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Phonak Pediatric Roger Solutions: At home and in school

Brandy Heckroodt, AuD

A solid green circle is located on the left side of the slide, partially cut off by the edge.

Presenter disclosures

- Financial: I am employed by Phonak.
- Non-financial: I have no relevant non-financial relationships to disclose.



Learning Objectives

After this course, participants will be able to

1. explain how hearing aid selection impacts a student in the classroom
2. identify when to choose a specific Roger microphone for home use
3. list Roger solutions applicable to children and their families



Hearing well at home, at school, and in daily life starts with the hearing aid

Solutions for children, tweens, and teens

What's in a name?

Sky M50-SP

Naída P70-UP

Audéo L90-RL

Portfolio > Platform > Performance level > Model

Strong pediatric hearing aid portfolio



Sky M-M



Sky M-PR



Sky M-SP



Sky Link M



Naída P-UP



Audéo P-312



Audéo P-13T



Audéo L-R



Audéo L-RT



Audéo L-RL



CROS P-13/R

Phonak Audéo Life

Parylene-coated internal circuitry

Additional microphone protection

Lithium-ion rechargeable battery



Pin-less receiver port

Inductive charging coil

**Silicone sealings at seams
and housing openings**

Audéo Life vs. IP68



	Audéo L-RL	IP68-only hearing aid
Water-resistant at 1 m for 1 hour	Yes (IP68)	Yes (IP68)
Waterproof at 50 cm	Yes	No
Freshwater tests	Yes	Yes
Pool water tests	Yes	No
Salt water tests	Yes	No
Sweat tests	Yes	No

Marvel, Paradise, & Lumity – Streaming protocols

Roger™



Binaural VoiceStream Technology™



**Bluetooth®
Classic**



**AirStream™
technology**



**Bluetooth®
Low Energy**



Why is Roger needed?



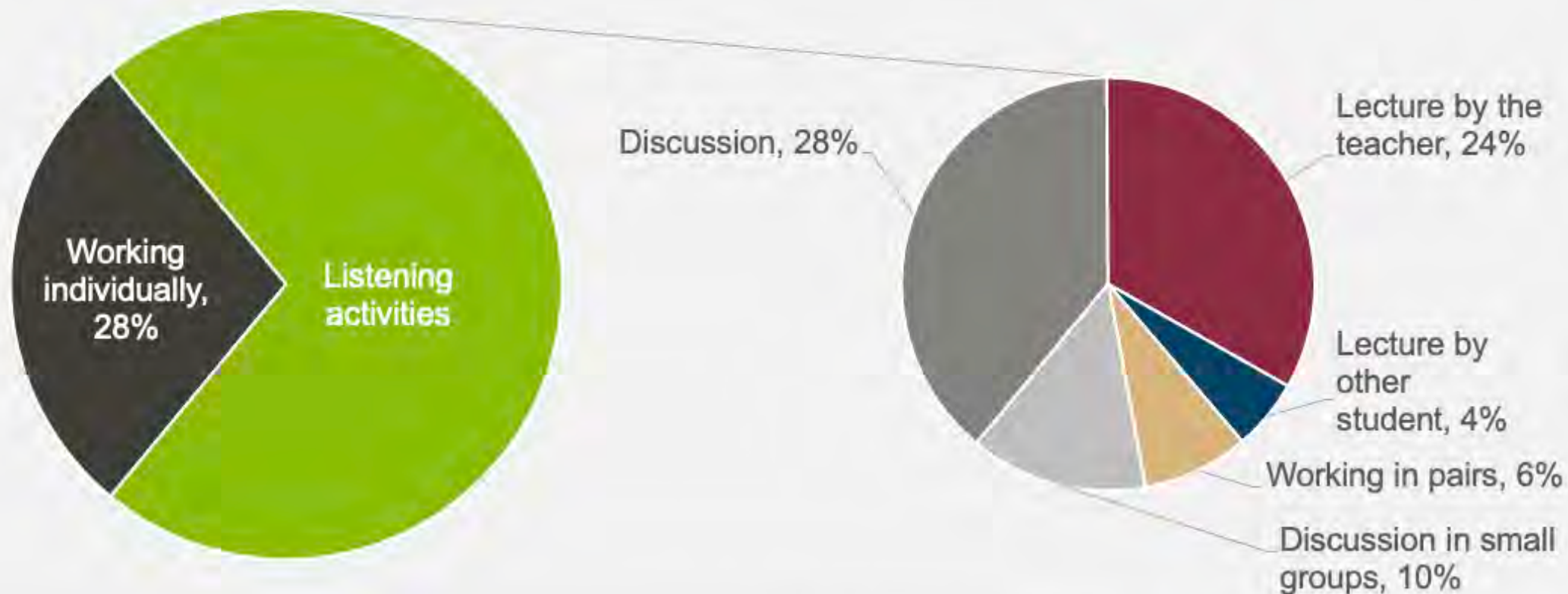
A day in the life

40%

of speech in a child's typical day comes from a distance of over six feet and/or with 'overlapping' noise



Hearing more means learning more



Léjon, A.K. (2013). Inclusion or Exclusion: Children with hearing loss, are they really integrated in the classroom? Comfort Audio White Paper. Retrieved from www.phonakoro.com

Understanding speech in background noise is more difficult for children

Children listen differently compared to adults¹



Their auditory network and listening skills are still developing²



This can compromise their ability to learn³



Ear infections, with temporary hearing loss, is common in young children and adds further challenge⁴



¹ Palmer, C.V. (1997). Hearing and listening in a typical classroom. *Language, Speech and Hearing Services in Schools*, 28, 213-218.1

² Flexer, C. (2002). Rationale and use of soundfield systems: An update. *The Hearing Journal*, 55(8), 10-18.

³ Wolfe, J., Morais, M., Neuman, S., et al. (2013). Evaluation of speech recognition with personal FM and classroom audio distribution systems. *Journal of Educational Audiology*, 19, 65-79.

⁴ Millett, P. (2008). Soundfield amplification research summary. York University. Retrieved from <http://simeoncanada.com/technology/research-innovation/>

Classroom acoustics

For Unoccupied Classroom Acoustics, ASHA recommends¹ that:

Noise levels do not surpass
35 dB(A)

35dB

SNR should be at least
+15 dB at the child's ears

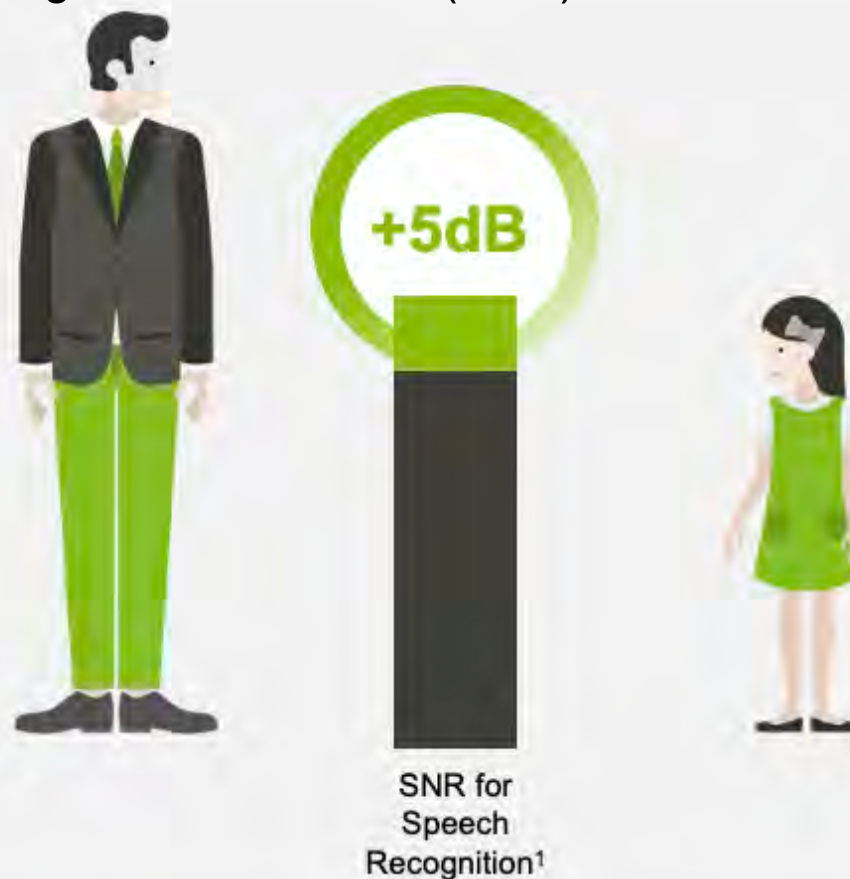
15dB

Reverberation times must
not exceed
0.6 seconds in smaller
classrooms or **0.7 seconds**
in larger rooms

0.6s
0.7s

The impact of background noise in the classroom

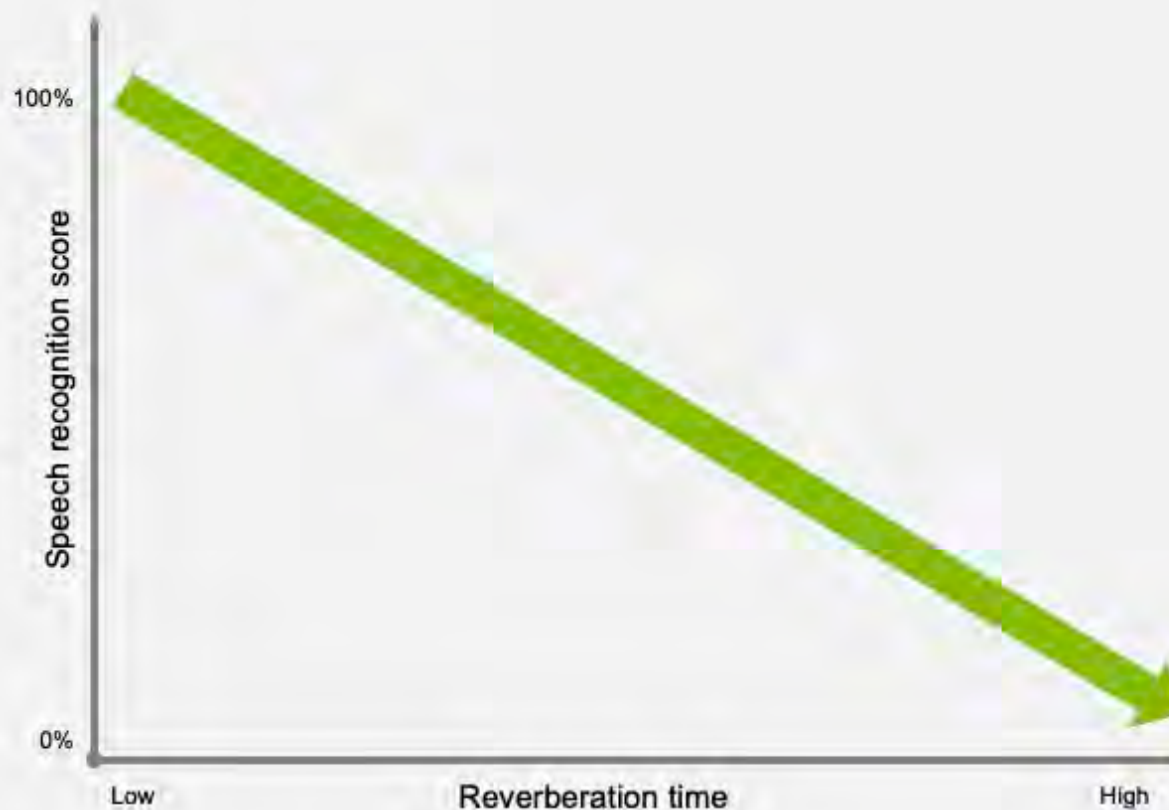
Children require a more favorable signal-to-noise ratio (SNR) than adults¹



¹ Boothroyd A (1997). Auditory development of the hearing child. Scandinavian Audiology, Supplemental, 46, 9-16.

The impact of reverberation

Speech recognition scores decrease as reverberation time increases¹



¹ Nabelek, A., & Nabelek, I. (1985). Room acoustics and speech perception. In J. Katz (Ed.), Handbook of Clinical Audiology (3rd ed.). Baltimore: Williams and Wilkins.

Typical classroom acoustics

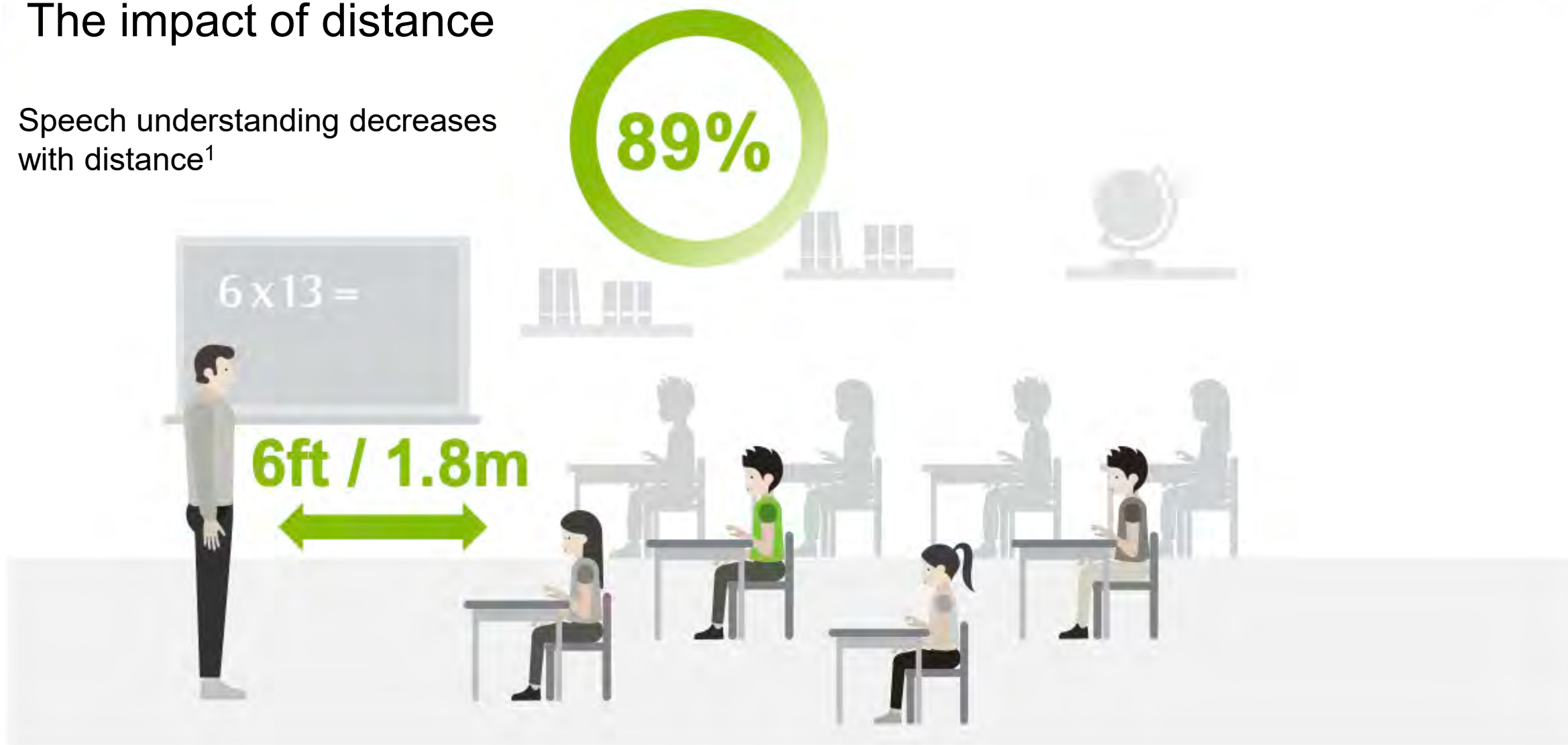


The impact of distance

Speech understanding decreases
with distance¹

89%

6ft / 1.8m



¹ Crandell, C., & Bess, F. (1986). Speech recognition of children in a "typical" classroom setting. American Speech, Language, & Hearing Association, 29, 87.

Roger: How it works



roger



Adaptive – As the background noise gets louder, the Roger signal gets louder too



Automatic – AutoSense OS selects the Roger program. Automatic microphone modes

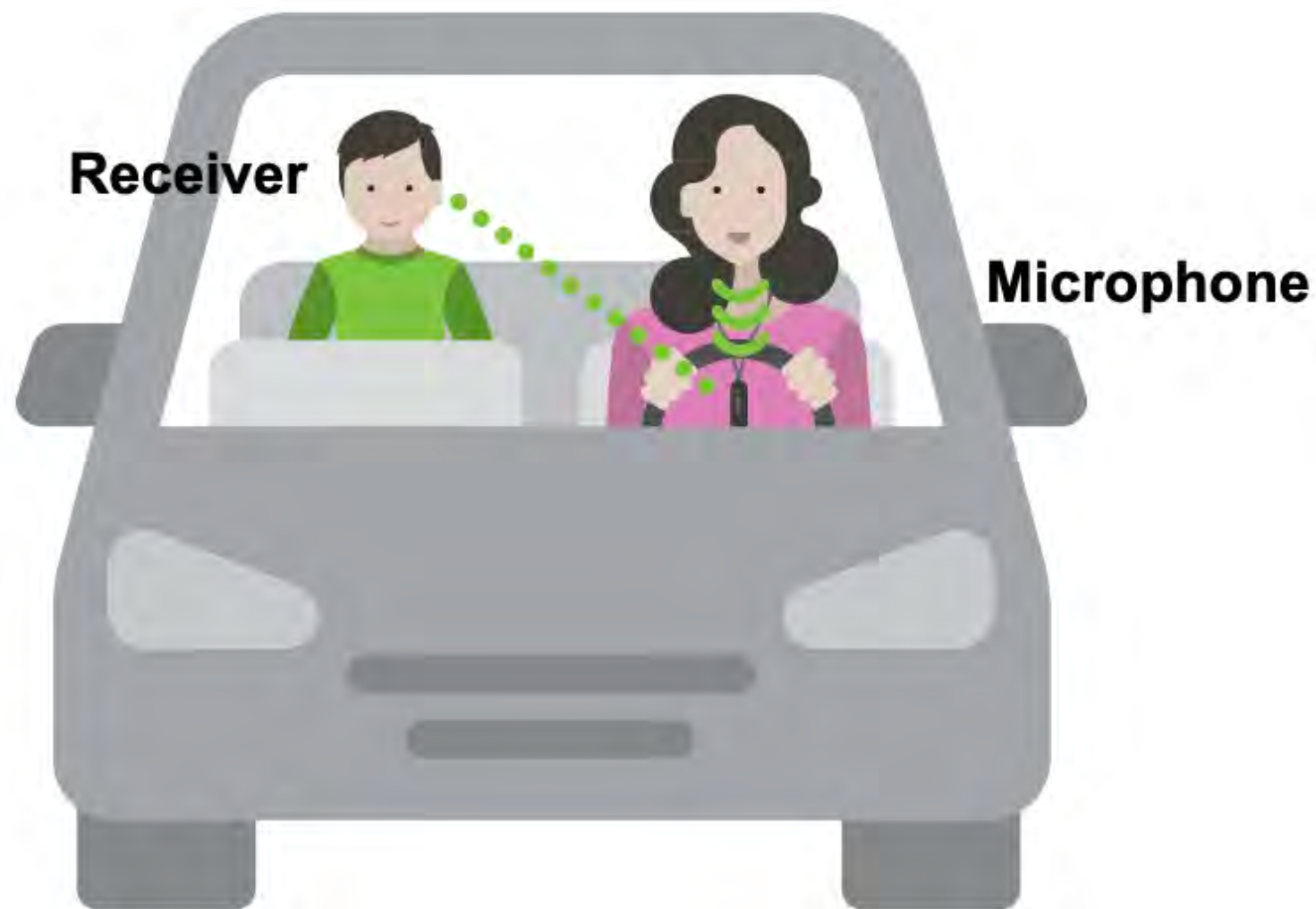


Access to multiple talkers – MultiTalker Network provides access to multiple talkers in any situation



Compatibility – Roger is compatible with almost any hearing aid and cochlear implant

What is a Roger system?



Roger receivers

Universal



Roger X*



Roger Neckloop



Roger Focus II

Design Integrated for HIs



Roger 18



Roger 19

Design Integrated for CIs



Roger 20**



Roger 21



Roger 14



Roger 17

Roger NeckLoop

- Universal Roger receiver
- Compatible with Non-Phonak hearing instruments through T-coil
 - Manual Public T-coil program needed
- Replaces MyLink and Digimaster X receivers
- NeckLoop
 - Detachable
 - Long and short sizes available
- Standard 3.5mm audio jack
- LED Screen & battery indicator

roger



Roger Focus II

Ear-level receiver for:

- Auditory Processing Disorder
- Autism
- Dyslexia
- English Language Learners
- ADHD
- Unilateral Hearing Loss
 - Fit on normal hearing ear



- NOT a hearing aid
- Available in 312 battery & rechargeable models
- Can be used with any Roger microphone
- Couples via slim tube and open domes
- Volume button with locking feature
- Indicator light & tamperproof battery door option

RogerDirect™

- RogerDirect is a **feature**
 - A Roger receiver is still necessary
 - Roger microphones can connect and stream directly to Phonak hearing aids without the need to physically attach a Roger receiver



Up to **42%**

Smaller*

Up to **32%**

Lighter*

*Sky M-M vs Sky B-P + Roger 18 (Design Integrated Receiver)

RogerDirect: Found in Marvel, Paradise, and Lumity



Sky M-M



Sky M-PR



Sky M-SP



Sky Link M



Naída P-UP



Audéo P-312



Audéo P-13T



Audéo L-R



Audéo L-RT



Audéo L-RL

Roger
microphones/transmitters

Roger for education



Roger for home/adults



Roger receivers





Roger for Education Portfolio



roger



Roger Touchscreen Mic benefits

Touchscreen with
swipe technology

Indicator lights
including
obvious mute
status

10 hours of
battery life

Accelerometer
and automatic
microphones

One microphone
for teachers or
teenagers



Touchscreen Mic with automatic microphone modes



Lanyard



Small Group



Pointing

Roger Pass-around benefits

Light-weight and
small

Two
indicator
lights

Safe and secure
table stand



Improved mute
functionality

Volume controls
and automatic
sensitivity

Roll
prevention

Roger Multimedia Hub benefits

Two indicator
lights

Mixing of audio
and voice
simultaneously

Ideal for
independent
listening activities



Roger DigiMaster SoundField Speakers

- Developed by scientists, engineers, and audiologists
- Adaptive: Ensures positive signal to noise ratio
- Only one DigiMaster 5000 is needed per normal-sized classroom
- Two or more DigiMaster 7000s can be networked for larger spaces
- No professional installation required
- Bluetooth® connectivity to connect smart devices



Roger SoundField benefits

- No seating limitations for children
- No mobility limitations for teachers
- Reduced vocal strain and throat infections for teachers
- Improved reading, phonemic awareness and phonic skill
- Increased attention and focus
- Greater ability to learn, follow directions and accomplish higher academic achievements
- Positive impact on:
 - Behavior and attitude
 - Engagement, interaction and active participation
 - Self-esteem
- Reduces stigmatization of children with learning disabilities, hearing loss, ADHD, and English language learners



Digimaster Setup options



A Wall
Mount



Floor Stand



A Desk Stand



A Tripod

Roger WallPilot

- Ideal for all network management
- Simple to install and set-up
- Placed on the wall in the classroom close to the entrance door
 - Multiple WallPilots for multiple entrances
 - Reduced range option
- Works automatically
 - Connects Roger receivers & microphones to classroom network



Roger Repeater



- Roger range extender device
- Adds on an additional 66 feet to Roger transmission
- Connects to Roger primary microphone
- Useful in auditoriums, gymnasiums, cafeterias, and other larger spaces
- Compatible with Roger for Education mics, Roger Dynamic SoundField, and Roger receivers

Roger for education portfolio



Roger Pass-around Mic



Roger Touchscreen Mic



Roger DigiMaster



Roger Multimedia Hub

Roger for home portfolio



Roger On
Roger On iN



Roger Select
Roger Select iN



Roger Clip-on
Mic



Roger Table Mic II
Roger Table Mic II iN

Receiver/microphone compatibility

(02) receivers



Touchscreen
Mic



Pass-around
Mic



Multimedia
Hub

(03) receivers



Roger On
Roger On iN



Roger Select
Roger Select iN

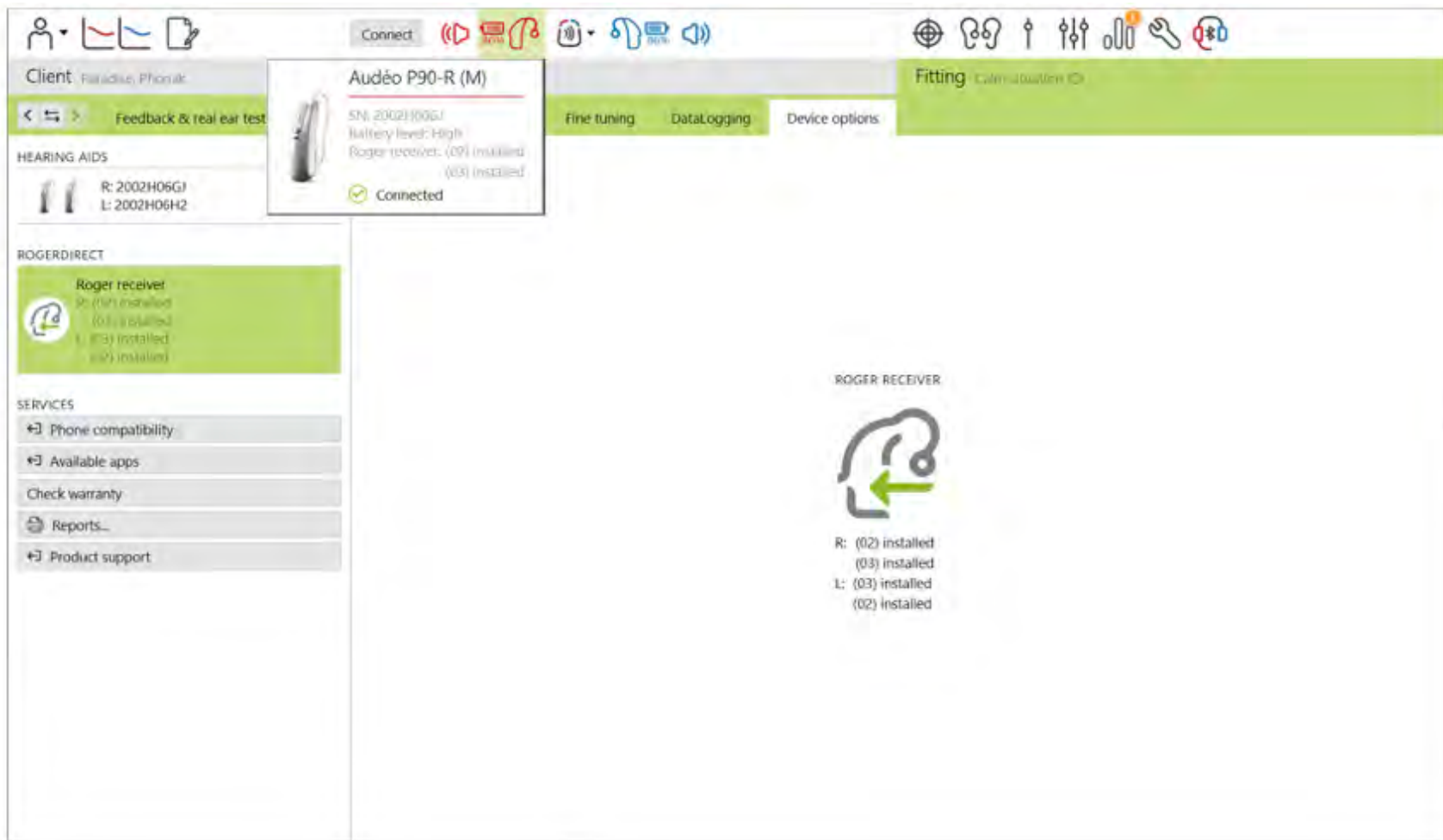


Roger Clip-on
Mic



Roger Table Mic II
Roger Table Mic II iN

RogerDirect status in Target



- Device options → Left side of screen ROGERDIRECT
- Hover cursor over hearing aid icon at top of Target screen → drop down will show Roger receiver status (02/03)
- Once these settings have been saved in Target, you do not have to connect the hearing aid to Target in order to see that Roger has been installed

Roger for home portfolio



Roger On
Roger On iN



Roger Select
Roger Select iN



Roger Clip-on
Mic



Roger Table Mic II
Roger Table Mic II iN

Roger at home

54% better speech understanding compared to other remote mic technologies¹

5300

more words
per day!²

12%

more child-
directed speech³

Better

receptive discourse
skills⁴

Significantly better access to both **quantity**
and **quality** of language

1. Thibodeau, L. (2014). Comparison of speech recognition with adaptive digital and FM remote microphone hearing assistance technology by listeners who use hearing aids. *American Journal of Audiology*, 23(2), 201–210.

2. Benitez-Barrera, C., Angle, G., & Tharpe, A.M. (2018). Remote microphone system use at home: Impact on caregiver talk. *Journal of Speech, Language and Hearing Research*, Vol. 61, 399–409.

3. Bacic, L. & Tharpe, A.M. (2019). Impact of remote microphone system use on access to child-directed speech when used in homes of children with hearing loss. *Field Study News*, in preparation.

4. Curran, M., Walker, E., Roush, P., & Spratford, M. (2019). Using Propensity Score Matching to Address Clinical Questions: The Impact of Remote Microphone Systems on Language Outcomes in Children Who Are Hard of Hearing. *Journal of Speech, Language, and Hearing Research*. 62 (3): 564-576.

Roger On/On iN

Display

- Microphone mode
- Device status
- Battery status

Three microphones in a triangle

- MultiBeam 2.0 Technology

Three microphones in a row

- Pointing mode 2.0

Button

Two colors

- Champagne
- Graphite grey

On/off

- Clear indication of on/off

Clip

Charging

- USB-C
- 8 hours usage
- 3 hours charging



Automatic switching to the situation



Presenter mode

with orientation-independent in
presenter mode



Pointing mode 2.0

with three microphones



Table mode

with MultiBeam 2.0 Technology



Streaming TV and Multimedia

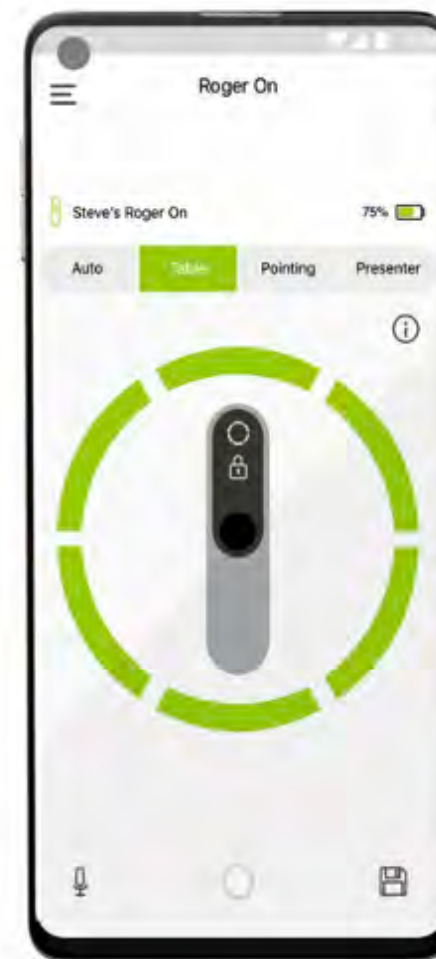


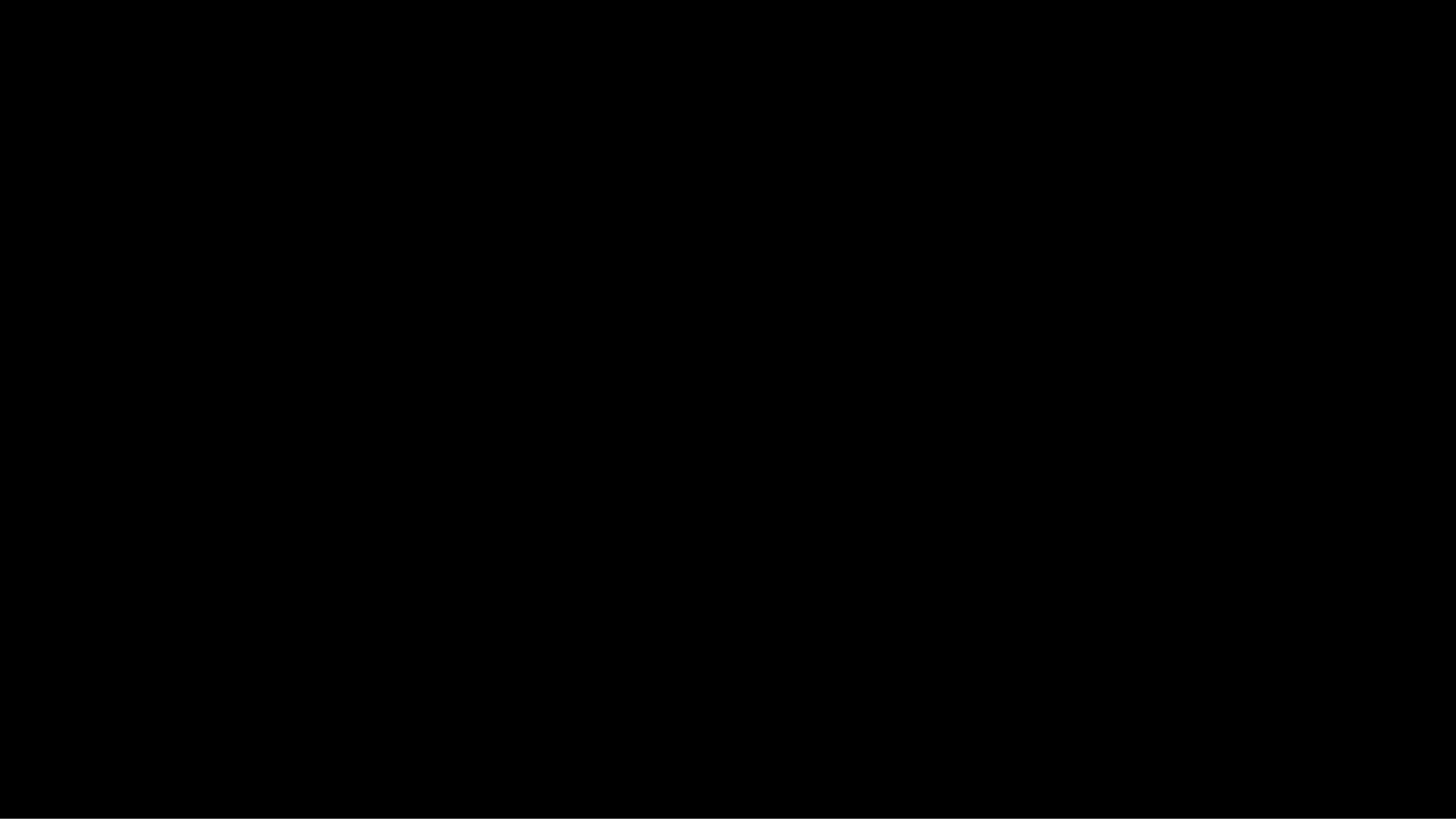
myRogerMic app to personalize

With myRogerMic app you can:

- Steer microphone beam
- Change microphone mode
- Mute and unmute
- See microphone status
- Save custom modes
 - Specific to different scenarios/situations

For Roger On/On iN only





Roger Select

MultiBeam Technology

Ease of use through Table mode,
Selection mode and Lapel mode



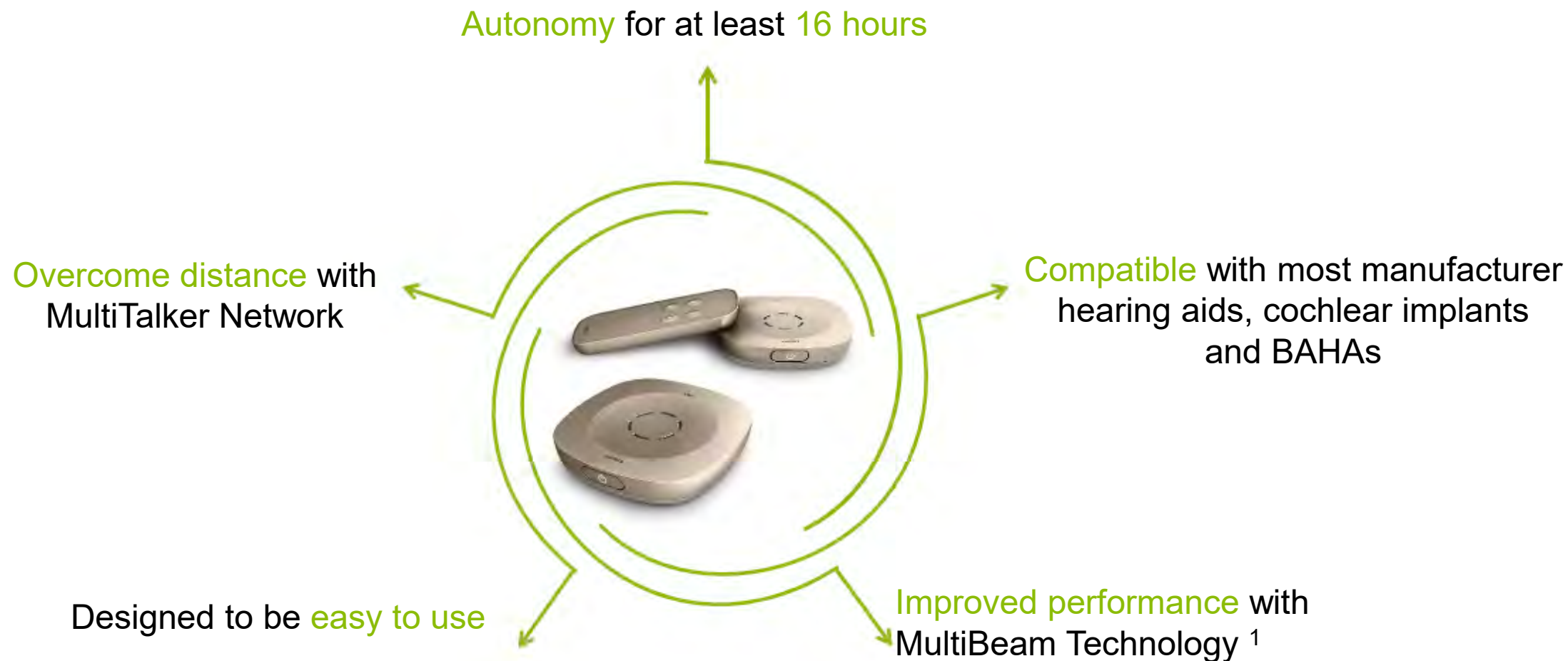
Multi-functionality with
cellphones calls, TV or multimedia

Completely compatible with most
manufacturer hearing aids, cochlear
implants and BAHAs

Roger Clip-On Mic



Roger Table Mic II



¹ Based on preliminary data. Peer-reviewed article and Field Study News in preparation, available end of 2018 at www.phonakpro.com/evidence



Roger Use Cases

Roger use cases



Roger Touchscreen Mic



Roger On



Roger Select



Roger Clip-on Mic

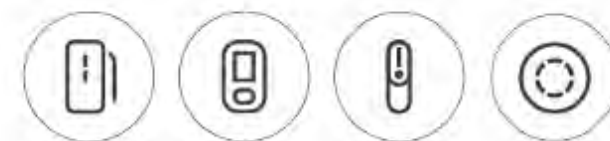
Sitting in a stroller





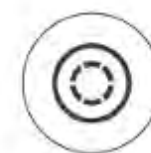


Car journeys





Playing games



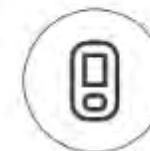
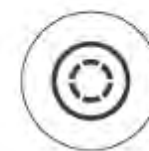


Mealtimes





Parks and playgrounds



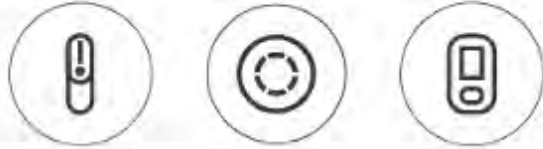


Connectivity

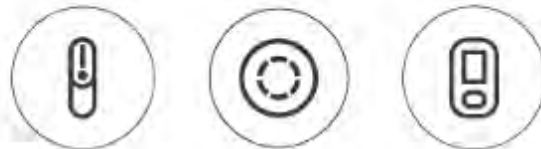


Roger Use Cases

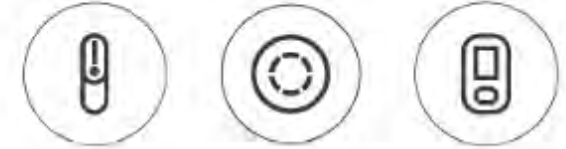
Mealtimes



Playing games



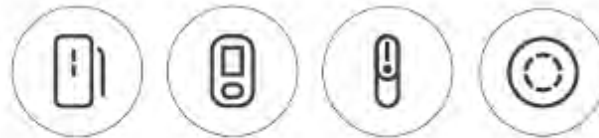
Parks and playgrounds



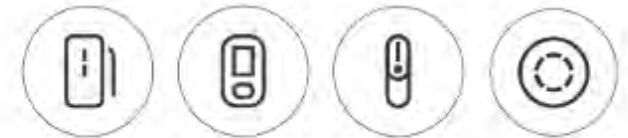
Sport activities



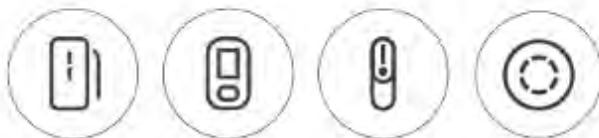
Extracurricular activities and clubs



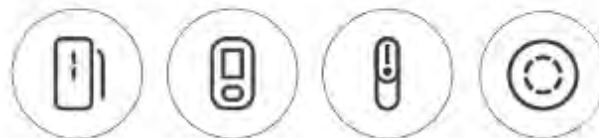
Car journeys



Sitting in a stroller



Connectivity





Roger vs other
remote microphones

How is Roger different?

	Phonak Roger	Other Remote microphones
Universal solution	Yes	No
Adaptive gain	Streamed signal increases respective to ambient noise level	Same output
Personalization of adaptive gain	Standard vs Dual	N/A
Microphone beamformer in remote microphone program	Adaptive from RES to Fixed directional	Same directionality as in General acoustic program

Roger vs other remote microphones – technical measures

- Technical check by Phonak UK
- Used methods that can be replicated out in the field using your own verification equipment
- Compared Phonak Roger Touchscreen mic functionality to other remote microphones
 - Measured latency
 - Signal frequency analysis



Back to basics: Latency

What is it?

Refers to a short period of delay (usually measured in milliseconds) between when an audio signal enters a system and when it emerges

What is it in terms of remote microphones and hearing aids?

The time it takes for a spoken signal into a remote mic to reach and be processed by the hearing aids.



When is latency important?

Less important – Only audio	Important - Audio & Visual both present
Phone Calls	Streaming media (TV/Movies)
Music streaming	Classroom Instruction/Lectures
Podcasts	Zoom/Remote meetings

When does it have an effect?



> 45 ms



30 ms to 40 ms



> 30 ms

Hearing aid latency

- Aids programmed with N3 hearing loss (mild sloping to moderate)
- Test measured via an Interacoustics test box
 - You can replicate this test if your verification equipment has the option

Sky M



Input level	70 dB
Average delay	7.0 ms
Stimulus	Chirp
Coupler type	2 cc (IEC 60318-5)
Battery	Standard battery
Smoothing index	0

Remote microphone latency

Sky M & Roger Touchscreen Mic



Input level	70 dB
Average delay	23.0 ms
Stimulus	Chirp
Coupler type	2 cc (IEC 60318-5)
Battery	Standard battery
Smoothing index	0

Bluetooth LE Streamer 1 & compatible hearing aid



Input level	70 dB
Average delay	46.0 ms
Stimulus	Chirp
Coupler type	2 cc (IEC 60318-5)
Battery	Standard battery
Smoothing index	0

Remote microphone latency

Bluetooth LE Streamer 1 & compatible hearing aid

Input level	70 dB
Average delay	46.0 ms
Stimulus	Chirp
Coupler type	2 cc (IEC 60318-5)
Battery	Standard battery
Smoothing index	0



Bluetooth LE Streamer 1 with Roger X & compatible hearing aid

Input level	70 dB
Average delay	28.3 ms
Stimulus	Chirp
Coupler type	2 cc (IEC 60318-5)
Battery	Standard battery
Smoothing index	0

Remote microphone latency

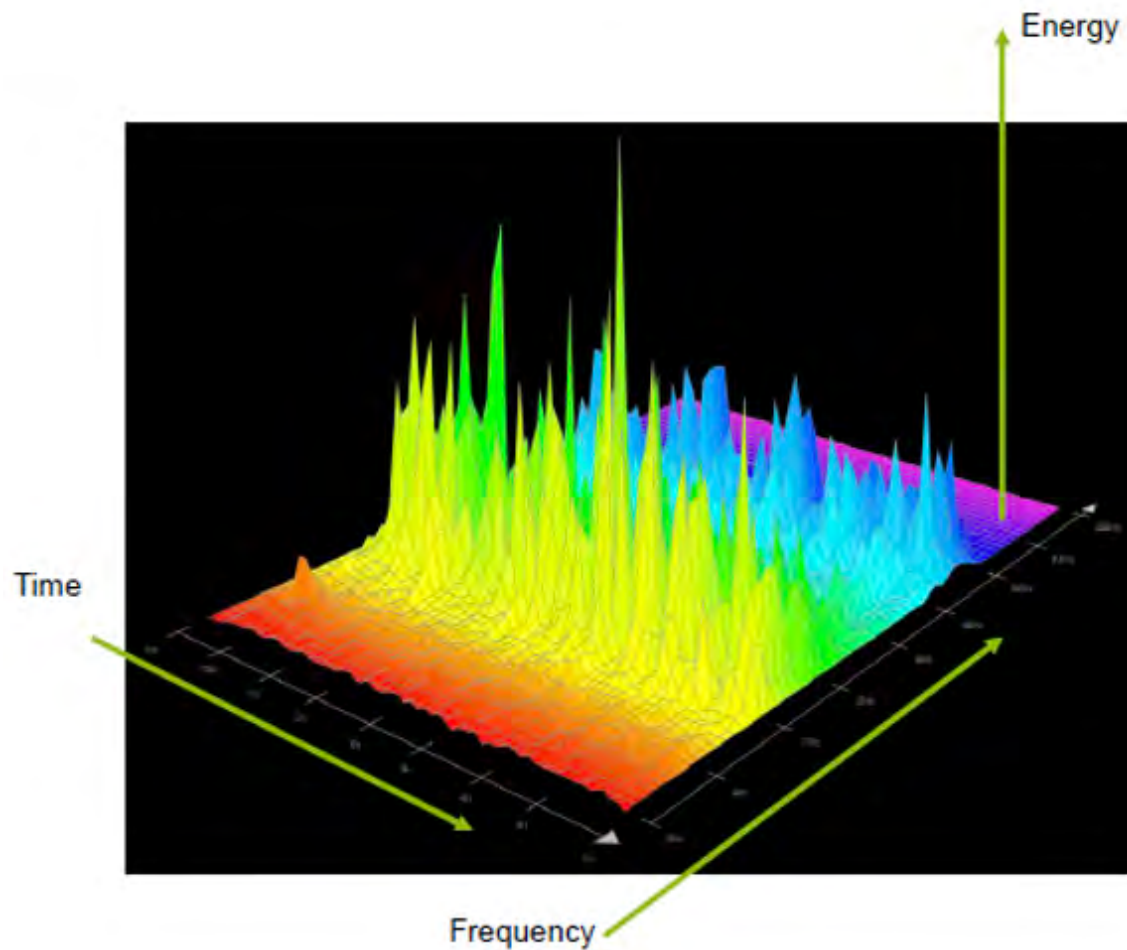
Bluetooth LE Streamer 2 & compatible hearing aid

Input level	70 dB
Average delay	33.9 ms
Stimulus	Chirp
Coupler type	2 cc (IEC 60318-5)
Battery	Standard battery
Smoothing index	0

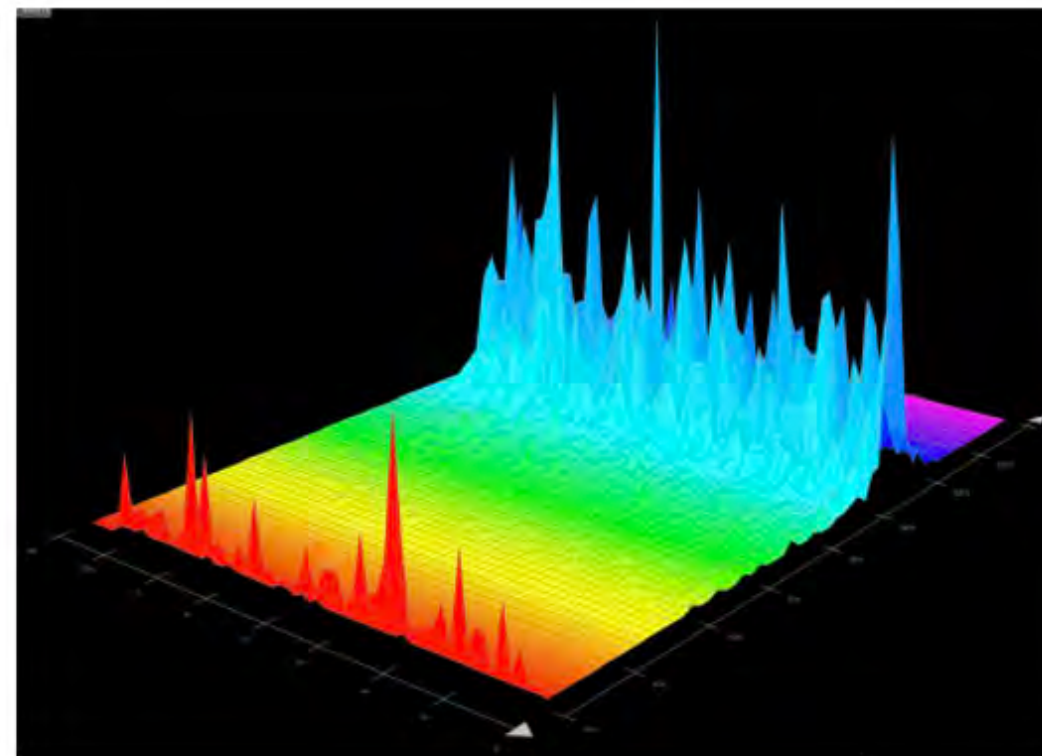


Bluetooth LE Streamer 3 & compatible hearing aid

Input level	70 dB
Average delay	41.6 ms
Stimulus	Chirp
Coupler type	2 cc (IEC 60318-5)
Battery	Standard battery
Smoothing index	0



Roger Touchscreen Mic



Bluetooth LE Streamer 1

WaveLab is a digital audio editor and recording computer software application for Windows and macOS, created by Steinberg.



Roger – Benefits for all

- **Universal compatibility**
- Adaptive gain model – **Increases speech intelligibility and decreases listening effort**
- **Low latency and a full audio bandwidth signal**
- **Extensive** Roger portfolio
- **Proven performance**



Together we
change lives