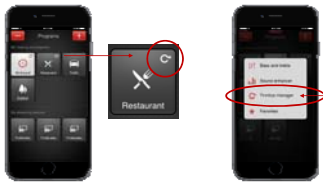
Convenience

- Allows users to make adjustments to sound therapy without having to visit their hearing healthcare professional.

ReSound LINX®

Tinnitus manager: Availability for users

- The Tinnitus manager will only be visible in the app in active mode if the TSG has been enabled in the HI via FSW (Aventa).
- The Tinnitus manager is always visible in demo mode.



If TSG is enabled in a program, a Tinnitus icon (vicious cycle) will show on the program button

If available per program, Tinnitus manager will show in the *More Options* menu

ReSound LINEX


Tinnitus manager: The features

If fit in Aventa: TSG

Controls for:

- Sound Variation
 - Amplitude Modulation
- Pitch
 - Frequency Shaping

If fit in Aventa: Nature Sounds



Note: Even if AM is not active in FSW (OFF), it will be an active option in the app.

Choose between the six new Nature Sounds in the HI.


Or, enable white noise to control Pitch. Sound Variation will not be available.

ReSound LINEX

Tinnitus manager: Feature details

- Per-program adjustments are same steps as in FSW (Aventa)

- Sound Variation (Amp Modulation): Off, Mild, Moderate, Strong
- Pitch (Frequency Shaping):
 - Low: Off, 500 Hz, 750 Hz, 1000 Hz, 1500 Hz, 2000 Hz
 - High: 2000 Hz, 3000 Hz, 4000 Hz, 5000 Hz, 6000 Hz, Off
 - NB: If either Low or High is set at 2000, the other handle can only go to the nearest value (Low: 1500, High: 3000)
- Nature sounds: Shoreline, Beach Surf, Breaking Waves, Calming Waves, Ocean & Water creek



ReSound LINEX

Tinnitus manager: Feature details

- Adjustments 'stick' per program unless...
 - 'Undo' button is pressed (changes Tinnitus Manager settings only)
 - Tap base program twice on program selection screen, user will get the option to restore original program settings.
 - Master reboot of the HIs is performed
 - 'Favorite' with original Tinnitus Manager settings is selected
- Save as Favorites
 - Can save Tinnitus Manager settings to a Favorite and select this when preferred.

ReSound LINX®

Restore original program settings (for Tinnitus Manager only)

Pressing the *Undo* button will return the user's settings to the original TSG program settings.

The *Undo* button only applies to changes in Tinnitus Manager settings.
It does not apply to changes applied in Sound Enhancer or Bass/Treble.



ReSound LINX®

Restore original program settings (for all settings)

By tapping the base program twice on program selection screen, user will get the option to restore original program settings.



ReSound LINX®

Favorites in the Smart app

Tinnitus Manager settings can be saved as a Favorite just like any other feature within the Smart app.

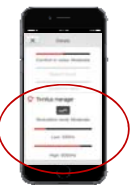
A favorite will be removed when...

- A base program of a Favorite has been removed
 - E.g. Favorite is based on Program 2 settings, then that Program 2 is removed
- If conditions for use of the advanced features in the app have been removed:
 - Noise Tracker II / Sound Cleaner Pro set to Per Environment
 - Directionality setting is something other than Adaptive Directionality
 - WindGuard/Wind noise reduction disabled
 - TSG disabled

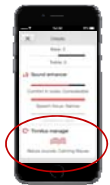
ReSound LINX™

Tinnitus Manager: Favorites (Details)

If fit with: **TSG**



If fit with: **Nature Sounds**



ReSound LINX™

Compatibility for v. 3.1

Hearing Instruments

- ReSound: ReSound LINX², ReSound LINX, ReSound LINX TS, ReSound Enzo, ReSound Up Smart

iOS devices

- Apple Watch (Tinnitus Manager N/A), iPhone 6, iPhone 6 Plus, iPhone 5s, iPhone 5, iPhone 5c, iPad Air 2, iPad Air, iPad (4th gen), iPad mini 3, iPad mini 2, iPad mini with Retina display, iPad mini, iPod touch (5th gen). Optimized for iPhone 5.

iOS versions

- iOS 7.0 or later. If used with iPhone 6 or iPhone 6 Plus, iOS 8.1 or later is recommended.
- Apple Watch requires min. iOS 8.2

Android

- Soon to come

ReSound LINX™